

August 2020

Whitney Road Corridor Plan



AVI, PC

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Whitney Road Corridor Plan

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Numerous agencies, local associations and individuals devoted their time to the development of this document, including but not limited to:

Cheyenne Metropolitan Planning Organization

Policy Committee
Technical Advisory Committee
Citizens Advisory Committee
Whitney Road Steering Committee

Laramie County

County Commissioners
Planning Commission
Laramie County Planning and Development Office
Public Works

City of Cheyenne

City Council Planning Commission

Community

Interested Stakeholders Property Owners Area Residents





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Kimberly-Horn-Whitney Ranch Traffic Study
US30 Corridor Study -Kimley Horn



Introduction

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1.0 INTRODUCTION

Various areas in East Cheyenne and Laramie County have begun to develop and redevelop in the last several years. Until the previous decline in energy related oil, gas, and mineral extraction, the area has seen a steady growth in the job market as a result of a number of new industrial companies, age related baby boomer market businesses including health care providers, long-term care, and health care support businesses. This growth has increased the demand for additional housing in area. Consequently, fringe City and County residential developments like Saddle Ridge Subdivision have begun to advance in un-platted and open parcels available within and surrounding the City of Cheyenne. Saddle Ridge Subdivision entailed a 209 acre residential housing development and has steadily reached build-out. The subdivision has recently been expanded to a twelfth filing to the east and other housing and mixed use developments have now been prompted to develop within Laramie County including Whitney Ranch.

The estimated population for the City of Cheyenne in 2020, 2030, and 2040 is projected to increase from 65,891 to 71,848 to 75,621 residents according to the Department of Administration and Information Economic Analysis Division. This corresponds to approximately +9.0% over the next 10 years and +14.8% over a 20 year period. As the community continues to experience growth, the existing transportation system will not be sufficient to accommodate all the expansion.

A number of important transportation connections in the eastern Cheyenne roadway network, north of I-80 and south of Iron Mountain Road, have not been completed or planned. The need for an east west connector other than Dell Range Blvd. and Pershing between Whitney Road and College Drive has been evident for quite some time as potential rural residential developments adjacent to the area have begun to emerge.

The boundaries of the Whitney Road Corridor Study are U.S. 30 to the south and Beckle Road/ Storey Blvd. to the north. The boundary is illustrated in Figure 1.1 Corridor Study Area and Vicinity Map.



Introduction

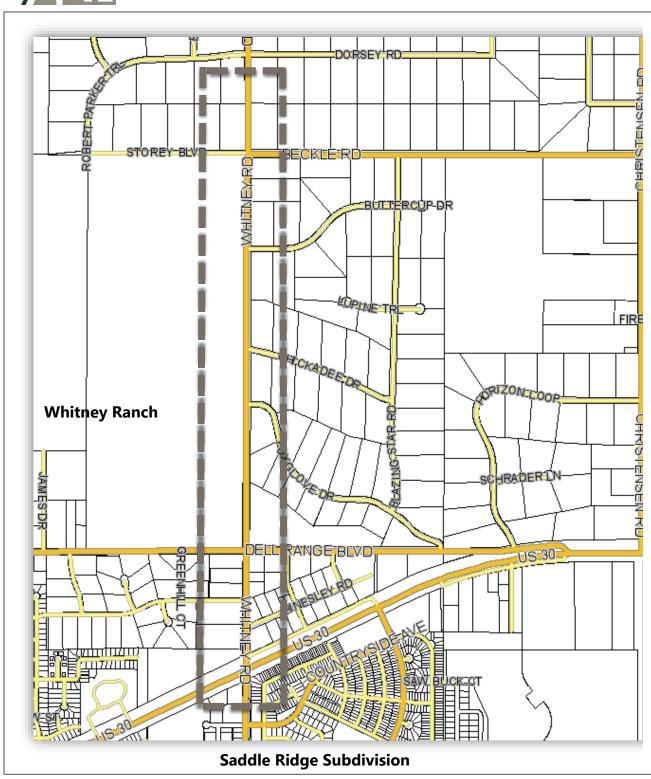


Figure 1.1 Corridor Study Area and Vicinity Map



Introduction

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The project was reviewed with oversight by a steering committee comprised of the following agencies or representative organizations:

- The Cheyenne Metropolitan Planning Organization.
- Laramie County Public Works.
- Cheyenne Urban Planning.
- City Engineering.
- Black Hills Energy.
- High West Energy.
- City of Cheyenne Board of Public Utilities.
- WYDOT District #1.
- WYDOT Traffic.

The primary objective of the plan is to create a comprehensive plan which strives to optimize safety, growth, and fiscal responsibility. After discussion with the members of the Steering Committee, the goal of the project was to create a 10% design corridor plan for the future development of Whitney Road that met the following criteria:

- Understand the community and neighborhood vision for the roadway.
- Improve roadway and intersection safety and function.
- Address drainage and snow drifting.



Glimpse

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2.0 GLIMPSE

The Glimpse section of the plan provides a summary of the review of the known existing information related to the roadway, right-of-way, and planning area.

History and Platting

Prior to platting, the roadway was likely used by local ranchers, property owners, and businesses as a shared access road. Based on the Cheyenne – Laramie County Cooperative GIS Database Search/Interactive Mapping Site [1], the first recorded plat of Whitney Road was the Foster Tracts Subdivision recorded on September 29, 1952.

U.S. 30 to Dell Range (Middle Section)

The Foster Tracts, 2nd Filing dedicated 33' of Whitney Road right-of-way on the east side of Section 24 from U.S. 30 to the north approximately 1,348.2' or what is now Dell Range Blvd. A total of 66' of right-of-way was illustrated on the plat (Figure 2.1 Foster Tracts Subdivision 2nd Filing Plat with a 66' Right-of-way width).

It appears that an additional 7' of right-of-way was dedicated for a total of 40' based on survey monuments located in the field. Other platting continued to the west of the corridor with the Final Plat of Greenmeadow Estates recorded in June 2019 (Figure 2.2 Greenmeadow Estates Subdivision 40' West Right-of-way). This plat dedicated a right-of-way width of 40' west of the east line of Section 26, Township 14 N, Range 66 West from Dell Range Blvd. to the south for 949.30'. The remainder of the west right-of-way line of Whitney Road from U.S. 30 to Greenmeadow Estates is defined by un-platted 5.0 acre mobile home park boundary and the Jolly Roger Subdivision. The Jolly Ranch Subdivision dedicated approximately 40' of right-of-way and an additional 10' Road Reservation from the east line of Section 26, T 14 N, R 66 W. The plat was recorded on May 10, 1994 (Figure 2.5 Jolly Rogers Subdivision).

Dell Range to Beckle Road/ Storey Blvd. (North Section)

The north portion of the corridor (i.e. north of Dell Range Blvd.) was first platted with the Meadowlark Estates plat recorded on November 19, 1997 (Figure 2.3 Final Plat Meadowlark Estates 40' Right-of-way East of West Section Line 24). The plat dedicated 40' of right-of-way from the west line of Section 24 to the east. The west right-of-way is defined by deed on an un-platted parcel owned by Gysel Whitney, LLC. Development based on a boundary survey conducted by AVI. This area is under development planning and future right-of-way needs should be addressed during the development agreement process.



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U.S. 30 to Country Side Avenue (South Section)

The south right-of-way for the section of Whitney Road was dedicated by two plats. The first was the Saddle Ridge Subdivision recorded June 27, 2007 (Figure 2.4 Saddle Ridge Subdivision). The Saddle Ridge Subdivision dedicated a total of 50' of right-of-way from the west line of Section 25 to the east. The east right of right-of-way was confirmed by the US 30 Business Plaza recorded February 9, 2016 to be 40' east of the West Section 25 (Figure 2.6 US 30 Business Plaza).

Dell Range Blvd.

The Dell Range Blvd. right-of-way northeast of Whitney Road is defined on the north by the Meadowlark Estates Subdivision plat which dedicated 60' to the north of the south line of Section 24, T 14 N, R 66 W. The right-of-way southeast of Whitney Road is defined by the Foster Tracts, 2nd Filing where 33' south of the north line of Section 25 was dedicated for right-of-way. The southwest right-of-way at Dell Range Blvd. at Whitney Road is Greenmeadow Estates plat which dedicated 50' of right-of-way south of the north line of Section 26, T 14 N, R 66 W while the northwest right-of-way was established by legal/ deed on an un-platted parcel owned by Gysel Whitney, LLC. Based on the boundary work completed by AVI, it appears that 40' of right-of-way exists north of south line of Section 23.

Table 2.1 Platted Roadway Right of Widths summarizes the information known at this time related to the right-of-way widths of the corridor and intersecting cross streets. Please see Appendix G for recorded plats and road reservation documentation.



Glimpse

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Table 2.1 Platted Roadway Right of Widths

Roadway Section	Platted Width [1]	Notes
Whitney Road:		
Beckel Road/ Storey to Dell Range Blvd.	80′	40' East, 40' West (AVI Boundary of Whitney-Gysel Property)
Dell Range Blvd. to U.S. 30	73′	40' West, 33' East (Property corner indicates 80' by monument evidence)
U.S. 30 to Country Side Avenue	90′	50' East, 40' West
Dell Range Blvd.		
East of Whitney Road	93′	60' North, 33' South
West of Whitney Road	90′	50' South, 40' North (AVI Boundary of Whitney-Gysel Property)
Whitney Road Intersecting Roadways		
Beckle Road (East)	90′	40' North, 50' South
Storey Blvd (Beckle Road) (West)	50′	
Buttercup Drive	80′	
Chickadee Drive	80′	
Foxglove	80′	
Greenmeadow Drive	60′	
Hinsley Road	80′	
U.S. 30	300′	

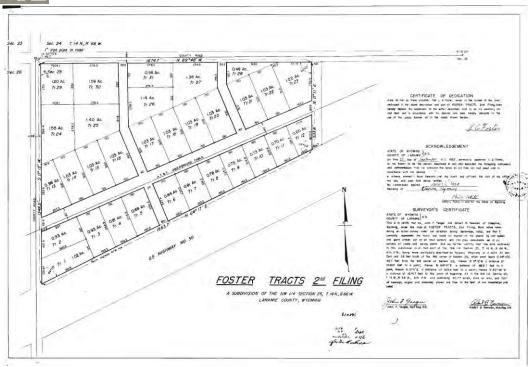


Figure 2.1 Foster Tracts Subdivision 2nd Filing Plat with a 66' Right-of-way width

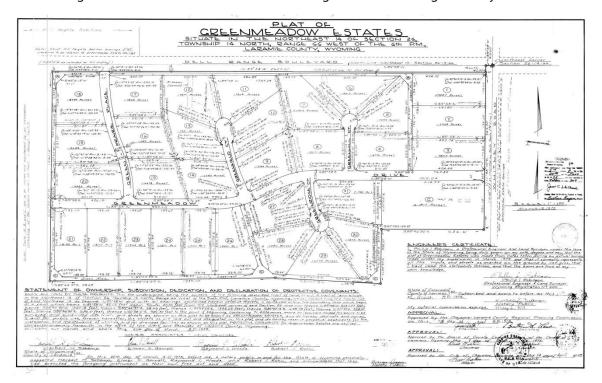


Figure 2.2 Greenmeadow Estates Subdivision 40' West Right-of-way

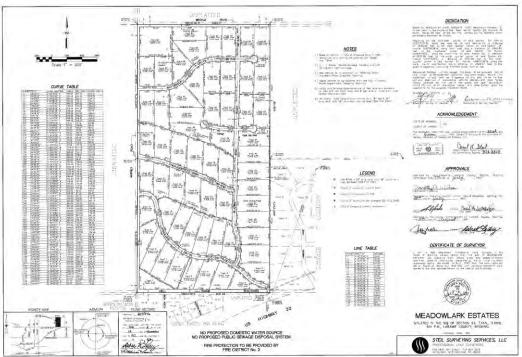


Figure 2.3 Final Plat Meadowlark Estates 40' Right-of-way East of West Section Line 24

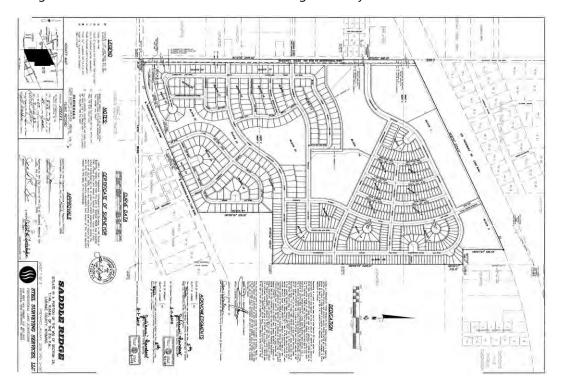


Figure 2.4 Saddle Ridge Subdivision

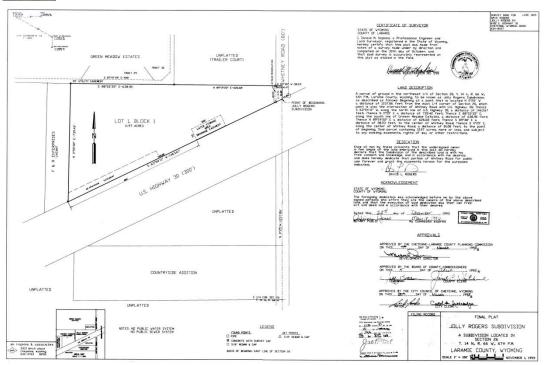


Figure 2.5 Jolly Rogers Subdivision



Figure 2.6 US 30 Business Plaza



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Existing Corridor and Boundary Conditions

Whitney Road runs north/south and connects large lot developments in the northeast area of Cheyenne with east/west arterials in the eastern side of the community. It is classified as a minor arterial from US 30 to Dell Range and a major collector from Dell Range northward. Whitney extends four miles north to Iron Mountain Road which then connects to Interstate 25 (I-25) approximately five point five (5.5) miles to the west. The major cross streets on the corridor are Dell Range Blvd. and U.S. Highway 30. Dell Range Blvd. is a principal arterial and contains the principal big box and strip mall, and mall shopping areas in Cheyenne. State highway U.S. 30 is also a principal arterial and connects to the downtown of Cheyenne where much of the state and city government offices, as well as, the regional hospital are located.

Traffic on the narrow, rural Whitney Road has been increasing due to the growth in eastern Cheyenne including the Saddle Ridge subdivision and the other county subdivisions north of Dell

Range. In particular, the varying conditions are summarized below.

Whitney Road between US 30 and Dell Range Boulevard

As shown in Figure 2.7 and 2.8 this section of Whitney Road is a narrow county road with an approximate width of 20' to 22' without shoulders. The posted speed limit is this section of roadway is 30 mph. The boundary conditions contain rural residential, a mobile home park, travel park, undeveloped parcels, industrial, and commercial. The properties along this stretch are close to the road. The intersection with US 30 and Whitney is stop controlled and skewed with Whitney Road at an angel of sixty point three seven (60.37) degrees.



Figure 2.7 Whitney Road north of US 30 (Looking north)



Figure 2.8 Whitney Road at US 30 (Looking southwest)



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Whitney Road between Dell Range Boulevard and Beckle Road/ Storey Blvd.

As shown in Figure 2.9 Whitney Road (Dell Range Blvd. to Storey Blvd. / Beckle Road) this section of Whitney Road is also a narrow county road with an approximate width of 20' to 22' without shoulders. The posted speed limit is this section of roadway is 40 mph from Dell Range Blvd to Foxglove Road and 45 mph north of Foxglove Road. The boundary conditions are rural residential to the east and north, and an undeveloped parcel to the west containing an old ranch house and supporting buildings. The intersection of Whitney at Dell Range is stop controlled. Additionally, this section of Whitney has recently been impacted by heavy semi-truck traffic due to oil and gas well drilling and production in area which prompted regulatory signage "No Truck Traffic" to be placed north of Dell Range Blvd. on Whitney. This section of Whitney Road contains, and elevation change of approximately 95 feet from Dell range with grades in excess ten (10) percent. This grade and elevation change creates unsafe sightlines as you near the top of the hill heading north and coming over the crest heading south. This grade becomes dangerous in inclement weather and icy conditions.



Whitney Road north of Chickadee Drive (Looking north)



Whitney Road at Dell Range (Looking north)

Figure 2.9 Whitney Road (Dell Range Blvd. to Storey Blvd. / Beckle Road)



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Historical Review

The Whitney Road corridor plan area is not known to be a part of any historic districts at the present time. Additionally, the Wyoming State Historic Preservation Office (SHPO) website was reviewed for all the National Register listings in the area of the study and none were found.

Please note that if federal funds are used on any future projects or if a federal agency is part of the planning and implementation, a Section 106 Study will be required to determine potential impacts to any historic properties. Properties in the area of any construction impacts will be identified and evaluated based on the Secretary of Interior's Standards and Guidelines for identification. Several determinations can be made in the evaluation including the following:

- No historic properties affected.
- Historic property adversely affected.
- Historic property not adversely affected.

Utilities

Based on observed surface locates and desktop research the following utilities have been identified within the corridor area:

- Black Hills Energy: Overhead Electric, Underground Natural Gas Line.
- High West Energy: Overhead Electric.
- Century Link: Underground telephone; fiber optic.
- Suncor Energy: 12.75" Petroleum Pipeline (2' to 5' deep; east side of Whitney Road),
 Easement Bk #1282, page 780-783 South of U.S. 30.
- Plains All American Pipeline System, LLC: 16" Petroleum Pipeline (4'-3" to 14'-5" deep; west side of Whitney Road), <u>Easement Bk #1976</u>, p. 1815.
- City of Cheyenne Board of Public Utilities (BOPU).
 - o Water Main
 - Sanitary Sewer Main

Whitney Utility Infrastructure

Further development of the corridor will require wet and dry utility infrastructure to be expanded and coordinated with the individual entities to support future development. Water and sewer utilities are not immediately available within the corridor area with the exception of a small section on the southwest corner of the corridor beginning at Whitney Road at U.S. Highway 30 and Saddle Ridge. Future water and sewer development of this area would likely be served by the BOPU as the SCWSD is not allowed to serve or expand outside their current boundary without City of Cheyenne and BOPU approval.

As with any new roadway project, prudent engineering and planning for underground utility infrastructure should be evaluated and incorporated into the roadway construction plans. This approach results in the least expensive method to get the utility infrastructure installed as the road



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construction project will have the all of the soft project costs such as mobilization, traffic control, testing, surveying, bonds & insurance already included as well as the more expensive hard cost associated with roadway resurfacing. In additions, the inconvenience to the traveling motorist is considerable reduced as all work is completed under and during a single construction project.

There is an existing 12" water main located at the south end of Whitney road and a 15" existing sewer main available for extension. As these mains extend up Whitney to Del range intersection, the water line would connect to a proposed 12" water main planned to be extended east down Del range to Whitney Road. Both water and sewer mains need to extend past the Roundabout splitter island limits currently under design. This will minimize have new improvements removed to connect into these mains. Utility main stub outs should also be made into each County road side street for ease for future main extension. BOPU should be consulted to determine what the optimum main size should be based on their system modeling efforts and assumed development density for the contributing areas.

An area of contribution exhibit has been prepared see Figure 2.10 Water and Sewer Main Summary that indicates those county properties that would potentially connect to the Whitney water and sewer infrastructure over the next 20 years. Initial estimates are approximately 260 acres would benefit from the water main being extended and approximately 390 acres would contribute to the sanitary sewer main. At urban densities, this would serve around 1000 residential units. County parcel along Whitney road are prime for redevelopment as traffic counts are projected to increase. This combined with the installation and availability of utility infrastructure will allow the adjacent properties to transition into higher and better uses.

A cross section of Whitney road in Figure 2.10 Water and Sewer Main Summary depicts potential infrastructure location and spacing with the road section.



Glimpse

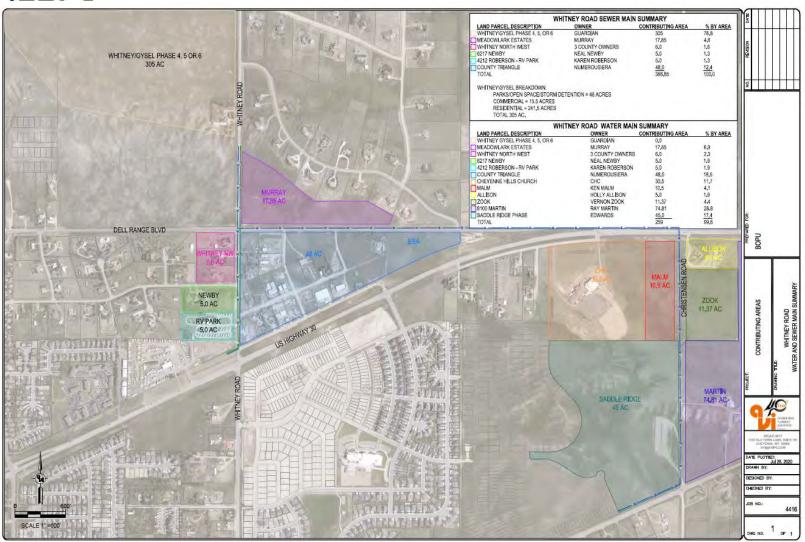


Figure 2.10 Water and Sewer Main Summary



Glimpse

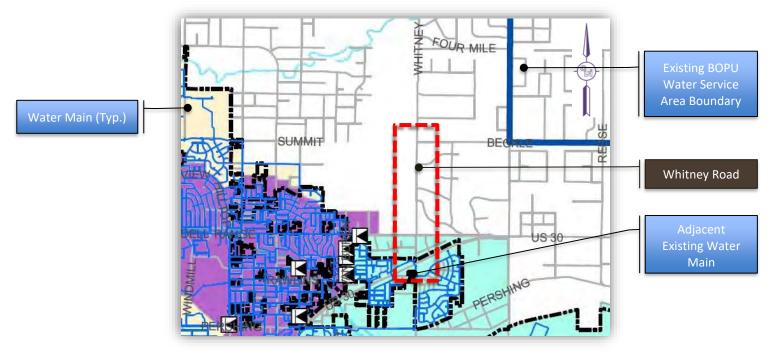


Figure 2.11 Water Service Area and Existing Distribution Lines (BOPU)

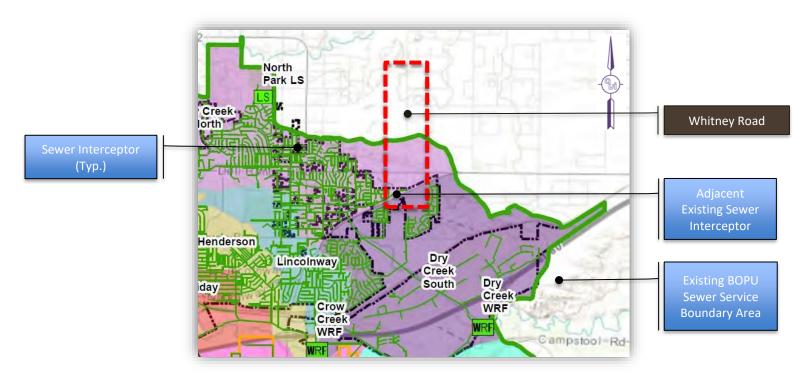


Figure 2.12 Sewer Service Boundary, Existing Collection System (BOPU)



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Adjacent water and wastewater distribution and collection lines, as well as, service area boundaries are illustrated in the excerpt figures from the 2013 Cheyenne Water and Wastewater Master Plans by HDR for the City of Cheyenne Board of Public Utilities [2] and shown in Figure 2.11 Water Service Area and Existing Distribution Lines (BOPU) and Figure 2.12 Sewer Service Boundary, Existing Collection System (BOPU). The primary developments in the area appear to be served by onsite septic and groundwater well systems. This is based on a review of the e-permit Application and Water Rights Database by the Wyoming State Engineer's Office [3] which indicates four hundred twenty-one (421) water rights existing within T 14 N, R 66 W, Section 23, 24, 25, and 26 adjacent to the corridor area. As the corridor and area develops, property owners will have the ability to connect to future water and sewer mains within the area.

The utility companies that posed potential conflicts or crossings were notified of the planning project. Those were the Suncor Pipeline and Plains All American Pipeline which are on the east and west side of the existing roadway, respectively. These petroleum pipeline companies were specifically were asked about any special requirements required for possible crossings or boundary conditions of a future roadway in the area. Please see Collaboration Section 3.0 for additional information. Desktop and courthouse research at this level of corridor study did not reveal the easements for Suncor Pipeline North of U.S. 30 on Whitney Road. The Plains All American Pipeline has a standard Laramie County Easement within the right-way. See Appendix F for additional information. The contacts for these two specialized coordination efforts for the adjacent petroleum lines will be required of a future project and as noted below:

Contacts:

Dillon R. Ohrt, SR/WA, Right-of-way and Public Awareness Coordinator Suncor Energy (U.S.A.) Pipeline Company Cheyenne, WY 82001 307-549-8008 dorhrt@suncor.com

Steve Sullivan, ROW 307-472-9900 sdsullivan@paalp.com

Plains All American Pipeline 2500 E 5th St Cheyenne, WY 82001 Corporate Headquarters 333 Clay Street, Suite 1600, Houston, TX 77002 713-646-4100.



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Drainage

None of the Whitney Road Corridor study area is within the Federal Emergency Management Agency (FEMA) regulated Dry Creek or Childs Draw Basin floodplains as shown on Flood Insurance Rate Map (FIRM), Panel 1111 of 1650, Map Number 56021C1111F, Effective January 17, 2007 (https://msc.fema.gov/portal).

The corridor appears to be within Unshaded Zone X. The Unshaded Zone X is classified to be outside the 0.2% annual chance floodplain. Detailed hydraulic and hydrologic modeling efforts along with sound engineering judgment will be critical to overall success of the future final plan development.

Bicycle Transportation

Currently there are no bike lanes, multiuse paths, or formal trails within the corridor boundary. However, it should be noted that Whitney Road was designated for a "Shoulder Bikeway" and "Greenway" connection with Dell Range Blvd designated for a "Buffered Bike Lane" and US 30 for a "Greenway" in the *September 2012 Cheyenne On-street* Bicycle Plan and Greenway Plan Update [4] . See the existing and future proposed plan excerpt shown in Figure 2.13 Planned Bike and Trial Network.

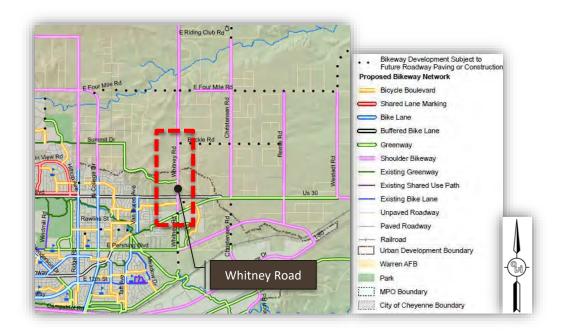


Figure 2.13 Planned Bike and Trail Network



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Transit

Based on existing corridor use and conditions no transit has been utilized to date. Based on a review of the long range direction of the transit system illustrated in the Cheyenne Transit Program Five-Year Transit Development Plan, it appears that no additional routes have been planned in this area. The nearest Cheyenne Transit Program (CTP) stop is at the intersection of Dell Range Blvd. at Ocean Loop approximately one point two (1.2) miles west of the corridor location. Future need for transit will depend on the development of the corridor, land use densities, and surrounding boundary conditions.

Environmental

Environmental considerations were reviewed for possible impact to future improvements within the corridor based on a desktop analysis without field confirmation or independent investigation. AVI reviewed publicly available databases and submitted inquires to public agencies in an attempt to accurately identify resources that may be present. No significant impacts were identified but, will need to be investigated with future planning projects to confirm or identify. Refer to Profile Chapter and Appendix F for additional information and reference.



Figure 2.14 Existing Transit Routes

Current Traffic Conditions

Traffic Volume

Traffic volume data was collected for this project on average weekdays at various times during April 4 thru April 10, 2017. Peak hour counts were collected at the key intersections along Whitney Road during the morning and evening peak hours. Noon peak hour counts were evaluated when they were available. Peak hour and daily traffic volumes, laneage, and traffic control are contained in Figure 2.15 Existing Traffic Conditions 2017.

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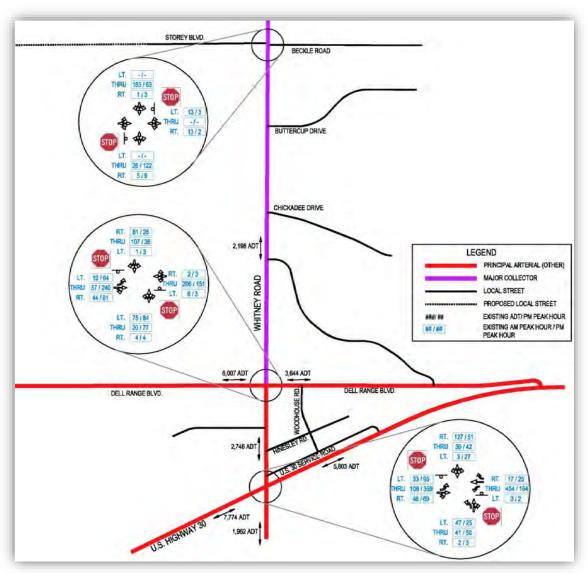


Figure 2.15 Existing Traffic Conditions 2017

Traffic Safety

Crash data was provided by WYDOT and the City of Cheyenne for each of the key intersections along the corridor for the time period beginning on January 2014 and ending on September 2017. The number of crashes ranged from a total of eleven (11) at Whitney Road at U.S. 30 and one (1) at the intersection of Whitney Road at Beckle Road. Given the low calculated crash rates, it would appear that no crash problems are present on the corridor at this time. However, given crash rate at intersections is based on accidents per million entering vehicles, volumes are not that high, and one fatality occurred our analysis is skewed.



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Intersection Crash Rate (R) is calculated as follows:

 $R = (1,000,000 \times C)/365 \times N \times V$ where,

- R = Crash rate for the intersection expressed as accidents per million entering vehicles (MEV).
- C = Total number of intersection crashes in the study period.
- N = Number of years of data.
- V = Traffic volumes entering the intersection daily.

Based on observation, failure to yield is the primary cause of the crashes for both Whitney Road at Dell Range Blvd and Whitney Road at U.S. 30. Both intersections pose the highest risk for potential safety concerns for the corridor due to speeds, geometry, and vertical alignment. The crash data is detailed in Appendix E and summarized in Table 2.2 2014 - 2018 Crash Summary for Key Intersections.

Table 2.2 2014 - 2018 Crash Summary for Key Intersections

		Whitney Road			
Туре	Beckle Road	Dell Range Blvd.	US 30		
**		Number of Crashes			
Angle	=	7	10		
Rear End	1	-	3		
Fixed Objects	-	1	4		
Head-on	-	-	-		
Total	1	8	17		
Rate	0.33	0.53	0.89		
PDO	1	4	11		
Injury	-	3	4		
Fatality	=	1	2		
Total	1	8	17		
Failure to Yield ROW	-	7	9		
Following too Closely	1	ı	2		
Speeding	-	=	2		
Driving too Fast for Conditions	=	1	3		
Mechanical Failure			1		
Total	1	8	17		



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Existing Land Use and Zoning

Land Use in the corridor study area varies but, is mainly comprised of agricultural in combination with agricultural residential, medium density residential, mixed use (Laramie County), Public, and Community Business. The current Zoning Map is illustrated in Figure 2.16 2015 Zoning Map.

The following zoning uses are currently within the corridor area:

City Zoning: Description:

- CB Community Business
- MR Medium Density Residential
- MU Mixed Use (Laramie County)
- P Public
- AR Agricultural Residential
- A-2 Agricultural

The Laramie County Land Use Regulations [5] and City of Cheyenne UDC [6] does not correlate to Mixed Use in the City of Cheyenne. This is due to the fact that Laramie County unlike Cheyenne does not distinguish mixed-use residential and mixed-use business for land use types. Laramie County only has a single Mixed Use Zone which can be residential or commercial.

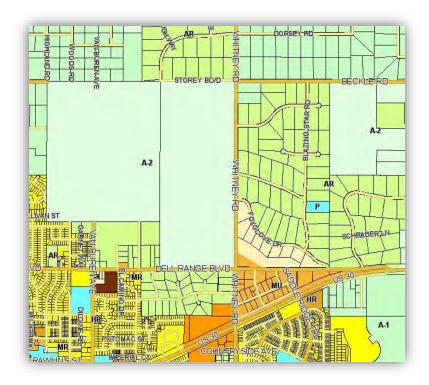


Figure 2.16 2015 Zoning Map

MPO

WHITNEY ROAD CORRIDOR PLAN

COLLABORATION

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3.0 COLLABORATION

The collaboration is the process and planning context phase of the project. It provided an avenue for a cooperative design effort which defined the opportunities and constraints of the corridor, as well as framework for key planning considerations, that shaped the plan.

The Whitney Road Corridor Study relied heavily upon extensive public and stakeholder participation. The process involved stakeholder one-on-one meetings, open house format meetings with residents, business owners, developers, landowners, project steering committee meetings, Cheyenne MPO committees, Laramie County and City of Cheyenne Planning Commissions, and City and County Jurisdictional approvals or acknowledgements.

Steering Committee

The first collaboration component of the project involved enlisting the assistance of a Steering Committee during the plan development. The committee was comprised of the following staff and key stakeholders from the City, County, WYDOT and other agencies:

- Bruce Hattig, BOPU
- Nathan Beauheim, City of Cheyenne,
- Susana Montana, City of Cheyenne,
- Amy Allen, City of Cheyenne
- Anissa Gerrard, City of Cheyenne
- Randy Greisbach, WYDOT,
- Timothy Morton, WYDOT
- Mark Wingate, WYDOT,
- Jeffery Mellor, WYDOT,
- Rob Geringer, Laramie County,
- Dave Bumann, Laramie County,

- Jef McMann, Black Hills Energy,
- Lloyd Sisson, High West Energy,
- Tom Mason, MPO,
- Nancy Olson, MPO,
- Sreyoshi Chakraborty, MPO,
- Tom Cobb, AVI/MPO,
- Cassie Pickett, AVI
- Daryl Johnson, AVI
- Joe Henderson, STS, Inc.,
- Curtis Rowe, Kimley-Horn,
- Troy Russ, Kimley-Horn.

The Steering Committee formally met three (3) times during the project to guide the consultant team, review project information, provide insight, discuss public and stakeholder involvement, and collaborate to make decisions about the plan direction and recommendations. Agenda, meeting minutes, and presentations can be found in Appendix C.

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Whitney Road Corridor Study 2-3987.17



Collaboration

Table 3.1 Public Outreach Matrix

Activity	Date(s)
Steering Committee (2)	5.09.2017 10.19.2017 2.13.2019
Public Open House (2)	11.08.2017
	6.28.2018
Individual One-on-one Meetings (12)	5.07.2018
	8.08.2018 & 8.09.2018
	10.30.2018 & 10.31.2018
	11.13.2018 & 11.16.2018
	1.15.2019
	3.11.2019 & 3.12.2019
	4.23.2019
	5.02.2019
Utility Meetings: Suncor Energy USA Pipeline Plains All American Pipeline	5.09.2017 6.23.2018
MPO Technical Advisory Committee (TAC) (5)	9.12.2018
	11.14.2018
	3.13.2019
	5.15.2019
	8.15.2019
MPO Citizen's Advisory Committee (CAC) (3)	9.12.2018
	5.15.2019
	8.15.2019
Planning Commissions	
City of Cheyenne	12.12.2018
	7.15.2019
Laramie County	12.19.2018
	7.11.2019
Governing Bodies (2)	
City Council	9.9.2019
County Commissioners	8.20.2019



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Public Open House

The second collaboration component involved a combination presentation and open house style forum for stakeholder and public comments. AVI led the public involvement process with assistance and contributions from all the team members. The meetings were advertised through various media including newspaper, website, Facebook®, and electronic message boards. Planning and Engineering consultants from AVI, representatives of the Cheyenne



Metropolitan Office, and Laramie County Public Works were present at both meetings to receive public comment. Information and input were collected using three different avenues; direct communication with a team member (i.e. consultant, MPO staff members, and Laramie County), having the public write comments on Post-it® notes and place them on large planning area maps, and filling out a written survey. The primary purpose of the three (3) different communication avenues was to create the most comfortable environment for individuals to convey information to the team. A total of two (2) Open Houses were conducted in November 2017 and June 2018. The meetings were very well attended, and comment card respondents identified themselves by the following demographic information shown in Figure 3.1 Who Attended Public Meetings?

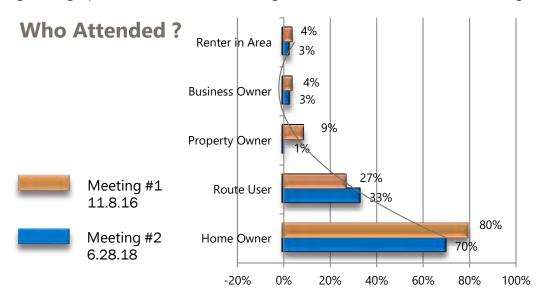


Figure 3.1 Who Attended Public Meetings?



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Public Open House #1

A brief presentation, combined with an Open House, was conducted on November 8th, 2017 at Dildine Elementary School. One hundred twenty people were listed on the Sign-In-Sheet as attending the meeting. It was estimated that approximately 150 people attended. A twenty (20) minute presentation focused on the following: Introduction of Team, Project Overview and Limits, Purpose and Goals, Overall Study Process, What to expect (i.e. Schedule), Identifying the Issues, and Possible Conceptual Ideas for addressing future traffic. After the presentation attendees were asked to adjourn to two duplicate workshop station areas to ask specific questions, review exhibits, and complete comment cards. Each station was comprised with the following elements:

- Existing Conditions
 - (Aerial photo map and site location photos along the corridor),
- Traffic Conditions
 - (Aerial photo map with existing lane configurations, speed limits, known crash data)
- Opportunities and Constraints
 - (Aerial photo map outlining physical constraints and safety concerns at U.S. 30 and Dell Range Blvd.)
- Conceptual Roadway Cross Sections
 - (Existing Roadway, Conceptual Rural 2 Lane Roadway, Conceptual Rural 3 Lane Roadway, Conceptual Urban 3 Lane Roadway)

Overview

Results from the written survey were entered into the web-based program by the consultants after the open houses and the public had the option of directly providing comments electronically to the survey through the Survey Monkey® web link. The link was provided on the www.plancheyenne.org & www.avipc.com websites. A complete summary of comments, exhibits, sign in sheets, and individual comment cards are enclosed in Appendix C.

Of the one hundred thirty (130) persons attending the public open house two-hundred thirty-seven (237) written comments were returned at the rate of one-hundred eighty-two-point three percent (182.3%).

We asked the public two specific questions for comments related to the corridor summarized as follows.

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Q1. Please rate the importance of the following transportation users and issues based on what you consider to be the most important design considerations for Whitney Road?

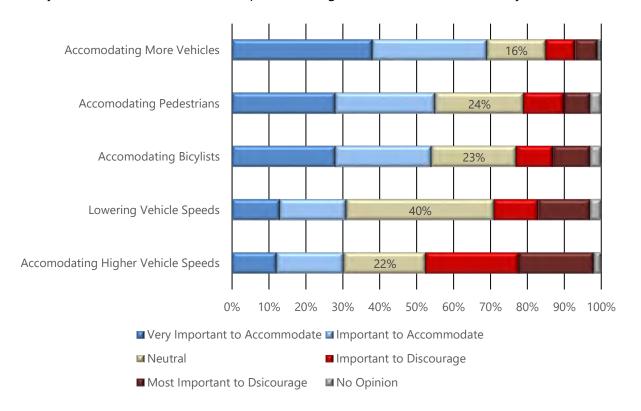


Figure 3.2 What were Considered Important Transportation Design Elements?

The rating for each category as illustrated graphically above: Very Important to Accommodate, Important to Accommodate, Neutral, Important to Discourage, Most Important to Discourage, No Opinion. It is easy to graphically view what most people consider the important design elements for the corridor in Figure 3.2 What were Considered Important Transportation Design Elements? Very Important to Accommodate and Important to Accommodate are shown in varying shades of blue while Most Important to Discourage and Important to Discourage are shown in shades of red. Neutral is shown in gold and label as a percentage of the total responses.

Most respondents believed that it is important to Accommodate More Vehicles on the roadway, Accommodate Pedestrians, and Bicyclists. Additionally, respondents believed that the speed of vehicles along the roadway corridor meets their needs after combining the two design elements of Lowering Vehicle Speeds and Accommodating Higher Vehicle Speeds.



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Q2. If you could make one change to the existing Whitney Road Corridor what change would you make?

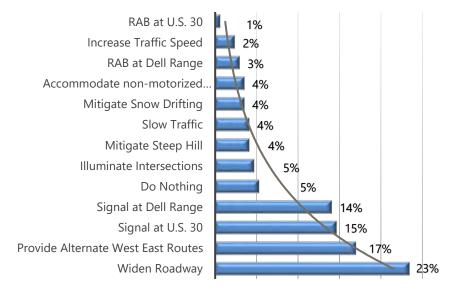


Figure 3.3 What one Change would you make?

After evaluating the raw data from the question, the most common categories were developed and tabulated. The results of the tabulation are illustrated graphically in Figure 3.3 What one Change would you make? The top four (4) most important changes requested were as follows:

- Widen the Roadway
- Provide Alternative East West Traffic Routes
- Provide Traffic Signals at U.S. 30 and Dell Range Blvd.
- Provide Intersection Illumination.

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Public Open House #2

A brief presentation combined, with an Open House, was conducted on June 28th, 2018 at Dildine Elementary School. A total of 68 people was listed on the Sign-In-Sheet as attending the meeting. It was estimated that approximately 75 people attended this meeting. A twenty (20) minute presentation focused on the following: Study Area and Primary Goals, Where we have been and what to expect, What we heard (Public Meeting No. 1), Details of the Identified Issues, and Overview of recommended Improvements. After the presentation attendees were asked to adjourn to two duplicate workshop station areas to ask specific questions, review exhibits, and complete comment cards. The station comprised the following elements:

- Proposed Conceptual Improvements
 (Aerial photo map overlaid with proposed improvements for the corridor),
- Conceptual Roadway Cross Sections
 (Beckle Road/ Storey Blvd. Intersection (Looking North), Dell Range Blvd to Beckle Road/Storey Blvd. (Looking North), U.S. 30 to Dell Range Blvd. (Looking North).

Overview

Results from the written survey were entered in the web-based program by the consultants after the open houses and the public had the option of directly providing comments electronically through the Survey Monkey® web link. The link was provided on the www.plancheyenne.org & www.avipc.com websites. A complete summary of comments, exhibits, sign in sheets, and individual comment cards can be found in Appendix C.

Of the sixty-eight (68) persons attending the public open house four-hundred thirteen (413) written comments were returned at rate of six-hundred and seven-point four percent (607.4%).

Recommendations for Conceptual Typical Cross-Sections for all segments identified received strong public consensus from 83.4% to 77.8% combining "Definitely Like" and "Like" for the section of Whitney Road from Beckle Road/Storey to Dell Range Blvd. and Dell Range Blvd. to U.S. 30, respectfully. Additionally, conceptual intersection options at U.S. 30 (Realignment to remove skew/signalized) and Dell Range Blvd (Single Lane Roundabout) received support at 56.4% and 49.4% combining "Definitely Like" and "Like", respectfully. It should be noted that adding "No Opinion" to "Definitely Like" and "Like" for the alternatives yielded 55.5% for the Single Lane Roundabout at Dell Range Blvd. and 74.8% for the realignment of U.S. 30 Intersection.

Additional ideas, information, or other comments received at this meeting included the following:

 "Traffic in this area would be significantly reduced with a connection of Storey Blvd and Four Mile Rd through Whitney all the way to Christensen RD. As well as further reductions when Christensen exit/overpass project is completed from



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Interstate 80. Funds would be better spent with more effective results with the development of these alternative routes."

- "Something needs to be done for both Highway 30/Whitney and Dell Range/Whitney intersections before serious injuries start occurring from the growing traffic and pedestrian traffic Intersection Down Lighting on Existing Power Poles or Independent Poles."
- "Get the project out to bid and started before the costs go up"

One-on-one Meetings

The third type of collaboration component involved a series of one-on-one meetings with local business owners who had either expressed concerns about the design team proposals or where right-of-way was thought to be needed to accommodate the proposed improvements. The following are a list of the stakeholder groups and individuals who provided input outside of the public open house process:

- Utility Meetings
 - Suncor Energy USA Pipeline Plains All American Pipeline
- Whitney Ranch Development
 - Connie and Bill Holgerson,
 - Carol and Dave Anderson
 - Joe Patterson
- U.S. 30 Service Road Business Group
 - Jeannie Spraker, Big Al's Auto & Exhaust
 - Andy Vehar, Big Al's Auto & Exhaust
 - Dave Rose, Big Al's Towing
 - Jim Hanrahan, Pinnacle Cabinet
 - Gary Everett, Pinnacle Cabinet
 - Shane Pickel, Unique Wood Design
- Restway Travel Park
 - Karen Sherman
 - Scott Sherman
 - Kelly Bartlett
- Jolley Rogers RV
 - Steve Hamlin
- Private Property Owner (6405 Hinesley Road)
 - **Betty Beckle**
 - Don Beckle
 - Zack Middelstadt
 - Stan Middelstadt



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One-on-one Meetings (Utility Meetings)

Meeting No. 1: May 9, 2017: 2:00 p.m. to 3:30 p.m.: Suncor Energy USA Pipeline

Meeting attended by Dillon Ohrt, Barry McCann, Regan Marsh, Cameron Nuss, Suncor; Tom Cobb, AVI. The meeting was conducted at Suncor Energy USA Pipeline office on 1715 Fleischli Parkway, Cheyenne, Wyoming.

Meeting No. 2: May 9, 2017: 2:00 p.m. to 3:30 p.m.: Suncor Energy USA Pipeline

Meeting attended by Steve Sullivan, ROW, Jason Norris, Op. Supervisor, Tyler Keller, District Manager, and Eric Heap, Technical Manager; Plains All American Pipeline (PAAPL); Tom Cobb, AVI, Nancy Olson, MPO. The meeting was conducted via phone conference at the AVI office located on 1103 Old Town Lane, Cheyenne, Wyoming

Overview of Meetings

The following notes are based on the MPO's understanding of the meeting. The agenda of the meetings included: Introductions, Introduce Whitney Project, Additional available pipeline data and details, Ability to complete isolated relocation or realign a portion of the pipeline, Potential Benefits, Primary Options, and Alternatives to Consider.

After introductions and introducing the project to both groups, the discussion focused on the future development of the property west of Whitney Road, called Whitney Ranch, that is moving forward with the planning and construction of a large residential development. The purpose of the Whitney Road plan is to create a comprehensive plan that will optimize safety, growth and fiscal responsibility which meets the following goals:

- Understand the community and neighborhood vision for the roadway,
- Improve roadway and intersection safety and function and
- Address drainage and snow drifting.

The interrelationship of the petroleum pipelines and the roadway corridor planning project is the result of the horizontal and vertical location of the lines within the right-of-way and the ability of the planning project to meet the established criteria; i.e., removal or mitigation of the steep roadway grade to improve safety for users and establish a non-motorized sidewalk/path that meets the Americans with Disability Act (i.e. ADA) accessibility requirements. The current terrain of the roadway north of Dell Range Blvd. contains up to a 13% roadway profile, located south of the existing ranch house. If the roadway were lowered to accommodate a 5% profile, approximately a 26' cut would be created and require relocation of the petroleum lines. For reference and additional information refer to Figure 3.4 Existing and Proposed Profile Concept Whitney Road. It was conveyed by both petroleum groups the size, type, and location of their respective mains. Suncor's pipeline is a 12.75" steel crude line at 1,440 psi of pressure and a depth of approximately 2' to 5' deep on the east side of the corridor while the PAAPL is a 16" steel crude pipeline at a depth from 4' to 15' located on west side of the corridor. Both pipeline groups emphasized the importance of potholing the lines when the final design begins to



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ensure the most accurate information on the depth and location of lines. Horizontal and vertical information was furnished by both companies to assist in the preliminary design of the roadway concept. It was confirmed that the location of the pipelines roughly follows the marker locations in the field. Both companies indicated that the procedures and logistics for isolated relocation or realignment of a portion of the line would need to be accomplished approximately two years in advance of proposed roadway construction. Typical costs for relocation were given by each company at approximately \$1.0 million and did not seem to depend on length of the relocation or whether the line was moved horizontally or vertically.

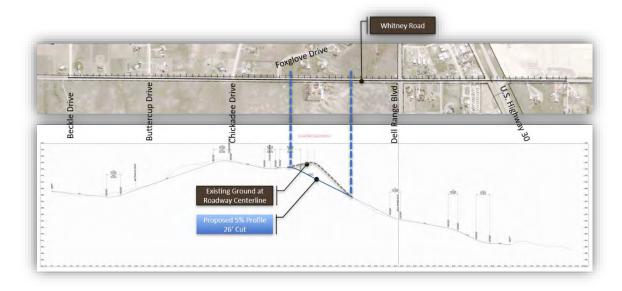


Figure 3.4 Existing and Proposed Profile Concept Whitney Road

Further discussion continued as to whether either line was scheduled for a maintenance shut-down which could provide an opportunity for relocation. No shut-downs were indicated. It was discussed whether retaining walls could be used to accommodate the roadway and pipeline. PAAPL indicated a retaining wall no closer than 10' from a footer could be utilized while Suncor did not desire retaining walls near their line.

The pipe lines companies were asked if they could furnish easement documentation and if they understood who had the responsibility of relocation under this circumstance. PAAPL forwarded easement documentation via email immediately following the meeting and furnished the recorded book and page (i.e. BK#1976, pg. 1815) while Suncor did not have the information readily available. Suncor did indicate their easement has been in place since 1950 and believed all costs to relocate the line would be the responsibility of the entity which initiated the relocation. The PAAPL document is a "Board Approval" for location within Laramie County and not an easement. It was unclear as the meaning of the "Board Approval" document, further investigation will be necessary.



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One-on-one Meetings (Whitney Ranch)

Meeting No. 1: May 7, 2018: 4:00 p.m. to 5:00 p.m.

Meeting attended by Brad Emmons – AVI (Whitney Ranch), Tom Mason, MPO, Tom Cobb, AVI The agenda of the meeting included: Why Modification to Roadway Alignment, Potential Benefits, Primary Options, and Alternatives to Consider. The meeting was conducted at AVI at 1103 Old Town Lane, Suite 100, Old Town Lane, Cheyenne, Wyoming.

Meeting No. 2: August 8, 2018: 11:00 a.m. to 12:30 p.m.

Meeting attended by Joe Patterson, Guardian Development, Connie, and Bill Holgerson, Gysel Whitney, LLC, and Tom Cobb, AVI The meeting was conducted at 1103 Old Town Lane, Suite 100, Old Town Lane, Cheyenne, Wyoming.

Meeting No. 1 and 2 centered upon discussion of the primary reason for an alignment modification which is due to the existing roadway profile or longitudinal grade of up to 13% exceeds. The City of Cheyenne Unified Development Code (UDC) and Laramie County Land Use Regulations (LCLU) of 8% for a Collector and Minor Collector, respectfully. This steep grade creates safety concerns due to the fact it reduces sight distance and creates hazardous conditions during ice and snow events. Two options were presented which shifted the steepest portion of the existing alignment of Whitney Road west though and/or around the existing farm house and barn structures. Potential options were discussed with these alternatives including creating a northbound and southbound lane using a combination of the shifted alignment with the existing alignment and a three-lane section in the proposed alignments with a greenway component within the unused portion of the existing right-of-way.

The second meeting further explored the original alternatives but was expanded to extend north completely within the Whitney Ranch property. A third alternative was developed which required removal of the west side of the existing barn structure. Those alternatives were developed to document the amount of impact to the property where the petroleum transmission mains were completed avoided. The right-of-way required to shift the road, ranged from 9.8 acres to 16.8 acres. The development group and current owners of the property indicated these options adversely impacted the future development of property. They believed the shifted alignments either bifurcated the property or impacted the existing barn which they wish to protect.

Meeting No. 3: October 30, 2018: 1:30 p.m. to 3:00 p.m.

Meeting attended by Joe Patterson, Guardian Development, Connie, and Bill Holgerson, Gysel Whitney, LLC, Tom Mason, MPO, Nancy Olson, MPO, and Tom Cobb, AVI The meeting was conducted at the MPO office at 615 West 20th Street.

The meeting was scheduled to present a three-dimensional exhibit which explored the possibility of shifting the roadway centerline to the west without impacting either the petroleum



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lines or the barn structure using a 5% vertical profile grade. Using those parameters, it was not possible to create an alignment which satisfied both conditions. The alternative created a 35 ft. deep cut at the highest portion of the existing ground. This coincides with the location of the barn structures. Potentially, retaining walls could be placed that would mitigate the width of the impacted area, however this would not be cost effective and create additional maintenance cost with snow drifting. The primary goals of a viable alternative solution were discussed and summarized below:

- Minimize impact to adjacent property owners.
- Fiscally responsible to the taxpayer, the petroleum pipeline companies, and the Whitney Ranch stakeholders.
- Meet or exceed the minimum criteria established by the UDC and LCLU documents for the City of Cheyenne and Laramie County.
- Establish a non-motorized sidewalk/path that meets the ADA accessibility requirements.

The following notes are based on the MPO's understanding of the meeting, questions, and concerns. No comments or questions are specifically attributed to allow stakeholders to speak freely and in confidence.

Comments/Questions:

• I understand that public comments did not mention the steepness of the road as a concern with the existing road. Why is this a concern of the design?

Leaving the steep vertical grade is dangerous in inclement weather, especially ice. Additionally, it does not meet the current UDC, LCLU, or ADA accessibility criteria. It is possible to meet the UDC and LCLU regulations using 8% maximum, but this is not desirable. First, there is a need to get the roadway slope to an acceptable percent that meets the UDC standards and addresses safety. Second, an 8% grade does not meet the ADA accessibility requirements and really is the absolute maximum grade for snow an ice.

What is the maintenance and replacement schedule for the petroleum pipeline?

The MPO has made several attempts to inquire with Plains All American Pipelines to discuss future maintenance or replacement plans. Based on our understanding of the easement documentation, costs for lower or relocating the pipelines would fall upon the roadway construction or jurisdictional entity for the Suncor Pipeline and on the pipeline company itself for the Plains All American Pipeline. Please keep in mind this is based on conversations with Suncor and not easement documentation.

Could an alternate alignment be considered which abandons north Whitney to Dell Range where the roadway would head west from Foxglove into the development and then down to Dell Range? Additionally, Van Buren is the only North/South road within the development at this point.



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The MPO has some concern with this option which potentially could force unnecessary additional traffic on Dell Range Blvd. corridor west of the proposed location.

• The Barn is the main obstacle in shifting the alignment and will create an isolated large parcel of land from the rest of the subdivision that would become virtually worthless.

The MPO noted the concern by the developer but believe some connection could be maintained.

Could an option be developed to move southbound and keep northbound in the right of way as mentioned in the previous meeting?

The City, County and WYDOT are under pressure to have the MPO get the plan complete and move forward with solutions, due to the recent accidents. The MPO will develop this option further to investigate the feasibility.

• The pipeline should be moved to accommodate the needs of the roadway. Can an option be looked at that impacts the west pipeline only and not the barn structures?

The MPO will investigate the possibility of an option which moves the roadway as close to the Barn as possible without impact and assuming the pipeline will be moved.

If a consensus cannot be reached, the Plan may need to present up to three alternative alignments with pros and cons of each including estimated construction costs. The Planning Commission and governing bodies would be required to make a final decision on the selected alternative.

Meeting No. 4: November 16, 2018: 10:00 a.m. to 11:30 a.m.

Meeting attended by Joe Patterson, Guardian Development, Connie, and Bill Holgerson, Gysel Whitney, LLC, Tom Mason, MPO, Nancy Olson, MPO, and Tom Cobb, AVI The meeting was conducted at the MPO office at 615 West 20th Street.

The meeting was scheduled to present, review, and gather feedback on the six (6) alternatives. Detailed three-dimensional exhibits of all alternatives were presented with the brief pros and cons summarized.

- Alternative 1: Do Nothing Alternative
- Alternative 2: Existing Alignment with Maximum Profile (3 Lane Section) and Pedestrian Path
- Alternative 3: Existing Alignment with Accessible Profile (3 Lane Section)
- Alternative 4: NBL/SBL Independent Roadways w/Maximum NBL and Accessible SBL Profiles
 - o Alternative 4a: SBL Alignment placed east of Whitney-Gysel Barn Structure
 - o Alternative 4b: SBL Alignment placed West of Whitney-Gysel Barn Structure



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- Alternative 5: Three-lane Roadway, Revised Alignment, Accessible Profile, and Impact to Plains All American Pipeline (PAAPL)
- Alternative 6: Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney-Gysel Barn Structure.

The MPO presented the north alignment options to the City of Cheyenne and Laramie County staff. Based solely on the information and exhibits as shown, the jurisdictional or public perspective the preferred alternatives in order were Alternative #6, Alternative #3, and Alternative #2. This was based on construction cost, maintenance cost, objectives and goals, multi-modal corridor, accessibility, potential snow and ice accumulation and safety.

The following notes are based on the MPO's understanding of the meeting, questions, and concerns.

Comments/Questions:

The developer understood the perspective and order of preference of the alternatives and added the following comments for record.

Alternative #2 was the favorable option with the developer. They believed that it would go together with their concept of a trail system. Asked if the alignment for the path could be changed to fit in with their ideas?

The alignment was a concept only. It could easily be modified but would need to stay at or under a 5% vertical profile.

Alternative #4a was the developers preferred option prior to reviewing the three-dimensional plan and profile. Based on the available information, it appears that it is not possible to avoid both the barn structures or petroleum pipeline (PAAPL) using a 5% grade on the SBL. This option requires either the pipeline or barn to be relocated. A pedestrian underpass connects the "proposed park area" to the rest of the development. Alternative #4b divides the property and is not preferred.

The developer expressed that they would like to receive a legal opinion from Mark Voss, County Attorney, on the easement documents for the pipelines and not get locked in to the design for the old ranch buildings until more information is available. They contend that the best option is to have the pipeline relocated.

The MPO will continue to investigate and inquire about the easement documentation and opinion of the County Attorney. As we previously discussed, we have not been able to acquire the documentation of all the pipeline easements through investigation at the Courthouse. We will again request the documentation through the pipe line companies. It is the intent that the documentation will provide some insight into financial responsibility for relocation of the petroleum transmission mains.



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Alternative #6 is the least desirable option for the landowner and developer. They acknowledged the need for the detention and amenities like a playing field, gazebo, playground, and use of the existing buildings within the development plan. However, it was noted that Guardian (developer) CEO, Ross Malinski's "vision was to preserve the history of the Barn and have nice overlooks of the city". The developer is looking into the feasibility of creating a venue for weddings or to add a recreation center in the historic area.

They also noted that within the 588 acres of land available that there will be some undevelopable portions. These areas have already been identified as open space or parkland. They see this separated section as over and above the dedicated undevelopable land. They believed that this area as shown in Alternative #6 is a double hit where the developer must pay for the road relocate and lose the developable land used as right-of-way.

It was reiterated that fiscal responsibility is an important criterion for both the jurisdictional entities, tax payers, petroleum companies, and the Whitney Ranch stakeholders. Alternative #6 fulfills all but one of the primary goals of a viable alternative solution previously discussed:

- Minimize impact to adjacent property owners
- Fiscally responsible to the taxpayer, the petroleum pipeline companies, and the Whitney Ranch stakeholders ✓
- Meet or exceed the minimum criteria established by the UDC and LCLU documents for the City of Cheyenne and Laramie County ✓
- Establish a non-motorized sidewalk/path that meets the ADA accessibility requirements. ✓

The developer presented another version of Alternative 4a, where the southbound alignment would be forced to the west near Chickadee or Foxglove and then commence south onto Dell Range Blvd., half-way between Gysel Place and Whitney Road. Additionally, this alignment could work well with approximately 35 acres in the southeast corner they have "reserved" for commercial purposes and multi-family in the southern portion of the development.

The MPO indicated that this realignment option would require a reassessment by the developers traffic engineer, Kimley-Horn to determine traffic impacts and feasibility. Concerns to the impact on Dell Range Blvd. were discussed.

Additionally, east – west connections or alternate routes like Storey Blvd. were discussed which will directly improve congestion and impacts to Dell Range Blvd.



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Guardian does not have an immediate plan to construct Storey Blvd. at this point due to constraints with water distribution pressure and serviceable gravity sewer boundaries. Guardian will be meeting with BOPU on December 14th to get answers for the water issue to the north along Storey Blvd. and Summit Drive. Depending on the meetings and information, this might allow Storey to be built sooner than anticipated for the development.

The MPO will require AutoCAD or detailed sketches indicating the approximate boundary limits of the proposed commercial area to review an Alternative #4c. Additionally, Kimley-Horn will need to update the traffic impact assessment report.

Has an alternative been investigated shifting the alignment to the east of the existing centerline?

The MPO will investigate the feasibility of shifting the roadway alignment to the east. It is our understanding this would impact the Suncor pipeline which we understand the cost would fall onto the developer or jurisdictional agency reconstructing the road which would impact the pipeline.

Meeting No. 5: March 11, 2019: 1:00 p.m. to 2:30 p.m.

Meeting attended by Joe Patterson, Guardian Development, Connie, and Bill Holgerson, Gysel Whitney, LLC, Tom Mason, MPO, Nancy Olson, MPO, and Tom Cobb, AVI The meeting was conducted at the Municipal Complex at 2101 O'Neil Avenue, Room 208.

The meeting was scheduled to review additional details and gather feedback on the top two (2) feasible alternatives for a north alignment of Whitney Road along with a new third alternative (Alternative #7). This alternative was discussed as a possibility in our last meeting. It shifts the existing alignment east to avoid impacting Whitney Ranch and the Guardian development. Detailed three-dimensional exhibits of all alternatives were presented with additional electronic information on the PAAPL and Suncor petroleum pipelines vertical profile projected onto the conceptual design exhibits.

- Alternative 2: Existing Alignment with Maximum Profile (3 Lane Section) and Pedestrian
 Path
- Alternative 6: Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure.
- Alternative 7: Three-lane Roadway, Revised Alignment East, Accessible Profile.

Alternative #7 was investigated at the request of the developer at the last meeting. The option appeared to be viable in theory however, after close examination, the option could not be shifted far enough east to prevent impacting one of the petroleum lines (i.e. PAAPL and Suncor). The only way to avoid impact to a petroleum line (PAAPL) was to install a 15'



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retaining wall on the west side. Furthermore, residential properties are burden with major impacts to small lots on the east side of the alignment due to the large movement of earthwork required to realign the roadway.

After the initial alignments were reviewed by the group, they discussed the latest information on the petroleum pipeline easements and County Attorney opinion. First, the group was reminded by the MPO that the PAAPL is located on the west side of the right-ofway of Whitney Road while the Suncor pipeline is located on east side of the right-of-way. Second, Mark Voss, Laramie County Attorney reviewed the PAAPL Board Approval documentation on Whitney Road (Book#1976. PG#1815, REC# 460462). Mr. Voss' basic answer to the question about who would bear the cost for relocation of the lines was stated to be "complicated". He reviewed a copy of the resolution issued by the Board of Commissioners allowing for the installation of the PAAPL line in 2006. That resolution references to sections of the 1988 zoning ordinances which have been supplanted by a revision done in 2011. In any case, the resolution does not contain any language regarding the cost of relocation. He further indicated that given the cost of relocation of pipelines, there will be a "fight" over the payment with the entities owning or using the pipelines. He referenced case law and state statutes that require utilities pay the cost of removing and relocating their facilities placed upon public highways when necessitated by highway improvements. At the time of the correspondence with the County Attorney, Suncor pipeline apparently had no easement documentation whatsoever. Mr. Voss believed there may be somewhat stronger grounds to have the company relocate the utility at their cost. However, whether documentation exists or not, he believed that we should anticipate a strong and forceful objection to paying the cost of moving the line. After corresponding with Mr. Voss, Suncor furnished some documentation of the easements on Whitney Road north of Beckle Road. No documentation can be located for Suncor pipeline easements from Beckle Road to U.S. 30 at this time.

Consequently, based the fact that relocation was not specifically addressed in the resolution by the County in 2006, the MPO agrees it is unclear who would bear the cost of improvements. Therefore, the MPO believes that the plan or alternatives considered should assume that the cost of relocation of the PAAPL would be assumed to be on the developer or jurisdiction making the roadway improvements.

The following notes are based on the MPO's understanding of the meeting, questions, and concerns.

Comments/Questions:

The developer understood the easement issues and constraints, the preference of the alternative #2 or #6 and elimination of Alternative #7 for further consideration. They added the following comments for record.

Indicated that a Land Planner had been hired to complete a Master Plan for the development. Would like to have MPO meet with the land planner.



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The MPO would be happy to coordinate and meet with new Land Planner. However, we are trying to complete the plan as soon as practically possible.

One-on-one Meetings (U.S. 30 Service Road Business Group Foster Tracts Subdivision) Meeting No. 1: August 9, 2018: 8:00 a.m. to 10:30 a.m.

Meeting attended by Jeannie Spraker, Big Al's Auto, Jim Hanrahan, Pinnacle Cabinet, Gary Everett, Pinnacle Cabinet, Shane Pickel, Unique Wood Designs, Dave Rose, Big Al's Towing, and Tom Cobb, MPO. The meeting was conducted at Big Al's Auto 6526 U.S. 30 Service Rd Cheyenne, WY.

Local business owners had previously attended the first public meeting and expressed concerns about an original proposal by the design team which eliminated the U.S. 30 Service Road and Whitney Road connection using a cul-de-sac on the west end of the service road. The proposed improvements were developed to address existing and potential safety concerns. Those safety concerns were as follows:

- Proximity of the service road intersection to the U.S. 30/Whitney Road Intersection (171.6' CL to CL spacing).
- Cut-through traffic observed to and from Saddle Ridge Subdivision via Saddle Ridge Trail to the U.S. 30 Service Road to Whitney Road and back;
- Projected increase in ADT on Whitney Road anticipated to increase from 2,746 (2017) to 9,400 (2040) or 10.54% per year.

The business owners within the Foster Tracts Subdivision understood the safety concerns and the need to control access to and from the U.S. 30 Service Road onto Whitney Road. However, they indicated that elimination of the connection and the creation of a cul-de-sac would drastically impact their businesses. Additionally, not allowing proper ingress/egress for large semi-truck deliveries and business-owned tow truck haulers (37') hauling tractor-trailer combinations up to 80' long is a problem. They stated that most of the business deliveries and tow trucks access the businesses from the interstates to U.S. 30 then to Whitney Road and finally onto the U.S. 30 Service Road. If the cul-de-sac was constructed, they would be forced to use the U.S. 30 Service Road access onto U.S. 30 at the Saddle Ridge Trail intersection (i.e. east of Whitney Road) for both ingress and egress. Delivery vehicles would not be able to turn around to egress at the same location due to the size of vehicles used and limitation on the cul-de-sac radius (i.e. maximum cul-de-sac 50' radius to accommodate future 12' travel lane, 12' deceleration/auxiliary lane, 8' shoulder, and a 22' clear-zone for 55 mph ADT > 6,000). Consequently, to address safety concerns, the business owners and design team developed a compromise solution where an access control median would be installed on Whitney Road north of U.S. 30 to prevent left turns in and out of the U.S. 30 Service Road. The business owners requested that if an access control median is installed, could a full access be constructed at Woodhouse Road onto U.S. 30 to improve business access and visibility into the Foster Tracts



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area. They indicated that other access points into the area on Hinesley Road and Woodhouse Road do not allow easy access for large trucks due to the lack of roadway maintenance and poor surfacing, as well as, snow drifting issues. It was conveyed that any new access proposed on U.S. 30 would need to be approved by WYDOT. WYDOT has the jurisdictional control over access onto U.S. 30 and the U.S. 30 Service Road.

Meeting No. 2: October 31, 2018: 10:30 a.m. - 11:00 a.m.

Meeting attended by Jeannie Spraker, Big Al's Auto, Andy Vehar, Big Al's Auto, Nancy Olson, MPO, and Tom Cobb, MPO. The meeting was conducted at Big Al's Auto 6526 U.S. 30 Service Rd Cheyenne, WY.

This meeting was a follow-up to the previous meeting to update the group on the progress of developing an option for the extension of Woodhouse Road and future anticipated public meetings.

One-on-one Meetings (Jolley Rogers RV)

Meeting No. 1: October 31, 2018: 9:00 a.m. to 10:30 a.m.

Meeting attended by Steve Hamlin, Jolly Rogers, Nancy Olson, MPO, and Tom Cobb, MPO. The meeting was conducted at Jolly Rogers RV, 6102 U.S. 30.

An exhibit was presented of the latest proposed re-alignment of the intersection of Whitney at U.S. 30 which removes the skew angle and installs an access control median for improved safety. U.S. 30 would have a full movement access as it is currently. The Whitney access would be right in right out. The proposed improvements were developed to address existing and potential safety concerns. Those safety concerns were as follows:

- Proximity of the service road intersection to the U.S. 30/Whitney Road Intersection (171.6' CL to CL spacing).
- Cut-through traffic observed to and from Saddle Ridge Subdivision via Saddle Ridge Trail to the U.S. 30 Service Road to Whitney Road and back.
- Projected increase in ADT on Whitney Road anticipated to increase from 2,746 (2017) to 9,400 (2040) or 10.54% per year.

The discussions focused on the current design proposal which requires approximately 4,727 sq. ft. of land and removal/replace trees within a portion of Jolley Roger's RV property. This included approximately 10' of reserved right-of-way on the east side of the Jolley Roger RV property. It was explained that the negotiations for right-of-way would be done through the Wyoming Department of Transportation (WYDOT) and that land owners are compensated at fair market value and that trees are normally replaced at least 2 to 1 to sometimes a 3 to 1 ratio depending on the project and type of impact. Further discussion centered on the timeframe of the reconstruction project(s). Currently, Whitney Road is programed to be redesigned and built in 2022 and WYDOT has U.S. 30 reconstruction programed for 2024.



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Mr. Hamlin expressed his support for the project and realignment proposal if they are fairly compensated for the value of the property required. Some concern was expressed that an estimated 50% of his customers and employees turn left onto Whitney to avoid the U.S. 30 intersection. Mr. Hamlin stated that he would need to discuss the proposed improvements with his partner and let us know the final answer. Mr. Hamlin contacted the MPO the following day and expressed his support of the proposed improvements and reiterated his stipulations to fair compensation for the property and would like the access approach location relocated farther south to better accommodating the turning movement of employee and recreational vehicles using the right-in-right-out on Whitney Road.

One-on-one Meetings (Restway Travel Park)

Meeting No. 1: October 31, 2018: 1:00 p.m. to 3:00 p.m.

Meeting attended by Karen Sherman, Restway Travel Park, Scott Sherman, Restway Travel Park, Nancy Olson, MPO, and Tom Cobb, MPO. The meeting was conducted at Restway Travel Park, 4212 Whitney Road.

The purpose of the meeting was to introduce them to the project, design team, and set up a future meeting to discuss details of the conceptual improvements and to understand their business operation and needs. A brief overview of the current plan was presented which included an access control median on Whitney Road preventing left turns at their existing approach. They were concerned over the realignment as it impacts a RV dump station, an existing mobile home/trailer they are renting, a picnic shelter, and their sign as well as trees and some landscaping.

Meeting No. 2: November 13, 2018: 9:00 a.m. to 10:30 a.m.

Meeting attended by Karen Sherman, Restway Travel Park, Scott Sherman, Restway Travel Park, Kelly Bartlett, Restway Travel Park, and Tom Cobb, MPO. The meeting was conducted at Restway Travel Park, 4212 Whitney Road.

An exhibit was presented of the latest proposed re-alignment of the intersection of Whitney at U.S. 30 which removes the skew angle and installs an access control median for improved safety. The Whitney access into their existing business would be right-in right-out. The proposed improvements were developed to address existing and potential safety concerns. Those safety concerns were as follows:

- Proximity of the service road intersection to the U.S. 30/Whitney Road Intersection (171.6' CL to CL spacing);
- Cut-through traffic observed to and from Saddle Ridge Subdivision via Saddle Ridge Trail to the U.S. 30 Service Road to Whitney Road and back;
- Projected increase in ADT on Whitney Road anticipated to increase from 2,746 (2017) to 9,400 (2040) or 10.54% per year.



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The discussions where related to the approximate 5,238 sq. ft. of land and remove/replace trees within a portion of Restway Travel Park property. It was explained that the negotiations for right-of-way would be done through the Wyoming Department of Transportation (WYDOT) and that land owners are compensated at fair market value and that trees are normally replaced at least 2 to 1 to sometimes a 3 to 1 ratio depending on the project and type of impact. Further discussion centered on the timeframe of the reconstruction project(s). Currently, Whitney Road was explained to be programed to be redesigned and built in 2022 and WYDOT has U.S. 30 programed for 2024.

The owners expressed concern over the proposed improvements' direct impact to their business due to access being removed from U.S. 30 by a median. They indicated that all current patrons access their business from U.S. 30. The MPO indicated that the storage and deceleration length of southbound right and left turn lanes dictate the length of the access control median. It was further explained that the project goals are to improve safety and not destroy or hinder business. Alternatives will be developed to improve access and a follow-up meeting will be scheduled.

Meeting No. 3: January 15, 2019: 2:00 p.m. to 4:30 p.m.

Meeting attended by Karen Sherman, Restway Travel Park, Scott Sherman, Restway Travel Park, Kelly Bartlett, Restway Travel Park, and Tom Cobb, MPO. The meeting was conducted at Restway Travel Park, 4212 Whitney Road.

The purpose of the meeting was to follow-up the previous November 13, 2018 meeting after developing an alternative to allow full access into the current business. This proposed option added an ingress access north to align with Hinesley Road in conjunction with keeping the current access as a restricted right-in-right-out. The alternative required some reconfiguration of the RV sites in the northwest portion of the property. The RV sites were placed at 40' long x 16' wide at a 60° angle to optimize placement. The current sites in that location are approximately 40' long x 16' wide at varying angles. See Figure 3.5 Restway Travel Park Alternative 2.

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Figure 3.5 Restway Travel Park Alternative 2

The following notes are based on the MPO's understanding of the meeting, questions, and concerns.

Comments/Questions:

The owners expressed concern over the cost to reconfigure the RV sites and asked if they would they be compensated for the reconfiguration?

The MPO indicated that the design is only in the planning stages and a final design will need to be completed. Right-of-way negotiations for this project will be conducted by the WYDOT Right-of-way Section and they would be contacted during the final design phase of the project. It is our understanding that compensation is based on right-of-way area and damages (i.e. number and type of sites impacted) by the roadway modifications. The owners indicated that the impacts occur to different types of sites. Water, electric; water, sewer, and electric; tent sites. The MPO stated that each site would likely be valued at different levels depending on the type of site.

They also indicated that a one-way in and one-way out configuration is not the most desirable and could an alternative be developed for a two-way entry at each approach location?

The MPO will investigate the feasibility of developing a two-way entry/exist at each approach.



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Could we review an option with increased RV site size and reconfiguration of the non-discharging sewer lagoon area and west portion of the site?

The MPO will investigate the feasibility of developing an alternative for re-imagined site for the lagoon area and the west portion of the site that could potentially add large RV sites.

Additional discussions:

Existing RV site sizes on the property are approximately 16' wide: south sites 50' depth, middle sites are 60' depth, and the northwest sites are 40' in depth. The angles and total length vary depending on angle of the site.

The minimum width of any reconfiguration of site shall be 25' to account for width of RV, extensions, and vehicle (16' + 9' = 25').

What are the costs to connect to the City of Cheyenne Board of Public Utilities sanitary sewer main south of the property?

The MPO will investigate the costs and the sizes of the RV sites are noted for future reference and information.

Meeting No. 4: March 12, 2019: 2:00 p.m. to 4:30 p.m.

Meeting attended by Karen Sherman, Restway Travel Park, Scott Sherman, Restway Travel Park, Kelly Bartlett, Restway Travel Park, and Tom Cobb, MPO. The meeting was conducted at Restway Travel Park, 4212 Whitney Road.

The purpose of the meeting was to present two additional conceptual plans for the owners to review and comment. The third conceived concept plan reconfigured the west and northwest portion of the RV park site utilizing a two-way entry/exit at each of the approaches previously shown. The north approach is a full movement access aligning with Hinesley Road while the south approach is widened in its current location with restricted right-in-right-out access. The RV campsites were placed at 60' long x 25' wide and were placed at 60° angle to optimize placement. The fourth concept similarly reconfigured the northwest and west portions of the RV Park as outlined in the third option except for a new two-lane drive realigned into the site office. The concept was also different in that it eliminated the south approach and shifted the north approach south. See Figure 3.6 Restway RV Travel Park Concept 4.

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Figure 3.6 Restway RV Travel Park Concept 4

The following notes are based on the MPO's understanding of the meeting, questions, and concerns.

Comments/Questions:

The owners expressed deep concern over the cost to reconfigure of the RV sites and remove the evaporative lagoon on the southwest corner of the site.

They are concerned over the removal of the permanent mobile home on the west side of the site. They indicated it is a constant revenue source.

The MPO reiterated that this a planning study and a final design will need to be completed. The only modification required at this point of the Whitney Road Construction would be the northwest and west portion of the site. Additionally, the intent of the concept was to show the owners another way to look at the site. In this case, how many large RV sites could fit within your existing property.

Could the MPO look at the feasibility of realigning Hinesley Road to line up the Restway RV Travel Park approach rather than moving the approach to align with Hinesley?

The MPO will investigate the feasibility of developing an option to realign Hinesley Road to the south and coordinate with the adjacent property owners. Realigning Hinesley Road will require additional right-of-way acquisition.



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Meeting No. 5: May 2, 2019: 2:00 p.m. to 3:30 p.m.

Meeting attended by Karen Sherman, Restway Travel Park, Scott Sherman, Restway Travel Park, Gay Woodhouse, Roden, Nethercott, LLC, Dave Bumann, Laramie Count Public Works, Tom Mason, MPO, Tom Cobb, MPO. The meeting was conducted at the MPO office at 615 West 20th Street. The purpose of the meeting was to introduce the legal team hired by the owners to the MPO and briefly discuss the history and answer any questions.

The meeting began with an MPO overview and graphical presentation of the four concept plans developed along with the Concept Plan #5. Concept #5 realigned Hinesley Road to the south and relocated the approach for Restway RV Travel Park to the north Figure 3.7.



Figure 3.7 Restway Travel Park Concept 5

The following notes are based on the MPO's understanding of the meeting, questions, and concerns.

Comments/Questions:

The legal team had a question as why the U.S. 30 and Whitney Road Intersection was shifted to the west instead of the east which would have less burden on their client?

The MPO explained the reason to shift the intersection alignment to the west and not to the east was to remove the skew angle from Whitney to U.S. 30. This was based on two factors: first, the Saddle Ridge developers had just completed the new single-family homes and duplexes on the southeast corner of the intersection of U.S. 30 and Whitney Road; second, two underground petroleum transmission mains run parallel and follow the existing ground grade on each side of Whitney Road. The Suncor line is on the east side while the Plains All American Pipeline is on the west. We



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understand from the pipe line companies that the transmission lines generally follow the existing ground grade and as a result begins to rise due to the topography on the east side of the right-of-way. Consequently, a significant intersection shift to the east will likely require relocating or lowering of the Suncor pipeline. Any adjustments to the Suncor pipeline on the east side of Whitney Road within the area of Saddle Ridge would require the jurisdiction (i.e. Laramie County/WYDOT) to pay for that relocation. This is based on the original and revised easement agreements (BK#1937, PG# 484). See Appendix G for additional information. To better illustrate the difference in the existing ground or depth of the petroleum lines see Figure 3.8 Whitney Road at U.S. 30 (Looking South) east is to the left in the photo.



Figure 3.8 Whitney Road at U.S. 30 (Looking South)

The owners expressed concerns over the negative impacts to the property and potential impact to the business because of the property change and construction period that would limit access.

The MPO explained that the construction activity would obviously disrupt normal business but, access would need to be maintained. This would be coordinated with WYDOT during final design and construction.

Additionally, the Restway Travel Park Concept incorporated more than just the realignment of Hinesley Road. The traffic engineering consultant (Kimley-Horn and Associates) for the Whitney Ranch developed the original traffic volume projections previously used to calculate the storage que lengths for this project (Sustainable Traffic Solutions). Those volume projections and turn lane storage que lengths were examined and recalculated by Kimley-Horn on the U.S. 30/Dell Range Corridor Study. Concept #5 utilized the revised storage que lengths for the Whitney southbound left and right-turn lanes which were significantly reduced. The MPO would like to develop a Concept #6 which shifts the alignment by minimizing the design speed, incorporate new storage que lengths, and independent parallel left turns for



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southbound Whitney Road and the northbound Restway RV Park access. The MPO optimistically believes this option could provide significant reduction to the impact to the Restway RV Travel Park and meet the goals of the Whitney Road project.

The MPO will develop the Restway Travel Park Concept #6 and send to group for review.

One-on-one Meetings (Private Property: 6405 Hinesley Road)

Meeting No. 1: April 23, 2019: 2:00 p.m. to 4:00 p.m.

Meeting attended by Betty Beckle, Don Beckle, Zack Middelstadt, Stan Middlestadt, and Tom Cobb, MPO. The meeting was conducted at 6405 Hinesley Blvd. The purpose of the meeting was to present the Restway Travel Park Concept #5 conceptual plan for review by the impact owner and residences for review and comment.

The following notes are based on the MPO's understanding of the meeting, questions, and concerns. No comments or questions are specifically attributed.

Comments/Questions:

Placing a median on Whitney restricts access into their property and prevents them from backing in a tractor trailer combination headed southbound. What is the purpose of the median?

The proposed improvements addressed existing and potential safety concerns. Those safety concerns were as follows:

- Proximity of the service road intersection to the U.S. 30/Whitney Road Intersection (171.6' CL to CL spacing);
- Cut-through traffic observed to and from Saddle Ridge Subdivision via Saddle Ridge Trail to the U.S. 30 Service Road to Whitney Road and back;
- Projected increase in ADT on Whitney Road anticipated to increase from 2,746 (2017) to 9,400 (2040) or 10.54% per year.
- Conflicting northbound and southbound left turn movements overlap at the Restway RV Travel Park and Whitney Road.

The MPO discussed an option with the owners to have an access off the U.S. 30 Service Road in conjunction with the approach on Whitney Road. An access permit would need to be submitted to WYDOT.

The owner indicated that they were in favor of the combination of approaches to allow access and provide an opportunity for future commercial development. They indicated that a previous access permit was denied several years ago.

The MPO will introduce the concept to WYDOT for initial comment. The MPO cannot speak on behalf of WYDOT but, believes that based on the proposed future restricted access to the service road the new approach would likely not be denied at this time.



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The owner and residence had no issue with realigning Hinesley Road and the impact to the northwest corner of the property. They indicated that portion of the property is not really being utilizing but, they would like to be compensated fairly if the right-of-way is required.

They indicated that two households occupy the single property at this time and the structures to the north and steel Quonset building are both garages. A single underground water well supplies water to the two homes and a single septic and leach field are located north of the west house on Whitney Road.

Storm runoff from Whitney Road and Hinesley Road significantly impacts the house on the southeast corner of the property due to existing grading and ditches. Additionally, a single pipe install by others conveys runoff from the property onto the U.S. 30 Service Road north ditch. The lowest elevation or invert elevation of pipe is close to the finished floor elevation of the west house. Could the pipe be modified to improve drainage on this project?

The MPO indicated that it would illustrate an "WYDOT M-1" inlet and relayed pipe be placed on the plan to alleviate the effect of storm water from the site. Additionally, the plan already shows curb and gutter, inlets, and a storm water conveyance system which will reduce the impact of small storms to the residence.

Planning Commission

The fourth structure component of the project involved updates and a final presentation to the Laramie County and City of Cheyenne Planning Commissions. The primary purpose of the meetings was to convey the comments received from the public input, present recommended solutions for the corridor, and have a forum for any additional comments from the public or the commissioners.

Cheyenne Metropolitan Planning Organization (Committee Meetings)

The fifth type of structure component involved presenting design development updates, soliciting input, and final approvals from the established Cheyenne Metropolitan Planning Organizations Technical Committee and Citizens' Advisory Committee, and Policy Committee.

Jurisdictional Meetings

The fifth type of structure component involved presenting design development updates and final adoption or reception of the plan by the Cheyenne Governing Body and Laramie County Commissioners.

Reference

The Collaboration or public involvement phase of the project provided one of the components utilized for development of the Design portion of the plan. Please see the "Glimpse" section of the plan, which encompasses the culmination of the collaboration components and rationale behind the recommendations set forth in the plan.



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4.0 PROFILE

The Profile section contains a set of foundations which help frame the boundary of the plan. The four (4) foundations are listed and detailed in the following chapter:

- Foundation 1: Cheyenne's Future Land Use Plan
- Foundation 2: Key Planning Considerations
- Foundation 3: Potential Funding Mechanisms
- Foundation 4: Environmental Constraints

Foundation 1: Future Land Use Plan

The Future Land Use Plan is a long-range growth-focused map that provides the basis to guide future development in the City of Cheyenne and Laramie County areas of the Whitney Road Corridor. The map focuses on areas where new development will likely occur in the future and redevelopment areas. The Land Use for this area was not revised and was used as the basis for future traffic volumes. Please see Figure 4.1 Future Land Use Plan Detail and Figure 4.2 Future Land Use Plan Cheyenne Urban Area.

Foundation 2: Key-Planning Considerations

The Glimpse, Collaboration, and Profile phase of the project provide a framework for the future land development and corridor vision of the various stakeholders. The Whitney Road Corridor area has the potential to grow and develop as additional utility and roadway infrastructure become available and are appropriately sized for future capacity needs. The following structure considerations shape the corridor:

- Transit and Non-motorized Transportation
- Provide a safe, accessible and continuous pedestrian connection along the entire corridor
- Provide street lighting at intersections and non-motorized crossings where appropriate
- Provide shoulder bike lanes per the Cheyenne On-Street Bicycle Plan and Greenway Plan
 Update, Volume 1 by Update by Alta Planning + Design in 2012.
- Review options to expand the Greenway north of Dell Range Blvd. within the future developments for connectivity to schools and existing greenway components.
- Minimize impacts to nearby residential properties and businesses.

Traffic Safety and Operation

- Build a roadway cross section that enhances travel efficiency and accommodates all modes of transportation.
- Provide peak hour intersection operations with a minimum Level of Service (LOS) C through horizon year 2040.
- Attempt to maintain commercial and residential access approaches.
- Where appropriate, provide for proper turning radius at intersection to accommodate a conventional single unit truck, bus, or semi-trailer combination with a minimum wheelbase



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of forty (40) feet (i.e. 3 to 4 axle), and maximum of sixty-five (65) feet (i.e. 5 to 6 axles).

Roadway Connectivity

- Review options to promote development in undeveloped open space.
- Review existing roadways and provide additional or enhanced street connectivity.

Utility Companies

- Consult with wet and dry utility companies to provide enhanced or improved facilities to that will facilitate redevelopment.
- Attempt to provide a dry utility corridor within the current or proposed road right-of-way corridor.

Cooperation

 Multiple public agencies or wet utilities that have areas of jurisdiction in the area: Laramie County Government, City of Cheyenne, WYDOT, Board of Public Utilities.

Foundation 3: Potential Funding Mechanisms

Keys to successful development and revitalization in the corridor will be predicated on the following:

- A clear vision, considering the market and economic reality.
- A proactive strategy for reinvestment (public and private).
- Educated citizenry and policy makers.
- Calculated strategy to attract investment and remove barriers.
- Quantifiable leveraged public investment.
- Fiscally and economically responsible phasing plan.
- Equalization of economic risk vs. reward.
- On-going project support (political).

The public sector (City of Cheyenne, Laramie County, Cheyenne MPO, and WYDOT) will play an important role in "readying the area for private investment" through infrastructure improvements, public planning and policy initiatives. From these initiatives and/or investments, private sector development and redevelopment can be leveraged.

Funding mechanisms for public infrastructure could include loans and grants (e.g., Wyoming Business Council's Business Ready Community Program and Community Facilities Grant and Loan Program); Community Development Block Grant (CDBG) funds; 5th and 6th Penny Sales Tax projects revenue bonds; general obligation bonds; and Surface Transportation Program – Urban Systems (federal funds).

One of the "truths" in corridor development and revitalization is that private investment will typically follow public investment. The types of public infrastructure recommended in the Corridor Plan will not only encourage new development on vacant and/or underutilized parcels, but redevelopment of existing sites and buildings. This new private investment represents the "leveraged" return to the public sector from their initial investments.

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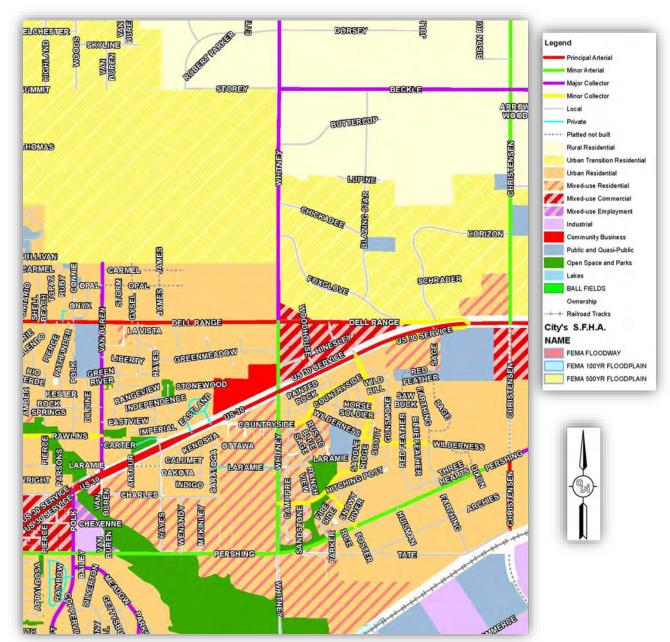


Figure 4.1 Future Land Use Plan Detail

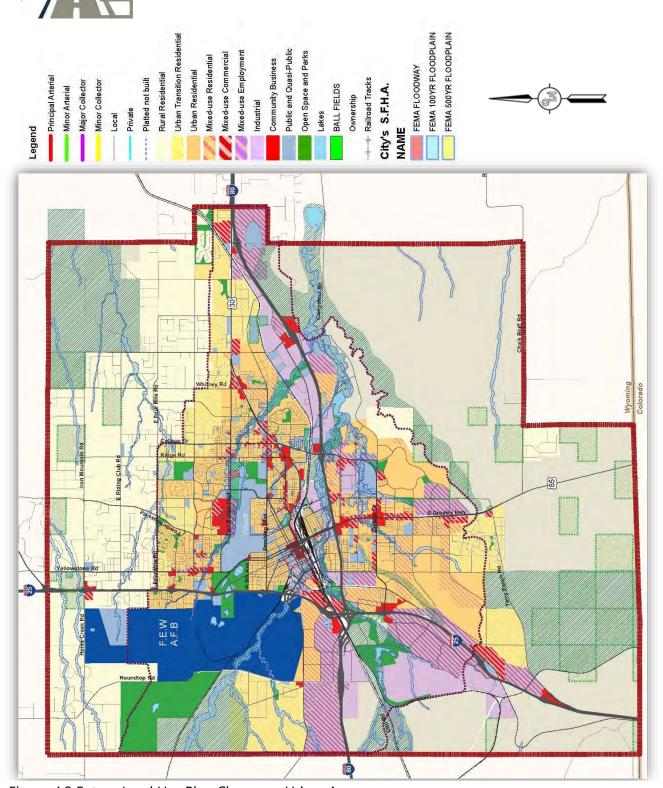


Figure 4.2 Future Land Use Plan Cheyenne Urban Area



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Foundation 4: Environmental Constraints

The following environmental checklist Table 4.1 Environmental Review Corridor Checklist was reviewed for the corridor to identify any areas of environmental concern that may need to be addressed in future development of the corridor plan, roadway design, and construction.

A formal environmental report will likely be required to secure funding before and/or during the final design phases of the project.

The MPO conducted a desktop survey for the existing and potential alternatives and identified potential wetlands that are regulated by the Army Corps of Engineers (ACOE). No waters of the U.S. were identified. Please see Figure 4.3 Potential Wetlands Whitney Road and desktop environmental report contained in Appendix F for additional information and reference.



Figure 4.3 Potential Wetlands Whitney Road



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Table 4.1 Environmental Review Corridor Checklist

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environ	ment			
Threatened or Endangered Species	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	✓Yes □ No □Unknown □ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Further investigation will be required during final design but not anticipated to be a factor. Review of area and U.S. Fish & Wildlife website. Unofficial US fish and Wildlife Service online database suggests the following: Mammals: Preble's meadow jumping mouse, Least Tern, Piping Plover, Whooping Crane, and Pallid Sturgeon. Flowering Plants: Colorado Butterfly Plant, Ute Ladies'-tresses, Western Prairie Fringed Orchid. While these species have some potential, it is unlikely they are present. However, specific species/habitat surveys may be required once an alignment is selected. We are still waiting on response from the FWS from our letter request.
Wildlife Corridors	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ☐Unknown ✓Not applicable	Further investigation will be required during final design but not anticipated to be a factor. Based on WGFD GIS data, no wildlife corridors cross or are in the area.
Invasive Species	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Further investigation will be required during final design but not anticipated to be a factor.





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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environm	ent (Continued)			
Wetland Areas	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	Further investigation will be required during final design but not anticipated to be a factor. Please see Appendix F and Figure 4.3 for additional information and reference.
Riparian Areas	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ✓ Not applicable	Observation
100-Year Floodplain	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ✓ Not applicable	FEMA website and County GIS review. (see Glimpse: Drainage; Figure 2.7)
Clean Water Act Sections 404/401 Waters Of The United States	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ✓ Not applicable	WYDEQ identified no Class I waters, but further detailed design/layouts will be needed to determine what if any permits will be required from the Army Corps of Engineers and WYDEQ-WQD.
Prime Or Unique Farmland	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	The USDA National Resources Conversation Service of Laramie County Custom Soil Survey identified Sections of Prime or Unique Farmlands in the area (i.e. Map Unit Symbol: 100) and areas of Prime Farmland, if irrigated (Map Unit Symbol 102, 104, 158). See Appendix F Soil Survey.



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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environm	nent (Continued)			
Wild and Scenic Rivers	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	Observation and public process. Visual leisure in the case is "open space/aerial". Although this is subjective it may have impacts throughout the corridor.
Designated Scenic Road/Byway	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Formal survey was not completed; however, the Disturbed nature of the area would suggest that it is unlikely to find surface deposits. Buried artifacts may be possible. Formal surveys are likely once an alternative is selected. We are still waiting on a response from SPHO from our letter request.
Cultural Resources				
Archaeological Resources	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Formal survey was not completed; however, the Disturbed nature of the area would suggest that it is unlikely to find surface deposits. Buried artifacts may be possible. Formal surveys are likely once an alternative is selected. We are still waiting on a response from SPHO from our letter request.
Historical Resources	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Observation



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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Section 4(f) and S	Section 6(f) Resou	ırces		
Section 4(f)1 Wildlife and / or Waterfowl Refuge	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	No impacts are anticipated based on observation.
Section 4(f) Historic Site	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	A section 106 Study will be required to determine potential impacts however, the area was not listed on the SHPO website.
Wild and Scenic Rivers	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	Observation
Section 4(f) Park	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	Observation
Section 6(f)2 Resource	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	

¹ Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S. Code § 303, as amended); see <Section 4(f)>.

 $^{^{2}}$ Section 6(f) of the Land and Water Conservation Fund Act





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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.	
Human Environme	ent				
	✓ Yes	✓ Yes	✓ Yes		
Foliation:	□ No	□ No	□ No	Existing approaches, fences and right-	
Existing Development	□ Unknown	□ Unknown	□ Unknown	of-way will be necessary to complete the project based on the preliminary	
·	□ Not applicable	□ Not applicable	□ Not applicable	plan.	
	✓ Yes	☐ Yes	☐ Yes		
Planned Development	□ No	□ No	□ No	Potential development is anticipated on	
	□ Unknown	✓ Unknown	✓ Unknown	underdeveloped properties based on	
	□ Not applicable	□ Not applicable	□ Not applicable	discussions with adjacent boundaries.	
	☐ Yes	✓ Yes	✓ Yes		
	✓ No	□ No	□ No	Possible impacts to adjacent business	
Displacements	□ Unknown	□ Unknown	□ Unknown	adjacent to the existing Whitney because of realignment of south	
	□ Not applicable	□ Not applicable	□ Not applicable	Whitney.	
	✓ Yes	✓ Yes	✓ Yes		
A	□ No	□ No	□ No		
Access Restriction	□ Unknown	□ Unknown	□ Unknown	Observation	
	□ Not applicable	□ Not applicable	□ Not applicable		
	☐ Yes	☐ Yes	✓ Yes		
Ni alala alala a di	□ No	□ No	□ No		
Neighborhood Continuity	✓ Unknown	✓ Unknown	□ Unknown	Observation	
	□ Not applicable	□ Not applicable	□ Not applicable		



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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Human Environ	ment (Continue	ed)	ı	
Community Cohesion	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	Public Involvement process.
Physical Environ	nment			
Title VI/Environme ntal Justice Populations ₃	☐ Yes ☐ No ✓ Unknown ☐ Not applicable	☐ Yes ✓ No ☐ Unknown ☐ Not applicable	☐ Yes ☐ No ☐ Unknown ✓Not applicable	
Utilities	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	✓ Yes □ No □ Unknown □ Not applicable	Observation See Section Glimpse; Utilities.
Hazardous Materials	☐ Yes☐ No ✓ Unknown☐ Not applicable	☐ Yes☐ No ✓ Unknown☐ Not applicable	☐ Yes☐ No ✓ Unknown☐ Not applicable	Observation

³ refers to Title VI of the 1964 Civil Rights Act and 1994 Executive Order 12898 on environmental justice



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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.	
Physical Enviro	nment (Continu	ed)			
	✓ Yes	✓ Yes	✓ Yes		
Sensitive Noise Receivers ₄	□ No	□ No	□ No		
	□ Unknown	□ Unknown	□ Unknown	Adjacent Neighborhoods	
	□ Not applicable	□ Not applicable	□ Not applicable		
	☐ Yes	☐ Yes	☐ Yes		
	□ No	□ No	□ No		
Air Quality	□ Unknown	✓ Unknown	✓ Unknown		
	✓ Not applicable	□ Not applicable	□ Not applicable		
	☐ Yes	☐ Yes	☐ Yes		
	□ No	□ No	□ No		
Energy	✓ Unknown	✓ Unknown	✓ Unknown		
	□ Not applicable	□ Not applicable	□ Not applicable		

Resource Areas Requiring Potential Further Review

Based on a desktop review and observation, the following resource areas may require additional review and are summarized below:

- Threatened or Endangered Species
- Visual Resources
- Wetland Areas
- Prime or Unique Farmland
- Archaeological Resources

- Displacements
- Existing Development
- Planned Development
- Utilities
- Energy.

⁴ under FHWA's Noise Abatement Criterion B: picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals



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5.0 DESIGN

The Glimpse, Collaboration, and Profile phase of the project provided a solid basis for development of the Design portion of the plan. The design section of the plan encompasses the culmination of the groundwork components and rationale behind the recommendations set forth in the plan.

The overall recommendations are specifically designed to address the modes of transportation and safety needs of the present and future users of the Whitney Road. All recommendations have been examined carefully to ensure the requests of the stakeholders have been considered as well as their practicality, functionality, aesthetic appeal, sustainability, and successful implementation. The physical layout of the improvements are detailed in the following pages and can be found on the corridor plan and profile sheets contained in Appendix A. Detailed cost estimates are shown in Appendix D.

Roadway Concept Alternatives

The conceptual roadway "typical" alternatives were developed and evaluated using a multi-modal framework as a base. At intersections and other locations with unique design challenges (e.g. driveways, areas with limited sightline, skew, etc.), special designs and modifications may be needed to address issues of road geometry, adjacent land uses, traffic volumes and other characteristics. The Whitney Road Corridor Study evaluated conceptual improvement alternatives for the roadway segments and streetscape with the following framework components:

- What are the existing and future adjacent conditions and uses?
- What variations can be made to create a more user-friendly corridor?
- What movements and interactions will take place on the corridor?
- What is the corridor vision of the stakeholders?
- What can we do to add low maintenance streetscape to "soften" the corridor for non-motorized modes of transportation?
- Current City of Cheyenne Unified Development Code (UDC) and Laramie County Land Use Regulations (LCLU) typical sections based on roadway classifications.



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Design Guide Criteria

The roadway corridor is comprised of two different roadway classifications with corresponding criteria developed from industry standards and a merging of two independent jurisdictional criteria (i.e. Laramie County and City of Cheyenne). ^{1 2 3}

(Minor Arterial: South of Dell Range Blvd.)

Roadway Classification: Minor Arterial

Minimum Design Speed: 30 mph (Intersection of U.S. 30); 40 mph (Corridor)

Clear Zone Width: 16 feet (ADT > 6,000), 1V:5H to 1V:4H

14 feet (ADT > 6,000), 1V:6H

Stopping Sight Distance: 30 mph: 200 feet; 40 mph: 305 feet
Passing Sight Distance: 30 mph: 500 feet; 40 mph: 600 feet

■ Crest Vertical Curve: K = 89 (30 mph); K= 129 (40 mph): Passing Sight Distance

K = 19 (30 mph); K=44 (40 mph): Stopping Sight Distance

Sag Vertical Curve: K = 37 (30 mph); K=64 (40 mph)

Grade (Max./ Min.): 6%/ 0.5%Design Vehicle: WB-67

■ Horizontal Curve CL: R = 333′ (30 mph); R = 762′ (40 mph): Adverse Crown: -2.0%

• Transitions: $L = WS^2/60 = W(30 \text{ or } 40)^2/60$

(Major Collector: North of Dell Range Blvd.)

Roadway Classification: Major Collector

Minimum Design Speed: 35 mph

Clear Zone Width: 12 feet (ADT 1,500-6,000), 1V:5H to 1V:4H

10 feet (ADT 1,500-6,000), 1V:6H

Stopping Sight Distance: 35 mph: 250 feet
 Passing Sight Distance: 35 mph: 550 feet

Crest Vertical Curve: K = 108 (Passing Sight Distance)

K = 29 (Stopping Sight Distance)

Sag Vertical Curve: K = 49 (Stopping Sight Distance)

Grade (Max./ Min.): 8%/ 0.5%Design Vehicle: WB-40

■ Horizontal Curve CL: R = 510′ (Adverse Crown: -2.0%)

• Transitions: $L = WS^2/60 = W(35)^2/60$

2-3987.17

A Policy on Geometric Design of Highways and Streets (Officials, A Policy on Geometric Design of Highways and Streets,

 ²⁰¹⁸⁾ City of Cheyenne Unified Development Code (Last Amended Cheyenne, 2017), (Cheyenne, 2017)
 The Laramie County Land Use Regulations (2019 Edition Laramie County, Effective January 1, 2019)



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Future Traffic Volume Conditions

Traffic volume projections were developed for Year 2040 by Kimley-Horn to estimate the impacts of the traffic growth on the corridor. Projected peak hour volumes were developed for the key intersections along the corridor as well as daily volumes for the links along the corridor using the following process.

- **Background Traffic**, the existing peak hour and daily volumes were inflated by 1.25% annually to estimate the growth in background traffic along the corridor. This rate is used by the MPO and WYDOT to estimate traffic growth in the Cheyenne metropolitan area which was developed in the City of Cheyenne Transportation Plan.
- Development Traffic, the year 2040 estimated trips that are expected to be generated by the new development/ redevelopment areas adjacent to the corridor were distributed and assigned to the intersections utilizing Figure 4.1 Future Land Use Plan Detail and Figure 4.2 Future Land Use Plan Cheyenne Urban Area in addition to the Whitney Ranch Traffic Impact Study.
- **Total Traffic,** the background traffic was combined with the development traffic to estimate year 2040 total traffic. The year 2040 volumes peak hour and daily volumes are summarized in *Figure 5.2 Today and 2040 Projected Volumes (ADT)* and *Figure 5.3 2040 Projected Peak Hour and ADT Overall Volumes*.

Cross Sectional Elements

Lane Widths

As shown in Table 5.1 Ultimate Typical Section Jurisdictional Comparison, lane width requirements vary between the jurisdictional entities from ten to twelve (10-to-12) feet. According to AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2018) and our experience, smaller lane widths may be used in more constrained areas where truck and bus volumes are relatively low and where speeds are less than 45 mph. Lane widths of eleven (11) feet wide are frequently used in urban street designs while twelve (12) foot wide lanes are desirable on high speed, free flowing corridors.

After extensive discussion between the design team and Steering Committee, we recommend the use of eleven (11) foot wide travel lanes on Whitney Road. This width still accommodates larger design vehicles and allows increases the available tree lawn width, which can be used for snow storage, pedestrian separation, and drainage.

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Table 5.1 Jurisdictional Cross Section Elements Comparisons

	IV	linor Arterial	Major Collector			
Description	City of Cheyenne (1)	Laramie County (2)	2018 AASHTO (3)	City of Cheyenne (1)	Laramie County (2)	2018 AASHTO (3)
Travel Lane width	12′	12′	10' – 12'	12′	11′	11′
Turn Lane width	12′	12′	Context	12′	12′	Context
Parking	none	none	Context	none	None	7' to 10'
Roadway Width	48′	48′	Volume	48′	44′	Volume
Sidewalk/ Pedestrian Area	6′	6′	Context	6′	6′	Context
Parkway/ Tree Lawn	8'	8′	-	8′	5′	-
Bike Lane/ Shoulder	6′	6′	8′	6′	6′	6′
Volume Capacity	7,500 – 18,000	7,500 –	>2,000	6,000 –	3,500 –	>2,000
(ADT)		15,000		10,000	7,500	

Curbs

The type and location of curbs affect driver behavior and safety. Curbs serve many purposes including drainage control, roadway edge delineation, delineation of pedestrian walkways, and access control. Although curbs are not considered fixed objects in the context of a clear zone obviously, they will affect impacting or overriding car movements, after discussion within the public, design team and Steering Committee, we recommend the use of curb and gutter on Whitney Road. Curb and gutter will provide better access control and pedestrian delineation for use by pedestrians, young school children, and control drainage.

Bicycle Facilities

Bicycling is becoming increasingly popular as a means of transportation and recreation in Cheyenne. To promote and support multi-modal transportation both the Unified Development Code of the Cheyenne, Wyoming (UDC) and the Laramie County Land Use Regulations make provisions for bike lanes on both the major collector and minor arterial street sections (See Table 5.1 Jurisdictional Cross Section Elements Comparisons).

This ensures a comprehensive, continuous, safe, and efficient bicycle system network within the urban boundary of Cheyenne and Laramie County. Multi-modal corridor design emphasis provides safe, efficient, and convenient movement of all modes of transportation including vehicles, bicycles, and pedestrians. A Bike Lane is defined as a designated area of the roadway favored or exclusive to bicyclists while a separated multi-use pathway provides the broadest opportunity for a variety of non-motorized transportation modes. Advanced commuter cyclists seem to prefer riding within the roadway.

Whitney Road was designated for a "Shoulder Bikeway" while Dell Range Blvd has been designated for a "Buffered Bike Lane," and US 30 for a "Greenway" in the September 2012 Cheyenne On-street Bicycle Plan and Greenway Plan Update [4].



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The Urban Bikeway Design Guide by the *National Association of City Transportation Officials* (Officials N. A., 2014) recommends the following conventional bike lane standard.

- Conventional Bike Lanes. A 6-inch to 8-inch stripped area with a minimum width of four (4) feet when no curb and gutter is present, five (5) feet when adjacent to curb and gutter, and six (6) feet where right-of-way allows.
- **Buffered Bike Lanes.** The buffer shall be no less than 18 inches wide and marked with two 6 to 8-inch-wide solid white lines. If the width is three (3) feet or wider, the buffer area shall have interior diagonal cross hatching or chevron markings. The chevron markings shall be 4 inch white angled at 30 to 45 degrees at intervals of 10 to 40 feet.

After discussion with the public, design team and Steering Committee, we recommend the use of additional on-street shoulder / bike lane on the Whitney Road Corridor.

Pedestrian Facilities

The need for continuous and updated pedestrian facilities and accessible facilities are fundamental to encourage redevelopment, development, and promote an efficient and fair transportation system. All people benefit from pedestrian facilities, however youth, seniors, physically, economically, and socially disadvantaged people require non-automobile options which provide convenient and safe multi-modal connectivity.

The need for pedestrian facilities received moderate support during the public process for Whitney Road. This is likely due to the rural nature of the area which naturally promotes the use of motorized vehicle transportation. As this area begins to develop and redevelop the need for pedestrian facilities will become a paramount necessity on the corridor. Discussions during the planning process centered on utilizing two types of facilities:

- Shared Use Path. A multi-use path designed primarily for use by bicyclists and pedestrians, including pedestrians with disabilities for transportation and recreation purposes. Shared use paths are physically separated from motor vehicle traffic by an open space or barrier. They are either within the right-of-way or within an independent right-of-way or easement.
- Sidewalks. A well-maintained sidewalk provides a safe and accessible conduit for pedestrian movement and access which enhances connectivity and promotes walking. The Urban Street Design Guide by the National Association of City Transportation Officials (Officials N. A., 2014) recommends that sidewalk have a desired minimum through zone of 6 feet and absolute minimum of 5 feet. Where sidewalk is directly adjacent to moving traffic, the desired minimum is 8 feet, providing a two-foot buffer for street furnishings and utilities.

After discussion with the public, design team and Steering Committee, we recommend the use of 6' sidewalks on each side of the roadway south of Dell Range Blvd. and a 7' multi-use path on the east side of the corridor north of the Dell Range Blvd. on the Whitney Road Corridor.



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Safety Medians

The primary function of medians is safety. They separate traffic streams, guide turning movements at intersections, and provide access control to/from minor access drives and intersections. It is very important that medians be delineated in a way that makes them visible and distinguishes them from the adjacent driving lanes. Curbed medians and traffic islands provide an added benefit by "softening" the urban roadway edge and subjectively enhance the aesthetic quality when utilizing a combination of the material types.

Three (3) types of medians are most common in the urban roadway environment: raised, flush, and two-way left-turn lanes.

- <u>Raised Medians.</u> A raised median is used in urban streets where it is desirable to control or restrict mid-block left turns and cross maneuvers. Installing a raised median can result in the following benefits:
 - Improve traffic safety
 - o Restrict left-turn and crossing maneuvers to specific locations or certain movements
 - o Increase capacity and reduce delays
 - o Provide a pedestrian refuge area (minimum of six (6) feet wide).
 - AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2018) recommends that intersection median turn lanes have a minimum medial separator of four (4) feet between turning lane and opposing traffic. Additionally, they recommend that with wider medians, consideration should be given to offsetting the left-turn lanes to provide maximum visibility between opposing traffic volumes.
- **Flush Medians.** Flush medians are surface painted medians that can be traversed. (Although they discourage left-turn and crossing maneuvers by their striping configuration, they do not prevent left turns because the median can be easily crossed).
- Two-way Left-turn Lane. Two-way left-turn lanes (TWLTL) are flush medians that may be used for left turns by traffic from opposing directions on the street. AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2018) recommends the use of a TWLTL on arterials with numerous cross streets, commercial, residential drives, or where it is impractical to limit left turn movements.

After discussion and evaluation by the public, design team, and Steering Committee, we recommend the use of all three types of medians at appropriate locations along the corridor. Please see Appendix A for additional detail. The medians will only be used at locations near major intersections at Dell Range Blvd. and U.S. Highway 30 for safety and access control.



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Auxiliary Lanes (Speed-Change Lanes)

The existing corridor would be governed under the jurisdiction of WYDOT, Laramie County, and the City of Cheyenne. Their criteria along with AASHTO, and the National Cooperative Highway Research Program (Kay Fitzpatrick, 2014)) Report 780, Design Guidance for Intersection Auxiliary Lanes was utilized for reference and information. A summary of the individual criteria is summarized in Table 5.2 Jurisdictional Left and Right Turn Warrant Criteria and careful consideration was given to the proposed conceptual alternatives to use the safest and most practical deceleration length on the corridor. Therefore, due to the proximity of access approaches, and expected relatively lower speeds approaching intersections, a one-hundred (100) foot deceleration length is recommended to be applied to the auxiliary lane development on Whitney Road and four hundred fifteen (415) foot on U.S. 30 with corresponding tapers 100' and 150' minimum tapers, respectively. If specific site conditions did not allow development of a full deceleration lane, it was so noted. Consequently, for a twelve (12) foot auxiliary lane, this equates to approximately an 8.3:1 on Whitney Road and 12.5:1 on U.S. 30.

Left Turn Lane, AVI recommends that a left-turn deceleration lane and taper are required for any access with a projected peak-hour ingress turning volume greater than 10 vehicles per hour (vph). The taper length shall be included with the required deceleration length

Right Turn Lane, A right-turn deceleration lane and taper is required for any access with a projected peak hour ingress turning volume greater than 25. The taper length should be included within the deceleration length.

Table 5.2 Jurisdictional Left and Right Turn Warrant Criteria

6.44.44	Through	Left-turn	Right-turn	Notes
Criteria	Turning V	er hour (vph)]	113.63	
City of Cheyenne	NA	>10 vph	>25 vph	12' (no less than 10')
Laramie County	>10 vph	>10 vph	>25 (Program, 2014) vph	12' (no less than 10')
NCHRP 780	250	15	-	-





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Table 5.3 Jurisdictional Requirements for Deceleration and Tapers for Auxiliary Lanes

	Stop Condition	15 MPH Turns	Minimum Taper				
Design Speed	Deceleration	Ratio					
AASHTO 2018							
30	150′	-	8:1				
35	205′	-	8:1 to 15:1				
40	265′	-	8:1 to 15:1				
50	415′	-	15:1				
55	505′	-	15:1				
60	600′	-	15:1				
City of Cheyenne	-						
35	275′	235′	10:1				
40	315′	295′	11.5:1				
50	435′	350′	13:1				
Laramie County							
30	235′	185″	8:1				
35	275′	235′	10:1				
40	315′	295′	11.5:1				
50	435′	405′	15:1				
WYDOT							
40	275′	-	150′ (12.5:1)				
50	410′	-	150' (12.5:1)				
55	485′	-	150' (12.5:1)				
NCHRP 788							
30	170′	80′	180′ (15:1)				
35	230′	120′	245' (20.4:1)				
40	290′	170′	320′ (26.7:1)				
50	460′	290′	600' (50:1)				
60	650′	460′	720′ (60:1)				

Intersection Storage Lengths

All intersection storage lengths in the study were calculated by Kimley Horn using Synhro®10 Signal Timing and Analysis Software based on future signalization, 2040 traffic volumes, signal cycle length, and signal phasing assumptions. Assumption details can be found in Appendix E. The lengths shown were used to develop the recommended intersection layouts shown in Appendix A and the document.



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Table 5.4 Intersection Storage Lengths

Intersection/ Movement		Minimum Turn Bay Length (ft) ⁴		Thru Movement Storage		Recommended Auxiliary Turn Lane Lengths (ft)		
	AM	PM	AM	PM	Storage	Decel.	Taper	Total
Whitney Road (DS = 30 mph) at Dell Range Blvd. (DS = 40 mph)								
Eastbound Left (EBL)	28′	m 23'	82'	#599'	125′	265′	100′	290′
Westbound Left (WBL)	M 21'	m10′	#506′	355′	100′	265′	100′	265′
Northbound Left (NBL)	168	m#134	134′	#451	100′	150′	100′	250′
Southbound Left (SBL)	56	#107	#452' 318'		100′	150′	100′	250′
Whitney Road (DS = 30 r	nph) at U	.S. 30 (DS =	50 mph)					
Eastbound Left (EBL)	53′	m 227′	28′	m 126′	375′	415′	150′	790′
Eastbound Right (EBR)	0′	m 15']	111 120	100′	415′	150′	365′
Westbound Left (WBL)	m 4′	55′	204′	98′	100′	415′	150′	365′
Westbound Right (WBR)	13′	50′	204 90		100′	415′	150′	365′
Northbound Left (NBL)	192′	112′	96′	95′	100′	150′	100′	250′
Southbound Left (SBL)	m 4′	m 19′	m 34′	m 70′	150′	150′	100′	300′
Southbound Right (SBR)	m 193′	m 130′			200′	150′	100′	350′

Provision for Dry Utilities

As previously described in the study, utilities are interlaced in the corridor area and are both underground and overhead. Obviously, utilities should desirably be located underground or at the edge of the right-of-way, when practical. Based on the constrained right-of-way width of 80 feet, we would recommend that new developments have dry utility facilities relocate underground and within easements outside of the existing corridor.

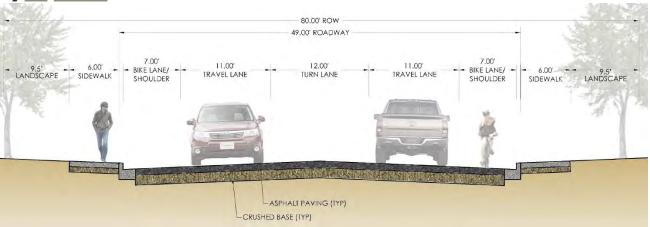
⁴ m - Volume for 95 percentile queue is metered by upstream signal

^{# - 95&}lt;sup>th</sup> percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after two cycles

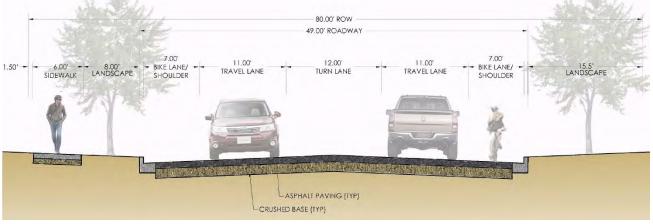


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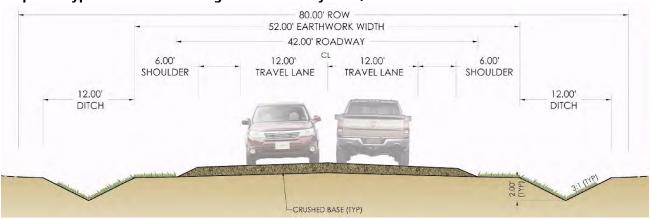
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Proposed Typical Section U.S. 30 to Dell Range Blvd.



Proposed Typical Section Dell Range Blvd. to Storey Blvd./ Beckle Road



Proposed Typical Section Beckle Road North

Figure 5.1 Recommended Typical Sections Whitney Road (Looking North)

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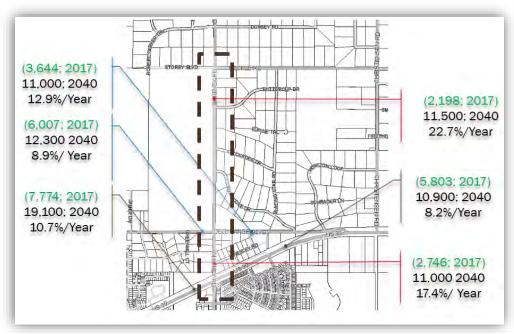


Figure 5.2 Today and 2040 Projected Volumes (ADT)

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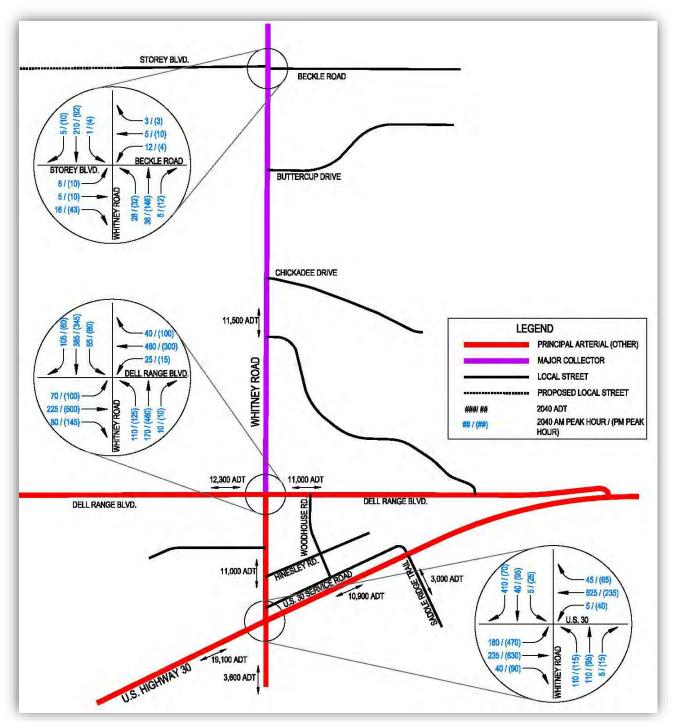


Figure 5.3 2040 Projected Peak Hour and ADT Overall Volumes



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Drainage and Detention

The requirements for drainage and detention for the City of Cheyenne and Laramie County differ in policy. We understand that the roadway at this time is in Laramie County however, it is within the City of Cheyenne Planning Area Boundary.

The primary requirements for each jurisdiction are briefly outlined below:

Laramie County

- Detention. Stormwater detention is based on the one hundred (100) year design frequency.
 - Post development design requirements shall be for a system to maintain total contributory site discharge at no greater than a pre-development (i.e. historic) fifty (50) year release rate for a 100-year storm event.
 - o Drainage planning shall include a design to maintain post-development runoff rates to historic rates for all return periods.
 - o Emergency spillways shall be included in the design planning facilities.
- Drainage Conveyance. Drainage conveyance system elements shall be based on the following minimum criteria for a minor arterial street to accommodate both sections of Whitney Road:
 - Minor Storm
 - No curb overtopping and one interior drive lane clear of spread
 - Major Storm (100-year)
 - Maximum depth in gutter flowline 12 inches, 6 inches flow across street intersections.
 - Drainage Swales (Major Storm within easement)

City of Chevenne

- Detention. Detention of stormwater shall be based on the more restrictive of the following:
 - No increase in peak discharge rates.
 - o 100-year post-project peak rate no greater than the pre-project fifty (50) year release rate.
 - o The downstream conveyance capacity of a project.
 - As provided for in Section 3.2.3.a.3(a). Drainage facilities shall be designed to, at a minimum, not adversely impact downstream properties. Proposals to increase downstream conveyance capacity of an area may be considered in-lieu of overdetention on a project, with justification.
 - Drainage planning and design shall provide for stormwater detention based on a design storm up to a 100-year frequency. The design shall maintain postdevelopment runoff rates to predevelopment rates for return periods up to a 50-year frequency.
 - Emergency spillways shall be sized to convey the 100-year inflow peak. Spillway design velocities exceeding 5 fps shall require buried soil riprap.



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- o Embankments shall be no steeper than 4:1 below the 100-year water surface elevation and no steeper than 3:1 above the 100-year water surface elevation. The top width shall be 40 percent of the maximum dam height plus 4 feet.
- A 15-foot maintenance access with an 8 foot all weather surface shall be provided to assure access to all pond components.
- o Post-construction Stormwater Best Management Practices (BMPs) are required to treat a minimum of the Water Quality Capture Volume (WQCV) as defined in the Urban Storm Drainage Criteria Manual (UDFCD) published by the Mile High Flood District (District, 2010, 2019). The WQCV shall be added to the detention volumes up to the 50-year and may be incorporated within the 100-year detention volume.
- Drainage Conveyance. Drainage conveyance system elements shall be based on the following minimum criteria for a minor arterial street:
 - Minor Storm
 - No curb overtopping and one 10 foot interior drive lane clear of spread
 - Maximum depth of 6 inches in cross pans, where allowed.
 - o Major Storm (100-year)
 - Maximum depth of 12 inches in gutter flowline and cross street intersections.
 - Channels (100 cfs or greater). Design for the 100-Year frequency with one foot of freeboard. Maximum velocities 5 fps for erosive soils and 7 fps for non-erosive soils.
 Bank slopes 4:1 desirable; steeper slopes require review and approval.
- Storm Sewers. Storm sewers shall not be designed to surcharge in the minor storm (surcharge is a depth of flow greater than 80 percent of the height). The maximum hydraulic head shall be 0.5 feet below the lip of drop inlets for the minor storm. The minor storm varies depending on zoning and land use from 2-Year to 10-Year.

The design team developed a conceptual drainage plan for the corridor. Due to the minimum size of the right-of-way at approximately 80 feet and level of design, planning level opportunities exist for improving the post development drainage adjacent to the corridor. After careful review, we recommend a combination of detention methods and storm sewer be implemented at the final design phase:

- Roadside drainage that capture and treat water via longitudinal gravel beds, and the use of roadside ditches as linear detention/water quality facilities
- Conventional offsite detention as available from adjacent landowners.

Redirect flows along Whitney and Dell Range east down Whitney south via storm sewer system.

North Alignment Alternatives

The north alignment or namely Whitney Road from Dell Range Blvd. to Storey Blvd./Beckle Road was the only section of the corridor considered for realignment during the study process. This is due to the fact this section of Whitney Road contains an elevation change of approximately 95 feet from Dell Range with grades in excess ten (10) percent. This grade and elevation change create unsafe sightlines as you near the top of the hill heading north and coming over the crest heading south.



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Additionally, the grade becomes dangerous in inclement weather with icy and hydro-plane conditions. However, just mitigating the steep grades in this area of the corridor potentially has significant impacts to both adjacent landowners and the petroleum lines located within the right-of-way of the corridor as previously mentioned in other sections of this report. The interrelationship of the petroleum pipelines and the roadway corridor planning project is the ability of the planning project to meet the established criteria; i.e., removal or mitigation of the steep roadway grade to improve safety for users and establish a non-motorized sidewalk/path that meets the Americans with Disability Act (i.e. ADA) accessibility requirements while minimizing impacts. Many different concepts were suggested, reviewed, and evaluated for consideration for the Whitney Road north alignment from Dell Range Blvd. to Storey Blvd./Beckle Road during the study process. Those considered included the following:

- Do Nothing
- Existing Alignment with Maximum Allowable Profile (3 Lane Section)
- Existing Alignment with Accessible Profile (3 Lane Section)
- NBL/ SBL Independent Roadways and Maximum Allowable NBL and Accessible Profile SBL
 - o Alignment placement east of Whitney Gysel Barn Structure
 - o Alignment placement west of Whitney Gysel Barn Structure
- Three-lane Roadway, Revised Alignment, Accessible Profile, and Impact to Plains All American Pipeline (PAAPL)
- Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure.
- Three-lane Roadway, Revised Alignment East, Accessible Profile.

A detailed description of each Alternative, it is advantages and disadvantages, are detailed in the following portion of the study.

Alternative 1: Do Nothing. This alternative utilizes the existing Whitney Road right-of-way north of Dell Range Blvd without any improvements.

Advantages:

- No construction cost.
- No impact to adjacent property.
- No impact to existing utilities within the right-of-way.

Disadvantages:

- Future development would be limited due to the limited vehicle capacity of a rural two-lane roadway.
- Safety concerns.
 - The longitudinal profile of the roadway is steep with limited visibility for stopping site distance. The posted speed limit exceeds the stopping site distance on the crest hills, as well as, the sags of the roadway.
 - Snow and ice issues related to the steep incline would remain a potential threat.



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- Shoulders to do not provide the width to accommodate emergency parking.
- Roadway does not provide for non-motorized transportation modes (i.e. pedestrians and bicycles).

Alternative 2: Existing Alignment with Maximum Allowable Profile (3 Lane Section) with Independent Accessible Non-motorized Route. This alternative utilizes the existing alignment and available right-of-way. Improvements would be required to the roadway including widening for shoulders and center turn lane to accommodate future anticipated traffic volumes. Potential independent detached sidewalk alignment to accommodate a maximum of a 5% grade for pedestrian and/ or non-motorized modes of travel on the west side. See Figure 5.4 Alternative 2: Existing Alignment with Maximum Allowable Profile.



Figure 5.4 Alternative 2: Existing Alignment with Maximum Allowable Profile

Advantages:

- Lower impact to adjacent property owner property.
- No impact to existing barn structure.
- Minimal impact to existing utilities within the right-of-way.
- Provides independent accessible route for pedestrians and non-motorized transportation.
- Adjacent property is not bifurcated by roadway development.
- No additional right-of-way required.

Disadvantages:

- Snow and ice issues related to the steep incline would remain a potential threat.
- Although roadway provides width for non-motorized transportation modes, the steep incline limits the type of bicyclist using the facility.
- Potential impact to underground petroleum transmission lines exist. Further underground investigation would be required to determine impact(s).



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Alternative 3: Existing Alignment with Accessible Profile (3 Lane Section). This alternative utilizes the existing alignment and available right-of-way. Improvements would be

required to the roadway including widening for shoulders and center turn lane to accommodate future anticipated traffic volumes.

Additionally, the longitudinal slope of the roadway would be lowered to accommodate a maximum of a 5% grade for pedestrian and/ or non-motorized modes of travel on the roadway, as well as, a sidewalk on the west side.



Figure 5.5 Alternative 3: Existing Alignment with Accessible Profile

Advantages:

- Provides accessible route for pedestrians and non-motorized transportation.
- Adjacent property is not bifurcated by roadway development.
- Roadway provides full accessibility for non-motorized transportation modes and pedestrians.
- No additional right-of-way required.

Disadvantages:

- Significant impact to adjacent property and barn structure.
- Significant impact to underground petroleum transmission lines and existing utilities.
- Significant snow drifting and maintenance due to prevailing wind and depth of roadway below adjacent ground.

Alternative 4: NBL/ SBL Independent Roadways and Maximum Allowable NBL and Accessible Profile SBL. This alternative creates two independent travel lane roadways for a Northbound lane (i.e. NBL) and a Southbound lane (SBL), respectfully. The roadways are comprised of 3.5' inside and 7' outside shoulders and an 11' travel lane. The NBL longitudinal profile was developed with a maximum of an 8% vertical grade without sidewalk and the SBL was developed with an accessible profile of 5.0%. As a part of the alternative, backslopes were reviewed at both 4:1 and 3:1 with a retaining wall option to minimize adjacent impacts.

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Alternative 4a: Alignment placement east of Whitney Gysel Barn Structure

Advantages:

- Adjacent Whitney Gysel property not bifurcated by roadway development.
- Provides accessibility for nonmotorized transportation modes and pedestrians on SBL.

Disadvantages:

- Significant impact to adjacent property and barn structure.
- Figure 5.6 Alternative 4a: Alignment placement east of Whitney Gysel Barn Structure underground petroleum transmission lines and existing utilities (West or Plains All American Pipeline).
- Although roadway provides the width for non-motorized transportation modes, the steep incline limits the type of bicyclist using the NBL facility.
- Snow and ice issues related to the steep incline would remain a potential threat on NBL.
- Significant snow drifting and maintenance due to prevailing wind and depth of roadway below adjacent ground for SBL.
- Additional right-of-way required.

Alternative 4b: Alignment placement West of Whitney Gysel Barn Structure

Advantages:

- No impact to existing barn structure or existing petroleum transmission lines.
- Provides accessibility for nonmotorized transportation modes and pedestrians on SBL.
- Mitigates snow drifting and ice on SBL facility.

Figure 5.7 Alternative 4b: Alignment placement west of Whitney Gysel Barn Structure

Disadvantages:

- Adjacent property somewhat bifurcated by roadway development.
- Although roadway provides the width for non-motorized transportation modes, the steep incline limits the type of bicyclist using the NBL facility.
- Snow and ice issues related to the steep incline would remain a potential threat on NBL.
- Additional right-of-way required.



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Alternative 5: Three-lane Roadway, Revised Alignment, Accessible Profile, and Impact to Plains All American Pipeline (PAAPL). This intent of this alignment alternative was to only impact one of the two parallel petroleum pipelines within the Whitney Road right-of-way. This alternative utilized a three-lane roadway section, snow storage ditches, 4:1 backslopes, and an accessible profile of 5%. The roadway itself consisted of a two (2) 11' travel lanes, 12' center turn lane, and 7' shoulder/ bike lanes. As a part of the alternative, backslopes were reviewed at both 4:1 and 3:1 with a retaining wall option to minimize adjacent impact to the existing barn structure on the Whitney Gysel property.



Figure 5.8 Alternative 5: Three-lane Roadway, Revised Alignment, Accessible Profile, and Impact to Plains All American Pipeline (PAAPL)

Advantages:

- Adjacent Whitney Gysel property not bifurcated by roadway development.
- Roadway provides limited accessibility for non-motorized transportation modes and pedestrians on SBL.
- No impact to existing PAAPL petroleum transmission line with use of retaining walls.
- Provides accessibility for non-motorized transportation modes and pedestrians

Disadvantages:

- Significant impact to adjacent property.
- Impact to existing barn structure.
- Retaining walls required to mitigate the impact to the PAAPL petroleum pipeline.
- Additional right-of-way required.
- Significant snow drifting and maintenance due to prevailing wind and depth of roadway below adjacent ground.



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Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure. This intent of this alignment alternative was to have no impact to either of the two parallel petroleum pipelines within the Whitney Road right-of-way and the Whitney Gysel Barn Structure. The alternate utilized a three-lane roadway section, snow storage ditches, and 4:1 backslopes. The roadway itself consisted of a two (2) 11' travel lanes, 12' center turn lane, and 7' shoulder/ bike lanes. As a part of the alternative, backslopes were reviewed at both 4:1 and 3:1 with a retaining wall option to eliminate adjacent impact to the existing barn structure on the Whitney Gysel property.



Figure 5.9 Alternative 6: Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure

Advantages:

- Provides accessibility for non-motorized transportation modes and pedestrians on SBL.
- No impact to existing barn structure.
- No impact to existing petroleum transmission lines.
- Provides accessibility for non-motorized transportation modes and pedestrians.
- Mitigates snow drifting and ice.

Disadvantages:

• Whitney Gysel development property bifurcated by roadway development.



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Alignment East, Accessible Profile, No Impact to Whitney Gysel Barn Structure. This intent of this alignment alternative was to have no impact to the Whitney Gysel Barn Structure and Petroleum lines. The alternate utilized a three-lane roadway section, snow storage ditches, and 4:1 backslopes. The roadway itself consisted of a two (2) 11' travel lanes, 12' center turn lane, and 7' shoulder/ bike lanes, 6' attached walk west side of roadway. The option appeared to be viable in theory however, after close examination, the option could not be shifted far enough east to prevent impacting one of the petroleum lines (i.e. PAAPL and Suncor). The only way to avoid impact to a petroleum line (PAAPL) was to install a 15' retaining wall on the west side.



Figure 5.10 Alternative 7: Three-lane Roadway, Revised Alignment East, Accessible Profile, No Impact Whitney Gysel Barn Structure

Furthermore, residential properties are burdened with major impacts to small lots on the east side of the alignment due to the large movement of earthwork required to realign the roadway.

Advantages:

- No impact to existing barn structure.
- Provides accessibility for non-motorized transportation modes and pedestrians.

Disadvantages:

- Significant impact to both existing petroleum transmission lines.
- Significant snow drifting and maintenance due to prevailing wind and depth of roadway below adjacent ground.
- Significant impact to adjacent property east of roadway.

North Alignment Alternative Analysis

The north alignment alternatives summarized above were qualitatively evaluated and compared based on select four (4) criteria group, questions, and sub-weight outlined as follows. Please note the sub-weight criteria was based on engineering judgement but is subjective and therefore depends on the perspective of the person assessing measures. The evaluation categories and questions are listed in Table 5.5 Alignment Analysis Criteria and Questions. The performance of each alternative was evaluated according to these criteria and results of the evaluation are compiled in Table 5.6 North Alignment Alternatives Analysis. The performance of each criteria was based (1) – Excellent, (2) – Fair, (3) – Poor, and (4) – Unacceptable.



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Table 5.5 Alignment Analysis Criteria and Questions

Criteria	Questions?	Sub-weight
Traffic Safety	 Does the alternative worsen traffic safety conditions? Does the alternative meet the minimum criteria established by the UDC and LCLU documents for the City of Cheyenne and Laramie County? Does the alternative provide for the projected future volumes anticipated for the area? 	50%
Developable and Compatible	 Is the alternative sensitive to the needs and impacts of stakeholders? 	20%
Fiscally Responsible	 Is the alternative too costly to construct? Could the alternative construction be phased to minimize future expense? Does the alternative minimize long term maintenance cost? 	25%
Accessible	Does the alternative serve all transportation users?	5%

Table 5.6 North Alignment Alternatives Analysis ⁵

Tuble 5.6 Worth Amgrithen American American								
	Alternative							
	1	2	3	4a	4b	5	6	7
Criteria	Do	Sep.	5%	5% SBL	5% SBL	5% Road	5% Road	5% Road
	Nothing	Trail	Road	East of	West of	East of	West of	East of
		8%		Barn	Barn	Barn	Barn	ROW
		Road		8%	8%			
Traffic Safety	3	2	2	2	2	2	1	2
Developable and Compatible	4	1	3	4	3	4	3	4
Fiscally Responsible	3	1	3	3	2	3	2	3
Accessible	4	2	1	2	2	1	1	1
Weighted Average	3.25	1.55	2.4	2.65	2.2	2.6	1.65	2.6

-

⁵ Performance Criteria: (1) – Excellent, (2) – Fair, (3) – Poor, and (4) – Unacceptable.

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Selection of Recommended North Whitney Alignment Alternative

The results of the alternatives analysis were vetted through the design team, steering committee, and various stakeholders. Based on the criteria, the most viable alternatives are Alternative 2: Existing Alignment with Maximum Allowable Profile (3 Lane Section) and Alternative 6: Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure. Both alternatives meet the primary objectives of the alignment to mitigate the steep roadway grade, improve safety for users, and establish a non-motorized sidewalk/path that meets the Americans with Disability Act (i.e. ADA) accessibility requirements while minimizing impacts. However, these alternatives distinctively counter each other. For example, Alternative 2 requires no additional right-of-way and minimizes the impact to adjacent property while Alternative 6 bifurcates the private property and impacts the adjacent property. Conversely, potential for ice and snow issues related to steep grades remains a disadvantage with Alternative 2 and is removed in Alternative 6. Both alternatives do not necessitate relocation of the petroleum lines but, further subsurface utility investigations will be needed prior to final design. A summary of the advantages and disadvantages of the top two alternatives is shown in Figure 5.11 Direct Comparison of Highest Rated Whitney North Alignment Alternatives.

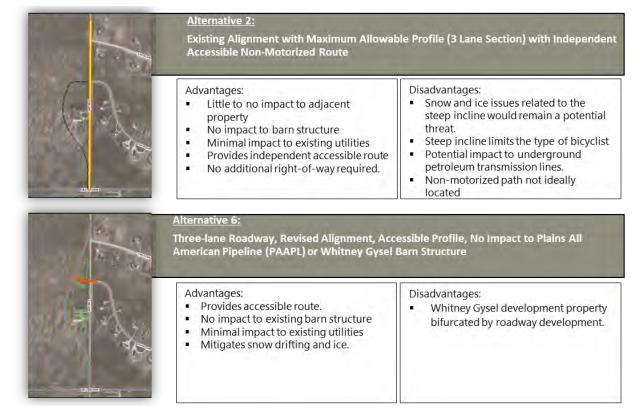


Figure 5.11 Direct Comparison of Highest Rated Whitney North Alignment Alternatives



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Consequently, after careful consideration AVI recommends Alternative 2: Existing Alignment with Maximum Allowable Profile (3 Lane Section) with accessible non-motorized route as the recommended alternative for the north alignment with the following stipulation: Alternative 6: Three-lane Roadway, Revised Alignment, Accessible Profile, No Impact to Plains All American Pipeline (PAAPL) or Whitney Gysel Barn Structure should remain as a possible solution for the roadway development. This will allow flexibility to both the developer and the jurisdictional entity as development agreements and land use plans are formalized.

Conceptual Intersection Options and Recommended Alternatives

The goal of the intersection improvements is to create practical solutions that result in a multi-model corridor which fulfills the following objectives:

- Is sensitive to the needs of the property owners,
- Promotes safety,
- Minimizes long term maintenance,
- Fiscally responsible,
- Efficiently serves all transportation users.

Intersection alternatives were developed and vetted through a collaborative planning process which included known stakeholders. These included the design team, roadway users, land owners, business owners, interested stakeholders, jurisdictional planning commissions, governing bodies, and the project steering committee. The recommended alternatives summarized in the following sections of the report considered every stakeholder's unique opinions and prospective and attempted to achieve consensus. However, in order to properly evaluate and ultimately make an objective recommendation, a systematic data-driven and performance-based approach was utilized to evaluate and identify an optimal recommended alternative. Consequently, a majority and not complete consensus was achieved due to the unique prospective and diverse opinions of all the stakeholders. The following primary intersections required an alternative analysis:

- Whitney Road at U.S. 30
- Whitney Road at Dell Range Blvd.

The following Table 5.6 Intersection Alternative Evaluation Criteria summarizes the evaluation criteria and context developed and used to determine the recommended intersection improvements. Please note the sub-weight for each criteria component was based on engineering judgement and is somewhat subjective and therefore depends on the perspective of the person assessing measures.



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Table 5.7 Intersection Alternative Evaluation Criteria

Criteria	Context	Sub- weight
Construction Cost	Preliminary level construction costs are summarized in Table 5.7 Cost Estimates and detailed in Appendix D.	20%
Right-of-way	The alternative minimizes the amount and cost of required right-ofway area requirements.	10%
Constructability	The constructability parameter is based the ease of construction and the ability to minimize impacts to adjacent landowners, businesses, and the traveling public.	2.5%
Ability to Phase Construction	The relative ease of constructing an alternative in sequential phases or layered components.	5%
Maintenance Cost	This consists of operating costs and indirect costs for maintenance. Maintenance includes routine upkeep, replacements. Indirect costs are unforeseen expenditures that may occur as a result of implementation of an alternative (e.g. impact cost to other roadways, etc.).	10%
Stakeholder Consensus	Input from the public involvement process based on the written and verbal comments received and summarized in the Collaboration section of the study.	15%
	Is the alternative acceptable by the public, local jurisdictions, and other stakeholders?	
Environmental Impact	The alternative has potential to affect environmental constraints such as wetlands, waterbodies, floodplains, etc. Please see the Environmental Review, Appendix F.	2.5%
Qualitative Traffic Analysis	The alternative that best provides the highest operation level or service at the horizon year 2040. See Appendix D Traffic Analysis for additional information.	10%
Traffic Safety	Does the intersection alternative address the safety need by enhancing safety performance?	25%
	Does the alternative meet the minimum criteria established by the UDC and LCLU documents for the City of Cheyenne and Laramie County?	



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Intersection of Whitney Road at U.S. Highway 30

This intersection is currently under jurisdictional control of the State of Wyoming Department of Transportation. Large vehicles use the intersection regularly including semi-truck and trailer combinations, recreational vehicles, mobile homes, and tow trucks for local business access on Whitney Road and the U.S. 30 North Service Road.

The current post speed limits are as follows:

U.S. 30, 55 mph; Whitney Road, 30 mph. Upon review of the existing intersection the following observations were noted as significant and are illustrated in Figure 5.12 Significant Observations Intersection of Whitney Road at U.S. 30.

Cut-thru traffic from and to Saddle Ridge Subdivision using the U.S. 30 Service Road and Saddle Ridge Trail during peak hour demands.

- The intersection is skewed at an angle > 10° at 25.8°
- The proximity of adjacent driveway accesses creates unsafe turning movements
- Unsafe opposing cross maneuver from U.S. 30 North Service Road southbound onto Whitney Road
- Inadequate storage que length as a result of the installation of pedestrian refuge island
- "Ghosted" thru and auxiliary turn lane related to the skew angle of the intersection for vehicles traveling northbound on Whitney Road.
- Lack of pedestrian facilities exception on the south leg of intersection.



Figure 5.12 Significant Observations Intersection of Whitney Road at U.S. 30



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Three primary alternatives appeared to be the most viable to consider during the design and collaboration process. Those alternatives were No build, Signalization, and Realign Intersection to Remove skew angle. The latter alternatives are illustrated in Figure 5.14 Realign Intersection/Remove Skew and Figure 5.13 Signalize and Widen Intersection.

Conceptual Options and Recommended Alternative

No Build Alternative. Based on the anticipated increased traffic volumes the No Build alternative from the onset was virtually eliminated during the evaluation process. It was not a consensus option from the stakeholders, does not provide any traffic safety improvements, and will continue to see an increase in maintenance cost. Given the crash history, severity of crashes, and traffic operation based on increased volumes, a No build option does not appear to be the best alternative option.

Signalize and Widen without Removing Skew. See Figure 5.13 Signalize and Widen Intersection without Removing Skew for reference. Widening and signalizing the intersection provides a viable option for this intersection that has a lower construction cost and does not require any right-of-way. However, from the traffic safety criterion, the intersection signalization provides a better intersection than the No Build option. What remains is the visibility issues caused by the substantially-different from 90-degree angle of the intersection. Even with signalization, drivers making right-turn-on-red (RTOR) maneuvers will still have difficulty seeing on-coming traffic at the intersection with a severe skew. This is due in part to the geometry of roadway, vehicle structural frames or other parts blocking a driver's field of vision, and the added difficulty of a driver turning their head at an obtuse angle. A Policy on Geometric Design of Highways and Streets, 2018 indicates that in new or redesigns of existing facilities where right-of-way is restricted the intersection design, should meet at an angle of not less than 75 degrees. Additionally, the policy indicates that at skewed intersections where the approach leg to the left intersects the driver's approach leg an angle less than 75 degrees, the prohibition of RTOR is desirable. The current intersection intersects at an angle of 65.2 degrees which is also the opposing leg to left which intersects the driver's approach leg (i.e. southbound Whitney Road to eastbound U.S. 30).

Realign Intersection to Remove Skew. See Figure 5.14 Realign Intersection/ Remove Skew for reference. Realigning, widening, and signalizing when warranted provides a very viable option from the traffic safety and stakeholder consensus criterion. The challenges of the alternative are the required right-of-way acquisition to remove the skew from the intersecting roadways and the increased cost. Improving the intersecting angle while increasing the width and corner radii will improve the operational use of the facility for large tractor trailer combinations and dramatically improve the safety of intersection as noted above in the discussion of the Signalize and Widen without Remove Skew alternative.

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Figure 5.13 Signalize and Widen Intersection without Removing Skew



Figure 5.14 Realign Intersection/ Remove Skew



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The following Table 5.8 Alternative Analysis Whitney at U.S. 30 summarizes the alternative analysis and identifies the preferred alternative based on the evaluation criteria. The performance of each criteria was based (1) – Excellent, (2) – Fair, (3) – Poor, and (4) – Unacceptable in conjunction with the context and weight established illustrated in Table 5.7 Intersection Alternative Evaluation Criteria. Based upon the scoring criteria, the option with the lowest average is the highest-ranking option and is the Realign Intersection to Remove Skew.

Table 5.8 Alternative Analysis Whitney at U.S. 30

	Whitney at U.S. 30				
Criteria	No Build Option	Signalization without Removing Skew	Realign Intersection to Remove Skew		
Construction Cost	1	1	2		
Right-of-way	1	1	3		
Constructability	1	1	2		
Ability to Phase Construction	1	1	2		
Maintenance Cost	4	2	2		
Stakeholder Consensus	4	2	1		
Environmental Impact	1	1	1		
Qualitative Traffic Analysis	4	1	1		
Traffic Safety	4	3	1		
Weighted Average	2.8	1.75	1.575		

AVI recommends the alternative, Realign Intersection to Remove Skew based on the following:

- Provides the most improved traffic safety
- Improved traffic flow and efficiency
- Accommodates multi-modal transportation
- Signalization can be phased to be constructed or installed as warranted
- Adjacent property owners amicable to right-of-way acquisition purchase based on fair market value.



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The final recommended alternative is illustrated in Figure 5.15 Recommended Intersection Alternative Whitney Road at U.S. 30.

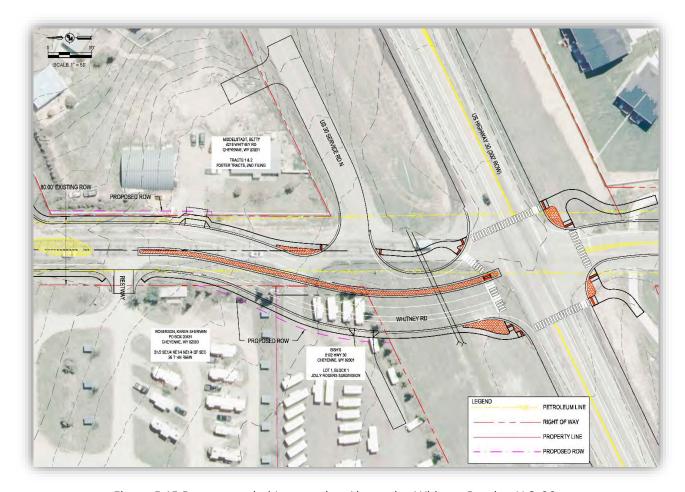


Figure 5.15 Recommended Intersection Alternative Whitney Road at U.S. 30



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Intersection of Whitney Road at Dell Range Blvd.

This intersection is currently under jurisdictional control of Laramie County. Large vehicles use the intersection regularly including semi-truck and trailer combinations, recreational vehicles, mobile homes, and truck and horse trailer combinations accessing the rural residential areas and oil production pads north of Dell Range Blvd. The current posted speed limits are as follows: Dell Range Blvd., 45 mph; Whitney Road, 30 mph (South of Dell Range Blvd.), 40 mph (North of Dell Range Blvd.), and 45 mph (North of Foxglove Road). Upon review of the existing intersection the following observations were noted as significant and are illustrated in Figure 5.16 Significant Observations Intersection of Whitney Road at Dell Range Blvd.

- Snow and ice issues related to wind direction, surroundings, and steep grades.
- Steep vertical profile of Whitney Road up to 13%.
- The proximity of adjacent driveway accesses creates unsafe turning movements
- The intersection of Whitney Road at Dell Range Blvd. has limited visibility at early morning, dusk, night, and significant weather which creates potentially unsafe driving conditions.

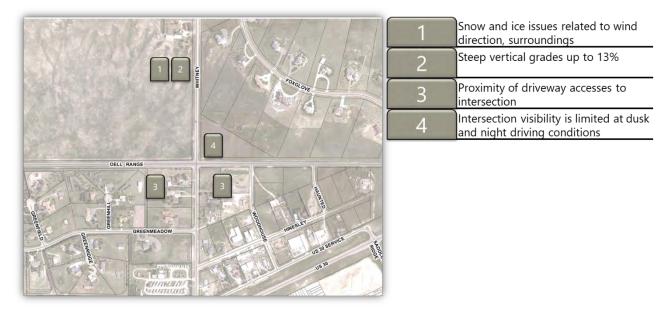


Figure 5.16 Significant Observations Intersection of Whitney Road at Dell Range Blvd.



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Conceptual Options and Recommended Alternative

The Whitney Road and Dell Range Blvd. intersection is situated within Cheyenne's and Laramie County's high growth corridors. While currently rural in character, the land uses surrounding the intersection are transitioning into a more suburban development pattern. The Whitney Ranch and Saddle Ridge developments are the two largest influencing land use and traffic changes occurring in the area. This intersection is a very important component in the Cheyenne and Laramie County roadway network. Intersections control the amount of traffic able to use the intersecting roadways and together with the capacity of the connecting roadways determines network capacity. The appropriate intersection design and control solution at this intersection will provide improved safety, increase operational performance, and encourage the development and redevelopment of the surrounding area and corridor. The primary objective of the recommended alternative should be a fiscally responsible control that balances the safety, operational efficiency, road environment, roadway users, and physical constraints of the site.

Three primary alternatives were evaluated at the Dell Range and Whitney Road intersection: No Build, Standard Intersection, and Roundabout. These options are summarized below followed by an overview and summary of the alternative's analysis.

No Build Alternative. The No Build alternative was not a consensus option from the stakeholders, does not provide any traffic safety improvements, and will continue to see increases in maintenance cost. Given the current traffic use, anticipated future volumes, and crash history, the no build alternative was eliminated from consideration.

Standard Intersection Alternative. See Figure 5.20 Standard Intersection Alternative for reference. A standard four-way intersection alternative would include widening, signalizing, and providing auxiliary lanes where appropriate and provides a viable option for this intersection that has a lower construction cost and does not require any right-of-way. Signalization would be determined by warrants and is predicated on development occurring within and adjacent to the corridor. With new developments like Whitney Ranch, Woods Landing, ERA, and redevelopment projects like Mission Village, and surrounding property redevelopment potential surrounding the corridor, this does not seem unrealistic.

One of the major objectives of any traffic signal design is to maintain the free flow of traffic. This design requires that important decisions be made about assigning green time to vehicle movements (e.g. signal phasing). Exclusive phasing such as left-turn arrows generally increase the cycle length and add delay. In this case, the recommended future roadway has dedicated left turn lanes on all intersection legs. Design factors such as progression efficiency (i.e. signal coordination with signals in series), pedestrian times, protected and clearance intervals need to be incorporated into final signal design. All these design features can lead to increased delays at an intersection. The proposed signalized intersection configuration is summarized on the following page:



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- Whitney Road southbound approach: One (1) right-turn (RT) lane, one (1) thru lane, one (1) left-turn (LT) lane.
- Whitney Road northbound approach: One (1) combined right-turn (RT) and thru lane, one (1) left-turn (LT) lane.
- **Dell Range Blvd. east and west approach:** One (1) right-turn (RT) lane, one (1) thru lane, one (1) left-turn (LT) lane.

Roundabout Alternative. See Figure 5.19 Single Lane RAB Alternative for reference. A rural roundabout alternative was conceptualized for this alternative. The roundabout is proposed with a one-hundred thirty (130) foot inscribed circle diameter with a design speed of 25 mph. The roundabout would include one lane approaches for all legs with channelized islands, pedestrian, and bicycle accommodations. Due to higher anticipated vehicle speeds on Dell Range Blvd., horizontal chicanes were included in the conceptual design elements of the channelized islands. During the Collaboration portion of the planning stakeholders believed trucks, emergency vehicles, RV campers, and horse trailers would have a difficult time negotiating the roundabout. The major concern is related to the larger vehicles negotiating too small of inscribed interior circle radius and too high of curb height on the apron of the central interior island. Most of the surrounding area roundabouts have such high drive over apron curbs that trailer tires are dragged and rub around the apron curb as the truck is turning within the roundabout. Through proper design, roundabouts can easily accommodate emergency and larger size vehicles.

Alternative Analysis

During the early stages of the planning and design process this intersection received consensus from the Steering Committee, design team, and public stakeholders for a single lane roundabout as a long-term solution. The recommendation was based on a safety assessment and the 2016 traffic projections and analysis documented in the approved City of Cheyenne Whitney Ranch Traffic Impact Assessment. However, it was later discovered that the original study did not estimate the redistribution of projected future traffic utilizing the Christensen Road Extension to Interstate 80. This project which is currently under construction will significantly change driver patterns which allows another network connection to cross over the Union Pacific Railroad tracks into the City of Cheyenne. The additional traffic routed to the intersection negatively impacted the level of service (LOS) and a third alternative was evaluated. This alternative is a One lane Roundabout Alternative w/ EB and SB Right Turn Lanes. The analysis within this report documents both the most recent and historic operational assessment for context and record.



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Intersection Capacity

Year 2040 traffic operational assessment was conducted by Kimley-Horn for the Whitney Road and Dell Range Blvd. intersection. The alternatives evaluated included the no build; a single lane roundabout; a single lane roundabout with eastbound and southbound additional right-turn slip ramps; and, a signalized intersection with left-turn and a shared through and right-turn travel lane on each approach. The level of service (LOS) and delay analysis is shown below Table 5.9 Kimley-Horn 2040 Traffic Level of Service (LOS) and Delay.

The revised or updated analysis by Kimley-Horn shows the signalized intersection and the roundabout with additional right turn lanes meet the minimum traffic operation expectation in both the AM and PM peak hours. The roundabout operates at a LOS D with an overall delay of 31. 8 seconds in the PM peak hour while the signalized intersection operates slightly better with a LOS C with an overall delay of 27. 5 seconds in the PM peak hour. The software used to analyze the signalized intersection was Synchro 10®. Sidra Intersection 8.0® was used for the roundabout.

Table 5.9 Kimley-Horn 2040 Traffic Level of Service (LOS) and Delay

	Delay [Second] (HCM:LOS, RAB: LOS)								
Movement	No Build Two-Way Stop Control		One Lane Roundabout		One Lane Roundabout w/ EB & SB Right Turn		Signalized Intersection		
	AM	PM	AM	PM	AM	PM	AM	PM	
Overall	-	-	19.9 (C)	45.5 (E)	11.9 (B)	31.8(D)	33.7(C)	27.5(C)	
NB Approach	>300	>300	-	-	-	-			
EB Approach	8.8 (A)	8.5 (A)	1	1	-	1			
WB Approach	8.0 (A)	9.1 (A)	-	-	-	-			
SB Approach	>300	>300	-	-	-	-			

The original analysis conducted by Sustainable Traffic Solutions (STS) included a single lane roundabout; and a signalized intersection with one (1) right-turn (RT) lane, one (1) thru lane, one (1) left-turn lane on the south, east, and west approaches and a combined right-turn and thru lane and one (1) left-turn lane on the north approach. The level of service (LOS) and delay analysis is shown in Table 5.10 STS 2040 Level of Service (LOS) and Delay.

STS showed the signalized intersection and single lane roundabout meet the minimum traffic operation expectation in both the AM and PM peak hours. The roundabout operated the best with a LOS A in the AM peak hour with a delay of 9.7 seconds and a LOS C with an overall delay of 16.9 seconds in the PM peak hour. The signalized intersection operates slightly worse with a LOS D in the AM peak hour with an overall delay of 38.5 seconds and a LOS C in the PM peak hour with a delay of 29.1 seconds. STS utilized PTV Vistro 6® to analyze the intersection.



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Table 5.10 STS 2040 Level of Service (LOS) and Delay

	Delay [Seconds] (LOS)						
Movement		Lane	Signalized				
Movement	Round	labout	Intersection				
	AM	PM	AM	PM			
Overall	9.7 (A)	16.9 (C)	38.5(D)	29.1 (C)			
NB Approach	5.9 (A)	23.3 (A)	-	-			
SB Approach	14.2 (B)	11.6 (B)	-	-			
EB Approach	7.0 (A)	16.4 (C)	-	-			
WB Approach	7.4 (A)	14.6 (B)	-	-			
NB LT	-	-	42.1 (D)	34.5 (C)			
NB Thru + RT	-	-	31.6 (C)	46.0 (D)			
SB LT	-	-	31.0 (C)	39.8 (D)			
SB Thru	-	-	87.8 (F)	33.3 (C)			
SB RT	-	-	30.0 (C)	22.5 (C)			
EB LT	-	-	15.8 (B)	23.3 (C)			
EB Thru	-	-	10.6 (B)	19.5 (B)			
EB RT	-	-	9.8 (A)	15.3 (B)			
WB LT	-	-	12.2 (B)	24.3 (C)			
WB Thru	-	-	12.6 (B)	17.3 (B)			
WB RT	-	-	9.6 (A)	14.5 (B)			

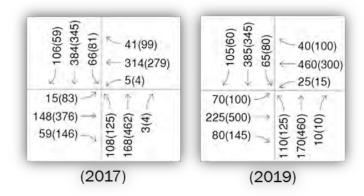


Figure 5.17 2040 Peak Hour AM/ (PM) Volumes Whitney Road at Dell Range Blvd.



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Looking closer at the Peak Hour volumes between the original and revised distribution of Christensen Road, it appears the most significant increase in traffic volumes were on the EB PM Peak Hour and WB AM Peak Hour of Dell Range Blvd. The volumes increased by 33% and 46.5%, respectively.

Ultimately, operational efficiency is only one of many important components for evaluating this intersection. Different methods/ software used to calculate delays and LOS produce different results as illustrated in Table 5.9 and Table 5.10. Two independent Professional Traffic Engineers using the same Peak Hour volume data yielded different level of service grades and total delay values. This does not indicate whether one method or another is correct, incorrect, or more accurate. All the methods used to calculate the operational assessment are considered state of the practice and a model of an intersection. The model uses data that has been projected to emulate driver behavior (i.e. peak hour volumes) and development that has not been observed. The results and different methods should be relatively compared to each other and not be interpreted as exact.

Additionally, the delay thresholds set for LOS grades for signalized intersection and roundabouts by the Highway Capacity Manual, Sixth Edition (HCM) merit careful evaluation. The HCM Level of Service (LOS) delay thresholds for roundabouts are set to the same standard as stop sign-controlled intersections. Meaning that the same delay experienced by drivers at a signalized intersection considered acceptable can be unacceptable at standard stop control intersection or roundabout. For example, A level of Service E for an unsignalized intersection is set >35-50 seconds while a signalized intersection is set at >55-80 seconds. We believe this creates a LOS bias against roundabouts when compared with signalized intersection treatments when showing a LOS grade equal to or lower than a B. The actual computed delay was used to compare alternatives not just the Level of Service letter grade.

Consequently, the analysis generally indicates that the roundabout alternatives operate at a high level of service in the 2040 Peak AM while the signalized intersection operates more efficiently in the 2040 Peak PM.

Right-of-way Requirements

The signalized intersection alternative configuration can be accommodated within the existing 80' south of the Whitney Road right-of-way limits. The roundabout option requires additional right-of-way in northwest and southeast portions of the intersection to accommodate the required improvements. However, the Dell Range Blvd. portion of the intersection will require additional seventeen (17) feet of right-of-way on the north regardless of the alternative selected. This is to allow for additional lanes required as a result of future anticipated development.



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Costs

Cost estimates for the alternatives were developed using the following information and assumptions:

- Engineering estimated at 10% of Estimated Construction cost excluding contingency or right-of-way costs.
- Cost estimates were development using data from the Weighted Bid Prices compiled by the Wyoming Department of Transportation (WYDOT); Colorado Department of Transportation (CDOT); and from historical AVI project data and experience.
- Quantities were based on conceptual layouts and are not intended to be used as final quantities.
- Please note that the costs and unit prices were calculated in Present Worth or Present Value dollars. Adjustments should be made for years beyond the present to better estimate the needed dollars for any future improvement plan(s).

	Estimated Costs						
Alternative	Construction	Right-of-way	Engineering	Contingency	Total	For Estimate	
No Build Option	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Single Lane Roundabout	\$1,010,035.50	\$ 6,413.40	\$101,004.00	\$151,505.00	\$1,268,957.90	\$1,270,000.00	
Single Lane Roundabout w/ Slip Lanes	\$1,142,608.50	\$ 119,700.00	\$114,261.00	\$171,391.00	\$1,547,960.50	\$1,550,000.00	
Signalized Intersection	\$1,058,671.00	\$ -	\$105,867.00	\$158,671.00	\$1,323,209.00	\$1,330,000.00	

The cost difference between roundabout and a traffic signal is comparable. Where long-term costs are considered, roundabouts eliminate hardware, maintenance and electrical costs associated with traffic signals, which have been estimated at \$3,500 to \$10,000 per year.

Safety

Studies have shown that roundabouts are safer than traditional stop sign or signal controlled intersections. Washington State Department of Transportation have found a 37% percent reduction in overall collisions, a 75 percent reduction in injury collisions, and a 90% reduction in fatality collisions (Transporation, 2020). It is generally accepted by the engineering design community that roundabouts provide proven benefits to vehicle traffic in terms of safety. They dramatically reduce the incidence of fatal and severe-injury crashes compared to traditional signalized intersections. However, roundabouts have generated a significant number of subjective complaints from pedestrians and bicyclists both nationally and locally suggesting difficulties and safety concerns. In addition, recent observational and safety data at the nearby roundabout at Converse Avenue and Pershing Blvd. confirm that local drivers misunderstand the rules of the roundabout, resulting in improper use and avoidable collisions (Mark T. Johnson, 2019). The majority or 75% of all crashes in this local roundabout where a result of entering vehicles failure-to-yield.



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Driver Familiarity, Public Opinion, Involvement, and Impact

Researchers have conducted studies on public opinion of roundabouts in the US. Public opinion polls of drivers in Hutchinson, Kansas; Harford County, Maryland; and Reno, Nevada (communities where roundabout construction was planned) show that more than half of surveyed drivers (55%) were opposed to roundabout construction and were not aware of their operational characteristics (Dr. Aemal Khattak, 2009). Drivers surveyed stated safety, confusion, or that they would rather have a traffic signal as the main reasons for opposing roundabouts both before and after construction. The reasons given for opposing roundabouts were the same before and after roundabout construction, but the overall proportion of drivers opposed to roundabouts reduced by 27 percent after roundabout construction.

In our public involvement efforts, we specifically asked stakeholders to evaluate the a "Recommended Alternative Whitney Road at Dell Range Blvd.: Single Lane Roundabout". Respondents were given the option of Definitely Like, Like, No Opinion, Do Not Like, and Definitely Do Not Like as options. The results indicated that 49.4% of the stakeholders were in favor of the single lane roundabout with 45.3% opposing the recommendation. 6.2% of the respondents had "No Opinion". Concerns varied by some of the primary concerns were related to the following:

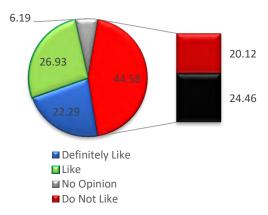


Figure 5.18 Stakeholder Evaluation: Single Lane Roundabout

- The ability of the roundabout to accommodate larger vehicles including trailers, recreational vehicles, and emergency services
- Snow, ice, and weather concerns
- Incompatible with the current and future use of Dell Range. Specifically, placing a roundabout within a corridor of signalized intersections
- More crashes than a standard intersection
- Perceived high speeds witnessed on the corridor
- Adjacent longitudinal steep grades north of the intersection
- Drivers misunderstanding of the rules of a roundabout.



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Environmental

The Whitney Road and East Dell Range intersection is situated within Cheyenne's and Laramie County's high growth corridors. While currently rural in character, the land uses surrounding the intersection are transitioning into a more suburban development pattern. Whitney Ranch and Saddle Ridge are the two largest developments influencing land use and traffic changes occurring in the area.

A zoning and infrastructure assessment of the area shows Whitney Road will function as the City of Cheyenne's eastern boundary for many years. Sewer service expansion in the area is limited east of Whitney Road. Furthermore, most of the properties east of Whitney Road are large lot residential parcels and likely not to redevelop. The Whitney Road and East Dell Range intersection will function as a gateway between the urban and suburban patterns of development within Whitney Ranch, the City of Cheyenne with the more rural development pattern of Laramie County.

Between the two alternatives a roundabout presents a stronger gateway and urban design opportunity for transitioning land uses than a signalized intersection. The roundabout creates a physical transition between the higher travel speeds anticipated in rural areas east Whitney Road and the lower traffic speeds in the more suburban pattern west of Whitney Road. The roundabout balances mobility demands while providing a distinctive place-making opportunity.

Summary of Findings

The following Table 5.11 Alternatives Analysis Whitney Road at Dell Range Blvd. summarizes the alternative analysis and identifies the preferred alternative based on the evaluation criteria. The performance of each criteria was based (1) – Excellent, (2) – Fair, (3) – Poor, and (4) – Unacceptable in conjunction with the context and weight established illustrated in Table 5.7 Intersection Alternative Evaluation Criteria.

Based upon the scoring criteria, the option with the lowest average is the highest-ranking option is the Single Lane Roundabout by a small margin over the Signalized Intersection.

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Table 5.11 Alternatives Analysis Whitney Road at Dell Range Blvd.

	Whitney at Dell Range Blvd.						
Criteria	No Build Option	Single Lane Roundabout	Single Lane Roundabout w/ Slip Lanes	Signalized Intersection			
Construction Cost	1	2	3	2			
Right-of-way	1	2	3	1			
Constructability	1	2	2	1			
Ability to Phase Construction	1	1	1	1			
Maintenance Cost	4	2	2	3			
Stakeholder Consensus	4	3	3	1			
Environmental Impact	1	1	1	1			
Qualitative Traffic Analysis							
Kimley-Horn Analysis	4	3	3	2			
STS Analysis	4	2	2	2			
Traffic Safety	4	1	2	3			
Weighted Average	2.95	1.90	2.40	2.00			

Sub- weight
15.00%
10.00%
2.50%
5.00%
10.00%
15.00%
2.50%
7.50%
7.50%
25.00%
100.00%



Figure 5.20 Standard Intersection Alternative



Figure 5.19 Single Lane RAB Alternative



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After careful review and consideration of the alternatives and the alternative analysis of the Whitney Road at Dell Range Intersection, AVI concludes that either a Single Lane Roundabout or Signalized Intersection could feasibly be integrated in the future design of Whitney Road. We recommend that a careful and prudent design approach be incorporated with either approach as WYDOT and Laramie County move forward with the final design. Those additional design elements include further evaluation and incorporation of the following, when available:

- Final TransCAD model data from the Metropolitan Planning Organization's Connect 2045 Project when complete
- Review of continuity and compatibility with intersection plans on adjacent corridor intersection on Dell Range Blvd. at Van Buren Avenue and U.S. 30.
- Incorporation of more accurate traffic impacts and generation from future Whitney Ranch Commercial and Residential components for scale and impact
- Compatibility with the needs and vision of the rural residential users and commercial traffic surrounding the intersection (i.e. larger trucks, recreational vehicle movements, and stock and horse trailers.

We understand that Laramie County and WYDOT were moving forward with the Single Lane Roundabout design. Therefore, we have illustrated that alternative into the final recommendation and implementation portion of the report.

Proposed Corridor Right-of-way Requirements

During this preliminary design phase of the project, the team researched the Laramie County GIS website (GreenwoodMap.com, 2020) and recorded documents in the Laramie County Clerk's office in order to identify potential needs for future right-of-way. The purpose was two-fold; first, to identify the preliminary physical property needs and ownerships and second, to commence open communication with the present landowners.

The planning and design team have made recommendations for right-of-way acquisition that we believe were necessary to fulfill the goals of the project and minimize the impact to existing landowners. Please note that a Wyoming Professional Land Surveyor will be required to establish the existing right-of-way along the corridor and determine the acreages required for the project. The following table and figures summarize the parcels and ownerships which have been identified at the ten (10) percent design level for proposed right-of-way acquisition. These are outlined in the following Table 5.12 Summary or Right-of-way requirements and illustrations.



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Table 5.12 Summary of Right-of-way Requirements

Parce	Parcel No.	Property Address	Area (Acres)	Anticpated Right-of-way	Owner	Address	Reference
1	14662310000100	DELL RANGE BLVD	1.04	Platting	GYSEL WHITNEY LLC	PO BOX 72, ALBIN, WY 82050	FIGURE 5.21
2	14662520300200	DELL RANGE BLVD	0.12	Vacant	HARRINGTON, HUGH M ET UX	4501 WHITNEY RD	FIGURE 5.22
3	14662520300100	DELL RANGE BLVD	0.15	Level 1 Commercial	CALHOON, RANDY R ET UX	4506 WOODHOUSE DR	FIGURE 5.22
4	14662610100800	4512 WHITNEY RD	0.01 (509 SF)	Residential	MUELLER, MARTIN REV TR ET AL	4512 WHITNEY RD	FIGURE 5.23
5	14662610000100	4212 WHITNEY RD	0.03 (1,407 SF)	Level 2 Commercial	ROBERSON, KAREN SHERMAN	PO BOX 20431	FIGURE 5.24
6	14662611600100	6102 HWY 30	0.14	Level 2 Commercial	JOLLY ROGER LLC	6102 HWY 30	FIGURE 5.24
7	14662520400400	4219 WHITNEY RD	0.02 (921 SF)	Residential	MIDDELSTADT, BETTY	4219 WHITNEY RD	FIGURE 5.24
Total			1.51				

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Figure 5.21 Parcel 1 Exhibit



Figure 5.22 Parcel 2 and 3 Exhibit

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Figure 5.23 Parcel 4 Exhibit

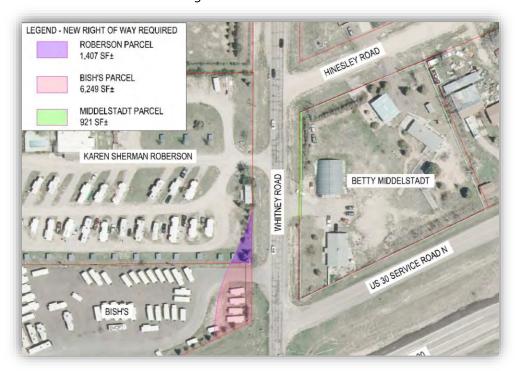


Figure 5.24 Parcel 5,6, and 7 Exhibit



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Post Development Drainage

The corridor, as previously described, is located within the Child's Draw and Dry Creek Drainage Basins. The entire contributory drainage area encompasses about 18 square miles (CH2M Hill, November 1988). Child's Draw is predominantly a rural basin but, is in the process of urbanization. The topography in and around the study area generally slopes to the northeast within Childs Draw basin (brown) and Southwest within the Dry Creek basin (purple) in Figure 5.25 Drainage Basin Overview.

Initially we recommend that the roadway drainage criteria utilize the requirements of the *Laramie County Land Use Regulations 2019*. (County, The Laramie County Land Use Regulations 2019 Edition, 2019) Drainage planning and design shall provide for stormwater detention based on a design storm up to a one-hundred (100) year frequency. Post development design requirements shall be for a system to maintain total contributory site discharge at no greater than a pre-development (i.e. historic) fifty (50) year release rate for a 100-year storm event.

Additionally, at a minimum, drainage conveyance system elements shall be based on the following criteria for an arterial street:

- Minor Storm (5-year) No curb overtopping and one interior drive lane clear
- Major Storm (100-year) Maximum depth 12" above gutter flow line, 6" flow across street intersections.
- Downstream conveyance paths shall be reviewed to ensure no adverse impacts to downstream property or property owners.

The design team developed conceptual drainage plan opportunities for the Whitney Road Corridor. The layout outlined planning level opportunities for improving the post development drainage along the corridor. A brief summary of the systems and critical constraints are outlined below and in Figure 5.26 Conceptual Drainage Plan.

Conceptual Storm Sewer Trunk Line N-1. This sub-basin roughly encompasses Whitney Road from the high point north of Chickadee Drive proceeding north to Storey Blvd./ Beckle Road. The proposed profile mimics the existing topography which creates a low point for the basin on South of Storey Blvd./ Beckle Road. The conveyance system would require a series of inlets at locations along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above.

Conceptual Storm Sewer Trunk Line S-1. This basin roughly encompasses Whitney Road from a natural high point north of Chickadee Drive to south U.S. 30 right-of-way. This basin eventually runs west to the Dry Creek drainage. The proposed profile mimics the existing topography which



Figure 5.25 Drainage Basin Overview



Design

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creates a couple of low points within the profile. The conveyance system would require a series of inlets at the low point locations and along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above. The runoff would then be conveyed to stormwater detention ponds either north of Dell Range Blvd. on the east or west side of the roadway or combination of both. A local offsite inlet near the northeast side of U.S. 30 Service road should be installed to mitigate localized flooding occurring on adjacent properties.

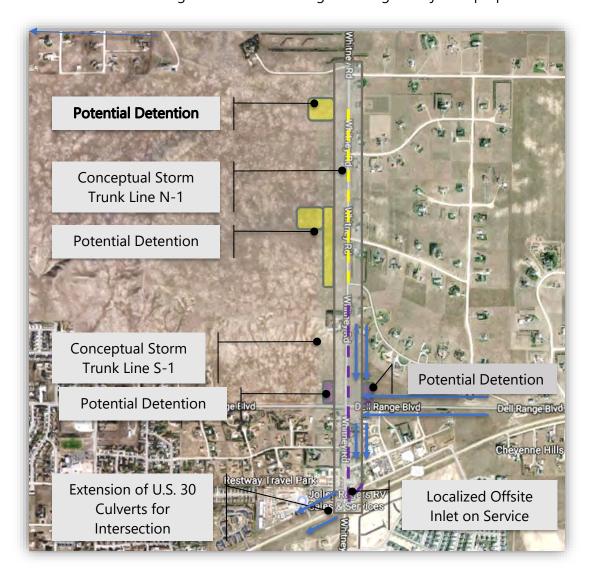


Figure 5.26 Conceptual Drainage Plan



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Special Features

Snow Fence. Another concern expressed about the future construction of the Whitney Road corridor was snow drifting due to the natural topography and predominant wind direction. Every effort was made in this design to incorporate design features within the roadway cross section, alignment, and vertical profile to mitigate snow drifting, improving visibility, and reducing slush and ice. However, in most areas, it was impractical to include such design features to mitigate snow movement.

Consequently, we recommend that those areas utilize snow fence as a mitigation method until housing and structures to the northeast mitigate drifting. Unfortunately, the fence will need to be installed on private property due to right-of-way constraints. The basic design benefits and constraints are illustrated in Figure 5.27 Porous and Solid Snow Fence Drift from the *Design Guidelines for the Control of Blowing and Drifting Snow* by Ron Tabler of Tabler & Associates (Ronald D. Tabler, 2003). Benefits include reductions in Snow removal costs, Accidents, Property damage, Road closures, and Pavement maintenance.

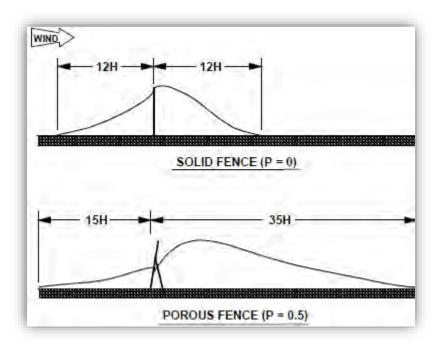


Figure 5.27 Porous and Solid Snow Fence Drift Comparisons



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Engineer's Opinion of Probable Costs and Funding Options

Cost estimates for the preferred alternative were developed using the following information and assumptions. Please note that the total costs and unit prices are calculated in Present Worth or Present Value dollars. Adjustments should be made for years beyond the present to better estimate the needed dollars for any future improvement plan(s).

Table 5.13 Cost Estimates 2020

	Estimated Costs								
Description of Area	Construction	Right-of- way	Engineering	Contingency	Total	For Estimate			
Whitney Road at Dell Range Blvd. Intersection (RAB W\Slib Lane)	\$ 1,142,609	\$ 19,700	\$ 114,261	\$ 171,391	\$1,547,961	\$ 1,550,000			
Dell Range Blvd. to U.S. 30	\$ 1,245,878	\$108,070	\$ 124,588	\$ 249,176	\$1,727,712	\$ 1,730,000			
Sub-total Phase I	\$ 2,388,487	\$ 227,770	\$ 238,849	\$ 420,567	\$ 3,275,673	\$ 3,280,000			
Storey Blvd. to Dell Range Blvd.	\$ 2,446,254	\$ -	\$ 244,625	\$ 489,251	\$ 3,180,130	\$ 3,190,000			
Whitney Road Totals									

Assumptions:

- 1. Engineering estimated at 10% of Total Construction costs.
- Cost Estimates were developed using data from the 2019 Weighted Average Bid Prices, complied by WYDOT; Colorado Department of Transportation (CDOT) 2019 Cost Data Book, compiled by the Engineering Estimates and Marketing Analysis Unit; Typical Costs from historical AVI project experience.
- 3. Quantities are based on the Conceptual Improvement Plan layouts. Please see Appendix A for additional information.
- 4. Right-of-way costs are based on listed values of adjacent similar properties gathered by the City of Cheyenne and historical AVI project experience in the region and projects of similar characteristics.

AVI recommends that future costs from the present 2020 dollars and should be updated using the United States Department of Labor and Bureau of Labor Statistics. Quantities are based on the Conceptual Improvement Plan layouts. Please see Appendix A and Appendix D for additional information.



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Funding Opportunities

Based on AVI's experience in securing funding for other municipalities, we identified the following potential funding sources for improvements to the City of Cheyenne and Laramie County.

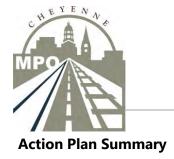
- The public sector: City of Cheyenne, Laramie County, and WYDOT, etc. will play important roles in "readying the area for private investment" through infrastructure improvements, public planning, and policy initiatives. From these initiatives and/or investments, private sector development can be leveraged.
- Funding mechanisms for public infrastructure could include loans and grants (e.g., Wyoming Business Council's Business Ready Community Program and Community Facilities Grant and Loan Program); Community Development Block Grant (CDBG) funds; Federal Surface Transportation Program (STP) revenue bonds; and general obligation bonds; and Sixth Penny Special Use Tax.
- A public-private partnership for development will likely take many forms and have many partners, responsibilities, and funding alternatives. In the end, a successful partnership will ensure that both the public and private sectors will realize reasonable returns on their investments and the community will realize their long-term vision for this portion of Laramie County and the City of Cheyenne.

Implementation Program

Key Planning Considerations. The decisions and directions made in the Whitney Corridor Plan were developed as a collaborative effort and were shaped by several influences. Those decisions and directions that are documented in this plan were shared with the community during the public outreach and engagement process. Every effort was made for complete transparency through open communication with participants of the team, stakeholders, and community participants.

There is a natural tendency to believe that a Corridor Plan will be applied in its entirety with minimal changes. However, that would not appropriately respond to natural and unforeseen opportunities that arise in a community. Decisions within the plan need to be periodically updated to reflect new or emerging circumstances. Each succeeding jurisdictional entity also has the discretion to reconsider long-range policy and plan decisions and may choose to modify this Plan.

Summary of Corridor Recommendation. The overall recommendations are specifically designed to address all modes of transportation, and safety needs of the Whitney Road Corridor. All recommendations have been examined carefully to ensure practicality, functionality, sustainability, and successful implementation. The physical layout of the improvements are detailed on the following in Plan of Appendix A. Detailed cost estimates are shown in Appendix D.



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Table 5.14 Short Term Action Plan Summary

Short Term Plan Implementation

Action / Goal		Specific Tasks	Roles & Responsibilities	Time Frame
	1	Install larger Stop Signs (30" x 30" to 36 x 36 or 48 x 48)	Laramie County	Now
Interim Safety Improvements	2	Install Stop Bars on Whitney Road at Dell Range Blvd.	Laramie County	Now
Whitney Road at Dell Range Blvd.	3	Install Stop Bars on Dell Range Blvd.	Laramie County	Now
	4	Install solar powered Flashing Beacon on Stop Signs at Dell Range Blvd.	Laramie County	Near
	5	Install Intersection Down Lighting on Existing Power Poles at Dell Range Blvd.	Laramie County/ City of Cheyenne	Near
	1	Install larger Stop Signs (30" x 30" to 36 x 36 or 48 x 48)	WYDOT	Complete
Interim Safety	2	Install Stop Bar pavement markings on Whitney Road	WYDOT/ City of Cheyenne	Complete
Improvements Whitney Road at U.S. 30	3	Install Flashing Beacon for Stop Control and Warning	WYDOT	Complete
	4	Remove pedestrian refuge median for improved stacking	City of Cheyenne	Complete
	5	Widen EB to SB auxiliary turn to improve visibility and remove "ghosting" effect	WYDOT	Complete
	6	Extend center pavement markings on the north leg of the intersection at U.S. 30	Laramie County WYDOT	Now
	7	Relocate pedestrian greenway crossing until intersection is reconstructed	City of Cheyenne	Mid

MPO

Whitney Road Corridor Plan

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Table 5.15 Long Term Action Plan Summary

Long Term Plan Implementation

Action / Goal		Specific Tasks	Roles & Responsibilities	Time Frame
	1 4 1 .	Implement Construction Phased	Laramie County	Mid to Long
		Strategies along the Corridor	City of Cheyenne	
	2	Install Uniform Roadway and	Laramie County	Long
	1	Pedestrian Lighting	City of Cheyenne	
		Investigate Possible Posted Speed Reduction	Laramie County	Mid
		a. U.S. 30 East West of	WYDOT	
	2	Whitney (Pershing to		
	3	Christensen Road) from 55 mph to 45 mph		
		b. Whitney Road from Storey		
		Blvd. from 45 mph to 30 mph		
	4	Implement wet and dry utility priority projects as funding resources become available or development becomes the catalyst.	City of Cheyenne BOPU	Mid
	5	Develop/ Create additional egress/ access routes north of Dell Range (i.e. Storey Blvd. West, Four Mile, Riding Club)	Laramie County/ City of Cheyenne	Mid to Long
	6	Reserve and/ or purchase right-of- way as development occurs along the undeveloped corridor.	Laramie County/ City of Cheyenne	Near, Mid, Long
	7	Explore opportunities, as area develops, to provide roadway storm water detention / retention features / facilities.	Laramie County/ City of Cheyenne	Near, Mid, and Long
	8	Explore public/ private partnerships to implement	Laramie County/ City of Cheyenne	Near, Mid, and Long

WHITNEY ROAD CORRIDOR PLAN

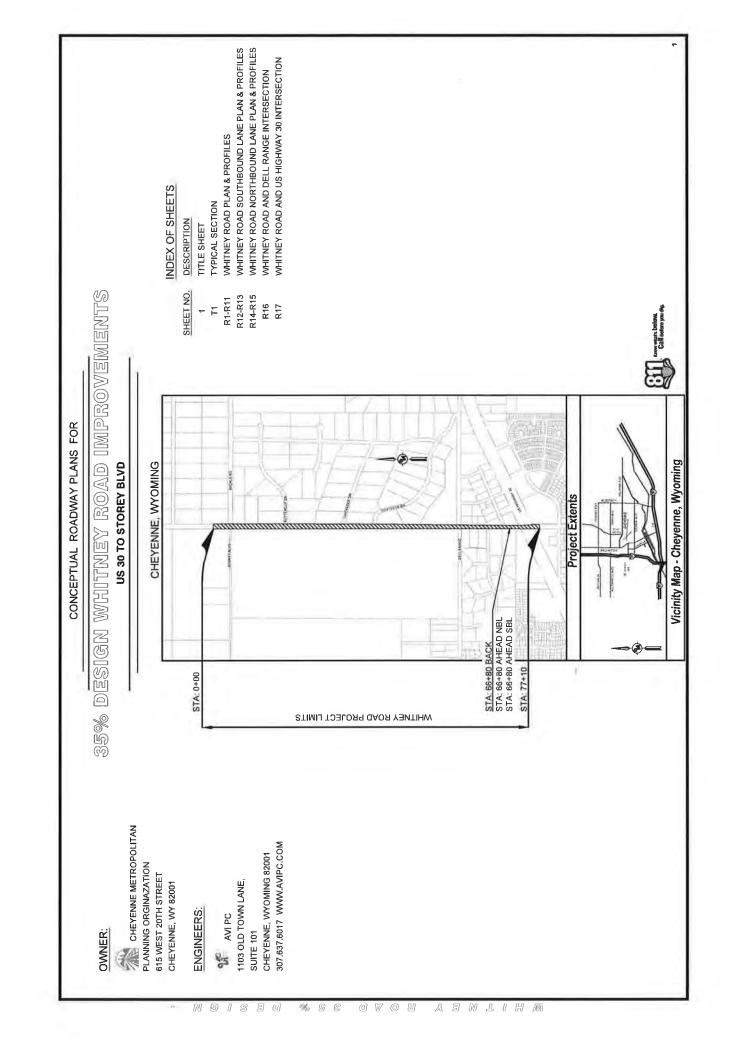
APPENDIX A: IMPROVEMENT PLANS

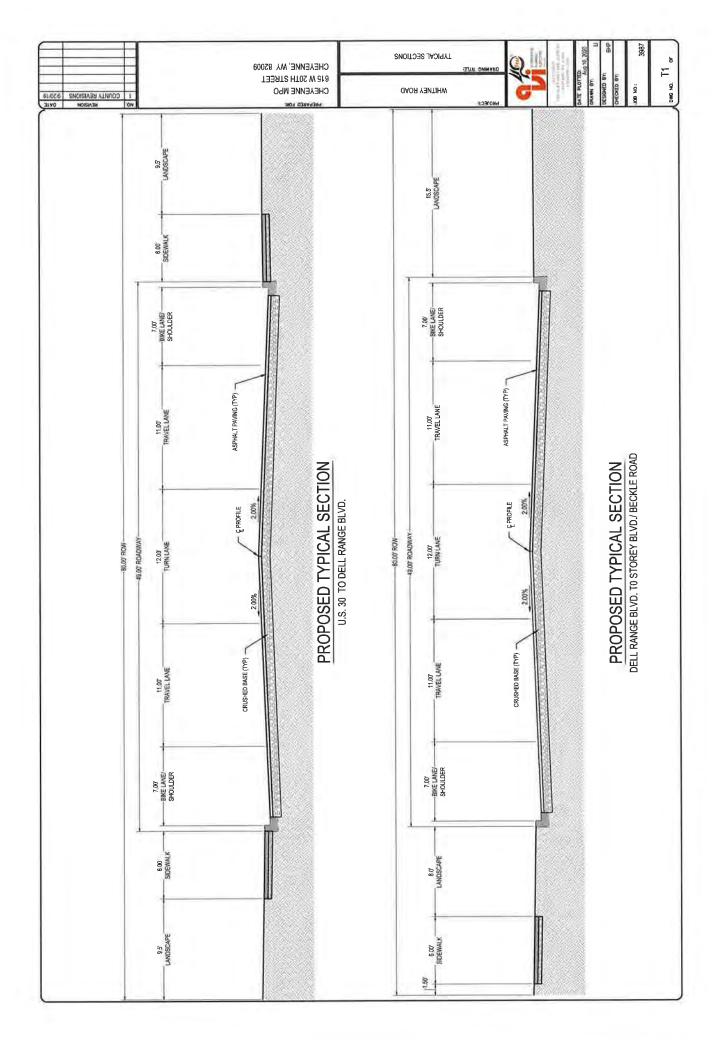
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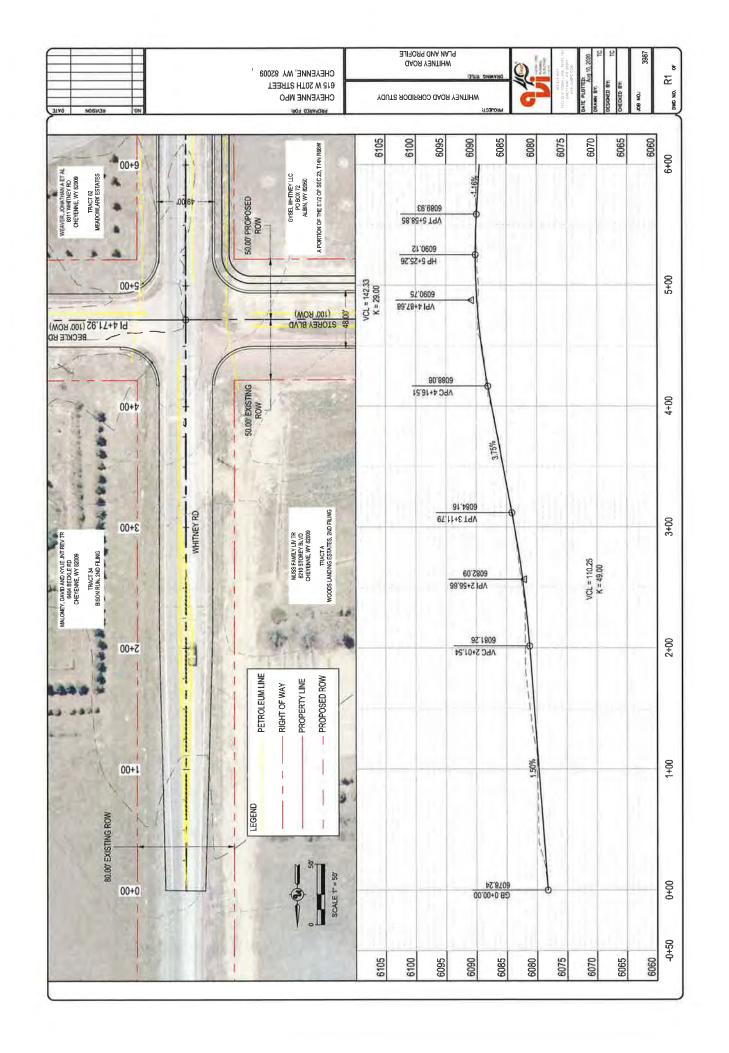
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Improvement Plans

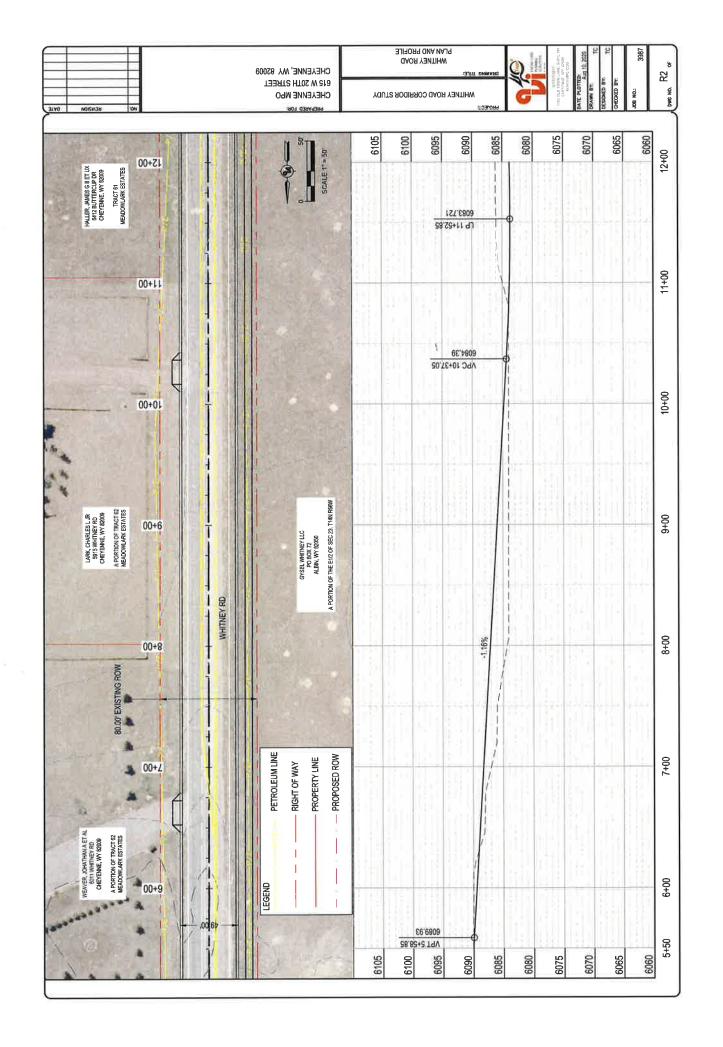


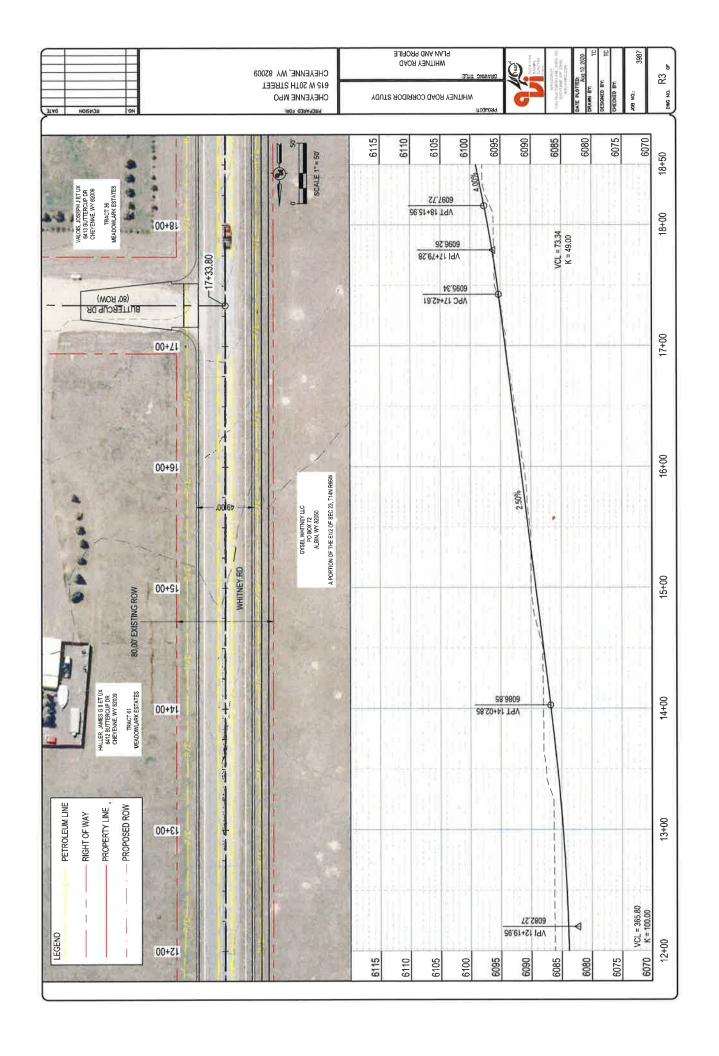


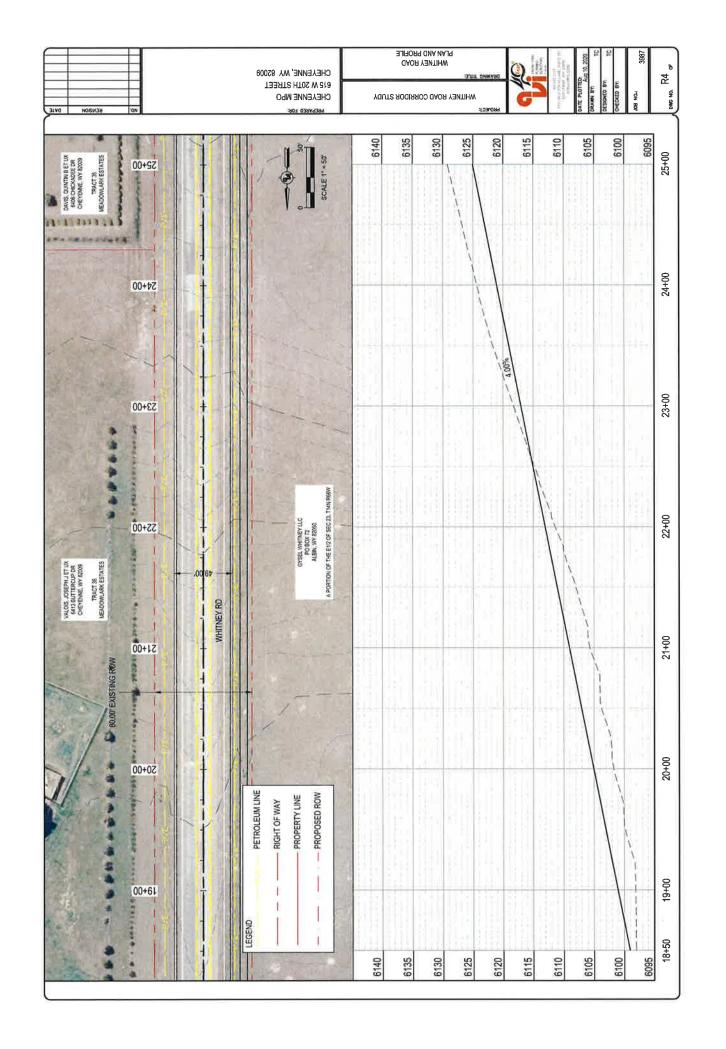


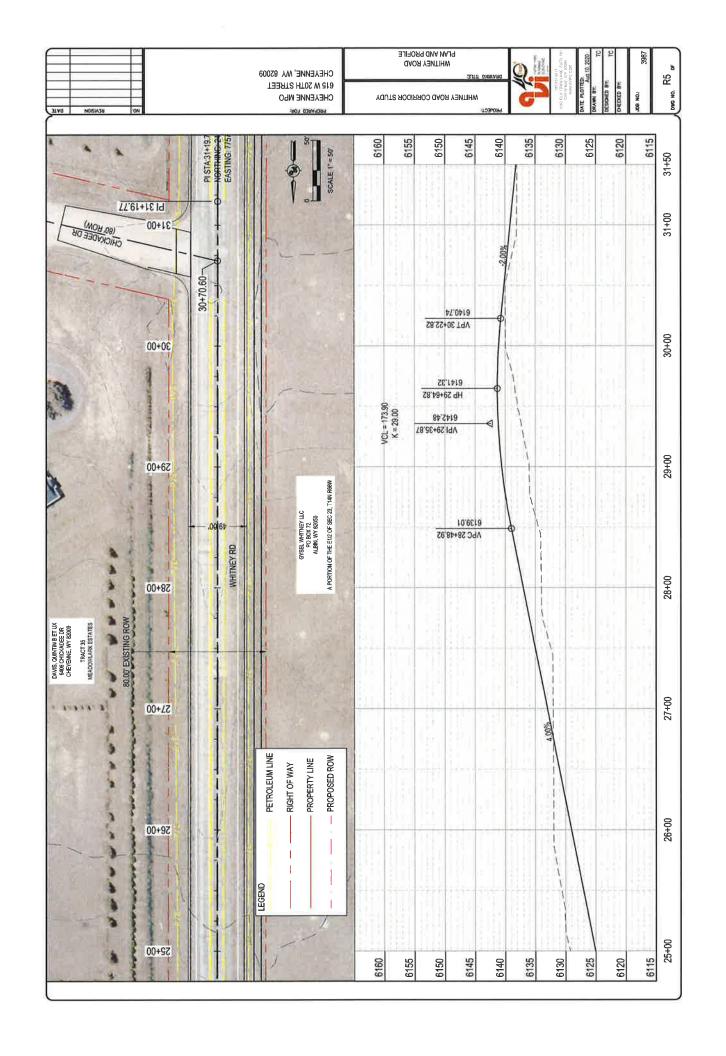


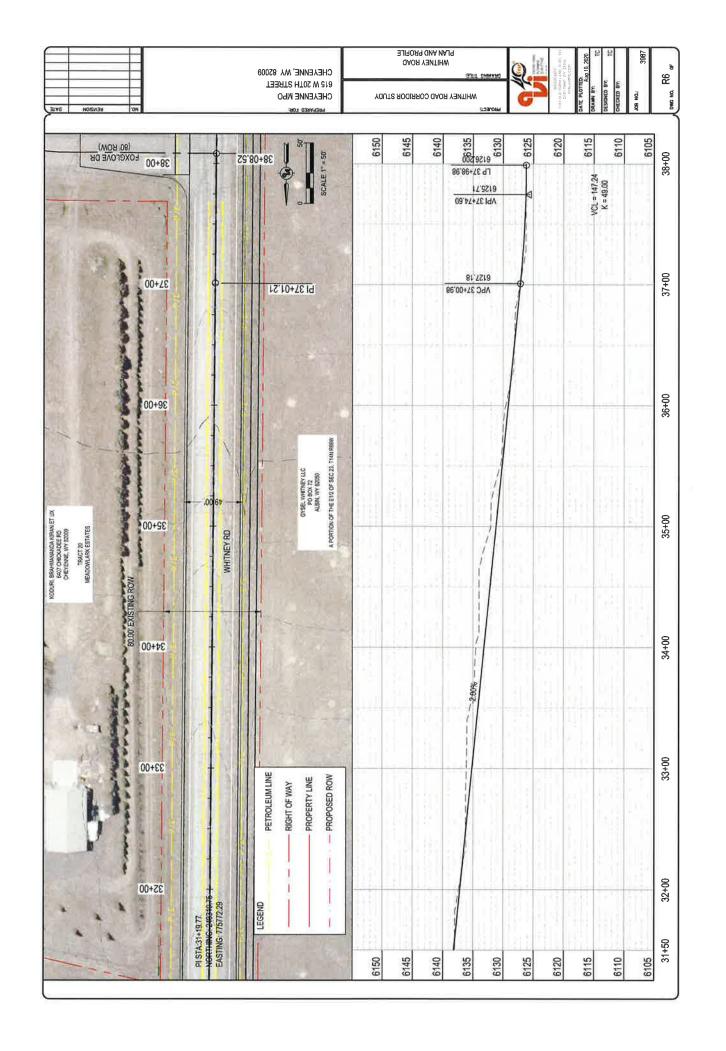


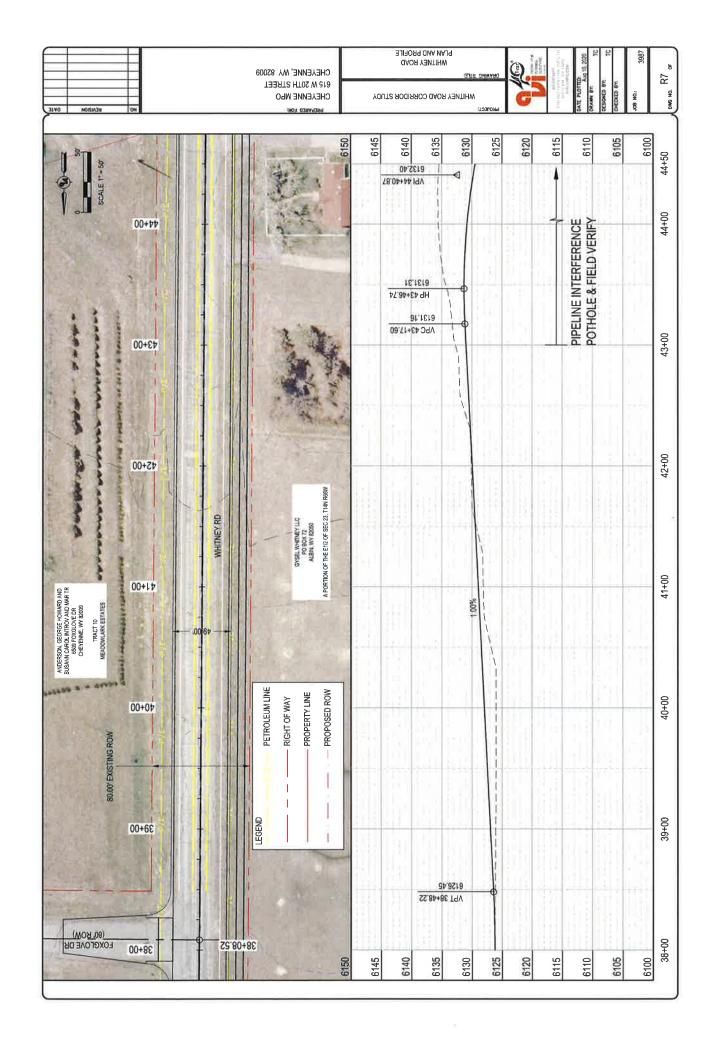


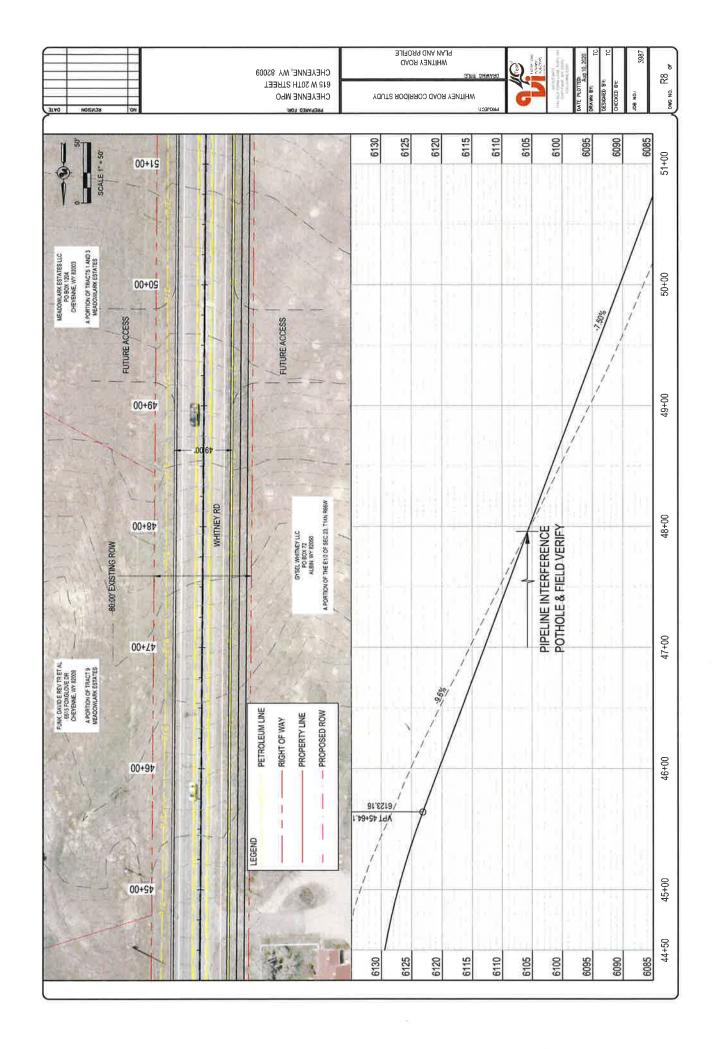


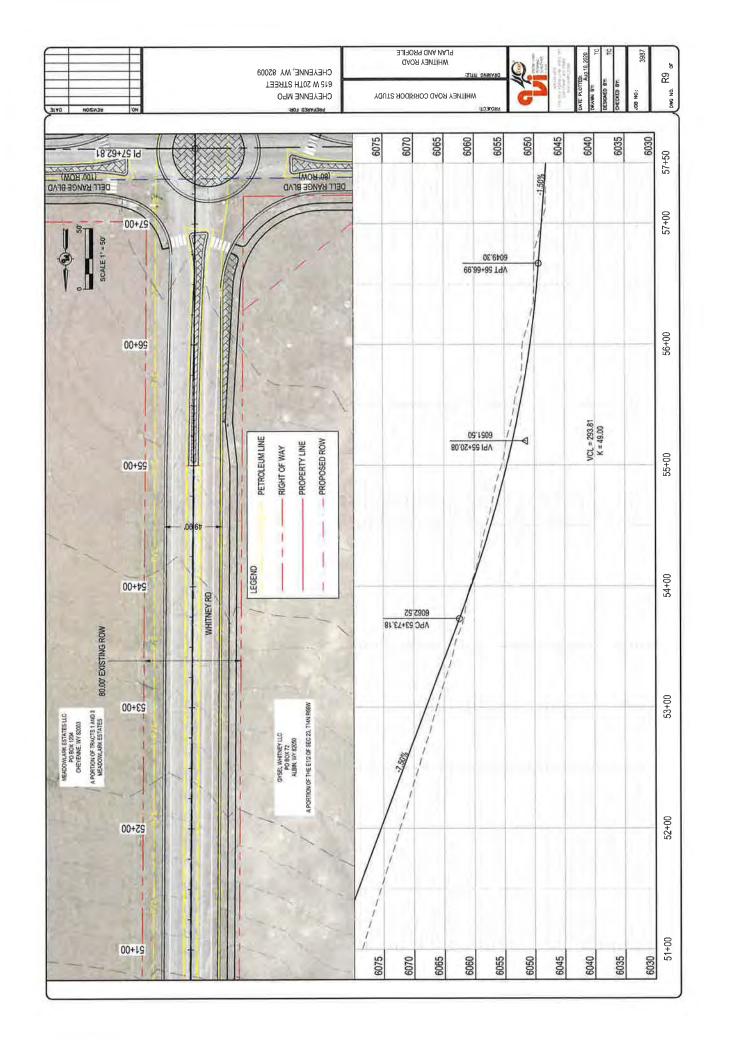


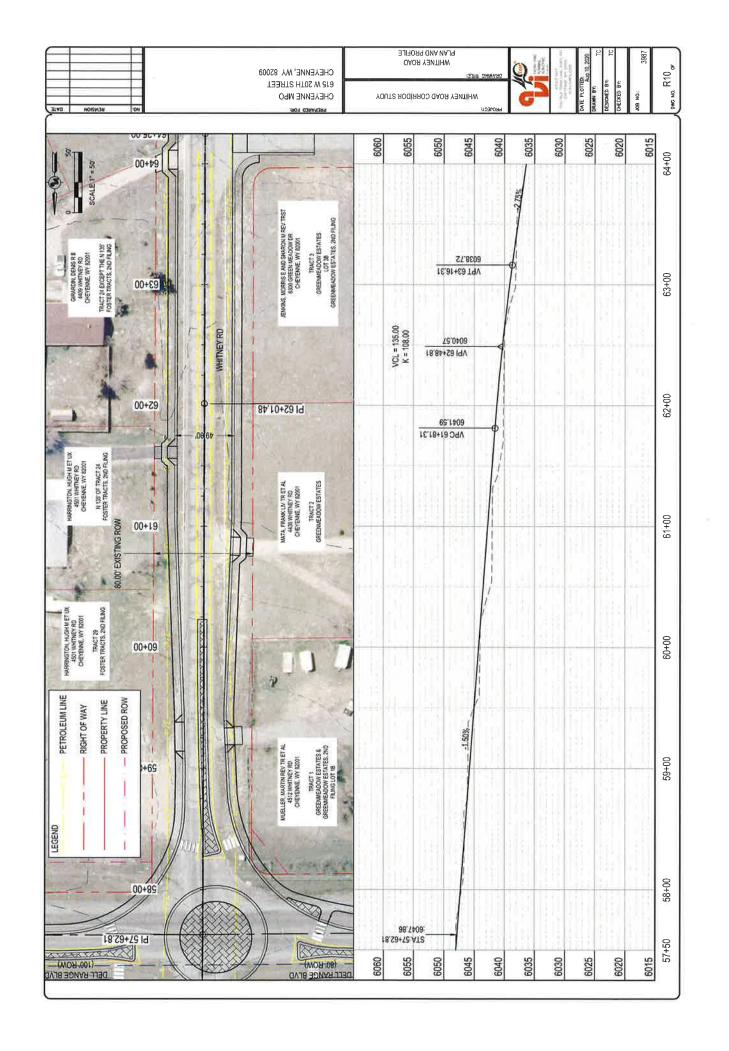


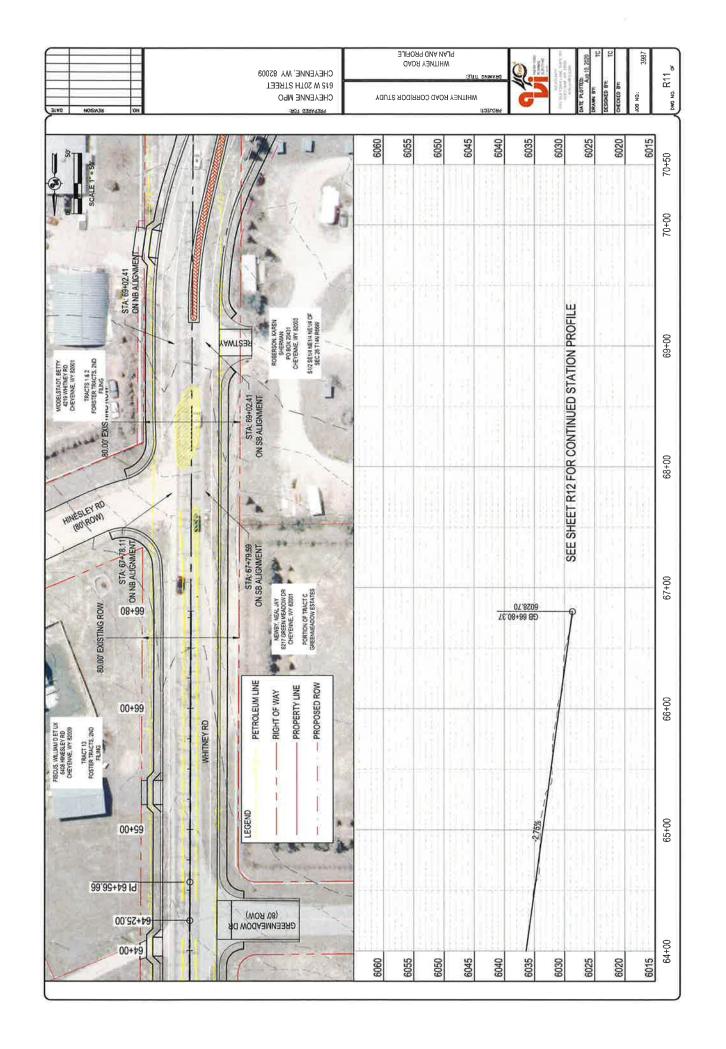


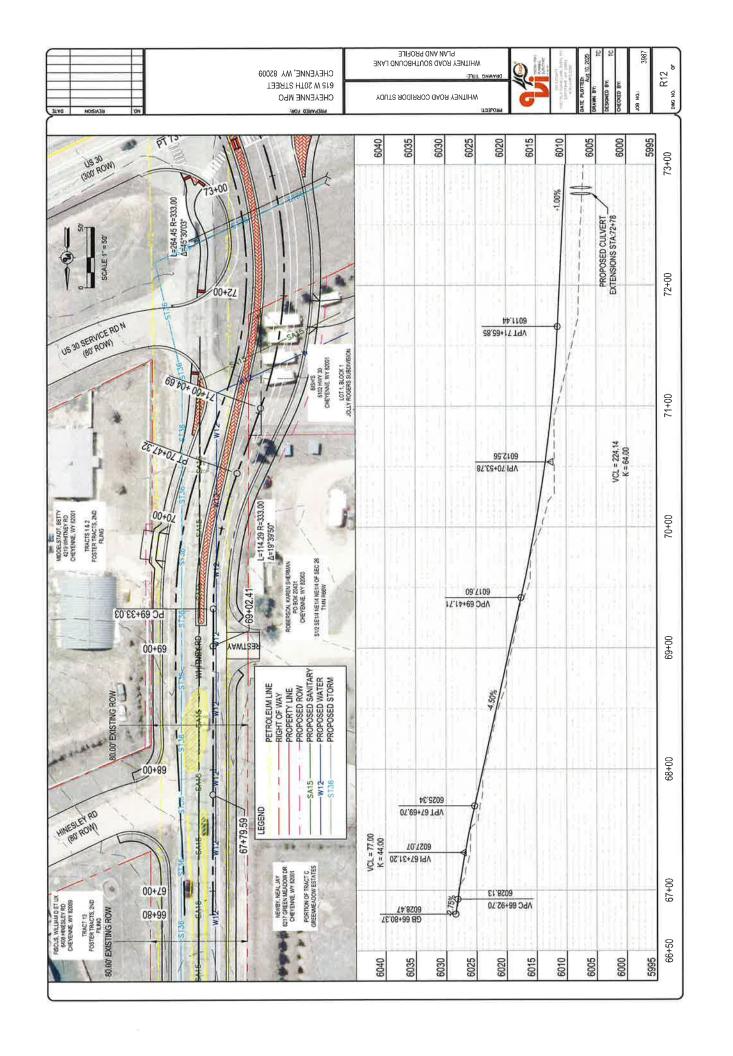


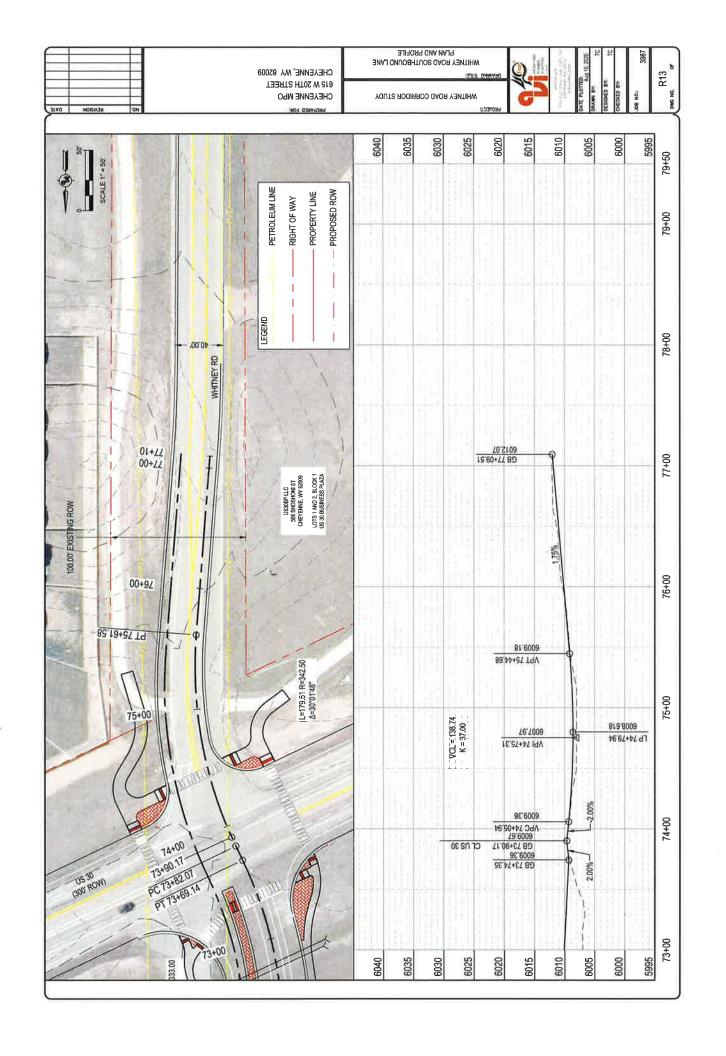


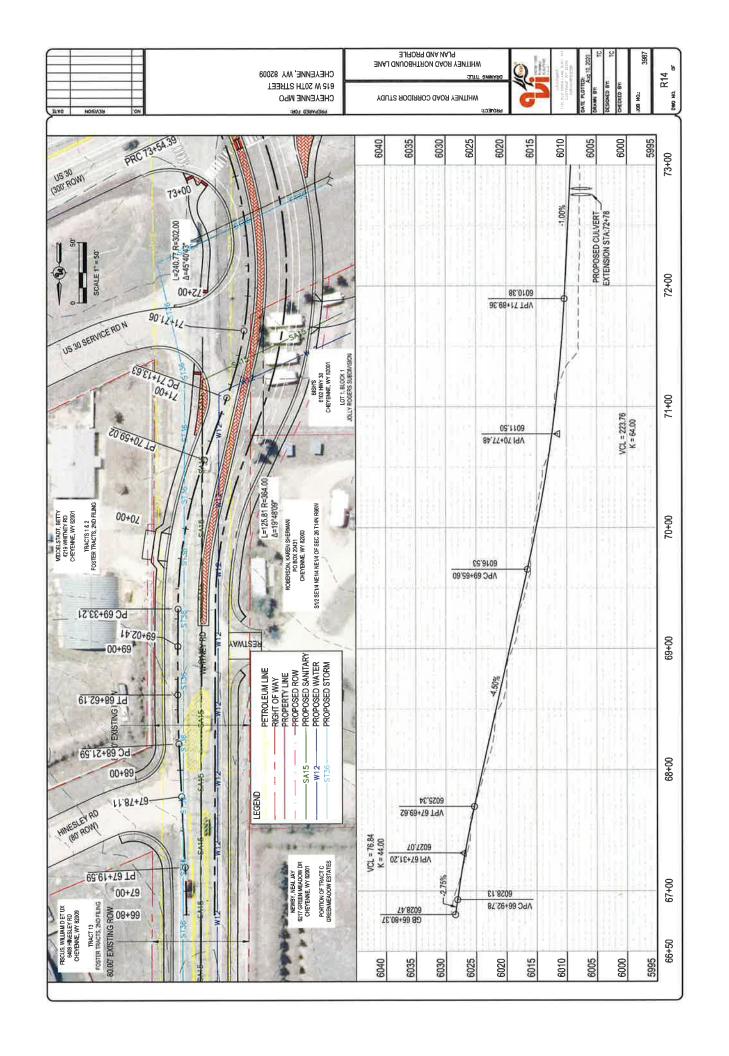


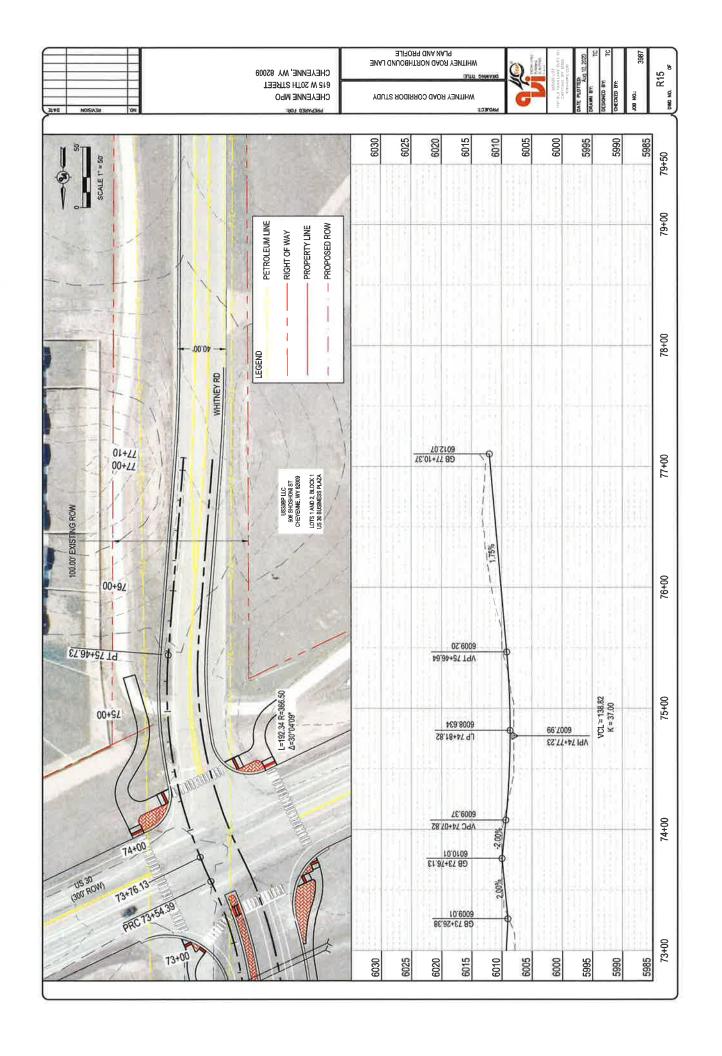


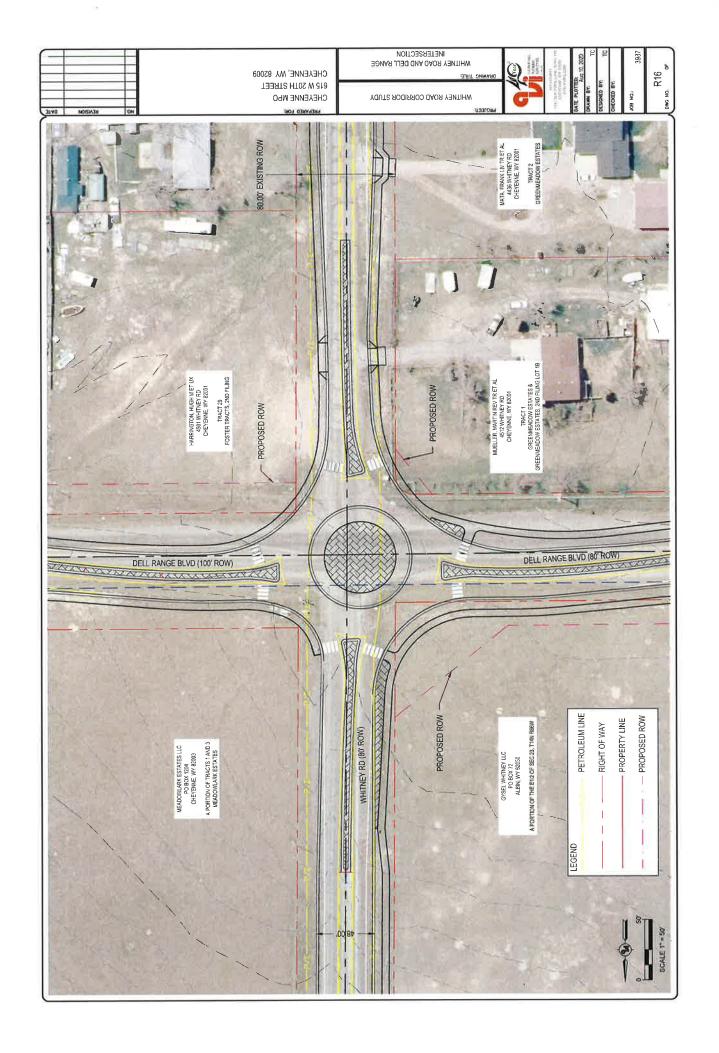


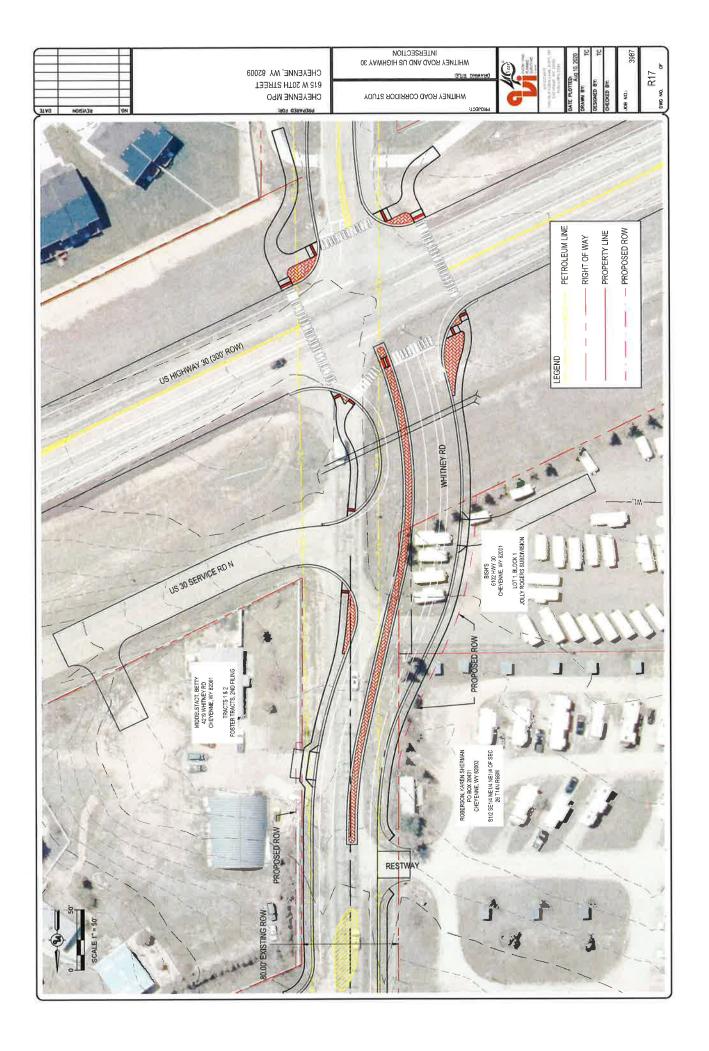














WHITNEY ROAD CORRIDOR PLAN

APPENDIX B: PUBLIC MEETINGS

August 2020

APPENDIX B Public Meetings







Whitney Road Corridor Study PUBLIC OPEN HOUSE

PLEASE attend a meeting for the **Whitney Road Corridor Study**. The objective of this Cheyenne Metropolitan Planning
Organization (MPO) project is to create a plan for the future
Whitney Road that improves roadway and intersection safety,
addresses drainage and snow drifting, and handles growth for
all modes of travel for the next 20-30 years. At this meeting
stakeholder input is paramount ucial for the planning team to
understand traveler's issues and concerns for this roadway.
The project limits of Whitney Road are from U.S. 30 on the
south to Beckle Road/ Storey Blvd. on the North.

A brief **Presentation** combined with an **Open House** will be held on **Wednesday**, **November 8**, **2013 at 5:00 p.m. and 6:00 p.m. in the gym** at Dildine Elementary School, 4312 Van Buren Avenue.

For more information call please call the **MPO at 307.638.4385**.









Facility/Risk Management 3320 Maxwell Avenue Phone: 307-771-2633 Cheyenne, WY 82001 Fax: 307-771-2382

EXHIBIT 81

APPLICATION FOR USE OF DISTRICT FACILITY

se XShort Term Lease	lante y	Gym X and 2nd Gym	Other	Event Mativity. Public meeting for whithey Road (City of Cheugane metropolitan Paraing Copanization)	Tom cabb	(c) 970.24.6542	City. Chayane State: W Zip: 82009		Telephone: 970 214.1642	End Date: 11.8.17	Include sef-up, rebearsal, clean-up, etc.	(2C of 1 bosons of sort)
□ Long Term Lease	Dildine Elementary	Cafeteria G)	Parking Lot Only	Whithey Road (City	Contact Person: To	(W) 307.637.6017	City. Chalane		Telephone:	End Date:	- 1	
Date: 10-12-17	A request is made for the following school: Dildine Elementary School	Туре of Space: Classroom	Kitchen Auditorium	Event / Activity: Ridic meeting for	Organization: AVI. P.C.	Telephone: (H)	Address: 1103 Old Than Lane	Email: Cobba avipc.com	On Site Contact Person: Tom Cobb	Start Date: 11.8.17	Start Time: 4:45pm End Time: 7:15pm.	Attendance Expected: 50 Adult/Student Ratio: N/A

Explain in detail (using diagrams, if necessary) how the facility is to be set up. State if the work is to be done by district employees. List equipment needed, i.e., tables, chairs, bleachers, risers, and any other pertinent information:

power point presentation 4 Screen Tobles, Chairs, and

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🗡 affirm that I have read and agree to comply with the LCSD! Facility Use Terms

1850 Ö Thomas Signature:

Client#: 1246955

CERTIFICATE OF LIABILITY INSURANCE

ACORD.

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY ANIO CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE HOLDER, THIS CERTIFICATE FOR DOES NOT FERMANTIVELY OR RIGHTMEN, AMEND, EVERND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER. 5/08/2017

INPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(les) must be endorsed. If SUBROCATION IS WANCED, subject to the certificate policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

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AVI PC dba AVI Engineering PC 1103 Old Town Lane, Sulte 101 Cheyenne, WY 82009 CERTIFICATE HOLDER

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

CANCELLATION

VOLUNIO SHOUTON AS FIGHTS PRINCES

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Whitney Road 10% Corridor Plan

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November 8, 2017



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Brian Crozier 6522 Keystane Dr	307-640-2845
Wayne Lax 7906 Aztec Drive	307-632-6705
Meris + Sharen	307-638-1818
Alan Jones Co 406 Dorsey Rd	307 421 7677
Kody Zubrod 5905 Green Mendru D	30 m
Ken + Kathy Conve 5911 Blazi, Stor	3=2-05-36-5
DAUD DICKINSONS 6511 TULIA Rd.	- 85 27
Shannand Yvonne Redikt LAUZ WHISTIFF Dr. 83009	301-421-1488

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ANDY DAVIS 6607 Buttercup Dr Cheyenne wy 630-8317 adavis 89 Eur. com SEAN BIBBEY
8090 HEAVENLY DR.
CHEVENNE, WY 82009
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Eric Johnson
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November 8, 2017



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5300 Dell RANGE Blid	307-763-2526
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November 8, 2017



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Jim WOLLDER	JKWOLLACK@MSN.
7297 TELLURIDE DR.	307-256-9401
Cynthia & Jerry Richmond	JIRCMR \$929@ gmail.com
6909 Julia Rd	307-635-0929
Teresa Walling	307- 634- 4094
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Whitney Road 10% Corridor Plan Public Meeting

November 8, 2017



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Stan MIDDELSTADT 4219 WHITNEY RD	307.421-5978 SMIDDECSTADT @gmail. Com
Oung Johnson 6632 Brekly Rd	307 421 -1400
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Warren Adams 19742 Elizabeth Rd	675 - 800 P
DENNIS WILEY 6535 E 4 MUERD	421-4110
Aaron Grissom 7316 Beckle Rd TED ESPINOZA	agrissom 1982 @ gmail
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Whitney Road 10% Corridor Plan

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Scot Henderson	
Sion Hindursos Dwy 90V	
Jim + Borbara Boyd	
4608 Van Burn Ave	blboyd 7@msn.com
814-710-8722	
Jack Flores	
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DaveRose 1530 US 30	RBIGALS.01 @ ad. com
620 WAY	
Chris+ Chrissy Tetlow	425-766-391D
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Leif Anderson	707 /31-117/4
	307-631-4766
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	ninalewpike @gmail com
7087 Dorsey Rd	



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Frank & Anna Mar 307 - 635-1672	
Katherine & Charlie Work	5915 whitney re
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AVI Professional Corporation 1193 Old Team Lane: Guille 101: Chayonne: WY 87009 Pt 307-637-6012

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Cose Orthodorfun GSIT Butterey Or	714 757-7673 gliste@yohoo con
Bill Rummage 71145ulia Rd	630.2752 rediec puele e yahou.com
PAUL BULKAN 77017 DORSLY R.D. WYOGULL @ GRATL. COM	
Shawn Broad 11431 Chief Twomon Ad	(307) 214-6296 Shawndrood 1 6 gmoil. com
PAUL & SHOESH WILLER	(307) 634-3749
EDWARD MELK P 4330 PATHEINDER	307- 214-0940
ROVER INCUBIENT 9201 SMOW CREEF DR	

AVI Profassional Corporation 1103 Old Town Lane; Suite 101; Cheyanne, WY 82009 PJ 307 637-6017

2-3987 1



Whitney Road 10% Corridor Plan Public Meeting

November 8, 2017



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Elizabeth & Michael 6	1 agy 307 2B6 6995
Pay Sawczento	307-630-8868
Tolon Eatherly 6710 Bullercop Drive	900 788-8001
Eric Eatherly 670 Bull-scap De Chayana wy are	enc Deatherly net 307-2010 - 2171
Gilbert + Reserva Ferrel	Tisyla la 26 Pija hoo com
7323 Darsay Pol 80009 Marica partorous Unit 80009 Marica partorous United and and and and and and and and and an	Monica. yarborough@gmail.com
great lynn Singer	Ir Singer 20 hotman. com



Whitney Road 10% Corridor Plan

Public Meeting

November 8, 2017



Picase Emini Your Name & Address	Please Enter Your Phone 5/Or Email
Sharn Roberth Rd.	421-558C 5 (Shorts W) EUNSI.COM
Brahma Koduri 6407 Chickadee Br	307365 8789 drkoduri@gmail 60
MARC WOODS 1805 YARINA WAY	BOWHUNTER@ HILLECT. COM
Trou Te-	pete is wood networment
KAGAY ITHER SECT IMPERIAL CT 8001	TIMEBUY @ CLOLICOM
ander Troj Thepark	undreasherret D,
Doug Broudle 6636 Dorsey Rd	dongbrendle pamail con
ROBGERWALE LC PW	307-633-430Z



Whitney Road 10% Corridor Plan Public Meeting

November 8, 2017



Piease Entr. Your Name & Address	Please Effer Your Phone 20/Or Front
Lois Madland 6704 Foxglove Dr.	307-421-6728 madland 6@ yahoo.com
Jonathan Marotz 7099 SALKAIIT Ril.	309-214-1322 Marotz San Ottolon Allcon
Daryl Vohnson 3168 Bluff E Cheyenne wy	dipound leverce mon. cor
LEE POITH 11500 YELLOW BEEN RD CHEVENNE WY BZORG	lec/0, 88@ acl com
College & Judd Eifealdt 6770 Whistor Dr Cheyenne, Wy	eifered @ven.com jfsanta on @ gnail.com
Chan a cun Murhead 6=05 Chickador 125 Chenenne, LUY	ann-minchead a yahou ce
July Parks 4214 Greeninge Ct Cheyenne WY 83001	207 638-9377
Goil & John Young 3414 Campber Trl. Chrumner 14 83001	jsglyoung@man.com

AVI Professional Corporation 1103 Old Town Lane. Suite 101. Choyerine, WY 82009 PJ 307 637-6017





Whitney Road 10% Corridor Plan Public Meeting

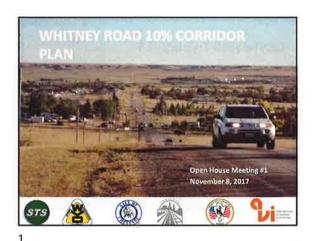
November 8, 2017



Please Enter Your Name & Address	Please Enter Your Phone 27(0) Email
Neil + ZITH Carlyon 7600 Monarch Dr Chayenne Wy 82009	307-514-5275
Candow Croswell 7297 Monarch Dr 82009	Candace, Crowell® grail, com
De Patterson 6524 Faith Dr	Jaceguardian companies. com
Sheery Freeze lev for 7310 Beeze lev for	301-1220 4165 - Rich- Promfrank indirector com-
JIMMY J. TEWILLO 6603 CHICKADEL DR	307 630-1726
Mike Larson 5512 Blazing Star Pd	307-632-4654
Dennis Brunner 11755 Chief Twomoon	307-631-8883
Randy Biers 1418 East (22nd 82001	vandy@tdej.ucs 307 6308358

2 3987 1

AVI Professional Corporation 1103 Old Town Lanc. Suite 101, Cheyenne, WY 82009 PJ 307-637 6017



Verliney Road 10% Corridor Plan

OVERALL STUDY PROCESS

- Estating Committions - Topings Plan
- Topings Plan
- Topings Plan
- Utilities - Data age
- Enveronmental - Historical - Account's Treff Projections - Regulatory Dealing Products - Utilities - Public Committee - Jurisdictional Meetings - Administration Orwestignment - Administration

4

AGENDA

Introductions

Project Overview
Limits
Purpose and Goals

Overall Study Process

What to expect (i.e. Schedule)?
Identifying the Issues
Possible Concept Ideas?

Adjourn to Workshop Area

2

3

WHAT TO EXPECT? PROJECT MILESTONES MILESTONE DATES March 1, 2017 Notice to Proceed Initial Kickoff Meeting MPO March 22, 2017 Traffic Counts April 4, 2017 Steering Committee Meetings Mey 9, 2017; December 2017 Open House/ Public Meeting #1 November 8, 2017 November - December 2017 Keighborhood Meeting #2 January 2018 Submit DRAFT Plan to MPD January 2018 Fresentation to the Governors Body March, 2018

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PROJECT OVERVIEW

* History
| Study not Construction

* Limits
| Northern Limit - Storey Blvd / Beckle Road
| Scothern Limit - US 30

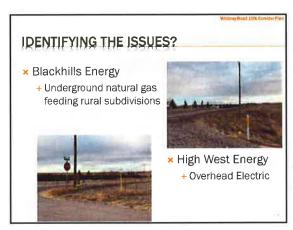
* Objective
| Create a comprehensive plan which strives to optimize safety growth and fiscal responsibility

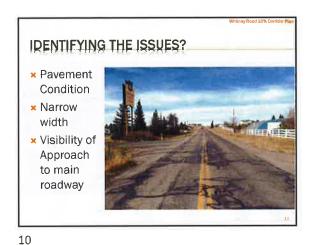
* Goals
| Understand the community and neighborhood vision for the roadway and function
| Address drainage and snow drifting

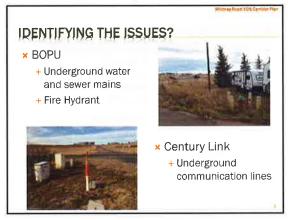
IDENTIFYING THE ISSUES?

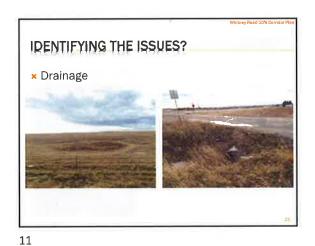
* Utilities

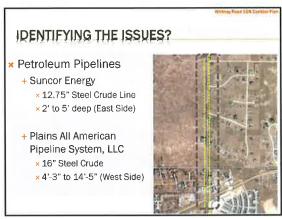
+ Blackhills Energy
+ High West Energy
+ Plains All American
Pipeline System,
LLC
+ Qwest/ Century
+ BOPU Water

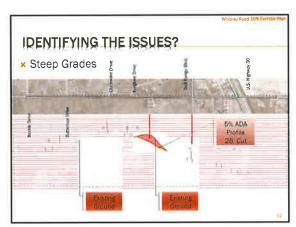




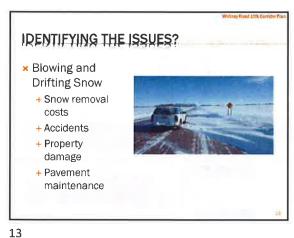


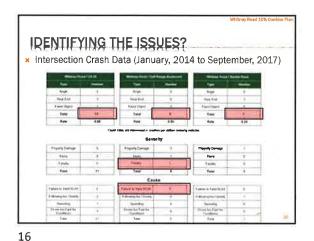




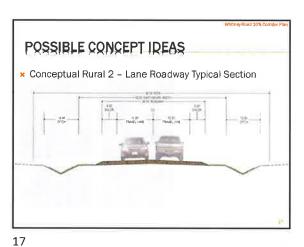


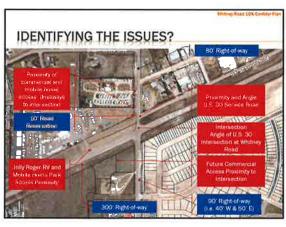
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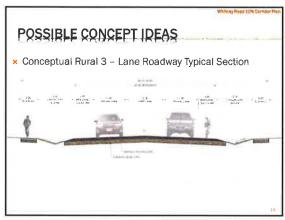


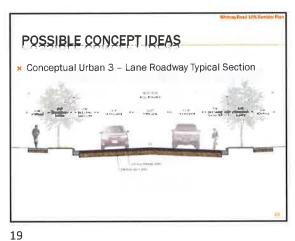


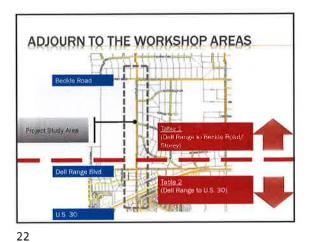
IDENTIFYING THE ISSUES?











POSSIBLE CONCEPTS x Standard 4 leg Intersection + Plain × Marked w/ Rightturn Lanes

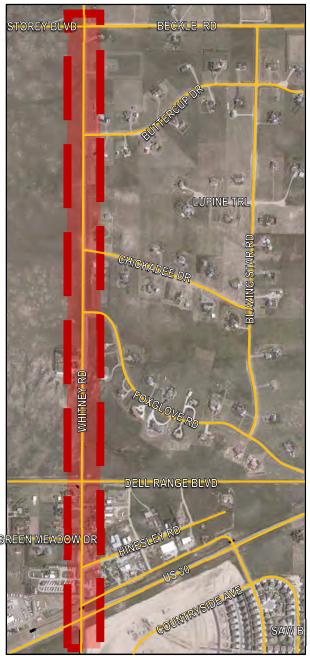
× Marked w/ Left-turn
Lanes × Channelized Islands × Roundabouts + 1 Lane + 2 Lane

20

WORK SHOP STATION AREAS × Two (2) identical Work Station Tables + Overall corridor aerial layout + Existing and conceptual street sections + Existing Traffic Conditions layout × Comment card area × Refreshment area

WHITNEY ROAD CORRIDOR PLAN

WHERE IS THE PROJECT?



OBJECTIVE

 Create a comprehensive and community accepted plan that optimizes safety, growth and fiscal responsibility.

GOALS

- Find the community and neighborhood vision for the roadway
- Improve roadway and intersection safety and function
- Address drainage and snow drifting

Find Us Online:

www.plancheyenne.org

For More Information Contact:

Nancy Olson – 307.638.4366 or

nolson@cheyennempo.org

WHAT TO EXPECT?



WHITNEY ROAD CORRIDOR

Dear Neighborhood Resident:

The Cheyenne Metropolitan Planning Organization (MPO) has engaged AVI, P.C. to study the future transportation needs of the Whitney Road corridor from U.S. 30 to Beckle Road/ Storey Blvd.

You have received this notification/ survey form because you use the corridor and we need your help to plan the future roadway.

Please take a few minutes to answer the questions by one of the following ways:

- Fill out the online form at https://www.surveymonkey.com/r/WHITNEY1
- 2. Complete the postcard form below, refold so that the return address is shown on the outside, seal it closed with tape, and mail or drop off at the address shown.
- 3. Call AVI, P.C. at 307.637.6017



AVI, PC 1103 Old Town Lane, Suite 101 Cheyenne, WY 82009

Cheyenne, WY 82001	[AME]
2101 O'Neil, Room 205	E
Cheyenne MPO	of them.
	10000

1. If you are interested in attending future public or neighborhood
meetings about this project, please give us the best way to contact you to
keep you informed (Optional)?

Email:			
or			
Phone:			

2. What meeting times would work best to accommodate your schedule?

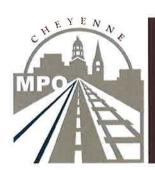
Description	Mornings	Afternoons	Evenings
Weekdays			0
Weekends			

3. What day of week is usually best for you to be able to attend a public or neighborhood meeting (Circle all that apply)? M Tu We Th Fr Sat



WHITNEY ROAD CORRIDOR STUDY

For More Information:



Cheyenne Metropolitan Planning Organization (MPO) http://www.plancheyenne.org/mpo-project

Nancy Olson | MPO | 307.638.4366 | nolson@cheyennempo.org

Tom Cobb | AVI, pc | 307.637.6017 | cobb@avipc.com



WE NEED YOUR HELP:

In determining roadway improvements along Whitney Road from U.S. 30 to Beckle Road/ Storey Blvd.



Let us know when you are available at the link below:

https://www.surveymonkey.com/r/WHITNEY1

WHITNEY ROAD CORRIDOR STUDY

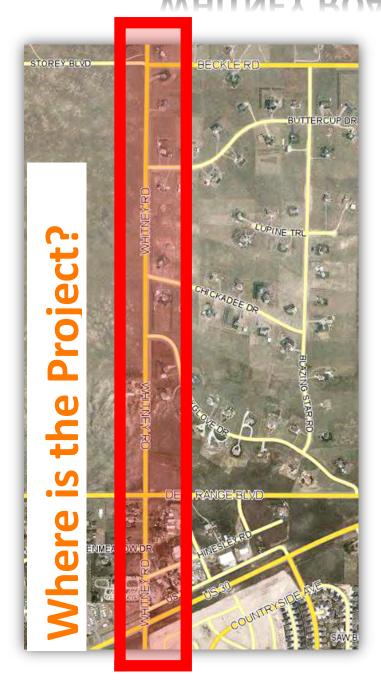


Do you want to be notified?

Please enter your information – Thank you

NAME	EMAIL	PHONE
Jin + Barb Boy	blboyd 70 msn.com	816-139-0489
Charles Roberson		307-638-3466
Lomo Rad	4715 Gysel PI cheyenne wy	307-6327066

WHITNEY ROAD CORRIDOR PLAN



Objective

 Create a comprehensive plan that strives to optimize safety, growth and fiscal responsibility.

Goals

- Find the community and neighborhood vision for the roadway
- Improve roadway and intersection safety and function
- Address drainage and snow drifting

Find Us Online:

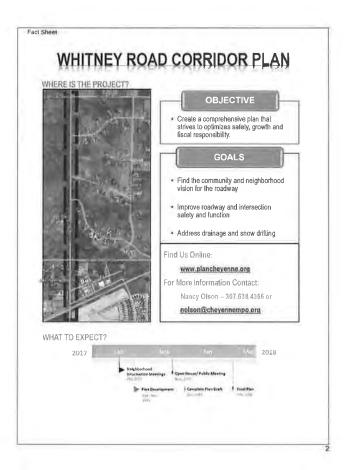
www.plancheyenne.org

For More Information Contact:

Nancy Olson – 307.638.4366 or nolson@cheyennempo.org

What to Expect?





3,	
Thank you for providing input for this project!	
For additional information and updates please check the Laramie County Planning and Development Office Website at http://www.laramieco.org/con/_departmenty_planning/	
Or Contact Tom Cobb at AVI, P.C. email: Cobb@avipc.com or 307 637 6017	

	d in attending future public or ntact you to keep you informe	neighborhood meetings abou	ut this project, please giv
Name	naut you io keep you intollie	a (Optionary)	- 1
Address			
Phone			
Email			
2. What meeting times	s would work best to accomп	Calubadas vous echadulas	
Z, What meeding white:	Mornings	Afiemaons	Evenings
Weekdays	Murnings	Allelitablis	Evenings.
	-		
Weekends			
Other (please specify):			
2 What day of the we	ak ie ucually baet far you to b	ne able to attend a public or n	olabbarhood maailaa
	ek is usually best for you to t	be able to attent a public of it	eiginoumoud meeting
(Mark all that apply)?			
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(Mark all that apply)?			
(Mark all that apply)? Monday Tuesday			
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(Mark all that apply)? Monday Tuesday Wednesday Thursday			
(Mark all that apply)? Monday Tuesday Wednesday Thursday Friday			
(Mark all that apply)? Monday Tuesday Wednesday Thursday Friday			
(Mark all that apply)? Monday Tuesday Wednesday Thursday Friday			

SurveyMonkey

Q1 Which of the following best describes you (Please mark all that apply)?

%001 %06 Answered: 237 Skipped 0 40% 30% 20% %OL %O Other (please 3.4% specify): Business owner in the area. Employee in 3.4% Renter in the area. Commercial 1.3% Property Owner. Property Owner in the area. Route user.

ANSWER CHOICES			R	RESPONSES	
Home owner in the area, (1)			96	80 2%	190
Renter in the area. (2)			0	0.8%	2
Business owner in the area. (3)			ri e	3,8%	6
Commercial Property Owner. (4)			+	1.3%	60
Employee in the area, (5)			rô	3.4%	60
Property Owner in the area. (6)			œ.	8.9%	21
Route user (7)			27	27.0%	19
Other (please specify): (8)			က်	3,4%	80
Total Respondents: 237					
BASIC STATISTICS					
Minimum 1.00	Maximum 8,00	Median 1.00	Mean 2.99	Standard Deviation 2,69	
# OTHER (PLEASE SPECIFY):	SPECIFY):			DATE	
Real Estate Broker	Real Estate Broker Real Estate Broker			11/21/201	11/21/2017 6:56 PM
2 Red Estate Buyer	Real Education Cheyenne resident thinking of moving over there	ing of moving over the	Te	11/16/201	11/16/2017 8:38 PM

Whitney Road Corridor Study Comment Sheet

SurveyMonkey

11/14/2017 11:00 AM 11/15/2017 3:39 PM 11/11/2017 8:30 AM 11/6/2017 8:25 AM 11/9/2017 5:45 PM 11/6/2017 3:20 PM Region 1998. Live in Cheyenne, close top downtown, let's get on with this project and stop dragging it out! MPO CAC Member | MPO Citizens Advisory Committee Member Reute User Friend of homeowners in the area Route User Homeowner in middle of town Real Estate Broker Realtor TEST

2/32

SurveyMonkey

Whitney Road Corridor Study Comment Sheet

SurveyMonkey

Q2 Please help us keep you informed by giving us the way to contact you (Optional).

Answered: 107 Skipped: 130

City/State/ZIP: Phone: Email: Address: Name:		63.55%	89
vi			
ió		70,09%	75
iá		%62'88	98
		92.52%	66
		98,13%	105
	NAME:		DATE
	Marc Woods		12/7/2017 10:35 AM
	Candace Croswell		11/30/2017 4:24 PM
100	Shaun Roberts		11/22/2017 2:20 PM
**	Sara Janes Ellis		11/21/2017 7:39 PM
60	Joe Prunty		11/21/2017 6:56 PM
9	Natasha Gallizzi		11/21/2017 4:47 PM
7	Richard D. Vosler (Dick)		11/20/2017 11:51 AM
60	Wayne Lax		11/20/2017 11:25 AM
0)	Henry Uhden		11/20/2017 7:08 AM
10	Walter hall		11/19/2017 7:25 PM
11	Rebecca Oleary		11/18/2017 9:36 PM
12	Barbara Edmunds		11/16/2017 2:04 PM
52	Linda erikson		11/16/2017 8:47 AM
14	Bryce Bump		11/16/2017 7:06 AM
15	David Sutherland		11/15/2817 9:29 PM
16	Jim woods		11/15/2017 8:33 PM
17	Scott Allen		11/15/2017 8:15 PM
18	don kantner		11/15/2017 7:38 PM
19	Carl Volgtsberger		11/15/2017 5:05 PM
20	Mara Funk		11/15/2017 1/08 PM
21	Danna Loyd		11/15/2017 10:01 AM
22	Chad Doss		11/14/2017 9:07 PM
23	Mike Mills		11/14/2017 8:14 PM
24	Charles Retz		11/14/2017 6:34 PM
25	Sheri Emmert		11/14/2017 5:15 PM
26	Tom & Janice Rath		11/14/2017 1:59 PM
27	Jennifer Woods		11/14/2017 11:25 AM
28	Andy Sparks		11/14/2017 11:07 AM

11/14/2017 10:42 AM 11/11/2017 11:44 AM 11/14/2017 10:32 AM 11/13/2017 10:00 AM 11/12/2017 10:00 PM 11/11/2017 10:09 PM 11/10/2017 11:14 AM 11/14/2017 9:51 AM 11/14/2017 9:05 AM 11/14/2017 9:01 AM 11/14/2017 8:46 AM 11/14/2017 8:23 AM 11/14/2017 8:12 AM 11/13/2017 3:44 PM 11/13/2017 1:14 AM 11/12/2017 6:27 PM 11/12/2017 5:43 PM 11/11/2017 7:36 PM 11/10/2017 5:29 PM 11/10/2017 3:08 PM 11/10/2017 6:46 AM 11/13/2017 5:38 AM 11/13/2017 4:19 AM 11/12/2017 7:36 PM 11/10/2017 6:09 AM 11/9/2017 3:11 PM 11/9/2017 8:57 PM 11/9/2017 6:53 PM 11/9/2017 6:27 PM 11/9/2017 5:45 PM 11/9/2017 3:49 PM 11/9/2017 3:46 PM 11/9/2017 3:43 PM 11/9/2017 3,37 PM 11/8/2017 3:18 PM 11/9/2017 3:16 PM Ray & Melissa Hollingshead Elizabeth & Michael Gnagy Jacquin y & Ruth E Flores Kevin & Susan Heyborne Christopher Harbeson George Diefenderfer Monica Yarborough Richard Hammond Sue Hollingshead Cyndi Henderson Steven Woodson Camille Howard Mandy Brekhus Jeremy Santee Dianna Madvig Rachel Bailey Kristen Spiker Julie mutchler Leif Anderson Lois Madland Sandra Smith WENDY Volk Brenda Birkle TW Hartman Terri Brantz Jim Boyd Jr Ryley hardy Lee Hooker Cynthia Dill 20 52 53 22 53 57 58 29 09 19 62 63

11/9/2017 3:11 PM

Richard Eiscranton

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Andy Vehar David Rose Paula Baldeshwiler

Sorbora Boyd

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Shon Dermondy	11/9/2017 2:52 PM
Pat Sawezinko	11/9/2017 2:47 PM
Morris & Sharon Jenkins	11/9/2017 2:40 PM
Ed & Peggy Uplain	11/9/2017 2:36 PM
Frank & Anna Mata	11/9/2017 2:33 PM
Lee Rolth	11/9/2017 2:30 PM
Chris Tetlow	11/9/2017 2:27 PM
Gilbert & Rebecca Ferrel	11/9/2017 2:25 PM
Hugh & Denise Harington	11/9/2017 2:23 PM
Dave Allem	11/9/2017 2:22 PM
Shawn Broad	11/9/2017 2:20 PM
Neil & Edith Carlyon	11/9/2017 2:18 PM
Nina Pike & Steve Rissler	11/9/2017 2:15 PM
Jun Larson	11/9/2017 2:13 PM
Linda Larson	11/9/2017 2:08 PM
Dennis Brunner	11/9/2017 2:04 PM
Cynthia & Jerry Richmond	11/9/2017 1:59 PM
Dan Sutton	11/9/2017 1:47 PM
James Cicarelli	11/9/2017 1:16 PM
Alan Jones	11/9/2017 12:48 PM
Erica Pascoe	11/9/2017 11:31 AM
Steven Girt	11/9/2017 11:22 AM
Devonna Rainer	11/9/2017 10:36 AM
Kathy Starr	11/9/2017 9:44 AM
Dawn Fiscus	11/9/2017 9:18 AM
Slade Franklin	11/9/2017 8:34 AM
James Mestack	11/9/2017 8:06 AM
Rex Lockman	11/8/2017 6:32 PM
Kenneth J. Widney	11/8/2017 6:29 PM
Carol Anderson	11/7/2017 6:45 AM
Michael Peadman	11/6/2017 8:25 AM
Erica Mathews	11/4/2017 8:43 PM
Glenn Митау	11/4/2017 9/10 PM
Teresa Walling	11/4/2017 5:25 PM
Randy Byers	11/4/2017 2:56 PM
ADDRESS:	DATE
Heartend Subdivision 7805 Yarina Way	12/7/2017 10:35 AM
Fox Run 7297 Monarch Drive	11/30/2017 4:24 PM
Bison Run (Whitney Road) 6408 Elizabeth Rd	11/22/2017 2:20 PM
Saddle Ridge 4004 Gunsmake Road	11/21/2017 7:39 PM
Out of Study Area 6106 Yellowstone	11/21/2017 6:56 PM
Boom Sm. 6634 Saukally Rd	14734 DAG 14.47 DAG

SurveyMonkey

SurveyMonkey

7	Fox Run 10145 Crystal Min. Rd	11/20/2017 11:51 AM
00	Heartland Subowision 7906 Aztec Drive	11/20/2017 11:25 AM
6	See Right 6906 Snowy River Road	11/20/2017 7:08 AM
10	Cut of Study Area 812 east 5th street	11/19/2017 7:25 PM
Ξ	Wyorning Ranchettes 12411 Empire dr	11/18/2017 9:36 PM
12	Simple Subdivior 7311 e Pershing	11/16/2017 2:04 PM
13	Fox Run 7705 Sorrento Lane	11/16/2017 7:06 AM
4	Section State 6606 campfire ct	11/15/2017 9:29 PM
15	Woods Linid Estatus 6004 Storey Blvd	11/15/2017 8:33 PM
16	Fox Run 6801 Monarch Dr	11/15/2017 8:16 PM
17	Hill Heights 5710 dellrange	11/15/2017 7:38 PM
18	Wyorning Ranchettes 11303 yellowbear rd	11/15/2017 5:06 PM
19	Mesdawlerk Estatos: 6515 Foxglove	11/15/2017 1:08 PM
20	Out of Study Area 3529 McComb Ave	11/15/2017 10:01 AM
21	Fox Run 9907 Crystal Mountain Road	11/14/2017 9:07 PM
22	Fox Run 9424 Crystal Mountain Road	11/14/2017 8:14 PM
23	Heartland Subdivision 7317 Aztec Dr.	11/14/2017 6:34 PM
24	Fox Run 6740 Crested Butte Dr	11/14/2017 6:15 PM
25	Fox Run 6630 Telluride Dr	11/14/2017 1:59 PM
26	Fox Run 6641 Crested Bulte	11/14/2017 11:25 AM
27	Fox Run 7045 Keystone dr	11/14/2017 11:07 AM
28	Fox Run Whitney Road 6427 monarch dr.	11/14/2017 10:42 AM
29	Fox Run 10822 Snow Valley Ct	11/14/2017 10:32 AM
30	Fox Run 6763 Keystone Dr	11/14/2017 9:51 AM
31	Fox Run 7330 Telluride Dr	11/14/2017 9:05 AM
32	Fox Run 9466 Sugarloaf Ln	11/14/2017 9:01 AM
33	Fox Run 7049 Monarch Drive	11/14/2017 8:46 AM
32	Fox Run 7282 Monarch Drive	11/14/2017 8:23 AM
35	Mentowhite Edition 6704 Foxglove Drive	11/13/2017 3:44 PM
36	Fox Run Crested Butte	11/13/2017 10:00 AM
37	Cut of Study Area 3580, R.d. 215	11/13/2017 5:38 AM
38	Crown Subdivision 4924 Carmel Dr	11/13/2017 4;19 AM
39	Fox Run 7100 telluride dr	11/13/2017 1:14 AM
40	Christenson Tracts 4701 Craigy J	11/12/2017 10:00 PM
41	Sestion Refine 6905 hitching post in	11/12/2017 7:36 PM
42	6800 us highway 30	11/12/2017 6:27 PM
43	Buton Run 6633 Dorsey Road	11/12/2017,5/43 PM
44	Fox Run 9353 Crystal Mountain Rd	11/11/2017 10:09 PM
45	Stulds Fellow Brinkley	11/11/2017 7:36 PM
46	Wenning From 3305 McKinley Ave	11/11/2017 11:44 AM
47	Meadownark Editates 6515 Buttercup Dr.	11/10/2017 5:29 PM
48	Heritage Hills 3160 Heavenly Dr	11/10/2017 3:08 PM

Meadowhark Estates 7125 Buttercup Dr	11/10/2017 6:46 AM	91	Baron Rum Whitney Road 6404 Saykally Road	11/9/2017 8:34 AM
Woods Land Entains 6819 Longabaugh Way	11/10/2017 6:09 AM	92	Bison Run 6861 Dorsey Rd	11/9/2017 8:06 AM
Wyoming Ranchettes 11059 White Eagle Road	11/9/2017 8:57 PM	63	Fox Run 7058 E. Riding Club	11/8/2017 6:32 PM
State State 6833 laramie st	11/9/2017 6:53 PM	94	Bison Run 6631 Elizabeth Rd	11/8/2017 6:29 PM
Fox Run 6784 Monarch Dr	11/9/2017 6:27 PM	95	Cut of Study Area 1602 Animas PI Loveland, CO	11/7/2017 8/46 AM
Out of Study Aven P O Box 2969	11/9/2017 5:45 PM	96	Broom Run 7413 Toria Rd	11/4/2017 9:43 PM
Bison Run 7303 Julia	11/9/2017 3:49 PM	16	Heritage Hills 6871 Solitude Loop	11/4/2017 9:10 PM
SAME SULE 6808 Hitching Post Lane	11/9/2017 3:46 PM	86	Praine Dog Alley 4717 Summit Drive	11/4/2017 5:26 PM
Bison Run 6973 Elizabeth Rd	11/9/2017 3:43 PM	66	Out of Study Area 1418 East 22nd Street	11/4/2017 2:56 PM
Hill Heights 4608 Van Buren Ave	11/9/2017 3:37 PM	**	CITY/STATE/ZIP:	DATE
Hill Heights 5204 Dell Range Blvd	11/9/2017 3:18 PM	-	Cheyenne,WY, 82009	11/30/2017 4:24 PM
Bison Run 6919 Julia Read,	11/9/2017 3:16 PM	2	Cheyenne	11/22/2017 2:20 PM
Bison Run 7315 Julia Road	11/9/2017 3:11 PM	8	Cheyenne WY 82001	11/21/2017 7:39 PM
6526 Hwy 30	11/9/2017 3:07 PM	**	Cheyenne Wy. 82009	11/21/2017 6:56 PM
RATE 7741 6530 US 30	11/9/2017 3:02 PM	w	Cheyenne, WY 82009	11/21/2017 4:47 PM
Meadowlark Estates 6603 Foxglove Drive	11/9/2017 3:02 PM	9	Cheyenne, WY, 82009	11/20/2017 11:25 AM
Hill Heights 4608 Van Buren Ave	11/9/2017 2:57 PM	*	Cheyenne	11/20/2017 7:08 AM
Meadowlank Estates 6710 Buttercup Dr	11/9/2017 2:55 PM	85	Cheyenne wy82007	11/19/2017 7:25 PM
Woods Land Estates 5712 Story Blvd	11/9/2017 2:52 PM	O	Сheyenne 82009	11/18/2017 9:36 PM
Saudie Ridge 4100 Gunsmoke Rd	11/9/2017 2:47 PM	10	Cheyenne Wyoming 82001	11/16/2017 2:04 PM
(Sternin Sternine) Whitney Road 6300 Green Meadow Dr (Comer of Whitney Road &	11/9/2017 2:40 PM	#	Cheyenne, WY 82009	11/16/2017 7:06 AM
Green Meadow)		12	Cheyenne	11/15/2017 9:29 P.M.
Cut of Study Area 801 Mequery	11/9/2017 2:36 PM	13	82009	11/15/2017 8:33 PM
Whitney Road 4436 Whitney Rd	11/9/2017 2:33 PM	41	Cheyenen WY 82009	11/15/2017 8:16 PM
Wyoning Ranchettes 11500 Yellow Bear rd	11/9/2017 2:30 PM	15	cheyenne	11/15/2017 7:38 PM
Hentinge Hills 6517 Whistler Dr	11/9/2017 2:27 PM	16	CHEYENNE	11/15/2017 S:06 PM
Bison Run 7323 Dorsey Rd	11/9/2017 2:25 PM	17	Cheyenne	11/15/2017 1:08 PM
Form Trees Whitney Road 4501 Whitney Rd	11/9/2017 2:23 PM	18	Cheyenne WY 82002	MA 10:017:10:01 AM
Fox Run 7816 Sorrento Ln	11/9/2017 2:22 PM	19	Cheyenne Wy	11/14/2017 8:07 PM
Wyoming Ranchettes 11431 Chief Twomoon Rd		20	Cheyenne/WY/82009	11/14/2017 8:14 PM
Fox Run 7600 Manarch Dr	11/9/2017 2:18 PM	21	Cheyenne, WY 82009	11/14/2017 6:34 PM
Black Run 7087 Dorsey Rd	11/9/2017 2:15 PM	22	Cheyenne, WY, 82009	11714/2017 5:15 PM
Wyoming Ranchette: 12302 Chier Two Moon	11/9/2017 2:13 PM	23	Cheyenne, WY 82009	11/14/2017 1:59 PM
Wyoning Ranchettes 12302 Chief Two Moon Road	11/9/2017 2:08 PM	24	Cheyenne, Wy	11/14/2017 11:25 AM
Wyoming Rancherres 11755 Chief Two Moon	11/9/2017 2:04 PM	25	Cheyenne Wyoming 82009	13/14/2017 11:07 AM
Bison Run 6909 Julia Rd	11/9/2017 1:59 PM	26	Cheyenne wy 82009	11/14/2017 10:42 AM
Hostinge Hills 6889 Solitude Dr.	11/9/2017 1:47 PM	27	Chevenne WY 82009	11/14/2017 10:32 AM
Pranto Stoy Entates 7502 Rilley Rd	11/9/2017 1:16 PM	28	Chevenne	11/14/2017 9:S1 AM
Bison Run Whitney Road 6406 Dorsey	11/9/2017 12:48 PM	29	Chevenne, WY 82009	11/14/2017 9:05 AM
Profite Sky Estates 7360 Rilley Road	11/9/2017 11:31 AM	30	Chevenne Wv 82009	11/14/2017 9:01 AM
Fox Run 6726 Telluride Dr	11/9/2017 11:22 AM	31	Chevenne, WY 82009	11/14/2017 8:46 AM
Sattentaly Supary Int. 5608 Imperial Ct	11/9/2017 9:44 AM			
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82009	11/13/2017 10:00 AM	10	3076300781	11/20/2017 7:08 AM
Cheyenna, Wy, 82009	11/13/2017 5:38 AM	-	3072568402	11/19/2017 7:25 PM
Cheyenne, WY 82009	11/13/2017 4:19 AM	'60	3072207775	11/16/2017 2:04 PM
CHeyenne WY 82009	11/12/2017 10:00 PM	©)	402-990-0743	11/16/2017 7:06 AM
Cheyenne,WY 82003	11/12/2017 6:27 PM	10	286-7048	11/15/2017 9:29 PM
Сheyвплв, Wy 82009	11/12/2017 5:43 PM	#	307-630-7884	11/15/2017 8:33 PM
Cheyenne WY 82009	11/11/2017 10:09 PM	12	3074339288	11/15/2017 5:06 PM
3621 Purple Sage Rd	11/11/2017 7:36 PM	13	635-0495	11/15/2017 1:08 PM
Cheyenne, WAY 82001	11/11/2017 11:44 AM	14	3074215508	11/14/2017 9:07 PM
Cheyenne WY 82009	11/10/2017 5:29 PM	rt)	918-645-8902	11/14/2017 8:14 PM
Cheyenne, WY 82009	11/10/2017 3:08 PM	16	307-630-7938	11/14/2017 6:34 PM
Cheyenne, WY 82009	11/10/2017 6:46 AM	- 4.7	626-222-7169	11/14/2017 5:15 PM
Cheyenne	11/10/2017 6:09 AM	80	307 637 3766	11/14/2017 1:59 PM
Cheyenne, Wyoming 82009	11/9/2017 8:57 PM	19	307-634-5440	11/14/2017 11:07 AM
Cheyenne	11/9/2017 6:53 PM	20	3072872188	11/14/2017 10:42 AM
Cheyenne, WY82009	11/9/2017 6:27 PM	21	3072599642	11/14/2017 9:51 AM
Cheyenne WY 82003-2969	11/8/2017 5:45 PM	22	3072569155	11/14/2017 9:05 AM
Cheyenne, WY 82009	11/8/2017 3:16 PM	23	307-630-8130	11/14/2017 8:23 AM
Сheyenne, Wy 82009	11/9/2017 3:02 PM	24	307-421-6728	11/13/2017 3:44 PM
62008	11/9/2017 2:30 PM	25	6388123	11/13/2017 5:38 AM
Cheyenne, WY 82009	11/9/2017 2:25 PM	26	307-221-0136	11/13/2017 4:19 AM
Cheyenne	11/9/2017 1:47 PM	27	2566162	11/12/2017 6:27 PM
Cheyenne, WY 82009	11/9/2017 1:16 PM	28	307-214-5283	11/11/2017 10:09 PM
Cheyenne	11/9/2017 11:31 AM	29	979-213-9732	11/11/2017 11:44 AM
Cheyenne	11/9/2017 11:22 AM	38	7143973873	11/10/2017 5:29 PM
Cheyenne WY 82001	11/9/2017 9:44 AM	15	307-778-2911	11/10/2017 6:46 AM
Cheyenne, WY 82001	11/9/2017 9:18 AM	32	3072143098	11/10/2017 6:09 AM
Cheyenne/WY/82009	11/9/2017 8:34 AM	23	3072146965	11/9/2017 8:57 PM
Cheyenne, WY 82009	11/9/2017 8:06 AM	34	307-630-5263	11/9/2017 5:45 PM
Cheyenne WY 82009	11/8/2017 6:32 PM	32	307-286-0736	11/9/2017 3:49 PM
Cheyenne	11/8/2017 6:29 PM	32	274-2988	11/9/2017 3:46 PM
80538	11/7/2017 6:46 AM	37	631-4766	11/9/2017 3:43 PM
Cheyenne, WY 82009	11/4/2017 9:43 PM	38	816-739-0489	11/9/2017 3:37 PM
Cheyenne, WY 82009	11/4/2017 9:10 PM	98	307-633-4989	11/9/2017 3:18 PM
Cheyenne, WY 82009	11/4/2017 5:26 PM	40	307.286-6985	11/9/2017 3:16 PM
Cheyenne, Wyoming 82001	11/4/2017 2:56 PM	41	635-1923	11/9/2017 3:11 PM
PHONE:	DATE	42	307-220-2740	11/9/2017 3:07 PM
307-631-9300	127/2017 10:35 AM	64	307-630-8965	11/9/2017 3:02 PM
4109165232	11/30/2017 4:24 PM	77	307-634-4749	11/9/2017 3:02 PM
3074215580	11/22/2017 2:20 PM	45	816-716-8722	11/9/2017 2:57 PM
307-773-8490	17/21/2017 6:56 PM	46	307-222-8191	11/9/2017 2:55 PM
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438	307-630-8888	11/9/2017 2:47 974	14	DpsBeet@ive.com	11/15/2017 9:29 PM
69	307-638-7818	11/9/2017 2:40 PM	15	Ourneckofthswoods@juno.cam	11/15/2017 8:33 PM
99	532-7149	11/9/2017 2:36 PM	16	HBS1993@live.com	11/15/2017 8:16 PM
100	307-635-1672	11/9/2017 2:33 PM	17	d_ekentner@hormal.com	11/15/2017 7:38 PM
25	307-421-0355	11/8/2017 2:30 PM	18	Fishingtue@gmail.com	11/15/2017 5:06 PM
53	425-766-3910	11/9/2017 2:27 PM	19	Marafunk70@gmail.com	11/15/2017 1:08 PM
55	307-421-8511	11/9/2017 2:25 PM	20	Herabo@genail.com	11/14/2017 9:07 PM
55	637-3063	11/9/2017 2:23 PM	21	Mile2101@yahoo.com	11/14/2017 8:14 PM
56	307-701-7111	11/9/2017 2:22 PM	22	Cf_walhabe@holmail.com	11/14/2017 6:55 PM
22	307-214-6296	11/9/2017 2:20 PM	23	Retzu@hatmail.com	11/14/2017 6:34 PM
80	307-514-5275	11/9/2017 2:18 PM	24	Sheri336@hotmail.com	11/14/2017 5:15 PM
28	307-630-4299	11/8/2017 2:15 PM	25	мулјгаth@yahoo.com	11/14/2017 1:59 PM
09	307-635-4215	11/9/2017 2:13 PM	26	Saspatks7@gmail.com	11/14/2017 11:07 AM
61	307-635-4215	11/9/2017 2:08 PM	27	Sdkinzey@gmail.com	11/14/2017 10:42 AM
62	307-631-883	11/9/2017 2:04 PM	28	camille@yourspecialkid com	11/14/2017 10:32 AM
12	635-0929	11/9/2017 1:59 PM	59	Madvig@áol.com	11/14/2017 9:51 AM
64	3074214920	11/9/2017 1:47 PM	30	radiam01@yahoo.com	11/14/2017 9:05 AM
65	307-421-6055	11/9/2017 1:16 PM	31	cyndi henderson@ymail com	11/14/2017 9:01 AM
99	307-421-7877	11/9/2017 12:48 PM	32	Mandybrekhus@gmail com	11/14/2017 8:46 AM
19	3077777163	11/9/2017 11:22 AM	33	Krs5117@aol.com	11/14/2017 8:23 AM
89	307-421-9921	11/9/2017 9:44 AM	34	kneyborn@wyoming.com	11/14/2017 8:12 AM
27	307-631-9044	11/9/2017 8:34 AM	35	Jswaod2403@yahoo.com	11/13/2017 6:20 PM
20	307-287-1548	11/9/2017 8:06 AM	36	matlandb@yahoo.com	11/13/2017 3:44 PM
7.1	3076312248	11/8/2017 6:29 PM	37	50brucebmg@gmail.com.	11/13/2017 5:38 AM
72	9706630039	1177.2017 6,46.AM	38	jasantee@hotmail,com	11/13/2017 4:19 AM
27	307-632-7987	11/4/2017 9:10 PM	39	Anachotas@hotmail.com	11/13/2017 1:14 AM
74	307-634-4094	11/4/2017 5:26 PM	40	SSmith4701@gmail.com	11/12/2017 10:00 PM
75	3076308358	11/4/2017 2:56 PM	41	FMS chayenne com	11/12/2017 6:27 PM
40	EMAIL:	DATE	42	Monica.yarborough@gmail.com	11/11/2017 10:09 PM
	mwoods@remax.net	12/7/2017 10:35 AM	43	Winters Iz@comcast.net	11/11/2017 7:36 PM
N	candace.croswell@gmail.com	11/30/2017 4:24 PM	44	Twhartman@gmail.com	11/11/2017 11:44 AM
65	srobertswy@msn.com	11/22/2017 2:20 PM	45	gdiefe@yahoo.com	11/10/2017 5:29 PM
4	Wyjanes@gmail.com	11/21/2017 7:39 PM	46	sue.holling@gmail.com	11/10/2017 3:08 PM
w	Joe@Move2Wya.com	11/21/2017 6:56 PM	47	Rendesign1@gmail.com	11/10/2017 11:14 AM
9	Tashg13@msn.com	11/21/2017 4:47 PM	48	Terribrantz@gmail.con	11/10/2017 6:46 AM
+	viaynebassihunderS@hotmail.com	11/20/2017 11:25 AM	49	Jmutchler90@gmail.com	11/10/2017 6:09 AM
60	henry uhden@gmail.com	11/20/2017 7:08 AM	50	dilic@yahoo.com	11/9/2017 8:57 PM
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Whitney Road Corridor Study Comment Sheet

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Whitney Road Corridor Study Comment Sheet

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raymanhollings@gmail.com

vbirkle@live.com

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Rebecca.oleary5@gmail.com Starranime2@netzero.com

BBumper1@gmail.com Ljerikson@gmail.com

henry uhden@gmail.com Walterhall56@gmail.com

Ryan.harbeson@gmail.com

Lhook7@yahoo.com

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Jboyd6@gmail.com	11/8/2017 3:37 PM
Yelyrf@yahoo.com	11/9/2017 3:11 PM
reiscranton@gmial.com	11/0/2017 3:11 PM
andy@bigalsavtoservice,com	11/9/2017 3:07 PM
rbigals01@aol.com	11/9/2017 3:02 PM
vpfoxglove 1@gmail.com	11/9/2017 3:02 PM
blboyd7竖msn.com	11/9/2017 2:57 PM
eric@eartherly.net	11/9/2017 2:55 PM
shondergg@email.com	11/9/2017 2:52 PM
shadow1977@live.com	11/9/2017 2:47 PM
sjenkins@prodigy.net	11/9/2017 2:40 PM
anamata49@yahqo.com	11/9/2017 2:33 PM
Іеегоі88@gmail.com	11/9/2017 2:30 PM
christe@microsoft.com	11/9/2017 2:27 PM
sissylala28@yahoo,com	11/9/2017 2:25 PM
d21allen@gmail.com	11/9/2017 2:22 PM
shawnbroad1@gmail.com	11/9/2017 2:20 PM
ninalewpike@gmail.com	11/9/2017 2:15 PM
659lurbo@msn.com	11/9/2017 2:13 PM
larsruss@aol.com	11/9/2017 2:08 PM
dennis brunner@gmail.com	11/9/2017 2:04 PM
Ircant0929@gmail.com	11/9/2017 1:59 PM
d1_sutton@msn.com	11/9/2017 1:47 PM
cicarellij@msn.com	11/9/2017 1:16 PM
alan jones@cowboyjonescc.com	11/9/2017 12:48 PM
е8Зар@уаһоо сот	11/9/2017 11:31 AM
spgirt@gmail.com	11/9/2017 11:22 AM
devonna.reiner@laramie1.org	11/9/2017 10:36 AM
Starwy@adl.com	11/9/2017 9:44 AM
DawnFiscus@msn.com	11/9/2017 9:18 AM
sladefranklin@gmail.com	11/9/2017 8:34 AM
i_meslack@inbox.com	11/9/2017 8.05 AM
mlock@live.com	11/8/2017 6:32 PM
e_widney@yahoo,com	11/8/2017 6:29 PM
andersoncarolw@gmail.com	11/7/2017 8:46 AM
emathews29@gmail.com	11/4/2017 9:43 PM
lingledr@msn.com	11/4/2017 9:10 PM
twalling0925@gmail.com	11/4/2017 5:26 PM
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Q3 Please rate the importance of the following transportation users and issues based on what you consider to be the most important design consideration for Whitney Road?

Answered: 215 Skipped: 22

Ē	Accommodating more Vehicles	**			**		16%	935			
ACC	Accommodating Higher Vehic		*	223		25%		20%	38		
	Lowering Vehicle Speeds	超	West.		460%		1	4	**		
A	Accommodating Pedestrians	THE STATE OF THE S		THE STATE OF		24%		30%	SHE THE		
A	Accommodating Bicyclists	Tight.		202		28%		1057	10%, 48%		
	Other	No.		346	28%	77.2		250			
	% No.	10% ry Import portant to	0% 10% 20% 30% 40° Very important to Accomodate Important to Discourage Imp	40%	50% Important nportant	40% 50% 60% 70% ate Important to Accomodate	ρ, —	80% 90% Neutral	90% 100% ral nion		
	VERY IMPORTANT TO ACCOMODATE		IMPORTANT TO ACCOMODATE	NEUTRAL		IMPORTANT TO DISCOURAGE	MOST IMPOR TO DISCO(MOST IMPORTANT TO DISCOURAGE	NO OPINION	TOTAL	WEIGHTEL
Accommodating more Vehicles	38%	% F	30%	16%		8%		12	% 69	214	3.8
Accommodating Higher Vehicle Speeds	13% 27	% >	39	22%		25%		20%	2%	215	2.7
Lowering Vehicle Speeds	13%	~ 80	18%	40%		12%		15% 31	3%	213	2.9
Accommodating	28%	% -	27% 58	24%		16%		7%	3%	215	3.5
Accommodating Bicyclists	29%	% -	26%	23%		19%		10%	3%	214	9,6
Other	29%	19	8%	28%		254		%0 %0	34%	10	2.6
÷	"IF OTHER (PLEASE SPECIFY)	E SPECIF	۲.						DATE		
Pu	Pulling traffic from Whiteney rd	Aiteney n	T						12/7/2	12/7/2017 10:36 AM	AM

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Whitney

2	It's the city's growth direction	11/21/2017 6:58 PM
m	Flattening out the grade of Whitney road all the way from the corridor to Iron mountain road,	11/21/2017 4:51 PM
4	Pave Iron Mountain to help defer traffic and ease of better access to northern Whitney Road	11/19/2017 8:34 AM
NS.	This road way does provide access to a variety of users, from far north to get to the east portion of lown, many runners and bicyclists use this conridor as well, even in dark and low light times. Improving this roadway would help to ensure the safety of drivers, and pedestrians.	11/16/2017 8:53 AM
6	I don't think it is as important to modify Whitney as it is to connect Whitney to College via Beckle to Storey	11/15/2017 8:49 PM
4	Might icorportate the 'Green Way' for pedestrians and bicyclists for access along the road.	11/15/2017 3:40 PM
60	Need wider road between HWY 30 & Dell Range	11/15/2017 1:11 PM
ø,	Equine trails	11/14/2017 6:35 PM
10	Provide other routes Pave Iron Mountain Rd.	11/14/2017 5:37 PM
£	Signal at Del Range Blvd There needs to be a stoplight at the intersection of Whitney and Del Range	11/14/2017 11:01 AM
12	Shoulder	11/14/2017 8:13 AM
13	Continuation & Connection to " Greeway" from Saddle Ridge	11/13/2017 3:46 PM
14	Do Nothing Leave it alone!!!!!!!	11/13/2017 8:27 AM
15	Invertigation illumination. Lighting at Pershing and dell range crossings. Completely black at night there and unsafe.	11/12/2017 7:38 PM
9	Provide other routes. Residents and traffic have increased substantially in the last 5 years. Whitney Road needs to be widened and made safer, all the way up to Iron Mounian. Also. Whitney Road needs another outlet to the west, such as completely connecting with Storey Blvd for access to town.	11/10/2017 8:06 AM
17	Stop light or another alternative for crossing at Whitney and 30	11/9/2017 6:55 PM
50	Whitney and US 30 Intersection	11/9/2017 5:48 PM
19	stop light @ Whitney Rd & Dell Range	11/9/2017 2:58 PM
20	Street Lights on Del Range Whitney	11/9/2017 2:48 PM
21	Roadway is sufficient only needs accommodation for pedestnan use.	11/9/2017 1:53 PM
22	Make Whitney 4 lanes	11/9/2017 1:29 PM
23	Pedestrians with Dogs and Snow Drifts	11/9/2017 8:08 AM
24	Address the NO visibility for left turns coming off of Elizabeth rd. Sacally rd. and Four Mile rd. when turning onto Whitney.	11/8/2017 6:35 PM
25	Connect Stoley to College is most important	11/8/2017 10:15 AM
26	Safety and fire protection	11/4/2017 9:13 PM
27	Help reduce drifting	11/3/2017 4:40 PM

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Q4 If you could make one change to the existing Whitney Road Corridor, what change would you make?

Answered 148 Skipped 89

		1
	Do nothing Nothing	12/14/2017 12:12 PM
	Attenditive Iradic Route Donathing Connect Storey (1st). Connect Four Miler Rd (2nd), pave Iron Mountain Rd, (3rd) - Leave Whitney alone and a make other connections first.	12/7/2017 10:36 AM
	Michael Traffic Reute Paving Iron Mountain, Or connecting Storey or Four Mile	11/30/2017 4:26 PM
	Widen - Shidr Add Shoulders.	11/29/2017 12:32 PM
	Site Distance Blind corners at Whilney and Elizabeth, Saykally and Whistler	11/22/2017 2-21 PM
	Illines in Street Limit Increase speed limit	11/22/2017 6:01 AM
	Omer Miscullaneous Continue it to campstool	11/22/2017 1:22 AM
	Additionally a rating Rouge 1'd like to have storey completed from college to Whitney	11/21/2017 9:44 PM
	Intersection Lighting Story Traffic Lighting and speed	11/21/2017 7:40 PM
	Other Miscellaneous None so far	11/21/2017 6:58 PM
	RAB at U.S. 30 Traffic Signat Delf Range Traffic Signat U.S. 30 Stop light at Whitney/DelRange or stop light/roundabout at hwy30/Whitney	11/21/2017 4:51 PM
	Widen - Shldr Widen road. Put in good shoulders	11/21/2017 4:28 PM
13	Widen - Shidt Widen - Travel Inness Improve/Widen Sector US30 to Dell Range	11/20/2017 11:52 AM
	Office Mescallumbia, Remove the "calming islands" at Hwy, 30 and Whitney Rd.	11/20/2017 7:09 AM
	Other Macellaneous Expand Hwy 30 to 4 Lanes past the Archer Tumoff.	11/19/2017 8:13 PM
	Deplicated Multi-user Path (Iconomics) Separated bike path to accommodate bike safety while maintaing higher speed fraffic.	11/19/2017 8:11 PM
17	Gener Milesplaneous Stick to the budget we voted for	11/19/2017 7:26 PM
	Office Miscellaneous Connect to Campstool	11/19/2017 1:53 PM
	Advocation Traffic Route Pave Iron Mountain	11/19/2017 8:34 AM
	Widen EB Dell Range Going west on Dell Range, at the intersection of Dell Range and Whitney, there should be a left turning lane.	11/19/2017 5:26 AM
	Order-Mandianous (Widen-Trivellands) (Widen-Tem Lank) Extend the lurn lane going west from Whitney onto Hwy 30. That new greenway crossing thing is awful and prevents good flow of traffic. Also, widen Whitney between Hwy 30 and Dell Range. That is a must.	11/18/2017 10:12 AM
	Minimus Trail Routh Pave iron mountain and bring 4 mile or story blvd through	11/17/2017 5:50 AM
	Intersection Lightning Lightning	11/16/2017 10:31 PM
	Other - Miscellaneous Beautification	11/16/2017 8:39 PM
	Traffic Signal Dell Rongo Traffic Signal U.S. 30 Lights on both high way 30 and Pershing	11/16/2017 2:06 PM
	Traine Signal Dell Roago Traine Signal U.S. 30 Widon - Stock Widon - Turn Lian Add lights and light it up walt. Also add a stop light a bollove may help too . It's a dangerous intersection two seen cars not even stop just rum right through Widen it also and make it a bigger intersection	11/16/2017 12:36 PM
	Widon - Stilds widen the roadway to add shoulders.	11/16/2017 8:53 AM
	Traffo Signal U.S. 30 Widen - Turn Land Stoplight at Lincoln way and wider turning lane on dell range	11/16/2017 8:49 AM
20	Indian Court Middle contides (charildons) to conserve about	And the Participant of the Parti

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Road Corridor Study Comment Sheet	

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	Traffic Signat Ded Range Traffic Signat U.S. 30 Stop light at Whitney and Dell Range and Hwy 40	11/15/2017 10:01 PM
	Some traffice frontie Signal U.S. 30 Put a light at Whitney and 30, Slow the traffic on 30 until past saddle ridge.	11/15/2017 9:31 PM
	Alternative Traffic Route Connect Storey Blvd. to College to help relieve the traffic from del range	11/15/2017 8:50 PM
33	Avainative Irailo Revial I would connect Storey Blvd to College Dr saving time for emergency responders and laking considerable travel load off of the section of Whitney Rd between Del Range and Hwy 30.	11/15/2017 8:49 PM
	Allermative Traffic Route More west to east connections.	11/15/2017 8:18 PM
35	Do nothing Nothing	11/15/2017 7:47 PM
36	Do nothing leave it alone, stupid drivers are everywhere	11/15/2017 7:x1 PM
37	Assemble of the Paye Iron Mountain Rd from Whitney Rd West	11/15/2017 6:54 PM
80	Other - Miscellaneous Join Torrington hwy	11/15/2017 5:07 PM
33	Add Sidewalk, Dadicated Multi-uso Path Widen - Turn Land Sidewalks or bike path, Turn lanes north of 30,	11/15/2017 3:41 PM
40	Orner - Mecularicous Need to view the plan,	11/15/2017 3:40 PM
41	Attentioned France Aconnection or two between College Drive and Whitney,	11/15/2017 1:11 PM
42	Traffic Signal U.S. 30 Stoplight at Whitney and Hwy 30	11/15/2017 1:10 PM
43	Add Sidewalk for people to walk on	11/15/2017 12:56 PM
44	Do nothing None	11/15/2017 10:02 AM
45	Alternative Traffic Route Extend over the railroad to Campstool Rd.	11/15/2017 8:20 AM
46	Attendance India Special India Secretion Wides Special Variation Wides the shoulder and paint while lines on edgest increase speed limit! Have almost been hit on my bloycle numerous times. Peve fron mountain road in crease the speed limit! Oil field traffic is a hazard doing 25 mph!	11/14/2017 9:14 PM
47	Annuary Traffe Rate. 1st thing would be to pave from Mountain Road to connect Whitney to a paved road that allows travel to the West at the North end that is paved.	11/14/2017 8:17 PM
	Search The intersection at Whitney and Del Range can be dangerous with high speeds,	11/14/2017 8:07 PM
	Abarmative frating Route Dedicated Matteure Patri Add trail for walkers and connect iron mountain with paved road	11/14/2017 7:22 PM
	Desircted Mall-use Path. A shoulder for bicyclists and runners, Or a path along the road for them would be even betterf	11/14/2017 6:57 PM
	Dedicated Milli-use Path Widen. Shor Non-motor Widen the road and adding a multi use path.	11/14/2017 6:35 PM
	Augustalive Traffic Route Storey to College	11/14/2017 5:16 PM
	Widen - Shidr Widen - Travellane(n) Widen - Turn Lane Make the road wider	11/14/2017 5:16 PM
	Traffic Signal Dell Ranne, Stop light at Whitney and Dell range,	11/14/2017 12:10 PM
	Milgate anow onling! Eliminate drifting snow	11/14/2017 11:08 AM
	Train Signature (Whitney and Del Range) There needs to be a stoplight at the intersection of Whitney and Del Range	11/14/2017 11:01 AM
	Widon - Tum Lane Merging turning lanes	11/14/2017 10:44 AM
28	RAB at Dell Range Stoplights or traffic circles	11/14/2017 10:33 AM
59	Aremore Traffic Route Make Whitney four lane from Iron Mountain Road to I-80,	11/14/2017 9:57 AM
09	Safay Widan - Turn Lane, Whitney road currently has more traffic than it can safely manage. As more people move into out neighborhood we need to have better intersections, wider lanes with turn lanes in high turning areas. Thank you	11/14/2017 9:56 AM
	Sometime Slow traffic	11/14/2017 9:42 AM
	In contrast of the speed limit 50 mph	11/14/2017 9:37 AM

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Whitney Road Corridor Study Comment Sheet

And make Traffic Route. A road connecting to storey blvd.	11/14/2017 9.22 AM
Intersection Liptung Traffic Signal Dell Range Widen EB Dell Range Traffic light, food lights at Whitney and Delirange, Plus more than one lane eastbound on DELLRANGE PAST RIDGE	11/14/2017 9:05 AM
Other - Miscellaneous Traffic flow at both dell range and hwy 30 intersections	11/14/2017 8:47 AM
Widen Shar Non-moon Space for walkers, bicycles and runners.	11/14/2017 8:25 AM
Widen - Shor Non-motor Wider shoulders or a bike/walking lane	11/14/2017 8:13 AM
Mitigate steep hill Steep hill in bad weather	11/14/2017 8:13 AM
Intersection Equiting. Light at the intersection of Whitney and DelRange, It is hard to see on the dark.	11/13/2017 7:43 PM
Sing and a state of the state o	11/13/2017 7:14 PM
Tradic Signal Del Rainge Traffic Signal U.S. 30 StopJights at Whitney / Del Range and Whitney / Hwy 30.	11/13/2017 6:28 PM
Traffic Signal U.S. 30 Traffic light at Whitney and Hwy 30. This area can be very busy and other drivers become impallent and take risks by crossing across HWY 30 possibly too soon. Putting themselves and others at risk.	11/13/2017 6:24 PM
RAB at Dell Range Traffic Signat U.S. 20 Round about ar Whitney and Dell Range. Stop light at Whitney and highway 30. We live in Saddle Ridge and those intersections are very scarry. As far as Whitney north of Dell Range, road needs to be wider as I am a user to get to 425 north.	11/13/2017 6:15 PM
Glove Fortis Widon Shid Non-motor Widon the road to "safely" Accommodate homeowners to be able to walkinde bikes along "Residential" planned plates. Speed limit adjusted for walking & bike palls,	11/13/2017 3:46 PM
Widen - Shift Non-motor Widen It and greenway expansion	11/13/2017 10:02 AM
Remove applied like to see the pavement removed and have gravel replace it.	11/13/2017 8:27 AM
Widon Shide Widon Travellands) Wider roadway with 8 foot shoulders	11/13/2017 8:22 AM
Traffic Signal Dell Range Traffic Signal U.S. 30 Stop lights at Dell Range and Hwy 30 intersections.	11/13/2017 5:17 AM
Widen Travel lane(s) Add more lanes.	11/13/2017 4:20 AM
Donathing Militaries wow driften I have no issues with the road, My only problem is when it snows. The road is extremely dangerous,	11/13/2017 1:18 AM
Traffic Signal Bell Range Light at Whitney and Del Range	11/12/2017 10:01 PM
Salety Salety	11/12/2017 7:51 PM
Intersection Lighting. Street lights at intersections, way too much traffic to have it not lit at night	11/12/2017 7:38 PM
Intersection Lighting Lighting at the intersection of Whitney and Dell Range	11/12/2017 3:37 PM
Traffic Sanal Dell Rango Traffic Sanal U.S. 30 Traffic lights ?? at Whitney and hwy 30	11/12/2017 11:25 AM
Safeyy Create a solution for the stop sign. To stop sigb at both dell range and highway 30 are dangerous and a better and safer solution needs created, Whether is a stop light or redirecting the flow of traffic something needs done to avoid accidents and loss of life,	11/12/2017 7:08 AM
Miligate steep hill The hill	11/11/2017 10:10 PM
Other Miscellandous Traffic flew not stop and go.	11/11/2017 7:39 PM
RAB at Dell Range Traffic Signal U.S. 39 Widon - Shor Non-motor Place a round-about at Whiney & Del Range, and place a stop light at Whitney and 30.	11/11/2017 7,38 PM
Atternative Traffic Route, Widening whitney gor bicycle lanes, storey connection, 4 mile connection, and paving iron mountain.	11/11/2017 7:28 PM
Wigen - Shldr Wigen - Travel lane(s) Making it wider	11/11/2017 6:50 PM
Widen - Turn langs wides road possible with a center turn lane for residential streets, right turn lane for dell range, bike lane and sidewalk	11/10/2017 5:33 PM
Mingrate systemething Mingrate steep fill Take out the steep decline to Dell Range. This section	11/10/2017 3:11 PM

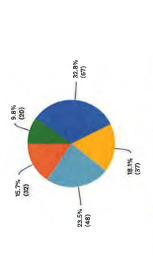
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	Others Mitedilianous Rove the calming island on Whitney and hey 30.	11/10/2017 12:16 PM
	Widen Stidt Normand Widen Travel Innel Additional lanes and sidewalks for safety of walkers, runners and bicyclists, Crossing highway 30 can be difficult and dangerous as well	11/10/2017 11:16 AM
	Do nothing The narrow readway with no shoulders	11/10/2017 9:28 AM
	Mentalive Traffic Route 1. Complete connection with Storey Blvd 1a. Widen the road for safety.	11/10/2017 8:06 AM
	Widen - Shar Non-motor Widen the road for walkers and bikers	11/10/2017 6:47 AM
	RAB at Dell Range Triffic Signit Dell Runge Traffic Signat U.S. 30 Something needs to be done at the intersections of dell range and hwy 30. Roundabouts? Stop lights?	11/10/2017 6:11 AM
	Widen - Turn Lune Widening by adding turn lanes and shoulders.	11/9/2017 9:03 PM
	Do nothing Nothing	11/9/2017 7:53 PM
	Traffic Signal U.S. 30 Stop light or another alternative for crossing at Whitney and 30	11/9/2017 6.55 PM
	Salest A form of traffic control at Whitney and Dell Range. Road improvement on Whitney between Dell Range and hwy 30	11/9/2017 6:30 PM
	Traffic Stratus 30 Adding a light at the intersection of US 30 and Whitney	11/9/2017 5:48 PM
	Mitigate steep hill Blind spols and steep grades	11/9/2017 3:50 PM
	Widen - Shidr [Widen - Travel lane(S)] Width	11/9/2017 3:47 PM
	Widen Shidr Widen Turn Lane Widening Whitney between 30 & Del Range	11/9/2017 3:46 PM
	Widon - Shdr Northhoter Safe pedestrian paths	11/9/2017 3:44 PM
	Traffic Signal Dell Range Traffic Signal U.S. 30 Red/Green lights	11/9/2017 3:42 PM
	(Miscato and defined Safety) Improve intersections Del Range Hwy 30. Put wind breaks either snow fence or free planting son west side for drift control.	11/9/2017 3:20 PM
	Traffic Signal Doll Rungo Lighting & traffic control (Stop Light) Whitney & Dell Range	11/9/2017 3:16 PM
	Widen Shidt Midon Travellanets) make it wider	11/9/2017 3:11 PM
	Attenuative Traffic Resets easi?West connecting roads to North end of Whitney	11/9/2017 3:09 PM
	Safety Widen Roadway Inter Section safety	11/9/2017 3:07 PM
	Widen Shidt Migen Travellangs) Widen the road and when doing so make sure the road does not crown!!	11/9/2017 3:05 PM
	Widen Shor Non-motor (Widen - Turn Lane) Bike shoulder three lanes between Del Range & Pershing	11/9/2017 3:03 PM
	Do nothing stop it from being changed	11/9/2017 2:56 PM
	Altanusive Trans Rodus Prioritize connecting Storey Blvd first. This will reduce Whitney traffic and Del Range congestion	11/9/2017 2:53 PM
	(Inceraction Lighters) Widen - Turn Lane Put overhead lighting on Whitney & Del Range, mark it better, turn lane on Del Range	11/9/2017 2:48 PM
	Widon Stutr Non-motor Widen and provide protection for PEDS/Bicycles	11/9/2017 2:30 PM
	Traffic Signal Dell Range Traffic Signal U.S. 39 you need traffic lights @Whitney & Del Range & Whitney & Hwy 30	11/9/2017 2:28 PM
	Widon - Turn Lane Make turn lane @Del Range & Whitney headed south	11/9/2017 2:25 PM
	Traffic Signal Dell Runge Traffic Signal U.S. 30 Traffic Lights on Whitney & Del Range & Whitney & 30	11/9/2017 2:23 PM
	(Information Lighting) Desperately need street lights @ Whitney/Del Range it's too dark, hard to see turn lane @ night	11/9/2017 2:19 PM
	Traffic Signal Poll Range (No Round Abouts!!!) Stop light @ Whiteny & Del Range	11/9/2017 2:16 PM
	Avaing to happen. Whitney is a fatality waiting the Mountain Intersection at 4 mile & Whitney is a fatality waiting to happen.	11/9/2017 2:09 PM
	Traffic Signal Boll Range Traffic Signal U.S. 30 Stop Light® DelRange & Whitney plus Hwy 30& Whitney speed burnos to slow down speeders	11/9/2017 2:01 PM

SurveyMonkey 11/9/2017 12:54 PM 11/9/2017 11:52 AM 11/9/2017 11:35 AM 11/9/2017 11:24 AM 11/8/2017 11:44 AM 11/9/2017 12:03 PM 11/8/2017 10:15 AM 11/9/2017 12:49 PM 11/5/2017 8:18 AM 11/9/2017 1:53 PM 11/9/2017 9:46 AM 11/9/2017 9:19 AM 11/9/2017 8:46 AM 11/9/2017 8:08 AM 11/8/2017 6:35 PM 11/8/2017 6:35 PM 11/7/2017 6:48 AM 11/4/2017 9:44 PM 11/4/2017 9:13 PM 11/4/2017 5:27 PM 11/3/2017 4:40 PM Dedicated Mutherse Polit Miteate and without India Stand Dell Randold Have more than one suggested changed, some may be constraints. Utilize "Living Snow Fences" to help mitgate high risk areas for snow accumulation and wind. That may ental working with homeowness and providing an instructive program for planding. Occaseration Destind may be a good resource, Look into wider wider shoulders or opportunities with a Greenway spur parallel to the road. The road has significant use by walkers, loggers and takers. A greenway spur parallel to the road insert and milegal tru/ANT a calvaise. Orisistance no engass will fixly milegale some of the tarding occurs once its finished. A stop light at Whitney and Del Range would significantly reduce the problems with traffic. This may be my 41 suggested change. There are some bind spot points along the road that are high probability for accidents, especially arither training should include the leaving of some of these areas curring in eaxt major road project along the conflor. ic Stand Dell Runge Traffic Stand U.S. 30 Add lights at the intersections and lower speed at both HWY 30/Whitney intersection and Del Range/Whitney, NO ROUNDABOUT! Sounds Assistance in a reduce traffic on Del Range and College to Whitney to reduce traffic on Del Range and traffic congestion at Del Range and College intersection. Connection between Whitney and Storey to reduce Iraffic concentrating Miden Shar Non-maler Widen the road (especially between Dell Range and US 30) and add a Miden Shdr Non-motor wider lanes and room for pedestrians/cyclists, RAB at Dell Range Stor Timine Tradic Signal Dell Range Tradic Signal U.S. 30. Slow the speed down to 40 mph and 30 at blind curves. Improve pavement quality. Add a traffic light or fronto Sonal Dell Range (franto Storal U.S. 30, Stop lights at Dell Range and Highway 30, heese are big safety issues for the homeowners in this area. Mistrate stoop fill. Cutting the 14/15% grade at peak of hill to Del Range down to 5% grade. Widon Shar Non-motor. Bicycle or walking path to encourage and accommodate physical Signal Dall Range Wider, take out the dip. Traffic light at Dell Range and Whitney Storey should be connected between Whitney and College. Traffic Route Pave Storey all the way from College to Christianson side shoulder side wide shoulder Missellangous Change approach into Whitney farmstead Extend 4 Mile Road not Summit Drive Traffic Signal Dell Range Traffic Signal U.S. 30 Traffic light round about at the Highway 30 and Whitney intersection. Beckle\Storey to College Slow vehicles & make travel easier Shidr (Widen - Travellane(s) Widen mol U.S. 30 Stoplight at US30. Whitney Road Corridor Study Comment Sheet if the Del Range/Whitney intersection. disconnected bike/pedestrian path. 128 130 132 133 135 138 140 141 143 145 146 147 148 129 131 134 137 144

SurveyMonkey

Q5 Please rate the Conceptual Rural 2 Lane Roadway Typical Section for Whitney Road shown above

Answered: 204 Skipped: 33



	Definite!	y Like	Like No	Opinion	Do Not Like	🛮 Definitely Like 🛮 Like 📄 No Opinion 📗 Do Not Like 📑 Definitely Do Not Like	Not Like		
	DEFINITELY LIKE	LIKE	NO	DO NOT	DEFINITE	DEFINITELY DO NOT LIKE	TOTAL	WEIGHTED	
or ibel)	9.8% 20	32.8%	18,1%	23.5%	.e.m	15.7%	204		2.98
	ADDITIONAL CC	DMMENT	ADDITIONAL COMMENTS OR SUGGESTIONS?	ONS?				DATE	
	Would like 8' shoulders	olders					_	11/29/2017 12:33 PM	PM

ADDITIONAL COMMENTS OR SUGGESTIONS? Would like 8 shoulders Not enough shoulder: Inke the 8 shoulders, No accommodations for pedestrians is a major issue. Lots of dich Too narrow, not much different than what we have now, Widen each travel lane to 14 ft., Include center turn lanes. Add a few feet to the shoulder. Needs to be wider. This would account for increased safely for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafely passing at high speeds, Shoulders may alleviate this problem. It is a waste of more typing to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Need turning lane on dell range east to whitney south Connect Storey BNd., to college to help relieve traffic on del range It ranks some of the traffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.			
Would like the 6's shoulders Not enough shoulder Lots of dich Too narrow, not much different than what we have now, Widen each travel lane to 14 ft, include center turn lanes. Add a lew feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Naed turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range It rangly seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the fraffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		ADDITIONAL COMMENTS OR SUGGESTIONS?	DAIE
Not enough shoulder Lots of disch Too narrow, not much different than what we have now, Widen each travel lane to 14 ft, Include center turn lanes. Add a lew feet to the shoulder. Needs to be wider. This would account for increased safety for padestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Naed turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range. It rayel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Would like 8:shoulders	11/29/2017 12:33 PM
Lois of dich Too narrow, not much different than what we have now. Widen each travel ane to 14 ft, include center turn lanes. Add a few feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural aft the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Need turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range. It rangly seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the fraffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Not enough shoulder	11/21/2017 8:57 PM
Lots of dich Too narrow, not much different than what we have now, Widen each travel lane to 14 ft, Include center turn lanes. Add a few feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Need turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range it really seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the fraffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Like the 6' shoulders, No accommodations for pedestrians is a major issue.	11/21/2017 7:45 PM
Too narrow, not much different than what we have now, Widen each travel lane to 14 ft, include center turn lanes. Add a few feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions Naed turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range it really seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the fraffic, and not so much to modify an adequate existing roadway. 14 fravel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Lats of ditch	11/21/2017 6:59 PM
Widen each travel lane to 14 ft, include center turn lanes. Add a few feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions Need turning lane on dell range east to whitney south Connect Storay Blvd, to college to help relieve traffic on del range it results seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the traffic, and not so much to modify an adequate existing roadway. 14 travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.	, in	Too narrow, not much different than what we have now.	11/21/2017 4:52 PM
Add a few feet to the shoulder. Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in VIV and sometimes if you want to drive you have to know how to drive in those conditions. Need turning hare on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range. It revely seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the traffic, and not so much to modify an adequate existing roadway. If travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Widen each travel lane to 14 ft, Include center turn lanes.	11/20/2017 7:10 AM
Needs to be wider. This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motodists unsafety passing at high speeds. Shoulders may alleviate this problem. It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in VIV and sometimes if you want to drive you have to know how to drive in those conditions Need turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range It sails seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the traffic, and not so much to modify an adequate existing roadway. It travel lanes Earthwork should come off the shoulder and reduce drop off 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Add a few feet to the shoulder.	11/19/2017 8:13 PM
This would account for increased safety for pedestrian usage, However, the total length of the road way and number of turn offs, often results in motorists unsafety passing at high speeds. Shoulders may alleviate the problem. It is a waste of morey trying to please people who think rural sib the same as urban, it blows and it snows in VIY and sometimes if you want to drive you have to know how to drive in those conditions Need turning lane on dell range east to whitney south Connect Storey BNd. to college to help relieve traffic on del range It sails seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the traffic, and not so much to modify an adequate existing roadway. It travel lanes Earthwork should come off the shoulder and reduce drop off 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		Needs to be wider.	11/19/2017 1:53 PM
It is a waste of money trying to please people who think rural sib the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions. Need turning lane on dell range east to whitney south Connect Storey Blvd, to college to help relieve traffic on del range. It really seems to make more sense to me to make the connection between Whitney and College threeby relieving some of the fraffic, and not so much to modify an adequate existing roadway. 14' travel tares Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.		This would account for increased safety for pedestrian usage, However, the total length of the road way and number of tum offs, often results in motorists unsafely passing at high speeds, Shoulders may alleviate this problem	11/16/2017 8:55 AM
Need furning lane on dell range east to whitney south Connect Storay BMd, to college to help relieve traffic on del range. It really seems to make more sense to me to make the connection between Whitney and College thereby relieving some of the traffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.	0	It is a waste of money trying to please people who think rural s/b the same as urban, it blows and it snows in WY and sometimes if you want to drive you have to know how to drive in those conditions	11/16/2017 8:52 AM
Connect Storey BMd. to college to help relieve traffic on del range It really seems to make more sense to me to make the connection between Whitney and College thereby relieving some of the Iraffic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have,		Need turning lane on dell range east to whitney south	11/15/2017 9:33 PM
It really seems to make more sense to me to make the connection between Whitney and College thereby relieving some of the Irafflic, and not so much to modify an adequate existing roadway. 14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have,	2	Connect Storey Blvd. to college to help relieve traffic on del range	11/15/2017 9:02 PM
14' travel lanes Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become corgested, Looks like what we have.	m	It really seems to make more sense to me to make the connection between Whitney and College thereby relieving some of the fraffic, and not so much to modify an adequate existing roadway	11/15/2017 8:54 PM
Earthwork should come off the shoulder and reduce drop off. 4 lanes for future expansion, 2 lanes will quickly become congested. Looks like what we have.	4	14' travel lanes	11/15/2017 8:20 PM
4 lanes for future expansion, 2 lanes will quickly become congested, Looks like what we have,	22	Earthwork should come off the shoulder and reduce drop off	11/15/2017 3:42 PM
	9	4 lanes for future expansion. 2 lanes will quickly become congested	11/15/2017 3:09 PM
	2	Looks like what we have.	11/15/2017 1:11 PM

Whitney Road Corridor Study Comment Sheet

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SurveyMonkey

Bicycle lanes/shoulders PLEASE!!	11/14/2017 9:15 PM
This is the current design and is not a viable option.	11/14/2017 6:36 PM
Add more shoulder for vehicle pulloff I case of breakdown.	11/14/2017 5:38 PM
Needs pedestrian or bike allowance	11/14/2017 3:58 PM
A bike/podestrian lane might be helpful because I know there are a lot of pedestrians and bikers (or skateboarders, scoolers, etc.) We are living in a world where bike lanes are becoming more and more of a necessity	11/14/2017 11:04 AM
Need four lanes	11/14/2017 9:58 AM
Appears to be like existing road	11/14/2017 8:14 AM
Isn't this what we currently have!?	11/14/2017 7:23 AM

Heel as though this is the same amount of space for driving as is already available. This needs to be expanded,	11/13/2017 6:26 PM
Presently have & NOT SAFE!	11/13/2017 3:47 PM
8 foot shoulder to accommodate bicycle riders	11/13/2017 8:24 AM
Should add bike lanes.	11/13/2017 5:18 AM
With the addition of the new lots, we need more lanes	11/13/2017 4:21 AM
I wish the lanes were wider.	11/13/2017 1:21 AM
Prefer wider	11/12/2017 3:38 PM
Does not appear to allow any growth accommodation.	11/11/2017 7:40 PIM
No need for 12 ditches.	11/10/2017 12:17 PM
Not sure I understand how this is different than now?	11/10/2017 11:17 AM
People like to walk, run, or bike on Whitney Road. It continues to be dangerous unless the road is widened,	11/10/2017 B:07 AM
Looks like what we have	11/10/2017 6:12 AM
like the phase ability of this design	11/9/2017 3:44 PM
I would like more room in the center. Rual roads are notoriously dangerous in the dark and prone to driffing. With new housing planned on Whitney, traffic is bound to increase. I expect to see a new school in coming years	11/9/2017 3:13 PM
	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

27 28 29 30 31 33 33 34 35

	וובא פרוניסו ווו רסוויות לפערפ	
40	Existing been that way since the sixtys	11/9/2017 3:04 PM
41	Where is option to have 2-traffic lanes, turn lane, bike /shoulder/with no sidewalks	11/9/2017 2:53 PM
42	Do Not want to loose the whole front of our property! What about the oil & gas lines in front of property?	11/9/2017 2:42 PM
43	Pipeline is running in front of our house - how is this going to handled	11/8/2017 2:34 PM

	new School in coming years	
40	Existing been that way since the sixtys	11/9/2017 3:04 PM
41	Where is option to have 2-traffic lanes, turn lane, bike /shoulder/with no sidewalks	11/9/2017 2:53 PM
42	Do Not want to loose the whole front of our property! What about the oil & gas lines in front of property?	11/9/2017 2:42 PM
43	Pipeline is running in front of our house - how is this going to handled.	11/9/2017 2:34 PM
44	This is what we have now	11382017 2:31 PM
15	Shift roadway center line east and add sidewalk on west side.	11/9/2017 2:16 PM
46	Too many pedestrians & bikes on the road	11/8/2017 2:05 PM
47	No disconnected bike path, I ride almost daily on the shoulder from D.R to Iron Mountain	11/9/2017 12,04 PM
4B	lanes need more separation - cars speed down that road	11/9/2017 11:53 AM
49	might be nice to have it a fittle wider	11/9/2017 11:33 AM
20	Too narrow. Grew up off Horse Creek. The widening of that road made sence with a center lane	11/9/2017 11:26 AM

46	Too many pedestrians & bikes on the road	11/8/2017 2:05 PI
47	No disconnected bike path, I ride almost daily on the shoulder from D.R to fron Mountain	11/8/2017 12:04 F
48	lanes need more separation - cars speed down that road	11/9/2017 11:53 /
49	might be nice to have it a fittle wider	11/8/2017 11:33
20	Too narrow. Grew up off Horse Creek. The widening of that road made sence with a center lane for passing/turning	11/9/2017 11:26

51	There is a need for tuming lanes onto roads off of Whitney	11/9/2017 10:38 AM
52	For safety reasons, for walkers, bikers and runners. I would like to see the shoulder length extended on Whitney at a minimum of 10.	11/9/2017 8:49 AM
53	no room for bikes, pedestrians, dog walking or always having to slow down for vehicles turning down a road bersuise most is no bassino zone so we cannot no around.	11/9/2017 8:10 AM

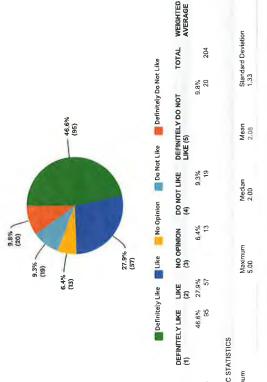
		ts use	
Whitney Road Corridor Study Comment Sheet	Wider with turn lanes.	Design should ensure that shoulder is safe for cyclists use	Add wider shoulders and bike lane
Whitney Ro	24	55	56

Surveyintolikey	11/8/2017 6:35 PM	11/6/2017 8:26 AM	11/4/2017 9:13 PM
	11/8	11/6	11/4

SurveyMonkey

Q6 Please rate the Conceptual Rural 3 Lane Roadway Typical Section for Whitney Road shown above.

Answered: 204 Skipped: 33



		DEFINITELY LIKE (1)	(2)	NO OPINION (3)	DO NOT LIKE (4)	DEFINITELY DO NOT LIKE (5)	TOTAL	WEIGHTED AVERAGE	
	(no label)	46.6% 95	27.9%	6.4%	93%	9.8%	3% 20 204		3 92
	BASIC S	BASIC STATISTICS							
	Minimum 1.00			Maximum 5,00	Median 2 00	Mean 2,08	Standard Deviation	iation	
,-	雜	ANY ADDITIONAL COMMENTS?	AL COMMI	ENTS?			Ď	DATE	
	_	more lanes for auto movement	uto movem	ent			11	11/30/2017 11:58 AM	
	2	Again, 8' shoulde	er, could tal	ke center tum to 1	1'8' shoulder wou	Again, 8' shoulder, could take center turn to 11. 8' shoulder would help give more buffer to bikes.		11/29/2017 1:05 PM	
	65	Accommodating	multiple mo	odes of travel wou	Accommodating multiple modes of travel would be a wonderful improvement!!!!	mprovement!!!!	11	11/21/2017 7:45 PM	
	4	Again lots of ditch and landscape buffer	h and land:	scape buffer			1.1	11/21/2017 7:01 PM	
	vo.	A tum lane will be seen a lot of peol going to be more families live out h	e very ben ple passinç dangerou: iere and wa	eficial in the sectlo g others on the left s with the new ado alking/biking on W	A turn lane will be very beneficial in the section with the new neigh seen a lot of people passing others on the left when they slow dow going to be more denjectors with the new addition on the west slid annies to be on the and walkingbiking on Whitney is adaptedual.	A turn lane will be very beneficial in the section with the new neighborhood west of Whitney, I've seems at lot of people persing others on the left when they slow drown to turn into their street. This is egoing to be more dengerious with the new addition on the west side. A bike lane is needed. Lots of families the out there and walkingthixing on Whitney is dangerous.		11/21/2017 4:55 PM	
	49	Sidewalk OK Remove the bike lanes.	move the l	bike lanes.			1.0	11/20/2017 7:12 AM	
	1	Seems safer					1.1	11/15/2017 8:40 PM	
	60	Waste of money.	that the co	ounly and state co	Waste of money, that the county and state could better use else where	where	11	11/16/2017 8:S3 AM	
	on.	Connect Storey E	Slvd to col	lege to help relieve	Connect Storey Blvd to college to help relieve traffic from del range	əɓu	4.0	11/15/2017 9:03 PM	
	10	This seems like it mention the cost	t will make to acquire	This seems like it will make an incredible imps mention the cost to acquire the land needed	act on the existing I	This seems like it will make an incredible impact on the existing homeowners in the area not to mention the cost to acquire the land needed.		11/15/2017 8:56 PM	
	+	Rural auto traffic should be the priority	should be	the priority			11	11/15/2017 8:22 PM	
	12	Like the bike lane	e, but stree	it is too wide. Only	r need turn lane at r	Like the bike lane, but street is too wide. Only need turn lane at major intersections.	11	1/15/2017 3:43 PM	
	13	Takes up a lot of area.	area.				44	11/15/2017:3:41 PM	

41	If looking for a place to install Bike route and running trail than ok, But I struggle with this funding, Just give a shoulder on the road for them to use.	11/14/2017 8:20 PM
15	Bike allocation should be separate from vehicle traffic	11/14/2017 3:59 PM
16	Lilke this design in reference to my comment on the traditional design	11/14/2017 11:06 AM
17	Need four lanes	11/14/2017 9:58 AM
18	The added surface area will be much safer for those of us that enjoy biking and walking,	11/14/2017 9:58 AM
19	Allows room for cars, pedestrians and bikes	11/14/2017 8:15 AM
20	This looks as though it will accommodate the increase in traffic (for the present situation and for the future considering the continued increases in building in the area) and make the space safer for those pedestrians and bicyclists, as well. This looks like it is the best option	11/13/2017 6:28 PM
21	Would somewhat accommodate both pedestrians/bikers and vehicles, do feel that bikes would ride on sidewalks-especially family bikers w/younger children.	11/13/2017 3:48 PM
22	Travel lane could be a little bit wider	11/13/2017 1:23 AM
23	I do like the idea of a turn lane to help the flow of traffic.	11/12/2017 7:13 AM
24	Better but I'd rather see wider sidewalks to accommodate bicycles.	11/11/2017 7:41 PM
25	YES! YES! YES! YES!	11/11/2017 6:53 PM
26	A lum lane would help with some of the slow moving farm equipment that goes down this road. I	11/10/2017 3:12 PM
27	Seems a little safer for non vehicle users	11/10/2017 11:17 AM
28	This option is better than Rural 2	11/10/2017 8:08 AM
29	Love this option	11/9/2017 3:13 PM
30	Allows for growth in area	11/9/2017 3:04 PM
31	No need for bicycle lanes because of laking more property away from residents still having property and bicycle lanes, do not have enough bicyclists to have bicycle lanes, in this area	11/9/2017 3:00 PM
32	Do Not want to loase the whole front of our property! What about the oil δ gas lines in front of property?	11/9/2017 2:42 PM
33	Cutting into our property too-	11/9/2017 2:35 PM
34	Still Rural but provides protection for PEDS/Bicycles and more room for vehicles	11/9/2017 2:31 PM
35	Sidewalk would not be necessary on west (rural) side of road, Widen only where necessary for	11/9/2017 2:16 PM

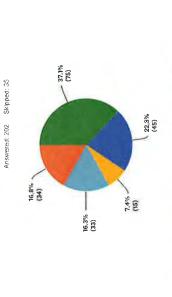
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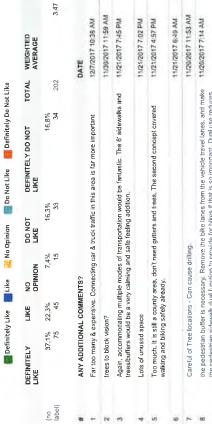
Whitney Road Corridor Study Comment Sheet

SurveyMonkey

SurveyMonkey

Q7 Please rate the Conceptual Urban 3 lane Roadway Typical Section for Whitney Road shown above.





11/9/2017 12:49 PM 11/9/2017 2:10 PM 11/9/2017 11:26 AM

11/9/2017 9:22 AM

11/9/2017 8:55 AM

Whitney doesn't need a sidowalk on both sides. I don't see a turn lane as a significant need whitney doesn't need to those the side of the training and the side of the side o

40

I really don't think this is necessary for the bike lane and sidewalk. If someone wants to walk they can go across Highway 20 and walk on the Greenway. There is too much traffic to be safe for pedestrian traffic.

Why Cant "runners" run on the side roads east of Whitney?

no need for sidewalks

38 38 39

7	Careful of Tree locations - Can cause drilling	11/20/2017 11:53 AM
w	the pedestrian buffer is necessary. Remove the bike lanes from the vehicle travel lanes, and make the pedestrian sidewalk dust function to provide for bikes if that is so important. Dust use reduces cost.	11/20/2017 7:14 AM
UN.	Do not need curb and gutter.	11/19/2017 8:12 PM
10	Those trees would cause drifting and waste water also regarding money see previous answer	11/16/2017 8:54 AM
+	But not necessary in rural environment.	11/16/2017 7:12 AM
12	Connect Storey Blvd. to college to help releve traffic from del range	11/15/2017 9:03 PM
13	Doesn't fit area,	11/15/2017 3:44 PM
14	Takes up too much area.	11/15/2017 3:42 PM
15	LOVE LOVE LOVE	11/15/2017 12:58 PM
16	Same as previous	11/14/2017 8:21 PM
17	Trees will cause drifting on the roadway	11/14/2017 5:31 PM

11/9/2017 8:14 AM

11/8/2017 6:35 PM

11/6/2017 8:27 AM

Having a center turn lane would add an additional element of safety, as would having a buffered sidewalk.

Sidewalks probably not needed at this time but while under construction grade for future

dewalks

£ 4 43

slant to side would be a hazard and snow drifts a problem.

18	Use right tum lanes instead	11/14/2017 4:00 PM
18	I don't think that a turn lane is necessary	11/14/2017 11:06 AM
20	Water issue will having landscaping, yes it looks nice but is it necessary in term of water used?	11/14/2017 10:46 AM
21	Need four lanes	11/14/2017 9:59 AM
22	To much for the type of road and traffic	11/14/2017 9:39 AM
23	Not conductive to a rural area.	11/14/2017 8:15 AM
24	Meets everyone's needs, as the Whitney Development takes place, and with the thought of another school built in this area - we must be proactive! School could be a North High School 7 that would mean more cara/more joggers - Track Season.	11/13/2017 3:50 PM
.52	No bike lane too much traffic	11/12/2017 10:03 PM
26	Why spend all that extra money for trees and buffer?	11/12/2017 7:53 PM
27	Too much. Not needed. Exta costs. If subdivisions want sidewalks or bike paths the homerwher's association can purchase.	11/12/2017 7:13 AM
28	Again would rather see wider sidewalks to accommodate pedestrians and bicycles.	11/11/2017 7:42 PM
29	Love the treesmaybe we do a living snowlence to help with the road in the winter	11/11/2017 8:54 PM
30	I'm not sure the sidewalk would be used a lot. We do have some runners in our neighborhood but not a lot.	11/10/2017 3:13 PM
31	Takes too much land and maintenance.	11/10/2017 12:18 PM
32	Trees are great, not a priority, compared to safety	11/10/2017 11:18 AM
33	Too much	11/10/2017 8:08 AM
34	I am concerned that trees too close to the road will block the view for people entering and exiting	11/10/2017 6:48 AM
325	Education could be an important plece, ie dangers of passing on a hill, jogging etc	11/9/2017 3:51 PM
36	Concerned about snow drifts across road	11/9/2017 3:47 PM
37	it is important to focus on the future growth	11/9/2017 3:47 PM
38	The trees are nice, but not necessary.	11/8/2017 3:14 PM
33	Don't think it needs to be this elabolate	11/9/2017 3:10 PM
40	Trees will obstruct view	11/9/2017 3:08 PM
14	over the top for a rural area	11/9/2017 3:04 PM
42	trees are great but VERY distract full and city does not keep them brimmed, they get in the way of line of sight for pedestrians and bioyolists.	11/9/2017 3:01 PM
53	Spending funds for pedestrian traffic seems like a waste of funds!!!!!!!	11/9/2017 2:55 PM
14	no need for sidewalk	11/9/2017 2:42 PM
12	Not appropriate for this area	11/9/2017 2:32 PW
46	Discourage use of Whitney so as to keep the rural appeal for those users that reside north of Del Range.	11/9/2017 2:27 PM
47	Trees are good for wind break & earth	11/9/2017 2:26 PM
48	No trees they will cause drifts	11/9/2017 2:14 PM
49	Trees are bad idea (drifting snow)	11/9/2017 2:10 PM
20	Curb and gutter is not needed on Whitney and disconnected access on one side is a less expensive option.	11/9/2017 12:06 PM
- 15	I live in the county and do not want to have sidewalks. If people on this comidor want this maybe they should move back to town to have these amenities.	11/9/2017 9:24 AM
25	Again,not sure a sidewalk is needed on both sides, Increase the sidewalk to a minimum of 10' return the shoulder to 6'. I'm not sure a tum lane is needed. However, maybe in the future it will be needed.	11/9/2017 8:55 AM
23		

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11/6/2017 8:28 AM

Wider bike lane/shoulder is the most favorable design to me, if this is feasible. My anly concern would be encouraging high speeds in the area.

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Whitney Road Corridor Study Comment Sheet

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Q8 Do you have any additional ideas, information, or other comments that you would like to provide at this time?

Answered: 79 Skipped: 158

26 27 28 29 33 38

33 32

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90

RESPONSES	
Connecting Storey to Summit would pull so much traffic from Del Range, it would be environmentally friendly as it would reduce miles for 100's if not 1,000s everyday, it would make Del Range safer by reducing many, many Vehicles, Please leave Whitney Rd, alone and make some connections in east Cheyerne	12/7/2017 10:40 AM
Need a light at Dell Range and the study should evaluate paving and connecting alternate routes for Whitney	11/30/2017 4:28 PM
what about the bottle neck this will cause in all areas - whilney, 30, Dell Range	11/30/2017 12:00 PM
I'd like storey to go from college drive to Whitney	11/21/2017 9:45 PM
Please review salety of Saykally and other intersections. The hills restrict vision of oncoming traffic when we pull out onto Withiney and people drive very fast, it is a disaster waiting to happen. I'm nervous for my kież to become teens driving on this unsafe intersection! I may be good to reduce speeds on Whitney to 40, Reduce speed on hwy 30 in this are too? If Storey bird will connect to Witney, make sure Whitney can safely handle that much more frefit being diverted north through our neglophorhoad. People other than this neighborhoad will use it and our traffic could be increased significantly. Thank you for the public survey and meeting at Dildine.	11/21/2017 5:03 PM
Roundabout on Whitney & Dell Range, Stoplight on Whitney & US 30	11/20/2017 11:53 AM
Do not put blike lanes next to vehicle traffic, Bicyclisis want to be treated like a car except when it comes to basic traffic laws.	11/20/2017 7:15 AM
Widen the road and build a greenway from Saddle Ridge to Iron Mountain Rd.	11/19/2017 B:13 PM
Stick to the budget we voted in November	11/19/2017 7:27 PM
None	11/19/2017 1:54 PM
Winter driving on this road is treacherous, There needs to be a flashing red light at the crossroads of Whitney and Dell Range	11/16/2017 10:36 PM
Definitely include trees in the plans.	11/16/2017 8:41 PM
Just lights to help slaw the racer track people down	11/16/2017 2:07 PM
None at this time Thank you	11/16/2017 7:12 AM
Need a turn lane on pershing east to taff south to accommodate traffic using pershing to get to saddle ridge and other, Especially when SR 2 is done, May need a light at Whitney and pershing at that time too,	11/15/2017 9:40 PM
Connect Storey Blvd, to college dr, to help relieve traffic from det range, I'm sure it would help service so many rural neighborhoods especially since then it would tie in all the way to Reese Rd	11/15/2017 9:05 PM
I also think it would make sense to look at paving the last two miles of fron Mountain Rd	11/15/2017 9:05 PM
really doesn't matter, they will do what they want	11/15/2017 7:43 PM
Protect bike lanes with offset. No roundabouts, they aren't designed well.	11/15/2017 3:48 PM
Expanding may be something to incorporate in future updates to the road.	11/15/2017 3:43 PM
Please pave Iron Mountain.	11/15/2017 1:12 PM
Fix and beautify existing before starting a new projectrealty?	11/15/2017 10:05 AM
Bicycle lanes!! PLEASE!!	11/14/2017 9:17 PM
Paving Iron Mountain Road is the best first move to make. Then tooking at adding shoulders to	11/14/2017 R-22 PM

40 41 41 43 44

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Whitney Road Corridor Study Comment Sheet

SurveyMonkey

Why all the straight lines, Straight lines are out, Curved adewalsts, bive lanes and roads to accommodate aestractically pleasing threes, landscape and other hardscapes is in, Why is Cheyenne so far behind on improving our ports of entry and islands, etc.	
Plan for multi-use alongside the road such as horses along with bicyclists and pedes(rians,	11/14/2017 6:37 PM
Pave Iron Mountain	11/14/2017 5:31 PM
Paving Iron Mountain needs to be done also to assist in traffic Ilow.	11/14/2017 2:03 PM
We need better access into town, Please PAVE IRON MOUNTAIN ROAD, - PLEASE PAVE 4 MILE RD THROUGH TO COLLEGE, Thank you in advance	11/14/2017 11:12 AM
If I could emphasize anything, it would be the necessity of a stoplight at Whitney and Del Range. It can be, and has been before, extremely dangerous as it is.	11/14/2017 11:07 AM
Getting across del range on whitney is very hard duming peak hours and can feel quite dangerous, I feel we need to add merging turning lanes onto del range and slow traffic through the intersection,	11/14/2017 10:48 AM
I know it takes time to make improvements. Please slow the speed of traffic on Del Range and Lincolnway, especially Lincolnway, it is very dangerous,	11/14/2017 10:38 AM
Need four lanes, if not possible the three lane option is good. Thank you for the opportunity to comment,	11/14/2017 10:00 AM
The road has turned into a speedway slow traffic down	11/14/2017 9:46 AM
Also address flooding north of 4 mile radius,	11/14/2017 9:40 AM
The intersection at Whitney and Dell Range needs addressed for safety issues.	11/14/2017 8:27 AM
Must provide other paved routes other than Whitney, e.g. Storey Blvd., Four Mile Rd, East Riding Club and/or Iron Mountain Rd.	11/14/2017 8:18 AM
I feel as though the expansion of the road in addition to a light at HWY 30 and Whitney make this intersection and road safer for our growing community.	11/13/2017 6:29 PM
From the Whitney Road Bike/Walk Paths I would like to see the Greenway continued to nu/winding between the Mandadiark properties back-yakes and Da Rhange, connecting by to near the Radio towers (crossing Del Range) to connect with Saddle Rodge Platte and their Greenbelt which parallels: Hwy30, Cheyenne has encouraged health, exercise, and well-being for Central and Western sides of Cheyenne - we need to extend to the East and this is a great opportunity to do soil.	11/13/2017 3:53 PM
Со амау.	11/13/2017 8:29 AM
Lower speed limit and install traffic lights	11/12/2017 10:04 PM
Cost	11/12/2017 7:54 PM
Lighting needs upgraded ASAP	11/12/2017 2:40 PM
I would support roundabouts that are correctly designed. A pathway that could eventually connect to the existing freeway would be amazing and so much safe for both pedestrians/bikers and for drivers. I've had many dose encounters. Taking the grade of the hill down a notch would be fantastic. Future proofing its so important.	11/1/2017 10:14 PM
Would rather see roads for cars/frucks and Greenway type constructs for pedestrians and bicycles.	11/11/2017 7:44 PM
I think any of the idess are great! The more buffer between car and pedestrian the better but if cost is too substantial anything would be an safer.	11/11/2017 7,33 PM
Build it big for all future possible growth, Do it right the first time!!!!	11/10/2017 5:34 PM
I think this road is too hilly and curvy, I'm not sure why it couldn't be straighter and leveled out a bit. It Also, 40-45 MPH is just too slow but it is better than when it started out at 30 MPH. The traffic has definitely increased over the last 10 or 11 years. The dip at Child's Draw needs work, It floods.	11/10/2017 3:17 PM
Widen as best you can, Sidewalks for pedestrians are so very important. Thank you for looking at this roadway	11/10/2017 11:18 AM
Thank you for asking for opinions!	11/10/2017 6:48 AM
The intersection at Whitney-Dell Range, and Whitney-HW/30 are terrible in the morning 7-7:30 and 5-5:30, I actually changed my work schedule to avoid the risk of an accident. The sooner	11/9/2017 9:14 PM

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mon Calmin	ביינים מוניים	
52	Leave it alone	11/9/2017 7:55 PM
53	Stop light or another atternative for crossing at Whitney and 30	11/9/2017 6:56 PM
54	Add a light at intersection of Whitney and Dell Range, another light at US 30 and Whitney, and another at at east Pershing and Whitney.	11/9/2017 6:22 PM
52	Lighting at Dell Range & Whitney is essential improved signage - street & stop Reduction in grade of the hill would improve winter safety immensely	11/9/2017 3:48 PM
56	yes to traffic circle at Whitney and Dell Range	11/9/2017 3:45 PM
22	Immediately need a light at the intersection of Del Range and Whitney Rd as it is so dark it is extremely difficult to see where the turn is from Del Range to Whitney and thus very dangerous, it is important to know now many stresse would filter onto Del Range and onto Whitney due to the development of the Whitney/Gysel land, I realize you will be addressing this problem but it certainly is a grave concern to those of us in Meadowlark Estatres.	11/9/2017 3:15 PM
58	Round about at Whitney and Del Range or at least a stop ligth	11/9/2017 3:12 PM
59	Red-light at US30 and Whitney Rd	11/9/2017 3:09 PM
09	Remove "New" calming islands south of HWY30, this turn lane was requested by residents and county planning when Saddle Ridge was developed, Bike path was planned to go across Whitney further south of HWY 30	11/9/2017 3:06 PM
61	Keep Whitney Rural	11/9/2017 2:56 PM
62	RT, Hand turn land on Del Range for cars (urning onto Whitney (Driving eastbound), "Put speed limits signs on US30, People pull out from Whitney and do 30 mph on Pershing	11/9/2017 2:49 PM
63	Simplify plans to save money. Put the orus of sidewalks and turning lanes on the developer not unlike by bowder House and the Point Consider placement of sidewalks on developers land. Use as little tax payer money as possible. Developer should not profit from taxpayers footing the bill for code compilance.	11/9/2017 2:38 PM
64	Would like to see a turn lane for south bound Whitney traffic to go west on Dell Range without waiting for people going further south on Whitney	11/9/2017 2:32 PM
92	see traffic lights suggestion previously	11/9/2017 2:29 PM
99	please extend a road from Whilney N to Storey, 4-mile, or Riding Club	11/9/2017 2:26 PM
29	Widen Whitney between Del Rang & Highway 30	11/9/2017 2:17 PM
69	Any addition of Storey thru to Whitney may alleviale too much traffic that has become an issue on Iron Mountain since Whitney intersects Iron Mountain there now.	11/9/2017 2:12 PM
69	No Round Abouts	11/9/2017 2:01 PM
20	Separated bike/pedestrian path way needed. Do not lower the existing speed.	11/9/2017 12:07 PM
71	For everyone east of Whitney using Beckle then would Beckle get paved or maintained more often?	11/9/2017 11:37 AM
72	I would strongly oppose a roundabout at high speed intersections. Not a good option,	11/9/2017 11:27 AM
73	At Whitney and US30 when southbound on Whilney need to have a wider area to turn right onto 30 with big RVs going to Jolly Rogers:	11/9/2017 9:48 AM
74	Since there is no funding for this I think the intersections at Highway 30 and Dell Range really need to have stop lights give that needs to be addressed even if the road is not done. I also think that the city needs to work with the Whitney develope to figure out a way to get traffic onto Dell Range without using Whitney. It is at its capacity. I think that Whitney is only non exmall piece of the traffic some that farms give without using Whitney, it is at its capacity. I think that Whitney is only non exmall piece of the traffic issue in this area. More turning large at the stressedtons are needed to allevide traffic back up, I think a stop light also needs to be put in al Highway 30 and Saddle Ridge Trail. When we moved inch this area over 20 years ago, out dirth thave the Meadow Lark Estates and Saddle Ridge Development. Traffic patterns have increased by over 100 percent. Unfortunalety you are not being progressive you are currently behind the 8 ball. Good Luck.	11/9/2017 9:32 AM
75	right/left turn and straight larres at major intersections at del range and Hwy 30, street lights are a must with possible signal light, make sure all services, like electric, cable, phone all stay underground, wind buffers like trees would be helpful and important during big anow storms to give drives a site reference to road-list's important to make road inviting to homeowners as this road will confinue to be major with or future housing.	11/9/2017 8:29 AM
92	Connect Whitney and Strarey	11/4/2017 9:46 PM

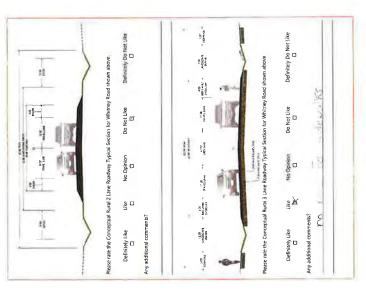
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	Williams reduced contract comments and	familian inc
77	With current subdivisions off Whitney and proposed subdivision the main concern would be fire department response time would greatly improve with the connection and paving of the Storey road from College to Chistianson	11/4/2017 9:18 PM
78	Leave Summit as it is and extend a different mad, if the extension is inevitable, intersection lights at College and Ridge Road are imperative.	11/4/2017 5:33 PM
62	Whitney Road planning must include non-vehicular transportation modes and must anticipate a future school(s) in this area. Writney/Del Range intersection requires careful evaluation and redesign. Please look for below grade crossing opportunities for pedestrians and bitcyclists, is there an opportunity to extend s future spur of the Greenway north along Whitney?	11/4/2017 3:03 PM

32 / 32

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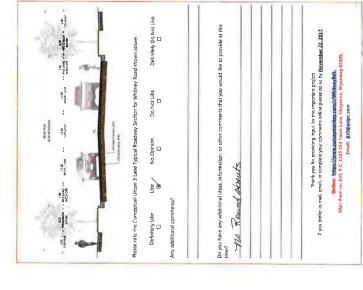
Any additional comments?

Please rate the Conceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above

Do you have any additional ideas, information, or other comments that you would like to provide at this firm?

Thank you lor providing input for this important project. If you prefer to mail, enail or complete your comments online please do so by **Movember 22, 2011**.

Online https://www.nersmenkor.com/c/Mathech63, Mail them to: AVI, P.C. 1103 Old Town Lans, Cheyenne, Wyoming 82009, Email: &/IEAvips.com



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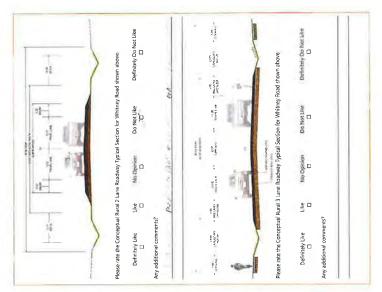
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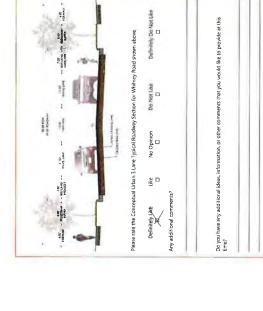
Any additional comments?

Please rate the Conceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above.

Do you have any additional ideas, information or other comments that you would like to provide at this time?

Thank you for providing input for this important project, If you prefer to mail, email, or complete your comments online please do so by **November 22, 2012**.

Online: https://www.sucrepmeinker.com/L/WhiteeRdL. Mail them to: AVI, P.C. 1103 Old Town Lane, Cheyenne, Wyoming Fmail: AVICecies.com



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Online: https://www.aurocomments.com/physiotensis.it

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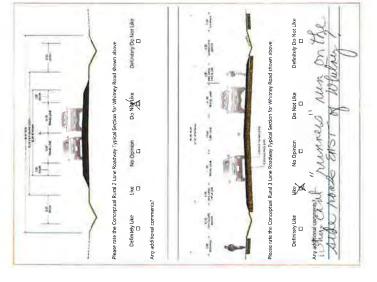
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Thank you for providing input for this important project. If you prefer to mail, email, or complete your comments online please do so by November 22, 2012.

Online: https://www.ann.comentex.com/https:501.
Mail them to: AVI, P.C. 1103 Old Town Lane. Cheyenne, Wyoming 82009.
Email: AVI@avloc.com

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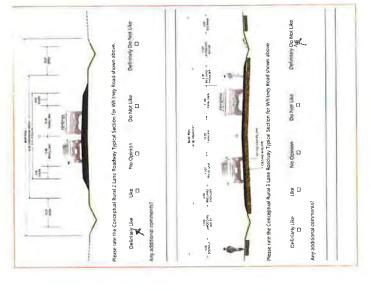
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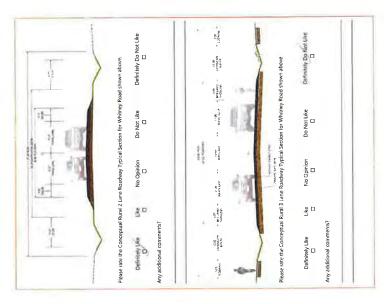
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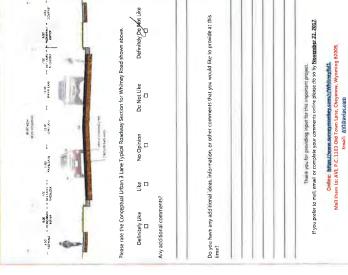
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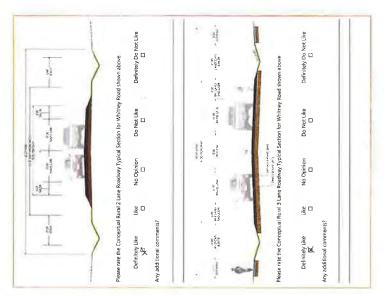


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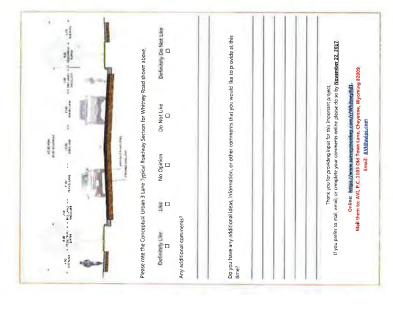
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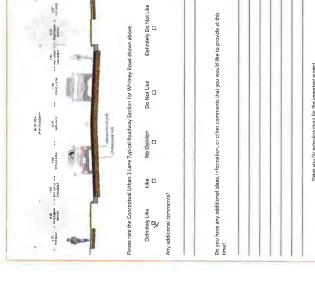
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Thank you for providing input for this important project.
If you prefer to mail email, or complete your comments online please do so by Navember 22, 2012.

Online https://www.min.compakey.com/2/WahneyAdl. Mail them to: AVI, P. C. 1103 Old Town Lane, Cheyenne, Wyoming 82009. Email: AVIGRAIPS.com

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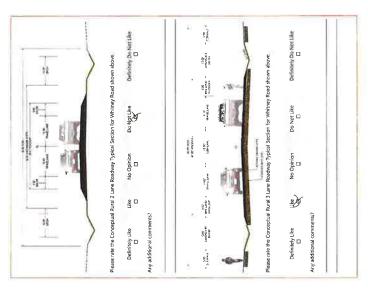
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Mail them to: AVI. P.C. 1103 Old Town Lane. Cheyenne, Wyoming 82009.
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in Orner (pheses specify) TOYOLO HON ION O DUI BING & Unitary HON HONE II you could make one pheses to the Washing wood Comada man change made you make? Please rate the importance of the following transportation users and issues (circle the most appropriate for each) based on what you consider to be the most important design considerable. Most monovate Most (Please Turn Over) Property Owner in the area (Please specify) Please help us lesso you informed by giving us the best way to contact you (Optional)? Name: Chi Chi + + + K classes, Fell Charge Andress: 1323 | December 18 | Charge Andress: 1323 | April 8 | Ellipse Andress: 1323 | April 8 | Ellipse Andress: 1533 | April 8 | Apri Whitney Road Corridor Study Comment Sheet Employee in the area ☐ Route user Which of the following best describes you (Please check all that apply)? D Other Neutral Important to Accommodate □ Business owner in the area Commercial Property owner Home owner in the area Very Important to Accommodate Accommodating Higher Vehicle Speeds Lowering Vehicle Speeds

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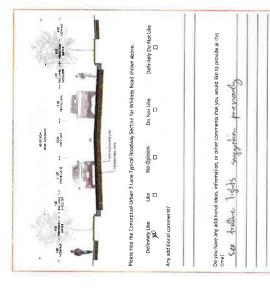
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Online. https://www.accessories.com/cynchine.gifl.
Mail them to: AVI, P.C. 1103 Old Town Lans, Citeyenne, Wyoming 82009
Email: gVI@wdps.com



Definitely Do Not Like

Thank you for the mail or complete your commonts online please do so by **November 32, 2011.** If you prefer to mail, email, or complete your commonts online please do so by **November 32, 2011.**

Definitely Do Not Like

(Please Turn Over)

Online https://www.https://www.data.com///Whitmcodd... Mail them to: AVI, P.C. 1103 Old Town Lane, Cheyenne, Wyoming I Email: AVI@exinc.com

Whitney Road Corridor Study Comment Sheet

Which of the following best describes you (Please check all that apply)?

Ef Home owner in the area | Employee in the area |

Renter in the area | Property Owner in the area |

Bushess owner in the area | Route user |

Commercial Property owner | Other |

Please help us keep you informed by giving us the best way to contact you (Optiona))? Name: LE fOol ${\cal H}$

Name: LEE ROITH
Address: 115to YELLOW SEAR ED SCAOT
Phone: 307 421 0555

leers : 88 @ aul . com

Email:

Please rate the importance of the following transportation users and issues (sincle the most appropriate for each) based on what you consider to be the most important design consideration the whithey Road Important Mont

Description	Very Important to Accommodate	Important to Accommodate	Neutral	to Discourage	Important to Discourage	No
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Accommodating Pedestrians	4	0	m	2	-	0
Accommodating Bicyclists	16	6	1	2	à	0
Other	10	4	*	N	**	0
If Other (please specify)						

Whitney Road Corridor Study Comment Sheet

(Please Turn Over)

Which of the following best describes you (Please check all that apply)?

 ₩ Home owner in the area
 □ Employee in the area

 □ Renter in the area
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 □ Commercial Property owner
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 □ Commercial Property owner
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Please help us seen you informed by giving us the best way to contact you (Optional)? Name: f , a M of f

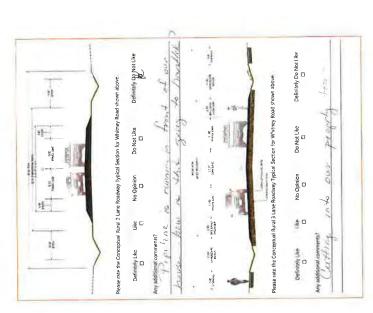
Address: 4476 (JA) 4247 12 Phone: 5016851/472 Email: 300 (1) 512 49 (2) 40/20 (1007) Please rate the importance of the following transportation users and issues (circle the most appropriate for each based on what you consider to be the most important debugs (conclinations) in Whitney Apart and based on what you consider to be the most important debugs (conclinations).

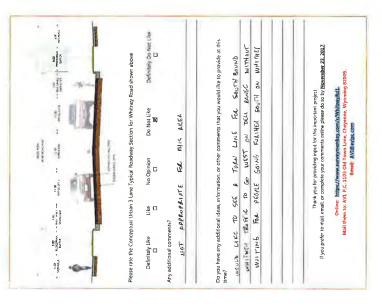
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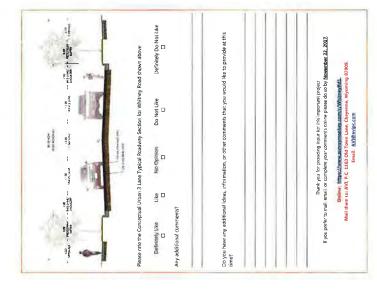
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- 1000 Definitely Do Not Like Definitely Do Not Like STILL RULL BUT PROVIDES PROFELTION FAX PERS/BICYCLES 1 Please rate the Conceptual Rural 2 Lane Roadway Typica! Section for Whitney Road shown above Please rate the Conceptual Rural 3 Lane Roadway Typical Section for Whitney Road shown Do Nat Like 20.00 Do Not Like 27 No Opinion No Opinjań : 好·樹· 400 1 THIS IS WHAT WE 30 ş 🗆 Any additional comments? Definitely Like * Definitely like 1.00







Opinion a Other (Please specify) Property Owner in the area Please help us keep you informed by giving us the best way to contact you (Optional)? Whitney Road Corridor Study Comment Sheet Employee in the area If you could make one change to the Whitney Road Corridor what change would you make? ☐ Route user Which of the following best describes you (Please check all that apply)? Neutral Important to Accommodate Business owner in the area Commercial Property owner ☐ Home owner in the area Address: Sol incomes in Renter in the area Phone: 133, 7145 Accommodating Higher Vehicle Speeds Lowering Vehicle Speeds Accommodating Pedestrians Accommodating Pedestrians Accommodating Discyclists Other Description

Whi	tney Road (Whitney Road Corridor Study Comment Sheet	ıdy Cor	nment Si	heet	
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Email:	Gerkin Condignort	net.	1			
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Please rate the Conceptual Rural 2 Lane Roadway Typical Section for Whitney Road shown above.

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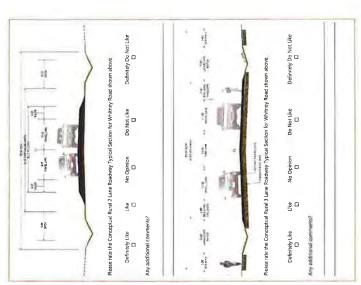
Any additional comments?

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Mary - william

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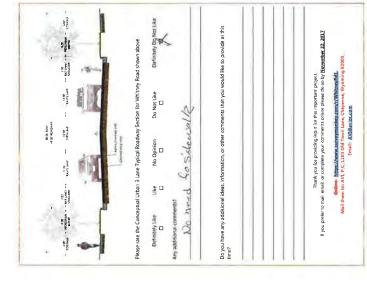
Any additional comments? Definitely Like

Please rate the Conceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above

Do you have any additional ideas, information, or other comments that you would like to provide at this impli-

Thank you profer to mail, or complete your comments online please do so by November 22, 2017.

Online: https://exx.aexx.orm.org.com///finiteofall.
Mail them to: AVL P.C. 1103 Old Town Lane Chayenne, Wyoming 82009.
Email: AVI@aclas.com



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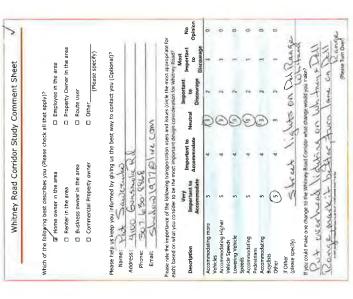
Definitely Class

Any additional comments?

If you could make one change to the Whitney Road Corridor what change would you make?

(Please Turn Over)

Please rate the Conceptual Rural 3 Lane Roadway Typical Section for Whitney Road shown above.



Whitney Road Corridor Study Comment Sheet

Which of the following best describes you (Please check all that apply)?

| Figure |

| Renter in the area | Property Owner in the area | Business owner in the area | Route user | Commercial Property owner | Other_______

Commercial Property owner
 Other___(Please specify)

Please help us keep you informed by giving us the best way to contact you (Optional)?

Name: 5400) DEFINORY Address: 5712 Strucky Beach Phone: 307-631 1269 Email: Shoulder 49 Comtal. com Presse rate the importance of the following transportation users and issues (circle the most appropriate feet each) based on what you consider to be the most important derigh considerations for Winney Saaut each) based on what you consider to be the most important derigh considerations for Winney Mosts.

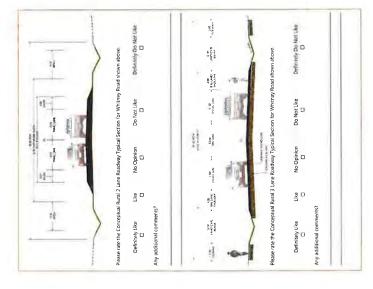
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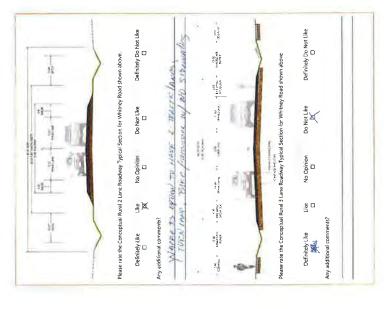
If you could make one change to the Whitney Road Corridor what change would you make?

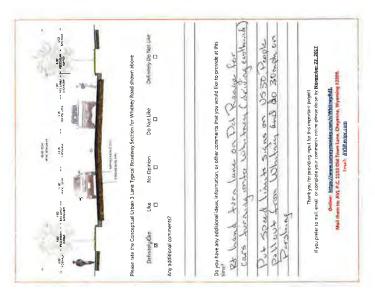
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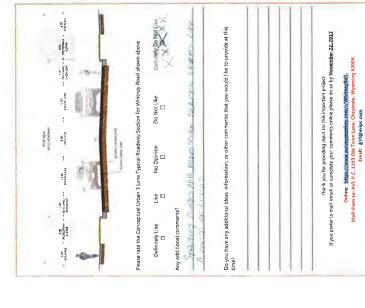
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No Oplnion Please rate the importance of the following bransportation users and issues (circle the most approxibite seath) based on what you consider the other activities of the circle seath) based on what you consider the other activities of the circle seath of the circle sea □ Property Owner In the area (Please specify) Please help us keep you informed by giving us the best way to contact you (Optional)? 0 Ð -0 Whitney Road Corridor Study Comment Sheet Employee in the area If you could make one change to the Whitney Road Corridor what change would you make? ☐ Route user Which of the following best describes you (Please check all that apply)? D Other A = 420 642 00 Name: Evic Est VIC □ Commercial Property owner Business owner in the area M Home owner in the area □ Renter in the area (3) odating Higher Pedestrians Accommodeung Accommodaling (please specify)

Which of the	Which of the following best describes you (Please check all that apply)?	eck all that apply)?
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_	☐ Renter in the area	☐ Property Owner in the area
J	 Business owner in the area 	☐ Raute user
_	☐ Commercial Property owner	D Other (Please specify)
lease help us	Please help us keep you informed by giving us the best way to contact you (Optional)?	est way to contact you (Optional)?
Name:	Name: S Corrocra, Corre	
Address:	Address: 4608 Van Burren, Ave	*
Риопе:	Phone: \$16-116 8703	
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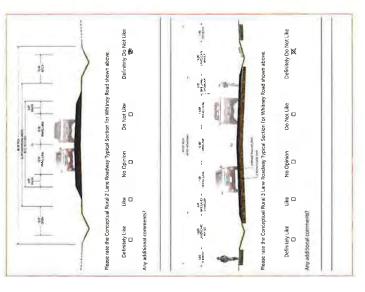
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If you could make one change to the Whitney Road Corridor what change would you make?

Definitely Like

(Please Turn Over)



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12.03 Notes (April

-- SIMT TAVES -- RESIDENCE -- STANDER -- STA

Definitely Do Not Like

Do Not Like

No Opinion

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Defendely Use CI Any additional cor

Please rate the Conceptual Urban 3 Line Typical Roadway Section for Whitney Road shown above.

Do you have any additional ideas, information, or other comments that you would like to provide at this lime?

Kased Warners Rurel

Thank you for providing input for this important project.
If you prefer to mail, email, or complete your comments online please do so by November 22, 2011.

Owner https://environs.comserver.com/INNthro2811
Mail them to: AVI, P.C. 1103 Old Town Lane. Cheyenne, Wyoming 82009
Email: 6/1/8/aript.com

(Please Turn Over)



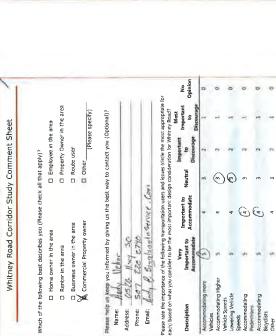
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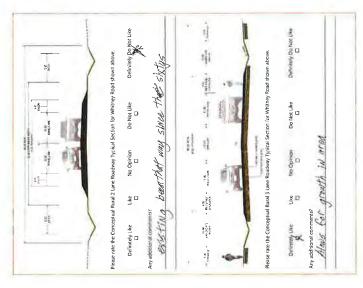
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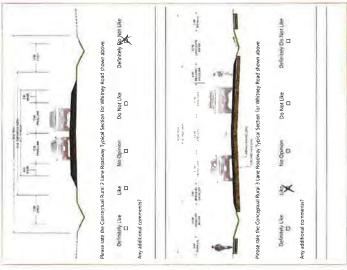
Thank you for providing input for this important project if you prefer to mail email, or complete your comments online please do so by November 22, 2012. Online: https://www.nauconn.co.kg.ze/.com/inst@43, Mail them to: AVI, P.C. 1103 Old Town Lane Cheyenne, Wyoming 82009.
Email: AVI@aufoc.com

der Three-laws Sections Control what change mound you make? Please rate the importance of the following transportation users and issues circle the most appropriate for each) based on what you consider to be the most important design consideration for Whitely Road K Property Owner In the area (Please specify) Please help us keep you informed by giving us the best way to contact you (Optional)? Name: D_{MM}/P_{SC} Whitney Road Corridor Study Comment Sheet Employee in the area Route user Which of the following best describes you (Please check all that apply)? Other_ ddress: 6530 4530 Phone: 307 630 8965 Email: R&I 6345 01 @ aof.com 0 A Business owner in the area A Commercial Property owner (A) Home owner in the area Very Important to Accommodate ☐ Renter in the area Bike shoulder Vehicles Accommodating Higher Vehicle Speeds Lowering Vehicle Speeds Accommodating Pedestrians Accommodating Picyclisis Other Accommodating more If Other (please specify) Description



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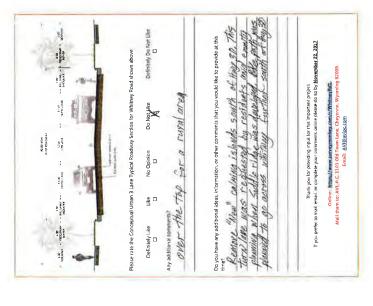


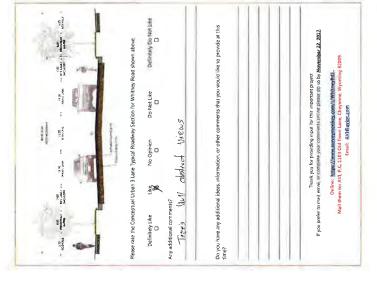
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If you could make one change to the Whitney Road Corridor what change would you make?

(blease specify)

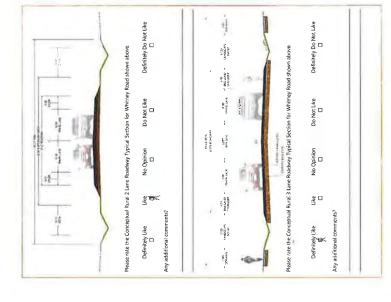
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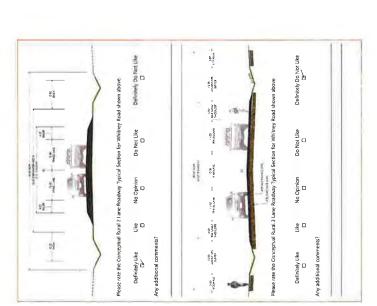


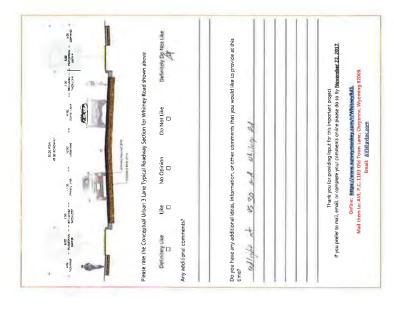


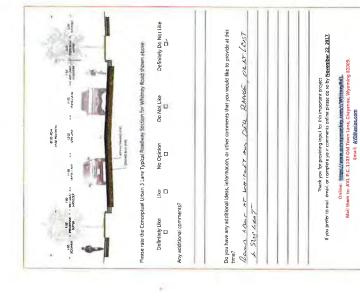
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Which of the following best describes you (Please check all that apply)?	best describes y	rou (Please check	k all that a	¿(Aldda		
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Please help us keep you informed by gIving us the best way to contact you (Optional)? Name:	u informed by g	Iving us the best	t way to co	ontact you (O	ptional)?	
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П Сошпел	Commercial Property owner	wner	Other.	[(Please specify)	
Please help us keep you informed by giving us the best way to contact you (Optional)?	informed by g	ving us the best	way to co	antact you (C)ptional)?	
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each) tased on what you consider to be the most important design consideration for Whitney Road?	sider to be the n	ost important des	ign conside	ration for Whi	tney Road?	5
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threase specify; If you could make one change to the Whitney Road Corridor what change would you make?	ge to the Whitne	y Road Corridor w	hat change	would you ma	ke,	
PARK IN VIOLE	74					









Whitney Road Corridor Study Comment Sheet

□ Property Owner in the area Employee in the area 12 Route user Which of the following best describes you (Please check all that apply)? □ Business owner in the area □ Commercial Property owner D Kome owner in the area ☐ Renter in the area

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Please rate the Conceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above.

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Any additional comments? Definitely Like

□ Other (Please specify)

Please help us keep you informed by giving up the best way to contact you (Optional)?

Name: Liza beth, 1 Whichlat! Fragg.

Adverses: Lella Tullia Road, Chilylehink 1 LIV \$2009

Phone: 307 284-16485

Email:

Please rate the importance of the folkowing transportation users and issues (orde the most appropriate for each) based on what you consider to be the most important design consideration for Whitney Road?

Description In	Important to Accommodate	Accommodate	B. Then	Discourage	Discourage	Opinion
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Whitney Road Corridor Study Comment Sheet

(Piesse Tum Over)

Which of the following best describes you (Please check all that apply)?

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□ Other____(Please specify) □ Property Owner in the area □ Employee in the area ☐ Route user Commercial Property owner □ Business owner in the area Home owner in the area □ Renter in the area

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If you could make one change to the Whitney Road Corridor what change would you make?

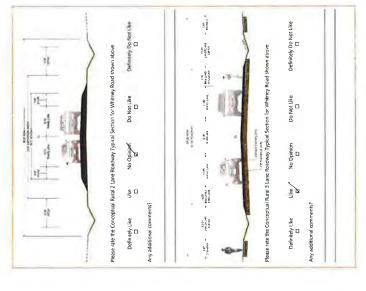
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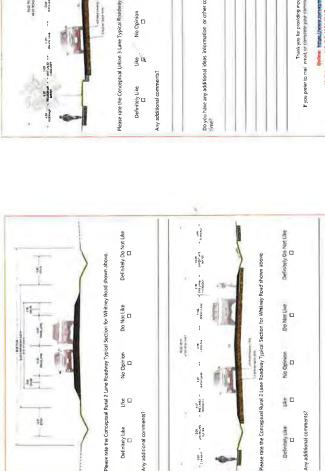
sents that you would like to provide at this

Do you have any additional ideas, information, or other time?

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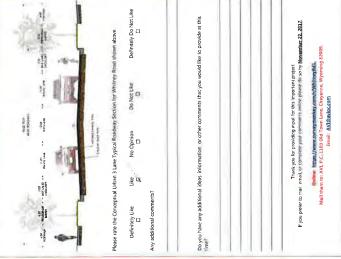
Thank you for providing input for this important project if you prefer to mail on complete your comments online please do so by **Rosembert 22, 2013**.

Online: https://drive.necomoning.com/d2bitmsfl.dd.
Mail them to: AVI, P.C. 1103 Old Town Lane, Cheyenne, Wyoming 82009
Email: AVI@aviloc.com



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Opinion Please rise the importance of the lebitation that interest and issues (circle the most appropriate for each) based on what you consider to be the most important to the properties of the most important to heuran interest important to heuran to important to the properties of the most important to heuran to the properties of the most important to the properties of the most important to the most appropriate for the most (Please furn Over) ☐ Property Owner In the area (Piease specify) Please help us keep you informed by giving us the best way to contact you (Optional)? Whitney Road Corridor Study Comment Sheet ☐ Employee in the area If you could make change to the Whitney Road Comidor what change would you make? +☐ Route user Which of the following best describes you (Please check all that apply)? Names: Sim Bayd JS. Address. Hur. Phone: 914. 139-0489 Email: 11694 6 @ gmg.1. Com. (Best) Other, ☐ Commercial Property owner Business owner in the area A Home owner in the area Very Important to Accommodate Renter in the area 可多多四 Accommodating increased Accommodating Higher Vehicle Speeds Lowering Vehicle Speeds Accommodating Pedestrians Accommodating Bicyclists Other If Other Diese specify

Which of the following best describes you (Please check all that apply)?	heck all that apply)?
K Home owner in the area	□ Employee in the area
☐ Renter in the area	□ Property Owner in the area
☐ Business owner in the area	☐ Route user
☐ Commercial Property owner	G Other (Please specify)
Please help us weap you promised by giving us the best way to contact you (Optional)? Name: Left Haderson	best way to contact you (Optional)?
Address: (973 Elibabeth Rd	
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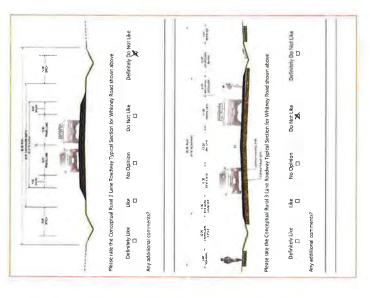
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If you could make one change to the Whitney Road Corridor what change would you make? Safe prodestrian paths

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(Please Turn Over)



Do you have any additional ideas, information, or other comments that you would like to provide at this time?

Thank you the providing uput for this important project if you prefer to mail, email, or complete your comments online please do so by **November. 32, 2012**.

Online: https://www.incremorbey.com//Abithorp.dd.
Mail them to: AVI, P. C. 1103 Old Town Lane, Cheyenne, Wyoming 82009.
Email: &Vi@evdyc.com

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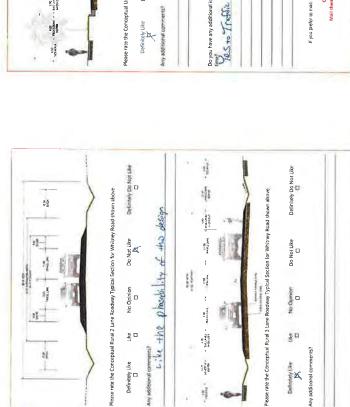
Please rate the Conceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above

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No Opinion

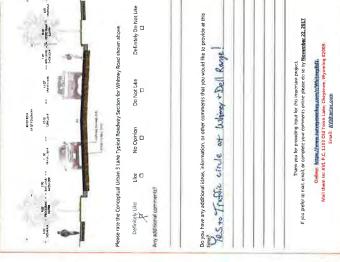
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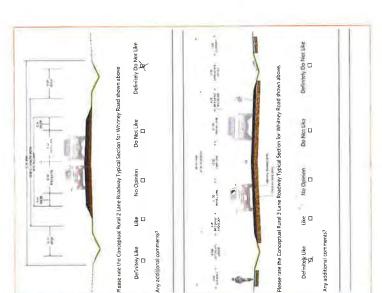
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Please rate the Canceptual Urban 3 Lane Typical Roadway Section for Whitney Road shown above.

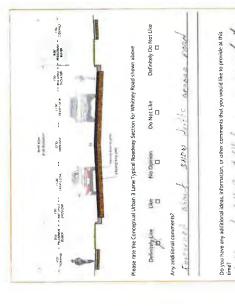
Do you have any additional ideas, information, or other comments that you would like to provide at this time?

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Liebrate ACONST

Thank you for moviding input for this important project from prefer to mail email or complete your comments online please do so by <u>Movember 22, 2037.</u>

Online: https://enry.aucropments.com///Whitnessdd. Mail them to: AVI, P.C. 1103 Old Town Lane, Cheyenne, Wyoming 82009 Email: &VI@arigs.com



e rate the Conceptual Rural 2 Lane Roadway Typical Section for Whitney Road shown above

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Thenk you for providing input for this important project If you prefer to mail email or complete your comments online please do so by November 22, 2012

Online https://axxx.auccements.cam/Abilte.ch.fl.
Mail them to: AVI, P.C. 1103 Old Town Lane, Cheyenne, Wyoming 82009

Tmail: AVIBaxips.com

No Opinion Please rate the importance of the following transportation users and issues (circle the most appropriate for each) based on what you consider to be the most important design consideration for Whitney Road? (Please Tuen Query ☐ Property Owner in the area (Please specify) Please not us weep you informed by giving us the best way to contact you (Optional)? Most Whitney Road Corridor Study Comment Sheet Employee in the area If you could make one change to the Whitney Road Corridor what change would you make? Dind Spars and Sleep goodes ☐ Route user Which of the following best describes you (Please check all that apply)? Other | Neutral @@@~ Important to Accommodate Phone: 201-220 072/ Email: Volv Kie @ live... Corr Name: Xear Address: 72 Commercial Property owner Business owner in the area Home owner in the area Very Important to Accommodate Renter in the area Accommodating Higher Vehicle Speeds Lowering Vehicle Speeds Accommodating Pedestrians Accommodating Bicyclists (blease specify) Description

Which of the following best describes you (Please check all that apply)?	heck all that apply)?
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☐ Business owner in the area	☐ Route user
☐ Commercial Property owner	G Other (Piesse specify)
Phase help us were you informed by giving us the best way to contact you (Optional)? Hanne: $L_{n,s} \in \mathcal{M}_{\infty}$, $(L_{2,o},A)$	best way to contact you (Optional)?
Address: 1,704 Foxqlove De	7.4
Phone: 301-4-21-67-28	
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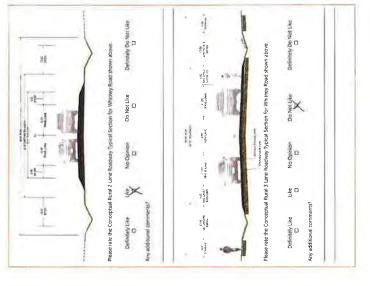
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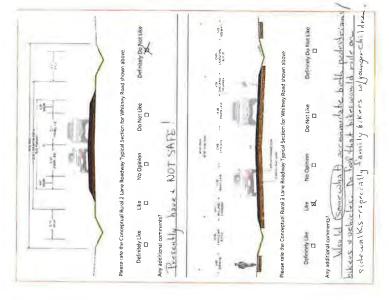
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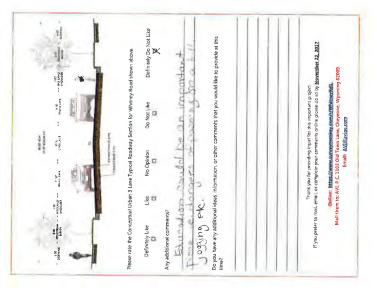
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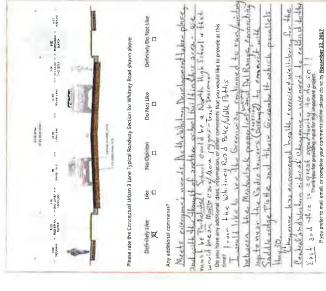
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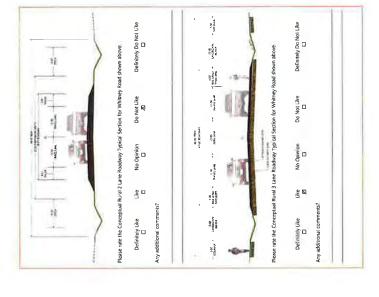




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	Section for Whitney R. Do Not Like	renents that you would	Thank you for pervising input for this important project If you prefer to mail email, or complete your commerce online please do so by Moonthier 22, 2012. Online https://www.norphierichiay.com/s/fritherspall. Mail than to: ANI p. 1, 213.0 of four hart, Chrystone, Wooming 82009, Timili ANIE-black.com
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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018
Dildine Elementary School, 4312 Van Buren Avenue

PLEASE plan on attending the **2nd Whitney Road Corridor Study** Open House. The objective of this Cheyenne
Metropolitan Planning Organization (MPO) project is to create a plan for Whitney Road that improves roadway and intersection safety, addresses drainage, snow drifting, and growth projections. Stakeholders will be asked to provide input on the recommend draft plan. The project limits are from U.S. 30 to Storey Blvd./Beckle Rd.

The Open House will be held on **Thursday**, **June 28th** from **5:00 p.m. - 6:30 p.m.** A **presentation** will take place at **5:30 p.m.** in the gym.

For more information, please call the **MPO at 638.4385**.











EXHIBIT 81 APPLICATION FOR USE OF DISTRICT FACILITY

Please read all 3 pages of this form

Please follow these steps:

- Fill out the request form completely and print legibly.

 Submit request, form by to the building Principal or Athletic Director when possible, or fax to 307-771-2382, by email to analysed termice large, in person or by U.S. mail to Facilities Management, Attn: Facility Use, 3320 Maxwell Avenue, Cheyenne, WY 82001.

 A Certificate of Insurance in the amount of \$1,000,000 may be requested naming Larantic County School District One, 2810 House Ave., Cheyenne, WY as an additional insured Proof of medical coverage or An Assumption of Bish. Waiver and Release of Liability signed by each participant or participant's guardian for any and all damages which may be sustained by the participant as a result of his/her participation in the event may be requested.

Submit your Proof of Liability Insurance as described in the Building Use Terms to the Facility Management office via fax, 307-771-2382, in person or U.S. mail

Please note: we are not able to process your request without Proof of Liability Insurance

Please note:

- School events take priority. Your permit or a date on your permit may be cancelled due to school
 activities. You may re-schedule based on availability
- Once your permit is ready our office will contact you
- Your rental fee must be paid in advance, other applicable fees will be billed lt takes a minimum of 7-10 business days to process the permit
- Possible additional fees:

 - A monitor or custodian may be required based the date of the permit.

 Use of a kitchen requires district staff to monitor/operate equipment
 - Technical equipment used in the auditorium or gym(s) requires a district technician to operate the
- Until the permit process has been completed, your space is not reserved. We recommend not
 advertising your event until the permit has been finalized.

EXHIBIT 81 LARAMIE COUNTY SCHOOL DISTRICT I APPLICATION FOR USE OF DISTRICT FACILITY

Board of Trustees policies and regulations have been brought to the attention of the applicant. The above activity can be scheduled The following fees will apply:

FOR USE BY BUILDING PERSONNEL AND BUSINESS OFFICE ONLY

	Number of Hours	Cost per Hour	Total Cos
Rental Fee			
Custodial Fee			
Required Supervisor Fee			
Technician's Fee			
Equipment Rental Fee			
Police/Security Fee			
TOTAL COST			

istrict Representative assigne (Principal, Athletic Di		presentative must be an site at all times)
equest Approved	(Signature)	Principal or Designor
quest Approved	(Signature)	Asst. Supt. of Support Operations or Designee

rease note that all outside groups will manage themselves. This includes crisis situations and/or inclement weather. Groups are responsible for multifaction of parents or participants and any execution plans. Groups may choose to cancel an exert even if LCSD i still open in the case of a crisis situation and/or inclement weather. LCSD is not responsible for managing outside groups in a crisis situation.

Form FM113 Adopted 8/13/90 Revised 10/12/95, 1/8/96, 7/1/96, 7/10/00, 6/2/11, 7/9/14, 7/13/15, 7/1B/16

EXHIBIT 81 LARAMIE COUNTY SCHOOL DISTRICT 1

	Long Term Lease	
	Dildine Elementary Scho	
Type of Space: Classroom	СвfeteriнGym X	and 2nd Gym
Kitchen Auditorium	Parking Lot Only Oth	ici
	Vhitney Road (City of Cheyenne, Me	
Organization: AVI, pc	Contact Person: To	m Cobb
Felephone: (11)	(w) 307-637-6017 (C)	970-214-6542
Address: 1103 Old Town La	(w) 307-637-6017 (C)	e _{State:} WY _{Zip:} 82009
cobb@avipc.com		
Tom Cobb	Telephone:	970-214-6542
Tom Cobb Start Date: June 28, 2018	End Date:	June 28, 2018
4:30 pm	End Time: 7:00 pm Inc	lude set-un rehearsal elean-un etc
	Adult/Student Ratio: NA to	
	Proceeds to be devoted to: NA	
Explain in detail (using diagrams, if nece	ssary) how the facility is to be set up. State	The work is to be done by district
employees List equipment needed, i e ,	ssary) how the facility is to be set up. State is ables, chairs, bleachers, risers, and any other en for Power point present	pertinent information:
employees List equipment needed, i e ,	ables, chairs, bleachers, risers, and any other	pertinent information:
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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

Please Enter Your Number & Address	Please Enter Your Phone W/Or Entel
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Rick FreNo 7312 Berlielu RL	307-634-2579

AVI Protessar & Corporation 1103 Old Town Lane; Sulle 101; Cheyenne, WY 82009 PJ 307-637-6017

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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

Judine Liemontary States	,
Please Enter Your Planne & Address	Please Enter Your Pricing &c/Cr Email
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Buddy Tenmant ands 15 y Rio Wards ands Charante ging 82001	970 834 1036
Jary Johnson 3158 Bluff R Chey WY 82009	970834 1036 cj poundhaven e man.com 307-632.3413
Kein Hollerson 388 K7 RAFLIT Ld CHEVENING WY 32027	Krim worder com 307 775 7908
RMOY GRIESBACH WYDOT LARMIG, WY	randy griesbach & wgo, gov
Linda Mueller, 45 12 Whitney Rd. Cheep.	634.9672
Upon Singa 6717 Whitney Rd	630 6065
Jim + Barb Bayd 4008 Van Byren Ava	816-716-8722

AVI Professional Corporation 1103 Old Town Lane; Suite 101; Cheyenne, WY 02009 PJ 307-637-6017

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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

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CHEYENNE, WYO 82001	
Ellen Sowthwell 4918 Cockise Rd	
Cherjenne by 82009 Mike Cowley of SUID Iron min of Cheyere, we ezeog	
Success Amond Abbeths Unio Elicanta Ed Chapenaly 82m	
Monica yerboroush 9350 Crydial Mountain Rd Chayend wy 82009	
EDA PAT SMITH GBOG FOXGLOUD DRIVE CHEVENNEIMY 84009	
Lathber + Lyon Lasson 5302 Whitney Rd Cley 82009	
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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

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6515 Foxglove 82009	marefunk 70@ gmin 10m
Cody & Finnegan Fournier 3351 Belaire Ave (2001	307 630 2060
Jeannie Spare & Ardy Whar 14602 Forglove Pr. 82009	Sprakerjm@gmail.com
TOMY MARY GABUNZ 6503 HIGH SPEENS RD	ZNCLBAGTM & MSW. COM
Angi Brow 6615 Wildernss Dr	307 287-0373
Bell + Comi Holgeson Albi WY 82050	307-246-1298
Carel TSTELL Hopkin, 6627 Riverband Roug	307-256-6498
Kathyr Byers P.O. Box 20124	wybyers@gmail

AVI Professional Corporation 1103 Old Town Lane; Suita 101; Chayenne, WY 82009 PJ 307-637-6017

Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

Physics Enter Your Name & Address	Please Entir Your Phone 870) Email
GARY + NORMA Diesing 6208 IRON MOUNTAIN	201-421-7789
Mick Voser	
10145 Crystal An D	307-635-7402
Mike Larson 55/8 Blazing Star Rd Chy wy 82009	307-421-4005 wyolarsons e hotmail.com
Mike Lujan 6751 Say kally Ru Phayanni Wy szon?	lyan m11@ hutner 1.com
A Judd Fifealdt 6770 whistler Dr. Cheyenne, WY 82009	307-320-5685
CHESINGE CITY WHITOKY FORD CHEJENNE WY BONG Moris + Shavbu Joh Kins	307-632-1207
Moris + Shavba Johkins 6300 Green Meadow PL	307-638-1818
Lisa Brandes 6983 Sundance Gop	307-631-4533

AVI Professional Corporation 1103 Old Town Lane: Suite 101: Chevenne, WY 82009 Pt 307-637-8017

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Whitney Road Corridor Study PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

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Food 540n2 634-6017 4011 Jumm.T DR	
Joyce Hora 4011 SUMMIT DR	634-6017
DAVE BUMANN LARAMIZ COURT	633-4307
TRACES PETERSON 9428 SNOWCRESTUR	421-6801
KERIZY JO & MIKE STEPHAN 9555 Crystel Albuntain Rd	510-326-3457
Kathy & Quint Dovis 6406 Chickadee Dr	631-8713

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Whitney Road Corridor Study

PUBLIC OPEN HOUSE

Thursday, June 28, 2018 5:00 p.m. - 6:30 p.m. Dildine Elementary School, 4312 Van Buren Avenue

Please Enter Visu, Name & Address	Please Life Your Plone 870 Limat
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Downled Beck 1-e AD BOX 23 17 7519 Beck to Re	(307)630-118/
James Mestack 6861 Dorsey Rd	307-287-1548
KAVEN GONZULEZ 6747 DONSEY POC	gonzalez 82009@ AOL
Janine Ramase 7119 Julia Rd	307-630-2667
Magen Seeley-Marotz 7099 Say Kally Rd	307-421-5927
Joe Patterson	Joe Eguardian companies - com
Che Ryon 4501 Greenfull CT	3076321665

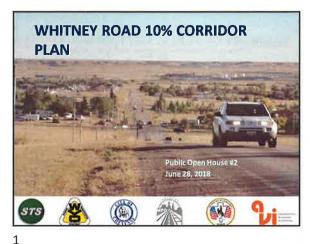
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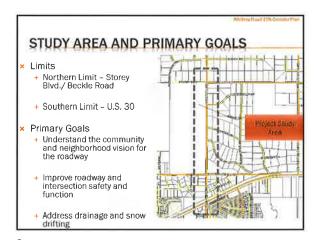
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AGENDA Study Area and Primary Goals Where we have been and what to expect? What we heard (Public Meeting No. 1)? Details of the Identified Issues? Overview of recommended Improvements Adjourn to Workshop Area

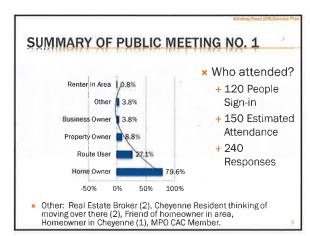
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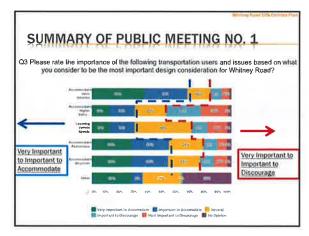


WHERE WE HAVE BEEN AND WHAT TO EXPECT? Mai 9, 2017 January 23, 2018 May 10 2017 October 19 2017 March 7, 2018 & TRT August 15, 2018 MPO Technical Activities y Committee (1) August 20, 2018 August 9, 2018 Presentations to the Governing Disclos (County and City)

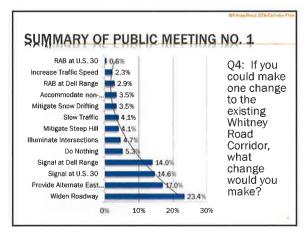
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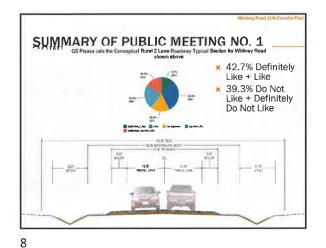
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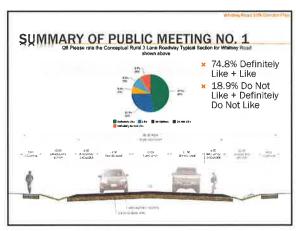


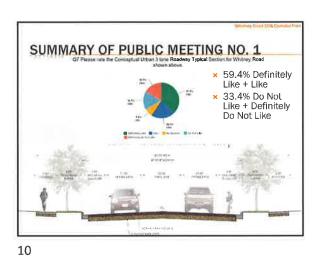


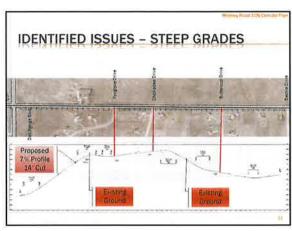
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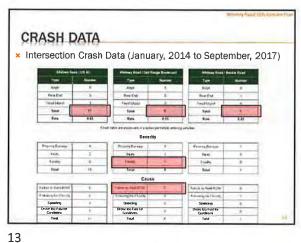








WHAT HAPPENS WHEN YOU FLIMINATE THE STEEP GRADES



2040 AND (TODAY)

14

16

GENERAL CORRIDOR RECOMMENDATIONS Whitney Rd × Long term Implement Construction Phased Strategies along Corridor. + Install Uniform Roadway and Pedestrian lighting Investigate Possible Posted Speed Reduction
 VIS 30 East and West of Whitney from 55 mph to 40 mph
 Whitney Road from Beckel/ Storey Blvd from 45 mph to 30 mph implement wet and dry utility priority projects as funding resources become available or development becomes the catalyst. Develop/ Create additional egress/ access routes north of Deli Range (i.e. Storey Blvd. West, Iron Mountain Road) + Reserve right-of-way as development occurs along the undeveloped corridor. Explore opportunities, as area develops, to provide roadway storm water detention / retention features / facilities.

RECOMMENDED TYPICAL SECTIONS Whitney Road at the Beckel Road/ Storey Blvd. (Looking + Interim Rural 2 - Lane Roadway Typical Section AT THE BECKLE ROAD / STOREY BLVD INTERSECTION

15

RECOMMENDED TYPICAL SECTIONS Dell Range Blvd. to Beckle Road (Looking North) + Urban 3 - Lane Roadway Typical Section (Special) DELL RANGE BLVD TO BECKLE ROAD / STOREY BLVD 50:00 POI-49:00 EQADWAY

PRELIMINARY RECOMMENDED TYPICAL SECTIONS × U.S. 30 to Dell Range Blvd. + Urban 3 - Lane Roadway Typical Section U S 30 TO DELL RANGE BLVD

17 18



whitney road at dell range blvd.

* Alternative 1
+ Single Lane RAB

* Alternative 2
+ Standard Signalized Intersection

19

21

RECOMMENDED ALTERNATIVE - SINGLE LANE
RAB

Special Features:

• Utilize lower truck apronto prevent trailer drag and truck tire rubbing.

• Blycle ramp for entry and exit from roundabout.

Additional Right-of-way.

INTERIM RECOMMENDATIONS PRIOR TO RECONSTRUCTION

- Transverse Rumble Strips Northbound and Southbound
- ★ Flashing Beacon on Whitney Road Improve Visibility for Stop Control
- ★ Intersection Down Lighting on Existing Power Poles or Independent Pole at Intersections

WHITNEY ROAD AT U.S. 30

Prountly of commencial and mobile holite access forwaring to intersection and angle of U.S. 30 Service Road

Total section from the commencial and access from the commencial access from

WHITNEY ROAD AT DELL RANGE BLVD.

* Alternative 1

+ Realign Skewed Intersection
+ Signalized Intersection as Warranted

* Alternative 2

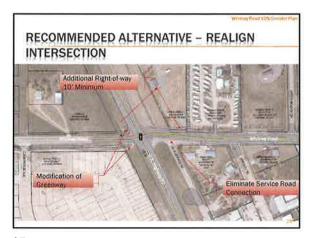
+ Leave Intersection Skew and Widening
+ Signalized Intersection as Warranted

24

20

22

010 1

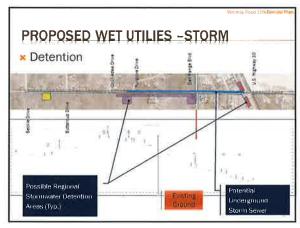


INTERIM OPTIONS - PHASING

- Signalization w/ Future Arm Lengths and Locations
- x Eliminate Service Road Connection
- * Regional Stormwater Detention Ponds

25

26



OTHER NON-MOTORIZED RECOMMENDATIONS PEDESTRIAN AND BIKE OPTIONS

× Soft surface Multiuse Trail or Additional Trail "Old" Right-of way

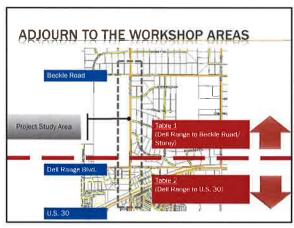
× Additional Greenway connection from Whitney to new master plan school site

27

28

FINAL THOUGHTS

- Collaborative effort with input of over 250+ people including professionals, users, property owners, business owners, and other stakeholders
- Provides recommendations that attempt to balance the needs of <u>all</u> the users of roadway
- Provides a vision and framework for the corridor for year 2040 and is <u>not</u> a construction document
- Purpose of the plan is to be guide document for short and long term development of the area. The final plan is dynamic and should be updated to reflect future changes not seen at this time.

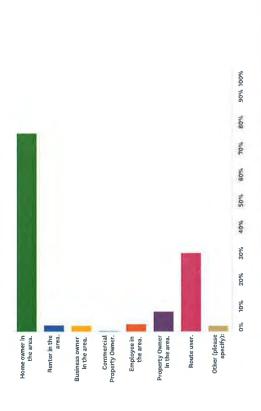


Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

Q1 Which of the following best describes you (Please mark all that apply)?

Answered: 311 Skipped: 0



75.88% 2.57% 2.26% 7.72% 30.23% 7.72% 30.23% 2.25% 30.23% 2.25% 30.23% 7/10/2018 9:53 PM who drives through the area 7/15/2018 10:55 AM 7/2018 12:59 PM	ANSWER CHOICES	HOICES	RESPONSES	
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2.25% 0.32% 7.72% 30.23% 30.23% 2.25% phre in the area 7/10/2018 9:53 PM 7/10/2018 9:59 PM 7/10/2018 9:59 PM 7/10/2018 3:59 PM 7/10/	Renter in the	area.	2.57%	60
2.89% 7.72% 30.23% 30.23% 2.25% ther in the area 7/10/2018 9:53 PM 7/10/2018 3:59 PM 7/20/2018 3:59 PM 7/20/2018 3:59 PM 7/20/2018 3:59 PM 7/20/2018 12:59 PM	Business ow.	ner in the area.	2.25%	1
2.89% 7.72% 30.23% 2.25% Interin the area 7/10/2018 9:53 PM 7/10/2018 10:56 AM 7/10/2018 3:59 PM 7/10/2018 3:59 PM 7/10/2018 3:59 PM 7/10/2018 12:59 PM	Commercial	Property Owner.	0.32%	1
7.72% 30.23% 2.25% the rin tie area 71/0/2018 9:53 PM who drives through the area 77/2/2018 3:59 PM 77/2/2018 3:59 PM 6d	Employee in	the area.	2.89%	6
30.23% adents: 311 OTHER (PLEASE SPECIFY): City resident who drives through the area 7/202018 9.53 PM Just infaresbod 7/202018 12.59 PM	Property Ow.	ner in the area.	7.72%	24
(PLEASE SPECIFY): refighter in the area dent who drives through the area	Route user.		30.23%	94
PLEASE SPECIFY): efighter in the area ent who drives through the area	Other (please	s specify):	2.25%	7
h the area	Total Respon	idents: 311		
	200-	OTHER (PLEASE SPECIFY):	DATE	w
		Former firefighter in the area	7/10/2	2018 9:53 PM
	2	City resident who drives through the area	7/6/20	D18 10:56 AM
	· m	S	773/20	D18 3:59 PM
	4	Just interested	7,2720	018 12:59 PM

1/31

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

2/31

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

Q2 Please help us keep you informed by giving us the way to contact you (Optional).

Answered: 113 Skipped: 198

Name 96 45% 109 Address; 82 30% 108 City/State/ZiP- 68 14% 77 Finanti: 68 14% 77 Email: Andy MCMAHON 771/22018 9:33 AM 2 Michaels Bain 771/22018 9:33 AM 3 Michaels Bain 771/22018 9:33 AM 3 Kushin Roward 771/22018 9:33 AM 4 Berind covarid 771/22018 9:33 AM 5 Kushin Roward 771/22018 7:35 PM 6 Kushin Roward 771/22018 5:21 PM 7 Susan Hopkins 771/22018 5:21 PM 8 Kushin Roward 771/22018 5:21 PM 11 John Payne 771/22018 5:22 PM 11 John Payne 771/22018 5:22 PM 12 John Payne 771/22018 5:22 PM 13 John Payne 771/22018 5:24 AM 14 Audroy Janaffeld 771/22018 5:24 AM 15 John Payne 771/22018 5:24 AM 16 John Payne 771/22018 5:24 AM 1	ANSWER CHOICES		RESTONGES	
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Brittany Wilson	7/10/2018 6:00 PM
Jason Johnson	7/10/2018 2:52 PM
Ed & Pat Smith	7/10/2018 2:52 PM
Shawn Broad	7/9/2018 9:47 PM
Georgia Broyles	7/9/2018 9:11 PM
Lisa and Robert Brandes	7/9/2018 7:41 PM
Lynn Rainey	7/9/2018 6:03 PM
Mysty Haight	7/9/2018 3:04 PM
James Mestack	7/9/2018 2:49 PM
Susie Havner	7/9/2018 11:55 AM
Duane Welte	7/8/2018 8:05 PM
Tiffany	7/8/2018 4:31 PM
Barbara	7/7/2018 10:24 PM
Maggie Doss	7/5/2018 7:44 PM
Taylor	7/6/2018 11:33 AM
Lanae McDonald	7/6/2018 7:31 AM
Кафгул Warren	7/5/2018 1:16 PM
Jeff Trøfren	7/5/2018 11:23 AM
Jeff Woods	7/5/2018 8:31 AM
Lori Medina	7/5/2018 7:54 AM
Max Minnick	7/5/2018 12:34 AM
Steven girt	7/4/2018 6:20 PM
Кечи Неубате	7/4/2018 10:36 AM
Candace Croswell	7/3/2018 9:13 PM
Kari Happold	7/3/2018 9:01 PM
Katrina Vosler-Suter	7/3/2018 8:42 PM
Ellen Taylor	7/3/2018 8:26 PM
Jerry Riaf	7/3/2018 6:30 PM
Kathie Dreifus	7/3/2018 6:07 PM
Ana munoz	7/3/2018 5:03 PM
Shirley Welte	7/3/2018 4:37 PM
Sheri Emmert	7/3/2018 3:59 PM
Cyndi Henderson	7/3/2018 3:58 PM
Monica Yarborough	7/3/2018 3:52 PM
Jim	7/2/2018 11:09 PM
Dutch McBride	7/2/2018 10:35 PM
Denise Hopkins	7/2/2018 9:26 PM
David Hopkins	7/2/2018 9:13 PM
Richard D (Dick) Vosler	7/2/2018 1:06 PM
Michael & Jennifer Larson	7/2/2018 9:30 AM

	Dennis Wiles	7/2/2018 9:25 AM
	Mike Lujan	7/2/2018 9:20 AM
	Pam quick	7/2/2018 9:11 AM
	Magen Seeley-Marotz	7/2/2018 9:06 AM
	Кету Jo & Mike Stephan	7/2/2018 9:02 AM
	Cody Foumier	7/2/2018 8:49 AM
	Judd Eifeafdt	7/2/2018 8:44 AM
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	David & Mara Funk	7/2/2018 8:35 AM
	Buddy Tenrant	7/2/2018 8:29 AM
	Dillion Ohat -Suncar	7/2/2018 8:24 AM
	Ellen Southwell	7/2/2018 7:40 AM
	Joyce Stone	7/2/2018 7:26 AM
	Rod Stone	7/2/2018 7:20 AM
	Chris Ryan	7/2/2018 7:16 AM
	Andy Vehar	7/2/2018 7:12 AM
	Dave Rose	772/2018 7:07 AM
	Barbara Boyd & Jim Boyd	7/2/2018 7:01 AM
	Mike Cowley	7/2/2018 6,58 AM
	Janine Ramage	7/2/2018 6:55 AM
	Jessie Parker	7/2/2018 6:53 AM
	Tim and Tammy Bauer	7/2/2018 6:24 AM
	Dennis Brunner	7/2/2018 5:46 AM
	Bill Pacheco	7/1/2018 10:03 PM
	Carl Voigtsberger	7/1/2018 8:03 PM
	Dale Bratton	7/1/2018 9:22 AM
	Te	7/1/2018 8:54 AM
	Caroline Mattson	7/1/2018 7:47 AM
	Charles Relz	7/1/2018 12:02 AM
	Michaela Bradshaw	6/30/2018 8:59 PM
66	Linda Schmidt	6/30/2018 5:06 PM
100	Susan Parkins	6/30/2018 B:19 AM
101	Matt	6/30/2018 7:09 AM
102	Karlee ramirez	6/29/2018 10:37 PM
103	Tim Woodard	6/29/2018 9:46 PM
104	Alicía Smith	6/29/2018 9:21 PM
105	Patrick	6/29/2018 9:10 PM
108	Kristin Nuss	6/29/2018 6:51 PM
107	Tim Walsh	6/29/2018 5:41 PM
108	Chad Doss	6/29/2018 5:09 PM
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7297 Monarch Drive	7/3/2018 9:13 PM	82	4505 El Camino Dr	7/1/2018 7:47 AM
7422 Monarch dr	773/2018 9:01 PM	68	7317 Aztec Dr.	7/1/2018 12:02 AM
10145 Crystal Mountain Rd.	7/3/2018 8:42 PM	84	3711 Blue Sage Rd	6/30/2018 8:59 PM
7203 Crested Butte Drive	7/3/2018 8:26 PM	82	7317 Darsey Rd	6/30/2018 5:06 PM
10501 Crystal Mountaib Rd	7/3/2018 6:30 PM	86	3531 Fire Side Dr	6/30/2018 8:19 AM
9327 Snow Crest Dr	7/3/2018 6:07 PM	87	3629 Rustic rd	6/30/2018 7:09 AM
7100 telluride dr	7/3/2018 5:03 PM	888	5914 e 13th st	6/29/2018 10:37 PM
7331 Keystone Dr	7/3/2018 4:37 PM	50	8200 Beckle RD	6/29/2018 9:46 PM
6740 Crested Butte Dr	7/3/2018 3:59 PM	06	8401 Hazer Court	6/29/2018 9:21 PM
9466 Sugarloaf Lane	7/3/2018 3:58 PM	₽6	Woods Landing Estates	6/29/2018 6:51 PM
9352 Crystal Mountsin Rd	7/3/2018 3.52 PM	35	9200 jordann lane	6/29/2018 5:41 PM
7907 Aztec Dr	7/2/2018 11:09 PM	93	9907 Crystal Mountain Road	6/29/2018 5:09 PM
6603 Riverbend Road	7/2/2018 10:35 PM	*	CITY/STATE/ZIP:	DATE
Dorsey Rd	7/2/2018 9.26 PM	-	Cheyenne 72009	7/12/2018 9:53 AM
10149 Crystal Mtn Rd	7/2/2018 1:06 PM	2	Cheyenne	7/12/2018 7:08 AM
5518 Blazing Star Rd	7/2/2018 9:30 AM	m	82001	7/11/2018 9:26 PM
6615 Wilderness Trail	7/2/2018 9:28 AM	4	Cheyenne, WY 82009	7/11/2018 8:21 PM
6535 E 4Mile Rd	7/2/2018 9:25 AM	w	Cheyenne, WY 82001	7/11/2018 7:58 PM
6751 Say Valley Rd	7/2/2018 9:20 AM	9	82009	7/11/2018 5:21 PM
3267 sandstone In	7/2/2018 9:11 AM	7	CHEYENNE	7/11/2018 4:15 PM
7099 Say Kally Rd	7/2/2018 9:D6 AM	œ	Cheyenne, WY 82001	7/11/2018 3:25 PM
9555 Crystal Mountain Rd	7/2/2018 9:02 AM	6	Cheyenne	7/11/2018 1:39 PM
3351 Belair Ave	7/2/2018 8:49 AM	10	Cheyenne Wyoming 82009	7/11/2018 12:28 PM
6770 Whistler Dr	7/2/2018 8:44 AM	11	сhвуеппе	7/11/2018 11:22 AM
6770 Whistler Dr	7/2/2018 8:41 AM	12	Cheyenne WY 82001	7/11/2018 10:57 AM
6515 Foxglove	7/2/2018 8:35 AM	13	Cheyenne	7/11/2018 10:54 AM
1580 Rio Glende Circle	7/2/2018 8:29 AM	14	Cheyenne wy 82001	7/11/2018 9:48 AM
1715 Fleishli Pkwy,	7/2/2018 8:24 AM	15	Cheyenne WY 82001	7/11/2018 9:11 AM
4011 Summitt Dr.	7/2/2018 7:26 AM	16	Chayerne, MY 82001	7/11/2018 8:45 AM
4011 Summit Dr	7/2/2018 7:20 AM	17	Chayenne	7/11/2018 8:44 AM
4501 Greenbull Ct	7/2/2018 7,16 AM	18	Cheyenne, WY 82001	7/11/2018 8:07 AM
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4608 Van Burenb Ave	77212018 7-01 AM	20	Cheyenne, WY 82001	7/11/2018 7:14 AM
5610 Iron Mtn Rd	772/2018 6:58 AM	21	Cheyenne, WY 82001	7/11/2018 6:51 AM
7119 Julia Rd	772/2018 5:55 AM	22	Cheyenne WY 82001	7/11/2018 6:42 AM
6744 Grace Rd	7/2/2018 6:53 AM	23	Cheyenne WY 82001	7/11/2018 5:51 AM
6809 Laramie st	7/2/2018 6:24 AM	24	Cheyenne, WY 82001	7/11/2018 3:28 AM
11755 Chief Twomoon Rd.	7/2/2018 5:46 AM	25	Cheyenne WY 82009	7/10/2018 6:00 PM
9131 James Cole Ct	7/1/2018 10:03 PM	26	Cheyenne, WY	7/10/2018 2:52 PM
11303 yellowhear rd	7/1/2018 8:03 PM	27	Cheyenne, Wyoming 82009	7/9/2018 9:47 PM

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307-214-5283	7/3/2018 3:58 PM		andy@frontieraccess.com	7/12/2018 9:53 AM
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307-772-0117	7/2/2018 11:09 PM	es	Raymanhollings@gmail.com	7/11/2018 9:26 PM
307-286-2315	7/2/2018 10:35 PM	4	Brendaoswlad@asdwy.com	7/11/2018 B:21 PM
635-7402 landline 421-6981 cell	7/2/2018 1:06 PM	រេវ	Alsajane521@hotmail.com	7/11/2018 7:24 PM
307-421-4005	7/2/2018 9:30 AM	9	Blka87@msn.com	7/11/2018 6:18 PM
307-287-0373	7/2/2018 9:28 AM	7	Kelly, archer@ymail.com	7/11/2018 5:21 PM
307-421-4110	7/2/2018 9:25 AM	80	skfermelia@gmail.com	7/11/2018 4:15 PM
307-630-3972	7/2/2018 9:20 AM	gr	kjgk4749@gmail.com	7/11/2018 3:21 PM
3076316748	7/2/2018 9:11 AM	10	brewerwilliam79@yahoo.com	7/11/2018 1:39 PM
307-421-5927	7/2/2018 9:06 AM	11	Johnnyoning77@gmall.com	7/11/2018 12:28 PM
510-326-3457	7/2/2018 9:02 AM	12	dwoodys@msn.com	7/11/2018 10:57 AM
307-630-2060	7/2/2018 8:49 AM	13	dramateacher78@gmail.com	7/11/2018 10:54 AM
307-320-5685	772/2018 8:44 AM	14	Ryan.harbeson@gmail.com	7/11/2018 10:01 AM
307-320-5685	7/2/2018 8:41 AM	15	Angel@wyoming.com	7/11/2018 9:48 AM
635-0495	7/2/2018 8:35 AM	. 16	mike.colgan71@yahoo.com	7/11/2018 9:11 AM
970-834-1036	7/2/2018 8:29 AM	17	tweetpea73@gmail.com	7/11/2018 8:45 AM
303-549-8002	7/2/2018 8:24 AM	18	Cleoizzy2@yahoo.com	7/11/2018 8:44 AM
634-6017	7/2/2018 7:26 AM	19	Fe1peter3.8@gmail.com	7/11/2018 8:07 AM
634-6017	7/2/2018 7:20 AM	20	rethablakely@yahoo.com	7/11/2018 7:17 AM
307-632-1665	7/2/2018 7:16 AM	21	gene_schumacher@msn.com	7/11/2018 7:14 AM
307-220-2740	7/2/2018 7:12 AM	22	lindsayk310@gmail.com	7/11/2018 6:51 AM
307-630-8965	7/2/2018 7:07 AM	23	sheljessbeth@yahoo.com	7/11/2018 6:42 AM
816-716-8722	7/2/2018 7:01 AM	24	mike.colgan71@yahoo.com	7/11/2018 5:51 AM
307-630-8559	772/2018 6:58 AM	25	wyo7011@yahoo.com	7/11/2018 3:28 AM
307-630-2667	7/2/2018 6:55 AM	28	Wilson bryanbrittany@gmail.com	7/10/2018 6:00 PM
3076388018	7/2/2018 6:24 AM	27	jasomusselljohnson@gmail.com	7/10/2018 2:52 PM
3076318883	7/2/2018 5:46 AM	28	ekpasmith@aol.com	7/10/2018 2:52 PM
3074339287	7/1/2018 8:03 PM	29	shawnbroad1@gmail.com	7/9/2018 9:47 PM
3076313448	7/1/2018 9:22 AM	30	Broylesg@msn.com	7/9/2018 9:11 PM
307-630-2385	7/1/2018 7:47 AM	31	Lkbwyo@gmail.com	7/9/2018 7:41 PM
307-630-7938	7/1/2018 12:02 AM	32	Lovegodiva30@gmail.com	7/9/2018 6:03 PM
3076401599	6/30/2018 8:59 PM	33	Mystyhaight@hotmail.com	7/9/2018 3:04 PM
307-634-6557	6/30/2018 8:19 AM	স	susie.havner@gmail.com	7/9/2018 11:55 AM
307-631-8545	6/29/2018 10:37 PM	35	duanewelte@sbcglobal.net	7/8/2018 8:05 PM
307-631-9167	6/29/2018 9:46 PM	36	Tiffanyg60@gmail.com	7/8/2018 4:31 PM
3077605681	6/29/2018 9:21 PM	37	Slarranime2@netzero.com	777/2018 10:24 PM

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murphyspleasants@gmail.com

ujanml1@holmail.com Pmmypain@gmail.com

healthyminds101@gmail.com

Dutchm31@hotmail.com

Cancelli1@yahoo.com

Wyobrewer@vcn.com

usa_eagle78@yahoo.com wyolarsons@hotmail.com 7/2/2018 8:41 AM 7/2/2018 8:35 AM

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buddy_tenrant@yahoo.com

jacedash@yahoo.com

rbigals01@aol.com

blboye@msn.com

dohrt@suncor.com

Marafunk70@gmail.com

77 73 74 74

cnfournier@hotmail.com

fsanta01@gmall.com fsanta01@gmail.com

nikerryjc@pacebll.net

seeleymj@hotmail.com

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Monica yarborough@gmail.com

Cyndi.henderson@ymail.com

anab_80@hotmail.com Sheri336@hotmail.com

Chywy@dreifi.com

SurveyMonkey

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

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amedina44@gmail.com

Maxminnick@msn.com

Spgirt@gmail.com

Wyomingskimom@gmail.com

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dennis.brunner@gmail.com

Snoslyd2@yahoo.com

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Candace.croswell@gmail.com

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kvosler8@gmail.com

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Q3 Please rate the Recommended Roadway Typical Section for Whitney Road at Beckle Road/ Storey Blvd. (Looking North) as shown.

DEFINITELY DO NOT TOTAL WEIGHTED LIKE AVERAGE 90% 100% 268 9,70% %02 ■ Definitely Like ■ Like ■ No Opinion ■ Do Not Like ■ Definitely Do Not Like Answered: 268 Skipped: 43 %09 20% 23.51% 63 DO NOT LIKE 40% 20% 30% 30,22% DEFINITELY LIKE NO LIKE OPINION 0% 10% 5.60% 30.97% 15 83 (no label)

(ho label)	5,60% 30,97% 30,22% 23,51% 9,70% 15 63 81 63 26	268 2,1	2,99
#	ADDITIONAL COMMENTS OR SUGGESTIONS?	DATE	
-	Make larger	7/12/2018 9:41 AM	
8	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30. There are numerous wrecks and close calls at these intersections. With the housing development and population growth these need to be addressed	7/12/2018 8:13 AM	
n	Needs a left turn lane separate of the flow of traffic	7/11/2018 8:01 PM	
4	Needs to be wider	7/11/2018 6:19 PM	
ιo	How is dive different than how it looks now?	7/11/2018 5:24 PM	
9	not much different than it currently is,	7/11/2018 1:21 PM	
7	Center tum fane is already needed	7/11/2018 11:00 AM	
60	Make it wider, Cheyanimals consistently drive 10 mph under the speed limit, a passing lane is a must.	7/11/2018 8:29 AM	
6	Needs to be wider between Hwy 30 and Dell Range? Actually the whole thing needs to be 4 lane.	7/11/2018 7:21 AM	
10	The roadway should be wider, Traffic will increase as the area continues to grow, More homes are being built and will create more congestion as time moves on	7/11/2018 3:29 AM	
Ε	Either widen lanes, or make two lanes both ways, also add bike paths, as their are a lot of joggers on Whitney Rd. And add street lights up and down Whitney road, and a way to slow down traffic	7/10/2018 2:55 PM	
12	Too narrow between vehicles	7/10/2018 2:52 PM	
13	No Area for Walking or Biking.	7/9/2018 2:51 PM	
14	no tum lanes. no walking or bike paths.	7/9/2018 12:09 PM	
15	Whitney does not need to be widened, you just need to finish roads that could intersect it, such as Four Mile and Storey	; 7/6/2018 11:38 PM	
5	Bicycle lanes!	7/5/2018 7:45 PM	
17	Profer to see a dedicated bike lane	7/6/2018 10:56 AM	

18	I would like to see a bike/walking lane.	7/5/2018 8:32 AM
19	Needs to be wider and have a turn bay	7/5/2018 7:53 AM
20	Wider	7/4/2018 9:10 AM
21	Not sure exactly what the question is. Is it asking if I like the current road or is the above picture suppose to be the "new" one, The pic looks like the current one to me and I don't like the current road for safety reasons.	7/3/2018 8:47 PM
22	Would love to have a center lane extending to the end of Whitney Rd to the north.	7/3/2018 6:09 PM
23	Needs sidewalk.	7/3/2018 4:00 PM
24	Would like to see it wider	7/3/2018 3:55 PM
25	I wish the road expansion with wider shoulders and bike lane would continue north as well,	7/3/2018 3:53 PM
26	needs to be paved, more space between north and south bound vehicles and safe placed to walk	7/2/2018 9:31 AM
27	Love	7/2/2018 9:28 AM
28	No Sidewalks or bike paths	7/2/2018 9:20 AM
59	I think their might as well be a bike lane or sidewalk all the way through Whitney.	7/2/2018 9:07 AM
30		7/2/2018 9:04 AM
31	Will this accommodate future extension to Iron Mountain to the North?	7/2/2018 8:38 AM
32	needs to be wider	7/2/2018 8:29 AM
33	I believe given the bicycle traffic a bike lane should be included,	7/2/2018 7:41 AM
34	Storey Blvd to Beckle Rd, does not exist too much private property involved.	7/2/2018 7:27 AM
35	Whitney Road is fine the way it is, this is not needed, a lot of money and headache for nothing,	7/2/2018 7:21 AM
36	4-lane road	772/2019 6:53 AM
37	Road needs to be widened	7/1/2018 10:41 PM
38	Isn't this how it is right now?	6/30/2018 8:21 AM
39	As population grows in the area, more and more people are running and walking dogs on the road. Someone is going to get killed if there is no foot path along the road.	6/29/2018 B.15 PM
40	Needs bicycle lanes	6/29/2018 5-12 PM
=	Pierre and the second of the s	Contraction of the last section of

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Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

Love the bicycle lane!!

7/6/2018 7:48 PM 7/6/2018 7:34 AM

7/2/2018 3:53 PM 7/2/2018 1:11 PM

should be the alignment on Whitney no of beckle also car keep as is possible pavement overlay no

Sidewalk and shoulder are excellent!

I think this is the best of the three choices

but need sidewalk on both sides

19 20 21 22

7/2/2018 9:31 AM 7/2/2018 9:20 AM 7/2/2018 9:09 AM 7/2/2018 7:42 AM 7/2/2018 7:22 AM 7/2/2018 6:54 AM

I don't know if a turning lane is necessary, but probably is if the development would be like Saddle

Pedestrian is a waste as no true country person walks anywhere. Landscape is a waste, causes drifts, causes visual obstructions. No need for bigger Rd, Too much traffic, Is this for people who live there or others to pass thu?

What is wrong with Whitney Rd, It is in the County most people ride horses not bikes,

23 24 25

26

Q4 Please rate the Recommended Typical Section for Whitney Road from Dell Range Blvd. to Beckle Road/ Storey Blvd (Looking North) as shown above.

6/30/2018 10:26 AM 6/29/2018 8:16 PM

6/29/2018 2:13 PM

Please punch through Storey, It would relieve so much pressure on Whitney and Del Range,

If reducing snow drifts is one of the goals, trees and other landscape defeat that purpose,

I like turn lanes but the sidewalk and the trees I don't.

One foot path should be adequate and should save a lot of money.

Needs a street light at the Intersection

28

32 33 32 33

6/30/2018 8:48 PM

Please add a bike lane on each side. This would benefit a lot of us in the area and give us a close

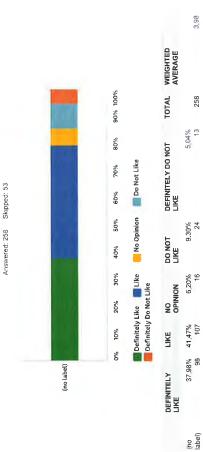
7/1/2018 8:46 PM

17/31

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Q5 Please rate the Typical Roadway Section for Whitney Road from U.S.

30 to Dell Range Blvd. (Looking North) as shown above.



-		DATE
#	ANY ADDITIONAL COMMENTS:	DAIE
_	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30, There are numerous wrecks and close calls at these intersections. With the housing development and population growth these need to be addressed	7/12/2018 8:14 AM
8	Needs less landscaping and both right and left lum lanes as well as a lane for thru traffic and sidewalks on both sides. It's set up close to this already and backs up severely during rush hours, especially without a traffic light.	7/11/2018 8:05 PM
.00	All lanes need to be 12 ' wide	7/11/2018 6:20 PM
4	A tum lane is not needed in my opinion. Waste of materials. The rest would be good.	7/11/2018 5:26 PM
10	Roundabout for the intersection	7/11/2018 1:00 PM
9	No need for bike lane	7/11/2018 11:24 AM
-	you're moving pedestrians and bikes back into the traffic lanes, these roads likely will have higher traffic pedes and othing its worse theat hyping to navigate around peus and bikes, downtown chayeme bike lanes on carey and pioneer are a ingitimate for everyone, even the bikes don't use them, and other are taveiling the woing direction anyway.	7/11/2018 10:51 AM
60	It's better. Road way to narrow.	7/11/2018 7:22 AM
6	This has become quite busy with traffic, both auto and pedestrian. With the anticipated continued boom in growth out here. I believe this should be as wide as possible.	7/11/2018 5:48 AM
10	Who is going to pay for side walk and frees? Who is going to be responsible for snow removal? Why do we need a side walk in the first place. Lived here 20 + years and no walks by here,	7/10/2018 12:25 PM
Ε	Who is going to pay for the sidewalk, maintain and scoop in the winter, Your sidewalk and landscaping will be on my property where you don't have rights to,	7/10/2018 10:31 AM
12	What about traffic lights at the intersection of Whitney and Dell Range?	7/4/2018 9:07 PM
13	Excellent accommodations for multiple user types!	7/4/2018 9:50 AM
14	Don't know the need for sidewalk expense.	7/3/2018 8:55 PM

6/30/2918 10:27 AM 6/30/2018 8:51 PM 7/2/2018 7:02 AM 7/3/2018 6:13 PM 7/3/2018 5.57 PM 7/2/2018 1;11 PM 7/2/2018 9:32 AM 7/2/2018 9:21 AM 7/2/2018 7:43 AM 7/2/2018 7:23 AM But add in right turn lane from Whitney to US 30, Would fove a traffic light at this intersection as it has gotten a fot busier and will only continue to get more traffic thru this intersection I'm not sure a tum lane is necessary for this short stretch, I drive it daily, most days I'm on it multiple times and have never thought that a turn lane is necessary, A wider road, bike land and sidewalk will be a nice feature though! Carry the bike lane north onto Whitney!! Landscaping the prairie wastes resources and landscaping roads causes drifts - obstructions. I don't like the bike path they should ride on the sidewalk. It is to dangerous for bikes Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2) You can make a bike path however they will ride their bike's on the road Pedestrian Section is too close to the road Needs a street light at the Intersection this is too much for county/city space but sidewalks are not detached 17 80 19 20 21 22 23 24 25 26 27 27 28 29 16

6/30/2018 9:36 AM 6/29/2018 8:16 PM 6/29/2018 5:15 PM 6/29/2018 3:10 PM 6/29/2018 2:13 PM

Please punch through Storey, It would relieve so much pressure on Whitney and Del Range.

Dual foot paths are excessive and costly.

Run this to Beckle!

Make travel lanes 12 feet wide

I dont want a sidewalk on my property

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20 / 31

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Q6 Recommended Alternative Whitney Road at U.S. 30: "Realign" Whitney Road at U.S. Highway 30 and remove U.S. 30 Service Road connection to Whitney Road.

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	DEFINITELY LIF	LIKE NO OPINION	DO NOT LIKE	DEFINITELY DO NOT LIKE	TOTAL	WEIGHTED AVERAGE	
(no label)	22.22% 36 56	36 51% 19.84% 92 50	11,51%	9 92% 25	252		3.50
31:	ANY ADDITIONAL COMMENTS?	OMMENTS?				DATE	
_	There needs to be tra numerous wrecks and population growth the	There needs to be traffic lights at dell range an numerous wrecks and dose calls at these inter population growth these need to be addressed	and Whitney and V tersections, With the	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30. There are numerous wrecks and dose calls at these intersections. With the housing development and population growth these need to be addressed	re are	7/12/2018 8:14 AM	
73	Do not remove service n when pulling trailers etc.	e road as it's a good all	emative to using L	Do not remove service road as it's a good alternative to using U.S.30 in the event of accident or when pulling traiters etc.		7/11/2018 8:10 PM	
60	I don't like the idea of our lights so you don't the light would help ke to Dell Range or Whit	don't like the idea of 3 lights in one mile (Christiansen, Dell Range bur lights so you don't have to stop at the all, Also the use of a green the light would help keep people from tuning so many lights, Pertra to Dell Range or Whitliey, but not have both of them open to US 30.	ristiansen, Dell Ra Also the use of a g so many lights. F of them open to Us	I don't like the idea of 3 lights in one mile (Christiansen, Dell Range and Whitney). We need to time our lights so you don't have to stop at the all. Also the use of a green turn arrow at the beginning of the light would help keep people from running so many lights. Perhaps the traffic could be diverted to Dell Range or Winliney, but not have both of them open to US 30.		7/11/2018 6:48 PM	
*	I don't think this is necessary	cessary				7/11/2018 5:27 PM	
wh .	The service road is im	nportant because of the	speed of Hwy 30	The service road is important because of the speed of Hwy 30 and the weather and ice in that area		7/11/2018 4:46 PM	
9	In need of a light at this intersection.	iis intersection.			15	7/11/2018 3:27 PM	
7	Not sure if a stop light is needed	t is needed				7/11/2018 12:35 PM	
80	This intersection need	ds something to help wi	th crossing and tur	This intersection needs something to help with crossing and turning, this is a grateful idea,		7/11/2018 11:09 AM	
on on	Unless if this redesign removes that rid render one and one-half vehicles in a b roads, the 12th street? sun valley rede reasons why I chose to sell my house i neighborhoods is very important to tho worse, people wish they never bought.	n removes that ridiculou raif vehicles in a turning / sun valley redesign y to sell my house in that y important to those when y important to those when rever bought.	is set of safety isla lane, then Hell no ears ago is an abs neighborhood, tra o live there, when	Unless if this redesign removes that idiculous set of safety islands on whitney / hwy 30 that now ender one and one-half vehicles in a turning lane, then Hell no, mpo and the city love to "offset" oscillates, the ?It is treet / sun valley redesign years ago is an absolute mistake, it was one of the easons why I chose to set my house in that neighborhood, traffic design into and out of registeriorables is very important to those who live there, when changes are made that make it worse, people wish they never bought.		7/11/2018 10:55 AM	
10	It would upset some pec the stop sign constanlly	beople but I think its nee	eded. People hauf	It would upset some people but I think its needed. People hauf buit down the service road and run the stop sign constantly.		7/11/2018 10:24 AM	
£	Don't put a light it will	Don't put a light it will absolutely kill traffic flow like the stop sign on ridge and storey	w like the stop sign	on ridge and storey		7/11/2018 10:09 AM	
12	Another light on a high	Another light on a highway? No thanks. It really doesn't get that much traffic yet	ally doesn't get tha	t much traffic yet.		7/11/2018 9:46 AM	

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12	Additional Institution 11530 is needed. High spands you was a manufactured from the second se	7/14/2019 P-47 ANA
0	Auditional trainic courtin on USSO is needed, migh speeds are very confinon and crashes frequent	7/11/2018 8:47 AIM
4	While I like how a traffic light will take the Cheyaninal's questionable decision making out of the equation, I do not like the idea of on in the middle of highway 30, This town times traffic lights in the most idiotic way so a driver will get stopped by each one, no matter driving style.	7/11/2018 8:31 AM
20	Stop light is needed.	7/11/2018 7:24 AM
9	Why a stoplight? There is not that Mucj traffic there and putting stop lights on a 55mph road seems like it's just going to slow down traffic unnecessarily.	7/11/2018 7:23 AM
17	Get that stoplight in there ASAP!	7/11/2018 5:49 AM
8	We absolutely need a traffic light here, Many people will wave through oncoming traffic to be courteous. The problem with that is it treates a disruption of the traffic flow. There have been several accidents here that could've been a lot worse, Contunately, these crashes have mostly been minor injuries. I'm not a fan of the realignment on Whittey north of Hwy 30, but I'll take it if we get a traffic light. There will be lots of slide offs in the winter.	7/11/2018 3:33 AM
6)	No sure what this is trying to do	7/10/2018 9:07 PM
20	This needs to remain as is, Does not make any since to change it,	7/10/2018 12:25 PM
21	The service road is a pretty active road with businesses, How would those businesses have access to their property, Hinesley Road was not designed to have that traffic.	7/10/2018 10:33 AM
22	I think a traffic light would be better placed on the dell range side	7/8/2018 4:37 PM
23	Putting a traffic light off the hill will be challenging for those hauling trailers,	778/2018 7:36 AM
24	Adding a stop light on a 55mph highway seems very counter productive. But would be much better than another round about! Removing access to the service road from Whitney road is the opposite of what is bould happen. Instead remove the access from the highway 30 and service road intersection if that would really help. That is a low traffic road portion of this equation and would be best served toft alone.	7/5/2018 12:44 AM
25	No stop light. Stop signs on whitney	7/4/2018 9:12 AM
26	With a traffic light!	7/3/2018 9:22 PM
27	Why does anything need to he done here? Provide feedback please	7/2/2018 11:09 PM
28	needs to be done now!!!	7/2/2018 9:32 AM
29	So Needed, Thank You!	7/2/2018 9:28 AM
30	need free right lum lane on Southbound Whilney Rd. to west bound US-30	7/2/2018 9:22 AM
34	Agree with stoplight. What would be the reason to remove the service road access? I think this is a good choice.	7/2/2018 9:10 AM
32	пеед тоге	7/2/2018 8:30 AM
33	Why is all this necessary." Fix the roads that have problems now! Isn't this all County?	7/2/2018 7:28 AM
34	Fix the roads we have Dell Range east is in need of repair, keep the service road, in the future it will probably be needed,	772/2018 7:24 AM
35	As a business owner of Big Al's focated on 6526 HWY 30 the removal of access at Whitney and the Service Rd is a big concern. We receive 3-5 Tractor trailer deliveries per week that will have problems with the dead on Service Rd. Please contact me anytime. Andy Vehar 304-220-2740 Big Al's Auto 307-637-8955	7/2/2018 7:15 AM
36	Suggest a one way East Bound on 30 Service Road from Whitney to connection at Hwy 30 to accommodate Iruck deliveries. Also Hinesley to Whitney Alignment needs to be looked at as Southbound Whitney traffic is hard to see.	7/2/2018 7:09 AM
37	I love the light because it will slow down most of the traffic. It would be nice to have it traffic controlled not timed control.	7/2/2018 7:03 AM
38	I like that the intersection will be closer to being perpendicular. Elimination of service road connection should help tremendously,	772/2018 6:59 AM
20	Not sure about removal of service road	7/1/2018 10.44 PAR

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40	This needs to happen.	7/1/2018 12:02 AM
1	is a noundabout feasible here? I understand there's a bit of larger fruck and trailer traffic but let's make this as efficient as possible. I'm not sure adding a traffic light is the best option. I have never had to wait more than a minute to cross the road.	6/30/2018 8:53 PM
42	This is such a dangerous intersection!! Please put a street light here!	6/30/2018 10:28 AM
43	We absolutely need a traffic light above all else at this intersection. It has grown to be an extremely dangerous area over the last three years we have lived here. Those driving highway 30 actually appear to speed up occasionally when individuals are trying to cross on white wy. It's out of control.	6/30/2018 7:12 AM
4	Traffic control is critical. It has become a real hazard at rush-hour and people shooting the gap to cross Highway 30 on Whitney.	6/29/2018 S.21 PM
45	Eliminate the islands and you might have a useful option	6/29/2018 8:09 PM
46	Please punch through Storey, It would relieve so much pressure on Whitney and Del Range.	6/29/2018 2:14 PM

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Q7 Recommended Alternative Whitney Road at Dell Range Blvd.: Single Lane Roundabout.

Answered: 249 Skipped: 62



	3.01		AM	AM	PM .	PM	PM s	PM 6	PIM :	PM s	MA 1	SE PM	1 AM	JE AM	55 AM	29 AM	39 AM
WEIGHTED		DATE	7/12/2018 B:15 AM	7/12/2018 B:01 AM	7/11/2018 9:10 PM	7/11/2018 8:11 PM	7/11/2018 6:48 PM	7/11/2018 5:29 PM	7/11/2018 3:25 PM	7/11/2018 1:28 PM	7/11/2018 1:04 PM	7/11/2018 12:36 PM	7/11/2018 11:11 AM	7/11/2018 11:06 AM	7/11/2018 10:55 AM	7/11/2018 10:29 AM	7/11/2018 10:09 AM
DEFINITELY LIKE NO DO NOT DEFINITELY DO NOT TOTAL LIKE LIKE	22.49% 26.91% 5.22% 20.08% 25.30% 56 67 13 50 63 249	ANY ADDITIONAL COMMENTS?	This would slow the traffic and control traffic flow	Why?! What would this help solve? Why is it necessary?	Make It a controlled intersection and expand Del Range from college to US 30	Would greatly slow down traffic on US 30 but would help the intersection flow better	Better than a light, but need to take into account large trailers, etc as was discussed in the meeting. Definitely one lane only.	Why does Whitney veer off to the west? I think it's necessary during busy times and as you build nore houses.	I suggest a 4 way stop like on Ridge and Story. Also need a street light there it is really dark and and can't the the turn from Dell Range on to Whitney going south to US 30.	Not a good idea especially in the winter coming south off whitneyway to slick coming down the hill you will see more accidents not less	Why signal at us 30 and roundabout at Del Range?	Not needed	People in this town are terrible at roundabouts. I've seen too many accidents at converse and pershing.	No reason for a round about in non complex intersection. This area that is going to see fast increased growth and traffic. Put a traffic light there and be done with it. Works now and when it gets busier in the future	double down on the hell no.	The drivers on Del Range are already going 45 mpt, most would not slow down and I believe it would cause accidents. If they widened Del Range to include two turn lanes, both right and left at this intersection, I believe it would help.	Ruins traffic flow same at converse and Pershing
	(no label)	*	_	2	n	4	ıo.	ø	7	80	6	10	=	12	13	4	15

16	No one knows how to use a roundabout in this city as it is.	7/11/2018 9:47 AM
17	Roundabouts only work in civilized areas, Cheyanimals have the belief that when one enters a roundabout, they enter a time warp to a new dimension,	7/11/2018 8:33 AM
8	Should make a double for expansion of dell range as it is congested as well	7/11/2018 7:01 AM
19	We need lighting here as well, I wonder whether a traffic light would be better than a roundabout with for people approaching at 45 miles an hour.	7/11/2018 5:51 AM
20	I'll take the roundabout if it is well fit. Again, there have ben many accidents at this intersection as well, it's very difficult to see the turn from Dell Range on the southbound Whitney in the dark. I usually look for the single reflector pole and then slow down, We definitely need more lighting here.	7/11/2018 3:35 AM
21	Hard to negotiate a roundabout with a trailer, there are a lot of trailers being pulled. Need a traffic light.	7/10/2018 2:58 PM
22	If is big enough for large motorhomes & Towvehicle	7/10/2018 2:54 PM
23	I think a stop light would be a much better solution.	7/10/2018 12:25 PM
	You need to sit and watch traffic in the mornings and in the evenings to know that this is not a good solution. Along with the new houses at Writney Ranch you will increase the amount of traffic accidents in the area, Also with the amount of traffic I think this will not work.	7/10/2018 10:38 AM
	1) With today's stop light technology, road sensors and such signal lights can be programmed to delay changing or quickly thange depending upon taffic coming and aging during busiest times of the day, 2) After talking to someone who ran the intersection, lighting and a traffic signal would have helped in recognizing that there was an intersection there. 3) Culting back on bushes on 4512 Winthings will also help reduce accidents and intersection there. 3) Culting back on bushes on 4512 Winthings will also help reduce accidents and intersection there. 3) Culting back on bushes on 4512 Winthings will also help reduce accidents and cinceases visability. 4) A Traffic Light will work better for young and aged divers and those win have large travel traflers and 5th wheel traflers (A Draft is a must). 6) Important to keep Wintiney straight as possible to not slow down the flow of increased traffic (straight definetely enhances visability, 7). Whitney should have a 5% grade for biopidiss, walkers and wheelcharies sepecially since commercial buildings will be placed on property from Whitney along DeRlange, 8) Do not place a park between Whitney and the expanded 400 homes, just asking for trouble with Kids crossing the road to get to park or walkway, someone will get ran over, 9) it will be much better in the long run to redo natural gas and oil line on existing path of Whitney, keeping Whitney straight, enhancing visability and lessoning the chances of children getting but consisting path of Whitney, keeping the road to get to a park or walkway, 10) Whitney should have all the utilities including fiber optic lines run for further expansion of lechnology.	7/9/2018 3:24 PM
	i do not like, people drive too fast down whitney to approach a round about, needs to be a light, I do not like the road being closed that goes to foxglove, chickadee and buttecup, why can't there still be a road to access these three stretets only, then after butterup be a culdesse, then bring in a new road from dell range to storeybeckle, this would also alleviate traffic and the number of cars on whitney and the new whitney road, closed different access.	7/9/2018 12:14 PM
	Traffic speeds need to be reduced for this option to be viable	7/8/2018 4:38 PM
	Please post a picture of the rest of this ideaif you shift Whitney to the west, how far west and when does it go straight north again?	7/6/2018 11:41 PM
	I like the roundabout idea as it slows traffic during congested periods.	7/6/2018 10:57 AM
	Make plenty wide for trailers	7/6/2018 7:37 AM
	Should keep people from going 55 past my yard with my kids in the yard	7/5/2018 11:26 AM
	Too dangerous considering the hill on the east	7/5/2018 7:55 AM
	Please just use a stop light!! Round abouts serve a good purpose in low speed residential areas, and where more that 4 directions of traffic meet,	7/5/2018 12:46 AM
	Awesome idea. Slowing drivers down off the southbound Hill on Whitney would be a great safety improvement as well	7/4/2018 9:52 AM
35	Roundabout or a traffic light	7/3/2018 9:22 PM
36	No roundahouts!! Diesse do a fraffic signal. We have enough roundahouts that people do not know	7/2/2010 0:30 0:40

37	This is a good alternative option and may reduce commercial traffic thoroughfare and keeping them to US 30 to Pershing / College Dr_{κ}	7/3/2018 6:18 PM
38	Single fane ok or needs traffic signal,	7/3/2018 5:59 PM
39	Hove single lane roundabouts and find them extremely effective as long as they are large enough to accomodate long truck/camper combinations.	7/3/2018 3:57 PM
40	needs to be done even sooner!!!	7/2/2018 9:32 AM
41	Another useless roundabout Several accidents occur each month in town - not needed	7/2/2018 9:27 AM
42	But need to have overhead street lights, to dark at night at this intersection.	7/2/2018 9:22 AM
43	I am very concerned about the roundabout during the winter at the bottom of a very steep hill. Also having a single lane roundabout seems like it would back up traffic quite a bit dew Dell Range, Is there consideration of Dell Range being widened to 4-lanes at anytime?	7/2/2018 9:12 AM
4	Cheap way of not puting in a light, which would be better at the bottom of a hill, To many assumptions with this plan - assumes everyone will slow down and yield, In the long run a light at what becomes a heavily used intersection will be cheaper than the liability of poor roadway design.	7/2/2018 9:04 AM
45	Would like to see RT turn lane that does not use the roundabout on N, Whitney to D,R, and Del range to S. Whitney road to remove a significant amount of traffic from the circle at peak use times,	7/2/2018 8:46 AM
46	Would like to see Rt turn lane that does not use the Roundabout on N. Whitney to D.R. and Del Range to S. Whitney road to remove a significant amount of traffic from the circle at peak use times.	7/2/2018 8:42 AM
47	Actually if you get it in place by the time I head home from here tonight, I will be delighted, Reduce speed to 40mphn on HWY 30 ASAP from Cheyenne Hills church to Whispering Chase	7/2/2018 8:37 AM
89	Definitely Do Not Like- Semi Traffic alone would destroy this! Definitely Like - if it is built to handle this kind of traffic!	7/2/2018 8:32 AM
49	This whole project should look the future as this will result in a large traffic increase as more travelers find they can circumvent town from 88 via Powderhouse (via N Star) to fron to Whitney. With traffic already out of control this likely should be 44anes or at lest one fulltime deputly should be assigned.	7/2/2018 7:54 AM
20	There is not need!	7/2/2018 7:28 AM
51	Should move intersection to the east to accommodate a double fane both east and west bound DelRange as extra room for truck traffic will be needed.	7/2/2018 7:10 AM
52	It would help to have a flashing light so people can see the roundabout before they actually get to the roundabout	7/2/2018 7:04 AM
53	Definitely need roadway lighting.	7/2/2018 7:00 AM
54	No on a roundabout!	7/1/2018 9:24 AM
25	No roundabout! Please No!!!!! These are not effective traffic control measures in Cheyenne, If you do anything, please do a four way stop or a traffic signal. A roundabout would be detrimental to the traffic flow and area.	7/1/2018 12:04 AM
99	Yes!!!!	6/30/2018 8:54 PM
57	Putiting in a roundabout where there isn't a problem is a waste of money in construction costs as well as snown maintenance. Why screw things up with an unnecessary roundabout? Does Chayerne have to follow Colorado's stupfd ideas just because we are forced to have a Metropolitan Planning Commission?	629/2018 8:12 PM
28	Roundabouts are dumb, amd useless at that specific section of road, Just put a stoplight	6/29/2018 3:12 PM
23	I have witnessed many people RUN the stop sign there, This elimnates that problem greatly,	6/29/2018 2:40 PM
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Q8 Do you have any additional ideas, information, or other comments that you would like to provide at this time?

Answered 76 Skipped: 235

RESPONSES	
Something needs to be done for both highway 30/Whitney and dellrange/Whitney intersections before serious injuries start occurring from the growing traffic and pedestrian traffic	7/12/2018 8:18 AM
Light at Whitney and US30	7/12/2018 7:11 AM
Make the intersections at both Del Range and US 30; 4 lane (with turn lane) E-W and Whitney 2 Lane (with turn lane) N-S and make them traditional controlled intersections.	7/11/2018 9:12 PM
Keep the country feel, do not make this a thorough Fante in a city	7/11/2018 8:41 PM
Widen Whitney so it has right and left turn lanes for all lanes and sides of US 30	7/11/2018 8:12 PM
I do not like the idea of Whitney going through the neighborhood to the west, I would rather keep tgessteep grade than have to drive through a neighborhood, I don't link the spead needs to decrease. 45 is reasonable, I think the reason people want to flower it is because people drive 5-60, I would prefer the proposed neighborhood at deli range and Whitney traffic dump into Dell Range rather than Whitney. This would lead to less traffic on the roundabout. With the increased traffic from Wood's landing thom Mourtain and possible Storey throughway, there will already be a marked increase in traffic.	7/11/2018 6:53 PM
A sheriif on the road on occasion would be nice to see, People drive 60 MPH at times on the road, I know that the sherriif's Office is not doing the HIVE like CPD. but it sure would be great, You also need to keep in mind that those of us on North Whitney would not have any way to get to Dell Range if you take the entire road down (for example Sundance loop). We are land locked into Whitney, And not last the only connection is powerthouse off iron min and that takes us way out of our way. I know we are one household, but just food for thought.	7/11/2018 5:32 PM
The intersection at whitney and dell range needs controlled but you need to consider the winter driving conditions. The hill north up whitney is take a skating rink. Add a round a bout and you are going to have traffic backed up daily.	7/11/2018 1:30 PM
Get the project out to bid and started before the costs go up	7/11/2018 11:25 AM
Think about having a timed traffic light at 300Mhitney and then a busy roundabout right after at Dell Range. The congestion would back up and impact 300Mhitney almost immediately after its built.	7/11/2018 11:11 AM
Where can I find out what is going on for US39 and Dell Range? Starrwy@aol.com	7/11/2018 11:07 AM
We can be guaranteed that if the public don't like something then that is the route the planners take under the guise of safety and concern for its ditzens. The 12th street / sun valley drive worse and most criticized option was the one picked.	7/11/2018 10:57 AM
I believe if Whitney Road between Del Range and US30 was wider it would cause less congestion. The malblooks are super does by the street and when the malman it celevaning mail to them it cause people to aserve into the opposite lane to avoid him. This results in everyone in that lane having to slam on their brakes and has caused a least one accident I'm aware of.	7/11/2018 10:33 AM
Connect storey to beckle and run 4 lane two west two east on dell range to 30	7/11/2018 10:10 AM
Can we please just get the damn road fixed so it doesn't feel like I'm driving over railroad tracks the whole time? You guys have all these massive plans that serve no purpose at this time and fail to realize how homble the road stelf is. Fix the small shift first and show you actually care about the road and residents before shutting it down to add more of a waste and more stuff that will need repair, but doesn't get it.	7/11/2016 9:49 AM
With the residential now mixed with commercial traffic restrictions need to be added. No semi	7/11/2018 8:49 AM

SurveyMonkey 7/5/2018 11:27 AM 7/11/2018 8:34 AM 7/11/2018 7:34 AM 7/10/2018 2:57 PM 7/9/2018 12:15 PM 7/8/2018 10:12 PM 7/6/2018 11:41 PM 7/11/2018 8:06 AM 7/11/2018 7:50 AM 7/11/2018 7:23 AM 7/11/2018 3:37 AM 7/10/2018 3:00 PM 7/9/2018 9:18 PM 7/9/2018 3:07 PM 7/8/2018 8:07 PM 7/8/2018 4:40 PM 7/8/2018 8:07 AM 7/5/2018 6.58 PM 7/9/2018 8:23 PM 7/9/2018 3:28 PM 7/7/2018 7:58 AM 7/5/2018 1:22 PM 7/9/2018 9:52 PM White these all seem like line ideas on paper, one must remember this construction is taking place in Chepsymer, W.F., The Chepsyminal is sugably the worst driver on the planet, most likely due to limited brain capacity and sense of entillement. Whitney and 30? On south Greeley, as you head north, there is a flashing sign to warnifulorm of the light inext to me diseal. would love to see that asy vob head (coming from the area of 30 with Neese and Cristensen road). As a parent of a soon to be leen driver, I would love to also see rivets (wording?) in the road as you approach the light just to add extra safety. I'm thinking of those I feel that a roundabout at the intersection of Whitney and Dell Range would be a very bad idea, I would rather see a traffic signal instead, need different access points to fox run and other areas, not just one road, leave whitney two lanes would like to see the road widened and some landscaping but in. When I go to the Deriver subunds like in a real man and an are land with several lined with beautiful trees and landscaping. Here in Cheypmen that observe the appear All we get is some prainle grass and weeds. The City and County can do more to creases in the road along a highway shoulder that alert you lifty by ug to far over, Some towns put them in the lane as you approach major intersections. This will be a high speed intersection and I worry about the unavoidable running of the light. What all can we do to minimize that? Thanks aesthetics of the area. What they need to do is quit pushing their pet projects and do Make whitney road one speed limit instead of going back and forth between two different speeds. The intersections at Whitney and U.S.highway 30 and the intersection at Whitney and Del Range Please install a light at the intersection of US 30 and Whitney. I can t recall how many times I've Mainly feel the problem is not wide enough road between us 30 and Dell range on whitney, and Need to definitely wide the lanes of Whitney rd, slow down traffic, add street lights, and walkingfolke paths. Bottom of Whitney hill needs a traffic light. Punch more roads through to the Will there be flashing signs and or rivets in the road to just add extra visibility to the stop light at The intersections at US 30 & Whitney Road and Whitney Road & Dell Range need something devote to their need fronty temporality, these 2 intersections are a Nightmare! Also, on your overhead shot of houses or hospitove, the house with the long driveway to A RV garage is our property your have 3 other peoples names by it. are extremely congested and dangerous. I have seen several accidents in both of these intersections. I think the only real solution is to add stop lights! Especially if you are planning in A traffic light is needed at Whitney and highway 30. It is so dangerous. Lower speed limit on the traffic at those intersections, Is it not possible to put in a roundabout along the us30 Creating a pass thru from Storey through College would help alleviate a lot of traffic on Move Dell range south in the right of way planned not north into my yard as proposed See prior comments regarding Whitney and Del Range Intersection and going North. Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2) for the first three streets, at a second road to approach to beckle/storey Finish the connection between the new storey and the old summit drive Cul d sac Dell Range and make all traffic drop down to US 30 at a light, I have received comments lately which indicate a desire for a stop fight. Widen the stretch of Whitney road between highway 30 and dell range. would like to see Whitney connected to College via Storey/Beckle. nearly gotten hit by a people who turn at the same time that I do. some stuff that will actually be enjoyed by more of the citizens. Continue the road improvements beyond beckle rd Traffic light at Whitney and dell range Connect Whitney and Storey Blvd. adding turning lanes! 17 00 19 25 26 27 28 29 30 3, 32 33 34 35 36 38 39 20 21 22 23 24

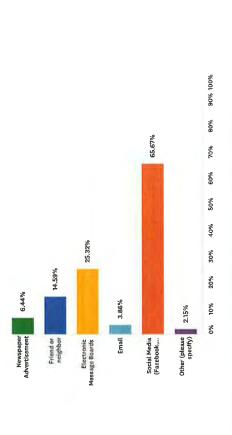
Whitne	Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)	SurveyMonkey
40	I think the county should look at connecting some of the roads that would make it easier to get around the area. Like take Whitiney all the way throught to &C connect Storay, connect Four Mile, connect Riding Club, connect Converse and connect Powderhouse, I believe that by connecting these roads it would cust down on teaffic and congestion in several other locations.	7/5/2018 8:41 AM
+1	A fair amount of traffic could be diverted to Pershing if the quality of that road was improved, which should be in the plan along with the Christiansen overpass project. Once that artery is open, less traffic will be using these 2 intersections, and this will likely be irrelevant,	7/5/2018 12:49 AM
42	Please no roundabout.	7/4/2018 6:22 PM
43	Thank you for collecting data from the community. This is the second survey I've completed and appractate being able to be involved, Great public involvement!	7/4/2018 9:53 AM
44	I think a stop light is better then a round about due to the commercial traffic and those of us that haul trailers and horse trailers down that corridor, seems more like a nuisance with a round about	7/4/2018 8:48 AM
45	Would like to see Storey connected	7/3/2018 9:23 PM
46	No roundabouts, they are ridiculous!	7/3/2018 8:57 PM
47	Keep in mind that the big hill on Whitney just north of Dell Range is tricky for going up and corning down (traveling south) in the winter.	7/3/2018 8:53 PM
48	Increase speed limit on whitney, Del range and perishing have higher limits	7/3/2018 7:48 PM
49	Flare out intersection from Whitney Rd to residential streets for easier right turns, Especially at Four Mile Rd.	7/3/2018 6:20 PM
20	I think you guys are doing a great job collecting information and presenting it back to community. It's unfortunate that the city did such a poor job designing the roundabout on Pershing as it has given a lot of resopte a bad taste in regards to them. If done right this corridor will be a great section, moving forward into the next couple of decades.	7/3/2018 4:01 PM
12	Leave the road alone!! You're going to ruin people's properties and livelyhoods who have lived in these areas for decades, City planners and engineers are too lazy to actually plan and execute a proper design that will not croade any issues for the residents around this road. Maybe, just maybe, instead of creating issues with a road that is fine, fix problems that need dealt with right now. Just a thought,	7/3/2018 1:49 PM
52	Prefer traffic light over roundabout.	7/3/2018 9:50 AM
53	Raise the speed limit from Del Range to Iron Mountain on Whitney Rd.	7/2/2018 11:10 PM
54	Safety lighting near intersections	7/2/2018 9:30 PM
55	Street lighting at Dell Range and Whitney.	7/2/2018 9:21 PM
56	Finish Storey Blvd form Callege Drive to Whitney Rd. before starting construction on Whitney Rd, so traffic has another way in and out of Whitney Rd.	7/2/2018 9:23 AM
22	If moving/improving Whitney is years down the road, I am very concerned about the roundabout being placed before the hill on Whitney is reduced, This would be very dangerous during the winter.	7/2/2018 9:14 AM
28	Our family is concerned about the well-being of the prairie dog and badger population currently inhabiting the Whitney Rd comfort, is there a plan in place to humanethy relocate what could be considered an established ecosystem? Presumably, Fox glove, chickedee, and Buttercup roads will continue on info this ecosystem once construction begins. Again, is anything being done to protest such a valuable speces who according to the prairie dog caldition, currently only occupy one percent of their original range? Prairie dogs ensure seed diversity of the prairie and grasslands upon which we reside, simply ignoring their value and destroying their habitss will push enangreed species like the Blank Footed Ferret into extinction, Can we relocate to public Lands? Perhaps Parks and Rec can help with green space or nature persevere so that our children will have nature to appearate in the future.	7/2/2018 8:59 AM
es	additional access for Storie -4-mille- Iron Mt. will relieve much of traffic on Whilney	7/2/2018 8:46 AM
9	1, Speed Bumps 2. Greatly increased law enforcement patrols, 3, Open up this route to oil traffic,	7/2/2018 7:55 AM
19	Instead of moving Whitney Rd, make them move their pipeline, A million dollars to move on is worth it.	7/2/2018 7:25 AM

62	Should put proposed plans out for review before final meetings, the changes that have been put in since the last meeting are extreme,	7/2/2018 7:10 AM
63	Connect story Blvd	7/2/2018 1:09 AM
64	A roundabout at Whitney and US 30 might work also, although east bound traffic would lose momentum for the hill which could be difficult when icy	7/1/2018 10:46 PM
92	Uniformity is key. And roundabouts are a great option versus traffic lights,	6/30/2018 B:55 PM
99	I especially like the paving of Storey and connecting over to Whitney.	6/30/2018 5:12 PM
29	Why do we keep taking advice from people who don't live in the area, No one likes round abouts so stop putting them in my city, Areas around these roundabouts suffer because of them.	6/30/2018 12:47 PM
68	Anything that would stow traffic at the Whitney dell range and Whitney highway30 intersections would be an improvement, Lights or round about. The speed of drivers and the confusion of who is turning onto those two major roads is nuts	6/30/2018 7:13 AM
69	4 lane all the way! North, south, east, and west! Do it right the first time and don't worry about "fixing" this issue again in 5 years!	6/29/2018 10:12 PM
0.2	Repair the roads that need it instead of spending lax dollars on dumb ideas like more roundabouts, For instance Dell Range from College to Whitney could definitely stand resurfacing, as could East Pershing from Christianson over the railroad ro the east,	6/29/2018 8:16 PM
71	Thank you!	6/29/2018 7:24 PM
22	There has been talk of completing the connection of Storey Blvd (between Summit and Beckle) once the fand to the south it so developed, Cornecting Storey now instand of televal light excludes an alternative route and decrease traffic at the Whitney and Dell Rarge intersection. Widening Whitney without adding extra travel lanes does nothing to alleviate traffic congestion, and as a landowner on Whitney I am opposed to that idea, Instead, provide an alternative route by completing Storey that not only essess congestion but also provides better fire and emergency access to subdivisions off of Whitney.	6/29/2018 7:05 PM
73	Bitycle fanes! Please!!	6/29/2018 5:17 PM
74	It would be great if the sidewalk went all the way up Whitney.	6/29/2018 4:13 PM
75	Roundabouts are dumb and you're pissing off a lot of us that afready live on this road, espcially those of us who live directly off Whitney	6/29/2018 3:13 PM
92	Please autoch through Storey, it would relieve so much pressure on Whitney and Del Range	AND ATA DAY

SurveyMonkey

Answered: 233 Skipped: 78

Q9 How did you find out about this meeting (Please check all that apply)?

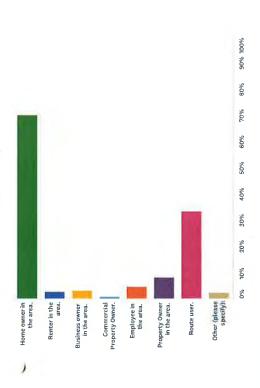


ANSWER CHOICES				RESPONSES	
Newspaper Advertisement (1)				6 44%	15
Friend or neighbor (2)				14.59%	\$
Electronic Message Boards (3)				25.32%	59
Email (4)				3 86%	6
Social Media (Facebook, etc.) (5)				65.67%	153
Other (please specify) (6)				2.15%	20
Total Respondents: 233					
BASIC STATISTICS					
Minimum 1.00	Maximum 6.00	Median 5.00	Mean 3.97	Standard Deviation 1.35	

SurveyMonkey

Q1 Which of the following best describes you (Please mark all that apply)?

Answered: 407 Skipped: 0



Property Owner in the area. 2.70% 21 Residence in the area. 2.70% 11 Business owner in the area. 3.19% 13 Commercial Property Owner. 0.74% 3 Employee in the area. 4.67% 19 Property Owner in the area. 8.11% 33 Reute user. 33.42% 136 Other (please specify): 2.21% 9 # OTHER (PLEASE SPECIFY): DATE	ANSWER CHOICES	RESPONSES	
2.70% where, 3.19% where, 4.67% 13.42% 11.% 2.21% DATE	ne owner in the area.	70.27%	286
3.19% 0.74% 0.74% 1.67%	Renter in the area.	2.70%	11
Wriet. 4.67% 4.67% 8.11% 3.342% 13 2.21% PLEASE SPECIFY): DATE	iness owner in the area.	3,19%	13
4.67% 11 3 3.3.42% 13	umercial Property Owner.	0.74%	3
8-11% 8-11% 33-42% 1.	playee in the area.	4.67%	19
33.42% 1 2.21% PLEASE SPECIFY): DATE	perty Owner in the area.	811%	33
2.21% (PLEASE SPECIFY):	Route user,	33.42%	136
	Other (please specify):	2.21%	6
	Il Respondents: 407		
	OTHER (PLEASE SPECIFY):	DATE	

DATE	7/13/2018 8:09 PM	7/12/2018 6:20 PM	7/10/2018 9:53 PM	7/6/2018 10:56 AM
OTHER (PLEASE SPECIFY):	Customer of business in the area	First Responder in area	Former firefighter in the area	City resident who drives through the area
41:	-	2	62	4

Whitne	Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)	SurveyMonkey
un.	w	7/3/2018 3:59 PM
9	Just interested	7/2/2018 12:59 PM
7	Concered Community Member	7/2/2018 8:49 AM
100	Pipeline -Suncor	7/2/2018 8:24 AM
· Oi	Concerned cilizen	7/2/2018 1:06 AM

SurveyMonkey

Q2 Please help us keep you informed by giving us the way to contact you (Optional).

Answered: 133 Skipped: 274

ANSWER CHOICES		
Name:	%66 96	129
Address:	81.95%	109
City/State/ZIP:	69.92%	93
Phone:	67 67%	06
Email:	86 47%	115
# NAME:		DATE
Brian J Heath		7/16/2018 12:44 PM
2 Elizabeth Schock		7/16/2018 8:28 AM
3 Jason		7/15/2018 8:15 PM
4 Shawna Ward		7/15/2018 6:06 PM
5 lessica Taken		7/15/2018 3:43 PM
6 Matthew Shovetski		7/15/2018 2:50 PM
7 Dan Sutton		7/15/2018 2:48 PM
8 Stari		7/15/2018 2:39 PM
9 Rocky		7/15/2018 2:24 PM
10 Nicholas leuer		7/15/2018 11:42 AM
11 Leif Anderson		7/15/2018 5:54 AM
12 Richard		7/14/2018 9:40 PM
13 Doug Slames		7/13/2018 8:51 PM
14 Kevin Bell		77372018 B:09 PM
15 Robert Mauch		7/13/2018 3:15 PM
16 SAndra Smith		7/13/2018 2:45 PM
7 Jeannie Spraker/Big Al' Auto & Exhausl	N' Auto & Exhaust	7/13/2018 10:21 AM
18 Chad Federer		7/13/2018 5.26 AM
19 Scott Maddison		7/12/2018 6:20 PM
20 Erin Shackley		7/12/2018 1:29 PM
21 Andy MCMAHON		7/12/2018 9:53 AM
22 Michelle Bain		7/12/2018 7:08 AM
23 Hollingshead		7/11/2018 9:26 PM
24 Brenda oswald		7/11/2018 8:21 PM
25 Kathrin Ryan		7/11/2018 7:58 PM
26 Kelly Archer		7/11/2018 5:21 PM

SurveyMonkey 7/11/2018 12:28 PM 7/11/2018 11:22 AM 7/11/2018 10:57 AM 7/11/2018 10:54 AM 7/11/2018 10:01 AM 7/11/2018 7:14 AM 7/11/2018 3:25 PM 7/11/2018 8:07 AM 7/11/2018 3:2B AM 7/10/2018 6:00 PM 7/5/2018 12:34 AM 7/11/2018 3:21 PM 7/11/2018 1:39 PM 7/11/2018 9:48 AM 7/11/2018 9:11 AM 7/11/2018 8:45 AM 7/11/2018 B:44 AM 7/11/2018 7:17 AM 7/11/2018 6:51 AM 7/11/2018 6:42 AM 7/11/2018 6:22 AM 7/11/2018 5:51 AM 7/10/2018 2:52 PM 7/10/2018 2:52 PM 7/9/2018 11:55 AM 7/7/2018 10:24 PM 7/6/2018 11:33 AM 7/5/2018 11:23 AM 7/8/2018 8:05 PM 7/8/2016 4:31 PM 7/6/2018 7:44 PM 7/5/2018 7:54 AM 7/9/2018 9:47 PM 7/9/2018 6:03 PM 7/6/2018 7:31 AM 7/5/2018 1:16 PM 7/5/2018 8:31 AM 7/9/2018 7:41 PM 7/3/2015 3:04 PM 7/9/2018 2:49 PM 7/9/2018 9:11 PM Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2) Lisa and Robert Brandes Christopher Harbeson Eugene Schumacher Audrey J Mayfield Lanae McDonald Ginni Sutherland Lindsay Kimbrell Georgia Broyles Kathryn Warren Jason Johnson Ed & Pat Smith James Mestack **Brittany Wilson** William Brewer Retha Blakely Shawn Broad David Woody D'Anna Feurt Mark Trimble Eric Stransky Lynn Rainey Mysly Haight Susie Havner Duane Welte Maggie Doss Mike Colgan Mike Colgan Max Minnick John Payne Jeff Trefren Lori Medina Janet Toler Jeff Woods fred volk Barbara Shelley Danielle Taylor

Amy Brockel

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Tim Walsh

ADDRESS:

7/16/2018 12:44 PM

7/15/2018 6:15 PM 7/15/2018 3:43 PM 7/15/2018 2:50 PM 7/15/2018 2:48 PM

6/29/2018 5:09 PM

6/29/2018 4:11 PM

DATE

7/15/2018 11:42 AM

7/15/2018 5:54 AM 7/14/2018 9:40 PM 7/13/2018 B:51 PM 7/13/2018 3:15 PM 7/13/2018 2:45 PM

7/15/2018 2:39 PM

4113 Gem Trail

Harrimond

311 E. 6th Ave.

Schrader lane

7/13/2018 10:21 AM

7/13/2018 5:26 AM

7/12/2018 6:20 PIM 7/12/2018 1:29 PM 7/12/2018 9:53 AM 7/12/2018 7:08 AM 7/11/2018 9:26 PM 7/11/2018 8:21 PM

11316 Chief Twomoon Road 4079 Antelope Meadows

10

13

6974 Horse Soldier Rd 6808 Hitching Post Ln.

6501 Julia Rd

5/37

9891 Hynds Blvd

6/29/2018 10:37 PM

6/29/2018 9:46 PM 6/29/2018 9:21 PM 6/29/2018 9:10 PM 6/29/2018 6:51 PM 6/29/2018 5:41 PM

7/1/2018 12:02 AM 6/30/2018 8:59 PM 6/30/2018 5:06 PM 6/30/2018 B:19 AM 6/30/2018 7:09 AM

> Linda Schmidt Susan Parkins

Charles Retz

Karlee ramirez

122 123 124 125

Tim Woodard

Alicia Smith

Kristin Nuss

Patrick

SurveyMonkey

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

Tim and Tammy Bauer

Dennis Brunner

Bill Pacheco.

Dale Bratton

7/2/2018 6:24 AM

7/2/2018 5:46 AM

7/1/2018 10:03 PM

7/1/2018 8:03 PM 7/1/2018 9:22 AM 7/1/2018 8:54 AM 7/1/2018 7:47 AM

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69	Steven girt.	7/4/2018 6:20 PM
70	Кеviп Неубате	7/4/2018 10:36 AM
F	Candace Croswell	7/3/2018 9:13 PM
72	Kari Happold	7/3/2018 9:01 PM
73	Katrina Vosler-Suter	7/3/2018 8:42 PM
74	Ellen Taylor	7/3/2018 8:26 PM
75	Jerry Rief	7/3/2018 6:30 PM
76	Kathie Dreifus	7/3/2018 6:07 PM
1	Ana munoz	7/3/2018 5:03 PM
78	Shirley Welte	7/3/2018 4:37 PM
79	Sheri Emmert	773/2018 3.59 PM
88	Cyndi Henderson	7/3/2018 3:58 PM
19	Moniea Yarborough	7/3/2018 3:52 PM
82	mil	7/2/2018 11:09 PM
83	Dutch McBride	7/2/2018 10:35 PM
84	Denise Hopkins	7/2/2018 9:26 PM
85	David Hopkins	7/2/2018 9:13 PM
98	Richard D (Dick) Voster	7/2/2018 1:06 PM
87	Michael & Jennifer Larson	7/2/2018 9:30 AM
80	Angi Bruce	7/2/2018 9:28 AM
689	Dennis Wiles	7/2/2018 9:25 AM
06	Mike Lujan	7/2/2018 9:20 AM
91	Pam quick	7/2/2018 9:11 AM
92	Magen Seeley-Marotz	772/2018 9:06 AM
93	Кету Jo & Mike Stephan	7/2/2018 9:02 AM
26	Cody Fournier	772/2018 8:49 AM
95	Judd Eilealdt	7/2/2018 8:44 AM
96	Judd Eifealdt	7/2/2018 8:41 AM
26	David & Mara Funk	772/2018 8:35 AM
98	Buddy Tenrant	772/2018 8:29 AM
66	Diffion Ohot -Suncor	7/2/2018 8:24 AM
100	Ellen Southwell	7/2/2018 7:40 AM
101	Joyce Stone	7/2/2018 7:26 AM
102	Rod Stone	7/2/2018 7:20 AM
103	Chris Ryan	7/2/2018 7:16 AM
104	Andy Vehar	7/2/2018 7:12 AM
105	Dave Rose	7/2/2018 7:07 AM
106	Barbara Boyd & Jim Boyd	772/2018 7:01 AM
107	Mike Cowley	7/2/2018 6:58 AM
108	Janine Ramage	7/2/2018 6.55 AM
109	Jessie Parker	772/2018 6:53 AM

3713 GUNSMOKE KO	7/11/2018 7:58 PM	62	9327 Snow Crest Dr	7/3/2018 6:07 PM
6824 Sundance Loop	7/11/2018 5:21 PM	63	7100 telluride dr	7/3/2018 5:03 PM
6509 RIVERBEND RD	7/11/2018 4:15 PM	75	7331 Keystone Dr	7/3/2018 4:37 PM
6715 Painted Rock Trail	7/11/2018 3:25 PM	99	6740 Crested Butte Dr	7/3/2018 3:59 PM
9450 McKenna trail	7/11/2018 12:28 PM	199	9466 Sugarloaf Lane	7/3/2018 3,58 PM
3531 Gunsmake Rd	7/11/2018 10:57 AM	29	9352 Crystal Mountsin Rd	773/2018 3:52 PM
4929 Gunsmake Rd	7/11/2018 10:54 AM	89	7907 Aztec Dr	7/2/2018 11:09 PM
6611 horse soldier rd	7/11/2018 9:48 AM	69	6603 Riverbend Road	7/2/2018 10:35 PM
3628 Rustic Rd	7/11/2018 9:11 AM	20	Dorsey Rd	7/2/2018 9:26 PM
6524 Kicking Horse Court	7/11/2018 8:45 AM	77	10149 Crystal Mtn Rd	7/2/2018 1:06 PM
3501 Ranch View Dr	7/11/2018 8:44 AM	22	5518 Blazing Star Rd	7/2/2018 9:30 AM
6606 Campfire Court	7/11/2018 8:07 AM	73	6915 Wilderness Trail	7/2/2018 9:28 AM
6903 Snowy River Road	7/11/2018 7:17 AM	74	6535 E 4Mile Rd	7/2/2018 9:25 AM
6509 Campfire Ct	7/11/2018 7:14 AM	75	6751 Say Valley Rd	7/2/2018 9:20 AM
6511 Painted Rock Trall	7/11/2018 6:51 AM	76	3267 sandstone In	7/2/2018 9:11 AM
3754 Saddle Ridge Trail	7/11/2018 6:42 AM	77	7099 Say Kally Rd	7/2/2018 9:06 AM
3628 Rustic Rd	7/11/2018 5:51 AM	78	9555 Crystal Mountain Rd	7/2/2018 9:02 AM
6613 Horse Soldier Rd	7/11/2018 3:28 AM	79	3351 Belair Ave	7/2/2018 8:49 AM
6601 Sundance Loop	7/10/2018 8:00 PM	80	6770 Whistler Dr	7/2/2018 8:44 AM
6806 Foxglove	7/10/2018 2:52 PM	81	6770 Whistler Dr	7/2/2018 8:41 AM
11431 Chief Twompon Road	7/9/2018 9:47 PM	82	6515 Foxglove	7/2/2018 8:35 AM
1121 Gethysburg Drive	7/9/2018 9:11 PM	83	1580 Rio Glende Circle	7/2/2018 8:29 AM
6983 Sundance Loop	7/9/2018 7:41 PM	28	1715 Fleishli Pkwy,	7/2/2018 8:24 AM
9208 Heavenly Dr.	7/9/2018 3:04 PM	85	4011 Summitt Dr.	7/2/2018 7:26 AM
6861 Dorsey Rd	7/9/2018 2:49 PM	86	4011 Summit Dr	7/2/2018 7:20 AM
9335 Crystal Mountain Rd	7/9/2018 11:55 AM	87	4501 Greenbull Ct	7/2/2018 7:16 AM
7331 Keystone Dr	7/8/2018 8:05 PM	88	6530 US 30	7/2/2018 7:07 AM
7311 e Pershing	7/7/2018 10:24 PM	89	4508 Van Buronb Ave	7/2/2018 7:01 AM
9907 Crystal Mountain Rd	7/6/2018 7:44 PM	06	5610 Iron Min Rd	7/2/2018 6:58 AM
11804 E Four Mile Rd	7/6/2018 7:31 AM	91	7119 Julia Rd	7/2/2018 6:55 AM
6967 Boot Strap Ct.	7/5/2018 1:16 PM	92	6744 Grace Rd	7/2/2018 6:53 AM
5707 Dell range blvd	7/5/2018 11:23 AM	93	6809 Laramie st	7/2/2018 6:24 AM
6641 Crested Butte Dr	7/5/2018 8:31 AM	26	11755 Chief Twompon Rd	7/2/2018 5:46 AM
6519 Dorsey Road	7/5/2018 7:54 AM	95	9131 James Cole Ct	7/1/2018 10:03 PM
6726 telluride dr	7/4/2018 6:20 PM	98	11303 yellowbear rd	7/1/2018 8:03 PM
6578 Crested Butte	7/4/2018 10:36 AM	26	PO Box 96	7/1/2018 9:22 AM
7297 Monarch Drive	7/3/2018 9:13 PM	86	4505 El Camino Dr	7/1/2018 7:47 AM
7422 Monarch dr	7/3/2018 9:01 PM	8	7317 Aztec Dr.	7/1/2018 12:02 AM
10145 Crystal Mountain Rd.	7/3/2018 8:42 PM	100	3711 Blue Sage Rd	6/30/2018 8:59 PM
7203 Crested Butte Drive	7/3/2018 8:26 PM	101	7317 Dorsey Rd	6/30/2018 5:06 PM

3629 Rustic rd	6/30/2018 7:09 AM	34	Cheyenne	7/11/2018 8:44 AM
5914 e 13th st	6/29/2018 10:37 PM	\$2	Cheyenne, WY 82001	7/11/2018 B:07 AM
8200 Beckle RD	6/29/2018 9:46 PM	36	Cheyenne, Wy 82001	7/11/2018 7:17 AM
8401 Hazer Court	6/29/2018 9:21 PM	37	Cheyenne, WY 82001	7/11/2018 7:14 AM
Woods Landing Estates	6/29/2018 6:51 PM	800	Cheyenne, WY 82001	7/11/2018 6:51 AM
9200 jordann lane	6/29/2018 5:41 PM	38	Cheyenne WY 82001	7/11/2018 6:42 AM
9907 Crystal Mountain Road	6/29/2018 5:09 PM	40	Cheyenne WY 32001	7/11/2018 5:51 AM
CITY/STATE/ZIP:	DATE	41	Cheyenne, WY 82001	7/11/2018 3:28 AM
Cheyenne	7/16/2018 12:44 PM	42	Cheyenne WY 82009	7/10/2018 6:00 PM
82009	7/15/2018 6:15 PM	43	Cheyenne, WY	7/10/2018 2:52 PM
Cheyenne	7/15/2018 3:43 PM	44	Cheyenne, Wyoming 82009	7/9/2018 9:47 PM
Cheyenne	7/15/2018 2:50 PM	45	Cheyenne, Wyoming 82001	7/9/2018 9:11 PM
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Cheyenne Wy 82009	7/15/2018 2:39 PM	47	Cheyenne, Wy 82009	7/9/2018 3:04 PM
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Cheyenne,wy,82001	7/14/2018 9:40 PM	90	Cheyenne/WY/82009	7/8/2018 8:05 PM
Cheyenne	7/13/2018 8:51 PM	51	Cheyenne Wyoming 82001	7/7/2018 10:24 PM
Cheyenne	7/13/2018 8:09 PM	52	Cheyenne/Ny/82009	7/6/2018 7:44 PM
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Cheyenne WY 82009	7/13/2018 2:45 PM	25	Cheyenne WY 82009	7/5/2018 11:23 AM
Cheyenne, WY 82009 & 82001	7/13/2018 10:21 AM	55	Cheyenne, Wyoming 82009	7/5/2018 8:31 AM
Cheyenne Wy 82001	7/13/2018 5:26 AM	56	Сһвуепле. WY 82009	7/5/2018 7:54 AM
Burns	7/12/2018 6:20 PM	24	Cheyenne WY 82009	7/4/2018 6:20 PM
Cheyenne, WY 82009	7/12/2018 1:29 PM	58	Cheyenne, WY 82009	7/4/2018 10:36 AM
Cheyenne 72009	7/12/2018 9-53.AM	59	Cheyenne WY 82009	7/3/2018 9:13 PM
Сheyenne	7/12/2018 7:08 AM	09	Сheynne, WY 82009	7/3/2018 9:01 PM
82001	7/11/2018 9:26 PM	19	Cheyenne, WY 82009	7/3/2018 8:42 PM
Cheyenne, WY 82009	7/11/2018 8:21 PM	29	Cheyenne, WY 82009	7/3/2018 8:26 PM
Cheyenne, WY 82001	7/11/2018 7:58 PM	63	Cheyenne WY, 82009	7/3/2018 6:30 PM
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cheyenne	7/11/2018 11:22 AM	69	Cheyenne WY 82009	7/3/2018 3:52 PM
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Cheyenne wy 82001	7/11/2018 9:48 AM	72	Cheyenne, WY 82009	7/2/2018 9:30 AM
Cheyenne WY 82001	7/11/2018 9:11 AM	73	Cheyenne WY 82009	7/2/2018 9:20 AM

Cheyenne, 82001	7/2/2018 8:24 AM	22	3072862867	7/11/2018 10:54 AM
Chey 82009	772/2018 7:20 AM	23	307 640-3765	7/11/2018 9:11 AM
Cheyenne Wy 82001	772/2018 6:24 AM	24	307-286-0436	7/11/2018 8:45 AM
Cheyenne	7/2/2018 5:46 AM	25	3072771271	7/11/2018 B:44 AM
Cheyenne, WY 82009	7/1/2018 10:03 PM	26	3076305802	7/11/2018 8:07 AM
Cheyenne	7/1/2018 8:03 PM	27	307 514-4752	7/11/2018 7:17 AM
Hillsdale Wy 82060	7/1/2018 9:22 AM	28	307-369-4477	7/11/2018 7:14 AM
Cheyenne, WY 82001	7/1/2018 7:47 AM	29	307 640-3765	7/11/2018 5:51 AM
Cheyenne, WY 82008	7/1/2018 12:02 AM	30	307-256-6971	7/11/2018 3:28 AM
Cheyenne, WY 82001	6/30/2018 8:59 PM	31	307-630-5196 307-630-5197	7/10/2018 2:52 PM
Cheyenne, Wyoming 82009	6/30/2018 5:06 PM	32	307-214-6296	7/9/2018 9:47 PM
Cheyenne. WY 82001	6/30/2018 8:19 AM	33	307-632-4635	7/9/2018 9:11 PM
Cheyenne wy 82001	6/30/2018 7:09 AM	28	307-631-4533	7/9/2018 7:41 PM
Cheyenne, wy 82001	6/29/2018 10:37 PM	55	3073899915	7/9/2018 3:04 PM
Cheyenne, WY 82009	6/29/2018 9:46 PM	38	307-287-1548	7/9/2018 2:49 PM
Cheyenne, WY 82009	6/29/2018 9:21 PM	37	3072146369	7/9/2018 11:55 AM
Сheyenne	6/29/2018 9:10 PM	38	630-992-5416	7/8/2018 8:05 PM
Сheyenna	6/29/2018 5:41 PM	38	2207775	7/7/2018 10:24 PM
Cheyenne/Wy/82009	B/29/2018 5:09 PM	40	3074219877	7/6/2018 7:44 PM
PHONE:	DATE	41	3072141565	7/5/2018 11:23 AM
3076311545	7/16/2018 12:44 PM	42	307-630-4537	7/5/2018 7:54 AM
9709804931	7/16/2018 8:28 AM	43	3072861591	7/4/2018 6:20 PM
3072750189	7115/2018 3:43 PM	25	307-350-8105	7/4/2018 10:36 AM
3072568694	7/15/2018 2:50 PM	45	410.916,5232	7/3/2018 9:13 PM
3074214920	7/15/2018 2:48 PM	97	3076406339	M4 10:018 9:01 PM
3072212586	7/15/2018 2:39 PW	24	307-286-7981	7/3/2018 8:42 PM
8033541594	7/15/2018 11:42 AM	\$	3076381111	7/3/2018 6:30 PM
307-256-6126	7/14/2018 9:40 PM	49	3076374855	7/3/2018 5:03 PM
3076375038	7/13/2018 8:51 PM	50	626-222-7168	7/3/2018 3:59 PM
307 2567691	7/13/2018 3:15 PM	51	3076317547	7/3/2018 3:58 PM
307 6304048	7/13/2018 2:45 PM	52	307-214-5283	7/3/2018 3:52 PM
307-214-0434 or 307-637-8955	7/13/2018 10:21 AM	53	307-772-0117	7/2/2018 11:09 PM
307 635-5515	7/13/2018 5:26 AM	54	307-286-2315	7/2/2018 10:35 PM
3076350433	7/12/2018 7:08 AM	52	635-7402 landline 421-6981 cell	7/2/2018 1:06 PM
3072214831	7/11/2018 9:26 PM	32	307-421-4005	7/2/2018 9:30 AM
307638-1979	7711/2018 8:21 PM	57	307-287-0373	7/2/2018 9:28 AM
307-214-0027	7/11/2018 5:21 PM	58	307-421-4110	7/2/2018 9:25 AM
3074212743	7/11/2018 4:15 PM	59	307-630-3972	7/2/2018 9:20 AM
3076310428	MR 25.18 1.39 PM	0.9	3076316748	7/2/2018 9:11 AM
307 630-2969	7/11/2018 12:28 PM	. 19	307-421-5927	7/2/2018 9:06 AM

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Whimey Road Corridor Study Comment Sheet (Open House Meeting No. 2)

13	Ssmith4701@gmail.com	7/13/2018 2:45 PM
14	sprakenim@gmail.com or bigalsauto01@gmail.com	7/13/2018 10:21 AM
15	Chad.fms@gmail.com	7/13/2018 5:26 AM
16	firedoc82009@yahoo.com	7/12/2018 6:20 PM
17	erinmariemoullon@gmail.com	7/12/2018 1:29 PM
18	andy@frontieraccess.com	7/12/2018 9:53 AM
19	mbain811@gmail.com	7/12/2018 7:08 AM
20	Raymanhollings@gmail.com	7/11/2018 9:26 PM
21	Brendaoswlad@asdwy.com	7/11/2018 8:21 PM
22	Alisajane521@hotmail.com	7/11/2018 7:24 PM
23	Blka87@msn.com	7/11/2018 6:18 PM
24	Kelly,archer@ymail.com	7/11/2018 5.21 PM
25	skfermelia@gmail.com	7/11/2018 4:15 PM
26	kjgk4749@gmail.com	7/11/2018 3:21 PM
27	brewerwilliam79@yahoo.com	7/11/2018 1:39 PM
28	Johnnyoning77@gmail.com	7711/2018 12:28 PM
29	dwoodys@msn.com	7711/2018 10:57 AM
30	dramateacher78@gmail.com	7/11/2018 10:54 AM
31	Ryan.harbeson@gmail.com	7/11/2018 10:01 AM
32	Angel@wyoming.com	7/11/2018 B-48 AM
33	mike_colgan71@yahoo_com	7/11/2018 9:11 AM
34	tweetpea73@gmail.com	7/11/2018 8:45 AM
35	Cleoizzy2@yahoo.com	7/11/2018 B:44 AM
36	Fe1peter3.8@gmail.com	7/11/2018 B:07 AM
37	rethablakely@yahoo.com	7/11/2018 7:17 AM
38	gene_schumacher@msn.com	7/11/2018 7:14 AM
39	Indsayk310@gmail.com	7/11/2018 6:51 AM
40	shallessbath@yahoo.com	7/11/2018 6:42 AM
41	mike.colgan71@yahoo.com	7/11/2018 5:51 AM
42	мур7011@уайоссот	7/11/2018 3:28 AM
43	Wilson, bryantivittarry@gmäll.com	7/10/2018 6:00 PM
44	Jasonrusselljohnson@gmail.com	7/10/2018 2:52 PM
45	ekpasmith@aol.com	7/10/2018 2:52 PM
46	shawnbroad1@gmail.com	7/9/2018 9:47 PM
47	Broylesg@msn.com	7/9/2018 9:11 PM
48	Lkbwyo@gmail.com	7/9/2018 7:41 PM
64	Lovegodiva30@gmail.com	7/9/2018 6:03 PM
20	Mystynaight@hotmail.com	7/9/2018 3:04 PM
51	susie, havner@gmail.com	7/9/2018 11:55 AM
52	duanewelle@sbcglobal.net	7/8/2018 8:05 PM

Superchicken6w@gmail.com

Rickhammond1@charter net

dslame@bresnan.net

Stacid112@gmail.com Nleuer_11@yahoo.com

frypan9@gmail com

shovelskim@aol com D1_sutton@msn.com

7/15/2018 2:50 PM

7/15/2018 2:48 PM 7/15/2018 2:39 PM 7/15/2018 11:42 AM

7/15/2018 5.54 AM 7/14/2018 9.40 PM 7/13/2018 8.51 PM 7/13/2018 8:09 PM

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E .	Starranime2@netzero.com	7/7/2018 10:24 PM	98	murphycanyonsne@ad.com Sneelyd?@vzheo.com
Yyou	Wyorningskimom@gmail.com	7/6/2018 7:44 PM	100 H	SnoslydZ@yahoo.com
aylo	Taylor_amold101@yahoo.com	7/6/2018 11:33 AM	26	dennis.brunner@gmatl.com
mae	lanaemcdonald@gmail.com	7/6/2018 7:31 AM	806	butte_rat84@yahoo.com
athry	kathryntratiff@gmail.com	7/5/2018 1:16 PM	66	Fishingtrue@gmail.com
afffre	Jefftrefren 1@gmail, com	7/5/2018 11:23 AM	100	Cowcopper7@yahoo.com
Nood	Jwoods@cheyennebopu.org	7/5/2018 8:31 AM	101	cgmattson@yahoo.com
med	lamedina44@gmail.com	7/5/2018 7:54 AM	102	Retzc@hotmail.com
Тахц	Maxminnick@msn.com	7/5/2018 12:34 AM	103	Michaelasbradshaw@gmail.com
pgin	Spgirt@gmail.com	7/4/2018 6:20 PM	104	Enchant63@gmail.com
heyb	kheybom@wyoming.com	7/4/2018 10:36 AM	105	w7par@msn.com
and	Candace.croswell@gmail.com	7/3/2018 9:13 PM	106	Msturtevant@gmail.com
happ	khappold@gmail.com	7/3/2018 9:01 PM	107	Kmgnurse01@aol.com
vosle	kvosler8@gmail.com	7/3/2018 8:42 PM	108	woodard4@hotmail.com
ntayl	Lntaylor5@gmail.com	7/3/2018 8:26 PM	109	Asmith0124@msn.com
- Au	RunWyo@yahoo.com	7/3/2018 6:30 PM	110	Bakingkid17@gmail.com
Avd.	Chywyddreifi com	7/3/2018 6:07 PM	111	Kristinmnuss@gmail.com
4	Colombia Col	Z/3/2018 5:03 PM	112	timenim@hotmail.com
	in the state of th	707076 3.E0 DW	143	Horstomailcom
La La	Shenssb@nomail.com		2 4	
yndi	Cyndi.henderson@ymail.com	7/3/2018 3:58 PM	114	adeebish@gmail.com
Aonic	Monica yarborough@gmail.com	7/3/2018 3:52 PM	115	Randilosalu@gmail,com
Vyob	Wyobrewer@vcп.com	773/2018 9:47 AM		
and	Cancelli1@yahoo.com	7/2/2018 11:09 PM		
Ltch	Dutchm31@hotmail.com	7/2/2018 10:35 PM		
eatt	healthyminds101@gmail.com	772/2018 9:26 PM		
Sa	usa_eagle78@yahoo.com	772J2018 9:13 PM		
yola	wyolarsons@hotmail.com	772/2018 9:30 AM		
dia	murphyspleasanta@gmail.com	7/2/2018 9:25 AM		
ijanr	lujanm/1@hotmail.com	7/2/2018 9:20 AM		
Ē	Pmmypain@gmail.com	7/2/2018 9:11 AM		
eele	seeleymj@hotmail.com	7/2/2018 9:06 AM		
riker	mikerryjc@pacebll.net	7/2/2018 9:02 AM		
rifou	cnfournier@hotmail.com	7/2/2018 8:49 AM		
sant	ifsanta01@gmail.com	7/2/2018 8:44 AM		
sant	ifsanta01@gmail.com	7/2/2018 8:41 AM		
lara	Marafunk70@gmail.com	7/2/2018 8:35 AM		
ppn	buddy_tenrant@yahoo.com	7/2/2018 8:29 AM		
tohrt	dohri@suncor.com	7/2/2018 8:24 AM		
peoe	jacedash@yahoo.com	7/2/2018 7:40 AM		
bigal	rbigals01@aof.com	7/2/2018 7:07 AM		
		7/2/2018 7:01 bW		

SurveyMonkey

7/2/2018 6:58 AM 7/2/2018 6:24 AM

7/1/2018 10:03 PM

7/1/2018 8:03 PM 7/1/2018 9:22 AM

7/2/2018 5:46 AM

7/1/2018 7:47 AM 7/1/2018 12:02 AM

6/30/2018 5:06 PM 6/30/2018 8:19 AM 6/30/2018 7:09 AM

6/30/2018 8:59 PM

6/29/2018 10:37 PM

6/29/2018 9:46 PM 6/29/2018 9:10 PM

6/29/2018 9:21 PM

6/29/2018 6:51 PM 6/29/2018 5:41 PM 6/29/2018 5:09 PM

6/29/2018 4:11 PM

6/29/2018 2:32 PM

SurveyMonkey

Q3 Please rate the Recommended Roadway Typical Section for Whitney Road at Beckle Road/ Storey Blvd. (Looking North) as shown.

Answered: 349 Skipped: 58

(no label) and	Western .	311.3240%		Ш	32.66%			7.6Mic	3.88%		
	0% 10%	20%	30%	40%	20%	%09	20%	80%	90% 100%	۵	
	🜃 Definitely Like 🏻 🎆 Li 🙀 Definitely Do Not Like	Like	Like	No Opinion	inion	Do Not Like	ot Like				
DEFINITELY LIKE	LIKE	NO OPINION	_	DO NOT		DEFINITELY DO NOT LIKE	LY DO N	TOT	TOTAL	WEIGHTED	
5.44%	% 31,52% 19 110	32,0	32,66% 114	21,4	21,49%			8,88%	349		3.03
ADDITIONAL COMMENTS OR SUGGESTIONS?	COMMENTS	OR SUGG	ESTIO	NS?						DATE	
Why aren't we	Why aren't we making this two lanes each way?	vo lanes ea	ach way	مخ					.69	7/15/2018 2:35 PM	
Have middle I	Have middle lane for turning									7/15/2018 1:13 PM	
My opinion is	My opinion is paved shoulder	L.							14.	7/15/2018 11:44 AM	
Bicycle and pedestrian travel not accounted for. A separate "Greenway-style" path on one side heading north from this point would get LOTS of use.	Bicycle and pedestrian travel not accounted for. A se heading north from this point would get LOTS of use.	I not accout t would get	unted for	of use.	ate "Gre	enway-sty	/le" path	on one si	1,5	7/15/2018 6:03 AM	
Center tum la again!	Center turn lane because of all the new development, You'll just have to spend money to do again!	all the new	v develo	opment, Yo	ou'll just	have to sp	ош риас	ney to do		7/13/2018 8:57 PM	
You cannot close off access affect numerous businesses	You cannot close off access to businesses at the frontage road entrance off of hwy 30,. This will affect numerous businesses	to busines	ses at	the frontag	e road	entrance o	ff of hwy	30 This		7/13/2018 8:11 PM	
No reason to	No reason to not widen it all the way out to iron mtn	the way or	ut to iro	n mtn					10	7/13/2018 2:25 PM	
It's a little narrow	WO								10	7/13/2018 5:27 AM	
Should be 14"	Should be 14" wide lane to accommodate larger fire apparatus in the county	ccommoda	ate larg	er fire appa	aratus ir	the count	λī		10	7/12/2018 6:22 PM	
Make larger										7/12/2018 9:41 AM	
There needs to be traffic lights at dell range and Whitney and Whitney and highway 30, The numerous wrecks and close calls at these intersections, With the housing development and population growth these need to be addressed	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30. There are numerous wrecks and close calls at these intersections, With the housing development and population growth these need to be addressed	calls at the	ange ar sse inte dressec	nd Whitney rsections	and W	hitney and housing	highway	/ 30, Then nent and		7/12/2018 8:13 AM	
Needs a left to	Needs a left turn tane separate of the flow of traffic	ate of the fl	low of th	raffic						7/11/2018 8:01 PM	
Needs to be wider	ider								1-	7/11/2018 6:19 PM	
How is this dif	How is this different than how it looks now?	w it looks n	CW01						1-	7/11/2018 5:24 PM	
not much diffe	not much different than it currently is,	rently is.							1-	7/11/2018 1:21 PM	
Center turn la	Center turn lane is already needed	pepea							-	7/11/2018 11:00 AM	_
Make it wider. Cheyanimals consistently drive 10 mph under the speed limit, a passing lane is a	Chevanimals	concictent	or drives	1		1	,				

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Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

		7/11/2018 7:21 AM
	Needs to be wider between Hwy 30 and Dell Range? Actually the whole thing needs to be 4 lane.	
9	The roadway should be wider. Traffic will increase as the area continues to grow. More homes are being built and will create more congestion as time moves on	7/11/2018 3:28 AM
20	Either widen lanes, or make Iwo lanes both ways, also add bike paths, as their are a lot of joggers on Whitney Rd, And add street lights up and down Whilney road, and a way Io slow down traffic	7/10/2018 2:55 PM
	Too патоw between vehicles	7/10/2018 2:52 PM
22	No Area for Walking or Biking.	7/9/2018 2:51 PM
23	no tum lanes, no walking or bike paths,	7/9/2018 12:09 PM
24	Whitney does not need to be widened, you just need to finish roads that could intersect it, such as Four Mile and Storey	7/6/2018 11:38 PM
25	Bicycle lanes!	7/8/2018 7:45 PM
26	Prefer to see a dedicated bike lane	7/6/2018 10:56 AM
27	I would like to see a bike/walking lane.	7/5/2018 8:32 AM
28	Needs to be wider and have a turn bay	7/5/2018 7:53 AM
29	Wider	7/4/2018 9:10 AM
	Not sure exactly what the question is, Is it asking if I like the current road or is the above picture suppose to be the "new" one. The pic looks like the current one to me and I don't like the current road for safety reasons.	7/3/2018 8:47 PM
	Would love to have a center lane extending to the end of Whitney Rd to the north,	7/3/2018 6:09 PM
32	Needs sidewalk.	7/3/2018 4:00 PM
33	Would like to see it wider	7/3/2018 3:55 PM
34	I wish the road expansion with wider shoulders and bike lane would continue north as well.	7/3/2018 3:53 PM
	needs to be paved, more space between north and south bound vehicles and safe placed to walk	7/2/2018 9:31 AM
36	Love	7/2/2018 9:28 AM
	No Sidewalks or bike paths	7/2/2018 9:20 AM
38	I think their might as well be a bike lane or sidewalk all the way through Whitney.	772/2018 9:07 AM
39		7/2/2018 9:04 AM
40	Will this accommodate future extension to Iron Mountain to the North?	7/2/2018 8:38 AM
41	needs to be wider	772/2018 8:29 AM
42	I believe given the bicycle traffic a bike lane should be included.	7/2/2018 7:41 AM
	Storey Blvd to Beckle Rd, does not exist too much private property involved.	7/2/2018 7:27 AM
44	Whitney Road is fine the way it is, this is not needed, a lot of money and headache for nothing.	7/2/2018 7:21 AM
45	4-lane road	7/2/2018 6:53 AM
46	Road needs to be widened	7/1/2018 10:41 PM
	Isn't this how it is right now?	6/30/2018 8:21 AM
89	As population grows in the area, more and more people are running and walking dogs on the road. Someone is going to get killed if there is no foot path along the road.	6/29/2018 8:15 PM
49	Needs bicycle lanes	6/29/2018 5:12 PM
		A SHALL SHAL

SurveyMonkey

Q4 Please rate the Recommended Typical Section for Whitney Road from Dell Range Blvd. to Beckle Road/ Storey Blvd (Looking North) as shown

Answered: 345 Skipped: 62

AN 5.808.2 S.808.2	60% 70% 80% 90% 100%	DEFINITELY DO NOT TOTAL WEIGHTED LIKE AVERAGE	3_19% 11 345	DATE	7/15/2018 2:36 PM	eptable, but bike lane 7/15/2018 12:39 PM d encourages irrational ideas red a leisure activity.	7/15/2018 6:03 AM	making the sidewalk part of 7/13/2018 10:26 AM be on the regular roadway to storaws safely, see to roadwall taffic or they will sees. Also, with the hills it's liturial you're right on top of	y and highway 30, There are 7/12/2018 8:13 AM ising development and	having it right by the road 7/11/2018 7:13 PM	7/11/2018 6:19 PM	ey, Totally my own fault, but 7/11/2018 5:25 PM ededbut maybe with all the limit, there would be zero	turn into 7/11/2018 4:43 PM	
MIZIBA	40% 50% 60%	DO NOT DEFIN	7 83% 27		vith a center turn lane	cessary Shoulder is acc which is dangerous and ravel should be conside	ian traffic as well as tum	der is, I would suggest r be safe for bike riders to er trucks and the bicycle picycles, without regard I them to slam on their bri by be at the top of the hill outh driver and rider.	nd Whitney and Whitney ersections. With the hou d	ad, it seems safer than		as trying to run on Whitn t a turn lane is really nee ople would do the speec	e barely any houses to	
destructions.	0% 10% 20% 30% Definitely Like	LIKE NO OPINION	46.67% 5.80% 161 20	ANY ADDITIONAL COMMENTS?	This would be better as two lanes each way with a center turn lane.	landscape area is a wasted space and unnecessary. Shoulder is acceptable, but bike lane designation promotes bicycles with car traffic, which is dangerous and encourages irrational ideas of bicycles as regular transportation. Bicycle travel should be considered a leisure activity.	Like accommodations for bicycle and pedestrian traffic as well as tum lane,	Instead of having a bike lane where the shoulder is, I would suggest making the sidewalk part of the greenway or like the greenway. It will not be safe for bike ridest to be on the regular noadway as there will not be enough room for the bigger trucks and the bicycles to travel safely. I see as there will not be enough room for the bigger trucks and the bicycles to travel safely. I see so shedes move way over for pedestians and bicycles, without regard to encoming usific or they will stop all obstance are shall be belief to the will see the bind them to dism on their brakes. Also, with the fillis it's almost impossible to see any bicycles that may be at the top of the hill until you're right on top of harm, again causing an unsale condition for both driver and rider.	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30. There are numerous wrecks and close calls at these intersections. With the housing development and population growth these need to be addressed	l like that the sidewalk is set away from the road, it seems safer than having it right by the road	All lanes need to be at least 12 ft wide!,,	This is great. I have almost died a couple times trying to run on Whitney, Totally my own fault, but thits would make that better. I am not sure that a turn lane is really neededbut maybe with all the teach busing coming in west of Whitney, If people would do the speed limit, there would be zero need for isilgating.	No tproblem asonfor a turn land when they are barely any houses to turn into	
(no label)	0	DEFINITELY LIKE	36,52% 126	ANY ADDITION	This would be b	Landscape area designation prot of bicycles as re	Like accommod	Instead of havir the greenway or as there will not vehicles move v stop all together almost imposelhe them, again cau	There needs to numerous wred population grow	l like thal the sic	All lanes need t	This is great I have this would make the new housing comin need for tailgating	No tproblem as	

No need for separated sidewalk, that creates problems with landscaping and is more expensive	7/11/2018 11:23 AM
Remove the bike lane / shoulder and this is a lot better, bikes need to be separated just like pedestrians from the higher speed (raffic,	7/11/2018 10:49 AM
If commercial projects at Whitney/Dell Range are true, need more lanes.	7/11/2018 9:17 AM
Better	7/11/2018 7:21 AM
I like the Jandscaping. The sidewalks away from the roadway are nice too, I feel like they are safer, especially at the speeds people travel on these roads,	7/11/2018 3:30 AM
There is enough people in the are to constitute a sidewalk on both sides of the road	7/9/2018 2:55 PM
better, would be better to have 4 lanes for traffic	7/9/2018 12:10 PM
Love the bicycle lane!!	7/8/2018 7:48 PM
Maybe wider?	7/6/2018 7:34 AM
Sidewalk and shoulder are excellent!	7/3/2018 3:53 PW
should be the alignment on Whitney no of beckle also car keep as is possible pavement overlay no of beckle.	7/2/2018 1:11 PM
I think this is the best of the three choices	7/2/2018 9:31 AM
but need sidewalk on both sides	7/2/2018 9:20 AM
I don't know if a tuming lane is necessary, but probably is if the development would be like Saddle Ridge.	7/2/2018 9:09 AM
Pedestrian is a waste as no true country person walks anywhere. Landscape is a waste, causes drifts, causes visual obstructions,	7/2/2018 7:42 AM
No need for bigger Rd. Too much traffic, Is this for people who live there or others to pass thru?	772/2018 7:27 AM
What is wrong with Whitney Rd, It is in the County most people ride horses not bikes.	7/2/2018 7:22 AM
4-lane	7/2/2018 6:54 AM
	7/1/2018 8:46 PM
Please add a blike lane on each side. This would benefit a lot of us in the area and give us a close road to go and enjoy to become a healthier community.	6/30/2018 8:48 PM
Needs a street light at the Intersection	6/30/2018 10:25 AM
One foot path should be adequate and should save a lot of money.	6/29/2018 8:16 PM
If reducing snow drifts is one of the goals, trees and other landscape defeat that purpose.	6/29/2018 8:08 PM
I like turn lanes but the sidewalk and the trees I don't.	6/29/2018 3:10 PM

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SurveyMonkey

Q5 Please rate the Typical Roadway Section for Whitney Road from U.S. 30 to Dell Range Blvd. (Looking North) as shown above.

Answered: 332 Skipped: 75

(no label) 8558/10658/2028

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

		Definitely Like 📑 Li Definitely Do Not Like	ke Like o Not Like	No Opinion	Do Not Like			
	DEFINITELY LIKE	LIKE	NO OPINION	DO NOT LIKE	DEFINITELY DO NOT LIKE	TOTAL	WEIGHTED AVERAGE	
(no label)	34.94% 116	42.77%	6.63%	10.54% 35	5,12%	332	69	3,92
*	ANY ADDITIONAL COMMENTS?	AL COMMEN	TS?			-	DATE	
	This should also	be two lanes	each way with	This should also be two lanes each way with a center turn lane.		35	7/15/2018 2:36 PM	
2	Landscaping is n	wasteful usage	e of land/space	, bike travel with c	Landscaping is wasteful usage of land/space, bike travel with cars is irrational and dangerous.		7/15/2018 12:40 PM	
en	Bicycle and pedestrian travel is decent with this proposal,	estrian travel i	s decent with the	is proposal.		*7	7/15/2018 S:03 AM	
4	How are the bus	sinesses you v	vill close off acc	How are the businesses you will close off access to supposed to survive?	to survive?	**	7/13/2018 8:13 PM	
LO.	LImits access to businesses	businesses					7/13/2018 11:35 AM	
9	Again, there would not be enough room for bike riders an greenway type option would be much safer for everyone,	uld not be eno	ugh room for b e much safer fo	ike riders and larg or everyone,	Again, there would not be enough room for bike riders and large vehicles on this stretch of road, A greenway type option would be much safer for everyone,		7/13/2018 10:28 AM	
4	There needs to be traffic lights at dell range an numerous wrecks and close calls at these inter population growth these need to be addressed	be traffic lights ks and close co th these need	s at dell range s alls at these int to be addresse	and Whitney and Versections. With the	There needs to be traffic lights at delt range and Whitney and Whitney and highway 30. There are numerous weeks and dose calls at these intersections. With the housing development and population growth these need to be addressed		7/12/2018 8:14 AM	
ø	Needs less fandscaping and bo sidewalks on both sides, It's se especially without a traffic light	scaping and b th sides. It's si ut a traffic light	oth right and le et up close to th	oft turn lanes as wais already and ba	Needs less landscaping and both right and left turn lanes as well as a lane for thru traffic and sidewalks on both sides. It's set up close to this already and backs up severely during rush hours, especially without a traffic light		7/11/2018 8:05 PM	
0	All lanes need to be 12 ' wide	be 12 wide					7/11/2018 6:20 PM	
10	A turn lane is no	ot needed, in m	ny opinion. Was	ste of materials, T	A turn lane is not needed, in my opinion, Waste of materials, The rest would be good.		7/11/2018 5:26 PM	
11	Roundabout for the intersection	the intersection	U.				7/11/2018 1:00 PM	
12	No need for bike lane	e lane					7/11/2018 11:24 AM	
13	you're moving pedestrians and bikes back into the traffic It. Traffic speeds and nothing is worse than trying to navigate cheywore bike lanes on carey and pionese are a rightment them, and often are travelling the wrong direction anyway.	edestrians and nothing is wanes on carey are travelling is	d bikes back inlyonse than tryin and pioneer arthe wrong direct	to the traffic lanes g to navigate arou e a nightmare for tion anyway	you're moving pedestrians and bikes back into the traffic lenes, these roads likely will have higher traffic geeds and bikes, downtown traffic geeds and nothing is worse than trying to navigate around peds and bikes, downtown or helpenne bike lanes on carey, and pioneer are a nightmare for everyone, even the bikes don't use them, and often are travelling the wrong direction anyway.		7/11/2018 10:51 AM	
4	It's better. Road way to narrow	way to narrow					7/11/2018 7:22 AM	
15	This has become boom in growth.	e quite busy w out here, I bell	ith traffic, both leve this should	This has become quite busy with trafife, both auto and pedestrian. Wi boom in growth out here, I believe this should be as wide as possible	This has become quite busy with traffic, both auto and pedestrian, With the anticipated continued boom in growth out here, I believe this should be as wide as possible.		7/11/2018 5:48 AM	

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16	Who is going to pay for side walk and trees? Who is going to be responsible for snow removal? Why do we need a side walk in the first place, Lived here 20 + years and no walks by here,	7/10/2018 12:25 PM
17	Who is going to pay for the sidewalk, maintain and scoop in the winter. Your sidewalk and landscaping will be on my property where you don't have rights to.	7/10/2018 10:31 AM
18	What about traffic lights at the intersection of Whitney and Dell Range?	7/4/2018 9:07 PM
19	Excellent accommodations for multiple user types!	7/4/2018 9:50 AM
20	Don't know the need for sidewalk expense.	7/3/2018 8:55 PM
21	But add in right turn lane from Whitney to US 30, Would love a traffic light at this intersection as it has gotten a lot busier and will only continue to get more traffic thru this intersection	7/3/2018 6:13 PM
22	I don't like the bike path they should ride on the sidewalk, It is to dangerous for bikes	7/3/2018 5:57 PM
23	Good!	7/2/2018 1:11 PM
24	this is too much for county/city space	7/2/2018 9:32 AM
25	but sidewalks are not detached	7/2/2018 9-21 AM
26	Landscaping the prairie wastes resources and landscaping roads causes drifts - obstructions,	7/2/2018 7:43 AM
27	You can make a bike path however they will ride their bike's on the road	7/2/2018 7:23 AM
28	Pedestrian Section is too close to the road	7/2/2018 7:02 AM
29	I'm not sure a turn lane is necessary for this short stretch, I drive it daily, most days I'm on it multiple times and have never thought that a turn lane is necessary. A wider road, bike land and sidewalk will be a nice feature though! Carry the bike lane north onto Whitney!!	6/30/2018 8:51 PM
30	Needs a street light at the Intersection	6/30/2018 10:27 AM
31	Make travel lanes 12 feet wide	6/30/2018 9:36 AM
32	Dual foot paths are excessive and costly.	6/29/2018 8:16 PM
33	Run this to Beckle!	6/29/2018 5:15 PM
34	I dont want a sidewalk on my property	6/29/2018 3:10 PM
Ti C		Action in the last of the last

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Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

Q6 Recommended Alternative Whitney Road at U.S. 30: "Realign" Whitney Road at U.S. Highway 30 and remove U.S. 30 Service Road connection to Whitney Road.

Answered: 325 Skipped: 82

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(no (abel)	%0		DEFINITELY LIKE	20,31% 66	ANY ADDITIONAL COMMENTS?	Service road is primary access to business in this area, and connection removal will restrict access. This will cause economic harm to these businesses. It is also unnecessary, no traffic problems are caused by service road connection to Whitney Rd.	A traffic light here (or a roundabout) definitely needed here.	Outs off frontage road businesses and makes customers travel out of the way to access. Also would add traffic to the side and back streets around the frontage road businesses,	Would require employees of frontage road businesses to travel miles out of their way (maybe not a big deal for one trip, but added up for everyday it bocomes exponsive in time and fuel)	HORRIBLE for Big Al's !! YOU try running a business with this sort of recommendation!!	How about we close off access to your businesses an cut you off from your livelihood? This city is goting stupider all the finner! You want to do stuff manke everyoner happy that wants to buy those big expensive houses an crap on the people who have lived here there whole lives supporting his city and county!! You people need to pull your heads out of your a\$\$est!	Businesses need that extra exitway,
				(no label)	*	_	N	m	7	10	40	1

23 / 37

10	I have no objection to the stop light, but I do have a HUGE objection to removing the service road connection to Whitney RG. The simple option would be ton termowher his. I's not a staffy connection, like the US 30 and Whitney intersection, Another option would be to insert a turn in for the service road from Hwy 30, about where the proposed turn around is featured in the plans. There is quite a bid to service include the proposed turn around is featured in the plans. There is quite a bid to service include the white a cesser from Wooldwoes is allowed incompaging to and from the businesses would morn the businesses would morn the businesses would morn the businesses would must hose companies. In the white, access from Wooldwoes is allowed into season would with snow your cart drive a vehicle through. Trying to get the large rucks up the large enough for the semi trocks to be able for thin around proposed would not be large enough for the semi forces to be able for thin around proposed would not be large enough for the semi forces to be able to the macroal made large frough and raffic getting stuck in her didd I know there was concern about having a turn out from highway 30 too does to the proposed stop lights at the him 30 and Whittey intersection, but there's close turn outs all the way down Dot II sarge to accommodate the businesses there, so it would be the same here as well. It should the ball sarge to accommodate the businesses where to a through the tense and residences on the service road. From the information I received at the meeting, it sounds like there will be a possibility of waiting to remove the east service road access to the businesses and residences on the solving service road residences on the solving service road residences con the service road from the information I received at the meeting, it is caucial while the businesses and residents who would so vasity affect the proposed change, where not against change, but to mise est businesses and it turn one decidences and in turn or self wit	//13/2018 10:45 AM
o	into a southor) that was work for an patters would be investingly do say the teast. This would be a serious hindrance to the daily operations of our business as well as to our customers.	7/13/2018 10:12 AM
10	This would make it difficult for my accessibility to my business and my mailbox	7/13/2018 5:29 AM
Ξ	Although this may be a safer aspect, there are business along the Service road that would be restricted to only one entrance.	7/12/2018 1:31 PM
2	There needs to be traffic lights at dell range and Whitney and Whitney and highway 30. There are numerous wrecks and close calls at these intersections. With the housing development and population growth these need to be addressed	7/12/2018 8:14 AM
13	Do not remove service road as it's a good alternative to using U.S.30 in the event of accident or when pulling trailers etc.	7/11/2018 B:10 PM
4	I don't like the idea of 3 lights in one mile (Christiansen, Dell Range and Whitney). We need to time our lights so you don't have to stop at the all. Also the use of a green turn arrow at the beginning of the light would help keep people from running so many lights. Perhaps the traffic could be diverted to Dell Range or Whitney, but not have both of them open to US 30.	7/11/2018 6:48 PM
ιΩ	I don't think this is necessary.	7/11/2018 5:27 PM
16	The service road is important because of the speed of Hwy 30 and the weather and ice in that area	7/11/2018 4:46 PM
17	In need of a light at this intersection.	7/11/2018 3:27 PM
18	Not sure if a stop light is needed	7/11/2018 12:35 PM
19	This intersection needs something to help with crossing and turning, this is a grateful idea,	7/11/2018 11:09 AM
20	Unless if this redesign removes that ridiculous set of salety islands on whitney / hwy 30 that now render one and one-half vehicles in a turning lane, then Hell no, mpo and the city love to "offset" croads, the 12th street / sun valley redesign years ago is an ebsolute mistake, It was one of the reasons why I chose to sell my house in that neighborhood. Iraffic design into and out of neighborhoods is every important to those who live there, when changes are made that make it worse, people wish they never bought.	7/11/2018 10:55 AM
21	It would upset some people but I think its needed. People haul butt down the service road and run the stop sign constantly.	7/11/2018 10:24 AM
22	Don't put a light it will absolutely kill traffic flow like the stop sign on ridge and storey	7/11/2018 10:09 AM
23	Another light on a highway? No thanks, It really doesn't get that much traffic yet.	7/11/2018 9/46 AM

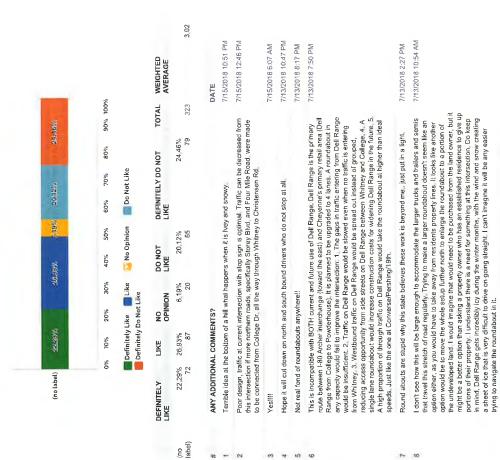
25	While I like how a traffic light will take the Cheyanimal's questionable decision making out of the equation, I do not like the idea of on in the middle of highway 30. This town times traffic lights in the most idiotic way so a driver will get stopped by each one, no matter driving style.	7/11/2018 B:31 AM
26	Stop light is needed.	7/11/2018 7:24 AM
27	Why a stoplight? There is not that Mucj traffic there and putting stop lights on a 55mph road seems like it's just going to slow down traffic unnecessarily.	7/11/2018 7:23 AM
28	Get that stoplight in there ASAP!	7/11/2018 5:49 AM
59	We absolutely need a traffic light here. Many people will wave through oncoming traffic to be courfeous. The problem with that is it creates a disruption of the traffic flow. There have been several accidents here that could've been a lot worse. Fortunately, these creaties have mostly been minor injuries. I'm not a fan of the realignment on Whitney north of Hwy 30, but I'll take it if we get a traffic light. There will be lots of side offs in the winter.	7/11/2018 3:33 AM
30	No sure what this is trying to do	7/10/2018 9:07 PM
31	This needs to remain as is. Does not make any since to change it.	7/10/2018 12:25 PM
32	The service road is a pretty active road with businesses, How would those businesses have access to their property. Hinesley Road was not designed to have that traffic.	7/10/2018 10:33 AM
33	I think a traffic light would be better placed on the dell range side	7/8/2018 4:37 PM
8	Putting a traffic light off the hill will be challenging for those hauling trailers.	7/6/2018 7:36 AM
35	Adding a stop light on a 55mph highway seems very counter productive, But would be much better than another round about Removing access to the service road from Whitney road is the opposite of what should happen, instead remove the access from the highway 30 and service road intersection if that would really help. That is a low traffic road portion of this equation and would be best served left alone.	7/5/2018 12:44 AM
36	No stop light. Stop signs on whitney	7/4/2018 9:12 AM
37	With a traffic Ilght?	7/3/2018 9:22 PM
38	Why does anything need to he done here? Provide feedback please	7/2/2018 11:09 PM
39	needs to be done now!!!	7/2/2018 9:32 AM
40	So Needed, Thank You!	7/2/2018 9:28 AM
41	need free right turn lane on Southbound Whitney Rd. to wast bound US-30	7/2/2018 9:22 AM
42	Agree with stoplight. What would be the reason to remove the service road access? I think this is a good choice.	7/2/2018 9:10 AM
43	пеед тоге	772/2018 8:30 AM
44	Why is all this necessary. Fix the roads that have problems now! Isn't this all County?	7/2/2018 7:28 AM
45	Fix the roads we have Dell Range east is in need of repair, keep the service road, in the future it will probably be needed.	7/2/2018 7:24 AM
46	As a business owner of Big Al's located on 6526 HWY 30 the removal of access at Whitney and the Schook Rd. is a big concern. We receive 3-5 Tractor trailer deliveries per week that will have problems with the deed on Service Rd. Please contact me anytime. Andy Vehar 304-220-2740 Big Al's Auto 307-637-8955	7/2/2018 7,15 AM
47	Suggest a one way East Bound on 30 Service Road from Whitney to connection at Hwy 30 to accommodate truck deliveries. Also Hinesley to Whitney Alignment needs to be looked at as Southbound Whitney traffic is hard to see.	7/2/2018 7:09 AM
48	I love the light because it will slow down most of the traffic. It would be nice to have it traffic controlled not timed control.	7/2/2018 7:03 AM
49	I like that the intersection will be closer to being perpendicular, Elimination of service road connection should help tremendously.	7/2/2018 6:59 AM
20	Not sure about removal of service road	7/1/2018 10:44 PM
51	This needs to happen.	7/1/2018 12:02 AM

52	Is a roundabout feasible here? I understand there's a bit of larger truck and trailer traffic but let's make this as efficient as possible. I'm not sure adding a traffic light is the best option. I have never had to wait more than a minute to cross the road.	6/30/2018 8:53 PM
633	This is such a dangerous intersection!! Please put a street light here!	6/30/2018 10:28 AM
54	We absolutely need a traffic light above all else at this intersection, it has grown to be an extremely dangerous area over the last lines years we have lived here. Those driving highway 30 actually appear to speed up occasionally when individuals are trying to cross on white wy, it's out of control.	6/30/2018 7:12 AM
55	Traffic control is critical. It has become a real hazard at rush-hour and people shooting the gap to cross Highway 30 on Whitney.	6/29/2018 8:21 PM
26	Eliminate the islands and you might have a useful option.	6/29/2018 8:09 PM
22	Please punch through Storey, It would relieve so much pressure on Whitney and Del Range.	6/29/2018 2:14 PM

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Q7 Recommended Alternative Whitney Road at Dell Range Blvd.: Single Lane Roundabout.

Answered 323 Skipped: 84



Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

Ø	A stoplight would be a better option for this intersection, Too many people do not know how to properly use a roundabout which causes more confusion.	7/12/2018 1:32 PM
10	This would slow the traffic and control traffic flow	7/12/2018 8:15 AM
1	Why?! What would this help solve? Why is it necessary?	7/12/2018 8:01 AM
12	Make it a controlled intersection and expand Del Range from college to US 30	7/11/2018 9:10 PM
13	Would greatly slow down traffic on US 30 but would help the intersection flow better	7/11/2018 8:11 PM
4	Better than a light, but need to take into account large trailers, etc as was discussed in the meeting. Definitely one lane only,	7/11/2018 5.48 PM
15	Why does Whitney veer off to the west? I think it's necessary during busy times and as you build more houses.	7/11/2018 5:29 PM
9	I suggest a 4 way stop like on Ridge and Story, Also need a street light there it is really dark and and can't the the turn from Dell Range on to Whitney going south to US 30.	7/11/2018 3:25 PM
17	Not a good idea especially in the winter coming south off whitney,way to slick coming down the hill, you will see more accidents not less	7/11/2018 1:28 PM
18	Why signal at us 30 and roundabout at Del Range?	7/11/2018 1:04 PM
19	Not needed	7/11/2018 12:36 PM
20	People in this town are terrible at roundabouts, I've seen too many accidents at converse and pershing,	7/11/2018 11:11 AM
21	No reason for a round about in non complex intersection. This area that is going to see fast increased growth and traffic . Put a traffic light there and be done with it, Works now and when it gets busier in the future	7/11/2018 11:06 AM
22	double down on the hell no	7/11/2018 10:55 AM
23	The drivers on Del Range are already going 45 mph, most would not slow down and I believe it would cause accidents. If they widened Del Range to include two turn lares, both right and left at this intersection. I believe it would help.	7/11/2018 10:29 AM
24	Ruins traffic flow same at converse and Pershing	7/11/2018 10:09 AM
25	No one knows how to use a roundabout in this city as it is.	7/11/2018 9:47 AM
26	Roundabouts only work in civilized areas. Cheyanimals have the belief that when one enters a roundabout, they enter a time warp to a new dimension,	7/11/2018 8:33 AM
27	Should make a double for expansion of dell range as it is congested as well	7/11/2018 7:01 AM
28	We need lighting here as welt. I wonder whether a traffic light would be better than a roundabout with for people approaching at 45 miles an hour.	7/11/2018 5:51 AM
29	I'll take the roundaboul if it is well fit. Again, there have ben many accidents at this intersection as well. It's very difficult to see the turn from Del Range on the southbound Whitney in the dark. I usually look for the single reflector pole and then slow down. We definitely need more lighting here.	7/11/2018 3:35 AM
30	Hard to negotiate a roundabout with a trailer, there are a lot of trailers being pulled. Need a traffic light	7/10/2018 2:58 PM
31	If is big enough for large motorhomes & Towvehicle	7/10/2018 2:54 PM
32	I think a stop light would be a much better solution.	7/10/2018 12:25 PM
333	You need to sit and watch traffic in the momings and in the evenings to know that this is not a good solution. Along with the new houses at Whitney Ranch you will increase the amount of traffic accidents in the area. Also with the amount of traffic I think this will not work.	7/10/2018 10:38 AM

Whitne	Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)	SurveyMonkey
8	1) With today's stop light technology, road sensors and such signal lights can be programmed to delay changing or quickly change depending upon traffic coming and going during busiest times of the day, 2.5 Affet stillings business times of the day, 2.5 Affet stillings business times of the day, 2.5 Affet stillings business times of 4512 Whitney will also help reduce accidents an increased visability, 4.1 A Traffic Light will work better for increased traffic from Semi's; 5,1 A Traffic Light will work better for vinceased traffic from Semi's; 5,1 A Traffic Light will work better for vinceased traffic from Semi's; 5,1 A Traffic Light will work better for young and aged divivers and those with have straight as one stop straight of the seminary straight as one straight define to keep Whitney straight as possible to not slow down the flow of increased traffic (straight definetely enhances visability, 7) Whitney should have a 5% grade for bicyclists, walkers and whreelchairs especially since commercial buildings will be placed on properly from Whitney adoing Deffance, 8) Do not place a park between Whitney and the expanded 2400 homes, just asking for touble with Kids crossing the road to get to park or walkway, someone will get ran over 9) it will the much petater in the long run to redo ratural gas and oil line on existing path of Whitney, Keeping Whitney straight, enhancing visability and tessoning the chances of children getting but crossing the road to get to park or walkway, 10) Whitney should have all the utilities including fiber optic lines vun of ruture expansion of technology.	7/9/2018 3:24 PM
35	i do not like, people drive too fast down whitney to approach a round about, needs to be a light, I do not like the road being closed that goes to foxglove, chickadee and buttecup, why can't there still be a road to access these three stress only, then fate buttercup be a culdesec, then bring in a new road from tell trange to storey/beckle, this would also alleviate traffic and the number of cars on whitney and the new whitney road, gives different access.	7/9/2018 12:14 PM
36	Traffic speeds need to be reduced for this option to be viable	7/8/2018 4:38 PM
37	Please post a picture of the rest of this ideaif you shift Whitney to the west, how far west and when does it go straight north again?	7/5/2018 11:41 PM
38	I like the roundabout idea as it slows traffic during congested periods.	7/6/2018 10:57 AM
39	Make plenty wide for trailers.	7/6/2018 7:37 AM
40	Should keep people from going 55 past my yard with my kids in the yard	7/5/2018 11:26 AM
41	Too dangerous considering the hill on the east	7/5/2018 7:55 AM
42	Please just use a stop light!!! Round abouts serve a good purpose in low speed residential areas, and where more that 4 directions of traffic meet.	7/5/2018 12:46 AM
43	Awesome idea, Slowing drivers down off the southbound Hill on Whitney would be a great safety improvement as well,	7/4/2018 9:52 AM
44	Roundabout or a traffic light	7/3/2018 9:22 PM
45	No roundabouls!! Please do a traffic signal. We have enough roundabouls that people do not know how to use,	7/3/2018 8:39 PM
94	This is a good alternative option and may reduce commercial traffic thoroughfare and keeping them to US 30 to Pershing / College Dr_{s}	7/3/2018 6:18 PM
47	Single lane ok or needs traffic signal.	7/3/2018 5:59 PM
88	I love single lane roundabouts and find them extremely effective as long as they are large enough to accomodate long truck/camper combinations.	7/3/2018 3:57 PM
49	needs to be done even sooner!!!	7/2/2018 9:32 AM
20	Another useless roundabout Several accidents occur each month in lown - not needed	7/2/2018 9:27 AM
51	But need to have overheed street lights, to dark at night at this intersection,	7/2/2018 9:22 AM
52	I am very concerned about the roundabout during the winter at the bottom of a very steep hill. Also having a single lane roundabout seems like it would back up traffic quite a bit dew Dell Range, Is there consideration of Dell Range being widened to 4-lanes at anytime?	7/2/2018 9:12 AM
53	Cheap way of not putting in a light, which would be better at the bottom of a hill, To many assumptions with this plan - assumes everyone will slow down and yield, In the long run a light at what becomes a heavily used intersection will be cheaper than the liability of poor roadway design.	7/2/2018 9:04 AM
54	Would like to see RT turn lane that does not use the roundabout on N. Whitney to D.R. and Del range to S. Whitney road to remove a significant amount of traffic from the circle at peak use times,	7/2/2018 8:46 AM

55	Would like to see Rt turn lane that does not use the Roundabout on N, Whitney to D,R, and Del Range to S, Whitney road to remove a significant amount of traffic from the circle at peak use times.	7/2/2018 8:42 AM
26	Actually if you get it in place by the time I head home from here tonight, I will be delighted, Reduce speed to 40mphn on HWY 30 ASAP from Cheyenne Hills church to Whispering Chase	7/2/2018 8:37 AM
27	Definitely Do Not Like- Semi Traffic atone would destroy this! Definitely Like - If it is built to handle this kind of traffic!	7/2/2018 8:32 AM
80	This whole project should look the future as this will result in a large traffic increase as more travelers find they can circumvent town from 85 via Powderhouse (via N Star) to Iron to Whitney, With traffic already out of control this likely should be 44anes or at lest one fulltime deputy should be assigned,	7/2/2018 7:54 AM
29	There is not need!	7/2/2018 7:28 AM
90	Should move intersection to the east to accommodate a double lane both east and west bound DelRange as extra room for truck traffic will be needed.	7/2/2018 7:10 AM
94	It would help to have a flashing fight so people can see the roundabout before they actually get to the roundabout	7/2/2018 7:04 AM
62	Definitely need roadway lighting.	772/2018 7:00 AM
63	No on a roundabout!	7/1/2018 9:24 AM
64	No roundabout! Please No.!!!! These are not effective traffic control measures in Cheyenne. If you do anything, please do a four way slop or a traffic signal, A roundabout would be detrimental to the traffic flow and area.	7/1/2018 12:04 AM
65	Yesiiii	6/30/2018 8:54 PM
99	Putting in a roundabout where there isn't a problem is a wastie of money in construction costs as well as snow maintenance. With screw things up with an unnecessary roundabout? Does Cheyenne have to follow Colorado's supid ideas just because we are forced to have a Metropolitan Planning Commission?	6/29/2018 8:12 PM
29	Roundabouts are dumb, amd useless at that specific section of road, Just put a stoplight	6/29/2018 3:12 PM
99	I have witnessed many people RUN the stop sign there. This eliminates that problem greatly.	6/29/2018 2:40 PM
69	Please punch through Storey, It would relieve so much pressure on Whitney and Del Range,	6/29/2018 2:14 PM

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Whimey Road Corridor Study Comment Sheet (Open House Meeting No. 2)

Q8 Do you have any additional ideas, information, or other comments that you would like to provide at this time?

Answered: 87 Skipped 320

	KENDONSEN	DAID
	Traffic in this area would be significantly reduced with a connection of Storey Blvd and Four Mile Rd hrough Whitings all the way to Christensen RD, &s well as further reductions when Christensen exitoverpass project is completed from Interstate 80, Funds would be better spent with more effective results with the development of these alternative routes.	7/15/2018 12:50 PM
2	Latso like how you have drawn up Whitney Road up the hill from Dell Range—the curve should provide a gentler grade and hopefully be safer.	7/15/2018 6:08 AM
69	I said what I came to say, Big Al's has done so much for Cheyenne, etc, leave the service road as it is. Thank you	7/13/2018 8:55 PM
4	Add a stop light at Del Range and Highway 30	7/13/2018 2:50 PM
w	Whitney needs fixed all the way out to iron mountain. Needs to be widened all the way	7/13/2018 2:27 PM
ID.	Do not do the del range highway 30 shut down Terrible decision	7/13/2018 11:36 AM
	I think visiting with the businesses and residents of the areas that will be affected the most by changes under league. Super bere needs to be something done, as the way Whitney sits of words safe, Afthe very least, Whitney needs to be widened. I'm having a hard time understanding how all the funding for this project has afready been approved without having a final plan approved, I certainly hope this meeting was not just a way to say the public was a saked to be involved and those are actually the final designs that have already been approved, I'm not the only person or business that would like to have a discussion about the service road acress, I ask that you at least visit with us before making any final decisions. Thank you,	7/13/2018 11:01 AM
	Definitely a stoplight at whitney road and highway 301	7/12/2018 10:36 PM
	No	7/12/2018 9:57 PM
10	To prepare for future growth, please expand to four lanes (two lanes going north and south bound), Additionally, Dell range should be expanded to four lanes,	7/12/2018 4:05 PM
1	I do not agree with changing the speed limit on Whitiney to 30 MPH, This seems more dangerous, as most people will not abide by this, if Dell range can be 40 MPH, why can a HWY outside of town not be. For those of us who drive this every day, the speed limit should be kept the same,	7/12/2018 1:34 PM
12	Something needs to be done for both highway 30/Whitney and delitange/Whilney intersections before serious injuries start occurring from the growing trafife and pedestrian traffic	7/12/2018 B:18 AM
13	Light at Whitney and US30	7/12/2018 7:11 AM
4	Make the intersections at both Del Range and US 30: 4 lane (with turn lane) E-W and Whilney 2 Lane (with turn lane) N-S and make them traditional controlled intersections,	7/11/2018 9:12 PM
15	Keep the country feel, do not make this a thorough Fante in a city	7/11/2018 8:41 PM
16	Widen Whitney so it has right and left turn lanes for all lanes and sides of US 30	7/11/2018 8:12 PM
4	I do not like the idea of Whitney going through the neighborhood to the west. I would rather keep quavistee grade than have for drive through a neighborhood, I don't hink the spead needs to decrease. 45 is reasonable, I think the reason people want to lower it is because poople drive 55-60, would prefer the proposed neighborhood at dell range and Whitney traffic dump into Dell Range rather than Whitney. This would lead to less traffic on the roundabout. With the increased traffic from Wood's landing flon Mountain and possible Storey throughway, there will already be a marked increase in reasonable.	7/11/2018 6:53 PM

31/37

18	A sheriff on the road on occasion would be nice to see. People drive 60 MPH at irries on the road, Irone that the sheriff's Office is not dioing the HTVE like CPD, but it sure would be great You also need to keep in mind dait those of us on North Whitney would not have any way to get to Dell Range if you use the entire road down (for example Sundance loop), We are land locked into Whitney, And not late the entire road down (for example Sundance loop), We are land locked into Whitney, And not late the only connection is powerdhouse of irron min and that takes us way out of our way. I know we are one household, but just food for thought.	7/11/2018 5:32 PM
9	The intersection at withrey and deli range needs controlled but you need to consider the winter driving conditions. The full north up whitney is tuke a skaling rink, Add a round a bout and you are going to have fraffic backed up daily.	7/11/2018 1:30 PM
20	Get the project out to bid and started before the costs go up	7/11/2018 11:25 AM
2.1	Think about having a limed traffic light at 30/Mhilney and then a busy roundabout right after at Dell Range. The congestion would back up and impact 30/Mhilney almost immediately after its built.	7/11/2018 11:11 AM
22	Where can I find out what is going on for US39 and Dell Range? Starrwy@aol.com	7/11/2018 11:07 AM
23	We can be guaranteed that if the public don't like something, then that is the route the planners take under the guise of safety and concern for its clitzers. The 12th street / sun valley drive worse and most criticized option was the one picked,	7/11/2018 10:57 AM
24	I believe if Whitney Road between Del Range and US30 was wider it would cause less congestion. The malloxes are super close to the street and when the mailtains it sell-vering mail to them it cause people to severe into the opposite lane to savid lim. This results in everyone in that lane having to slam on their brakes and has caused a least one accident I'm aware of.	7/11/2018 10:33 AM
25	Connect storey to beckle and run 4 lane two west two east on dell range to 30	7/11/2018 10:10 AM
56	Can we please just get, the damn road fixed so it doesn't feel like I'm driving over railroad tracks the whole time? You guys have all these massive plans that serve no purpose at this time and fail to realize how hormble the road itself is, Fix the small shit first and show you actually care about the road and residents before shutting it down to add more of a waste and more stuff that will need repair, but doesn't get it,	7/11/2018 9:49 AM
27	With the residential now mixed with commercial traffic restrictions need to be added, No semi trucks, lower speeds, more control on US30, Reduces noise and increases safety	7/11/2018 8:49 AM
28	While these all seem like fine ideas on paper, one must remember this construction is taking place in Cheyenne, WY, The Cheyanimal is arguably the worst driver on the planet, most likely due to limited brain capacity and sense of entitlement.	7/11/2018 8:34 AM
29	Mainly feel the problem is not wide enough road between us 30 and Dell range on whitney, and the traffic at those intersections. Is it not possible to put in a roundabout along the us30 intersection?	7/11/2018 8:06 AM
30	Will there be flashing signs and or rivels in the road to just add extra visibility to the stop light at Whitney and 30? On south Greeley, as you head north, there is a flashing sign to warmfundom of the light next to me diesel. It would love to see that as you head (coming from the area of 30 with Reese and Crisitensen read). As a parent of a soon to be teen driver, I would love to also see rivets (wording?) in the road as you approach the light just to add extra safety. If muthriking of those creases in the road and a highway shoulder that alerty ou if you go the rower, some towns put them in the lane as you approach major intersections. This will be a high speed intersection and I worry about the unavoidable trunning of the light. What all can we do to minimize that? Thanks	7/11/2018 7:50 AM
31	Widen the stretch of Whitney road between highway 30 and dell range,	7/11/2018 7:34 AM
32	Please install a light at the intersection of US 30 and Whitney, I can't recall how many times I've nearly gotten hit by a people who turn at the same time that I do.	7/11/2018 7:23 AM
es es	I would like to see the road widened and some landscaping put in, When I go to the Denver suburbs, their siteets are lined with beautiful tress and landscaping, Here in Cheyenne that doesn't happen, All we get its some praine gass and weeds, The City and County can do more to improve the aestericis of the eras. What hey need to do its quit pushing their pet projects and do some stuff that will actually be enjoyed by more of the cultzens,	7/11/2018 3:37 AM
34	Need to definitely wide the laries of Whitney rd, slow down traffic, add street lights, and walking/bike paths. Botton of Whitney hill needs a traffic light. Punch more roads through to the west	7/10/2018 3:00 PM

Whitney	Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)	SurveyMonkey
85	The intersections at US 30 & Whitney Road and Whilney Road & Dell Range need something done to them need if only temporarily, these 2 intersections are a Nightmare! Also, on your overhead shot for louces on foxglove, the house with the long driveway to A RV garage is our property you have 3 other peoples names by it.	7/10/2018 2:57 PM
36	I feel that a roundabout at the intersection of Whitney and Dell Range would be a very bad idea, I would rather see a traffic signal instead.	7/9/2018 9:52 PM
37	I have received comments lately which indicate a desire for a stop light.	7/9/2018 9:18 PM
38	Connect Whitney and Storey Blvd.	7/9/2018 8:23 PM
39	See prior comments regarding Whitney and Del Range Intersection and going North,	7/9/2018 3:28 PM
40	Make whitney road one speed limit inslead of going back and forth between two different speeds.	7/9/2018 3:07 PM
1	need different access points to fox run and other areas, not just one road, leave whitney lwo lanes for the first three streets, at a second road to approach to becklefstorey	7/9/2018 12:15 PM
42	A traffic light is needed at Whitney and highway 30. It is so dangerous, Lower speed limit on highway 30!!	7/8/2018 10:12 PM
43	Continue the road improvements beyond beckle rd	7/8/2018 8:07 PM
44	Crealing a pass thru from Storey through College would help alleviate a lot of traffic on Whitney/Dell Range	7/8/2018 4:40 PM
45	I would like to see Whitney connected to College via Storey/Beckle	7/8/2018 8:07 AM
94	Traffic light al Whitney and dell range	7/7/2018 7:58 AM
47	Finish the connection between the new storey and the old summit drive	7/6/2018 11:41 PM
48	Cul d sac Dell Range and make all traffic drop down to US 30 at a light.	7/5/2018 6:58 PM
49	The intersections at Whitney and U.S.highway 30 and the intersection at Whitney and Del Range are extremely congested and dangerous. I have seen several accidents in both of these intersections. I think the only real solution is to add stop lights! Especially if you are planning in adding luming lanes!	7/5/2018 1:22 PM
20	Move Dell range south in the right of way planned not north into my yard as proposed	7/5/2018 11:27 AM
51	I think the county should look at connecting some of the mads that would make it easier to get around the area. Like take Whitney all the way through 10 85, Connect Storey, connect Four Mille, cornect Rding Club, connect Converse and connect Powderhouse, believe that by connecting these roads it would cut down on traffic and congestion in several other locations.	7/5/2018 8:41 AM
252	A fair amount of traffic could be diverted to Pershing if the quality of that road was improved, which should be in the plan along with the Christiansen overpass project. Once that artery is open, less traffic will be using these 2 intersections, and this will likely be irrelevant,	7/5/2018 12:49 AM
53	Please no roundabout.	7/4/2018 6:22 PM
54	Thank you for collecting data from the community, This is the second survey five completed and appreciate being able to be involved. Great public involvement!	7/4/2018 9:53 AM
55	I think a stop light is better then a round about due to the commercial traffic and those of us that haul trailers and horse trailers down that corridor, seems mote like a nuisance with a round about	7/4/2018 8:48 AM
26	Would like to see Storey connected	7/3/2018 9:23 PM
57	No roundabouts, they are ridiculous!	7/3/2018 8:57 PM
58	Keep in mind that the big hill on Whitney just north of Dell Range is tricky for going up and coming down (traveling south) in the winter.	7/3/2016 8:53 PM
29	Increase speed limit on whitney, Del range and perishing have higher limits	7/3/2018 7:48 PM
90	Flare out intersection from Whitney Rd to residential streets for easier right turns, Especially at Four Mile Rd,	7/3/2018 6:20 PM
61	I think you guys are doing a great job collecting information and presenting it back to community. It's unfortunate that the city did stud a peror job designing the roundabout on Pershing as it has given a lot of people a bad taste in regards to them. If done right this corridor will be a great section, moving forward into the next couple of detades.	7/3/2018 4:01 PM

29	Leave the road alone!! You're going to ruin people's properties and livelyhoods who have lived in these areas for decades, City planners and englineers are too lazy to actually plan and execute a proper design that will not create any issues for the residents around this road. Maybe, just maybe, instead of creating issues with a road that is fine, fix problems that need dealt with right now, Just a thought.	7/3/2018 1:49 PM
63	Prefer traffic light over roundabout	773/2018 9:50 AM
94	Raise the speed limit from Del Range to Iron Mountain on Whitney Rd.	7/2/2018 11:10 PM
99	Safety lighting near intersections	7/2/2018 9:30 PM
99	Street lighting at Dell Range and Whitney.	772/2018 9:21 PM
29	Finish Storey Blvd form College Drive to Whitney Rd, before starting construction on Whitney Rd, so traffic has another way in and out of Whitney Rd.	772/2018 9:23 AM
68	If moving/improving Whitney is years down the road, I am very concerned about the roundabout, being placed before the hill on Whitney is reduced. This would be very dangerous during the winter.	7/2/2018 9:14 AM
69	Our family is concerned about the well-being of the prairie dog and badger population currently inhabiting the Whitney Rd conflort is there a plan in place to humanely relocate what could be considered an established ecosystem? Presumably, Fox glove, chickadee, and Buttercup roads will continue up into this coosystem once construction begins - Again, is anything being done to will continue up into this coosystem once construction begins - Again, is anything being done to protect such a valuable species who according to the prairie day collision, currently only occupy one percent of their original range? Prairie dogs ensure seed diversity of the prairie and grasslands upon which we reside, simply ignoring their value and destroying their habitats will push endangeed species (like the Black Footed Ferret thio extinction, Can we relocate to public Lands? Perhaps Parks and Rec can help with green space or nature persevere so that our children will have nature to appreciate in the future.	7/2/2018 8:59 AM
70	additional access for Storie -4-mille- Iron ML will relieve much of traffic on Whitney	7/2/2018 8:46 AM
71	1. Speed Bumps 2, Greatly increased law enforcement patrols, 3. Open up this route to oil traffic.	7/2/2018 7:55 AM
72	Instead of moving Whitney Rd, make them move their pipeline, A million dollars to move on is worth it.	7/2/2018 7:25 AM
73	Should put proposed plans out for review before final meetings, the changes that have been put in since the last meeting are extreme,	7/2/2018 7:10 AM
74	Connect story Blvd	7/2/2018 1:09 AM
75	A roundabout at Whitney and US 30 might work also, although east bound traffic would lose momentum for the hill which could be difficult when icy	7/1/2018 10:46 PM
76	Uniformity is key And roundabouts are a great option versus traffic lights	6/30/2018 8:55 PM
77	I especially like the paving of Storey and connecting over to Whitney.	6/30/2018 5:12 PM
78	Why do we keep taking advice from people who don't live in the area, No one likes round abouts so stop putting them in my city, Areas around these roundabouts suffer because of them.	6/30/2018 12:47 PM
79	Anything that would slow traffic at the Whitney dell range and Whitney highway30 intersections would be an improvement. Lights or round about, The speed of drivers and the confusion of who is turning onto those two major roads is nuts.	6/30/2018 7:13 AM
80	4 lane all the way! North, eoult, east, and west! Do it right the first time and don't worry about "fixing" this issue again in 5 years!	6/29/2018 10:12 PM
20	Repair the roads that need it instead of spending tax dollars on dumb ideas like more roundabouts. For instance Dell Range from College to Whitney could definitely stand resurfacing, as could East Pershing from Christianson over the raliroad ro the east.	6/29/2018 8:16 PM
82	Thank you!	6/29/2018 7:24 PM

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83	There has been talk of completing the connection of Storey Blvd (between Summit and Beckle) once the famf to the south its developed. Connecting Storey now, instead of later will give residents an atternative route and dercrase traffic at the Whitney and Dell Range intersection. Wildering Whitney without adding extra travel lanes does nothing to alteviate traffic congestion, and as a landowner on Whitney! and poposed to that idea. Instead provide an atternative route by completing Storey that not only eases congestion but also provides better fire and emergency access to subdivisions off of Whitney.	6/29/2018 7:05 PM
2	Bicycle lanes! Please!!	6/29/2018 5:17 PM
85	It would be great if the sidewalk went all the way up Whitney	6/29/2018 4:13 PM
98	Roundabouts are dumb and you're pissing off a lot of us that already live on this road, espoially those of us who live directly off Whilney	6/29/2018 3:13 PM
87	Please punch through Storey, It would relieve so much pressure on Whitney and Del Range.	6/29/2018 2:14 PM

Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)

SurveyMonkey

Q9 How did you find out about this meeting (Please check all that apply)?

Answered: 301 Skipped-106

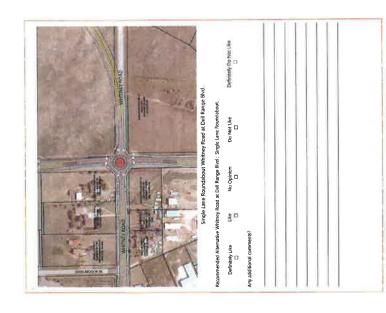
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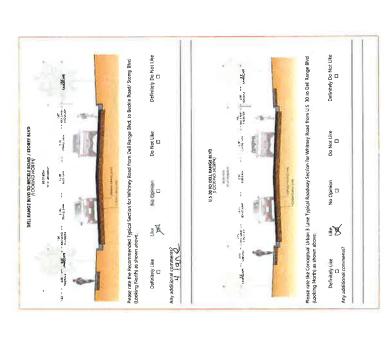
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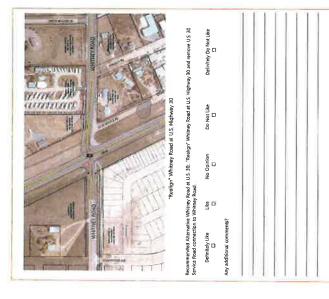
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Whitney Road Corridor Study Comment Sheet (Open House Meeting No. 2)	НОА	CAC Member	Signs along Dell Range
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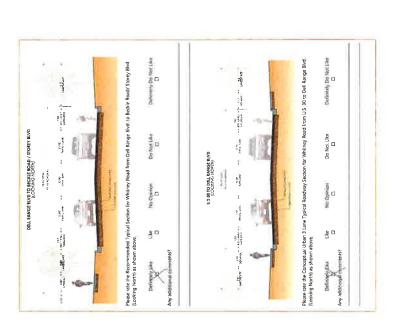
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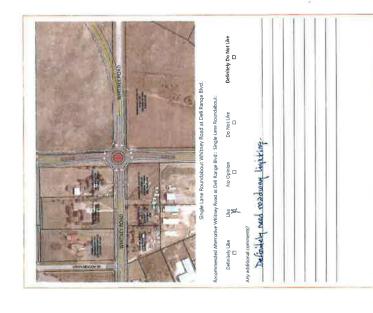
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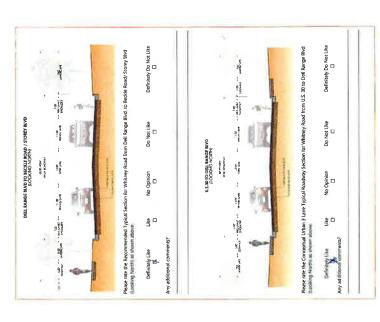
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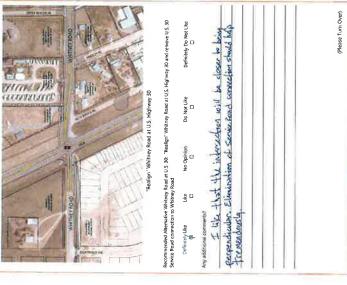
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Do you have any additional ideas, information, or other comments that you would like to provide at this time?



(Nesse Turn Over) Please rate the Recommended Roadway Typical Section Whitney Road at Beckle Road/Storey Bird. (Looking North) a shown above. POST PROPER Whitney Road Corridor Study Comment Sheet D Property Owner in the area Employee in the area Please help us keep you informed by giving us the best way to contact you (Optional)? Do Not Like ☐ Route user Name Berber - Rejd + Tim Wegd Other Which of the following best describes you (Please check all that apply)? Addres 4608 Van Buren Ave inst blood 4 6 meacon No Opinion □ Commercial Property owner ■ Business owner in the area Phone 8/6-7/6-8732 M Home owner in the area ☐ Renter in the area हें हैं 17.00 OrfCii Definitely Like



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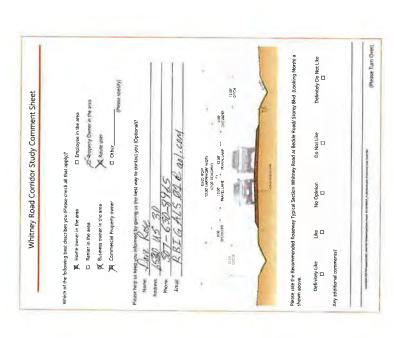
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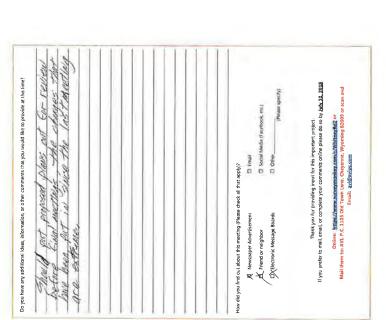
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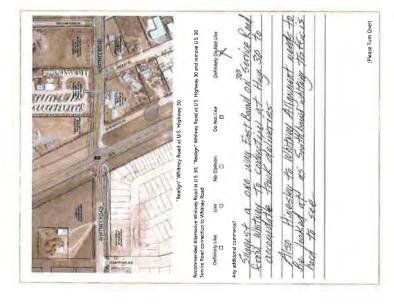
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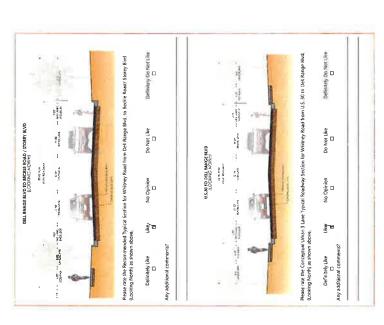
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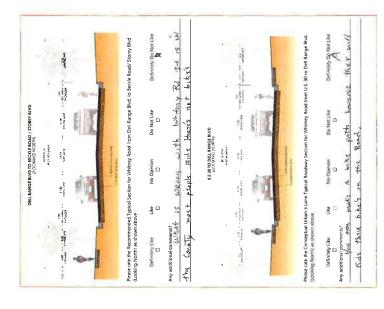


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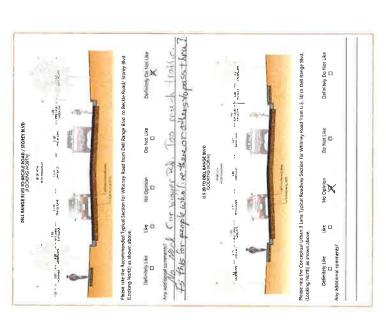


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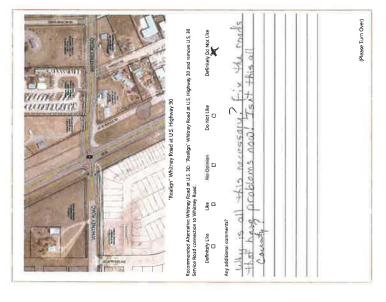
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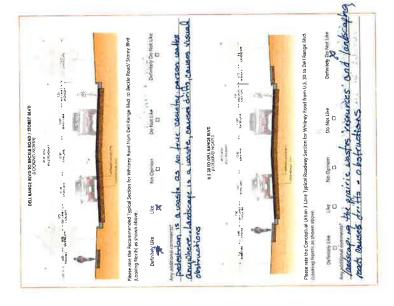


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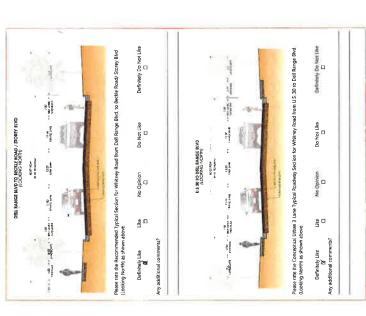
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Recommended Attenative Whiting/Road at U.S. 30: "Realign" Whitney Road at U.S. Highway 30 and remove U.S. 30 Service Road connection to Whiting/Road.

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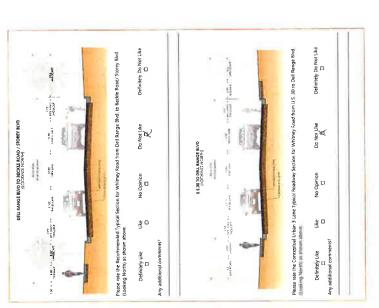
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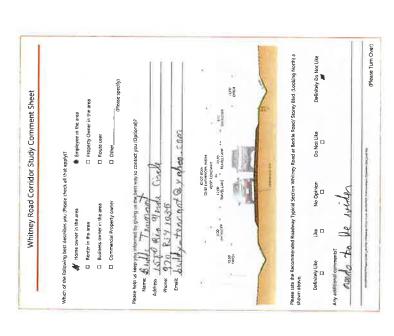
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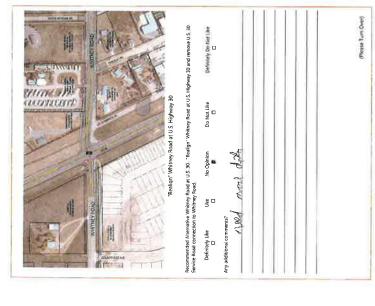


Single Lane Roundabout Whitney Road at Dell Range Blvd Recommended Alternative Whitney Road at Dell Range Blvd : Single Lane Roundabout. Do Not Life

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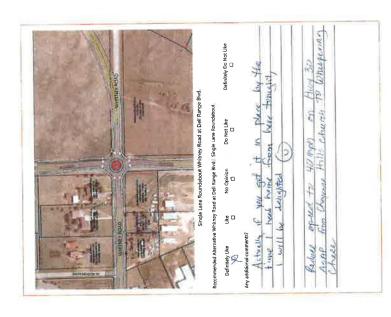
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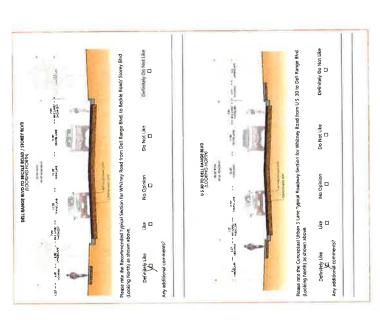
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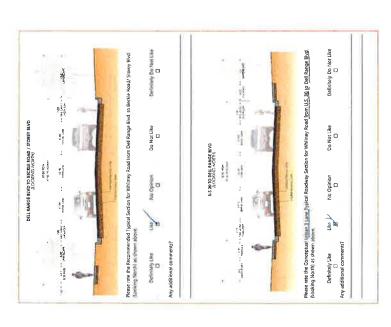
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Recommended Alternative Whitney Road at Dell Range Blvd : Single Lane Roundabout.

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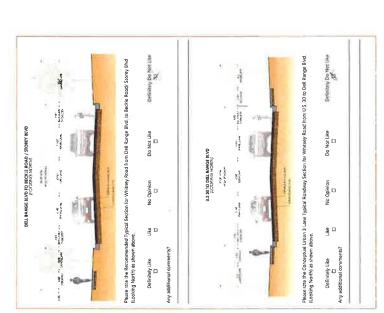


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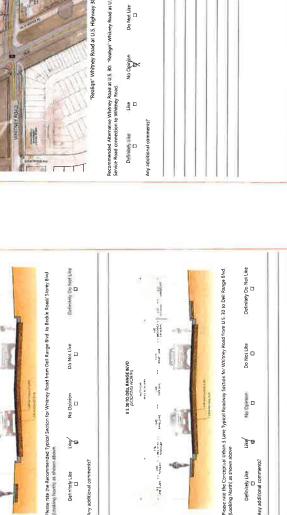
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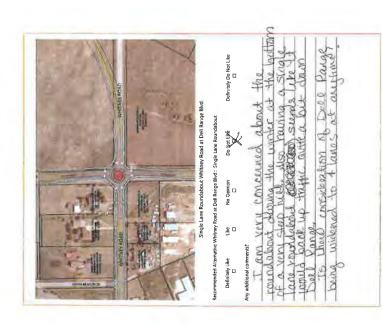
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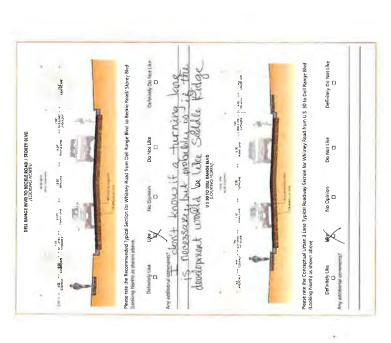
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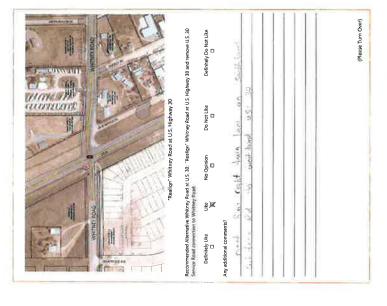
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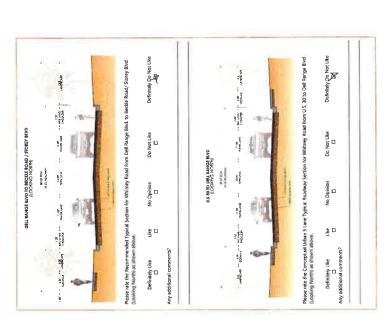
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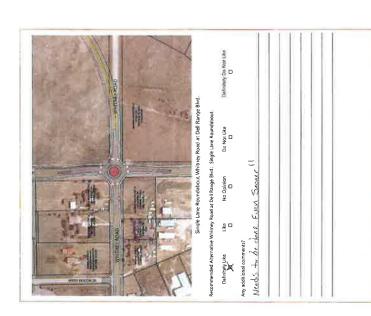
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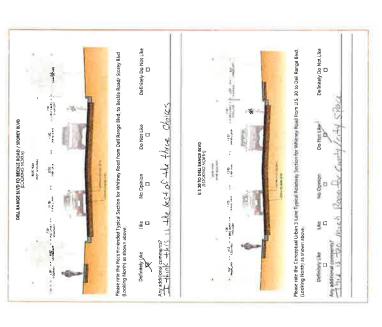
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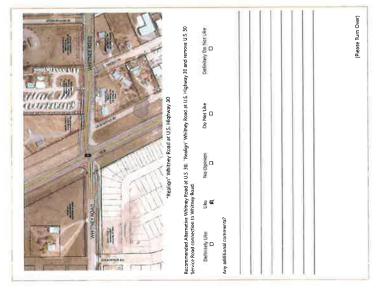
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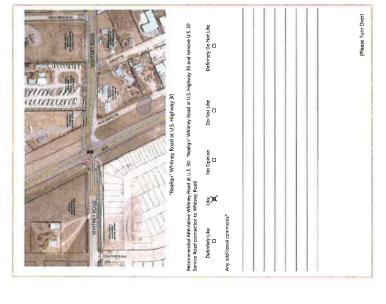
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WHITNEY ROAD 10 % CORRIDOR PLAN

APPENDIX C: PRESENTATIONS

August 2020

APPENDIX C Presentations





AGENDA



Quarterly Meeting MPO Citizens Advisory Committee Laramie County Library, Willow Room (1st floor) May 15, 2019

- 1) Call meeting to order (introductions if needed)
- 2) Approval of the November 15, 2018 minutes
- 3) Presentation and Approval of the draft FY '20-'23 Transportation Improvement Program
- 4) 2019 Cheyenne Transit Program Greg Singer our Operations Coordinator
- 5) Greenway and Trails Richard Zita
- 6) Update on MPO Planning Projects
 - a) Whitney Road Corridor Plan
 - b) 2018 East Dell Range and US 30
 - c) Parsley Boulevard Corridor Plan
 - d) Archer Greenway and Trail Connector Plan
 - e) Municipal Complex Pedestrian Routing Plan
 - f) PlanCheyenne Master Transportation Plan
 - g) Others
- 7) Other Business
- 8) Next Meeting meeting- August 22, 2019.



MEETING MINUTES

Subject: Project Update Meeting

	2-3987,17	MPO Office
	Project No: 2-3987,17	Meeting M. Location:
Client: Metropolitan Planning Organization (MPO)	Project: Whitney Road 10% Corridor Plan	Meeting Date: 6/09/2017 @ 2:00 PM – 3:15 PM
Client:	Project:	Meeting Date:

Minutes compiled by: C Pickett, PE and T Cobb, PE, AVI, P.C. 6/9/2017 & 6/12/2017

Minutes are in plain type. Action items are in bold type.

ATTENDEES: Nancy Olson, MPO; Tom Mason, MPO; Tom Cobb, AVI; Cassie Pickett, AVI.

TOPICS OF DISCUSSION:

1. PETROLEUM PIPELINE BACKGROUND

Two petroleum pipelines parallel Whitney Road on the East and West, A 12.75" diameter Suncor Energy petroleum pipeline runs parallel along the east borrow ditch approximately 30' off of the centerline of the existing roadway while the All American High Plains runs parallel along the west side Whitney. The exact locations of the utilities are not known at this time.

A meeting was conducted with Suncor Energy on May 9, 2017 at the Suncor offices. During that meeting Suncor conveyed the following information:

Suncor Pipeline

- Suncor believes that the easement they have executed requires any movement of the
 pipeline be paid by the party requiring the changes. AVI will research and acquire a
 copy of the existing easement.
- Pipeline impacts were directed to the area of Whitney between Foxglove Drive and Dell Range Blvd where approximately a 26' cut would be required to place the roadway and sidewalk at a 5% maximum vertical grade. Suncor indicated the cost to move 700' of impacted pipeline would be approximately \$1,000,000. Alternatives were discussed for either horizontal or vertical options to minimize impacts but, the pipeline cost of the pipeline move apparently is due to the fact connections to the existing pipeline can only take place during scheduled shut-downs.
- Separation distances were discussed from pipeline edge to a retaining wall as an
 option to realignment, Suncor preferred not to entertain the use of a retaining wall
 due to safety concerns,
- Suncor will provide pothole services of their line at their own cost in order to provide
 additional information for the project. AVI will need to contact one-call to initiate
 the locate.

3708 – HIGHPLAINS ROAD – STEERING COMMITTEE MEETING #2 – MEETING MINUTES AVI PROFESSIONAL CORPORATION 1103 OM Town Lane; Suike 101, Chayenne, WY 82009 phone; 307 637 6017

AVICC07202015 Page 1 of 3



All American High Plains Pipeline

 All American High Plains Pipeline has not been responsive to requests for a meeting at this time. AVI will continue to efforts to schedule a meeting.

POSSIBLE DESIGN ALTERNATIVES

The following ideas were brainstormed during the discussion for possible alternatives for Whitney. Road in regard to the pipeline utility impacts:

- Roadway paved shoulder over the top of the pipeline.
- Realigning Whitney Road to the west in order to leave the pipeline undisturbed.
- Realigning Whitney Road using a series of horizontal curves from Storey Blvd / Beckel Road to Dell Range Blvd. in order to reduce the vertical grade rather than lowering the roadway

AVI will investigate the feasibility of the alternatives presented and report to the Steering Committee and MPO on these options at future meetings,

III. PUBLIC INVOLVEMENT

Information Sheet

- The Information Sheet is on the MPO Website and will be used as informational handouts for people that would like a project overview,
- More information needs to be provided about the project to add to the Whitney Road

Public Notification Options

- A draft of a neighborhood/local project information and initial contact post card was discussed. Some suggestions for the cards include:
- Find something to place on the front of the card that highlights or emphasizes the Whitney Road Corridor Study.
- Add additional contact information for an option to be able to mail contact information.
- An option was discussed of providing a notification sign in public locations with a Survey
 Monkey Link for area north of Beckel Road, Storey to gather contact information. Given
 the number of residences north this would be more economical than sending the
 notification/ contact cards.
- Would community mailboxes be an adequate place for an informational sign to be
 placed? MPO will find GIS cluster box locations. AVI and MPO will investigate the
 feasibility of placement of information signs in these areas.
- Variable Message Signs could be utilized with the Survey Monkey Link requesting information from the public but, would be cost prohibitive.
- The Notifications should contain the following information:
- Request Contact Information,

3705 - HIGH PLANS ROAD - STEERING COMMITTEE MEETING #2 - MEETING MINUTES
AVI PROFESSIONAL CORPORATION 1103 Old Town Lene; Suile 101, Cheyenne, WY \$2009 phone: 307 637 6917

AVICC07202015 Page 2 of 3



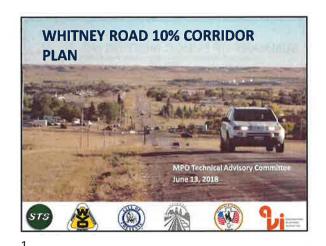
- Available Meeting Times,
- "How would you like to see Whitney Road Improved."

Neighborhood Meetings and two Public Meetings. This would allow some flexibility in the Public Meetings to have present alternatives and presented a recommended/ preferred option or have Depending on the responses from the Notification/ Contact Cards, it may better to contact two an informational meeting and an alternatives meeting. Meeting place options were discussed including area resident homes and Our Savior Lutheran Church. However, after reviewing the The contact is setup to contain three Neighborhood Meetings and One Public Meeting. area map, feasible locations for Public and Neighborhood Meetings include: Neighborhood Meetings

- Our Savior Lutheran Church: 5101 Dell Range Blvd. (P) 632,2580.
- Dildine Elementary School: 4312 Van Buren Avenue (P) 771_2320, Saddle Ridge Elementary School: 6815 Wilderness Trail (P) 771_2360,



AVI will contact the Lutheran Church for availability and whether or not a use fee would be charged for Neighborhood or Public Meetings in the facility. Additional discussions will be required to finalize locations and dates for the meeting after the Notification/ Contact Information Cards are mailed and information is collected.



AGENDA

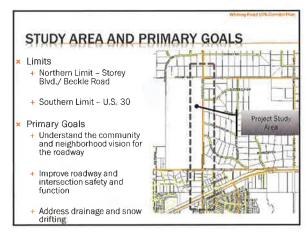
× Study Area and Primary Goals

× Summary of Public Outreach

× Overview of recommended Improvements

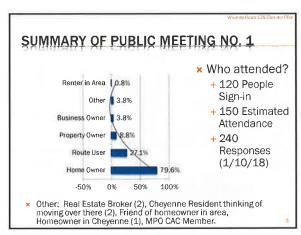
× Questions

2



SUMMARY OF PUBLIC OUTREACH Public Outreach Matrix Comprehensive Foundation November 8, 2017, June 28, 2018 · Transparency May 9, 2017, January 23, 2018 house Committee (2) Listening May 10, 2017 October 19, 2017 Strong Opinions Expressed March 7, 2018 & TRY June 13 2018 Regist 6 2018 August 9, 2018

3

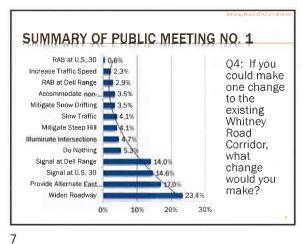


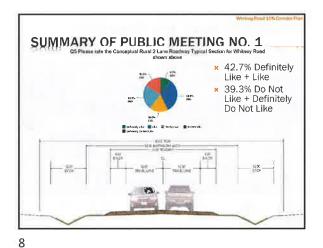
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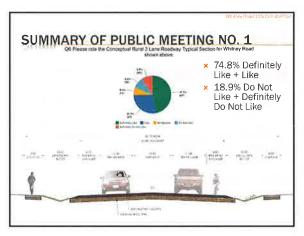
SUMMARY OF PUBLIC MEETING NO. 1

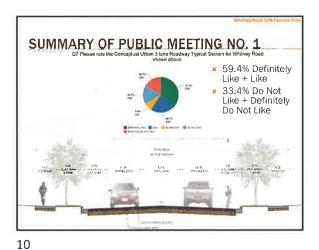
Q3 Please rate the importance of the following transportation users and issues based on what you consider to be the most important design consideration for Whitney Road?

6





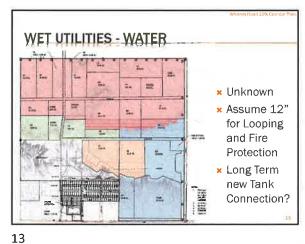




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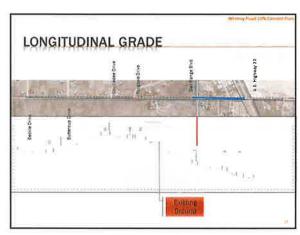
PROPOSED WET UTILITY OPTIONS Developer Needs vs 2013 BOPU Master Plan/ County/ City/ State Current Requirements / Needs + Sewer + Water + Storm × Detention 11

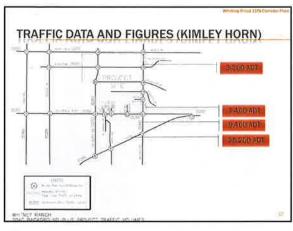
WET UTILITIES - SEWER 72 × 504.8 gpm peak 2040 (CEEE) A PAGE (15")200 mil ٤, × Lift Station . Force Main Chickadee Road 12

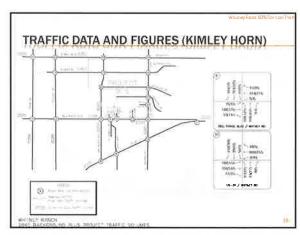


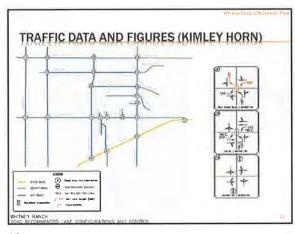


PROPOSED WET UTILIES -STORM × Detention Possible Regional









ADDITIONAL NEEDS (STS)

* Lane Configuration(s)

* Queuing Analysis Recommendations

* Other?

19

20

22

24

PRELIMINARY RECOMMENDED TYPICAL SECTIONS

* Beckel to Dell Range
+ Interim Rural 2 - Lane Roadway Typical Section

PRELIMINARY RECOMMENDED TYPICAL SECTIONS

* Beckel to Dell Range

+ Ultimate Rural 3 - Lane Roadway Typical Section

21

23

PRELIMINARY RECOMMENDED TYPICAL SECTIONS

* Dell Range to U.S. 30

+ Urban 3 - Lane Roadway Typical Section

PEDESTRIAN AND BIKE OPTIONS

Cheyenne On-street
Bicycle Plan and
Greenway Update, 2012

Cheyenne Metropolitan
Area Pedestrian Plan,
2010

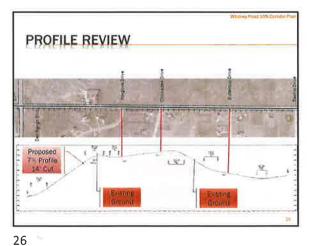
Other Options

On-street Bike/ Lane
Shoulder

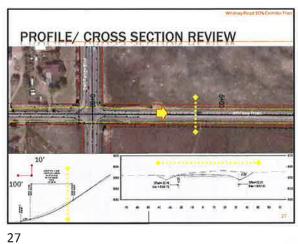
Trail or Additional Trail

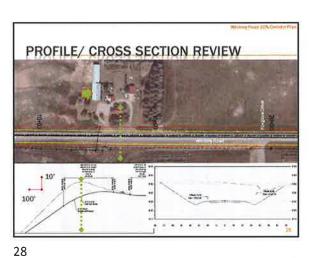
Multi-use Path
Sidewalk

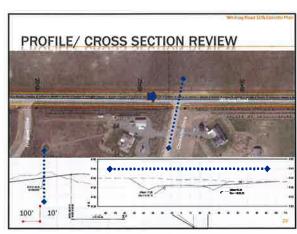




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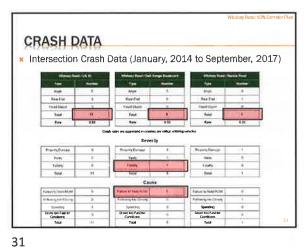






ROADWAY/ INTERSECTION CONCEPTS ★ Signal Warrants + Dell Range Boulevard × Warranted by Year 2040 (based on Kimley Horn Study) + US 30 × Signalize by Year 2022 (Signal warrant analysis not included in Kimley Horn Study)

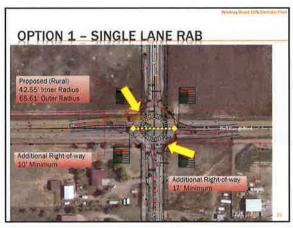
29 30



INTERSECTION WHITNEY AT DELL RANGE BLVD. Meadowlark Estates 1997

32

34



OPTION 2 - STANDARD SIGNALIZED Additional Right-of-way Additional Right-of-way

33

INTERIM OPTIONS - PHASING * Transverse Rumble Strips - Northbound and Southbound × Wide Transverse Pavement Markings + Thermoplastic Pavement Markings or conventional * Flashing Beacon - Stop Control x Intersection Down Lighting on Existing Power Poles or Independent Pole

WHITNEY ROAD AT U.S. 30

35 36





37 38

INTERIM OPTIONS - PHASING

★ Signalization w/ Future Arm Lengths and Locations

- x Channelized Islands
- ★ Eliminate Service Road Connection
- * Regional Stormwater Detention Ponds

STEERING COMMITTE MEETING NO. 1 WHITNEY ROAD CORRIDOR STUDY

May 9, 2017@ 2:00 P.M.

LIST OF ATTENDEES



300	Bruce Hattig	ВОРU	bhattig@cheyennebopu.org	(307)637-6416
SOO	Cassie Pickett	AVI	cpeterman@avipc.com	(307)637-6017
	Daryl Johnson	AVI	djohnson@avipc.com	(307)631-7891
	Jef McMann	Black Hills Corp	Jef.Mcmann@blackhillscorp.com	(307)778-2144
	Jeffery Mellar	WYDOT	Jeffery.mellor@wyo.gov	(307)777-4164
R	Lloyd Sisson	High West Energy	Isisson@highwestenergy,com	(307)245-4302
1	Nancy*Olson	МРО	nolson@cheyennempo.org	(307)638-4366
	Nathan Beauheim	City of Cheyenne	nbeauheim@cheyennecity.org	(307)638-4315
\$	Randy Griesbach	WYDOT	randy, griesbach@wyo, gov	(307)745-2100
The	Rob Geringer	Laramie County	rgeringer@laramiecounty.com	(307)633-4618
30	Sreyoshi Chakraborty	МРО	schakraborty@cheyennempo org	(307)638-4384
	Susana Montana	City of Cheyenne	smontana@cheyennecity,.com	(307)637-6528
	Timothy Morton	WYDOT	timothy,mortan@wyo.gov	
20	Tom Cobb	AVI	cobb@avipc.com	(970)214-6542 (307)637-6017
F	Tom Mason	MPO	tmason@cheyennempo.org	(307)637-6299
VIAPX	Joe Henderson	STS	loe@sustaibabletrafficsolutions.com	(303)589 6875
ľ				

ACCIONAL CORPORATION 118 No Time Law Sale (3) Chemina WY 8700 point 30 507 501

Page 1 of 1



DRAFT MEETING MINUTES

Subject:	ubject: Steering Committee Meeting #1		
Client:	Client: Cheyenne MPO		
Project:	Project: Whitney Road Corridor Study	Project No: 2-3987.17	2-3987,17
Meeting Date:	deeting Date: 5/09/2017 @ 2:00 PM – 3:30PM	Meeting Location:	Meeting AVI: 1103 Old Town Ln Suite 101 Location: Cheyenne, WY 82009
Minute	Minutes compiled by: C. Pickett, EIT and T. Cobb, PE, AVI, P.C. 5/10/2017.	2017	

Minutes are in plain type: Action items are in bold type.

ATTENDEES: See attached Sign In Sheet attached.

TOPICS FOR DISCUSSION:

- I. INTRODUCTIONS
 - II. OVERVIEW:
- Steering Committee Meeting #1 will be the first of three Steering Committee Meeting to discuss the Whitney Road 10% Corridor Plan.
- The purpose of the meeting was to discuss the preliminary aspects of the Whitney Road 10% Corridor Plan. These aspects include existing conditions, utilities, public involvement, and initial design concepts.
- Reference the Whitney Road 10% Corridor Plan Steering Committee #1 PowerPoint for meeting presentation.

III. MEETING COMMENTS

- BOPU:
- BOPU noted that it might be beneficial to install sleeves under Dell Range in order to ease construction for future waterlines.

WYDOT:

- A presentation to Ralph Tarango, WYDOT Maintenance Foreman regarding detention facilities along USHWY 30 would begin the process for pursuing possible approval;
- Randy indicated the agreement that a cul-de-sac may be an acceptable solution to terminating the service road along HWY 230 connecting to Whitney Road.
- WYDOT plans to leave the four (4) lanes where existing and expanding the three
 (3) lanes of USHWY 30 to five (5) lanes. The alignment is planned to stay centered, not shifted north. This is only a preliminary plan.
- WYDOT has volumes from planning as follows, an increase from Pershing to Van Buren of 92.5%. Van Buren to Dell Range an increase volume of 106%, Dell Range

H 1997 WHITNE FOUND CORPORATION 1103 Old Town Lane; Sulte 101, Cheyenne, WY 82009 phone: 307 637 8017

Page 1 of 2

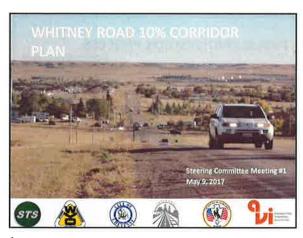


to Westedt Road an increase of 37%, and Westedt Road to Archer an increase of 2.5%. These increases are represented projected twenty (20) years (2036)

- · MPO:
- The MPO will be review projected volumes in the Plan Cheyenne and Christensen Road Corridor Plan to compare with WYDOT data
- MPO will be meeting with Tom and Cassie to discuss a plan for Public Involvement
- Suncor Energy
- $_{\odot}$ On May 10th, 2017 a meeting is planned to be held with Suncor Energy to discuss options for design with respect to the horizontal and vertical location of the Suncor Pipeline
- High West Energy:
- Lloyd will send a map indicating High West underground and overhead utilities to assist in the design.

IV. ACTION ITEMS

- AVI
- Setup Meeting with Ralph Tarango, WYDOT maintenance to begin conversation about WYDOT right-of-way use for storm water detention facilities.
- o Meeting Minutes and presentation to steering committee.
- o Schedule follow-up meeting with MPO regarding social media and block
- Complete meeting minutes for this meeting and forward with presentation to MPO and Steering Committee for review and record.



AGENDA

* Introductions

* Purpose and goals
Steering Committee

* What to expect?

* Overall project approach

* Public participation
process

* Discussion

+ Project constraints and
opportunities

+ Goals

+ Initial concepts

* Other

+ Block Meeting Concept

2

4

1

INTRODUCTIONS

x Tom Cobb, PE
+ Project Manager/Public Involvement

x Cassie Pickett, EIT
+ Project Assistant/Road Design/Social Media

x Joe Henderson, PE
+ Traffic Engineer

PURPOSE & GOALS x Goals of Today's × Purpose of Steering Meeting Committee + Formal kick-off the steering committee and project process. Assists in steering the project from inception to completion. Update on surrounding Provides advice, input, and development status. guidance during the + Review known project constraints. development of the plan. + Input from committee on purpose and goals of the project from the Provides Recommendations Steering Committee.
+ Input on initial conceptual typical section and U.S. Concept. Input on proposed Block Meeting Agenda.

3

WHAT TO EXPECT

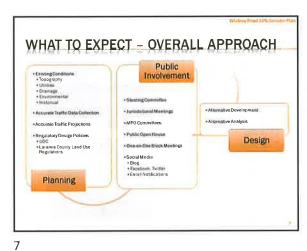
2017

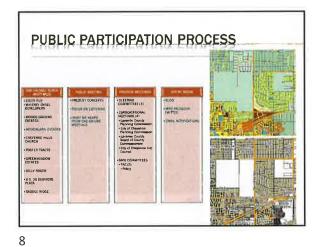
2018

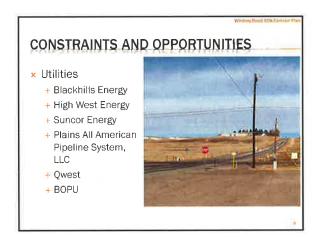
Phase foreign framework from the foreign framework framework from the foreign framework fr

WHAT TO EXPECT? PROJECT MILESTONES MILESTONE DATES March 1, 2017 Notice to Proceed Initial Kickoff Meeting MPO March 22, 2017 @2:00 Traffic Counts April 4, 2017 Steering Committee Meetings May 9, 2017: August/ September, October, 2017 Nelghborhood Block Meeting #1. June, July. and August, 2017 #2, and #3 Open House/Public Meeting September, 2017 October, 2017 Submit to MPO for Final Adoption November, 2017 Presentation to the Governing Body January/ February, 2018

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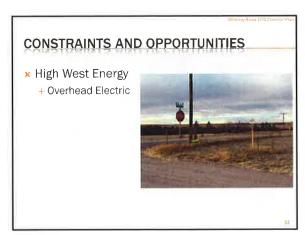




CONSTRAINTS AND OPPORTUNITIES × Blackhills Energy + Underground natural gas feeding rural subdivisions

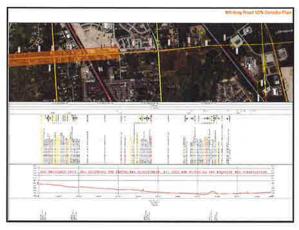
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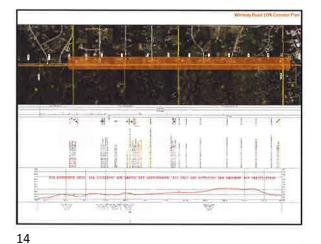
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CONSTRAINTS AND OPPORTUNITIES Suncor Energy + 12.75" Steel Crude Line + 1,440 psi + 2' to 5' deep (East Side) + Dillon R. Ohrt, SR/WA × Right of Way and Public Awareness Coordinator × Suncor Energy (U.S.A.) Pipeline Company + Meeting scheduled 5/10/17 at Suncor Office

11 12





13

CONSTRAINTS AND OPPORTUNITIES

* Plains All American
Pipeline System, LLC
+ 16" Steel Crude
+ 4'-3" to 14'-5" (West Side)
+ Gregg Werger

* Plains All American Pipeline
* Manager-Pipeline
Commercial Operations
* In process of setting up
meeting

× Timing

15 16

CONSTRAINTS AND OPPORTUNITIES

* Existing Zoning

+ AR - Agricultural
Residential

+ A2 - Agricultural
+ A1 - Agriculture and
Rural Residential

+ CB - Community
Business

+ MU - Mixed Use

+ HR-2 (City of
Cheyenne)High
Density Residential
Developing

CONSTRAINTS AND OPPORTUNITIES

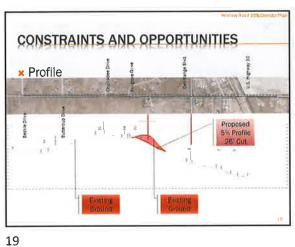
* Drainage

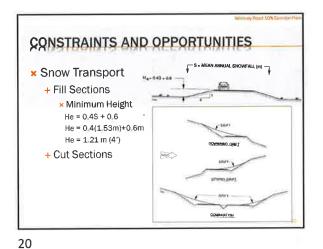
Childs Basin

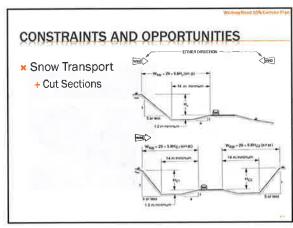
Dry Creek

Pussible Regional
Stormwater Datention
Area (Typ.)

17







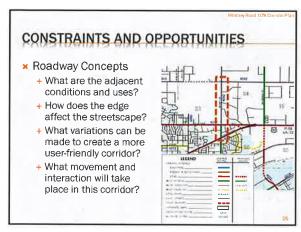
CONSTRAINTS AND OPPORTUNITIES

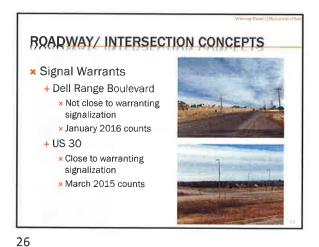
22 21



CONSTRAINTS AND OPPORTUNITIES x Intersections + Dell Range Boulevard × 11 crashes during the last six years × All were angle crashes + US 30 × Ten (10) crashes during the last four years × Five (5) were angle crashes + Beckle Road

23 24



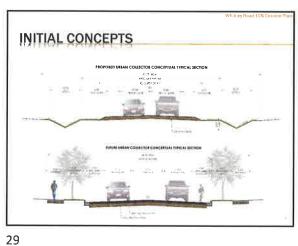




INITIAL CONCEPTS nive.

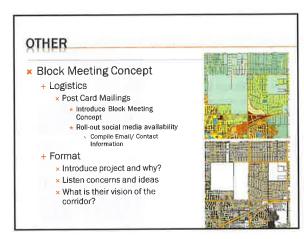
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INITIAL CONCEPTS EHIMENNE GERRAFIERE

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STEERING COMMITTE MEETING NO. # 2 WHITNEY ROAD CORRIDOR STUDY

.LIST OF ATTENDEES . February 23, 2018 @ 1:30 P.M.



To Record Attendance	HOME	CONFANC	EMAIL	(06117-9H058E)
Boy	Bruce Hattig	BOPU	bhattig@cheyennebopu.org	(307)637-6416
	Daryl Johnson	AVI	dJohnson@avipc.com	(307)631-7891
Charl	Jef McMann	Black Hills Corp	Jef.Mcmann@blackhillscorp.com	(307)778-2144
the	Jeffery Mellor	WYDOT	jeffery mellor@wyo.gov	(307)777-4164
R	Lloyd Sisson	High West Energy	lsisson@highwestenergy.com	(307)245-4302
140	Nancy Olson	МРО	nolson@cheyennempo.org	(307)638-4366
80	Nathan Beauhelm	City of Cheyenne	nbeauheim@cheyennecity.org	(307)638-4315
要	Randy Griesbach	WYDOT	randy.griesbach@wyo.gov	(307)745-2100
77	Rab Geringer	Laramie County	rgeringer@laramlecounty.com	(307)633-4618
	sceyosbi Charasporty	MPO	schakraborty@cheyennempo.org	(307)638-4384
	Susana Montana	Clty of Cheyenne	smontana@cheyennectty.com	(307)537-6528
	Timothy Mortan	WYDOT	timothy.morton@wyo.gov	
701	Tam Cobb	AVI	сорр@аvipc.com	(970)214-6542 (307)637-6017
1W	Tom Mason	MPO	tmason@cheyennempo.org	(307)637-6299
VIAPX	Joe Henderson	515	loc@sustalbabletrafficsolutions.com	(303)589.6875

Whitney Road Corridor Study Steering Committee Meeting #2 January 23, 2018

- Introduction and Sign In
- Power Point Discussion =
- a. Study Areab. Objectives
- Objectives of Steering Committee
 Comments or Additional Ideas for Intersection options
 Comments or Additional Ideas for Conceptual Typical

Section(s)

- d. Overview of Activities to Date
 e. Summary of Public Comments
 f. Whitney Ranch Masterplan Updates
 g. Proposed Wet Utility Upgrades/ Options
 - - ✓ Water
- SewerStormDetention
- h. Traffic data and figures (Kimley Horn Whitney Ranch) i. Typical Section Alternatives
- Rural
- ✓ Urban
 ✓ Pedestrian Options: Trail, Multi-use Path, Sidewalk
 j. Profile Review
 k. Intersection Alternatives
 ✓ Whitney and Dell Range
 ✓ Whitney and Dell Range
 1. Standard Intersection
 2. Free RT SB To EB

- Roundabout Option
- Realign to eliminate skew Whitney and U.S. 30
- 1. Signalize Intersection warranted
 - Lane configuration/ widening
 Signalization
- Other items

1/22/2018 H:V987_WHITNEVR!Medings\Stearing Committee\Meding #2\Aganda_2018.01.22 doc

(307) SAS SAR LOTS (307) JAS - 211]

DAUSES 238DAOT

MIKE HEIGHT!

PALPH TANGALSO -

SLAE SECTION TO WAVE

BEXIGRALD CHECK
T. MADSON BENIEW

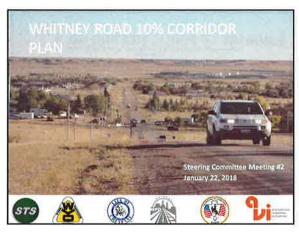
1803 MULTINU HAJED THIS SUMMER 8/ SHALDER, PRISO,

Jan mewan

FLASHIUG AT WIGHT

马台马

MARIAL OT - LAWRENCE - LAWRENCE -



OBJECTIVES OF TODAY'S MEETING × Comments or Additional Ideas for Intersection Options × Input on Preliminary Recommended Typical Sections x Input on Pedestrian, Trial, and Bike Options × Other Items + Profile Input + Petroleum Line Realignment/

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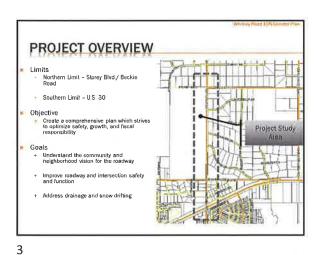
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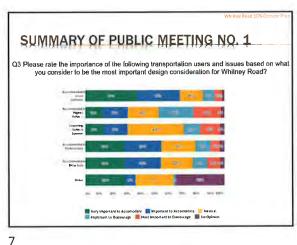
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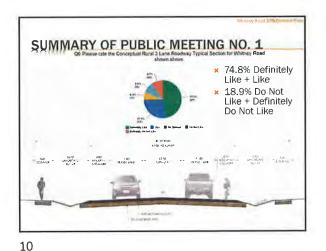
AGENDA Sign In Sheet Project Overview × Objectives of this Meeting Overview of Activities To Date Summary of Public Meeting Whitney Ranch Master Plan Updates Proposed Wet Utility Upgrades/ Options Profile Review × Intersection Alternatives × Other Items

OVERVIEW OF ACTIVITIES TODATE? Notice to Proceed March 1, 2017 Initial Kickoff Meeting MPO March 22, 2017 April 4, 2017 Traffic Counts Steering Committee Meetings May 9, 2017; January 23, 2018 Open House/Public Meeting #1 November 8, 2017 November 2017 - February, 2018 Draft Plan Neighborhood Meeting #2 January. 2018? Submit DRAFT Plan to MPO January. 2018 Presentation to the Governing Body March, 2018



SUMMARY OF PUBLIC MEETING NO. 1 × Who attended? Renter in Area 1.0.8% + 120 People Sign-in Other 1 3.8% + 150 Estimated Business Owner Attendance Property Owner 8.8% + 240 Responses Route User (1/10/18)Home Owner -50% 50% Other: Real Estate Broker (2), Cheyenne Resident thinking of moving over there (2), Friend of homeowner in area, Homeowner in Cheyenne (1), MPO CAC Member.





SUMMARY OF PUBLIC MEETING NO. 1 RAB at U.S. 30 10,6% Q4: If you Increase Traffic Speed 2.3%
RAB at Dell Range 2.9% could make one change to the Mitigate Snow Drifting 3.5% existing Slow Traffic Whitney Mitigate Steep Hill Road Illuminate Intersections Corridor, Do Nothing what Signal at Dell Range 14.09 change Signal at U.S. 30 14.6% would you Provide Alternate East. 17.0% make? Widen Roadway 0% 10% 20%

8

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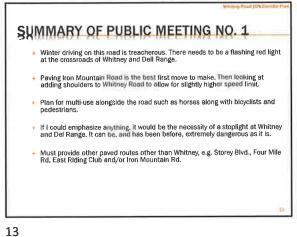
SUMMARY OF PUBLIC MEETING NO. 1 59.4% Definitely Like + Like 33.4% Do Not Like + Definitely Do Not Like

SUMMARY OF PUBLIC MEETING NO. 1 42.7% Definitely Like + Like 39.3% Do Not Like + Definitely Do Not Like

SUMMARY OF PUBLIC MEETING NO. 1 Q8: Do you have any additional ideas, information, or other comments that you would like to provide at this time? Connecting Storey to Summit would pull so much traffic from Del Range. It would be environmentally friendly, as it would reduce miles for 190's if not 1,000s everyday. It would make Del Range safer by reducing many, many Vehicles. Please leave Whitney Rt. alone and make some connections in east Cheyenne. Please review safety of Saykally and other intersections. The hills restrict vision of oncoming traffic when we pull out onto Whitney and people drive very fast. It is a disaster waiting to happen. I'm nervous for my lids to become teens diriving on this unsafe intersection III may be good to reduce speeds on Whitney to 40. Reduce speed on hery 30 in this are too? If Storey blid will connect to Whitney make sure Whitney can alsely handle that much more traffic being diverted north through our neighborhood. People other than this neighborhood will use it and our traffic could be increased significantly. Thank you for the public survey and meeting at Dildine.

12

11



PROPOSED WET UTILITY OPTIONS Developer Needs vs 2013 BOPU Master Plan/ County/ City/ State Current Requirements / Needs + Sewer + Water + Storm × Detention

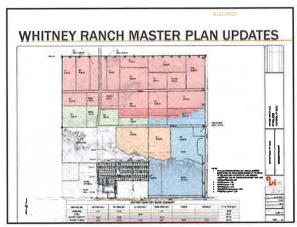
16

SUMMARY OF PUBLIC MEETING NO. 1

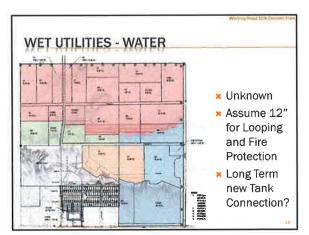
- Whitney Road planning must include non-vehicular transportation modes and must anticipate a future school(s) in this area. Whitney/Del Range intersection requires careful evaluation and redesign. Please look for below grade crossing opportunities for pedestrians and bicyclists. Is there an opportunity to extend s future spur of the Greenway north along Whitney?
- + Leave Summit as it is and extend a different road. If the extension is inevitable, intersection lights at College and Ridge Road are imperative.

WET UTILITIES - SEWER m × 504.8 gpm peak 2040 54 (15") ж. Lift Station Sec. Force Main Chickadee Road

17 14

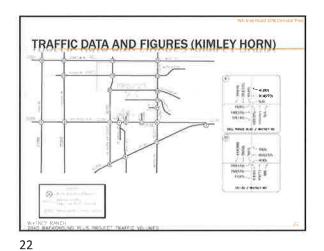


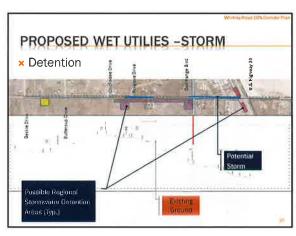
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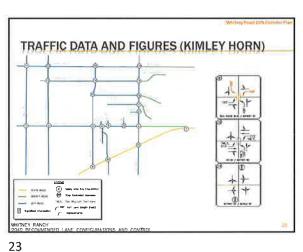


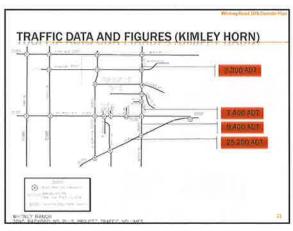
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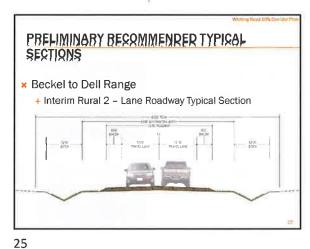


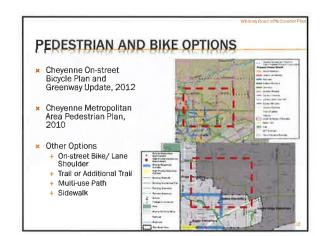




ADDITIONAL NEEDS (STS) ★ Lane Configuration(s) × Queuing Analysis Recommendations × Other?

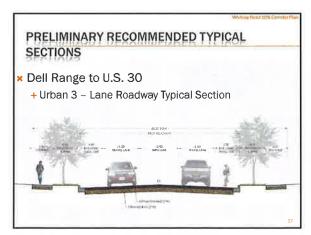
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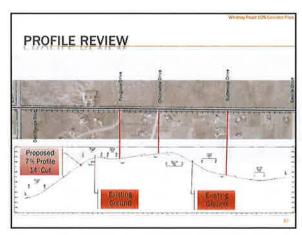




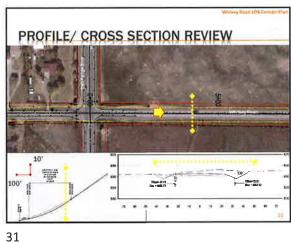
PRELIMINARY RECOMMENDED TYPICAL SECTIONS * Beckel to Dell Range + Ultimate Rural 3 - Lane Roadway Typical Section PEDESTRIAN AND BIKE OPTIONS × Other Options + On-street Bike/ Lane Shoulder + Trail or Additional Trail + Multi-use Path + Sidewalk

26 29

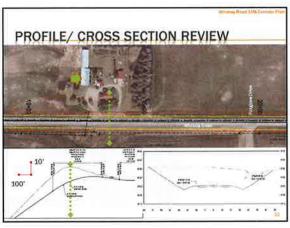




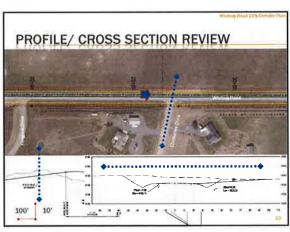
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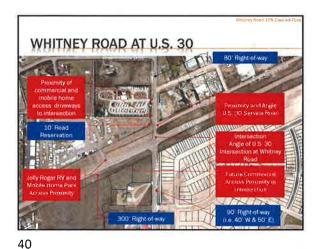


CRASH DATA x Intersection Crash Data (January, 2014 to September, 2017)



INTERSECTION WHITNEY AT DELL RANGE BLVD. Meado 1997 Foster Tracts 2nd Filing







OPTION 1 - REALIGN SKEWED INTERSECTION SIGNALIZATION PERSONAL Potential Regional Stormwater Detenti Eliminate Service Potential Regional Stormwater Detention

41 38

INTERIM OPTIONS - PHASING x Transverse Rumble Strips - Northbound and Southbound × Wide Transverse Pavement Markings + Thermoplastic Pavement Markings or conventional painting * Flashing Beacon - Stop Control

▼ Intersection Down Lighting on Existing Power

Poles or Independent Pole



42 39

INTERIM OPTIONS - PHASING

- Signalization w/ Future Arm Lengths and Locations
- × Channelized Islands
- * Eliminate Service Road Connection
- * Regional Stormwater Detention Ponds

Traffic Impact Study

Whitney Ranch Cheyenne, Wyoming

Prepared for: AVI, PC

Kimley » Horn

Whitney Ranch

TRAFFIC IMPACT STUDY

Cheyenne, Wyoming

Prepared for AVI, PC 1103 Old Town Lane Suite 101 Cheyenne, Wyoming, 82009 Prepared by
Kimley-Horn and Associates, Inc.
4582 South Ulsiter Street
Suite 1500
Denver, Colorado 80237
(303) 228-2300

Post Property Propert

December 2017

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

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1.0 EXECUTIVE SUMMARY

to be located on the northwest comer of the Whitney Road and Dell Range Boulevard intersection in Cheyenne, Wyoming. At full build out, the project is proposed to include approximately 1,293 single-family detached homes, 913 condominiums/townhouses, two elementary schools, and 567,325 square feet of retail use. It is expected that construction of Whitney Ranch will be developed in phases with the first phase, as studied herein to be Filings 1 and 2, being completed in 2022. The remainder of the project will develop in approximately Whitney Ranch, a new residential community with supporting neighborhood retail, is proposed twenty years. The first phase is expected to include 232 single-family detached homes and 24 condominiums/townhomes. Analysis was therefore conducted for the 2022 short term horizon, as well as the 2040 long-term twenty-year planning horizon.

measures required for identified impacts. The following intersections, labeled intersection number 1-22 to correspond with the figures, were incorporated into this traffic study in accordance with the City of Cheyenne standards and Wyoming Department of Transportation The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation (WYDOT) requirements:

- 1. Dell Range Boulevard and Ridge Road
- 2. Dell Range Boulevard and College Drive
- Dell Range Boulevard and Van Buren Avenue
- Dell Range Boulevard and El Camino/Gysel Place
- Dell Range Boulevard and James Drive

Dell Range Boulevard and Whitney Road

- Dell Range Boulevard and US-30
 - 8. US-30 and Van Buren Avenue
 - 9. US-30 and Hayes Avenue
 - 10. US-30 and Whitney Road
- 11. Storey Boulevard and Ridge Road
- 12. Storey Boulevard and College Drive
- 13. College Drive and Thomas Road

14. Whitney Road and Beckle Road

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- 15. Whitney Road and Buttercup Drive
- 16. Whitney Road and Chickadee Drive
- 17. Whitney Road and Foxglove Drive
- Storey Boulevard and Van Buren Avenue (Future)
- 19. Van Buren Avenue and Thomas Road (Future)
- Van Buren Avenue and Chickadee Drive (Future)
- Whitney Road Commercial Access (Future)
- 22, Dell Range Boulevard Commercial Access (Future)

Chickadee Drive, Foxglove Drive, and Commercial Access. Internal future access will also be Regional access will be provided by Interstate 25 (I-25), Interstate 80 (I-80), and US-85, Primary and Van Buren Avenue. Direct access to proposed development will be provided by accesses access to the site will be provided by Whitney Road, Dell Range Boulevard, Storey Boulevard, along Dell Range Boulevard including Gysel Place, James Drive, and Commercial Access while access will also be provided along Whitney Road with Buttercup Drive/Thomas Road, provided along Van Buren Avenue with Chickadee Drive as well as Thomas Road.

during the afternoon peak hour. During the first phase, which is anticipated to include Filings 1 trips with 1,983 of these trips occurring during the morning peak hour and 3,444 trips occurring and 2, the project is expected to generate approximately 2,464 daily trips with 188 trips Whitney Ranch at full buildout is anticipated to generate approximately 26,869 weekday daily occurring during the AM peak hour and 243 trips occurring during PM peak hour. Based on the analysis presented in this report, Kimley-Horn believes the proposed Whitney network. The existing traffic volume analysis, proposed project development, and expected Ranch development will be successfully incorporated into the existing and future roadway future traffic volumes resulted in the following conclusions and recommendations:

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2022 Phase 1 Traffic Condition Improvements

- provide two eastbound through lanes. The existing pork chop raised island could be The intersection of Dell Range Boulevard and College Drive (#2) should be improved to reconstructed to allow for the second through lane through the signalized intersection to then taper to a single eastbound through lane further east using the existing transition.
- signalized, and the northbound and southbound approaches should be designated to The Dell Range Boulevard and Van Buren Avenue intersection (#3) should be provide separate 100-foot left turn lanes
- The northbound approach to the intersection of Dell Range Boulevard and Whitney Road (#6) should be improved to provide a 100-foot separate left turn lane,
- Range Boulevard to provide paved access to the project site upon completion of the first Gysel Place is recommended to be a paved roadway from the intersection with Dell phase of development.
- direction throughout the study area. Likewise, the US-30 intersections with Dell Range Boulevard, Van Buren Avenue, Hayes Avenue, and Whitney Road are anticipated to be It is understood that WYDOT is improving US-30 to include two through lanes in each signalized.

2040 Long-Term Horizon Traffic Condition Improvements

- providing two through lanes in each direction between and through the intersections of College Drive to Van Buren Avenue. The five-lane roadway is recommended to transition to one through lane in each direction east of the Van Buren Avenue It is recommended that Dell Range Boulevard be improved to be a five-lane roadway intersection. A continuous two-way left tum lane should remain through the five-lane section.
- It is recommended that Dell Range Boulevard be improved to be a three-lane roadway with a continuous two way left turn lane between James Drive and Whitney Road,

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- It is recommended that the northbound right turn lane at the Dell Range Boulevard and Ridge Road intersection (#1) be restriped to show an extension from the existing 125 feet to 200 feet, Additionally, this intersection may require a second northbound through lane and a 100-foot westbound right turn lane by the long-term horizon.
- The intersection of Dell Range Boulevard and College Drive (#2) may need 225-foot northbound dual left turn lanes, a 250-foot northbound right turn lane, a 100-foot westbound right turn lane, and a 100-foot southbound right turn lane by 2040.
- The intersection of Dell Range Boulevard and James Drive (#5) should be improved to provide a center two-way left-tum lane along Dell Range Boulevard.
- The intersection of Dell Range Boulevard and Whitney Road (#6) should be signalized, and the westbound and southbound approaches should provide separate 100-foot left turn lanes so that all approaches include left turn lanes.
- The eastbound left turn lane at the US-30 and Van Buren Avenue intersection (#8) should be extended to a length of 250 feet to accommodate projected queues.
- A westbound left turn lane at the US-30 and Hayes Avenue intersection (#9) is recommended to be 100-foot long to accommodate projected queues.
- The Storey Boulevard and Ridge Road intersection (#11) should be signalized.
- It is recommended that the eastbound right turn lane at the Storey Boulevard and College Drive intersection (#12) be extended from 100 feet to 175 feet. This intersection should also be considered for signalization and provide a separate 100-foot westbound left turn lane.
- The intersection of College Drive and Thomas Road (#13) may warrant signalization upon buildout of the proposed Whitney Ranch development. The eastbound and

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westbound approaches of this intersection should provide separate left turn lanes of 100 feet and 275 feet, respectively.

- The future intersection of Storey Boulevard and Van Buren Avenue (#18) should operate
 with stop control along Van Buren Avenue or be constructed as a single lane roundabout
 to accommodate future traffic volumes.
- The future intersection of Thomas Road and Van Buren Avenue (#19) should operate
 with all-way stop control or be constructed as a single lane roundabout to accommodate
 future traffic volumes.
- At the full movement access intersections along Dell Range Boulevard (#22) and Whitney Road (#21) for the commercial parcel on the northwest corner of this intersection, it is recommended that the driveway approaches to the public street have separate left turn and right turn lanes and operate with stop control. Likewise, 100-foot left turn lanes for entering traffic movements are also recommended along the public street.

General Recommendations

All on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings, and conform to City of Cheyenne and/or Wyoming Department of Transportation standards as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

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2.0 INTRODUCTION

Kimley-Hom and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study of future traffic conditions associated with the proposed Whitney Ranch project to be located on the northwest comer of the Whitney Road and Dell Range Boulevard intersection in Cheyenne, Wyoming. A vicinity map illustrating the project location is shown in Figure 1.

At full build out, Whitney Ranch is proposed to include approximately 1,293 single-family detached homes, 913 condominiums/townhouses, two elementary schools, and 567,325 square feet of retail use. A conceptual land use site plan illustrating the development and access is shown in **Appendix F**. It is expected that construction of Whitney Ranch will be developed in phases with the first phase, as studied herein as Filings 1 and 2, being completed in 2022. The remainder of the project will be developed in approximately twenty years. The first phase will consist of filings one and two and is expected to include 232 single-family detached homes and 24 condominiums/fownhomes. Analysis was therefore conducted for the 2022 short term horizon, as well as the 2040 long-term twenty-year planning horizon.

The purpose of this study is to identify project traffic generation characteristics, to identify potential project traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts. The following intersections, labeled intersection number 1-22 to correspond with the figures, were incorporated into this traffic study in accordance with the City of Cheyenne standards and requirements:

- 1. Dell Range Boulevard and Ridge Road
- 2. Dell Range Boulevard and College Drive
- 3. Dell Range Boulevard and Van Buren Avenue
- 4. Dell Range Boulevard and El Camino/Gysel Place
- Dell Range Boulevard and James Drive
- Dell Range Boulevard and Whitney Road
- . Dell Range Boulevard and US-30
- 8. US-30 and Van Buren Avenue
 - 9. US-30 and Hayes Avenue
- 10. US-30 and Whitney Road

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11. Storey Boulevard and Ridge Road

12. Storey Boulevard and College Drive

13. College Drive and Thomas Road

14. Whitney Road and Beckle Road

15. Whitney Road and Buttercup Drive

16. Whitney Road and Chickadee Drive

17. Whitney Road and Foxglove Drive

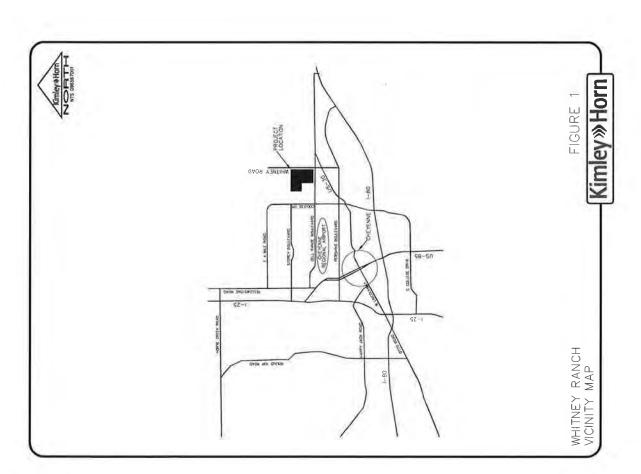
Storey Boulevard and Van Buren Avenue (Future)
 Van Buren Avenue and Thomas Road (Future)

20, Van Buren Avenue and Chickadee Drive (Future)

21, Whitney Road Commercial Access (Future)

22. Dell Range Boulevard Commercial Access (Future)

Regional access will be provided by Interstate 25 (I-25), Interstate 80 (I-80), and US-85. Primary access to the site will be provided by Whitney Road, Dell Range Boulevard, Storey Boulevard, and Van Buren Avenue. Direct access to proposed development will be provided by accesses along Dell Range Boulevard including Gysel Place, James Drive, and Commercial Access while access will also be provided along Whitney Road with Buttercup Drive/Thomas Road, Chickadee Drive, Foxglove Drive, and Commercial Access. Internal future access will also be provided along Van Buren Avenue with Chickadee Drive as well as Thomas Road.



3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Roadway Network

Roadway Descriptions

Whitney Road extends north-south with one through lane in each direction with posted speed limits ranging from 30 miles per hour to 40 miles per hour. It is presently a County roadway. Whitney Road does not widen at intersections for auxiliary turn lanes with the exception of the northbound approach at U-30. Dell Range Boulevard is an east-west roadway that provides two through lanes in each direction west of College Drive and one through lane in each direction east of College Drive. Van Buren Avenue extends northwest of College Drive and 35 miles per east of College Drive. Van Buren Avenue extends northsouth with one through lane in direction with a posted speed limit of 30 miles per hour south of Dell Range Boulevard and 25 miles per hour north of Dell Range Boulevard.

Storey Boulevard is an east-west roadway that provides one through lane in each direction with a posted speed limit ranging from 30 miles per hour to 35 miles per hour within the study area. The Storey Boulevard alignment changes names to Summit Drive east of Ridge Road and to Beckle Road east of Whitney Road. Storey Boulevard is an unpaved gravel road east of College Drive and terminates at Highland Road to the east. Ridge Road extends north-south with one through lane in each direction with a center two-way left turn lane with a posted speed limit of 35 miles per hour. College Drive is a north-south roadway that provides one through lane in each direction with a posted speed limit of 40 miles per hour. Thomas Road extends east-west with one through lane in direction. Thomas Road is a gravel road to the east of College Drive. US-30 is an east-west roadway with a span that extends northeast and southwest within the study area. US-30 provides two through lanes in each direction with a landscaped median west of Hayes Avenue while providing one through lane in each direction with a center two-way left-turn lane east of Hayes Avenue. US-30 carries a speed limit of 45 miles per hour west of Dell Range Boulevard and 55 miles per hour east of Dell Range Boulevard.

El Camino Drive and Gysel Place are north-south roadways offset by approximately 130 feet and are located between Van Buren Avenue and Whitney Road, Gysel Place is a gravel road extending north of Dell Range Boulevard. El Camino Drive extends south of Dell Range Boulevard with one through lane in each direction, Hayes Avenue extends north-south with one

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through lane in each direction with a posted speed limit of 25 miles per hour. James Drive Boulevard. Buttercup Drive is a County gravel roadway extending east of Whitney Road with a alignment is currently a gravel driveway within the County, extending north of Dell Range posted speed limit of 30 miles per hour. Chickadee Drive, a gravel County road, extends east of Whitney Road. Foxglove Drive extends east of Whitney Road with one through lane in each direction with a posted speed limit of 30 miles per hour. Foxglove Drive is a County roadway that transitions to a southeast and northwest alignment roadway where it also extends north from Dell Range Boulevard.

Intersection Descriptions

eastbound approach of this intersection provides a left turn lane, two through lanes and a right outermost lane being a shared through/right turn lane. The northbound and southbound The intersection of Dell Range Boulevard and Ridge Road (Intersection Number 1 in the list and figures) is signalized with protected/permitted left tum phasing on all four approaches. The turn lane while the westbound approach has a left turn lane and two through lanes with the approaches include a left tum lane, one through lane, and a right tum lane.

The intersection of Dell Range Boulevard and College Drive (#2) is signalized with protected/permitted left turn phasing on all four approaches. The eastbound approach of this intersection provides a left turn lane, one through lane, and a right turn lane. The westbound, northbound, and southbound approaches all provide a left turn lane and two through lanes with the outernost lane being a shared through/right turn lane.

and westbound approaches of this intersection provide a left turn lane and shared through/right The intersection of Dell Range Boulevard and Van Buren Avenue (#3) operates with stop control on the northbound and southbound approaches of Van Buren Avenue. The eastbound tum lane. The northbound and southbound approaches provide a single shared all movement

The existing intersection of Dell Range Boulevard and El Camino Drive/Gysel Place (#4) operates with stop control along the northbound and southbound approaches. The north and south legs of this intersection are offset by approximately 130 feet, but is analyzed as a four-leg intersection instead of two T-intersections. The eastbound and westbound approaches of this

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch – Cheyenne

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intersection provide a left tum lane and shared through/right tum lane. The northbound and southbound approaches provide a single shared all movement lane.

providing access to a single-family residence. All four approaches to this intersection provide a The intersection of Dell Range Boulevard and James Drive (#5) operates with stop control along the northbound and southbound approaches. The south leg of this intersection is a driveway single shared all movement lane. The Dell Range Boulevard and Whitney Road intersection (#6) operates with stop control along the northbound and southbound approaches of Whitney Road. The eastbound approach of this intersection provides a left tum lane and a shared through/right tum lane. The westbound, northbound, and southbound approaches provide single shared movement lanes. The intersection of Dell Range Boulevard and US-30 (#7) provides stop control along the a left turn lane and a shared through/right turn lane. The westbound approach includes a left northbound and southbound approaches. The eastbound approach of this intersection provides tum lane, one through lane, and a channelized right tum lane. The northbound and southbound approaches provide a single shared all movement lane.

a left turn lane and two through lanes while the westbound approach includes two through lanes with the outermost lane being a shared through/right turn lane. The southbound approach The T-intersection of US-30 and Van Buren Avenue (#8) operates with stop control on the southbound Van Buren Avenue approach, The eastbound approach of this intersection provides provides a shared left turn/right turn lane. The US-30 and Hayes Avenue intersection (#9) provides stop control along the northbound and two through lanes and a right turn lane while the westbound approach provides a short left turn lane and two through lanes with the outermost lane being a shared through/right turn lane. The southbound approaches. The eastbound approach of this intersection provides a left turn lane, northbound and southbound approaches provide a single shared all movement lane.

northbound and southbound approaches. The eastbound and westbound approaches of this The intersection of US-30 and Whitney Road (#10) operates with stop control along the

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intersection provide a left tum lane, one through lane, and a right turn lane. The northbound approach includes a left turn lane and a shared through/right turn lane. The southbound approach provides a single shared all movement lane.

The Storey Boulevard and Ridge Road intersection (#11) operates with stop control along eastbound and westbound Storey Boulevard approaches. The eastbound and westbound approaches of this intersection provide a left turn lane, one through lane, and a right turn lane. The northbound and southbound approaches include a left turn lane and a shared through/right turn lane.

The Storey Boulevard and College Drive intersection (#12) operates with stop control along eastbound and westbound Storey Boulevard approaches. The eastbound approach of this intersection provides a left turn lane, one through lane, and a right turn lane, while the westbound approach provides a single shared movement lane. The northbound and southbound approaches provide a left turn lane and a shared through/right turn lane.

The intersection of College Drive and Thomas Road (#13) operates with stop control along eastbound and westbound approaches. The eastbound and westbound approaches of this intersection provide a shared movement lane. The northbound and southbound approaches include a left turn lane and a shared through/right turn lane.

The Whitney Road and Beckle Road intersection (#14) operates with stop control along the eastbound and westbound approaches. All four approaches to this intersection provide a single shared movement lane.

The T-intersection of Whitney Road and Buttercup Drive (#15) operates with stop control along the westbound Buttercup Drive approach. The westbound approach of this intersection provides a shared left turn/right turn lane. The northbound approach provides a shared through/right turn lane while the southbound approach provides a shared left turn/through lane.

The T-intersection of Whitney Road and Chickadee Drive (#16) operates with stop control along the westbound Chickadee Drive approach. The westbound approach of this intersection

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provides a shared left turn/right turn lane. The northbound approach provides a shared through/right turn lane while the southbound approach includes a shared left turn/through lane.

The T-intersection of Whitney Road and Foxglove Drive (#17) operates with stop control along the westbound Foxglove Drive approach. The westbound approach of this intersection provides a shared left turn/right turn lane, The northbound approach provides a shared through/right turn lane while the southbound approach provides a shared left turn/through lane.

The intersection lane configuration and control for the study area key intersections are shown in Figure 2.

3.2 Future Roadway Network

It is understood that WYDOT is improving US-30 to include two through lanes in each direction throughout the study area. Likewise, the US-30 intersections with Dell Range Boulevard, Van Buren Avenue, Hayes Avenue, and Whitney Road are anticipated to be signalized.

Road at Whitney Road. The gravel segment of Storey Boulevard between College Drive and Avenue alignment at Storey Boulevard. The extension of Van Buren Avenue will create three Development of Whitney Ranch will create additional roadways and extensions of existing roadways. Storey Boulevard transitions to Summit Drive east of Ridge Road. Summit Drive extends from Ridge Road to the west and Highland Road to east. Summit Drive is a gravel roadway between College Drive and Highland Road. As Whitney Ranch develops, the existing Summit Drive segment extending from Ridge Road to Highland Road will be named Storey Boulevard. Storey Boulevard currently terminates to east at Highland Road and will be constructed to extend east from Highland Road approximately 5,330 feet to align with Beckle Highland Road will be paved with development of Whitney Ranch. Van Buren Avenue currently extends approximately 1,000 feet north of Dell Range Boulevard and will be constructed to extend north from Opal Drive approximately 4,300 feet to connect with the existing Van Buren future major intersections that are analyzed in this study. The three future intersections along Van Buren Avenue consist of Van Buren Avenue/Storey Boulevard (#18), Van Buren Avenue/Thomas Road (#19), and Van Buren Avenue/Chickadee Drive (#20). Additionally, two commercial accesses within the retail parcel proposed to be located on the northwest comer of he Dell Range Boulevard and Whitney Road intersection were analyzed in this study. One

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access is proposed as a full movement access along Whitney Road (#21) while the other is a proposed full movement access along Dell Range Boulevard (#22).

3.3 Existing Study Area

The existing site is comprised of vacant land. The surrounding area contains a mix of uses, but it is primarily residential communities consisting of single-family detached homes. Commercial uses exist to the west of the site and downtown Cheyenne is located several miles southwest of the project site.

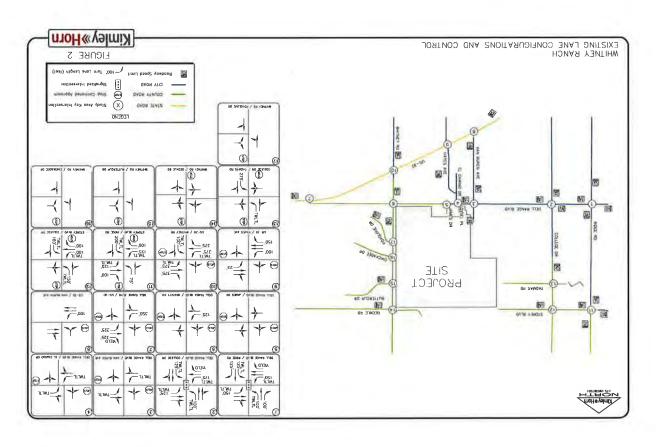
3.4 Existing Traffic Volumes

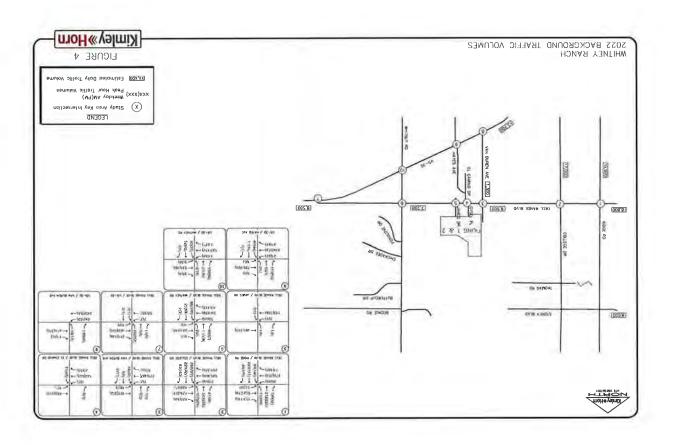
Existing peak hour turning movement counts were conducted at the study area intersections on Wednesday, September 6, 2017. The counts were conducted in 15-minute intervals during the moming and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. Existing turning movement counts are shown in Figure 3 with count sheets provided in Appendix A.

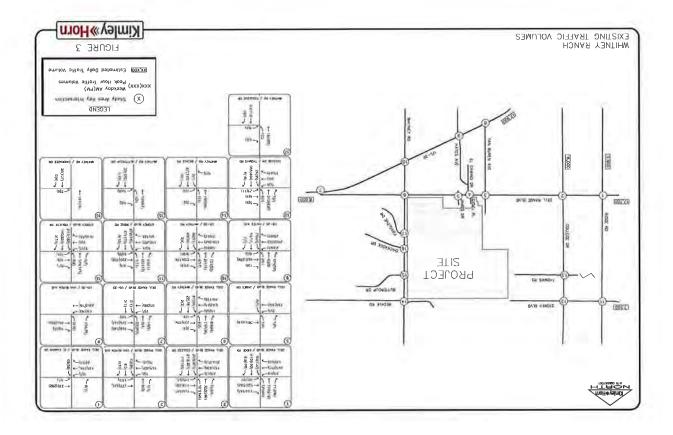
3.5 Unspecified Development Traffic Growth

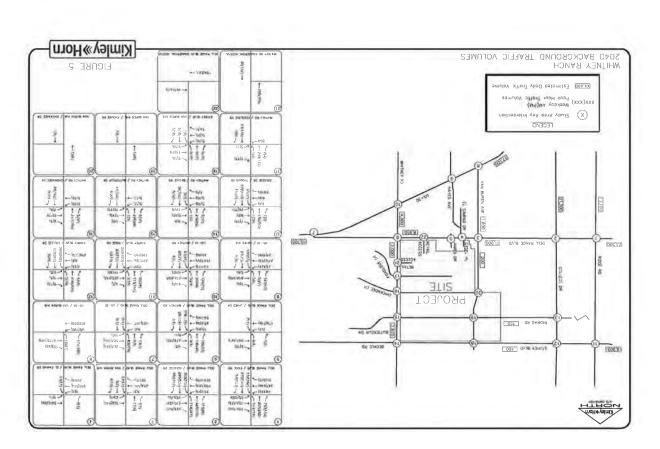
The City of Cheyenne Transportation Plan identifies a growth assumption of 1,25 percent per year through year 2040. The associated growth assumption is included in **Appendix B**. Based on this, an annual growth rate of 1,25 percent was used to calculate future traffic volumes. This annual growth rate was used to estimate near term 2022 and long term 2040 traffic volume projections at the study area intersections. Background traffic volumes for 2022 and 2040 are shown in **Figures 4** and **5**, respectively.

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4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Report** published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Hom used the ITE Trip Generation Report regression equations that apply to Single-Family Detached Housing (ITE Code 210), Condominium/Townhouse (230), Shopping Center, and Elementary School (520) for traffic associated with the proposed Whitney Ranch Lab project.

Table 1 summarizes the estimated trip generation for phase 1 (Filing 1 and 2) for the proposed development. The trip generation worksheets are included in Appendix C. These calculations illustrate the equations used and directional distribution of trips.

Table 1 - Whitney Ranch Phase 1 (2022) Project Traffic Generation

				Vehi	Vehicles Trips	SC		
			AM	Peak	AM Peak Hour		PM Peak Hour	Hour
Land Use	Quantity	Daily	ū	Out	In Out Total In Out Total	In	Out	Total
Single-Family Detached Housing (ITE 210)	232 Units	2,278 43 129	43	129	172 141 83	141	83	224
Condominium/Townhouse (230)	24 Units	186	m	13	16	13	9	19
Total		2,464 46 142	46	142	188 154 89 243	154	88	243

As shown in **Table 1**, the first phase of the project with development of Filings 1 and 2 is expected to generate approximately 2,464 daily weekday trips with 188 of these trips occurring during the morning peak hour and 243 trips occurring during the afternoon peak hour.

Table 2 summarizes the estimated trip generation for buildout of the Whitney Ranch project.

¹Institute of Transportation Engineers, *Trip Generation: An Information Report*, Ninth Edition, Washington DC, 2012.

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ffic Generation
roject Tra
Buildout P
y Ranch F
- Whitne
Table 2

				Veh	Vehicles Trips	sdi		
		:	AN	AM Peak Hour	Hour	PM	PM Peak Hour	our
Land Use	Quantity	Daily	드	Out	In Out Total	ū	Out Total	Total
Single-Family Detached Housing (ITE 210)	1,293 Units	11.066	229	989	915	663	389	1,052
Condominium/Townhouse (230)	913 Units	4,406	52	251	303	247	122	369
Shopping Center (820)	567,325 SF		278		449	920	266	1,917
Elementary School (520)	700 Students	904	174	174 142	316	53	53	106
Total		26.869 733 1.250 1.983 1.883 1.561	733	1,250	1,983	1,883	1,561	3,444

At buildout, the proposed development is anticipated to generate approximately 26,869 weekday daily trips with 1,983 of these trips occurring during the morning peak hour and 3,444 trips occurring during the afternoon peak hour.

4.2 Trip Distribution

Distribution of Whitney Ranch traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding development areas and type, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The first phase 2022 and buildout 2040 trip distributions for the project are illustrated in Figures 6 and 7, respectively.

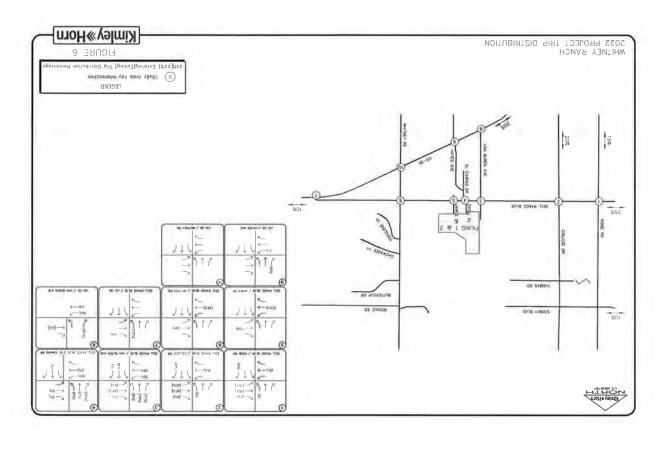
4.3 Traffic Assignment

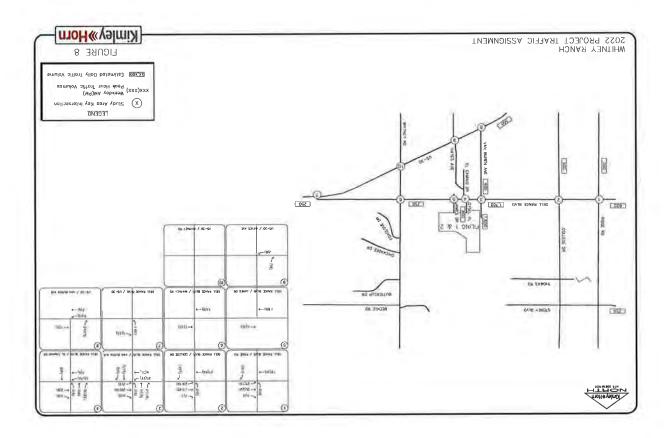
Traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the project shown in **Table 1** for phase 1 and **Table 2** for buildout. Project traffic assignment for phase 1 and buildout of Whitney Ranch is shown in **Figure 8** and **Figure 9**, respectively.

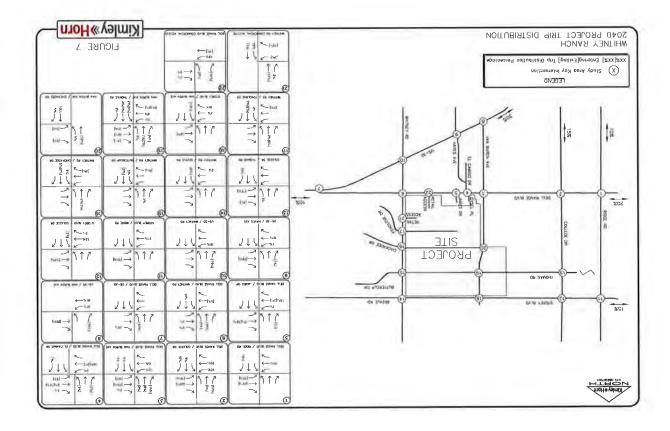
4.4 Total (Background Plus Project) Traffic

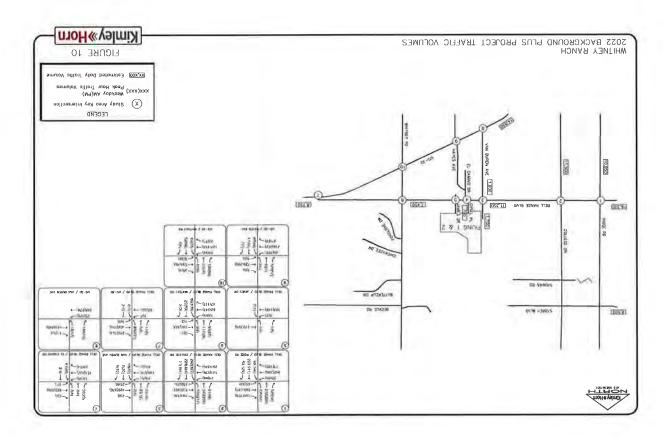
Project traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2022 horizon and long term 2040 horizon. These total traffic volumes for the site are illustrated for the 2022 and 2040 horizon years in Figure 10 and Figure 11, respectively.

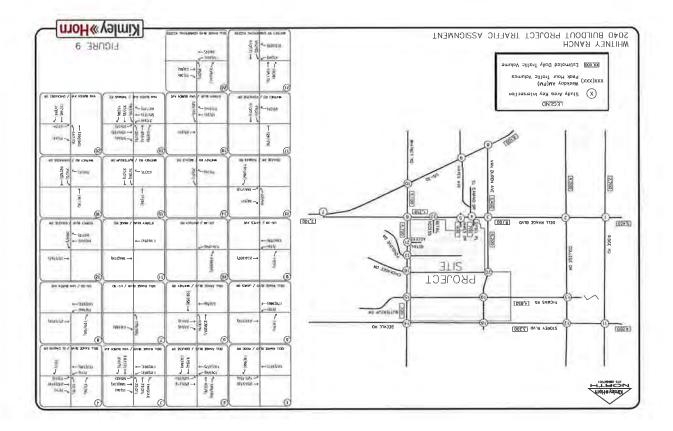
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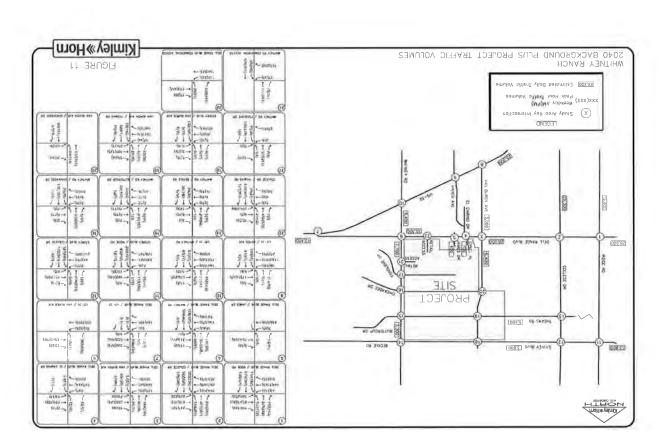












5.0 TRAFFIC OPERATIONS ANALYSIS

horizon analysis due to the level of development being built by 2022 and the street network Kimley-Hom's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2022 and 2040 development horizons at the identified key intersection and access driveways. Intersection numbers 1-10 were analyzed in the short-term expected to exist. Intersection numbers 1-17 as well as the project constructed internal intersection numbers 18-22 were analyzed in the long-term horizon analysis. The acknowledged source for determining overall capacity is the current edition of the Highway Capacity Manual

5.1 Analysis Methodology

engineering procedure recommends overall intersection LOS D and movement/approach LOS E as the minimum threshold for acceptable operations. Table 3 shows the definition of level of or highway during a specific time interval. It ranges from A (very little delay) to F (long delays For intersections and roadways in this study area, typical standard traffic Capacity analysis results are listed in terms of Level of Service (LOS) LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street service for signalized and unsignalized intersections. and congestion).

Table 3 - Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≥ 10	≥ 10
В	> 10 and < 20	> 10 and < 15
0	> 20 and < 35	> 15 and ≤ 25
O	> 35 and ≤ 55	> 25 and ≤ 35
Е	> 55 and ≤ 80	> 35 and ≤ 50
ц	> 80	> 50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010

² Transportation Research Board, Highway Capacity Manual, Special Report 209, Washington DC, 2010

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Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the level of service (LOS) for and is defined for each minor movement. Level of service for a two-way stop-controlled intersection is not defined for the intersection as a whole. Level of service for a signalized and a two-way stop controlled intersection is determined by the computed or measured control delay all-way stop controlled intersection is defined for each approach and for the intersection.

The Dell Range Boulevard and Ridge Road intersection currently operates under traffic signal

Dell Range Boulevard and Ridge Road (#1)

operates acceptably with LOS C during the peak hours, With the addition of project traffic and

control with protected-permitted left phasing on all four approaches, This intersection currently

LOS D or better during the morning and afternoon peak hours in 2022, It is anticipated that a

second northbound through lane and a westbound right tum lane will be needed at this intersection by 2040 in order to achieve acceptable levels of service. With these improvements in 2040, the intersection is expected to operate acceptably with LOS C during the moming peak hour and LOS D during the afternoon peak hour. Table 4 provides the results of the level of

SO7

FOS AM Peak Hour

Delay (sec/veh) 28.0

PM Peak Hour

Table 4 - Dell Range Boulevard and Ridge Road (#1) LOS Results

service at this intersection.

O Ω Ω Ω

33.2 36.4

33.5

2022 Background

2017 Existing

ပ ပ ပ

37,3

52.5

O

30,4

ပ ပ

the existing lane configuration, the intersection is expected to continue to operate acceptably at

5.2 Key Intersection Operational Analysis

the Dell Range Boulevard/Ridge Road and Dell Range Boulevard/College Drive intersections utilizes the observed cycle lengths of 100 seconds with existing phasing and timing. Synchro study area are provided in Appendix D. The existing year analysis is based on the lane geometry and intersection control shown in Figure 2. The signalized intersection analysis for The Synchro Highway Capacity Manual (HCM) methodology reports were used to analyze Calculations for the level of service at the key intersections and project access driveways for the traffic analysis software was used to analyze the study area and access roadway intersections. intersection delay and level of service.

= Two Northbound Through Lanes and a Westbound Right Turn Lane 33,4 31.7 32.4 2040 Background Plus Project # 2022 Background Plus Project 2040 Background

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Dell Range Boulevard and College Drive (#2)

intersection currently operates acceptably with LOS C during the morning peak hour and LOS D during the afternoon peak hour. It is anticipated that two eastbound through lanes will be control with protected-permitted left turn phasing on all four approaches. With this control, this needed by 2022. With this improvement and the addition of project traffic, the intersection is expected to continue to operate acceptably at LOS D during the morning and afternoon peak The intersection of Dell Range Boulevard and College Drive currently operates under signal hours in 2022.

each direction through this intersection. In addition, northbound dual left turn lanes, a anticipated to operate acceptably during the peak hours in 2040, Table 5 provides the results of By 2040, it is anticipated that Dell Range Boulevard will need to provide two through lanes in northbound right turn lane, a westbound right turn lane and a southbound right turn lane may be needed if future traffic volumes are realized. With these improvements, this intersection is the level of service at this intersection,

Table 5 - Dell Range Boulevard and College Drive (#2) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	ros
2017 Existing	28.8	ပ	36.8	٥
2022 Background	34.7	ပ	42.3	Ω
2022 Background Plus Project #	37.2	D	40.9	D
2040 Background	46.8	O	88 1	ш
2040 Background Plus Project ##	31,4	O	52.7	۵

= Two Eastbound Through Lanes
= Northbound Dual Left Turn Lanes, Northbound Right Turn Lane, and
Southbound Right Turn Lane

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Dell Range Boulevard and Van Buren Avenue (#3)

southbound left turn lanes were also included. With this improvement, the intersection is The intersection of Dell Range Boulevard and Van Buren Avenue currently operates with stop control along the northbound and southbound Van Buren Avenue approaches. All movements at this intersection currently operate acceptably with LOS B or better during the morning and afternoon peak hours under existing conditions. With Whitney Ranch development of filings 1 and 2 in 2022, it is anticipated that this intersection will need to be signalized. Northbound and expected to operate acceptably at LOS B during both peak hours in 2022.

expected to operate acceptably with LOS D or better during the peak hours in 2040. Table 6 between College Drive and Van Buren Avenue. With these improvements, the intersection is By 2040, Dell Range Boulevard is anticipated to provide two through lanes in each direction provides the results of the level of service analysis for this intersection.

Table 6 - Dell Range Boulevard and Van Buren Avenue (#3) LOS Results

	AM Peak Hour	t Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
2017 Existing				
Eastbound Left	8.2	۷	20,	∢
Westbound Left	8,1	∢	8,7	V
Northbound Approach	13.8	B	14.9	Δ
Southbound Approach	12.8	80	12.7	В
2022 Background				
Eastbound Left	8.2	4	8.2	A
Westbound Left	8.1	∢	8.8	4
Northbound Approach	14.5	8	15.6	O
Southbound Approach	13.3	80	13.0	В
2022 Background Plus Project #	23.0	O	17.0	Ω
2040 Background				
Eastbound Left	8.5	4	8,3	∢
Westbound Left	8.0	V	9.2	۷
Northbound Approach	14.6	æ	17.2	ပ
Southbound Approach	13.6	8	14.4	В
2040 Background Plus Project #	23.5	O	43.5	۵

^{# =} Traffic Signal and Northbound and Southbound Left Turn Lanes ## = Eastbound Continuous Right Turn Lane

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Dell Range Boulevard and Gysel Place/El Camino Drive (#4)

With this control and this configuration, all movements currently operate acceptably with LOS B or better during the peak hours. With the addition of project traffic and the existing lane The intersection of Dell Range Boulevard and Gysel Place/El Camino Dive currently operates configurations, all movements at this intersection are expected to operate acceptably during the peak hours in both 2022 and 2040. Therefore, no improvements are anticipated to be needed at this intersection. Table 7 provides the results of the level of service analysis for this Gysel Place (north leg) and El Camino Drive (south leg) are offset by approximately 130 feet but this intersection is being analyzed as one four-leg intersection rather than two T-intersections. with stop control along the northbound and southbound approaches. As mentioned previously, intersection.

Table 7 - Dell Range Boulevard and Gysel Place/El Camino Drive (#4) LOS Results

	AM Peak Hour	k Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
2017 Existing				
Eastbound Left	0.0	∢	8,0	۷
Westbound Left	9"2	∢	8,5	∀
Northbound Approach	12,2	Δ	13.8	ш
Southbound Approach	0.0	V	10.3	В
2022 Background				
Eastbound Left	0.0	¥	8.1	۷
Westbound Left	7.7	4	8 6	∢
Northbound Approach	12,5	ω	14.4	B
Southbound Approach	0.0	A	10.5	В
2022 Background Plus Project				
Eastbound Left	8.2	∢	8.6	∀
Westbound Left	7.7	∢	8.7	٧
Northbound Approach	14,0	B	26.5	۵
Southbound Approach	11.6	В	12.4	В
2040 Background				
Eastbound Left	0.0	∢	8.2	Α
Westbound Left	7.7	∢	o 80	V
Northbound Approach	13.7	ш	15.5	O
Southbound Approach	0.0	4	10.7	В
2040 Background Plus Project				
Eastbound Left	9.5	∢	9.5	∢
Westbound Left	8.1	∢	13.2	Ω
Northbound Approach	19.8	O	36.6	ш
Southbound Approach	16.3	ပ	23.3	O

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Dell Range Boulevard and James Drive (#5)

The Dell Range Boulevard and James Drive intersection currently operates with stop control along the southbound James Drive approach. All movements at this intersection currently operate acceptably with LOS B or better during the peak hours under existing conditions... With the addition of project traffic and the existing lane configurations, all movements at this intersection are expected to operate acceptably during the peak hours in both 2022 and 2040. Table 8 provides the results of the level of service analysis for this intersection.

Table 8 - Dell Range Boulevard and James Drive (#5) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	K Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
2017 Existing				
Northbound Approach	0 0	V	12,6	Ω
Eastbound Left	0'0	٧	0.1	⋖
Southbound Approach	10.9	ω	0.0	V
2022 Background				
Northbound Approach	0'0	∢	12,9	В
Eastbound Left	0.0	∢	0.1	٧
Southbound Approach	11.1	Ф	0.0	V
2022 Background Plus Project				
Northbound Approach	0.0	V	13,1	В
Eastbound Left	0.0	V	0.1	٧
Southbound Approach	11.2	В	0.0	V
2040 Background				
Northbound Approach	0'0	٧	13.7	80
Eastbound Left	0'0	∢	0.0	∢
Southbound Approach	12.2	ш	13.7	В
2040 Background Plus Project				
Northbound Approach	0.0	∢	22.4	ပ
Eastbound Left	9.5	∢	9.5	V
Southbound Approach	15.2	O	16.4	O

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Whitney Road and Dell Range Boulevard (#6)

along the northbound and southbound Whitney Road approaches. All movements at this Whitney Road in 2022. With these improvements, all movements at this intersection are The intersection of Whitney Road and Dell Range Boulevard currently operates with stop control intersection currently operate acceptably with LOS E or better during the morning and afternoon peak hours under existing conditions. Prior to the addition of project traffic, the northbound approach of this intersection is anticipated to operate at LOS F during the afternoon peak hour left-turn lane between James Drive and through this intersection to allow for two stage left turns from Whitney Road in 2022. Additionally, a northbound left turn lane should be provided along in 2022. It is anticipated that Dell Range Boulevard would need to be improved with a two-way expected to operate acceptably during the peak hours in 2022.

peak hours, and LOS E or better during the 2040 peak hours. Therefore, a traffic signal may be signal control in 2040. Westbound and southbound left turn lanes were also included in the LOS B during morning peak hour and LOS C during the afternoon peak hour in 2040. Table 9 With this control, the intersection is expected to operate acceptably with LOS A in the 2022 the preferred control type for this intersection. This intersection meets the four-hour signal warrants with projected 2040 traffic volumes. As a result, this intersection was analyzed under 2040 analysis. With these improvements, the intersection is expected to operate acceptably with This intersection was also studied as a single lane, unsignalized roundabout in 2022 and 2040. provides the results of the level of service analysis for this intersection.

Table 9 - Whitney Road and Dell Range Boulevard (#6) LOS Results

	AM FERK HOUR	50.	LIM LEGK HOUL	1000
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	TOS
2017 Existing				
Eastbound Left	7.8	<	7.7	∢
Westbound Left	0.3	∢	0.2	V
Northbound Approach	25.4	O	40.9	ш
Southbound Approach	15.5	O	14.5	ω
2022 Background				
Eastbound Left	7.8	<	7.7	<
Westbound Left	0.3	∢	0.2	∢
Northbound Approach	30.2	۵	56.8	L
Southbound Approach	16.6	O	15.3	O
2022 Background Plus Project #				
Eastbound Left	7.8	<	7,8	∀
Westbound Left	0.3	⋖	0,2	∢
Northbound Left	20.3	O	17.2	O
Northbound Through/Right	10.9	В	14.6	ш
Southbound Approach	14.0	В	12.7	В
2022 Background Plus Project (Roundabout)	7.1	4	7.3	4
2040 Background				
Eastbound Left	7.9	∢	7.8	4
Westbound Left	0.2	∢	0,2	∢
Northbound Approach	36.1	Ш	124.3	<u>LL</u>
Southbound Approach	18.1	O	17.0	O
2040 Background Plus Project ##	17.3	В	22.7	O
2040 Background Plus Project (Roundahout)	10.5	c	47.6	ц

= EB and WB TWLTL, NB Left Turn Lane; ## = Signalized, WB and SB Left Turn Lanes

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Dell Range Boulevard and US-30 (#7)

The Dell Range Boulevard and US-30 intersection currently operates with stop control along the northbound and southbound approaches. All movements at this intersection currently operate acceptably with LOS C or better during the morning and afternoon peak hours under existing conditions, By 2022, it is anticipated that US-30 will provide two through lanes in each direction and this intersection will have signal control. With this configuration and control, the intersection is anticipated to operate acceptably at LOS B during morning peak hour and LOS C during the afternoon peak hour in 2022. This intersection is expected to continue to operate acceptably during the peak hours in 2040. Table 10 provides the results of the level of service analysis for this intersection.

Table 10 - Dell Range Boulevard and US-30 (#7) LOS Results

and seed the	AM Dock Dane	Done	Die Dock House	V House
Scenario	Detay (sec/veh)	FOS	Delay (sec/veh)	FOS
2017 Existing				
Northbound Approach	14.6	В	13.4	ω
Eastbound Left	8.4	∢	9.2	V
Westbound Left	7.4	V	0.0	V
Southbound Approach	16.9	O	23.4	O
2022 Background #	15.0	8	21.9	ပ
2022 Background Plus Project #	15.4	В	22.6	O
2040 Background #	13.9	8	23.0	O
2040 Background Plus Project #	000	C	107	C

= Traffic signal control with two lanes EB and WB

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US-30 and Van Buren Avenue (#8)

The existing T-intersection of US-30 and Van Buren Avenue currently operates with stop control on the southbound Van Buren Avenue approach. With this control, all movements at this intersection currently operate acceptably with LOS C or better during the peak hours under existing conditions. By 2022 it is expected that this intersection will be signalized. With the addition of project traffic and a traffic signal, the intersection is expected to operate acceptably during the peak hours in 2022 and 2040. Table 11 provides the results of the level of service analysis for this intersection.

Table 11 - US-30 and Van Buren Avenue (#8) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOI
2017 Existing Eastbound Left	10.8	m	8.7	∢
Southbound Approach	17.2	O	12.4	В
2022 Background #	8.8	A	0.6	ď
2022 Background Plus Project #	7.0	A	7.1	<
2040 Background #	18.3	В	12.1	В
2040 Background Plus Project #	5.0	٧	6.9	∢
# = Signalized				

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US-30 and Hayes Avenue (#9)

The intersection of US-30 and Hayes Avenue currently operates with stop control along the northbound and southbound Hayes Avenue approaches. All movements at this intersection currently operate acceptably with the exception of the northbound approach during the afternoon peak hour, it is anticipated that this intersection will have signal control by 2022. With this improvement, this intersection is anticipated to continue to operate acceptably during the peak hours throughout the 2040 horizon. Table 12 provides the results of the level of service analysis for this intersection.

Table 12 - US-30 and Hayes Avenue (#9) LOS Results

Scenario 2017 Existing	THE PARTY NAMED IN	WIN LEAN HOUR	LIM LEAK HOUL	TOOL Y
2017 Existing	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
Eastbound Left	9.5	∢	83	⋖
Westbound Left	7.8	∢	6.8	V
Northbound Approach	42.3	ш	0.06	ш
Southbound Approach	14.2	В	24.4	O
2022 Background #	16.6	В	8.6	∢
2022 Background Plus Project #	16.8	В	8.8	A
2040 Background #	19.4	В	13.5	В
2040 Background Plus Project #	18.4	8	7.9	A

= Signalized

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US-30 and Whitney Road (#10)

The US-30 and Whitney Road intersection currently operates with stop control along the northbound and southbound Whitney Road approaches. The northbound left turn movements and the southbound approach currently operate with unsatisfactory LOS during the afternoon peak hour, it is anticipated that this intersection will operate with signal control by 2022, With the addition of project traffic and a traffic signal, this intersection is anticipated to operate acceptably during the peak hours throughout the 2040 horizon. Table 13 provides the results of the level of service analysis for this intersection.

Table 13 - US-30 and Whitney Road (#10) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	Hone
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	S07
2017 Existing				
Eastbound Left	8,8	۷	7.9	∢
Westbound Left	7.6	A	8,4	∢
Northbound Left	57.0	ш	74.7	ш
Northbound Through/Right	21.8	ပ	32.6	O
Southbound Approach	24.3	O	64.8	ч
2022 Background #	20.4	U	22.9	C
2022 Background Plus Project #	23.5	O	22.9	O
2040 Background #	23.3	ပ	22.1	O
2040 Background Plus Project #	32.7	O	45.0	O
# = Signalizari				

t = Signalize

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Storey Boulevard and Ridge Road (#11)

The Storey Boulevard and Ridge Road intersection currently operates with stop control on the eastbound and westbound and westbound Storey Boulevard approaches, Movements along the eastbound and westbound approaches at this intersection currently are experiencing long delays and LOS F during the peak hours under the existing intersection configuration, As a result, a signal warrant analysis was performed and it was determined that this intersection meets the four-hour signal warrant with future projected traffic volumes, it is understood that this intersection is close to meeting signal warrants today and will be signalized by the City in the near future. Under signal control and the existing lane configurations, this intersection is expected to operate acceptably with LOS B during the peak hours in 2040. Table 14 provides the results of the level of service analysis for this intersection.

Table 14 - Storey Boulevard and Ridge Road (#11) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	LOS
2017 Existing				
Northbound Left	8.1	<	8,1	V
Eastbound Left		,	124.9	ш
Eastbound Through	52.5	ш	167.7	ш
Eastbound Right	9.5	4	10,3	В
Westbound Left	64.6	ш	•	i
Westbound Through	2 66	ட	73.7	ш
Westbound Right	8.7	∢	9,5	∢
Southbound Left	7.4	V	7.7	A
2040 Background				L
Northbound Left	8 8	∢	69 1	V
Eastbound Left		•	672,6	ш
Eastbound Through	108.1	ш	304.0	ш
Eastbound Right	8 8	V	10.5	8
Westbound Left	v	A		٠
Westbound Through	247.7	ш	97.0	ш
Westbound Right	8 8	∢	රි	٧
Southbound Left	7.4	V	7.8	A
2040 Background Plus Project #	18,2	В	18,3	B

= Signalized

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Storey Boulevard and College Drive (#12)

The Storey Boulevard and College Road intersection currently operates with stop control on the eastbound and westbound Storey Boulevard approaches. All movements at this intersection are currently operating acceptably with LOS D or better during the peak hours under existing conditions. It is anticipated that a traffic signal will be needed upon buildout of the proposed development. Under signal control and the addition of a westbound left turn lane, this intersection is expected to operate acceptably at LOS B during the morning peak hour and LOS C during the afternoon peak hour in 2040, Table 15 provides the results of the level of service analysis for this intersection.

Table 15 - Storey Boulevard and College Drive (#12) LOS Results

	AM Peak Hour	(Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	TOS
2017 Existing				
Northbound Left	8,3	٧	8,2	V
Eastbound Left	22.3	O	24.4	ပ
Eastbound Through	21.4	O	22,5	ပ
Eastbound Right	10.8	В	11.7	6 0
Westbound Approach	27.5	۵	28,1	
Southbound Left	0.0	A	7.9	A
2040 Background				
Northbound Left	8.7	∢	8.5	∢
Eastbound Left	30.8	۵	36,1	٥
Eastbound Through	28.6	Ω	31.0	Ω
Eastbound Right	11.7	В	13,7	60
Westbound Approach	32.1	۵	29,7	Ω
Southbound Left	7.7	A	8.1	4
2040 Background Plus Project #	12.6	B	22.3	O

= Signalized, WB Left Turn Lane

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College Drive and Thomas Road (#13)

The College Drive and Thomas Road intersection currently operates with stop control on the eastbound and westbound Thomas Road approaches. All movements at this intersection are currently operating acceptably with LOS D or better during the peak hours under existing conditions. It is anticipated that a traffic signal will be needed upon buildout of the proposed development. Under signal control and the addition of eastbound and westbound left turn lanes, this intersection is expected to operate acceptably during the peak hours in 2040. Table 16 provides the results of the level of service analysis for this intersection.

Table 16 - College Drive and Thomas Road (#13) LOS Results

	AM Peak	Hour	PM Peak	k Hour
Scenario	Delay (seclveh)	SOT	Delay (sec/veh)	SO7
2017 Existing				
Northbound Left	8.2	4	9.6	∢
Eastbound Approach	12.6	В	18.9	Ç
Westbound Approach	24.8	O	27.9	۵
Southbound Left	8.2	V	8.4	A
2040 Background				
Northbound Left	8.5	4	9.0	4
Eastbound Approach	13.7	В	21.7	ပ
Westbound Approach	29.7	۵	38.7	ш
Southbound Left	8.5	4	0.6	٧
2040 Background Plus Project #	11.5	В	36.0	٥

= Signalized

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Whitney Road and Beckle Road (#14)

The Whitney Road and Beckle Road intersection currently operates with stop control on the eastbound and westbound approaches. All movements at this intersection are currently operating acceptably with LOS B or better during the peak hours under existing conditions. With the addition of project traffic and the existing lane configurations, all movements at this intersection are expected to continue to operate acceptably during the moming and affermoon peak hours in 2040. Table 17 provides the results of the level of service analysis for this intersection.

Table 17 - Whitney Road and Beckle Road (#14) LOS Results

	AM Peak Hour	c Hour	PM Peak Hour	K Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	100
2017 Existing				
Northbound Left	9'2	V	7.4	٧
Eastbound Approach	8,8	<	8.8	∢
Westbound Approach	10.0	В	8.6	∢
Southbound Left	7.3	⋖	9.2	∢
2040 Background				
Northbound Left	7.7	∢	7.4	4
Eastbound Approach	10.6	80	10.5	Ω
Westbound Approach	10.4	0	10.6	Ω
Southbound Left	7.3	V	2.6	V
2040 Background Plus Project				
Northbound Left	7.8	<	7.5	٧
Eastbound Approach	10,3	00	10.1	Ф
Westbound Approach	11.1	60	11.3	60
Southbound Left	7,3	4	2.6	V

Whitney Road and Buttercup Drive (#15)

The intersection of Whitney Road and Buttercup Drive currently operates with stop control on the westbound Buttercup Drive approach. All movements at this intersection are currently operating acceptably with LOS B or better during the peak hours under existing conditions. A west leg of this intersection, Thomas Road, will be constructed with development of the project site, With the addition of project traffic and the new west leg, all movements at this intersection are expected to continue to operate acceptably with LOS C or better during the moming and aftermoon peak hours in 2040. Table 18 provides the results of the level of service analysis for this intersection.

Table 18 - Whitney Road and Buttercup Drive (#15) LOS Results

	AM Peak Hour	(Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
2017 Existing				
Westbound Approach	10.0	m	10.1	20
Southbound Left	7.3	A	2.6	A
2040 Background				
Westbound Approach	10.2	Ω	10.3	Ω
Southbound Left	7.3	A	7.6	4
2040 Background Plus Project				
Northbound Left	7.9	∢	7.7	∢
Eastbound Approach	10.6	Θ	11.0	В
Westbound Approach	13.0	<u>m</u>	15.8	ပ
Southbound Left	7.4	4	7.7	V

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Whitney Road and Chickadee Drive (#16)

The intersection of Whitney Road and Chickadee Drive currently operates with stop control on the westbound Chickadee Drive approach. All movements at this intersection are currently operating acceptably with LOS B or better during the peak hours under existing conditions. A west leg of this intersection will be constructed with development of the project site, With the addition of project traffic and the new west leg, all movements at this intersection are expected to continue to operate acceptably with LOS C or better during the morning and affermoon peak hours in 2040, Table 19 provides the results of the level of service analysis for this intersection.

Table 19 - Whitney Road and Chickadee Drive (#16) LOS Results

	AM Peak Hour	k Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	TOS
2017 Existing				
Westbound Approach	10.1	В	10.2	8
2040 Background				
Westbound Approach				
Southbound Left	10.0	В	10.1	80
2040 Background Plus Project				
Northbound Left	8.1	∢	7-9	∢
Eastbound Approach	11.3	Θ	12.5	ω
Westbound Approach	13.4	m	17.1	O

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Whitney Road and Foxglove Drive (#17)

The intersection of Whitney Road and Foxglove Drive currently operates with stop control on the westbound Foxglove Drive approach. All movements at this intersection are currently operating acceptably with LOS A during the peak hours under existing conditions. A west leg of this intersection will be constructed with development of the project site. With the addition of project traffic and the new west leg, all movements at this intersection are expected to continue to operate acceptably with LOS B or better during the moming and afternoon peak hours in 2040. Table 20 provides the results of the level of service analysis for this intersection.

Table 20 - Whitney Road and Foxglove Drive (#17) LOS Results

	AM Peak Hour	Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	ros
2017 Existing				
Westbound Approach	9.6	۷	9,5	∀
Southbound Left	7.3	V	972	∢
2040 Background				
Westbound Approach	10.1	œ	9.4	A
Southbound Left	7.3	V	2.6	V
2040 Background Plus Project				
Northbound Left	8.2	<	8,0	V
Eastbound Approach	11.1	В	11.3	Ф
Westbound Approach	13.6	ω	11.5	В
Southbound Left	7.5	A	8.2	٧

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Storey Boulevard and Van Buren Avenue (#18)

The intersection of Storey Boulevard and Van Buren Avenue will be constructed with development of Whitney Ranch. Stop control should be provided along Van Buren Avenue and single shared all movement lanes are expected to be sufficient on all four approaches upon buildout of the project site. With this control and lane configurations, all movements are anticipated to operate acceptably during the peak hours in 2040 with the addition of project traffic. An additional analysis was performed with this intersection under roundabout control. This intersection is expected to operate acceptably with LOS A during the peak hours in 2040 under roundabout control. Table 21 provides the results of the level of service analysis for this intersection.

Table 21 - Storey Boulevard and Van Buren Avenue (#18) LOS Results

Scenario (sec/veh) 2040 Background Plus Project (TWSC) 10,4 Eastbound Approach 7.3 Westbound Approach 7.5 Southbound Approach 9.4 Southbound Approach 9.4		AND AND ADDRESS OF THE PARTY.	
	SOT	Delay (sec/veh)	SOT
	8	13,0	В
Westbound Approach 7,5 Southbound Approach 9,4	<	7.3	٧
Southbound Approach 9.4	<	7.8	V
	V	10.5	В
2040 Background Plus Project (Roundabout) 4.4	4	5.6	∢

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Van Buren Avenue and Thomas Road (#19)

The Van Buren Avenue and Thomas Road intersection will be constructed with development of Whitney Ranch. This intersection can operate with all-way stop control or a single lane roundabout, With either control condition, all movements are anticipated to operate acceptably during the peak hours in 2040 with the addition of project traffic. This intersection is expected to operate acceptably with LOS A during the peak hours in 2040 under roundabout control. Table 22 provides the results of the level of service analysis for this intersection.

Table 22 - Van Buren Avenue and Thomas Road (#19) LOS Results

	AM Peak Hour	(Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	LOS
2040 Background Plus Project (AWSC)	6	A	16.2	ပ
2040 Background Plus Project (Roundabout)	5.6	4	8,5	A

Van Buren Avenue and Chickadee Drive (#20)

The T-intersection of Van Buren Avenue and Chickadee will be constructed with development of the project site, The westbound approach of this intersection should be stop controlled, With this control and lane configurations, all movements are anticipated to operate acceptably during the peak hours in 2040 with the addition of project traffic, An additional analysis was performed with this intersection under roundabout control. This intersection is expected to operate acceptably with LOS A during the peak hours in 2040 under roundabout control. Table 23 provides the results of the level of service analysis for this intersection.

Table 23 - Van Buren Avenue and Chickadee Drive (#20) LOS Results

	AM Peak Hour	K Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	ros	Delay (sec/veh)	ros
2040 Background Plus Project (TWSC)				
Westbound Approach	10.9	æ	15.9	O
Southbound Approach	7.6	4	8.2	V
2040 Background Plus Project (Roundabout)	9	4	99	<

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Whitney Road and Commercial Access (#21)

The T-intersection Commercial Access along Whitney Road will be constructed with development of the project site. The westbound approach of this access intersection should stop controlled while providing a left turn lane and a right turn lane. The northbound approach should provide a left turn lane and one through lane while the southbound approach provides a shared through/right turn lane. With this control and lane configurations, all movements are expected to operate acceptably during the peak hours in 2040 with the addition of project traffic. Table 24 provides the results of the level of service analysis for this intersection,

Table 24 - Whitney Road and Commercial Access (#21) LOS Results

	AM Peak Hour	c Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	FOS	Delay (sec/veh)	LOS
2040 Background Plus Project				
Eastbound Left	12.1	Ф	20.0	O
Eastbound Right	13.1	В	12.3	В
Northbound Left	8 5	V	88	A

Dell Range Boulevard and Commercial Access (#22)

The T-intersection Commercial Access along Dell Range Boulevard will be constructed with development of Whitney Ranch. The eastbound approach of this access intersection should provide a left turn lane and one through lane while the westbound approach provides a shared through/right turn lane. The southbound approach should be stop controlled while providing a left turn lane and a right turn lane. With this control and lane configurations, all movements are expected to operate acceptably during the peak hours in 2040 with the addition of project traffic. Table 25 provides the results of the level of service analysis for this intersection.

Table 25 - Dell Range Boulevard and Commercial Access (#22) LOS Results

	AM Peak	Hour	PM Peak Hour	k Hour
Scenario	Delay (sec/veh)	SOT	Delay (sec/veh)	SOT
2040 Background Plus Project				
Eastbound Left	6.9	¥	10.6	മ
Southbound Left	14.2	ω	37.2	ш
Southbound Right	17.2	O	19.8	O

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5.3 Queuing Analysis

Queuing analysis was conducted for the study area intersections per City of Cheyenne standards and requirements. Results were obtained from the 95th percentile queue lengths obtained from the Synchro analysis, Queue analysis worksheets at the signalized intersections are provided in **Appendix E**. Queue lengths are shown on the worksheets for the unsignalized intersections on the operational analysis sheets within **Appendix D**. Results of the queuing analysis and recommendations at the study area intersections are provided in **Table 26**.

Table 26 - Queuing Analysis Results and Recommendations

Intersection Turn Lane	Existing Turn Lane Length (feet)	2022 Calculated Queue (feet)	2022 Recommended Length (feet)	2040 Calculated Queue (feet)	2040 Recommended Length (feet)
Dell Range Blvd &					
Fastbound off	150' T	65	150'	,09	150'
Westhound Left	150' T	9	50.	234'	150°T
Westhound Right	- NC	3 *		.26	100,
Northbound Left	125' T	108'	125'	243'	125' T
Northbound Right	125'	48	125	288,	200,
Southbound Left	100' T	110,	100,	138'	100' T
Southbound Right	100,	35,	100,	55'	100,
Dell Range Blvd &					
College Drive (2)					
Eastbound Left	175' T	104'	175'	217	175' T
Westbound Left	125' T	.28	125′	248'	125' T
Westbound Right	DNE			29'	100,
Northbound Left	125' T	326'	125' T	214'	225' DL
Northbound Right	DNE	*		254'	250,
Southbound Left	100, T	190,	100, T	323,	100. ⊥
Southbound Right	DNE			100,	100,
Dell Range Blvd &					
Van Buren Avenue (3)					
Eastbound Left	TWLTL	-44	TWLTL	222'	TWLTL
Westbound Left	TWLTL	25'	TWLTL	38,	TWLTL
Northbound Left	DNE C	43	100,	59,	100,
Southbound Left	DNE	67	001	64	001
Whitney Road (6)					
Eastbound Left	125'	25'	125'	55'	125'
Westbound Left	DNE		•	25'	100,
Northbound Left	DNE	36'	100,	88,	100,
Southbound Left	DNE			58,	100,
Dell Range Blvd &					
US-30 (7)					
Eastbound Left	320,	25	320	25	320,
Westbound Left	325	25'	325	25	325

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US-30 & Van Buren					
Eastbound Left	100,	45	100,	238'	250,
US-30 & Hayes Ave (9)					
Eastbound Left	100,	44	100,	41	100.
Eastbound Right	150	25	150'	25	150'
westbound Left	0	07	70	62	OUL
US-30 & Whitney Road				1	
(10)	i	i	-		ŀ
Eastbound Left	3/5/1	3	3/5	408	3/5/
Westbound Left	375' T	25	375 T	52	375' T
Northbound Left	100, T	45	100 T	72.	100, T
Storey Boulevard &					
Ridge Road (11)					
Eastbound Left	125' T		125	25'	125
Eastbound Right	100,		100	28,	1001
Westbound Left	125° T		125	22.	125
Westbound Right	100,		100,	25'	100,
Northbound Left	200' T		200	197	200.
Southbound Left	75'		75'	25'	75'
Storey Boulevard &					
College Road (12)					
Eastbound Left	100, T	,	100,	25'	100,
Eastbound Right	100,		100,	126	175'
Westbound Left	DNE			25'	100,
Northbound Left	160' T	,	160	187	160' T
Southbound Left	150° T	*	150'	25'	150,
College Drive &					
Thomas Road (13)					
Eastbound Left	DNE			25'	100,
Westbound Left	DNE			269	275'
Northbound Left	275'	ı	275'	25'	275'
Southbound Left	TWLTL		TWLTL	90,	TWLTL
Whitney Road					
Commercial Access (21)					
Eastbound Left	DNE	,	+	25	100,
Northbound Left	DNE		1.0	25	100,
Dell Ridge Boulevard			1		
Commercial Access (22)					
Eastbound Left	DNE			20	100,
Southbound Left	DNE		*	25	100,

Down Town Left Turn Lane Beyond Left Turn Lanes; TWLTL = Two Way Left Turn Lane; T = TWLTL Exists Beyond Left Turn Lane

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All new access and roadway intersections should be constructed with the recommended left turn and right turn storage lengths as identified in **Table 26**. The recommended storage lengths that include a "T" indicate that existing storages are not anticipated to meet future storage demands but potential vehicle queues will extend into an existing two way left turn lane.

In the 2022 horizon, the northbound and southbound left turn lanes at the Dell Range Boulevard and Van Buren Avenue intersection (#3) are recommended to provide lengths of 100 feet. The northbound left turn lane at the Dell Range Boulevard and Whitney Road intersection (#6) is recommended at 100 feet.

(#13), separate 100-foot eastbound and 275-foot westbound left turn lanes are recommended if left turn lanes of 100 feet in length are recommended to be provided at the Dell Range Van Buren Avenue intersection (#8) is recommended at a length of 250 feet. The westbound (#12) may need to be extended to provide 175 feet of storage. In addition, a 100-foot westbound left turn lane may be needed. At the Thomas Road and College Drive intersection Thomas Road provides a connection to the Whitney Ranch project. At the commercial By the 2040 horizon, there are several other turn lane improvements needed. The existing need to be extended by 2040 to provide 200 feet of storage while the westbound approach may need to provide a 100-foot right turn lane. The northbound approach to the Dell Range Boulevard and College Drive intersection (#2) may need to be improved by 2040 to provide dual left turn lanes with 225 feet of storage, a separate 250-foot right turn lane, a 100-foot westbound right turn lane, and a 100-foot southbound right tum lane. Additional southbound and westbound Boulevard and Whitney Road intersection (#6), The eastbound left turn lane at the US-30 and left turn lane at Dell Range Boulevard and Hayes Avenue (#9) is recommended at 100 feet. The existing eastbound right tum lane at the Storey Boulevard and College Drive intersection accesses along Dell Range Boulevard (#22) and Whitney Road (#21), 100-foot left tum lanes are recommended for entering traffic movements along the public street. Likewise, separate northbound right turn lane at the intersection of Dell Range Boulevard and Ridge Road (#1) may 100-foot left turn lanes and right turn lanes are recommended for the existing access approach.

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5.4 Signal Warrant Analysis

A traffic signal warrant analysis was conducted at the intersections of Dell Range Boulevard/Nan Buren Avenue, Dell Range Boulevard/Mhitney Road, US-30/Hayes Avenue, US-30/Whitney Road, Storey Boulevard/Ridge Road, Storey Boulevard/College Drive, and College Drive/Thomas Road due to long delays currently being experienced or expected to be experienced with left furm and through movements from stop controllege Drive, and College Drive/Thomas Road due to long delays currently being experienced or expected to be experienced with left furm and through movements from stop controllege Drive. The most restrictive form of traffic control is the traffic signal. A traffic signal not only provides traffic control and direction to motorists, it also takes on the active role of allocating and assigning time to each direction of travel. Therefore, the installation of traffic signals must be uniform across the entire nation to maintain the proper respect for the devices, as well as to ensure the device benefits the public. The Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) 2009 establishes the standards and the basic principles governing the design, usage, and installation of all traffic control devices (including the traffic signal). The determination to install a traffic control signal should be based on an engineering study of existing traffic conditions, pedestrian characteristics, and the geometry of the intersection in question.

Signal warrant evaluations were conducted in accordance with the requirements set forth in the MUTCD 2009. The intent of this analysis was to conduct an evaluation of traffic and roadway conditions in order to determine if a traffic signal may be the appropriate form of traffic control at the subject intersections. Further study will be required in the future after traffic volumes are realized since the traffic signal warrant application is to be based on actual traffic conditions.

The MUTCD 2009, provides a series of signal warrants that define the minimum conditions under which the installation of a traffic control signal should be considered. The installation of a traffic control signal, even when justified by existing conditions, can be improperly designed, placed, and operated, causing excessive delay, driver disregard and increases in collision frequency. The MUTCD states; "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." As such, consideration should be given to providing alternative, less restrictive, forms of traffic control; including the installation of multiway STDP sign control, roundabouts, and turning movement restrictions. Although most of the steps in conducting the traffic signal warrant analysis are quantitative, the final step of recommending whether a signal should be considered for installation involves a degree of qualitative assessments that require the use of engineering judgment.

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The justification for the installation of a traffic signal at an intersection is based on warrants stated in the MUTCD 2009. The decision to install a signal should not be based solely upon the warrants, since the installation of traffic signals may increase certain types of collisions. Delay, congestion, approach condition, driver confusion, future land use or other evidence of the need for right-of-way assignment beyond that which could be provided by stop signs must be demonstrated.

When the 85th percentile speed of traffic on the major street exceeds 40 miles per hour in either an urban or rural area, or when the study intersection lies within the built-up area of an isolated community having a population of less than 10,000, the traffic volumes evaluated may be 70 percent of the stated minimums. For reference, the Dell Range Boulevard/Van Buren Avenue, Dell Range Boulevard/Whitney Road, Storey Boulevard/Ridge Road, Storey Boulevard/College Drive, and College Drive/Thomas Road intersections are not within the 70 percent volume threshold due to the posted speed limits at these locations being 40 miles per hour or less. The intersections of US-30/Hayes Avenue and US-30/Whitney Road fall within the 70 percent volume threshold.

The installation of a traffic control signal should be considered if one or more of the following traffic signal warrants as outlined within the MUTCD are met:

Warrant 1, Eight-Hour Vehicular Volume

Warrant 2, Four-Hour Vehicular Volume

Warrant 3, Peak Hour Volume

Warrant 4, Pedestrian Volume Warrant 5, School Crossing Warrant 6, Coordinated Signal System

Warrant 7, Crash Experience

Warrant 8, Roadway Network

Warrant 9, Intersection Near a Grade Crossing

Since this analysis is for a projection of future traffic to determine the likelihood of these intersections meeting traffic volume warrants, the Four-Hour Vehicular Volume (Warrant 2) was

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evaluated. These four hours were projected from the moming and afternoon peak hour counts conducted at the intersections with background traffic growth and the addition of project traffic.

Warrant 2, Four-Hour Vehicular Volume

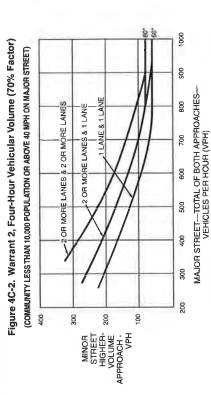
The four-hour vehicular volume warrant is intended to be applied where the volume of intersecting traffic is the principal reason to consider installing a traffic control signal. The installation of a traffic signal shall be considered if the plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor street approach are above the appropriate curve in Figure 4C-1 (MUTCD – see following). The higher volume on the minor street does not have to be on the same approach during each of the four hours, if the posted speed limit or the 85th percentile speed exceeds 40 mph on the major street, or if the intersection lies within the built-up area of an isolated community having a population less than 10,000 people, Figure 4C-2 (MUTCD – see following), which represents a 70 percent factor may be used.

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115* 1400 1300 Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume 1200 1 LANE & 1 LANE MAJOR STREET—TOTAL OF BOTH APPROACHES-VEHICLES PER HOUR (VPH) 2 OR MORE LANES & 2 OR MORE LANES OR MORE LANES & 1 LANE 1000 900 800 200 900 20 400 300 90 900 400 300 200 MINOR STREET 3 HIGHER-VOLUME APPROACH - 2

*Note: 115 yph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 yph applies as the lower threshold volume for a minor-street approach with one lane.



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

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Traffic Signal Warrant Analysis Results

The following provides an intersection by intersection discussion relative to when traffic signal warrants are anticipated to be met.

Dell Range Boulevard and Van Buren Avenue

The Four-Hour Vehicular Volume signal warrant condition is satisfied for the projected 2040 total traffic conditions at the intersection of Dell Range Boulevard and Van Buren Avenue. All four of the hourly data points for 2040 which represent the vehicles per hour on the major street (total of both directions) and the corresponding vehicles per hour on the minor street approach are above the curve in Figure 4C-1 of the MUTCD for the existing combination of dual approach lanes and a single approach lane. The plotted points are shown in Figure 12. Therefore, a traffic signal is anticipated to be the appropriate control at this intersection with development of Whitney Ranch.

Dell Range Boulevard and Whitney Road

The Four-Hour Vehicular Volume signal warrant condition is satisfied for the projected 2040 total traffic conditions at the intersection of Dell Range Boulevard and Whitney Road, All four of the hourly data points for 2040 which represent the vehicles per hour on the major street (total of both directions) and the corresponding vehicles per hour on the minor street approach are above the curve in Figure 4C-1 of the MUTCD for the existing combination of a single approach lane and a single approach lane. The plotted points are shown in Figure 13. Therefore, a traffic signal is anticipated to be the appropriate control at this intersection with continued development of the surrounding area.

Storey Boulevard and Ridge Road

The Four-Hour Vehicular Volume signal warrant condition is satisfied for the projected 2040 total traffic conditions at the intersection of Storey Boulevard and Ridge Road. All four of the hourty data points for 2040 which represent the vehicles per hour on the major street (total of both directions) and the corresponding vehicles per hour on the minor street approach are above the curve in Figure 4C-1 of the MUTCD for the existing combination of dual approach lanes and a single approach lane. The plotted points are shown in Figure 16. Therefore, a traffic signal is anticipated to be the appropriate control at this intersection with continued development of the surrounding area.

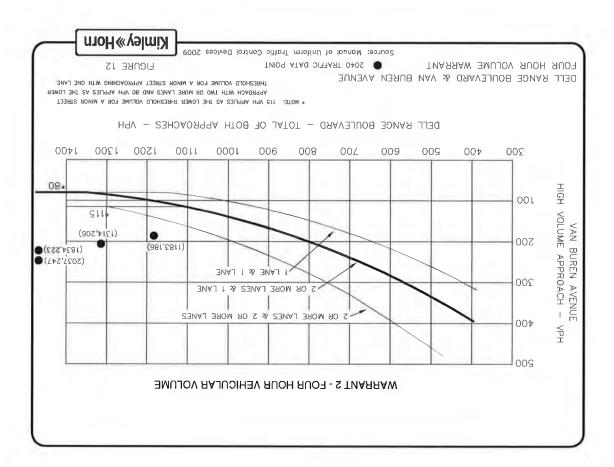
Kimley-Horn and Associates, Inc 096567001 – Whitney Ranch – Cheyenne

College Drive and Storey Boulevard

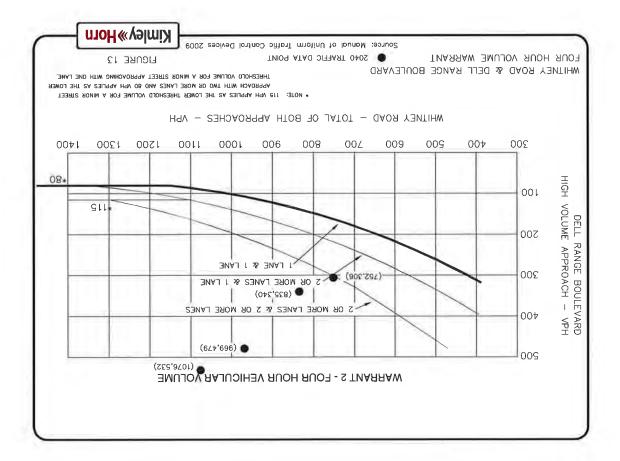
The Four-Hour Vehicular Volume signal warrant condition is satisfied for the projected 2040 total traffic conditions at the intersection of College Drive and Storey Boulevard. All four of the hourly data points for 2040 which represent the vehicles per hour on the major street (total of both directions) and the corresponding vehicles per hour on the minor street approach are above the curve in Figure 4C-1 of the MUTCD for the existing combination of a single approach lane and a single approach lane. The plotted points are shown in Figure 17. Therefore, a traffic signal is anticipated to be the appropriate control at this intersection with continued development of the surrounding area.

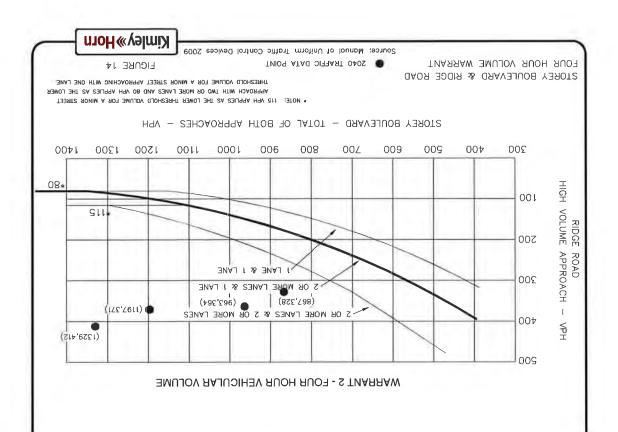
College Drive and Thomas Road

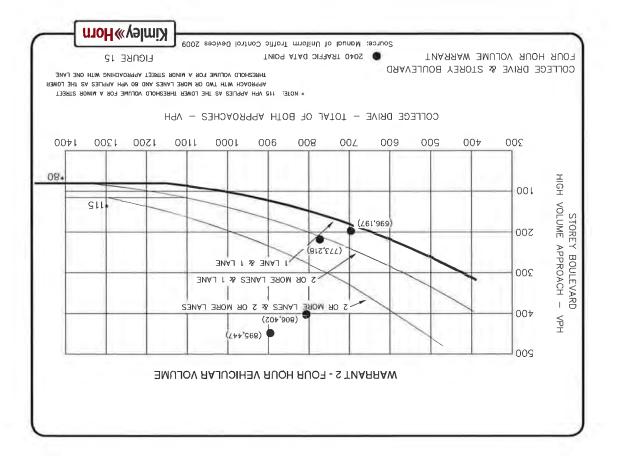
The Four-Hour Vehicular Volume signal warrant condition is satisfied for the projected 2040 total traffic conditions at the intersection of College Drive and Thomas Road. All four of the hourly data points for 2040 which represent the vehicles per hour on the major street (total of both directions) and the corresponding vehicles per hour on the minor street approach are above the curve in Figure 4C-1 of the MUTCD for the existing combination of a single approach lane and a single approach lane. The plotted points are shown in Figure 18. Therefore, a traffic signal is anticipated to be the appropriate control at this intersection with development of Whitney Ranch.

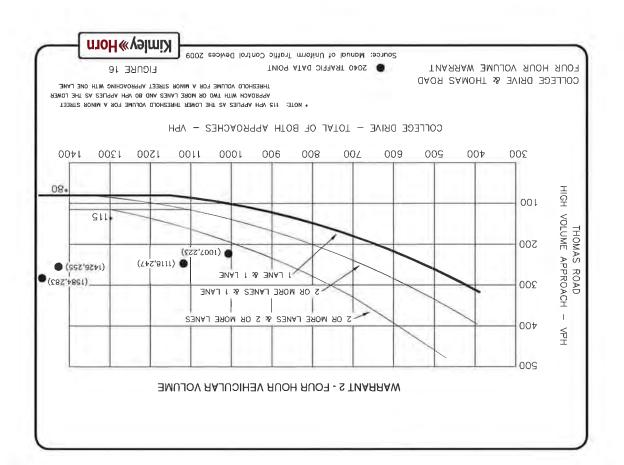


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5.5 Pedestrian and Transit Connections

Kimley » Horn

Stop Controlled App

FIGURE

TWIL Two-Way Lett-Turn Lone

⊕ ⊗ 1

TWL TSO

Pedestrian connections are recommended from Whitney Ranch to surrounding sidewalks. As part of the first phase of Filings 1 and 2, sidewalks will be constructed along both sides of the public streets within the project site. These sidewalks will provide a connection to Van Buren Avenue and the existing sidewalk provided along the east side of the roadway. Sidewalks exist along both sides of Van Buren Avenue to Dell Range Boulevard that connect to the pedestrian pathways along this roadway. Likewise, a crosswalk exists across the west leg of the Dell Range Boulevard and Van Buren Avenue intersection to provide pedestrian access to the school to the south of this intersection. This pedestrian crosswalk will be enhanced by the recommended signalization of this intersection. Presently, no transit service is available in the area. As the population of the area grows, necessary connections to any transit facility will be considered.

5.6 Improvement Summary

Based on the results of the operational and queuing analysis, the recommended lane configurations and control of the study key intersections and project access driveway is shown in Figure 19 for the 2022 horizon and Figure 20 for the 2040 horizon.

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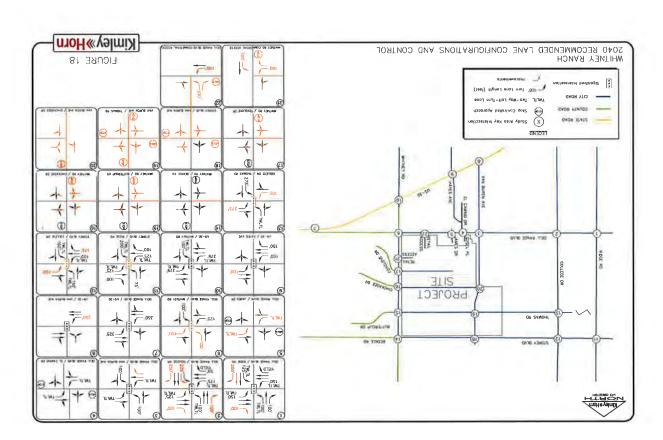
WHITNEY RANCH

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6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Hom believes the proposed Whitney Ranch development will be successfully incorporated into the existing and future roadway network. The existing traffic volume analysis, proposed project development, and expected future traffic volumes resulted in the following conclusions and recommendations:

2022 Phase 1 Traffic Condition Improvements

- The intersection of Dell Range Boulevard and College Drive (#2) should be improved to
 provide two eastbound through lanes. The existing pork chop raised island could be
 reconstructed to allow for the second through lane through the signalized intersection to
 then taper to a single eastbound through lane further east using the existing transition.
- The Dell Range Boulevard and Van Buren Avenue intersection (#3) should be signalized, and the northbound and southbound approaches should be designated to provide separate 100-foot left turn lanes.
- The northbound approach to the intersection of Dell Range Boulevard and Whitney Road (#6) should be improved to provide a 100-foot separate left turn lane.
- Gysel Place is recommended to be a paved roadway from the intersection with Dell Range Boulevard to provide paved access to the project site upon completion of the first phase of development.
- It is understood that WYDOT is improving US-30 to include two through lanes in each direction throughout the study area. Likewise, the US-30 intersections with Dell Range Boulevard, Van Buren Avenue, Hayes Avenue, and Whitney Road are anticipated to be signalized.

2040 Long-Term Horizon Traffic Condition Improvements

It is recommended that Dell Range Boulevard be improved to be a five-lane roadway providing two through lanes in each direction between and through the intersections of College Drive to Van Buren Avenue. The five-lane roadway is recommended to

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transition to one through lane in each direction east of the Van Buren Avenue intersection. A continuous two-way left turn lane should remain through the five-lane

- It is recommended that Dell Range Boulevard be improved to be a three-lane roadway with a continuous two way left turn lane between James Drive and Whitney Road.
- It is recommended that the northbound right turn lane at the Dell Range Boulevard and Ridge Road intersection (#1) be restriped to show an extension from the existing 125 feet to 200 feet. Additionally, this intersection may require a second northbound through lane and a 100-foot westbound right turn lane by the long-term horizon.
- The intersection of Dell Range Boulevard and College Drive (#2) may need 225-foot northbound dual left turn lanes, a 250-foot northbound right turn lane, a 100-foot westbound right turn lane, and a 100-foot southbound right turn lane by 2040.
- The intersection of Dell Range Boulevard and James Drive (#5) should be improved to provide a center two-way left-tum lane along Dell Range Boulevard.
- The intersection of Dell Range Boulevard and Whitney Road (#6) should be signalized, and the westbound and southbound approaches should provide separate 100-foot left turn lanes so that all approaches include left turn lanes.
- The eastbound left turn lane at the US-30 and Van Buren Avenue intersection (#8) should be extended to a length of 250 feet to accommodate projected queues.
- A westbound left turn lane at the US-30 and Hayes Avenue intersection (#9) is recommended to be 100-foot long to accommodate projected queues.
- The Storey Boulevard and Ridge Road intersection (#11) should be signalized.
- It is recommended that the eastbound right turn lane at the Storey Boulevard and College Drive intersection (#12) be extended from 100 feet to 175 feet. This intersection

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should also be considered for signalization and provide a separate 100-foot westbound left turn lane.

- The intersection of College Drive and Thomas Road (#13) may warrant signalization upon buildout of the proposed Whitney Ranch development. The eastbound and westbound approaches of this intersection should provide separate left turn lanes of 100 feet and 275 feet, respectively.
- The future intersection of Storey Boulevard and Van Buren Avenue (#18) should operate
 with stop control along Van Buren Avenue or be constructed as a single lane roundabout
 to accommodate future traffic volumes.
- The future intersection of Thomas Road and Van Buren Avenue (#19) should operate with all-way stop control or be constructed as a single lane roundabout to accommodate future traffic volumes.
- At the full movement access intersections along Dell Range Boulevard (#22) and Whitney Road (#21) for the commercial parcel on the northwest comer of this intersection, it is recommended that the driveway approaches to the public street have separate left turn and right turn lanes and operate with stop control. Likewise, 100-foot left turn lanes for entering traffic movements are also recommended along the public street.

General Recommendations

All on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings, and conform to City of Cheyenne and/or Wyoming Department of Transportation standards as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

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APPENDICES

APPENDIX A

Intersection Count Sheets

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne



Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Ridge Rd

File Name: Dell Range and Ridge AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

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08:00 AM	9	61	26	0	93	9	101	4	0	151	16	49	7	0	72	58	22	56	a	110	426
08:15 AM	12	63	17	0	92	10	134	29	0	173	16	47	14	0	77	30	51	19	0	100	442
08:30 AM	5	73	14	0	100	00	106	10	0	124	31	30	7	0	69	19	46	50	0	82	377
08:45 AM	12	29	2	0	92	10	129	20	0	159	23	32	o	0	64	19	32	16	0	49	382
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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Ridge Rd

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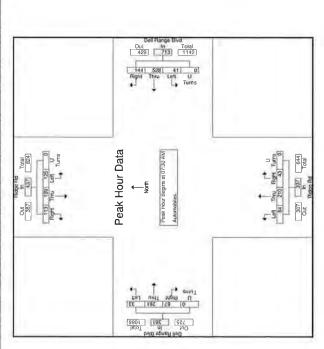


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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Ridge Rd

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Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Ridge Rd

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Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Ridge Rd

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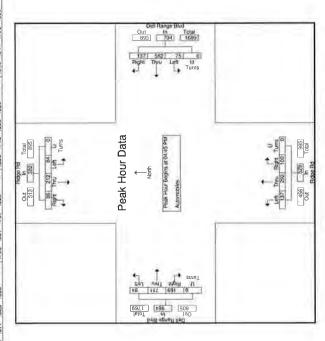
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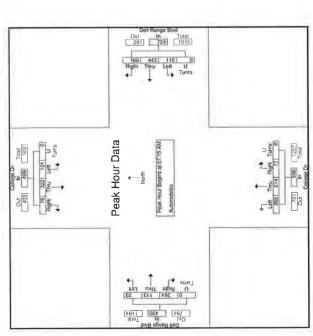
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Ridgovow Dates

Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and College Dr

File Name : Dell Range and College PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

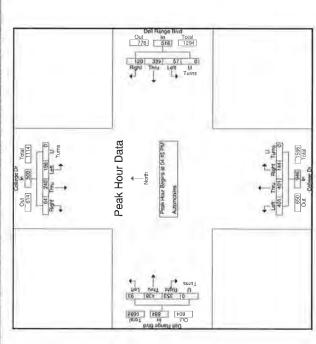
Out Total Total 1147 5.82 2079



9/6/2017 04:00 PM 9/6/2017 05:45 PM ←-¥

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Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd a

Morrison, CO 80465

RIDG Ridgovnow Data Collaction

Dell Range and College PM	IPO 262	1
File Name	Site Code	

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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Van Buren Ave

File Name: Dell Range and Van Buren AM Site Code: IPO 262 Start Date: 9/6/2017 Page No::1

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Van Buren Ave

File Name : Dell Range and Van Buren AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

| Del Riinte Blvd | Oul | In Total | 288 | 744 | 1032 Right Thru Left U Regres Times Lord U 143 197 250 Out In Total 9520170705AM 9520170845AM Automobiles



RIDIC Ridgeview Dates Collection

Morrison, CO 80465

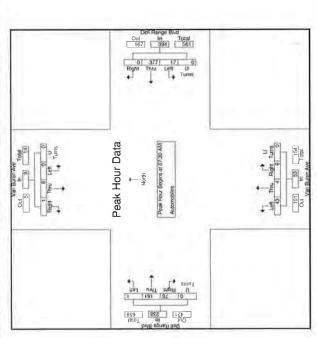
Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Van Buren Ave

File Name : Dell Range and Van Buren AM Site Code : IPO 262

Page No 3

- PO 262	9/6/2017	C
Site Code	Start Date	Dage No

٦	Dell Ra East	Dell Range Blvd Eastbound	DA			Dell	Dell Range Blvd Westbound	Blvd			Var	an Buren Av Northbound	Van Buren Ave Northbound			Var.	Van Buren Ave Southbound	und und		
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eak Hour for Entire Intersection Begins at 07:30 AM	Interse	ction E	Begins	al 07	30 AI	2														
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Van Buren Ave

File Name : Dell Range and Van Buren PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

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Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Van Buren Ave

Out In Total 18 29

File Name : Dell Range and Van Buren PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Van Buren Ave

Morrison, CO 80465

Ridgeview Deta

File Name : Dell Range and Van Buren PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

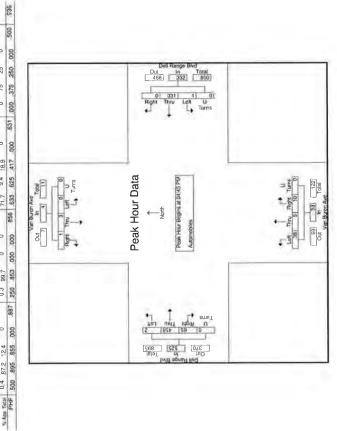
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Ridgeview Detail

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Gysel PI/El Camino

File Name : Dell Range and Gysel El Camino AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Gysel PI/El Camino

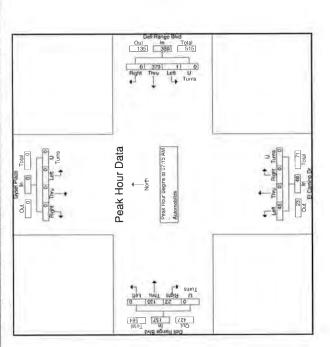
File Name: Dell Range and Gysel El Camino AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

Out the Total 37 80 126 Out Total 95/2017 07:00 AM 95/2017 08:45 AM



Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Gysel PI/El Carnino

File Name : Dell Range and Gysel El Camino AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3





Morrison, CO 80465

File Name : Dell Range and Gysel El Camino PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1 Cheyenne, WY Whitney Ranch PM Peak Dell Range Bivd and Gysel PI/El Camino

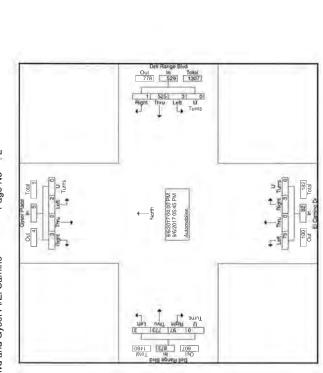
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Morrison, CO 80465 Ridgeview Date Collection

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Gysel PI/El Camino

File Name : Dell Range and Gysel El Camino PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Gysel PI/El Camino

File Name: Dell Range and Gysel El Camino PM

: IPO 262	: 9/6/2017	ee
Site Code	Start Date	Page No

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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and James Dr

File Name: Dell Range and James AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and James Dr

File Name: Dell Range and James AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

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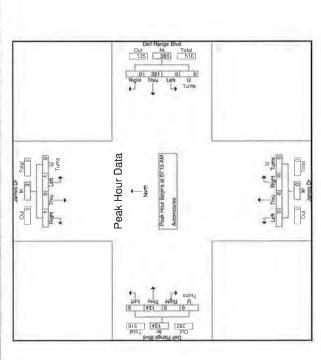
Ridgeview Deca Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and James Dr

File Name: Dell Range and James AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

. 13	Ea:	Dell Range Blvd Eastbound	Blvd		3	We	Dell Range Bivd Westbound	Bivd		å	, 8	James Dr Northbound	ng .		1	Sou	James Dr Southbound	- Pu		- [
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	LOU.	A 00,700 may sis From 07,00 A	AM to	M to 08:45 A	AM -	Peak 1	1 10													
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	47	0	0	47	0	90	0	0	90	0	0	0	0	0	0	0	0	0	0	137
	32	0	0	35	0	66	0	0	66	0	D	0	0	0	-	0		0	6)	133
171	134	0	0	134	0	381	0	0	381	0	D	D	Ь	0	-	0	-	0	2	517
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and James Dr

File Name: Dell Range and James PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

		E E	Dell Hange Blvd Eastbound	Blvd			Dell	Dell Range Blvd Westbound	Bivd			2 S	James Dr Northbound	P P	П		So	Southbound	E PE		
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04:15 PM	a	89	0	0	88	0	54	0	0	54	0	0	0	0	0	0	0	0	0	0	143
04:30 PM	0	83	0	0	93	0	74	0	0	74	0	0	o	0	0	a	0	0	0	o	167
04:45 PM	0	97	0	0	97	0	57	0	0	57	0	0	0	0	0	0	0	0	0	o	154
Total	0	365	0	0	365	0	238	0	0	238	0	ø	0	0	0	0	0	0	0	0	603
05:00 PM	0	105	0	o	105	0	98	0	0	98	0	0	0	0	0	O	0	d	0	0	203
05:15 PM	+	92	0	0	96	0	68	0	0	99	0	0	0	0	0	0	0	0	0	0	164
M9 05:30	0	115	0	0	115	0	71	0	D	71	-	0	a	0	-	0	0	0	0	0	187
05:45 PM	0	90	0	0	90	0	54	•	O	22	0	0	0	0	0	0	0		0	•	146
Total	-	405	0	0	406	0	291	**	0	292	-	0	0	0	-	0	0	-	0	+	700
Grand Total	-	770	0	0	77.	0	529	-	0	530	-	0	0	0	**	0	0	-	0	-	1303
Approft %	0.1	99.9	0	0		0	99 8	0 2	0		100	0	0	0		0	0	100	0		
Total %	0.1	59.1	0	0	59.2	0	40.6	0 1	0	40 7	0.1	0	0	0	0.1	0	0	0 1	0	0 1	



Morrison, CO 80465

RIDIC Ridgoviow Dozo Calloccion

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and James Dr

File Name ; Dell Range and James PM Site Code ; IPO 262 Start Date ; 9/6/2017 Page No ; 2

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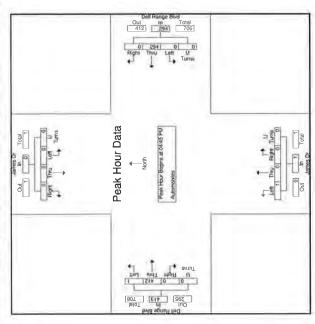
Del Range Bird
Out | 1770 | 550 | 1300 |

1 | 229 | 0 | 0 |

Right Theu Left Units

9/6/2017 04:00 PM 9/6/2017 05:45 PM

Automobiles



Out In Total

File Name | Dell Range and James PM Site Code | IPO 262 Start Date | 9/6/2017 Page No | 3 | Start Time | Left | Thru | Regit | Left | Thru | Regit | Left | Thru | Regit | Left Dell Range Bivd Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and James Dr Dell Range Blvd



RIDC Ridgeview Data Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Whitney Rd

File Name: Dell Range and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

		V						5	J Office	COUNTY THE PART WILLIAM ES	2000	2					1	1			
		Dell	Dell Range Blvd Eastbound	Blvd Ind			Dell	Dell Range Bivd Westbound	Blvd			≥ N	Whitney Rd Northbound	Pd ind			§ 8	Whitney Rd Southbound	nd d		
Start Time	Lott	Thru	Thru Gott	O Salm	ber ten	Lett	Thru	Right	1100	Thru Right steel age ton	Lett	Thru Right			Age that	Lett	The	Right	Right Liber an inch	-	10, 798
07:00 AM	-	13	o	0	23	-	49	0	0	20	100	2	0	0	S	-	23	52	0	49	145
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07:45 AM	4	20	(0)	0	42	Ø	46	12	D	5	28	4	N	0	34	0	19	16	0	35	162
Total	11	20	2	0	119	4	208	60	0	215	<u>F</u>	83	~	0	105	2	110	90	ь	192	631
08:00 AM	n	20	7	0	35	-	48	0	0	49	23	Ø	-	D	56	0	6	19	D	58	138
08:15 AM	7	17	12	0	36	0	36	+	0	37	18	4	0	0	22	0	7	10	0	23	117
08:30 AM	on	23	2	0	\$	-	19	N	D	22	17	9	+	0	24	0	0	10	0	19	66
08:45 AM	S	22	2	D	53	0	43	0	D	43	Ξ	6	0	0	14	0	7	o	0	16	102
Total	54	82	83	0	134	evi .	146	60	0	151	69	5	2	0	98	0	37	48	D	82	456
Grand Total	35	146	72	0	253	ω	354	ø	0	366	150	37	4	0	191	2	147	128	D	277	1087
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Total %	32	13.4	99	0	23.3	90	32.6	90	0	33.7	13.8	3.4	0.4	0	17.6	0 2	13.5	11.8	0	25 5	



Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Whitney Rd

File Name: Dell Range and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

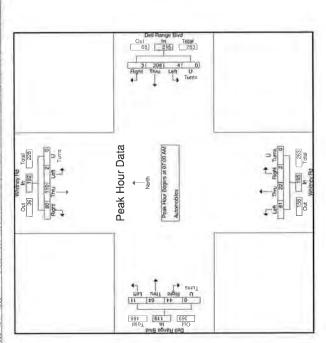
| 1283 1447| 21 0 | Payer This Left U Out 101 Total Out In Total
78 277 355 9/6/2017 07:00 AM 9/6/2017 08:45 AM Automobiles



Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and Whitney Rd

File Name : Dell Range and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

		Dell	Dell Range Blvd Eastbound	Blvd			Dell	Dell Hange Bivo Westbound	Biva			≯ž	Whitney Rd Northbound	Rd			S &	Whitney Rd Southbound	nd Bd		
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A JUL	Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of	From:	07.00	AM lo	CB-45	AM-	Peak 1	110													
our fc	Peak Hour for Entire Intersection Begins at 07:00	e Inter	sectio	n Begi	ns at 0	7:00 A	AM														
07:00 AM	-	13	6	0	23	-	49	0	0	22	18	S	0	0	23	-	23	22	0	49	145
07:15 AM	N	4	80	0	24	0	5	0	0	51	15	9	0	0	23	+	35	83	0	23	155
07:30 AM	4	17	თ	0	30	*	62	0	0	8	20	7	0	0	27	0	33	16	0	49	169
07:45 AM	4	50	18	0	42	cvi	46	n	0	5	28	4	ev	0	34	0	19	16	0	35	162
Potal Valume	11	49	44	0	110	4	208	60	0	215	1	22	N	0	105	N	110	80	0	192	631
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Whitney Rd

File Name Dell Range and Whitney PM Site Code PO 262 Start Date 9/6/2017 Page No 1

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0 92 0 49	0	0	0	49		D	0	49	17	18	0	0	35	0	တ	10	0	19	195
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0 359 1 148	359	359	-	148		N	0	151	A	57	4	0	115	2	35	34	0	99	883
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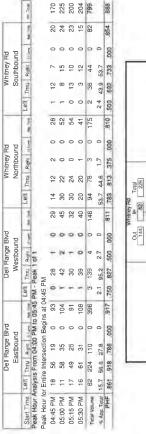


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Morrison, CO 80465

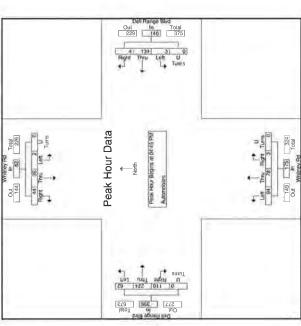
Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Whitney Rd

File Name : Dell Range and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2



170 225 200 200 204 799

854 888



Out In Total

Morrison, CO 80465

Ridgevrow Date Collection

Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and Whitney Rd

File Name: Dell Range and Whitney PM Site Code: PIO 262 Start Date: 9/6/2017 Page No: 3

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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and US-30

File Name : Dell Range and US-30 AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

		Ü	US - 30 Eastbound	o pu			3	US - 30 Westbound	Pu			US-3C No	US-30 Service Rd Northbound	se Hd			Sou	Dell Range Blvd Southbound	Blvd		
Start Time	Lett	THE	Thru Right	il task	1	Lett	2	Thru Rote	THE ST	1	1,64	E	Thru Rots over		1	167	Thru Raft		1	Ass. Inc.	198
07:00 AM	0	19	0	a	19	0	87	51	0	138	0	0	0	0	0	13	0	-	0	14	171
07:15 AM	-	23	0	0	24	0	119	46	0	165	0	0	0	0	0	Ξ	0	en	0	14	203
07:30 AM	0	12	0	D	21	0	101	57	0	158	0	-	0	0	***	18	0	-	0	6	199
07:45 AM	10	28	0	0	34	-	7	4	0	116	0	-	0	0	-	20	0	'n	0	22	176
Total	*	16	0	0	98	-	378	198	0	277	0	ru	0	0	CH	62	0	10	0	72	749
08:00 AM	6	9	2	0	24	0	47	43	0	96	**	-	0	0	CV	16	0	-	0	17	133
08:15 AM	-	36	0	0	37	0	26	58	0	82	0	0	-	c	4	12	+		0	14	137
08:30 AM	-	4	0	0	15	0	32	19	0	5	+	0	0	0	-	56	0	0	0	59	96
08:45 AM	0	15	-	0	16	-	32	43	0	76	0	0	0	0	0	16		0	0	17	109
Total	NO.	84	ers	0	183	-	167	131	0	299	in	+	-	0	1	20	cu.	un.	0	11	475
Grand Total	12	175	(r)	0	190	2	545	329	0	876	ιΩ	ღ	-	0	m	132	N	15	0	149	1224
Apprch %	6.3	92.1	1.6	0		0 2	62.2	37.6	0		55 6	33 3	11.1	0		88.6	13	10.1	0		
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Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and US-30

File Name : Dell Range and US-30 AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

Oul In Total
308 976 1184

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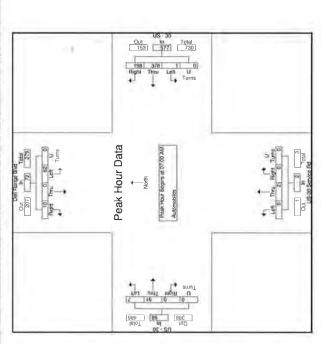
Hand Tru Let U
Turns Left Thru Right Turns Out In San Second Red 9/6/2017 08:45 AM 18107 N 100 1855 199 100



Cheyenne, WY Whitney Ranch AM Peak Dell Range Blvd and US-30

File Name : Dell Range and US-30 AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

		E	US - 30 Eastbound	pu.			W	US - 30 Westbound	pui			ESO Z	30 Service Northbound	US:30 Service Rd Northbound	A		Sou	Dell Range Bivd Southbound	Bivd		
Start Time Left		Thru	Right	2000	Thru Right	Left	Thru	Right	3	40,100	Left	Thru	Thru Right	100	100	Len	Thro	Thru Right	-	1	in two
Hour		S From	07:00	AMI	07:00 AM to 08:45 AM -	AM.	Peak	1 10	9												
Hour t	or Entir	e Inter	sectio	in Begi	Peak Hour for Entire Intersection Begins at 07:00 AM	7:00 A	Z														
D7:00 AM	0	19	0	0	19	D	87	5	0	138	0	0	0	0	0	13	0	-	0	4	171
07:15 AM	-	23	0	0	24	0	119	46	0	165	0	0	0	0	0	Ξ	0	673	0	14	203
D7:30 AM	0	21	0	0	21	0	101	22	0	158	0	-	0	0	-	18	0		0	19	199
07:45 AM	9	28	0	0	34		71	4	0	116	0	-	0	0	**	20	0	s	0	52	176
Fotal Volume	-	16	0	0	98	-	378	198	0	577	0	N	a	0	N	29	0	10	0	7.5	749
A Amp Total	7.1	92.9	0	0		0.2	65.5	34.3	0		0	100	0	0		86.1	0	13.9	0		
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Dell Range Bivd and US-30

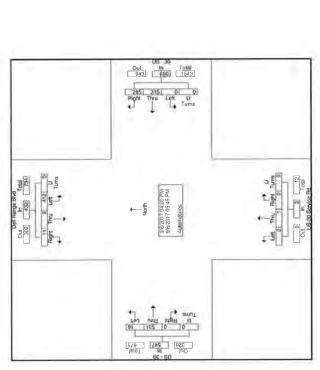
File Name: Dell Range and US-30 PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

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	nua	westpound	3	na	Eastbound
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0 311		0 163 148	241 0 163	0 163	0 241 0 163
0 80		0 35 45	35	0 35	0 35
69 0		0 35 33	35	0 35	0 35
94		0 44 37	44	0 44	0 44
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Cheyenne, WY Whitney Ranch PM Peak Dell Range Blvd and US-30

File Name Dell Range and US-30 PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Deil Range Blvd and U

File Name ; Dell Range and US-30 PM Site Code : IPO 262

		A In Case		52 171	54 218	49 199	63 232	8 820		5 884
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9/6		Left		49	53	46	61	209	95 9	857
o ate		And hear		Q		0	-	2	11	909
Start Date: 9/6/2017 Page No: 3	Se Hd			0	0	0	0	0	0	000
Sta	US-30 Service Hd Northbound	Thru Rett un-		0	0	0	0	0	0	000
	US-30	Thru		0	-	0	0	-	20	250
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		1		28	8	89	20	287		880
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	US - 30 Westbound	Left Thru Right	+ 10	52	45	33	37	140	48 B	778
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		Left .	45 PN	0	0	0	0	a	0	000 R35
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nd L	d and US US - 30 Eastbound	idht	H.00 F	0	0	0	0	0	0	non c
vd a	Eas	hru B	Inters	29	82	79	98	306	97 B	890
E BI		Left T	alysis	CA.	-	479	-	1	2.2	583
PM Peak Dell Range Blvd and US-30		Start Time Left Thru Bight	Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 04:45 PM	04:45 PM	05:00 PM	05:15 PM	05:30 PM	Telsi Velume	_	-

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RIDIC Ridgovew Data Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak US-30 and Van Buren Ave

File Name : US-30 and Van Buren AM Site Code : IPO 262 Start Date : 9/6/2017 Page No :1

300 356 337 312 1305

48 24 40 143

22 40 134

203 240 230 186 859

US-30 Eastbound Thru U Luma App Totali 52 0 66 60 0 80 71 0 65

16 16 17 17 17 17 16

07:30 AM 07:15 AM 07:45 AM Total

Start Time 07:00 AM

Van Buren Ave Southbound Right II Tums App. Total

Groups Printed- Automobiles US - 30

241 220 179 160

33 33 15

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08:45 AM Total

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Out in Total (195) 195 195 195 195 195 195 195 195 195 195	North North Section Torbo Aw 99/2021 Torbo Aw Authorables	
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Morrison, CO 80465

RIDG Ridgeview Data Collection

Cheyenne, WY Whitney Ranch AM Peak US-30 and Van B

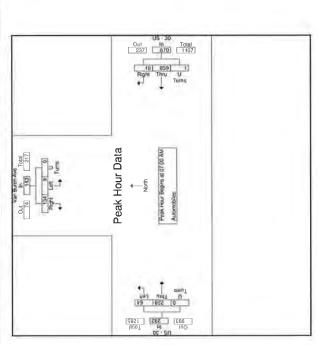
File Name: US-30 and Van Buren AM Site Code: IPO 262 Start Date: 9/6/2017



Cheyenne, WY Whitney Ranch AM Peak US-30 and Van Buren Ave

File Name 2 US-30 and Van Buren AM Site Code 2 IPO 262 Start Date 9/6/2017 Page No 3

	Int Total		300	356	337	312	1305		916
П	otal	X	31	48	24	40	143		745
en Ave ound	Tums App T		0	0	0	0	0	0	000
Van Buren Ave Southbound	Right L		28	4	22	40	134	93.7	781
	Leit		es		CV.	0	Ø)	63	.583
Ī	App Total		208	242	233	187	D/B		898
30 ound	U Tums A		1	0	0	0	4	0.1	.250
US - 30 Westbound	Right		4	63	6	-	10	1.1	.625
	Thru		203	240	230	186	828	98.7	568
	App Total	M - Peak 1 of	119	99	80	982	282		859
30 nud	U Turms Ac	at 07:00	0	0	0	0	0	0	000
US - 30 Eastbound	Thru	o AM to	45	25	9	71	228	78.1	.803
	Left	From 07:0 Intersection	16	14	50	14	49	21,9	.800
	Start Time	Peak Hour Analysis From 07:00 AM to 08:45 AM - Pa Peak Hour for Entire Intersection Beoins at 07:00 AM	07:00 AM	07:15 AM	07:30 AM	07:45 AM	Total Volume	% App Total	PHF





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak US-30 and Van Buren Ave

US-30 and Van Buren PM	: IPO 262	+ 0/6/2017
Sn	: IPC	9/0
File Name	Site Code	

1PO 262	: 9/6/2017	**
Site Code	Start Date	Page No

00 00	Groups Printed-Automobiles	00			Them Division	2000		
US - 30 Eastbound	Westbound			1	Van Buren Ave Southbound			
Thru U Turns App. Total Th	Thru Right U	U Tums A	App. Tatal	Her	Right U	U turns Ap	App. Total	Int. Total
	1 29	0	89	co.	21	0	26	252
141 0 162	82 2	0	25	4	19	O	23	589
125 0 155	94 2	0	96	eo	18	0	21	272
146 0 186	86 3	0	89	4	14	0	90	283
544 1 661	329 8	0	337	16	72	0	88	1086
186 0 222	95 7	0	102	60	17	0	20	344
211 0 248	99 2	0	101	4	25	0	29	378
173 0 203			20	10	19	0	24	303
131 0 153	73 3	0	0/				0	289
701 0 826	.,	0 0	106	4	56	0	30	
1245 1 1487	-	000	385	4 6	87	0 0	103	1314
837 01	- 13	0000	385	32 5 4	26 87 159	000	103	1314
519 0 62	- 13	0 0 0 0 0	385	32 32 16.8	26 159 83.2	0 0 0 0	103	1314



File Name: US-30 and Van Buren PM Site Code: 1PO 262 Start Date: 9/6/2017 Page No: 12

Cheyenne, WY Whitney Ranch PM Peak US-30 and Van Buren Ave

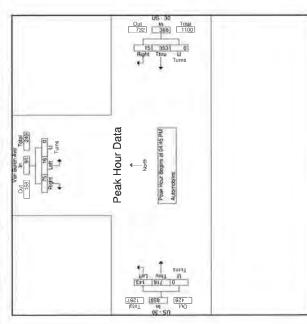
Cheyenne, WY Whitney Ranch PM Peak US-30 and Van Buren Ave

File Name: US-30 and Van Buren PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

Morrison, CO 80465

RIDIC Ridgeview Dozo Collection

	In Tolai		293	344	378	303	131E		872
	App Total		18	20	58	24	-B	ì	784
en Ave	U Turns Ap		0	0	o	0	0	0	000
Van Buren Ave Southbound	Fight L		14	17	25	19	73	82.4	,750
	Left		à	17	4	its	16	17.6	800
	D Total		89	102	101	9/	368		905
30 pund	Right U Tums App Total		0	0	0	0	0	0	000
Westbound	Hight U	1	17	1	2	e	15	4.1	.536
	Thru	-	98	95	66	73	353	95.9	168
T	D Total	Peak 1 of	186	222	248	203	828		398
or pun	U Turns App Total	5:45 PM - Peak 1 of at 04:45 PM	0	0	0	0	0	0	000
US - 30 Eastbound	Thru u	D PM to D	146	186	211	173	716	83.4	848
	Left	nom 04:01	4	36	37	30	143	16.6	.884
	Start Time	east Hour Analysis From 04:00 PM to 05:45 PM - Pe Pask Hour for Entire Intersection Begins at 04:45 PM	04:45 PM	05:00 PM	05:15 PM	05:30 PM	Total Volume	% App. Total	PHF



Out In Total 1929 1929 1929 1921 1929 1921 1929 1921 192	
North Second fulforth 9-67017 fulforth Administra	
THE STATE OF THE S	



Cheyenne, WY Whitney Ranch AM Peak US-30 and Hayes Ave

File Name: US-30 and Hayes AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

	5 8	Eastbound	pu			We	US - 30 Westbound	P			¥ 8	Hayes Ave Northbound	o P			Sol	Hayes Ave Southbound	2 e		
Lett Thro Rett	_	おな	11.1	As 144	Tet.	Thru Rgts		Sheet.	Acres 1	Lott	1	Thru Right at the		-	Len	TIE	Thru Right	of Lower	100 04	100
BE 9		80	0	25	6	168	-	0	172	27	4	0	0	33	-	-	27	0	23	284
6 47		eo	0	99	0	197	0	0	197	13	9		0	56	0	-	27	0	28	307
8 56		4	0	89	0	177	0	0	177	14	-	4	0	19	-	-	32	0	8	298
3 65		ເນ	0	73	-	143	0	0	144	15	va	7	0	22	0	-	20	0	2	260
23 206		50	0	249	4	685	-	0	069	75	16	7	0	86	N	4	106	0	112	1149
62		NO.	0	74	a	94	0	0	94	9		N	0	9	2	+	16	0	10	193
4 46		in	0	22	m	97	N	0	102	9	10	0	0	4	-	0	12	0	5	184
10 32		w	0	47	0	73	0	0	73	7	+	0	0	80	**	+	15	0	17	145
6 35		9		48	0	09	-	0	19	0	1	-	0	=	0	+	14	0	15	135
27 175		2	-	224	o	324	m	0	330	52	10	00	0	39	4	63	22	0	9	657
50 381		41	-	473	7	1009	4	0	1020	100	22	15	0	137	9	7	163	0	176	1806
10 6 80 5		8.7	02		0.7	6 86	0.4	0		23	16.1	10.9	o		3 4	4	926	0		
28 21 1		23	0.1	262	0.4	55.9	0 2	0	56 5	5,51	1,2	0.8	0	2 6	0.3	0.4	თ	0	8.7	



Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak US-30 and Hayes Ave

File Name: US-30 and Hayes AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

Out 402 1000 1422 4 1009 7 0 Right Thru Lett U Left Thu Rott Turn 55 137 192 Out Total 9/6/2017 08:45 AM Automobiles | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100



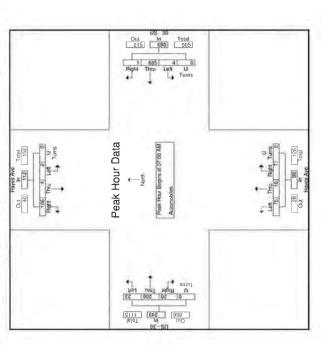
Cheyenne, WY Whitney Ranch AM Peak US-30 and Hayes Ave

File Name: US-30 and Hayes AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

File Name : US-30 and Hayes PM

	100	2	22	K	26	96	56	33	28	22	#	21.1		
	Agi line	10	15	5	20	28	16	23	17	9	74	132		C)
e 2	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Hayes Ave Southbound	Piper	S	10	10	15	40	12	14	0	4	49	68	67.4	4.2
SoH	Thru Right Life	ro	4	9	ιD	17	n	S	7	N	17	34	25.8	
	Left	0	-	0	0	+	-	4	-	7	80	თ	9 9	0.4
	-	7	60	13	16	44	-	21	17	18	67	Ξ		C)
a pu	_	0	0	0	0	0	0	0	0	0	0	0	0	0
Hayes Ave Northbound	Right Life	2	0	÷	ro	9	-	2	-	7	Ξ	17	15.3	0.8
N A	Thru	è	4	00	0	16	-	4	10	-	10	32	28 8	15
	Left	מו	4	4	Ţ	22	თ	15	9	10	40	62	55.9	
	1	29	90	92	7	295	82	99	7	77	296	591		27.9
Pu	in home.	0	0	0	0	0	0	0	0	0	0	o	0	0
US - 30 Westbound	Right	ev	ev	ev	-	1	N	+	N	ó	5	12	Ŋ	0.6
N W	Thru	57	78	82	69	588	79	65	92	77	286	572	96.8	27
	Left	0	0	•	•	(V	-	0	4	0	10	7	12	0.3
	100	142	143	125	159	569	184	221	175	133	213	1282		80 6
_ P	100	0	0	0	0	0	0	0	0	0	0	0	0	0
US - 30 Eastbound	Rom	10	9	12	9	47	17	26	20	Ξ	74	121	9.4	5.7
_ @	Thru	111	113	96	122	442	142	163	139	109	823	995	77.6	47
	Lett	21	24	17	18	80	52	32	16	13	88	166	129	7 8
	Start Time	04:00 PM	04:15 PM	04:30 PM	04:45 PM	Total	05:00 PM	05:15 PM	05:30 PM	05:45 PM	Total	Grand Total		Total %

284 307 298 260 824 936 Thru Right when the rest 700 500 1.00 826 000 Hayes Ave Southbound 198 Lett Left Thu Age .-- -| Start Time | Left | Through Regist | Thr Northbound Hayes Ave US - 30 Eastbound US - 30



Ridgeview Date Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak US-30 and Hayes

: IPO 262		
Site Code	Start Date	

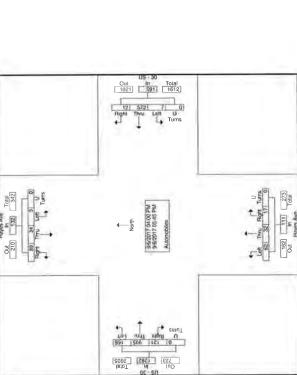
			a Ties	218	246	236	266	996	293	331	280	246	1150	2116	
			40 144 00	10	15	6	20	28	16	23	17	90	74 1	132 2	_
7		A1 TO	100	0	0	0	0	0	0	0	0	0	0	0	0
9/6/2017		Hayes Ave Southbound	Piote: Li	S	0	10	15	40	12	14	6	4	49	68	67.4
9/6		Sout	Thru B	ιn	4	6	ιD	17	e	S	7	N	17	34	25.8
Ø)	,	14	1.60	0	-	0	0	+	-	4	-	N	80	o	68 2
Start Date	2		-	7	60	13	16	44	=	21	17	18	29	111	-
Sta	ช์ -	n 70		0	0	0	0	0	0	0	0	0	0	0	0
		Hayes Ave Northbound	Right with	7	0	÷	ro	9	-	2	-	7	=	17	53
	plies	Hay	Thru	è	4	00	0	16	-	4	10	-	9	32	28.8
	Automo		Left	מו	4	4	Ξ	22	თ	15	9	10	40	62	55.9
	Groups Printed- Automobiles		1	29	90	92	7	535	82	99	71	77	296	591	
		US - 30 Westbound	a liene	0	0	0	0	0	0	0	0	0	0	0	0
	Gro		Right	ev	ev	ev	-	2	N	+	01	ó	w.	12	Ø
		We	Thru	57	78	82	69	585	79	9	92	11	286	572	96.8
			Left	0	0	•	-	CV.	-	0	4	0	in	7	7
			1	142	143	125	159	969	184	221	175	133	213	1282	
		p	3	0	0	0	0	0	0	0	0	0	0	0	0
d Hayes Ave	Ž	US - 30 Eastbound	200	10	9	12	9	47	17	56	20	Ξ	72	121	9.4
9/0	g S	Ea	Thru	111	113	96	122	442	142	163	139	109	853	995	77.6
I	5		107	21	24	17	9	8	52	32	16	13	198	166	5 8



Cheyenne, WY Whitney Ranch PM Peak US-30 and Hayes Ave

File Name : US-30 and Hayes PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

Out Total Total 210 132 342





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak US-30 and Hayes Ave

File Name: US-30 and Hayes PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

Start Time Left Time Restroction Personal Plant Time Restroction Restroc			IAI	00-00	7	ī		Ha	Hayes Ave	9 7			Ēő	Hayes Ave	e F	ī	
Division From 04:00 PM to C Entire Intersection Begins 18 122 19 0	1		Wes	westbound			1		Northbound	2			8	OGLIID	2		
Blysia From 04:00 PM to 0 Entire Intersection Begins 18 122 19 0	1	Lett	Thru B		-	1	reft	Thru Right		-	1	Left	Thru	Thru Rah	-	100	Total
Entire Intersection Begins 18 122 19 0	05:45 PI	M - Pe	sak 1 o	1.1													
122 19	is at 04:4	45 PM															
440 47	159		69	-	0	71	Ξ	N	0	0	16	0	in	15	0	50	266
_	184	-	79	S	0	82	0	-	-	0	Ξ	-	es	12	0	16	293
32 163 26 0	221	0	65		0	99	15	4	14	0	27	4	in	14	0	23	331
16 139 20 0	175	w	9	cv	a	7	9	10	÷	0	17	٠	7	တ	0	17	280
91 566 82 0	739	9	278	9	0	290	14	17	-	0	92	œ	20	50	0	10	1170
123 766 111 0		219	95.9	2 1	0	1	63 1	26.2	10.8	0	I	7.9	26.3	658	0		9
	.636	375		. 057.	000	864	.683	425	583	000	.774	375	714	833	000	826	884
				_ []= *	18 18 18 18 18 18 18 18 18 18 18 18 18 1	82	16.	Total									
16 196 158 10 16 196 158 10 170 1	*1 T* su			<u>a</u>	Peak Hour Data	Hou North	I D	ata				Stight Thru Lett 1	G 27n ol	Out In Tot			

16th Thru Right Turts
651 TR1 731 01

Out Hayes Ave



Cheyenne, WY Whitney Ranch AM Peak US-30 and Whitney Rd

Start Time Leff | Thru 07:00 AM 8 20

Total 32

07:30 AM 07:45 AM

07:15 AM

08:00 AM 08:15 AM

File Name: US-30 and Whitney AM Site Code: 1PO 262 Start Date: 9/6/2017 Page No: 1

222 258 258 235 267 982

20

164 178 130 111

25 53 583

Grand Total 62 230 56 Apprich % 17.8 66.1 16.1 Total % 4 14.7 36

10

08:45 AM

08:30 AM

	Out Total 251 770 1027 59 713 41 9 Right Three Left Turns	
Out With 170g 140g 140g 140g 140g 140g 140g 140g 14	North Seczon 0700 Mill Seczon 0700 Mill Automobiles	Color Transfer Transf

Ridgeview Dates Collection

Morrison, CO 80465

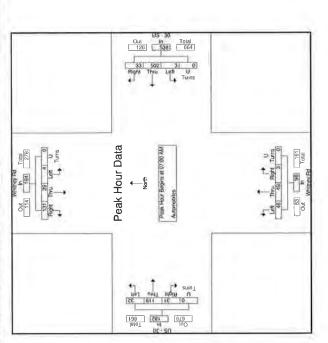
Cheyenne, WY Whitney Ranch AM Peak US-30 and Whitney Rd

File Name: US-30 and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2



Cheyenne, WY Whitney Ranch AM Peak US-30 and Whitney Rd

File Name: US-30 and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak US-30 and Whitney Rd

File Name US-30 and Whitney PM Site Code IPO 262 Start Date 9/6/2017 Page No 1

		تن آ	US - 30 Eastbound	P			W	US - 30 Westbound	- 30 Whi			N ON	Whitney Rd Northbound	문문			Sou	Whitney Rd Southbound	무면		
Start Time	Lett	Thro	Right	1	2	Lett	THE	Reght	1	1	Left	Tree Rose	Hotel		20.00	Lett	Thru	Roh	I	445 349	100
04:00 PM	15	7		0	96	2	39	S	0	46	10	1	0	0	15	e	12	Ξ	0	56	183
04:15 PM	24	89	12	0	104	0	20	0	0	23	9	9	-	0	13	ю	Ξ	80	0	N	192
04:30 PM	21	29	00	0	96	-	90	9	0	67	in	10	0	0	10	S	16	10	0	3	204
04:45 PM	83	72	12	0	107	0	40	10	0	45	1	11	0	0	82	4	F	19	0	34	204
Total	83	278	52	0	403	10	189	19	0	211	56	53	-	0	26	15	20	48	0	113	783
05:00 PM	2	106	4	0	141	0	46	Ξ	0	57	ro	15	(V	0	22	6	24	18	0	45	265
05:15 PM	32	103	18	0	153	17)	42	6	0	54	00	13	0	0	24	e	16	ťΩ	0	34	265
05:30 PM	18	105	18	0	141	+	44	6	0	48	9	18	0	0	28	7	17	9	0	30	247
05:45 PM	15	78	17	0	110	0	46	7	0	53	00	12		0	2	4	14	4	0	32	216
Total	98	392	67	0	25	4	178	용	0	212	93	28	0	0	92	17	7	2	0	141	993
Grand Total	169	670	109	0	948	7	367	49	0	423	57	87	7	0	151	32	121	101	0	254	1776
Apprch %	178	707	± no	0		17	868	116	0		37.7	57.6	4 6	0		126	476	39 8	0		
Total %	9 8	37.7	6.1	0	53.4	0 4	20.7	28	0	23.8	3.5	4.9	0 4	0	8 2	18	68	2 2	0	14.3	



RIDGO Ridgovow Bats Collect on

Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak US-30 and Whitney Rd

Out In Total 305 254 559

File Name: US-30 and Whitney PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

File Name : US-30 and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

	a tas in head			45 265	34 265	30 247	32 216	141 993		783 .937
P	1			0	0	0	0	0	0	000
Southbound	160			18	15	9	14	23	37.6	736
S	Thut			24	16	17	14	71	50.4	740
	Lett			(*)	92	*	*	17	121	607
	-			22	24	28	21	95		848
pur	-			0	0	0	0	0	0	000
Northbound	Rutht			SV.	(7)	0		9	63	500
ž	Thru			15	13	18	12	28	61.1	908
	Left			rb	89	10	8	31	326	.775
	Lan. 16 116			57	54	48	53	212		930
pur	1			0	a	0	0	0	0	000
Westbound	Right	10		Ξ	6	6	7	30	4.2	582
3	Thru	Peak 1	PM	46	42	4	46	178	84	1967
	Let	Md		0	10	-	0	4	19	333
	Pre- 1844	05:45	ns at 0	141	153	141	110	545		168
рш	4	malysis From 04:00 PM to 05:45 PM	n Begi	0	0	0	0	0	0	000
Eastbound	Right	04:00	rsectio	4	8	19	17	19	123	931
üΪ	Thru	S Fron	re Inte	106	103	105	78	392	71.9	.925
	Len	SAILT	or Enti	21	32	50	5	86	15.B	672
	Start Time	Peak Hour A	Peak Hour for Enlire Intersection Begins at 05:00	05:00 PM	05:15 PM	05:30 PM	05:45 PM	Total Volume	To have Total	JHd

Oul un Total
709 423 1132
49 357 7 0
Right Thru Let II
Turns

3/6/2017 05:45 PM 9/6/2017 05:45 PM

101 041 Men 101 163

05 - 2U | 100 | 100 | 140 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 150 | 15

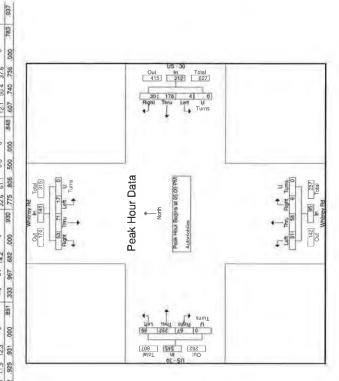
Automobiles

←—å

Whitney Rd

Whitney Rd

US - 30



237 15t 388

Cheyenne, WY Whitney Ranch PM Peak US-30 and Whitney Rd

Morrison, CO 80465

RIDIC Ridgeview Data Collection



Cheyenne, WY Whitney Ranch AM Peak Storey Blvd/Summit Dr and Ridge Rd

File Name : Storey Summit and Ridge AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

		iğ ill	Storey Blvd Eastbound	D Pu			O S	Westbound	ig or			ž	Northbound	pur			S	Ridge Hd Southbound	ind		
Start Time	Left	Thro	mont	1	Age line	Lett	The	Roll	1	11.45	Len	Thru	Hope	9110	Am inc	Left	Thru	Rott	1	1	-
MA 00:70	-	24	60	0	33	-	43	0	0	44	56	12	4	0	42	0	23	7	0	30	149
07:15 AM	0	24	10	0	34	CV	41	-	0	44	18	14	0	0	32	S	28	00	0	38	148
07:30 AM	N	34	18	0	54	4	29	-	0	94	35	4	4	0	53	-	23	in	0	53	200
07:45 AM	0	32	56	0	9	0	99	+	0	67	59	2	ෆ	0	83	0	23	os	0	35	243
Total	63	117	8	0	182	2	508	60	0	219	138	19	Ξ	o	210	20	97	53	0	129	740
08:00 AM	-	52	23	0	74	S	52	-	0	55	67	16	-	0	84	0	23	14	0	37	250
08:15 AM	N	44	9	0	77	N	45	0	0	47	41	16	-	0	28	0	16	13	0	59	211
08:30 AM	4	36	52	0	65	2	59	0	0	9	22	15	2	0	39	0	20	ιΩ	0	52	160
08:45 AM	-	23	4	D	38	0	26	0	-	27	27	22	0	0	49	0	17	4	0	2	135
Total	00	155	6	0	254	10	23	-	-	160	157	69	4	0	230	0	92	36	0	112	756
Grand Total	Ξ	272	153	0	436	13	361	4	-	379	295	130	15	0	440	n	173	65	0	241	1496
Apprch %	2.5	62 4	35 1	0		3.4	95.3	-	03		29	29.5	3.4	0		12	718	27	0		
Total %	0.7	18.2		0	29 1	0.9		0.3	0.1	25.3	19.7	8.7	-	0	29 4	0.2	116	4.3	0	16.1	



Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Storey Blvd/Summit Dr and Ridge Rd

File Name Storey Summit and Ridge AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

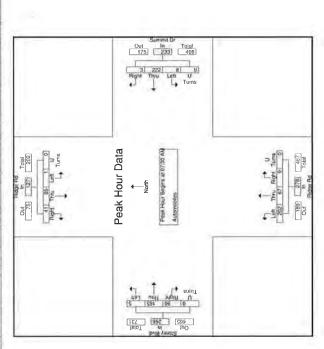
Surrote Ur Out In Total 290 379 669 4 361 13 1 Rote Thu Left U 339 440 779 Out Patoc Rd Out 145 241 386 9/6/2017 08:45 AM 9/6/2017 08:45 AM Automobiles | Sulp |



Cheyenne, WY Whitney Ranch AM Peak Storey Blvd/Summit Dr and Ridge Rd

File Name: Storey Summit and Ridge AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

		65 ப	Storey Bivd Eastbound	DA DI			Se	Summit Dr Westbound	jo P			E S	Ridge Rd Northbound	10 pur			S	Ridge Ra Southbound	pur		
Start, Time	Leit	E	100	1	1	Len	Thr	Thru Rett Inc.	1	1	Left	Thru Rati	Ruth	1	1	Left	Thru	Acid	1	1	To.
ak Hour	Analys	S From	nom 07:00 AN	2	08.45	AM. P	pak 1	1 10													
eak Hour for Entire Intersection Begins at 07:30	or Entil	re Inter	rsection	n Begin	is at 07	:30 AM	V														
07:30 AM	N	34	19	0	54	4	59	-	0	4	35	14	4	0	53	-	23	ĸ	0	83	200
07:45 AM	0	35	56	q	19	0	99	-	0	29	59	21	Ø	0	83	0	23	6	0	32	243
08:00 AM	-	52	2	0	74	8	52		0	55	67	16	-	a	84	0	23	14	0	37	250
08:15 AM	2	44	9	0	77	N	45	0	0	47	4	16	-	0	58	0	16	ن	0	53	211
ela Volume	S	185	36	0	266	æ	222	m	0	233	202	19	တ	0	278		85	41	0	127	904
A Age Tetal	6	62	36.1	0	1	4	95.3	53	0		72.7	24.1	32	0	1	0.8	699	32.3	0		
HHE	309	20%	144	AAA	BEA	200	444	AUA	200	REG	300	200	200	WWW	R27	nen	200	333	2000	858	904





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Storey Blvd/Summit Dr and Ridge Rd

File Name : Storey Summit and Ridge PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

		K W	Storey Blvd Eastbound	D D		1	0 ₹	Summit Dr Westbound	- P		1	E 8	Ridge Rd Northbound	PL			R SS	Ridge Rd Southbound	g g		
Start Time	Lett	Then	Stort	1	1	Lett	Thu	Right	Star 1	946 344	Left	Thru	Right	-	A11. MA	Lett	That	Pugnt -	1	400 000	14.128
04:00 PM	3	46	34	0	83	-	27	2	0	30	58	33	0	0	54	2	14	es	a	19	186
04:15 PM	-	58	35	0	94	Ŋ	40	2	0	47	24	36	69	0	53	N	7	4	0	6	207
04:30 PM	145	25	45	0	104	2	46	2	0	20	33	28	C/I	0	63	-	14	in	0	20	237
04:45 PM	10	28	53	0	90	0	49	6	0	25	27	35	4	0	63	+	21	m	0	25	232
Total	Ξ	217	143	o	371	60	162	Ξ	o	181	113	=======================================	cri	0	233	60	26	t.	0	11	862
05:00 PM	-	69	32	0	108	60	45	Ŋ	0	20	33	53	m	0	99	CV)	37	4	0	43	266
05:15 PM	ш	69	49	0	124	0	38	6	0	47	43	22	c)	0	100	Ø	27	9	0	36	307
05:30 PM	9	28	33	0	6	-	30	10	0	41	42	43	-	0	98	ιO	32	Œ	0	45	269
05:45 PM	un	58	27	0	61	0	41	9	0	47	30	28	4	0	62	ო	59	ω	0	37	207
Total	24	225	141	o	390	4	151	30	0	185	148	155	9	o	313	13	125	23	0	161	1049
Grand Total	35	442	284	0	761	12	313	14	0	366	261	266	19	0	546	13	181	88	0	238	1911
Apprch %	4 6	58.1	37.3	0		33	85.5	112	0		47.8	48.7	3.5	0		89	76.1	16	0		
Total %	1.8	23.1	149	0	39.8	9.0	18.4	2	0	19.2	101	0	-	0	28.6	-	6	c	c	12.5	



Cheyenne, WY Whitney Ranch PM Peak Storey Blvd/Summit Dr and Ridge Rd

File Name: Storey Summit and Ridge PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

Out In Total 342 238 580

Storey Blvd/Summit Dr and Ridge Rd

Cheyenne, WY Whitney Ranch PM Peak

File Name : Storey Summit and Ridge PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

Morrison, CO 80465

Ridgevrow Data Collection



Out 10 Total 480 340 846 Thight Thru Left U

9/6/2017 05:45 PM

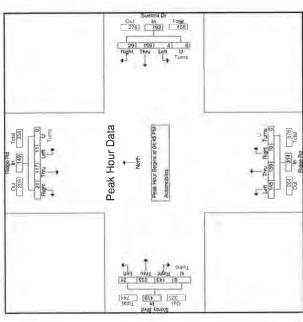
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232 266 307 269 269



477 545 1023 Out to Total

See Tare Mar Torse



RIDIC Ridgeview Deca Collocation

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Summit Dr and Colleg

File Name : Summit and College AM Site Code : IPO 262

Summit Dr and College Dr	<u>a</u>		•					Great	P SdD	Groups Printed-Automobiles	Auto	mobile				4					
		N III	Summit Dr Eastbound	à P			Se	Summit Dr Westbound	P			OZ	College Dr Northbound	i Pur			OS	College Dr Southbound	5 P		
Start Time	Let	Thro	Rote	and in	Thro. Rote	Left	Left Thu Bight	Hight	4	A 1100	Left		Thru Right out	200	1	Lon	Three	Thru Rote o	-	Ave 144	0. 1
07:00 AM	N	0	23	0	52	0	0	0	0	0	46		-	0	83	0	46	-	0	47	155
07:15 AM	N	-	27	a	30	-	0	D	0	-	40	35	0	0	75	-	48	-	0	20	156
07:30 AM	-	0	36	0	37	2	0	0	0	2	94	32	0	0	96	0	54	-	0	22	190
07:45 AM	0	-	37	0	38	60	-	0	0	4	99	4	0	0	104	0	47	4	0	51	197
Total	ın.	N	123	0	130	40	-	0	0	Pro-	214	143	-	0	358	-	195	7	0	203	698
08:00 AM	N	0	99	0	5	IV.	0	0	0	CA.	48	35	0	0	80	0	43	0	0	43	176
08:15 AM	rv.	-	42	0	45	0	0	0	0	0	14	41	2	0	84	0	35	4	0	39	168
08:30 AM	÷	0	35	0	36	0	0	0	0	0	30	24	0	0	54	0	42	-	0	43	133
08:45 AM	•	a	24	0	52		0	0	0		27	24	-	0	52	0	93	-	0	35	110
Total	10	-	150	0	157	179	0	0	0	w	146	121	m	0	270	0	151	iD	0	157	587
Grand Total	Ξ	9	273	0	287	6	-	0	0	10	360	264	4	0	628	_	346	5	0	360	1285
Approh %	3.8	-	95 1	0		90	10	0	0		57.3	42	9 0	0		03	96.1	3.6	0		
Total %	0			•					,	0											



Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Summit Dr and College Dr

File Name : Summit and College AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

Out In Total

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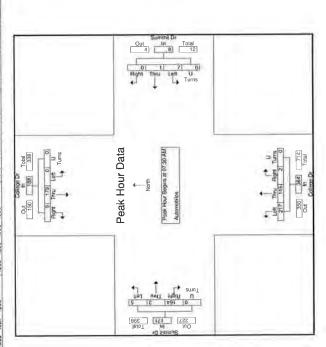
Rephi Thru Left U Turns Rapit 1700 Lms Out In Total Out College Total 9/6/2017 08:45 AM A fomobios 199 THE 100



Cheyenne, WY Whitney Ranch AM Peak Summit Dr and College Dr

File Name: Summit and College AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

	Sur Eas	Summit Dr Eastbound				ĭ × ×	Summit Dr Westbound	in Di				Coilege Dr Northbound	ig Pi			0 %	College Dr Southbound	- P		
	ani m	Thru Aght attention	1	No. 19th	Left Thru Right	Thru		1	Ave tool	Lett		Right	Thru Right uses	1	Left	Thou	Thru Reft	Nine.	Apr. 100	Total
13.	four Analysis From 07:01	00.70	AM to	08:45	A to 08:45 AM - Peak	Petit 1	1 10													
e	nters	Peak Hour for Entire Intersection Begins at 07:30 AM	Begin	s at 0	7:30 A	Σ														
	0	36	0	37	2	0	0	0	12	64	32	0	0	96	0	54	-	0	53	190
	-	37	0	38	ന	+	0	0	*7	64	40	0	0	104	0	47	**	0	5	197
	0	49	0	51	2	0	0	0	evi	48	32	0	0	80	0	43	0	0	43	176
	-	42	0	45	0	0	0	0	0	41	41	7	0	84	0	35	**	0	33	168
	2	164	D	E	1	-	0	0	00	217	145	2	D	364	0	179	Ø	0	188	731
2.9 1	2	95.9	0	1	87.5	12.5	0	0		59.6	39 8	0.5	0		0	95.2	4 8	0		-
2 342	Enn 027	1	one	838	838 483	250	000	000	500	Red	RS4	R84 250	200	875	000	828	563	000	855	928





Cheyenne, WY Whitney Ranch PM Peak Summit Dr and College Dr

File Name : Summit and College PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

		ωш	Summit Dr Eastbound	는 P			w ≥	Summit Dr Westbound	i d			υž	College Dr Northbound	pun			ပို့ ဖြ	College Dr Southbound	i P		
Start Time	Left	Ten	Richt	1	1	Lott	Treu	Right	1	1	Lett		Thru Rote	-	3	Lett	Thru Right		Miles	And Sent	St. Task
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04:15 PM	~	0	29	0	61	ev	0	0	0	2	4	45	-	0	87	0	44	6	0	47	197
04:30 PM	0	0	2	0	22	-	-	0	0	2	47	45	0	0	92	0	43	60	0	46	197
04:45 PM	N	-	56	0	59	0	N	0	0	W	52	47	6/1	0	101	0	35	2	0	37	199
Total	10	-	213	0	224	6	m	0	0	9	172	182	*	0	358	0	164	Ξ	0	175	763
05:00 PM	4	ev.	20	0	16	0	-	0	0	-	39	65	7	0	11		53	4	0	28	246
05:15 PM	m	24	68	0	73	-	0	+	0	2	46	74	6	0	123	*	47	+	0	49	247
05:30 PM	N	*	9	0	64	m	0	0	0	(1)	45	70	60	0	118	0	40	0	0	40	225
05:45 PM	9	0	30	0	36	0	-	-	0	20	46	63	N	0	111	0	33	0	0	33	182
Total	12	9	828	0	248	*	tv.	CV.	0	60	176	272	50	0	463	14	173	in	0	180	900
Count Total	52	ω	442	a	473	7	ιΩ	2	0	4	348	454	19	-0	821	2	337	16	0	355	1663
Appreh %	5.3	13	93.4	0		20	35.7	143	0		42 4	55.3	23	0		9 0	94.9	4 5	0		
Total M.	7	DA	0	0	28.4	0.4	0 3	0.1	0	0.8	20.00	020	Ξ	0	49.4	0 1	20.3	_	0	213	



RIDIC Ridgovow Data Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Summit Dr and College Dr

Out Total 481 356 836

File Name : Summit and College PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

File Name : Summit and College PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

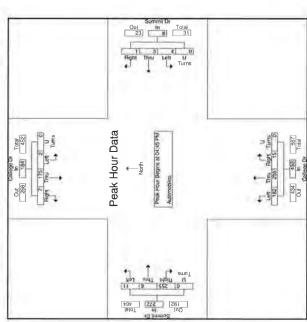
Morrison, CO 80465

Ridgeview Dates Collection



199 246 247 225 917

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796 821 1607 Out in Total

Cheyenne, WY Whitney Ranch PM Peak Summit Dr and College Dr Superiil Double Total
27 14 41
2 5 7 0

Right Type Left U



Cheyenne, WY Whilney Ranch AM Peak Thomas Rd and College Dr

File Name: Thomas and College AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

	1	Thomas Eastbou	T 51-			94	We	Thomas Rd Westbound			991	OZ	College Dr Northbound	i p		10	D SS C	Southbound	- Pu		100
		1	-41		10					7		8		0	10	C	8	-	0	67	174
	,	4.	- 1	3	9 (1				,	2			76	173
	0	0	o	0	0	n:	-	N	0	n	10	/4	-	0	3	-	5	v.	2	0	
	0	D	9	0	10	m		2	0	10	CV	96	ල	0	101	0	87	2	0	92	209
	0	-	7	0	0	N	n	0	0	in	10	102	N	0	114	0	82	÷	0	98	213
	0	m	83	0	89	9	0	60	0	23	28	352	m	0	389	4	311	ID.	o	321	769
	-	-	en	0	Ŋ	4	-	-	0	9	no.	92	-	0	85	0	95	-	0	96	192
	0	÷	2	0	9	12	-	N	0	15	9	8	14	0	88	*	76	-	0	78	188
	-	-	Ξ	0	5	-	0		0	S	7	52	*	a	64	2	73	0	0	75	154
	-	0	ĸ	0	9	ო	-	-	0	5	10	20	63	0	58	0	57	0	D	57	126
100	m	62	24	0	30	R	177	0	0	28	30	259	+	0	296	6	301	CM.	0	306	099
	(T)	9	27	0	99	30	60	13	0	51	58	611	16	0	685	7	612	60	0	627	1429
4	4.5	9.1	86.4	0		58.8	15.7	25.5	0		8 2	89 2	23	0		=	97.6	ر	0		
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Thomas Rd and College Dr

File Name: Thomas and College AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

Out | Total | 29 | 51 | 80 | 15 | 81 | 30 | 0 | Rept | Turns Loft Thru Right Turns Hort Thru Lims 699 685 1384 Out In Total Out In Total 9/6/2017 07:00 AM 9/6/2017 08:45 AM Automobilee Most U Dht DD hT



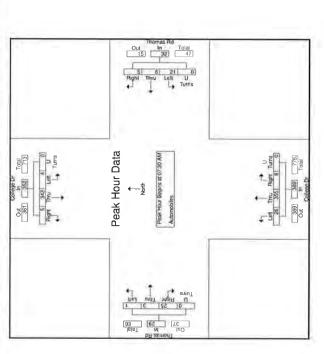
Ridgeview Deca

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Thomas Rd and College Dr

File Name: Thomas and College AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

	A 754			209	213	192	188	802		1961
	1			92	98	96	78	352		215
ind bur	1			0	0	0	0	0	0	000
College Dr Southbound	Roth			**	*	-	÷	S	14	625
රි ගි	That			87	85	95	9/	343	97.4	903
	Left			ė*	C	0	-	44	17	333
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i pu	1			0	0	0	0	0	0	900
College Dr Northbound	Right			m	tu	+	cu	æ	2	567
ÖΖ	Thru			96	102	76	10	355	91.3	670
	Left			N	10	8	9	26	6.7	650
	1			9	S	9	15	32		533
2 B	1	P		0	0	0	0	0	0	000
Thomas Rd Westbound	Hotel Hotel	110		N	D	-	2	S	15.6	625
E 8	Thr	Peak 1	AM		173	+	-	9	18.8	500
	Left	AM .		e	N	4	12	2	65.6	438
	1	08:45	o le si	10	60	ഗ	9	58		725
P P	1	AM to	n Begir	0	0	0	0	0	0	000
Thomas Hd Eastbound	Right	07.00	Section	10	7	ო	co	22	86.2	625
E m	Thru	S Fron	re Intel	0	-	-	-	m	10.3	750
	Lett	nalys	or Entire	0	0	-	0	-	3.4	250
	Start Time	Peak Hour Analysis From 07:0	Peak Hour for Entire Intersection Begins at 07:30	07:30 AM	07:45 AM	08:00 AM	08:15 AM	Tetal Veterne	St Ago, Total	PHF





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Thomas Rd and College Dr

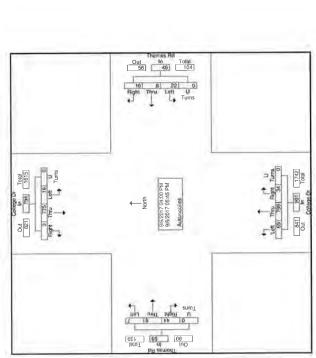
File Name: Thomas and College PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

		Thomas Dd	70			ľ	Thomas Ba	70	1		N.	Contract of	ė	Ī		0		-	I	
LΝ		Eastbound	nud			3	Westbound	nd a			5 Z	Northbound	5 2	I		SS	Southbound	2		
Lot	I Thru	Left Thru Rgrt	-	Anni line	Left	125	Thu mak	1	*	Lett	Theo	200	770	The Lett	Let	18	Thus High	-	201.00	and hose
N		60	0	11	0		en	0	in	*	79	100	D	91	4	82	0	0	98	191
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Cheyenne, WY Whitney Ranch PM Peak Thomas Rd and College Dr

File Name: Thomas and College PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2



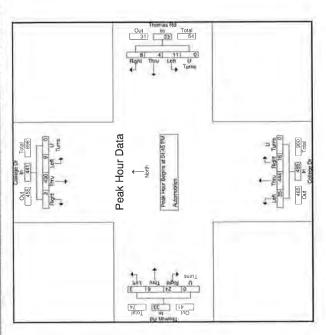


Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Thomas Rd and College Dr

File Name Thomas and College PM Site Code IPO 262 Start Date 9/6/2017 Page No :3

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Ridgeview Date Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Beckle Rd and Whitney Rd

Start Time Lett 07:00 AM 0

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File Name : Beckle and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Beckle Rd and Whitney Rd

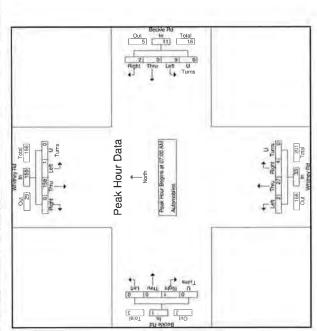
File Name : Beckle and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2



Cheyenne, WY Whitney Ranch AM Peak Beckle Rd and Whitney Rd

File Name : Beckle and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Beckle Rd and Whitney Rd

File Name: Beckle and Whitney PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Beckle Rd and Whitney Rd

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File Name: Beckle and Whitney PM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

File Name : Beckle and Whitney PM

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Cheyenne, WY Whitney Ranch PM Peak Beckle Rd and Whitney Rd

Morrison, CO 80465

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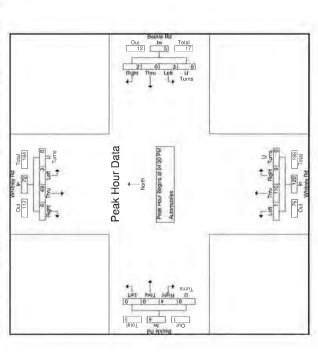
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Cheyenne, WY Whitney Ranch AM Peak Buttercup Dr and Whitney Rd

File Name: Buttercup and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

		West	Westbound				North	Northbound				Southbound	Southbound			
Start Time	Lot	Right	Right U Turns App. Total	ADD.	Total	Thru	Right	Right Li Turns App. Total	App	otal	Lett	Tho	U. Tums	Thru U Turns App Total	al Int. Total	17
07:00 AM	CH	0	0		2	2	0	0		2	0	\$	0	54		91
07:15 AM	in	0	0		10	7	0	0		7	0	43	0	43	8	22
07:30 AM	c	-	0		n	12	0	0		2	0	\$	-	4	4	59
07:45 AM	က	0	0		60	6	-	0		10	-	53	0	30	0	43
Total	12	+	0		55	33	-	0		34	+	169	**	121		218
08:00 AM	N	0	0		2	4	1	0		ın	0	24	0	24	4	31
08:15 AM		o	0		-	12	0	0		57	0	18	0	18	80	31
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Buttercup Dr and Whitney Rd

File Name : Buttercup and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

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RIDIC Ridgeview Data Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Chickadee Dr and Whitney Rd

File Name: Chickadee and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

	Whitney Rd Southbound	a Total Lett Thru U Turns I App Total Int. Total	6 0 55 0 55 61	7 0 49 0 49 58	11 0 43 0 43 55	12 0 34 0 34 48	36 0 181 0 181 222	3 0 26 0 26 32	12 0 17 0 17 30	19 0 16 0 16 36	8 0 16 0 16 24	42 0 75 0 75 122	78 0 256 0 256 344	0 100 0	
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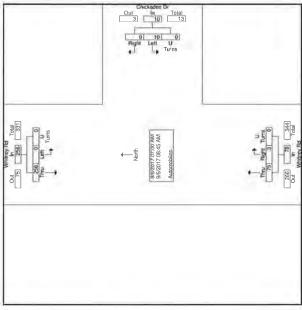


Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Chickadee Dr and Whitney Rd

File Name: Chickadee and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 2

Out Mn Total 75 75 2551 331

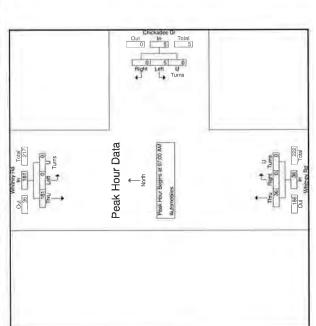




Cheyenne, WY Whitney Ranch AM Peak Chickadee Dr and Whitney Rd

File Name: Chickadee and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 3

Whitney Ra Southbound	Thru U Turns App Total Int. Total
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Chickadee Dr and

File Name : Chickadee and Whitney PM

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hitney Ranch I Peak	iickadee Dr and Whitney Rd			Start Time	04:00 PM	04:15 PM	04:30 PM	04:45 PM	Total	05:00 PM	05:15 PM	05:30 PM	05:45 PM	Total	Grand Total	Apprch %	Total %



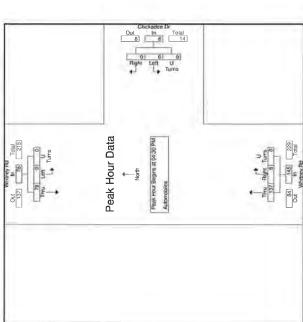
Cheyenne, WY Whitney Ranch PM Peak Chickadee Dr and Whitney Rd

File Name : Chickadee and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

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Thru | Right | U.Tums | App. Total 33 34 45 45 31 32 32 44 137 94.5



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Cheyenne, WY Whitney Ranch PM Peak Chickadee Dr and Whitney Rd

File Name : Chickadee and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

Morrison, CO 80465

RIDG Ridgeview Date Callection

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3/6/2017 04:00 PM 9/6/2017 05:45 PM

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RIDIC Ridgeview Date Collection

Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Foxglove Dr and Whitney Rd

File Name: Foxglove and Whitney AM Site Code: IPO 262 Start Date: 9/6/2017 Page No: 1

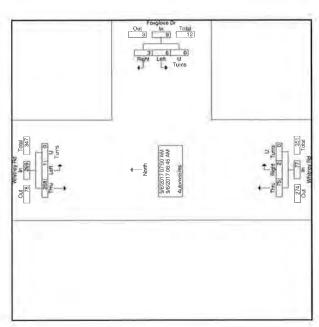
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Left	Right	Right U Turns App Total	App	Total	Teru	Right	U Tums	Right U Tums App Total	Lett	Thru	Thru U Turns App. Total	total o	Int. Total
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Morrison, CO 80465

Cheyenne, WY Whitney Ranch AM Peak Foxglove Dr and Whitney Rd

File Name Foxglove and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

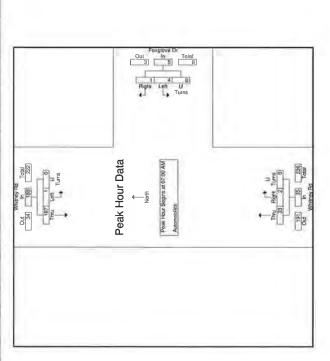




Cheyenne, WY Whitney Ranch AM Peak Foxglove Dr and Whitney Rd

File Name : Foxglove and Whitney AM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

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South	Thru		24	49	48	8	187	99.5	820
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П	App Total		9	80	11	10	33	ì	.795
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White	Fight L			0	0	+	ce	2'5	200
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ve Dr	J Turns	08-45 AA	0	0	0	0	0	0	000
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	Len	From 07.0 Intersecti	0	04	0	N	9	80	.500
	Start Time	Peak Hour Analysis From 07:00 AM to 08:45 AM - Pe Peak Hour for Entire Intersection Beoins at 07:00 AM	MA 00:20	07:15 AM	MA 05:30	07:45 AM	Total Volume	% App. Total	PHF





Morrison, CO 80465

Cheyenne, WY Whitney Ranch PM Peak Foxglove Dr and Whitney Rd

File Name : Foxglove and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 1

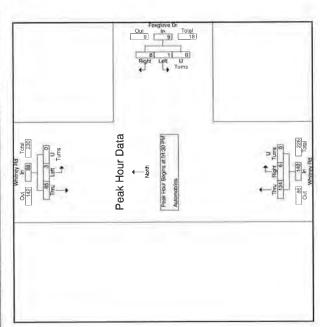
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04:30 PM	-	4	0		in	28	s	0		8	0	2	0	21	29
04:45 PM	0	-	0		-	30	÷	0		31		80	D	19	51
Total	+	1	0		00	119	80	0		127	N	29	0	99	201
05:00 PM	0	*	0		-	32	0	0		35	0	29	D	58	65
05:15 PM	0	4	0		tv	41	0	0		14	(V	17	D	19	9 62
05:30 PM	0	0	0		0	36	0	0		98	0	15	0	15	51
05:45 PM	0	ŧ	0		+	30	5	0		88	G	5	0	13	3 46
Total	0	4	0	1	4	142	cv	0		144	r,	74	0	76	5 224
Grand Total	-	Ξ	0		12	261	10	0		271	4	138	0	142	425
Apprch %	83	91.7	0			96.3	3.7	0			28	97.2	0		
Total %	0.2	5.6	0	. •	2.8	61.4	2.4	0		83.8	6.0	32.5	0	33.4	



Cheyenne, WY Whitney Ranch PM Peak Foxglove Dr and Whitney Rd

File Name : Foxglove and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 2

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Morrison, CO 80465

RIDIC Ridgeview Data Collection

Cheyenne, WY Whitney Ranch PM Peak Foxglove Dr and Whitney Rd

File Name Foxglove and Whitney PM Site Code : IPO 262 Start Date : 9/6/2017 Page No : 3

		Total			21	19	59	13	88		.759
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Whitney Rd	Southbound							Ī			
Wh	Sou	Thru			21	18	59	17	82	996	733
		Left			0	-	0	N	ဇ	3.4	375
	1	pp Total			33	34	35	41	140		854
Whitney Rd	Northbound	U Turns App Total			0	0	0	0	0	0	000
Whitn	North	Right			10		0	0	۵۱	4.3	300
		Thru	-		58	30	35	41	134	28.7	.817
		U Tums App. Total	Peak 1 of	PM	2	-	-	8	6	1	.450
D.	pur	rums A	45 PM	at 04:30	0	0	0	0	0	0	000
Foxglove Dr	Westbound	Hight u	30 PM to 05	on Begins	**	+	+	2	80	88.9	200
		Lett	rom 04.1	Intersect	-	0	0	0	-	11.1	250
		Start Time	Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of	Peak Hour for Enlire Intersection Begins at 04:30 PM	04:30 PM	04:45 PM	05:00 PM	05:15 PM	Total Volume	% App. Total	HHd.

Out In Total

14 12 26

11 1 0 Roht Left U

9/6/2017 04:00 PMF 9/6/2017 05:45 PM

Aufomübiles

←§

Int Total

.912

APPENDIX B

City of Cheyenne Transportation Plan Traffic Growth

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne



INTRODUCTION

The shape section of the Transportation Plan outlines a transportation vision for the Cheyenne Area. The Transportation Vision defines the roadway, transit, bicycle, and pedestrian facilities that will be needed to provide Cheyenne Area residents with an adequate, connected, multimodal transportation system.

The Transportation Plan is based on information available at the time it was created, including other sections of Plandcheyenne. It includes enhancements to reflect the myriad of plans conducted since the Plan was first adopted in 2006. As future plans, documents, and studies are developed, these studies may amend the Transportation Plan. It is also anticipated that large tracts of property could develop their own master development plan. As part of the master development plan. As part of the master development plan process, transportation elements of Plancheyenne may be considered for amendment, provided that the transportation elements will continue to meet the principles, policies, and process described in Plancheyenne. Furthermore, priorities presented in this plan may change in the future as development occurs.

PRINCIPLES AND POLICIES

Creation of a robust and effective transportation system in Chepenne requires a vision of the type of transportation system the area desires. Plancheyenne lays out seven Foundations, one of which speaks directly to transportation. The Cheyenne Area will confinue to celebrate and enhance the character, quality, and authenticity of the community by developing a connected and diverse transportation system. To guide this vision, a set of principles and policies was developed. These principles reflect a vision of the character of Cheyenne's future transportation system. The associated policies present transportation system. The associated policies present away to implement this vision.

GROWTH IN THE REGION

The first step in the definition of a Transportation Vision is to identify the growth that is expected to take place in and around Cheyenne. Growth forecasts were generated for 2040 and beyond based on the Future Land Use Plan. Once growth has been quantified, future needs can be assessed.

NEEDS ASSESSMENT

After growth forecasts have been developed, the next step in developing a Transportation Vision is to identify needs that will arise as the region grows. These needs include roadway needs, transit needs, and needs for non-motorized transportation. Understanding the needs that the community will face allows planners to propose solutions that will fill these needs.

VISION PLANS - 2040 AND BEYOND

The 2040 Transportation Vision is a fiscally unconstrained plan for the transportation system in the Cheyenne area. This plan provides sufficient capacity to accommodate growth on most roadways and includes new roadways, sidewalks, and bike lanes in developing areas. Recommendations for retrofitting existing roads with sidewalks and bike lanes are also provided. The 2040 Vision Plan is based on a growth assumption of 1.25% per year.

The Buildout Transportation Vision Plan compliments the buildout of the Future Land Use Plan, but is not likely to occur until sometime after 2060. The buildout plan designates roadways and multimodal comidors that should be preserved for future use.



■ TRANSPORTATION PLAN: CITY OF CHEVENNE VERSION - 53 ■

APPENDIX C

Trip Generation Calculations

Whitney Ranch Trip Generation Summary

					AM			MM	
Land Use	Quantity	Units	Daily	u	Out	Total	- In	Out	Total
Single-Family Detached Housing (210)	1,293	Units	11,056	229	989	515	663	389	1,052
Condominium/Townhouse (230)	913	Units	4,406	52	251	303	247	122	369
Shopping Center (820)	\$57,325	- 35	10,493	278	171	449	920	997	1917
Elementary School (520)	200	Students	904	174	142	316	53	53	106
	0		45 0000	****	436 .	2.003	4.003	4224	2 800

	1				AM			PIM	
Land Use	Quantity	Units	Daily	lu	Out	Total	lu lu	Out	Total
ingle-Family Detached Housing (210)	232	Units	2,278	43	129	172	141	83	324
Candominium/Townhouse (230)	24	Units	186	1	13	16	13	9	19
Total			2,464	90	142	188	154	89	243

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne

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Designed by loff Dianch Date Conformation 21	Sentember 21, 2017 Joh No. 006562001
Ш	Sheet No
TRIP GENERATION MANUAL TECHNIQUES	
ITE Trip Generation Manual 9th Edition, Fitted Curve Equations	Curve Equations
Land Use Code - Single-Family Detached Housing (210)	ing (210)
Independant Variable - Dwelling Units (X)	
X = 1,293 T = Average Vehicle Trip Ends	
Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 297)	our Between 7 and 9 a.m. (page 297)
Average Weekday (T) = 0.70 (X) + 9.74 (T) = 0.70 * (1293) + 9.94	Directional Distribution: 25% ent. 75% exit T = 915 Average Vehicle Trip Ends 229 entering 686 exiting
	229 + 686 = 915
Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 298)	our Between 4 and 6 p.m. (page 298)
Average W eekday Ln(T) = 0.90 Ln(X) + 0.51 Ln(T) = 0.90 * Ln(1293) + 0.51	Directional Distribution: 63% ent. 37% exit T = 1052 Average Vehicle Trip Ends 663 entering 389 exiting
	663 + 389 = 1052
Peak Hour of Generator, Saturday (page 302)	7
Average Saturday (T) = 0 89 (X) + 8.77 (T) = 0 89 *	Directional Distribution: 53% ent. 47% exit. T = 1160 Average Vehicle Trip Ends 615 entering 545 exiting
	615 + 545 = 1160
Weekday (page 296)	
Average Weekday Ln(T) = 0 92 Ln(X) + 2.72 Ln(T) = 0 92 * Ln(1293) + 2.72	Directional Distribution: 50% entering, 50% exting T = 11066 Average Vehicle Trip Ends 5533 entering 5533 exting
	5533 + 5533 = 11066

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Whitney Ranch Trip Generation for Shopping Center	
Designed by Jeff Planck Date September 21, 2017 Checked by Date	Job No. 096567001 Sheet No. 1 of 1
TRIP GENERATION MANUAL TECHNIQUES ITE Trip Generation Manual 9th Edition, Fitted Curve Equations	
Land Use Code - Shopping Center (820) Independant Variable - 1000 Square Feet Gross Leasable Area (X) Gross I assabla Area = 567 325 Smlare Feet	
ip Ends	
Peak Hour of Adiacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 1562)	
$L_{\rm h}(T) = 0.61 L_{\rm h}(X) + 2.24$ T = 0.61 Ln(X) + 2.24 T = 78 Avera Ln(T) = 0.61 Ln(567) + 2.24 T = 78 entering	tion: 62% ent. 38% exit. Average Vehicle Trip Ends 171 exiting
Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 5 p.m. (page 1563)	
$Ln(T) = 0.67 Ln(X) + 3.31 \\ Ln(T) = 0.67 Ln(567) + 3.31 \\ Directional Distribution: Directional Directional Distribution: Directional Distribution: Directional Directional Directional Distribution: Directional Distribution: Directional Distribution: Directional Distribution: Directional Directional Distribution: Directional Directional Distribution: Directional Directional Distribution: Directional Dire$	tion: 48% ent. 52% exit Average Vehlicle Trip Ends 997 exiting
Weekday (page 1561)	
Daily Weekday Ln(T) = 0.65 Ln(X) + 5.83 Ln(T) = 0.65 * Ln(567) + 5.83 10493 entening	Directional Distribution: 50% enlering, 50% exiting T = 20986 Average Vehicle Trip Ends 10493 entering 10493 exiting
<u>enerator</u> Directional Distribu	n: 52% ent 48% exit
Ln(T) = 0.65 Ln(X) + 3.78 T = 2702 Avera Ln(T) = 0.65 * Ln(567) + 3.78 1405 entering	Average Vehicle Trip Ends 1297 exiting
ip Volumes (Per ITE Trip Generation Handboo	
PM Peak Hour = 34% Pass-by Saturday F	Saturday Peak Hour = 26% Pass-by
206 127	iturday pass-by rates (26%)
6925 6925 '	by rate
Saturday Peak 1040 960 2000	

 PM Peak Hour of Adjacent Street Traffic 4pm to 6pm (page 981)

 Directional Distribution: 49% entering, 51% exiting

 (T) = 0.15 (X)
 T = 106
 Average Vehicle Trip Ends

 (T) = 0.15 *
 (700.0)
 53 entering

 53 = 106
 53 + 53 = 106

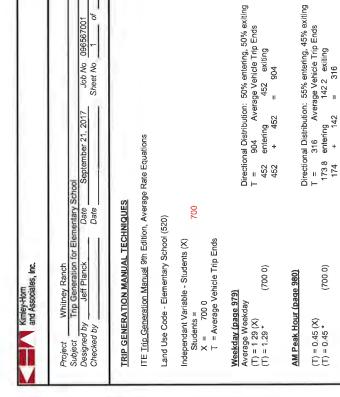
#

Directional Distribution: 45% entering, 55% extiting T = 196 Average Vehicle Trip Ends 88 2 entering 107 8 extiting 88 + 108 = 196

PM Peak Hour of Generator (page 982)

(700.0)

(T) = 0.28 (X)(T) = 0.28 *



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Whitney Rench - Phase 1 Trip Generation for Single-Family Detached Housing (Phase 1) Trip Generation for Single-Family Detached Housing (Phase 1) Job No. 098567001 d by Cale September 21, 2017 Sheet No. 1 of 1	TRIP GENERATION MANUAL TECHNIQUES	Land Use Code - Single-Family Detached Housing (210)	idant Variable - Dwelling Units (X)	= 232 = Average Vehicle Trip Ends	Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (page 297)	Weekday Directional Distribution: 25% ent. 75% exit. T0 (X) + 9,74 T = 172 Average Vehicle Trip Ends 70° 43 entering 129 exiting	43 + 129 = 172	Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 298)	Weekday Directional Distribution: 63% ent. 37% exit. 0.90 $Ln(X) + 0.51$ T = 224 Average Vehicle Trip Ends 0.90 * $Ln(232) + 0.51$ 141 entering 83 exiting	141 + 83 = 224	Peak Hour of Generator, Saturday (page 302)	Directional Distribution: 53% ent 47% exit Saturday Directional Distribution: 53% ent 47% exit S9 (X) + 8.77 T = 215 Average Vehicle Trip Ends S9 * (232) + 8.77 114 entering 101 exiting 101 exiting 102 103 10	114 + 101 = 215	ay (page 296)	Weekday Directional Distribution: 50% entering, 50% exting 0.92 Ln(X) + 2.72 T = 2278 Average Vehicle Trip Ends 0.92 ** Ln(232) + 2.72 1139 entering	1139 + 1139 = 2278
Project Whitney Ranch - Phase Subject Trip Generation for Single Designed by Jeff Planck Checked by	TRIP GENERATION MANUAL TECH!	Land Use Code - Single-Family Detach	Independant Variable - Dwelling Units (X)	X = 232 T = Average Vehicle Trip Ends	Peak Hour of Adjacent Street Traffic	+		Peak Hour of Adjacent Street Traffic	32)		Peak Hour of Generator, Saturday (s	(232) +		Weekday (page 296)	(2)	

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Ш															
	0					exit			exit			CD.		exit	
Job No 096567001 Sheet No. 1 of					3951	tion: 17% ent 83% Average Vehicle Trip Ends 13 exiting	16	396)	tion: 67% ent. 33% Average Vehicle Trip Ends 6 exiting	19		Directional Distribution: 50% entering, 50% exting T = 186 Average Vehicle Trip Ends 93 entering	186	rtion: 54% ent 46% Average Vehicle Trip Ends 23 extiting	20
Sh					(page	age Ve	11	(pag	age V	11		50% age V	= (00)	age V	н
use 2017					a.m.	Aver	m	5 D.M.	Aver	9		oution: Aver	93	Aver	23
minium/Townhouse September 21, 2017	ons	<u>(</u>			7 and	al Distrib 16 entering	+ 13	4 and	al Distrib 19 entering	+		al Distrib 186 entering	+ erator (al Distrib 50 entering	+
Septem Septem	urve Equati	nhouse (23			ur Between	Directional Distribution: T = 16 Avers 3 entering	ო	ur Between	Directional Distribution: T = 19 Avers 13 entering	13		Direction T = 93	93 our of Gen	Directional Distribution: T = 50 Aver. 27 entering	22
Trip Generation for Residential Condominium/Townhouse Jeff Planck Date September 21, 201 Date	TECHNIQUES Edition, Fitted C	ondominium/Tow	Units (X)	spu	Traffic, One Ho	+ 0.26		Traffic, One Ho	+ 0.32			+ 2.46	Saturday Peak H	+ 42 63	
Generation for	N MANUAL	esidential Co	ole - Dwelling	= 24 = Average Vehicle Trip Ends	cent Street	+ 0 26 Ln(24 0)		cent Street	+ 0,32 Ln(24.0)		[4]	+ 2,46 Ln(24.0)	Peak Uses	24	
Subject Trip Generation Designed by Jeff Planck Checked by	TRIP GENERATION MANUAL TECHNIQUES ITE <u>Trip Generation Manual</u> 9th Edition, Fitted Curve Equations	Land Use Code - Residential Condominium/Townhouse (230)	Independant Variable - Dwelling Units (X)	X = 24 T = Average V	Peak Hour of Adjacent Street Traffic. One Hour Between 7 and 9 a.m. (page 395)	Ln(T) = 0.80 Ln(X) + 0.26 Ln(T) = 0.80 * Ln(2)		Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (page 396)	Ln(T) = 0.82 Ln(X) + 0.32 Ln(T) = 0.82 * Ln(24)		Weekday (page 394)	Average Weekday Ln(T) = 0.87 Ln(T) Ln(T) = 0.87 *	93 + 93 = Weekday Midday Peak Uses Saturday Peak Hour of Generator (page 400)	$(T) = 0.29^{+}(X) + 42.63$ $(T) = 0.29^{+}$	

APPENDIX D

Intersection Analysis Worksheets

HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

2017 Existing AM.syn 12/12/2017

	\	Ť	~	•	,	/	_	-		ě.	•	,
Movement	EB	HBI	ä	WEI	WEST	WER	NES	MEE	MBR	8	188	280
Lane Configurations	M.	**	R	je:	44		×	4	¥.	¥.	*	P
Traffic Volume (veh.h)	33	261	29	41	528	144	84	210	43	125	188	113
Future Volume (veh/h)	33	261	19	41	528	144	84	210	43	125	199	113
Number	7	4	14	m	00	18	9	2	12	•	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	100		100
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, vehituin	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	48	281	0	52	636	203	131	262	28	144	219	5
Adj No of Lanes	×	2	-	-	2	0	-	-	7	7	-	
Peak Hour Factor	69.0	0.93	0.64	0.79	0.83	0.71	0.64	0.80	0.77	0.87	0.91	0.81
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	CV	24
Cap, veh/h	234	1156	517	516	867	277	342	387	329	319	399	340
Arrive On Green	0.04	0.39	000	0.01	0.13	0.13	20:0	0.25	0.25	90.0	0.25	0.25
Sat Flow, veh/h	1494	2980	1333	1494	2224	200	1494	1569	1333	1494	1569	1333
Gra Volume(v) vehili	48	281	0	52	426	413	131	262	99	144	219	140
Gro Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1443	1494	1569	1333	1494	1569	1333
O Serve(a s), s	1.4	4.8	0.0	1.5	20.6	202	4 9	113	25	5.4	9.1	6.6
Cycle Q Clearing, c), s	1.4	4.8	0.0	1.5	20.6	20.7	4.9	11.3	2.5	5.4	9,1	9
Prop In Lane	1.00		1.00	100		0.49	1.00		1:00	1.00		1,00
Lane Grp Cap(c), vehilh	234	1156	517	516	581	583	342	387	329	319	388	340
V/C Ratio(X)	0.21	0.24	00.0	0.10	0.73	0.73	0.38	0.68	0.17	0.45	0.55	0.41
Avail Cap(c_a), veh/h	272	1156	517	295	581	563	345	387	329	319	388	88
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	100	100	100	9	8
Upstream Filter(I)	1.00	1.8	0.00	0.61	0.61	0.61	100	8	100	8	6	9
Uniform Delay (d), s/veh	15.6	15.5	0.0	13.1	28.9	28.9	19.6	25.5	222	18.7	242	233
Incr Delay (d2), s/veh	4.0	9,0	0.0	0.1	5.0	5.2	0.7	9.2	1,1	1.0	5.3	6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	õ
%ile BackOfQ(50%),vehiln	9.0	2.0	0.0	9.0	9.3	9.1	2.1	5.9	1.0	2.3	4.5	28
LnGrp Delay(d),s/veh	16.0	16.0	00	13.1	33.9	34.1	203	34.7	23.3	20.7	28.5	592
LnGrp LOS	æ	8		œ	U	O	O	O	O	U	O	
Approach Vol. vehith		329			891			449			503	i
Approach Delay, s/veh		16.0			32.8			29.1			26.3	۱
Approach LOS		80			O			ပ			O	
Timer	Ť	e.	.00	7	9	9	9	60	Š		Ä	
Assigned Phs	,-	lovi	m	4	5	10	1	80		ì		
Phs Duration (G+Y+Rc), s	10.6	23.0	7.8	33.6	10.0	23.6	7.7	33.7				
Change Period (Y-Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	6.1	18.5	5.1	27.3	5.5	19.1	S,	27.3				
	7.4	13.3	3.5	6.8	6.9	116.1	3.4	22.7				
Green Ext Time (p_c), s	0.0	1.7	0.0	7.6	0.0	2.3	0.0	2.8				
Intersection Summany	l	ŀ		Ų				l	ŀ	ŝ		į
HCM 2010 Ctrl Delay			28.0									

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne

Synchro 9 Report Page 1

2017 Existing PM.syn 12/12/2017

HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

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Novement	Ħ	EBI	***	WBL	WBI	WBR	MBE	NBI	MBR	SBI	SBT	SBS
Lane Configurations	*	**	R.	h-	4.4		jķ-	*	¥:	je.	4	Fin
Traffic Volume (vehih)	84	711	169	75	582	137	137	292	100	8	212	98
Future Volume (veh/h)	84	711	169	75	582	137	137	292	100	84	212	86
Number	7	4	14	3	80	18	S	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, vehhilin	1569	1569	1269	1569	1269	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	92	726	0	100	626	171	165	395	123	100	252	108
Adj No of Lanes	-	2	-	-	2	0	-	-	-	-	Ī	-
Peak Hour Factor	0.88	0.98	0.88	0.75	0.93	0.80	0.83	0.74	0.81	0.84	0.84	0.80
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	066	443	272	775	211	366	475	404	251	462	393
Arrive On Green	90.0	0.33	00.0	0.02	0.11	0.11	0.07	0.30	0.30	90.0	0.29	0.29
Sat Flow, vehilh	1494	2980	1333	1494	2316	632	1494	1569	1333	1494	1569	1333
Grp Volume(v), veh/h	98	726	0	100	403	394	165	395	123	100	252	108
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1457	1494	1569	1333	1494	1569	1333
Q Serve(g_s), s	3.1	16.1	0.0	3.3	19.8	19.8	5.4	17.6	5.3	3.5	10.1	4.7
Cycle Q Clear(g_c), s	3.1	16.1	0.0	3.3	19.8	19.8	5.4	17,6	5.3	3.5	10.1	4.7
Prop In Lane	1 00		1.00	1.00		0.43	1 00		1.00	1.00		1 00
Lane Grp Cap(c), veh/h	231	066	443	272	499	488	366	475	404	251	462	393
V/C Ratio(X)	0.41	0.73	0.00	0.37	0.81	0.81	0.45	0.83	030	0 40	0.55	0.27
Avail Cap(c_a), veh/h	245	066	443	280	499	488	366	475	404	256	462	393
HCM Platoon Ratio	100	1.00	1.00	0.33	0.33	0.33	1.00	1.00	100	1 00	1.00	1 00
Upstream Filter(I)	1 00	1.00	0.00	0.58	0.58	0.58	1 00	1.00	1 00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.9	22.1	0.0	17.6	31.0	31.0	18.4	24.3	20.1	18.7	22.2	20.3
Incr Delay (d2), s/veh	1.2	4.8	0.0	0.5	8.1	8.3	60	15.5	1.9	1.0	4 6	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	ر ئ	7.2	0.0	 	6.3	9.1	0.8	9.6	2.2	15	4.9	1.9
LnGrp Delay(d),s/veh	190	26.9	0.0	18.0	39.1	39.3	192	39.8	220	19.7	26.8	22.0
LnGrp LOS	m	U		B			В		O	20	ပ	٥
Approach Vol, veh/h		821			897			683			460	
Approach Delay, s/veh		26.0			36.8			316			24.1	
Approach LOS		O			٥			ပ			ပ	i
Tierae	-	3	ě	4	90	9	7	80	l	Œ	Ì	
Assigned Phs	-	2	က	4	2	9	7	00		ŀ	ľ	
Phs Duration (G+Y+Rc), s	93	27.2	9.1	29.4	66	26.6	8.9	29.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	22.5	5.0	24.5	5.4	22.1	5.1	24.4				
Max Q Clear Time (g_c+1), s	5.5	19.6	5.3	181	7.4	12.1	5.1	218				
Green Ext Time (p_c), s	0.0	1.4	0.0	4.5	0.0	3.5	0.0	2.0				
Intersection Summary	ì	ĺ	l	١	l	ì	Į	Ì	١	Ì	١	Ī
HCM 2010 Ctrl Delay			30.4									
HCM 2010 LOS			C									
)									

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

2022 Background AM,syn 12/12/2017

	\	†	~	6	ļ	1	•	-		*	+	•
Movement	EBI	EBI	EBB	WEL	TBW	WBR	MH	MES	MBR		LES	Ši
Lane Configurations	<u>r</u>	**	¥.	M.	434		F	4	¥	je.	+	~
Traffic Volume (veh/h)	32	278	71	4	299	153	68	223	46	133	212	120
Future Volume (veh/h)	35	278	11	44	562	153	88	223	46	133	212	120
Number	7	4	14	e	00	18	2	2	12	-	9	=
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	Ī
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1 00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/In	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	5	299	0	56	677	215	139	279	09	153	233	148
Adj No. of Lanes	-	2	-	-	2	0	-	-	-	-	1	İ
Peak Hour Factor	69.0	0.93	0.64	0.79	0.83	0.71	0.64	0.80	0.77	0.87	0.91	0.81
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	Ì
Cap, veh/h	162	1048	469	431	786	250	426	541	460	408	550	468
Arrive On Green	0.04	0.35	00.00	0.01	0.12	0.12	0.08	0.34	0.34	0.08	0.35	0.3
Sat Flow, veh/h	1494	2980	1333	1494	2227	707	1494	1569	1333	1494	1569	1333
Gro Volume(v), veh/h	51	599	0	26	453	439	139	279	9	153	233	148
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1444	1494	1569	1333	1494	1569	133
Q Serve(q_s), s	2.2	7.2	0.0	2.4	29.8	29.9	5.9	14.2	3.1	6.5	11.3	80
Cycle Q Clear(g_c), s	2.2	7.2	0.0	2.4	29.8	29.9	5.9	14.2	3.1	6.5	11.3	80
Prop In Lane	100		1.00	100		0.49	100	E	1 00	1 00		1.00
Lane Grp Cap(c), veh/h	162	1048	469	431	526	510	426	541	460	408	550	468
V/C Ratio(X)	0.31	0.29	00.00	0.13	0.86	98.0	0.33	0.52	0 13	0.37	0.42	0.3
Avail Cap(c_a), veh/h	188	1124	503	452	559	541	463	541	460	424	550	468
HCM Platoon Ratio	100	1.00	1.00	0.33	0.33	0.33	100	1.00	1.00	1 00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.42	0.42	0.42	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24 1	23.4	0.0	20.1	41.8	41.8	19.0	26.1	22.5	19.3	24.8	23.7
Incr Delay (d2), s/veh	1.1	0.1	0.0	0.1	5.7	5.9	0.4	3.5	9.0	9.0	2.4	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	0.9	3.0	0.0	1.0	13.2	12.8	2.5	9.9	1.2	2.7	5.3	3
LnGrp Delay(d),s/veh	25.2	23.5	0.0	20.1	47.5	47.7	19.5	29.6	23.1	19,9	27.1	25.5
LnGrp LOS	ပ	ပ		ပ	۵	۵	œ	U	O	В	ပ	
Approach Vol, veh/h		350			948		ŀ	478	ă		534	W
Approach Delay, s/veh		23.8			46.0			25.8			24.6	
Approach LOS		O			٥			O			O	
Tital	iii	2	m	10	40	19		8	l	ŀ	Ì	
Assigned Phs	T	2	3	7	5	9	7	80	ŀ		l,	ľ
Phs Duration (G+Y+Rc), s	12.9	39.0	8.4	39.7	123	39.6	83	39.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	i		ì	ľ
Max Green Setting (Gmax), s	9.5	29.5	5.3	37.7	10.3	28.7	5.5	37.5				
Max Q Clear Time (g_c+11), s		16.2	44	9.2	7.9	13.3	4.2	319				h
Green Ext Time (p_c), s	0.0	3,2	0.0	9.3	0.1	3.4	0.0	3.4				
Intercontinu Quemental	ĺ					ĺ	ì	Ĭ	i	ì	Ĭ	Ĭ
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HCM 2010 Signalized Intersect	1: Ridge Road & Dell

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Novement	EBI	E81	366	WHI	WBT	WER	MBI	MBI	MBR	SBS	SBI	SBE
ane Configurations	¥	*	R.	K	24		N.	4	¥	k	*	P.
fraffic Volume (veh/h)	88	757	180	80	619	146	146	311	106	68	526	92
-uture Volume (veh/h)	88	757	180	80	619	146	146	311	106	88	226	92
Vumber	7	4	14	က	œ	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, vehitifin	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	101	772	0	107	999	182	176	420	131	106	569	115
Adj No. of Lanes	-	2	-	-	2	0	-	-	-	-	-	Ī
Peak Hour Factor	0.88	0.98	0.88	0.75	0.93	0.80	0.83	0.74	0.81	0.84	0.84	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	926	436	224	754	506	414	594	505	283	534	453
Arrive On Green	90'0	0.33	0.00	90.0	0.33	0.33	0.09	0.38	0.38	0.05	0.34	0.34
Sat Flow, veh/h	1494	2980	1333	1494	2315	632	1494	1569	1333	1494	1569	1333
3rp Volume(v), veh/h	101	772	0	107	429	419	176	420	131	106	269	115
Srp Sat Flow(s), veh/h/In	1494	1490	1333	1494	1490	1457	1494	1569	1333	1494	1569	1333
2 Serve(g_s), s	4.4	23.5	0.0	4.7	27.2	27.3	7.4	22.7	6.8	4.6	13.7	6.2
Cycle Q Clear(g_c), s	4.4	23.5	0.0	4.7	27.2	27.3	7.4	22.7	6.8	4.6	13.7	6.2
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	9		1.00
.ane Grp Cap(c), veh/h	197	926	436	224	485	474	414	294	202	283	534	453
//C Ratio(X)	0.51	0.79	0.00	0.48	0.88	0.88	0.45	0.71	0.26	0.37	0.50	0.25
4vail Cap(c_a), veh/h	212	1034	463	224	499	488	428	294	505	283	534	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	90	1.00	1.00	8	1.00	1.00
Jpstream Filter(I)	1.00	1.00	0.00	0.52	0.52	0.52	1.00	1.00	1.00	100	1.00	1.00
Jniform Delay (d), s/veh	24.6	30.5	0.0	23.6	31.9	31.9	18.7	76.4	21.4	21.7	26.3	23.8
ncr Delay (d2), s/veh	2.1	4.0	0.0	0.8	9.6	9.9	0.7	6.9	1.2	0.8	3.4	1.3
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.9	10.2	0.0	2.0	12.5	12.3	31	10.9	2.7	19	6.4	2.5
nGrp Delay(d),s/veh	26.7	34.6	0.0	24.4	41.5	41.8	19.4	33.3	22.7	22.5	29.7	25.2
LINGID LOS	O	O		O	۵	٥	В	O	ပ	O	ပ	٥
Approach Vol, veh/h		873			955			727			490	
Approach Delay, s/veh		33.7			39.7			28.0			27.1	
Approach LOS		O			۵			O			ပ	
Times	ļ	2	8	¥	10	ė	2	8		ĺ	i	
Assigned Phs	-	2	က	4	2	9	7	8				
hts Duration (G+Y+Rc), s	10.0	42.4	10.4	37.2	13.9	38.5	10.6	37.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5,5	35.9	5.9	34.7	10.3	31.1	7.1	33.5				H
	9.9	24.7	29	25.5	9.4	157	6.4	29.3				ľ
Green Ext Time (p_c), s	0.0	4.0	0.0	6.4	0'0	4.7	0.0	33,0				
MESSECTION SUFFREY										Ì	۱	Ī
HCM 2010 Ctrl Delay	ŀ		33.2				Н					
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HCM 2010 Signalized Intersection Summary 1; Ridge Road & Dell Range Boulevard

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Movement	EBI	83	EBB	WEI	WBT	WBR	i i	188	NBR	SBI	SBT	SS
Lane Configurations	×	奉奉	*	¥.	*		ħ	*	Ж.,	J.	*	F
Traffic Volume (veh/h)	32	290	7.1	65	298	160	88	223	23	135	212	120
Future Volume (veh/h)	35	290	71	92	598	160	68	223	23	135	212	120
Number	7	4	14	3	80	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	٥
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	6	312	0	85	720	225	139	279	69	155	233	148
Adj No of Lanes	-	2	-		6	0	-	=	-		-	Ì
Peak Hour Factor	69.0	0.93	0.64	0.79	0.83	0.71	0.64	0.80	0.77	0.87	0.91	0.81
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	23
Cap, veh/h	212	1268	567	521	696	303	335	400	340	309	413	351
Arrive On Green	0.04	0.43	000	0.03	0.29	0.29	60.0	0.26	0.26	60.0	97.0	92.0
Sat Flow, vehilh	1494	2980	1333	1494	2237	669	1494	1569	1333	1494	1569	1333
Gro Volume(v), velvh	51	312	0	82	480	465	139	279	69	155	233	148
Gro Sat Flow(s), vehillin	1494	1490	1333	1494	1490	1445	1494	1569	1333	1494	1569	1333
O Serve(q. s), s	1.9	6.7	0.0	3.1	29.1	28.1	8.9	16.1	411	15	12.9	6
Cycle Q Clear(q_c), s	6.1	6.7	0.0	3.1	29.1	29.1	6.8	16.1	4.1	7.5	12.9	9.2
Prop In Lane	1 00		1.00	1.00		0.48	1.00		1.00	1.00		1,0
Lane Grp Cap(c), veh/h	212	1268	292	521	645	626	335	400	340	309	413	32,
V/C Ratio(X)	0.24	0.25	0.00	0.16	0.74	0.74	0.42	0.70	0.20	0.50	0.56	0.4
Avail Cap(c_a), veh/h	238	1268	292	548	645	929	345	400	340	310	413	32,
HCM Platoon Ratio	1.00	1.00	1.00	29.0	29.0	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3	18.4	0.0	15.3	30.5	30.5	24.8	33.8	29.3	25.2	31.9	30.5
Incr Delay (d2), s/veh	9.0	0.5	0.0	0	4.1	4.2	0.8	9.7	1,3	13	6.5	m
Initial O Delay(d3), siveh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	00	0
%ile BackOfQ(50%),vehilin	0.8	2.9	0.0	1.3	127	12.4	2.9	60.1	1.6	3.5	6.2	m
LnGrp Delay(d) s/veh	19.9	18.9	0.0	15.4	34.5	34.7	25.6	43.4	30.6	26.4	37.4	×
LnGrp LOS	æ	80		8	O	S	O	۵	O	O	۵	
Approach Vol, veh/h		363			1027			487			536	
Approach Delay, siveh		19.0			33.1			36.5			33.3	
Approach LOS		В			O			٥			O	
Timel		ini	100	9	Š	و	4	***	ŀ	ľ	ì	9
Assigned Phs	-	2	9	4	2	9	7	60				
Phs Duration (G+Y+Rc), s	13.9	30.0	9.1	47.0	13.1	30.8	8,3	47.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		25.5	6.4	40.6	9.3	25.7	5,5	41,5				
Max Q Clear Time (q. c+11), s		18.1	51	8.7	8.8	14.9	3.9	31.1				
Green Ext Time (p_c), s	0.0	2.3	0.0	10.4	0.0	2.9	0.0	5.8				
Mores alon Commission	ŀ	ł	ì	Ì	ľ			ļ	ì	ì	Å	١
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Signalized Intersection Summary	Vard
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The control of the		1	1	7	1	ţ	4	•	-	•	٨	→	*
10	Movement	183	HBH	EBR	WBE	WBI	WBR	NBI	TER	MBR	381	SBT	SBR
89 796 180 93 641 150 146 311 129 97 226 7 4 14 3 84 150 146 311 129 97 226 10 0	ane Configurations	34T	李李	Kin	K.	44		¥	*	۲.,	<u> </u>	*	W.
89 796 180 93 641 150 146 311 129 97 226 7 4 1 3 641 150 146 311 129 97 226 100 10	Traffic Volume (veh/h)	68	962	180	93	641	150	146	311	129	26	526	92
7 4 14 3 8 18 5 2 12 1 6 100 100 100 100 100 100 100 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	Future Volume (veh/h)	88	962	180	93	641	150	146	311	129	26	526	92
100 100 100 100 100 100 100 100 100 100	Number	7	4	14	e •	œ (9	<u>ب</u>	7	15	- '	9	16
100	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
100	Ped-Bike Adj(A_pbT)	8.9	,	1.00	1.00	,	1.00	1.00		1.00	0.1	7	1.00
10 10 10 10 10 10 10 10	Parking Bus, Adj	00.1	00.1	00.1	1.00	1.00	00.1	1.00	1.00	1.00	1.00	1.00	1.00
1	Adj Sat Flow, veh/h/In	1969	1569	1569	1569	1569	180	1569	1569	1569	1569	1569	1569
0.88 0.98 0.98 0.75 0.93 0.80 0.83 0.74 0.81 0.84 0.84 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj No of Lanes	5 -	210	- c	124	600	00	- 10	450	60	<u>-</u>	1	-
2 2	Peak Hour Factor	0.88	0.98	0.88	0.75	0.93	0.80	0.83	0.74	0.81	0.84	0.84	0.80
211 1076 481 256 860 235 362 547 231 469 1044 2366 0.00 0.02 0.12	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1494 2980 1333 4944 2316 632 1494 1569 1333 4944 2869 1494 1490 1333 4944 1490 1432 1494 1490 1333 4944 1490 1437 1494 1490 1333 1494 1490 1437 1494 1569 1333 1494 1569 1432 1494 1490 1437 1494 1569 1333 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1432 1494 1569 1434 1	Cap, veh/h	211	1076	481	256	860	235	362	525	447	231	463	393
1494 2980 1333 1494 2316 632 1494 1569 1333 1494 1569 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1494 1490 1333 1494 1490 1	Arrive On Green	90.0	96.0	0.00	0.02	0.12	0.12	60.0	0.34	0.34	0.05	0.29	0.29
101 812	Sat Flow, veh/h	1494	2980	1333	1494	2316	632	1494	1569	1333	1494	1569	1333
1494 1490 1333 1494 1490 1457 1494 1569 1333 1494 1569 142 239 0.0 5.1 289 290 7.9 24.3 9.0 5.4 14.6 1.00 1.	Grp Volume(v), veh/h	101	812	0	124	443	434	176	420	159	115	269	115
42 239 0.0 5.1 289 290 7.9 24.3 9.0 5.4 146 42 239 0.0 5.1 289 290 7.9 24.3 9.0 5.4 146 400 1.00 </td <td>Эгр Sat Flow(s), veh/h/ln</td> <td>1494</td> <td>1490</td> <td>1333</td> <td>1494</td> <td>1490</td> <td>1457</td> <td>1494</td> <td>1569</td> <td>1333</td> <td>1494</td> <td>1569</td> <td>1333</td>	Эгр Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1457	1494	1569	1333	1494	1569	1333
42 239 0.0 51 28.9 29.0 7.9 24.3 90 54 146 100 100 100 100 100 100 100 100 104 0.75 0.00 0.48 0.80 0.49 0.80 0.49 0.80 0.90	2 Serve(g_s), s	4.2	23.9	0.0	5.1	28.9	29.0	7.9	24.3	9.0	5.4	14.6	6.7
100	Cycle Q Clear(g_c), s	4.2	23.9	0.0	5.1	28.9	29.0	7.9	24.3	9.0	5.4	14.6	6.7
211 1076 481 256 554 541 362 525 447 231 463 0.48 0.75 0.00 0.48 0.80 0.80 0.49 0.80 0.38 0.38 0.33 1.00 1.00 1.00 1.00 0.48 0.83 0.33 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Prop In Lane	100		1.00	1.00		0.43	1.00		1.00	1.00		1.00
0.48 0.75 0.00 0.49 0.80 0.49 0.86 0.36 0.56 0.58 1.00 1.00 1.00 1.00 0.33 0.33 0.33 1.00 1.00	Lane Grp Cap(c), veh/h	211	1076	481	256	554	541	362	525	447	231	463	393
227 1076 481 266 554 541 362 525 447 231 463 100 100 100 0.33 0.33 100 <td>V/C Ratio(X)</td> <td>0.48</td> <td>0.75</td> <td>0.00</td> <td>0.48</td> <td>0.80</td> <td>0.80</td> <td>0.49</td> <td>0.80</td> <td>0.36</td> <td>0.50</td> <td>0.58</td> <td>0.29</td>	V/C Ratio(X)	0.48	0.75	0.00	0.48	0.80	0.80	0.49	0.80	0.36	0.50	0.58	0.29
100 100 100 033 033 100 100 100 100 100	Avail Cap(c_a), veh/h	227	1076	481	266	554	541	362	525	447	231	463	393
1.00 1.00 0.00 0.53 0.53 0.53 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	HCM Platoon Ratio	1 00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
227 281 0.0 22.3 40.3 40.3 216 30.2 25.1 25.3 30.0 17 4.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Upstream Filter(I)	100	1.00	0.00	0.53	0.53	0.53	1.00	9	1.00	1.00	1.00	1.00
17 4.9 0.0 0.8 6.5 6.6 10 12.0 22 1.7 5.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Uniform Delay (d), s/veh	22.7	28.1	0.0	22.3	40.3	40.3	21.6	30.2	25.1	25.3	30.0	27.2
00 00 00 00 00 00 00 00 00 00 00 00 00	Incr Delay (d2), s/veh	1.7	4.9	0.0	0.8	6.5	9.9	1.0	12.0	2.2	1.7	5.3	1.9
148 105 0.0 2.1 13.0 12.7 3.3 12.3 3.6 2.3 7.0 2.4 330 0.0 2.1 13.0 12.7 3.3 12.3 3.6 2.3 7.0 2.0 C C C C C C C D D C C D C C D C C D C C D C C C D C	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
244 330 0.0 23.1 46,7 46,9 22.0 42.2 2.13 30.2 30.2 2.0 43.9 3.2 2.0 42.2 2.13 30.3 30.2 2.0 43.9 32.0 43.9 34.5 31.9 2.0 43.9 34.5 31.9 2.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	%ile BackOfQ(50%),veh/ln	00 0	10.5	0.0	2.1	13.0	12.1	3.3	12.3	3.6	2.3	0.7	2.6
913 1001 755 320 43.9 34.5 C D D C C D C C D C C D C C C D C C C D C	Lingip Delay(d),s/ven	t t 7	33.0	0.0	- 72. - C	/ 0.	60.9	0.77	7.74	21.3	507 C	25.C	- K
320 439 345 C D C D C D C C D C C D C C C D C C C C D C	Approach Vol. veh/h		913	1		1001		,	755		,	499	
C C D D C C C C C C C C C C C C C C C C	Approach Delay, s/veh		32.0			43.9			34.5			31.9	
1 2 3 4 5 6 7 101 30 11 31 31 31 31 31 31 31 31 31 31 31 31	Approach LOS		ပ			۵			ပ			O	Ī
10 380 114 406 140 340 103 4 100 380 114 406 140 340 103 4 5 55 335 7.5 35 5 95 295 69 5 5 74 263 7.1 259 99 166 62 5 0.0 3.1 00 6.8 0.0 4.4 0.0 D	Tittler	-	25	**	19	40	عا	7	60	l	ř	ŀ	
100 380 114 406 140 340 103 4 4 5 45 45 45 45 45 45 45 45 5 5 5 335 75 355 99 166 62 3 0 0 3.1 0 0 6.8 0 0 44 0.0 D	Assigned Phs	-	2	က	4	2	9	7	00		ŀ	ŀ	ı
45 45 45 45 45 45 45 45 45 85 85 85 85 85 85 89 8 8 9 166 62 8 9 9 166 62 8 9 9 9 166 62 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Phs Duration (G+Y+Rc), s	10.0	38.0		40.6	14.0	34.0	10.3	41.7				
s 55 335 75 355 95 295 69 s 74 263 71 259 99 166 62 0.0 31 0.0 6.8 0.0 4.4 0.0 36.4	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	45	4.5				ĺ
s 74 26.3 7.1 25.9 9.9 16.6 6.2 0.0 3.1 0.0 6.8 0.0 4.4 0.0 36.4 D	Max Green Setting (Gmax), s	5.5	33.5	7.5	35.5	9.5	29.5	6.9	36.1				
s 0.0 3.1 0.0 6.8 0.0 4.4 0.0 36.4 D	Max Q Clear Time (g_c+11), s	7.4	26.3	7.1	25.9	66	16.6	6.2	310				
	Green Ext Time (p_c), s	0.0	3.1	0.0	6,8	0.0	4.4	00	4.0				
	Messesion Summary	۱	Ì	ì	i	1	Ì	ì	ŀ	Ì	ŀ	Ī	
	HCM 2010 Ctrl Delay			36.4									
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HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

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Novement	EB	EBI	EBB	WEL	WBI	WBR	NBIE	NBI	MBR	SBE	IBS	SBR
Lane Configurations	jk.	李李	Fin	£	43		¥-	*	W_	K.	*	P.
Traffic Volume (veh/h)	4	347	88	22	203	192	112	279	24	166	265	150
Future Volume (veh/h)	4	347	88	92	703	192	112	279	24	166	265	150
Number	7	4	14	က	80	18	2	2	12	Ī	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	48	377	0	9	764	500	122	303	62	180	288	163
Adj No of Lanes	-	2	-	F	2	0	-	-		-	-	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	196	1250	559	469	626	268	293	401	341	306	478	407
Arrive On Green	0.04	0.42	0.00	0.03	0.28	0.28	0.05	0.26	0.26	0.10	0.31	0.31
Sat Flow, veh/h	1494	2980	1333	1494	2314	633	1494	1569	1333	1494	1569	1333
Grp Volume(v), veh/h	48	377	0	09	492	481	122	303	62	180	288	163
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1457	1494	1569	1333	1494	1569	1333
Q Serve(g_s), s	1.8	8.4	0.0	2.3	30.4	30.4	5.5	17.8	3.6	8.5	15.6	9.7
Cycle Q Clear(g_c), s	1.8	8.4	0.0	2.3	30.4	30.4	5.5	17.8	3.6	8.5	15.6	9.7
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	1250	559	469	631	617	293	401	341	306	478	407
V/C Ratio(X)	0.25	0.30	0.00	0.13	0.78	0.78	0.42	92.0	0.18	0.59	09:0	0.40
Avail Cap(c_a), veh/h	217	1250	559	487	631	617	293	401	341	307	478	407
HCM Platoon Ratio	1.00	1.00	1.00	29.0	29.0	29.0	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.41	0.41	0.41	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.2	19.3	0.0	15.8	31.5	31.5	27.4	34.3	29.0	24.2	29.6	27.5
Incr Delay (d2), s/veh	9.0	9.0	0.0	0.0	4.0	4.1	6.0	12.4	1.2	5.9	5.5	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/lin	0.8	3.6	0.0	0.9	13.2	12.9	0.8	9.1	1.4	3.7	7.5	3.6
LnGrp Delay(d),s/veh	20.8	19.9	0.0	15.8	35.5	35.6	28.4	46.8	30.2	27.1	35.1	30.4
LnGrp LOS	O	m			۵		O		O	O		
Approach Vol. veh/h		425			1033			487			631	
Approach Delay, s/veh		20.0			34.4			40.0			31.6	
Approach LOS		ပ			ပ			۵			O	
Tirster	of comme	Ø	m	*	9	un	7	8			ŀ	
Assigned Phs	-	2	က	4	5	9	7	æ				
Phs Duration (G+Y+Rc), s	14.9	30.1	90	46.4	10.0	35.0	8.2	46.8			ľ	
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	į	Ì	ì	
Max Green Setting (Gmax), s	Ľ	25.5	5.3	40.7	5.5	30.5	5.1	40.9				
Max Q Clear Time (9_c+11), s		19.8	4.3	10.4	7.5	17.6	3.8	32.4			I	H
Green Ext Time (p_c), s		2.2	0.0	111	0.0	3.7	0.0	5.3				
Intercection Summers			ĺ	l	į		Ì	ŀ	ì	ŀ		
000 000 mg			* 00									
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HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

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Lancontage Fig. F		\	t	>	-	Ļ	1	~	-	L	A.	+	7
ns 1	Movement	183	EBI	EBR	WEL	WET	WER	NEC	NBIT	NBR	SSE	188	SBS
112 946 225 100 774 182 182 389 133 112 282 141 12 946 225 100 774 182 182 389 133 112 282 141 12 946 225 100	ane Configurations	**-	*	R	J E-	4		r	*	K.	*	d -	Pin.
eth h) 112 946 225 100 774 182 182 389 133 112 282 1	Fraffic Volume (veh/h)	112	946	552	100	774	182	182	389	133	112	282	114
100 100 100 100 100 100 100 100 100 100	Future Volume (veh/h)	112	946	225	100	774	182	182	386	133	112	282	114
100 100	Number	7	4	14	m	00	9	2	2	12		9	16
bit) 100 100 100 100 100 100 100 100 100 10	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	9 5
1.00 1.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569 1569 1669 1669 1569	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.1	1.00
122 1028 0 109 841 198 198 423 145 122 307 1 1 2 10.2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0	Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1569	1600	1569	1569	1569	1569	1569	1569
1 2 1 1 2 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Adj Flow Rate, veh/h	122	1028	0	109	841	198	198	423	145	122	307	124
h,% 2, 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adj No of Lanes	-	2	-	-	2	0	-	-	-		-	1
h, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
210 1261 564 213 981 231 276 483 393 177 409 0.06 0.42 0.00 0.03 0.29 0.29 0.05 0.26 1494 2980 0.29 0.29 0.29 0.20 0.20 0.20 0.20 0.2	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1006	Cap, veh/h	210	1261	564	213	981	231	276	463	393	177	409	348
1494 2980 1333 1494 2395 564 1494 1569 1333 1494 1569 1122 1028	Arrive On Green	90.0	0.45	00.0	0.03	0.27	0.27	60.0	0.29	0.29	0.05	0.26	0.26
122 1028	Sat Flow, veh/h	1494	2980	1333	1494	2395	564	1494	1569	1333	1494	1569	1333
1494 1490 1333 1494 1490 1469 1469 1569 1494 1569 147 30.4 0.0 4.2 33.3 33.3 8.5 26.0 8.6 5.1 180 1.00	Gm Volume(v), veh/h	122	1028	0	109	523	516	198	423	145	122	307	124
4.7 30.4 0.0 4.2 33.3 33.3 8.5 26.0 8.6 5.1 18.0 10.0 1.00 1.00 4.2 33.3 33.3 8.5 26.0 8.6 5.1 18.0 1.00 1.00 4.2 33.3 33.3 8.5 26.0 8.6 5.1 18.0 1.00 1.00 1.00 1.00 1.00 1.00 1.	Gro Sat Flow(s).veh/h/ln	1494	1490	1333	1494	1490	1469	1494	1569	1333	1494	1569	1333
4.7 30.4 0.0 4.2 33.3 33.3 8.5 26.0 8.6 5.1 18.0 1.00 1.00 1.00 1.00 1.00 1.00 1.	Q Serve(q_s), s	4.7	30.4	0.0	42	33.3	33.3	8.5	26.0	8 6	5.1	18.0	7.6
100	Cycle Q Clear(g_c), s	4.7	30.4	0.0	4.2	33.3	33.3	8.5	26.0	8.6	5.1	18.0	7.6
h 210 1261 564 213 610 602 276 463 393 177 409 058 082 000 615 1086 086 0872 091 037 069 075 058 082 000 015 1086 086 0872 091 037 069 075 077 091 037 069 075 077 091 037 069 075 077 091 037 069 075 077 091 091 091 091 091 091 091 091 091 091	Prop in Lane	1.00		1.00	1.00		0.38	1.00		1 00	100		1 00
058 082 000 051 086 086 077 091 037 069 075 1210 1261 564 213 610 602 276 463 393 177 409 100 100 100 100 010 057 067 1100 1100 1100 1100 1100 1100 1100	Lane Grp Cap(c), veh/h	210	1261	564	213	610	602	276	463	393	177	409	348
210 1261 564 213 610 602 276 463 393 177 409 100 100 100 0.67 0.67 0.67 100 1.00 1.00 1.00 1.00 1.00 1.00 1.00	V/C Ratio(X)	0.58	0.82	0.00	0.51	0.86	0.86	0.72	0.91	0.37	69 0	0.75	0,36
100 100 100 067 067 100 100 100 100 100 100 100 100 100 10	Avail Cap(c_a), veh/h	210	1261	264	213	610	602	276	463	393	177	409	348
1.00 1.00 0.012 0.12 1.00 1.00 1.00 1.00	HCM Platoon Ratio	1.00	1.00	1.00	29'0	29.0	0.67	1.00	1.00	100	100	9	1 00
222 254 00 713 335 335 284 340 779 317 340 40 0.0 0.0 0.0 21 86 251 26 106 119 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Upstream Filter(I)	1.00	1.00	0.00	0,12	0.12	0.12	1.00	1.00	100	1 00	100	1.00
40 59 0.0 0.2 2.0 2.1 8.6 25.1 2.6 106 119 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	22.2	25.4	0.0	21.3	33.5	33.5	28.4	34.0	27.9	317	340	30.1
00 00 00 00 00 00 00 00 00 00 00 00 00	Incr Delay (d2), s/veh	4.0	5.9	0.0	0.2	2.0	2.1	9.6	25.1	2.6	10.6	113	2.8
21 135 0.0 1.7 14.1 139 2.5 14.5 3.5 1.8 9.1 2.2 2.2 0.0 2.16 3.5 3.5 0.9 1.3 0.0 2.16 3.5 3.5 3.0 3.10 3.0 2.2 2.2 0.0 2.16 3.0 3.0 3.0 3.4 2 0.0 2.0 0.0 2.0 0.0 2.0 0.0 2.0 0.0 2.0 0.0 2.0 0.0 2.0 0.0 2.8 0.0 4.8 3.7 0.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1150 282 313 0.0 216 355 356 370 591 305 423 459 20 60 60 60 60 60 60 60 60 60 60 60 60 60	%ile BackOfQ(50%),veh/lin	2.1	13.5	0.0	1.7	14.1	13.9	2.5	14.5	3.5	00	9.1	5.0
1150	LnGrp Delay(d),s/veh	26.2	31,3	0.0	21.6	35.5	35.6	37.0	59.1	30.5	42.3	45.9	32.9
The first state of the first sta	LnGrp LOS	O	O		O	٥	۵	۵	w	O		۵	٥
1 2 3 4 5 6 7 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Approach Vol, veh/h		1150			1148			992			553	
1 2 3 4 5 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	Approach Delay, s/veh		30.8			34.2			48.0			47.7	1
1 2 3 4 5 6 7 1 2 3 4 5 6 7 9.6 340 9.6 468 130 306 110 4.5 4.5 4.5 4.5 4.5 4.5 4.5 5.1 280 5.1 42.3 8.5 26.1 6.5 6.7 7.1 280 6.2 32.4 10.5 20.0 6.7 0.0 0.8 0.0 8.0 0.0 2.8 0.0	Approach LOS		ပ			ပ			٥			٥	
1 2 3 4 5 6 7 7 9 9 6 468 130 30.6 11.0 4 9 6 468 13.0 30.6 11.0 4 9 6 468 13.0 30.6 11.0 4 9 6 46.8 13.0 30.6 11.0 4 9 6 9 6 9 6 9 6 9 6 9 6 9 6 9 6 9 6 9		*	co	**	*	30	9	ř	(00)		K	P	
9.6 340 9.6 46.8 13.0 30.6 11.0 4 4.5 4.5 4.5 4.5 4.5 4.5 4.5 5.1 29.5 5.1 42.3 8.5 28.1 6.5 7.1 28.0 6.2 32.4 10.5 20.0 6.7 0.0 0.8 0.0 8.0 0.0 2.8 0.0 37.3	Assigned Phs	-	2	9	4	5	9	7	80				ı
45 45 45 45 4,5 4,5 4,5 4,5 4,5 5,1 28,5 1 42,3 8,5 26,1 6,5 7,1 28,0 6,2 32,4 10,5 20,0 6,7 0,0 0,0 0,0 8,0 0,0 2,8 0,0 3,7,3	Phs Duration (G+Y+Rc), s	9.6	340	9.6	46.8	13.0	30.6	11.0	45.4				
51 295 5.1 42.3 8.5 26.1 6.5 71 280 6.2 32.4 10.5 200 6.7 0.0 0.8 0.0 8.0 0.0 2.8 0.0 37.3	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				i
71 280 62 324 105 200 67 0.0 0.8 0.0 8.0 0.0 2.8 0.0 37.3	Max Green Setting (Gmax), s	5.1	29.5	5.1	42.3	8.5	26.1	6.5	40.9				
s 0.0 0.8 0.0 8.0 0.0 2.8 0.0 4, 37.3	Max Q Clear Time (g_c+11), s	7.1	28.0	6.2	32.4	10.5	20.0	29	35.3				
	Green Ext Time (p_c), s	0.0	0.8	0.0	8.0	0.0	2.8	0.0	4.8				
	obesedon Summey					10			i L			l	i
	HCM 2010 Ctrl Delay			37.3									

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forement	88	齫	EBR	MBIL	WBT	188	84	TREE	888	88	SBI	SBR
ane Configurations	je.	争争	K.	je-	44	K	M.	\$	¥	¥	+	PL-
Fraffic Volume (veh/h)	4	494	88	180	953	192	112	279	130	166	592	150
Future Volume (veh/h)	4	494	88	180	953	192	112	279	130	166	265	150
Number	7	4	14	e	æ	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adi	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adi Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569
Adi Flow Rate, veh/h	48	537	0	196	1036	500	122	303	141	180	288	163
Adi No of Lanes	1	2	-	-	2	Ţ	-	2	-	-	-	-
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1215	544	450	1380	618	251	625	280	350	400	340
Arrive On Green	0.04	0.41	0.00	0.03	0.15	0.15	90.0	0.21	0.21	0.11	0.25	0.25
Sat Flow, veh/h	1494	2980	1333	1494	2980	1333	1494	2980	1333	1494	1569	1333
Gro Volume(v), veh/h	48	537	0	196	1036	209	122	303	141	180	288	163
Gro Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1333	1494	1490	1333	1494	1569	1333
Q Serve(g_s), s	1.8	13.0	0.0	7.0	33.3	14.0	6.5	8.9	9.3	9.0	16.8	10.4
Cycle Q Clear(g_c), s	1.0	13.0	0.0	7.0	33.3	14.0	6.5	8.9	9.3	9.0	16.8	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	185	1215	544	450	1380	618	251	625	280	320	400	340
V/C Ratio(X)	0.26	0.44	00.0	0.44	0.75	0.34	0.49	0.48	0.50	0.51	0.72	0.48
Avail Cap(c_a), veh/h	212	1215	544	525	1380	618	251	625	280	372	400	340
HCM Platoon Ratio	1 00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.62	0.62	0.62	1.00	1.00	1.00	1.00	9.0	1.00
Uniform Delay (d), s/veh	202	21.4	0.0	15.7	36.8	28.7	29.5	34.8	34.9	25.5	34.0	31.6
Incr Delay (d2), s/veh	2.0	1,2	0.0	0.4	5.4	0.9	1.5	2.7	6.4	1.2	10.7	4.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	5.6	0.0	5.9	14.2	5.3	2.7	3.9	3.9	3.8	8.5	4.3
LnGrp Delay(d),s/veh	21.0	22.6	0.0	16.1	39.2	29.6	31.0	37.5	41.3	26.7	44.7	36.4
LnGrp LOS	O	ပ		8	O	O	O	٥		O		۵
Approach Vol, veh/h ·		585			1441			299			631	
Approach Delay, s/veh		22.4			34.7			37.0	١		37.4	
Approach LOS		ပ			O			۵	ì		٥	ı
Imer		(4)	300	*	5	9	1					ľ
Assigned Phs	-	2	m	4	S	9	7	80		ì	H	Ì
Phs Duration (G+Y+Rc). s	15.5	25.5	13.7	45.3	11.0	30.0	8.2	50.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	Ù	19.5	14.3	35.7	6.5	25.5	5,5	44.5				
Max Q Clear Time (g_c+1), s		11.3	0.6	15.0	8.5	18.8	3.8	35.3				
Green Ext Time (p_c), s	0.1	3.1	0.2	12,3	0.0	2.7	0.0	6.8				
Intersection Sommary		4		L	ŀ		ŀ					
HCM 2010 Ctrl Delay			33.4									

2040 Total PM.syn 12/12/2017

HCM 2010 Signalized Intersection Summary 1: Ridge Road & Dell Range Boulevard

	`	t	>	*		,	-	-	_	4	•
Movement	Ħ	EBT	H	**************************************	WEI	Wee	IBV	MBI	MBR	SBI	100
Lane Configurations	×	**	R.	k	44	ĸ.	×	*	K.	je-	*
Traffic Volume (veh/h)	112	1323	225	256	1086	182	182	388	321	112	282
Future Volume (veh/h)	112	1323	225	256	1086	182	182	389	321	112	282
Number	7	4	14	က	00	18	2	2	12	-	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1 00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	122	1438	0	278	1180	81	198	423	153	122	307
Adj No of Lanes	-	2	10	-	2	_	-	2	-	-	Ī
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	364	1371	613	229	1503	673	184	809	272	209	282
Arrive On Green	90.0	0.46	0.00	0.21	1.00	1.00	0.08	0.20	0.20	0.05	0.18
Sat Flow, vehilh	1494	2980	1333	1494	2980	1333	1494	2980	1333	1494	1569
Grp Volume(v), vehith	122	1438	0	278	1180	81	198	423	153	122	307
Grp Sat Flow(s), vehilhlin	1494	1490	1333	1494	1490	1333	1494	1490	1333	1494	1569
2 Serve(g_s), s	43	46.0	0.0	10.5	0.0	0.0	7.5	13.2	10.3	5.1	18.0
Cycle Q Clear(g_c), s	4.3	46.0	0.0	10.5	0.0	0.0	7.5	13.2	10.3	5.1	18.0
Prop In Lane	1.00		1.00	1.00		100	1.00		1.00	100	
are Grp Cap(c), veh/h	384	1371	613	229	1503	673	184	809	272	500	282
//C Ratio(X)	0.34	1.05	00.0	-2	0.78	0.12	1.08	0.70	0.56	0.59	1.09
Avail Cap(c_a), vehith	369	1371	613	523	1503	673	184	909	272	500	282
HCM Platoon Ratio	1,00	1.00	1 00	200	2.00	200	1,00	1,00	1,00	1,00	100
Jostrean Filter(II)	1.00	1.00	0.00	0.39	0.39	0.39	1.00	1.00	1.00	1.00	1.00
Jniform Delay (d), s/veh	12.5	27.0	0.0	24.8	0.0	0.0	36.8	36.9	35.8	35.5	410
nor Delay (d2), siveh	0.5	38.2	0.0	11.8	1.7	0	88.0	6.5	8.2	4.2	78.8
nitial () Delay(d3), siveh	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0	00
%ile BackOfQ(50%),vehilin	00	26.1	0.0	13.3	0.4	0.0	4.5	9.0	4.4	7	13.9
.nGrp Delay(d), s/weh	2	65.2	0.0	136.6	13	2	124 7	43.4	440	39.7	119.8
norp LOS	a	1 22.5		L	4	ď	_	2	2		- 1
Approach Vol. venin		0001			600			417			4/5
Applicacii Delay, siveri		L L			0.07			5.45 L.			31.2
Approacii LOS	P	ш	1	I	ر	I	Ì	ш	I	ľ	_
inter	-	Ġ	m		2	9	7	10	Ì		
Assigned Phs	1	2	60	4	5	9	7	∞			
Phs Duration (G+Y+Rc), s	9.6	24.9	15.0	50.5	12.0	22.5	10.6	54.9			
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			
Max Green Setting (Gmax), s	5.1	20.4	10.5	46.0	7.5	18.0	6.4	50.1			
Max Q Clear Time (g_c+11), s		15.2	12.5	48.0	9.5	20 0	6.3	2.0			
Green Ext Time (p_c), s	0.0	2,4	0.0	0.0	0.0	0.0	0.0	35.4			
Intersection Summary	ì	ì	3	i	Ì	Ì	ì	Ì	Ĭ	ţ	
HCM 2010 Ctrl Delay			52.5								П
HCM 2010 LOS			۵								

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HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

2017 Existing AM.syn 12/12/2017

Colore			ŀ		•		,	_	-	_		 -	,
1	Movement	EBL	EBI	EBR	WBI	WBT	WBB	NBE	NBI	NBR	IBS	SBI	SPIC
23 113 224 115 443 166 265 274 77 101 322 7 4 16 43 166 265 274 77 101 322 1 0	Lane Configurations	K	4	¥.	×	43		r	424		M.	4.7	
23 113 284 115 443 166 266 214 77 101 322 1 4 1 3 8 166 26 2 1 6 1 0 100	Traffic Volume (veh/h)	23	113	264	115	443	166	265	214	77	101	322	9/
7 4 14 3 8 18 5 2 1 6 1.00 0 0 0 0 0 0 0 0 1.00	Future Volume (veh/h)	23	113	264	115	443	166	592	214	77	101	322	76
10	Number	1	4	14	က	00	18	ιn	2	12	-	9	16
100	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
100	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28 120 0 151 487 193 388 306 143 155 382 0.82 0.94 0.91 0.70 0.91 0.70 0.91 0.82 0.94 0.81 0.86 0.74 0.70 0.84 0.81 0.86 0.74 0.70 0.84 0.81 0.86 0.74 0.70 0.84 0.81 0.86 0.74 0.70 0.84 0.81 0.82 0.2 2	Adj Saf Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
1 2 0 1 2	Adj Flow Rate, veh/h	28	120	0	151	487	193	358	306	143	125	362	104
0.82 0.94 0.95 0.76 0.91 0.86 0.74 0.70 0.54 0.81 0.88 2	Adj No. of Lanes	-	-	-	-	2	0	-	2	0	-	2	0
2 2	Peak Hour Factor	0.82	0.92	0.92	0.76	0.91	0.86	0.74	0.70	0.54	0.81	0.89	0.73
215 427 353 452 649 256 453 672 307 420 550 1494 1569 1333 1494 2090 323 1494 1999 0.34 0.34 0.34 1494 1569 1333 1494 2090 1494 1999 0.34 0.34 140 1569 1333 1494 1490 1423 1494 1490 1490 140 154 0.0 5.1 15.7 15.8 13.1 8.9 9.3 4.6 10.6 140 150 0.0 5.1 15.7 15.8 13.1 8.9 9.3 4.6 10.6 150 100 100 0.88 100 0.65 100 151 427 333 452 463 442 453 503 475 470 151 223 0.00 0.33 0.75 0.75 0.75 0.75 0.75 0.75 152 27.3 0.00 100 100 100 100 100 100 153 0.33 0.33 0.33 0.35 0.45 0.47 0.30 150 0.0 0.0 0.0 0.0 0.0 0.0 0.0 151 2 3 4 5 5 5 3 3 4 152 27.3 0.0 185 2.32 2.33 16.9 19.4 19.5 188 25.7 153 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 154 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0 0.0 155 0.0 0.0 0.0 0.0 0.0	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1494 1569 1333 1494 2039 1494 1593 1333 1494 1490 1494 1593 1494 1593 1494 1593 1494 1490 1403 1494 1593 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1494 1490 1403 1404 1405 1406 1400	Cap, veh/h	215	427	363	452	649	256	453	672	307	420	550	156
1494 1569 1333 1494 2090 823 1494 1989 909 1494 2294 1494 1569 1333 1494 1490 1494 1490 1494 1569 1333 1494 1490 1494 1490 14	Arrive On Green	0.01	60.0	0.00	0.07	0.31	0.31	0.18	0.34	0.34	0.08	0.24	0.24
28 120 0 151 346 334 358 227 222 125 234 1494 1569 133 1494 1490 1409 1494 1490 1496 1499 1499 1499 1499 1499 1490	Sat Flow, veh/h	1494	1569	1333	1494	2090	823	1494	1989	606	1494	2294	650
1494 1569 1333 1494 1490 1423 1494 1490 1408 1494 1490 110 5.4 0.0 5.1 15.7 158 131 8.9 9.3 4.6 10.6 1.00 1.00 1.00 0.8 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.65 1.00 0.05 0.10 0.65 1.00 0.05 0.10 0.05 0.0	Grp Volume(v), veh/h	28	120	0	151	346	334	358	227	222	125	234	232
1.0 5.4 0.0 5.1 15.7 15.8 13.1 8.9 9.3 4.6 10.6 1.0	Grp Sat Flow(s), veh/h/ln	1494	1569	1333	1494	1490	1423	1494	1490	1408	1494	1490	1454
1.0 5.4 0.0 5.1 15.7 15.8 13.1 8.9 9.3 4.6 10.6 215 427 353 452 453 452 613 615 0.13 0.28 0.00 0.33 0.75 0.75 0.79 0.45 0.47 0.30 0.65 0.13 0.28 0.00 0.33 0.75 0.75 0.79 0.45 0.47 0.30 0.65 0.13 0.23 0.33 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.13 0.33 0.33 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.2 273 0.0 185 232 233 189 184 185 188 257 0.3 16 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.4 25 0.0 0.4 0.6 1.00 1.00 1.00 1.00 1.00 0.4 25 0.0 0.5 7.8 7.6 6.4 4.1 4.0 1.9 5.2 0.5 273 3.1 3.1 3.1 2.3 2.3 2.3 1.9 1.5 273 3.1 3.1 3.1 3.1 3.1 1.5 3 4 5 6 7 8 3.1 1.5 3 4 5 6 7 8 4.5 1.0 2.0 3.6 2.45 180 2.25 6.7 2.78 1.0 2.3 5.1 2.04 13.5 180 2.5 0.0 5.3 1.0 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 3.1 1.5 3.1	Q Serve(g_s), s	1.0	5.4	0.0	5.1	157	15.8	13.1	8.9	9.3	4.6	10.6	10.8
1,00	Cycle Q Clear(g_c), s	1.0	5.4	0.0	5.1	15.7	15.8	13.1	8.9	9.3	4.6	10.6	10.8
215 427 363 482 463 442 453 503 476 420 386 271 427 603 603 605 77 604 605 368 271 427 463	Prop In Lane	1.00		1.00	100		0.58	1 00		0.65	1.00	ľ	0.45
0.13 0.28 0.00 0.33 0.75 0.79 0.45 0.47 0.30 0.65 0.73 0.33 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Lane Grp Cap(c), veh/h	215	427	363	452	463	442	453	503	475	420	358	349
271 427 353 482 463 442 465 563 475 460 386 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.00 100	V/C Ratio(X)	0.13	0.28	0.00	0.33	0.75	0.75	0.79	0.45	0.47	0.30	0.65	0.67
0.33 0.33 0.33 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	271	427	363	452	463	442	453	503	475	450	358	349
0.97 0.97 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	HCM Platoon Ratio	0.33	0.33	0.33	1 00	1.00	1.00	1 00	1.00	1.00	1.00	1.00	1.00
202 273 0.0 185 232 233 169 194 195 188 257 0.0 3 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	0.97	0.97	0.00	1.00	1.00	1.00	1,00	1.00	1.00	1.00	1,00	1.00
0.3 16 0.0 0.4 106 114 9.2 2.9 3.3 0.4 9.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	20.2	27.3	0.0	18.5	23.2	23.3	16.9	19.4	19.5	18.8	25.7	25.8
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Incr Delay (d2), s/veh	0.3	1.6	0.0	0.4	10.6	11.4	9.2	5.9	3.3	0.4	9.0	9.7
0.4 25 0.0 0.5 7.8 7.6 6.4 4.1 4.0 1.9 5.2 2.5 2.5 2.9 0.0 189 3.3.6 3.4.7 26.1 22.3 22.8 19.2 3.4.6 27.3 22.3 22.8 19.2 3.4.6 27.3 27.3 27.3 27.3 27.3 27.3 27.4 24.1 27.3 27.3 27.4 24.1 24.1 27.3 27.4 24.1 24.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
205 289 0.0 189 338 347 261 223 228 192 346 C C C B C C B C C C B C C C B C C C B C C C C B C C C C B C C C C B C C C C C B C C C C C B C	%ile BackOfQ(50%), veh/In	0.4	2.5	0.0	0.5	7.8	2.6	6.4	4.1	4.0	1.9	5.2	5.3
C C B C C C B C C C B C C B C C C B C C C B C C C C B C	LnGrp Delay(d),s/veh	20.5	28.9	0.0	18.9	33.8	34.7	26.1	22.3	22.8	19.2	34.6	35.5
148 831 867 27.3 31.4 24.1 2	LnGrp LOS	ပ	O		В	ပ	U	O	O	ပ	80	O	
27.3 31.4 24.1 C C C C C C C C C C C C C C C C C C C	Approach Vol, veh/h		148			831			807			591	
1 2 3 4 5 6 7 8 10 1 28 96 249 180 225 6.7 278 45 45 45 45 45 45 45 45 45 5 66 11.3 71 74 15.1 128 30 178 0.0 4.6 0.0 4.2 0.0 2.5 0.0 1.3	Approach Delay, s/veh		27.3			31.4			24.1			31.7	
1 2 3 4 5 6 7 10 29 8 44 5 6 7 10 29 86 49 180 225 6 7 45 45 45 45 45 45 45 45 5 66 11.3 71 74 151 128 30 0.0 46 0.0 42 0.0 25 0.0	Approach LOS		ပ			O			ပ			O	
107 298 96 249 180 225 67 7 7 298 96 249 180 225 67 67 67 7 7 238 51 204 151 128 30 0.0 4,6 0.0 4,2 0.0 2,5 0.0 0.0 4,6 0.0 4,2 0.0 2,5 0.0 0.0 4,6 0.0 4,2 0.0 2,5 0.0 0.0 0.0 4,6 0.0 4,2 0.0 2,5 0.0 0.0 0.0 4,6 0.0 4,2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Timer		60	0	NE.	3	60	11	00	ĺ	ŀ		
10.7 29.8 9.6 24.9 18.0 22.5 6.7 45. 45. 45. 45. 45. 45. 45. 45. 45. 45.	Assigned Phs	-	2	e	4	5	9	7	000	ı	h	ı	
8 77 238 5,1 204 135 18,0 5,0 8 66 113 71 74 15,1 128 3,0 20 46 0,0 42 0,0 25 0,0 6 78 88	Phs Duration (G+Y+Rc), s	10.7	29.8	9.6	24.9	18.0	22.5	6.7	27.8			ŀ	ı
s 7.7 238 5.1 20.4 13.5 18.0 5.0 s 66 11.3 7.1 7.4 15.1 12.8 3.0 0.0 4.6 0.0 4.2 0.0 2.5 0.0 28.8	Change Period (Y+Rc), s	45	4.5	4.5	45	4.5	4.5	4.5	4.5	Ì	ľ	Ì	
s 66 11.3 7.1 7.4 15.1 12.8 3.0 0.0 4.6 0.0 4.2 0.0 2.5 0.0 28.8		7.7	23.8	5.1	20.4	13.5	18.0	5.0	20.5			ı	l
0.0 4.6 0.0 4.2 0.0 2.5 0.0 28.8	Max Q Clear Time (q c+11), s	99	11.3	7.1	7.4	151	12.8	3.0	17.8	İ	ľ	Ì	
	Green Ext Time (p_c), s	0.0	4.6	0.0	4.2	0.0	2.5	0.0	1.3				ı
	Interceding Summer	ì		V.			ľ	١	į	į	ļ	å	
	HCM 2010 Chi Delav			28.8									
	HCM 2010 LOS			0.02								1	

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2017 Existing PM syn

HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

	1	†	<u> </u>	4	ļ	1	•	—	4	٨	→	*
Movement	183	EBI	EBR	Œ.	WBT	88	MBK	1991	MBR	SBE	SBI	SBS
Lane Configurations	×	4	ж.	K	4.4		F	424		je.	413	
Traffic Volume (veh/h)	83	438	353	22	339	120	401	401	144	196	240	29
Future Volume (veh/h)	93	438	353	25	339	120	401	401	144	196	240	B
Number	7	4	14	6	80	19	3	2	12	-	ø	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1 00	1,00		100
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8
Adj Sat Flow, velativin	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	127	456	0	72	365	132	427	201	197	215	261	76
Adj No. of Lanes		-	-	i	2	0	-	2	0	-	64	0
Peak Hour Factor	0.73	0.96	0.88	0.79	0.93	0.91	0.94	0.80	0.73	0.91	0.92	0.84
Percent Heavy Veh, %	2	2	7	2	2	2	2	2	2	N	2	2
Cap, veh/h	330	486	413	193	626	223	478	626	245	305	250	157
Arrive On Green	0.02	0.10	0000	90.0	0.29	0.29	0.16	0.30	0.30	0.10	0.24	0.24
Sat Flow, veh/h	1494	1569	1333	1494	2155	768	1494	2095	818	1494	2290	653
Grp Volume(v), veh/h	127	456	0	7.5	251	246	427	356	342	215	168	169
Grp Sat Flow(s), veh/h/ln	1494	1569	1333	1494	1490	1433	1494	1490	1424	1494	1490	1453
O Serve(q_s), s	4.4	21.7	0.0	2.5	10.8	11.0	11.9	16.5	16.6	7.5	7.2	7.5
Cycle Q Clearig_c), s	4.4	21.7	0.0	2.5	10.8	11.0	11.9	16.5	16.6	7.5	7.2	7.5
Prop In Lane	1 00		1.00	100		0.54	1.00		0.58	1:00		0.45
Lane Grp Cap(c), veh/h	330	486	413	193	433	417	478	445	425	302	358	349
V/C Ratio(X)	0.38	0.94	000	0.37	0.58	0.59	0.89	0.80	0.80	0.71	0.47	0.48
Avail Cap(c_a), veh/h	330	486	413	215	433	417	478	445	425	302	358	349
HCM Platoon Ratio	0.33	0.33	0.33	8	1.00	100	1,00	1.00	1 00	100	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.00	1,00	1.00	100	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.6	33.0	0.0	20.0	22.7	22.8	214	24.2	24.3	21.6	24.4	24.5
Incr Delay (d2), s/veh	9.0	23.6	0.0	1.2	5.6	6.0	18.7	13.9	14.9	7.6	4.4	4.00
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	00
%ile BackOfQ(50%),vehi/in	1.9	12.6	0.0	7	5,1	5.1	6.3	8.4	8.2	2.0	3,4	3.5
LnGrp Delay(d),s/veh	19.1	28.6	0.0	21.2	28.2	28.8	40.1	38.2	39.2	29.2	28 8	29.3
LuGrp LOS	B	ш		U	U	O	٥	۵	۵	O	U	U
Approach Vol, vehih		583			569			1125			552	
Approach Delay, s/veh:		48.4			27.6			39.5			29.1	
Approach LOS		۵			U			Q			ပ	
Thigh		200	199	÷	un	100	T.	8				
Assigned Phs	-	2	e	4	2	9	7	80				
Phs Duration (G+Y+Rc), s	12.0	26.9	8.4	27.7	16.4	22.5	9.8	26.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.5	22.4	5.0	22.1	11.9	18.0	5.3	21.8				
Max Q Clear Time (g_c+11), s	9.5	186	4.5	23.7	13.9	9.5	6.4	130				
Green Ext Time (p_c), s	0.0	2.1	0.0	0.0	0'0	4.1	0.0	3 9				
Margarith Sammary			İ	Ì	Ì	į		8				
HCM 2010 Ctrl Delay			36.8									
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HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

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Movement	æ	EBI	EBR	WBI	WBT	WBR	E.	NBT	ABB	386	SBT	SBB
Lane Configurations	*	4	¥.	×	44		3-	4.2		k-	44	
Traffic Volume (veh/h)	24	120	281	122	471	177	282	228	82	107	343	81
Future Volume (veh/h)	24	120	281	122	471	177	282	228	82	107	343	8
Number	1	4	14	က	00	18	S	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1269	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	59	128	0	161	518	206	381	326	152	132	385	111
Adj No of Lanes	-	-	-	-	2	0	-	2	0	-	2	0
Peak Hour Factor	0.82	0.94	0.92	0.76	0.91	0.86	0.74	0.70	0.54	0.81	0.89	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	137	314	267	376	571	226	526	880	405	488	763	217
Arrive On Green	0.01	0.07	00.0	0.10	0.27	0.27	0.19	0.44	0.44	90.0	0.33	0.33
Sat Flow, veh/h	1494	1569	1333	1494	2087	826	1494	1989	606	1484	2291	653
Gra Volume(v), veh/h	29	128	0	161	369	355	381	243	235	132	249	247
Gro Sat Flow(s),veh/h/ln	1494	1569	1333	1494	1490	1423	1494	1490	1408	1494	1490	1453
2 Serve(g. s), s	1.5	7.8	0.0	8.2	23.9	24.1	15.8	10.8	11.2	5.7	13.4	13.7
Cycle Q Clear(g_c), s	1.5	7.8	0.0	8.2	23.9	24.1	15.8	10.8	11.2	5.7	13.4	13.7
Prop In Lane	1.00		1.00	1.00		0.58	1.00		0.65	1.00		0.45
Lane Grp Cap(c), veh/h	137	314	267	376	408	389	526	999	623	488	496	484
V/C Ratio(X)	0.21	0.41	0.00	0.43	0.91	0.91	0.72	0.37	0.38	0.27	0.50	0.51
Avail Cap(c_a), veh/h	172	347	295	397	425	406	629	099	623	537	496	484
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.8
Upstream Filter(I)	96.0	0.96	0.00	1.00	1.00	1.00	1.00	1.00	1.00	9.1	8	1.00
Uniform Delay (d), s/veh	32.5	41.0	0.0	26.4	35.1	35.1	16.4	18.6	18.7	19.1	26.7	26.8
Incr Delay (d2), s/veh	0.7	0.8	0.0	0.8	22.2	23.9	3.3	1.6	1.7	0.3	36	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	0.7	3.5	0.0	3.4	12.4	12.0	6.8	4.7	4.6	2.4	0.9	9.0
LnGrp Delay(d),s/veh	33.2	41.8	0.0	27.1	57.2	29.0	19.8	20.1	20.4	19.4	30.3	30.6
LnGrp LOS	O	D		ပ	ш	ш	В	ပ	O	23	U	
Approach Vol, veh/h		157			882			829			628	
Approach Delay, s/veh		40.3			52.5			20.0			28.1	ı
Approach LOS		۵			0			O			O	Ĭ
Timer	-	23	æ	*	40	9		80	Ì	R	Ĭ	l
Assigned Phs	-	2	က	4	5	9	7	00	Ì	K		
Phs Duration (G+Y+Rc), s	12.1	48.8	14.6	24.5	23.1	37.8	7.3	31.9				
Change Period (Y+Rc), s	4.5	45	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.9	37.5	11.5	22.1	25.5	22.9	5.1	28.5				
Max Q Clear Time (g_c+11), s		13.2	10.2	8.6	17.8	15.7	3.5	26.1				
Green Ext Time (p_c), s	0.1	9.9	0.1	4.3	0.8	3.4	0.0	1.2				
Intersection Summary			ŀ	Ì	ľ	8		ţ.		Ą		ij
HCM 2010 Ctrl Delay			34.7									

ICM 2010 Signalized Intersection Summary	ge Drive & Dell Range Boulevard
HCM 2010 Sig	2: College Driv

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Movement	EBE	HEE	EBS	WBL	WB3	WBR	NBL	NBE	NBB	SE	188	SBR
Lane Configurations	r	4	k.	je-	4.		K-	43		je-	4.5	
Traffic Volume (veh/h)	66	466	376	61	361	128	427	457	153	500	255	89
Future Volume (veh/h)	66	466	376	61	361	128	427	427	153	509	255	99
Number	7	4	14	က	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, wehlhiln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	136	482	0	17	388	141	449	534	210	230	277	9
Adj No. of Lanes	-	-	-	-	2	0	-	2	0	-	5	0
Peak Hour Factor	0.73	96.0	0.88	0.79	0.93	0.91	0.95	0.80	0.73	0.91	0.92	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	7	7	2
Cap, veh/h	315	517	439	166	641	230	520	991	529	317	473	136
Arrive On Green	0.03	0.11	0.00	0.09	0.30	0.30	0.23	0.32	0.32	0.13	0.21	0.21
Sat Flow, veh/h	1494	1569	1333	1494	2151	772	1494	2094	820	1494	2287	959
Grp Volume(v), veh/h	136	485	0	11	267	262	449	380	364	230	179	179
Grp Sat Flow(s), veh/h/ln	1494	1569	1333	1494	1490	1432	1494	1490	1424	1494	1490	1453
Q Serve(g_s), s	6.1	30.7	0.0	3.5	15.3	15.7	23.1	23.4	23.5	12.1	10.8	11.2
Cycle Q Clear(g_c), s	6.1	30.7	0.0	3.5	15.3	15.7	23.1	23.4	23.5	12.1	10.8	11.2
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.58	1.00		0.45
Lane Grp Cap(c), veh/h	315	517	439	166	444	427	520	470	449	317	308	300
V/C Ratio(X)	0.43	0.94	00.0	0.47	09.0	0.61	98.0	0.81	0.81	0.72	0.58	0.60
Avail Cap(c_a), veh/h	364	525	447	167	444	427	520	470	449	317	308	300
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	43.6	0.0	26.6	30.0	30.1	22.3	31.4	31.5	27.5	35.8	35.9
Incr Delay (d2), s/veh	9.0	18.9	0.0	2.0	2.3	2.6	14.1	13.8	14.7	8.0	7.8	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	16.1	0.0	1.5	9.9	6.5	11.5	11.4	11.0	5.7	5.1	5.2
LnGrp Delay(d),s/veh	24.4	62.4	0.0	28.6	32.3	32.7	36.3	45.2	46.1	35.5	43.5	44.4
LnGrp LOS	ပ	ш		O	ပ	ပ	۵	٥	٥	۵	۵	
Approach Vol, veh/h		621			909			1193			588	
Approach Delay, s/veh		54.1	1		32.0			42.1			40.6	1
Approach LOS		۵			ပ			۵			٥	
Temps.		2	3		MO	ě	1	00				
Assigned Phs	1	2	3	4	vo	8	7	80	1			
Phs Duration (G+Y+Rc), s	17.1	36.1	9.4	37.4	28.0	25.2	12.5	34.3				
Change Period (Y+Rc), s	45	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	12.6	30.9	5.0	33.5	23.5	20.0	11.3	27.2				
Max Q Clear Time (g_c+11), s		25.5	5.5	32.7	25.1	13.2	8 1	17.7				
Green Ext Time (p_c), s	0.0	3.0	0.0	0.3	0.0	3.7	0.1	4,4				
Marchine Summan	Ì	į	Ī	ř	ł			Ī		Ĭ		Ī
HCM 2010 Ctrl Delay			423									
HCM 2010 LOS	ľ	ì	0									

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HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

2022 Total AM.syn 12/14/2017

		t	*	•		,	_	-		•	+	7
Experient	EBI	題	EBR	WES	WEE	WBR	E	NEET.	SHER.	8	188	8
Lane Configurations	*	**	¥.	×	474		JF.	4		¥	4	
rraffic Volume (veh/h)	24	141	281	150	535	184	282	528	91	109	343	8
Future Volume (veh/h)	24	141	281	150	535	184	282	228	91	109	343	80
Number	7	4	14	က	80	139	S	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	53	150	0	197	588	214	381	326	169	135	385	111
Adj No of Lanes	-	2	-	-	2	0	-	2	0	-	2	0
Peak Hour Factor	0.82	0.94	0.92	92.0	0.91	0.86	0.74	0.70	0.54	0.81	0.89	0.73
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	851	381	531	788	286	436	643	327	380	478	136
Arrive On Green	0.01	60.0	00.0	0.11	0.37	0.37	0.22	0.34	0.34	0.00	0.21	0.21
Sat Flow, veh/h	1494	2980	1333	1494	2143	778	1494	1915	972	1494	2291	653
Этр Volume(v), veh/h	53	150	0	197	409	393	381	252	243	135	249	247
Srp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1431	1494	1490	1397	1494	1490	1453
Q Serve(g_s), s	1.4	4.6	0.0	8.9	23.9	24.0	19.0	13.5	14.0	7.0	15.9	16.2
Cycle Q Clear(g_c), s	1.4	4.6	0.0	8.9	23.9	24.0	19.0	13.5	14.0	7.0	15.9	16.2
Prop In Lane	1.00		1.00	1.00		0.54	1.00		0.70	1.00		0.45
ane Grp Cap(c), veh/h	200	851	381	531	248	527	436	201	469	380	311	304
//C Ratio(X)	0.14	0.18	0.00	0.37	0.75	0.75	0.87	0.50	0.52	0.35	080	0.81
4vail Cap(c_a), veh/h	235	851	381	278	248	527	495	501	469	419	311	304
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	18	1.00
Jpstream Filter(I)	96.0	96.0	0.00	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1 00
Jniform Delay (d), s/veh	25.8	34.4	0.0	19.9	27.5	27.5	23.1	26.5	26.7	27.2	37.6	37.7
ncr Delay (d2), s/veh	0.3	0.4	0.0	0.4	9.7	7.9	14.5	3.6	4.0	9.0	19.1	20.8
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	9.0	2.0	0.0	3.7	10.9	9.01	9.6	0.9	5.9	2.9	8.	8
.nGrp Delay(d),s/veh	26.1	34.9	0.0	20.3	35.1	35.5	37.6	30.1	30.7	27.7	56,6	58.5
nGrp LOS	٥	د		U				O	O	U	ш	ш
Approach Vol, veh/h		179			666			928			631	
Approach Delay, s/veh		33.5	1		32.3			33.5			51.2	
Approach LOS		ပ			ပ			O			۵	ľ
mier.	2	2	e		i	ij	*	80	Ĭ	ľ		
Assigned Phs	-	2	e	4	32	9	7	œ				
Phs Duration (G+Y+Rc), s	13.3	38.1	15.5	33.1	26.1	25.4	7.3	41.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	_	33.6	14.1	22.9	25.5	19.5	5.1	31.9				
Max Q Clear Time (g_c+11), s	0.6	16.0	10.9	9.9	210	18.2	3.4	26.0				
Green Ext Time (p_c), s	0.1	0.9	0.2	5.7	0.5	0.8	0'0	3.0				
Mersechon Summary	ļ			į,	ì	į		ì	į	i	ļ	I
HCM 2010 Ctrl Delay			37.2									

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HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

ane Configurations Fe far and Configurations Fe farmer Volume (vehh) 99 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		E 16.	HI K	W81	WBK	MBI	ISN :	MBR	SBL	SBI	SBS
100 100 100 100 136 136 136 136 136 136 136 100 100 100 100 100 100 100 100 100 10		Win (#	4		,	1		k	41	
99 99 99 100 1100 1186 136 136 136 136 136 136 136 136 136 100 100 100 100 100 100 100 100 100 10		010		-		F	2			1	
99 7 7 1100 1569 136 136 136 136 136 136 136 136 136 136		3/0	62	401	132	427	427	184	217	255	99
7 100 100 1569 136 136 136 136 136 136 136 136 136 136		376	6/	401	132	427	427	184	217	255	99
100 100 1569 136 13 13 13 13 13 13 13 13 13 13 13 13 13		14	က	œ	18	2	2	12	-	9	16
100 1569 136 136 27 281 281		0	0	0	0	0	0	0	0	0	0
100 1569 1 136 1 0.73 2 2 2 2 2 2 81		1,00	100		100	1,00		1.00	1.00		8
1569 1 136 1 0.73 0 2 2 1 281	_	00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	.8
136 0.73 (699	1569	1589	1600	1569	1569	1600	1569	1569	1600
% 0.73 2 2 281 0.03	557	0	100	431	145	448	534	252	238	277	20
% 2 2 2 281 003 0		4100		2	0		2	0	+	2	0
281		0.88	67.0	0.93	0.91	0.95	0.80	0.73	0.91	0.92	80
281 Smean 0.03		2	2	2	2	2	2	2	2	2	2
0.03		411	264	620	207	543	614	289	326	468	134
		0.00	900	0.28	0.28	0.25	0.31	0.31	0.14	0.20	0.20
1494	2980 1	333	1494	2197	732	1494	1969	926	1494	2287	656
		0	100	291	285	449	404	385	238	179	179
uln 1494	1490 1	333	1494	1490	1439	1494	1490	1405	1494	1490	1453
6.3		0.0	4.8	17.4	17.7	22.5	25.6	25.7	12.3	10.8	11.2
_c), s 6.3	17,9	0.0	4.8	17.4	17.7	22.5	25.6	25.7	12.3	10.8	11.2
1.00		1.00	1.00		0.51	1.00		99.0	1.00		0.45
p(c), veh/h 281		411	264	420	406	543	465	438	326	302	297
0.48		00.0	0.38	0.69	0.70	0.83	0.87	0.87	0.73	0.59	0.60
h 286	-1	411	264	420	406	809	465	438	356	302	297
0.33		0.33	1.00	1.00	1.00	90	1.00	00.	00.	90.5	1.00
0.69		000	0.91	0.91	0.91	1.00	1.00	1.00	1.00	00.1	1.00
eh 25.5		0.0	24.9	32.0	32.1	21.1	32.5	32.5	26.9	36.0	36.1
0.9		0.0	0.8	8.3	9.0	8.4	19.3	50.6	6.8	8.0	8.8
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
vehifin 2.7		0.0	20	8.5	 00	10.4	129	12.5	5.6	÷	5.2
y(d),siveh 26.4	412	0.0	25.7	40.4	413	29.6	51.7	53.1	33.7	44.0	44.9
nGrp LOS C	۵		ပ	۵	۵	O	٥	۵	O	٥	
	693			919			1235			969	
y, sweh	60		Ì	38.5			44.1			40.1	
pproach LOS	٥			۵			Ф			۵	
mer T	8	9	*	46	9	1	8				Ā
1 1	2	3	4	5	9	7	8				
		10.0	35.3	29.7	24.9	12.6	32.7				
Change Period (Y+Rc), s 4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
s 16.5		5.5	28.8	59.6	18.1	8.5	25.8				
c+1), s 14.3	27.7	8.9	19.9	24.5	13.2	83	19.7				
		0.0	4.7	0.7	2.9	0.0	3.5				
scepton Summary									I		9
HCM 2010 Ctrl Delay	7	40.9									
HCM 2010 LOS	000	۵									

Synchro 9 Report Page 1

FBL FEST FBP WEL WET WEST	4	†	7	1	ţ	4	•	←	4	•	→	*	
1	Movement	EBI	183	EBR	WBI	WBI	WER	HE	181	MBR	153	SBT	SBB
150 351 153 559 221 353 255 102 134 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 170 186 1869 1869 1869 1869 1860 1869 1860 1869 186 186 186 186 186 186 186 186 186 186 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 187 188 188 188 188 188 188 188 188 188 188	Lane Configurations	ji.	4	¥.	K	44		×	4.0		je.	42	
150 351 153 580 221 353 285 102 134 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 100 100 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1560 1333 1494 422 725 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1490 1434 1560 1333 1494 1490 1428 1494 1560 1333 1494 1490 1428 1494 1560 133 133 133 133 133 133 1560 133 133 133 133 133 133 1570 1440 1560 130 130 1570 1440 1560 130 130 130 1570 1440 1560 130 130 130 1570 1440 138 348 254 256 256 256 1570 1440 138 348 254 256 256 256 1570 1440 138 348 254 256 256 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 1450 1570 1440 1450 1450 145	Traffic Volume (veh/h)	31	150	351	153	290	221	353	285	102	134	428	101
7 4 14 3 8 18 5 2 12 10 10 100 100 100 100 100 100 100	-uture Volume (veh/h)	31	150	351	153	290	221	353	285	102	134	428	101
100	Number	7	4	14	e	σο	18	2	2	12	-	9	16
100 100 100 100 100 100 100 100 100 100	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Ped-Bike Adj(A_pbT)	1 00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569 1569 1569 1660 1569 1569 1660 1569 1569 1569 1660 1569 1569 1569 1660 1569 1670 1670 1711 146 175 176 17	Parking Bus, Adj	1,00	100	1.00	1 00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
34 163 0 166 641 240 384 310 111 146 092 092 092 092 092 092 092 092 092 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
175 476 404 462 776 290 092 092 092 092 092 092 092 092 092	Adj Flow Rate, veh/h	34	163	0	166	641	240	384	310	111	146	465	110
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adj No. of Lanes	-	-	-	-	2	0	-	2	0	-	2	0
175 476 404 462 776 290 402 72 290 411 414 4169 4133 4144 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 795 4149 2124 21	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
175 476 404 462 776 290 409 712 250 441 1494 1569 1333 1494 2124 795 1494 1490 1494 1494 1569 1333 1494 1490 1424 1490 1494 1494 1569 1333 1494 1490 1428 1494 1490 1494 1494 1569 1333 1494 1490 1428 1494 1490 1494 1496 1569 1333 1494 1490 1428 1494 1490 1494 1497 1569 1333 1494 1490 1428 1494 1490 1494 1498 1569 1333 1494 1490 1428 1494 1490 1494 1409 1400 100 100 100 100 1400 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 100 1500 100 100 100 100 100 1500 100 100 100 100 100 1500 100 100 100 100 100 1500 100 100 100 100 100 1500 100 100 100 100 1500 100 100 100 100 100 1500 100 100 100 100 1500 100 100 100 100 1500 100 100 100 100 1500 100 100 100 100 1500 100 100 100 1	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Hebritian 1494 1569 1333 1494 2124 795 1494 2164 760 1494 1569 1333 1494 1244 1490 1490	Cap, veh/h	175	476	404	462	176	290	409	712	250	411	491	115
1494 1569 1333 1494 2124 795 1494 2164 760 1494 169 1494 169 1494 169 1494 1494 169 1494 1494 1496 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494 1496 1494<	Arrive On Green	0.01	0.10	000	60'0	0.37	0.37	0.22	0.33	0.33	0.09	0.21	0.21
34 163 0 166 450 431 394 212 209 146 1494 1569 1333 1494 1490 1430 1494 1569 133 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490 1430 1494 1490	Sat Flow, veh/h	1494	1569	1333	1494	2124	795	1494	2164	260	1494	2396	563
1494 1569 1333 1494 1490 1428 1494 1490 1434 1494 1494 1490 1434 1494 1490 1434 1494 1496 1437 1494 1496 1437 1494 1496 1437 1494 1496 1437 1494 1496 1437 1496 1438 1494 1496 1438 1496 1438 1496 1438 1496 1438 1496 1438 1496 1438 1496 1438 1496	Sro Volume(v), velvh	8	163	0	166	450	431	384	212	508	146	288	787
16 97 00 73 274 275 196 111 115 75 100 116 97 00 73 274 275 196 111 115 75 100 1	Grp Sat Flow(s),veh/h/ln	1494	1569	1333	1494	1490	1428	1494	1490	1434	1494	1490	1469
1.6 9.7 0.0 7.3 27.4 27.5 19.6 11.1 11.5 7.6 10.0 10.0 10.0 10.0 10.0 10.0 10.0 10	2 Serve(g_s), s	1.6	6.1	0.0	7.3	27.4	27.5	19.6	111	11.5	97	19.0	193
100 100 100 0.65 100 0.65 100 0.65 100 0.65 100 0.65 100 0.65 100 0.65 100 0.65 0.04 0.04 0.05 0.04 0.04 0.05 0.0	Cycle Q Clear(q_c), s	1.6	6.7	0.0	7.3	27.4	27.5	19.6	11.1	11.5	7.6	19.0	19.3
175 476 404 462 545 522 409 409 472 411 205 476 404 462 585 522 409 409 472 411 205 476 404 492 585 523 439 644 638 208 638 638 638 638 638 638 203 633 633 100 100 100 100 100 100 256 557 60 60 60 60 60 60 60 20 60 60 60 60 60 60 60	Prop In Lane	1.00		1,00	1.00		0.56	1.00		0.53	100		0.38
0.19 0.24 0.00 0.36 0.83 0.84 0.84 0.85 0.84 0.89 0.84 0.89 0.84 0.89 0.84 0.89 0.84 0.89 0.84 0.89 0.89 0.89 0.89 0.89 0.89 0.89 0.89	.ane Grp Cap(c), veh/h	175	476	404	462	545	522	406	490	472	411	305	8
205 476 404 482 545 552 433 460 472 442 693 033 033 000 100 100 100 100 100 100 10	//C Ratio(X)	0.19	0.34	0.00	0.36	0.83	0.83	0.94	0.43	0.44	0.36	16.0	0.95
0.33 0.33 0.33 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), vehith	205	476	404	492	545	522	433	480	472	442	305	3
0.93 0.93 0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	HCM Platoon Ratio	0.33	0.33	0.33	100	1.00	1.00	1.00	1.00	1.00	8	1.00	1.00
256 357 100 700 788 242 262 264 272 015 118 010 015 134 139 2776 28 310 015 017 45 010 010 010 010 010 017 45 010 30 133 128 135 50 49 32 026 375 010 30 133 128 135 50 49 32 027 020 020 020 020 020 027 037 037 037 037 037 028 039 039 039 039 037 037 038 038 039 039 04 037 038 038 039 039 05 04 039 039 039 06 07 08 07 07 08 09 09 09 08 09 09 09 09 09 09 09	Upstream Filter(I)	0.93	0.93	0.00	1.00	1.00	1.00	1.00	9.	90	18	1.00	1.00
0.5 1.8 0.0 0.5 13.4 13.9 27.6 2.8 3.0 0.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Uniform Delay (d), siveh	55.6	35.7	0.0	20.0	28.8	28.8	242	262	26.4	27.2	39.2	393
00 00 00 00 00 00 00 00 00 00 00 00 00	ncr Delay (d2), s/veh	0.5	1,38	0.0	0.5	13,4	13.9	27.6	2.8	3.0	0.5	38.7	41.
07 45 00 30 133 128 135 50 49 32 261 375 00 204 422 428 518 290 294 277 197 1047 0	nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
261 375 0.0 204 4.22 4.28 518 390 294 277 107 107 1047 1040 107 107 1040 107 107 1040 107 1040 107 1040 107 1040 <	%ile BackOfQ(50%),veh/In	0.7	4.5	0.0	3.0	13,3	128	13.5	5.0	4.9	3.2	111	11.3
C D C D D D C C C C C C C C C C C C C C	LnGrp Delay(d).s/veh	26.1	37.5	0.0	20.4	42.2	42.8	51.8	29.0	29.4	27.7	77.9	804
197 1047 805 356 380 400 D D D 1 2 3 4 5 6 7 8 14.0 37.4 13.8 34.8 26.4 25.0 7.6 41.0 4.5 4.5 4.5 4.5 4.5 4.5 4.5 5 116 32.9 31.17 7.13 22.9 5 9.6 13.5 9.3 11.7 7.13 3.6 29.5 0.1 6.1 0.1 6.0 0.3 0.0 0.0 2.0	nGrp LOS	ပ	0		O	۵	۵	0	O	O	O	ш	
356 380 400 1 2 3 4 5 6 7 8 140 374 138 348 264 250 76 410 45 45 45 45 45 45 45 16 324 113 267 235 205 51 2 1 61 0.1 60 0.3 0.0 0.0 20	Approach Vol, veh/h		197			1047			805			721	
D D D D D D D D D D D D D D D D D D D	Approach Delay, siveh		35.6			39.0			40.0			68.7	
1 2 3 4 5 6 7 140 374 138 348 264 250 76 4 5 45 45 45 45 45 45 45 5 6 51 8 9.6 135 9.3 117 216 213 36 20 0.1 6.1 0.1 6.0 0.3 0.0 0.0	Approach LOS		O			0			0		l	ш	Ĺ
140 374 138 348 264 250 76 45 45 45 45 45 45 45 85 816 35 916 115 910 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Turber		-	er.	15	4	ف	į.	**	ŀ		Ì	Ň
14.0 37.4 13.8 34.8 26.4 25.0 7.6 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	Assigned Phs	-	2	6	4	2	9	7	∞			ı	H
45 45 45 45 45 45 45 45 45 45 85 85 10 85	Phs Duration (G+Y+Rc), s	14.0	37.4	13.8	34.8	26.4	25.0	7.6	41.0				
s 11.6 324 11.3 26.7 23.5 20.5 5.1 3 5 9.6 13.5 9.3 11.7 21.6 21.3 3.6 20.0 0.1 6.1 6.0 0.3 0.0 0.0 0.0 46.8	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
s 96 135 9.3 117 216 213 36 3 0,1 6,1 0,1 6,0 0,3 0,0 0,0 46,8 46,8		11,6	32.4	11.3	26.7	23.5	20.5	5.1	32.9				
0.1 6.1 0.1 6.0 0.3 0.0 0.0 46.8		9.6	13.5	93	11.7	21.6	213	3.6	29.5				
	Green Ext Time (p_c), s	0.1	6.1	0.1	0.9	0.3	0.0	0.0	2.0				
	Intercection Summary	ľ		į	l		Ì	ŀ	Ì	l	į	er T	į
	HCM 2010 Ctrl Delay			46.8									
	HCM 2010 LOS		ŧ	0			b		į		ļ	ı	9

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JM 2010 Signalized Intersection Summary	II Range Boulevard
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IN 207	College

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Novement	EBE	EBI	EBR	WBE	WBI	WBR	IBN	MBT	MBR	388	SBT	SBR
ane Configurations	K.	4	¥.	K	47		<i>y</i>	44		¥	4	
rraffic Volume (veh/h)	124	583	470	92	451	160	534	534	192	261	319	82
-uture Volume (veh/h)	124	583	470	92	451	160	534	534	192	261	319	82
Number	7	4	14	က	8	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	i	1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	135	634	0	83	490	174	280	280	500	284	347	92
Adj No of Lanes	-	-	ζ-	-	2	0	-	2	0	-	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	557	473	147	713	252	456	572	206	295	421	110
Arrive On Green	0.02	0.12	00.0	0.05	0.33	0.33	0.23	0.27	0.27	0.15	0.18	0.18
Sat Flow, veh/h	1494	1559	1333	1494	2161	763	1484	2150	773	1494	2339	612
Grp Volume(v), veh/h	135	634	0	83	337	327	580	402	387	284	219	220
Grp Sat Flow(s), veh/h/lin	1494	1569	1333	1494	1490	1434	1494	1490	1432	1494	1490	1461
2 Serve(g_s), s	5.8	35.5	0.0	3.6	19.6	19.8	23.5	26.6	26 6	14.9	14.2	14.5
Cycle O Clear(g_c), s	5.8	35.5	0.0	3.6	19.6	19.8	23.5	26.6	56.6	14.9	14.2	14.5
Prop in Lane	1,00		1.00	1.00		0.53	1.00		0.54	1.00		0.42
Lane Grp Cap(c), veh/h	286	292	473	147	492	473	456	386	381	295	268	283
V/C Ratio(X)	0.47	1.14	000	0.57	69.0	0.69	1.27	1.01	102	96.0	0.82	80
Avail Cap(c_a), vehith	286	257	473	147	492	473	456	386	381	295	268	263
HCM Platoon Ratio	0.33	0.33	0.33	1 00	100	100	100	1.00	100	1 00	100	100
Upstream Filter(I)	0.58	0.58	000	1.00	1.00	1.00	1.00	1.00	1,00	1,00	1.00	50
Uniform Delay (d), s/veh	23.0	44.1	0.0	25.8	29.0	29.1	25.4	36.7	36.7	30.1	39.4	39.6
Incr Delay (d2), slveh	0.7	75.2	0.0	9.0	7.6	8.0	138.5	48.6	50.4	42.6	23.4	25.8
nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8
%ile BackOfQ(50%), veh/in	2.4	27.0	0.0	1.7	6.1	8.9	17.6	16.3	15.8	5.2	7.5	7.7
LnGrp Delay(d), siveh	23.7	1193	0.0	30.8	36.6	37.1	164.0	85.4	87.1	726	629	65.3
LuGrp LOS	ပ	LL		O	۵	۵	u.	ıL	4	ш	ш	ш
Approach Vol, veh/h		692			747			1369			723	
Approach Delay, s/veh		1025			36.2			119.2			67.4	
Approach LOS		Œ			۵			ш			ш	
		2	80	w	S	9	is	80		ŀ	ŀ	
Assigned Phs	-	2	e	¥	5	9	7	∞		ı	l	
hs Duration (G+Y+Rc), s	19.4	31.1	9.5	40.0	28.0	22.5	120	37.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	14.9	56.6	5.0	35.5	23.5	180	7.5	33,0				
Max Q Clear Time (g_c+11), s	16.9	28.6	9.9	37.5	25.5	16.5	7.8	21.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0'0	0.0	1.0	0.0	6.2				
sterochu Sumay		ì	Ì		l	R	i	L		Ì	١	Ī
HCM 2010 Ctrl Delay			88.1								ľ	
IOIN The same and			,									

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

2040 Total AM syn

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help) 104 297 351 278 840 221 333 322 175 134 491 104 297 351 278 840 221 353 322 175 134 491 104 297 351 278 840 221 353 322 175 134 491 104 297 351 278 840 221 353 322 175 134 491 104 297 351 278 840 221 353 322 175 134 491 104 297 351 278 840 221 353 322 175 134 491 104 291 100 100 100 100 100 100 100 100 100 1	Novement	199	183	EBR	WBL	WBI	WBR	MBI	MBT	NBR	TBS	SEL	SBR
Public 194 287 351 278 840 221 353 322 175 134 491 140 297 351 278 840 221 353 322 175 134 491 140 297 351 278 840 221 353 322 175 134 491 140 297 351 278 840 221 353 322 175 134 491 140 100 1.00 1.00 1.00 1.00 1.00 1.00	Lane Configurations	K	**	¥.	je.	++	¥L.	K.	4	¥.	b.	*	E.
eth(t) 104 297 351 278 840 221 353 322 175 134 491 1	Traffic Volume (veh/h)	104	287	351	278	840	221	353	322	175	134	491	226
100	Future Volume (veh/h)	104	297	351	278	840	221	353	322	175	134	491	226
100	Number	7	4	14	e	80	18	2	2	12	_	9	16
bbf) 100 100 100 100 100 100 100 100 100 10	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
100 100	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
hith 1569 1569 1569 1569 1569 1569 1569 1569	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1,00	1.00	100	1.00	1.00	1.00	1.00
113 323 0 302 913 240 384 350 190 146 534 1 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569
1 2 1 1 2 1 1 2 1 1 2 2 2 2 2 2 2 2 2 2	Adj Flow Rate, veh/h	113	323	0	302	913	240	384	350	190	146	534	246
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adi No of Lanes	-	2	-	-	2	-	2	2	-	-	2	Ī
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
240 941 421 557 1199 536 568 769 344 347 700 0.09 0.42 0.00 0.15 0.40 0.40 0.40 0.40 0.40 0.40 0.40 0.4	Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
1494 290 042 0.00 0.15 0.40 0.40 0.12 0.26 0.26 0.09 0.23 1494 2980 1333 1494 2980 1333 1494 2980 1333 1494 2980 1333 1494 2980 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 129 264 131 9.9 9.9 12.3 7.3 167	Cap. veh/h	240	941	421	557	1199	536	568	169	344	347	200	313
1494 2980 1333 1494 2980 1333 2896 2880 1333 1494 2980 1494 2980 1494 2980 1494 1494 1494	Arrive On Green	60.0	0.42	0.00	0.15	0.40	0.40	0.12	0.26	0.26	0.09	0.23	0.23
113 323 0 302 913 240 384 350 190 146 534 1494 1490 1333 1494 1490 1433 1494 1490 1495 5.1 7.3 0.0 12.9 264 131 9.9 9.9 12.3 7.3 167 1.00 1.00 1.00 1.00 1.00 1.00 1.00 247 0.34 0.00 0.34 0.75 0.45 0.68 0.46 0.34 347 700 0.34 0.34 0.00 0.34 0.75 0.45 0.68 0.46 0.34 347 700 0.38 0.38 0.38 0.39 0.40 0.00 1.00 1.00 1.00 0.39 0.39 0.39 0.39 0.57 0.30 0.30 0.00 0.30 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.30 0.00 0.00 0.00 0.00 0.00 0.00 0.30 0.00 0.00 0.00 0.00 0.00 0.30 0.00 0.00 0.00 0.00 0.00 0.30 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	Sat Flow, veh/h	1494	2980	1333	1494	2980	1333	2898	2980	1333	1494	2980	1333
1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 1333 1494 1490 130 120	Gro Volume(v), veh/h	113	323	0	302	913	240	384	350	190	146	534	246
5.1 7.3 0.0 12.9 26.4 131 9.9 9.9 12.3 7.3 16.7 16.7 16.0 10.0 10.0 10.0 10.0 10.0 10.0 10.0	Gro Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1333	1449	1490	1333	1494	1490	1333
1.00	2 Serve(a s). s	5.1	7.3	0.0	12.9	26.4	13.1	6.6	6.6	12.3	7.3	16.7	17.3
1.00	Cycle Q Clear(g_c), s	5.1	7.3	0.0	12.9	26.4	13.1	6.6	9.6	12.3	7.3	16.7	17.3
hh 240 941 421 557 1199 538 588 769 344 347 700 247 0334 000 0.54 0.76 0.48 0.68 0.46 0.55 0.42 0.76 0.48 0.55 131 31 33 1.00 1.00 1.00 1.00 1.00 1.00	Prop In Lane	1.00		1.00	1.00		100	1.00		1.00	1.00	Ì	1.00
133 133 134 160 0.654 0.76 0.45 0.66 0.46 0.55 0.42 0.76 1.36 0.48 0.46 0.55 0.42 0.76 1.36 0.48 0.48 0.48 0.48 0.48 0.70 0.48 0.48 0.88 0.00 0.62 0.62 0.62 0.00 1.00 1.00 1.00 1.00 0.88 0.88 0.00 0.62 0.62 0.62 1.00 1.00 1.00 1.00 1.00 0.00 0.00 0.0	Lane Grp Cap(c), veh/h	240	941	421	557	1199	536	999	692	344	347	200	313
251 941 421 648 1199 536 568 769 344 361 700 1.33 1.33 1.33 1.30 1.00 1.00 1.00 1.	V/C Ratio(X)	0.47	0.34	0.00	0.54	0.76	0.45	89.0	0.46	0.55	0.42	92'0	0.79
1.33 1.33 1.33 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	251	941	421	648	1199	536	568	692	344	381	200	313
0.88 0.88 0.00 0.62 0.62 0.62 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
221 220 0.0 169 257 218 263 312 321 254 356 113 0.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	0.88	0.88	0.00	0.62	0.62	0.62	1.00	1.00	1.00	1.00	1.00	1.00
13 0.9 0.0 0.5 2.9 1.7 3.2 1.9 6.3 0.8 7.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	22.1	22.0	0.0	16.9	25.7	21.8	26.3	31.2	32.1	25.4	35.6	35.9
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Incr Delay (d2), s/veh	1.3	6.0	0.0	0.5	5.9	1.7	3.2	1.9	6.3	0.8	7.7	17.7
22 31 0.0 5.4 11.3 5.0 4.2 4.3 5.1 3.0 7.6 2.3 2.9 0.0 17.4 28.6 23.4 29.5 33.1 38.4 28.3 43.3 2.0 C C C D C D C D C D C D C D C D C D C	Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23.3 22.9 0.0 17.4 28.6 23.4 29.5 33.1 38.4 26.3 43.3 43.5 43.5 43.5 43.5 43.5 43.5 43	%ile BackOfQ(50%),veh/In	2.2	3.1	0.0	5.4	11.3	5.0	4.2	4.3	5.1	3.0	7.6	7.9
12 1455 14	LnGrp Delay(d),s/veh	23.3	22.9	0.0	17.4	28.6	23.4	29.5	33.1	38.4	26.3	43.3	53.6
436	LnGrp LOS	O	ပ		8	ပ	ပ	ပ	ပ	۵	O	۵	
230 25.4 32.7 C C C C C C C C C C C C C C C C C C C	Approach Vol, veh/h		436			1455			924			926	
1 2 3 4 5 6 7 1 1 1 2 1 3 1 4 1 5 1 1 1 3 1 3 1 3 1 3 1 4 1 5 1 1 3 1 1 3 1 3 1 3 1 1 3	Approach Delay, s/veh		23.0			25.4			32.7			43.4	
1 2 3 4 5 6 7 13 2 3 4 5 6 7 13 30 3 199 36,1 160 280 113 14 5 25 215 25,5 115 23,5 7,5 9,3 14,3 14,9 9,3 119 19,3 7,1 0,1 4,9 0,5 8,6 0,0 2,7 0,0	Approach LOS		ပ			ပ			O			٥	
137 303 199 36.1 16.0 28.0 113 45 45 45 45 45 45 45 45 45 9.3 119 193 71 50.1 49 0.5 8.6 0.0 2.7 0.0	Tieser	- Brown	0	m	*	Ġ	9	1000	8	b	ł	ŀ	
13.7 30.3 19.9 36.1 16.0 28.0 11.3 45 45 45 45 45 45 45 45 45 45 9.3 14.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 23.5 11.5 25.5 11.5 25.5 11.5 25.5 11.5 25.5 11.5 25.5 11.5 25.5 11.5 25.5 11.5 25.5 25	Assigned Phs	-	2	က	4	5	9	7	80				
45 45 45 45 4.5 4.5 4.5 4.5 4.5 115 235 215 255 115 235 7.5 9.3 14.3 14.9 9.3 11.9 19.3 7.1 0.1 4.9 0.5 8.6 0.0 2.7 0.0	Phs Duration (G+Y+Rc), s	13.7	30.3	19.9	36.1	16.0	28.0	11.3	44.7				
11.5 23.5 21.5 25.5 11.5 23.5 7.5 9.3 14.3 14.9 9.3 11.9 19.3 7.1 0.1 4.9 0.5 8.6 0.0 2.7 0.0 31.4	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				f
9.3 14.3 14.9 9.3 11.9 19.3 7.1 0.1 4.9 0.5 8.6 0.0 2.7 0.0 31.4		11.5	23.5	21.5	25.5	11.5	23.5	7.5	39.5				
0.1 4.9 0.5 8.6 0.0 2.7 0.0 31.4	Max Q Clear Time (q c+11), s		14.3	14.9	9.3	11.9	19.3	7.1	28.4				1
	Green Ext Time (p_c), s		4.9	0.5	8.6	0.0	2.7	0.0	6.7				
	Interpolity Communication	i		Ì	ŀ	Ì	ĺ	Ì	į	ì		į	
	HCM 2010 Ctd Delay			24.4									
	HOM 2010 CUI Delay		ì	5		ı			ı			ı	

2040 Total PM.syn

HCM 2010 Signalized Intersection Summary 2: College Drive & Dell Range Boulevard

	\	†	-	•	,	,	-	-	,	A	+	7
lovement	183	183	æ	WBE	WBT	WBR	MEE	NBI	MBR	Ħ	381	SBR
ane Configurations	M	*	Pin	JE.	44	Ж.	**	**	*_	je.	4	Pt
raffic Volume (veh/h)	312	096	470	232	292	160	534	628	380	261	397	241
-uture Volume (veh/h)	312	096	470	232	763	160	534	628	380	261	397	241
Number	7	4	14	က	8	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569	1569
Adj Flow Rate, veh/h	339	1043	0	252	829	57	280	683	217	284	432	105
Adj No of Lanes	-	2	-	-	2	-	2	2	-	_	2	-
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	338	1037	464	248	897	401	700	647	289	277	280	264
Arrive On Green	0.22	0.46	00:00	0.12	0:30	0.30	0.16	0.22	0.22	0.14	0.20	0.20
Sat Flow, veh/h	1494	2980	1333	1494	2980	1333	2898	2980	1333	1494	2980	1333
Sro Volume(v), veh/h	339	1043	0	252	829	22	280	683	217	284	432	105
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1333	1449	1490	1333	1494	1490	1333
2 Serve(q s), s	16.5	34.8	0 0	118	56.9	3.1	15.6	21.7	15.2	13.7	13.6	6.9
Cycle Q Clear(g_c), s	16.5	34.8	0.0	11.8	56.9	3.1	15.6	21.7	15.2	13.7	13.6	6'9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
ane Grp Cap(c), veh/h	338	1037	464	248	897	401	700	647	588	277	230	264
VIC Ratio(X)	1.00	1.01	0.00	1.01	0.92	0.14	0.83	1.06	0.75	1.03	0.73	0.40
Avail Cap(c_a), veh/h	338	1037	464	248	897	401	700	647	289	277	290	264
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jpstream Filter(I)	0.11	0.11	0.00	0.64	0.64	0.64	1.00	8	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.8	56.9	0.0	25.5	33.8	25.5	27.9	39.2	36.6	30.3	37.6	34.9
ncr Delay (d2), s/veh	16.5	10.5	0.0	49.4	11.6	0.5	8 2	51.1	16.3	61.1	7.8	4 4
nitial Q Delay(d3),s/veh	0.0	0.0	00	0 1	0.0	0.0	0.0	0.0	00	00	00	0.0
%ile BackOfQ(50%), veh/In	10.8	15.7	0.0	10.2	12.5	1.2	2.5	13.5	6.9	9.9	6.2	2.8
LnGrp Delay(d),s/veh	39.3	37.4	00	751	45.5	26.0	36.1	90.3	52 9	914	45.4	393
LIIGID LOS	ш	ш		ıL	۵	ပ		4	٥	ш		
Approach Vol, veh/h		1382			1138			1480			821	
Approach Delay, s/veh		37.9			51.0			63.6			909	
Approach LOS		٥			۵			ш			ш	
ime	-	e,	-	v	147	9	11	8	Ī			
Assigned Phs	944	2	က	4	22	9	7	00				
Phs Duration (G+Y+Rc), s	18.2	26.2	16.3	39.3	20.1	24.3	21.0	34.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	13.7	21,7	11.8	34.8	15.6	19.8	16.5	30.1				
Max Q Clear Time (g_c+11), s	15.7	23.7	13.8	36.8	17.6	15.6	18.5	28.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0'0	0.0	2,9	0.0	1.0				
Intersection Summery	Î				Ì	ľ	İ	i	i	۱	ł	
HCM 2010 Ctd Delay		a.	52.7									

Synchro 9 Report Page 1

M Unsignalized Intersection Capacity Analysis	: Van Buren Avenue & Dell Range Boulevard
HCM Unsig	3: Van Bure

2017 Existing AM.syn 12/12/2017

	\	†	>	/	ļ	1	~	-	•	ě	+	•
Movement	25	188	EBR		WEST	HOM	NBI	MBT	NBR	SBI	55	SSO
Lane Configurations	×	42		je.	¢Å.			4			4	
Traffic Volume (veh/h)	-	161	9/	17	377	0	43	4	9	0	6 0	Ī
Future Volume (Veh/h)	•	161	9/	17	377	0	43	4	9	0	80	-
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.84	0.49	0.53	06.0	0.92	29'0	0.25	0.38	0.92	0.40	0.25
Hourly flow rate (vph)	4	192	155	32	419	0	64	16	16	0	20	4
Pedestrians				į					ì		ı	Ĭ
Lane Width (ft)											1	
Walking Speed (ft/s)				۱				ì			i	i
Percent Blockage											١	1
Right turn flare (veh)					ı	i	Ì					
Median type		TWLTL			TWLTL							1
Median storage veh)		2			2							ľ
Upstream signal (ft)											١	1
pX, platoon unblocked						i				ŀ	ŀ	1
vC, conflicting volume	419			347			774	260	270	707	838	419
vC1, stage 1 conf vol							278	278	1	483	483	ì
vC2, stage 2 conf vol					ı		497	483		224	322	
vCu, unblocked vol	419			347			774	760	270	707	838	419
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)					ı		6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			98	97	86	100	96	99
cM capacity (veh/h)	1140			1212			470	485	169	498	462	634
Direction, Cane #	183	E8 2	1881	WB2	184	188	1	Ì.	ŀ	8		
Volume Total	4	347	32	419	96	24					١	
Volume Left	4	0	32	0	9	0						ı
Volume Right	0	155	0	0	16	4					1	1
cSH	1140	1700	1212	1700	202	484			l	ı		
Volume to Capacity	0.00	0.20	0.03	0.25	0.19	0.05				١	1	1
Queue Length 95th (ft)	0	0	2	0	17	4						
Control Delay (s)	8.2	0.0	8.1	0.0	13.8	12.8		١	١		١	1
Lane LOS	×		V		œ	8						ı
Approach Delay (s)	0.1		9.0		13.8	12.8					Ì	
Approach LOS					00	00						
Inforcerton Samman	i				Ì	Ĭ	Ī	Ĭ				
Average Delay			2.1									
Intersection Capacity Utilization	ration		40.4%	2	ICU Level of Service	of Service			A			
1												

2017 Existing PM.syn 12/12/2017

	\	†	*	*		,		-	_	À.	•	,
Movement	88	HH	EBB	WBE	WBT	WBR	MBI	NBT	NBR	TBS:	SBT	SBR
Lane Configurations	*	ęŻ.		K	24			4			ę	
Traffic Volume (veh/h)	2	458	65	-	331	0	33	5	10	0	e	-
Future Volume (Veh/h)	2	458	65	_	331	0	38	c)	10	0	က	-
Sign Control		Free			Free			Stop			Stop	ı
Grade	0	%	i.	100	%0	000	0	%0	9 0	000	%0	0
Heak Hour Factor	0.50	0.90	0.85	0.25	380	78.0	0.03	0.62	0.42	76.0	0.38	070
Podoctrions	+	800	2	+	203	0	8	0	47	0	0	4
l ane Width (#)												ĺ
Walking Speed (fl/s)		I	١					ŀ				Ì
Percent Blockage												
Right furn flare (veh)								l		Ì		
Median type		TWLTL		ĺ	TWLTL							ı
Median storage veh)		0			2						l	
Instream signal (B)												
bX. platoon unblocked		Ì	ŀ									
vC, conflicting volume	389			585			096	952	547	942	066	389
vC1, stage 1 conf vol	ŀ						555	555		397	397	
vC2, stage 2 conf vol							405	397		545	593	
vCu, unblocked vol	389			585			096	952	547	942	066	389
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	88	96	100	86	66
cM capacity (veh/h)	1170			066			434	439	537	423	425	629
Direction Lane #	189	E8.2	WBif	W8.2	181	188	A	l	Ì	İ	ì	Ĭ
Volume Total	4	585	4	386	92	12						
Volume I,eft	4	0	4	0	09	0				٩	i	h
Volume Right	0	9/	0	0	24	4						
SH	1170	1700	066	1700	457	482						
Volume to Capacity	000	0.34	0.00	0.23	0.20	0.02						
Queue Length 95th (ft)	0	0	0	0	19	2						
Control Delay (s)	8.1	0.0	8.7	0.0	14.9	12.7						
Lane LOS	¥		4		8	8						
Approach Delay (s)	0.1		0.1		14.9	12.7						
Approach LOS					В	В						ł
Moconfern Salmman		Ĭ	i	H	ď	į	H	ľ	l	i		
Average Delay		ı	1.5		ľ		ŀ	ı	ı	ı		
Intersection Capacity Utilization	ation		50.2%	ō	U Level o	ICU Level of Service			∢			
Annie Daried (min)			1									

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ICM Unsignalized Intersection Capacity Analysis	2022 Background AM.syn
: Van Buren Avenue & Dell Range Boulevard	12/12/2017

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Movement	EBF	EBI	FBR	WBL	WBT	WBR	NE	NBT	MBC	8	188	100
Lane Configurations	*	Ž.		3 5	23			4			4	
Traffic Volume (veh/h)	-	171	81	18	401	0	46	4	9	0	6	-
Future Volume (Veh/h)	-	171	81	18	401	0	46	4	9	0	6	Ī
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.84	0.49	0.53	0.30	0 92	290	0.25	0.38	0 92	0.40	0,25
Hourly flow rate (vph)	4	204	165	34	446	0	69	16	16	0	23	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												۹
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2						í	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	446			369			824	808	286	750	891	446
vC1, stage 1 conf vol							294	294		514	514	
vC2, stage 2 conf vol							530	514		236	377	
vCu, unblocked vol	446			369			824	808	286	750	891	446
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)						Ĭ	6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3,5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			82	26	86	100	95	8
cM capacity (veh/h)	1114			1190			447	467	753	478	444	612
Direction, Lage #	田	EB 2	WB1	WB 2	NB 1	SBT	i	ì	ì	ì	i	
Volume Total	4	369	34	446	101	27						
Volume Left	4	0	34	0	69	0						ì
Volume Right	0	165	0	0	16	4						
CSH	1114	1700	1190	1700	481	463						
Volume to Capacity	00'0	0.22	0.03	0.26	0.21	90.0						
Queue Length 95th (ft)	0	0	2	0	20	2						
Control Delay (s)	8.2	0.0	8.1	0.0	14.5	13.3						
Lane LOS	⋖		4		8	В						
Approach Delay (s)	0.1		9.0		14.5	13.3						
Approach LOS					8	8	į			ı		
Intersection Summary		ļ.		į	ķ	ŀ	Ĭ	١	ľ	ł		ŀ
Average Delay			2.2				ł				ı	
Intersection Capacity Utilization	ration		42.1%	2	U Level	ICU Level of Service			∢			ı

HCM Unsignalized Intersection Capacity Analysis 3: Van Buren Avenue & Dell Range Boulevard

	\	t	-	>			-	_	_		•	
fovernent	FBI	581	FRR	MB	18%	WBB	MBI	NBT	NBR	1	199	SBP
and Configurations	×	ę		k	4			4			4	
Target Maliano (12 ft)		407	00		250	c	V	ed u	14	c	C	Ī
ramic volume (ven/n)	7	46/	8		225		9:	0	= :	، د	0 0	ľ
-uture Volume (Veh/h)	2	487	69	-	352	0	40	2	1	0		
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.50	06.0	0.85	0.25	0.85	0.92	0.63	0.62	0.42	0.92	0.38	0.25
Hourly flow rate (vph)	4	541	81	4	414	0	63	00	56	0	80	4
Pedestrians												
ane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
DX, platoon unblocked												
AC, conflicting volume	414			622			1020	1012	582	1001	1052	414
vC1, stage 1 conf vol							290	280		422	422	
vC2, stage 2 conf vol							430	422		629	630	
vCu, unblocked vol	414		h	622			1020	1012	582	1001	1052	414
C. single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)							6.1	5.5		6.1	5.5	
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
on queue free %	100			100			82	88	95	100	86	66
cM capacity (veh/h)	1145			959			413	422	513	401	407	638
Direction Lune #	EBI	585	WB.1	WB.2	NB.1	SB 1	Ī	ŀ		j) A	
Volume Total	4	622	4	414	97	12						
Volume Left	4	0	4	0	63	0						
Volume Right	0	81	0	0	56	4						
-SS-	1145	1700	959	1700	437	463						i
Volume to Capacity	0.00	0.37	00.0	0.24	0.22	0.03						
Queue Length 95th (ft)	0	0	0	0	21	2						
Control Delay (s)	8.2	0.0	80	0.0	15.6	13.0						
Lane LOS	∢		V		O	В						
Approach Delay (s)	0.1		0.1		15.6	13.0						
Approach LOS					O	Ф			ŀ			
Intersection Summary		r						ľ	i			đ
Average Delay			1.5				ļ		þ	h		Í
Intersection Capacity Utilization	ation		52.5%	2	U Level o	ICU Level of Service			¥			

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HCM 2010 Signalized Intersection Summary 3: Van Buren Avenue & Dell Range Boulevard

2022 Total AM.syn 12/12/2017

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THE STATE OF	8	188	586	MBI	WBI	MBR	NBI	MEN	MBR	is:	SBT	SBR
ane Configurations	<u> </u>	ęž.		K	t,		F	L3		W.	£	
raffic Volume (veh/h)	24	180	81	52	429	2	46	6	æ	7	23	72
-uture Volume (veh/h)	24	180	81	25	429	2	46	6	80	7	23	72
Number	7	4	14	e	∞	18	വ	2	12	Ī	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	96	214	165	47	477	2	69	36	21	œ	28	288
Adj No of Lanes	-	-	0	-	-	0	1	-	0	1		0
Peak Hour Factor	0.25	0.84	0.49	0.53	0.90	0.92	0.67	0.25	0.38	0.92	0.40	0.25
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	400	457	352	470	998	4	213	330	193	513	81	404
Arrive On Green	0.56	0.56	0.56	0.56	0.56	0.56	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, vehin	912	823	634	1000	1561	7	1031	930	543	1341	229	1138
Srp Volume(v), veh/h	96	0	379	47	0	479	69	0	22	00	0	346
Grp Sat Flow(s), veh/h/lin	912	0	1457	1000	0	1567	1031	0	1473	1341	0	1368
2 Serve(g_s), s	7.5	0.0	15.6	3.0	0.0	19.6	6.2	0.0	2.6	0.4	0.0	21.8
Cycle Q Clear(g_c), s	27.1	0.0	15.6	18.6	0.0	19.6	28.0	0.0	2.6	3.0	0.0	21.8
Prop In Lane	1.00		0.44	1.00		0.00	1.00		0.37	1.00		0.83
ane Grp Cap(c), veh/h	400	0	808	470	0	870	213	0	523	513	0	486
//C Ratio(X)	0.24	0.00	0.47	0.10	0.00	0.55	0.32	0.00	0.11	0.05	0.00	0.71
Avail Cap(c_a), veh/h	400	0	808	470	0	870	213	0	523	513	0	486
HCM Platoon Ratio	1.00	1:00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9.0	9:	1.00
Jpstream Filter(I)	0.92	0.00	0.92	1.00	0.00	1.00	0.96	0.00	96.0	1.00	0.00	1.00
Jniform Delay (d), s/veh	22.9	0.0	13.4	19.0	0.0	14.3	40.0	0.0	21.6	22.6	0.0	27.8
ncr Delay (d2), s/veh	1.3	0.0	1 .	0.4	0.0	2.5	3.9	0.0	0.4	0.1	0.0	8.6
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	2.0	0.0	9.9	6.0	0.0	9.0	2.0	0.0	1.1	0.7	0.0	9.4
-nGrp Delay(d),s/veh	24.3	0.0	15.2	19.4	0.0	16.8	43.8	0.0	22.0	22.7	0.0	36.5
nGrp LOS	ပ		8	Ф	١	œ			U	O		
Approach Vol, veh/h		475			526			126			354	
Approach Delay, s/veh		17.0			17.0			34.0			36.2	
Approach LOS		00			8			O			٥	
Integral	۰	es	m	**	9	ija		8		1	į	
Assigned Phs	ľ	2		4		9		80			J	
Phs Duration (G+Y+Rc), s		40.0		0 09		40.0		0.09				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		35.5		55.5		35.5		55.5				
Max Q Clear Time (g_c+1), s		30.0		29.1		23.8		21.6				
Green Ext Time (p_c), s		1,4		7.1		23		9-7				
Intersection Symmetries		ĺ	ľ	ľ	ŀ		١		l	ŀ	į	Į
HCM 2010 Ctrl Delay			23.0									

2022 Total PM.syn 12/12/2017

4CM 2010 Signalized Intersection Summary	3: Van Buren Avenue & Dell Range Boulevard
Signalized I	en Avenue 8
JCM 2010	3: Van Bur

	1	Ť	>	1	ļ	1	•	-		*	→	*
Movement	H	EBT	æ	WE	WEI	WER	NBE	NBI	MBR	SBI	SBT	SBB
Lane Configurations	je-	.		je.	£		JC.	£		J.	£\$	
Traffic Volume (veh/h)	79	518	69	5	370	00	40	20	19	4	12	46
Future Volume (veh/h)	79	518	69	2	370	80	40	20	19	4	12	46
Number	7	4	14	က	œ	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	158	929	81	20	435	6	63	32	45	4	32	184
Adj No of Lanes	-	-	0	-	-	0		-	0	Ī	-	0
Peak Hour Factor	0.50	06.0	0.85	0.25	0.85	0.92	0.63	0.62	0.42	0.92	0.38	0.25
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	586	606	128	406	1034	21	178	139	195	324	47	273
Arrive On Green	99.0	0.68	99.0	0.68	0.68	0.68	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	942	1346	189	773	1531	32	1161	591	831	1317	202	1162
Grp Volume(v), veh/h	158	0	657	20	0	444	63	0	77	4	0	216
Grp Sat Flow(s), veh/h/ln	942	0	1535	773	0	1563	1161	0	1422	1317	0	1364
Q Serve(g_s), s	9.5	0.0	24.3	1.5	0.0	12.9	5.2	0.0	4.4	0.2	0.0	14.4
Cycle Q Clear(g_c), s	22.0	0.0	24.3	25.8	0.0	12.9	19.6	0.0	4.4	4.6	0.0	14.4
Prop In Lane	1.00		0.12	1.00		0.02	1.00		0.58	1.00		0.85
Lane Grp Cap(c), veh/h	586	0	1036	406	0	1055	178	0	334	324	0	320
V/C Ratio(X)	0.27	0.00	0.63	90.0	0.00	0.42	0.35	0.00	0.23	0.01	0.00	0.67
Avail Cap(c_a), veh/h	586	0	1036	406	0	1055	178	0	334	324	0	320
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.00	0.09	1.00	00.0	1.00	96.0	0.00	96.0	1.00	0.00	1.00
Uniform Delay (d), s/veh	124	0.0	9.5	16.6	0.0	7.4	43.7	0.0	30.9	32.8	0.0	34.8
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.2	0.0	1.2	5.3	0.0	1.5	0.1	0.0	10.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	10.3	0.3	0.0	5.8	1.9	0.0	1.9	0.1	0.0	6.4
LnGrp Delay(d),s/veh	12.5	0.0	9.5	16.8	0.0	9.6	49.0	0.0	32.5	32.9	0.0	45.6
LnGrp LOS	В		A	8		∢			ပ	O		
Approach Vol, veh/h		815			464			140			220	
Approach Delay, s/veh		10.1			9.0			39.9			45.4	
Approach LOS		œ			V			0			O	
Imer	-	2	177	w	S	۵	-	00	ř	Ì	ŀ	F
Assigned Phs		2		4		9		80				
Phs Duration (G+Y+Rc), s		28.0		72.0		28.0		720				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		23.5		67.5		23.5		67.5				
Max Q Clear Time (g_c+1), s		21.6		26.3		16.4		27.8				
Green Ext Time (p_c), s		0.4		11.3		1.2		11.2				
Attended Summary	ŀ	١	ŀ	ì	ľ	١	ſ	ŀ	l	l	ļ	ľ
HCM 2010 Ctrl Delay			17.0									

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	1	†	<u> </u>	-	ţ	4	•	—	•	٠	→	*
Movement	EBI	H	EBR	WE	WEI	WES	E	NET	NBB	Š	55	ies.
Lane Configurations	je-	£		k	24			4.2			42	
Traffic Volume (veh/h)	4	214	101	23	502	0	22	, co	00	0	=	
Future Volume (Veh/h)	-	214	101	23	502	0	22	ĸ	80	0	=	
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	Ψ-	233	110	52	546	0	62	S	0	0	12	Ì
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)											ŀ	
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	546			343			893	886	288	842	941	546
vC1, stage 1 conf vol							290	290		969	296	
vC2, stage 2 conf vol							603	969		246	345	
vCu, unblocked vol	246			343			893	886	288	845	941	546
tC, single (s)	4,1			4.1			7.1	6.5	6.2	7.1	6.5	9
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			82	66	66	100	97	100
cM capacity (veh/h)	1023			1216			426	440	751	443	427	538
Direction; Lane #	E	EB 2	WB1	WB2	NET	SB1	į	ì	ŀ	l	ŀ	j,
Volume Total		343	25	546	9/	13						
Volume Left	-	0	52	0	62	0						B
Volume Right	0	110	0	0	6	_						
CSH	1023	1700	1216	1700	450	434						
Volume to Capacity	0.00	0.20	0.02	0.32	0.17	0.03						
Queue Length 95th (ft)	0	0	2	0	15	2						
Control Delay (s)	8.5	0.0	8.0	0.0	14.6	13.6						
Lane LOS	V		V		B	8						
Approach Delay (s)	0.0		0.4		14.6	13.6						
Approach 1 Oc	*				2	2 6		ł		١	۱	ı

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ICU Level of Service

15 49.3% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis 3: Van Buren Avenue & Dell Range Boulevard

fovertent	æ	199	586	Meli	WBT	WBR.	ME	1881	MBR	188	SBI	SBR
ane Configurations	M.	2,		×				4			¢	
Fraffic Volume (veh/h)	'n	609	98	-	440	0	51	7	13	0	4	-
-uture Volume (Veh/h)	3	609	98	-	440	0	51	7	13	0	4	_
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	က	662	93	-	478	0	22	æ	14	0	4	
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												j
Percent Blockage												
Right turn flare (veh)												
Median type	Ī	TWLT			TWLTL							
Median storage veh)		2			2							
Jpstream signal (ft)												1
oX, platoon unblocked												
vC, conflicting volume	478			755			1198	13	108	1166	1241	478
vC1, stage 1 conf vol				l			714	714		480	480	
AC2, stage 2 conf vol							483	480		989	161	1
/Cu, unblocked vol	478			755			1198	1194	208	1166	1241	478
C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)							6.1	5.5		6.1	5.5	ı
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
on dueue free %	100			100			82	86	97	100	66	100
cM capacity (veh/h)	1084			855			358	371	434	356	357	287
Direction Lane &	T SH	583	WBI	WB2	NB.1	3B.1		l				
Volume Total	က	755	-	478	11	22						
Volume Left	3	0	-	0	22	0						
Volume Right	0	93	0	0	14	-						
EST.	1084	1700	855	1700	371	387						
Volume to Capacity	0.00	0.44	0.00	0.28	0.21	0.01						
Queue Length 95th (ft)	0	0	0	0	19	-						
Control Defay (s)	8.3	0.0	9.5	0.0	17.2	14.4						
Lane LOS	4		4		ပ	20						
Approach Delay (s)	0.0		0.0		17.2	14.4						
Approach LOS					ပ	8						
Aberceting Summany	۱	ľ	H		Ĭ		j.	Š	l	j	H	
Average Delay	I	I	-				١	l	N		ŀ	1
Intersection Capacity Utilization	tion		AF 69	_	lava I I	ICLL Level of Service			α			
			2	2	2000	77			1			

Synchro 9 Report Page 1

tersection Summary	Dell Range Bouleyard
HCM 2010 Signalized Intersection Summary	3: Van Buren Avenue & Dell Range Boulevard

2040 Total AM.syn

Lane Configurations 11 13 12 12 13 13 14 15 15 16 16 16 16 16 16	324 324 324 4 0 0 1.00 1.00 2 2 1027 0.65 1569 352 11269 110.0 110.0	101 101 110 110 110 110 110 110 110 1133 3.1 3.1	73 73 73 73 73 73 73 73 73 73 79 79 79 79 79 79 79 79 79 79 79 79 79	690 690 8 8 8 8 8 8 8 8 8 0 0 0 1,00 1,00 1,00	15 15 16 10 10 10 10 10 10 10 10 10 10 10 10 10	57 57 57 57 57 60 100 1100 1269 62 129 129 129 1025 1077 1077	49 49 49 49 49 69 53 53 53 69 212 212 212 212 00.0 00.0	37 37 37 12 0 1.00 1.00 1.00 60 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	25 25 1.00 1.00 1569 27 27	± 8 8 9 0 0	189
111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	324 4 4 0 0 0 0 1.00 352 352 352 0.05 569 352 569 10.07 10.0	101 101 1101 1100 1100 1100 1100 1100	73 73 73 73 70 11.00 1569 79 79 79 79 79 79 79	690 690 690 8 8 8 8 0 0 1569 1569 1569 1569 1569 1569 1665 1665	15 18 18 10 1.00 1.00 1600 1600 0 0 0 0 0 0 0 2 2 2 2 2 2 2 3 3 3 3 3	57 57 57 62 0 1.00 1.00 1.00 1.00 2 1.00 2 1.00 1.29 6.25 1.29 0.25 1.07 1.07 1.07 1.07 1.07 1.07 1.07 1.07	49 49 49 49 2 2 53 53 53 69 2 212 0 0 0 0 2 2 2 2 2 2 2 2 2 2 0 0 0 0	37 37 12 10 1.00 1.00 1.00 1.00 1.00 1.00 1.0	25 25 1.00 1.00 1.69 27 27	<u></u> \$ \$ \$ \$ \$ 0 0	189 189 16
111 111 111 111 111 111 111 111 111 11	324 4 4 0 0 1.00 569 352 352 2 2 0.05 10.00 10.0	101 101 101 14 100 1569 1100 2 2 2 2 2 2 1100 1100 1100 1110 1110 1110 1133 3.1	73 73 73 73 79 79 79 65 926 926	690 690 690 1569 1569 1569 1500 165 1530 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	15 1600 1600 1600 1600 1600 1600 1600 16	57 57 57 1.00 1.00 1.00 1.569 62 129 0.92 129 0.25 1077 62 1077 62 1077 82 83 82 83 83 83 84 85 85 85 86 86 86 86 86 86 86 86 86 86 86 86 86	49 49 2 2 2 53 53 60.25 60.25 831 0.25 831 0.00	37 37 12 100 1.00 1.00 1600 40 0 0 0 0 0 0 0 2 2 160 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.00 1.55 27 27 27 27 27 27 27 27 27 27 27 27 27	. 8 8 9 0	189 189 16
1111	324 4 4 0 0 0 0 569 352 352 2 2 2 2 2 027 0.65 1569 110.0	101 14 0 100 1569 1100 1100 1100 1100 1100 1100 1100 11	73 3 3 1.00 1.00 1.00 1.569 79 79 2 586 0.65 926 79	690 8 8 8 8 8 7 100 1569 750 750 750 750 750 750 750 750	15 100 100 100 160 160 0 0 0 0 0 0 0 0 0 0	5 5 6 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	49 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	37 12 0 1.00 1.00 1600 40 0 0 0 0.92 2 2 160 160 0 0.92 2 82 160 160 160 160 160 160 160 160 160 160	1.00 1.00 1.69 27	98 9 0	189
7 1.00 1.00 1.00 1.00 1.20 1.00 1.00 1.00	4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14 0 0 11.00 10.00	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	8 8 0 0 1569 750 1 1002 0 65 1530 0 00	18 1.00 1.00 1.00 1.00 1.00 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3	1.00 1.00 1.00 1.00 1.00 1.00 2 2 2 2 1.02 0.25 1.07 1.07 1.00 1.00 1.00 1.00 1.00 1.00	100 100 1569 53 53 53 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	12 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 27	90	16
100 100 120 121 121 121 123 128 10.92 10.92 10.93 10.04 10.0	0 1.00 352 352 1 1 0.92 2 027 027 0.65 160 10.0 10.0	0 1100 1100 1100 110 2 2 2 2 873 873 133 1133 3.1	1.00 1.00 1.00 1.00 7.9 2 2 2 2 2 5.86 9.26 7.9 7.9	0 1100 11569 750 1 0.92 2 2 2 2 1002 0 00 0 00	0 1.00 1.00 1.00 1.00 1.00 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3	0 1.00 1.00 1.00 62 62 129 0.92 129 0.25 1077 62 62 1077	100 1569 53 53 53 2 2 2 2 2 2 2 2 2 2 83 83 0.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00 1.00 1.00 1.00 40 0 0.92 2 2 2 2 160 0.25 627	1.00 1.00 1569 27	0	C
1.00 1.00 1.21 1.21 1.21 1.22 1.29 1.100 1.000 1	1.00 352 352 1 1 0.92 2 027 005 569 352 10.0 10.0	1.00 1.00 1.10 1.10 1.10 2 2 2 8.73 8.87 1.10 1.10 1.13 3.1	1.00 1.00 1.00 1.00 2 2 5.86 0.65 9.26 7.9	1,00 1,569 7,50 1,009 2,2 2,2 1,009 0,65 0,65 0,65 0,65	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1.00 1.00 1.00 1.00 2 1.00 2 1.29 0.25 10.77 10.77 5.3 5.3	1.00 1569 53 53 1 0.92 2,2 2,2 2,2 831 831	1.00 1600 1600 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00		,
1.00 1.569 1.00 2.02 2.02 0.052 0.065 0.065 0.065 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	1.00 569 352 1 0.92 2 0.027 0.65 569 10.0 10.0	1.00 110 110 110 2 2 873 873 0.065 110 110 1333 3.1	1.00 1569 79 79 2 2 586 0.65 926 79	1,00 1,569 750 1,092 1,002 1,002 1,530 0 0 0 0 0	1,00 1600 1600 16 0 0 0,92 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1.00 1569 62 62 129 2 129 0.25 1077 1077 5.3 25.5	1.00 1569 53 53 1 0.92 222 212 0.25 831	1.00 1600 40 0 0.92 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 627	1569		1.00
1569 11 121 121 121 13 129 129 139 142 143	569 352 1 0.92 2 0.027 0.65 569 352 1569 10.0 10.0	110 110 0.92 2 2 2 873 0.65 1333 1110 1110 1333 3.1	1569 79 79 2 2 2 2 2 586 0.65 926 79 79	1569 750 1 0.92 2 2 2 1002 1065 1530 0 0 0	1600 16 0 0 0.92 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1569 62 1 129 125 0.25 1077 1077 5.3 25.5	1569 53 53 212 212 0.25 831 0	1600 40 0.92 160 0.25 627	1569	1.00	1.00
121 : 121 : 28 : 28 : 28 : 28 : 28 : 28	352 0.92 2 2 2 0027 352 352 352 1569 10.0 10.0	110 1 0.92 2 873 0.65 1333 110 3.1	79 1 0.92 2 2 586 0.65 926 79	750 1 0.92 2 2 2 2 1002 1530 0 0 0 0	16 0 0 0.92 2 2 2 2 3 3 3 3 3 3 3 2 1 5 6 3 3 3 3 3 3 3 3 2 2 3 3 3 3 3 3 3 3 3	62 129 0.92 129 0.25 1077 1077 5.3	0.25 0.25 0.25 0.00 0.00	40 0.92 2 160 0.25 627	27	1569	1600
eh, % 29 10 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1 2 2 2 2 0027 0.65 1569 1569 110.0 10.0	1 0.92 2 873 873 0.65 1133 110 110 3.1	1 0.92 2 586 0.65 926 926	0.00 0.00 0.00 0.00 0.00 0.00	0.02 2 2 2 2 33 33 2 33 2 33 2 33 2	0.92 2 129 0.25 1077 1077 5.3 25.5	0.92 212 0.25 0.25 0 0	0.92 2 160 0.25 627	,	93	202
eh, % 298 11 eh/h 298 11 eh/h 199 11 c), s 100 t, veh/h 298 11 c), s 100 t, veh/h 298 11 eh/h 298 11 sisch	0.92 2 0027 0.65 1569 352 352 100 100 100 0.34	0.92 2 873 0.65 1333 110 110 3.1	0.92 2 586 0.65 926 79 926	0.00 0.00 0.00 0.00	0.92 2.2 2.2 2.3 3.3 3.3 3.3 3.3 3.3 3.3 3.	0.92 129 0.25 1077 62 1077 5.3 25.5	0.92 212 212 0.25 831 0	0.92 160 0.25 627		-	0
eh. % 2 8 11 659 61 699 11 eel/th 121 1 142 1 150 69 11 eel/th 121 1 142 1 150 69 1	2 0027 0.65 1569 352 1569 10.0 10.0	2 873 0065 11333 110 110 3.1	2 586 0.65 926 79 926	1530 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21 21 0.65 33 33 2 33 2 33 2 0 0 2	2 129 0.25 1077 62 1077 5.3 25.5	0.25	160 0.25 627	0.92	0.92	0.92
298 11 699 11 699 11 ceht/h 121 c, s 1.00 . veht/h 298 1 bit 20,3 c, veht/h 298 1 bit 20,3 c, veht/h 298 1 bit 3,3 sveh 3,3 c,3 c,4 c,4 c,4 c,4 c,4 c,4 c,4 c,4 c,4 c,4	027 0.65 1569 352 1569 10.0 10.0 0.34	873 0.65 1133 110 110 3.1	586 0.65 926 79	1002 0 65 1530 0 0	21 0.65 33 766 1563 33.2 0.02	129 0.25 1077 1077 5.3 25.5	212 0.25 831 0 0	0.25 627	2	2	2
0.65 G eb/h 121 121 14.2 14.2 15. s 1.00 1. veh/h 121 14.2 10.0 1. veh/h 121 14.2 10.0 1. veh/h 129 11 298 11 3, sveh 1, sveh	0.65 352 352 10.0 10.0 10.2 0.34	0.65 1333 110 1333 3.1	0.65 926 926	1530	33 33 33 2 33 2 33 2 0 0 2	0.25 1077 62 1077 5.3 25.5	0.25 0 0 0.0	627	337	111	245
699 11 121 121 121 121 121 121 121 121 121	352 352 1569 10.0 10.0 10.27	1333 110 1333 3.1 3.1	926	0 0 0 0	33 1563 33.2 33.2 0.02	62 1077 5.3 25.5	0.0	627	0.25	0.25	0.25
121 1699 1. 1699 1. 17.3 1. 100 2. 298 1. 1.00	352 1569 10.0 10.0 10.27 0.34	110 1333 3.1 3.1	79 926	0000	766 1563 33.2 33.2 0.02	62 1077 5.3 25.5	0.0	03	1298	437	962
699 1 47.3 47.3 47.3 47.3 1.00 2.98 1 1 1.00	10.0 10.0 10.27 0.34	1333 3.1 3.1	926	0 0 0	1563 33.2 33.2 0.02	1077 5.3 25.5	0.0	20	27	0	298
14.2 1 14.2 1 14.3 1 14.3 1 12.98 1 12.98 1 12.98 1 10.0 1	10.0 10.0 1027 0.34	3.1	4 4	000	33.2	5.3	0.0	1458	1298	0	1399
s 47.3 1 1.00 1.00 1.00 1.00 1 1.00 1	10.0	3.1	4 1	0	33.2	25.5		5.1	1.7	0.0	20.2
100 100 100 100 100 100 100 100	0.34		14.1	0.0	0.05		0.0	5.1	6.8	0.0	20.2
nh 298 1 0.41 (298 1 1.00 1 0.92 (eth 27.7 eth 3.8 eth 3.8	0.34	1.00	1 00		1004	1.00		0.43	9.1		0.69
0.41 0 298 1 1.00 1 0.92 0 eh 27.7 3.8 eh 0.0 eh/ln 3.0	0.34	873	586	0	1024	129	0	372	337	0	357
298 1 1.00 1 0.92 (eh 27.7 3.8 eh 0.0 eh/n 3.0	-	0.13	0.13	0.00	0.75	0.48	0.00	0.25	0.08	0.00	0.84
1.00 1 0.92 (0.92 (27.7 3.8 eh 0.0 eh/ln 3.0	10.57	873	586	0	1024	129	0	372	337	0	357
0.92 (27.7 3.8 0.0 3.0 31.5	1.00	1.00	1.00	1.00	100	1.00	1.00	100	9:	00 1	9.1
3.8 3.8 0.0 3.0 31.5	0.92	0.92	1.00	0.00	8	0.58	0.00	0.58	1.00	0.00	1.00
3.8 3.0 31.5	7.7	6.5	10.8	0.0	11.7	47.5	0.0	29.6	32.3	0.0	35.3
3.0 31.5	0.8	0.3	0.5	0.0	2.0	7.2	0.0	6 0	0.5	0.0	20.1
31.5	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0
31.5	4.5	1.2	Ξ	0.0	15.5	2.0	0.0	7.1	0.7	0.0	0.6
	8.5	6.8	1	0.0	16.7	54.7	0.0	306	32.8	0.0	55.4
0	∢	∢	20		Ω	٥		د	د		
	283			845			155			325	
', s/veh	129			16.2			40.2			53.5	١
Approach LOS	m			00			۵			O	
	*	es	*	10	9	98	00	3			
Assigned Phs	2		4		9		60		ı		
G+Y+Rc), s	30.0		70.0		30.0		20.0				
	4.5		4.5		4.5		4.5				
x), s	25.5		65.5		25.5		65.5				
40	27.5		49.3		22.2		35.2				
Green Ext Time (p_c), s	0.0		8.7		6.0		12.0				
Intersortion Summers	ř	İ	ŧ	į							5
HCM 2010 Cirl Delay		23.5									
HCM 2010 LOS		0					1	4	3		

2040 Total PM.syn

HCM 2010 Signalized Intersection Summary 3: Van Buren Avenue & Dell Range Boulevard

	1	t	~	1	ļ	1	*	•	4	٨	-	*
Mevernent	EBE	EB	EBB	WBE	WBI	WBR	WBIL	NBI	MBR	SBL	SBT	SBR
Lane Configurations	¥-	4	*	¥.	23		je.	£,		je.	4	
Traffic Volume (veh/h)	285	891	98	83	674	38	21	120	88	31	86	235
Future Volume (veh/h)	285	891	98	63	674	38	51	120	88	31	86	235
Number	7	4	14	က	80	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	310	968	93	68	733	41	22	130	96	æ	107	255
Adj No of Lanes	-	-	-	-	-	0	-	-	0	F	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	2	2	2	2	2	2	7	2
Cap, veh/h	369	1118	951	202	1049	29	72	165	122	129	91	194
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	694	1569	1333	530	1472	82	1016	839	620	1150	412	983
Grp Volume(v), veh/h	310	896	93	89	0	774	22	0	226	봈	0	362
Grp Sat Flow(s), veh/h/In	694	1569	1333	530	0	1554	1016	0	1459	1150	0	1395
Q Serve(g_s), s	45.8	46.3	2.2	11.0	0.0	28.5	0.0	0.0	14.7	5.9	0.0	19.7
Cycle Q Clear(g_c), s	71.3	46.3	2.2	57.3	0.0	28.5	19.7	0.0	14.7	17.6	0.0	19.7
Prop In Lane	1.00		1.00	1.00		0.05	1.00		0.45	1.00		0.70
Lane Grp Cap(c), veh/h	369	1118	951	205	0	1108	72	0	287	129	0	275
V/C Ratio(X)	0.84	0.87	0.10	0.33	0.00	0.70	0.76	0.00	0.79	0.26	0.00	1.32
Avail Cap(c_a), veh/h	369	1118	951	205	0	1108	72	0	287	129	0	275
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.16	0.16	0.16	1.00	0.00	1.00	0.44	0.00	0.44	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	10.8	4.4	32.2	0.0	8.2	20.0	0.0	38.1	46.5	0.0	40.2
Incr Delay (d2), s/veh	3.8	1.6	0.0	4.3	0.0	3.7	28.4	0.0	9.3	4.9	0.0	166.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	8.9	20.1	0.8	1.9	0.0	13.2	2.1	0.0	9.9	1.7	0.0	20.2
LnGrp Delay(d),s/veh	33.3	12.3	4.5	36.5	0.0	11.9	78.4	0.0	47.5	51.4	0.0	206.2
LnGrp LOS	ن	m	∢			m	ш			٥		٦
Approach Vol, veh/h		1371			845			281			386	
Approach Delay, s/veh		16.5			13.9			53.5			192.9	
Approach LOS		Ф			8			Ω			ш	
Tirstein	-	2	60	Ħ	9	60	J.	8				
Assigned Phs	4	2	l	4	ľ	9		80		ľ		ı
Phs Duration (G+Y+Rc), s		24.2		75.8		24.2		75.8				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		19.7		71.3		19.7		71.3				
Max Q Clear Time (g_c+1), s		217		73.3		21.7		59.3				
Green Ext Time (p_c), s		0.0		0.0		0.0		10.3				
Information Summers	ŀ	ľ	l	١	l	l	ŀ		Ì	ľ		Ī
HCM 2010 Ctd Delay			43.5									
HCM 2010 LOS												
2011			1									

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		1	Ť	<i>></i>	/	Ļ	4	•	←	4	٠	→	¥
-	Movement	183	183	EBR	WBI	WBT	MBR	MEE	NBT	MBR	Ø	188	8
	Lane Configurations	je.	ęź		K	4			Ą			ę	
,	Traffic Volume (veh/h)	0	135	22	-	379	0	48	0	0	0	0	1
_	Future Volume (Veh/h)	0	135	22	-	379	0	48	0	0	0	0	Ī
	Sign Control		Free			Free			Stop			Stop	
	Grade		%0			%0			%0			%0	
_	Peak Hour Factor	0.92	0.75	62.0	0.25	0.97	0.92	0.63	0.92	0.92	0 92	0.92	0.92
_	Hourly flow rate (vph)	0	180	28	4	391	0	9/	0	0	0	0	
_	Pedestrians												
_	Lane Width (ft)												
	Walking Speed (ft/s)												
_	Percent Blockage												
_	Right turn flare (veh)												
_	Median type		TWLTL		_	TWLTL							
_	Median storage veh)		2			2				l	l	Ì	
_	Upstream signal (ft)												
-	bX, platoon unblocked				į					ì		ı	ij
	vC, conflicting volume	391			208			593	593	194	579	607	391
	vC1, stage 1 conf vol							194	<u>\$</u>		388	399	
_	vC2, stage 2 conf vol							388	399		180	208	
	vCu, unblocked voi	391			208			593	593	194	629	209	391
-	.C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	9
-	.C, 2 stage (s)							6.1	5.5		6.1	5.5	
-	IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
_	po queue free %	100			100			87	100	100	100	100	100
•	cM capacity (veh/h)	1168			1363			218	929	847	582	552	658
	Direction Late #	E81	EB2	WBIL	WB 2	I BU	SB1	ł	i	١	d	ľ	
	Volume Total	0	208	4	391	92	0						
	Volume Left	0	0	4	0	92	0						
	Volume Right	0	28	0	0	0	0						
0	cSH	1700	1700	1363	1700	878	1700						
	Volume to Capacity	00'0	0.12	0.00	0.23	0.13	00.00						
-	Queue Length 95th (ft)	0	0	0	0	1	0						
_	Control Delay (s)	0.0	0.0	7.6	0.0	12.2	0.0						
_	ane LOS			∢		ω	A						
-	Approach Delay (s)	00		0.1		12.2	0.0						
-	Approach LOS					ω	∢		H			i	
	plercochon Sammany		j	ļ	9	ŀ	Ì	i	ì			ì	
-	Average Delay		h	1.4		l	ŀ	ı		l	ı	ŀ	H
_	ntersection Capacity Utilization	ation		79 70/	3	I amend				ŀ			ı
	·	1000		0/ 1/0	2	o level o	ICO Level of Service			V			

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HCM Unsignalized Intersection Capacity Analysis 4: El Camino Drive/Gysel Place & Dell Range Boulevard

2017 Existing PM.syn 12/12/2017

	١	Ť	<u> </u>	•	r	/	1	-		*	•	*
Movement	8	183	EBB	WBI	WBT	WBR	NEW .	NBI	MBR	SBI	188	SBR
Lane Configurations	K	62		¥.	Ź.			4			÷	
Traffic Volume (veh/h)	-	416	51	-	292	0	38	0	0	0	0	1
Future Volume (Veh/h)	-	416	51	-	292	0	38	Q	0	0	0	-
Sign Control		Free			Free			Stop			Stop	ı
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.87	0.85	0 25	08.0	0.92	0,73	0.92	0.92	0.92	0.92	0.25
Hourly flow rate (vph)	4	478	9	4	365	0	52	0	0	0	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	365			538			893	888	208	826	919	365
vC1, stage 1 conf vol							516	516		373	373	
vC2, stage 2 conf vol							377	373		486	546	
vCu, unblocked vol	365			538			893	888	208	829	919	365
(C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
oo anene free %	100			100			88	100	100	100	100	66
cM capacity (veh/h)	1194			1030			461	429	565	475	447	089
Tirection Lane #:	188	E8.2	WB1	WBZ	NB.1	198	I	ľ	l	ij		
Volume Total	4	538	4	365	52	4						
Volume Left	4	0	4	0	52	0	ł					
Volume Right	0	9	0	0	0	4						
HSS	1194	1700	1030	1700	461	680						
Volume to Capacity	00.0	0.32	0.00	0.21	0.11	0.01						
Queue Length 95th (ft)	0	0	0	0	တ	0						
Control Delay (s)	8.0	0.0	8.5	0.0	13.8	10.3						
Lane LOS	V		ď		80	ω						
Approach Delay (s)	0.1		0.1		13.8	10.3						
Approach LOS					В	8						
Interception Symmony	Ì				į	i	Į	i			Ì	K
Average Delay	۱	l	60		I	l	ľ		l			
Intersection Canacity Liftization	noi		45.5%	_	U.Level	ICU Level of Service			V			

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4. El Callillo Dilve/Gysel Flace a Dell Ivalige boulevalu	Josef P	aca) di igo			I	I	١	١	١	
	4	†	>	/	ţ	1	•	←	•	۶	-	*
Whement	E8	H	EBR	WEL	181	WSR	SE SE	MET	MSR	Ħ	188	SBR
Lane Configurations	***	2.	ı	N.	4			**			4	
Traffic Volume (veh/h)	0	144	23	-	403	0	21	0	0	0	0	0
Future Volume (Veh/h)	0	144	23	gia.	403	0	51	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.75	0.79	0.25	0.97	0.92	0.63	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	192	59	4	415	0	81	0	0	0	0	0
Pedestrians												I
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												Ì
vC, conflicting volume	415			221			630	630	206	615	644	415
vC1, stage 1 conf vol							206	506		423	423	I
vC2, stage 2 conf vol							423	423		192	221	
vCu, unblocked vol	415			221			630	630	206	615	64 4	415
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	Ī
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1144			1348			290	541	834	263	537	637
Direction Lane #	183	583	WE 1	WB2	188	188	ľ	Ì			i	
Volume Total	0	221	4	415	81	0						
Volume Left	0	0	4	0	8	0					Ì	
Volume Right	0	59	0	0	0	0						
SSH	1700	1700	1348	1700	260	1700					ı	i
Volume to Capacity	0.00	0.13	0.00	0.24	0.14	000						1
Queue Length 95th (ft)	0	0	0	0	13	0					l	į
Control Delay (s)	0.0	0.0	7.7	0.0	12.5	0.0						
Lane LOS			∢		В	V						
Approach Delay (s)	0.0		0.1		12.5	0.0						
Approach LOS					œ	V		l				
Intraceding Summay		Ī		I		ì	Ė	İ		H	ľ	
Average Delay			14			ı			ŀ		i	
Average Delay	ation) oc 20	2					ŀ			
			35.2%	5	ICU Level of Service	or Service			V			

HCM Unsignalized Intersection Capacity Analysis 4: El Camino Drive/Gysel Place & Dell Range Boulevard

	4	†	<u> </u>	/	Ļ	1	•	—	•	۶	→	•
foundation	æ	EBI	EBP	WEE	WET	WER	MBI	NBI	NBR	385	185	SBR
Lane Configurations	M.	2.5		K	Δ.			4			42	
Traffic Volume (veh/h)	100	443	25	÷	311	0	40	0	0	0	0	-
Future Volume (Veh/h)	-	443	54	-	311	0	40	0	0	0	0	-
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.87	0.85	0.25	0.80	0.92	0.73	0.92	0.92	0.92	0.92	0.25
Hourly flow rate (vph)	4	509	64	4	389	0	55	0	0	0	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median tyne		ITIMI		ĺ	IT IWIT							
Modian chrane such)		0			6							
leutan storage veny		7			7							
Upstream signal (It)												
ox, platoon unblocked	000						6	9				ì
vC, conflicting volume	389			5/3	i		950	940	24	914	9/8	389
vC1, stage 1 conf vol		Ì					248	249		397	397	
vC2, stage 2 conf vol							401	397		517	581	
vCu, unblocked vol	388			573			950	946	541	914	978	389
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
IC, 2 stage (s)							6.1	5.5		6.1	5.5	
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
of queue free %	100			100			87	100	100	100	100	99
oM capacity (veh/h)	1170			1000			440	441	541	455	429	629
Inection, Lane #	188	EB2	WES	WB2	MBIL	188	l	ŀ	Ì	ì	ł	ŀ
Volume Total	4	573	4	386	22	4						
Volume Left	4	0	4	0	22	0						
Volume Right	0	64	0	0	0	4						
SSH	1170	1700	1000	1700	440	629						
Volume to Capacity	000	0.34	0.00	0.23	0.13	0.01						
Queue Length 95th (ft)	0	0	0	0	11	0						
Control Delay (s)	8.1	0.0	9.8	0.0	14.4	10.5						
Lane LOS	A		4		æ	8						
Approach Delay (s)	0.1		0.1		14.4	10.5						
Approach LOS					Ω	В						
Moreophon Cummony	ľ	ì			Î	ľ	ļ					ł
Average Delay		۱	d		ı	ı	ı	ı	ı	ŀ	ł	0
ptersection Capacity Hilization	noite		A7 50%	_	o love	ICLLI evol of Service			٧			
mon friends concerning com-	11000		2	2								

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Lane Configurations	0.25 4 4 TT	405 405 405 405 Free 0% 0.97 0.97 418	NBR NBI 2 51 2 51 2 51 2 61 2 81	S. T.	NBP		-	
And the second of the second o					MBP			1
Activations Activations Activations Activations Activations Activations Activate Activations Activate						Š	ž	
Volume (veh/h) 12 151 Volume (veh/h) 12 151 Volume (veh/h) 12 151 Ontrol 0.92 0.75 Iour Factor 0.92 0.75 Iour atte (vph) 13 201 rians Worth (tt) 13 201 rians In Blockage (tt/s) 150 In Blockage veh) 7WLTL storage veh) 7WLTL storage veh) 7WLTL storage veh 7 10 10 10 10 10 10 10 10 10 10 10 10 10							4	
Volume (Vet/th) 12 151 ontrol Free ontrol 0% four Factor 0,92 0.75 flow rate (vph) 13 201 rains. Vidth (th) 13 201 rains. I Blockage I Blockage I Blockage I Blockage I Blockage I Blockage I Storage veh) 7WLTL storage veh) 840					0	7	7	36
ontrol Free 0% 0% 10% 10% 13 201 13 201 13 201 13 201 13 201 14 200 15 200 16 200 16 200 17 200 18				1 2	0	7	7	က
Now Factor 0,92 0,75				Stop			Stop	
iour Factor 0,92 0,75 flow rate (vph) 13 201 mins strains flower of the process o				%0			%0	
13 201 TWLTL 2 840						0.92	0.92	6.0
Æ		WLTL 2	11		0	80	80	39
MΤ	E	WLTL 2	ı				0	
MΙ	E	WLTL 2						
WL	F	WLTL 2						
ΔL	F	WLTL 2						
MT.	F	WLTL 2						
		2						
N niston inhinched								
DA, DIALOGII UIDIOCNEU								
vC, conflicting volume 420	230		710	0 670	216	655	683	419
vC1, stage 1 conf vol			242			427	427	
			469			228	256	
vCu, unblocked vol 420	230		710	0 670	216	655	683	419
tC, single (s) 4.1	4.1		7		6.2	7.1	6.5	9
stage (s)			9			6.1	5.5	
tF(s) 2.2	2.2		e			3,5	4.0	3.3
p0 queue free % 99	100		83			66	88	26
cM capacity (veh/h) 1139	1338		481	1 521	824	549	524	634
Direction Lane # EB 1 EB 2 WB 1	WB2	NB.1 SB	12	ĺ	Ī	ŀ		
2	420	83	55					
13	0		80					
59	2		39					
1139	1700		602					
	0.25		60.0					
th (ft) 1 0	0		00					
Control Delay (s) 8.2 0.0 7.7	0.0	14.0 11	11.6					
A			8					
Approach Delay (s) 0.4 0.1			11.6					
Approach LOS		a	æ				i	
placeation Summer	İ	ļ				ŀ	ì	١
Average Delay						ł	ŀ	Н
pacity Utilization 42	D)	ICU Level of Service	rvice		¥			

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HCM Unsignalized Intersection Capacity Analysis 4: El Camino Drive/Gysel Place & Dell Range Boulevard

T. C. Califfic Directored I lace & Deli Italiae Boulevala	- NSel	acc		200		2			١	١	١	11/12/21/21
	1	†	<i>></i>	1	ļ	1	•	—	•	٨	-	*
oversent	EBI	æ	EBB	WEL	WET	HER	NBI	MBIT	NBR	SE	SBI	SES
Lane Configurations	K	£,		h	¢Ŷ.			4			42	
fraffic Volume (veh/h)	40	447	54	÷	319	00	40	œ	0	4	4	23
Future Volume (Veh/h)	40	447	54	-	319	00	40	80	0	4	4	23
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.87	0.85	0.25	080	0.92	0.73	0.92	0.92	0.92	0.92	0.25
Hourly flow rate (vph)	160	514	64	4	388	6	22	თ	0	4	4	92
Pedestrians												
_ane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												į
Median type		TWLTL			TWLTL							
Wedian storage veh)		2			2							á
Jpstream signal (ft)		840										
oX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	Ī
vC, conflicting volume	408			578			1367	1282	246	1250	1310	404
vC1, stage 1 conf vol							998	998		412	412	
vC2, stage 2 conf vol							201	416		838	868	
/Cu, unblocked vol	408			206			1357	1265	471	1230	1295	404
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)							6.1	5.5		6.1	5.5	ĺ
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
no queue free %	98			100			9/	6	100	66	66	98
cM capacity (veh/h)	1151			982			225	273	220	274	275	647
rection Lane#	183	EB.2	WB1	WB2	NB.1	SB 1			ľ	ì	Š	la la
Volume Total	160	578	4	408	64	100						
/olume Left	160	0	4	0	22	4						į
/olume Right	0	64	0	o	0	92						
TS:	1151	1700	982	1700	231	284						
Volume to Capacity	0.14	0.34	0.00	0.24	0.28	0.17						Ī
Queue Length 95th (ft)	12	0	0	0	27	15						
Control Delay (s)	9.6	0.0	8.7	0.0	26.5	124						١
ane LOS	×		V		٥	8						Ì
Approach Delay (s)	1.9		0.1		26.5	12.4						
Approach LOS					۵	80						
Hossierinn Semmean.		ſ	ľ		ı	ij				i	ì	
Average Delay			3.3		ŀ							
Same and Consider Climation												

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2040 Background AM.syn	12/12/2017
HCM Unsignalized Intersection Capacity Analysis	4: El Camino Drive/Gysel Place & Dell Range Boulevard

	\	Ť	~	-		,	_	-	_	À	•	,
Mousment	Ħ	æ	EBB	186	WBI	WBR	MBL	199	MBB	SBI	B	386
Lane Configurations	×	Ž.		æ	42			4			(\$	
Traffic Volume (veh/h)	0	180	53	-	204	0	64	0	0	0	0	0
Future Volume (Veh/h)	0	180	59	-	504	0	64	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	196	32	-	548	0	70	0	0	0	0	0
Pedestrians												ĺ
Lane Width (ft)									١			۱
Walking Speed (ft/s)		N					ı	1	ì	ı	i	į
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												1
pX, platoon unblocked			ì				i			ı		ı
vC, conflicting volume	248			228			762	762	212	746	778	248
vC1, stage 1 conf vol			١	ı			212	212		220	220	
vC2, stage 2 conf vol							220	220		196	228	
vCu, unblocked vol	248			228			762	762	212	746	778	248
tC, single (s)	4 1			4.1		١	7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1021			1340			485	481	828	488	478	536
Direction, Lane #	183	E82	18%	WB2	181	SB 1		1	l			
Volume Total	0	228	-	548	20	0						
Volume Left	0	0	-	0	20	0						
Volume Right	0	32	0	0	0	0						
cSH	1700	1700	1340	1700	485	1700						
Volume to Capacity	00'0	0.13	0.00	0.32	0.14	000	ı				١	١
Queue Length 95th (ft)	0	0	0	0	13	0					d	
Control Delay (s)	0.0	0.0	7.7	0.0	13.7	0.0						
Lane LOS			V		a	V						
Approach Delay (s)	0.0		0.0		13.7	0.0				١	١	
Approach LOS					æ	∢						
Intersecting Summer		b				ì						
Average Delay			11	ij				ì	ı	ĺ		ı
Intersection Capacity Utilization	zation		42 4%	2	Ill evel	ICU Level of Service			V			

HCM 1

2040 Background PM.syn	12/12/2017	
I Unsignalized Intersection Capacity Analysis	l Camino Drive/Gysel Place & Dell Range Boulevard	

	4	†	<i>></i>	1	ļ	4	•	4 -	4	٠	→	*	
Movement	B	EBT	EBR	WB	WBT	WBR	NET	NBL	MBR	NS.	199	SHE	
Lane Configurations	N.	ţî.	10	£-	¢Å.			4			¢		
Traffic Volume (veh/h)	÷	554	89	-	388	0	21	0	0	0	0	4-	X,
Future Volume (Veh/h)	**	554	68	-	389	0	51	0	0	0	0	-	
Sign Confrol		Free			Free			Stop			Stop		
Grade		%0			%0			%0			%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	-	602	74	-	423	0	55	0	0	0	0	-	
Pedestrians													
Lane Width (ft)													
Walking Speed (fl/s)													
Percent Blockage													
Right turn flare (veh)													
Median type		TWLTL		ĺ	TWLTL								
Median storage veh)		2			2								
Upstream signal (R)													
pX, platoon unblocked													
vC, conflicting volume	423			929			1067	1066	639	1029	1103	423	
vC1, stage 1 conf vol							641	149		425	425		
vC2, stage 2 conf vol							426	425		604	879		
vCu, unblocked vol	423			929			1067	1066	638	1029	1103	423	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)							6.1	5.5		6.1	5.5		
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	100			100			98	100	100	100	100	100	
cM capacity (veh/h)	1136			915			388	406	476	414	393	631	
Direction Lane #	1881	288	WEI	WE 2	NB-1	SB 1	Ì	Ī	۱	Î	1		
Volume Total	-	929	-	423	55	-							
Volume Left	1	0	-	0	22	0							
Volume Right	0	74	0	0	0	-							
cSH	1136	1700	915	1700	388	631							
Volume to Capacity	0.00	0.40	0.00	0.25	0.14	000							
Queue Length 95th (ft)	0	0	0	0	12	0							
Control Delay (s)	8.2	0.0	8.9	0.0	15.5	10.7							
Lane LOS	4		4		ပ	8							
Approach Delay (s)	0.0		0.0		15.5	10.7							
Approach LOS					O	8							
Interesting Symmon				l	ļ		Ì	۱	١				
Average Delay	ì	ı	a c	ı	l	ı	ł	ŀ	۱	ł	Į		
Intersection Capacity Utilization	_		26.2%	S	ICLI Level of Service	Service			æ			ı	
Analysis Period (min)	i		15						ī				

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Control Clerk Control Cler	EBI EBI O								
Fig. Fig. Fig. Wig. Wig. Wig. Wig. Wig. Wig. Wig. W	(f) 9.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	<u>ب</u> مر	ţ	1	•	←	4	٠	-
The color of the	(t) 7 337 (h) 7 337 Free 0.92 0.92 (h) 8 366 (h) 8 366 (h) 8 366 (h) 8 368 (h) 8 388 (h) 8 388 (h) 9 8 (h)	188 188	18#	WER	MBI	ABT.	MBR	SBS	381
Maring	(t) 7 337 (h) 7 337 (h) 7 337 (h) 8 386 (h) 8 386 (h) 8 388 (h) 8 388 (h) 8 388 (h) 8 38 (h) 8 38 (h) 8 38 (h) 8 38 (h) 8 38 (h) 8 38 (h) 8 38 (h) 9 9 (h) 9 9 (h) 9 9 (h) 9 9 (h) 9 9 9 (h) 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	je	24			(2)			42
Free	(t) 7 337 Free Free Free Free Free Free Free Fre		2	7	64	0	7	13	0
Free Free Slop 19% 1	Free (%) (%) (%) (%) (%) (%) (%) (%) (%) (%)			7	64	0	7	13	0
0,92 0,92 0,92 0,92 0,92 0,92 0,92 0,92	(t) 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92		Free			Stop			Stop
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	(f) 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93					%0			%0
H) B 366 32 15 809 8 70 0 8 14 TWLTL TWLTL 2 2 2 2 38 398 398 843 H1 170 334 1237 1239 395 317 1218 EB 1 EB 2 WB 1 WB 2 NB 1 SB 1 EB 1 1 170 0 11 0 23 77 C	(f) B 366 TVALTL 2 840 ed 817 4.1 4.1 4.1 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.396 8.300 8.32 8.36 8.37 8.37 8.37 8.37 8.37 8.30 8.00 8.00 8.00 8.00 8.00 8.00 8.00 8.00 8.00 8.00 8.0	0		0.92	0.92	0.92	0 92	0.92	0.92
TWLTL	TWLTL 2 840 840 841 411 411 411 411 681 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 398 8 30 9 30 9 3			00	70	0	00	14	0
TWUTL TWUT	TWITL TWITL 842 842 847 841 847 841 847 841 841 848 898 8 3								
TWLTL	TWLTL 1 2 840 ed 817 817 4.1 4.1 4.1 4.1 6.1 6.8 8 8 398 8 398 8 398 8 11 1700 0 32 0 32 0 32 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 32 0 0 0 0 32 0 0 0 0 32 0 0 0 0 32 0 0 0 0 32 0 0 0 0 0 32 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0								
TWUTL TWUTL 2	TWITL 2 840 841 4.1 4.1 4.1 4.1 4.1 4.1 6.1 8 398 8 398 8 398 8 17 8 398 8 40 9 00 00 00 00 00 00 00 00 00 00								
TWUTL	PW17. 10								
TWLTL	TWITL ed 847 no 847 4.1 4.1 4.1 2.2 9.9 8.19 8.398 8.398 8.398 8.398 8.398 8.398 8.300 0.32 0.01 0.23 0.07								
840 0.95 0	ed 817 840 840 840 841 841 841 841 841 841 841 841 841 1700 0.01 0.23 8 0.03 8 0.01 0.23 8 0.01 0.23 8 0.00 9.5		TWLTL						
B40 0.95 0	end 840 lo 817 2.2 99 811 4.1 4.1 4.1 4.1 6.81 8 398 8 308 8 3		2						
ed 817 398 129 095 095 095 095 095 095 095 095 095 09	ed 817 1 817 4.1 4.1 4.1 4.1 4.1 4.1 6.2 9.9 8.398 8.398 8.398 8.0 0.32 0.01 0.01 0.03 0.03 0.03								
March Marc	8 398 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8 9 8	0.95			0.95	0.95	0.95	0.95	0.95
State	817 4.1 4.1 4.1 4.1 4.1 4.1 8 8 8 8 8 8 8 0 32 0.01 0.01 0.01 0.03 0.01 0.03 0.01 0.03 0.01 0.03 0.01 0.03 0.03	398			1251	1245	382	1233	1257
Secondary Seco	817 4.1 2.2 99 811 8 398 8 0 0 0 32 811 1700 0.01 0.23 (ft) 10 9.5 0.0				398	398		843	843
### 1237 1238 1238 1248	817 2.2 99 811 811 8 398 8 398 8 10 0 3 811 1700 0.01 0.23 (f) 4 0 0.2				853	847		390	414
#1 4,1 4,1 7,1 6,5 6,2 7,1 6,5 6,2 7,1 6,5 6,2 7,1 6,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,5 6,1 5,1 5,1 5,1 5,1 5,1 5,1 5,1 5,1 5,1 5	2.2 99 811 811 81 396 8 0 0 32 811 1700 0.01 0.23 (ft) 1 0.03 0.01 0.23 0.01 0.23 0.02	334			1237	1230	317	1218	1243
2.2 2.2 3.5 4.0 3.3 3.5 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.5 8.1 6.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5	2.2 99 811 EBI EBI2 8 398 8 39 0 3 0 3 0.01 0.23 (ft) 1,700 0.01 0.23 0.01 0.23	4.1			7.1	6.5	6.2	7.1	6.5
22 22 35 40 33 35 89 89 89 89 89 89 89 89 89 80 811 88 398 15 817 78 28 8 9 8 9 80 80 81 81 82 8 8 90 80 81 81 82 8 8 90 80 80 81 8 8 14 8 81 14 811 1700 1158 1700 324 0.08 8 14 8 14 8 11 1700 1158 1700 324 0.08 8 14 8 14 8 11 1700 1158 1700 324 0.08 8 14 8 14 8 14 8 11 1700 1158 1700 324 0.08 8 14 8 14 8 14 8 14 8 14 8 14 8 14 8	2.2 99 811 81 281 8 398 8 398 8 10 0 32 0.01 0.23 (ft) 1 1700 0.01 0.23 A A O O				6.1	5.5		6.1	5.5
### 158	811 811 8 398 8 398 8 0 0 32 811 1700 0.01 0.23 (ft) 1 0 9.5 0.0 A A	2.2			3.5	4.0	3.3	3.5	4.0
S11	811 E82 8 998 8 0 32 8 11 1700 0.01 0.23 0.0 9.5 0.0 0.2 0.2	66			11	100	66	96	100
EB1 EB2 WB1 WB2 NB1 SB1 8 398 15 817 78 28 8 0 15 0 70 14 8 14 70 158 700 321 347 iny 0.01 0.23 0.01 0.08 (s) 0.2 0.1 1 0.08 (s) 0.2 0.1 1 0.00 (c) C (c) C (d) 0.1 0.00 (d) 0.1 0.00 (e) 0.1 0.00 (e) 0.1 0.00 (f) 0	EB 1 EB 2 8 386 8 306 8 30 0 32 811 1700 in) 1 023 in) 1 0 0.2 (s) 0.2	1158			302	332	684	321	335
8 396 15 817 78 28 8 9 15 817 78 28 8 9 15 9 70 14 9 9 9 9 9 9 9 9 9	8 398 8 0 0 32 0 32 811 1700 inh (ft) 0.23 (s) 0.2 (s) 0.2	Bit WB2	NB 1	- BS	I	Ŋ	Ĭ		Ĭ,
1	8 0 32 0 32 11 1700 1700 1700 1700 1700 1700 1700			28					
ity 0.01 0.32 0.0 8 8 14 14 17 17 10 1158 17 10 321 347 17 10 0.01 0.08 10 10 10 10 10 10 10 10 10 10 10 10 10	(s) 0.2 (h) 1700 (h) 1 0.2 (h) 9.5 0.0 A (s) 0.2			14					
ity 0.01 0.23 0.01 0.48 0.24 0.08 inf (t) 1 0 0.1 0.2 0.2 7 A A A C C (s) 0.2 0.1 1 0.1 0.1 The state of the state of	ity 0.01 023 (i) 1 0.01 0.23 (s) 0.02 (s)			14					
ity 0.01 0.23 0.01 0.48 0.24 0.08 Inh (tt) 1 0 1 0 23 7 A A A C C (s) 0.2 0.1 19.8 16.3 C C Reary 1.6 Inheritation 6.4 6.9 Inheritation 1.6 Inherita	ity 0.01 0.23 in (ft) 9.5 0.0 A S) 0.2			347					
in (ff) 1 0 1 0 23 7 7 8 9.5 0.0 8.1 0.0 19.8 16.3 A A C C C C C C C C C C C C C C C C C	ith (ft) 1 0 9.5 0.0 A A (s) 0.2 (s) 0.2			90.0					
(s) 0.2 0.0 8.1 0.0 19.8 16.3 A A C C C C C C C C C C C C C C C C C C	9.5 0.0 A (s) 0.2	1 0	23	7					
(s) 0.2 0.1 19.8 16.3 C C C C C C C C C C C C C C C C C C C	(s) 0.2 rmage		19.8	16.3					
(\$) 0.2 0.1 19.8 16.3 C C C C C C C C C C C C C C C C C C C	r(s) 0.2 rmany	A	ပ	ပ					
C C C C T C C C C C C C C C C C C C C C	may	0.1	19.8	16.3					
1.6 64.60, 10111 and of Coming			ပ	O					
1,6 64.50, OLI I And of Consiso		Ì		i	ŀ	ţ	İ		L
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2040 Total PM.syn 12/12/2017

HCM Unsignalized Intersection Capacity Analysis 4: El Camino Drive/Gysel Place & Dell Range Boulevard

Location of the configurations FeBL EBT FEBR WIBT WIB		1	Ť	>	1	ļ	1	*	—	4	٨	→	*
ontigurations	Philomolds	FRI	FRI	FRR	WR	WBI	WRR	MBI	NBT	MER	in.	HE S	ES.
Volume (vehin) 20 924 68 17 708 19 51 0 19 16 0 0 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	and Configurations				*	÷			ě			45	
Volume (verlin) 20 924 68 17 708 19 51 0 19 10 0 Ovolume (verlin) 20 924 68 17 708 19 51 0 19 10 0 Ovolume (verlin) 22 102 0.92	alle collingui audiis				į	2 2	4	7,2		4	9	4	7.7
Volume (Verhit) 20 924 68 17 708 19 51 0 19 16 0 Outroll Free Free 092 09	raffic Volume (veh/h)	8	954	8	1	90/	20	2	0	2 :	2	> .	- !
Proceedings Proce Proce Stop	-uture Volume (Veh/h)	50	924	68	17	208	19	21	0	9	9	0	17
Total Capacity Cap	Sign Control		Free			Free			Stop			Stop	
092 092 092 092 092 092 092 092 092 092	Srade		%0			%0			%0			%0	
TWUTL TWUTL TWUTL TWUTL 2 1004 74 18 770 21 55 0 21 17 0 2 340 0.46 0.46 0.46 0.46 0.46 0.46 0.46 0.	Peak Hour Factor	0 92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0 92	0.92	0.92	0.92
TWUTL TWLTL 2 840 940 940 941 791 791 791 791 791 791 791	Hourly flow rate (vph)	22	1004	74	18	770	77	22	0	21	17	0	9
Width (ft) Width (ft) Width (ft) Width (ft) Rig Speed (fts) TWLTL TWLTL At Blocked 100 color 100 color Lit Blocked 100 color 100 color 100 color In the per control (red) 100 color	Pedestrians												ı
19 Speed (ft/s) 11 Biolodage Lum Mare (veh) 11 Biolodage Lum Mare (veh) 11 Biolodage Lum Mare (veh) 12 2 2 2 2 34 35 4.0 13 2 2 3 17 18 18 19 1100 14 1	ane Width (ft)												
th Blockage Interface (eh)	Walking Speed (ft/s)												Ī
Lum flare (veh) TWLTL TWLTL TWLTL n storage veh) 2 2 2 n storage veh) 840 0.46 0.46 0.46 0.46 n storage veh) 840 0.46 0.46 0.46 0.46 0.46 nem signal (veh) 840 0.46	Percent Blockage												
TWLTL	Right turn flare (veh)												
Page 16 Page 16 Page 16 Page 16 Page 17 Page	Median type		TWLTL			LWLTL.							
tage (s) 2.2 2.2 2.2 3.5 6.2 7.1 6.2 7.1 6.2 6.2 7.1 6.2 7	Median storage veh)		2			7							ł
100	Upstream signal (ft)		840										
milicting volume 791 1078 1909 1912 1041 1886 1938 1899 1992 control vol degree 1091 1912 1041 1886 1938 1999 1992 1091 1912 1041 1886 1938 1999 1992 control vol degree 1091 1992 1992 1993 1993 1993 1993 1993 19	oX, platoon unblocked				0.46			0.46	0.46	0.46	0.46	0.46	Í
1085 1085	vC, conflicting volume	791			1078			1909	1912	1041	1886	1938	780
tage 2 conf vol 131 824 827 1069 1122 conflocked vol 791 573 239 2405 425 145<	vC1, stage 1 conf vol							1085	1085		816	816	
At age (s) 731 573 2386 2405 492 2347 2463 Atgge (s) 4.1 4.1 4.1 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.5 6.1 5.5 6.1 5.5 6.1 5.5 6.1 5.5 6.1 5.5 7.1 6.5 6.5 7.1 6.5 6.5 7.1 6.5 6.2 7.1 6.5 6.1 5.5 4.0 3.3 3.5 4.0 3.5 4.0 3.3 4.0 3.5 4.0 3.5 4.0 3.5 4.0 9.0	C2, stage 2 conf vol							824	827		1069	1122	
gge (s) 4.1 4.1 4.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.1 5.5 4.0 9.2 4.0 9.2 4.0 9.2 4.0 9.2 4.0 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 8.0 100 9.2 100 9.2 100 9.2 100 9.2 100 9.2 100 9.5 1.0 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2 9.2	rCu, unblocked vol	791			573			2398	2405	492	2347	2463	780
kiage (s) 2.2 2.2 6.1 5.5 6.1 5.5 sue free % 97 96 68 100 92 4.0 pacity (ve/h) 829 455 169 176 263 161 158 pacity (ve/h) 829 455 18 791 76 35 176 263 161 158 pacity (we/h) 829 770 18 791 76 35 17 891 76 35 17 re total 22 1078 18 791 76 35 17 891	C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2 2.2 3.5 4.0	C, 2 stage (s)							6.1	5.5		6.1	5.5	ĺ
By Specific (which) 95 68 100 92 89 100 Packly (which) 829 455 169 176 263 161 158 Packly (which) 829 181 181 182 181 181 181 181 181 181 182 181 182 <	F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
### ### ### ### ### ### ### ### ### ##	of queue free %	97			96			68	100	92	88	100	95
## FB2 WB1 WB2 NB1 SB1 22 1078 18 791 76 35 22 0 18 0 55 17 0 21 18 829 1700 455 1700 188 231 0.03 0.63 0.04 0.47 0.40 0.15 2 0 3 0 45 13 9.5 0.0 132 0.0 36 23.3 A B B C C A B B C C A B B C C A C C A B C A B C	M capacity (veh/h)	829			455			169	176	263	161	158	395
22 1078 18 791 76 35 22 0 18 0 55 17 0 74 4 0 21 829 1700 455 1700 188 231 0.03 0.63 0.04 0.47 0.40 0.15 2 0 3 0 45 13 9.5 0.0 132 0.0 3.6 23.3 A B B C C 0.2 0.3 36.6 23.3 C C C C C C C C C C C C C C C C C C C	Mar for Lare #	183	EB 2	WB4	WB2	NB:1	88			ď	Ì	ı	Ì
22 0 18 0 55 17 829 1700 455	Volume Total	22	1078	18	791	92	35						
829 1700 455 1700 188 231 0.03 0.03 0.04 0.47 0.15 0.03 0.4 0.15 0.15 0.0 188 23.3 0.0 0.2 0.3 0.0 0.2 0.3 0.0 0.2 0.3 0.0 0.2 0.3 0.0 0.2 0.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Volume Left	22	0	18	0	22	17						
829 1700 455 1700 188 231 0.03 0.63 0.04 0.47 0.40 0.15 2 0 3 0 45 13 9.5 0.0 132 0.0 36.6 23.3 A B E C 0.2 0.3 36.6 23.3 E C 0.2 0.3 10.0 Level of Service	Volume Right	0	74	0	21	21	18						
0.03 0.63 0.04 0.47 0.40 0.15 2 0 3 0 45 13 9.5 0.0 132 0.0 3.6 23.3 A B E C 0.2 0.3 3.6 23.3 E C 2.0 Cultivation 76.5% ICUltication Column 76.5% IC	HSS	829	1700	455	1700	188	231						
2 0 3 0 45 13 9.5 0.0 13 0.0 366 23.3 A 18 E C 0.2 0.3 36.6 23.3 E C 2.0 CU Level of Service	Volume to Capacity	0.03	0.63	0.04	0.47	0.40	0.15						
9.5 0.0 13.2 0.0 36.6 23.3 A B E C 0.2 0.3 36.6 23.3 E C 2.0 2.0 1CU Level of Service	Queue Length 95th (ft)	2	0	3	0	45	13						
y (s) 0.2 0.3 86.6 23.3 mms.y 2.0 10.0 Level of Service	Control Delay (s)	9.5	0.0	13.2	0.0	36.6	23.3						
y (s) 0.2 0.3 36.6 23.3 E C C C C C C C C C C C C C C C C C C	Lane LOS	A		8		ш	ပ						i
E C 20 10 Level of Service 76.5% ICU Level of Service	Approach Delay (s)	0.2		0.3		36.6	23.3						
20 CU Level of Service 76.5% ICU Level of Service	Approach LOS					ш	O						
2.0 CU Level of Service 76.5% ICU Level of Service	Total Summary	8	A	ŀ	į			l					İ
pacity Utilization 76.5% ICU Level of Service	Average Delay			2.0						l			
	Intersection Capacity Utilizat	tion		76.5%	0	U Level	of Service			Ω			

Synchro 9 Report Page 1

Analysis	
ICM Unsignalized Intersection Capacity Analysis	5. Dell Range Boulevard & James Drive

2017 Existing AM.syn 12/12/2017

	١.	ŀ	•	•		,	-	-	_		•	
Movement	E	ES	388	MBE	181	Milita	181	181	MBR	SBI	裹	SBR
ane Configurations		**			4			4			4	
raffic Volume (veh/h)	0	134	0	0	381	0	0	0	0	-	0	Ī
Future Volume (Veh/h)	0	134	0	0	381	0	0	0	0	-	0	
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.71	0.92	0.92	96.0	0.92	0.92	0.92	0.92	0 25	0.92	0.25
Hourly flow rate (vph)	0	189	0	0	397	0	0	0	0	4	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												d
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			None							
Median storage veh)		2										
Upstream signal (ft)												
bX, platoon unblocked												I
vC, conflicting volume	397			189			230	286	189	286	286	397
vC1, stage 1 conf vol				Ì			189	189		397	397	į
vC2, stage 2 conf vol							401	397		189	189	١
vCu, unblocked vol	397			189			230	586	189	586	286	397
.C. single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	9
IC, 2 stage (s)							6.1	5.5		6.1	5.5	
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
on gueue free %	100			100			100	100	100	66	100	ði
cM capacity (veh/h)	1162			1385			277	559	853	582	228	652
Direction, kane #	183	WBT	NB.1	188			Į					Š
Volume Total	189	397	0	&								
Volume Left	0	0	0	4				ł			i	١
Volume Right	0	0	0	4				١		١	١	
SSH	1162	1385	1700	615						Ì	l	
Volume to Capacity	0.00	0.00	0.00	0.01						١	١	
Queue Length 95th (ft)	0	0	0	-								
Control Delay (s)	0.0	0.0	0.0	10.9								
Lane LOS			∢	8								
Approach Delay (s)	0.0	0.0	0.0	10.9						١		
Approach LOS			×	8							١	ı
Intersection Summary		ä	i				l	i	ì	Ĭ		۱
Average Delay			0.1	ı					ì	Į		
Intersection Capacity Utilization	ation		33.8%	_	ICU Level of Service	Service			A			
	-											

2017 Existing PM.syn

HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive

Movement	Ħ	188	EBR	WBL	WBT	WBR	MBE	NBT	NBR	SBI	SBI	SBR
ane Configurations		4			4			4			42	
raffic Volume (veh/h)	-	412	0	0	294	0	-	0	0	0	0	0
-uture Volume (Veh/h)	-	412	0	0	294	0	-	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.25	0.30	0.92	0.92	0.75	0.92	0.25	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	458	0	0	392	0	4	0	0	0	0	0
Pedestrians												
.ane Width (ft)												
Nalking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
/ledian storage veh)		7										
Jostream signal (ft)												
X, platoon unblocked				Ī								
C, conflicting volume	392			458			828	828	458	858	858	392
/C1, stage 1 conf vol						ı	466	466		392	392	
vC2, stage 2 conf vol							392	392		466	466	
JCu, unblocked vol	392			458			858	828	458	828	828	392
C, single (s)	4.1			4 1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)							6.1	5.5		6.1	5.5	P
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
on dueue free %	100			100			66	100	100	100	100	100
cM capacity (veh/h)	1167			1103			480	473	603	481	474	657
Hection: Lane #	19	181	MBT	188			ì	Ü	ľ		j	
olume Total	462	392	4	0								
olume Left	4	0	4	0								
olume Right	0	0	0	0								
SH	1167	1103	480	1700								
Volume to Capacity	0.00	00.00	0.01	0.00								
Queue Length 95th (Tt)	0	0	-	0								
Control Delay (s)	0.1	0.0	12.6	0.0								
ane LOS	V		8	A								
Approach Delay (s)	0.1	0.0	12.6	0.0								
pproach LOS			В	∢								ı
Mercachin Summan	Ì	ļ	I	l				l	i i		H.	
Average Delay	Ì	ı	0.1	l	ľ	ľ	l	l	l		ı	NI.
ntersection Capacity Utilization	tion		36.7%	<u></u>	o laya	CLL Level of Service			۵			ĺ
months of the second									E			

Synchro 9 Report Page 1

HCM Unsignalized Intersection Capacity Analysis	
Capacity	James Drive
ersection	5. Dell Rande Rouleyard & Jam
ed Int	Sydin't
ınaliz	AP BY
Unsig	Ran
HCM	5

AM.syn	12/12/2017	
Background		
2022 B		l

Abytement and Configurations												
and Configurations	89	EBI	ER	WEI	WET	WBb	NBI	NBT	MBR	88	Segr	SBO
alle Commandina		**			4			Ç			4	
raffic Volume (veh/h)	0	143	0	0	405	0	0	0	0	-	0	
-uture Volume (Veh/h)	0	143	0	0	405	0	0	0	0	-	0	-
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%	10000
Peak Hour Factor	0.92	0.71	0.92	0.92	96.0	0.92	0,92	0.92	0.92	0.25	0.92	0.25
Hourly flow rate (vph)	0	201	0	0	422	0	0	0	0	4	0	*
Pedestrians												
ane Width (ft)												
Nalking Speed (fl/s)												8
Percent Blockage												
Right turn flare (veh)												ĺ
Median type		TWLTL			None							١
Median storage veh)		2										Ì
Jostream signal (ft)												١
oX, platoon unblocked												i
/C, conflicting volume	422			201			627	623	201	623	623	422
vC1, stage 1 conf vol							201	201		422	422	
vC2, stage 2 conf vol							426	422		201	201	
/Cu, unblocked vol	422			201			627	623	501	623	623	422
.C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)							6.1	5.5		6.1	5.5	ı
F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
on queue free %	100			100			100	100	100	66	100	66
cM capacity (veh/h)	1137			1371			558	544	840	563	544	632
irection Lane #	H	WB3	NB.1	188	Į		i	ì	Ì	l	ĺ	Ī
/olume Total	201	422	0	8								1
/olume Left	0	0	0	4								ì
/olume Right	0	0	0	4								
SH	1137	1371	1700	296						Ŋ		ď
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	-								Í
Control Delay (s)	0.0	0.0	0.0	11.1								
ane LOS			V	8								1
Approach Delay (s)	0.0	0.0	0.0	11.1								
Approach LOS			V	8							ø	Ī
ntersection Summary			h	ŀ			i	į	ì	þ	i	
Average Delay		ì	0.1	1	ŀ						ı	
ntersection Capacity Utilization	_		35.3%	ਹੁ	ICU Level of Service	Service			⋖			ſ
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive

PM.syn	12/12/2017
2022 Background	
20	

## FEE FEE WEE WEE WOT WOR NEE NOT NOT 1 438 0 0 313 0 1 0 0 0 1 0				-	-			-	-				
rations 44	ONE WHERE	H	EBI	EBR	WBE	WBT	WBR	NEE	NBT	NBR	SBE	SBH	ES.
re (vehit) 1 438 0 0 313 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ane Configurations		ę			4			4			c	
re (vehit) 1 438 0 0 313 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	affic Volume (veh/h)	-	438	0	0	313	0	-	0	0	0	0	0
Free Free Stop Stop Stop Stop Stop Stop Stop Stop	rture Volume (Veh/h)	-	438	0	0	313	0	-	0	0	0	0	0
Control of the cont	gn Control		Free			Free			Stop			Stop	
4 487 0 0.92 0.92 0.75 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	ade		%0			%0			%0			%0	
TWUTL None TWUTL None 4 487 0 0 417 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	eak Hour Factor	0.25	06.0	0.92	0.92	0.75	0 92	0.25	0.92	0.92	0 92	0.92	0.92
(s) TWLTL None (h) TWLTL None (h) TWLTL None (h) 2 (h)	ourly flow rate (vph)	4	487	0	0	417	0	4	0	0	0	0	0
(s) TWLTL None (h) 2 340 417 487 912 912 487 912 487 912 487 912 487 912 487 912 487 912 487 912 912 487 912 912 912 912 912 912 912 91	edestrians												
(s) TWLTL None TWLTL None 1912 912 487 912 A 417 417 495 100 1142 1076 459 100 1142 1076 459 100 1142 1076 459 100 1142 1076 459 100 1142 1076 459 100 1143 1076 459 100 1144 1076 459 100 1145 1076 459 100 1146 1070 10 10 10 10 100 1147 1070 10 10 10 10 10 100 1148 1070 10 10 10 10 10 10 10 10 10 10 10 10 10	ane Width (ft)												
ht) TWLTL None th) 2	alking Speed (ft/s)												
TWLTL None Public Publ	ercent Blockage												
TWLTL None TWLTL None	ght turn flare (veh)												
99 veh) 2 99 veh) 2 99 veh) 2 99 veh) 417 487 912 487 912 00001 vol 417 487 912 487 912 0001 vol 417 47 477 495 0001 vol 100 100 100 100 100 100 100 100 100 10	edian type		WLTL			None							
417 487 912 912 487 912 417 417 417 417 417 417 417 417 417 417	edian storage veh)		2										
417 487 912 912 487 912 487 912 487 912 487 912 487 912 487 495 495 447 417 417 417 417 417 417 417 417 417	ostream signal (R)												
417 487 912 487 912 487 912 487 417 417 417 417 417 417 417 417 417 41	(, platoon unblocked												
495 495 497 417 417 417 417 417 417 417 417 417 41	conflicting volume	417			487			912	912	487	912	912	417
417 487 417 418 495 4.1 4.1 4.1 417 417 499 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.1	C1, stage 1 conf vol							495	495		417	417	
417 487 912 487 912 487 912 487 912 487 912 487 912 487 912 487 912 487 912 487 912 912 912 912 912 912 912 912 912 912	22, stage 2 conf vol							417	417		495	495	
4.1 4.1 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.1 5.1 5.5 6.1 5.1 5.5 6.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5.1 5	Cu, unblocked vol	417			487			912	912	487	912	912	417
2.2 2.2 35.6 1.1 100 100 100 3.3 3.5 1142 1076 459 456 581 460 1142 1076 459 1700 1142 1076 459 1700 1142 1076 459 1700 1142 1076 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
2.2 2.2 3.5 4.0 3.3 3.5 1.00 100 1100 1100 1100 1100 1100 110	, 2 stage (s)							6.1	5.5		6.1	5.5	
100 100 100 100 1142 1076 459 100 100 100 1142 1076 459 456 581 460 100 100 100 100 100 100 100 100 100 1	(s)	2.2			2.2			3,5	4.0	3.3	3.5	4.0	3.3
### 1742 1076 459 456 581 460		100			100			66	100	100	100	100	100
EB1 WB1 NB S814 491 417 4 0 4 0 4 0 0 0 0 1142 1076 459 1700 0.00 0.00 0.01 0.00 0 1 0.0 129 0.0 A B A 0.1 0.0 129 0.0 B A 0.1 0.0 129 0.0 0 0 1 0.0 1132 0.0 1132 0.0 1132 0.0 1133 0.0 1134		1142			1076			459	426	581	460	457	636
491 417 4 0 4 0 4 0 0 0 0 1142 1076 459 1700 0.00 0.00 0.01 0.00 0 1 0.0 0.1 0.0 12.9 0.0 A B A 0.1 0.0 12.9 0.0 B A B A 0.1 0.0 12.9 0.0 0.1 0.0 13.83%, ICLI Level of Service	神経を見るをま	183	1.8/1	WHI.	SB1					ì			
1142 1076 459 1700 1142 1076 459 1700 0.00 0.00 0.01 0.00 0.1 0.0 12.9 0.0 A B A 0.1 0.0 12.9 0.0 B A (C.) Level of Service	olume Total	491	417	4	0								
1142 1076 459 1700 0.00 0.00 0.01 0.00 0.0 0.1 0.0 1.29 0.0 A B A A B A O.1 0.00 0.1 0.0 12.9 0.0 B A O.1 0.0 12.9 0.0 B A B A B A B A B B A B A B B A B B A B A B B A B B A B B A B B A B B A B B A B B B A B B B B A B	olome Left	4	0	4	0								
1142 1076 459 1700 0.00 0.00 0.01 0.00 0.1 0.0 12.9 0.0 A B A 0.1 0.0 12.9 0.0 B A Illization 38.3%, ICLU Level of Service	olume Right	0	0	0	0			ı					
0.00 0.00 0.01 0.00 0.1 0.00 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.0 0.1 0.1	五	1142	1076	459	1700								
0 0 1 0 0.1 0.0 12.9 0.0 0.1 0.0 12.9 0.0 B A Hilzation 38.3%, ICLI Level of Service	olume to Capacity	00.0	0.00	0.01	0.00								
s) 0.1 0.0 12.9 0.0 (s) 0.1 0.0 12.9 0.0 Intersect 0.1 Shade Market Militarium 38.3% ICLI level of Service	ueue Length 95th (ft)	0	0	-	0								
(5) 0.1 0.0 12.9 0.0 B A	ontrol Delay (s)	0.1	0.0	12.9	0.0								
(6) 0.1 0.0 12.9 0.0 B A Decision	ane LOS	4		മ	<								
B A https://doi.org/10.10.10.10.10.10.10.10.10.10.10.10.10.1	pproach Delay (s)	0.1	0.0	12.9	0.0								
0.1 C.U. Level of Service	pproach LOS			Φ	K								
0.1 C.U. Level of Service 38.3% I.C.U. Level of Service	Inspection Summary			ŀ	l	h	ŀ	ľ	h	ŀ	h	ì	
38.3% ICUI evel of Service	verage Delay			0.1									
	ntersection Capacity Utilization	_		38.3%	0	Level !!	of Service			A			

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HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive

		l		l	l	l	l	l	١	l	١	l
	4	†	~	/	ļ	4	•	-	•	٠	→	*
Мочетен	188	183	EBR	WBI	181	WER	W.	184	NBR	88	188	SBR
Lane Configurations		4			*			÷			牵	
Traffic Volume (veh/h)	0	157	0	0	410	0	0	0	0	-	0	Ī
Future Volume (Veh/h)	0	157	0	0	410	0	0	0	0	-	0	_
Sign Control		Free			Free			Stop			Stop	i
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.71	0.92	0.92	96.0	0.92	0.92	0.92	0.92	0.25	0.92	0.25
Hourly flow rate (vph)	0	221	0	0	427	0	0	0	0	4	0	4
Pedestrians											i	
Lane Width (ft)				١		۱	١	ı	ı	ı	١	ı
Walking Speed (ft/s)								Ì	١		l	Ì
Percent Blockage												į
Kignt turn nare (ven)	ľ	F		ľ	T 1940				l			
Median type		WEIL			IMFIL	ı						
Median storage veh)		2	i		2							i
Upstream signal (ft)												
pX, platoon unblocked						ľ						ľ
vC, conflicting volume	427			221			652	648	221	648	648	427
vC1, stage 1 conf vol							221	221		427	427	i
vC2, stage 2 conf vol							431	427		221	221	
vCu, unblocked vol	427			221			652	648	221	88	648	427
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	66	100	66
cM capacity (veh/h)	1132			1348			220	537	819	555	537	628
Direction, Cane #	188	1/8/1	181	288		l						
Volume Total	221	427	0	00								
Volume Left	0	0	0	4			i				i	
Volume Right	0	0	0	4				١		1	ı	
cSH	1132	1348	1700	289							ı	i
Volume to Capacity	0.00	000	000	0.01				ı	۱	ı	ı	۱
Queue Length 95th (ft)	0	0	0	- ;						ı		ì
Control Delay (s)	0.0	0.0	0.0	11.2					Ì			
Lane LOS			∢ 9	e ;								
Approach Delay (s)	0.0	0.0	0.0	2.11					Ì	į	Ì	
Approach LOS			¥	20					ì			
Intersection Summary		ľ	Ę	ļ	i	I	Į.	Į				
Average Delay			0.1			1	Į		H			ı
Intersection Capacity Utilization	ation		3E 60/	_	0/10	Oll Land of Service			<			
			0/0/0	2		200.00			<			

HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive

2022 Total PM.syn 12/12/2017

	4	†	<u> </u>	1	ļ	1	•	←	•	٨	→	*
Movement	EBI	EBI	EBR	MBI	WET	WER	NB	NET	NES	88	188	SER
Lane Configurations		+\$			4			4			43	
Traffic Volume (veh/h)		447	c	C	328	C	-	-	C	C	0	0
Future Volume (Veh/h)	٠	447	0	0	328	0	-	c	0	0	0	0
Sign Control		Free			Free			Stoo			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0,25	06.0	0.92	0.92	0.75	0.92	0.25	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	497	0	0	437	0	4	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	437			497			942	942	497	942	942	437
vC1, stage 1 conf vol							505	505		437	437	
vC2, stage 2 conf vol							437	437		505	505	
vCu, unblocked vol	437			497			942	942	497	942	942	437
tC, single (s)	4.1			4.1			7,1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3,5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			66	100	100	100	100	100
cM capacity (veh/h)	1123			1067			449	447	573	450	448	620
Direction Lane #	188	WBI	VB.1	- SB	ľ			į.	j	l	ŧ	
Volume Total	501	437	4	0					l			
Volume Left	4	0	4	0								
Volume Right	0	0	0	0								
SH	1123	1067	449	1700								
Volume to Capacity	0.00	0.00	0.01	00.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.1	0.0	13.1	0.0								
Lane LOS	4		8	V								
Approach Delay (s)	0.1	0.0	13.1	0.0								
Approach LOS			B	V						۱		ı
refresserion Commune			i	Ĭ	K	Ĭ	ļ		ł		Ĭ	
Anergon Delay	ł	ı	0	l			l	ŀ	ı	l	ı	Ì
Interportion Consolly Hilization	noile		39 0%	2	ICLL Loyol of Copying	Consider			<			ı
Analysis Period (min)	IIOII		15	5	o revel o	201410			τ			
the state of the s			2									ĺ

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HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive	Interse	ction C Jame	apacit s Drive	y Ana.	lysis			20	2040 Background AM.syn 12/12/2017	ckgrou	nd AN	AM.syn 12/12/2017
	1	Ť	~	1	ļ	1	•	←	•	٠	→	*
Movement	EBI	EBT	EBR	WB	WBT	HEN	NEE	MBI	MBR	8	摄	摄
Lane Configurations		¢			+			Ç		ľ	4	
Traffic Volume (veh/h)	0	178	0	0	202	2	0	0	0	2	0	
Future Volume (Veh/h)	0	178	0	0	203	2	0	0	0	2	0	
Sign Control		Free			Free			Ston			Ston	

			-				_	-	_			
forement	æ	EBI	285	18/M	WBI	WER	NE	MBIL	TIBE	195	158	S
-ane Configurations		¢			**			÷			42	
Fraffic Volume (veh/h)	0	178	0	0	202	3	0	0	0	2	0	
-uture Volume (Veh/h)	0	178	0	0	203	2	0	0	0	2	0	
Sign Control		Free			Free			Stop			Stop	
		%0			%0			%0			%0	
Peak Hour Factor (0,92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	193	0	0	551	2	0	0	0	2	0	
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			None							
Median storage veh)		2										
Jpstream signal (ft)												
pX, platoon unblocked												
	929			193			748	749	193	746	746	554
				- Order			193	193		554	554	
vC2, stage 2 conf vol							554	556		193	193	
	929			193			748	749	193	746	746	554
.C, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1015			1380			485	481	849	487	482	532
Direction Lang #	1.83	WB/T	NB.1	SB.1	ļ	ŀ	B	ľ	ŀ		ŀ	
Volume Total	193	556	0	9								
Volume Left	0	0	0	2								
Volume Right	0	2	0	-								
L CSH	1015	1380	1700	201								
	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.0	0.0	0.0	12.2								
-ane LOS			4	8								
Approach Delay (s)	0.0	0.0	0.0	12.2								
Approach LOS		ì	V	∞			ı					
ntersection Summary		l	į		i		ğ	ì	ŀ		B	Ī
Average Delay	Ö.		0.0	٢	o love I	Oll Level of Coprise						
TELEGRAPH CAPACITY DITIERION												

Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figure Figur	←				
s		•	٠	→	*
s 44 0 0 44 0 0 391	NBI NBI	NBR	SBE	188	SBR
(h) 1 548 0 0 331 Free 0 0 391 Free 0 0 0 292 0.92 0.92 0.92 0.92 0.92 0.92	ę	•		÷	
hth) 1 548 0 0 331 Free Free Free Free Free Free Free Fre	1 0	0	4	0	0
Free Free Free Free Free Free Free Free	-		4	0	0
(a) 174 (b) 177 (c) 17	Stop	0		Stop	
h) TWITL None 1) TWITL None 1) 10 TWITL None 1) 10 10 10 10 1124 980 112				%0	
(a) TWLTL None (b) TWLTL None (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	0.92 0.92	0	0.92	0.92	0.92
(c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	1 0	0	4	0	0
(sed 436 596 (sed 436 416 1124 980 416 416 417 417 980 610 610 610 610 610 610 610 610 610 61					
TWLTL S96 S96 S96 S96 S96 S96 S96 S96 S96 S96 S97 S9					
TWLTL me 436 596 lod 436 596 lod 436 596 4.1 4.1 2.2 2.2 100 100 100 1124 980 416 416 1124 980 416 416 1124 980 0.00 0.01 0 0 0 0.1 0 0 0 0.1 A B B B A B B A B A B A B A B A B A B					
ked 436 596 100 436 596 436 436 596 436 436 416 1124 980 416 416 1124 980 416 416 1124 980 416 416 1124 980 416 416 1124 980 10 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0 0 01 100 0					
TWLTL					
(a) 2 (b) 2 (c) 3 (c) 4					
(sed 436 (sed 436 (sed 436 (sed 436 (sed 436 (sed 441 (sed 436 (se					
ked 436 A11 A22 100 1100 1124 B81 NB1 NB1 S97 436 1124 380 416 1124 380 416 1124 380 416 1124 380 416 A 0.00 0.00 0.00 A A B A B A B A B A B A B A B A B A B					
me 436 436 4.1 4.1 4.1 4.1 4.1 1100 1124 1124 1124 1124 1124 1124 1124 1127					
A 136 4.1 2.2 100 1124 1124 980 416 1124 980 416 1124 980 416 1124 980 117 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1028 1034	4 596	1028	1028	430
2 2 100 1124 881 881 881 881 881 881 881 881 881 88	598 598	80	430	430	
436 4.1 1.22 1.00 1.1124 1.00 1.124 1.00 1.124 1.00 1.124 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		9	298	598	
2.2 1100 1124 1124 597 436 1 1 0 1 1124 980 416 1124 980 416 1124 980 416 1124 980 116 1124 980 116 1124 980 116 1124 980 116 1124 980 116 1124 980 1187	1028 1034	Ì	1028	1028	430
22 100 1124 188 WB1 MB1 S 597 436 1 1 0 1 0 1124 980 416 1124 980 416 0 0.00 0.00 0.00 0 0 0.00 0.00 0 0 0.00 0.00 0.00 0 0 0 0.00 0.00 0.00 0 0 0 0.00		5 6.2	7.1	6.5	6.2
2.2 100 1124 897 436 1 0 1 0 1124 980 416 0 0.00 0.00 0.00 0.00 0 0 0 0 0 0 0 0 0	6.1 5.5		6.1	5.5	
1124 WE1 NE1 1124 1124 137 1			3.5	4.0	33
1124 WE1 ME1 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			66	100	100
597 436 1 1 0 1 0 1124 980 416 y 0.00 0.00 0.00 0 0 0 0 A B A B B	416 418	8 504	416	419	625
597 436 1 1 0 1 0 1124 980 416 y 0.00 0.00 0.00 0			ì		
1124 980 416 1124 980 000 0 000 000 000 0 0 0 0 0 A B B B					
1124 980 416 100 000 000 100 0 0 0 0 100 0 0 0 0 13.7 100 0 0 13.7				Ì	I
1124 980 416 y 0.00 0.00 0.00 100 0.0 0.0 13.7 A B B B B B B B B B B B B B B B B B B B					
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0			į		
0.0 0.0 0.0 13.7 A B B B C 13.7 C C C C C C C C C C C C C C C C C C C					
0.0 0.0 13.7 A B B 0.0 0.0 13.7					
A B B 0.0 0.0 13.7					
0.0 0.0 13.7					
nterseason Summary			Ì	Į	Ţ
0.1					
ntersection Capacity Utilization 45.2% ICU Level of Service	g _Q	<			

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ysis	
HCM Unsignalized Intersection Capacity Analysis	5: Dell Range Boulevard & James Drive

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	4	†	*	1	ļ	1	•	-	4	٠	→	*
houmen	Ħ	183	88	18/	WEI	WER	B	器	NBR	麗	SBIT	SER
ane Configurations	je-	ę±		k	48			4			4	
raffic Volume (veh/h)	7	348	0	0	754	2	0	0	0	2	0	14
-uture Volume (Veh/h)	7	348	0	0	754	S	0	0	0	2	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92
Hourly flow rate (vph)	<u></u>	378	0	0	820	ιO	0	0	0	2	0	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Wedian storage veh)		2			2							
Jostream signal (ft)												
oX, platoon unblocked												
vC, conflicting volume	825			378			1229	1219	378	1216	1216	822
vC1, stage 1 conf vol							394	394		822	822	
vC2, stage 2 conf vol							835	825		394	394	
vCu, unblocked vol	825			378			1229	1219	378	1216	1216	822
C. single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	8.2
C, 2 stage (s)							6.1	5.5		6,1	5.5	
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	33
on dueue free %	66			100			100	100	100	66	100	96
cM capacity (veh/h)	802			1180			312	344	699	334	350	374
Direction Lane	88	E82	WB.1	WB 2	NB.	SB1		9	l			
Volume Total	8	378	0	825	0	17						
Volume Left	8	0	0	0	0	7						ì
Volume Right	0	0	0	2	0	15						
SSH	802	1700	1700	1700	1700	368						
Volume to Capacity	0.01	0.22	0.00	0.49	0.00	0.05						П
Queue Length 95th (ft)	-	0	0	0	0	4						ì
Control Delay (s)	9.5	0.0	0.0	0.0	0.0	15.2					ı	
Lane LOS	V				4	O						
Approach Delay (s)	0.5		0.0		0.0	15.2						
Approach LOS					K	ပ						
Interpretation Stemman		ſ			k	ľ	Ī	ŀ	Ĺ			
Average Delay		ŀ	0.3									
Intersection Capacity Utilization	tion		£7 £0/	٢	The second				6			
			0/0/0	2	ICU Level of Service	II Service			n			

HCM Unsignalized Intersection Capacity Analysis 5: Dell Range Boulevard & James Drive

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outleyard & la	מוכיאפות מיס	
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Rouleyard & la	מספוס מופי מים	
on Rouleyard & la	מל המתוכאות לי	
on Rouleyard & la	ingo Dodiovalid & Sair	
Pance Bouleyard & la	tarige boardward & sai	
Pance Bouleyard & la	is a place point of the	
Pance Bouleyard & la	is a place podice and a series	
Pance Bouleyard & la	is a parchal a sail	

2040 Total PM.syn 12/12/2017

		ì					•	-	_		۰	
Movement	ESE	EBI	283	ME	WBT	HEIS	NEW	MET	CHEN	288	188	菌
Lane Configurations	W.	Ž,		×	¢			ą.			4	
Traffic Volume (veh/h)	50	934	0	0	728	10	1	0	0	4	0	16
Future Volume (Veh/h)	20	934	0	0	728	10	-	0	0	4	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1015	0	0	791	=	-	0	0	4	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							Ì
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	802			1015			1867	1861	1015	1856	1856	962
vC1, stage 1 conf vol							1059	1059		962	962	
vC2, stage 2 conf vol							808	802		1059	1059	
vCu, unblocked vol	805			1015			1867	1861	1015	1856	1856	796
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
F (s)	2.2			2.2			3,5	4.0	3.3	3.5	4.0	3.3
po queue free %	26			100			100	100	100	86	100	96
cM capacity (veh/h)	822			683			208	235	289	217	240	387
Describin Line 4	EBI	EBIZ	WB-I	WB.2	NB.1	188	H	ŀ	ŀ	ŀ	ŀ	
Volume Total	22	1015	0	802	-	21						
Volume Left	22	0	0	0	-	4						
Volume Right	0	0	0	1	0	17						
CSH CSH	822	1700	1700	1700	208	337						
Volume to Capacity	0.03	09.0	0.00	0.47	0.00	90.0						
Ouene Length 95th (ft)	2	0	0	0	0	2						
Control Delay (s)	9.5	0.0	0.0	0.0	22.4	16.4						
Lane LOS	V				O	0						
Approach Delay (s)	0.2		0.0		22.4	16.4						
Approach LOS					ပ	O						ı
ofecación Semman			ľ		Ì		ļ	į	ı	l		
American Delay	I	ı	0	ı	ı	ł	ı	l	į	ı	I	ı
Intersection Capacity Utilization	uo		68 4%	S	ICIT Level of Service	f Service			c			
the state of the s												

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	١	t	>	1	ļ	1	•	-	•	۶	→	*
Morement	EBI	EBI	EBS	WB	WBI	Wes	ME	MBT	MBR	133	155	SBB
Lane Configurations	k	2.0			*			42			42	
Traffic Volume (veh/h)		49	4	4	208	3	8	22	2	7	110	80
Future Volume (Veh/h)	11	64	44	4	208	3	81	22	2	2	110	8
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	69.0	0.80	0.61	0.50	0.84	0.25	0.72	0.79	0.25	0.50	0.79	0.80
Hourly flow rate (vph)	16	80	72	00	248	12	113	28	00	4	139	100
Pedestrians												
Lane Width (ft)												
Walking Speed (R/s)												
Percent Blockage												
Right turn flare (veh)											i	
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	260			152			588	424	116	404	454	254
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	260			152			588	454	116	404	454	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	66			66			09	98	66	66	72	87
cM capacity (veh/h)	1304			1429			283	513	936	522	493	785
Distriction (200 #	H	583	184	NB I	SB.1		Ī	ì	l	İ	l	Ī
Volume Total	16	152	268	149	243							
Volume Left	16	0	œ	113	4							
Volume Right	0	72	12	80	100							
SSH	1304	1700	1429	323	583							
Volume to Capacity	0.01	60.0	0.01	0.46	0.42							
Queue Length 95th (R)	-	0	0	28	21							
Control Delay (s)	2.8	0.0	0.3	25.4	15.5							
Lane LOS	A		4	٥	ပ							
Approach Delay (s)	0.7		0.3	25.4	15.5							
Annuach I OC				c	C							

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ICU Level of Service

9.4 46.7% 15

Average Delay Intersection Capacity Utilization Analysis Period (min)

HCM Unsignalized Intersection Capacity Analysis 6: Whitney Road & Dell Range Boulevard

syn	12/2017
PM.s	12/12
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2017	

		†	-	•		,	_	-			•	
Mountien	Ħ	199	EBR	West	WET	WBR	NBC	NBT	MBR	SBI	IBS	SBR
ane Configurations	K	63			4			4			÷	
Traffic Volume (veh/h)	62	224	110	65	139	4	94	. 82	3	2	36.	44
Future Volume (Veh/h)	62	224	110	m	139	4	94	78	ന	7	36	44
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	98.0	0.92	0.79	0.75	0.83	0.50	0.78	0.81	0.38	0.50	69.0	0.73
Hourly flow rate (vph)	72	243	139	4	167	œ	121	96	00	4	52	90
Pedestrians												
Lane Width (ft)												١
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	175			382			722	640	312	622	202	171
vC1, stage 1 conf vol												i
vC2, stage 2 conf vol												
vCu, unblocked voi	175			382			722	940	312	622	705	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												1
(F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
po queue free %	82			100			22	74	66	8	82	93
cM capacity (veh/h)	1401			1176			270	372	728	304	341	873
Director: Late 4	189	EB 2	WBA	NB1	SET	l				Ì	i	Ħ
Volume Total	72	382	179	225	116							
Volume Left	72	0	4	121	4							
Volume Right	0	139	80	00	9							
HS3	1401	1700	1176	314	495							١
Volume to Capacity	0.05	0.22	0.00	0.72	0.23							1
Queue Length 95th (ft)	4	0	0	130	23							
Control Delay (s)	7.7	0.0	0.2	40.9	14.5							
Lane LOS	A		V	ш	8							
Approach Delay (s)	1.2		0.2	40.9	14.5							
Approach LOS	į			ш	œ							ì
Intersection Summary	ĺ	ľ		i		i	ï					Ï.
Average Delay			11.8				I		ì			
Intersection Capacity Utilization	tion		59.1%	0	ICU Level of Service	of Service	4		00			

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2022 Background AM.syn	12/12/2017
HCM Unsignalized Intersection Capacity Analysis	6: Whitney Road & Dell Range Boulevard

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Mosement	182	H	E88	WBI	VBI	SW SP		188	88	Ø	調	SBR
Lane Configurations	je.	25			4			Ą			ę	
Traffic Volume (veh/h)	12	89	47	4	221	3	98	23	2	2	117	85
Future Volume (Veh/h)	12	89	47	4	221	က	98	23	2	2	117	82
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	69.0	0.80	0.61	0.50	0.84	0.25	0.72	0.79	0.25	0.50	0.79	0.80
Hourly flow rate (vph)	17	82	11	89	263	12	119	58	80	4	148	106
Pedestrians												Ĭ
Lane Width (ft)												1
Walking Speed (RJs)											Ì	ı
Percent Blockage												1
Right turn flare (veh)												i
Median type		None			None				۱	ı		1
Median storage veh)												
Upstream signal (ft)								١			ı	١
pX, platoon unblocked										١		ı
vC, conflicting volume	275			162			622	448	124	426	481	569
vC1, stage 1 conf vol												Î
vC2, stage 2 conf vol							1					i
vCu, unblocked vol	275	ł		162			622	448	124	456	481	269
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)									į			i
IF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	66			66			25	8	66	66	69	88
cM capacity (veh/h)	1288			1417			257	496	927	503	475	110
Smechon Lane#	E8 :	EB 2	WE-T	NB V	188	i	Ĭ	ľ	Ì	Į	į	
Volume Total	17	162	283	156	258							
Volume Left	17	0	00	119	4			i				
Volume Right	0	11	12	∞	106					ı	ı	
SSH	1288	1700	1417	295	565		į			H	l	
Volume to Capacity	0.01	0.10	0.01	0.53	0.46						١	Ì
Queue Length 95th (ft)	-	0	0	72	28		ı					ĺ
Control Delay (s)	7.8	0.0	0.3	30.2	16.6							
Lane LOS	A		∢	٥	O							Ì
Approach Delay (s)	0.7		0.3	30.2	16.6							
Approach LOS				0	ပ	ł						i
Herspellon Summary							Ĭ				Į	٩
Average Delay			10.5	ı	ı			1				
Intersection Capacity Utilization	ation		48 7%	0	U Level	ICU Level of Service			A	ı		1
Analysis Period (min)			12									

HCM Unsignalized Intersection Capacity Analysis 6: Whitney Road & Dell Range Boulevard

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Overneat	Ħ	ERI	EBR	WES	WBT	WEB	ME	NBT	WED	185	100	8
Lane Configurations	1	23			4			4			4	
Fraffic Volume (veh/h)	99	238	117	က	148	4	100	83	e	2	38	47
Future Volume (Veh/h)	99	238	117	က	148	4	100	83	က	2	38	47
Sign Control		Free			Free			Stop			Stop	
		%0			%0			%0			%0	
Peak Hour Factor	98'0	0.92	62.0	0.75	0.83	0.50	0.78	0.81	0.38	0.50	69.0	0.73
Hourly flow rate (vph)	77	259	148	4	178	œ	128	102	00	4	25	64
Pedestrians												
Lane Width (ft)												
Walking Speed (fl/s)	İ											3
Percent Blockage												ı
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (R)												
X, platoon unblocked												
vC, conflicting volume	186			407			768	681	333	662	751	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
/Cu, unblocked vol	186			407			768	681	333	662	751	182
C, single (s)	4.1			4,1			7.1	6.5	6.2	7.1	6.5	6.2
C, 2 stage (s)												ı
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
po queue free %	94			100			48	71	66	66	83	93
oM capacity (veh/h)	1388			1152			245	351	402	275	320	861
action Lase #	-88	EB3	WBIT	NB-1	188	Ì	ţ	ŧ	ļ			ļ,
folume Total	11	407	190	238	123							
olume Left	11	0	4	128	4							
Volume Right	0	148	80	80	64							
	1388	1700	1152	288	471							
Volume to Capacity (90'0	0.24	0.00	0.83	0.26							
Queue Length 95th (ft)	4	0	0	170	56							
Control Delay (s)	7.7	0.0	0.2	56.8	15.3							
ane LOS	⋖		V	L	ပ							
Approach Detay (s)	1.2		0.2	56.8	15.3							
pproach LOS				Œ	O							i
Brsschith Summary	Ĭ	i	ŀ	ľ		ļ	ĺ	l	ĺ	ì	į	ł
Average Delay	ı	h	15.5	h	li	ľ	ř	h		Ì	l	
ntersection Capacity Utilization			61 7%	<u>C</u>	ICLI Level of Service	Service			α			
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HCM Unsignalized Intersection Capacity Analysis	6: Whitney Road & Dell Range Boulevard

2022 Total AM.syn 12/12/2017

The case Fibra Wile Wi		4	†	<u> </u>	1	ţ	4	•	←	•	۶	→	•
12 82 47 4 226 3 86 23 2 2 117 Free Color	Movement	FBI	B	EBR	WBI	WBT	WBB	MBE	MBT	MBR	88	SEL	SBR
12 82 47 4 226 3 86 23 2 2 117 Free Free Free Free 7 8 520 0 2 2 117 Free 0 061 0.50 0.64 0.25 0.72 0.79 0.25 0.50 0.79 0.60 0.61 0.50 0.64 0.25 0.72 0.79 0.25 0.50 0.79 0.70 0.77 8 269 12 119 29 8 4 148 17 103 77 8 269 12 119 29 8 4 148 180 41 4.1 4.1 7.1 87 142 450 505 180 646 472 142 450 505 180 699 99 75 180 289 119 37 288 180 180 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A C B B B 0.7 0 0.3 20.3 10.9 14.0 A A A B B B B 0.7 0 0.3 20.3 10.9 14.0 A A A B B B B B B B B B B B B B B B B	Lane Configurations	K	2,			4		AF.	43			42	
12	Traffic Volume (veh/h)	12	82	47	4	526	en	98	23	2	2	117	85
Fiee Fiee Shop	Future Volume (Veh/h)	12	82	47	4	226	m	98	23	2	2	117	85
0.69 0.69 0.61 0.50 0.84 0.25 0.72 0.79 0.25 0.50 0.79 0.79 0.79 0.79 0.79 0.79 0.79 0.7	Sign Control		Free			Free			Stop			Stop	
281 TWITL None 646 472 142 450 505 079 078 177 8 269 12 119 29 8 4 148 189 189 189 189 189 189 189 189 189 18	Grade		%0			%0			%0			%0	
TWUTL None	Peak Hour Factor	0.69	0.80	0.61	0.50	0.84	0.25	0.72	0.79	0.25	0.50	0.79	0.80
281 TWLTL None 646 472 142 459 505 176 176 176 291 291 471 42 459 505 41 41 41 41 41 41 41 41 41 41 41 41 41	Hourly flow rate (vph)	17	103	77	80	569	12	119	53	80	4	148	106
281 TWLTL None 646 472 142 450 505 214 281 180 646 472 142 450 505 214 281 180 646 472 142 450 505 214 282 180 646 472 142 450 505 214 282 180 699 99 75 180 289 119 37 288 119 0 0 3 20 3 10 9 14.0 66 0.39 0.01 0.01 0.03 20.3 10.9 14.0 66 0.39 0.07 0.03 20.3 10.9 14.0 6 0.39 0.03 20.3 10.9 14.0 6 0.39 0.03 20.3 10.9 14.0 6 0.39 0.03 20.3 10.9 14.0 6 0.39 0.03 20.3 10.9 14.0 6 0.30 0.03 20.3 10.9 14.0 6 0.39 0.03 10.0 10.3 20.3 10.9 14.0 6 0.39 0.03	edestrians												
281 TWLTL None 646 472 142 450 505 41	ane Width (ft)												
281 TWLTL None 646 472 142 450 505 129 170 180 646 472 142 450 505 144 180 646 472 142 450 505 144 180 646 472 142 450 505 144 180 180 180 180 180 180 180 180 180 180	Walking Speed (ft/s)												ı
281 180 646 472 142 450 505 175 176 176 176 234 291 291 41 180 646 472 142 450 505 140 140 140 140 140 140 140 140 140 140	Percent Blockage												Н
7WLTL None 281 281 282 283 4.1 4.1 4.1 4.1 4.1 4.1 4.1 4.	Right turn flare (veh)												
281 180 646 472 142 450 505 176 176 291 291 281 281 180 646 472 142 450 505 214 281 281 281 281 281 281 281 281 282 22 2 2 2	Median type		WLTL			None							
281 180 646 472 142 450 505 281 180 646 472 142 450 505 4.1 4.1 4.1 4.1 7.1 6.5 142 450 505 4.1 4.1 4.1 7.1 6.5 142 450 505 2.2 2.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 99 99 75 1282 1700 1396 334 647 656 0.01 0.01 0.03 20.3 10.9 14.0 A A C B B B 0.7 7 0 0.3 20.3 10.9 14.0 A A C B B B 0.7 7 0 0.3 20.3 10.9 14.0 A A C B B B 0.7 7 0 0.3 20.3 10.9 14.0 A A C B B B 0.7 7 0 0.3 20.3 10.9 14.0 C B B B C C C C B B B C C C C C C C C C	Median storage veh)		2										
281 180 646 472 142 450 505 141 176 176 291 291 291 471 297 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 450 505 141 287 142 141 287 141 287 142 141 287 14	Jpstream signal (ft)												
281 180 646 472 142 450 505 414 281 4180 646 472 142 450 505 418 418 418 418 418 418 418 418 418 418	X, platoon unblocked												
281	C, conflicting volume	281			180			646	472	142	450	505	275
281 41 297 160 214 4.1 4.1 4.1 4.1 297 160 214 4.2 2.2 2.2 4.1 5.5 6.2 7.1 6.5 9.9 9.9 9.9 6.0 95 95 95 1282 1396 8.1 9.2 2.8 1 17 180 289 119 37 258 17 180 289 119 37 258 17 180 289 119 37 258 18	C1, stage 1 conf vol							176	176		291	291	
281	C2, stage 2 conf vol							471	297		160	214	
4.1 4.1 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.1 6.5 6.2 7.2 2.2 2.2 3.5 4.0 3.3 3.5 4.0 3.5 7.2 2.2 3.5 4.0 3.6 4.0 3.5 7.2 2.2 3.5 4.0 3.6 4.0 3.6 4.0 3.2 3.5 4.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3	Cu, unblocked vol	281			180			949	472	142	450	505	275
22	C, single (s)	4.1			4.1			7.1	6.5	6.2	7,1	6.5	6.2
22 35 4.0 3.3 3.5 4.0 1289 99 99 75 1282 1396 99 99 75 1396 99 99 99 99 99 99 99 99 99 99 99 99 9	C, 2 stage (s)							6.1	5.5		6.1	5.5	
99 99 75 1396 69 95 99 75 1396 1396 1364 600 906 642 596 17 1396 1397 288 17 180 289 119 37 288 17 17 0 8 119 0 4 4 17 180 1396 134 647 656 1001 111 0.01 34 0.06 0.39 14.0 7 1 0 36 5 4 10.0 14.0 17 0.0 36 5 4 10.0 14.0 17 0.0 36 5 4 10.0 14.0 17 0.0 36 5 4 10.0 14.0 17 0.0 36 5 4 10.0 14.0 17 0.0 36 5 4 10.0 14.0 17 0 36 5 4 10.0 14.0 17 0 0 36 5 4 10.0 14.0 17 0 0 36 5 4 10.0 14.0 17 0 0 36 5 4 10.0 14.0 17 0 0 36 5 4 10.0 14.0 17 0 0 36 5 4 10.	F (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1282	of queue free %	66			66			99	96	66	66	75	98
17 180 289 119 37 258 17 180 289 119 37 258 17 0 8 119 0 4 0 0 7 12 0 8 106 1282 1700 1396 354 647 656 0.01 0.11 0.01 0.34 0.06 0.39 0.07 0.3 20.3 10.9 14.0 A A C B B 0.7 0.3 18.0 14.0 C B B 7.4 17.4 10U Level of Service	:M capacity (veh/h)	1282			1396			354	900	906	642	969	764
17 180 289 119 37 268 17 0 8 119 0 4 0 7 12 0 8 106 1282 1700 1396 354 647 656 0.01 0.11 0.01 0.34 0.06 0.39 1 0 0 36 35 47 1 0 0 36 3 47 7.8 0.0 0.3 20.3 10.9 14.0 A A C B B 0.7 0.3 16.0 B B 7.4 ICULevel of Service	Dection Lane #	H	ER2	WBit	NB 1	NB 2	\$8.1	A	ì	ì		Ì	
17 0 8 119 0 4 1820 177 12 0 8 119 0 777 12 0 8 106 0.01 0.11 0.01 0.34 0.67 656 1 0 0 36 5 47 7.8 0.0 0.3 20.3 10.9 14.0 A A C B B B A A C B B A A C B A A C B B A C B B A C C B A C C B B A C C B B A C C B B A C C B B A C C B B A C C B A C C B B A C C C B A C C C B A C C C B A C C C B A C C C B A C C C C B A C C C C C C C C C C C C C C C C C C	/olume Total	17	180	289	119	37	258						
1282 1770 136 8 106 1282 1700 1396 354 647 656 10.0 0.1 0.1 0.0 0.34 0.6 0.39 1 0 0 0.3 20.3 10.9 14.0 A A C B B A A C B B B C C C C C C C C C C C C C C C C	/olume Left	17	0	00	119	0	4						
1282 1700 1396 354 647 656 0.01 0.11 0.01 0.34 0.06 0.39 0.03 0.03 20.3 10.9 14.0 A A C B B B 0.7 0.3 18.0 14.0 C B B 7.4 ICULevel of Service	/olume Right	0	77	12	0	00	106						
0.01 0.11 0.01 0.34 0.06 0.39 1 0 0 36 5 47 7.8 0.0 0.3 20.3 10.9 14.0 A A C B B B 0.7 0.3 18.0 14.0 C B B 7.4 1CU Level of Service	LS:	1282	1700	1396	354	647	959						
7.8 0.0 0.3 5 47 7.8 0.0 0.3 20.3 10.9 14.0 A A C B B 0.7 0.3 18.0 C B 6.3 14.0 C B 7.4 16.0 A 47.4% IOU Level of Service	/olume to Capacity	0.01	0.11	0.01	0.34	90.0	0.39						
7.8 0.0 0.3 20.3 10.9 14.0 A C B B 0.7 0.3 18.0 14.0 C B 7.4 10U Level of Service	Queue Length 95th (ft)	-	0	0	36	2	47						
A A C B B C B C B B C C B C C C C C C C	Control Delay (s)	7.8	0.0	0.3	20.3	10.9	14.0						
0.7 0.3 18.0 14.0 C B 7.4 7.4 ICU Level of Service	ane LOS	ď		4	O	60	8						ï
C B 7.4 47.4% IOU Level of Service	Approach Delay (s)	0.7		0.3	18.0		14.0						
7.4 47.4% IOU Level of Service 14.	Approach LOS				ပ		Φ						ď
7.4 TOU Level of Service 47.4% IOU Level of Service 15.	Marrachina Seminana		l	ı	ı	į	į	ŀ				Ì	
47,4% ICU Level of Service	Average Delay	ŀ	ı	7.4	ı	ı	ı	l	ı	ı	۱	ł	
15	ntersection Capacity Utiliza	afinn		47.4%	2	III evel	Service			4			Ī
	Analysis Period (min)			15	2					4			

HCM Unsignalized Intersection Capacity Analysis 6: Whitney Road & Dell Range Boulevard

K	117
S	2
₽	12/1
Total	
2022	

	١	t	-	*		,	-	-			•	
Movement	EBC	EBI	HHH	WEE	WET	WER	NEC	MBI	MBK	ies.	SBI	馬
Lane Configurations	je-	٤٤			*		p.	£,			4	
Traffic Volume (veh/h)	99	247	117	9	163	4	100	83	က	7	38	47
Future Volume (Veh/h)	99	247	117	က	163	4	100	83	က	2	38	47
Sign Control		Free			Free			Stop			Stop	
Grade		%0			%0			%0			%0	
Peak Hour Factor	0.86	0.92	0.79	0.75	0.83	0.50	0.78	0.81	0.38	0.50	0.69	0.73
Hourly flow rate (vph)	77	268	148	4	196	œ	128	102	œ	4	22	64
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												Ì
Median type		TWLTL			None							
Median storage veh)		2										
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	204			416			962	208	342	689	778	200
vC1, stage 1 conf vol							496	496		208	208	
vC2, stage 2 conf vol							300	212		481	220	
vCu, unblocked vol	504			416			962	708	342	689	778	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			02	78	66	66	88	92
cM capacity (veh/h)	1368			1143			421	473	701	402	446	841
Direction Langle	HBH	EB2	WB-1	NB.1	MB/2	1.88		İ	Ī	Ł	ĺ	
Volume Total	11	416	208	128	110	123						
Volume Left	11	0	4	128	0	4						
Volume Right	0	148	80	0	00	64						
SH	1368	1700	1143	421	484	287						
Volume to Capacity	90.0	0.24	000	0.30	0.23	0.21						
Queue Length 95th (R)	4	0	0	35	22	50						
Control Delay (s)	7.8	0.0	0.2	17.2	14.6	12.7						
Lane LOS	ď		4	U	80	8						
Approach Delay (s)	1.2		0.2	16.0		12.7						
Approach LOS				O		Φ						
Infocostion Summany		Ì		Ì	ì	ŀ	ļ	AI G	ŀ	Ì	ļ	j
Average Delay	ŀ		5.7	i.	ŀ						ı	
Intersection Capacity Utilization	tion		57.8%	ō	U Level	ICU Level of Service			co			

Synchro 9 Report Page 1

HCM 2010 Roundabout 6: Whitney Road & Dell F

2022 Total AM Roundabout 6,syn

Range Boulevard
Range F
& Dell
Road
Whitney

ntersection Delay, s/veh	7.1			
ntersection LOS	A			
proach	993	8/8	SN NB	SB
ntry Lanes				
conflicting Circle Lanes	-	_	-	-
di Approach Flow, vehih	197	588	156	258
emand Flow Rate, veh/h	201	294	159	263
chicles Circulating, vehilth	163	168	126	403
ehicles Exiting, veh/h	503	117	238	29
ollow-Up Headway, s	3.186	3.186	3.186	3.186
ed Vol Crossing Leg. #ih	0	0	0	0
ed Cap Adj	1 000	1 000	1.000	1,000
pproach Delay, s/veh	5.9	7.1	5.2	9.5
proach LOS	∢	A	V	A
92	197	Left	liell	Left
esignated Moves	LTR	LTR	LTR	LTR
ssumed Moves	LTR	LTR	LTR	LTR
Channelized				
ane Util	1.000	1 000	1 000	1.000
ritical Headway, s	5.193	5 193	5 193	5.193
Entry Flow, vehilh	201	294	159	263
ap Entry Lane, veh/h	096	992	966	755
try HV Adj Factor	0.980	0.982	0 984	0.981
low Entry, vehilh	197	289	156	258
Cap Entry, veh/h	941	938	086	741
C Ratio	0.209	0.308	0 160	0.348
ontrol Delay, s/veh	5.9	7.1	5,2	9.5
SC	A	A	A	ď
				•

out Dell Range		& Dell Range Boulevard
	ndabout	Dell Rang
	M 2010 R	Vhitney Road

2022 Total PM Roundabout_6.syn 12/12/2017

ntersection Delay, s/veh	7.3			
Hersechori LOS				
pproach	183	- W	NB.	88
entry Lanes	1			
Conflicting Circle Lanes	-	-	-	-
di Approach Flow, veh/h	162	283	143	290
Jemand Flow Rate, veh/h	165	288	146	295
fehicles Circulating, veh/h	182	155	109	394
fehicles Exiting, veh/h	204	100	238	49
ollow-Up Headway, s	3 186	3.186	3.186	3 186
Ped Vol Crossing Leg. #th	0	0	0	0
Ped Cap Adi	1,000	1,000	1,000	1 000
oproach Delay, s/veh	5.6	6.9	4.9	9.8
pproach LOS	A	A	A	A
電	100		168	lell
besignated Moves	LTR	LTR	LTR	LTR
ssumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
ane Util	1.000	1,000	1,000	1.000
Critical Headway, s	5.193	5,193	5 193	5.193
Entry Flow, veh/h	165	288	146	295
Sap Entry Lane, veh/h	942	896	1013	762
Entry HV Adj Factor	0.983	0.981	0.982	0.982
low Entry, veh/h	162	283	143	230
Cap Entry, veh/h	926	949	982	748
//C Ratio	0.175	0.298	0.144	0.387
Control Delay, s/veh	5.6	6.9	4.9	9.8
OS	A	A	A	A
Drut altita O				

Synchro 9 Report Page 1

HCM Unsignalized Inte 6: Whitney Road & Dell

Marconic Feb. Feb. Wild Wil		\	t	-	*		/		_	L	•	+	,
Configurations T Th	Overnent	EBI	EBI	EBB	WBL	WBT	WBR	NBE	MET	MBN	788	199	288
Volume (vehith) 15	ane Configurations	Je-	2.5			+3			4			4	
s volume (vehfn) 15 85 59 5 277 4 108 29 3 3 146 500 1000 10000000000000000000000000000	raffic Volume (veh/h)	15	85	29	2	277	4	108	53	3	c	146	106
Prece Prece Stop	uture Volume (Veh/h)	15	85	69	3	277	4	108	53	e	m	146	106
Hour Factor (192 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.	ign Control		Free			Free			Stop			Stop	
My Cheur Factor (192 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.	brade		%0			%0			%0			%0	
How rate (rph) 16 92 64 5 301 4 117 32 3 159 With first With first With first With first With first With first Bord Speed (fits) In Sp	eak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92
tytians (this) None	fourly flow rate (vph)	16	92	64	5	301	4	117	32	e	e	159	115
Width (ft) None None None Anni Base (ver) None None Anni Base (ver) None Anni Base (ver) None Anni Base (ver) None Anni Base (ver) None Anni Base (ver)	edestrians												
9 Speed (fts) In Blackage Inn flate (veh) In type	ane Width (ft)												
nt Blockage fund flags (b) fund flags (c) fund flag	Valking Speed (ff/s)												
turn flare (veh) None None None n stronge wh) 156 664 471 124 456 501 sam signal (th) 305 156 664 471 124 456 501 sam signal (th) 305 156 664 471 124 456 501 stage 1 cont vol 305 156 664 471 124 456 501 stage 1 cont vol 305 4,1 4,1 7,1 6,5 5,2 7,1 6,5 stage 1 cont vol 4,1 4,1 7,1 6,5 6,2 7,1 6,5 stage 1 cont vol 4,1 4,1 7,1 6,5 6,2 7,1 6,5 stage (s) 4,1 4,1 7,1 6,5 6,2 7,1 6,5 pacify (selvh) 126 30 100 9 100 9 6 9 6 pacify (selvh) 16 6 4 <	ercent Blockage												
None None None None None None Sara signal (1) attacked by the sam signal (1) attacked visible	tight turn flare (veh)												
n storage veh) atom to back and the storage veh) atom to belay (s)	Median type		None			None							
sem signal (†) sem signal (†) miliciting volume 305 156 664 471 124 456 501 miliciting volume 305 156 664 471 124 456 501 417 417 711 655 664 477 124 456 501 miliciting volume 49 90 100 90 90 90 90 90 90 90	(edian storage veh)												
atron unblocked at the first state of the first sta	lpstream signal (ft)												
156 664 471 124 456 501 438 501	X, platoon unblocked												
tage Loom foul digres of control and secretary of the control of t	C, conflicting volume	305			156			664	471	124	456	501	303
ttage 2 confivol 305 156 664 471 124 456 501 publicocked vol 305 156 664 471 124 456 501 stage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 3.5 4.0 3.3 3.5 4.0 pacify (verkn) 1256 1424 2.2 4.9 93 100 99 66 pacify (verkn) 1256 310 182 277 4.9 93 100 99 66 66 4.0 4.0 99 66 66 66 4.0 33 3.5 4.0 99 66 66 4.0 4.0 99 66 66 4.0 4.0 99 66 66 4.0 4.0 4.0 93 100 99 66 66 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4	C1, stage 1 conf vol												
156 664 471 124 456 501 156 664 471 124 456 501 159 2	C2, stage 2 conf vol												
tigle (s) 4,1 4,1 7,1 6,5 6,2 7,1 6,5 Atage (s) 2,2 2,2 3,5 4,0 3,3 3,5 4,0 Bue free % 99 100 49 33 100 99 66 packly (eh/hr) 1256 WB1 NB1 SB1 49 33 100 99 66 packly (eh/hr) 1256 WB1 NB1 SB1 48 44 44 44 377 481 464 <td>Cu, unblocked vol</td> <td>302</td> <td></td> <td></td> <td>156</td> <td></td> <td></td> <td>999</td> <td>471</td> <td>124</td> <td>456</td> <td>201</td> <td>303</td>	Cu, unblocked vol	302			156			999	471	124	456	201	303
stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 sue free % 99 100 49 93 100 99 66 pacity (veh/h) 1256 1424 229 483 927 481 464 pacity (veh/h) 1256 WB1 NB1 SB1 87 481 464 e Chall 16 156 310 152 277 8 144 464	S, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
22 22 35 40 33 35 40 pacity (velthr) 1256 100 49 99 100 99 66 pacity (velthr) 1256 1424 229 483 97 481 464 non Lane RB 1 RB 1 SB 1 229 483 97 481 464 non Lane RB 1 16 16 17 3 7 7 81 464 non Lotal 16 16 17 3 7 8 17 8 e Right 0 64 3 71 3 8 8 17 8 e Right 0 0 64 3 71 8 17 8 e Right 0 0 0 0 8 0.50 9 66 9 66 9 66 67 9 9 9 9 9 9 9 <	5, 2 stage (s)												
1256 100 49 53 100 59 66	(s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1256	0 queue free %	66			100			49	83	100	66	99	22
HB1 EB2 WB1 NB1 SB1 16 156 310 152 277 16 0 5 17 3 0 64 4 3 115 1256 1700 1424 262 549 0,01 0,09 0,00 0,58 0,50 1 0 0 83 71 7,9 0,0 0,2 36,1 18,1 A A E C 0,7 0,2 36,1 18,1 E C 1,7 0,2 36,1 18,1 E C 1,17 CU Level of Service	M capacity (veh/h)	1256			1424			229	483	927	481	464	737
16 156 310 152 277 1 0 5 117 3 0 6 4 115 1256 1700 1424 262 549 0.01 0.09 0.00 0.58 0.50 1 0 0 36 1181 2 0 0 0 2 36.1 18.1 A A E C 0.7 0.2 36.1 18.1 A A E C 0.7 0.2 36.1 18.1 A A E C 1.17 C 0.2 36.1 18.1 A A E C 1.17 C 0.2 36.1 18.1 C 0.3 36.1 18.1	irection: Lane #	183	E82	WB 1	183	1.88		j	Ą	į	ì	1	E
16 0 5 117 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	'olume Total	16	156	310	152	277							
1256 1700 1424 262 549 0.01 0.09 0.00 0.58 0.50 1 0 0 0.8 71 7.9 0.0 0.2 36.1 18.1 A A E C 0.7 0.2 36.1 18.1 III.7	'olume Left	16	0	2	117	က							
1256 1700 1424 262 549 001 0.09 0.00 658 0.50 1 0 0 83 71 1 0 0 2 36.1 18.1 A A E C 0.7 0.2 36.1 18.1 E C 11.7 II.7 II.7 II.7 II.7 II.7 II.7 II.7	olume Right	0	64	4	က	115							
0.01 0.09 0.00 0.58 0.50 1 0 0 83 71 7.9 0.0 2 36.1 18.1 A E C 0.7 0.2 36.1 18.1 E C 1.17 III.7 ICU Level of Service	SH	1256	1700	1424	262	549							
1 0 0 83 71 7.9 0.0 0.2 36.1 18.1 A	folume to Capacity	0.01	60.0	0.00	0.58	0.50							
7.9 0.0 0.2 36.1 18.1 A A E C 0.7 0.2 36.1 18.1 E C 11.7 11.7 ILL evel of Service	theue Length 95th (ft)	-	0	0	83	11							
A A E C 0.7 0.2 36.1 18.1 E C 11.7 I.1.7 I	control Delay (s)	7.9	0.0	0.2	36.1	18.1							
0.7 0.2 36.1 18.1 E C 11.7 11.7 CU Level of Service	ane LOS	∢		∢	ш	O							Ĭ
E C 11.7 11.7 11.7 11.7 11.7 11.7 11.7 11.	pproach Delay (s)	0.7		0.2	36.1	18.1							
11.7 58.5% ICU Level of Service	pproach LOS				ш	ပ							١
11.7 58.5% ICU Level of Service	theseston Sommany	ľ	h	ŧ	Ĭ		l				ŀ	İ	P
58.5% ICU Level of Service	verage Delay			11.7		ŀ			ŀ			ľ	
	ntersection Capacity Utiliza	tion		58.5%	೦	U Level o	f Service			8			

HCM Unsignalized Intersection Capacity Analysis 6: Whitney Road & Dell Range Boulevard

Processional Configurations Processional Configuration Processional Configurations Processional Configuration Processional Configuration Processional Configurational Configuration Processional Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurational Configurati													
Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part Configurations National Part	Moresten	EBI	EBI	EBR	WBI	WBI	888	ME	MBIT	MBR	两	SBT	88
Volume (vehith)	Lane Configurations	38°	23			*			-2			4	
Volume (Vehith) 83 298 146 4 185 5 125 104 4 3 48 Stop	Traffic Volume (veh/h)	83	298	146	4	185	2	125	104	4	က	48	ò
Optional Free Free Stop	Future Volume (Veh/h)	83	298	146	4	185	2	125	104	4	က	48	25
How rate (pth) 90 324 159 4 201 5 136 113 4 3 52 How rate (pth) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 90 324 159 4 201 5 136 113 4 3 52 trians with (th) 1365 136 138 138 138 138 138 138 138 138 138 138	Sign Control		Free			Free			Stop			Stop	
Hour Factor (992 092 092 092 092 092 092 092 092 092	Grade		%0			%0			%0			%0	
Flow rate (vph) 90 324 159 4 201 5 136 113 4 3 52	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0.92
trians (thick fift) 10 Speed (tils) 11 Blockage 11 Int flackage 12 Int flackage 13 Int flackage 14 Int flackage 15 Int flackage 16 Int flackage 17 Int flackage 18 Int	Hourly flow rate (vph)	06	324	159	4	201	ιΩ	136	113	4	က	52	79
Width (t) None	Pedestrians												
None None None None None In Eucladage With Interference (16s) In Special (16s) In Storage With Int Blockage Interference (16s) In storage with Int Blockage Interference (16s) In storage with Int Blockage Interference (16s) In storage with Interference (16s) In storage with Interference (16s) In storage (16s) In storage with Interference (16s) In storage (16s)	Lane Width (ft)												
nt Blockage fun miner (wh) fun mare (wh) fun	Walking Speed (ft/s)												
turn flare (veh) None None None n storage veh) n storage veh) 885 798 404 776 874 sam signal (veh) 206 483 885 798 404 776 874 dage Loonf vol stage Loonf vol stage Loonf vol stage Loonf vol stage (s) 4.1 4.1 7.1 6.5 874 4.0 404 776 874 dage Loonf vol stage Loonf vol stage (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 874 4.0 874 </td <td>Percent Blockage</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Percent Blockage												
In type Annotage with) Annot	Right turn flare (veh)												
nsforage veh) are maintained it) are milliciting volume = 206	Median type		None			None							
tage 1 (t) sem signal (t) sem signal (t) sem signal (t) sem signal (t) stage 1 cont vol stage 2 cont vol stage 2 cont vol stage 2 cont vol stage 3 cont vol stage 6 (s) 4,1 4,1 4,1 7,1 6,5 6,5 7,1 6,5 7,1 6,5 8,4 9,9 9,9 9,1 9,6 9,9 9,9 9,1 9,6 9,9 9,9	Median storage veh)												
atoon unblocked attacked attacked attacked attacked attacked by the figure of the figu	Upstream signal (ft)												
Multicriting volume 206 483 885 798 404 776 874 439	pX, platoon unblocked								þ				
stage I confl vol 483 885 798 404 776 874 stage 2 confl vol 4,1 4,1 7,1 6,5 6,2 7,1 6,5 stage (s) 4,1 4,1 7,1 6,5 6,2 7,1 6,5 stage (s) 2,2 3,5 4,0 3,3 3,5 4,0 8,4 9,9 8,1 stage (s) 2,2 2,2 3,5 4,0 3,3 3,5 4,0 7,1 6,5 4,0 7,1 6,5 4,0 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,5 8,2 7,1 6,2	vC. conflicting volume	506			483			885	798	404	276	874	204
tigge 2 confluct 483 885 798 404 776 874 ninlocked vol 206 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 3.5 4.0 3.3 3.5 4.0 pacify (exhth) 185 100 3.1 6.2 99 99 81 pacify (exhth) 185 100 2.2 3.5 4.0 3.3 3.5 4.0 pacify (exhth) 186 1.0 2.2 1.0 3.1 6.2 7.1 6.5 pacify (exhth) 4.8 3.1 4.7 2.0 2.8 8.1 pacify (exhth) 1.5 3.0 2.3 1.1 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 8.4 9.2 9.0 9.0 9.0 <th< td=""><td>vC1. stage 1 conf vol</td><td></td><td></td><td>N</td><td></td><td></td><td>ŀ</td><td></td><td></td><td></td><td>ı</td><td></td><td></td></th<>	vC1. stage 1 conf vol			N			ŀ				ı		
Marched 206 483 885 798 404 776 874 Autoridade 206 483 885 798 404 776 874 Autoridade 22 2.2 2.2 3.5 4.0 3.3 3.5 4.0 Autoridade 33 210 223 138 235 4.0 3.3 3.5 4.0 Autoridade 200 44 136 3 138 237 647 209 268 Autoridade 200 44 136 3 138 238 248 Autoridade 200 200 200 200 200 200 Autoridade 200 200 200 200 200 Autoridade 200 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 Autoridade 200 200 200 200 200 Autoridade 200 200 200 200 200 200 Autoridade 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 200 20	vC2, stage 2 conf vol												
type (s) 4.1 4.1 7.1 6.5 6.2 7.1 6.5 stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 aue free % 93 100 31 6.2 99 99 81 pacity (vehin) 1365 1080 31 6.2 99 99 81 pacity (vehin) 1365 100 4 18 287 6.7 209 268 pacity (vehin) 1365 100 4 138 3 4 6.7 209 288 pacity (vehin) 1365 100 2.5 4 6.4 7 2.09 288 pacity (vehin) 1365 100 2.6 4.18 8 3 4.0 3.3 3.5 4.0 2.2 2.0 2.2 4.18 8 4.18 8 4.18 8 4.18 8 4.18 8 4.18 8 4.18 8	vCu, unblocked vol	206	i	ı	483			885	288	404	9//	874	207
stage (s) 2.2 2.2 3.5 4.0 3.3 3.5 4.0 sue free % 93 100 31 62 99 99 81 pacity (veh/n) 1365 1080 198 297 647 209 268 pacity (veh/n) 1365 100 136 3 15 40 288 per Left 90 483 210 253 119 297 647 209 268 per Left 90 4 136 3 4 64 4 64	tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	9
22 22 35 40 33 35 40 34 35 40 34 35 35 40 34 35 35 40 34 35 35 35 35 35 35 35	tC, 2 stage (s)	į											
93 100 31 62 99 99 81 185 186 186 186 186 186 186 186 186 186 186	tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
1365 1080 198 297 647 209 268 181 185 190 198 297 647 209 268 181 181 181 181 181 181 181 181 181 1	p0 queue free %	93			100			31	62	66	66	81	6
90 483 210 253 119 90 483 210 253 119 91 0 4 136 3 91 0 4 136 3 91 0 4 136 3 91 0 4 136 3 91 0 4 136 3 91 0 0 236 418 91 0 0 107 0.28 91 0 0 272 29 91 0 0 272 29 92 0 0 124.3 17.0 93 0 0 272 29 94 0 0 272 29 95 0 0 272 29 96 0 0 272 29 97 0 28 0 0 107 0.28 97 0 0 272 29 97 0 272 29 97 0 272 272 272 272 272 272 272 272 272	cM capacity (veh/h)	1365			1080			198	297	647	209	268	837
90 483 210 253 119 90 0 4 136 3 90 0 4 136 3 1365 1700 1080 236 418 0.07 0.28 0.00 1.07 0.28 5 0 0 272 29 7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 7.30% ICU Level of Service	Direction (meet	ä	EB2	181	1991	SBr			١	i	j	ł	
90 0 4 136 3 0 159 5 4 64 136 1709 1080 236 418 0.07 0.28 0.00 1.07 0.28 5 0 0 272 29 7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 F C 73.0% ICU Level of Service	Volume Total	06	483	210	253	119							
0 159 5 4 64 1965 1700 1080 236 418 0.07 0.28 0.00 1.07 0.28 7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 F C 73.0% ICU Level of Service	Volume Left	06	0	4	136	3							
1365 1700 1080 236 418 0.07 0.28 0.00 1.07 0.28 5 0 0 272 29 7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 F C 73.0% IOU Level of Service	Volume Right	0	159	ĸ	4	64							
0.07 0.28 0.00 1.07 0.28 5 0 0 2.72 29 7.8 0.0 0.2 124.3 17.0 1.2 0.2 124.3 17.0 F C 1.2 0.2 124.3 17.0 29.6 ICU Level of Service	ESH.	1365	1700	1080	236	418							
5 0 0 272 29 7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 F C 29.6 IOU Level of Service	Volume to Capacity	0.07	0.28	0.00	1.07	0.28							
7.8 0.0 0.2 124.3 17.0 A A F C 1.2 0.2 124.3 17.0 F C 29.6 ICU Level of Service	Queue Length 95th (ft)	ഗ	0	0	272	29							
A A F C 1.2 0.2 124.3 17.0 F C 29.6 IOU Level of Service	Control Delay (s)	7.8	0.0	0.5	124.3	17.0							
1.2 0.2 124.3 17.0 F C 29.6 IOU Level of Service	Lane LOS	A		V	ш	O							
F C 29 6 73.0% ICU Level of Service	Approach Delay (s)	1.2		0.2	124.3	17.0							
29.6 73.0% ICU Level of Service	Approach LOS				ш	ပ							
29.6 73.0% ICU Level of Service	Infersection Summany		Å,	l	Å		i	Ì	ł		ł	ł	ı
73.0% ICU Level of Service	Average Delay			29 6			l	H			i		ì
	Intersection Capacity Utiliza	ation		73.0%	2	o jevel I	f.Service			C			

Synchro 9 Report Page 1

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HCM 2010 Signalized Intersection Summary	6: Whitney Road & Dell Range Boulevard
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2040 Total AM.syn 12/12/2017

		Ì	•	-			-	-				
Management	武	抽	H	MBI	WIET	1888	Si.	梅	MBR	SBS	SBT	SBR
-ane Configurations	K.	23		k	<u>**</u>		N-	Žş.	ŀ	×	£\$	
Fraffic Volume (veh/h)	15	148	26	2	314	41	108	168	က	99	384	106
-uture Volume (veh/h)	15	148	29	ເດ	314	41	108	168	က	99	384	106
Number	7	4	14	3	80	9	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4dj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
4dj Flow Rate, veh/h	16	161	64	S	341	45	117	183	က	72	417	115
Adj No. of Lanes	-	-	0	Ī	-	0	-	-	0	-		0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	7
Cap, veh/h	195	329	131	333	418	55	375	834	14	663	642	177
Arrive On Green	0.31	0.31	0.31	0.31	0.31	0.31	0.54	0.54	0.54	0.54	0.54	0.54
Sat Flow, veh/h	993	1069	425	1151	1358	179	868	1539	25	1193	1184	327
3rp Volume(v), veh/h	16	0	225	5	0	386	117	0	186	72	0	532
Grp Sat Flow(s),veh/h/ln	993	0	1494	1151	0	1537	898	0	1564	1193	0	1511
Q Serve(g_s), s	6.0	0.0	7.4	0.2	0.0	13.9	9.9	0.0	3.7	2.0	0.0	14.9
Cycle Q Clear(g_c), s	14.8	0.0	7.4	7.6	0.0	13.9	21.5	0.0	3.7	5.7	0.0	14.9
Prop In Lane	1.00		0.28	1.00		0.12	1.00		0.05	1.00		0.22
Lane Grp Cap(c), veh/h	195	0	460	333	0	473	375	0	848	693	0	819
//C Ratio(X)	0.08	0.00	0.49	0.02	0.00	0.82	0.31	0.00	0.22	0.10	0.00	0.65
Avail Cap(c_a), veh/h	245	0	535	391	0	551	375	0	848	693	0	816
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9.	1.00	1.00	1.00	1.00
Jpstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.87	0.00	0.87	1.00	0.00	1.00
Jniform Delay (d), s/veh	26.0	0.0	16.9	20.0	0.0	19.2	17.3	0.0	7.1	8.6	0.0	9.7
ncr Delay (d2), s/veh	0.2	0.0	0.8	0.0	0.0	œ 	1.9	0.0	0.5	0.3	0.0	4.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	0.3	0.0	3.1	0.1	0.0	7.0	1.8	0.0	1.7	0.7	0.0	7.0
nGrp Delay(d),s/veh	26.2	0.0	17.7	20.0	0.0	27.3	19.2	0.0	7.7	8.9	0.0	13.7
LnGrp LOS	ပ	1	m	O		ပ	60		∢	V		۳
Approach Vol, veh/h		241			391			303			604	
Approach Delay, s/veh		18.3			27.2			12.1			13.1	
Approach LOS		Ω			O			φ			00	Ī
Timer	i	2	eri	**	9	9	2	00		I	ĺ	i
Assigned Phs		2		4		9		œ				1
Phs Duration (G+Y+Rc), s		37.0		23.0		37.0		23.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		29.5		21.5		29.5		21.5				
Max Q Clear Time (g_c+11), s		23.5		16.8		16.9		15.9				
Green Ext Time (p_c), s		2.8		1.6		4.6		1.9				
nlessection Summary	ŀ	ļ	ı			ŀ	ļ	Ì	ŀ	ŧ	ŀ	i i
HCM 2010 Ctrl Delay		l	173		l	l	١	l		l	ı	
2000			2									

2040 Total PM.syn

HCM 2010 Signalized Intersection Summary 6: Whitney Road & Dell Range Boulevard

#(/	4	†	7	6	ţ	4	•	•	4	٠	-	*
Movement	EBI	EBI	EBB	Well	WBI	WBR	JEN	MBI	MBR	SBE	SBT	SER
Lane Configurations	K.	£3		K	£		je.	£,		je-	23	
Traffic Volume (veh/h)	83	376	146	4	279	66	125	462	4	81	345	59
Future Volume (veh/h)	83	376	146	4	279	66	125	462	4	8	345	29
Number	7	4	14	3	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1 00		100	100		1 8
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00	100	100	1 00	1 00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	90	409	159	4	303	108	136	205	4	88	375	64
Adj No. of Lanes	-	-	0	-	-	0	_	-	0	-	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	308	447	174	167	459	163	316	929	co.	267	268	97
Arrive On Green	0.41	0.41	0.41	0.41	0.41	0.41	0.44	0 44	0.44	0.44	0.44	0 44
Sat Flow, veh/h	971	1076	418	840	1105	394	946	1554	12	886	1306	223
Grp Volume(v), veh/h	06	0	268	4	0	411	136	0	909	88	0	439
Grp Sat Flow(s), veh/h/ln	971	0	1495	840	0	1499	946	0	1566	888	0	1529
Q Serve(g_s), s	4.9	0.0	21.5	0.3	0.0	13.3	8.0	0.0	16.2	5.5	0.0	13.6
Cycle Q Clear(g_c), s	18.2	0.0	21.5	21.8	0.0	13.3	21.6	0.0	16.2	21.7	0.0	13.6
Prop in Lane	1.00		0.28	1.00		0.26	1.00		0.01	1.00		0.15
Lane Grp Cap(c), veh/h	308	0	620	167	0	622	316	0	681	267	0	999
V/C Ratio(X)	0.29	0.00	0 92	0.05	0.00	99.0	0.43	0.00	0.74	0.33	0.00	99.0
Avail Cap(c_a), veh/h	318	0	635	176	0	637	316	0	681	267	0	999
HCM Platoon Ratio	1.00	1.00	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	100	1.00	0.00	1.00	0.45	0.00	0.45	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	0.0	16.6	26.8	0.0	14.1	22.0	0.0	14.1	23.2	0.0	13.4
Incr Delay (d2), s/veh	0.5	0.0	17,9	0.1	0.0	2.5	1.9	0.0	3.3	3.3	0.0	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/lin	1.4	0.0	11.9	0.1	0.0	5.9	2.2	0.0	7.5	9.	0.0	6.7
LnGrp Delay(d),s/veh	22.0	0.0	34.4	26.9	0.0	16.6	23.9	0.0	17.4	26.5	0.0	18.5
LnGrp LOS	0		O	٥		m	د		20	ر		۱۳
Approach Vol, veh/h		658			415			642			527	
Approach Delay, s/veh		32.7			16.7			18.8			19.8	Ì
Approach LOS		ပ			Ω			8			œ	
Times	Ť	ci	0	19	9	æ	7	93		H	ě	
Assigned Phs		2	i	4		9		00	H			
Phs Duration (G+Y+Rc), s		30.6		29.4		30.6		29.4				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				H
Max Green Setting (Gmax), s		25.5		25.5		25.5		25.5				
Max Q Clear Time (g_c+1), s		23.6		23.5		23.7		23.8				
Green Ext Time (p_c), s		1.3		1.3		1.2		7				
Interpreten Simmate	١	ŀ	ĺ		ľ			Ī		į	ł	Ī
HCM 2010 Ctd Delay			727									
HCM 2010 J OS			C									
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Synchro 9 Report Page 1

HCM 2010 Roundabout 2040 Total AM_Roundabout 6_18_19_20.syn 6: Whitney Road & Dell Range Boulevard

tersection Delay, s/veh	19.5			
ntersection LOS	၁			
hroeth	88	WB.	90	88
Entry Lanes	1			
Conflicting Circle Lanes	-	-	_	-
Adj Approach Flow, veh/h	241	391	303	604
Demand Flow Rate, veh/h	245	399	309	615
/ehicles Circulating, veh/h	203	322	253	472
/ehicles Exiting, veh/h	584	240	495	249
Follow-Up Headway, s	3.186	3.186	3.186	3 186
ed Vol Crossing Leg, #/h	0	0	0	0
ed Cap Adi	1.000	1 000	1 000	1,000
Approach Delay, s/veh	10.1	11.1	8.2	34.4
Approach LOS	B	В	¥	O
300	Let	E	曹	LEAR
Designated Moves	LTR	ETR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
ane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	245	399	309	615
Cap Entry Lane, veh/h	683	819	877	705
Entry HV Adj Factor	0.983	0.980	0.982	0.982
-low Entry, veh/h	241	391	303	604
Cap Entry, veh/h	672	803	861	692
C Ratio	0.359	0.487	0.352	0.873
ontrol Delay, s/veh	10.1	11.1	8.2	34.4
SC	80	8	A	0
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HCM 2010 Roundabout 6: Whitney Road & Dell Range Boulevard

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ntersection Delay, s/veh	47.6			
ntersection LOS	Ш			
record.	88	WB	NE	SB
itry Lanes	-	- 4		
onflicting Circle Lanes	-	-	1	-
di Approach Flow, veh/h	658	415	642	252
emand Flow Rate, veh/h	671	423	655	537
etticles Circulating, veh/h	476	743	299	452
ehicles Exiting, weh/h	513	511	548	714
ollow-Up Headway, s	3.186	3.186	3.186	3.186
ed Vol Crossing Lea. #/h	0	0	0	0
ed Cao Adi	1.000	1 000	1.000	1.000
pproach Delay, s/veh	48.5	31.5	77.8	22.3
pproach LOS	ш	D	14	O
1	- E-	Less Less	[6]	THE STATE OF THE S
esignated Moves	LTR	LTR	LTR	LTR
ssumed Moves	LTR	LTR	LTR	LTR
T Channelized				
ane Util	1.000	1,000	1,000	1.000
hitical Headway, s	5.193	5.193	5 193	5.193
Entry Flow, veh/h	671	423	655	537
Sap Entry Lane, veh/h	702	537	621	719
ntry HV Adj Factor	0.980	0.981	0 880	0.980
ow Entry, veh/h	658	415	642	527
ap Entry, veh/h	688	527	809	705
V/C Ratio	0.956	0,787	1.055	0.747
ontrol Delay, s/veh	48.5	31.5	77.8	22.3
SC	ш	Ω	F	O
DEAL OF 121 - O. 12. 12.	11	7	40	•

Synchro 9 Report Page 1

2017 Existing AM.syn 12/12/2017 1 378 198 1 378 198 0 0 0 0 0 0 Free Free 2.5 7.9 87 2.5 79 87 2.2 2 4 478 228 HCM 2010 TWSC 7: Dell Range Boulevard & US-30 2.8 Lane Comfigurations
Traffic Vol, wehh
Future Vol, wehh
Conflicting Peets, #hrr
Sign Control
Sign Control
Str Charmelized
Storage Length
Veh in Median Storage, #
Grade, %
Grade, %
Feak Hour Factor
Heavy Vehicles, %
Mvmt Flow Intersection Int Delay, s/veh

Waterfillinge	Magor				Same?			Minori			Manage	i	İ
Conflicting Flow All	478	0	0		112	0	0	657		112	649		478
Stage 1	Ì		-		6	176	e e	161			486	486	i
Stage 2	(*)	St;			4		89	496			163		
Critical Hdwy	412		1		4.12	514	(4	7.12		6.22	7.12		6.22
Critical Hdwy Stg 1	335	22	Y.		ji.	à	94	6.12		•	6.12		Ì
Critical Hdwy Stg 2	2	1E	X		30	16	.9	6.12	5.52		6.12	5.52	
Follow-up Hdwy	2.218	•			2 218	· Ar	æ	3.518		ന	3.518		3
Pot Cap-1 Maneuver	1084	2	180		1478	4	0	378		941	383		587
Stage 1	71	,T.I.	9		K	×	0	841		ì	563		1
Stage 2	*	k	1			*	0	556	551	٠	839	765	i
Platoon blocked, %						(6)							
Mov Cap-1 Maneuver	1084		1		1478	A	3	358		941	373		587
Mov Cap-2 Maneuver	27	•	1.00		334	9.	354	358	380	ı	373	380	•
Stage 1	×	12			S	9	٠	822		١	551		٨
Stage 2	J.B.	in.	À		(a)	(*)	0	536		1	816		*
						i				ı			ij
Approach	83	Ň	H		8//8			92		ì	SB	M	j
HCM Control Delay, s HCM LOS	15				0.1			14.6 B			16.9 C		9 1
Umo Carefilate Mart	NBIDE	Ħ	E81	88	WBI	SETS	Salut		Q			H	Ī
Capacity (veh/h)	380	1084		9	1478		402						
HCM Lane V/C Ratio	0.011	0.022		714	0.003	0.	0.247						
HCM Control Delay (s)	14.6	8.4	×	•	7.4	×	169						
HCM Lane LOS	80	A		*	A	(4)	ပ					١	١
HCM 95th %tile Q(veh)	0	0.1	×	•	0	*	Ļ						

HCM 2010 TWSC 7: Dell Range Boulevard & US-30

Illnesment ane Configurations ratific Vol. webh ratific Vol. webh Conflicting Peds, #hr Sign Control Sign Control St Chamber St Chamber St Chamber Web in Median Storage, #	Ö											
ane Configurations Traffic Vol. vehih Traffic Vol. vehih Confiding Peds. #frr Sign Control TR Chamelized TR Chamelized Storage Length Median Storage.#	400	i	EBR	WBI	WBI	WER	MBI	NBT	MBR	揚	SBI	SBR
Traffic Vol. vehih cuture Vol. vehih Conflicting Peds. #fihr Sign Control AT Channelized Storage Length Veh in Median Storage. #	K	ę\$		*	*	¥		4			4	
uture Vol, vehih Conflicting Peds, #fir Al Gh Control Storanselized Storanselized Storage Length	7	306	0	0	147	140	-	Ī	0	500	4	rc
Conflicting Peds, #fir Sign Control AT Chamelized Storage Length Feh in Median Storage, #	7	306	0	0	147	140	-	-	0	209	4	r.
Sign Control RT Chamelized Storage Length Pet in Median Storage #	0	0	0	0	0	0	0	0	0	0	0	0
RT Channelized Storage Length Jeh in Median Storage. #	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Storage Length Jeh in Median Storage, #	1	8	None			Free			None			None
/eh in Median Storage. #	350	ı	'n	325	i	325			e	[*	j†	
	•	0			0			0	ì		0	ľ
Srade, %	•	0			0		•	0			0	,
Peak Hour Factor	88	88	92	25	83	78	25	25	92	98	90	62
leavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Avmt Flow	12	34	0	0	177	179	4	4	0	243	00	80
Asio/Misor	Majort			Maga2		3	Minori			Minor?	ľ	ŀ
Conflicting Flow All	177	0	0	344	0	0	553	545	344	547	545	177
Stage 1		×			16	ię.	368	368		177	177	3.5
Stage 2		1	,	(*)		311	185	177	h	370	368	17
Critical Hdwy	4.12			4.12	*	A	7.12	6.52	6.22	7 12	6.52	6 22
Critical Hdwy Stg 1	٠		٠	*)	**	86	6.12	5.52	٠	6.12	5,52	
Critical Hdwy Stg 2	•	r	i		Í		6.12	5.52		6.12	5,52	Ì
-ollow-up Hdwy	2.218	•	,	2.218	9	(*)	3,518	4 018	3.318	3.518	4.018	3,318
ot Cap-1 Maneuver	1399			1215	0	0	444	446	669	448	446	998
Stage 1	•	١	1	30		0	652	621	1	825	753	Œ
Stage 2	٠	1	ı	**	X	0	817	753	,	650	621	Ť
Platoon blocked, %		٠			•							
Aov Cap-1 Maneuver	1399	•		1215		62	431	445	669	445	442	998
Mov Cap-2 Maneuver		į,	ě	*		*23	431	442	1	442	442	Ì
Stage 1		0					646	616		818	753	i
Stage 2		1	4	74	9		801	753	1	640	616	Ί
Hermonia	8			and a	П		QV.	ı		8	П	П
Old Cartering	0	ľ		c			404	Ì		200	l	
HCM LOS	20			2			2.00			, C		
Mor Lane Major Munit	MBLn1	ä	EBT	BM MB	WBT	SBLn1		I			8	Ü
apacity (veh/h)	436	1399	į.	- 1215		449		H			ı	ī
ICM Lane V/C Ratio		6000	Ž,	7.	*	0.577						
ICM Control Delay (s)	13.4	9.4	1	0 -	E	23.4						3
HCM Lane LOS	В	A	F	A	į	ပ						
ICM 95th %tile Q(veh)	0.1	0	3	0	3	3.6						

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 7: Dell Range Boulevard & US-30

2017 Existing PM.syn 12/12/2017

2022 Background AM.syn

	4	1	*	4	ļ	1	•	_		*	→	¥
Movement	EBI	EBI	EBB	WBL	WBT	WBR	MBE	NBT	NBR	381	199	88
Lane Configurations	<u></u>	47.4		¥	4.4			4			÷	
Traffic Volume (veh/h)	1	97	0	-	402	211	0	2	0	99	0	=
Future Volume (veh/h)	1	97	0	-	402	211	0	2	0	99	0	Ξ
Number	7	4	14	3	∞	0	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	24	120	0	4	209	243	0	4	0	82	0	22
Adj No of Lanes		2	0	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.29	0.81	0.92	0.25	0.79	0.87	0.92	0.50	0.92	0.78	0.92	0.50
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	410	1773	0	809	1129	537	0	416	0	352	9	76
Arrive On Green	0.02	0.59	00.0	0.01	0.58	0.58	0.00	0.26	0.00	0.26	0.00	0.26
Sat Flow, veh/h	1494	3059	0	1494	1962	933	0	1569	0	1083	23	286
Grp Volume(v), veh/h	24	120	0	4	386	366	0	4	0	107	0	0
Grp Sat Flow(s),veh/h/In	1494	1490	0	1494	1490	1404	0	1569	0	1393	0	0
Q Serve(g_s), s	0.7	1.7	0.0	0.1	14.8	15.0	0.0	0.2	0.0	5.6	0.0	0.0
Cycle Q Clear(g_c), s	0.7	1.7	0.0	0.1	14.8	15.0	0.0	0.2	0.0	6.1	0.0	0.0
Prop In Lane	1.00		0.00	1.00		99.0	0.00		0.00	0.79		0.21
Lane Grp Cap(c), veh/h	410	1773	0	809	828	808	0	416	0	434	0	0
V/C Ratio(X)	90.0	0.07	0.00	0.00	0.45	0.45	0.00	0.01	0.00	0.25	0.00	000
Avail Cap(c_a), veh/h	486	1773	0	913	828	808	0	416	0	434	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9.5	1.00	1.00	9.	8
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	00 1	0.00	1.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	9.3	8.6	0.0	8.8	12.2	12.2	0.0	27.1	0.0	29.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	1.7	2.0	0.0	0.0	0.0	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOrQ(50%), ven/in	0.3	0.7	0.0	0.0	0.0	7.0	0.0	0.1	0.0	2.5	0.0	0 0
LnGrp Delay(d),s/veh	6.3	8.6	0.0	χ. α.	13.9	14.0	0.0	27.1	0.0	30.6	0.0	0.0
chigh cos	<	ξ:		٤		٥		٠		اد		
Approach Vol. veh/h		4 .			1,56			4			107	
Approach Delay, s/ven		9.7			13.9			77.	١		30.6	1
Approach LOS		∢			00			O	i		O	
Tital	-	cs	8	2	iii	9	E.	180	î		H	
Assigned Phs		2	က	4		9	7	80	į	Ä	ŀ	
Phs Duration (G+Y+Rc), s		31.0	5.0	64.0		31.0	6.9	62.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	7.5	52.5		26.5	7.5	52.5				
Max Q Clear Time (g_c+1), s		2.2	2.1	3.7		8.1	27	17.0				
Green Ext Time (p_c), s		9.0	0.0	6.9		0.5	0.0	2.9				
Intercochus Summary	ŀ	Ĭ	ı	į	i	Ĭ	į	ŀ	Į	1	ľ	Ą
HCM 2010 Ctrl Delay			15.0									

ī.	4	†	~	>	ţ	4	•	4-	4	٠	→	*
Americal	EBI	EBT	188	WE	WBI	WBR	(MEI)	NBC	NBo	S	協	SBB
Lane Configurations	K-	424		r	4			Ą			¢	
Traffic Volume (veh/h)	7	326	0	0	156	149	-	-	0	222	4	5
Future Volume (veh/h)	7	326	0	0	156	149	-	-	0	222	4	S
Number	7	4	14	က	80	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	12	366	0	0	188	191	4	4	0	258	æ	œ
Adj No. of Lanes	-	2	0	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.58	0.89	0.92	0.92	0.83	0.78	0.25	0.25	0.92	0.86	0.50	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	330	1207	0	388	515	461	414	391	0	738	23	21
Arrive On Green	0.01	0.41	0.00	0.00	0.35	0.35	0.50	0.50	0.00	0.50	0.50	0.50
Sat Flow, veh/h	1494	3059	0	1494	1490	1333	713	775	0	1323	45	41
Grp Volume(v), veh/h	12	366	0	0	188	191	00	0	0	274	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	0	1494	1490	1333	1488	0	0	1409	0	0
Q Serve(g_s), s	0.5	8.3	0.0	0.0	9.4	10.9	0.0	0.0	0.0	11.7	0.0	0.0
Cycle Q Clear(g_c), s	0.5	8.3	0.0	0.0	9.4	10.9	0.3	0.0	0.0	11.9	0.0	0.0
Prop In Lane	1.00		0.00	1.00		1.00	0.50		0.00	0.94		0.03
Lane Grp Cap(c), veh/h	330	1207	0	388	515	461	802	0	0	782	0	0
V/C Ratio(X)	0.04	0.30	0.00	0.00	0.36	0.41	0.01	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	406	1207	0	472	515	461	805	0	0	782	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.2	20.2	0.0	0.0	24.5	25.0	12.3	0.0	0.0	15.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.0	0.0	0.0	2.0	2.7	0.0	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.5	0.0	0.0	4.1	4.4	0.1	0.0	0.0	4.9	0.0	0.0
LnGrp Delay(d),s/veh	20.3	20.8	0.0	0.0	26.5	27.7	12.3	0.0	0.0	16.4	0.0	0.0
LnGrp LOS	ပ	O			ပ	٥	œ			122		
Approach Vol, veh/h		378			379			00			274	
Approach Delay, s/veh		20.8			27.1			123			16.4	
Approach LOS		O			ပ			8			ω	
Teles	-	2	**	٠	, co	ıg.	į.	**			ŀ	
Assigned Phs	Ì	2	6	4		9	7	∞	i			1
Phs Duration (G+Y+Rc). s		55.0	0.0	45.0		55.0	5.9	39.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5		ij		
Max Green Setting (Gmax), s		50.5	5.0	31.0		50.5	6.5	29.5				
Max Q Clear Time (g_c+1), s		2.3	0.0	10.3		13.9	2.5	12.9				
Green Ext Time (p_c), s		1.8	0.0	4.9		1 8	0.0	4.5				
infersection Summary	İ	ľ	I	Ì		ľ	İ	ŀ	ľ	l	ì	i
HCM 2010 Ctrl Delay			219									
HCM 20101 OS		ł		H	ľ			į			į	1

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 7: Dell Range Boulevard & US-30

2022 Total AM.syn 12/12/2017

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forement	商	EBI	EBR	MBL	WBI	Wer	NBI	NBI	MBR	8	SBI	SBB
ane Configurations	je-	47		K	44			4			4	
raffic Volume (veh/h)	1	76	0	-	405	216	0	2	0	80	0	11
-uture Volume (veh/h)	7	- 61	0	-	402	216	0	2	0	80	0	Ξ
lumber	7	4	14	en	00	18	vn.	2	12	-	9	16
nitial O (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1 00		1 00	1 00		8	1 00		1.00	1 00		100
Parking Bus, Adj	1.00	1.00	1,00	1.00	1.00	1.00	1.00	18	1.00	8	1.00	1.00
Adj Sat Flow, vehilin	1589	1569	1600	1559	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	24	120	0	4	208	248	0	4	0	103	0	22
Adj No. of Lanes	10	2	0	-	2	0	0	-	0	0		0
Peak Hour Factor	0.29	0.81	0.92	0.25	0.79	0.87	0.92	0.50	0.92	0.78	0.92	0.50
Percent Heavy Veh. %	2	2	2	2	2	2	2	0	2	2	2	2
Cap, vehith	408	1773	0	809	1121	544	0	416	0	365	S	65
Arrive On Green	0.02	0.59	0.00	0.01	0.58	0.58	0.00	0.26	000	0.26	000	0.26
Sat Flow, veh/h	1494	3059	0	1494	1947	945	0	1569	0	1129	20	246
3rp Volume(v), veh/h	24	120	0	4	389	368	0	4	0	125	0	0
3rp Sat Flow(s), veh/h/ln	1494	1490	0	1494	1490	1402	0	1569	0	1395	0	0
2 Serve(g_s), s	0.7	1.7	0.0	0.1	15.0	12.1	0.0	0.2	0.0	6.8	0.0	0.0
Cycle Q Clear(g_c), s	0.7	1.7	0.0	0.1	15.0	12.1	0.0	0.2	0.0	7.2	0.0	0.0
Prop In Lane	1.00		0.00	1.00		0.67	0.00		0.00	0.82		0.18
ane Grp Cap(c), veh/h	408	1773	0	808	858	807	0	416	0	435	0	0
//C Ratio(X)	90.0	0.07	0.00	0.00	0.45	0.46	0.00	0.01	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	483	1773	0	913	828	807	0	416	0	435	0	0
HCM Platoon Ratio	1.00	9.	1.00	1.00	1.00	8	1.00	9:	90.5	1.00	1.00	1.00
Jpstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.0	0.00	0.1	0.00	8	0.00	0.00
Jniform Delay (d), s/veh	9.3	8.6	0.0	œ œ	12.2	12.2	0.0	27.1	0.0	29.6	0.0	0.0
ncr Delay (d2), s/veh	0.1	0.1	0.0	0.0	1.7	1.9	0.0	0.0	0.0	1.7	0.0	0.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	0.3	0.7	0.0	0.0	9.9	6.2	0.0	0.1	0.0	3.0	0.0	0.0
.nGrp Delay(d),s/veh	9.4	9.6	0.0	9. 69	13.9	14.1	0.0	27.1	0.0	31.3	0.0	0.0
nGrp LOS	∢	∢		¥	מ	2	2	اد	Ì	اد		
Approach Vol, veh/h		4			761			4		į	125	ì
Approach Delay, s/veh		89			14.0		١	27.1			313	١
Approach LOS		⋖			<u>a</u>			O			ပ	i
	ì	2	en I	9	w	9	łs.	00			1	Ī
Assigned Phs	ľ	2	e	4		9	7	80		ì		
Phs Duration (G+Y+Rc). s		31.0	2.0	64.0		31.0	6.9	62.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	7.5	52.5		26.5	7,5	52.5				
Max Q Clear Time (g_c+11), s		2.2	2.1	3.7		9.2	2.7	17.1				i
Green Ext Time (p_c), s		0.7	0.0	7.0		9.0	0.0	6.7				
ntersection Summary	ŀ	i	d				i	ļ	ľ	l	ļ	
HCM 2010 Ctrl Delay			15.4									
			0									

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2022 Total PM.syn 12/12/2017

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CM 2010 Signalized Intersection Summary	rd & US-30
Signalized	Dell Range Boulevard & US-30
CM 2010	Dell Ran

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(Abventaget	茁	183	888	WBE	WBT	WBR	MBE	NBR	MBR	SE	SBT	SBR
Lane Configurations	K.	社本		*	44			4			¢	
Traffic Volume (veh/h)	7	326	0	0	156	164	-	1	0	231	4	5
Future Volume (veh/h)	7	326	0	0	156	164	-	-	0	231	4	5
Number	7	4	14	က	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1600	1569	1600	1609	1569	1600
Adj Flow Rate, veh/h	12	366	0	0	188	210	4	4	0	569	00	00
Adj No. of Lanes	-	2	0	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.58	0.89	0.92	0.92	0.83	0.78	0.25	0.25	0.92	0.86	0.50	0.62
Percent Heavy Veh, %	2	7	2	2	2	2	2	2	5	7	2	2
Cap, veh/h	301	1177	0	387	200	448	422	388	0	753	22	20
Arrive On Green	0.01	0.40	0.00	0.00	0.34	0.34	0.51	0.51	0.00	0.51	0.51	0.51
Sat Flow, veh/h	1494	3059	0	1494	1490	1333	714	775	0	1327	43	40
Grp Volume(v), veh/h	12	366	0	0	188	210	80	0	0	285	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	0	1494	1490	1333	1488	0	0	1409	0	0
O Serve(g_s), s	0.5	8.5	0.0	0.0	9.6	12.4	0.0	0.0	0.0	12.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	8.5	0.0	0.0	9.6	12.4	0.2	0.0	0.0	12.3	0.0	0.0
Prop in Lane	1.00		00.00	1.00		1.00	0.50		0.00	0.94		0.03
Lane Gro Cap(c), veh/h	301	1177	0	387	200	448	820	0	0	962	0	0
V/C Ratio(X)	0.04	0.31	0.00	0.00	0.38	0.47	0.01	0.00	0.00	0.36	0.00	0.00
Avail Cap(c_a), vehith	377	1177	0	461	200	448	820	0	0	962	0	0
HCM Platnon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), slveh	21.1	20.9	0.0	0.0	25.2	26.2	11.8	0.0	0.0	14.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.7	0.0	0.0	2.1	3.5	0.0	0.0	0.0	1.3	0.0	0.0
Initial O Delay(d3), siveh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.6	0.0	0.0	4.2	2.0	0.1	0.0	0.0	2.0	0.0	0.0
LnGrp Delay(d), slveh	21.1	21.6	0.0	0.0	27.4	29.7	11.8	0.0	0.0	16.0	0.0	0.0
LINGAP LOS	اد	اد			اد	اد	20			20		
Approach Vol, veh/h		378			398			œ :			285	
Approach Delay, s/veh		21.5			28.6	١		11.8			16.0	
Approach LOS		ပ			ပ			B			മ	
Tento	12	2	100	9	.8	9	Z	8	ŀ		l	
Assigned Phs	ř	2	m	4		9	7	80	ľ	ı		
Phs Duration (G+Y+Rc), s		56.0	0.0	44.0		56.0	5.9	38.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		51.5	5.0	30.0		51.5	6,5	28.5				
Max Q Clear Time (g_c+11), s		2.2	00	10.5		143	2.5	14.4	ľ			Y
Green Ext Time (p_c), s		1.9	0.0	4.9		1.9	0.0	4.3				
Massellon Summay	I	l	ì	Ì	ì	į			i	ì		1
HCM 2010 Ctrl Delay		ŀ	22.6									

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 7: Dell Range Boulevard & US-30

2040 Background AM syn

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Movement	183	EBI	88	WBL	V/BT	WER	NBE	NBI	MBR	381	無	Ħ
Lane Configurations	<u>k</u> -	4.4		×	4.4			4			c	
Traffic Volume (veh/h)	6	121	0	-	503	263	0	က	0	8	0	13
Future Volume (veh/h)	6	121	0	-	503	263	0	ന	0	83	0	13
Number	7	4	14	ო	œ	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	10	132	0	-	547	286	0	က	0	90	0	14
Adj No. of Lanes	-	2	0	-	2	0	0	-	0	0		0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	384	1844	0	827	1152	601	0	384	0	360	4	46
Arrive On Green	0.01	0.62	0.00	0.00	0.61	0.61	0.00	0.25	0.00	0.25	0.00	0.25
Sat Flow, veh/h	1494	3059	0	1494	1895	989	0	1569	0	1198	13	188
Gro Volume(v), vehih	10	132	0	+	430	403	0	3	0	104	0	9
Gro Sat Flow(s), veh/h/In	1494	1490	0	1494	1490	1394	0	1569	0	1399	0	0
O Serve(q. s), s	0.3	8	0.0	0.0	15.9	16.0	0.0	0.1	0.0	5.7	0.0	00
Cycle Q Clear(q_c), s	0.3	1.8	0.0	0.0	15.9	16.0	0.0	0.1	0.0	9.0	0.0	0.0
Prop In Lane	1.00		000	1.00		0.71	000		000	0.87		0.13
Lane Gro Cap(c), veh/h	384	1844	0	827	906	847	0	384	0	410	0	0
V/C Ratio(X)	0.03	0.07	000	0.00	0.47	0.48	000	0.01	0.00	0.25	000	000
Avail Cap(c_a), veh/h	478	1844	0	922	906	847	0	388	0	410	0	0
HCM Platoon Ratio	1 00	1.00	1.00	8	1.00	1.00	1.00	1.00	1.00	1 00	1,00	100
Upstream Filter(I)	1.00	1.00	000	9	1.00	1.00	0000	1.00	000	1 00	00.00	0.00
Uniform Delay (d), slveh	9.8	7.6	0.0	7.8	10.8	10.8	0.0	28.6	0.0	30.8	0.0	00
Incr Delay (d2), s/veh	0.0	0.1	0.0	0.0	1.8	1.9	0.0	0.0	0.0	1.5	0.0	0.0
Initial O Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),vehifin	0.1	0.7	0.0	0.0	6.9	6.5	0.0	0.1	0.0	2.5	0.0	0.0
LnGrp Delay(d), s/veh	9.8	7.7	0.0	7.6	126	127	0.0	28.6	0.0	323	0.0	0.0
LuGrp LOS	A	A		A	B	œ		ပ		ပ		
Approach Vol, veh/h		142			834			က			\$	
Approach Delay, s/veh		7.7			12.6			28.6			32.3	
Approach LOS		∢			60			ပ			O	
Times		2	3		S	9	(1)	80	À			
Assigned Phs	7	2	60	*		100	7	œ		ì		I
Phs Duration (G+Y+Rc), s		29.0	4.6	66.4		29.0	5.7	65.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	s	24.5	6.5	55.5		24.5	7.5	54.5				
Max Q Clear Time (g_c+1), s	v	2.1	2.0	3.8		8.0	2.3	18.0				
Green Ext Time (p_c), s		0.5	0.0	8.0		0.4	0.0	1.7				
Interestion Summany	ľ	ļ	į		ľ	ł	1	Ĭ	ľ	Ĭ	ķ	ħ
TON 2040 Ctd Delen		l	000									ı
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HCM 2010 Signalized Intersection Summary 7: Dell Range Boulevard & US-30

2040 Background PM.syn 12/12/2017

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Mournied	183	FBT	885	MB	WRI	WBR	MBF	MBI	MBR	SBI	188	SBR
Lane Configurations	r	£\$		je:	474			4			4	
Traffic Volume (veh/h)	6	407	0	0	196	186	-	-	0	278	S	7
Future Volume (veh/h)	6	407	0	0	196	186	-	-	0	278	S.	7
Number	7	4	14	3	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	10	442	0	0	213	202	-	~	0	302	2	æ
Adj No of Lanes	-	2	0	Ī	2	0	0	-	0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	5	2	2	2	2	2	2	2
Cap, veh/h	303	1177	0	347	503	450	423	400	0	167	12	18
Arrive On Green	0.01	0.39	0.00	0.00	0.34	0.34	0.51	0.51	0.00	0.51	0.51	0.51
Sat Flow, veh/h	1494	3059	0	1494	1490	1333	716	777	0	1353	22	36
Gro Volume(v), veh/h	10	442	0	0	213	202	2	0	0	315	0	0
Gro Sat Flow(s),veh/h/ln	1494	1490	0	1494	1490	1333	1493	0	0	1411	0	0
Q Seve(g_s), s	0.4	10.5	0.0	0.0	11.0	11.8	0.0	0.0	0.0	13.9	0.0	0.0
Cycle Q Clear(g_c), s	0.4	10.5	0.0	0.0	11.0	11.8	0.1	0.0	0.0	13.9	0.0	0.0
Prop In Lane	1.00		00.00	1.00		1.00	0.50		0.00	96.0		0.03
Lane Grp Cap(c), veh/h	303	1177	0	347	503	450	823	0	0	797	0	0
V/C Ratio(X)	0.03	0.38	00.00	0.00	0.42	0.45	0.00	0.00	0.00	0.40	0.00	0.00
Avail Cap(c_a), veh/h	367	1177	0	420	503	450	823	0	0	797	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	50.9	21.5	0.0	0.0	25.6	25.8	11.8	0.0	0.0	12.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	5.6	3.5	0.0	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	0.2	4.4	0.0	0.0	4.9	4.7	0.0	0.0	0.0	5.7	0.0	0.0
LnGrp Delay(d),s/veh	21.0	22.4	0.0	0.0	28.2	29.0	11.8	0.0	0.0	16.6	0.0	0.0
LuGro LOS	ပ	ပ			O	ပ	8			8		1
Approach Vol, veh/h		452			415			2			315	
Approach Delay, s/veh		22.4			28.6			11.8			16.6	1
Approach LOS		O			O			Ω			ω	ĺ
illust.		0	č	*	150	9	1	80	į	i	ŀ	
Assigned Phs		2	9	4		9	7	00				
Phs Duration (G+Y+Rc), s		56.0	0.0	44.0		26.0	5.7	38.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		51.5	5.0	30.0		51.5	5.5	29.5				
Max Q Clear Time (g_c+11), s		21	0.0	12.5		15.9	2.4	13.8				ľ
Green Ext Time (p_c), s		2.1	0.0	5,3		2.1	0.0	5.1				
intersection Summany	H	ſ	i	Į	Ī		Ì	ì	l	Ì	Ì	
HCM 2010 Ctrl Delay			23.0									
HCM 2010 LOS			ပ									

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HCM 2010 Signalized Intersection Summary 7: Dell Range Boulevard & US-30

2040 Total AM syn

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forement	88	EB	EBB	IBM	WEI	WER	8	181	NBR	88	SBT	SER
ane Configurations	jr-	4.4		je-	44	l		÷			4	
raffic Volume (veh/h)	0	121	0	-	203	336	0	6	0	208	0	13
-uture Volume (veh/h)	6	121	0	-	503	336	0	က	0	208	0	13
Vumber	7	4	14	က	00	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	10	132	0	-	547	365	0	m	0	226	0	14
Adj No. of Lanes	-	2	0	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	1546	0	969	870	581	0	541	0	524	2	28
Arrive On Green	0.01	0.52	0.00	0.00	0.51	0.51	0.00	0.34	0.00	0.34	0.00	0.34
Sat Flow, veh/h	1494	3059	0	1494	1714	1143	0	1569	0	1317	2	82
Gra Volume(v), veh/h	10	132	0	-	476	436	0	3	0	240	0	0
3rp Sat Flow(s), veh/h/ln	1494	1490	0	1494	1490	1367	0	1569	0	1404	0	0
2 Serve(g_s), s	0.3	2.2	0.0	0.0	23.1	23.1	0.0	0.1	0.0	13.4	0.0	0.0
Cycle Q Clear(g_c), s	0,3	2.2	0.0	0.0	23.1	23.1	0.0	0.1	0.0	13.5	0.0	0.0
Prop In Lane	1 00		00'0	1 00		0.84	0.00		0.00	0.0		0.06
ane Grp Cap(c), veh/h	259	1546	0	969	757	694	0	541	0	224	0	0
//C Ratio(X)	0.04	0.09	0.00	0.00	0.63	0.63	0.00	0.01	0.00	0.43	0.00	0.00
4vail Cap(c_a), veh/h	323	1546	0	9//	757	694	0	541	0	554	0	0
HCM Platoon Ratio	100	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jpstream Filter(I)	1.00	1.00	00'0	9	1 00	1.00	0.00	1.00	0.00	0.1	0.00	0.00
Jniform Delay (d), s/veh	143	121	0.0	12.1	17.8	17.8	0.0	21.5	0.0	25.9	0.0	0.0
ncr Delay (d2), s/veh	0	0	0 0	00	3.9	4.3	0.0	0.0	0 0	5.2	0.0	0
nitial Q Delay(d3),s/veh	00	0.0	0.0	00	0 0	00	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	0	6.0	0.0	0.0	10.2	9.4	0.0	0	0 0	2.6	0.0	00
.nGrp Delay(d),s/veh	14.4	12.2	0.0	12.1	21.7	22.1	0.0	21.5	0.0	283	0.0	0.0
nGrp LOS	a	m	1	m	O	د		ن		ی		
Approach Vol, veh/h		142			913			က			240	
Approach Delay, s/veh		124			21.9			21.5			28.3	
Approach LOS		0			ပ			O			ပ	
The state of the s			en	÷	Ś	9	4	00	5			
Assigned Phs		2	က	4		9	7	8				ä
Phs Duration (G+Y+Rc), s		39.0	4.6	56.4		39.0	5.7	55.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		34.5	5,5	46.5		34.5	5.5	46.5				
Max Q Clear Time (g c+11), s	0,0	2.1	2.0	4.2		15.5	2.3	25.1				
Green Ext Time (p_c), s		1.5	0.0	8.9		1.3	0.0	7.4				
Morrostine Comments	Ì	١			ł		ŀ	ļ	ľ	١	i	ľ
HCM 2010 Chi Delay			22.0				ŀ					
			21.0									

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ntersection Summary	-30
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1 2010 Signalized I	Range Boul
HCM 20	7: Dell F

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Movement	EBE	EBI	EBB	WBI	WBT	WBR	NBE	NBT	NBR	IBS	188	SBR
Lane Configurations	je.	424		je	*			4			¢	
Traffic Volume (vehifi)	6	407	0	0	196	374	-	-	0	434	5	7
Future Volume (veh/h)	6	407	0	0	196	374	-	-	0	434	co	7
Number	7	4	14	m	φ.	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	100		100	8		0.1	9		1 00	1.00		1 00
Parking Bus, Adj	1.00	9	1.00	8	8	8	90	9	1.00	8	9	8
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	9	442	0	0	213	407	-	-	0	472	w	00
Adj No. of Lanes	-	2	0		2	0	0		0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	62	2	2	2	64	2	2	5	2
Cap, weh/h	8	1058	0	305	444	397	455	432	0	833	œ	13
Arrive On Green	0.01	0.35	000	000	030	0.30	0.56	0.56	0.00	0.56	0.56	0.56
Sat Flow, veh/h	1494	3059	0	1494	1490	1333	722	779	0	1373	15	23
Grp Volume(v), veh/h	10	442	0	0	213	407	2	0	0	485	0	0
Grp Sat Flow(s), veh/h/In	1494	1490	0	1494	1490	1333	1501	0	0	1411	0	0
O Serve(g_s), s	0.5	11.2	0.0	0.0	11.7	29.8	0.0	0.0	0.0	23.3	0.0	0.0
Cycle Q Clear(g_c), s	0.5	11.2	0.0	0.0	11.7	29.8	0.1	0.0	0.0	23.3	0.0	0.0
Prop in Lane	1.00		0.00	100		1.00	0.50		0.00	16.0		0.02
Lane Grp Cap(c), veh/h	06	1058	0	302	444	397	887	0	0	854	0	0
V/C Raffo(X)	0.11	0.42	000	0.00	0.48	1 02	00:00	0.00	0.00	0.57	00:0	00.00
Avail Cap(c_a), vehih	151	1058	0	376	444	397	887	0	0	854	0	0
HCM Platoon Ratio	100	90	1 00	1 00	1 00	100	100	1.00	1.00	1 00	1.00	100
Upstream Filter(I)	1,00	1.00	0.00	0.00	100	9	100	0.00	000	1,00	0.00	000
Uniform Delay (d), siveh	27.6	24.4	0.0	0.0	28.8	35.1	6.6	0.0	0.0	151	0.0	0.0
Incr Delay (d2), s/veh	0.5	1.2	0.0	0.0	3.7	51.6	0.0	0.0	0.0	2.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ie BackOfQ(50%),vehin	0.2	48	0.0	0.0	5.2	16.6	0.0	0.0	0.0	6.7	0.0	0.0
LnGrp Delay(d),siveh	282	25.6	0.0	0.0	32.4	86.7	6	0.0	0.0	17.8	0.0	0.0
LuGp LOS	O	O			٥	4	∢			В		
Approach Vol, veh/h		452			620			2			485	
Approach Delay, s/veh		25.7			68.1			66			17.8	
Approach LOS		ပ			ш			4			B	Ī
Intrace	×	0	9	•	Š	9	2	8	Ì	ì		
Assigned Phs		2	3	4	ŀ	9	7	∞	l	ŀ		
Phs Duration (G+Y+Rc), s		0.09	0.0	40.0		0.09	5.7	34.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5			Ē	ŀ
Max Green Setting (Gmax), s		55.5	2.0	26.0		55.5	5,3	25.7				
Max Q Clear Time (g_c+11), s		2.1	00	13.2		253	2.5	31.8				
Green Ext Time (p_c), s		3.6	0.0	5.8		3.4	0'0	0.0				
Intersection Summary	l	l	ì	ì	١	l	Ì	Ì	ì	ı		Ī
HCM 2010 Ctrl Delay			40.1									
HCM 2010 LOS			۵	Ì	ì			i			l	

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	Aveni
O	RIFF
TWS	Van F
310	م ا
HCM 2010 TWSC	8:115-3

2040 Total PM.syn 12/12/2017

2017 Existing AM.syn

Int Delay, siven	1.7							
Movement	EBI	EBI		WBI	WBR	SBI	Sen	
Lane Configurations	-	**		4		1/4		
Traffic Vol, veh/h	64	228		829	10	6	134	
Future Vol, veh/h	64	228		859	10	6	134	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Free	Free		Free	Free	Stop	Stop	
RT Channelized	-	None		i	None		None	
Storage Length	100			1		0	•	
Veh in Median Storage, #		0		0	-	0		
Grade, %		0		0	14	0		
Peak Hour Factor	80	80		6	62	29	92	10000
Heavy Vehicles, %	2	2		2	2	2	2	
Myrnt Flow	80	285		954	16	16	176	
Majoriffithor	Table 1	Ì		Sport		Memora		
Conflicting Flow All	971	0			0	1266	485	
Stage 1		74			1	963	To the second	
Stage 2	•	7.0		2	-	303		
Critical Hdwy	4.14					6.84	6.94	
Critical Hdwy Stg 1		(8)		*	à	5.84		
Critical Hdwy Stg 2	,	*			7	5.84		
Follow-up Hdwy	2.22	10		9	Äli	3.52	3.32	
Pot Cap-1 Maneuver	200			180		161	528	
Stage 1	1			•	22.	331	,	
Stage 2		4		ì	4	723		
Platoon blocked, %				Ī	(*)			
Mov Cap-1 Maneuver	200			9	-	143	528	
Mov Cap-2 Maneuver	•	245		9	1.6	255	ir.	
Stage 1	•	ě.			×	331	35	
Stage 2	100	*		*	•	641		
Approach	H			8	ļ	SS		
HCM Control Delay, s	24			0		17.2		
HCM LOS						O		
Moortasoffacilities	Ħ	SET WE	ST WBP SB1n1	Н				
Capacity (veh/h)	902	11	485	ľ	ı			
HCM Lane V/C Ratio	0.113	(4)	- 0.397					
HCM Control Delay (s)	10.8		* * 17.2			4		
HCM Lane LOS	Ω	¥	·					

HCM 2010 TWSC 8: US-30 & Van Buren Avenue

2017 Existing PM.syn 12/12/2017

## EBI EBI WEI WEIN	The same of			
All 424 0 All 424 0	MICH	SBL	SBR	
143 716 353 143 716 353 143 716 355		3/4		
### 143 716 353 ###################################	15	16	75	
All 424 0 All 424 0 All 424 0 All 424 0 All 424 0 All 424 0 All 424 0 All 424 0 All 424 0 All 432 All 432 All 432 All 432 All 432 All 432 All 433 All 444 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 434 All 444 All	15	16	75	
Free Free Free Free Free Free Free Free	0	0	0	
All 424 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Free	Stop	Stop	
All 424 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	None	3	None	
161 842 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		0	•	
## EBI EBY WEN SBIN		0		
414		0	,	
161 842 397 424 0 4.14 - 2.22 - 1322 - 1322 - 1432 - 687 - 1432 - 687		80	75	
161 842 397 424 0 424 0 414	2	2	2	
424 0 424 0 434 0 414 414 418 618 618 618 618 618 618 618 618 618 6	28	20	100	
424 0 414 222 1132 1132 114 8 1.4 WBR SB (n) 1 1132 607		Moore		
4.14	0	1154	212	
414	24	411		
414 222 1132 1132 114 8 114 1132 114 1132 1132 114	76	743	•	
2.22 1132 1132 - 114 EB EBT WEST WER SB (n) 1132 - 607		6.84	6.94	
1132 - 114 WBI WBR SBin1 1132 - 607	*	5.84		
1132 - 114 - 1132 - 114 - 1132 - 1132 - 1132 - 1132 - 1133		5.84		
1132 - 114		3.52	3.32	
## 1132 ### ### ### ### ### ### ### ### ###	Ų.	190	793	
EB EBT WBT WBR SBin1 (1122 - 607)		638		
EB EBT WET WBR SBEN1 1132 - 607		431		
1132 - 607	*			
EB WBR SBrail	w.	163	793	
114 WBR SBEN 1	¥.	280	54.0	
114 114 114 114 114 114 114 114 114 114	K.	638	*	
132 - 607	k)	370	- 1	
TA THE THE THE THE THE THE THE THE THE THE	۱			
114 EBL WBT WBRSBirst		88		
1132 - EBL EBT WEIT WBRE		12.4 B		
1132 - 1132 - 1				
1132	i			
0770				
lay (s) 8.7 - 12				
HCM Lane LOS A B				

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2022 Background AM.syn 12/12/2017

Goenein EBI -ane Configurations 7 -ane Configurations 7 -ane Configurations 7 -auther Volume (veh/n) 68 -auther Volume (veh/n) 7 -author									
		183	WBI	EEBR	95	350	ş		
		44	42		*				
	. 00	243	914	11	9	143			
	80	243	914	11	10	143			
	1	4	œ	18	-	9			
	0	0	0	0	0	0	١		
				0.1	1.00	0.1			
		00.	1.00	00.1	00.1	00.1		1	
Adj Sat Flow, veh/h/ln 1569		569	1569	1600	1569	0091			
h/h	C)	304	1016	18	200	188			
		2	2	0	0	0			
Peak Hour Factor 0.80		0.80	06.0	0.62	0.56	0.76			
Percent Heavy Veh, %		7	2	2	0	0			
		2042	1782	32	56	275			
Arrive On Green 0.05		69.0	1.00	1.00	0.22	0.22			
		3059	3075	S	117	1223			
weh/h		304	505	529	207	0			
Gra Sat Flow(s), veh/h/ln 1494		1490	1490	1559	1347	0			
		3.6	0.0	0.0	14.1	0.0			
c). s	_	3.6	0.0	0.0	14.1	0.0			
Prop In Lane 1.00	0			0.03	60.0	0.91			
(c), veh/h		2042	886	927	303	0			
		0.15	0.57	0.57	89.0	0.00			
Avail Cap(c_a), veh/h 522	П	2042	886	927	303	0			
		1.00	2.00	2.00	1.00	1.00			
Jpstream Filter(I) 1.00		1.00	0.83	0.83	1.00	0.00			
Jniform Delay (d), s/veh 6.2	7	5.5	0.0	0.0	35.5	0.0			
	.2	0.5	2.2	2.1	11.8	0.0			
nitial Q Delay(d3),s/veh 0.0	0	0.0	0.0	0.0	0.0	0.0			
eh/lu	6	1.5	0.5	0.5	6.2	0.0	ı		
y(d).s/veh	m	2.7	2.2	2.1	47.3	0.0			
nGrp LOS	¥	4	∢	¥	a				
Approach Vol, veh/h		389	1034		207				
Approach Delay, s/veh		5.8	2.2		47.3	1			
Approach LOS		V	∢		۵				
CHOL	42	63	es		- 5	(0)	Į.	8	
Assigned Phs				4		9	7	80	
Phs Duration (G+Y+Rc), s				73.0		27.0	0.6	64.0	
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s				68.5		22.5	8.5	55.5	
Max Q Clear Time (q c+11), s				5.6		16.1	4.1	2.0	
Green Ext Time (p_c), s				12.6		0.3	0.1	124	
ntersochin Summary	ŀ								
HCM 2010 CM Delay			8.8						
HCM 2010 LOS			×						

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

Language Fig. 189 189		1	ıt	ļ	1	1	*			
ations	Movement	EE	HE	WEIL	WEE	SBI	SBR		Ĭ	
Section 152 752 376 16 17 80 19	Lane Configurations	r	**	43		à-				
eyerh(ii) 152 762 376 16 17 80 weh	Traffic Volume (veh/h)	152	762	376	16	17	80			
weth 7 4 8 18 1 16 veh 7 100	Future Volume (veh/h)	152	762	376	16	17	80			
A-pbr) 1.00 0 0 0 0 0 0 0 0 0 4.pbr) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Number	7	4	00	18	-	16			
Apph) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Initial Q (Qb), veh	0	0	0	0	0	0			
March 100 10	Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00			
weithfulin 1569 1569 1569 1660 1568 1600 1569 1600 1560 1600 160	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
v. Fuhrh 17 896 422 30 21 107 verhith 17 896 422 30 21 107 very 67 3 12 2 0 0 0 0 ctor 0.89 0.85 1.89 0.54 0.80 0.75 very 67 3 1922 1490 106 5.9 299 en 0.07 0.64 1.00 0.20 221 1127 l. verbrh 17 896 2902 200 221 1127 s. verbrh 17 897 1490 1490 1533 129 0 s. verbrh 17 897 1490 1490 1490 1490 1490 verbrh 17 897 1492 766 809 360 0 verbrh 100 100 0.89 0.98 100 0.00 (d.) sverb 84 9 87 192 786 809 360 0 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 298 0.00 (d.) sverb 0.0 0.0 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0 0.0 0.0 (d.) sverb 0.0 0.0	Adj Sat Flow, weh/h/ln	1569	1269	1569	1600	1569	1600			
cor cor cor cor cor cor cor cor cor cor	Adj Flow Rate, veh/h	171	968	422	30	21	107			
ctor 0.89 0.85 0.84 0.87 0.75 Veb, % 5 2 2 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Adj No. of Lanes	-	2	2	0	0	0			
Veh, % 673 1922 190 106 299	Peak Hour Factor	0.89	0.85	0.89	0.54	0.80	0.75			
1922 1499 106 559 259	Percent Heavy Veh, %	2	2	2	2	0	0			
en 0.07 0.64 1.00 0.25 0.25 0.25 0.25 0.25 0.25 0.25 0	Cap, veh/h	673	1922	1490	106	29	299			
1, wehh	Arrive On Green	0.07	0.64	1.00	1.00	0.26	0.26			
I, velvh 171 896 222 230 129 0 S, Vehhlin 494 1490 1490 1533 135 0 (g.c.), S 4.9 153 0.0 0.0 7.7 0.0 (c), veh/h 673 192 76 809 360 0 (c), veh/h 673 192 766 809 360 0 N, veh/h 887 192 766 809 360 0 N, veh/h 887 192 77 0.0 0 0 A, syeh 8.2 9.0 0.0 100 0.0 0 0 A, syeh 8.2 9.0 0.0 0.0 0.0 0.0 0 0 A, syeh A A A A C A A A A A A A A A A A A A A A A A	Sat Flow, veh/h	1494	3059	2902	200	221	1127			
s, verhfuln 1494 1490 1533 1359 0 s	Grp Volume(v), veh/h	171	968	222	230	129	0			
s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 7.7 0.0 (g-c), s 4.9 15.3 0.0 0.0 1.0 (g-c), s 4.9 1.0	Grp Sat Flow(s), veh/h/ln	1494	1490	1490	1533	1359	0			
(g.C.), s 4.9 15.3 0.0 0.0 7.7 0.0 (g.C.), veh/h 67.3 1922 786 89.9 360 0.0 7.7 (g.C.) veh/h 67.3 1922 786 89.9 360 0.0 7.3 (g.C.), veh/h 88.1 1922 786 89.9 360 0.0 7.3 (g.C.), veh/h 100 1.00 2.00 2.00 1.00 0.00 (g.C.), veh/h 0.2 0.8 0.9 0.9 2.8 0.0 1.3 (g.C.), veh/h 0.2 0.8 0.9 0.9 2.8 0.0 1.3 (g.C.), veh/h 2.0 0.8 0.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Q Serve(g_s), s	4.9	15.3	0.0	0.0	1.7	0.0			
(c), veh/h 673 1922 786 809 360 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cycle Q Clear(g_c), s	4.9	15.3	0.0	0.0	7.7	0.0			
(c), vehith 673 1922 786 809 360 0 1, vehith 877 1922 786 809 360 00 1, vehith 887 1922 786 809 360 000 Ratio 1,00 1,00 2,00 2,00 1,00 1,00 Ratio 1,00 1,00 0,00 0,00 1,00 1, siveh 0,2 0,8 0,9 28 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,8 0,9 2,8 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 0,0 0,0 1, siveh 0,2 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0	Prop In Lane	1.00			0.13	0.16	0.83			
1, veh/h 0.25 0.47 0.28 0.30 0.00 1, veh/h 187 1922 0.39 3.60 0.00 1, veh/h 1.00 1.00 2.00 1.00 0.00 1, veh/h 1.00 1.00 2.00 1.00 0.00 1, s/veh 8.2 9.0 0.0 0.0 0.00 1, s/veh 0.2 0.8 0.9 0.9 2.8 0.0 1, s/veh 0.0 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0 0.0 0.0 1, s/veh 0.0	Lane Grp Cap(c), veh/h	673	1922	786	808	360	0			
N, Weh/In 887 1922 776 809 360 0 Ratio 1.00 1.00 200 200 100 100 Ratio 1.00 1.00 1.00 1.00 1.00 1.00 I, s/weh 8.2 9.0 0.0 0.0 0.0 0.0 0.0 I, s/weh 0.0 <td>V/C Ratio(X)</td> <td>0.25</td> <td>0.47</td> <td>0.28</td> <td>0.28</td> <td>0.36</td> <td>0.00</td> <td></td> <td></td> <td></td>	V/C Ratio(X)	0.25	0.47	0.28	0.28	0.36	0.00			
Ratio 1.00 1.00 2.00 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	887	1922	786	809	360	0			
rtf) 1.00 1.00 0.98 0.98 1.00 0.00 (d), siveh 8.2 9.0 0.0 0.0 298 0.0 (d), siveh 0.2 9.0 0.0 0.0 0.0 0.0 0.0 (d), siveh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	HCM Platoon Ratio	1.00	1.00	2.00	200	1.00	1.00			
(d), siveh 8.2 9.0 0.0 0.0 238 0.0 i, siveh 0.2 0.8 0.0 0.0 0.0 238 0.0 i, siveh 0.2 0.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	1.00	1.00	0.98	0.98	1.00	0.00			
1, 2, 4, 6, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Uniform Delay (d), s/veh	8.2	9.0	0.0	0.0	29.8	0.0			
(30)-siveh 0.0 0.0 0.0 0.0 0.0 0.0 (30)-siveh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Incr Delay (d2), s/veh	0.2	0.8	0.9	6.0	2.8	0.0			
10 10 10 10 10 10 10 10	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
Syveh	%ile BackOfQ(50%), veh/In	2.0	6.4	0.2	0.2	3.2	0.0			
vehith A A A C C vehith 1087 452 129 129 129 129 120 120 120 120 120 120 120 120 120 120	LnGrp Delay(d),s/veh	8.4	9.8	6.0	0.9	32.6	0.0			
vehinh 1067 452 129 y, s/veh 9,6 0,9 32.6 1, s A C C 16-Y-RC), s 69.0 31.0 11.7 17-RC), s 69.0 31.0 11.7 4, s 4, s 4, s 4, s 4, s 17-RC), s 64.5 4, s <td>LuGrp LOS</td> <td>4</td> <td><</td> <td>∢</td> <td>A</td> <td>U</td> <td>١</td> <td>1</td> <td></td> <td></td>	LuGrp LOS	4	<	∢	A	U	١	1		
y, s/veh 9.6 0.9 32.6 A A A C C G-Y-ARc), s 69.0 31.0 11.7 45 45 45 45 45 45 45 45 45 45 45 45 45 4	Approach Vol, veh/h		1067	452		129				
G-Y-RC), s 69 7 6 7 6 7 7 6 7 7 6 9 7 7 7 9 4 6 7 7 7 9 10 117 7 9 15 15 15 15 15 15 15 15 15 15 15 15 15	Approach Delay, s/veh		9.6	0.9		32.6				
4 5 6 7 4 5 7 4 6 7 4 6 7 1 (7-Ro), s 69.0 31.0 11.7 11.7 11.7 11.7 11.7 11.7 11.7 1	Approach LOS		∢	∢		ပ				
4 6 7 64'*R0,s 69.0 31.0 11.7 1 (Y-R0,s) 45 45 45 1 (Y-R0,s) 64.5 45 45 26 1 (Y-R0,s) 17.3 67 215 1 (Y-R0,s) 17.3 9.7 69 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3 0.4 1 (Y-R0,s) 12.7 0.3	inter		62	8	10	9	9	7	8	
690 31,0 11,7 45 45 45 4.5 64,5 26,5 21,5 17,3 9,7 6.9 12,7 0,3 0,4 A	Assigned Phs	Ì	į		4		9	7	80	
45 45 45 645 265 215 17.3 97 69 12.7 0.3 0.4 A	Phs Duration (G+Y+Rc), s				0.69		31.0	11.7	57.3	
64.5 26.5 21.5 17.3 97 6.9 12.7 0.3 0.4 9.0	Change Period (Y+Rc), s				4.5		4.5	4.5	4.5	
17.3 9.7 6.9 12.7 0.3 0.4 9.0 A	Max Green Setting (Gmax), s				64.5		26.5	21.5	38.5	
12.7 0.3 0.4 9.0 A	Max Q Clear Time (g_c+11), s				17.3		2.6	69	2.0	
	Green Ext Time (p_c), s				12.7		0.3	0.4	11.9	
	Intersection Summan	ì		Ì	Ì	l	į	l		
	HCM 2010 Ctd Delay			0						
	HCM 2010 LOS			9.0 4						
		ı	ı	۱	ı	ı				

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HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2022 Total AM, syn 12/12/2017

Movement	麗	188	TEM	Wes	185	888		
Lane Configurations	je-	*	40)			
Traffic Volume (veh/h)	175	0//	380	16	17	93		
Future Volume (veh/h)	175	770	380	16	17	93		
Number	7	4	00	48	-	16		
Initial Q (Qb), veh	0	0	0	0	0	0	١	
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	۱	
Adj Sat Flow, veryn/in	100	600	8001	0001	203	1600		
Adi No. of Lanes	1	200	174	9 -	-, c	47		
Peak Hour Factor	0.89	0.85	0.89	0.54	0.80	0.75		
Percent Heavy Veh, %	2	2	2	2	0	0		
Cap, veh/h	792	2329	1907	134	25	148		
Arrive On Green	90.0	0.78	1.00	1.00	0.13	0.13		
Sat Flow, veh/h	1494	3059	2904	198	195	1151		
Эгр Volume(v), veh/h	197	906	224	233	146	0		
Srp Sat Flow(s), veh/h/lin	1494	1490	1490	1534	1356	0		
O Serve(g_s), s	3.7	9.5	0.0	0.0	10.5	0.0		
Cycle Q Clear(g_c), s	3.7	9.5	0.0	0.0	10.5	0.0		
Prop In Lane	1.00			0.13	0.14	0.85		
ane Grp Cap(c), veh/h	792	2329	1006	1035	174	0		
//C Ratio(X)	0.25	0.39	0.22	0.22	0.84	0.00		
Avail Cap(c_a), veh/h	1051	2329	1006	1035	346	0		
HCM Platoon Ratio	1.00	1.00	5.00	2.00	1.00	1.00		
Jpstream Filter(I)	1.00	1.00	0.83	0.83	0.88	0.00		
Jniform Delay (d), s/veh	3.4	3.4	0.0	0.0	45.6	0.0		
ncr Delay (d2), s/veh	0.2	0.5	0.4	0.4	0.6	0.0		
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/In	1.5	4.1	0.1	0.1	4.4	0.0		
nGrp Delay(d),s/veh	3.6	3.9	0.4	0.4	51.6	0.0		
nGrp LOS	∢	∢	<	∢				
Approach Vol, veh/h		1103	457		146			
Approach Delay, s/veh		3.9	0.4		51.6			
Approach LOS		∢	∢		۵			
Unier		5	89		iri	80	1/6	
Assigned Phs				4		9	7	80
Phs Duration (G+Y+Rc), s				82.6		17.4	10.7	72.0
Change Period (Y+Rc), s				4.5		45	45	4.5
Max Green Setting (Gmax), s				65.5		25.5	23.5	37.5
Max Q Clear Time (g_c+1), s				11.5		12.5	5.7	2.0
Green Ext Time (p_c), s				13.2		0.3	0.5	12.0
ntessection Summany		l	Ì	Ì	Ä	ì	ļ	
TOWN DOLLARS			0					
HCM 2010 LOS			0 <		ı			
100								

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2022 Total PM syn 12/12/2017

	1	Ť	Ļ	1	٠	*			
Movement	Ħ	Ħ	WBI	WBR	房	SBS			
Lane Configurations	Je-	*	419		<u>></u> -				
Traffic Volume (veh/h)	175	770	380	16	17	93			
Future Volume (veh/h)	175	770	380	16	17	93			
Number	7	4	00	18	-	16			
Initial Q (Qb), veh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, vehih/In	1569	1569	1569	1600	1569	1600			
Adj Flow Rate, veh/h	197	906	427	30	21	124			
Adj No. of Lanes.	1	2	2	0	0	0			
Peak Hour Factor	0.89	0.85	0.89	0.54	0.80	0.75			
Percent Heavy Veh. %	2	2	2	2	0	0			
Cap, veh/h	792	2329	1907	134	25	148			
Arrive On Green	90.0	0.78	1.00	1.00	0.13	0.13			
Sat Flow, veh/h	1494	3059	2904	198	195	1151			
Gro Volume(v), vehilh	197	906	224	233	146	0			
Grp Sat Flow(s), veh/h/lin	1494	1490	1490	1534	1356	0			
O Serve(a s), s	3.7	9.6	0.0	0.0	10.5	0.0			
Cycle Q Clearfa c). s	3.7	9.5	0.0	0.0	10.5	0.0			
Prop In Lane	1.00			0.13	0.14	0.85			
Lane Gro Cap(c), veh/h	792	2329	1006	1035	174	0			
V/C Ratio(X)	0.25	0.39	0.22	0.22	0.84	0.00			
Avail Cap(c_a), veh/h	1051	2329	1006	1035	346	0			
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.98	0.98	0.30	000			
Uniform Delay (d), siveh	3.4	3.4	0.0	0.0	42.6	0.0			
Incr Delay (d2), s/veh	0.2	9.0	0.5	0.5	9.3	0.0			
Initial Q Delay(d3), s/veh	0.0	0.0	0:0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.5	4.1	0.1	0.1	4.4	0.0			
LnGrp Delay(d),s/veh	3.6	3.9	0.5	0.5	51.8	0.0			
LuGrp LOS	ď	¥	A	≪	۵				
Approach Vol. veh/h		1103	457		146				
Approach Delay, siveh	ı	on m	0.5		21.8				
Approach LOS		ď	ď		0				
limer	=		es		41	9	1	89	Carpet and Control
Assigned Phs	ı	h		4		9	7	œ	
Phs Duration (G+Y+Rc), s				82.6		17.4	10.7	72.0	
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s				65.5		25.5	23,5	37.5	
Max Q Clear Time (g_c+l1), s				11.5		12.5	2.7	2.0	
Green Ext Time (p_c), s				13.2		0.3	0.5	12.0	
nlessection Summary	ļ			ŀ					
HCM 2010 Ctrl Delay			7.1						
HCM 2010 LOS			Ą			١		ļ	

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2040 Background AM.syn 12/12/2017

Incopent	EBI	EBT	WBI	WER	SBI	SBR	ï		
ane Configurations	36°	**	415		ř				
rraffic Volume (veh/h)	82	303	1143	13	12	178			
-uture Volume (veh/h)	82	303	1143	13	12	178			
Vumber	7	4	00	18	-	16			
nitial Q (Qb), veh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1569	1569	1569	1600	1569	1600			
Adj Flow Rate, veh/h	92	329	1242	14	13	193			
Adj No of Lanes	-	2	2	0	0	0			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	0	0			
Cap, veh/h	298	2122	1874	21	17	248			
Arrive On Green	0.05	0.71	0.62	0.62	0.20	0.20			
Sat Flow vehih	1494	3059	3097	34	84	1253			
Gm Volume(v), veh/h	92	329	613	643	207	0	,		
Gro Sat Flow(s), veh/h/ln	1494	1490	1490	1563	1343	0			
Q Serve(q s), s	2.1	3.6	26.5	26.5	14.6	0.0			
Cycle Q Clear(q c), s	2.1	3.6	26.5	26.5	14.6	0.0			
Prop In Lane	1.00			0.02	90.0	0.93			
Lane Grp Cap(c), veh/h	298	2122	925	920	266	0			
V/C Ratio(X)	0.31	0.16	99.0	99.0	0.78	00:00			
Avail Cap(c_a), veh/h	374	2122	925	970	266	0			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	10.4	4.7	12.2	12.2	38.0	0.0			
ncr Delay (d2), s/veh	9.0	0.2	3.7	3.6	19.8	0.0			
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/In	6.0	1.5	11.7	12.2	6.9	0.0			
nGrp Delay(d),s/veh	10.9	4.8	15.9	15.8	27.8	0.0			
nGrp LOS	В	∢	В	8	ш				
Approach Vol, veh/h		421	1256		207				
Approach Delay, s/veh		6.2	15.9		57.8		١		
Approach LOS		V	œ		ш				
Times	-	2	m	190	(i)	œ	11	8	
Assigned Phs			ŀ	4		9	7	60	
Phs Duration (G+Y+Rc), s				75.7		24,3	9.1	9 99	
Change Period (Y+Rc), s				45		4.5	4.5	4.5	
Max Green Setting (Gmax), s				71.2		19,8	6.7	57.0	
Max Q Clear Time (q c+11), s				5.6		16.6	41	28.5	
Green Ext Time (p_c), s				17.3		0.2	0.1	13.4	
Hecester Surmay	ļ	ŀ		Ì	k		H		
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HCM 2010 Ctff Delay			200						
201000000000000000000000000000000000000			2						

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2040 Background PM.syn

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100 1.00 1.00 1.00 1.00 1.00 1.00 1.00		1.00 1.00 109 0.02 0.28 0.28 0.03 1115 0.00 0.00 0.00 0.00 0.00 0.00 0.00	
100 1.00 1.00 1.00 1.00 1.00 1.00 1.00		1,00 1600 1090 1092 1092 1115 1115 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
7669 1569 1569 1569 20 1569 1569 1569 1569 1569 1569 1569 1569		1600 1092 0.023 1115 1115 0.00 0.00 0.00 0.00 0.00 0.00	
207 1036 511 2 3 209 1494 3059 2890 1494 3059 2890 1494 3059 2890 1495 2891 1406 17.3 9.6 1.0 1.00 1.0 1.		0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
ses 1 2 2 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	
tor 0.92 0.92 0.92 Vah, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		0.92 0.262 0.023 0.00 0.00 0.00 0.00 0.00	
Veh, % 586 2012 1599 n 0.08 0.68 0.55 veh/n 1494 3059 2990 veh/n 1494 1490 1490 3, veh/n 1494 1490 1490 3, veh/n 586 2012 818 2, c), s 5, c 17,3 9, c 3, veh/n 586 2012 818 2, c), s 100 1,00 (i) siveh 8.0 81 12,3 siveh 0.4 0.9 1,0 5, veh/n 2,3 7,3 4,2 siveh A B B veh/n 1243 533 veh/n 1243 533 veh/n 1243 533 veh/n 1243 533		262 0.23 11115 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	
2012 1599 1		262 0.23 1115 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
0.08 0.68 0.55 1494 3059 2990 verbrit 207 1036 261 3,vehirlin 1494 1490 1490 5, yehirlin 1494 1490 1490 5, vehirlin 586 2012 818 20, s 5.6 17.3 9.6 3, vehirlin 586 2012 818 3, vehirlin 586 2012 818 3, vehirlin 586 2012 818 3, vehirlin 586 2012 818 3, svehirlin 0.4 0.9 1.00 50%, vehirlin 2.3 7.3 4.2 5,vehirlin 2.3 7.3 4.2 5,vehirlin 2.3 7.3 4.2 5,vehirlin 2.3 7.3 4.2 5,vehirlin 2.4 9.0 13.3 6, svehirlin 8.4 9.0 13.3 6, svehirlin 8.9 13.3		0.023 0.00 0.00 0.00 0.00 0.00 0.00 0.00	
verhin 207 1999 2990 verhin 1494 1490 1490 s, shrinin 1494 1490 1490 s, children 1494 1490 1490 s, children 1494 1490 1490 s, children 1494 1490 1490 c, children 140 140 1400 c, children 140 1400 c, children 140 1400 c, children 140 1400 c, children 140 c, children 1		0.0 0.0 0.0 0.0 0.00 0.00 0.00	
verint 207 1036 261), verintin 1494 1490 1490 5, 6, 17,3 9,6 5, 6, 17,3 9,6 1,00 1,0		0 0.0 0.0 0.82 0.00 0.00	
3, vehirlin 1494 1490 1490 1 5, vehirlin 586 2712 818 2, vehir 586 2012 818 0.35 0.51 0.32 0.45 0.01 0.00 (i) 100 1.00 1.00 (ii) 1.00 1.00 1.00 (iii) 1.00 1.00 1.00 (iii) 1.00 1.00 1.00 3, siveh 0.4 0.9 1.0 5, vehir 2.3 7.3 4.2 5, siveh A B B B B B B B B B B B B B B B B B B		0.0 0.0 0.82 0 0 0.00 0.00	
5.5 17.3 9.6 2.6, 3.2, 5.6 17.3 9.6 2.6, 5.6 17.3 9.6 1.00 2.1 1.00 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1		0.0 0.0 0.82 0.00 0.00 1.00	
3, vehin 586 2012 818 1.00 1.00 1.00 1.00 1.00 1.00 1.00		0.00 0.00 0.00 0.00	
1,00 3), veh/h 586 2012 818 veh/h 786 2012 818 2032 (veh/h 786 2012 818 2032 (veh/h 100 100 100 100 100 100 100 100 100 10		0.00 0.00	
2), veh/h 586 2012 818 2032 612 818 2035 635 635 635 635 635 635 635 635 635 6		0.00	
035 051 032 051 032 051 032 051 032 051 032 051 035 051 035 051 035 051 035 051 035 051 051 051 051 051 051 051 051 051 05		0.00	
veh/h 786 2012 818 adaio 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0		1.00	
labio 100 100 100 100 100 100 100 100 100 10		1.00	
(i)) 100 100 1 (ii), saveh 8.0 8.1 12.3 1 siveh 0.4 0.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0			
(d) siveh 8.0 8.1 12.3 18 siveh 0.4 0.9 1.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		00.00	
siveh 0.4 0.9 1.0 13/siveh 0.0 0.0 0.0 10/siveh 2.3 7.3 4.2 15/veh 8.4 9.0 13.3 1 12/siveh A A B 12/siveh 12/43 53.3 1. siveh 8.9 13.3 A B	2.3 32.4	0.0	
33,sveh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		0.0	
50%),vehrlin 2.3 7.3 4.2 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5.5 5		0.0	
sveh 8.4 9.0 13.3 . A A B Helm 1243 533 F, siveh A B A B A B		0.0	
A A A vehih 1243 8.9 8.9 A	36	0.0	
veh/n 1243 r, s/veh 8.9 A	В		
r, siveh 8.9	133		
A c	36.4		
The Company of the Co	٥		
MINES OF THE PARTY	9	9	8: 1
Assigned Phs 4	4	9	7 8
Phs Duration (G+Y+Rc), s	2.0		59
Change Period (Y+Rc), s	4.5		
Max Green Setting (Gmax), s 67.5	7.5		21.5 41.5
11), s	9.3		
Green Ext Time (p_c), s	6.1	0.3	0.5 13.6
dusection Summay		ŀ	
4CM 2010 Ctrl Delay 12.1			
ICM 2010 LOS			

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2040 Total AM.syn

Movestean	Ħ	EB3	WBT	WBR	386	SBR	Î		
Lane Configurations	¥-	*	- T		Ž.	*			
Traffic Volume (veh/h)	158	450	1393	13	12	303			
Future Volume (veh/h)	158	450	1393	13	12	303			
Number	7	4	80	18	-	16			
Initial Q (Qb), veh	0	0	0	0	o	0			
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1569	1569	1269	1600	1569	1269			
Adj Flow Rate, veh/h	172	488	1514	14	13	0			
Adj No. of Lanes	-	2	2	0	-	-			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	2			
Cap, veh/h	373	2167	1881	17	273	244			
Arrive On Green	90.0	0.73	1.00	1.00	0.18	0.00			
Sat Flow, veh/h	1494	3059	3104	58	1494	1333			
Grp Volume(v), veh/h	172	489	745	783	13	0			1
Grp Sat Flow(s), veh/h/ln	1494	1490	1490	1564	1494	1333			
Q Serve(g_s), s	3.9	5.4	0.0	0.0	0.7	0.0			
Cycle Q Clear(g_c), s	3.9	5.4	0.0	0.0	0.7	0.0			
Prop In Lane	1.00			0.02	1.00	1.00			
Lane Grp Cap(c), veh/h	373	2167	926	972	273	244			
V/C Ratio(X)	0.46	0.23	0.80	0.81	0.05	00.0			
Avail Cap(c_a), veh/h	455	2167	926	972	273	244			
HCM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.63	0.63	08.0	00.00			
Uniform Delay (d), s/veh	5.1	4.5	0.0	0.0	33.7	0.0			
Incr Delay (d2), s/veh	6.0	0.2	4.8	4.6	0.3	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	2.2	1.2	1.2	0.3	0.0			
LnGrp Delay(d),s/veh	5.9	4.7	4.8	4.6	33.9	0.0	i		
LuGrp LOS	V	V	V	×	O				
Approach Vol, veh/h		991	1528		13				
Approach Delay, s/veh		2.0	4.7		33.9				
Approach LOS		∢	¥		ပ				
Imer	e	2	m	*2	10	æ	4	8	ŀ
Assigned Phs	ŀ	ľ	1	4		9	7	80	h
Phs Duration (G+Y+Rc), s				77.2		22.8	10.5	299	
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s				72.7		18.3	11.5	56.7	
Max Q Clear Time (g_c+11), s				7.4		2.7	5.9	2.0	
Green Ext Time (p_c), s				27.6		0.0	0.2	25.8	
Intersection Summany						į			
HCM 2010 CM Delay			0						
HCM 2010 Cut Delay	۱	ł	0.0		ı				

HCM 2010 Signalized Intersection Summary 8: US-30 & Van Buren Avenue

2040 Total PM.syn

	\	t	ļ	1	۶	*			
foement	183	EBI	WBI	WBP	38	SBS			
ane Configurations	K	**	43		¥C.	×			
fraffic Volume (veh/h)	378	1330	782	20	21	256			
-uture Volume (veh/h)	378	1330	782	20	21	256			
Vumber	7	4	00	18	-	16			
nitial O (Ob), weh	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/in	1569	1569	1569	1600	1569	1569			
Adj Flow Rate, veh/h	411	1446	820	22	23	0			
Adj No. of Lanes.	Ī	2	2	0	-	-			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	2	2	2	2	2	2			
Cap, veh/h	628	2161	1586	41	276	247			
Arrive On Green	0.15	0.73	1.00	1.00	0.19	00.00			
Sat Flow, veh/h	1494	3059	3047	77	1494	1333			
Gro Volume(v), veh/h	411	1446	427	445	23	0			
Grp Sat Flow(s), veh/h/ln	1494	1490	1490	1555	1494	1333			
Q Serve(g_s), s	11.4	52.9	0.0	0.0	1.3	0.0			
Cycle Q Clear(g_c), s	11.4	25.9	0.0	0.0	1.3	0.0			
Prop In Lane	1.00			0.05	1.00	1.00			
ane Grp Cap(c), veh/h	628	2161	962	831	276	247			
//C Ratio(X)	0.65	0.67	0.54	0.54	0.08	0.00			
Avail Cap(c_a), veh/h	851	2161	962	831	276	247			
4CM Platoon Ratio	1.00	1.00	2.00	2.00	1.00	1:00			
Jpstream Filter(I)	1.00	1.00	0.91	0.91	0.58	0.00			
Jniform Delay (d), s/veh	6.3	7.3	0.0	0.0	33.7	0.0			
ncr Delay (d2), s/veh	1.2	1.7	2.3	2.3	0.3	0.0			
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.8	10.9	0.5	0.5	9.0	0.0			
.nGrp Delay(d),s/veh	7.4	9.0	2.3	2.3	34.1	0.0			
nGrp LOS	A	V	4	V	ပ				
Approach Vol, veh/h		1857	872		23				
Approach Delay, s/veh		8.7	2.3		34.1				
Approach LOS		∢	4		O				
imer		54	179	e	wn	9	2	8	
Assigned Phs		l		4		9	7	80	
Phs Duration (G+Y+Rc), s				77.0		23.0	19.1	57.9	
Change Period (Y+Rc), s				4.5		4.5	4.5	4.5	
Max Green Setting (Gmax), s				72.5		18.5	29.5	38.5	
Max Q Clear Time (g_c+11), s				27.9		3.3	13.4	2.0	
Green Ext Time (p_c), s				27.9		0.0	1,2	24.6	
riesserbon Summany.			H				Ī		
HCM 2010 Ctrl Delay			6.9						
HCM 2010 LOS			<						

Synchro 9 Report Page 1

9: Haves Avenue & US-30

2017 Existing AM.syn 12/12/2017

Activitient	Ė	FRI	FRR	W	2	18	VBR	EN	LEN	NBR	SBE	SBI	S
ane Configurations	je.	**	R.		K	42			4			4	
raffic Vol. veh/h	S	506	50		4	685		75	16	7	2	**	106
-uture Vol, veh/h	23	206	20		4	685	*	75	16	7	2	47	18
Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Ē	Free F	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	Ì	6	None		ě	Ĩ	None		i	None		*	None
Storage Length	100		150		25	34	Ų.	•	ľ	•	(4)	82	
Veh in Median Storage, #		0	1		a	0		Ì	0			0	4
Grade, %	٠	0	1		0.0	0	9.8		0	ı	29	0	i
Peak Hour Factor	72	79	62		33	87	25	69	67	4	90	100	83
Heavy Vehicles, %	2	2	2		2	c	2	2	2	2	2	C	~
Mvmt Flow	32	261	32		12	187	**	109	24	16	4	4	128
HOT MINT	Magn	ď		W.	0	X	î	Mendel		i	Miner?	ı	ğ
Conflicting Flow All	797	0	0	2	261	0	0	745	1141	130	1020	1139	396
Stage 1			Ī		18	×	i	325	325	(8	814	814	Ì
Stage 2			19		39	Œ	e.	420	816	9	206	325	ľ
Critical Hdwy	4.14	2	4	4	4.14		,,	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	1				,	[#]	12.	6.54	5.54		6.54		İ
Critical Hdwy Stg 2	9		**			2	ă.	6.54	5.54		6.54		İ
Follow-up Hdwy	2.22			2.	2.22	99	(2).	3.52	4.02	3.32	3.52		3.32
Pot Cap-1 Maneuver	825	4.	à	13	1300			305	199	968	191		603
Stage 1			*		ī	20	Ď.	991	648	•	338	-11	i
Stage 2			1.0		,	k	-	581	388	160	777	848	ì
Platoon blocked, %		*				(4)	·						
Mov Cap-1 Maneuver	825		4	13	300	Ħ		226	190	968	163	190	603
Mov Cap-2 Maneuver	/*	V.	114		э	85	Œ	226		1	163		i
Stage 1	9	ř	9		(*)	9		635		٠	325	386	İ
Stage 2	î		*		ж)*c	ž	449	385	٠	705	- 14	
	1	ı	ı	ı	10		١				9	П	1
pproxen	8		۱		2			2	ı	ı	00		ı
HCM Control Delay, s HCM LOS	0				0.1			423 E			14.2 B	П	1
Unce Lenes Major Munic	NBlui	副	E81	EBR W	WBII V	18	WER SRUE					P	
Capacity (veh/h)	238	825	N 35	- 13	1300	4 2	0.259	7					
HCM Lane V/C Katto	0.024	0.039	٠	0.0	8	٠	0.43	0		١			1
HCM Control Delay (s)	42.3	9.5			8 .	•	4	2	i				
HCM Lane LOS	ш	A	*		⋖	*	į.	20	ı	١		ı	ı
HCM 95th %tile Q(veh)	3.7	0.1	*	×	0	t	-					ģ	

HCM 2010 TWSC

	115-30
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7000	Avenue
20.00	Vec A
2	9. Haves

Int Delay, sheh 96 Lanconserat Eest EER Wei Vert VER VER NET NER Section VER VER VER NET NER Section VER VER VER VER VER VER VER VER VER VER	Intersection.												
FER EST FER WEL WOT WOR ME		9)											1
9g. # 11	Movement	Ħ	E83	盖	Wel	WBT	WBB	NEC	NBI	NBR	SBL	TIES!	SEE
91 566 82 6 278 6 41 17 7 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0	Lane Configurations	A.	**	k.	W.	42			4			4	
1 10 10 10 10 10 10 10	Traffic Vol, veh/h	91	999	82	9	278	9	41	17	7	9	20	20
Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Future Vol, veh/h	91	999	82	9	278	9	41	17	7	9	20	20
Free Free Free Free Free Free Stop Stop Stop Stop Stop	Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
## 1233	Sign Control	Free	Free	Free	Free	Free	Free	Stop		Stop	Stop	Stop	Stop
100 150 25	RT Channelized			None		,	None			None	•	•	None
11 87 77 38 88 75 68 42 58 2	Storage Length	100		150	25	,	,		1.0		•	,	,
1	Veh in Median Storage, #	(2	0	S.	ľ	0	١		0		•	0	Ė
123 87 77 38 88 75 68 42 58 2 2 2 2 2 2 2 2 2	Grade. %	*	0	14	X	0			0		•	0	ľ
178 651 106 16 316 8 60 40 12	Peak Hour Factor	11	8	11	38	88	75	99		88	38	71	83
128 651 106 16 316 8 60 40 12 324 0 0 651 0 0 1111 1262 325 4,14	Heavy Vehicles, %	2	2	2	2	2	2	2		2	2	7	2
Major Majo	Myrrit Flow	128	651	106	16	316	80	09		12	16	28	90
Miles Mile											1		
324 0 0 651 0 0 1111 1762 325 4.14	Magazifike	Major			Majori	H		Ment			Minor?	١	H
FIG. 1233	Conflicting Flow All	324	0	0	651	0	0	1111	1262	325	953	1258	162
## 1233 ## 1.00 ## 1.0	Stage 1	9	×	24	.*	.it	37	206			351	351	ľ
## 4.14 ## 4.14 ## 7.54 6.54 6.94 ## 6.54 6.94 ## 6.54 6.54 ## 6.54 6.54 ## 6.54 6.54 6.54 6.54 6.54 6.54 6.54 6.54	Stage 2		1	·	X	1.0	Ť	204			602	907	1
Fig. 1233 - 2.22 - 6.54 5.4 - 6.5	Critical Hdwy	4.14	×		4.14	*		7.54		6.94	7.54	6.54	6.94
First 1233 2.22 6.54 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 3.32 4.02 4.02 4.02 4.02 4.02 4.02 4.02 4.0	Critical Hdwy Stg 1			(*)	¥)	(8)	*	6.54			6.54	5.54	•
1233 2.22 3.5.2 4.02 3.3.2 1233 931 164 169 671 1233 931 1779 628 1233 931 119 149 671 12	Critical Hdwy Stg 2	ĺ	٠		9	*		6.54			6.54	5.54	i
First 1233 931 164 169 671 First 1233 931 164 169 671 First 1233 931 1779 628 - 7779 628 FIRST 1233 931 179 149 671 FIRST 1233 931 179 149 671 FIRST 12 0.4 90 C 0.795 0.104 - 0.017 - 0.362 (s) 90 83 89 - 244 FIRST 12 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	Follow-up Hdwy	2.22			2.22			3.52		3.32	3.52	4.02	3.32
er 1233 - 931 - 1779 628 - 779 628 -	Pot Cap-1 Maneuver	1233			931			164		671	214	170	854
er 1233 - 931 - 119 149 671 er 1233 - 931 - 119 149 671 er 123 - 931 - 119 149 671 EFB WB WB NB NB	Stage 1			114	ii†	int.	ıā.	297			639	631	•
FIFT 1233 - 931 - 119 149 671 FIFT 123 - 266 316 - 266	Stage 2	•	1	×	0	15	×	779		ı	453	353	i
1233 931 119 149 671 119 149 671 119 149 671 110 149 671 110 0.4 809 110 120 0.4 809 110 120 0.4 809 110 120 0.4 809 110 120 0.0 80 80 80 80 80 80 80 80 80 80 80 80 80	Platoon blocked, %			4		38							
HE WELL TEST THE WELL WITH WIST SELECT THE TAXAS TO THE T	Mov Cap-1 Maneuver	1233	N.	٠	931	(1)	Ŧ	119		671	152	150	854
12 0.4 90 1.2 1.6	Mov Cap-2 Maneuver	0.7	AT.	40	, e j:	5.0		119		*	152	120	1
HE WB NB NB NB 112 0.4 P F F F F F F F F F F F F F F F F F F	Stage 1	2		-	9).	1/4	n.	266		v.	573	620	i
FB	Stage 2			E.		15	.5	629		(0)	348	316	1
12 0.4 90 12 0.4 90 142 1233 - 931 - 288 0.795 0.104 - 0.017 - 0.382 9 8 3 - 89 - 244 9 A A A A C C 49 0.3 - 16		ı	И		П	ı	ı			ı		П	Ĥ
12 0.4 90 12 0.4 90 142 1233 - 931 - 288 0.795 0.104 - 0.017 - 0.362 90 83 - 89 - 244 F F A - A - 16 4.9 0.3 - 0.1 - 16	Approach		ı		MB			Ne			88	١	
142 1233 - 931 - 142 1233 - 931 - 931 - 931 90 83 - 8.9 F A A 9 0.3 - 0.17 - 4.9 0.3 - 0.1 - 1.0	HCM Control Delay, s HCM LOS	12			0.4			8 ₋			24.4 C		
142 1233 931 0.795 0.104 0.017 90 83 8.9 F A A 4.9 0.3 0.1	Minor Ease Mayor Mynt	ABLnt	Ħ	- 48		WBT	WBRSBL					П	
0.795 0.104 0.017 0.00 83 89 89 89 89 89 89 89 89 89 89 89 89 89	Capacity (veh/h)	142	1233	*	- 931		- 28	82	ŀ				
90 83 8.9 F A A A A A A A A A A A A A A A A A A A	HCM Lane V/C Ratio	0.795	0.104	45	- 0.017	t)	• 0.36	32					
F A A 4.9 0.3 0.1	HCM Control Delay (s)	8	83		- 8.9		- 24	4					
4.9 0.3	HCM Lane LOS	11	<	· ·	¥,			O					
	HCM 95th %tile O(veh)	4.9	03		0.1		•	9					

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 9: Hayes Avenue & US-30

2017 Existing PM.syn 12/12/2017

2022 Background AM.syn

	4	†	>	4	ļ	1	•	—	•	×	→	*
Movement	EBI	EBI	EBR	WBL	WBT	WBR	NBI	NBT.	MBR	SBE	SBI	SBS
Lane Configurations	ħ.	**	×.	×	44			4			12	
Traffic Volume (veh/h)	24	219	21	4	729	-	80	17	7	2	4	113
Future Volume (veh/h)	24	219	21	4	729	-	80	17	7	2	4	113
Number	7	4	14	က	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	33	277	34	12	838	4	116	25	16	4	4	136
Adj No. of Lanes	-	2	-	-	2	0	0	-	0	0	-	Ĭ
Peak Hour Factor	0.72	0.79	0.62	0.33	0.87	0.25	0.69	0.67	0.44	0.50	1.00	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	
Cap, veh/h	336	1597	714	647	1582	00	334	89	36	40	20	400
Arrive On Green	90.0	1.00	1.00	0.01	0.52	0.52	0.31	0.34	0.31	0.31	0.31	0.3
Sat Flow, veh/h	1494	2980	1333	1494	3042	15	863	217	123	10	65	1269
Gra Volume(v), veh/h	33	277	×	12	411	431	157	0	0	144	0	Ĭ
Grp Sat Flow(s), veh/h/lin	1494	1490	1333	1494	1490	1566	1202	0	0	1343	0	Ĭ
Q Serve(g_s), s	1.0	0.0	0.0	0.4	18.3	18.3	3.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.4	18.3	18.3	12.0	0.0	0.0	8.2	0.0	0.0
Prop In Lane	1.00		1.00	100		0.01	0.74		0.10	0.03		0.94
Lane Grp Cap(c), veh/h	336	1597	714	647	775	814	441	0	0	460	0	Ī
V/C Ratio(X)	0.10	0.17	0.05	0.02	0.53	0.53	0.36	00.00	00:0	0.31	00.0	0.00
Avail Cap(c_a), veh/h	377	1597	714	707	775	814	441	0	0	460	0	
HCM Platoon Ratio	2.00	5.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Upstream Filter(I)	0.97	0.97	0.97	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.7	0.0	0.0	10.9	15.9	15.9	27.8	0.0	0.0	26.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.1	0.0	2.6	2.5	2.2	0.0	0.0	1.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.2	8.1	8.5	3.8	0.0	0.0	3.3	0.0	0.0
LnGrp Delay(d),s/veh	11.9	0.2	0.1	109	18.5	18.4	30.1	0.0	0.0	28.0	0.0	0.0
LnGrp LOS	80	4	A	8	8	m	O			ပ		
Approach Vol, veh/h		344			854			157			144	
Approach Delay, s/veh		1.3			18.3			30.1			28.0	
Approach LOS		A			8			ပ		i	O	
Times		0	0	100	(Gra	49	÷	9	Ī	ŀ	Ī	
Assigned Phs		2	m	4		9	7	80	l	ľ	l	
Phs Duration (G+Y+Rc), s		36.0	5.9	58.1		36.0	7.5	56.5				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	45				
Max Green Setting (Gmax), s	"	31.5	5.5	49.5		31.5	5.7	49.3				
	S	14.0	2.4	2.0		10,2	3.0	203				
Green Ext Time (p_c), s		1.7	0.0	9.4		9	0.0	8.5				
Salvangolden Community	Ì	Ì			Š	Ì	ę			ł	Ì	ì
TO THE PERSON NAMED IN	ľ		9	Ì								
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2022 Background PM.syn 12/12/2017

HCM 2010 Signalized Intersection Summary 9: Hayes Avenue & US-30

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Covernont	199	188	EBR	ME	WRI	WBR	ME	NBI	NBR	38	Igs	888
ane Configurations	K.	**	'n.	k	4.7			4			÷	
raffic Volume (veh/h)	97	602	87	9	296	9	4	18	7	9	21	53
-uture Volume (veh/h)	97	602	87	9	296	9	44	18	7	9	21	23
Number	7	4	14	က	00	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, weh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
4dj Flow Rate, veh/h	137	692	110	16	336	00	65	43	12	16	30	64
Adj No. of Lanes	-	2	-	-	2	0	0	Ī	0	0	-	0
Peak Hour Factor	0.71	0.87	0.79	0.38	0.88	0.75	0.68	0.42	0.58	0.38	0.71	0.83
Percent Heavy Veh, %	5	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	629	1735	977	463	1604	38	242	147	37	74	123	216
Arrive On Green	0.12	1.00	1.00	0.05	0.54	0.54	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1494	2980	1333	1494	2976	71	705	555	140	124	463	817
Srp Volume(v), veh/h	137	692	110	16	168	176	120	0	0	110	0	0
3rp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1556	1399	0	0	1404	0	0
2 Serve(g_s), s	4.0	0.0	0.0	0.5	5.9	5.9	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.0	0.0	0.0	0.5	5.9	6'9	2.9	0 0	0.0	6.2	0.0	00
Prop In Lane	1.00		100	1 00		0.05	0.54		0.10	0.15		0,58
ane Grp Cap(c), veh/h	629	1735	277	463	803	839	426	0	0	413	0	0
//C Ratio(X)	0.21	0.40	0 14	0.03	0.21	0.21	0.28	00'0	000	0.27	000	0.00
Avail Cap(c_a), veh/h	814	1735	776	548	803	839	426	0	0	413	0	0
HCM Platoon Ratio	2 00	2.00	2.00	1.00	1 00	100	1 00	1 00	1 00	100	1.00	100
Jpstream Filter(I)	06.0	06.0	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Iniform Delay (d), s/veh	7.8	0.0	0.0	6.6	12.0	12.0	29.4	0.0	0.0	29.3	0.0	0.0
ncr Delay (d2), s/veh	0 1	9.0	0.3	0.0	9.0	9.0	1,6	0.0	0'0	10	0.0	0.0
nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	1.6	0.1	0.1	0.2	2.5	2.6	2.9	0.0	0.0	26	0.0	0 0
nGrp Delay(d),s/veh	8.0	9.0	0.3	10.0	12.6	12.6	31.1	0.0	0.0	30.8	0.0	00
nGrp LOS	A	A	V	A	В	Ю	ပ			ပ		
Approach Vol, veh/h		939			360			120			110	
Approach Delay, s/veh		1.7			12.4			31.1			30.8	
Approach LOS		V			В			O			ပ	
100	4	0	97	*	45	٥	t.	ю			Ĭ	
Assigned Phs		2	က	4		9	7	00			i	
Phs Duration (G+Y+Rc), s		31.0	6.3	62.7		31.0	10.6	58.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				ď
Max Green Setting (Gmax), s		26,5	7.5	52.5		26.5	16.5	43.5				
Max Q Clear Time (g_c+1), s	W	8.7	2.5	2.0		82	0.9	7.9				
Green Ext Time (p_c), s		1,2	0.0	9.3		1.2	0.2	8 8				
missection Surmany			l	Ī			l		L		Ī	F
HCM 2010 Ctrl Delay			8.6									

Synchro 9 Report Page 1

Signalized Intersection Summary	Avenue & US-30
	9. Haves Avenue

2022 Total AM.syn

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Coverner	EBI	EBI	EBP	WBIL	VEET	WBR	NBI	TSN	WERE	SBE	SBT	888
ane Configurations	Ж-	*	Min	ji.	47			4			*	
raffic Volume (veh/h)	56	219	21	4	729	-	80	17	7	2	4	120
-uture Volume (veh/h)	26	219	21	4	729	-	80	17	7	2	4	120
Vumber	7	4	14	က	∞	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1,00
Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	36	277	34	12	838	4	116	52	16	4	4	145
Adj No of Lanes	-	2	-	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.72	0.79	0.62	0.33	0.87	0.25	0.69	0.67	0.44	0.50	1.00	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	337	1597	714	645	1577	8	328	29	38	\$	19	401
Arrive On Green	90.0	1.00	1.00	0.01	0.52	0.52	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1494	2980	1333	1494	3042	15	842	213	120	ō	91	1272
Sro Volume(v), veh/h	38	277	æ	12	411	431	157	0	0	153	0	0
3rp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1566	1175	0	0	1343	0	0
2 Serve(g, s), s	17	0.0	0.0	0.4	183	18.3	3.8	0.0	0.0	0.0	0.0	00
Cycle Q Clear(g_c), s		0.0	0.0	0.4	18.3	18.3	12.6	0.0	0.0	89	0.0	0.0
Prop In Lane	1.00		100	100		0.01	0.74		0.10	0.03		0.95
ane Grp Cap(c), veh/h	337	1597	714	645	773	812	433	0	0	460	0	0
//C Ratio(X)	0.11	0.17	0.05	0.02	0.53	0.53	036	0.00	000	0.33	000	000
Avail Cap(c_a), veh/h	375	1597	714	706	773	812	433	0	0	460	0	0
ICM Platoon Ratio	2:00	200	2.00	1.00	100	90	8	8	1,00	8	8	1.00
Jostneam Filter(I)	0.92	0.92	0.92	8	1.00	8	90.	0.00	000	8	0.00	0.00
Iniform Delay (d), s/veh	117	0.0	0.0	110	16.0	16.0	78.	0.0	0.0	26.5	0.0	0.0
ncr Delay (d2), s/veh	0.1	0.2	0.1	00	2.6	2.5	2.4	0.0	0.0	J. 9	0.0	0.0
nitial Q Delay(d3),s/veh	0.0	0.0	00	0.0	0.0	00	0.0	0.0	000	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	0.4	0.0	0.0	0.2	8 1	8.5	30	0.0	0.0	3.5	0.0	0.0
nGrp Delay(d),s/veh	11.9	0.5	0.1	110	18.6	18.5	30.4	0.0	0.0	28.4	0.0	0
nGrp LOS	n	×	<	n	20	n	اد			اد		
Approach Vol, veh/h		347			824			157			153	
Approach Delay, s/veh		14			184		١	30.4		1	78.4	١
Approach LOS		∢			മ			ပ			ပ	i
mer	Î	2	185	×	5	e e		**		ŀ	ľ	Ì
Assigned Phs		2	m	4		9	7	00	ı			4
Phs Duration (G+Y+Rc), s		36.0	2.9	58.1		36.0	7.7	56.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		31.5	5.5	49.5		31.5	5.7	49.3				
		14.6	2.4	2.0		10.8	3.1	20.3				
Green Ext Time (p_c), s		00	0.0	9.4		1.9	0'0	8 5				
Intressering Summary	į	ľ	å	Ÿ			ł	ij		Ì	ľ	
HCM 2010 Ctrl Delay		l	16.8									

HCM 2010 Signalized Intersection Summary 9: Hayes Avenue & US-30

2022 Total PM.syn	12/12/2017

Lane Configurations Traffic Volume (veh/h) Future Volume (veh/h) Number										į		
Lane Configurations Traffic Volume (veh/h) Future Volume (veh/h) Number	EBE	EBT	EBB	WBL	WB3	WBR	MBI	MBE	NBR	SBL	SBT	SBR
Traffic Volume (veh/h) Future Volume (veh/h) Number nnitial O (Qb), veh	****	*	Ti.	ĸ.	\$ *			4			¢	
Future Volume (veh/h) Number Initial Q (Qb), veh	105	602	87	9	596	9	4	18	7	9	21	57
Number Initial Q (Ob), veh	105	602	87	9	296	9	44	18	7	9	21	57
Initial Q (Ob), veh	7	4	14	က	00	18	2	2	12	-	9	16
	0	0	0	0	0	0	0	0	0	0	0	J
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	148	692	110	16	336	80	92	43	12	16	30	69
Adj No. of Lanes		2	-	-	2	0	0	-	0	0	-	0
Peak Hour Factor	0.71	0.87	0.79	0.38	0.88	0.75	0.68	0.45	0.58	0.38	0.71	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	099	1735	276	460	1591	38	240	146	37	72	118	223
Arrive On Green	0.13	1.00	1.00	0.02	0.53	0.53	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, vehilh	1494	2980	1333	1494	2976	7.1	698	550	139	115	445	2
Grp Volume(v), veruh	148	692	110	16	168	176	120	0	0	115	0	0
Grp Sat Flow(s), veh/hiln	1494	1490	1333	1494	1490	1556	1387	0	0	1401	0	0
O Serve(g_s), s	4.4	0:0	0.0	0.5	5.9	5.9	0.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	0.0	0.0	0.5	5.9	5.9	6.9	0.0	0.0	6.5	0.0	0.0
Prop In Lane	1:00		1.00	1.00		90.0	0.54		0.10	0.14		090
Lane Grp Cap(c), veh/h	999	1735	776	460	197	832	423	0	0	412	0	0
V/C Ratio(X)	0.22	0.40	0.14	0.03	0.21	0.21	0.28	000	000	0.28	0.00	000
Avail Cap(c_a), vehih	824	1735	776	545	797	832	423	0	0	412	0	0
HCM Platoon Ratio	200	2.00	2.00	1 00	1 00	1.00	1.00	1.00	100	100	1.00	100
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	00.0	0.00	1.00	0.00	0.00
Uniform Delay (d), siveh	7.8	0.0	0.0	10.1	122	122	29.5	0.0	0.0	29.4	0.0	00
incr Delay (d2), s/veh	0.2	9.0	0.4	0.0	9.0	9.0	1.7	0.0	0.0	1.7	0.0	0.0
Initial O Delay(d3);s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfO(50%), vehilin		0.2	0.1	0.2	2.6	2.7	2.9	0.0	0.0	27	0.0	0.0
LnGrp Delay(d), siveh	8.0	9.0	0.4	10.1	12.8	12.8	31.2	0.0	0.0	31.1	0.0	0.0
LinGp LOS	×	A	A	ന	8	œ	U			U		
Approach Vol, veh/h		950			360			120			115	
Approach Delay, s/veh		1.7			12.7			31.2			31.1	
Approach LOS		<			ю			ပ			ပ	
Timbell	=	0	m	9	100	9	L	00	Ì		Ē	F
Assigned Phs		2	က	4		9	7	00				
Phs Duration (G+Y+Rc), s		31.0	6.3	62.7		31.0	11.0	58.0				
Change Period (Y+Rc), s	h	4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	7.5	52.5		26.5	17.5	42.5				
Max Q Clear Time (g_c+11), s	10	8.9	2.5	2.0		8.5	6.4	6 2				
Green Ext Time (p_c), s		1.2	0.0	9.3		1.3	0.3	8.8				
ntecordon Summary					ì		Ī					
HCM 2010 Ctrl Delay			00									
HCM 2010 LOS		9	Α.									

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HCM 2010 Signalized Intersection Summary 9: Hayes Avenue & US-30

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Movement and Configurations		ì	-	-		'	_	-	~		-	,
Lane Configurations	H	EBI	EBB	WEL	WET	WER	1	NBI	SSN	TES.	188	8
	<u>r</u> -	44	W.	×	44			42			4	
Traffic Volume (veh/h)	3	274	27	3	912	-	100	21	6	က	2	141
Future Volume (veh/h)	31	274	27	2	912	-	100	21	တ	es	ις	141
Number	7	4	14	m	00	18	2	2	12	1	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	34	298	29	5	991	-	109	23	10	es	2	153
Adj No. of Lanes	7	2	-		2	0	0	-	0	0		0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	.3	2	2	2	2	2
Cap, veh/h	298	1679	751	622	1648	2	310	19	23	89	90	376
Arrive On Green	0.03	0.56	0.58	0.01	0.54	0.54	0.29	0.29	0.29	0 29	0.20	0.29
Sat Flow, vehilh	1494	2980	1333	1494	3055	173	834	206	62	ထ	91	1276
Grp Volume(v), veh/h	34	298	53	2	483	509	142	0	0	161	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1568	1118	0	0	1343	0	0
Q Serve(g_s), s	1.0	4.8	1.0	0.2	22.1	22.1	3.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	4.8	1.0	0.2	22.1	22.1	12.9	0.0	0.0	9.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		00:0	0.77		0.07	0.05		0.95
Lane Grp Cap(c), veh/h	298	1679	751	622	804	846	393	0	0	433	0	0
V/C Ratio(X)	0.11	0.18	0.04	0.01	09:0	09.0	0.36	0.00	0.00	0.37	00:00	0.00
Avail Cap(c_a), veh/h	334	1679	751	694	804	846	393	0	0	433	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.1	10.6	9.7	10.4	15.7	15.7	29.8	0.0	0.0	28.2	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.2	0.1	0.0	3.3	3.2	2.6	0.0	0.0	2.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	0.4	5.0	0.4	0.1	9.7	10.2	3.6	0.0	0.0	3.8	0.0	0.0
LnGrp Delay(d),s/veh	12.2	10.8	8.6	10.4	19.0	18.9	32.4	0.0	0.0	30.7	0.0	0.0
LuGrp LOS	20	20	∢	20	20	20	O		ì	U		
Approach Vol, veh/h		361			266			142			161	
Approach Delay, s/veh		109			18.9			32.4			30.7	1
Approach LOS		00			8			O			ပ	Ì
Times	ī	2	63	*	(\$	9	tr.	es.	ŀ	1	l	ľ
Assigned Phs		2	က	4		9	7	00		1	ľ	
Phs Duration (G+Y+Rc), s		34.0	5.1	6 09		34.0	7.6	58.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	5	29.5	5.5	51.5		29.5	5.5	51.5				
Max Q Clear Time (g_c+11), s	S	14.9	22	8.9		11.6	3.0	24.1	i			
Green Ext Time (p_c), s		1.6	0.0	11.5		1.8	0'0	10.1				
Intersection Summary								į	į	ì	j	
HCM 2010 Ctrl Delay			19.4									
HCM 2010 LOS			m				200				Ì	

HCM 2010 Signalized Inters 9: Hayes Avenue & US-30

Summary	
Intersection	00 00
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einth) 121 753 140 hh		1	1	~	>	Į.	4	•	•	4	٨	→	*
121 753 1491 8 55 23 9 8 27 121 753 1491 8 370 8 55 23 9 8 27 121 753 1491 8 370 8 55 23 9 8 27 122 753 1491 8 370 8 55 23 9 8 27 123 141 3 8 18 5 2 12 1 0 100 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 136 1569 1569 1569 1569 1569 1560 1560 1569 132 133 148 9 402 0.92 0.92 0.92 0.92 132 133 148 38 0.35 1684 38 254 38 34 50 1494 1490 1333 1494 1490 1557 1386 0.0 0.0 0.0 1400 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1401 1491 1492 1492 1492 157 148 38 0.35 0.0 0.0 0.0 1402 1493 1494 1490 157 1386 0.0 0.0 0.0 1403 1493 1494 1490 157 1386 0.0 0.0 0.0 1404 1490 1333 1494 1490 157 1386 0.0 0.0 0.0 1405 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1406 1407 1408 1409 1409 157 1386 0.0 0.0 0.0 1408 1409 1409 1409 157 1386 0.0 0.0 0.0 1409 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1400 1401 144 812 848 845	Movement	æ	181	EBR	MBI	WBT	WBB	NBI	NBI	NBR	SBS	SBIT	SBR
121 753 140 8 370 8 55 23 9 8 27 121 753 140 8 370 8 55 23 9 8 27 121 753 140 8 370 8 55 23 9 8 27 132 140 140 140 140 140 140 140 140 140 1400 140 140 140 140 140 140 140 140 1569	Lane Configurations	K	**	R	ĸ	47			4			Ą	
121 753 109 8 370 8 55 23 9 8 27 10 0 0 0 0 0 0 0 0 0 0 0 100 100 1.00 1.	Traffic Volume (veh/h)	121	753	109	œ	370	80	22	23	6	80	27	67
7 4 14 3 8 18 5 2 12 1 6 1 6 1 100 1	Future Volume (veh/h)	121	753	109	ထ	370	00	55	23	6	80	27	29
100 10 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Number	7	4	14	က	∞	18	2	2	12	1	9	16
100 100 100 100 100 100 100 100 100 100	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569 1669 1669 1669 1660 1660 1660 1660 16	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
132 818 118 9 402 9 60 25 10 9 29 60 25 10 9 20 0 1 0 0 1 1 0 2 0 2 0 2 0 2 0 2 0 2	Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
1 2 1 1 2 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	Adj Flow Rate, veh/h	132	818	118	တ	402	6	09	25	10	o	23	73
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adj No. of Lanes	-	2	-	-	2	0	0	-	0	0	-	0
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
637 1815 812 383 1884 38 254 89 34 50 106 106 0.06 0.06 1 0.01 0.05 0.05 0.25 0.25 0.25 0.25 0.25 0.25	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
0.06 0.61 0.61 0.01 0.56 0.56 0.25 0.25 0.25 0.25 0.25 1494 1494 1333 1494 1299 0.67 1798 398 141 45 434 1494 1490 1557 1336 0 0 1410 0 0 1409 1333 1494 1490 1557 1336 0 0 1400 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Cap, veh/h	637	1815	812	363	1684	38	254	86	34	20	106	226
1494 2980 1333 1494 2890 67 798 398 141 45 434 1132 818 118 9 201 210 95 0 0 1111 0 0 135 1428 148 189 0 201 210 95 0 0 0 1111 0 0 135 144 1490 158 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Arrive On Green	90.0	0.61	0.61	0.01	0.56	0.56	0.25	0.25	0.25	0.25	0.25	0.25
132 818 118 9 201 210 95 0 0 111 0 0 1494 1490 1333 1494 1490 157 1436 0 0 0 111 0 0 3.5 148 38 0.3 6.8 6.8 6.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Sat Flow, vehith	1494	2980	1333	1494	2980	67	798	398	141	45	434	920
1494 1490 1333 1494 1490 1557 1336 0 0 0 1400 0 0 3.5 14.8 38 0.3 6.8 6.8 6.0 0.0 0.0 0.0 0.0 0.0 1.00 1.00 1.00	Grp Volume(v), veh/h	132	818	118	6	201	210	32	0	0	111	0	0
3.5 148 3.8 0.3 6.8 6.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1557	1336	0	0	1400	0	0
35 148 38 0,3 6.8 6.8 6.0 0.0 0.0 6.5 0.0 1.00 1.00 1.00 1.00 1.00 1.00 1.0	Q Serve(g_s), s	3.5	14.8	3.8	0.3	8.9	8.9	0.0	0.0	0.0	0.0	0.0	0.0
100 100 100 100 004 063 011 008 101 011 010 100 100 100 100 100 100 1	Cycle Q Clear(g_c), s	3.5	14.8	3.8	0.3	6.8	8.9	0.9	0.0	0.0	6.5	0.0	0.0
10	Prop In Lane	1.00		1.00	1.00		0.04	0.63		0.11	0.08		0.66
0.21 0.45 0.15 0.02 0.24 0.25 0.00 0.00 0.29 0.00 0.100 1.00 1.00 1.00 1.00 1.00 1.	Lane Grp Cap(c), veh/h	637	1815	812	363	842	880	386	0	0	382	0	0
726 1815 812 459 842 880 386 0 0 0 382 0 0 100 1.00 1.00 1.00 1.00 1.00 1.00	V/C Ratio(X)	0.21	0.45	0.15	0.02	0.24	0.24	0.25	0.00	0.00	0.29	0.00	0.00
1100 1100 1100 1100 1100 1100 1100 110	Avail Cap(c_a), veh/h	726	1815	812	459	842	880	386	0	0	382	0	0
1.00 1.00 1.00 1.00 1.00 1.00 0.00 0.00	HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7.6 10.5 8.4 9.6 10.9 10.9 30.7 0.0 0.0 30.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
0.2 0.8 0.4 0.0 0.7 0.6 1.5 0.0 0.0 1.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Uniform Delay (d), s/veh	9.7	10.5	8.4	9.6	10.9	10.9	30.7	0.0	0.0	30.9	0.0	0.0
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Incr Delay (d2), s/veh	0.2	0.8	0.4	0.0	0.7	9.0	7.	0.0	0.0	1.9	0.0	0.0
14 62 15 0.1 2.9 3.1 2.3 0.0 0.0 2.7 0.0 7.7 114 8.8 96 116 116 32 0.0 0.0 2.7 0.0 108 A B B C 95 111 108 A 120 32.9 0.0 11 2 3 4 5 6 7 8 220 5.6 654 220 100 61.0 4.5 4.5 4.5 4.5 4.5 24.5 7.8 6.5 8.8 8.0 2.3 168 8.5 5.8 8.8 1.0 0.0 11.2 1.0 0.2 11.5 1.3 5	Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7.7 114 8.8 9.6 116 116 322 0.0 0.0 32.9 A B A A 420 10.6 10.6 11.6 11.6 11.6 11.7 2 3 4 5 6.7 8 220 5.6 654 29.0 10.0 61.0 4.5 4.5 4.5 4.5 4.5 4.5 24.5 7.5 54.5 24.5 11.5 50.5 8.0 2.3 16.8 8.5 5.8 8.8 1.0 0.0 11.2 1.0 0.2 11.5 13.5 13.5	%ile BackOfQ(50%),veh/In	1.4	6.2	1.5	0.1	2.9	3.1	2.3	0.0	0.0	2.7	0.0	0.0
1060	LnGrp Delay(d),s/veh	7.7	11.4	8.8	9.6	11.6	11.6	32.2	0.0	0.0	32.9	0.0	0.0
1068 420 95 106 115 322 1	LnGrp LOS	¥	80	A	V	В	m	ပ			O		
106 116 322 B B C C C C C C C C C C C C C C C C C C	Approach Vol, veh/h		1068			420			92			111	i
2 3 4 5 7 8 290 56 654 290 100 610 45 45 45 45 45 45 245 75 545 245 115 505 80 23 168 85 55 88 10 00 112 1.0 02 115	Approach Delay, s/veh	۱	10.6	١		11.6			32.2			32.9	
1 2 3 4 5 6 7 290 56 654 290 100 45 45 45 45 45 45 245 75 545 245 115 80 23 168 85 55 1.0 0.0 11.2 1.0 0.2	Approach LOS		œ			8			ပ			ပ	
2 3 4 6 7 290 56 654 230 000 45 45 45 45 45 45 245 7.5 545 245 115 8.0 2.3 168 8.5 55 1.0 0.0 11.2 1.0 0.2 13.5	Imet	-	Ĥ	in	¥	ď	9	1	00	Á	i	i	Ī
290 56 654 290 100 45 45 45 45 45 45 245 75 545 245 115 80 23 168 85 55 1,0 0,0 11,2 1,0 0,2 13,5	Assigned Phs	l	2	m	4		9	7	8				
45 45 45 45 45 245 75 545 245 115 245 7.5 545 245 115 1.0 0.2 1.0 0.0 11.2 1.0 0.2 13.5 B	Phs Duration (G+Y+Rc), s		29.0	5.6	65.4		29.0	10.0	61.0				
245 7,5 54,5 24,5 11,5 8,0 2,3 16,8 8,5 5,5 1,0 0,0 11,2 1,0 0,2 13,5 R	Change Period (Y+Rc), s	þ	4.5	4.5	4.5		4.5	4.5	4.5				
8.0 2.3 16.8 8.5 5.5 1.0 0.0 11.2 1.0 0.2 13.5 R			24.5	7.5	54.5		24.5	11.5	50.5				
s 1.0 0.0 11.2 1.0 0.2 13.5 B	Max Q Clear Time (g_c+1), s		8.0	2.3	16.8		8.5	5.5	8.8				
	Green Ext Time (p_c), s		1.0	0.0	11.2		1.0	0.2	11.5				
	intersection Summany	ŀ	ì	ľ	þ	E	ŀ	ľ		ľ	١		
	HCM 2010 Ctrl Delay			13.5									
	HCM 2010 LOS		1	0		į							

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 9; Hayes Avenue & US-30

2040 Total AM syn 12/12/2017

nos		4	†	<i>></i>	1	Ļ	1	•	←	4	٦	→	*
1	Mement	m	EBIL	EBR	WEE	ME	WER	MBI	NBT	MER	188	SBI	SBB
38 413 27 5 1150 1 100 21 9 3 413 27 5 1150 1 1 100 21 9 1 1 100 21 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Lane Configurations	At-	**	K.	×	47			i	ľ		¢\$	
38 413 27 5 1160 1 100 21 9 1 100 21 9 1 100 100 100 100 100 100 100 100 10	Traffic Volume (veh/h)	38	413	27	2	1150	-	100	7	6	က	2	154
7 4 14 3 8 18 5 2 12 100 100 100 100 100 100 100 100 1100 100	Future Volume (veh/h)	38	413	27	2	1150	-	100	21	6	က	5	154
100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Number	7	4	14	c,	œ	18	c	2	12	Ī	9	16
100 100 100 100 100 100 100 100 100 100	Initial Q (Qb), veh	0	0	0	0	Q	0	0	0	0	0	0	0
150 150 100 100 100 100 100 100 100 100	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569 1569 1569 1660 1660 1569 1660	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
41 449 29 5 1250 1 109 23 10 0.92 0.92 0.92 0.92 0.92 0.92 0.92 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
or 1 2 1 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Adj Flow Rate, veh/h	41	449	29	ιΩ	1250	-	109	23	10	က	2	167
Fig. 98 2 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.	Adj No of Lanes	-	2	-	-	2	0	0	-	0	0	**	0
Ceh, % 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
240 7769 791 598 1730 1 266 51 19 1007 1100 100 1057 057 026 026 026 1008 1333 1494 3166 2 762 194 026 11	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1494 299 1333 1494 295 256 2		240	1769	161	298	1730	-	566	21	19	38	15	339
1494 2380 1333 1494 3066 2 762 194 72		0.07	1.00	1.00	0.01	0.57	0.57	0.26	0.26	0.26	0.26	0.26	0.26
wethfuln 149 149 29 5 610 641 142 0 0 0 vethfuln 1494 1490 1333 1494 1490 1358 1029 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1494	2980	1333	1494	3056	2	762	194	72	9	26	1281
vehhilin 1494 1490 1333 1494 1490 1568 1029 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	i	41	449	59	2	610	641	142	0	0	175	0	0
C), s 11, 0, 0, 0, 0, 1, 30, 30, 3, 8, 8, 9, 9, 9, 9, 9, 9, 9, 14, 9, 0, 0, 0, 0, 14, 9, 0, 0, 0, 0, 0, 14, 9, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,		1494	1490	1333	1494	1490	1568	1029	0	0	1342	0	0
Columbia Columbia		1.1	0.0	0.0	0.1	30.0	30.0	3.8	0.0	0.0	0.0	0.0	0.0
1.00	Cycle Q Clear(g_c), s	1.1	0.0	0.0	0.1	30.0	30.0	14.9	0.0	0.0	11.0	0.0	0.0
hh 240 1769 791 598 843 888 336 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Prop In Lane	1.00		1.00	1.00		0.00	0.77		0.07	0.02		0.95
0.17 0.25 0.04 0.01 0.72 0.72 0.42 0.00 0.00 2.00 0.00 2.00 2.00 0.00 2.00 0.00 2.00 0.00 2.00 0.00 2.00 0.00 2.00 0.00 2.00 0	Lane Grp Cap(c), veh/h	240	1769	791	598	843	888	336	0	0	392	0	0
266 7769 791 665 843 888 335 0 0 0 20 200 200 100 100 100 100 100 10	V/C Ratio(X)	0.17	0.25	0.04	0.01	0.72	0.72	0.42	0.00	0.00	0.45	0.00	0.00
2.00 2.00 1.00 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	266	1769	791	665	843	888	336	0	0	392	0	0
0.97 0.97 0.97 1.00 1.00 1.00 0.00 0.00 0.00 0.00 0.0	HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
127 0.0 0.0 9.2 15.9 15.9 33.1 0.0 0.0 0.0 0.0 0.0 0.5 3 3.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Upstream Filter(i)	0.97	0.97	0.97	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
0.3 0.3 0.1 0.0 5.3 5.1 3.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Uniform Delay (d), s/veh	12.7	0.0	0.0	9.5	15.9	15.9	33.1	0.0	0.0	31.1	0.0	0.0
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Incr Delay (d2), s/veh	0.3	0.3	0.1	0.0	5.3	5.1	3.9	0.0	0.0	3.6	0.0	0.0
184 184	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
130 0.3 0.1 9.2 21.3 21.0 370 0.0 0.0 0.0 8.5 9	%ile BackOfQ(50%),veh/In	0.5	0.1	0.0	0.1	13.4	14.1	3.8	0.0	0.0	4.5	0.0	0.0
519 1256 519 1256 1.3 2 6 7 2 3 4 6 7 310 5.1 6.39 3.10 7.9 4.5 4.5 4.5 4.5 4.5 4.5 2.65 5.1 5.49 2.6.5 5.1 1.4 0.0 18.7 1.6 0.0	LnGrp Delay(d),s/veh	13.0	0.3	0.1	9.5	21.3	21.0	37.0	0.0	0:0	34.7	0.0	0.0
519 1256 1.3 21.1 A C C C C C C C C C C C C C C C C C C C	LnGrp LOS	В	A	V	V	O	ပ	۵			O		
13 21.1 A C C F 7 2 3 4 6 7 310 51 639 310 7.9 4.5 4.5 4.5 4.5 4.5 4.5 26.5 5.1 2.0 130 3.1 1.4 0.0 18.7 1.6 0.0	Approach Vol, veh/h		519			1256			142			175	I
A C C 3 4 6 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Approach Delay, s/veh		1.3			21.1			37.0			34.7	1
2 3 4 6 7 310 51 639 310 79 45 45 45 45 45 265 5,1 549 265 5,1 169 21 20 130 3.1 14 0.0 187 16 0.0	Approach LOS		A			O			D			ပ	Į.
2 3 4 6 7 310 51 639 310 79 45 45 45 45 45 265 51 549 265 51 169 21 20 130 3.1 184	limite	Ĭ	es.		+	ú	(0)	n-	*	l	ľ		P
310 5.1 63.9 31.0 7.9 4.5 4.5 4.5 4.5 4.5 2.5 2.5 5.1 2.0 13.0 3.1 16.9 2.1 2.0 13.0 3.1 1.4 0.0 18.7 1.6 0.0	Assigned Phs	ı	2	က	4		9	7	00	1			
4.5 4.5 4.5 4.5 2.5 2.5 5.1 2.0 13.0 3.1 1.4 0.0 18.7 1.6 0.0	Phs Duration (G+Y+Rc), s		31.0	5.1	63.9		31.0	7.9	61.1				
26.5 5.1 54.9 26.5 5.1 16.9 2.1 2.0 13.0 3.1 1.4 0.0 18.7 1.6 0.0 18.4	Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
16.9 21 20 13.0 3.1 1.4 0.0 18.7 1.6 0.0 18.4	Max Green Setting (Gmax), s		26.5	5.1	54.9		26.5	5.1	54.9				
1.4 0.0 18.7 1.6 0.0 18.4	Max Q Clear Time (g_c+11), s		16.9	2.1	20		13.0	3.1	32.0				
	Green Ext Time (p_c), s		1.4	0.0	18.7		1.6	0.0	12.9				
	Infersection Summary	ľ		ŀ	Į	j		ŀ	ŀ	ì	Ì		Ī
	HCM 2010 Ctrl Delay			18.4									ĺ
HCM 2011 CS	HCM 20101 OS			60			Ì		d		ļ	i	ľ

HCM 2010 Signalized Intersection Summary 9: Hayes Avenue & US-30

	1	t	~	•	Ļ	/	~	-	L	A	+	•
Movement	Ħ	EBI	EBB	WBE	WEE	WBR	MBIL	NET	MBR	SBI	SBI	SBR
Lane Configurations	M	**	W.	Je.	43			÷			¢	
Traffic Volume (veh/h)	140	1111	109	. ∞	299	00	22	23	6	00	27	83
Future Volume (veh/h)	140	1111	109	80	299	89	55	23	6	8	27	83
Number	7	4	14	က	00	18	S	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	152	1208	118	6	725	0	09	25	10	0	59	8
Adj No of Lanes	-	2	-	-	2	0	0	F	0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	511	1964	879	340	1845	23	200	75	25	46	73	191
Arrive On Green	0.12	1.00	1.00	0.01	0.61	0.61	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1494	2980	1333	1494	3015	37	723	384	130	38	373	978
Grp Volume(v), veh/h	152	1208	118	6	358	376	95	0	0	128	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	1333	1494	1490	1562	1236	0	0	1390	0	0
Q Serve(g_s), s	3.7	0.0	0.0	0.2	12.3	12.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	0.0	0.0	0.2	12.3	12.3	7.7	0.0	0.0	8.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.05	0.63		0.11	0.07		0.70
Lane Grp Cap(c), veh/h	511	1964	879	340	912	926	300	0	0	310	0	0
V/C Ratio(X)	0.30	0.62	0.13	0.03	0.39	0.39	0.32	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	969	1964	879	406	912	926	300	0	0	310	0	0
HCM Platoon Ratio	2.00	5.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	6.2	0.0	0.0	7.2	6.6	6.6	35.3	0.0	0.0	35.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	1.0	0.2	0.0	1.3	1.2	2.8	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	1.5	0.3	0.1	0.1	5.3	5.5	2.6	0.0	0.0	3.5	0.0	0.0
LnGrp Delay(d),s/veh	6.5	1.0	0.2	7.2	11.2	11.1	38.0	0.0	0.0	39.7	0.0	0.0
LnGrp LOS	V	∢	4	A	8	œ	٥			۵		
Approach Vol, weh/h		1478			743			92			128	
Approach Delay, s/veh	Ì	1.5			111			38.0			39.7	
Approach LOS		4			മ			۵			٥	
Test	Ŧ	ei	œ	9	á	ció	2	9	l	l	ŀ	ľ
Assigned Phs	ı	2	33	4	I	9	7	00		ľ		
Phs Duration (G+Y+Rc), s		24.0	5.6	70.4		24.0	10.3	65.7				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		19.5	5.5	61.5		19.5	11.5	55.5				
Max Q Clear Time (g_c+11), s		2.6	2.2	2.0		10.1	5.7	143				
Green Ext Time (p_c), s		6.0	0.0	25.4		0.8	0.2	21.7				
Interesting Stemsory		١	ì	Ì	į	İ	Ì	Ì	İ	Ì	١	ı
HCM 2010 Ctrl Delay			7.9									

Synchro 9 Report Page 1

	US-30
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WSC	Road
HCM 2010 TWSC	/hitney
HCM	10: V

2040 Total PM.syn

2017 Existing AM.syn

	0.0												
Movement	EBI	193	EBB	W	BE. W	181	WER	MEI	NBI	MBR	崽	Ser	iss
Lane Configurations	*	*	K.		b-	4	R_	J.	45.			4	
Traffic Vol, veh/h	32	119	31		6	502	33	46	49	3	4	52	13,
Future Vol, veh/h	32	119	31		m	502	33	46	49		4	29	13
Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0		Ĭ
Sign Control	Free	Free	Free	Ū.	Free F	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None			-	None	1000		170			
Storage Length	375	11	375	(-,	375	,	375	100	0.5	6.1	ľ		
Veh in Median Storage, #	,	0	,			0			0	17			
Grade, %	,	0	ı		·	0	ı	*	0				
Peak Hour Factor	80	89	48		38	85	23	11	89	75	20	_	74
Heavy Vehicles, %	2	2	2		2	7	2	2	2		2		
Mvmt Flow	4	175	65			291	26	99	72	*4	80	4	177
Haralline	Maire			N.	9			EGNEST .			Street,		
Conflicting Flow All	591	0	0		175	0	0	974	861	175	889	861	53
Stage 1	•	•				8	(V	255	255	,	909		
Stage 2	'),	ı		19.0	(*)	ä	719	909	1	283		
Critical Hdwy	4.12	ľ	,	4	4.12	¥	À	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	٠	٠			71	*	è	6.12	5.52	*	6.12		
Critical Hdwy Stg 2	i		ľ			100	ð	6.12	5.52	1	6.12	5.52	
Follow-up Hdwy	2.218	1		2.2	2.218		74	3.518	4.018	3.318	3,518	4.018	3,318
Pot Cap-1 Maneuver	982	1	1	17	1401	à	ě	231	293	868	260		201
Stage 1	1	1	1		22	ř	a	749	969	١	484		
Stage 2	•	•	٠		×	ě	4	420	487		715	969	
Platoon blocked, %		1				•	¥				1000		7
Mov Cap-1 Maneuver	985	٠	٠	17	1401	Ť	è	126	279	868	200	279	20
Mov Cap-2 Maneuver	100	10	٠		*/	0	ě	126	279	•	200		
Stage 1	-	*	•					719	999	,	464	484	
Stage 2	12/13	(4)	0.0		÷	0	•	245	484	1	609		
												ŀ	
Approach	æ				8		l	MB		Ī	99		P
HCM Control Delay, s HCM LOS	13				0.1			37.3 F			24.3		
line Jamilian Ham	NEW ACT	0.00	ā	TOT	9		MOT US	00 00144		П			
Capacity (veh/h)	126	289	982			1401		415				à	п
HCM Lane V/C Ratio	0.474		0.041	×	0	900.0	¥	- 0.562					
HCM Control Delay (s)		21.8	8.8	ŀ		9.7		243					
HCM Lane LOS	u.	ပ	4	(0)		4	•	0					
HCM 05th %tile Of oh)	2.1	•	7			<		9 0					

HCM 2010 TWSC 10: Whitney Road & US-30

int Delay, s/veh 16.5												
Acvenent	EE	188	EBB	Wei.	1887	- Marc	MEG	MBT	MBR	388	SBT	SBR
Lane Configurations	*	*	处	*	*	N.	is.	¢2.			4	
Traffic Vol. veh/h	88	392	29	30	178	4	3	28	9	17	7	53
Future Vol. veh/h	86	392	29	30	178	4	31	58	9	17	71	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free		Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	•	•	None		•	None	•	•	None		١	None
Storage Length	375	ř	375	375	•	375	100					,
Veh in Median Storage, #	•	0	٠	ľ	0			0	i	•	0	Ú
Grade. %	•	0	1	ľ	0	,	•	0	١	i	0	1
Peak Hour Factor	29	93	93	33	46	89	78	84	20	61	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	7	2	2	7	7
Mymt Flow	128	422	72	91	184	9	40	72	12	28	96	72
Tartes at Research	3		١	Control			Manuel	ı		Mines	Í	Ħ
Confliction Flow All	184	-	-	422	c	c	1127	1043	422	1085	1043	184
Common of the Charles 1	5		>				678			365	365	ř
State 2						•	449	365	,	720	678	ľ
Critical Lidinar	4 42			A 12	ľ		7 12		609	7 12	6.52	622
Critical Edun Sto 1	71.7	9	9	71 -	ľ		612		,	612	5.52	,
Cilical Huwy stg 1		1				0	6.13	20.00	E I	6.12	5,52	Ī
Critical nowy Stg 2		0		0.00		o c	0.12		0 240	2 540	40.04	0 2010
Follow-up Hdwy	2.218	*		2.218	•	,	3.518			3.518	4.018	3.318
Pot Cap-1 Maneuver	1391	2		1137		9	182		632	194	573	828
Stage 1	•	9	it.	•	•		442	452		654	623	1
Stage 2	*	(*)			Ů	×	589		•	419	452	•
Platoon blocked, %		*	*		161	Œ						
Mov Cap-1 Maneuver	1391	V	,ti	1137	ľ		68	191	632	119	191	828
Mov Cap-2 Maneuver	,	*	*	i	•	٠	88		1	119	191	1
Stage 1	•)	-	5		Ì	£	401		i	594	573	Í
Stage 2	C					:(4):	413	573	•	308	410	i
												ā
おおりませ	æ			BW.			NB.			SBS		
HCM Control Delay, s	16		R	27			46.2	ì		64.8		
HCM LOS							ш		١	ш		
								ı				
Winge Lane Major Livror	WEEnt	Enflishe?	ERI	ENT ENR	WE	NSI .	WER SELECT	H			ŝ	Ť
Capacity (vehilh)	88	212	1391	100	1137	*1	- 238				L	
HCM Lane V/C Ratio	0.447	0.394	0.092		0.08	٠	- 0.821					
HCM Control Delay (s)	74.7	326	7.9		8.4	1	- 64.8					
HCM Lane LOS	ш	٥	∢		×	9	,					
HCM 95th %tile Q(veh)	19	1.8	0.3		0.3	٠	- 63				ļ	i

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HCM 2010 Signalized Intersection Summary 10: Whitney Road & US-30

2017 Existing PM.syn 12/12/2017

2022 Background AM.syn 12/12/2017

	1	Ť	*	-	ļ	4	•	—	4	٠	→	*
Movement	188	183	EBR	WEI	WBI	WBR	NSI	18N	MBR	8	SBI	SER
Lane Configurations	k	474		,be	4			4			Ą	
Fraffic Volume (veh/h)	34	127	33	m	534	32	49	25	65	4	31	139
Future Volume (veh/h)	34	127	33	e	534	35	49	52	3	4	31	139
Number	7	4	14	e	80	18	9	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1 00		1.00	1.00		1,00	1.00		1 00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.8
Adj Sat Flow, vehihin	1569	1569	1600	1569	1569	1600	1600	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	42	187	69	00	628	29	2	76	4	60	52	188
Adj No. of Lanes	×	2	0	-	2	0	0		0	0	-	0
Peak Hour Factor	0.80	0.68	0.48	0.38	0.85	0.59	0.77	0.68	0.75	0.50	0.60	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	384	1120	400	616	1365	128	202	222	11	45	107	351
Arrive On Green	0.03	0.52	0.52	0.01	050	0.50	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, vehin	1494	2154	769	1494	2755	258	462	862	32	15	319	1047
Gro Volume(v), veh/h	42	121	129	80	338	348	144	0	0	248	0	0
Grp Sat Flow(s), veh/h/fin	1494	1490	1433	1494	1490	1523	1157	0	0	1381	0	0
O Serve(g_s). s	1.4	4.5	4.7	0.3	14.9	14.9	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	4.5	4.7	0.3	14.9	14.9	11.8	0.0	0.0	14.5	0.0	0.0
Prop In Lane	1.00		0.54	1.00		0.17	0.44		0.03	0.03		0.76
Lane Grp Cap(c), veh/h	384	775	745	616	738	755	440	0	0	200	0	0
V/C Ratio(X)	0.11	0.16	0.17	0.01	0.46	0.46	0.33	0.00	0.00	0.50	0.00	0.00
Avail Cap(c_a), vehih	445	775	745	698	738	755	440	0	0	200	0	0
HCM Platoon Ratio	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	188	1,00	1.00
Upstream Filter(I)	100	8	1.00	1.8	1.00	1.00	1.00	0.00	0.00	9	000	0.00
Uniform Delay (d), s/veh	125	126	12.7	123	16.5	16.5	25.4	0.0	0.0	26.9	0.0	0.0
Incr Delay (d2), s/veh	0,1	0.5	0.5	0.0	2.1	2.0	5.0	0.0	0.0	3.5	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00
%ile BackOfQ(50%),vetylin	9.0	0	2.0	0.1	6.5	6.7	3.4	0.0	0.0	0.9	0.0	0.0
LnGrp Delay(d), siveh	12.7	13.1	13.2	123	18.5	18.5	27.4	0.0	0.0	30.4	0.0	0.0
LnGrp LOS	m	В	В	В	В	8	O			ပ		
Approach Vol, veh/h		298			695			4			248	
Approach Delay, s/veh		13.0			18.4			27.4			30.4	
Approach LOS		8			8			ပ	ì		O	
Timer	ì	2	63	Ť	9	10	Ť	8:			Ì	
Assigned Phs		2	6	4	ļ	9	7	80	ı	ı	l	
Phs Duration (G+Y+Rc), s		38.0	5.5	56.5		38.0	7 9	54.1				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		33.5	6.5	46.5		33.5	7.5	45.5				
Max Q Clear Time (g_c+11), s		13.8	2.3	6.7		16.5	3.4					
Green Ext Time (p_c), s		2.4	0.0	7.0		2.3	0.0	9-9				
Intersection Summan		ĺ	ŀ			Î	ļ			Ì		
HCM 2010 Ctrl Delay			20.4									

	1	†	*	-	ļ	/		-	L	*	→	*
Movember	H	EBEL	EBR	WEE	WET	WBR	MBL	MBI	NBR	SBL	SBT	SBR
Lane Configurations	*	44		K	4		V	23			4	
Traffic Volume (veh/h)	92	417	71	32	189	4	33	62	9	18	9/	56
Future Volume (veh/h)	92	417	71	32	189	4	33	62	9	18	92	56
Number	7	4	14	က	00	9	2	2	15	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	00.	00:	1.00
Adj Sat Flow, weh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	137	448	9/	97	195	9	45	11	12	8	103	92
Adj No of Lanes	-	2	0	-	2	0	-	-	0	0	-	0
Peak Hour Factor	0.67	0.93	0.93	0.33	0.97	0.68	0.78	0.81	0.50	0.61	0.74	0.74
Percent Heavy Veh, %	7	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	573	1005	170	387	1107	34	463	220	98	88	263	177
Arrive On Green	20:0	0.39	0.39	90:0	0.38	0.38	0.03	0.41	0.41	0.34	0.34	0.34
Sat Flow, veh/h	1494	2552	430	1494	2952	91	1494	1326	207	138	783	526
Gra Volume(v), veh/h	137	260	264	26	86	103	42	0	89	509	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	1493	1494	1490	1553	1494	0	1532	1448	0	0
Q Serve(g_s), s	5.6	12.8	13.0	3.9	4.4	4.4	1.8	0.0	3.6	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.6	12.8	13.0	3.9	4.4	4.4	1.8	0.0	3.6	11.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		90.0	1.00		0.13	0.14		0.36
Lane Grp Cap(c), veh/h	573	587	588	387	529	582	463	0	636	527	0	0
V/C Ratio(X)	0.24	0.44	0.45	0.25	0.18	0.18	60.0	0.00	0.14	0.40	00.00	0.00
Avail Cap(c_a), veh/h	633	587	588	460	529	582	208	0	636	527	0	0
HCM Platoon Ratio	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.8	22.3	22.3	18.0	50.9	50.9	19.1	0.0	18.2	25.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	2.4	2.5	0.3	0.7	0.7	0.1	0.0	0.5	2.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	2.3	5.7	5.7	1.7	1.9	2.0	0.7	0.0	1.6	4.8	0.0	0.0
LnGrp Delay(d), s/veh	17.0	24.7	24.8	18.3	21.6	21.6	19.2	0.0	18.6	27.9	0.0	0.0
LuGp LOS	œ	O	O	8	O	U	80		8	O		
Approach Vol. veh/h		199			298			131			209	
Approach Delay, s/veh		23.1			20.5			18.8			27.9	
Approach LOS		ပ			ပ			8			O	I
Times	÷	2	8	Ħ	9	(2)	6	*	ŀ	į	ŀ	
4ssigned Phs		2	m	4	S	9	7	80				
Phs Duration (G+Y+Rc), s		46.0	10.1	43.9	2.9	38.1	12.0	42.0				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				į
Max Green Setting (Gmax), s		41.5	10.5	34.5	6.5	30.5	11.5	33.5				
Max Q Clear Time (g_c+11), s		9.6	5.9	15.0	3.8	13.0	9.2	6.4				ı
Green Ext Time (p_c), s		1.9	0.1	4.3	0.0	1.6	0.1	4.7				
Herserting Stemman		Ì	ļ	Ì	Ì	ł		Ì	ì	Ì	Ì	
HCM 2010 Ctrl Delay			22.9									

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	1	t	1	1	ļ	4	1	-	4	٨		7
Movement	193	183	EBR	WBL	WET	WBR	NBE	NBI	NBR	SBL	198	SBB
Lane Configurations	K.	43		je.	*		J.C	a 23			4	
Traffic Volume (veh/h)	8	127	33	'n	534	35	49	52	က	4	3	139
Future Volume (veh/h)	34	127	33	es	534	35	49	52	9	4	31	139
Number	7	4	14	က	00	18	2	2	12	Ī	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	42	187	69	æ	628	29	64	76	4	00	52	188
Adj No. of Lanes	-	2	0	Ī	2	0	-	1	0	0	-	0
Peak Hour Factor	0.80	0.68	0.48	0.38	0.85	0.59	0.77	0.68	0.75	0.50	09.0	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	325	991	354	542	1200	113	373	583	31	42	98	323
Arrive On Green	0.03	0.46	0.46	0.01	0.44	0.44	0.04	0.40	0.40	0.31	0.31	0.31
Sat Flow, veh/h	1494	2154	692	1494	2755	258	1494	1477	78	15	319	1047
Grp Volume(v), veh/h	42	127	129	80	339	348	64	0	80	248	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	1433	1494	1490	1523	1494	0	1555	1381	0	0
Q Serve(g_s), s	1.5	5.0	5.3	0.3	16.6	16.7	2.8	0.0	3.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	5.0	5.3	0.3	16.6	16.7	2.8	0.0	3.3	15,1	0.0	0.0
Prop In Lane	1.00		0.54	1.00		0.17	1.00		0.05	0.03		0.76
Lane Grp Cap(c), veh/h	325	989	629	545	649	663	373	0	614	463	0	0
V/C Ratio(X)	0.13	0.19	0.20	0.01	0.52	0.52	0.17	00.00	0.13	0.54	0.00	0.00
Avail Cap(c_a), veh/h	359	989	629	609	649	663	423	0	614	463	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1 00	0.00	0.00
Uniform Delay (d), s/veh	15.9	15.9	16.0	15.5	20.6	20.6	20.7	0.0	19.3	29.1	0.0	0.0
Incr Delay (d2), s/veh	0.2	9.0	0.7	0.0	3.0	2.9	0.5	0.0	0.4	4.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	2.2	2.2	0.1	7.3	7.5	1.2	0.0	1,5	6.4	0.0	0.0
LnGrp Delay(d),s/veh	16.1	16.5	16.7	15.5	23.6	23.6	20.9	0.0	19.7	33.5	0.0	0.0
LuGrp LOS	В	m	8	m	U	U	U		-	U		1
Approach Vol, veh/h		298			695			4			248	
Approach Delay, s/veh		16.5			23.5			20.3			33.5	Ì
Approach LOS		В			ပ			ပ			ပ	
laner	į	2	8		in	9	1	8	ŀ	H	F	
Assigned Phs		2	က	4	2	9	7	æ		ı		
Phs Duration (G+Y+Rc), s		44.0	5.5	50.5	8.7	35.3	7.9	48.1				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				ľ
Max Green Setting (Grnax), s		39.5	5.5	41,5	7,5	27.5	5.7	41.3				
Max Q Clear Time (g_c+11), s	M	53	2.3	7.3	4.8	17.1	3,5	18.7				
Green Ext Time (p_c), s		2.2	0.0	8.9	0.0	1.4	0.0	6.2				
Oferstein Summary	į	ł	١	į	l	I	Ì	Ì	Ì	Ì	ļ	
HCM 2010 Ctrl Delay			23.5									1
HCM 2010 LOS			ပ					ă		۱	١	I

HCM 2010 Signalized Intersection Summary 10: Whitney Road & US-30

2022 Total PM.syn 12/12/2017

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forestrent	ä	Ħ	ä	18/1	WBI	38//	MBN	MBH	MBR	SBI	158	SBR
ane Configurations	*	25g		*	43		F	£,			÷	
raffic Volume (veh/h)	92	417	77	35	189	4	33	62	9	18	9/	99
-uture Volume (veh/h)	92	417	11	32	189	4	33	62	9	18	92	56
lumber	7	4	14	3	80	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	137	448	92	97	195	9	42	11	12	30	103	92
Adj No of Lanes	-	2	0	-	2	0	-	-	0	0	-	0
Peak Hour Factor	29.0	0.93	0.93	0.33	0.97	0.68	0.78	0.81	0.50	0.61	0.74	0.74
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Sap, veh/h	573	1005	170	387	1107	34	463	550	86	88	263	177
Arrive On Green	0.07	0.39	0.39	90.0	0.38	0.38	0.03	0.41	0.41	0.34	0.34	0.34
Sat Flow, veh/h	1494	2552	430	1494	2962	6	1494	1326	202	138	783	526
Srp Volume(v), veh/h	137	260	264	-87	86	103	42	0	88	508	0	0
Srp Sat Flow(s), veh/h/ln	1494	1490	1493	1494	1490	1553	1494	0	1532	1448	0	0
Cerve(g_s), s	9.9	12.8	13.0	3.9	4.4	4.4	1.8	0.0	3.6	0.0	0.0	0.0
Cycle Q Clearing_c), s	9.6	12.8	13.0	3.9	4.4	4.4	1.8	0.0	3.6	11.0	0.0	0.0
Prop in Lane	1.00		0.29	1.00		90.0	1.00		0.13	0.14		0.36
ane Grp Cap(c), veh/h	573	587	588	387	559	582	463	0	636	527	0	0
//C Ratio(X)	0.24	0.44	0.45	0.25	0.18	0.18	0.09	00:00	0.14	0.40	0.00	0.00
wail Cap(c_a), wehith	633	587	588	460	559	582	208	0	636	527	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jostream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Iniform Delay (d), siveh	16.8	22.3	22.3	18.0	20.9	50.9	19.1	0.0	18.2	25.7	0.0	0.0
ncr Delay (d2), s/veh	0.2	2.4	2.5	0.3	0.7	0.7	0.1	0.0	0.5	2.2	0.0	0.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.3	5.7	5.7	1.7	1.9	2.0	0.7	0.0	1.6	4.8	0.0	0.0
nGrp Delay(d),s/veh	17.0	24.7	24.8	18.3	21.6	21.6	19.2	0.0	18.6	27.9	0.0	0.0
nGrp LOS	മ	ပ	O	ω	O	ပ	ω		В	ပ		
Approach Vol, veh/h		661			298			131	ı	i	500	
Approach Delay, s/veh		23 1			20.5			18.8			27.9	
Approach LOS		O			O			8			ပ	
Imac	=	6	ě	42	M	in the	1	00	Ì	Ì	ľ	Ī
sesioned Phs		2	c.	4	9	9	7	00	Ì	ŀ		
Phs Duration (G+Y+Rc), s		46.0	10.1	43.9	7.9	38.1	12.0	42.0				
Change Period (Y+Rc), s	į	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		41.5	10.5	34.5	6.5	30.5	11.5	33.5				
Max Q Clear Time (g_c+I1), s		5.6	5.9	15.0	38	13.0	9 2	6.4				
Green Ext Time (p_c), s		1.9	0.1	4.3	0.0	1.6	0.1	4.7				
Hersetton Streman	ì	Ī		İ		į	į		ì		I	ŀ
HCM 2010 Ctrl Delay			22.9									Ì
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Synchro 9 Report Page 1

n Summary	
Intersection (US-30
0 Signalized	v Road & U
1CM 2010	0: Whitney

2040 Background AM.syn 12/12/2017

	\	t	-	•		,	-	-	_		•	,
lovembal	EBI	HBH	88	WBI	WEI	MBB	BE	豐	NBR	W.	SBI	SER
ane Configurations	Je	4		K	*13		*	£3			李	
raffic Volume (veh/h)	43	158	41	4	899	4	61	65	4	2	38	174
-uture Volume (veh/h)	43	158	41	4	899	4	61	65	4	ч	38	174
Number	7	4	14	က	00	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	100		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	47	172	45	4	726	48	99	71	4	2	42	189
Adj No. of Lanes	-	2	0	-	2	0	-	-	0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	1164	297	909	1316	87	340	537	30	39	73	305
Arrive On Green	0.04	0 49	0.49	0.01	0.46	0.46	0.04	0.37	0.37	0.28	0.28	0.28
Sat Flow, veh/h	1494	2353	900	1494	2838	188	1494	1471	83	8	265	1100
Sro Volume(v), veh/h	47	107	110	4	381	393	99	0	75	236	0	0
3rp Sat Flow(s), veh/h/ln	1494	1490	1463	1494	1490	1536	1494	0	1554	1373	0	0
O Serve(g_s) s	1.6	3.9	4.1	0.1	18.4	18.5	3.1	0.0	3.2	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.6	3.9	4.1	0.1	18.4	18.5	3.1	0.0	3.2	15.0	0.0	0.0
Prop In Lane	1.00		0.41	1.00		0.12	1.00		0.05	0.05		0.80
ane Grp Cap(c), veh/h	320	737	724	909	691	712	340	0	295	418	0	0
//C Ratio(X)	0.15	0.15	0.15	0.01	0.55	0.55	0.19	000	0.13	0.57	0.00	0.00
Avail Cap(c_a), veh/h	367	737	724	980	691	712	386	0	292	418	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00	100	1.00	1.00	1.00
Jpstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	000	1.00	1.00	0.00	0.0
Jniform Delay (d), s/veh	14.5	13.8	13.8	14.2	19.3	19.3	22.8	0.0	21.2	31.5	0.0	0.0
ncr Delay (d2), s/veh	0.2	0.4	4.0	0.0	3.2	3.1	0.3	0.0	0.5	5.5	0.0	0.0
nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	1.7	1.7	0.1	œ. 1-	8.4	1,3	0.0	1.5	6.3	0.0	0.0
nGrp Delay(d),s/veh	14.7	14.2	14.2	14.2	22.5	22.4	23.1	0.0	21.7	37.0	0.0	0.0
nGrp LOS	В	B	m	m	U	ပ	O		O	٥		
Approach Vol. veh/h		264			778			141			236	
Approach Delay, s/veh		14.3			22.4			22.3		١	37.0	1
Approach LOS		8			ပ			ပ			۵	ı
mer	Ť	2	e e	÷	ù:	ug:	Jr.	60				II.
Assigned Phs	۱	2	m	4	5	æ	1	8	1	ı		ı
Phs Duration (G+Y+Rc), s		41.0	2.0	54.0	80	322	60	50.9				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		36.5	5.5	44.5	7.5	24.5	6.8	43.2				
Max Q Clear Time (g_c+11), s	ĺ	5.2	2.1	6.1	5.1	17.0	3.6	20.5				
Green Ext Time (p_c), s		2.1	0.0	7.5	0.0	171	0.0	9.9				
ofestestion Somman	ŀ	ŀ	ŀ	1	ì	ŀ					i	
4 10 0000			6 00			l						
CM 2010 PT 10 Day			7.4.4									

HCM 2010 Signalized Intersection Summary 10: Whitney Road & US-30

PM.syn	19/19/9017
Background	
2040	

Lange Configurations	Ly	1	ıŤ	~	4	ļ.	1	•	-	4	•	→	*
14 522 89 40 237 5 41 77 8 23 94 144 522 89 40 237 5 41 77 8 23 94 17	Movement	æ	FRE	FBR	EW	MBI	MER	NBI	MEE	NER	SBI	188	SBS
114 522 89 40 237 5 41 77 8 23 94 14 14 14 14 14 14 14	Lane Configurations	*	424		K	44		K	2,			Ą	
14 522 89 40 237 5 41 77 8 23 94 100	Traffic Volume (veh/h)	114	522	88	40	237	2	41	11	00	23	94	71
7 4 14 3 8 18 5 2 12 1 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Future Volume (veh/h)	114	522	88	40	237	2	41	11	80	23	94	71
100 100 100 100 100 100 100 100 100 100	Number	7	4	14	E	00	18	2	2	12	-	9	16
100 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
100 100 100 100 100 100 100 100 100 100	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1569 1569 1600 1569 1669 1669 1669 1569 1569 1600 1569 124 25 2 2 2 2 2 2 2 2	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00	1.00	1.00	1.00	1.00
124 567 97 43 258 5 45 84 9 25 102 125 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
1 2 0 1 1 2 0 1 1 2 0 0 1 1 1 1 0 0 0 1 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 1 1 0 0 0 0 1 0	Adj Flow Rate, veh/h	124	295	97	43	258	2	45	84	6	52	102	11
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adj No. of Lanes	-	2	0	-	2	0	-	-	0	0	-	0
2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
569 1134 183 344 1240 24 423 536 57 72 243 1007 045 050 034 1240 244 1240 144 254 2591 34 1240 144 1393 1393 149 125 149 1393 149 105 798 114 1393 149 105 798 114 149 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1490 1490 1490 1490 1490 1490	Percent Heavy Veh, %	2	2	2	2	2	5	2	2	2	2	2	2
007 045 045 043 003 041 041 040 038 038 039 039 1494 2546 494 2991 36 46 494 1393 149 159 788 1494 1490 1458 1494 0 1542 1494 1490 1558 1494 0 1542 1496 0 00 1494 1490 1558 1494 0 1542 1496 0 00 00 00 00 00 00 00 00 00 00 00 00	Cap, veh/h	569	1134	193	344	1240	24	423	536	27	72	243	167
1494 2546 435 1494 2991 58 1494 1393 149 105 798 124 4391 333 43 128 135 45 0 93 204 0 947 1494 1490 158 1494 0 0 132 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Arrive On Green	0.07	0.45	0.45	0.03	0.41	0.41	0.04	0.38	0.38	0.30	0.30	0.30
124 331 333 43 128 135 44 0 93 204 47 1494 1490 1492 1494 1490 1492 1494 1490 1492 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1490 1494 1494	Sat Flow, veh/h	1494	2548	435	1494	2991	28	1494	1393	149	105	798	547
1494 1460 1492 1494 1490 1558 1494 0 1542 1460 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Grp Volume(v), veh/h	124	331	333	43	128	135	45	0	93	204	0	0
Joberg(q,s), s. 47 15,8 15,9 16 5,5 5,5 2,0 0,0 3,9 10,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,	Grp Sat Flow(s),veh/h/ln	1494	1490	1492	1494	1490	1558	1494	0	1542	1450	0	0
Quentigor), s 4,7 15.8 15.9 16 5.5 5.5 2.0 0.0 3.9 11.2 0.0 Lame 1.00 0.29 1.00 1.00 1.00 1.01 0.12 0.0 p Cap(c), welf/n 6.25 0.50 0.43 0.21 0.24 1.00 0.19 0.12 0.0 tio(x), welf/n 6.22 0.50 0.50 0.43 0.21 0.21 0.0 0.10 0.10 0.12 0.0 0.12 0.0 0.12 0.0 0.12 0.0 0.10 0.10 0.12 0.0 0.12 0.0 0.10 0.10 0.10 0.10 0.10 0.10 0.	Q Serve(g_s), s	4.7	15.8	15.9	1.6	5.5	5.5	5.0	0.0	3.9	0.0	0.0	0.0
Lane 100 029 100 004 100 0110 012 012 0100 0100 0110 012 0100000000	Cycle Q Clear(g_c), s	4.7	15.8	15.9	1.6	5.5	5.5	2.0	0.0	3.9	11.2	0.0	0.0
py Cap(c), veh/h 569 663 664 334 618 646 423 0 594 482 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Prop in Lane	1.00		0.29	1.00		0.04	1.00		0.10	0.12		0.38
tion (2), you have the first series of the first series (3), which (2) and (2), which (2) and (3) and	Lane Grp Cap(c), veh/h	569	663	664	344	618	949	423	0	594	482	0	0
augencia, verhin 628 663 664 389 618 646 467 0 594 482 0 10 ladeon Ratio 100 100 100 100 100 100 100 100 100 10	V/C Ratio(X)	0.22	0.50	0.50	0.13	0.21	0.21	0.11	00.00	0.16	0.45	0.00	0.00
laboun Ratio 100 100 100 100 100 100 100 100 100 10	Avail Cap(c_a), veh/h	628	663	664	389	618	949	467	0	294	482	0	0
and Filter(1) 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.	HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Dickey (d), s/reh 146 198 198 165 187 188 211 0.0 20.1 28.1 0.0 Dickey (d), s/reh 146 198 198 165 18.7 188 211 0.0 20.1 2.0 0.0 Dickey (d), s/reh 0.2 27 2.7 2.7 0.2 0.8 0.7 0.1 0.0 0.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.0
lay (2t), siveh 0.2 27 2.7 0.2 0.8 0.7 0.1 0.0 0.6 2.7 0.0 ordinary (3t), siveh 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	14.6	19.8	19.8	16.5	18.7	18.8	21.1	0.0	20.1	28.1	0.0	0.0
Delay(d3)sveh 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Incr Delay (d2), s/veh	0.2	2.7	2.7	0.2	0.8	0.7	0.1	0.0	9.0	2.7	0.0	0.0
CockOCIG/50%), veh/m 1.9 7.0 7.1 0.7 2.4 2.5 0.8 0.0 1.8 4.9 0.0 Doslay(d), such 14.8 2.5 2.5 16.6 19.5 19.5 2.1.2 0.0 1.8 4.9 0.0 OS Doslay (d), such 7.8 8 6 1.8 7.0 7.2 0.0 20.4 0.0	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Delay(d),siveh 148 225 225 166 195 195 212 0.0 20.7 30.8 0.0 C C B B C C C C C C C N V V V V V V V V V V V V	%ile BackOfQ(50%),veh/In	1.9	7.0	7.1	0.7	2.4	2.5	0.8	0.0	1.8	4.9	0.0	0.0
Consideration of the constraint of the constrain	LnGrp Delay(d),s/veh	14.8	22.5	22.5	16.6	19.5	19.5	21.2	0.0	20.7	30.8	0.0	0.0
to Vol, vehin 788 306 138 an Delay, sveh 213 19,1 20.9 an LOS	LnGrp LOS	<u>в</u>	O	O	m	B	m	O		O	ပ		ı
ad Phs (3-4) sheh (13	Approach Vol, veh/h		788			306			138			204	
ch LOS C	Approach Delay, s/veh	١	213			19.1			50.9			30.8	
de Phs 2 3 4 5 6 7 7 and other Phs 2 3 4 5 6 7 7 1 1 2 1 3 4 5 6 7 7 1 1 2 1 3 4 5 6 7 7 1 1 2 1 3 1 4 5 6 7 7 1 1 2 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Approach LOS		O			8			ပ			O	
ad Phs 2 3 4 5 6 7 7 7 8 9 9 81 349 11.0 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Tritis		2	8	9	(8)	9	7	00	l			
ration (G+Y+Rc), s 430 8.0 49.0 8.1 34.9 11.0 Period (Y+Rc), s 45 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	Assigned Phs		2	က	4	2	9	7	00	1			ļ
Pendo (Y-Rc), s 45 45 45 45 45 45 45 45 45 65 End (Y-Rc), s 88 5 65 415 65 275 105 End Setting (Cmax), s 98 5 65 415 65 275 105 End (Q-C-H1), s 1.9 0.0 6.1 0.0 1.5 0.1 End Setting (Q-C), s 1.9 0.0 6.1 0.0 1.5 0.1 End Setting 4	Phs Duration (G+Y+Rc), s		43.0	8.0	49.0	8.1	34.9	11.0	46.0				
een Setting (Gmax), s 38.5 6.5 41.5 6.5 27.5 10.5 Clear Time (g.c.H1), s 5.9 3.6 17.9 4.0 13.2 6.7 Clear Time (g.c.H1), s 1.9 0.0 6.1 0.0 1.5 0.1 Exp Summary 22.1 CCL Delay CC	Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Clear Time (g_cH), s 59 3.6 17.9 4.0 13.2 6.7 Ext Time (p_c), s 1.9 0.0 6.1 0.0 1.5 0.1 Flood Standard TOTO Chi Delay 22.1 C C C	Max Green Setting (Gmax), s		38.5	6.5	41.5	6.5	27.5	10.5	37.5				
Ext Time (p_c), s 1.9 0.0 6.1 0.0 1.5 0.1 cto. Summary 22.1 C CHI Delay C	Max Q Clear Time (g_c+11), s		5.9	3.6	17.9	40	13.2	2.9	7.5				
	Ext Time		1.9	0.0	6.1	0.0	1.5	0.1	6.5				
	Inferspeine Summay	l	į	Ī	Ì	I	į		ŀ	į	l	ŀ	Ť
	HCM 2010 Ctrl Delay			22.1		ŀ							
	HCM 2010 LOS			ပ									

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HCM 2010 Signalized Intersection Summary 10: Whitney Road & US-30

2040 Total AM.syn 12/12/2017

A PROPERTY OF THE PARTY OF THE							-	-				
Movement	EBI	EBI	EBS	WEI	TIME	WBR	ME	NBI	NBR	8	381	Seg
Lane Configurations	<u>u</u> -	474		×	424		A.	£			Ą	
Traffic Volume (veh/h)	182	158	41	4	899	4	61	88	4	2	39	412
Future Volume (veh/h)	182	158	41	4	899	44	61	65	4	2	33	412
Number	7	4	14	က	∞	18	S	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1 00	100		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	100	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1600	1569	1600
Adj Flow Rate, veh/h	198	172	45	4	726	48	99	71	4	2	45	448
Adj No of Lanes	-	2	0		2	0		-	0	0	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	353	1164	297	549	1147	9/	131	537	30	38	45	447
Arrive On Green	0.10	0 49	0.49	0.01	0.40	0.40	0.37	0.37	0.37	0.37	0.37	0.37
Sat Flow, veh/h	1494	2353	009	1494	2838	188	903	1471	83	4	125	1224
Grp Volume(v), veh/h	198	107	110	4	381	393	99	0	75	495	0	0
Grp Sat Flow(s), veh/h/ln	1494	1490	1463	1494	1490	1536	903	0	1554	1352	0	0
Q Serve(g_s), s	7.3	3.9	4.1	0.2	20.5	20.5	0.0	0.0	3.2	10.0	0.0	0.0
Cycle Q Clear(g_c), s	7.3	3.9	4.1	0.2	20.5	20.5	36.5	0.0	3.2	36.5	0.0	0.0
Prop In Lane	1.00		0.41	1.00		0.12	1.00		0.05	0.01		0.91
Lane Grp Cap(c), veh/h	353	737	724	549	602	621	131	0	299	530	0	0
V/C Ratio(X)	0.56	0.15	0.15	0.01	0.63	0.63	0.50	0.00	0.13	0.93	0.00	0.00
Avail Cap(c_a), veh/h	442	737	724	617	602	621	131	0	295	530	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.74	0.00	0.00
Uniform Delay (d), s/veh	16.8	13.8	13.8	17.5	23.8	23.8	33.7	0.0	21.2	31.8	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.4	0.4	0.0	2.0	4.9	13.1	0.0	0.5	20.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/In	3.1	1.7	1.7	0.1	9.5	9.5	2.3	0.0	1.5	16.7	0.0	0.0
LnGrp Delay(d),s/veh	18.2	14.2	14.2	17.5	28.8	28.7	46.8	0.0	21.7	52.7	0.0	0.0
LuGrp LOS	20	n	200	n	2	ن	٥		U			
Approach Vol, veh/h		415			778			141			495	
Approach Delay, s/veh		16.1			28.7			33.4			52.7	1
Approach LOS		00			ပ		Ì	ပ			۵	
Time	**	2	e	4	iä	9	2	8		ł	Ì	
Assigned Phs		2	3	4		9	7	00			ì	
Phs Duration (G+Y+Rc), s		41.0	5.0	54.0		41.0	14.1	44.9				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax),	S	36.5	5.1	44.9		36.5	15.5	34.5				
Max Q Clear Time (g_c+11), s	S	38.5	2.2	6.1		38.5	93	22.5				
Green Ext Time (p_c), s		0.0	0.0	7.5		0.0	0.3	4.9				
Inferceton Summay			ļ	į		Ì			Ì	ij	Å	
HCM 2010 Ctrl Delay			32.7									

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 10; Whitney Road & US-30

PM.syn	4000000
2040 Total	
. 1	

Lane Configurations 15 15 15 15 15 15 15 1		89 89 89 89 114 0 1100 1600 97 97 97 97 97 97 182 182 1492 1492 167 167	40 40 40 40 40 11.00 11.00 11.00 2 2 2 2 2 2 2 3 4 3 4 4 4 4 4 6 4 6 10 10 10 10 10 10 10 10 10 10 10 10 10	237 237 8 8 8 0 0 0 258 258 258 258 258 258 128 128 178 7.5 7.5	1100 1100 1100 1000 1000 1000 1000 100	411 411 411 411 411 411 411 411 411 411	#FF 20	8 8 8 2	23 23	₩ 4 2 2	368
472 472 472 472 77 77 77 70 100 100 100 100 100 100 100		89 89 89 114 0 0 1.00 1600 97 97 97 97 97 182 0.92 0.92 0.42 0.42 1.492 1.67 1.67	40 40 40 3 3 3 40 43 43 43 43 43 43 43 43 43 43 43 43 43	237 237 237 237 238 258 258 2092 2002 2002 2002 2001 2002 2002 2003 2003	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	44 44 44 44 44 44 44 44 44 44 44 44 44	# E 20	∞ ∞ <u>€</u>	23	\$ \$ ≥	368
472 472 472 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0		89 89 89 11.00 11.00 10.00 97 97 97 97 97 97 1182 1432 1452 16.7	40 40 40 40 1.00 1.00 43 43 43 43 43 43 43 43 43 43 43 43 43	237 237 8 8 0 0 0 1569 258 2092 2 2 2 2 2 2 2 3991 128 17.5 7.5	2 2 2 2 2 2 2 2 2 2 3 8 8 8 8 8 8 8 8 8	4 + 4 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 +	F E 2 0	∞ ∞ €	2 2	\$ 5	368
472 7 7 7 7 7 100 1.00 1.00 1.00 1.00 1.00 1		89 14 100 100 100 97 97 97 97 97 182 182 1435 1435 1432 1457 116.7	40 1.00 1.00 1.00 43 43 43 43 43 43 43 43 43 43	237 8 8 8 8 0 0 11.00 11.69 2 2.258 2.291 128 1490 7.5	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	11.00 11.00 1569 45 45 22	77 2 0	8 27	23	70	000
7 100 100 100 100 100 100 100 100 100 10		14 0 0 11.00 11.00 0.92 0.92 0.92 0.92 435 1492 116.7	11.00 11.00	8 0 0 11.00 1569 258 20.92 2991 128 1490 7.5 7.5	11.00 11.00 19.00	200 11.00 11.00 12.00 24 25 25 25 25 25 25 25 25 25 25 25 25 25	0 0	12	7	10	368
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00		0 0 0 11.00	0 0 1.00 1.00 1.00 1.00 1.00 1.00 1.00	0 11.00 1569 258 258 2 20.92 2 2991 1490 7.5 7.5	1.00 1.00 1.00 5 6 6 6 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8	0.1.00 1.00 1.00 1.00 4.5 2.2 2.2	0		-	9	16
100 1669 1669 1673 1673 1673 1674 1774 1775 1775 1775 1775 1775 1775 17		1.00 1.00 97 97 0.092 2 2 2 2 4.435 1492 1492 147 16.7	1.00 1.00 1.569 43 43 43 43 1494 43 1494 1494 1494	1.00 1569 258 2092 2991 128 1490 7.5	000 1 100 100 100 100 100 100 100 100 1	1.00 1.00 1.00 2.2 2.2 2.2 2.2 2.2 3.2 3.2 3.2 3.2 3.2		0	0	0	0
100 130 130 130 100 100 100 100 100 100		1.00 97 97 0.92 2.2 2.2 2.43 4.45 4.35 4.35 1.6.7 1.6.7	1.00 1569 43 43 43 1009 1494 1494 1494 1494 1494 1494 1494	1.00 1569 258 2 2 2 2 2 595 0.20 0.20 0.20 1.28 1.490 7.5 7.5	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	1569 25 - 25 2 2 5		1.00	1.00		1.00
1569 0.92 2.2 2.2 2.2 1494 1494 1494 1494 1494 1494 1494 149		97 97 0 0 92 2 2 2 2 435 435 435 435 16.7 16.7	1569 43 43 6002 1494 43 43 43 43 23 23 23	1569 258 2 2 2 2 2 299 1020 128 1490 7.5 7.5	0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.20	1569 45 20 20 20 20 20 20 20 20 20 20 20 20 20	1.00	1.00	1.00	1.00	1.00
513 0.92 0.25 0.25 0.25 1494 1494 1494 1494 1494 1494 1494 149		97 0 0 0 2 2 2 2 435 435 435 435 1492 116.7 0.29	43 43 43 43 43 43 43 43 43 43 43 43 43 4	2 0.92 2.95 0.20 0.20 2.2991 128 7.5 7.5	20 27 2 2 2 2 2 3	0.92	1569	1600	1600	1569	1600
25.5 26.0 27.0 28.0 25.5 25.5 25.5 25.5 25.5 25.5 25.5 25		0.092 2.2 2.2 0.042 435 435 1492 116.7 0.29	0.03 2 2 2 2 2 2 2 2 2 2 3 4 3 4 3 4 3 4 3 2 2 3 2 2 3 2 2 3 4 3 4	2 2 2 0.20 0.20 2291 128 1490 7.5	082288	0.92	25	o	52	102	400
0.05 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1494 1396 100 100 100 100 100 100 100 10		0.92 2 182 182 435 435 1492 1492 16.7 0.29	0.92 2.7 2.7 2.7 1494 43 43 43 43 2.3 2.3 2.3	2 2 295 0.20 128 1128 7.5 7.5	22 2 2 2 3	092	-	0	0	+	0
590 0025 0025 0025 1494 1494 1494 1505 100 100 100 100 130 130 130 130 130 130		182 0,42 435 435 333 1492 1492 16.7 16.7	277 0003 1494 1494 2.3 2.3 1,00	295 0.20 0.20 2991 128 1490 7.5	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 5	0.92	0.92	0.92	0.92	0.92
590 1494 1494 1494 1494 155 255 255 255 100 100 100 100 130 130 130 130 130 130	968 9.42 9.42 331 490 16.6	182 0,42 435 333 1492 1492 16.7 16.7 0.29	277 0.03 1494 43 2.3 2.3 1.00	595 0.20 2291 128 1490 7.5 7.5	020	*0*	2	2	2	2	2
1494 1494 1494 1494 1494 1494 1494 1494	548 331 490 16.6	0,42 435 333 1492 16.7 16.7 0.29	0003 1494 1494 2.3 2.3 1694	0.20 2991 128 1490 7.5 7.5	020	194	573	9	20	86	345
494 5 513 1494 2 55 5 25.5 25.5 25.5 25.5 25.5 25.5 2	331 490 16.6 16.6	435 333 1492 16.7 16.7 0.29	1494 1494 2.3 2.3	128 1490 7.5 7.5	00	0.04	0.41	0.41	0.33	0.33	0.33
513 1484 1484 25.5 25.5 25.5 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1	331 490 16.6 16.6	333 1492 16.7 16.7 0.29	43 2.3 2.3 2.3	128 1490 7.5 7.5	200	1494	1393	149	36	296	1045
1494 1 25.5 25.5 25.5 25.5 1.00 1.00 1.00 1.00 1.30 1.30 1.30 1.30	490 16.6 16.6	1492 16.7 16.7 0.29	2.3	1490 7.5 7.5	135	45	0	93	527	0	0
25.5 25.5 1.00 1.00 0.87 5.90 0.87 1.00 1.00 1.30 0.0	16.6	16.7 16.7 0.29	2.3	7.5	1558	1494	0	1542	1377	0	0
g.c), s 25.5 (100 (c), veh/h 590 (a) veh/h 590 (a) veh/h 590 (a) veh/h 100 (d) s/veh 13.2 (d) s/veh 13.2 (d) s/veh 13.2 (d) s/veh 13.2 (d) s/veh 13.2	16.6	16.7	2.3	7.5	9.7	1.9	0.0	3.8	18.4	0.0	0.0
1.00 690 690 690 690 7087 7087 7087 7087 7087 7087 7087 70		0.29	6		9.7	1.9	0.0	3.8	33.0	0.0	0.0
h 590 0.87 590 1.00 1.00 eh 22.6 eh 0.0 ehh 3.5			3		0.04	1.00		0.10	0.05		0.76
0.87 590 1.00 1.00 eh 22.6 eh 0.0 ehlm 13.0	625	625	277	297	310	194	0	634	492	0	0
590 1.00 1.00 eh 22.6 13.2 eh 0.0 ehlm 3.5	0.53	0.53	0.16	0.43	0.43	0.23	0.00	0.15	1.07	0.00	00.00
1.00 1.00 eh 22.6 eh 0.0 eh/in 13.2	625	625	316	297	310	217	0	634	492	0	0
1.00 An 22.6 An 13.2 Neth 0.0 Vehill 13.0	00.1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13.2 13.2 Mn 13.0	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.74	0.00	0.00
13.2 VM 13.0	21.7	21.7	30.2	35.1	35.1	19.4	0.0	18.5	34.7	0.0	0.0
Mn 13.0	3.2	3.2	0.3	4.5	4.4	9.0	0.0	0.5	55.2	0.0	0.0
13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35.9	7.4	7.4	6.0	3.5	3.6	8.0	0.0	1.7	21.1	0.0	0.0
0.00	24.9	24.9	30.5	39.7	39.5	20.0	0.0	18.9	89.9	0.0	0.0
	ပ	ပ	O	٥	O	O		B	ш		
ol, veh/h	1177	l		306			138			527	
Approach Delay, s/veh 29	29.7			38.3			19.3			89.9	
Approach LOS	O			٥			8			LL.	i
1000	51	3	*	413	٠	4	80				
Assigned Phs	2	9	4	2	9	7	00				
G+Y+Rcl. s	45.6	8.0	46.4	8 1	37.5	30.0	24.4				
	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
	41.1	6.1	39.3	5.1	31.5	25.5	19.9				
	5.8	4.3	18.7	3.9	35.0	27.5	9.6				
	5.0	0.0	5.8	0.0	0.0	0.0	4.1				
Interaction Survivan	ľ	i	i				Ī				
HCM 2010 Ctrl Delay		45.0									
HCM 2010 LOS		۵									

Synchro 9 Report Page 1

HCM 2010 TWSC 11: Ridge Road & St

	Storey Boulevard
000	Road & Storey
2007	1: Ridge

2017 Existing AM.syn 12/12/2017

Custosett	EBI	EBI	ER	WB	WBI	W89		MB	MBS	NBS	Se	S	
ane Configurations	<i>je</i> -	-	W.		+	N.		K	4ª			±,	.4
raffic Vol, veh/h	K	165	96		8 222			202	29	6		1 85	5 41
-uture Vol, veh/h	ιΩ	165	96		8 222			202	29	6		1 85	5 4
Conflicting Peds, #/hr	0	0	0		0 0	0		0	0	0	_	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop		Free	Free	Free	Free	e Free	e Free
RT Channelized			None			None		,		None			- None
Storage Length	125	,	100	125		100		200	*		75	25	
Veh in Median Storade, #	٠	0						3.	0			Ī	0
Grade. %	٠	0			0	. 1		,	0				0
Peak Hour Factor	69	6/	77	5		П		22	80	99	25	O.	2
Jean Vehicles %	3 0		2	,				0	3 0	3 6		,	2
Avmt Flow	1 00	209	125	16	2	4		269	2	19		O,	2 2
ajach Minar	Minorz			Minor			7	Sapri			Theory	EV	
Conflicting Flow All	891	992	120	86		92		149	0	0	100	٥	0
Stage 1	128	128		63	0 630	į			1	\$5			
Stage 2	763	638		233		•		-	-	ě			
Critical Hdwy	7.12	6.52	6.22	7.1		6.22		4.12	4	æ	4.12	2	
Critical Hdwy Stg 1	6.12	5.52	•	6.1	2 5.52	1		•	*	SI.			
Critical Hdwy Stg 2	6.12	5.52		6.12		i		-	14				14
-ollow-up Hdwy	3.518	4.018	3.318	3.51	4	3.318		2.218	(4)	*	2.218	89	
Pot Cap-1 Maneuver	263	333	931	275		965		1432	A	*	1493	3	
Stage 1	876	790	i.	470		,		1	Ü,	85		1	
Stage 2	397	471		770	992 0	,		ŀ	8	•			
Platoon blocked, %										è			
Nov Cap-1 Maneuver	i	270	931	7	76 ~ 262	965		1432	1	TK.	1493	3	
Aov Cap-2 Maneuver	•	270		7	1	•		3		4			,
Stage 1	711	788	•	382		•		8	X	Ci.			
Stage 2	104	383	1	489	992 6	1		•	ï	(4)	I		4
necesti			ľ	100	100		N	贸			88	60	1
HCM Control Delay s		1		96	4		ľ	5.9			0.2	2	
HCM LOS				L	ш								
											i		
insertamentagor himmi	MBX		Mark ES	In ESUNZE	VE EST	WELL ST	10.7	8.03	ď	35	Š	Ĭ	1
apacity (veh/h)	1432	i	-	- 270	0 931	76			1493				ì
HCM Lane V/C Ratio	0.188	•		0.774	O	0.211			0.003	•	9		
HCM Control Delay (s)	8.1		1	- 52.5	5	64	2 66	8.7	7.4	jė			
HCM Lane LOS	×	*	iii.	4			u.	V	4	16			
+CM 95th %tile Q(veh)	0.7	(6)		5.8	8 0.5	0.7	10.1	0	0	(8)	ě		

HCM 2010 TWSC 11: Ridge Road & Storey Boulevard

Inverser	ESI	B	188	i	ď	WBI	MER		MEE	NBI	MER	SBL	SBT	88
ane Configurations	HC.	4	比		de-	4	N.		K	Æ.		Jan.	+	
raffic Vol. veh/h	21	255	143		53	159	4		145	159	10	=	117	2
-uture Vol. veh/h	21	255	143		53	159	4		145	159	10	11	117	2
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	Ī
Sign Control	Stop	Stop	Stop	-,	Stop	Stop	Stop		Free	Free	Free	Free	Free	Free
RT Channelized	7	1	None		•	•	None		i	•	None			None
Storage Length	125	•	100		125		100		200	٠		75		
eh in Median Storage, #		0	•		161	0	3		•	0	٠		0	
Srade, %	r	0	î			0	×		,	0			0	
Peak Hour Factor	75	92	73		33	25	72		25	72	62	55	79	99
tean Vehicles, %	6	6	2		2	2	2		2	2	2	2	2	
Nmt Flow	28	277	196		88	196	9		227	221	16	20	148	32
														1
Sign finor	Minor2			100	late		-		Sajor S	ľ		Majorz	L	P
Conflicting Flow All	984	894	164		1025	902	229		180	0	0	237	0	
Stage 1	204	204	78		682	682			· ·	1	ě	ì	3	
Stage 2	780	069			343	220	٠			*	4	90.	*	
Critical Holwy	7.12	6.52	6 22		7 12	6.52	6.22		4.12	*	2	4 12		
Critical Hdwy Stg 1	6.12	5.52			6.12	5.52	٠		33	*			*	
Critical Holwy Stg 2	6.12	5.52	-		6.12	5,52			1	8	-		V	
-ollow-up Hdwy	3.518	4.018	3,318	E)		4.018	3.318		2.218	6	74	2.218	70	
ot Cap-1 Maneuver	228	280	881		213	277	810		1396	9	94	1330	11	
Stage 1	798	733			440	450	٠		3.5		¥	*		
Stage 2	388	446	200		672	721			1	1.0	ı	4	×	
Platoon blocked, %										0	2		*	
Aov Cap-1 Maneuver	25	55 ~ 231	881		45	228	810		1396	8	-	1330	16	
Nov Cap-2 Maneuver	22	- 1	•		8	228			*/.	*		•	***	
Stage 1	999	722			368	377	٠		-	6	2		-	
Stage 2	155	373			317	710	•		·	•	4			
		1												
pproach	88			-	WB	ł		Ħ	88	ì	l	88	H	h
HCM Control Delay, s	103.8					M	h		3.9			0.8		
HCM LOS	ш				16		ı				۱			
inor Lane Major Minut	NB.	100	MBR	Brotte	Lozen	Bing	Broth	Bin78	Bing	100	155	SBR		
apacity (veh/h)	1396	*	0.	55	231	881	*	228	810	1330		100	ř	
ICM Lane V/C Ratio	0 162	*/.	*	- 0.509		0.222	•	0.861	0.007	0.015				
+CM Control Delay (s)	8 1	i		- 1249 1	1677	10.3	•	73.7	9.5	17	i i			
HCM Lane LOS	×	(7)		ш	ш	80	30	L	4	V	a	T.		
4CM 95th %tile Q(veh)	9.0	•	10	5	13.5	0.8		8.9	0	0	14	4		

Synchro 9 Report Page 1

HCM 2010 TWSC 11: Ridge Road & Str

2017 Existing PM.syn

2040 Background AM.syn

Soulevard
& Storey E
Road 8
Ridge

Comparison														
7 200 128	Swement	Ħ	183	183	WBC	184	WBR	2	No.	1	28	ies.	Ser	H
7 220 128 11 235 4 269 89 12 1 113 7 220 128 11 295 4 269 89 12 1 113 0 0 0 0 0 0 0 0 0 0 0 0 0 Stop Stop Stop Stop Stop Free Free Free Free Free Free Free Fre	ane Configurations	K	*	W.	k	*	N.		*	2.		J.C.	Ť,	
7 220 128	raffic Vol, veh/h	7	220	128	11	295	4	2			12		113	55
Stop Stop Stop Stop Free	uture Vol, veh/h	7	220	128	11	295	4	2			12	-	113	55
Slop Slop Slop Slop Slop Free	conflicting Peds, #/hr	0	0	0	0	0	0		0	0	0	0	0	0
125	ign Control	Stop	Stop	Stop	Stop	Stop	Stop	Œ			ee	Free		Free
125 100 125 100 200 125 100 125 100 125 100 125 100 125 100 125 100 125 100 125 100 125	T Channelized			None	٠	•	None		1	2	ne			None
Color	torage Length	125	14	100	125	1	100	ď			,	75	•	
10	eh in Median Storage, #		0		,	0			,	0	ī	ĺ	0	ľ
Major Majo	irade, %	•	0		1	0			ì	0		,	0	ľ
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	eak Hour Factor	92	92	92	92	92	92			92	92	92	92	92
Nince S 239 139 12 321 4 292 97 13 1 123	eavy Vehicles, %	7	7	7	2	8	7			2	2	2	2	7
Major Minor Majo	vmt Flow	00	239	139	12	321	4	2		97	13	-	123	90
1003 850 153 962 873 103 183 0 0 110 155 155 688 688 -	was fresh	Times		9	Linear	ĺ	ì	i	7		ŀ	Control of		
155 156	onfliction Flow All	1003	RED	153	062	873	103	Total I	33	c	c	110	-	6
848 695 - 274 185 - 412 412 412 7.12 6.52 6.12 5.52 6.12 5.52 6.12 5.52 6.12 5.52 - 6.12 5.52 - 6.12 5.52 3.518 4.018 3.318 3.518 4.018 3.318 2.218 2.218 2.21 2.98 893 2.25 - 289 952 1392 1480 8.47 769 - 732 747 228 952 1392 - 1480 235 893 228 952 1392 - 1480 235 893 228 952 1392 - 1480 235 893 228 952 1480 235 893 - 228 952 1480 235 893 - 228 952 1480 3 5 893 - 228 952 1480 3 5 893 - 247.7 88 7.4 0 0.21 - 1.018 0.156 - 1.406 0.005 0.001 A A F A A B A F A A 57 0.6 - 182 0 0 0	Stane 1	155	155	2 '	889	688	2		3		9			
7.12 6.52 6.22 7.12 6.52 6.22 412 - 412 - 412 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.52 6.12 6.22 6.12 6.22 6.12 6.22 6.12 6.22 6.12 6.22 6.12 6.22 6.12 6.1	Stane 2	848	695		274	185	,		4	1				
6.12 5.52	ritical Howy	7.12	6.52	6.22	7.12	6.52	6.22	4	12			4.12		I
6.12 5.52 - 6.12 5.52	ritical Howy Stg 1	6.12	5.52		6.12	5.52								i
3518 4018 3318 3518 4018 3318 2218 . 2218 2218 2218 2218 2218 2217 298 893 255 289 952 1392 . 1480 847 766 . 435 447	ritical Howy Stg 2	6.12	5.52		6.12	5.52				18	()	1		
221 298 893 235 – 289 952 1392 - 39 847 769 - 436 447 - 732 747235 893228 952 1392235 699 768 - 345 353228 952 1392228 669 768 - 345 746228 768228 768228 768228 768228 768228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746228 746 74	ollow-up Hdwy	3.518	4.018	3,318	3.518		3,318	2.2	18	ā	39	2.218		
Sec	ot Cap-1 Maneuver	221	298	893	235	~ 289	952	13	35	126		1480	1	
356 444 - 732 747 235 893 228 952 1392 228 669 768 - 345 353 228 669 768 - 345 353 228 746 235 26 351 - 425 746 235 25 351 - 425 746 6 235 25 25 25 25 25 25 2 25 2 25 2 25	Stage 1	847	692	ı	436				11			2.2	**	
- 235 893 228 952 1392 236 768 768 768 768 746 228 746 746 237 748 746 748 748 748 748 748 748 748 748 748 748	Stage 2	356	#	,	732	747			¥	¥	36	1.	1/4	Î
- 235 893 228 952 1392 235 768 228 952 1392 228 669 768 228 768 228 768 228 768 228 768 26 351 225 893 952 1480	atoon blocked, %									×	٠		1	
- 235 228 228 - 28 - 28	lov Cap-1 Maneuver	1	- 235	893		- 228	952	13	35	8	r	1480	*	Ì
FEB 78 - 345 353	ov Cap-2 Maneuver	1	- 235							4.	*))	*	•	
26 351 - 425 746	Stage 1	699	292		345		•		i	D.		*		i
## NE NER EBLATEBLAZMBLAWBHZZMBLAS SBL SBT SBR 1392 - 235 893 - 228 952 1480 - 1.018 0.156 - 1.406 0.005 0.001	Stage 2	58	321		425	746	1				ą.	. 0	•	
1392 - 235 893 - 228 952 1480 - 1,018 0,156 - 1,406 0,005 0,001 - 1,018 0,156 - 1,406 0,005 0,001 - 1,018 1,156 - 1,406 0,005 0,001 - 1,018 1,156 - 1,406 0,005 0,001 - 1,018 1,156 - 1,406 0,005 0,001 - 1,018 1,156 - 1,406 0,005 0,001 - 1,018 1,156 - 1,156 - 1,156 - 1,157 0,00 -	percects	8			WB	١	Ì	Ī	99		ľ	88		
NR NB NEREBINEBINZMB.nWBirz/NBln3 SB SB SB 1392 235 893 228 952 1480 0.21 0.21 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.101 0.15 0.	CM Control Delay, s								9		l	0		
1392 - 235 839 - 289 852 1480 0.21 1,018 0.156 - 1406 0.005 0.001 8.3 108.1 9.8 - 247.7 8.8 7.4 A A B A B A B A B A B A B A B A B A B	CM LOS	*			(*)									
NH. NB. NH. EUIN FOR THE PROPERTY NH. NB. 188 188 1392 - 235 893 - 228 952 1480 0211018 0.156 - 1405 0.005 0.001 8.3108.1 9.8 -247.7 8.8 7.4 A - F A - F A A B A O.8								ě		и				
1392 - 235 893 - 228 952 1480 021 - 1018 0.156 - 1406 0.005 0.001 8.3 - 106.1 9.8 - 247.7 8.8 7.4 A A B B B B B B B B B B B B B B B B B	mor Lane Major Myrut	i i	NS!			H		н	-010					
0.21 1.018 0.150 - 1.406 0.005 0.001 8.3 1.06.1 9.8 - 2.47.7 8.8 7.4 A A A A A A A A A A A A A A A A A A A	apacity (veh/h)	1392	1	P	- 235	893				80				
0.3 - 100.1 9.0 - 241.7 0.0 1.4 A A A A A A A A A A A A A A A A A A A	CM Lane V/C Ratio	0.21		1 10	4004				5	5 5	•			
0.8 9.7 0.6 - 18.2 0 0	CM Lane LOS	0.0	13	133	100					7 , <	ic 9	. 30		ì
	ICM 95th %tile Q(veh)	0.8	14	1/4	6	9.0		18.2	0	0	134	i i		
	The second secon													

HCM 2010 TWSC 11: Ridge Road & Storey Boulevard

156 156 0 Free 4.12 15 0 5 Fee 1321 9.0 75 2,218 Volume exceeds capacity S: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon 212 13 212 13 0 0 ree Free 22 41 236 801 1321 - 0.976 0.007 0.012 97 9.5 7.8 F A A A 9 0 0 193 193 Free 200 1372 890 238 657 - 233 - 552 6.22 5.52 - 5.52 - 5.52 - 5.52 - 4.018 3.318 282 801 462 - 712 - 712 236 801 236 -391 -212 5 212 5 0 0 0 0 top Stop - None . . 22 25 20 238 857 - 1.522 1.548 0.241 \$ 672.6 \$ 304 10.5 - F F B - 4.1 22.5 0.9 92 230 402 402 7.12 6.12 6.12 3.518 454 625 125 385 989 881 185 217 217 - -712 652 622 612 552 -612 552 -612 552 -612 552 -7358 4018 3318 2518 4018 3318 3518 4018 3318 3518 4018 3318 -20 -238 857 -20 -238 -665 714 -135 388 -339 339 0 Stop 1372 0.153 8.1 A 0.5 222.4 F 28 28 Stop 125 87.8 Lane Configurations
Traffic Voi, velbh
Future Voi, velbh
Confideding Peds, #hr
Sign Control
Sign Control
Sign Str. Obannelized
Storage Length
Veh in Medan Storage, #
Grade, %
Peak Hour Factor
Heavy Vehicles, %
Mvmt Flow HCM Lane V/C Ratio HCM Control Delay (s) HCM Lane LOS HCM 95th %tile Q(veh) Critical Hdwy
Critical Hdwy Sig 1
Critical Hdwy Sig 2
Follow-up Hdwy
Rot Cap-1 Maneuver
Stage 1
Stage 2
Platoon blocked, 2
Platoon blocked, 2
Mov Cap-1 Maneuver
Mov Cap-2 Maneuver HCM Control Delay, s HCM LOS Conflicting Flow All int Delay, s/veh Stage 1 Stage 2 Stage 1 Stage 2

Synchro 9 Report Page 1

HCM 2010 Signalized Intersection Summary 11: Ridge Road & Storey Boulevard

2040 Background PM.syn 12/12/2017

2040 Total AM.syn 12/12/2017

WBL WBL <th></th> <th>1</th> <th>†</th> <th><i>></i></th> <th>6</th> <th>Ļ</th> <th>1</th> <th>•</th> <th>_</th> <th>L</th> <th>۶</th> <th>+</th> <th>•</th>		1	†	<i>></i>	6	Ļ	1	•	_	L	۶	+	•
The color of the	Movement	183	EBT	ERR	TBM	WEL	MBB	NBI	NB1	MBR	SBI	SBI	SBR
7 339 128 11 483 4 269 89 12 1 113 7 330 128 11 483 4 269 89 12 1 113 7 4 4 14 8 3 4 269 89 12 1 113 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ane Configurations	je.	4	r	ie	*	×	*	42		K.	ę±	
7 330 128 11 483 4 269 89 12 1 113 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Fraffic Volume (veh/h)	7	330	128	1	483	4	569	68	12	-	113	55
7 4 14 3 8 18 5 2 12 1 6 1 6 1 100 1	-uture Volume (veh/h)	7	330	128	11	483	4	569	88	12	-	113	55
100	Number	7	4	14	9	00	18	2	2	12	-	9	16
100	nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1 00	1.00		1.00
1589 1589	Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8 359 139 12 525 4 292 97 13 1 123 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1569	1569	1569	1600	1569	1569	1600
19	Adj Flow Rate, veh/h	00	359	139	12	525	4	292	62	13	-	123	99
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	Adi No of Lanes	-	-	-	-	-	-	-	-	0	-	-	0
19	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
196 631 536 321 631 536 667 81 638 446 0.40 0.40 0.47 0.27 0.27 0.45 0.45 0.45 0.45 8 359 133 12 525 4 292 0 110 1 0 8 359 133 12 525 4 292 0 110 1 0 9 194 106 4.2 113 189 0.1 122 0.0 2.6 0.0 194 106 4.2 113 189 0.1 152 0.0 2.6 0.0 100 100 100 100 100 100 100 0.15 0.0 100 0.04 0.57 0.55 0.04 0.05 0.0	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
## 1859 1333 896 1859 1333 1196 1353 1859 1379 44 8 94 9 94 94 9 94 9 94 9 94 9 94 9	Cap, veh/h	196	631	536	321	631	536	563	209	81	638	446	218
Hein 87 1569 1333 896 1569 1333 1196 1355 182 1278 997 4 Hein 8 359 139 12 525 4 222 0 110 Hein 97 1569 139 12 525 4 222 0 110 Hein 97 166 42 07 189 0.1 122 0.0 2.6 0.0 0.0 Hein 196 631 506 0.1 169 0.1 122 0.0 2.6 0.0 Hein 196 631 506 0.1 169 0.1 122 0.0 0.0 Hein 196 631 506 0.1 169 0.1 169 0.0 0.0 Hein 200 100 100 100 100 100 100 100 100 100	Arrive On Green	0.40	0.40	0.40	0.27	0.27	0.27	0.45	0.45	0.45	0.45	0.45	0.45
8 359 139 12 525 4 222 0 110 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1 1 1 0 1	Sat Flow, veh/h	871	1569	1333	968	1569	1333	1196	1355	182	1278	285	486
877 1569 1333 896 1569 1333 1196 0 1537 1278 0 140 150 150 150 150 150 150 150 150 150 15	Sro Volume(v), veh/h	80	358	139	12	525	4	292	0	110		0	183
184 106 4.2 0.7 183 0.1 1122 0.0 2.6 0.0 0.0 184 106 4.2 11.3 189 0.1 189 0.0 2.6 0.0 0.0 186 6.31 5.36 2.21 6.31 5.36 5.53 0 0.88 6.38 0.0 186 6.31 5.36 2.21 6.31 5.36 5.53 0 0.88 6.38 0.0 1.00 1.00 1.00 0.79 0.79 0.77 0.00 0.10 0.0 1.00 1.00 1.00 0.79 0.79 0.77 0.00 0.00 0.0 1.00 1.00 0.07 0.79 0.79 0.77 0.00 0.0 1.00 1.00 0.07 0.79 0.79 0.77 0.00 0.0 1.00 1.00 0.07 0.07 0.07 0.0 0.0 1.00 0.00 0.00 0.0 0.0 0.0 0.0 1.00 0.00 0.00 0.0 0.0 0.0 1.00 0.00 0.00 0.0 0.0 0.0 1.00 0.00 0.00 0.0 0.0 0.0 1.00 0.00 0.00 0.0 0.0 1.00 0.00 0.00 0.0 0.0 1.00 0.00 0.00 0.0 0.0 1.00 0.00 0.00 0.0 0.0 1.00 0.00 0.00 0.0 0.0 1.00 0.00 0.00 0.00 0.0 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 1.00 0.00 0.00 0.0	Gro Sat Flow(s), vehib/lin	871	1569	1333	896	1569	1333	1196	0	1537	1278	0	1483
194 106 42 113 189 0.1 169 0.0 26 26 0.0 150 150 150 150 150 150 150 150 150 15	2 Serve(q_s), s	9'0	10.6	42	0.7	18.9	0.1	12.2	0.0	2.6	0.0	0.0	4.7
1400 100 100 100 100 100 012 100 012 100 010 100 10	Cycle Q Clear(g_c), s	19.4	10.6	4.2	13	18.9	0.1	16.9	0.0	2.6	2.6	0.0	4.7
196 631 536 321 631 536 563 0 688 638 0 604 057 026 004 052 000 016 000 016 000 016 000 016 010 010	Prop in Lane	1.00		1.00	100		1 00	1.00		0.12	1 90		0.33
0.04 0.57 0.26 0.04 0.83 0.01 0.52 0.00 0.16 0.00 0.00 0.01 0.02 0.04 0.03 0.01 0.22 0.00 0.16 0.00 0.00 0.02 0.00 1.00 1.00 1.00 1.00	ane Gro Cap(c), vehilh	196	631	536	321	631	536	563	0	688	838	0	88
230 693 589 357 693 589 563 0 688 638 0 680 630 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	//C Ratio(X)	0.04	0.57	0.26	0.04	0.83	0.01	0.52	00.0	0.16	000	00.0	0.28
180 100 100 067 067 100 100 100 100 100 100 100 100 100 10	4vail Cap(c_a), veh/h	230	693	589	357	693	586	563	0	989	638	0	664
1400 100 100 079 079 047 040 047 100 000 1 252 139 120 218 200 132 167 0.0 9.9 106 00 1 00 00 00 00 00 00 00 00 00 00 00 00 01 09 00 00 00 00 00 00 00 00 00 01 47 15 02 93 00 42 0.0 11 00 00 02 148 12 218 264 13 144 00 11 106 00 1 03 148 2 28 262 18 4 5 6 7 8 04 4.5 4.5 4.5 4.5 265 189 214 67 209	HCM Platoon Ratio	1.00	1.00	1.00	0.67	29'0	0.67	1.00	1.00	1 00	1.00	1.00	1.00
252 139 120 218 200 132 157 00 99 106 00 101 09 03 00 64 00 16 00 02 00 00 00 11 47 15 02 93 00 42 00 00 00 00 00 00 14 7 15 02 93 00 42 00 11 00 00 253 148 122 218 264 132 174 00 101 106 00 10 253 148 122 218 264 132 174 00 101 106 00 10 143 265 262 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Upstream Filter(I)	3.8	1.00	1.00	0.79	0.79	0.79	0.47	0.00	0.47	1.00	0.00	8.
0.1 0.9 0.3 0.0 6.4 0.0 16 0.0 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), siveh	25.2	13.9	120	21.8	20.0	13.2	15.7	0.0	66	10.6	0.0	104
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ncr Delay (d2), s/veh	0.1	60	0.3	0.0	6.4	0.0	1.6	0.0	0.2	0.0	0.0	-
0.1 4.7 1.5 0.2 9.3 0.0 4.2 0.0 1.1 0.0 0.0 0.0 0.5 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Initial Q Delay(d3), siveh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	00	0.0	00
25.3 14.8 12.2 21.8 26.4 13.2 17.4 0.0 10.1 10.6 C B B B B B B B B B B B B B B B B B B	%ile BackOfQ(50%),vehilin	0.1	4.7	1.5	0.2	9,3	0.0	4.2	0.0	=	0.0	0.0	2
C B B C C B B B B B 506 541 402 403	LnGrp Delay(d) s/veh	25.3	14.8	122	21.8	26.4	13.2	17.4	0.0	10.1	10.6	0.0	1
506 541 402 14.3 26.2 15.4 18.9 2.7 2.7 2.9 14.3 26.5 11.4 28.6 15.4 5.6 7.8 18.9 21.4 6.7 20.9 18.5 2.7 2.9	LnGrp LOS	O	8	B	O	O	œ	œ		89	œ		
14.3 26.2 15.4 B C B C B 3.4 6 6 7 8 3.14 28.6 31.4 28.6 4.5 4.5 4.5 4.5 4.5 26.5 24.5 26.5 18.9 21.4 6.7 20.9 1.5 2.7 2.9	Approach Vol, veh/h		206			541			402			184	
2 3 4 5 6 7 8 2 4 6 7 8 314 286 314 286 4.5 4.5 4.5 4.5 4.5 189 214 67 209 1.5 27 2.9	Approach Delay, s/veh		14.3			26.2			15.4			11,5	
2 3 4 5 6 7 2 4 6 7 314 286 314 4.5 4.5 4.5 24.5 26.5 24.5 18.9 214 6.7 1.5 2.7 2.7	Approach LOS		8			O			В			80	
2 4 6 314 286 314 4.5 4.5 4.5 4.5 24.5 26.5 24.5 18.9 21.4 6.7 1.5 2.7 2.7	Imper	-	7	**	×	4	i i	į		j		ě	
314 286 314 4.5 45 45 245 26.5 24.5 1.9 214 6.7 1.5 2.7 2.7	Assigned Phs	ŀ	2		4	l	9		00			ì	ĝ
4.5 4.5 4.5 24.5 24.5 24.5 18.9 21.4 6.7 1.5 2.7 2.7 1.8	Phs Duration (G+Y+Rc), s		31.4		28.6		31.4		28.6				
245 265 245 189 214 67 1.5 27 27 182	Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
189 214 6.7 1.5 27 2.7 182	Max Green Setting (Gmax), s		24.5		26.5		24.5		26.5				
1.5 2.7 2.7	Max Q Clear Time (g_c+11), s	Į	189		21.4		2.9		50.9				
	Green Ext Time (p_c), s		1.5		2.7		2.7		2.9				
	Intersection Summary		B				Ä		P		Ĺ	i	P
	HCM 2010 Ctrl Delay			18.2									

HCM 2010 Signalized Intersection Summary 11: Ridge Road & Storey Boulevard

	1	t	/	•		,	-	-	_	٠	•
Movement		H	250	WEL	WEI	WER	MBI	NET	MBR	SBI	88
Lane Configurations	×	4	X .	K	4	¥.	r	43		¥.	ľ
Traffic Volume (veh/h)	28	621	190	36	446	5	193	212	13	15	156
Future Volume (veh/h)	28	621	190	39	446	5	193	212	13	15	156
Number	7	4	14	က	00	18	2	2	12	-	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1569	1569	1569	1569	1569	1569	1600	1569	156
Adj Flow Rate, veh/h	30	675	207	45	485	S	210	230	14	16	17
Adj No of Lanes	-	+	-	-	-	-	-	Ŧ	0	-	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.9
Percent Heavy Veh, %	2	2	7	7	2	2	2	2	2	2	
Cap, veh/h	348	799	629	207	799	629	404	499	30	366	4
Arrive On Green	0.51	0.51	0.51	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.3
Sat Flow, veh/h	903	1569	1333	627	1569	1333	1178	1464	88	1131	1299
Grp Volume(v), weh/h	30	675	207	42	485	2	210	0	244	16	Ĩ
Grp Sat Flow(s), veh/h/ln	903	1569	1333	627	1569	1333	1178	0	1553	1131	
Q Serve(g_s), s	1.5	222	5.4	3.8	15.4	0.1	6.6	0.0	7.4	0.7	0.0
Cycle Q Clear(g_c), s	17.0	22.2	5.4	26.1	15.4	0.1	15.8	0.0	7.4	8.0	0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		90.0	1.00	
Lane Grp Cap(c), veh/h	348	799	629	202	799	629	404	0	529	366	
V/C Ratio(X)	0.09	0.84	0.30	0.20	0.61	0.01	0.52	0.00	0.46	0.0	0.00
Avail Cap(c_a), veh/h	362	824	200	217	824	200	404	0	529	366	
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	5.
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	0.00	1.00	1.00	0.0
Uniform Delay (d), s/veh	17.3	12.7	8.5	28.8	14.8	9.7	21.0	0.0	15.5	18.6	0
Incr Delay (d2), s/veh	0.1	7.9	0.3	0.4	1.0	0.0	4.7	0.0	2.9	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
%ile BackOfQ(50%),veh//ln	0.4	11.3	2.0	0.7	6.9	0.1	3.7	0.0	3.5	0.2	0
LnGrp Delay(d),s/veh	17.4	20.6	8.8	29.5	15.8	9.7	25.7	0.0	18.4	18.8	0
LnGrp LOS	8	O	A	O	0	⋖	O		m	60	1
Approach Vol, veh/h		912			532			454			216
Approach Delay, s/veh		17.8			16.8			21.8			17.
Approach LOS		B			Φ			ပ			Ī
Tinter	10	2	esi	w.	40	g	17.	8	L	Ì	ļ,
Assigned Phs		2		4		9		80			
Phs Duration (G+Y+Rc), s		24.9		35,1		24.9		35.1			
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5			
Max Green Setting (Gmax), s		19.5		31.5		19.5		31,5			
		17.8		24.2		10.0		28.1			
Green Ext Time (p_c), s		9.0		4.8		2.5		2.5			
Intersection Summary		١	Ì		V	ı	B		H	l	8
HCM 2010 Ctrl Delay			18.3								

Synchro 9 Report Page 1

	12. Callage Daily & Charge Daily Danie
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LWSC	0
HCM 2010 TWSC	0000
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2040 Total PM.syn

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2017 Existing AM.syn 12/12/2017

in color), or color	0.0													
Tovement	Ħ	183	689	ŀ	WBI	WBT	WBR		4	MBI	MBR	SBL	198	
ane Configurations	*	*	K.			4			15	£		Jan.	£,	
raffic Vol, veh/h	5	2	162		7	-	0		217	145	2	0	179	6
-uture Vol, veh/h	5	2	164		7	~	0		217	145	2	0	179	o
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	0
Sign Control	Stop	Stop	Stop		Stop	Stop	Stop	_	Free	Free	Free	Free	Free	Free
RT Channelized	,	•	None		9	٠	None				None	•	*	None
Storage Length	100	1	100		*	.*:	(2)		160	70)):	150) ¥.	
Veh in Median Storage, #		0	٠		•	0	1		•	0		3	0	*
Grade, %	•	0	٠		٠	0	٠		ď	0	,		0	
Peak Hour Factor	62	20	84	è	58	25	92	l	82	88	25	92	83	56
Heavy Vehicles, %	2	2	2		2	7	2		2	7	2	2	C	2
Wymt Flow	8	4	195		12	4	0		255	165	80	0	216	16
Transa Manne	Micor	ì	ł	Ī	Town I	í		W	3	ł		African		
Confliction Flow All	905	200	VCC.		OOR	044	160		222	c		472	•	15
Stage 1	224	224	1		679	629	3 '					2	•	
Stage 2	681	683	•		226	232	١		ű.			*	,	
Critical Hdwy	7.12	6.52	6.22		7.12	6.52	6.22	i	4.12			4.12	1	1
Critical Hdwy Stg 1	6.12	5.52	1		6.12	5.52	,		,		٠	Í	*	1
Critical Hdwy Stg 2	6.12	5.52			6.12	5.52	ľ		٠					Í
-ollow-up Hdwy	3.518	4.018	3.318		3.518	4.018	3.318	2	2.218	a	Ç,	2.218		9
ot Cap-1 Maneuver	257	276	815		257	274	875		1336	ŭ.		1404	ě.	V.
Stage 1	779	718	ľ		441	451	1		1				7.	
Stage 2	440	449	۳		777	713	•		ř	ē	*	•		Á
Platoon blocked, %										*	×		20	
Mov Cap-1 Maneuver	216	223	815		165	222	875	Ī	1336	*		1404		ı
Mov Cap-2 Maneuver	216	223	1		165	222	1			ě.		*.	1	i
Stage 1	630	718			357	365	•		4				ì	i
Stage 2	352	363	1		288	713	1	ı	ş	ā		g.	3	
pproach	E8		Ì	B	WB	l		ŀ	MB			SB		
HCM Control Delay, s	11.5				27.5				2			0		
HCM LOS	6 0				٥									
thor Lanefilajor Myret	NBA	MBI	MBRE	Bintle	BENTERNZERAR	高い田	Mini.	器	159	SBB	Į.			
apacity (veh/h)	1336	9		216	223	815	176	1404		¥	į		i	
HCM Lane V/C Ratio	0,191			0.037	0.018	0.24	0.091	٠		٠				
HCM Control Delay (s)	8.3			22.3	21.4	10.8	27.5	0	10					
HCM Lane LOS	A		9	ပ	O	00	۵	A	ā	4				

HCM 2010 TWSC 12: College Drive & Storey Boulevard

nt Delay, s/veh	5.7													
lovenent	Ħ	189	EBR	Ī	9	184	28		MBI	MBT	NBR	155 155	SBT	SBR
ane Configurations	je-	*	ĸ.			4			K.	42.		*	ŧ\$	
raffic Vol. veh/h	=	9	255		4	en	-		182	256	15	2	175	7
-uture Vol, veh/h	11	9	255		4	n	-		182	256	15	2	175	7
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	0,	Stop	Stop	Stop		Free	Free	Free	Free	Free	Free
RT Channelized		25	None				None		•	0	None	•	٠	None
Storage Length	100	2.6	100		'n		ı		160	1		150	ı	,
/eh in Median Storage, #	ĺ	0	٠		F.	0	i		٠	0	٠	ľ	0	ľ
Grade %	ľ	0	٠		•	0	١		٠	0		١	0	ľ
Peak Hour Factor	69	75	91		33	38	25		88	98	54	20	82	4
Heavy Vehicles. %	2	2	2		7	2	7		7	7	2	2	2	2
Numt Flow	16	8	280		12	00	4		207	298	28	4	213	16
														1
Catefolius.	Minor		ı	2	live I		d	3	Jul 3	8		Major2		
Conflicting Flow All	096	896	221		958	962	312		229	0	0	325	0	0
Stage 1	229		•		725	725			19.	18	ì	100	(6)	1
Stage 2	731	739	٠		233	237	1		•	j <u>e</u> č	ě		*	•
Oritical Howy	7.12		6.22		7.12	6.52	6.22		4.12	7:	1	4 12	8	İ
Critical Hdwy Stg 1	6.12			Ī	6.12	5.52	٠		*1	80	Ť	**	¥.	•
Critical Hdwy Stg 2	6.12	5.52	٠	Ī		5.52	٠		1				1	
ollow-up Hdwy	3.518	4.018	3.318	n		4.018	3.318	2	2.218		٠	2,218	7	
ot Cap-1 Maneuver	236		819		237	256	728		1339	8	1	1235	14	i
Stage 1	774		1		416	430	•		(e	9.8	8		*	1
Stage 2	413	424	1		0//	209	7		×	2	1967		×	ar.
Platoon blocked, %				ı						15			×	ì
Aov Cap-1 Maneuver	201		819		133	216	728	Ì	1339	*		1235	*	i
Aov Cap-2 Maneuver	201		1		133	216	•		*:	30	•	*	*	
Stage 1	654	713	•		352	364	1		*	11.			•	i
Stage 2	340	358	*		466	707	1		٠	1	0		180	,
danoach	tt		i		9	1			SE	Ī		SB	ı	1
ICM Control Delay, s	126	i			28.1	H	H		3.2			0.1		
HCM LOS	<u>co</u>				٥					۱				
Book Recoll Print Research	VIDIV	TON	NDOR	Collect Dalle Street of	Tie St		Part and	100	15	85		ı	H	
Township Cont.(b.)	4220		HOUSE	204	24.4		180	122E			۱	l	ŀ	I
HCM Lane V/C Ratio	0.154					0.342		0.003		1				
HCM Control Delay (s)	8.2		. *.			117		6.2	. 5	,				
HCM Lane LOS	A	*2	*		ပ	В	۵	V						
ICM 95th %tile Q(veh)	0.5	Ì	1	03	0.1	1.5	0.5	0	.5					

Synchro 9 Report Page 1

	40. Online Drive & Charles Davies
()	OCTO
0 TWS	Original Contract
HCM 2010 TWSC	10.010

2017 Existing PM.syn 12/12/2017

2040 Background AM.syn 12/12/2017

TO SOUTH		Ì		١	ı		l		ı	۱		İ		
nt Delay, s/veh	9													
mement	183	8	688	9	183	Wei	WBR	100	1	111	188	is.	88	B
ane Configurations	N.	4	*			4			F	42		<u>*</u>	45.	
raffic Vol. veh/h	7	m	218		6	-	വ	2	289 1	193	က	2	238	12
-uture Vol. veh/h	7	က	218		6	-	လ	2		93	ෆ	ιΩ	238	12
Conflicting Peds, #/hr	0	0	0		0	0	0			0	0	0	0	0
Sign Control	Stop	Stop	Stop	0,	Stop	Stop	Stop	ᇤ	Free Fr	Free	Free	Free	Free	Free
RT Channelized	i		None				None		i	-	None	ì	•	None
Storage Length	100	,	100		ì		٠	-	160	,		150		
/eh in Median Storage. #	i				•	0	,			0	T	1	0	ì
Grade. %	'	0	•		١	0	•			0		•	0	167
Peak Hour Factor	92	92	92		92	92	92		92	92	92	35	85	- 65
Heavy Vehicles, %	2	2	2		7	2	2		2	2	2	2	2	•4
Avmt Flow	∞	60	237		9	-	ro	e	314 2	210	m	32	528	8
Sochlinor	Minor2	H		W	TOCE	ß	ij.	Mak	=	W		Major2		
Conflicting Flow All	1119	1117	265		1118	1123	211	2	272	0	0	213	0	J
Stage 1	276	276			840	840	ľ	į		B		*	í	i
Stage 2	843	841	1		278	283	1		·					17
Critical Hdwy	712	6 52	6.22		7.12	6.52	6.22	4	4 12	g	S.	4.12	2	ì
Critical Hdwy Stg 1	6.12		1		6.12	5.52	1			ů.	14		05	
Critical Hdwy Stg 2	6.12		1		6.12	5.52	,	i	ě	ä	ä	*	(2)	
-ollow-up Hdwy	3.518	4.018	3,318	e		4.018	3.318	2.2	2.218		æ	2.218	100	Ť
Pot Cap-1 Maneuver	184		774		184	206	829	12	1291	12/	4	1357	a.	1
Stage 1	730		ľ		360	381	٠		1	¥.	ě	60	*	
Stage 2	358	380	ì		728	219	ı		8	Ä		***		
Platoon blocked, %										ř	k.		*	
Mov Cap-1 Maneuver	147		774		102	155	829	12	291	W		1357	4	
Aov Cap-2 Maneuver	147		,		102	155	1			4	(%)	œ	2.5	
Stage 1	552		1		272	288	-		ú	ū	o	(0)	20.	Â
Stage 2	268	288		١	201	675	1	į	Œ.	w		*	127	
nimiseli	E	H	ı	H	MIR	ľ	8		15			85		
HCM Control Delay s	12.5	l	ı	l	32.1		l		5.2			0.2		
HCM LOS	8				۵					W			8	1
finor i anothree than	NG.	100	NPQ 5	Stell of Stan SHR maunit		0	Binl	SEE	155	8	ľ	Ì		13
anacity (veh/h)	1291	ĺ	i	147	156	774	149 1357	1357	.,	4				
HCM Lane V/C Ratio	0.243		74			0.306		0 004	•	÷,				
HCM Control Delay (s)	8.7	9	4		28.6	117	32.1	7.7	4	ri.				
HCM Lane LOS	∢	<u></u>	5¥	۵	۵	6 0 5	0	Y	ii ii	4			1	1
HCM 95th %tile Q(veh)			*	0.5	0	13	0.4	0	ı	×				

HCM 2010 TWSC 12: College Drive & Storey Boulevard

2040 Background PM.syn

Covernent	Ħ		ERR	1	785	Wet	MERC		MBI	MBI	MBS	38	SBIT	SBR
Lane Configurations	*	*	W-			÷			*	ç i L		şe-	ŧ.	
Traffic Vol, veh/h	15	œ	339		2	4	10		242	341	20	10	233	6
Future Vol, veh/h	15	æ	339		5	4	10		242	341	20	10	233	o
Conflicting Peds, #/hr	0	0	0		0	0	0		0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	0)	top	Stop	Stop		Free	Free	Free	Free	Free	Free
RT Channelized	ľ	1	None			V	None		1000		None		٠	None
Storage Length	100	1	100		Y		×		160	•	,	150	<u>(#)</u>	٠
Veh in Median Storage, #	,	0	1		1	0	1			0	٠	•	0	ľ
Grade. %	,	0	٠		•	0			١	0	ľ	٠	0	ľ
Peak Hour Factor	92	92	92		92	92	92		92	92	92	92	92	92
Heavy Vehicles, %	2	2	2		7	7	2		2	7	2	2	7	2
Myrmt Flow	16	ð	368		ις.	4	7		263	37.1	22	11	253	10
Majoriffinoc	Miner			Me	Lang.				Hotel			Major2:	ŀ	H
Conflicting Flow All	1195	1198	258	1		1193	382		263	0	0	392	0	0
Stage 1	280		١		806	806	ŀ		0	241	×	*	(9)	270
Stage 2	915		٠		284	285			*	4	÷	(F)	(*)	
Critical Hdwy	7.12		6.22			6.52	6.22		4.12		8	4.12		2
Critical Hdwy Stg 1	6.12		1	J		5.52				÷	è		*:	1
Critical Hdwy Stg 2	6.12		•	9		5.52				١		30	20	
Follow-up Hdwy	3.518	4	3.318	က		4.018	3.318		2.218	9	Să.	2.218	×	
Pot Cap-1 Maneuver	163		781		164	187	999		1301	/a	¥	1167	35	W
Stage 1	727	629	•		330	354	•		18.0		2)¥		
Stage 2	327	320	•		723	9/9	'			Ä	٠		A.	٨
Platoon blocked, %										į.	*3		2:	U
Mov Cap-1 Maneuver	132	147	781		69	148	999		1301		٠	1167	8)	1
Mov Cap-2 Maneuver	132	147	į.		69	148	7					0		ì
Stage-1	280	673	•		263	282	•		4	9	18		9	100/
Stage 2	253	279	1		373	029	7		1	4	14	(0.	17	1
Approach	88				WB				NB		Ì	SE		
HCM Control Delay, s	15			,,,	29.7				3.4	i	i	0.3		
HCM LOS	O				Ω					ı				
	ı				١					1	Į	I	۱	
Unor Lanestiage Ment	NB.	HEW.	MERE	REBLITER	EBLn2255m3	Stan Sill	Ent.	SBI	SHI	SSR				, O
Capacity (veh/h)	1301	-	•					1167	ł.					
HCM Lane V/C Ratio	0.202	è	Ī					6000	5	٠				
HCM Control Delay (s)	8.5	,	1	36.1		13.7	29 7	8.1	8	(4)				
HCM Lane LOS	∢	Ť	•	ш	۵	æ	٥	V	ě	4				
HCM 95th %file O(veh)	0.8	×	-	0.4	0.2	26	0.4	0		B				

Synchro 9 Report Page 1

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1CM ZUTU Signalized Intersection Summary	
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2040 Total AM.syn

	\	†	<i>></i>	*		/	_	-	_		•	,
fovement	EBI	EBI	EBE	WBE	WBT	WBR	NBE	NBE	NBH	SBI	無	SBS
ane Configurations	K.	4	R.	k	23		,Ar	£3		je.	ę±	
raffic Volume (veh/h)	1	6	240	o	151	2	327	193	e	40	238	12
-uture Volume (veh/h)	1	16	240	gn	151	S	327	193	က	3	238	12
Number	7	4	7	٣	80	18	5	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1,00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/In	1569	1569	1569	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	60	66	261	10	164	S)	322	210	ന	ιΩ	259	13
Adj No of Lanes	-	-		+	-	0		-	0	-	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	c	2	2	cv
Cap, veh/h	304	383	325	308	370	11	969	935	13	825	897	45
Arrive On Green	0.08	0.08	80:0	0.24	0.24	0.24	1.00	1.00	1.00	190	0.61	0.61
Sat Flow, veh/h	1211	1569	1333	1017	1514	46	1103	1543	22	1164	1481	72
3rp Volume(v), veh/h	80	66	261	10	0	169	355	0	213	S	0	272
3rp Sat Flow(s), veh/h/ln	1211	1569	1333	1017	0	1560	1103	0	1565	1164	0	1556
2 Serve(g_s), s	0.4	3.6	11.5	0.5	0.0	5.5	5.7	0.0	00	0.1	0.0	5.0
Cycle Q Clear(g_c), s	5.0	3.6	11.5	4.0	0.0	5.5	10.7	0.0	0.0	0.1	0.0	5.0
Prop In Lane	1.00		100	1.00		0.03	1.00		0.01	1,00		0.05
ane Grp Cap(c), veh/h	304	383	325	308	0	381	969	0	848	825	0	942
//C Ratio(X)	0.03	0.26	0.80	0.03	0.00	0.44	0.51	00:00	0.22	0.01	00:0	0.29
Avail Cap(c_a), veh/h	372	471	400	365	0	468	969	0	948	825	0	942
+CM Platoon Ratio	0.33	0.33	0.33	8	1 00	1.00	1.67	167	1.67	1.00	100	100
Upstream Filter(I)	0.79	0.79	0.79	1.00	0.00	1.00	0.63	0.00	0.63	1.00	0.00	1.00
Jniform Delay (d), s/veh	26.2	22.5	26.2	20.1	0.0	19.2	0.7	0.0	0.0	4.7	0.0	5.6
nor Delay (d2), s/veh	0.0	0.3	7.5	0.0	0.0	0.8	1.7	0.0	0.3	0.0	0.0	0.8
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
le BackOrQ(50%), veh/in	0.1	1.6	4.9	0.1	0.0	2.4	 80:	0.0	0.1	0.0	0.0	2.3
nGp Delay(d),s/veh	26.2	22.8	33.6	20.2	0.0	20.0	2.4	0.0	0.3	4.7	0.0	6.4
nGrp LOS	O	U	O	O		U	V		V	A		4
opproach Vol, veh/h		368			179			268			277	
Approach Delay, s/veh		30.5		ı	20.0			1.6			6.4	
Approach LOS		ပ			ပ			V	i		∢	Ī
THE .	ē	8	co	27	iii	CIÓ	D:	-	ì	ì		
Assigned Phs	l	2		4		9		∞	l	I	l	l
Phs Duration (G+Y+Rc), s		40.9		19.1		40.9		19.1				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5	4			
Max Green Setting (Gmax), s		33.0		18.0		33.0		18.0				
Max Q Clear Time (g_c+11), s		127		13.5		7.0		7.5				Ĭ
Green Ext Time (p_c), s		4.6		1.		4,9		1.9				
direction Summary	ĺ	l	Ì	ł	I	l	ŀ	ì			ļ	
HCM 2010 Ctrl Delay			12.6				Ī					Ī

2040 Total PM syn 12/12/2017

HCM 2010 Signalized Intersection Summary 12: College Drive & Storey Boulevard

	1	†	/	1	Ļ	1	•	—	•	٨	→	*
Movement	183	183	EBB	WBI	WBI	WBR	E	鹽	MBR	8	188	SBS
Lane Configurations	Je.	*	R.	je.	24		r	42		k	Ŷ.	
Traffic Volume (veh/h)	15	234	395	2	191	10	289	341	20	10	233	6
Future Volume (veh/h)	15	234	395	5	191	10	588	341	50	10	233	6
Number	7	4	14	e	00	18	2	2	12	-	9	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1269	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	16	254	429	2	208	1	314	371	22	Ξ	253	9
Adj No. of Lanes	-	-	Ī	1	-	0	-	-	0	-	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	910	433	250	480	25	969	770	46	479	787	3
Arrive On Green	0.11	0.11	0.11	0.32	0.32	0.32	0.52	0.52	0.52	0.52	0.52	0.52
Sat Flow, veh/h	1157	1569	1333	755	1477	78	1112	1466	87	987	1499	29
Grp Volume(v), veh/h	16	254	459	S	0	219	314	0	393	#	0	263
Grp Sat Flow(s), veh/h/ln	1157	1569	1333	755	0	1555	1112	0	1553	987	0	1558
Q Serve(g_s), s	0.8	9.5	19.3	0.3	0.0	9.9	13.5	0.0	9.7	0.4	0.0	5.8
Cycle Q Clear(g_c), s	7.4	9.5	19.3	9.5	0.0	9.9	19.3	0.0	9.7	10.1	0.0	5.8
Prop In Lane	1.00		1.00	1.00		0.05	1.00		90.0	9	ŀ	0.0
Lane Grp Cap(c), veh/h	368	510	433	250	0	505	296	0	815	479	0	818
V/C Ratio(X)	0.04	0.50	0.99	0.05	0.00	0.43	0.53	0.00	0.48	0.02	0.00	0.32
Avail Cap(c_a), veh/h	368	510	433	250	0	505	296	0	815	479	0	818
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	100	1.00	9.
Upstream Filter(I)	0.40	0.40	0.40	1.00	0.00	1.00	0.09	0.00	60.0	100	0.00	1.8
Uniform Delay (d), s/veh	24.5	222	26.7	20.7	0.0	15.9	13.7	0.0	9.1	123	0.0	80
Incr Delay (d2), s/veh	0.0	0.3	24.8	0.0	0.0	9.0	0.3	0.0	0.5	0.1	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0
%ile BackOfQ(50%),veh/In	0.2	4.0	10.1	0.1	0.0	2.9	4.1	0.0	4.1	0	0.0	2.7
LnGrp Delay(d),s/veh	24.5	22.5	51.5	20.7	0.0	16.5	14.0	0.0	9.5	124	0.0	9.5
LOG TOS	O	O		O		œ	В		<	2		4
Approach Vol, veh/h		669			224			707			274	
Approach Delay, s/veh		40.3		1	16.6		i	113			9.3	
Approach LOS		۵			a			Φ			∢	
inter	Ī	2	~	**	3	98	7	80		Î		
Assigned Phs		7		4		8		80				
Phs Duration (G+Y+Rc), s		36.0		24.0		36.0		24.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		31.5		19.5		31.5		19,5				
Max Q Clear Time (q, c+l1), s		21.3		21.3		121		11.5				
Green Ext Time (p_c), s		4.0		0.0		5.5		3.0				
Intersection Summers				i				l		k		
HCM 2010 Ctrl Delay			22.3									П
The state of the s			ر									

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	Road
	Thomas I
TWSC	e Drive 8
HCM 2010 TWSC	13: College

2017 Existing AM.syn 12/12/2017

nt Delay, siveh	28											
Movement	Ħ	EBI	E88	WB	WBT	WBR	NBK	NB3	MBR	SBE	88 1	SBR
ane Configurations		4			**		<i>y</i> .	par.		Acres (ŧ.	
Traffic Vol, veh/h	-	က	52	2			26	355	~	4	343	S
Future Vol, veh/h	_	m	25	2			26		80	4	343	S
Conflicting Peds, #/hr	0	0	0	0			0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Sto	ಶ	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	*	7	None		١	None	Ì		None		•	None
Storage Length		•				٥	275		ŀ	100	3	٦
Veh in Median Storage, #		0					i	0	ŀ		0	
Grade. %		0			,		i			œ,	0	ľ
Peak Hour Factor	25	75	62	4		9	69	87		33	90	62
Heavy Vehicles. %	2	2	2	2	2 2	2	2		2	2	2	2
Myrnt Flow	4	4	40	4			40	408	12	12	381	8
Sant Liner	Minor			Minde		ķ	Mann	ı	I	Major 2		
Conflicting Flow All	913	606	385	926	5 907	414	389	0	0	420	0	٥
Stage 1	409	409	147	494	4 494	•		4		N	13	î
Stage 2	504	200		432	2 413	-	2		:14	ile.	85	0.7
Critical Hdwy	7.12	6.52	6.22	7.12		6.22	4.12	4	5	4 12	٠	ì
Critical Hdwy Stg 1	6.12	5.52	a.	6.1					*	(9)	•	
Critical Hdwy Stg 2	6.12	5 52		6.12					9	(1)	(2)	A
Follow-up Hdwy	3.518	4.018	3	3.518	4	3	2.218	•		2.218		Ĥ
Pot Cap-1 Maneuver	254	275	663	249		929	1170	ľ		1139	9E	ì
Stage 1	619	296	¥:	227		,	i			•		Ĭ
Stage 2	220	543	Vi	602	2 594	•				3	1	â
Platoon blocked, %								•			(*	1/4
Mov Cap-1 Maneuver	234	263	663	223		1 638	1170			1139	17	
Mov Cap-2 Maneuver	234	263	1	223		•	.0		14)	*	٥	A
Stage 1	298	290	4	538							1	
Stage 2	513	524		929	6 588				*	*	•	ì
Approach	83	þ	Ì	*	88		#			SB	ľ	
HCM Control Delay, s	126			24.8	8		0.7			0.2		
HCM LOS	æ				O							
Marrie Late Moses Month	100	189	NRRES	NRR FStell// Blai	88	is.	SBR				E	
Capacity (veh/h)	1170	1	18	519 249	9 1139	6	Š				ı	
HCM Lane V/C Ratio	0.034			0.093 0.272	2 0.011	ġ.	(<u>*</u>					П
HCM Control Delay (s)	8.2	4	*	12.6 24.8	8 82	2	×.					۱
HCM Lane LOS	A	*				A	9.				ı	1
UCEA OF BY 410 Of 10h)	0											

HCM 2010 TWSC 13: College Drive & Thomas Road

Int Delay, stveh 2.5 Lone Configurations Traffic you's vehic traffic you's vehic better Vol, wehich Conflicting Peds, #hrr Sign Control Sign Control Sign Control Sign Control Sign Control Sign Control Sign Control Sign Control Signate Length	12											
Longuesting Configurations Lane Configurations Traffic Vol. vehh Conflicting Peds, #fhr Sign Control RT Channelized Storage Length	13											
Lane Configurations Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #fhr Sign Control RT Channeized Storage Length		191	SES.	WEL	WET	WER	MEE	NBH	MER	SBL	SBT	SBR
Traffic Vol, veh/h Future Vol, veh/h Conflicting Peds, #/hr Sign Control RT Charnelized Storage Length		d.			4		×	42		ic.	ę±	
Future Vol, veh/h Conflicting Peds, #/hr Sign Control RT Channelized Storage Length	e	9		==	4	00	35	444	16	6	430	2
Conflicting Peds, #/hr Sign Control RT Channelized Storage Length	က	9	24	=	4	80	35			6	430	2
Sign Control RT Channelized Storage Length	0	0		0	0	0	0	0	0	0	0	0
RT Channelized Storage Length	Stop	Stop	S	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Storage Length		•	None			None			None		٠	None
	*	()	74	•	1	,	275			100	•	ľ
Veh in Median Storage, #	7	0		•	0						0	ľ
Grade, %	Ž		-		0		•	0			0	
Peak Hour Factor	38		29	55	20	29	52	81		45	8	20
Heavy Vehicles, %	2	2	2	2	2	7	2		7	2	2	7
Myrrit Flow	00		36	20	00	12	19	472		20	478	4
Kajor Minor	Minor			Menne			Majort			Major2	i	
Conflicting Flow All	1147	1147	480	1161	1139	482	482	0	0	492	0	0
Stage 1	250	250		617	617			4		-	200	(0
Stage 2	627	627		544	522	,	*		*	(8)	(4)	ď.
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	4	4.12	8	(8)
Critical Hdwy Stg 1	6.12	5.52	•	6.12	5.52	τ	2	6	*0	Y	*11	ð)
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52		C	41			1	7
Follow-up Hdwy	3.518		3.318	3.518	4.018	3.318	2.218			2.218	£	•
Pot Cap-1 Maneuver	176	199	586	172	201	284	1081	1	ă	1071		10
Stage 1	539	532	ı	477	481	,	*		33	110	AS#	27
Stage 2	471	476		523	531		-	0	*	3	A	o.
Platoon blocked, %									245		*	7
Mov Cap-1 Maneuver	157	183	586	144	185	584	1081			1071	1	76
Mov Cap-2 Maneuver	157	183		144	185		*		20	*	925	50
Stage 1	909	522		447	451			-			S	ì
Stage 2	425	446		471	521	,))(()	(4)	7
												ľ
Approach	æ	F		WB			MB			SB		F
HCM Control Delay, s	189			27.9						0.3	ī	
HCM LOS	O	ı		٥								١
								ł			ı	
limor Lanelifajor Minit	9	MBI	MREBIN	鰮	SBL	SBT S	SBR	Ì				Ī
Capacity (veh/h)	1081	*	315	197	1071	Y	*					
HCM Lane V/C Ratio	0.062	•	0.177	0	0.019	į,						
HCM Control Delay (s)	8.6	,	- 18.9	27.9	8.4		-					
HCM Lane LOS	A	•	O		4	e e						
HCM 95th %tile Q(veh)	0.2	A	90	0.7	0.1		7	*				

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HCM 2010 TWSC 13: College Drive & Thomas Road

2017 Existing PM.syn 12/12/2017

2040 Background AM.syn 12/12/2017

Int Delay, siveh 2 Lane Configurations 1 Future Vol, veh/h 1 Confinition Peds, #fire 0 Confinition Peds, #fire 0 Storage Length Storage Length Storage Length Storage Length Storage Length Storage Length Storage Length Feak Hour Exfor 92 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hour Exfor 93 Feak Hou	H 477	EBR	WBI	ALC: N						100	
EBIL In In In In In In In In In In In In In I	# 4 7	EBR	WBI	MEDIT					-	400	į
lions 1	44.			100	WER	MBL	MES	MBR	iii.	202	Š
Storage, #	4			+2		A.	41		100	‡	
Storage, # 1	,	33	28	00	7	35	472	=	40	456	7
Storage, # Storage, #	4	33	28	00	7	35	472	11	S	456	7
Storage, #	0	0	0	0	0	0	0	0	0	0	0
Storage, # 92	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
Storage, #		None	İ	•	None	1	1	None			None
Storage, # 92	1	,	1	1	,	275	٠		100	•	ľ
1113 510 603 7,112	0			0			0			0	ľ
1113 1113 510 603 7,112	0	,	•	0			0			0	ľ
1113 510 603 7.12 7.12 8.43	92	92	92	92	92	92	92	95	65	92	92
1113 510 510 603 7.12	2	2	2	2	2	2	2	2	2	2	2
1113 510 510 603 7.12	4	36	30	6	80	38	513	12	S	496	60
510 510 603 7.12	2		Minorit			Hand.			25.00		
510 603 7.12	111	499	1125	1109	519	503	P	c	525	c	ľ
603	510	-	595	595		50	0.0	20	ď.	74	
7.12	601	1	530	514		24	200	227	8		ľ
613	6.52	6.22	7.12	6.52	6.22	4.12	×	22	4.12	74	
0.12	5.52		6.12	5.52	¥	1	×	*	×	(A)	ľ
92 6.12			6.12	5.52			10	*	Ž.	×	
		3.318	3.518	4.018	3.318	2.218		20	2,218	1	ľ
ot Cap-1 Maneuver 186	500	572	182	210	257	1001	•	+	1042	0	ı
	538		491	492			•			٠	ì
Stage 2 486	489		533	535			ia I	7.4		1	ì
							39	2/4		4	ľ
vlov Cap-1 Maneuver 172	201	572	163	202	257	1061	, è		1042		Ġ
neuver	201		163	202		4	¥	(8)	0		ì
	232		473	474	0	2	*	*	•		ı
Stage 2 454	471		493	532		83	10		**	•	
			WB			NB NB			88	Ī	F
rol Delay, s 13			29.7		H	90	1		0.1	Ĭ	
ICM LOS B			٥				Ī				
inor Lane Major Mynt NBL 1	NBT	NBR EBEnt	WELDI	SBL	SEL SE	SIR	d			Ì	
apacity (veh/h) 1061	J.	456	192	1042	ij	-					
1CM Lane V/C Ratio 0.036	100	- 0.091	0.243	0.005	(0.0						
HCM Control Delay (s) 8.5	2	- 137	56	8 5	·	(4)					
		-		A	10	200					
-ICM 95th %tile Q(veh) 0.1	-	- 0.3	6.0	0							

HCM 2010 TWSC 13; College Drive & Thomas Road

2040 Background PM syn 12/12/2017

Mostment	Œ		HBR		186		INBR	NB	*	1884 1884	3	Sec.	į
ane Confinirations		d		١		4		N.	41		N.	2	
Traffic Vol veh/h	4	00	32			y,	7	47	591	21	12	572	3
Future Vol. veh/h	4	80	32			2	Ξ	47	591	21	12	572	co
Conflicting Peds. #/hr	0	0	0		0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	(O)		top	Stop	Free	Free	Free	Free	Free	Free
RT Channelized			None				None		i	None		•	None
Storage Length	•	1	0					275	•	•	100	1	
Veh in Median Storage, #		0	٠		,	0	i		0	•		0	i
	,	0	٠			0	ı	Í	0	٠		0	ï
Peak Hour Factor	92	92	92		92	92	92	92	92	35	92	92	92
Heavy Vehicles, %	2	2	7		2	7	2	2	2	2	2	2	2
Mvrnt Flow	٥	б	35		16	လ	12	51	642	23	13	622	3
Discontinue.	Mino 2			W	Piort	L		Majori			Major2	F	
Conflicting Flow All	1414	1416	623	-	1427	1407	654	625	0	0	999	0	0
Stage 1	648	649			992	756	•	•		Ÿ		(4)	.*1
Stage 2	765		,		671	651	ı	*6	*		40	*	**
Critical Hdwy	7.12		6.22	1-		3.52	6.22	4.12		9	4.12	×	i
Critical Hdwy Stg 1	6.12	5.52		_		5.52		ĺ	Ť				
Critical Hdwy Stg 2	6.12		i	•			ī			0			ì
Follow-up Hdwy	3.518	4	3.318	e.	3.518 4.		3.318	2.218	7		2.218	(3)	.(*
Pot Cap-1 Maneuver	115		486			139	467	926		j	924	**	Í
Stage 1	458		1			416	ı		18	ğ			•
Stage 2	396	411	٠		446	465			25.	141		*	ì
Platoon blocked, %									177	ě		*.	•
Mov Cap-1 Maneuver	103	128	486		94	130	467	926	32	(*)	924	C	i
Mov Cap-2 Maneuver	103		•		94	130	800	*/	*	ŧ			Ì
Stage 1	434	459	H		379	394		í		1			İ
Stage 2	360	389	•		401	458	4	•	1		a		İ
Angrosch	Ħ				SM.	B	H	NB			88		H
HCM Control Delay, s	21.7			Ì	38.7			9.0			0.2		
HCM LOS	O		1	1	ш								
							ı			ı			١
Minor Langifilajor Mem.	NEW NEW	MBI	NBREB	Intitud	Bini	281	SBT	BR	H			ı	Ţ,
Capacity (vehift)	926	18	*	263	140	924		*					
HCM Lane V/C Ratio	0.053	*(0 -		0,241 0	0.014	×	10					
HCM Control Delay (s)	6	0	- 2	21.7	38.7	თ							
HCM Lane LOS	A	•	•	ပ	ш	∢	i i						
HOLLOSH WHIS Oweh	0.0	0	,	2.0	6.0	0	:(4						

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HCM 2010 Signalized Intersection Summary 13: College Drive & Thomas Road

2040 Total AM.syn 12/12/2017

		ì	•	-								
Appendit	EBL	EBI	EBS	WBL	WEET	WER	NBI	MBI	MBR	B	SBT	SBR
ane Configurations	r	¢±		JE.	Å,		¥	£3		¥-	¢\$	
Fraffic Volume (veh/h)	-	4	33	216	00	45	35	472	121	12	456	7
-uture Volume (veh/h)	-	4	33	216	80	45	32	472	121	27	456	7
Number	7	4	14	က	00	48	S	2	12	_	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1:00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, veh/h	-	4	36	235	6	49	38	513	132	23	496	00
Adj No of Lanes	-	-	0	-	1	0	-	-	0	-	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap. veh/h	384	31	282	403	49	267	582	745	192	383	953	15
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.62	0.62	0.62	0.82	0.82	0.82
Sat Flow, veh/h	1340	135	1218	1362	212	1153	891	1204	310	782	1539	25
Gro Volume(v), veh/h	-	0	40	235	0	28	38	0	645	53	0	504
Grp Sat Flow(s), veh/h/ln	1340	0	1354	1362	0	1365	891	0	1514	782	0	1564
Q Serve(g_s), s	0.0	0.0	1.4	6.6	0.0	2.0	1.3	0.0	17.0	1.3	0.0	0.9
Cycle Q Clear(g_c), s	2.1	0.0	1.4	11.3	0.0	2.0	7.3	0.0	17.0	18.3	0.0	9.0
Prop In Lane	1.00		0.90	1.00		0.84	1.00		0.20	1.00	ì	0.02
Lane Grp Cap(c), veh/h	384	0	313	403	0	316	582	0	937	383	0	896
V/C Ratio(X)	0.00	0.00	0.13	0.58	0.00	0.18	0.07	0.00	69.0	0.08	0.00	0.52
Avail Cap(c_a), veh/h	487	0	417	508	0	421	582	0	937	383	0	968
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	0.92	0.00	0.92
Uniform Delay (d), s/veh	19.4	0.0	18.3	22.8	0.0	18.5	7.3	0.0	9.7	8.6	0.0	2.6
Incr Delay (d2), s/veh	0.0	0.0	0.2	1.3	0.0	0.3	0.2	0.0	4.1	0.4	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	0.0	0.0	0.5	3.9	0.0	0.8	0.4	0.0	8.1	0.3	0.0	2.9
LnGrp Delay(d),s/veh	19.4	0.0	18.5	24.1	0.0	18.8	7.5	0.0	11.7	8.9	0.0	4.4
LnGrp LOS	В		В	O		മ	∢		80	A		<
Approach Vol, veh/h		41			293			683			533	
Approach Delay, s/veh		18.5			23.0			11.5			4.6	
Approach LOS		8			O			മ			∢	
Innot	4	6	ger G	ŧ	de	us	×	en		ij	Í	
Assigned Phs		2		4		9		80				
Phs Duration (G+Y+Rc), s		41.6		18.4		41.6		18.4				
Change Period (Y+Rc) s		4.5		4.5		4.5		4.5				
d	s	32.5		18.5		32.5		18.5				
	S	19.0		41		20.3		13.3				
Green Ext Time (p_c), s		6.9		F		6.4		9.0				
Infaccional Symmony			Ì	ì	ì	b	Å			ļ	i	K
HCM 2010 Ctrl Delay			11 E									
			2									

2040 Total PM.syn 12/12/2017

Summary	
HCM 2010 Signalized Intersection Summary 13: College Drive & Thomas Road	

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Toversent	EBE	EBI	EBR	WBE	WBT	WBR	MBI	MET	NER	SBL	188	SBR
ane Configurations	k	2.		K	25		M.	£3		K	£	
raffic Volume (veh/h)	4	00	32	249	ro.	28	47	591	303	88	572	m
-uture Volume (veh/h)	4	80	32	249	22	28	47	591	303	99	572	က
Number	7	4	14	3	80	18	2	2	12	-	9	16
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, vehilifin	1569	1569	1600	1569	1569	1600	1569	1569	1600	1569	1569	1600
Adj Flow Rate, vehih	4	6	35	271	чo	63	51	642	329	74	622	3
Adj No. of Lanes	-	,	0	-	-	0	-	-	0	-	-	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	69	588	396	24	307	408	620	318	98	886	ı
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	1328	281	1094	1357	66	1249	797	979	205	27.5	1560	•••
Srp Volume(v), veh/h	4	0	44	27.1	0	89	51	0	176	7.4	0	629
Srp Sat Flow(s), veh/h/lin	1328	0	1376	1357	0	1348	797	0	1480	577	0	1567
2 Serve(g. s): s	0.2	0.0	1.9	14.6	0.0	3.0	3.1	0.0	47.5	0.0	0.0	18.2
Cycle Q Clear(g_c), s	3.2	0.0	1.9	16.4	0.0	3.0	21.3	0.0	47.5	47.5	0.0	18.2
Prop In Lane	1,00		0.80	1.00		0.93	1.00		0.34	1.00		0.00
ane Grp Cap(c), vehith	369	0	338	396	0	332	408	0	938	8	0	994
//C Ratio(X)	0.01	00:0	0.13	990	000	0.20	0.13	000	103	0.77	0.00	0.63
Avail Cap(c_a), veh/h	370	0	338	397	0	333	408	0	938	96	0	98
ICM Platoon Ratio	1.00	1.00	1.00	1.00	1,00	1.00	1.00	100	1.00	1.00	1.00	1.00
pstream Filter(1)	1.00	000	1.00	1.00	0.00	100	1.00	0.00	1.00	0.85	0.00	0.85
Iniform Delay (d), s/veh	23.7	00	22.0	28.4	0.0	22.4	14.9	0.0	13.7	37.5	0.0	8.4
ncr Delay (d2), s/veh	0.0	0.0	0.2	4.8	0.0	0.3	9.0	0.0	38.7	39.0	0.0	2.6
itial O Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
lile BackOfQ(50%), veh/In	0.1	00	0.7	5.9	0.0	1.7	0.8	0'0	29.1	5.6	0.0	8.5
nGrp Delay(d) s/veh	23.7	00	22.2	33.2	0 0	22.8	15.5	0'0	52.5	76.5	0.0	10.9
nGrp LOS	ပ		O	O		ပ	8		ш	ш		B
pproach Vol, veh/h		48			339			1022			669	
Approach Delay, s/veh		22.3			31.1			50.6			17.9	
pproach LOS		O			ပ			۵			8	Ī
THE STATE OF THE S	į	2	es		S	9	1	80	ì	i	Ì	F
ssigned Phs		2		4		9		00				n
Phs Duration (G+Y+Rc), s		52.0		23.0		52.0		23.0				
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				Ī
Max Green Setting (Gmax), s		47.5		18.5		47.5		18.5				
Max Q Clear Time (g_c+11), s		49.5		5.2		49.5		18.4				Ī
Green Ext Time (p_c), s		0.0		13		0.0		0.0				
descentan Summer		l			Ī	ĺ	Ī	I	Ì	ļ		
LCM 2010 CFI Delay			90.0									Ì
WHITE THE PERSON			11000									

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HCM 2010 TWSC	14: Whitney Road & Beckle Road

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in Delay, swell	7												
Movement	Œ	188	EBR	R	WEI	MBIL	WBR	MBM	18H	NBR	Ħ	易	88
ane Configurations		÷				+ ₹			47			4	
raffic Vol, veh/h	0	0	-		6	0	2	2		4	-	158	
Future Vol, veh/h	0	0	_		ф	0	2	2	27	4	-	158	Ĭ
Conflicting Peds, #/hr	0	0	0		0	0	0	0		0	0	0	
Sign Control	Stop	Stop	Stop		Stop	Stop	Stop	Free	Free	Free	Free	ш	Free
RT Channelized	İ	i	None		i	1	None			None		Ì	None
Storage Length	•		£		1		•			t		'	ľ
Veh in Median Storage, #	٠	0	1		'	0	ľ				•	0	
Grade, %	ľ	0	•		1	0		,	0	,		0	
Peak Hour Factor	92	92	25	ľ	56	92	20	25		20	25	82	92
Heavy Vehicles, %	2	2	2		7	2	2	2	2	2	2	2	
Myrnt Flow	0	0	4		16	0	4	80	æ	00	4	193	
				ĺ									
SECTION 1	MINOR	ı			Imperi	k		N S			Table 1		1
Conflicting Flow All	259	261	193		259	257	40	193	0	0	\$	0	
Stage 1	201	201	1	ĺ	29	26	1			0		80	
Stage 2	28	09	*		203	201	,		9		0		
Critical Hdwy	7.12	6.52	6.22		7.12	6.52	6.22	4.12	(1)	(*	4.12	9	
Critical Hdwy Stg 1	6.12	5.52			6.12	5.52	1	·	(4)	9		(
Critical Hdwy Stg 2	6.12	5.52	•		6.12	5.52	•		W.	98	•	(4)	
Follow-up Hdwy	3.518	4.018	3.318		3.518	4.018	3.318	2,218	(4)	(9)	2.218		Ü
ot Cap-1 Maneuver	694	644	849		694	647	1031	1380	-		1564	1	ı
Stage 1	801	735	٠		926	848	٠	**	*	*		*	ľ
Stage 2	954	845	1		799	735	6		100		-	ì	
Platoon blocked, %									124	-3			
Mov Cap-1 Maneuver	687	638	849		989	641	1031	1380	(6	,	1564		
Aov Cap-2 Maneuver	289	638	1		989	641	Ŕ		12	170	2.*		
Stage 1	262	733			950	843	×		(A)			(3)	
Stage 2	945	840	1		793	733	è	36	*	360	*	*	Ĩ
			H		Ĭ							ì	
themath	89	H			MB.			SW.		i	88	L	P
HCM Control Delay, s	9.3	ı		١	2		Ì	1.2	22:03		0.1	l	
HCM LOS	V				80								
inor Lase/Naior Myre	MBE	192	NBRE	REBEAT	/BEn1	SB	188	SBR					
Sapacity (veh/h)	1380	8		849	735	1584	7		H				
HCM Lane V/C Ratio	900.0		140			0.003		/#/					
HCM Control Delay (s)	7.6	0		9.3	2	7.3	0						
HCM Lane LOS	K	∢	40	4	മ	A	¥	¥					

HCM 2010 TWSC 14: Whitney Road & Beckle Road

ntersection			1	ļ								I
Int Delay, s/veh												
Movement	H	i	EBR	WBE	WRI	WBR	WBI	NBT	NBR	381	SBI	SEE
Lane Configurations		4			·ŧ			4			4	
Traffic Vol. veh/h	0		4	3	0		-	110	o	3	69	0
Future Vol. veh/h	0	0	4	e	0	7	-	110	ത	က	69	0
Conflicting Peds. #/hr	0		0	0			0	0	0	0	0	0
Sign Control	Stop	Sto	Stop	Stop	S	St	Free	Free	Free	Free	Free	Free
RT Channelized			None			None	٠	×	None	Ĭ	١	None
Storage Length	ľ	•	,	150	0	*		90	36		1	٠
Veh in Median Storage, #	ľ	0		Ĺ	0	۰	ŀ	0	i	٠	0	ń
Grade, %	,			1		٠		0		-	0	
Peak Hour Factor	92		33	75		20	25	9/	26	38	72	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Myrrit Flow	0		12	4	0	4	4	145	16	00	96	0
Report Proc	Minor			Minor			Majorf			Major2		
Conflicting Flow All	275	281	96	275	273	153	96	0	0	161	0	0
Stage 1	112	112	200	161	161	٠	ĺ	1		٠	Š	•
Stage 2	163	169	(9)	118	112		*	6	**	٠	i	ī
Critical Hdwy	7.12		6.22	7.12	6.52	6.22	4.12	,	21	4.12	ı	ľ
Critical Hdwy Stg 1	6.12		*	6.12	5.52			*		•	٠	1
Critical Hdwy Stg 2	612			6.12	5.52	•	9	1		į	١	ť
Follow-up Hdwy	3.518	4.018	m	3,518	4,018	3	2.218	2.4	M	2.218	,	1
Pot Cap-1 Maneuver	677		960	673		893	1498	2	ď	1418	10	4
Stage 1	893	803		84	765	•		*	100		•	1
Stage 2	839	759	3	887	803		i	4	×	·	•	1
Platoon blocked, %								*	÷		٠	,
Mov Cap-1 Maneuver	699		960	999		893	1498	0	ļ	1418		i
Mov Cap-2 Maneuver	699			099	П	١		•	٠		į.	
Stage 1	890	198	ú	838			1	N.		7	4	
Stage 2	833		٠	87.	798	•	•	1		1/4	4	•
												T
Approach	£		H	WB		Ī	- MB	I		SB		
HCM Control Delay, s	8.8			8.6	~		0.2			90		
HCM LOS	V			1								
Mnon-Lane Major Mnot	ME	NBT	NBREB	LalWBLai	SBI	SEI	SBR	h	ì		l	
Capacity (vehth)	1498	A	×.	960 759	1418	4	A					
HCM Lane V/C Ratio	0.003	*	*	0	0.006	*	10					
HCM Control Delay (s)	17	0		6	7	0						Ì
HCM Lane LOS	×		0	A	A A	∢	74.5					
HCM 95th %ble O(veh)	0		4				3	ı				

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	7											
Icomen	188	EBI	EBP	MB	I WBT	WBR	MBI	NBI	MBR	SBL	SBI	SBB
ane Configurations		4 2			4			4			4	
raffic Vol. veh/h	S	5	-			es	8	36	2	140	210	40
-uture Vol. veh/h	S	2	-	-	12 5		m	38	S	-	210	3
Conflicting Peds, #/hr	0	0	0		0 0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	p Stop		Free	Free	Free	Free	Free	Free
RT Channelized		l	None					-	None	*	18	None
Storage Length		1	•			1	(35)	•	•		•	•
/eh in Median Storage, #	i	0	•		0 -			0	1	-	0	
Grade. %	3	0	,				•			340	0	
Peak Hour Factor	92	92	92	o	92 92	92	92	92	92	92	92	92
leavy Vehicles. %	2	7	7				2		64	2	2	2
Avmt Flow	2	2	-				(*)	33	40	-	228	10
Sandillinot	Minor	ï	i	Minor		ğ	Majori	B		Major	H	
Conflicting Flow All	286	284	231	284	4 284	45	234	0	0	45	0	ľ
Stage 1	233	233	i	4	48 48	1	Í	of the second		*	A)	
Stage 2	53	51	١	236	6 236			3	7	354	∰ .	150
Critical Hdwy	7.12	6.52	6.22	7.1	Ĭ	622	412	100	74	4.12	GF.	Î
Critical Hdwy Stg 1	6.12		1	6.12		٠			76	•	36	it.
Critical Hdwy Stg 2	6.12		i	6.1		0			ī	i	y	ST2
Follow-up Hdwy	3.518	4	3.318	3.518	4	38	2.218	*	Ŧ,	2.218	(* j.)	Ť
Pot Cap-1 Maneuver	999		808	99		1029	1333		4	1563	ľ	i
Stage 1	770	712	٠	962		9/1		Ì			•	1
Stage 2	096	852	ŀ	76	7 710			8			9	
Platoon blocked, %									ai		ję.	7,1
Aov Cap-1 Maneuver	658	623	808	99	1 623	1029	1333	1	3	1563	×.	
Aov Cap-2 Maneuver	658	623	•	991		*		0.0	**	*	(8)	î
Stage 1	768	711	7	96		(†)	,	0	*		*	
Stage 2	949	820	,	75	602 6	X	ì			1	**	H
onreach	Œ	ı	j	*			2		i	88		ij
ICM Control Delay, s	10.6	ı		10	4	l	9.0			0	ij	П
HCM LOS	80			В	8			H				
ling Lane Macc Muni	TEN:	ie.	MBRE	MBREELATMELA	1 SBI	188	SBR					
anacity (veh/h)	1333	1	1	652 687	7 1563	31						d
HCM Lane V/C Ratio	0 002	•	0	0	0		72					
HCM Control Delay (s)	7.7	0	4	10.6 10.4	4 7.3							
HCM Lane LOS	A	A	*	В	B A	¥	*					
HCM 95th %tile Q(veh)	0	9.	ň	0.1 0.1	1 0	*	T.				ĕ	

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Int Delay, siveh 15 East EBR Well Well Well Well Well Well Well We														
The color of the		1.5												
10 10 5 4 10 3 1 146 12 4 4 10 3 1 146 12 4 4 10 10 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Мометел	H	B	660	W	BL. W	BI	WER	NEC	NET	NBR	SBI	SBIT	SBR
10 10 5 4 10 3 1 146 12 4 10 10 10 10 10 10 10	Lane Configurations		4				4			4			4	
10 10 5 4 10 3 1 146 12 4 4 10 10 10 10 10 10	Traffic Vol, veh/h	10		2		4	9	er	-	146	12	4	92	10
10 0 0 0 0 0 0 0 0 0	Future Vol, veh/h	10		2		4	10	3	_	146		4	92	10
Stop Stop Stop Stop Stop Free Free Free	Conflicting Peds, #/hr	0		0		0		0	0	0		0	0	0
March None	Sign Control	Stop		Stop	ਲ			Stop	Free			Free	Free	Free
1	RT Channelized	5		None				lone					Í	None
1	Storage Length	95	(4)				•		1/4		1/4	٠	•	ľ
11	Veh in Median Storage, #	100	0	14		•	0	٠		0		C	0	ľ
15	Grade, %	•		(*)			0	ı	•	0		•	0	ľ
1	Peak Hour Factor	26		92			35	92	92	92	92	92	92	92
11 11 5 4 11 3 1 159 13 4 10 18	Heavy Vehicles, %	2		2			7	2	2	2	2	2	2	2
Minute M	Myrrit Flow	=	-	9		4	11	3	1	159	13	4	100	11
14 14 - 167 167 - 172 174 174 - 167 167 - 172 174 174 - 167 167 - 174 174 - 167 167 - 174 174 - 162 120 - 172 174 174 - 122 120 - 172 174 174 - 122 120 - 172 174 174 - 122 172														ı
174 14	Majoralistic Class All	2000		404	Min	9	100	101	A44	٩	•	A 20	ď	ľ
14 14 14 10 10 10 10 10	Connicang Flow All	744	п	62	7 7		0,0	60		>	>	7/1	0	>
174 174 174 175	Stage 1	474		٠	ľ		200			•		*	¥ (1
1,1 2,2 2,2 1,1 2,2 2,2 2,1 2,2 2,2 2,1 2,2 2,2 2,1 2,2	2 affile 2	740	1	' 6			2 2	, ,	. 40		0			١
642 552 - 612 552 - 612 552 - 642 552 - 642 552 - 642 552 - 642 552 - 642 552 - 642 552 - 642 552 642 651 650 949 648 621 879 1479 - 651 650 949 648 621 879 1479 - 651 650 949 648 621 879 1479 - 651 650 949 648 621 879 1479 - 651 650 949 882 794 - 651 650 949 882 794 - 651 651 650 949 882 794 - 651 651 651 651 651 651 651 651 651 651	Crocal Howy	7 7		77.0	- · ·		72	p.77	4.12	*	v	4.12	٧	٠
10	Ontical Howy Stg	21.0			o o		25		7.0	*	¥6	*	*	
3518 4,018 3,318 3,518 4,018 3,318 2,218 - 664 6,22 949 663 623 879 1479 - 651 620 949 648 621 879 1479 - 651 620 949 648 621 879 1479 - 651 620 949 648 621 879 1479 - 648 621 879 1479	Cutical Hdwy Stg 2	612			9		25			*	¥ř.		0	i
664 822 949 663 823 879 1479	-ollow-up Hdwy	3.518		3.318	3.5		18	.318	2.218	1		2.218	٠	1
891 801 835 760	ot Cap-1 Maneuver	664		949	9		53	879	1479			1405	(30)	12
828 755 882 796	Stage 1	891			89		09.		11.2	1	era.	9	9	9
661 620 949 648 621 879 1479 51 851 851 852 848 621 879 1479 51 820 794 82 794	Stage 2	828		100	80		96	-			14	(è	2).	65
651 620 949 648 621 879 1479 651 620 879 621 879 1479 651 620 648 621 621 621 621 621 621 621 621 621 621	Platoon blocked, %									(*)	À		/6	.*
10.5 10.5 10.6 10.5	Mov Cap-1 Maneuver	651	620	949	9		171	879	1479	Z	× i	1405	×	0.7
890 799	Mov Cap-2 Maneuver	651		0	9		171	1	#10 ************************************	*	15		90	191
FEB WE 794 FEB WE 794 FEB WE 10.5 FEB WE 10.5 FEB	Stage 1	890			80		.26	,			ŕ	1	0	1
10.5 10.6 0.0 0 10.5 10.6 0.0 0 10.5 10.6 0.0 0 1479 - 680 662 1405 - 10.5 10.5 10.5 10.5 10.5 10.5 10.5 10.5	Stage 2	812		•	80		94			1		ĺ	٠	
10.5 10.6 0.0 0 10.5 10.6 0.0 0 10.5 10.6 0.0 0 1479 - 680 662 1405 1479 - 10.5 106 76 0 7.4 0 10.5 106 76 0 0.0 0.1 0.1 0.1 0 0.0 0.1 0.1 0.1 0				ij					ı	ı	ı	ł		
10.5 10.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Approach	88		ì		en en	ľ		NB	ĺ		SB		
NRL NET REREDITIVELT SEL SE 1479 - 680 662 1405 0.001 - 0.04 0.028 0.003 7.4 0 - 10.5 10.6 7.6 A A - 0.1 0.1 0.1 0	HCM Control Delay, s	10.5			10	90			0			0 3		
1479 - 680 662 1405 0.001 - 0.04 0.028 0.003 7.4 0 - 10.5 106 7.6 A A A 0 - 0.1 0.1 0	HCM LOS	В	1			В								
1479 - 680 662 1405 0.001 - 0.04 0.028 0.003 7,4 0 - 10,5 106 7,6 A A B B A A B B A A D 1 0,1 0,1 0														ı
1479 - 680 662 1405 0.001 - 0.04 0.028 0.003 7.4 0 - 10.5 106 7.6 A A B B A A 0 - 0.1 0.1 0.1	Sinor Lane Major Myntt	NBI	MBIT	MBRE	Luting	nt S	-	SEL SE	~	H	Ĭ		Ĭ	ï
0.001 - 0.04 0.028 0.003 7.4 0 - 10.5 106 76 A A B B B A 0 - 0.1 0.1 0	Capacity (veh/h)	1479	*				92							Ī
7.4 0 - 10.5 106 76 A A B B A 0 - 01 01 0	HCM Lane V/C Ratio	0.001		7)		0	03	*0	10					
A A B B A O O O O O	HCM Control Delay (s)	7.4					9 /	0						
0 - 0,1 0,1	HCM Lane LOS	A		•		В	4	A						
	-ICM 95th %tile Q(veh)	0			g	-1	0	0						Î

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2040 Total AM.syn 12/12/2017

(Instruct)	120	100	COD		d	WET	COM	60	HO!	OGN	9	9	8
and Configurations	ď	*	1			•	100		4	NGS.	Ž.	9	ğ
Traffe Value (the		+	0		4.0	ŀ	c	c	1 8			\$ 5	
Hallic Vol. Verin	Ω (0 1	0 9		7	<u>د</u> د	n (97		n		017	
Future Vol, veh/h	2	2	16		12	S	3	28		2	_	210	
Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0	0	Ĭ
Sign Control	Stop	Stop	Stop		Stop	Stop	Stop	Free	正	Free	Free	Free	Free
RT Channelized	1		None		. •		None		•	None			None
Storage Length		1	1		•	'		İ	ľ				
Veh in Median Storage, #		0			•	0	è		0			0	
Grade. %	-	0			٠	0	•	ľ		.c[•		c	
Peak Hour Factor	65	6	6		65	65	65	92		00	00	00	92
Heavy Vehicles %	2				,	,	3 6	10	, ,	, 0	3 0	, ,	3
Mvmt Flow	2	KO.	17		13	I VO	က	30		ı vo	,-	228	
Majort Minner	Margo		l	2	100			Tane!			Majori		
Conflicting Flow All	340	338	231		348	339	42	234	0	0	45	0	ľ
Stage 1	233	233	·		103	103	ä	74			-		
Stage 2	107	105	•		245	236							
Critical Hdwy	7.12	6.52	6.22		7.12	6.52	6.22	4.12	13	1.0	4:12	Đ.	
Critical Hdwy Stg 1	6.12	5.52	1		6.12	5.52			*		£1 7 .	*	
Critical Hdwy Stg 2	6.12	5.52	1		6.12	5.52			,	*	*	8	
Follow-up Hdwy	3.518	4.018	3,318	က	3.518	4.018	3.318	2.218	٠		2.218	*	
Pot Cap-1 Maneuver	614	583	808		209	582	1029	1333	*		1563		, i
Stage 1	770	712	٠		903	810	٠			٠	•	٠	ľ
Stage 2	868	808	٠		759	710	•			×	17	E	f
Platoon blocked, %												Š	
Mov Cap-1 Maneuver	296	999	808		579	268	1029	1333	24	1	1563	ě	
Mov Cap-2 Maneuver	596	269	1		579	268			*	(4.		*	
Stage 1	752	711	ì		882	791	i,	•	88			×	
Stage 2	869	789	•		736	209	ı,	•	-	90	8	0	1
Approach	88	į,		Ş	WB	Ĭ,	i i	2	Į	i	88	Ĭ	H
HCM Control Delay, s	10.3		ī		11.1		Į	3.2		i	0	Ĭ	k
HCM LOS	Ω.				8		ı			۱			
Minne Language Marie	200	NRT	NBO S	RO CRImination	3	CEL	TOS	00	П	ı	ı		п
Capacity (veh/h)	1333	ľ	1	703	616	1563				l		ŀ	ı
HCM I ane V/C Ratio	0.03	1				0.00	19	Ř					
HCM Control Delay (s)	7.8	0	4			7.3	_						ľ
HCM Lane LOS	<	<	Ė		ď	4	4						
					1								

HCM 2010 TWSC 14: Whitney Road & Storey Boulevard/Beckle Road

	6.3											
Toversent	Ħ	183	200	8M	WBI	38/M	Med	181	MBR	SBI	188	ă
ane Configurations		d			4			4			÷	
raffic Vol, veh/h	10	10	43	ĺ	1 10		32	146	12	4	92	10
-uture Vol. veh/h	10	10	43	Ī	1 10		32	146	12	4	92	10
Conflicting Peds, #/hr	0	0	0	Ì			0	0	0	0	0	0
Sian Control	Stop	Stop	Stop	Stop		S	Free	正	Free	Free		Free
RT Channelized	35		None			None			None	×.	<u>(0</u>	None
Storage Length		N.	14		38			•		*	(4)	
/eh in Median Storage, #	•	0	1		0		Ė	0	ŀ		0	ľ
3rade. %	*	0	٠				•	0	ı	٠	0	ľ
Peak Hour Factor	92	92	92	92	2 92	92	92	92	92	92	92	92
Heavy Vehicles. %	2	2	2				2	7	2	2	2	2
Avmt Flow	#	=	47			10	35	159	13	4	100	=
tandline	2	i	Ì			ł	Take I			VEI012		
Conflicting Flow All	356	355	105	37	355	165	111	0	0	172	0	ľ
Stage 1	114			235				100	10		N	
Stage 2	242		1	14			2	(6)	:: * :		(2)	Í
Critical Hdwy	7.12		6.22	7.1	2 6.52	6.22	4.12	H		4.12	•	i
Critical Hdwy Stg 1	6.12	5.52	ı	6.12				*	*		1	
Critical Howy Stg 2	6.12		٠	6.1								ì
ollow-up Hdwy	3.518	4.018	3.318	3.518	4	3.318	2.218	٠	٠	2.218	i	
ot Cap-1 Maneuver	599	571	949	280		879	1479	n		1405	1	Î
Stage 1	891	801	•	76			'	ò	3		1/4	
Stage 2	762	902		860	962 0			×	•	3	*	٩
Platoon blocked, %									35		•	ì
Nov Cap-1 Maneuver	575		949	23	1 554	879	1479	1	,	1405	•	
Nov Cap-2 Maneuver	575		i	531		•		(*)	×	(4)	46	Ü
Stage 1	898		٠	74					٠	90	\$5	Ü
Stage 2	728	- 3	٠	804		•	Ì	.0	ħ.		Ť	
document.	B			OW.	0	ı	S			9	ı	
JOM Cooked Dolour	10.4	ı		113		ŀ	1.3	Ì		6.3		l
HCM LOS	2 80											
Make Land Sport Marrie	E	WELL	NBRE	BENTABLE	88	SBI	SBR				Ī	
Capacity (veh/h)	1479	((4)	.(*	780 586	8 1405	7	10					
HCM Lane V/C Ratio	0.024		•	0	0		è					
HCM Control Delay (s)	7.5		٧	10.1 11.3	3 7.6	0						
HCM Lane LOS	A	A	10		B A		10					
HCM 95th %tile Q(veh)	0.1	ì	Y	0.3 0	0.1							

Synchro 9 Report Page 1

HCM 2010 TWSC 15: Whitney Road &

2040 Total PM.syn 12/12/2017

2017 Existing AM syn 12/12/2017

Drive
& Buttercup
Road &
Whitney

int Delay, stveri	0.0						
cvement	WSL	WBR	MBT	MBR	386	SBT	Ī
Lane Configurations	2		.2			44.	
raffic Vol. veh/h	12	-	33		-	169	
Future Vol, veh/h	12	,	33	τ-	-	169	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized		None		None	Z -	None	
Storage Length	0	*11	•		•0		
Veh in Median Storage, #	0		0	į		0	
Grade, %	0		0		1	0	
Peak Hour Factor	09	25	69	52	25	78	
Heavy Vehicles, %	2	2	2	2	2	2	
Wrmt Flow	20	4	48	4	4	217	ł
Distribute	Mont		Manuf		Misor		
Conflicting Flow All	275	20	0	0	52	0	
Stane 1	20				*		
Stage 2	225						
Critical Hrtwv	6.42	6.22			4.12		
Critical Hdwy Stg 1	5.42	3*/	. Te	9	5.		
Critical Hdwy Stg 2	5.42		3/6	(+	17		
Follow-up Hdwy	3.518	3,318	190	×	2.218	(F)	
Pot Cap-1 Maneuver	715	1018	T.		1554	, T	
Stage 1	972	٠	(*)		**		
Stage 2	812				X		
Platoon blocked, %			200	*		7.0	
Mov Cap-1 Maneuver	713	1018			1554		
Mov Cap-2 Maneuver	713		24	10	ž	(8)	
Stage 1	972	757			17.		
Stage 2	810	9	%	6X	9	9	8
percept	W8		NB		B		
HCM Control Delay, s	10		0		0.1		
HCM LOS	В						0
		ш					
mor Lanel Raign Munit	TEL	NBRWBLn1 SBL	SBI				1
Capacity (veh/h)							
HCM Lane V/C Ratio	٠	O					
HCM Control Delay (s)		- 10 7.3	0				
HCM Lane LOS		B A	¥				

HCM 2010 TWSC 15: Whitney Road & Buttercup Drive

nt Delay, s/veh	0,8							
forentent	WB.	WER	ł			25	Ø	185
ane Configurations	>				,2			42
raffic Vol, veh/h	00	0		1	125	15	2	29
Future Vol, veh/h	80	0		1	125	15	2	29
Conflicting Peds, #/hr	0	0			0	0	0	0
Sign Control	Stop	Stop		Ē	Free F	Free	Free	Free
RT Channelized		None				None	ľ	None
Storage Length	0					(8)		
Veh in Median Storage, #	0			l	0	,	ŀ	0
Grade, %	0				0	,	ľ	0
Peak Hour Factor	9	92			87	75	20	20
Heavy Vehicles, %	2	2			2	7	2	2
Myrrit Flow	20	0	8		14	20	4	96
aportifáritos	Minori		Ì	Man	,	ı	Major?	
Conflicting Flow All	258	154			0	0	164	0
Stage 1	154				s	30	*	9.
Stage 2	104	*			¥.	*:	*	ř
Critical Hdwy	6.42	6.22			*)	y.	4.12	
Critical Hdwy Stg 1	5.42				6	(6	•	
Critical Hdwy Stg 2	5.45	9			ci i			
-ollow-up Hdwy	3.518	3.318			104	0.	2.218	
Pot Cap-1 Maneuver	731	892			įš.	×	1414	×
Stage 1	874	٠			×			100
Stage 2	920	*			¥	٠	•	Ŷ
Platoon blocked, %					83	*3		9
Mov Cap-1 Maneuver	729	892			r		1414	
viov Cap-2 Maneuver	729					())	*	740
Stage 1	874	2			S.	20	25	
Stage 2	917	1/2			94	٠) (*	ű,
noncach	WE		ŀ	*	19		98	
HCM Control Delay, s	10.1				0	o	0.3	
HCM LOS	œ	ı						
the language Marre	181	MBRWBLni	281	IBS	Н		H	
Sapacity (weh/h)		- 729	1414	1	ı		ı	
HCM Lane V/C Ratio	(it)	0 0 0 27	0.003	7/4/				
HCM Control Delay (s)	4	10.1	9.7	0				
HCM Lane LOS		œ .*	A	A				
+CM 95th %tile Q(veh)	*	0.1	0	0				

Synchro 9 Report Page 1

HCM 2010 TWSC 15: Whitney Road & Buttercup Drive

2017 Existing PM.syn

2040 Background AM,syn

fovernent	WEE	1100		NBT	MER	SBI	SBT	
Lane Configurations	N.			+2			47	
raffic Vol, veh/h	16	1		\$	-		225	
Future Vol, veh/h	16	-		44	-	-	225	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized	120	None		2	None		None	
Storage Length	0	10		•				
Veh in Median Storage, #	0	.0.		0			0	
Grade, %	0	B		0		1	0	
Peak Hour Factor	92	92		92	92	92	92	
Heavy Vehicles, %	2	2		2	2	2	2	
Vivint Flow	17	-		8	<u>-</u>	_	245	
Carrellinor	Minnet			Total Control	ł	Court		
Conflicting Flow All	295	48		0	0	49	0	
Stage 1	48			(4	12			
Stage 2	247	300		*		ľ	:	
Critical Hdwy	6.42	6.22		2	٠	4.12	v	
Critical Hdwy Stg 1	5.42	¥.		89	.	*.	*	
Critical Hdwy Stg 2	5.42			٠		•		
Follow-up Hdwy	3.518	3,318		(4)	7.	2,218	ĸ	
Pot Cap-1 Maneuver	969	1021		0	8	1558		
Stage 1	974	î.		705	7.	(Za	Vise	
Stage 2	794	v		×			3	
Platoon blocked, %				(*)	(P)		141	
Mov Cap-1 Maneuver	969	1021		*(1	1558		
Mov Cap-2 Maneuver	969	2/2		*	50	*	•	
Stage 1	974						¥	
Stage 2	793	74)			0.	•	ļ	
riprosch	W.B		ļ	NE		83		
HCM Control Delay, s	10.2			0		0		
HCM LOS	œ							
inor Lanethajor Munit	MBT	(BENVELIT)	SBL SBT	ľ	h	ŀ	7	Or other Party of the
Capacity (veh/h)			1558				Di Loui	
HCM Lane V/C Ratio	20							
HCM Control Delay (s)	*	- 102						
HCM Lane LOS	e e	ω,						
10 10 10 10 10 10 10 10 10 10 10 10 10 1								

HCM 2010 TWSC 15: Whitney Road & Buttercup Drive

2040 Background PM.syn

	C.D						
A CONFOSERS	MR	WRR	ľ	TEN	MBR	5	SBI
ane Confinirations	N			+2			43
Traffic Vol. web/h	- =	0		166		co	68
Future Vol. veh/h	÷	0		166	20	3	88
Conflicting Peds, #fhr	0	0		0		0	0
Sign Control	Stoo	Stop		Free	ŭ	Free	Free
RT Channelized		None					
Storage Length	0			ľ		,	
Veh in Median Storage #	0		ŀ	0	Œ		0
Grado %	c	ľ		-		ľ	
Dook Hour Eacher	8	00		65		65	
House Mohidan W	, ,	200					200
Murrit Flow	12	0		180	22	1 60	
(Involution)	Minori			Mapri		Majore	
Conflicting Flow All	294	191		0	0	202	0
Stage 1	191					ĺ	×
Stage 2	103	*		*	3(4)		*
Critical Hdwy	6.42	6.22			(*)	4.12	
Critical Hdwy Stg 1	5.42	•		·	1		œ.
Critical Hdwy Stg 2	5.42	i					
Follow-up Hdwy	3.518	3.318		3	100	2.218	\$(*
Pot Cap-1 Maneuver	269	851			14	1370	28
Stage 1	841	(-*		15	¥.		*
Stage 2	921	•		100	300		
Platoon blocked, %		100000			144		×
Mov Cap-1 Maneuver	969	851			(21	1370	
Mov Cap-2 Maneuver	969	*1		2	20	•0	•
Stage 1	841						
Stage 2	919	-£		۰		•	a
Approach	98		Ì	WB		SB	
HCM Control Delay, s	10.3			0		0.2	
HCM LOS	B						
						1.	
MinortaneManchimit	NET	NBRWBLn1	SBI	SEI	H		
Capacity (veh/h)	i i	969	1370	*			
HCM Lane V/C Ratio	8	- 0.017	0.002	ž.			
HCM Control Delay (s)		- 10.3	9.7	0			
HCM Lane LOS	:s:		¥	A			
HCM 95th %tile Q(veh)		0.1	0	191			

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HCM 2010 TWSC 15: Whitney Road & Thomas Road/Buttercup Drive

2040 Total AM.syn 12/12/2017

Intersection	ļ	ı			ij	1							H
Int Delay, s/veh	3												
Movemen	E81	EBI	EBB		WBL	WBI	MBR	MBE	IBI	MBR	SBi	SBI	88
Lane Configurations		Ą				+}						4	
Traffic Vol, veh/h	2	10	63		16	40	-	37		10		240	i
Future Vol, veh/h	5	5	63		16	S	-	37		-	_	240	
Conflicting Peds, #/hr	0	0	0		0	0	0	0		0	0	0	
Sign Control	Stop	Stop	Stop		Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	×		None				None		Ì				None
Storage Length		٠			•	10	7,8		13	()	.ca		
Veh in Median Storage, #		0				0	•		0		Ď	0	
Grade. %	•	0	.4		•	0	4	ĺ	0	•	(140)		
Peak Hour Factor	92	92	92		92	92	92	92			92	92	6
Heavy Vehicles, %	2	7	2		2	7	2	2	2	2	2		
Mvmt Flow	22	5	89		17	2	-	40		-		261	
													П
Majoriffinor	Panor?	ļ	Ï	Į,	in t	ì		Major		7	Filasor2		d
Conflicting Flow All	425	423	264		459	424	92	266	0	0	76	0	
Stage 1	266	566	,		156	156			2	N.		3	
Stage 2	159	157	•		303	268	•			i i	0.4	()	
Critical Howy	7.12	6.52	6.22		7.12	6.52	6.22	412		ia N	4.12	0	
Critical Hdwy Stg 1	6.12	5.52	,		6.12	5.52	٠) <u>*</u>	(N	.*		
Critical Hdwy Stg 2	6.12	5.52	٠		6.12	5.52	ŀ		À	II.		*	
Follow-up Hdwy	3.518	4 018	3.318	(,,		4.018	3.318	2.218	*	-	2,218	*	
Pot Cap-1 Maneuver	540	522	775			522	985	1298		¥	1523	*	
Stage 1	739	689	٠		846	769	•				•	(1)	
Stage 2	843	299			902	687	·		ĺ	4		30	
Platoon blocked, %									3	8		((*	
Mov Cap-1 Maneuver	522	505	77.5		451	202	985	1298		4	1523	•	
Mov Cap-2 Maneuver	522	505	1		451	202				12	0		
Stage 1	715	989	•		818	74	•			4	*	*	
Stage 2	808	743	•		638	989	×			4			
Anomach	84		ı	ı	9	B		*			88		
HOM Control Delay s	10.6	ı		ŀ	13	ı	i	27			C	ļ	П
HCM LOS	e m				<u> </u>								
Miny Fame Make Mont	RW.	IBI	NBRE	REBLANN	Biret	38	188	388				3	
Capacity (veh/h)	1298	13	ľ	724	474	1523	119	117		ľ			
HCM Lane V/C Ratio	0.031	1/2		0.11		0.001	2.9	11					
HCM Control Delay (s)	7.9	0	3	10.6	13	7.4	0						
HCM Lane LOS	A	⋖		8	80	K	A	۰					
All the same and a second													

HCM 2010 TWSC 15: Whitney Road & Thomas Road/Buttercup Drive

State		١							Ī					
Fig. Egg. Fig. Fig. Fig.	Int Delay, s/veh 3,8	8												
## 10 10 78 11 11 10 0 94 197 20 3 127 10 10 78 11 11 10 0 94 197 20 3 127 10 10 78 11 11 10 0 94 197 20 3 127 10 10 10 78 11 11 10 0 94 197 20 3 127 10 10 10 78 11 11 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Мочетел	183	EBI	883	*	H	191	WER	¥	MBT	NBR	SBL	Sel	SBB
10 10 78 11 10 0 94 197 20 3 127	Lane Configurations		÷				4			4			4	
10	Traffic Vol, veh/h	10	10			=	9	0	8	197	50	es	127	10
Stop Stop Stop Stop Stop Stop Stop Stop	Future Vol, veh/h	10	10				10	0	94	197	20	က	127	10
Stop Stop	Conflicting Peds, #/hr	0	0					0	0	0	0	0	0	0
## 1 None	Sign Control	Stop			SS			Stop	Free	Free	Free	Free	Free	Free
## - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 -	RT Channelized							None		•	None		•	None
9ge #	Storage Length	*	20	(*)				(8)	310	×		2.0	*	120
11 11 85 92 92 92 92 92 92 92 9	Veh in Median Storage, #	,	0	1		1	0	*	ľ	0			0	ľ
1	Grade, %	•		,			0	10	1	0			0	ľ
11 11 85 12 2 2 2 2 2 2 2 2	Peak Hour Factor	92		92		92	92	92	92	92		92	92	92
Minor 11 11 85 12 11 0 102 214 22 3 13	Heavy Vehicles, %	2		2		2	2	2	2	2		2	2	2
Minter M	Mvmt Flow	11		85		12	Ξ	0	102	214		3	138	Ξ
Markey M														
S85 590 143 627 584 225 149 0 0 236 150 150 - 429 429 - 429 150 150 - 429 429 - 429 17.12 6.52 6.22 7.72 6.52 6.22 4.12 17.12 6.52 6.22 7.72 6.52 6.22 17.12 6.52 - 6.12 5.52 17.13 6.12 5.52 - 6.12 5.52 17.14 6.12 5.52 - 6.12 5.52 17.15 6.12 5.52 - 6.12 5.52 17.15 6.12 6.22 4.12 - 6.12 17.15 6.12 6.22 4.12 - 6.12 17.15 6.12 6.22 4.12 - 6.13 17.15 6.12 6.22 4.12 - 6.13 17.15 6.12 6.22 4.12 - 6.13 17.15 6.12 6.22 6.12 - 6.12 17.15 6.12 6.22 4.12 - 6.13 17.15 6.12 6.22 6.12 - 6.13 17.15 6.12 6.22 6.12 - 6.13 17.15 6.12 6.22 6.12 - 6.13 17.15 6.15 6.15 6.15 17.15 6.15 6.15 6.15 17.15 6.15 6.15 6.15 17.15 6.15 6.15 6.15 17.15 6.15 6.15 6.15 17.15 6	Neion Tinor	Minor?			Min	E			Megari			Major	ı	
150 150	Conflicting Flow All	585		143	9	127	584	225	149	0	0	236	0	0
4.35 440 - 198 155 - 412 6.52 6.12 6.12 6.52 6.12 6.12 6.52 6.12 6.12 6.52 6.12 6.12 6.12 6.12 6.12 6.12 6.12 6.1	Stage 1	150			4	129	429		8	N.	200		(6)	1
1,12 6,52 6,52 7,12 6,52 6,52 4,12 4,11	Stage 2	435		,			155			<u>(*)</u>	×		A	
6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 - 6.12 5.52 6.12 5.12 6.12 5.12 6.12 5.12 6.12 6.12 6.12 6.12 6.12 6.12 6.12 6	Critical Howy	7.12		6.22	7.		6.52	6.22	412	2)	0	412	6	Ì
## 12.5	Critical Hdwy Stg 1	6.12		٠	6.		5.52			*			1	Ī
## 422 420 905 396 423 814 1432 - 133 81 8 2218 - 221 8 - 221	Critical Holwy Stg 2	6.12			9					4			16	
For the control of th	Fallow-up Hdwy	3.518			3.5			3,318	2,218			2.218	ì	
er 387 373 - 604 584 - 188	Pot Cap-1 Maneuver	422	420		e,		423	814	1432	1	Œ	1331	¥	
er 387 385 905 329 388 814 1432 133 er 387 385 905 329 388 814 1432 er 387 385 - 554 536 - 554 536 - 554 536 - 554 536 - 554 531 - 717 767 - 554 536 - 555 -	Stage 1	853	773		ę	04	584	T	[0]	15		(4)	*	•
Fer 387 385 905 329 388 814 1432 133 Fer 387 771 554 536 5 540 531 771 767 5 540 531 5 717 767 5 540 531 5 717 767 5 540 531 5 717 767 5 540 531 5 540 531 5 540 531 5 540 531 5 540 531 5 540 531 5 540 531 5 540 5 54	Stage 2	900	578	1	8	104	69/	ī	(8)	ľ	*	1	¥	nž.
387 385 905 329 388 814 1432 133 788 788 7 329 388 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Platoon blocked, %									20	93		(6)	.71.
### 1885 - 329 388 - 554 536 - 554 536 - 554 536 - 554 536 - 5554 536 - 5555 -	Mov Cap-1 Maneuver	387		902	67	129	388	814	1432	ì	100	1331	٠	ì
783 771 - 554 536	Mov Cap-2 Maneuver	387		,	כיי	129	388			U.S.		183	•	•
S40 531 - 717 767	Stage 1	783		1	49	254	536	-	30	3	3		30	ì
HER NEI NEI 158 23 HA32 - 710 355 1331 - 1432 - 0071 - 015 0.064 0.002 - 177 0 - 11 158 77 0 - 11 1	Stage 2	240		•	7	47	167		85	7.	īj.	54	79	۰
### NBI NBIEBITIVIST 15.8 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.4														
11 15.8 2.3 B C C C C C C C C C C C C C C C C C C	Approach	H				9			NB	h		88	Ų	Ē
nt sket sar sagres_nn/sun1 sig ser 1432	HCM Control Delay, s	11			¥	2.8			2.3			0.2	E	
1432 - 710 355 1331 - 0071 - 015 0064 0002 - 0071 - 015 0064 0002 - 017 0064 0002 - 017 0064 0002 - 018 0064 0002 - 018 0064 0002 - 019 0064 0002 - 019 0064 0002 - 019 0064 0064 0064 0064 0064 0064 0064 006	HCM LOS	В				ပ								
1432 . 710 355 1331				ŀ										
1432 - 710 355 1331 0.071 - 0.15 0.064 0.002 5) 7,7 0 - 11 158 7,7 A A B C A n) 0.2 - 0.5 0.2 0	Minor LaneMajor Ment	MR	188	NBRE	Hammer,	T	SBI		38			ŀ		
0.077 - 0.15 0.064 0.002 3) 7.7 0 - 11 15.8 7.7 A A - B C A h) 0.2 - 0.5 0.2 0	Capacity (veh/h)	1432		,		11000	331			ı			q	1
lay (s) 7.7 0 11 15.8 7.7 A A B C A Q(veh) 0.2 0.5 0.2 0	HCM Lane V/C Ratio	0.071					000							
A A B C A Q(veh) 0.2 0.5 0.2 0	HCM Control Delay (s)	7.7	0	,		5.8	17	0						
02 - 05 0.2 0	HCM Lane LOS	×	4	j(t		O	K	V	:(*					
	HCM 95th %tile Q(veh)	0.2	(4	2		0.2	0	5						

Synchro 9 Report Page 1

HCM 2010 TWSC 16: Whitney Road & Chickadee Drive

2040 Total PM.syn

2017 Existing AM syn 12/12/2017

in Delay, siveri							
Movoment	WEL	MRR	NBT	MBR	房	Sei	
Lane Configurations	4		.1.			4	
Traffic Vol, veh/h	50	0	38	0	0	181	
Future Vol. veh/h	'n	0	36	0	0	181	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized		None	•	None	•	None	
Storage Length	0	Q.		(8)	×	100	
Veh in Median Storage, #	0		0			0	į
Grade, %	0		0	•		0	
Peak Hour Factor	62	92	75	92	92	82	
Heavy Vehicles, %	2	2	2	7	7	2	
Myrnt Flow	80	0	48	0	0	221	
MajorMindir	Minoril		Majort	E	Litajor2		3
Conflicting Flow All	269	48	0	0	48	0	
Stage 1	48	20		GP.	100	No. of the last	
Stage 2	221	*		(8)			
Critical Hdwy	6.42	6.22	*	ŀ	4.12		
Critical Hdwy Stg 1	5.42	- 4 C		*	•	ř.	
Critical Hdwy Stg 2	5.42				-		
Follow-up Hdwy	3.518	3,318	•		2.218		
Pot Cap-1 Maneuver	720	1021	0.		1559		
Stage 1	974			OP.	9	il &	
Stage 2	816	(*)	*	٨			
Platoon blocked, %			**	*		9	
Mov Cap-1 Maneuver	720	1021		r	1559		
Mov Cap-2 Maneuver	720	100		0		1,67	
Stage 1	974	25.00	700			- N	
Stage 2	816		::•		•		
					I		
Approach	WB		NB		SB		
HCM Control Delay, s	101		0		0		
HCM LOS	100						
Minor Lane Major Minit	NET N	BRWBLn1 SBL	185	Ķ			
Capacity (veh/h)		- 720 1559			l		
HCM Lane V/C Ratio	+.	- 0.011 -	¥				
HCM Control Delay (s)		- 10.1 0	Y				
HCM Lane LOS	12	æ					

HCM 2010 TWSC 16: Whitney Road & Chickadee Drive

2017 Existing PM.syn 12/12/2017

	0.4						
fovernent	WBI	WBR		181	MBR	SBI	SBT
ane Configurations	N.			42			4
Fraffic Vol, veh/h	49	0		137		0	78
-uture Vol, veh/h	9	0		137		0	78
Conflicting Peds, #/hr	0	0		0		0	0
Sign Control	Stop	Stop		Free	Free	Free	
RT Channelized	Y	None		•	None		None
Storage Length	0	*		•		٠	
Veh in Median Storage, #	0			0	i	ľ	0
Grade, %	0	*		0			0
Peak Hour Factor	20	92		78	29	92	72
Heavy Vehicles, %	2	2		2		2	2
Normt Flow	12	0		176		0	108
Dipolifing	Megel		į	Major		Major2	
Conflicting Flow All	290	182		0	0	188	0
Stage 1	182	٠		24	2		
Stage 2	108	*		*	ã.		10
Critical Hdwy	6.42	6.22		*		4.12	
Critical Hdwy Stg 1	5.42	*				. 63	; •);
Critical Hdwy Stg 2	5.42	100					3
Follow-up Hdwy	3,518	3.318			14	2.218	834
Pot Cap-1 Maneuver	701	861			34	1386	2
Stage 1	849				•	090	*
Stage 2	916			*	4	*	ň
Platoon blocked, %					(6) (8)		*
Aov Cap-1 Maneuver	701	861		50		1385	
Mov Cap-2 Maneuver	701	*		1	-		**
Stage 1	849			2			
Stage 2	916	(1 0)		.5	2		
Annuality	WB			9		SB	
HCM Control Delay, s	10.2		ı	0		0	
HCM LOS	œ						
liner I noofficient forms	NOT N	SESAMBLE OF	CDI	100			
Canacity (wah(h)	101	102	1386			ı	
HCM Lane V/C Ratio		- 0.017	*				
HCM Control Delay (s)		- 10.2	0	1			
HCM Lane LOS		æ	¥	Š.			
HCM 95th %tile O(veh)	ā	0.1	0				

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HCM 2010 TWSC 16: Whitney Road & Chickadee Drive

2040 Background AM.syn

Int Delay, s/ven	9							
Movement	MBI	WBR		NBI	NBR	SBI	SET	
Lane Configurations	×-			+ 2.			4	
Traffic Vol. veh/h	7	2		48	0	0	241	
Future Vol., veh/h	7	2		48	o	0	241	
Conflicting Peds. #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized		None			None	•	None	
Storage Length	0	,		(e)		3	(*)	
Veh in Median Storage. #	0	٠		0			0	
Grade %	0			0			0	
Peak Hour Factor	92	92		92	92	92	92	
Heavy Vehicles, %	2	2		2	2	2	2	
Mvmt Flow	œ	2		25	0	0	262	
MajoriMinor	Minort			No.		Major?		
Conflicting Flow All	314	52		0	0	52	0	
Stage 1	25	16		6				
Stage 2	262	(*)		, j	i †		3:	
Critical Hdwy	6.42	6.22		1/4	(e	4.12		
Critical Hdwy Stg 1	5.42	S.			*	1	×	
Critical Hdwy Stg 2	5.42	100		Á			141	
Follow-up Hdwy	3.518	3.318		9.	×	2.218	(6)	
Pot Cap-1 Maneuver	629	1016		ě	ě	1554		
Stage 1	970	Ò		*	•0	ĺ		
Stage 2	782	-			r			
Platoon blocked, %				90			17.5%	
Mov Cap-1 Maneuver	629	1016		3		1554	/#	
Mov Cap-2 Maneuver	629	4		*	:	1	0	
Stage 1	970	3		9	(B)		1	
Stage 2	782	×		*	×	0	*	
Appreach	WB.			9		88		
HCM Control Delay s	10			0		0		
HCM LOS	2 00							
Time Lange Maint Month	MRT	MRRWR1m1 S	SB1	ı				
Canacity (weh/h)		733	1554	ı	l	l		
HCM Lane V/C Ratio	11.							
HCM Control Delay (s)	-	10	0					
HCM Lane LOS	2	8	A					
1 10 11 0 11 0 1 10 1 10 1 10 1 10 1 1		•						

HCM 2010 TWSC 16: Whitney Road & Chickadee Drive

niersection	8						
Int Delay, s/veh 0.4	4						
Novement	MAL	WER	MBT	MBR	188	SBT	
Lane Configurations	7		.2			4gr	
Traffic Vol. veh/h	00	4	182	11	0	104	
Future Vol. vehih	000	4	182	11	0	104	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	
RT Channelized		None	3	None		None	
Storage Length	0		0*	39	(if	W	
Veh in Median Storage, #	0		0		ľ	0	
Grade, %	0		0	(8)	,	0	
Peak Hour Factor	92	92	92	92	92	92	
Heavy Vehicles, %	2	2	2	2	2	2	
Mymt Flow	6	4	198	12	0	113	
MajorMinor	Minnet		Maiori	į	Major?		
Conflicting Flow All	317	204	0	0	210	0	
Stage 1	204	0.0	74	39	17	9	
Slage 2	113	2.00	×	78	i.e.	()	
Critical Hdwy	6.42	6.22	4	٠	4.12		
Critical Hdwy Stg 1	5.42	7.00	£	*	ľ	7.87	
Critical Hdwy Stg 2	5.42					100	
Follow-up Hdwy	3.518	3.318	ř		2.218	-	
Pot Cap-1 Maneuver	929	837	*	30	1361	•	
Stage 1	830	j)	334	9 4	•	30	
Stage 2	912	1		V	•	3	
Platoon blocked, %			W.	•		100	
Mov Cap-1 Maneuver	9/9	837	*	×	1361		
Mov Cap-2 Maneuver	929	• 2	10			*	
Stage 1	830	00					
Stage 2	912	(0)	(0)) • :		(e)	
Desirence	divi		WD	١	g		
Control of the Contro	40.4		•	l	9		
HCM LOS	B 8		0				
				ı			
Nuor LaneMajor Myrnt	NST J	BRWBLn1 SBL	SBT				
Capacity (veh/h)	9)	- 722 1361	ř				
HCM Lane V/C Ratio	£		25				
HCM Control Delay (s)		- 10.1 0	4				
HCM Lane LOS	(0)	, B A	le:				
HCM 95th %tile Q(veh)		0 1 0	74				

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HCM 2010 TWSC 16: Whitney Road &

2040 Background PM.syn

2040 Total AM.syn 12/12/2017

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lovement	ESI	EBI	EBS	MBI	WET	WBB	NBI	NBI	MBR	SBI	193	380
ane Configurations		4			4			4-			4	
raffic Vol, veh/h	5	5	20	7	5	2	28		0	0	319	5
-uture Vol, veh/h	5	2	20	7	5	2	29		0	0	319	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	_	Free	Free	Free	Free
RT Channelized		1	None	j	1	None			None			None
Storage Length		•	a		,	•		1		•	•	ľ
/eh in Median Storage, #	·	0	4		0	٠		0			0	1
Grade, %	•	0	134	1.5	0			0	: 0		0	ľ
Peak Hour Factor	92	92	92	92	85	65	92		65	6	92	65
leavy Vehicles. %	2	2	2	2	7	2	2	2	2	2	10	2
Avmt Flow	9	5	Z	80	5	2	32		0	0	347	S
Sept Minor	Minor?			Mingri						Fair 2		
Conflicting Flow All	535	532	349	562	535	120	352	0	0	120	0	0
Stage 1	349	349		183	183				×		(0)	1
Stage 2	186	183		379	352		±1-å	2.0			•	•
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	412	(a	×	4.12		
Critical Hdwy Stg 1	6.12	5.52		6.12				*	œ	1	ř	•
Critical Hdwy Stg 2	6.12	5.52		6.12		-	181	B				ı
-ollow-up Hdwy	3.518	4.018	3.318	3.518	4	3	2,218	*0	×	2.218		
ot Cap-1 Maneuver	456	453	694	438	452	931	1207	*		1468	0	ı
Stage 1	299	633		819	748	•				•		
Stage 2	816	748		643	632			Si .			0	١
Platoon blocked, %								3%	()		1	
Nov Cap-1 Maneuver	44	440	694	391	439	931	1207	4	90	1468	3	i
Nov Cap-2 Maneuver	441	\$		391	439	,		2.5	*	<u>.</u> *)	*	*
Stage 1	648	633	ì	962	727			*	•0)TI	ř	i
Stage 2	785	727		588	632	,			٠	20		
												h
presch	B	1		WB			SE .	à	100	88		ò
CM Control Delay, s	11.3			13.4			17			0		
HCM LOS	ന			Ф								
ner Finelithin flow	NED!	MET	MRDIDI	Coloutone	io	TOO	000	П	ľ	ı		
aposity (ush(h))	4307		623	2 AAE	1460		000					
JOM I and Wife Basic	9000		040	(1400							ľ
OM Lane V/C Rand	0.020	•	- 0.103	5 0.034	1 (•						1
HCM Control Delay (s)	80	0 <	11.3	-	0 4	Ť	*					
HCM Lane LOS	⋖	∢	8	9	⋖		*					

HCM 2010 TWSC 16: Whitney Road & Chickadee Drive

2040 Total PM.syn 12/12/2017

il Colaj, al col	7.7												
Overteal	H	8	H	j	181	WET	WBR	NBI	NBI	NBR	SBI	SBI	SBR
ane Configurations		4				4			4			÷	
raffic Vol, veh/h		10 10			80	9	4	75	307	11	0	220	10
-uture Vol, veh/h	-		62		00	10	4	75		11	0	220	9
Conflicting Peds, #/hr					0	0	0	0		0	0	0	0
Sign Control	Stop	p Stop	Stop		Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized					H	ď	None	i	٠	None	i	,	None
Storage Length			į		٠	•	4		•	•	•	1	•
/eh in Median Storage, #		0			3	0	4		0	٠	•	0	ľ
Grade. %					Ņ.	0		İ				0	,
Peak Hour Factor	O.				92	92	92	92	92	92	92	92	92
leavy Vehicles, %		2	2		2	7	2	2		2	2	2	2
Avrnt Flow		_	- 67		6	=	4	82	334	12	0	239	Ξ
andlinor	Mino		Ĕ,		finori	ľ		Magri		ł	Major		P
Conflicting Flow All	75	5 754	245		787	753	340	250	0	0	346	0	0
Stage 1	24				503	503		Î	*)		100	ì	ì
Stage 2	510	0 509			284	250			(0)	Q.	4	٠	y(.e.)
Critical Hdwy	7.1		6.22		7.12	6.52	6.22	4.12	1.9	3	4.12	14	١
Critical Hdwy Stg 1	6.1		۰		6.12	5.52	1	1.9	*	11.0	(<u>a</u>	¥	*
Critical Hdwy Stg 2	6.1				6.12	5.52	•	•	28		4	¥	L.K.
ollow-up Hdwy	3.51	4	3		3.518	4.018	3.318	2.218	×		2.218	841	
ot Cap-1 Maneuver	325		3 794		309	338	702	1316		7	1213	193	*
Stage 1	759				221	241		•	*	n	×	*	Ì
Stage 2	246	6 538	3		723	200	•	İ	*			*	i
Platoon blocked, %				n l	۱							•	i
lov Cap-1 Maneuver	83	296 312	794	i	259	313	702	1316		٠	1213	9	1
Aov Cap-2 Maneuver	53		1	į	259	313		•	1.0	Ú.	16	9	Ì
Stage 1	701				203	499	,			10		(*	*
Stage 2	4	497			921	92	•			×		(A)	•
porosch		18	Ä		88	D		WB			89		m
CM Control Delay, s	12.5	5		ŀ	17.1		ļ	1.5			0		
HCM LOS	N	8			O								
Sing LapelMaor Humi		NE NE	NBN I	EBLAN	Blat	胡	53	Siles			İ		
apacity (veh/h)	1316	9	ĺ	220	321	1213	h	ä					
HCM Lane V/C Ratio	0.062		241	0.156	0.074		3	a					
HCM Control Delay (s)	7	7.9	0	12.5	17.1	0	74						
HCM Lane LOS				- B	O	Þ	i i	(A)	ı				
JONA OF H. 9/ HIS OF WALL	_	0 0	70	90	0	C	À	,					

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HCM 2010 TWSC 17: Whitney Road & Foxglove Drive

Horzerfine						
veh	0.5					
Movement	WBL	WBR	NET NER	HS.	SBT	
Lane Configurations	¥		42.		¢¥.	
Traffic Vol, veh/h	4		33 2	Ī	187	
Future Vol, veh/h	4	-	33 2	_	187	
Conflicting Peds, #/hr	0	0		0	0	
Sign Control	Stop	Stop	Free Free	Free	Free	
RT Channelized		None	None		None	
Storage Length	0		304			
Veh in Median Storage, #	0		- 0		0	
Grade, %	0			•	0	
Peak Hour Factor	20	25	75 50	25	82	
Heavy Vehicles, %	2	2		2	2	
Myrrit Flow	œ	4	44 4	4	228	
			Total Control	100		
Mara Homes	MINES		THE STATE OF THE S	200		
Conflicting Flow All	282	46	0	48	0	I
Stage 1	46					
Stage 2	236		0.0	(8)	9	
Critical Hdwy	6.42	6.22		4.12	The second second	
Critical Hdwy Stg 1	5.42	Ť		*		
Critical Hdwy Stg 2	5.42	100	8	177		
Follow-up Hdwy	3.518	3.318	#S	2,218	*	
Pot Cap-1 Maneuver	202	1023	A THE REAL PROPERTY.	1559	(60	
Stage 1	976	187	1.0	٠	100	
Stage 2	803	3		9	9	
Platoon blocked, %			9.0		0.00	
Mov Cap-1 Maneuver	202	1023	2 2	1559		
Mov Cap-2 Maneuver	200	×	*	•	(4)	
Stage 1	976	2001				
Stage 2	801	100	***	*		

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9 6 A

HCM Control Delay, s HCM LOS

1 0 K

8KW8Lst SBL 787 1559 - 0.015 0.003 9.6 7.3 A A 0 0

Capacity (veh/h)
HCM Lane V/C Ratio
HCM Control Delay (s)
HCM Lane LOS
HCM Lane LOS
HCM B5th %tile Q(veh)

HCM 2010 TWSC 17: Whitney Road & Foxglove Drive

intersection	ľ	- CO		ĺ		
Int Delay, s/veh 0,8	8					
Novement	WEE	WBR	NBT	NBR	SEE	SBT
Lane Configurations	Ž.		+2.			4
Traffic Vol, veh/h		60	134	9	3	85
Future Vol, veh/h	-	80	134	9	က	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized		None	4	None		None
Storage Length	0	74	0.0	,	Ĭ.	78
Veh in Median Storage, #	0		0	ŀ		0
Grade, %	0		0		٠	0
Peak Hour Factor	52	90	82	30	38	73
Heavy Vehicles, %	2	2	2	2	7	2
Mvmt Flow	4	16	163	50	∞	116
Manufaline	Market		Tales II		Chiest	
Conflicting Flow All	305	173	0	0	183	0
Stage 1	173		-			14
Stage 2	132	¥	*	(K)	Ö	(A)
Critical Holwy	6.42	6.22		y	412	
Critical Hdwy Stg 1	5.42	(a)	**	×	8	200
Critical Hdwy Stg 2	5.42	*		*)	T.	
Follow-up Hdwy	3.518	3,318			2,218	
Pot Cap-1 Maneuver	687	871			1392	
Stage 1	857	101	\(\frac{1}{2}\)	() *	O.	
Stage 2	894			,		245
Platoon blocked, %			*	×		1.00
Mov Cap-1 Maneuver.	683	871	•	*	1392	
Mov Cap-2 Maneuver	683	2002	.6	3 411	7.0	(30)
Stage 1	857			*		
Stage 2	688	8		v	į	
Approach	WB.		NB		SB	
HCM Control Delay, s	9.5		0		0.5	
HCM LOS	×					
Minor Caneil Agor Munt.	NBT 1	SEL	SBT		Š	
Capacity (veh/h)		- 826 1392	41			
HCM Lane V/C Ratio	*()	õ	¥			
HCM Control Delay (s)	ti	7	0			
HCM Lane LOS	•	A A .	A			
HCM 95th %file O(veh)	1	0 1 0				

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HCM 2010 TWSC 17: Whitney Road & Foxglove Drive

2017 Existing PM.syn 12/12/2017

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Movemen	WEE	WBR	ľ	NBI	MBR	SBL	SBT	
Lane Configurations	2			1.			43	
Traffic Vol, veh/h	ĸ	-		44		100	249	
Future Vol, veh/h	чo	-		4	m		249	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized	(4)	None		10	None		None	
Storage Length	0	84		*				
Veh in Median Storage, #	0	1		0	,	13	0	
Grade, %	0	140		0		78	0	
Peak Hour Factor	92	92		92		92	92	
Heavy Vehicles, %	2	2		2	2	2	2	
Mvmt Flow	2	-		48		Ī	271	
Hajor/Minor	Minor			Majort		Manne		
Conflicting Flow All	322	49		0	0	51	0	
Stage 1	49	34		128	i.	0.0	14	
Stage 2	273	12		₽†.	ř	114	U#	
Critical Hdwy	6.42	6.22		283	7	4.12	4	
Critical Hdwy Stg 1	5.42	*		*	•	(*)	(4)	
Critical Hdwy Stg 2	5.45	•		2	,			
Follow-up Hdwy	3.518	3,318		*/:	Ť,	2.218	i.	
Pot Cap-1 Maneuver	672	1020		-		1555	1 ×	
Stage 1	973	ia.		×		2		
Stage 2	773	i i		0	ž		18	
Platoon blocked, %				**	Ť) K	
Mov Cap-1 Maneuver	671	1020			y	1555		
Mov Cap-2 Maneuver	671	¥.		٠	Ť	4	*	
Stage 1	973			*	ŕ			
Stage 2	772			ĺ	i		41	
Approach	8/8			80	l	88		
HCM Control Delay, s	101			0		0		
HCM LOS	8							
Minor LayelMajor Myrnt	NET 1	BRWELD	SELEC			l		
Capacity (vehit)	×	. 712	1555					
HCM Lane V/C Ratio)E	0.009 0.001	001	Ý				
HCM Control Delay (s)	*	101	7.3	0				
HCM Lane LOS	•	00	A	A				

2040 Background PM.syn HCM 2010 TWSC 17: Whitney Road & Foxglove Drive

mersection								
Int Delay, s/veh 0,5	5							
Movement	WHE	WBR		MBI	NBR	SBL	SBT	
Lane Configurations	2			+2			42	
Traffic Vol. veh/h	-	1		178	00	4	113	
Future Vol, veh/h	-	11		178	00	4	113	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized	•	None		•	None	**	None	
Storage Length	0			•		*	*1	
Veh in Median Storage, #	0			0		ì	0	
Grade, %	0	٠		0	٠	•	0	
Peak Hour Factor	92	92		92	92	92	92	
Heavy Vehicles, %	2	2		2	2	2	2	
Mymt Flow	-	12		193	6	4	123	
Rained finne.	Minori			Majort	ł	Elajor2		
Conflicting Flow All	330	198		0	0	202	0	
Stage 1	198	•		2	×	٠		
Stage 2	132	٠			(A)	A.C	36	
Critical Hdwy	6.42	6.22		*		4 12		
Critical Hdwy Stg 1	5.42	¥		*/				
Critical Hdwy Stg 2	5.42				8			
Follow-up Hdwy	3.518	3.318		(1		2.218	::*	
Pot Cap-1 Maneuver	999	843		1	4	1370		
Stage 1	835	٠		9		4.	*	
Stage 2	894			9	ĕ	*		
Platoon blocked, %				X	T		•1	
Mov Cap-1 Maneuver	663	843		000	×	1370		
Mov Cap-2 Maneuver	693	•		•		•		
Stage 1	835			0				
Stage 2	891	(30)	ı			1	()+	
			ı	I	ĺ	ľ		
Appropri	WB			MB		SB		
HCM Control Delay, s	9.4			0		0.3		
HCM LOS	V							
Minor Lane Major Mont	NET	VERMELOT	SBL SBI		200			
Capacity (veh/h)		- 824	1370	į				
HCM Lane V/C Ratio	φ1.	- 0.016 0	0.003	ų				
HCM Control Delay (s)		4.6	0 9.7	į	Î			
HCM Lane LOS		V	4					
HCM 95th %tile Q(veh)	3	0	0	į				

Synchro 9 Report Page 1

HCM 2010 TWSC 17: Whitney Road &

2040 Total AM.syn 12/12/2017

Drive	
Foxglove	
≪ნ	
Roac	
Whitney Road	

nt Delay, siven													
Instituti	EBI	EBI	EBR	ì	MET.	Wet	WBR:	MBI	NBI	NBB	SBL	SBT	SB
ane Configurations		¢				+}			4			4	
raffic Vol, veh/h	2	0	25		2	0	-	15	135	က	1	377	2
-uture Vol, veh/h	2	0	25		2	0	-	15	135	3	•	377	CA
Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0	0	٥
Sign Control	Stop	Stop	Stop	0,	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized		ľ	None				None		•	None		0.6	None
Storage Length	•		,		٠	1		•	٠			3	
/eh in Median Storage. #	,	0	'		•	0	i		0			0	
Frade %	٠	C			•	0	- 1	,	0			0	ľ
Peak Hour Factor	65	65	65		65	6	6	6	92	92	92	85	6
Heavy Vehicles %	, 0		10		10		0	0	0		2	6	
Wymt Flow	2	0	27		2	0	-	16	147	-	1	410	
Confilmen	Carrie	1	8		1		8	TAKE!	ı	Ì	Bland		
Conflicting Flow All	595	296	411		809	595	148	412	0	0	150	۰	Ĭ
Stage 1	413	413	ľ		181	181		8	ř.		0		
Stage 2	182	183	•		427	414	,		(1	4	9	(A	
Critical Hdwy	7.12	6.52	6.22		7.12	6.52	6.22	412	7	774	4.12	X	
Critical Hdwy Stg 1	6.12	5.52	10		6.12	5.52				12			
Critical Hdwy Stg 2	6.12	5.52	×			5.52					*	Y	
-ollow-up Hdwy	3.518	4.018	3.318	33		4.018	3.318	2,218	*	41	2.218	χij	71.6
Pot Cap-1 Maneuver	416	417	641		408	417	833	1147	1		1431	Y	
Stage 1	616	594	•		821	750						1	
Stage 2	820	748	1		909	593		A	•			(8)	Ĭ
Platoon blocked, %									•	4		3(4	
Alov Cap-1 Maneuver	410	410	641		386	410	899	1147	8	*	1431	24	
Mov Cap-2 Maneuver	410	410			386	410				î))•	(¥)	
Stage 1	607	593	8		608	739		*			×	(*)	
Stage 2	807	737			280	592	١	7.		*		*	
	ľ	ı	ı	۱		П		300	ı		4	ı	П
-tibroach	#	8	P			H		9		ŀ	8	ı	ı
HCM Control Delay, s	111				13,6			R'O	İ		9		
HCM LOS	00				m							п	R
Miner Lane Man Main	WE	IBI	MBB	REBLANDER	THE	SE	281 8	SBR					
Capacity (veh/h)	1147	ľ	18	615	427	1431	×						
HCM Lane V/C Ratio	0.014	'		0.048 0		0.001	gr.						
HCM Control Delay (s)	8.2	0	4	11.1	13.6	7.5	0					E	
HCM Lane LOS	A	⋖	100	В	മ	A	A	*					

HCM 2010 TWSC 17: Whitney Road & Foxglove Drive

nt Delay, siven	_												
Tovernent	Ħ	EBIT	EBR		186	TBM	WER	NBO	NBI	NBK	TBS	SBI	SBR
ane Configurations		4				+2			4			4	
raffic Vol. veh/h	4	0			-	0	11	38			4	291	4
uture Vol. veh/h	4	0	31		-	0	1	38		00	4	291	4
Conflicting Peds, #fhr	0	0			0	0	0	0			0	0	0
Sign Control	Stop	Stop	Stop	Ç	Stop	Stop	Stop	Free	Free	Free	Free	F.	Free
RT Channelized	i		None		•	•	None		i				None
Storage Length	,	1			i	i		7.5	2		•	1	
eh in Median Storage, #	1	0			•	0			0	٠	•	0	ľ
Grade, %	,		1		ı	0		ľ			•	0	ľ
Peak Hour Factor	92		92		92	92	92	92			92	92	92
eavy Vehicles, %	2	2	2		7	7	2	2		2	2	2	2
Nmt Flow	4		34		-	0	12	41	411		4	316	4
2000	à		ŀ	ŝ	\$			3					
Signatural Communication of the Communication of th	75000			400				MARDE	1	١	Medicina	ľ	ľ
Conflicting Flow All	831		318		847	827	415	321	0	0	420	0	0
Stage 1	327		1		498	498	٠	٥	•	ii:	•	*	17)
Stage 2	504		•		4	329		×	•	*		*	
Critical Hdwy	7.12	6.52	6.22	_	7.15	6.52	6.22	412			4 12	*	10
Critical Hdwy Stg 1	6.12		2	w	9.15	5.52	1	20	2	¥2.	*	9	
Critical Hdwy Stg 2	6.12			e.			1		-	-		-	ì
-ollow-up Hdwy	3.518	4	3,318	3			3.318	2,218		1141	2.218	(1)	
ot Cap-1 Maneuver	289	306	723		284	307	637	1239	8	9	1139	0	
Stage 1	989	648	4		554	544		12	*	37	.0*	98	2.5
Stage 2	220	545	3		671	646	,		3	24	(8)	(4	ii.
Platoon blocked, %										•		9	
Alov Cap-1 Maneuver	273	292	723		261	293	637	1239			1139	(8)	iti
Nov Cap-2 Maneuver	273		•		261	293		50		•	•	10	*
Stage 1	657	645			230	521	٠		j			*	1
Stage 2	516		٠		637	643	-		•	14	*	(9)	
ntarouth	Œ		Н		WB			NB.	١		55.		
CM Control Delay, s	11.3				115		4	0.7			0.1		
HCM LOS	Φ.				Ф								T
front front Brook Bawe	O.	REDIT	Singer	O STATE	2	ē	TOO	00	ı	ĺ			ì
anacity (veh/h)	1239	1		808	599	1139			h				ı
ICM Lane V/C Ratio	0.033		*			0.004							
CM Control Delay (s)	00		1	11.3	11.5	8.2	0						Ŕ
HCM Lane LOS	A	A	Ö		B	V	A						
HCM 95th %tile Q(veh)	0.1	77		0.2	0.1	0	(0	it					i

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HCM 2010 TWSC 18: Van Buren Avenue & Storey Boulevard

2040 Total PM.syn 12/12/2017

2040 Total AM.syn

Consenset	Œ	ŧ	OF THE	18/6	SURT.	MRP	3	MRT	CRN	8	185	KBS
NAME AND ADDRESS OF THE PARTY O	Total I	1	Parkett 1	101	•	NEOEs.	4	9	-13756	200	9	3
ane Configurations	1	ŧ			7			•			‡	1
raffic Vol. veh/h	2	20	82	2	38	2	132		2	5	2	S
-uture Vol, veh/h	S	20	85	ഹ	36	2	132		2	5	2	ഹ
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		,	None		ľ	None			None		•	None
Storage Length	٠	•			'		ľ	ľ		ľ	•	ľ
Jeh in Median Storage. #	•	0		ľ	C	1	ľ	C	,	-	C	1
Frade %	ľ	-		ľ			ľ			ľ	· c	ľ
Deals House Contra	6	3 0		' 8	8	5			6	' 6	2 5	, 5
eak Hour Factor	36	76	36	36	36	35	36		76	76	35	35
leavy Vehicles, %	7 4	7 6	7 00	7.	~ 6	7 2	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	7	7 -	7 .	7	7 .
WITH FLOW	C	7	76	C	25	c	54	8	C	C	۵	c
accitation	NS OF	ļ	١	Mace	Į,	ł	Minnet		ŀ	Cause C	j	Ī
Conflicting Flow All	45	0	0	114	0	0	137	13	89	137	178	42
Stage 1	3	8	ä	ST A	1.5		79	6/	1	53	53	ľ
Stage 2	9		140	199	3	j,	58	55	,	84	125	ľ
Critical Howy	4.12	1	V	4.12	35	ě	7.12	9	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	*)	*	*		*	ě	6.12			6.12	5.52	ľ
Critical Hdwy Stg 2	100	4	+		. 9	÷	612	5.52		6.12	5.52	ľ
-ollow-up Hdwy	2.218	•	100	2.218	P.		3,518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1563		a.	1475	24	3	834	757	995	834	716	1029
Stage 1	(F	4	274)(†	7)(7	930	829		096	851	Ï
Stage 2	39	7			2	100	954	849		924	792	ľ
Platoon blocked, %		*	140		3.	(*)						
Aov Cap-1 Maneuver	1563		ě	1475		÷	821	752	982	821	712	1029
Nov Cap-2 Maneuver	8	100	¥	100	ž.	ř	821	752		821	712	ľ
Stage 1	100	1	115	**			927	827		957	848	İ
Stage 2		7	ai.		1	ij	940	846	k	910	790	i
phroach	æ			WB	Ē		類		i	88		
HCM Control Delay, s	0.3			0.8			10.4			9.6		
HCM LOS							00			<		
mor Lane Major Myrint	MBlint	183	193	EBR. WELL	18/6	WBRSBL					Н	
apacity (veh/h)		1563	9	- 1475	3(6)	86	835				n	
HCM Lane V/C Ratio		0.003	80	- 0.004	**	- 0.02	20	ı			١	
ICM Control Delay (s)	10.4	7.3	0	7	0	6	9.4				i	I
HCM Lane LOS	B !	⋖ •	∢	Α .	∢		¥				Ì	
THE PARTY OF THE P						-						

	18: Van Buren Avenue & Storey Boulevard
	& Storey
SC	Avenue &
HCM 2010 TWSC	Buren
M 20	Van
S	18

2040 Total PM.syn

nt Delay, s/veh 5,2	7												
Movement	H	FBI	EBR	(4)	811	1	85	ME	MBI	NER	SBI	183	SBC
Lane Configurations		4							4			4	
Traffic Vol, veh/h	10	69	193			2	10	165	9		9	9	10
Future Vol, veh/h	10	69	193			42	10	165	10		10	10	9
Conflicting Peds, #/hr	0	0	0		0		0	0	0		0	0	0
Sign Control	Free	Free	Free	Free	ŭ		Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		•	None			- No	None	•		None		•	None
Storage Length		1	1			,		١	٠	,		*).	•
Veh in Median Storage, #	ľ	0				0	ļ	•	0	·		0	İ
Grade %	•	0	1			0		1	0	•		0	ľ
Peak Hour Factor	92	92	92	J,		2	92	92	92	92	92	92	92
Heavy Vehicles. %	2	2	2		2	2	2	2	2	2	2	2	2
Mvmt Flow	17	75	210			46	11	179	7	11	11	7	11
Rayora Kinor	Majort			Mago	9			Minori			Minor2	N	N
Conflicting Flow All	57	0	0	2	285	0	0	286	280	180	286	380	5
State 1		14	0.				ě	202	202	٠	73		i
Stage 2	Ċ		*		*	20	8	84	78	1	213		ľ
Critical How	4.12	1		4	4.12	V		7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1							į	6.12	5.52	•	6.12		i
Critical Howy Sto 2			IX		,		1	6.12	5.52	•	6.12	5.52	İ
Follow-up Hdwy	2.218			2.218	18	107	1	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cao-1 Maneuver	1547		16	1277	11	,		999	628	863	999	552	1017
Stage 1		114	*		1	,	(8)	800	734	٠	937	834	Ċ
Stage 2		14			,			924	830	,	789	661	İ
Platoon blocked, %			*			2.	300						
Mov Cap-1 Maneuver	1547			12	277			640	617	863	640		1017
Mov Cap-2 Maneuver	*	•	à		,			940	617		640		i
Stade 1					18.			793	727		929		Ì
Stage 2		•	074		2.0	,		894	823	7	761		İ
Approach	Ħ			W.	88	B	ì	MB			SB	3	
HCM Control Delay, s	0.3				1,3			13			10.5		
HCM LOS								8			80		
Manutanelitanelitane Nymt	NBEnt	88	EBT E	EBR WE	N N	5	BRSBLnt				į	ı	9
Capacity (veh/h)	648	1547	*	- 12	1277		683					á	
HCM Lane V/C Ratio	0.31		٠	- 0.009		٠	- 0.048						
HCM Control Delay (s)	13		0	T,	7.8	0	10.5						
HCM Lane LOS	89	A	4			A	8						
UCM OF B OF HO O COL	13	C	(1		c	i,	0.1						

Synchro 9 Report Page 1

2040 Total AM_Roundabout 6_18_19_20.syn 12/12/2017 HCM 2010 Roundabout 18: Van Buren Avenue & Storey Boulevard

ntersection Delay, s/veh	4.4				
ntersection LOS	A				
Approach	83		WB	BN	28
Entry Lanes	-		1		
Conflicting Circle Lanes	_		-	-	-
Adi Approach Flow, vehilh	119		64	153	15
Demand Flow Rate, veh/h	121		20	156	15
Vehicles Circulating, vehifth	15		156	32	191
Vehicles Exiting, vehith	191		32	104	15
Follow-Up Headway, s	3.186		3.186	3.186	3,186
Ped Vol Crossing Leg. #/h	0		0	0	0
Ped Cap Adj	1 000		1.000	1 000	1 000
Approach Delay, s/veh	4.2		4.2	4.6	4.0
Approach LOS	A		A	A	A
cane	Tiett		tell	18	極
Designated Moves	LTR		LTR	LTR	LTR
Assumed Moves	LTR		LTR	LTR	LTR
RT Channelized					
Lane Util	1,000	1	1.000	1,000	1,000
Critical Headway, s	5.193	9	.193	5 193	5.193
Entry Flow, veh/h	121		20	156	15
Cap Entry Lane, veh/h	1113		296	1094	933
Entry HV Adj Factor	0.980	0	.984	0 980	0.993
Flow Entry, veh/h	119		49	153	15
Cap Entry, veh/h	1091		952	1073	927
V/C Ratio	0.109	0	0.052	0.143	0 016
Control Delay, s/veh	4.2		4.2	4.6	4.0
SOT	4		A	A	A

HCM 2010 Roundabout 18: Van Buren Avenue & Storey Boulevard

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ersection Delay s/veh	C			
מסמים במהי	2.0			
ersection LOS	A			
tosch	æ	85	92	88
v Lanes	-			
ifficting Circle Lares	-	-	-	-
Approach Flow, vehith	296	89	201	33
mand Flow Rate, veh/h	301	69	205	33
cles Circulating, wehilh	33	205	88	241
iicles Exiting, veh/h	241	86	236	33
ow-Up Headway, s	3.186	3,186	3.186	3.186
d Vol Crossing Leg, #/h	0	0	0	0
Cap Adj	1 000	1,000	1,000	1 000
roach Delay, s/veh	0.9	4.7	5.5	4.4
roach LOS	A	A	A	A
100	101		掘	101
signated Moves	LTR	E.	LTR	LTR
sumed Moves	LTR	LTR	LTR	LTR
Channelized				
ne Util	1.000	1,000	1.000	1.000
ical Headway, s	5.193	5,193	5.193	5,193
ry Flow, veh/h	301	69	205	33
Entry Lane, veh/h	1093	921	1024	888
ny HV Adj Factor	0.982	0.987	0.979	0,993
w Entry, veh/h	296	89	201	33
Entry, veh/h	1073	806	1003	882
Ratio	0.275	0,075	0.200	0.037
ntrol Delay, s/veh	0.9	4.7	5.5	4.4
	A	A	A	A
%tile Queue, veh	-	0	-	0

Synchro 9 Report Page 1

Synchro 9 Report Page 1

	oad
	Thomas Road
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ICM 2010 AWSC	19: Van Buren Avenue
2010	n Bur
CM2	9: Va
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2040 Total AM.syn 12/12/2017

Road
Thomas
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ich ich ich ich ich ich ich ich ich ich	Illersection Delay, siven	g. 9.											
Charles Char	Intersection LOS	∢											
Migurations	Movement	8	EBI	EBI	EBR	WEG	MBI	HEE	68	Men	9	NBI	
ol, vehith 0 37 59 62 0 25 100 50 0 0 ol, vehith 0 97 59 62 0 25 100 50 0 0 ol, vehith 0 92 092 092 092 092 092 092 092 092 09	Lane Configurations		ľ	+\$				4				4	
Note that 0 37 59 62 0 25 100 50 0	Traffic Vol. veh/h	0	37	29	62	0	52	100	20	0	78	45	===
we reacher 092 092 092 092 092 092 092 092 092 092	Future Vol, veh/h	0	37	29	62	0	25	100	20	0	78	42	15
Colorest Colorest	Peak Hour Factor	0.92	0.92	0.92	0 92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
of Lanes O	Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	``
of Lanes 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 1 0 0 0 0 0 1 0	Mvmt Flow	0	40	64	29	0	27	109	Z	0	88	46	=
9 (Approach WB EB EB 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Number of Lanes	0	0	-	0	0	0	-	0	0	0	-	Ĭ
9 de Janes 19 de Janes 19 de Janes 19 de Janes 19 de Janes 10 de J	Approach	6	88	H		i	WB	i	I	b	98	ŀ	ŀ
9 Lanes 9 Lanes 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Opposing Approach		WB				H				es.		l
Approach Left SB NB NB NB NB NB NB NB NB NB NB NB NB NB	Opposing Lanes		-				-				-		
Approach Right 1 1 1 1 1 1 1 1 1	Conflicting Approach eft		E.				NA				- g		
ing Approach Right NB SB SB SB SB SB SB SB SB SB SB SB SB SB	Conflicting Lanes Left		-				-				-		
### State	Conflicting Approach Right		N.				a.				W.B		
Micro Delay A A A A A A A A A A A A A A A A A A A	Conflicting Lanes Right		-				-				-		
NS. A A A A A A A A A A A A A A A A A A A	HCM Control Delay		00				0.4				VO		
% 58% 23% 14% 19% 1,% 31% 37% 57% 38% 1, % 11% 37% 57% 38% 1, % 11% 39% 29% 42% 1, % 11% 37% 57% 38% 100 Stop 105 42% 40p 11 78 37 25 29 Vol 42 50 100 57 Vol 42 59 100 63 w Rate 147 172 190 162 Y Gp 17 190 162 50 63 w Rate 147 172 190 162 476 4767 e Headway (Hd) 5.042 4.735 4765 4767 4767 4767 477 from VIC Ratio 0.206 0.226 0.224 924 92 477 from VIC Ratio 0.008 0.229 0.254	HOM LOS		4 <		Ì		t <				1.0	Ì	
% 58% 23% 14% 14% 14% 14% 14% 14% 14% 14% 14% 14													
% 55% 23% 14% 1,% 31% 37% 37% 11% 39% 37% 37% 11% 39% 29% ntrol 5top 5top 5top 13 13 15 17 13 18 17 25 13 18 17 25 14 25 10 42 50 14 17 19 7 75 50 14 17 19 7 70 10 70 10			NO. THE	EDE DI	MACH	A PER UNIT							
1,% 31% 37% 37% 11,1 % 39% 37% 11,1 % 39% 37% 11,1 % 39% 29% 11,1 % 39% 29% 11,1 % 39% 29% 11,1 % 30% 11,1 % 3	Vol Left, %		28%	23%	14%	19%							
ti, % 11% 39% 29% 19% 11% 11% 19% 29% 19% 11% 11% 11% 11% 11% 11% 11% 11% 1	Vol Thru, %		31%	37%	21%	38%							
Stop Stop Stop Stop Stop	Vol Right, %		11%	39%	29%	45%							
ol by Lane 135 158 175 78 37 25 Vol 42 59 100 w Rate 147 172 190 y Gp 1 1 172 190 15 02.06 0.226 0.251 0.206 re Headway (Hd) 5.042 4.736 4.755 4 rence, Vin 706 752 749 Time 3.114 2.802 2.822 2 me ViC Ratio 0.208 0.282 2 me ViC Ratio 0.208 0.282 2 the Life Q 0.8 0.29 0.24 0 the Life Q 0.8 0.9 1	Sign Control		Stop	Stop	Stop	Stop							
Vol 42 37 25 Vol 16 62 50 W Rate 147 172 190 15 Util (X) 0.206 0.25 0.251 17 Util (X) 0.206 0.255 4.755 4 Proce, YIN 706 706 752 752 From VIC Ratio 0.208 0.282 9.282 Inne 3.114 2.802 2.822 Inne 0.208 0.229 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251 Intel 0.208 0.209 0.254 0.251	Traffic Vol by Lane		135	158	175	149							
Vol 42 59 100 w Rate 15 62 50 y Gp 1 1 1 1 Cull (X) 0.206 0.21 0.21 1 1 Cull (X) 0.206 0.21 0.25 0.21 0.21 1 Cull (X) Ves Yes Yes Yes Yes N Cull (X) Yes Yes Yes Yes Yes Yes Ime 3114 2802 2822 2822 2822 A 4 9.4 9.4 9.4 9.4 9.4 P	LT Vol		28	37	25	53							
15 62 50 W Rate 147 172 190 Y GIP 1	Through Vol		42	29	100	27							
147 172 190 1 1 17 190 9y (Hd) 5,042 4,736 4,756 4 7 06 752 749 and 0,208 0,292 2,822 2 9y 9,4 9,2 9,4 A A A A 0,8 0,9 1	RT Vol		15	62	20	83							
9y (Hd) 0.206 0.226 0.251 9y (Hd) 5.042 4.735 4.755 1 76 75 749 3.114 2.802 2.822 atio 0.208 0.224 0.254 3y 9.4 9.2 9.4 A A A A A A A A A A A A A A A A A A A	Lane Flow Rate		147	172	190	162							
0.206 0.256 0.251 1	Geometry Grp		-	-	-	-							
rdure Headway (Hd) 5042 4.735 4.755 4 ergence, YIN Yes Yes Yes Yes Yes Tune 706 728 2.822 2 Lane VIC Ratio 0.208 0.229 0.264 0.200 0	Degree of Util (X)		0.206	0.226	0.251	0.214							
ergence, Y/N Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Departure Headway (Hd)		5.042	4.735	4.755	4.767							
706 752 749 ce Time 3.114 2.802 2.822 Contro Delay 9.2 9.4 Lane LOS A A A 95th-tile Q 0.8 0.9 1	Convergence, Y/N		Yes	Yes	Yes	Yes							
3.114 2.802 2.822 0.208 0.229 0.254 9.4 9.2 9.4 A A A 0.8 0.9 1	Cap		902	752	749	747			i				
0.208 0.229 0.254 9.4 9.2 9.4 A A A A A 0.8 0.9 1	Service Time		3.114	2.802	2.822	2.839							
9.4 9.2 9.4 A A A A A A A A A A A A A A A A A A A	HCM Lane V/C Ratio		0.208	0.229	0.254	0.217							
A A A A A A A A A A A A A A A A A A A	HCM Control Delay		9.4	9.5	9.4	9.5							
0.8 0.9 1	HCM Lane LOS		V	4	∢	V							
	HCM 95th-tile Q		0.8	6.0	_	0.8							

2040 Total AM.syn 12/12/2017 63 092 68 68 HCM 2010 AWSC 19: Van Buren Avenue & Thomas Road 57 0 92 0 92 1 62 NB NB 188 Approach
Opposing Approach
Opposing Lanes
Conflicting Lanes Left
Conflicting Lanes Left
Conflicting Lanes Right
HCM Control Delay
HCM LOS Intersection Delay, s/veh Lane Configurations
Traffic Vol., wehth
Future Vol., wehth
Peiak Hour Factor
Heavy Vehicles, %
Mwnt Flow
Number of Lanes

Synchro 9 Report Page 2

HCM 2010 AWSC 19: Van Buren Avenue & Thomas Road

16.2 C

Intersection Delay, s/veh Intersection LOS

2040 Total PM.syn 12/12/2017

Lane Configurations Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. wehh Transfer, Vol. weh Transf			4	
6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2				
0 94 151 125 0 31 0 92 0,92 0,92 0,92 0,92 0,92 0,92 0,92				m
6 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92				(C)
Color				60
102 164 136 0 34				
CEB WB CEB WB	29 67	0	126 88	41
FEB WB WB The color of the color of				
WB Right 15 B B B B B B B B B B B B B B B B B B	MAIN		NB.	
1 Left SB			SB	
ach Left 1 1			-	
NB 198 1 198 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			EB	
NB 19.8 C C C ARBINI EBLINI WBLINI SBUNI 49% 25% 14% 33% 34% 25% 14% 33% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 35% 16% 34% 28% 36% 16% 34% 31% 10% 34% 28% 16% 34% 31% 10% 34% 1				i
9011 19.8 C. C. C. C. C. C. C. C. C. C. C. C. C.			WB	
19.8 C			-	
C ARBLAT REBLAT MELAT S 49% 25% 14% 34% 41% 26% 50p Stop Stop Stop Stop Stop Stop Stop Sto			14.9	
Nellot Belon Welfar 84% 44% 26% 44% 34% 44% 26% 44% 26% 44% 26% 44% 26% 24% 44% 26% 24%			6	
ASTIAL GELAT WICLIANS 49% 25% 14% 25% 14% 25% 14% 25% 14% 26% 15% 14% 26% 14% 26% 14% 26% 14% 21% 26% 26% 24% 24% 24% 24% 24% 24% 24% 24% 24% 24				
49% 25% 14% 34% 26% 14% 34% 26% 34% 28% 28% 28% 28% 28% 28% 28% 28% 28% 28				
34% 41% 57% 16% 34% 28% 16% 34% 28% 16% 34% 28% 16% 34% 28% 16% 34% 28% 116 94 31 11 94 31 11 94 31 11 94 31 11 125 11 11 125 11 12 125 11 12 125 11 12 125 11 12 125 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 12 12 11 1				
16% 34% 28% 28% 28% 28% 28% 28% 28% 28% 28% 28				
Shop Shop				
/ol by Lane 235 370 218 h Vol 16 94 31 h Vol 81 151 125 w Rate 255 402 237 ny Gp 1 1 1 of Util (x) 0.459 0.661 0.472 are Headway (Hd) 8-433 5916 6.206 gence, YIN Yes Yes Yes Time 4-523 397 4.237 Time 4-523 397 4.237 no Vivi Pain 0.458 6.48 57				
h Vol 81 151 125 237 2402 237 2402 237 2402 237 2402 237 2402 237 2402 237 2402 237 2402 2402 2402 2402 2402 2402 2402 240				
h Vol 81 151 125 we Rate 255 402 237 by Grp 0 Usil (x) 0 459 0.661 0.412 are Headway (Hd) 6.463 5916 6.266 gence, Y/N 7557 611 573 Time 4.523 397 4.327				
38 125 62 ow Rate 259 402 237 by Grp 1 1 1 1 of Util (x) 0.459 0.661 0.462 gence, YIN 6-463 5916 6.266 septoc, YIN 759 757 611 573 1.Time 4.523 3957 4.227				
Flow Rate 255 402 237 erry Grp 1 1 1 ferry Grp 1 1 1 ferry Grp 1 0.459 0.661 0.412 future Headway (Hd) 6.463 5916 6.265 ergence, YIN 7es Yes Yes From 7es 7es 7es 7es 7es 7es 7es 7es 7es 7es				
tety Grp 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				۱
e of Util (X) 0.459 0.661 0.472 ture Headway (Hd) 6.463 5.916 0.266 tigence, Y/N 788 Yes Yes Yes 557 611 573 567 11me 6.453 3.967 4.327 1.me Y/P Since 0.4453 3.967 4.327				
ture Headway (Hd) 6.463 5916 6.266 orgence, Y/N Yes Yes Yes Yes Farmer 557 611 573 ET III A.327 4.327 9.0414 ann VIVE Rain				۱
Agence, Y/N Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes				
557 611 573 Se Time 4.523 3.967 4.327 Lane VIC Patio 0.458 0.658 0.414				
4.523 3.967 4.327 0.458 0.658 0.414				
0.458 0.658 0.414				
0000				
19.8				1
B C B				
HCM 95th-tile Q 2.4 4.9 2 2.1				

2040 Total PM.syn 12/12/2017 78 0.92 2 85 0 HCM 2010 AWSC 19: Van Buren Avenue & Thomas Road **♦** E E 260 0 75 0 75 0,92 0,92 2 2 0 82 0 0 WB 1 14.2 Opposing Approach
Opposing Lanes
Opposing Lanes
Conflicting Approach Left
Conflicting Lanes left
Conflicting Lanes Right
HCM Control Delay
HCM LOS Intersection Delay, s/veh Intersection LOS Lane Configurations
Traffic Vol, veh/h
Future Vol, veh/h
Peath Hour Factor
Heaxy Vehicles, %
Mvmt Flow
Number of Lanes

Synchro 9 Report Page 2

Synchro 9 Report Page 1

out 6_18_19_20.syn 12/12/2017

HCM 2010 Roundabout	2040 Total AM Roundabout 6 18
19: Van Buren Avenue & Thomas Road	

ntersection Delay, s/veh	5.6					
ntersection LOS	A					
ppraech	E8		WE	WBW		88
ntry Lanes			-			
Conflicting Circle Lanes			1	-		-
dj Approach Flow, vehilh	171		190	147		162
Demand Flow Rate, veh/h	174		194	150		165
ehicles Circulating, wehilh	124		175	139		226
/ehicles Exiting, veh/h	267		114	159		143
ollow-Up Headway, s	3.186		3.186	3.186		3 186
ad Voi Crossing Leg. #/h	J	_	0	0		0
ed Cap Adj	1 000		1,000	1 000		1 000
approach Delay, siveh	5,3		5.9	5.2		5.9
pproach LOS	ď		A	A		V
ine.	Tel:		Left	H	類	
Designated Moves	LTR		LTR	LTR.	LTR	
Assumed Moves	LTR		LTR	LTR	LTR	
RT Channelized						
ane Util	1,000	-	000	1.000	1 000	
Critical Headway, s	5.193	u)	.193	5.193	5.193	
Entry Flow, veh/h	174		194	150	165	
Cap Entry Lane, veh/h	866		646	983	901	
Entry HV Adj Factor	0.981	0	826	0.981	0 980	
Flow Entry, veh/h	171		190	147	162	
ap Enfry, veh/h	979		928	964	884	
//C Ratio	0 174	D	0.205	0.153	0.183	
Control Delay, s/veh	5.3		5.9	5.2	5.9	
SO	V		A	A	A	
Oral prate O						

HCM 2010 Roundabout 19; Van Buren Avenue & Thomas Road

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19_20.s	42/45/9
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2040 Total	
CA	

ntersection Delay, s/veh	8.5			
ntersection LOS	A			
Commonth	88	Will	要	28
ntry Lanes		1		
Conflicting Circle Lanes	-	-	_	_
Adi Annoach Flow vehilb	402	237	255	244
Demand Flow Rate, vehilh	410	242	261	250
Jehicles Circulating, vehib	198	323	355	303
/ehicles Exiting, veh/h	355	293	253	262
follow-Up Headway s	3.186	3.186	3,186	3,186
Ped Voi Crossing Leg. #/h	0	0	0	0
Ped Can Adi	1.000	1 000	1,000	1,000
Approach Delay, s/veh	9.3	7.8	8.6	7.8
Approach LOS	A	A	ď	A
	let.		Lett	Eef
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1,000	1,000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	410	242	261	250
Cap Entry Lane, veh/h	927	818	792	835
Entry HV Adi Factor	0.980	0.980	0.978	0.978
Flow Entry, veh/h	402	237	255	244
Cao Entry, veh/h	806	802	775	816
V/C Ratio	0.442	0.296	0.329	0.300
Control Delay, s/veh	9.3	7.8	8.6	7.8
COS	A	A	A	A
95th %file Onene veh	2	-	-	_

Synchro 9 Report Page 1

HCM 2010 TWSC 20: Van Buren Avenue & Chickadee Drive

2040 Total AM.syn

	4.7							
Movement	WBI	WBR		NBi	MBR	Tes	SBT	
_ane Configurations	X.			£			4	
raffic Vol, veh/h	63	75		80	37	4	137	
Future Vol, veh/h	63	75		8	37	4	137	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized		None			None		None	
Storage Length	0	1.81		3	9	•		
Veh in Median Storage, #	0			0		•	0	
Grade. %	0	05.		0		'	0	
Peak Hour Factor	92	92		92	92	92	92	
Heavy Vehicles. %	2	2		2	2	2	2	
Myrrt Flow	99	82		87	40	48	149	
Agoration	Minori			142	I	Major2		1
Conflicting Flow All	352	107		0	0	127	0	
Stage 1	107			24	a			
Stage 2	245	,		934	98	7	(30)	
Critical Hdwv	6.42	6.22		**	4	412	1000	
Critical Hdwy Stg 1	5.42	•		18	į.	*		
Critical Hdwy Stg 2	5.42	3			y	2	×	
Follow-up Hdwy	3.518	3.318		*	٠	2.218	92	
Pot Cap-1 Maneuver	646	947		٠		1459	THE STATE OF THE PERSON NAMED IN	
Stane 1	917	3		٠		•	٠	
Stane 2	962	The state of		00	50A	i.V	3	
Platnon blocked. %					8		9.	
Mov Cap-1 Maneuver	623	746) (0)	10	1459		
Mov Cap-2 Maneuver	623	y.		(*	3 <u>\$</u>			
Stage 1	917	18.		•	*			
Stage 2	767	*:		(*)	(*)	.5	i i	
Approach	. WB			18		28	1	
HCM Control Delay, s	10.9			0		1.8		
HCM LOS	α							
Umor Lane Major Munit	MBI	NBRWBInt S	SBL SBT					
Capacity (veh/h)	100		1459 -					
HCM Lane V/C Ratio	Ţ.	- 0.196 0.0	0.033					
HCM Control Delay (s)	×	10.9	0 92					
HCM Lane LOS	(9)							
LICALOSH 9/ Flo Olyoh)		1	7 0					

Intersection Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh September Int Delay, Siveh Int Delay, Siveh September Int Delay, Siveh Int Delay, Siveh September Int Delay, Siveh Int Delay, Siveh Int Delay, Siveh September Int Delay, Siveh									
MSI MSI	Hersection	ĺ		ŀ	ŧ	ŀ			
MET MER MET MET MET MET	nt Delay, s/veh	10							
Marin Mari	lovernent	WEI	WBR		TEM	MBR	SSI	SBI	
178 94 197 94 113	-ane Configurations	2			,2.			4	
Mail Mail	affic Vol, veh/h	78	26		197	25	113		
Stop Stop Free	ıture Vol, veh/h	78	94		197	94	113		
Stop Stop Free Free Free	onflicting Peds, #/hr	0	0		0	0	0		
# 10	n Control	Stop	Stop		Free	Free	Free		
# 0	Channelized	181	None		2	None			
# 0	orage Length	0			2.4	÷.	,		
0	h in Median Storage, #	0	•		0	٠	- 1		
Section	ade, %	0	n		0	ı	ì		
Second Second	ak Hour Factor	92	92		92	92	92		
Microst 102 214 102 123 174 102 123 174 102 123 174 102 124 102 124	avy Vehicles, %	2	2		2	2	2		
Major Majo	rmt Flow	82	102		214	102	123		
686 265 0 0 316 (265 265 265 265 265 265 265 265 265 265		į							
686 265 0 0 316 0 421 6.22 4.12 5.42 5.42 5.42 3.518 3.318 2.218 44.3 77.4 1244 779 - 218 779 - 218 779 - 218 779 - 2218 779 - 2218 779 - 2218 774 - 2218 779 - 2218 774 - 2218 779 - 2218 774 - 2218 779 - 2218	HOLVERIOL .	HARDOUR			EM2SOFF.		71/02/0		
285	inflicting Flow All	989	265		0	0	316		
421 6.22 4.12 5.42 6.22 7.12 5.42 7.24 3.518 3.318 2.218 41.3 77.4 7.24 779 779 779 589 NB SB 774 779 779 589 NB SB 774 779 779 589 NB SB 774 779 779 589 NB SB 774 779 779 589 NB SB 774 779 779 589 NB SB 774 779	Stage 1	265	•		9	15			
6.42 6.22 4.12 5.42	Stage 2	421	•		76)	(5)			
5.42	tical Hdwy	6.42	6.22		٧		4.12		
\$42 413 774 662 662 368 777 989 WB NEW BLA SEL SET 15.9 C C A A	tical Hdwy Stg 1	5.45	4		71	s			
3518 3.318 2.21 779 - 124 589 774 - 124 368 777 - 15.9 662 - 124 368 774 - 124 662 - 124 662 - 124 663 - 124 664 - 124 665 - 124 665 - 124 665 - 124 665 - 124 666 - 124 666 - 125 667 - 126 668 - 124 668 - 124 668 - 124 669 - 125 669	tical Hdwy Stg 2	5.45	1		*		•	7	
413 774 124 662	llow-up Hdwy	3.518	3.318		6.0		2,218		
779 368 774 779 589 779 589 C C NBT NERVIELT SEL SET - 516 1244 - 516 1244 - 516 1244 - 618 2099 - 759 0.90	t Cap-1 Maneuver	413	774		Ì	ď	1244	4	
562 388 774 368 779 589 689 68 15,9 C C C 710 710 710 710 710 710 710 710 710 710	Stage 1	779	•		D).	72		10.	
388 774	Stage 2	662	•		*	ė	*	4	
368 774 - 124 779 589 689 779 C C	itoon blocked, %				*	÷		3	
779 589 WB NB NB NB SI 15.9 C C C T 15.9 C T 15.9 C C C C C C C C C C C C C C C C C C C	v Cap-1 Maneuver	368	774			.51	1244		
779 589 WB WB WB 15,9 C C C - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099 - 0.362 0.099	w Cap-2 Maneuver	368	ì		*	83	•	¥.	
889	Stage 1	779	2				100		
15.9 0.0 C.C	Stage 2	589	4		(0)				
WB NB NB NB NB NB NB NB NB NB NB NB NB NB									
15.9 0 C C A A A A A A A A A A C C C C C C C C	projects	WB		I	MB	Ì	88		
C SHE SET SET - 516 1244 0.362 0.099 15.9 8.2 0 C S A A A A A A A A A A A A A A A A A A	M Control Delay, s	15.9			0	ı	3.4	de la	
NBT NBRWBLn1 SBL SB - 518 1244 - 0.362 0.099 - 159 8.2 - C A /	SM LOS	U							
NBT NBRINBLAT SBL SB 516 1244 - 0.362 0.099 - 15.9 8.2 (
516 1244 - 0.362 0.099 - 15.9 8.2 (MBT	MBRWBlat	SBI SE	五	ľ	Ì		
- 0.362 0.099 - 15.9 8.2 (pacity (veh/h)		516	1244	(6)				
15.9 8.2 C A	M Lane V/C Ratio	20	0.362	660	83				
A O	M Control Delay (s)		- 15.9	8.2	0				The second second
	M Lane LOS	H.		×	A				

Synchro 9 Report Page 1

2040 Total AM_Roundabout 6_18_19_20.syn HCM 2010 Roundabout 20: Van Buren Avenue & Chickadee Drive

ntersection Delay, s/veh	4.9					
ntersection LOS	ď					
thoroach	W. Tarana	MB		98	as	
Entry Lanes		-			-	
Conflicting Circle Lanes		-		-	-	
Adj Approach Flow, veh/h	16	0		127	197	
Jemand Flow Rate, veh/h	16	65		30	201	
Vehicles Circulating, veh/h	w	6		49	69	
Vehicles Exiting, veh/h	06	0	2	221	173	
Follow-Up Headway, s	3.18	9	31	186	3.186	
Ped Vol Crossing Leg, #/h		0		0	0	
Ped Cap Adj	100	0	10	000	1.000	
Approach Delay, s/veh	4	4.9		4.5	5.3	
Approach LOS		V		4	A	
and a	も		(et		製	
Designated Moves	LR.		TR		L)	
Assumed Moves	LR		T		5	
RT Channelized						
ane Util	1.000		1,000		1,000	
Oritical Headway, s	5 193		5 193		5 193	
Entry Flow, veh/h	153		130		201	
Cap Entry Lane, veh/h	1034		1076		1055	
Entry HV Adj Factor	0 980		0.979		0 980	
Flow Entry, veh/h	150		127		197	
Cap Entry, veh/h	1013		1053		1034	
//C Ratio	0.148		0,121		0 191	
Control Delay, s/veh	4.9		4.5		5.3	
SO	V		4		⋖	
OEst O' HIS Chang ush	,					

2040 Total PM_Roundabout 6_18_19_20.syn HCM 2010 Roundabout 20; Van Buren Avenue & Chickadee Drive

Intersection Delay, s/veh Intersection LOS			
	6.6 A		
Approach	WB	9	33
Entry Lanes	-	J	*
Conflicting Circle Lanes	-	-	-
Adj Approach Flow, vehilh	187	316	298
Demand Flow Rate, vehilh	191	322	303
Vehicles Circulating, vehih	218	125	87
Vehicles Exiting, veh/h	229	265	322
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg. #/h	0	0	0
Ped Cap Adi	1 000	1 000	1,000
Approach Delay, s/veh	6.2	2.0	6.5
Approach LOS	A	A	A
200	Tell	let	100
Designated Moves	R	TR	- 11
Assumed Moves	LR	TR	L.
RT Channelized			
Lane Util	1.000	1,000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	191	322	303
Cap Entry Lane, veh/h	606	266	1036
Entry HV Adj Factor	0.979	0,981	0.982
Flow Entry, veh/h	187	316	298
Cap Entry, veh/h	890	978	1017
V/C Ratio	0.210	0.323	0.293
Control Delay, s/veh	6.2	7.0	6.5
SOT	A	A	A
95th %tile Queue, veh	-	-	-

Synchro 9 Report Page 1

HCM Unsignalized Intersection Capacity Analysis

2040 Total AM syn

	Δυσου	2000
	Commercia	
1	2 COS X COS >4	200
	Varinbov	2000

Linearening Fig.		4	~	•	4-	→	•	
regions	Movement	æ	899	NBL	NBT	188	SBR	
re (verlnt) 25 163 95 129 393 15 re (verlnt) Shop	Lane Configurations	F	YL.	×	*	42		
re (veht)	Traffic Volume (veh/h)	25	163	95	129	393	15	
Slop Free Free ate (uph) 27 177 103 140 427 16 ate (uph) 27 177 103 140 427 16 ate (uph) 27 177 103 140 427 16 ate (uph) 27 177 103 140 427 16 ate (uph) 27 177 103 140 427 16 ate (uph) 27 177 103 140 42 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 435 443 ate (uph) 281 1177 1700 1700 ate (uph) 281 482 88 0 0 0 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 1700 1700 ate (uph) 281 117 117 117 117 117 117 117 117 117 1	Future Volume (Veh/h)	52	163	95	129	393	15	
our Factor 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0% 0%	Sign Control	Stop			Free	Free		
From Factor (1) 27 177 103 140 427 16 Thou rate (vph) 27 177 103 140 427 16 Multi (ft) 100 100 100 100 100 100 100 100 100 10	Grade	%0			%0	%0		
Trans (uph) 27 177 103 140 427 16 Trans (uph) 27 177 103 140 427 16 Trans (uph) 27 177 103 140 427 16 Trans (uph) 27 177 103 140 427 16 Trans (uph) 27 177 103 140 427 16 Trans (uph) 27 177 177 177 177 177 177 177 177 177	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
trians (Math (R)) Midth (R) Midth (R) It Blockage It	Hourly flow rate (vph)	27	177	103	140	427	16	
Mile (f) Mile (f) 19 Speed (fis.) TVM.TL TVM.TL 2 Lun flare (veh) 1194 In type 1194 In the Oxidage veh) 118 sam signal (f) 1194 sam signal (f) 1194 sam signal (f) 1194 sam signal (f) 1194 sam signal (f) 1194 sam signal (f) 143 stool vol 435 stool vol 346 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 34 stool vol 36 stool vol 36 stool vol 36 stool vol 36 stool vol 36 stool vol 36 stool vol 36	Pedestrians							
in Speed (ftk) It Booksage Int	Lane Width (ft)							
In Blockage Land Res (veh) That I TWLTL I TWLTL I TWLTL I star age (e) I star age (s) I	Walking Speed (fb/s)							
turn flare (veh) 10 type 11	Percent Blockage							
n type an article and article and article and article art article art art art art art art art art art art	Right turn flare (veh)							
1194 2 2 2 2 3 3 3 3 3 3	Median type				LWLTL	TWLTL		
tage (s) 781 435 443 443 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 443 444 4	Median storage veh)				2	2		
atcon unblocked fulliciting volume 781 435 443 fage 2 cont vol 346 fage 2 cont vol 346 fage 3 54 41 fage 5 54 6 2 4.1 fage 6 5 54 6 2 4.1 fage 6 5 54 6 2 4.1 fage 6 5 6 6 6 2 4.1 fage 7 6 6 7 7 6 91 face 6 7 7 7 101 face 7 7 7 102 face 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 6 7 7 7 103 face 7 7 7 103 face 7 7 7 103 face 7 7 7 103 face 7 7 7 103 face 7 7 7 103 face 8 7 7 7 103 face 8 7 7 7 103 face 8 7 7 7 103 face 8 7 7 7 7 103 face 8 7 7 7 7 103 face 8 7 7 7 7 103 face 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 103 face 8 8 7 7 7 7 7 103 face 8 8 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Upstream signal (ft)				1194			
inflicting volume 781 435 443 tage I cont vol 435 tage I cont vol 435 tage I cont vol 435 tage Cont vol 346 tage Cont vol 781 435 443 tage (s) 6.4 6.2 4.1 tage (s) 6.4 6.2 4.1 tage (s) 6.4 6.2 4.1 tage I cont vol 435 te Left	pX, platoon unblocked							
tage 1 conf vol 335 tage 2 conf vol 346 tage 2 conf vol 346 tage 5 5.4 tage 6) 5.4 tage 6) 5.4 tage 7 77 t	vC, conflicting volume	781	435	443				
ttage 2 conf vol 346 435 443 ninblocked vol 781 435 443 inblocked vol 6.4 6.2 4.1 stage (s) 5.4 3.2 4.1 stage (s) 5.4 3.2 2.2 sue free % 95 72 91 pacity (veh/h) 531 621 117 pacity (veh/h) 531 621 117 not Lane# EB in EB 2 NB 1 NB 2 2B 1 re Total 27 177 10 0 0 re Left 0 177 0 0 6 Right 0 177 0 0 16 Right 4 29 8 0 0 Length Sch (ff) 1 1 1 1 1 Cost 1 2 8 0 0 Local acids 1 1 1 1 Le Included	vC1, stage 1 conf vol	435						
inblocked vol 781 435 443 lage (s) 6.4 6.2 4.1 lage (s) 6.4 6.2 4.1 lage (s) 6.4 6.2 4.1 lage (s) 6.4 6.2 4.1 lage (s) 3.5 3.3 2.2 lage (s) 3.6 3.4 lage (s) 3.6 3.7 lage (s) 3.7 101 lage (s) 6.7 117 lage (s) 6.7 117 lage (s) 6.7 107 lage (s) 6.7 107 lage (s) 6.7 107 lage (s) 6.7 107 lage (s) 6.7 107 lage (s) 6.7 107 lage (s) 6.8 0.9 0.8 lage (s) 6.8 0.9 lage (s) 6.8 0.	vC2, stage 2 conf vol	346						
tigle (s) 6.4 6.2 4.1 stage (s) 5.4 3.2 3.2 sue free % 95 72 91 packly (veh/n) 531 621 1177 packly (veh/n) 531 621 1177 packly (veh/n) 531 621 1177 packly (veh/n) 531 621 1177 packly (seh/n) 531 621 1177 103 0 ne Fight 0 177 0 0 0 16 16 e Right 0 177 0 17 0 0 0 16 16 16 16 17 0 16 16 16 16 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 18 17 18 18 18 18 18 18 18 18 1	vCu, unblocked vol	781	435	443				
stage (s) 5.4 3.3 2.2 sue free % 95 72 91 pacity (veh/n) 531 621 1117 pacity (veh/n) 531 621 1117 conclusion EB1 EB2 181 A43 er Total 27 177 103 140 443 er Including 27 177 103 10 0 Right 27 177 0 0 16 Right 31 43 0 0 0 Right 31 22 8 0 0 Diciary (s) 28 0 0 0 0 Diciary (s) B A 0 0 0 OS B A 0 0 0 Ach LOS B A 0 0 0 Ach LOS B A 0 0 Ach LOS B A <td>tC, single (s)</td> <td>6.4</td> <td>6.2</td> <td>4.1</td> <td></td> <td></td> <td></td> <td></td>	tC, single (s)	6.4	6.2	4.1				
3.5 3.3 2.2	tC, 2 stage (s)	5.4						
(t) 95 72 91 (t) 621 1117 (EB1 EB2 NB1 NB2 SB1 27 17 103 10 0 (0 177 0 0 16 531 621 1117 1700 1700 (t) 0.05 0.08 0.09 0.08 0.06 (t) 12.1 13.1 8.5 0.0 0.0 (s) 13.0 3.6 0.0 (c) 13.0 3.6 0.0 (c) 14.0 0.0 (c) 15.0 0.0	tF (s)	3.5	3.3	2.2				
pacity (veh/h) 531 621 1117 auritane EB	p0 queue free %	98	72	91				
Constraint Con	cM capacity (veh/h)	531	621	1117				
e Total 27 177 103 140 443 e Left 27 0 103 0 0 e Right 0 170 0 16 e Right 531 621 1177 1700 1700 e to Capacity 0.05 0.28 0.09 0.08 0.26 e Length 95h (ft) 4 29 8 0 0 o Soliday (s) 13.0 13.0 0.0 coh Locay (s) 13.0 3.6 0.0 coh LOS co	Direction, Cane #	183	E82	NB.1	NB2	581		
e Right 27 0 103 0 0 e Right 531 621 117 700 16 e to Capacity 0.05 0.28 0.09 0.08 0.26 e to Capacity 0.05 0.28 0.09 0.00 0.0 I Length S&H (1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Volume Total	27	177	103	140	443		
e Right 51 17 17 1700 16 16 17 17 1700 1700 1700	Volume Left	27	0	103	0	0		
to Capacity 531 621 1117 1700 1700 Length Sch (170 0.05 0.28 0.09 0.08 0.26 OS	Volume Right	0	177	0	0	16		
0.05 0.28 0.09 0.08 0.26 4 29 8 0 0 12.1 13.1 8.5 0.0 0.0 B 8 A 0.0 13.0 3.6 0.0 B 4.0 Milization 45.2% ICU Level of Service	CSH	531	621	1117	1700	1700		The second second second
12.1 13.1 8.5 0.0 0.0 B B A A 0.0 13.0 3.6 0.0 B B A A 0.0 B B A A 0.0 B B A A 0.0 B B A A 0.0	Volume to Capacity	0.05	0.28	0.09	0.08	0.26		
s) 12.1 13.1 8.5 0.0 0.0 B A 0.0 (s) 13.0 3.6 0.0 minery 4.0 (min) 15.0	Queue Length 95th (ft)	4	59	00	0	0		
(s) 130 3.6 0.0 This is a contract of Service (min) 15.8 (contract of Service contrac	Control Delay (s)	12.1	13.1	8.5	0.0	0.0		
7 (s) 13.0 3.6 0.0 B 4.0 4.0 1.0 Level of Service (min) 15	Lane LOS	В	8	∢				
B 4.0 4.0 1CU Level of Service (min) 15	Approach Delay (s)	13.0		3.6		0.0		
4 0 Pacity Utilization 45.2% ICU Level of Service (min) 15	Approach LOS	æ						
4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0	messection Summary	Ĭ	Ì		ij	j		
pacity Utilization 45.2% ICU Level of Service (min)	Average Delay			4.0		8		
	Intersection Capacity Utiliza	ition		45.2%	⊇	U Level	of Service	A
	Analysis Period (min)			15				

apacity Analysis	Access
Intersection Ca	& Commercial /
HCM Unsignalized Intersection Capacity Analysis	21: Whitney Road & Commercial Access

2040 Total PM.syn 12/12/2017

	`	•	_	-	•	,	
(Purplem)	EEE.	881	983	NEE	188	ands	
Lane Configurations	k	R	*	4	ęŝ		
Traffic Volume (veh/h)	3	203	245	388	281	38	
Future Volume (Veh/h)	31	203	245	399	281	38	
Sign Control	Stop			Free	Free		
Grade	%0			%0	%0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0,92	
Hourly flow rate (vph)	34	221	266	434	305	41	
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type				TWLTL TWLTL	TWLTL		
Median storage veh)				2	2		
Upstream signal (ft)				1921			
pX, platoon unblocked							
vC, conflicting volume	1292	326	346				
vC1, stage 1 conf vol	326						
vC2, stage 2 conf vol	996						
vCu, unblocked vol	1292	326	346				
tC, single (s)	6.4	6.2	4.1				
tC, 2 stage (s)	5.4						
F (s)	3.5	3.3	2.2				
po queue free %	88	69	78				
cM capacity (veh/h)	275	716	1213				
Dieection Usagill	E81	E8.2	NB.1	NB:2	188		
Volume Total	32	221	266	434	346		
Volume Left	æ	0	566	0	0		
Volume Right	0	221	0	0	41		
SSH	275	716	1213	1700	1700		
Volume to Capacity	0.12	0.31	0.22	0.26	0.20		
Queue Length 95th (ff)	10	33	21	0	0		
Control Delay (s)	20.0	12.3	8.8	0.0	0.0		
Lane LOS	ပ	8	4				
Approach Delay (s)	13.3		3.3		0.0		
Approach LOS	8						
intersection Summary							
Average Delay		ľ	44	ŀ	Ì		
Intersection Capacity Utilization	ation		49 8%	ੁ	ICU Level of Service	f Service	ď
Annah Carina A			4.5				

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HCM Unsignalized Intersection Capacity Analysis 22: Dell Range Boulevard & Commerical Access

2040 Total AM.syn

																																								6
•	SBP	×	225	225			0.92	245									0.91	266			479	6.2		3.3	22	537														Of the second
۶	Sel	je.	52	22	Stop	%0	0.92	27									0.91	1065	999	488	1024	6.4	5.4	3.5	94	420	88.2	245	0	245	537	0.46	29	17.2	ပ				I	100
4	WBR		15	15			0.92	16	ľ																		584	27	22	0	420	90.0	2	14.2	æ	16.9	ပ		l	3
ţ	WBT	T.,	513	513	Free	%0	0.92	558						WLTL	2	1111											WB 1	574	0	16	1700	0.34	0	0.0		0.0		ļ	0.22	70 407
t	EBI	#	196	196	Free	%0	0.92	213						TWLTL TWLTL	2												EBZ	213	0	0	1700	0.13	0	0.0				į	l	
4	EBI	¥	132	132			0.92	143									0.91	574			487	4.1		2.2	85	984	EB3	143	143	0	984	0.15	13	9.3	V	3.7			Ì	
	Movement	Lane Configurations	Traffic Volume (veh/h)	Future Volume (Veh/h)	Sign Control	Grade	Peak Hour Factor	Hourly flow rate (vph)	Pedestrians	Lane Width (ft)	Walking Speed (ft/s)	Percent Blockage	Right turn flare (veh)	Median type	Median storage veh)	Upstream signal (ft)	pX, platoon unblocked	vC, conflicting volume	vC1, stage 1 conf vol	vC2, stage 2 conf vol	vCu, unblocked vol	tC, single (s)	tC, 2 stage (s)	tF (s)	p0 queue free %	cM capacity (veh/h)	Direction Late #	Volume Total	Volume Left	Volume Right	CSH	Volume to Capacity	Queue Length 95th (ft)	Control Delay (s)	Lane LOS	Approach Delay (s)	Approach LOS	Inforesection Summary	Average Delay	The second second

HCM Unsignalized Intersection Capacity Analysis 22: Dell Range Boulevard & Commerical Access

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2040 Total PM.syn 12/12/2017

Mouseussi	ä	i		WIRE	5	SBR	
Lane Configurations	k	4	43		k	×	
Traffic Volume (veh/h)	339	574	477	38	31	281	
Future Volume (Veh/h)	336	574	477	88	31	281	
Sign Control		Free	Free		Stop		
Grade		%0	%0		%0		
Peak Hour Factor	0.92	0 92	0.92	0.92	0.92	0 02	
Hourly flow rate (vph)	368	624	518	41	34	305	
Pedestrians							
Lane Width (ft)							STATE OF STATE STA
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type		TWLTL TWLTL	TWITE				
Median storage veh)		2	2				
Upstream signal (ft)			1111				
pX, platoon unblocked							
vC, conflicting volume	559				1898	538	
vC1, stage 1 conf vol					538		
vC2, stage 2 conf vol					1360		
vCu, unblocked vol	559				1898	238	
tC, single (s)	4.1				6.4	6.2	
tC, 2 stage (s)					24		
IF (s)	2.2				3.5	3.3	
p0 queue free %	28				11	44	
cM capacity (veh/h)	1012				145	543	
Direction Lane #	EBI	EB 2	WBV	38.1	SB 2		
Volume Total	368	624	559	34	305		
Volume Left	368	0	0	34	0		
Volume Right	0	0	41	0	305		
SH	1012	1700	1700	145	543		
Volume to Capacity	0.36	0,37	0.33	0.23	0.56		
Queue Length 95th (ft)	42	0	0	33	88		
Control Delay (s)	10.6	0.0	0.0	37.2	19.8		
Lane LOS	8			ш	O		
Approach Delay (s)	3.9		0.0	21.5			
Approach LOS				O			
Abercefon Summony	ľ	i	ŀ	i	H		
Average Delay		ľ	25	l			
Intersection Canacity Utilization	ation		68 2%	0	ULevel	ICU Level of Service	U
Analysis Period (min)		ı	15	ě			

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne

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APPENDIX E

Queuing Analysis Worksheets

Queues 1: Ridge Road & Dell Range Boulevard

Lane Group Flow (vph) 51 312 111 82 945 will vier Ratio 0.26 0.24 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.74 0.17 0.18 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.18 0.17 0.17 0.17 0.17 0.17 0.17 0.17 0.17						
Flow (vph) 51 312 111 62 97 97 127 137 97 137 97 137 97 137 97 97 97 97 97 97 97 97 97 97 97 97 97	NBI	MBI	NER	381	SBT	88
9 y 15,7 19,7 42 18,3 y 7 15,7 19,7 19,7 19,7 19,7 19,7 19,7 19,7 19	139	279	69	155	233	148
y 15.7 19.7 4.2 18.3 y 0.0 0.0 0.0 0.0 0.0 15.7 19.7 4.2 18.3 17.7 19.7 4.2 18.3 18.3 19.0 0.0 0.0 18.3 19.0 0.0 0.0 18.3 19.0 0.0 18.	0.43	69.0	0.16	0.53	0.57	0.32
## 15.7 19.7 4.2 18.3 th 50.0 (10.0	25.3	43.8	2,3	28.4	38.7	7.2
15.7 19.7 4.2 18.3 (1.5 18	0.0	0.0	0.0	0.0	0.0	0.0
h Sóth (ft) 16 67 0 35 15 15 15 15 15 15 15 15 15 15 15 15 15	25.3	43.8	2.3	28.4	38.7	7.2
156th (ft) 26 100 9 m45 Dist (ft) 2328 60 150 sight (ft) 150 60 150 V (yeb) 200 1274 636 449 P Reductin 0 0 0 0	28	162	0	99	130	0
2328 60 150 1274 636 449 0 0 0	69	218	-	110	211	35
60 150 1274 636 449 0 0 0		288			5221	
1274 636 449 0 0 0	125		125	100		100
0 0 0	326	405	429	295	409	456
	0	0	0	0	0	0
0 0 0	0	0	0	0	0	0
0 0	0	0	0	0	0	0
0.24 0.17 0.18	0.43	0.69	0.16	0.53	0.57	0.32

2022 Total AM.syn 12/12/2017

Queues 1: Ridge Road & Dell Range Boulevard

2022 Total PM.syn

	1	†	~	-	ļ	•	←	•	۶	→	•
ane Group	EBI	183	H	WE	WBI	100	NBT	MBP	展	188	35
.ane Group Flow (vph)	101	812	205	124	877	176	420	159	115	269	115
/c Ratio	0.49	0.77	0.37	0.57	0.78	0.52	080	0.30	0.51	0.58	0.24
Control Delay	23.7	34.3	12.8	24.6	34.2	24.3	43.5	8.9	27.8	35.8	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
otal Delay	23.7	34.3	12.8	24.6	34.2	24.3	43.5	60	27.8	35.8	6.5
Queue Length 50th (ft)	33	238	38	46	298	70	241	16	44	145	0
Queue Length 95th (ft)	92	314	63	m60	m346	108	274	48	75	211	82
nternal Link Dist (ft)		2328			1890		782			5221	
um Bay Length (ft)	150		9	150		125		125	100		100
Sase Capacity (vph)	206	1001	549	218	1131	344	525	528	525	466	477
itarvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
itorage Cap Reductin	0	0	0	0	0	0	O	0	0	0	0
Reduced v/c Ratio	0.49	0.77	0.37	0.57	0.78	0.51	080	0.30	0.51	0.58	0.24

intersection parameters of the second of the

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Queues 1: Ridge Road & Dell Range Boulevard

Earle Soup ERI. ERI. ERI. ERI. FRR. VIS. Lane Group Flow (vph) 48 537 97 196 Control Delay 0.24 0.47 0.15 0.49 Control Delay 14.7 25.6 0.5 24.2 Queue Delay 0.0 0.0 0.0 0.0 Total Delay 14.7 25.6 0.5 24.2 Queue Length SOh (ft) 14 134 0 96 Queue Length SSIh (ft) 31 191 0 m13 Tum Bay Length (ft) 150 60 150 150 Stands Capachy (php) 202 1144 639 421 Standshort (R) 19 0 0 150 Standshort (R) 150 0 150 0 150		1036 0.72	WBR						
10w (vph)		1036		MBE	NBIL	MBR	is.	288	SBR
0.24 0.47 0.15 14.7 25.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5		0.72	209	122	303	141	180	288	163
14.7 25.6 0.5 0.0 0.0 0.0 14.7 25.6 0.5 14.7 25.6 0.5 14.1 24 0.5 195th (ft) 31 191 0 m 19ct (tt) 2328 0th (tt) 150 60 0th (tt) 202 1134 639 0th Resident		7 00	0.28	0.51	0.50	0.32	0.56	0.72	0.35
Delay 0.0 0.0 0.0 0.0 and on the control of the con		20.1	14.5	32.2	39.0	2.8	30.4	45.7	7.1
alay 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 0.5 14.7 25.6 15.7 25.7 25.7 25.7 25.7 25.7 25.7 25.7 2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Length 50th (ft) 14 134 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		38.7	14.5	32.2	39.0	2.8	30.4	45.7	7.1
Langth 95th (ft) 31 191 0 m Link Dist (ft) 2328 60 Vit kength (ft) 150 60 apparaty (vph) 202 1134 639 no Can Radierth 0 0		368	24	53	92	0	85	168	0
2328 150 60 202 1134 639	_	441	m92	26	136	10	138	#280	49
150 60 202 1134 639		1890			286			2072	
202 1134 639			150	125		125	100		100
Reducto 0 0 0		1445	735	241	909	440	333	400	462
		0	0	0	0	0	0	0	0
0 0		0	0	0	0	0	0	0	0
0		0	0	0	0	0	0	0	0
		0.72	0.28	0.51	0.50	0.32	0.54	0.72	0.35

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues 1: Ridge Road & Dell Range Boulevard

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 12/12/2017

	*	t	1	1	ţ	4	•	←	4	٨	-	*
Lane Griting	EB	te	EBB	100	WBI	WEEK	MBI	181	MBR	8	SBI	SBB
Lane Group Flow (vph)	122	1438	245	278	1180	198	198	423	349	122	307	124
v/c Ratio	0.61	1.05	0.36		0.79	0.26	1.14	0.70	0.87	99.0	1.09	0.37
Control Delay	23.6	66.2	10.6		13.3	1.0	141.6	43.9	44.5	48.5	119.5	11.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.6	66.2	10.6		13.3	1.0	141.6	43.9	44.5	48.5	119.5	11.7
Queue Length 50th (ft)	30	~528	48		204	0	~105	132	122	20	-22	5
Queue Length 95th (ft)	09#	#663	105	_	ш330	m3	#243	186	#288	#125	#388	55
Internal Link Dist (ft)		2328			1890			286			2132	
Turn Bay Length (ft)	150		9	150		150	125		125	100		100
Base Capacity (vph)	201	1370	675	219	1492	748	174	209	399	184	282	334
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.05	0.36	1.27	0.79	0.26	1.14	0.70	0.87	99.0	1.09	0.37

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

Both percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Synchro 9 Report Page 1

Queues 2: College Drive & Dell Range Boulevard

	1	t	<u> </u>	-	ļ	•	—	۶	→
and Group	189	183	88	WEE	WBT	NBI	NBT	8	Ser
Lane Group Flow (vph)	53	150	305	197	802	381	495	135	496
vic Ratio	0.17	0.21	0.23	0.45	0.76	0.87	0.47	0.43	0.75
Control Delay	21.7	34.3	6.0	19.2	27.3	40.8	21.8	20.9	428
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	34.3	6.0	19.2	27.3	40.8	21.8	20.9	42.8
Queue Length 50th (ft)	13	48	7	62	234	160	101	46	151
Queue Length 95th (ft)	m27	76	10	87	#334	196	102	2	#232
Internal Link Dist (II)		1890			2082		1020		1940
Turn Bay Length (ft)	175		20	125		125		100	
Base Capacity (vph)	175	723	1333	448	1057	469	1058	333	999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.21	0.23	0.44	92.0	0.81	0.47	0.41	0.75

Sth percentle volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m. Volume for 95th percentile queue is melered by upstream signal.

2022 Total AM.syn

Queues 2: College Drive & Dell Range Boulevard

2022 Total PM.syn 12/14/2017

	4	Ť	<u> </u>	/	ļ	•	—	۶	→	
ane Group	EBI	H	EBR	WEI	WBI	NEW TOTAL	WBT	S	183	
Lane Group Flow (vph)	136	557	427	100	976	449	786	238	358	
vic Ratio	0.60	0.61	0.32	0.44	0.74	0.85	0.78	0.76	0.54	
Control Delay	36.7	41.2	0.5	32.2	41.5	33.2	340	36.9	35.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	36.7	41.2	0.5	32.2	41.5	33,2	34.0	36.9	35,9	
Opened Mengata Cotto (E) No.	83	194	0	45	165	187	216	85	66	
Queue Length 95th (ft)	m104	250	0	71	229	#326	250	#190	152	
nternal Link Dist (ft)		1890			3832		1020		1940	
Turn Bay Length (ft)	175		20	125		125		100		
Base Capacity (vph)	229	918	1333	226	779	999	1003	346	199	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.59	0.61	0.32	0.44	0.74	0.79	0.78	69.0	0.54	

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Synchro 9 Report Page 1

Queues 2: College Drive & Dell Range Boulevard

2040 Total AM.syn

Lane Group ERM Lane Group Flow (ph) 113 vic Ratio Control Delay 226 Courto Delay 326 Oueue Delay 326 Oueue Length 50th (ft) 55 Oueue Length 50th (ft) 55 Oueue Length 55th (ft) 96	323 0.37 43.3 0.0 43.3	382 0.29 0.0 0.0	302 0.61 17.3 0.0	913 0.77 28.2 0.0	240 0.36 0.0 0.0	384 0.74 31.3 0.0	350	190 0.40	SBL	185	89
Flow (vph) 113 0.52 39 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	323 0.37 43.3 43.3	382 0.29 0.8 0.0	302 0.61 17.3 0.0	913 0.77 28.2 0.0	240 0.36 3.0 0.0	384 0.74 31.3 0.0	350	190			
9y 32.6 9y 32.6 9y 32.6 34h 50th (ft) 55 3th 50th (ft) 96 Frief (ft)	43.3 43.3 43.3	0.29	0.61 17.3 0.0	28.2	3.0	31.3	0.48	0.40	146	534	246
32.6 37 32.6 37 32.6 31 32.6 31 32.6 31 32.6 32.6 32.6 32.6 32.6 32.6 32.6 32.6	43.3	0.8	0.0	28.2	3.0	31.3	25.0		0.44	0.76	0.53
32.6 gth 50th (ft) 55 gth 95th (ft) 96 fth 95th (ft) 96	43.3	0.0	0.0	0.0	0.0	313	2000	7.5	25.2	43.6	12.9
32.6 gth 50th (ft) 55 gth 95th (ft) 96 Friet fft)	43.3	0.8	17.3			313	0.0	0.0	0.0	0.0	0.0
58 98 8	740		2	28.2	3.0	2	35.2	7.5	25.2	43.6	12.9
96	2	-	96	275	G	98	102	0	61	167	25
	158	0	ш142	327	m23	#124	148	55	108	229	100
	1890			3832			1020			1940	
		200	125		200	125		200	100		200
Capacity (voh) 220	883	1333	525	1183	673	524	730	470	344	704	464
	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0.51	0.37	0.29	0.58	72.0	0.36	0.73	0.48	0.40	0.42	92.0	0.53

95th percentile volume exceeds capacity, queue may be longer Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues 2: College Drive & Dell Range Boulevard

2040 Total PM.syn

	4	†	>	1	ţ	4	•	←	•	٠	→	7
ane Group	E		ä	WBL	WEI	WBR	NBI	NBI	MBR	SBL	SBT	SBR
Lane Group Flow (vph)	339	1043	511	252	829	174	580	683	413	284	432	262
v/c Ratio	1.09		0.38	1.06	0.93	0.33	06.0	1.06	0.82	1.07	0.73	0.56
Control Delay	95.8		0.5	93.1	47.8	5.8	42.8	90.3	27.5	102.2	45.9	6.0
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0
Total Delay	95.8		0.2	93.1	47.8	5.8	42.8	90.3	27.5	102.2	45.9	6
Queue Length 50th (ft)	~209		0	~131	276	11	140	-252	88	-157	136	e
Queue Length 95th (ft)	m#217	-	0m	m#248	m#366	m29	#214	#367	#254	#323	192	74
Internal Link Dist (ft)					3832			1020			1940	
Turn Bay Length (ft)	175		200	125		200	125		200	100		200
Base Capacity (voh)	310	1037	1333	238	968	275	644	646	503	266	230	470
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	1.01	0.38	1.06	0.93	0.33	06.0	1.06	0.82	1.07	0.73	0.56

Volume axceeds capacity, queue is theoretically infinite
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer
 Queue shown is maximum after two cycles.
 Moures for 95th percentile queue is metered by upstream signal.

Synchro 9 Report Page 1

88 0 8 8 0 98 0 8 8 0 0 98 986 0000 57 0.11 13.1 13.1 14 3 34.24 69 0.32 25.9 25.9 30 42 213 0 0 0 0 0 32 Queues 3: Van Buren Avenue & Dell Range Boulevard 404 404 379 0.45 7.3 0.0 7.3 118 3832 Ť 841 8 20 00 00 8 336 vic Ratio
Control Delay
Obereo Delay
Obereo Delay
Cheeve Length Softh (ft)
Obereu Length Softh (ft)
Internal Link Dist (ft)
Internal Link Dist (ft)
Base Capacity (vph)
Silavaten Cap Reductn
Spillback Cap Reductn
Spillback Cap Reductn
Spillback Cap Reductn
Reduced vic Ratio Lane Group Flow (vph)

2022 Total AM.syn 12/12/2017

Queues 3: Van Buren Avenue & Dell Range Boulevard

2022 Total PM.syn 12/12/2017

216 0.47 11.0 11.0 11.0 0 0 0 895 462 0 0 0 0 0.47 260 77 14.7 14.7 14.7 15 20 20 3424 370 037 63 36.9 36.9 33 43 1056 0 0 0 0.42 3 3 3 3 3 3 347 1 0000 657 0.63 14.4 252 252 3832 Ť 1044 487 0 0 0 0 0 0 0 32 82 0 0 0 0 0 4 4 0 0 0 0 0 4 4 Control Delay
Control Delay
Oneve Delay
Total Delay
Gueue Length 50th (ft)
Gueue Length 95th (ft)
Gueue Length 95th (ft)
Inflamat Link Dist (ft)
Is as Capacity (tp)
Sase Capacity (tp)
Sase Capacity (tp)
Sase Capacity (tp) Lane Group Flow (vph)

Volume for 95th percentile queue is metered by upstream signal

Synchro 9 Report Page 1

Queues 3: Van Buren Avenue & Dell Range Boulevard

2040 Total AM.syn 12/12/2017

are Group	茁	HBI	888	WE	WBI	ME	NBT	勝	SST	
ane Group Flow (vph)	121	352	110	79	766	29	93	12	298	
//c Ratio	0.46	0.34	0.12	0.15	0.75	0.45	0.23	0.10	89.0	
Control Delay	10.1	3.8	0.3	7.5	17.4	27.3	9.4	29.7	30,1	
Queue Delay	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0	
Fotal Delay	10.1	3.8	0.3	7.5	17.4	27.3	9.4	29.7	30.1	
Queue Length 50th (ft)	11	30	0	17	296	17	12	13	110	
Queue Length 95th (ft)	33	32	0	36	460	m18	m13	36	207	
nternal Link Dist (ft)		3832			760		3424		2586	
Turn Bay Length (ft)	100			100		100		100		
Base Capacity (vph)	262	1027	911	532	1025	137	400	278	438	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductin	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.46	0.34	0.12	0.15	0.75	0.45	0.23	0.10	89 0	
Harcotte Summan	Ì		۱			ľ		h	ļ	

Queues 3: Van Buren Avenue & Dell Range Boulevard

2040 Total PM.syn 12/12/2017

ane Goup EBI ABI AB		4	†	~	1	ţ	1	—	۶	→	
310 968 93 68 774 55 226 34 6 93 68 774 55 226 34 6 93 68 774 55 226 34 6 93 68 774 55 226 34 6 93 67 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	ane Group	E	Ħ	88	MEN	TBM	W.	NET	8	SBT	
0.98 0.87 0.10 0.33 0.70 0.89 0.72 0.28 0.07 0.09 0.07 0.00 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	ane Group Flow (vph)	310	968	93	89	774	55	226	R	362	
98.7 106 0.2 106 12.3 108.3 38.4 41.1 10.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	ile Rabo	0.98	0.87	0.10	0.33	0.70	0.89	0.72	0.28	100	
98.7 106 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Control Delay	38.7	10.6	0.2	10.6	12.3	108.3	38.4	41.1	77.3	
36.7 10.6 0.2 10.6 12.3 108.3 38.4 41.1 19.5 50.9 0 14 24 19 19 64 19 19 19.5 50.9 0 14 24 19 19 64 19 19 19.5 50.9 0 14 24 10.5 50.9 10 10.0 10.0 10.0 10.0 10.0 10.0 10.	Queue Delay	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	
195 509 0 14 241 19 64 19 10 10 242 m#123 49 10 100 382 100 100 100 100 100 100 100 100 100 10	Fotal Delay	36.7	10.6	0.2	10.6	12.3	108.3	38.4	41.1	77.3	
100 m#222 m540 m0 39 375 m#59 m#112 49 3832 100 3424 100 3424 100 3424 100 3424 100 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Queue Length 50th (ff)	195	506	0	14	241	119	B	16	171	
in Dist (ft) 3832 760 3424 tempth (ft) 100 100 100 addy (pah) 316 1118 977 206 1111 62 315 122 cap Reductin 0	Queue Length 95th (ft)	m#222	m540	Om	38	375	65#E	m#123	49	#363	
Length (t) 100 100 100 100 100 100 100 acity (aph) 316 1118 977 206 1111 62 315 122 122 Cap Reductin 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ntemal Link Dist (III)		3832			260		3424		2586	
1118 977 206 1111 62 315 122 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 087 0.10 0.33 0.70 0.89 0.72 0.28	Turn Bay Length (ft)	100			100		100		100		
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Sase Capacity (vph)	316	1118	216	206	1111	62	315	122	362	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
0.87 0.10 0.33 0.70 0.89 0.72 0.28	Storage Cap Reductin	0	0	0	0	0	0	0	0	0	
	Reduced v/c Ratio	96.0	0.87	0.10	0.33	0.70	0.89	0.72	0.28	1.00	

Synchro 9 Report Page 1

^{# 95}th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues 6: Whitney Road & Dell Range Boulevard

2040 Total AM.syn 12/12/2017

	1	†	/	Į.	•	—	۶	→	
Lone Group	Ħ	EBI	EM	Wei	MEI	NBT	88	158	
Lane Group Flow (vph)	16	225	ιΩ	386	117	186	72	532	
vic Ratio	0.10	0.46	0.05	0.80	0.38	0.22	0.13	0.63	
Control Delay	14.9	16.4	13.0	31.7	13.9	6.8	8.9	14.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.9	16.4	13.0	31.7	13.9	8.9	80	14.3	
Queue Length 50th (ft)	4	51	Ì	118	23	33	12	120	
Queue Length 95th (ft)	15	66	1	#208	99	69	33	234	
Internal Link Dist (II)		1031		4112		1506		1114	
Tum Bay Length (ft)	125		100		150		125		
Base Capacity (vph)	188	561	319	260	311	850	544	838	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductin	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced vlc Ratio	60'0	0.40	0.02	0.69	0.38	0.22	0.13	0.63	
		į	Ì		Ì	١			

⁹⁵th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Queues 6: Whitney Road & Dell Range Boulevard

2040 Total PM.syn 12/12/2017

	٩	t	۶	ļ	•	-	۶	→	
Lare Grup	EE	8	WBL	WBI	NBI	MBT	55	SBI	
Lane Group Flow (vph)	06	568	4	411	136	206	88	439	
v/c Ratio	0.37	06.0	0.03	0.65	0.50	0.72	0.38	663	
Control Delay	171	36.1	10.8	18.5	20.6	22.1	18.3	17.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	17.1	36.1	10.8	18.5	20.6	22.1	18.3	17.8	
Queue Length 50th (ft)	21	165		100	35	148	52	116	
Queue Length 95th (R)	22	#347	9	184	88	#297	53	207	
Internal Link Dist (ft)		1031		4112		1506		1114	
Tum Bay Length (ft)	125		100		150		125		
Base Capacity (vph)	259	662	150	199	274	701	230	969	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.35	98.0	0.03	0.62	0.50	0.72	0.38	0.63	

95th percentile volume exceeds capacity, queue may be longer Queue shown is maximum after two cycles.

Synchro 9 Report Page 1

Queues 7: Dell Ra

Trailige Doulevaild & CO-SO							102212)
	1	Ť	1	ţ	←	→	
(III)	EBI	H	WBL	WBI	NBT	SBI	
oup Flow (vph)	24	120	4	757	4	125	
Control of the last of the las	0.07	90.0	0.01	0.43	0.01	0.35	
Delay	1.7	1.8	7.0	10.5	27.5	27.1	
Selay	0.0	0.0	0.0	0.0	00	0.0	
day	17	80	7.0	10.5	27.5	27.1	
ength 50th (ft)	-	m	50	89	2	41	
ength 95th (ft)	-	S	-	141	9	100	
Link Dist (ft)		913		1774	437	277	
y Length (ft)	350		325				
spacity (vph)	384	1860	669	1751	415	358	
on Cap Reductn	0	0	0	0	0	0	
k Cap Reductin	0	0	0	0	0	0	
Cap Reductn	0	0	0	0	0	0	
1 v/c Ratio	0.06	90.0	0.01	0.43	0.01	0.35	

Synchro 9 Report Page 1

Synchro 9 Report Page 1

Queues 7: Dell Range Boulevard & US-30

2022 Total PM.syn 12/12/2017

ane Group	\	t	,	-	→	
Court Class Class Cont.	183	EBI	WBT	MBIT	SBT	
GIGO MON CADIL	12	366	398	00	285	
ic Ratio	0.04	0.31	0.34	0.01	0.48	
Control Delay	5.4	10.8	11,8	12.0	16.7	
Duene Delay	0.0	0.0	0.0	0.0	0.0	
otal Delay	5.4	10.8	11.8	12.0	16,7	
Dueue Length 50th (ft)	2	85	40	2	84	
Queue Length 95th (ft)	m3	76	77	m	83	
nternal Link Dist (ft)		913	1774	437	712	
um Bay Length (ft)	350					
lase Capacity (vph)	303	1117	1155	740	230	
Navation Cap Reductn	0	٥	0	0	0	
spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductin	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.31	0.34	100	0,48	

m Volume for 95th percentile queue is metered by upstream signal.

Queues 7: Dell Range Boulevard & US-30

	١	t	-	ļ	-	→	
ane Solly	田田	H	WE THE	191	TBI	158	
Lane Group Flow (vph)	9	132	-	912	es	240	
vic Ratio	0.04	80.0	00:0	0.56	10.0	0.55	
Control Delay	2.1	2.6	10.0	13.1	21,7	24.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	2.1	2.6	10.0	13.1	21.7	24.5	
Queue Length 50th (ft)	1	4	0	135	-	88	
Queue Length 95th (ft)	m2	Эш	m	241	60	169	
Internal Link Dist (ft)		913		1774	437	712	
Turn Bay Length (ft)	350		325				
Base Capacity (vph)	263	1623	607	1624	541	438	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.04	0.08	0.00	0.56	10.0	0.56	
Interception Summan					ı		

intersector sormany was a second of second signal of which we will be with percentile queue is metered by upstream signal.

Queues 7: Dell Range Boulevard & US-30

2040 Total AM.syn

2040 Total PM.syn 12/12/2017

27.0 27.0 27.0 27.5 27.5 27.5 27.5 0.00 0.53 0.53 0.10 0.11 0.00 1.18 1.18 130 130 130 130 130 130 130 Ť 0005 5.2 5.2 5.2 5.2 5.3 Lane Group
Lane Group Flow (vph)
vic Ratio
Control Delay
Control Delay
Queue Delay
Queue Delay
Queue Length 50th (ft)
Coueue Length 95th (ft)
Internat Link Dist (ft)
Tum Bay Length (ft)
Base Capacity (ph)
Starvation Cap Reductn
Spillack: Cap Reductn
Spillack: Cap Reductn
Storage Cap Reductn
Storage Cap Reductn
Reduced vic Ratio

inhoree on Simmer of the percentile queue is metered by upstream signal m. Volume for 95th percentile queue is metered by upstream signal.

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1057 0 0 0 0

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Synchro 9 Report Page 1

Queues 8: US-30

Jeues US-30 & Van Buren Avenue	ren Ave	une			2022 Total AM.syn 12/12/2017
	1	t	ţ	٨	
e-Group	語	Ħ	MET	SBL	
e Group Flow (vph)	197	906	457	145	
Ratio	0.30	0.37	0.22	0.63	
ntrol Delay	3.3	3.0	9.4	37.2	
oue Delay	0.0	0.0	00	0.0	
al Delay	33	3.0	9.6	37.2	
eve Length 50th (ft)	16	48	62	24	
eue Length 95th (ft)	45	66	114	73	
rmal Link Dist (R)		2716	1386	3424	
n Bay Length (ft)	100				
e Capacity (vph)	773	2457	2055	444	
rvation Cap Reductn	0	0	0	0	
Ilback Cap Reductn	0	0	0	0	
rage Cap Reductn	0	0	0	0	
duced v/c Ratio	0.25	0.37	0.22	0.33	
September Common State					

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	1	1	ţ	و	
ano Gene	182	HBH	WBT	188	
Lane Group Flow (vph)	197	906	457	145	
v/c Rabo	0.30	0.37	0.22	0.63	
Control Delay	3.3	3.0	4.6	31.3	
Queue Delay	0.0	0.0	0.0	0.0	
Total Delay	3.3	3.0	4.6	31.3	
Queue Length 50th (ft)	16	48	30	23	
Queue Length 95th (ft)	45	66	75	25	
Internal Link Dist (ft)		2716	1386	3424	
Turn Bay Length (ft)	100				
Base Capacity (vph)	773	2457	2055	444	
Starvation Cap Reductn	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	
Storage Cap Reductn	0	0	0	0	
Reduced v/c Ratio	0.25	0.37	0.55	0.33	

Queues 8: US-30 & Van Buren Avenue

2040 Total AM.syn 12/12/2017 171 0.46 111.3 0.0 111.3 6 m55 371 171 0.46 12.5 0.0 12.5 12.5 12.5 12.5 13.5 13.5 13.5 13.5 245 2166 1724 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1528 0.89 24.1 24.1 308 #407 1386 489 0.23 4.8 4.8 4.8 6.3 6.3 2716 172 0.75 39.1 0.0 39.1 53 53 Lane Group Flow (vph)

Lane Group Flow (vph)

Vic Ratio

Control Delay

Oueue Delay

Oueue Length 56th (ft)

Oueue Length 56th (ft)

Oueue Length 56th (ft)

Oueue Length 56th (ft)

Standan Link Dist (ft)

Turn Bay Length (ft)

Base Capacity (vph)

Standan Cap Reductn

Spillback Cap Reductn

Skindage Cap Reductn

Reduced vic Ratio

99th percentle volume exceeds capacity, queue may be longer Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal

Queues 8: US-30 & Van Buren Avenue

2040 Total PM.syn 12/12/2017

Lane Group Flow (vph) 411 1446 w/or Ratio Country Flow (vph) 411 1446 w/or Ratio Control Delay 28.0 9.3 0.67 Countrol Delay 28.0 9.3 0.67 Countrol Delay 28.0 9.3 0.67 Countrol Delay 28.0 9.3 Countrol Delay 28.0 9.3 Countrol Delay 28.0 9.3 countrol Delay 28.0 9.3 countrol Delay 28.0 9.3 countrol Delay 28.0 9.3 countrol Delay 28.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	8 872 7 064 3 227 0 00 3 227	23 23 32.4 32.4 12	278 278 0.59 8.9 8.9 8.9
Flow (vph) 4111 y 28.0 y 28.0 y 28.0 y 28.0 y 28.0 y 28.0 y 28.0 ngth (tt) 127 ngth (tt) 100 ngth (tt) 100 ngth (tt) 100 ngth (tt) 100		23 0.08 32.4 32.4 12	278 0.59 8.9 0.0 8.9
9 28.0 9 28.0 9 28.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0		0.08 32.4 32.4 12	0.00 8 0.00 8 0.00 8
y 28.0 y 0.0 0.0 10.5 Seth (10) 1.27 11.0 Exist (11) 1.28 11.0 Exist (11) 1.00 11.		32.4 0.0 32.4 12	8.9 0.0 8.9 8.9
9 9 0.0 28.0 th 56th (tt) 228 Dist (tt) 238 Dist (tt) 100 ngth (tt) 578 as Reductin 0		32.4	00 8.9 18
28.0 th 50th (ft) 127 in 95th (ft) 238 Dist (ft) 100 ingth (ft) 100 ingth (ft) 100 and an deductin 0		32.4	689
th 50th (ft) 127 th 95th (ft) 238 Dist (ft) 100 ingth (ft) 100 328 Seditiff 0		12	
(ft) 238 100 100 578			
100 578		m26	m45
100 578 578	ã	3424	
578 scfn 0		100	
actin 0	1356	275	473
		0	0
	0 0	0	0
Storage Cap Reductn 0 0	0	0	0
Reduced v/c Ratio 0,71 0,67	0	90.0	0.59

m Volume for 95th percentile queue is metered by upstream signal

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Quenes

	4	t	1	1	ţ	←	→	
lane Group.	189	189	EBK	WE	WET	MET	SBI	
Lane Group Flow (vph)	36	277	R	12	842	157	153	
vic Ratio	0.12	0.16	0.04	0.02	0.53	0.48	0.29	
Control Delay	0.6	9.6	9.0	10.0	26.7	32.4	6.6	
Oueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.0	9.6	9.0	10.0	26.7	32.4	6.6	
Oueue Length 50th (ft)	00	33	0	S	262	11	4	
Queue Length 95th (ft)	15	42	0	in.	297	96	48	
Internal Link Dist (ft)		1386			1488	601	902	
Turn Bay Length (ft)	100		150	52				
Base Capacity (vpt)	293	1713	794	548	1589	328	528	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.12	910	0.04	0.02	0.53	0.48	0.29	

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	1	1	~	1	ļ	←	→	
and Gruin	Ħ	ti	EBB	TBM	WELL	NET	158	
Lane Group Flow (vph)	148	692	110	16	344	120	115	
v/c Ratio	0.26	0.39	0.13	0.04	0.23	0.36	0.28	
Control Delay	8.2	10.8	2.4	5.5	15.3	32.2	15.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.2	10.8	2.4	5.5	15.3	32.2	15.1	
Queue Length 50th (ft)	34	26	0	4	74	69	22	
Queue Length 95th (ft)	4	122	14	S	106	46	44	
Internal Link Dist (ft)		1386			1488	109	706	
Turn Bay Length (ft)	100		150	22				
Base Capacity (vph)	622	1792	848	420	1502	338	416	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductin	0	0	0	0	0	0	0	
Reduned vir Ratio	N. O.	02.0	0.13	0.04	0.03	92.0	A 28	

Queues 9: Hayes Avenue & US-30

	\	Ť	-	-	,	-	+	
Sue Group	EBI		588	WE	18/6	NBI	387	
Lane Group Flow (vph)	41	449	53	S	1251	142	175	
vic Ratio	0.20	0.24	0.03	0.01	0.71	0.59	0.38	
Control Detay	9.5	8.4	0.2	2.6	14.8	42.6	10.7	
Owene Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.5	60	0.2	2.6	14.8	42.6	10.7	
Queue Length 50th (ft)	đ	25	0		349	11	- 44	
Queue Length 95th (ft)	m20	76	m2	E	416	145	72	
Internal Link Dist (ft)		1386			1488	109	706	
Turn Bay Length (ft)	100		150	52				
Base Capacity (vph)	202	1865	828	513	1750	241	463	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.20	0.24	0.03	0.01	0.71	0.59	0.38	

m Volume for 95th percentile queue is metered by upstream signal

Queues 9: Hayes Avenue & US-30

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 1212/2017

	4	†	~	1	ţ	•	→	
Lane Group	B	EBI	EBB	WBL	WBT	NBT	SBT	
Lane Group Flow (vph)	152	1208	118	o	734	95	128	
vic Ratio	0.35	0.58	0.12	0.03	0.42	0.43	0.37	
Control Delay	6.3	7.8	1.4	28	6.2	40.4	16.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	6.3	7.8	1.4	2.8	6.2	40.4	16.1	
Queue Length 50th (ft)	92	140	0	0	112	19	20	
Queue Length 95th (ft)	m41	170	m11	Ē	m132	102	73	
Internal Link Dist (ft)		1386			1488	109	706	
Turn Bay Length (ft)	100		150	52				
Base Capacity (vph)	458	2070	362	271	1732	221	344	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.33	0.58	0.12	0.03	0.42	0.43	0.37	

m. Volume for 95th percentile queue is metered by upstream signal

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Queues 10: Whitney Road & US-30

2022 Total AM.syn 12/12/2017

	1	t	/	ļ		-	•	
ane-Group.	ä	m	WBI	WBT	N.	NBT	387	
ane Group Flow (vph)	43	256	60	687	84	8	248	
ifc Ratio	0.15	0.18	0.02	0.51	0.20	0.13	0.47	
Control Delay	13.7	15.1	8.7	14.9	21.0	19.3	12.6	
Dueue Delay	00	0.0	0.0	0.0	0.0	0.0	0.0	
otal Delay	13.7	15.1	8.7	14.9	21.0	19.3	12.6	
Queue Length 50th (ft)	19	25	2	171	25	34	42	
Dueue Length 95th (ft)	37	71	2	92	45	45	38	
nternal Link Dist (ft)		1323		2503		1420	1506	
Turn Bay Length (ft)	375		375		100			
Rase Capacity (vph)	285	1448	483	1341	318	616	528	
Starvation Cap Reductin	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductin	0	0	0	0	0	0	0	
Reduced vic Ratio	0.15	0.18	0:05	0.51	0.20	0.13	0.47	

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HELVE SET OF	i.	in the second	Palite	THE STATE OF	-	-	der	
Caron Caron	CIN	CDI	WEST.	IN EST	(NEX	ON	190	
Lane Group Flow (vph)	137	524	16	201	42	58	508	
v/c Ratio	0.28	0.46	0.28	0.19	0.11	0.14	0.41	
Control Detay	16.1	29.5	14.8	20.3	18.5	16.8	20.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.1	29.5	14.8	20.3	18.5	16.8	20.9	
Queue Length 50th (ft)	99	172	56	38	16	30	96	
Queue Length 95th (ft)	75	235	20	58	35	55	126	
Internal Link Dist (ff)		1323		2503		1420	1506	
Tum Bay Length (ft)	375		375		100			
Base Capacity (vph)	501	1132	373	1041	376	643	516	
Starvation Cap Reductin	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.27	0.46	0.26	0.10	0.11	0.14	0.41	

Queues 10: Whitney Road & US-30

0.71 15.8 94 224 15.06 0.13 21.2 21.2 30 30 93.5 31.5 31.5 31.5 6E00088 0.69 22.4 22.4 215 300 27 12 12 12 12 440 0 0 0 0 0 212 212 212 212 213 213 213 0.62 32.7 112 355 0 0 0 0 0 0 0 vir Ratio
Control Delay
Control Delay
Queue Delay
Total Delay
Cheue Length 50th (1)
Internal Link Dist (1)
In Base Capacity (vph)
Starvation Cap Reductn
Spillback Cap Reductn
Spillback Cap Reductn
Storage Cap Reductn
Reduced vir Ratio Lane Group Flow (vph)

intersection Summary

M. Volume for 95th percentile queue is metered by upstream signal.

Queues 10: Whitney Road & US-30

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 12/12/2017

	4	†	-	ļ	•	•	→	
Cane Group	83	183	WBI	18/	NBN	199	SBI	
Lane Group Flow (vph)	513	664	43	263	45	93	527	
vlo Ratio	96.0	0.52	0.20	0.44	0.21	0.15	0.88	
Control Delay	51.9	25.2	16.5	32.7	20.4	17.8	40.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	51.9	25.2	16.5	32.7	20.4	17.8	40.2	
Queue Length 50th (ft)	345	226	12	89	17	33	242	
Queue Length 95th (ft)	#408	296	m24	m88	39	67	#463	
Internal Link Dist (ft)		1323		2503		1420	1506	
Turn Bay Length (ft)	375		375		100			
Base Capacity (vph)	537	1282	215	592	217	639	287	
Starvation Cap Reductn	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	
Reduced v/c Ratio	96:0	0.52	0.20	0.44	0.21	0.15	0.88	

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

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Queues 11: Ridge Road & Storey Boulevard

	4	†	<u> </u>	6	ţ	4	•	←	٠	→
Jane Group	193	183	簡	WEL	WBI	WBR	MR	NBI	381	SBI
Lane Group Flow (vph)	œ	359	139	12	525	-47	292	110	-	183
v/c Ratio	0.05	0.58	0.23	0.04	0.85	0.01	0.64	0.16	0.00	97.0
Control Delay	10.6	17.8	3,3	6	25.6	0.2	22.9	10.6	11.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	17.8	3.3	6 6	25.6	0.2	22.9	10.6	11.0	9.6
Queue Length 50th (ft)	2	91	0		103	0	8	77	0	30
Queue Length 95th (ft)	∞	157	25	ETT.	#300	e E	#197	49	m	89
Internal Link Dist (ft)		1090			1843			3069		857
Turn Bay Length (ft)	125		100	125		100	200		75	
Base Capacity (vph)	182	692	999	306	692	603	457	706	488	704
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.52	0.21	800	0.76	0.01	0.64	0.16	000	0.26

95th percente volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Molume for 95th percentile queue is metered by upstream signal.

Queues 11: Ridge Road & Storey Boulevard

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 12/12/2017

	4	t	1	1	ţ	1	•		۶	→	
are Group	EBE	189	EBE	MBI	WBI	W88	181	181	SBL	IBS	
Lane Group Flow (vph)	30	675	207	42	485	2	210	244	18	200	
v/c Ratio	0.10	0.88	0.27	0.25	0.63	10.0	090	0.44	0.05	0.36	
Control Delay	8.3	28.0	2.7	12.3	13.7	9.0	26.7	18.4	14.7	16.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	8.3	28.0	2.7	12.3	13.7	9.0	26.7	18.4	14.7	16.3	
Queue Length 50th (ft)	10	185	2	4	108	0	99	88	*1	90	
Queue Length 95th (ft)	17	#384	28	ш20	218	0E	#154	127	15	100	
Internal Link Dist (ft)		1090			1843			3006		857	
Turn Bay Length (ft)	125		100	125		100	200		75		
Base Capacity (vph)	308	823	791	178	823	712	349	655	316	526	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.10	0.82	0.26	0.24	69.0	0.01	090	0.44	0.05	0.36	

Hersection Summary
95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Tolume for 95th percentile queue is metered by upstream signal.

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Queues 12: College Drive & Storey Boulevard

	١	t	~	-	,		_	۶	+	
Sep Grain	183	EBI	688	WBI	WBI	MBI	MBI	Sei	SBI	
Lane Group Flow (vph)	600	66	261	10	169	355	213	40	272	
vicRatio	0.04	0.33	0.56	900	950	0.58	0.21	0.01	0.27	
Control Delay	18.1	20.4	17.2	18.0	27.8	18.3	10.5	5.0	5.7	
Queue Delay	0.0	0.0	0:0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.1	20.4	17.2	18.0	27.8	18,3	10.5	5.0	5.7	
Queue Length 50th (ft)	e	38	8	9	25	116	55	1	33	
Queue Length 95th (ft)	9m	122	125	12	97	m187	m102	4	79	
Internal Link Dist (ft)		1843			3827		1228		854	
Turn Bay Length (R)	100		100	100		160		150		
Base Capacity (vph)	292	470	585	326	470	610	1028	643	1025	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.03	0.21	0.45	0.03	0.36	0.58	0.21	0.01	0.27	

Intersection summary

M. Volume for 95th percentile queue is metered by upstream signal

Queues 12: College Drive & Storey Boulevard

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 12/12/2017

	1	†	<i>></i>	-	ļ	1	←	۶	→	
ane Group	æ	EBI	舖	ig.	WST	W.	NBT	SBL	383	
ane Group Flow (vph)	16	254	429	ιΩ	219	314	393	Ξ	263	
c Ratio	20.0	0.63	0.65	0.03	0.54	0.57	0.43	0.05	0.28	
control Delay	14.9	23.8	13.6	14.6	22.9	14.2	9.5	7.0	8.0	
lueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
otal Delay	14.9	23,8	13.6	14.6	22.9	14.2	9.5	7.0	8.0	
lueue Length 50th (ft)	9	102	86	-	65	Z	70	2	42	
lueue Length 95th (R)	9E	m126	т126	æ	113	158	143	00	88	
ntemal Link Dist (ft)		1843			3827		1228		854	
um Bay Length (R)	100		100	100		160		150		
ase Capacity (vph)	283	609	722	251	506	553	922	458	923	
tarvation Cap Reductn	0	0	0	0	0	0	0	0	0	
piliback Cap Reductn	0	0	0	0	0	0	0	0	0	
torage Cap Reductn	0	0	0	0	0	0	0	0	0	
educed v/c Ratio	90.0	0.50	0.59	0.02	0.43	0.57	0.43	0.05	0.28	

intersection Summing.

Wolume for 95th percentile queue is metered by upstream signal.

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Queues 13: College Drive & Thomas Road

	4	†	1	ţ	•	←	٨	→	
ane Group	E E	EBIT	WBI	WBT	NBI	NBT	SBE	SBIT	
Lane Group Flow (vph)	-	40	235	28	38	645	56	504	
wic Ratio	000	0.10	0.78	0.15	0.10	0.71	0.10	0.55	
Control Delay	14.0	7.3	38.6	7.4	7.5	15.5	6.7	9.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.0	7.3	38.6	7.4	7.5	15.5	6.7	9.5	
Queue Length 50th (ft)	0	***	74	2	9	150	B 133		1、1日の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の
Queue Length 95th (#)	m	19	#164	24	19	#347	m13	143	
Internal Link Dist (ft)		1031		3828		1890		1228	
Turn Bay Length (ft)	100		100		275		100		
Base Capacity (vph)	347	443	353	456	374	903	282	916	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductin	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced vic Ratio	00.0	0.09	19.0	0.13	0.10	0.71	0.10	0.55	

195th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles

To Volume for 95th percentile queue is metered by upstream signal.

Queues 13: College Drive & Thomas Road

2040 Total AM.syn 12/12/2017

2040 Total PM.syn 12/12/2017

	4	†	1	ļ	•	←	٠	→	
ane Group	183	Ħ	WBL	181	NB.	NBI	88	SRT	
ane Group Flow (vph)	ħ	44	27.1	89	51	971	74	625	
/c Ratio	0.01	0.12	96'0	0.18	0.15	1.00	0.58	0.63	
Control Delay	21.8	11.0	77.1	8.7	7.0	45.5	31.7	12.0	
Dueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	21.8	11.0	77.1	8.7	7.0	45.5	31.7	12.0	
Queue Length 50th (ft)	-	e	125	2	00	-387	1.1	155	
Queue Length 95th (ft)	đ	27	#269	31	23	#693	06#	256	
nternal Link Dist (ft)		1031		3828		1890		1228	
Turn Bay Length (ft)	100		100		275		100		
Base Capacity (vph)	275	367	281	380	338	196	127	992	
Starvation Cap Reductn	0	٥	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.01	0.12	96.0	0.18	0.15	1:00	0.58	0.63	

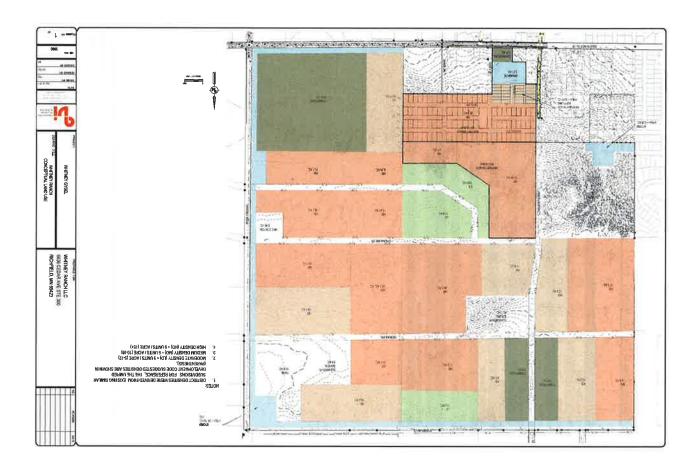
Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Synchro 9 Report Page 1



APPENDIX F

Conceptual Land Use Plan

Kimley-Horn and Associates, Inc. 096567001 – Whitney Ranch - Cheyenne

WHITNEY ROAD CORRIDOR STUDY

Whitney Ranch Meeting

March 7, 2018 @ 4:00 P.M.

•LIST OF ATTENDEES •

Record Record endance	NAME	сомрани	EMAIL	CELL PHONE
8	Tom Cobb	AVI	cobb@avipc.com	(970)214-6542 (307)637-6017
IMI	Tom Mason	МРО	tmason@cheyennempo.org	(307)637-6299
38	Brad Emmons	AVI	emmons@avipc.com	307,637.6017

Whitney Road Corridor Study Whitney Ranch Meeting March 7, 2018

Introduction and Sign In

Why Modification to Roadway Alignment

≓

- a. Impact to Petroleum high pressure lines in east and west side of roadway (Suncor 12.75' [2' to 5' deep; East] and Plains All American Pipeline 16" [4' to 14'-5" deep; West])
 b. Road sight distance related to design speed
 c. Roadway profile or longitudinal grade exceeds current standard 10% maximum snow 8%
- Potential Benefits ≡.
- a. Eliminate water and sewer crossing of petroleum line
 b. Storm Sewer outlet Whitney Road to Whitney Ranch
 c. Detention Area
- Primary Options
 a. Alignment East
 b. Alignment West
 c. Other ≥

- Alternatives >
- a. Single travel lane each alignment south/ north
 b. 3 Lane Section on new alignment
 - Greenway old alignment

5/22/2019
X:\Thomasc\2018\Whitney Road Corridor Plan\Meetings\Whitney Ranch\Agenda_2018 03 07.doc

Whitney Road Corridor Study

Whitney Ranch Meeting 16-Nov-18 * List of Attendees*



Please Initial to Confirm attendance	NAME	COMPANY	EMAIL	CELL/PHONE
7/1	Tom Mason	MPO	tmason@cheyennempo.org	637-6299
11/	Tom Cobb	MPO	tcobb@cheyennempo.org	638-4384
	Joe Patterson	Guardian Development	joe@guardiancompanies.com	220-1772
Vag	Connie Holgerson	Gysel Whitney, LLC	bholgerson@rtconnect.net	307-246-3294
MAG	Bill Holgerson	Gysel Whitney, LLC	bholgerson@rtconnect.net	307-246-3294
NO	Nancy Olson	MPO	nolson@cheyennempo.org	638-4366



WHITNEY ROAD CORRIDOR STUDY

Whitney Ranch Meeting
August 8, 2018 @ 11:00 A.M.

• LIST OF ATTENDEES •

Please Initial To Record Attendance	NAIVIE	COMPANY	FMAIL	CELL/ PHONE
72	Tom Cobb	AVI	cobb@avipc.com	(970)214-6542 (307)637-6017
G &	Connie Holgerson	Gysle Whitney, LLC	bholgerson@rtconnect.net	307.246.3294
	Brad Emmons	AVI	emmons@avipc.com	307,637.6017
0	Joe Patterson	Guardian Development	ioe@gulardiancompanies.com	307.220.1772
A.	Bill Holgerson	Cysel Whiteyll	Bill Ablacian Cysel Whiteyld bholgersnortened net	307.2K 3294

WHITNEY ROAD CORRIDOR STUDY SUNCOR ENERGY USA PIPELINE

•LIST OF ATTENDEES •



Tom Cobb



League Marie





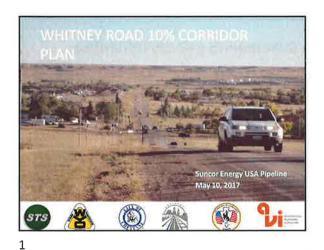
AGENDA

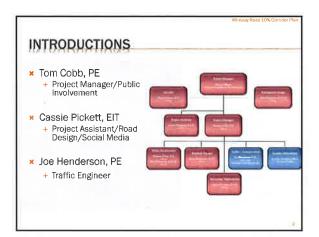
	Date: May 10, 2017	Project No: 2-3987.17	Suncor Energy USA Pipeline Co 1715 Fleischli Blvd. Cheyenne, WY 82001
	Date:	Project No:	Meeting (Location:
subject: Suncor Energy USA Pipeline	Client Cheyenne MPO	Project: Whitney Road Corridor Study	May 10, 2017 @ 2:00 pm
Subject:	Client	Project:	Meeting Ma

- I. Introductions
- II. Introduce Whitney Project
- III. Additional available pipeline data and details
- III.1 Verify datum
- Depth 111.2
- III.3 Marker location on pipeline or offset
- W. Ability to complete isolated relocation or realign of portion of pipeline
- Procedure logistics of process
 - Constraints IV.2
- Typical Costs IV.3
- Timing

THE TRYTHES AGENEY.

AN PROFESSIONAL CORPORATION 11G OID TOWN LAWS, Side 101, Chayretia, WY 2009 Phare, 201 637 641





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4

PURPOSE, OBJECTIVES, AND GOALS

* Purpose

+ Create a comprehensive planning document that will optimize safety, growth and fiscal responsibility.

* Objective

+ Development of a 10% conceptual design for Whitney Road between U.S. 30 and Beckle Road/ Storey Blvd.

* Goals:

+ Improve intersection and roadway design,

+ Address considerations such as drainage and snow drifting

+ Follow a comprehensive planning and public involvement process strategy.

WHAT TO EXPECT

Whitney Road 10% Cornete Flam

2017

Phase: Perhatura Flaming
Phase: Certific Report

Flamic Residency Property

Flamic Residency Property

Flamic Residency Property

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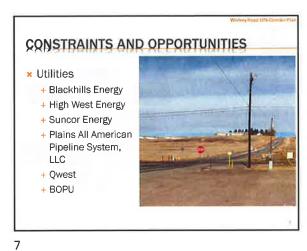
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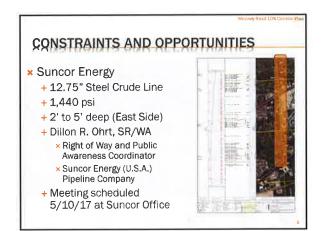
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3

WHAT TO EXPECT? PROJECT MILESTONES MILESTONE DATES Notice to Proceed March 1, 2017 Initial Kickoff Meeting MPO March 22, 2017 @2:00 April 4, 2017 Traffic Counts May 9, 2017: Steering Committee Meetings August/ September, October, 2017 Neighborhood Block Meeting #1. June, July, and August, 2017 Open House/Public Meeting September, 2017 Draft Plan October, 2017 Submit to MPO for Final Adoption November, 2017 Presentation to the Governing Body January/ February, 2018

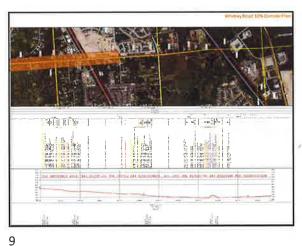
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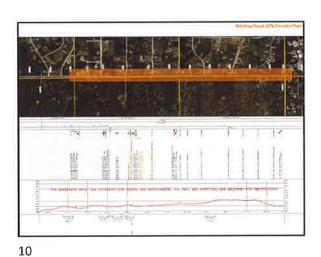


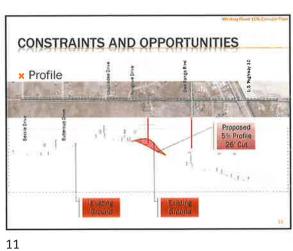


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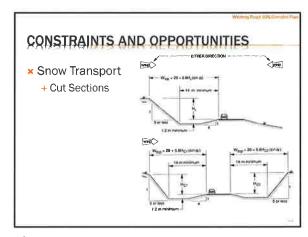
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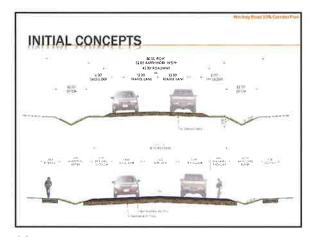




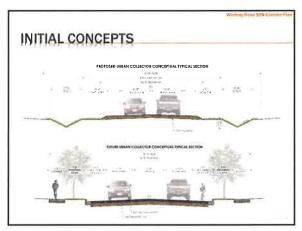


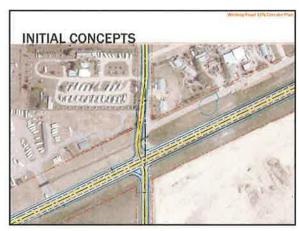
CONSTRAINTS AND OPPORTUNITIES × Snow Transport + Fill Sections × Minimum Height He = 0.4S + 0.6He = 0.4(1.53m)+0.6m He = 1,21 m (4') + Cut Sections





13 14





15 16



WHITNEY ROAD CORRIDOR STUDY PLAINS ALL AMERICAN PIPELINE

October 19, 2017@ 9:45 A.M.

•LIST OF ATTENDEES •

Plains All American Pipeline 1103 Old Town Lane, Suite 101. Cheyenne, WY 82001



Jason Norris, Op. Supervisor

Steve Sullivan, ROW

Nancy Olson

Tom Cobb

Tyler Keller, Dist. Mgr.

Eric Heap, Tech. Mgr

TANDANYOLF PROCESSIONAL CORPORATION 1103 OIG Town Lane; Suie 101, Cheyerne, WY 82009 phone: 307 637 691 1





MEETING MINTUES

Subject	Plains all American Pipeline		
Client:		Date:	
Project	Whitney Road Corridor Study	Project No:	2-3987 17
Meeting Date:	October 19, 2017 @ 9:45 am	Meeting Location:	1103 Old Town Lane, Suite 101 Cheyenne, WY 82009
Agenda Status:			

Tom Cobb, AVI ATTENDEES:

Nancy Olson, MPO Steve Sullivan, ROW, PAALP

Jason Norris, Op. Supervisor, PAALP Tyler Keller, Dist. Mgr., PAALP Eric Heap, Tech. Mgr., PAALP

TOPICS FOR DISCUSSION:

l. 16"

a. Pothole Location, coordinate

b. Conventional line

c. Horizontal location ± | \$500

Jason Norris (Contract)

=

Easement BK #1976, P. 1815, Steve ≡

Retaining Walls >

a. Foundation Type (Key Steve)

b. 10" From Footer

c. Cover min. 4' TOD. | Standard

AVIPC COM

AVI CHEVENNE P. 20. 627-6017 • F. 927-632-8366 - 183 CM Tourn Lans Sia 101 • Cheyenne WY 52008

AVI FORT COLLINS

P 970 424 9985 The South Cologne Stell Rent Cologne CO 10634

d. Eric Authouy

e. Rodway Traffic

f, 100' to 500' Budget Cost \$ Additional Detail
Time Frame E Forward | Group

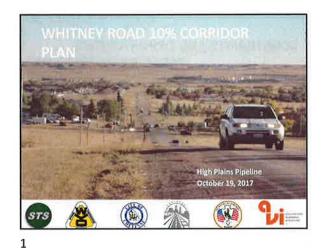
g. Shut down? No

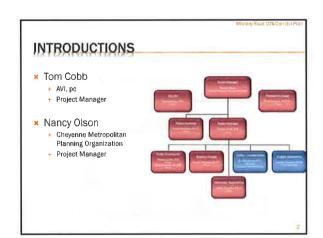
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CONSTRAINTS AND OPPORTUNITIES

2

× Profile

PURPOSE, OBJECTIVES, AND GOALS × Purpose Create a comprehensive planning document that will optimize safety, growth and fiscal responsibility. × Objective Development of a 10%

conceptual design for Whitney Road between U.S. 30 and Beckle Road/ Storey Blvd.

× Goals:

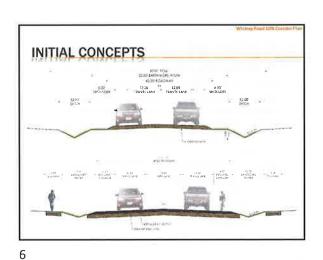
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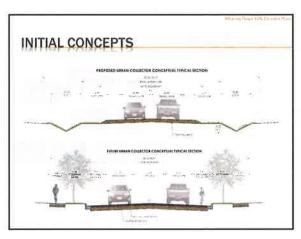
5

Improve intersection and

roadway design, Address considerations such as drainage and snow drifting

CONSTRAINTS AND OPPORTUNITIES × Snow Transport Mitigation Options + Cut Sections + Snow Fence





CONSTRAINTS AND OPPORTUNITIES

* Utilities

+ Blackhills Energy
+ High West Energy
+ Suncor Energy
+ Plains All American
Pipeline System,
LLC
+ Qwest
+ BOPU

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CONSTRAINTS AND OPPORTUNITIES

* Plains All American
Pipeline System, LLC
+ 16" Steel Crude(West
Side)
+ 4'-3" to 14'-5"
+ Gregg Werger

* Plains All American
Pipeline

* Manager-Pipeline
Commercial Operations

9

WHAT TO EXPECT? PROJECT MILESTONES MILESTONE DATES Notice to Proceed March 1, 2017 March 22, 2017 @2:00 Initial Kickoff Meeting MPO April 4, 2017 Traffic Counts Steering Committee Meetings May 9, 2017; November, 2017; December, 2017 November 8, 2017 Open House/Public Meeting October, 2017 - November Draft Plan Submit to MPO for Final Adoption December, 2017 Presentation to the Governing Body February, 2018

11 12





Whitney Road Corridor Study Restway Travel Park Meeting 13-Nov-18 * List of Attendees*

Ploase Initial to Coollim attensiance	NAME	COMPANY	EMAIE	CELL/PHONE
1.76	Tom Mason	MPO	tmason@chevenherhoo.org	637-6299
704	Tom Cobb	MPO	tcobb@cheyennempo.org	638-4384
Soul	Scott Sherman	Restway Travel Park	pertuantral mix	1854381
8 8	Karen Sherman	Restway Travel Park	Mos. com	Less -381)
X	Kelly BARFIEH	Kelly BARFIEH Restway Travel Park	11	南西
)				

Whitney Road Corridor Study Restway Travel Park Meeting 2-May-19 * List of Attendees*



Please Initial to Confirm attendance	NAME	COMPANY	EMAIL	CELL/PHONE
100	Tom Mason	МРО	tmason@cheyennempo.org	637-6299
TO	Tom Cobb	мро	tcobb@cheyennempo.org	638-4384
Kell -	Scott Sherman	Restway Travel Park	restwaytravelpark@yahoo.com	630-9812
ITSP	Karen Sherman	Restway Travel Park	restwaytravelpark@yahoo.com	631-925le
arte	Chris Breuna	WRN	Christopher D. Wrn bow firm.can	432-9390
(i)	Cay Woodhouse	WEN	Gay@Wrnbwfirn, . COM	432-9399

DAVE BUMANN LCPW

WHITNEY ROAD CORRIDOR PLAN

APPENDIX D: COST ESTIMATES

August 2020

APPENDIX D Cost Estimates







Project Name: WHITNEY ROAD CORRIDOR PLAN

WHITNEY ROAD (STOREY BLVD TO DELL RANGE) OPINION OF COST

				Engineers Es	tima	te
Item No.	ltem	Total	Unit	Unit Price		Total
1020.01	BONDS AND INSURANCE	1	LS	\$ 24,000.00	\$	24,000.00
1020.02	CONTRACTOR TESTING	1	LS	\$ 20,000.00	\$	20,000.00
1020.03	POTHOLING UTILITIES (NON-DESTRUCTIVE)	1	LS	\$ 5,000.00	\$	5,000.00
1030.01	MOBILIZATION	1	LS	\$ 166,925.00	\$	166,925.00
1050.01	TRAFFIC CONTROL	1	LS	\$ 25,000.00	\$	25,000.00
1563.01	STORMWATER MANAGEMENT & EROSION CONTROL	1	LS	\$ 15,000.00	\$	15,000.00
2050.01	REMOVAL OF EXISTING ASPHALT	16,320	SY	\$ 8.60	\$	140,352.00
2210.01	UNCLASSIFIED EXCAVATION - 12" Deep	10,250	CY	\$ 34.00	\$	348,500.00
2231.01	CRUSHED BASE - 6"	11,120	Ton	\$ 24.55	\$	272,996.00
2231.02	CRUSHED BASE - 4"	1,450	Ton	\$ 24.55	\$	35,597.50
2500.00	CEMENT STABILZATION FULL DEPTH RECLAMATION	34,810	SY	\$ 11.50	\$	400,315.00
2512.01	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'A' - 2"	34,810	SY	\$ 17.50	\$	609,175.00
2512.02	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'D' - 3"	34,810	SY	\$ 20.00	\$	696,200.00
2900.02	LANDSCAPING (RESTORE AND RECLAIM)	4.0	AC	\$ 2,500.00	\$	10,000.00
3330.01	CURB AND GUTTER - TYPE A	11,630	LF	\$ 19.50	\$	226,785.00
3340.03	CONCRETE SIDEWALK - 6' WIDE	3,925	SY	\$ 46.50	\$	182,512.50
3340.02	CONCRETE DRIVEWAY APPROACH - 8 INCH	50	SY	\$ 83.85	\$	4,192.50
3340.03	12' VALLEY PAN	150	SY	\$ 83.85	\$	12,577.50
4000.01	PAVEMENT MARKINGS (EXPOXY PAINT LINE 4 INCH)	22,650	LF	\$ 0.30	\$	6,795.00
7023.03	SIGN POST, SQ TUBULAR STL	8	EA	\$ 147.50	\$	1,180.00
7023.05	SIGN PANELS, ALUMINUM	32	SF	\$ 23.15	\$	740.80
7000.01	ROADWAY LIGHTING	1	LS	\$ 110,000.00	\$	110,000.00
			SUB-TOTAL		\$	3,313,843.80
	CONTINGENCY (20%)	1	LS	\$ 662,769.00	\$	662,769.00
		SUB-TOTAL CONST	RUCTION COST		\$	3,976,612.80
	ENGINEER DESIGN (10%)	1	LS	\$ 331,384.00	\$	331,384.00
		ENGINEERING		\$	331,384.00	
		OTAL PROJECT		\$	4,307,996.80	
		FOR	ESTIMATE		\$	4,310,000.00

- (1) The Cost Estimates were developed using data from 2019 Weighted Average Bid Prices, complied by WYDOT; and Typical Costs from historical AVI project experience database.
- (2) Right-of-way costs are based on previous projects in 2015 for City of Cheyenne, City of Laramie, at 2.5% Inflation Rate (AVI, pc) (i.e. Vacant, Commercial Level 2)
- (3) Please note totals and unit prices are calculated based on present worth or present value dollars. Adjustments should be made for years beyond the present year to better estimate required capital dollars for future improvements plan(s).
- (4) Landscaping (Restore and Reclaim) for areas adjacent to right-of-way.
- (5) Estimated values of Contract Bond and Insurance and Mobilization were estimated at 0.8% and 5.5% of total construction cost, respectively.
- (6) Right-of-way estimated for Whitney Road and Dell Range Only based on GIS and available plat data.



Project Name: WHITNEY ROAD CORRIDOR PLAN

WHITNEY ROAD (DELL RANGE INTERSECTION (RAB; SLIP LANE)) OPINION OF COST

				Engineers Es	stima	te
Item No.	ltem	Total	Unit	Unit Price		Total
1020.01	BONDS AND INSURANCE	1	LS	\$ 9,000.00	\$	9,000.00
1020.02	CONTRACTOR TESTING	1	LS	\$ 5,000.00	\$	5,000.00
1020.03	POTHOLING UTILITIES (NON-DESTRUCTIVE)	1	LS	\$ 2,000.00	\$	2,000.00
1030.01	MOBILIZATION	1	LS	\$ 62,069.00	\$	62,069.00
1050.01	TRAFFIC CONTROL	1	LS	\$ 25,000.00	\$	25,000.00
1563.01	STORMWATER MANAGEMENT & EROSION CONTROL	1	LS	\$ 5,000.00	\$	5,000.00
2050.01	REMOVAL OF EXISTING ASPHALT	5,800	SY	\$ 8.60	\$	49,880.00
2210.01	UNCLASSIFIED EXCAVATION - 12" Deep	1,940	CY	\$ 34.00	\$	65,960.00
2231.01	CRUSHED BASE - 6"	540	Ton	\$ 24.55	\$	13,257.00
2231.02	CRUSHED BASE - 4"	1,660	Ton	\$ 24.55	\$	40,753.00
2500.00	CEMENT STABILZATION FULL DEPTH RECLAMATION	5,110	SY	\$ 11.50	\$	58,765.00
2514.08	COLORED CONCRETE PAVEMENT	965	SY	\$ 50.00	\$	48,250.00
2512.01	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'A' - 2"	1,590	SY	\$ 17.50	\$	27,825.00
2512.02	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'D' - 3"	1,590	SY	\$ 20.00	\$	31,800.00
2514.08	CONCRETE PAVEMENT (8 IN)	4,590	SY	\$ 111.00	\$	509,490.00
2900.02	LANDSCAPING (RESTORE AND RECLAIM)	2.0	AC	\$ 2,500.00	\$	5,000.00
2900.03	LANDSCAPING (RAB)	1	LS	\$ 55,000.00	\$	55,000.00
3330.01	CURB AND GUTTER - TYPE A	2,225	LF	\$ 19.50	\$	43,387.50
3340.03	CONCRETE SIDEWALK - 6' WIDE	1,450	SY	\$ 46.50	\$	67,425.00
4000.01	PAVEMENT MARKINGS	1	LS	\$ 10,000.00	\$	10,000.00
7023.03	SIGN POST, SQ TUBULAR STL	20	EA	\$ 147.50	\$	2,950.00
7023.05	SIGN PANELS, ALUMINUM	120	SF	\$ 23.15	\$	2,778.00
7000.01	ROADWAY LIGHTING	1	LS	\$ 50,000.00	\$	50,000.00
			SUB-TOTAL		\$	1,190,589.50
	CONTINGENCY (15%)	1	LS	\$ 178,588.00	\$	178,588.00
		SUB-TOTAL CONSTI	RUCTION COST		\$	1,369,177.50
	ENGINEER DESIGN (10%)	1	LS	\$ 119,059.00	\$	119,059.00
		SUB-TOTAL	ENGINEERING		\$	119,059.00
	RIGHT OF WAY ACQUISITION (LEVEL 2 COMMERCIAL)	9,500	SF	\$ 12.60	\$	119,700.00
		SUB-TOTAL F	RIGHT-OF-WAY		\$	119,700.00
		Т	OTAL PROJECT		\$	1,488,236.50
		FOR	ESTIMATE		Ś	1,490,000.00

- (1) The Cost Estimates were developed using data from 2019 Weighted Average Bid Prices, complied by WYDOT; and Typical Costs from historical AVI project experience database.
- (2) Right-of-way costs are based on previous projects in 2015 for City of Cheyenne, City of Laramie, at 2.5% Inflation Rate (AVI, pc) (i.e. Vacant, Commercial Level 2)
- (3) Please note totals and unit prices are calculated based on present worth or present value dollars. Adjustments should be made for years beyond the present year to better estimate required capital dollars for future improvements plan(s).
- (4) Landscaping (Restore and Reclaim) for areas adjacent to right-of-way.
- (5) Estimated values of Contract Bond and Insurance and Mobilization were estimated at 0.8% and 5.5% of total construction cost, respectively.
- (6) Right-of-way estimated for Whitney Road and Dell Range Only based on GIS and available plat data.



Project Name: WHITNEY ROAD CORRIDOR PLAN

WHITNEY ROAD (DELL RANGE INTERSECTION (RAB)) OPINION OF COST

				Engineers Es	stimat	te
Item No.	Item	Total	Unit	Unit Price		Total
1020.01	BONDS AND INSURANCE	1	LS	\$ 8,000.00	\$	8,000.00
1020.02	CONTRACTOR TESTING	1	LS	\$ 5,000.00	\$	5,000.00
1020.03	POTHOLING UTILITIES (NON-DESTRUCTIVE)	1	LS	\$ 2,000.00	\$	2,000.00
1030.01	MOBILIZATION	1	LS	\$ 55,157.00	\$	55,157.00
1050.01	TRAFFIC CONTROL	1	LS	\$ 25,000.00	\$	25,000.00
1563.01	STORMWATER MANAGEMENT & EROSION CONTROL	1	LS	\$ 5,000.00	\$	5,000.00
2050.01	REMOVAL OF EXISTING ASPHALT	5,800	SY	\$ 8.60	\$	49,880.00
2210.01	UNCLASSIFIED EXCAVATION - 12" Deep	1,940	CY	\$ 34.00	\$	65,960.00
2231.01	CRUSHED BASE - 6"	540	Ton	\$ 24.55	\$	13,257.00
2231.02	CRUSHED BASE - 4"	1,420	Ton	\$ 24.55	\$	34,861.00
2500.00	CEMENT STABILZATION FULL DEPTH RECLAMATION	5,110	SY	\$ 11.50	\$	58,765.00
2514.08	COLORED CONCRETE PAVEMENT	965	SY	\$ 50.00	\$	48,250.00
2512.01	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'A' - 2"	1,590	SY	\$ 17.50	\$	27,825.00
2512.02	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'D' - 3"	1,590	SY	\$ 20.00	\$	31,800.00
2514.08	CONCRETE PAVEMENT (8 IN)	3,520	SY	\$ 111.00	\$	390,720.00
2900.02	LANDSCAPING (RESTORE AND RECLAIM)	2.0	AC	\$ 2,500.00	\$	5,000.00
2900.03	LANDSCAPING (RAB)	1	LS	\$ 55,000.00	\$	55,000.00
3330.01	CURB AND GUTTER - TYPE A	2,225	LF	\$ 19.50	\$	43,387.50
3340.03	CONCRETE SIDEWALK - 6' WIDE	1,450	SY	\$ 46.50	\$	67,425.00
4000.01	PAVEMENT MARKINGS	1	LS	\$ 10,000.00	\$	10,000.00
7023.03	SIGN POST, SQ TUBULAR STL	20	EA	\$ 147.50	\$	2,950.00
7023.05	SIGN PANELS, ALUMINUM	120	SF	\$ 23.15	\$	2,778.00
7000.01	ROADWAY LIGHTING	1	LS	\$ 50,000.00	\$	50,000.00
			SUB-TOTAL		\$	1,058,015.50
	CONTINGENCY (15%)	1	LS	\$ 158,702.00	\$	158,702.00
		SUB-TOTAL CONST	RUCTION COST		\$	1,216,717.50
	ENGINEER DESIGN (10%)	1	LS	\$ 105,802.00	\$	105,802.00
		SUB-TOTAL	ENGINEERING		\$	105,802.00
	RIGHT OF WAY ACQUISITION (LEVEL 2 COMMERCIAL)	509	SF	\$ 12.60	\$	6,413.40
	RIGHT OF WAY ACQUISITION (VACANT RESIDENTIAL/ COMMERCIAL)	5,180	SF	\$ 8.00	\$	41,440.00
		SUB-TOTAL	RIGHT-OF-WAY		\$	47,853.40
		1	OTAL PROJECT		\$	1,370,372.90
		FOR	ESTIMATE		\$	1,380,000.00

- (1) The Cost Estimates were developed using data from 2019 Weighted Average Bid Prices, complied by WYDOT; and Typical Costs from historical AVI project experience database.
- (2) Right-of-way costs are based on previous projects in 2015 for City of Cheyenne, City of Laramie, at 2.5% Inflation Rate (AVI, pc) (i.e. Vacant, Commercial Level 2)
- (3) Please note totals and unit prices are calculated based on present worth or present value dollars. Adjustments should be made for years beyond the present year to better estimate required capital dollars for future improvements plan(s).
- (4) Landscaping (Restore and Reclaim) for areas adjacent to right-of-way.
- (5) Estimated values of Contract Bond and Insurance and Mobilization were estimated at 0.8% and 5.5% of total construction cost, respectively.
- (6) Right-of-way estimated for Whitney Road and Dell Range Only based on GIS and available plat data.



Project Name: WHITNEY ROAD CORRIDOR PLAN

WHITNEY ROAD (DELL RANGE INTERSECTION (SIGNALIZED)) OPINION OF COST

				Engineers Estimate			te
Item No.	Item	Total	Unit		Unit Price		Total
1020.01	BONDS AND INSURANCE	1	LS	\$	9,000.00	\$	9,000.00
1020.02	CONTRACTOR TESTING	1	LS	\$	5,000.00	\$	5,000.00
1020.03	POTHOLING UTILITIES (NON-DESTRUCTIVE)	1	LS	\$	2,000.00	\$	2,000.00
1030.01	MOBILIZATION	1	LS	\$	57,748.00	\$	57,748.00
1050.01	TRAFFIC CONTROL	1	LS	\$	25,000.00	\$	25,000.00
1563.01	STORMWATER MANAGEMENT & EROSION CONTROL	1	LS	\$	5,000.00	\$	5,000.00
2050.01	REMOVAL OF EXISTING ASPHALT	5,800	SY	\$	8.60	\$	49,880.00
2210.01	UNCLASSIFIED EXCAVATION - 12" Deep	1,940	CY	\$	34.00	\$	65,960.00
2231.01	CRUSHED BASE - 6"	1,710	Ton	\$	24.55	\$	41,980.50
2231.02	CRUSHED BASE - 4"	650	Ton	\$	24.55	\$	15,958.00
2500.00	CEMENT STABILZATION FULL DEPTH RECLAMATION	5,110	SY	\$	11.50	\$	58,765.00
2514.08	COLORED CONCRETE PAVEMENT	965	SY	\$	50.00	\$	48,250.00
2512.01	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'A' - 2"	5,110	SY	\$	17.50	\$	89,425.00
2512.02	PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'D' - 3"	5,110	SY	\$	20.00	\$	102,200.00
2900.02	LANDSCAPING (RESTORE AND RECLAIM)	2.0	AC	\$	2,500.00	\$	5,000.00
3330.01	CURB AND GUTTER - TYPE A	2,225	LF	\$	19.50	\$	43,387.50
3340.03	CONCRETE SIDEWALK - 6' WIDE	1,450	SY	\$	46.50	\$	67,425.00
4000.01	PAVEMENT MARKINGS	1	LS	\$	10,000.00	\$	10,000.00
7023.03	SIGN POST, SQ TUBULAR STL	20	EA	\$	147.50	\$	2,950.00
7023.05	SIGN PANELS, ALUMINUM	120	SF	\$	23.15	\$	2,778.00
7000.01	ROADWAY LIGHTING AND SIGNALIZATION	1	LS	\$	400,000.00	\$	400,000.00
			SUB-TOTAL			\$	1,107,707.00
	CONTINGENCY (15%)	1	LS	\$	166,156.00	\$	166,156.00
		SUB-TOTAL CONST	RUCTION COST			\$	1,273,863.00
	ENGINEER DESIGN (10%)	1	LS	\$	110,771.00	\$	110,771.00
		SUB-TOTAL	ENGINEERING			\$	110,771.00
	RIGHT OF WAY ACQUISITION (LEVEL 2 COMMERCIAL)	0	SF	\$	12.60	\$	-
		SUB-TOTAL I	RIGHT-OF-WAY			\$	-
		\$	1,384,634.00				
·		FOR	ESTIMATE			\$	1,390,000.00

- (1) The Cost Estimates were developed using data from 2019 Weighted Average Bid Prices, complied by WYDOT; and Typical Costs from historical AVI project experience database.
- (2) Right-of-way costs are based on previous projects in 2015 for City of Cheyenne, City of Laramie, at 2.5% Inflation Rate (AVI, pc) (i.e. Vacant, Commercial Level 2)
- (3) Please note totals and unit prices are calculated based on present worth or present value dollars. Adjustments should be made for years beyond the present year to better estimate required capital dollars for future improvements plan(s).
- (4) Landscaping (Restore and Reclaim) for areas adjacent to right-of-way.
- (5) Estimated values of Contract Bond and Insurance and Mobilization were estimated at 0.8% and 5.5% of total construction cost, respectively.
- (6) Right-of-way estimated for Whitney Road and Dell Range Only based on GIS and available plat data.



Project Name: WHITNEY ROAD CORRIDOR PLAN

WHITNEY ROAD (DELL RANGE BLVD. TO US 30) OPINION OF COST

Item No. Item Total Unit Unit Price 1020.01 BONDS AND INSURANCE 1 LS \$ 16,000.00 \$ 1020.02 CONTRACTOR TESTING 1 LS \$ 20,000.00 \$ 1020.03 POTHOLING UTILITIES (NON-DESTRUCTIVE) 1 LS \$ 5,000.00 \$	Total 16,000.00
1020.02 CONTRACTOR TESTING 1 LS \$ 20,000.00 \$ 1020.03 POTHOLING UTILITIES (NON-DESTRUCTIVE) 1 LS \$ 5,000.00 \$	16,000.00
1020.03 POTHOLING UTILITIES (NON-DESTRUCTIVE) 1 LS \$ 5,000.00 \$,
	20,000.00
	5,000.00
1030.01 MOBILIZATION 1 LS \$ 112,740.00 \$	112,740.00
1050.01 TRAFFIC CONTROL 1 LS \$ 25,000.00 \$	25,000.00
1563.01 STORMWATER MANAGEMENT & EROSION CONTROL 1 LS \$ 15,000.00 \$	15,000.00
2050.01 REMOVAL OF EXISTING ASPHALT 5,280 SY \$ 8.60 \$	45,408.00
2210.01 UNCLASSIFIED EXCAVATION - 12" Deep 1,800 CY \$ 34.00 \$	61,200.00
2231.01 CRUSHED BASE - 6" 4,180 Ton \$ 24.55 \$	102,619.00
2231.02 CRUSHED BASE - 4" 800 Ton \$ 24.55 \$	19,640.00
2500.00 CEMENT STABILZATION FULL DEPTH RECLAMATION 12,625 SY \$ 11.50 \$	145,188.00
2512.01 PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'A' - 2" 12,625 SY \$ 17.50 \$	220,937.50
2512.02 PLANT MIX BITUMINOUS PAVEMENT (TYPE II) GRADING 'D' - 3" 12,625 SY \$ 20.00 \$	252,500.00
2645.00 FIRE HYDRANT ASSEMBLY 5 EA \$ 7,500.00 \$	37,500.00
2665.01 WATER MAIN PVC (C-900) 12" 2,100 LF \$ 75.00 \$	157,500.00
2665.02 GATE VALVE (AND BOX) - 12" 17 EA \$ 3,415.00 \$	58,055.00
2655.03 12" FITTING 10 EA \$ 1,200.00 \$	12,000.00
2700.01 SANITARY SEWER MANHOLE - 48" DIA 6 EA \$ 7,500.00 \$	45,000.00
2700.02 SANITARY SEWER MAIN PVC SDR 35 - 8" 1,475 LF \$ 65.00 \$	95,875.00
2725.01 STORM SEWER MAIN - 36" 1,800 LF \$ 125.00 \$	225,000.00
2725.02 STORM SEWER MAIN - 18" 65.00 \$	39,975.00
2725.03 36" FLARED END SECTION 3 EA \$ 5,000.00 \$	15,000.00
2725.04 INLET 7 EA \$ 6,800.00 \$	47,600.00
2725.05 STORM SEWER MANHOLE 6 EA \$ 6,500.00 \$	39,000.00
2900.02 LANDSCAPING (RESTORE AND RECLAIM) 2.0 ACRE \$ 2,500.00 \$	5,000.00
333.0.1 CURB AND GUTTER - TYPE A 5,395 LF \$ 19.50 \$	105,202.50
3340.02 CONCRETE SIDEWALK - 6' WIDE 2,290 SY \$ 46.50 \$	106,485.00
3340.03 CONCRETE DRIVEWAY APPROACH - 8 INCH 115 SY \$ 83.85 \$	9,642.75
3340.04 CONCRETE VALLEYPAN 45 SY \$ 83.85 \$	3,773.25
4000.01 PAVEMENT MARKINGS (EXPOXY PAINT LINE 4 INCH) 22,650 LF \$ 0.30 \$	6,795.00
7023.03 SIGN POST, SQ TUBULAR STL 8 EA \$ 147.50 \$	1,180.00
7023.05 SIGN PANELS, ALUMINUM 32 SF \$ 23.15 \$	740.80
7000.01 ROADWAY LIGHTING 1 LS \$ 110,000.00 \$	110,000.00
SUB-TOTAL \$	2,162,556.80
CONTINGENCY (20%) 1 LS \$ 432,511.00 \$	432,511.00
SUB-TOTAL CONSTRUCTION COST \$	2,595,067.80
ENGINEER DESIGN (10%) 1 LS \$ 216,256.00 \$	216,256.00
SUB-TOTAL ENGINEERING \$	216,256.00
RIGHT OF WAY ACQUISITION (LEVEL 2 COMMERCIAL) 8,577 SF \$ 12.60 \$	108,070.20
SUB-TOTAL RIGHT-OF-WAY \$	108,070.20
TOTAL PROJECT \$	2,811,323.80
	2,820,000.00

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- (3) Please note totals and unit prices are calculated based on present worth or present value dollars. Adjustments should be made for years beyond the present year to better estimate required capital dollars for future improvements plan(s).
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- (5) Estimated values of Contract Bond and Insurance and Mobilization were estimated at 0.8% and 5.5% of total construction cost,
- (6) Right-of-way estimated for Whitney Road and Dell Range Only based on GIS and available plat data.



		Estimated Costs											
Description of Area	Construction		R	Right-of-way		Engineering		Contingency		Total	Fo	r Estimate	
Whitney Road at Dell Range Blvd. Intersection (RAB W\Slib Lane)	\$	1,142,609	\$	119,700	\$	114,261	\$	171,391	\$	1,547,961	\$	1,550,000	
Dell Range Blvd. to U.S. 30	\$	1,245,878	\$	108,070	\$	124,588	\$	249,176	\$	1,727,712	\$	1,730,000	
Sub-total Phase I	\$	2,388,487	\$	227,770	\$	238,849	\$	420,567	\$	3,275,673	\$	3,280,000	
Storey Blvd. to Dell Range Blvd.	\$	2,446,254	\$	-	\$	244,625	\$	489,251	\$	3,180,130	\$	3,190,000	
								White	ney	Road Totals	\$	6,470,000	

WHITNEY ROAD CORRIDOR PLAN

APPENDIX E: TRAFFIC ANALYSIS

August 2020

APPENDIX ETraffic Analysis







Memorandum

Date: April 25, 2018

ma D. Add

To: Mr. Tom Mason, Director, MPO

CC: Ms. Nancy Olson, Project Manager, MPO

From: Thomas D. Cobb, PE, Project Manager

Subject: Whitney Road Corridor Study (AVI Project No. 3987.16) related to Traffic Impact Study Whitney Ranch completed by Kimley-Horn

The MPO and City of Cheyenne were in the process of reviewing the final *Traffic Impact Study Whitney Ranch Cheyenne, Wyoming December 21, 2017* (TIS) completed by Kimley-Horn (KM-H). AVI believes that the study has now been accepted by the City of Cheyenne. This detailed traffic impact study prompted discussion during the Whitney Ranch Steering Committee Meetings that scope alterations may be prudent related to Professional Traffic Engineering on the Whitney Road Corridor Study. Consequently, as you were aware, we instructed our subconsultant Sustainable Traffic Solutions (STS) to hold completion of the Whitney Road traffic analysis until a final determination was made.

Discussions at the time for the traffic impact study were specifically related to 2040 projected traffic volumes for Whitney Road (from Storey Blvd to U.S. 30) and Dell Range Blvd (from VanBuren Avenue to U.S. 30). Consequently, in order to complete our work for the Whitney Road Corridor Study, we respectfully request a formal response from the MPO regarding the following questions:

1. Has the MPO accepted the 2040 projected volumes for traffic and intersections related to the Whitney Road Corridor Study in the final Whitney Ranch *Traffic Impact Study for Whitney Ranch* developed by Kimley-Horn dated December 21, 2017?

Mr. Tom Mason, Director, MPO April 25, 2018 Page 2 of 2



2. If accepted, should STS and AVI utilize all the information within the KM-H TIS traffic impact study to complete the Whitney Road Corridor Study (i.e. Projected 2040 projected corridor volumes, Intersection directional volumes, Signal warrant analysis, Level of service analysis)?

Our recommendation would be to only utilize the 2040 projected land use and background volumes and have our sub-consultant review directional volumes, signal warrant analysis, and level of service of Whitney Road and Dell Range Blvd within our project area to confirm analysis.

The reduction of the traffic scope would then be applied to the Second Open House Public Meeting you have requested of the team.

Highway Safety Intersection Crash History Report

Intersection ID: 14886

County:LARAMIE

City:CHEYENNE

Years 2014 to 2014

Facility Type: UrXx3

Area Type:U

Marked Crosswalk at Intersection

Number of Legs:3

Leg	Date	Time	Report#	# Inj	# Killed	Lighting	Junction Relation	First Harmful Event	Manner of Collision	Grid Cell
2014										
WHITNEY RD	03/24/14	1304	04433	0	0	Daylight	03	Motor Vehicle in Transport on Roadway	Rear End (Front to Rear)	Sideswipe Straight North Parking Vehicle North

Highway Safety Intersection Report

WHITNEY RD | CR 129-1@BECKLE RD | CR 212-3

Intersection ID: 14886 County:LARAMIE City:CHEYENNE Years:2014 to 2018

Facility Type:UrXx3 Area Type:U Marked Crosswalk at Intersection Number of Legs:3

Intersection Crash Types Statistics

Intersection Crash Summaries

Grid Cell	Crash Type	Count	CRITICAL_CRASHES	0
K13	Sideswipe Straight North Parking Vehicle North	1	SERIOUS_CRASHES	0
			DAMAGE_CRASHES	1
			TOTAL_CRASHES	1
			PERSONS_INJURED	0
			PERSONS_KILLED	0

Collision Diagram

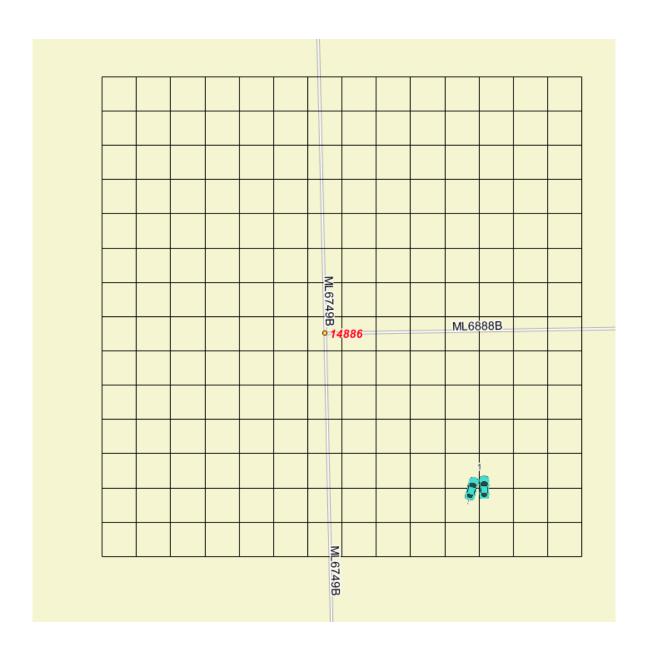
Intersection ID:14886

Intersection Names:WHITNEY RD | CR 129-1@BECKLE RD | CR

Crash types are based on a grid format are are not indicative of crash location

LRS Intersection: ML6749B|ML6888B

Intersection Name: WHITNEY RD | CR 129-1@BECKLE RD | CR 212-3



Severity Diagram

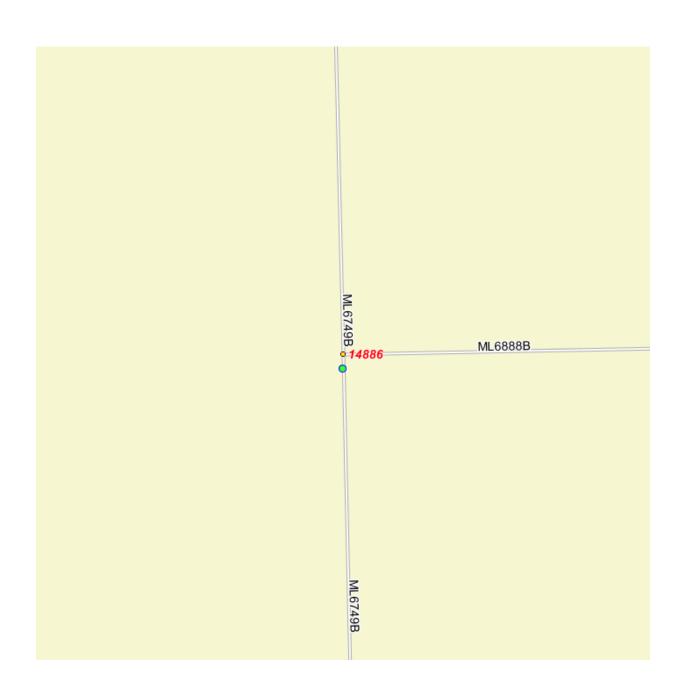
INTERSECTION_ID 14886

INTERSECTION_ROUTES:ML6749B|ML6888B

Locations displayed on Severity Diagram are based on longitude and latitude. Discrepancy between Latitude/Longitude and Route/MP may result in points not appearing on diagram.

LRS Intersection: ML6749B|ML6888B

Intersection Name: WHITNEY RD | CR 129-1@BECKLE RD | CR 212-3



LRS Intersection: ML6749B|ML6888B

Intersection Name: WHITNEY RD | CR 129-1@BECKLE RD | CR 212-3

Highway Safety Intersection Crash History Report

Intersection ID: 13343

County:LARAMIE

City:CHEYENNE

Facility Type: UrXx4

Area Type:U

Intersection w/o Marked Crosswalk

Years 2014 to 2018 Number of Legs:4

Leg	Date	Time	Report#	# Inj	# Killed	Lighting	Junction Relation	First Harmful Event	Manner of Collision	Grid Cell
2014										
WHITNEY RD	12/28/14	0848	17590	0	0	Daylight	01	Other Fixed Object	Not a Collision w/2 Vehicles in Transport	Unknown
DELL RANGE BLVD	07/25/14	1658	10018	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Right South Straight West
2016										
WHITNEY RD	08/25/16	0747	10155	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Left North
DELL RANGE BLVD	08/04/16	1144	10421	1	1	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Unknown
DELL RANGE BLVD	10/26/16	1904	12997	2	0	Darkness Lighted	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Right North
2017										
DELL RANGE BLVD	12/05/17	1301	15129	1	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight West Right North
DELL RANGE BLVD	07/27/17	0840	08859	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle (Front to Side), Opposing Direction	Angle Straight East Straight North
2018										
DELL RANGE BLVD	10/20/18	2108	12619	2	0	Darkness Lighted	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Right South Straight West

Highway Safety Intersection Report

WHITNEY RD | CR 129-1@DELL RANGE BLVD | CR 211-1

Intersection ID: 13343 County:LARAMIE City:CHEYENNE Years:2014 to 2018
Facility Type:UrXx4 Area Type:U Intersection w/o Marked Crosswalk Number of Legs:4

Intersection Crash Types Statistics

Intersection Crash Summaries

Grid Cell	Crash Type	Count
A1	Unknown	2
D5	Angle Right South Straight West	2
H10	Angle Straight East Left North	1
K8	Angle Straight East Straight North	1
M8	Angle Straight West Right North	1
K10	Angle Straight East Right North	1

CRITICAL_CRASHES	2
SERIOUS_CRASHES	2
DAMAGE_CRASHES	4
TOTAL_CRASHES	8
PERSONS_INJURED	6
PERSONS_KILLED	1

Collision Diagram

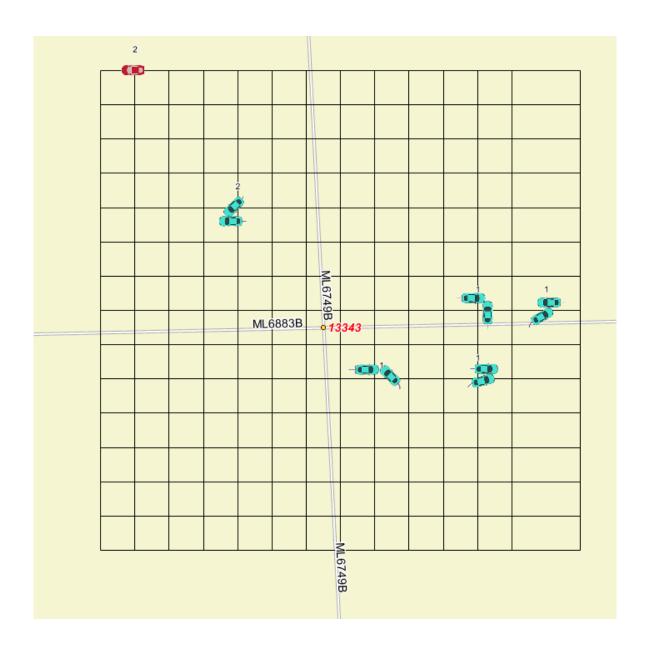
Intersection ID:13343

Intersection Names: WHITNEY RD | CR 129-1@DELL RANGE

Crash types are based on a grid format are are not indicative of crash location

LRS Intersection: ML6749B|ML6883B

Intersection Name: WHITNEY RD | CR 129-1@DELL RANGE BLVD | CR 211-1



Severity Diagram

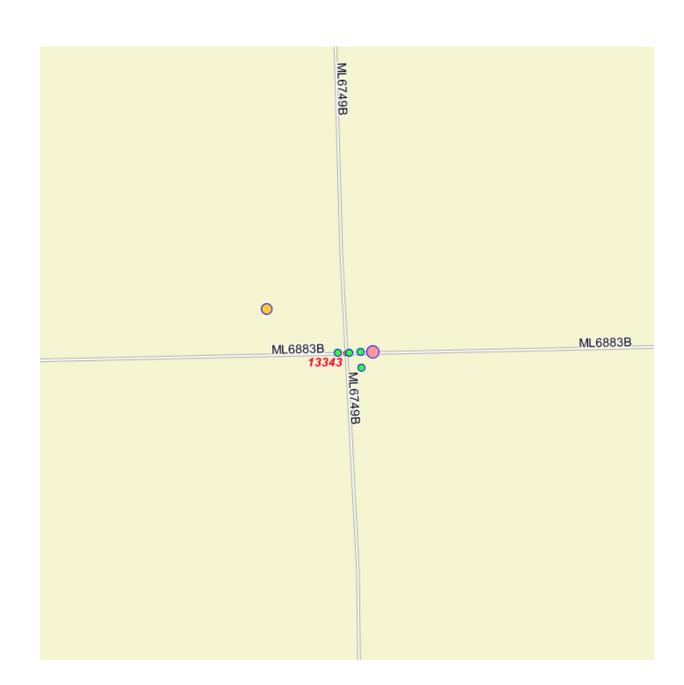
INTERSECTION_ID 13343

INTERSECTION_ROUTES:ML6749B|ML6883B

Locations displayed on Severity Diagram are based on longitude and latitude. Discrepancy between Latitude/Longitude and Route/MP may result in points not appearing on diagram.

LRS Intersection: ML6749B|ML6883B

Intersection Name: WHITNEY RD | CR 129-1@DELL RANGE BLVD | CR 211-1



LRS Intersection: ML6749B|ML6883B

Intersection Name: WHITNEY RD | CR 129-1@DELL RANGE BLVD | CR 211-1

Highway Safety Intersection Crash History Report

Intersection ID: 14459

County:LARAMIE

City:CHEYENNE

Facility Type: UrUn4

Area Type:U

Intersection w/o Marked Crosswalk

Years 2015 to 2018 Number of Legs:4

Leg	Date	Time	Report#	# Inj	# Killed	Lighting	Junction Relation	First Harmful Event	Manner of Collision	Grid Cell
015										
US 30	05/31/15	0113	06266	1	0	Darkness Unlighted	03	Earth Embankment/Berm	Not a Collision w/2 Vehicles in Transport	Unknown
US 30	07/05/15	1110	09117	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Unknown South
WHITNEY RD	02/05/15	0810	01430	0	0	Daylight	03	Traffic Sign Support	Not a Collision w/2 Vehicles in Transport	Unknown
WHITNEY RD	02/03/15	0748	01590	0	0	Daylight	03	Motor Vehicle in Transport on Roadway	Rear End (Front to Rear)	Sideswipe Straight South Parked Vehicle South
WHITNEY RD	11/05/15	0800	13726	0	0	Daylight	03	Motor Vehicle in Transport on Roadway	Rear End (Front to Rear)	Rear End Straigh North Straight North
016										
US 30	03/02/16	1927	03018	1	0	Darkness Unlighted	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Right South Straight West
US 30	01/18/16	1838	00552	0	0	Darkness Lighted	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Right North
US 30	02/18/16	1552	02196	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight West Right North
US 30	12/02/16	1515	16890	0	0	Daylight	02	Raised Median or Curb	Not a Collision w/2 Vehicles in Transport	Unknown
018										
US 30	10/20/18	1946	12925	2	0	Darkness Lighted	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Right North
US 30	10/20/18	1012	12338	5	1	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Right North

Highway Safety Intersection Crash History Report

Intersection ID: 14459

County:LARAMIE

City:CHEYENNE

Facility Type: UrUn4

Area Type:U

Marked Crosswalk at Intersection

Years 2015 to 2018

Number of Legs:4

Leg	Date	Time	Report#	# lnj	# Killed	Lighting	Junction Relation	First Harmful Event	Manner of Collision	Grid Cell
US 30	07/26/18	0553	08220	0	0	Dawn	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight South Right East
US 30	02/23/18	1407	02236	0	0	Daylight	03	Utility Pole/Light Support	Not a Collision w/2 Vehicles in Transport	Unknown
US 30	09/04/18	1649	10771	0	1	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Straight East Right North
US 30	02/13/18	0753	01683	5	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Right South Straight West
US 30	11/03/18	1829	12991	0	0	Darkness Unlighted	02	Motor Vehicle in Transport on Roadway	Angle (Front to Side), Opposing Direction	Angle Straight East Left North
WHITNEY RD	04/14/18	1221	04022	0	0	Daylight	02	Motor Vehicle in Transport on Roadway	Angle Right (Front to Side, includes Broadside)	Angle Right South Straight West

Highway Safety Intersection Report

US 30@WHITNEY RD | CR 129-1

Intersection ID: 14459 County:LARAMIE City:CHEYENNE Years:2014 to 2018
Facility Type:UrUn4 Area Type:U Intersection w/o Marked Crosswalk Number of Legs:4

Intersection Crash Types Statistics

Intersection Crash Summaries

Grid Cell	Crash Type	Count
K10	Angle Straight East Right North	4
A1	Unknown	4
D5	Angle Right South Straight West	3
M8	Angle Straight West Right North	1
D2	Sideswipe Straight South Parked Vehicle South	1
H10	Angle Straight East Left North	1
J13	Rear End Straight North Straight North	1
E11	Angle Straight South Right East	1
A2	Unknown South	1

CRITICAL_CRASHES	2
SERIOUS_CRASHES	4
DAMAGE_CRASHES	11
TOTAL_CRASHES	17
PERSONS_INJURED	14
PERSONS_KILLED	2

Collision Diagram

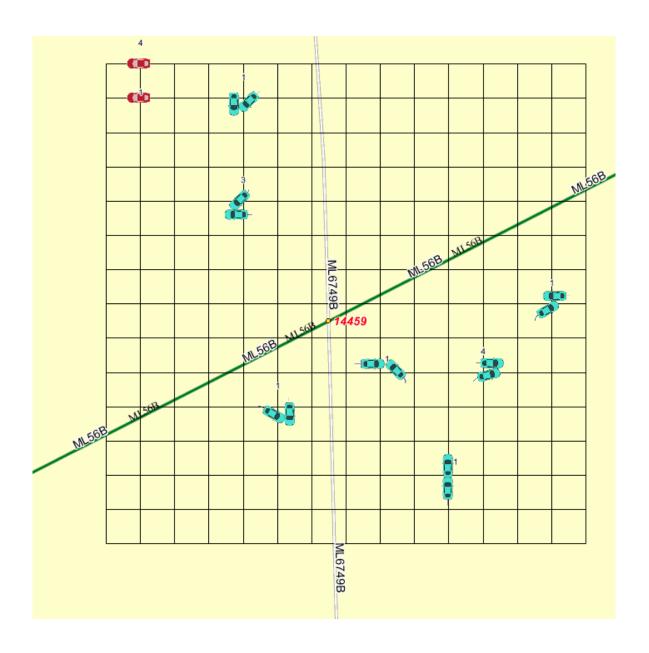
Intersection ID:14459

Intersection Names:US 30@WHITNEY RD | CR 129-1

Crash types are based on a grid format are are not indicative of crash location

LRS Intersection: ML56B|ML6749B

Intersection Name: US 30@WHITNEY RD | CR 129-1



Severity Diagram

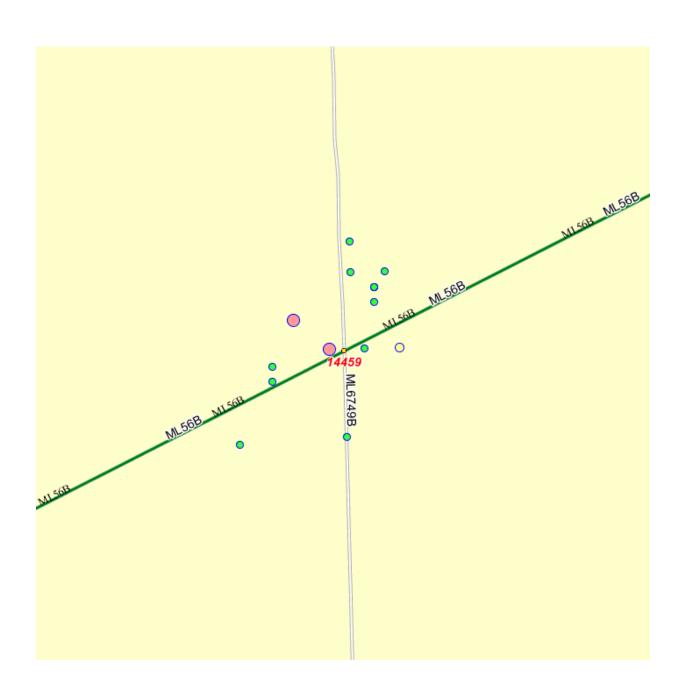
INTERSECTION_ID 14459

INTERSECTION_ROUTES:ML56B|ML6749B

Locations displayed on Severity Diagram are based on longitude and latitude. Discrepancy between Latitude/Longitude and Route/MP may result in points not appearing on diagram.

LRS Intersection: ML56B|ML6749B

Intersection Name: US 30@WHITNEY RD | CR 129-1



LRS Intersection: ML56B|ML6749B

Intersection Name: US 30@WHITNEY RD | CR 129-1



MEMO

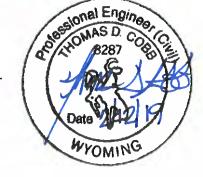
TO: Mr. Randy Greisbach, PE, WYDOT, District Traffic Engineer

FROM: Thomas D. Cobb, PE

DATE: February 12, 2019

SUBJECT: Whitney Road Corridor Study – Woodhouse Road/ U.S. 30 Service Road to U.S. 30

Proposed Connection



Purpose and Need

The intersection of U.S. 30 with Whitney Road was a major emphasis during the during the Whitney Road Corridor Study development. AVI, pc, Cheyenne MPO, and Whitney Road Steering Committee identified the following significant observations:

- Approach accesses are very close to the intersection on north and west legs.
- Under jurisdiction of the State of Wyoming Department of Transportation.
- Large vehicle usage at intersections including large semi-trailers, recreation vehicles, mobile homes, and tow trucks for local business support and access.
- Observed unsafe and opposing cross maneuvers from eastbound U.S. 30 Service Road to southbound Whitney Road.
- Intersection is skewed greater than 10° (25.78°)
- Vehicles traveling north on Whitney Road at the intersection of U.S. 30 can experience a "ghosting" problem with traffic on eastbound U.S. 30. The eastbound thru traffic on U.S. 30 can be "ghosted" or shield from view by right turning vehicles traveling eastbound U.S. 30 to southbound Whitney Road while in the auxiliary lane traffic.
- Posted speed on U.S. 30 is 55 mph.
- Posted speed Whitney Road is 30 mph.
- Inadequate storage length available for left turn bay on northbound Whitney Road created by pedestrian refuge island on south leg of intersection.
- Perceived unsafe pedestrian Greenway crossing location on south leg of intersection on Whitney Road.
- Cut-through traffic observed from Saddle Ridge subdivision via Saddle Ridge Trail to U.S.
 30 Service Road and Whitney Road during peak hours to avoid the Whitney Intersection.
- Intersection spacing on U.S. 30 between Whitney Road and the U.S. 30 Service Road/
 Saddle Ridge Trail is 1936 feet based on GIS aerial photo measurement.



Potential solutions to address the significant observations were developed and provided to the public for review and comment on June 28, 2018. The solution proposed removal of the service road connection into Whitney Road and replacing it with a cul-de-sac turnaround. Multiple written and verbal comments were expressed at the public meeting which indicated that a cul-de-sac would not function for the existing businesses adjacent to the U.S. 30 Service Road. As a result, multiple one-on-one meetings between AVI, pc, Cheyenne Metropolitan Planning Organization (MPO), and local business owners located on the north U.S. 30 Service Road East of Whitney Road were conducted with the purpose to understand concerns and work together to develop potential alternatives to the cul-de-sac option. A summary of the concerns/ constraints and potential alternatives considered is outlined below.

Concerns/ Constraints

- Thirty-seven (37) foot tow trucks haul up to 80' tractor/ trailer combinations and 40' recreational vehicles which require access from U.S. 30 to Whitney Road to the U.S. 30 Service Road.
- Tractor/ trailer combinations up to eighty (80) feet deliver parts, equipment, and inventory to the businesses along the U.S. 30 Service Road.
- Alternative routes are comprised by un-improved narrow gravel roadways which are minimally maintained, and snow removal is not accomplished.
- The alternative route of Woodhouse Road between the U.S. 30 Service road and Hinesley Road contains steep vertical slopes greater than 8% (maximum 11.8%). The average slope is 3.0% and generally slopes from North to South with a total elevation change of 39 feet.
- The alternate route Hinesley Road between Whitney Road and Woodhouse contains steep vertical slopes greater than 8% (maximum 15.1%). The average slope is 3.7% and generally slopes from East to West with a total elevation change of 42 feet.
- A large radii cul-de-sac of 50' using clearzone distance of 22' (i.e. Design Speed 55 mph, 6:1 or flatter foreslopes, >6000 ADT). Maximum vehicle turnaround WB-67 design vehicle.
- Alternate routes would need to be graded, surfaced, and maintained to accommodate large truck access to businesses.



Potential Alternatives to Cul-de-sac

- Develop alternative access point to business via Woodhouse Road/ U.S. 30 Service Road to U.S. 30 (Intersection spacing between Whitney Road and Woodhouse 982', Intersection spacing between Woodhouse and Saddle Ridge Trail/ U.S. 30 Service Road 978'.
- Access control median on Whitney Road to prevent left ingress or egress turning movement U.S. 30 Service Road to Whitney Road.
- Improve or upgrade service condition of alternative routes (i.e. Hinesley Road and/ or Woodhouse Road) to accommodate anticipated vehicles into the businesses.

Trip Generation

Traffic calculations are based on the *Trip Generation, 8th Edition: An ITE Informational Report* area and unit calculations as follows show below and the Cumulative Total Site Plan Trip Generation for the planning area associated with the potential creation of an access point by extending Woodhouse Road south into U.S. 30. The planning area for analysis is bounded by Whitney Road to the west, Dell Range Blvd. to the north and east, and U.S. 30 to the south and east.

Existing Traffic Generation

Employment data from the 2010 Business Employment Data Survey from Plan Cheyenne was utilized along with updates from "one-on-one" interviews conducted with the area businesses, observation, and engineering judgement to develop the 2018 Trip Generation for the planning area. See *Table 1 2010/ 2018 Business Employment Data* and *Figure 1 2010 Existing Land Use*.

Table 1 2010/2018 Business Employment Data

Mark	Address	Name		Full	Part
1	4408 Woodhouse	Elite Auto Upholstery		2	0
2	6702 Hinesley Road	Unique Wood Design, LLC		1	1
3	4219 Whitney Road	Mid City Auto		0	1
4	6800 U.S. 30	Alpine Cleaning Dial-a-Maid		6	1
5	6526 U.S. 30	Big Al's Auto and Exhaust		7	0
6	6600 U.S. 30	Pinnacle Cabinet and Millwork		9	1
7	6520 Hinesley Road	Big Al's Towing		16	0
		Sub-	totals	41	4
			Totals	-	45

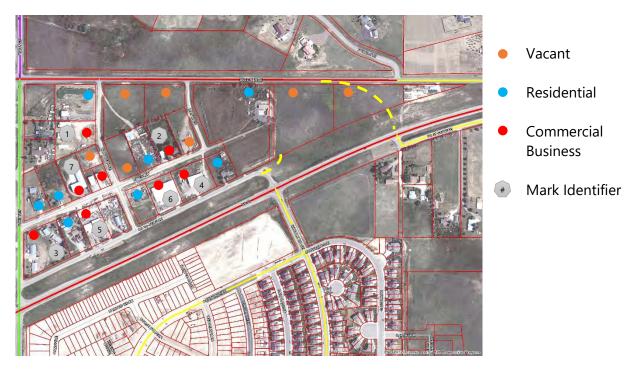


Figure 1 2010 Existing Land Use Foster Tracts



Figure 2 Existing Zoning

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The current 34.49 acres of land is being utilized as follows:

<u>Land Use</u>	Percentage (%)	<u>Acres</u>
Vacant Land	38.1%	13.13
Residential	48.7%	16.81 (7 du)
Office Park	3.5%	1.20
Manufacturing	3.4%	1.18
 Automotive Care Center 	<u>6.3%</u>	2.17
	100%	34.49

Existing Traffic Assumptions

- Residential DU = 7
- Big Al's Automotive and Exhaust (ITE Code 942, Automotive Care Center; 2 bay)
- Elite Upholstery, Mid City Auto (ITE Code 942, Automotive Care Center; 0.5 bay each)
- Big Al's Towing (ITE Code 942, Automotive Care Center; 1 bay)
- Unique Wood Designs and Pinnacle Cabinet & Millwork (ITE Code 140, Manufacturing; 12 total employees)
- Alpine Cleaning Dial-a-maid (ITE Code 770, Business Park; 7 employees)
- Distribution 80% US 30 Service Road, 10% Hinesley Road, 5% Woodhouse, 5% Haunted Road.

Table 2 2019 Trip Generation Foster Tracts

Description/ITE Code	Units	(peak hou			•	Generation of adjacer			Expected Units	Total	Generated	Trips	Total Distribution of Trips			
Description/TTE code	Offics	Weekday	AM	PM	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out
Business Park 770	Employees	4.04	0.45	0.39	85%	15%	22%	78%	7.0	28	3	3	3	0	1	2
Manufacturing 140	Employees	2.13	0.40	0.36	73%	27%	44%	56%	12.0	26	5	4	4	1	2	2
Single Family Homes 210	DU	9.57	0.75	1.01	25%	75%	63%	37%	7.0	67	5	7	1	4	4	3
Office Park 750	Acres	195.11	25.65	28.28	92%	8%	15%	85%		0	0	0	0	0	0	0
Automobile Care Center 942	Service Bays	12.48	12.48 1.52 2.17 68% 32% NA NA							50	6	9	4	2	NA	NA
	Totals											23	12	8	7	7

Existing Average Week Day Trips a day to/from Foster Tracts Area = 171 trips/ day

AM Peak Hour = 19 Trips/ hour

AM Peak Hour (Ingress) = 12 Trips/ hour

AM Peak Hour (Egress) = 8 Trips/ hour

PM Peak Hour = 23 Trips/ hour

PM Peak Hour (Ingress) = 7 Trips/ hour PM Peak Hour (Egress) = 7 Trips/ hour

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U.S. 30 Service Road Peak Hours 2019

AM Peak Hour (Ingress) = 12 Trips/hour x 0.80 = 10 TripsPM Peak Hour (Egress) = 7 Trips/hour x 0.80 = 6 Trips

2040 Future Traffic Generation

2040 projected traffic generation was based on planning judgement, conversations with existing business regarding future expansion, known future business development, and hypothetical potential for the Foster Tracts Area in the next twenty years.

Future Traffic Assumptions

- Residential DU = 6
- Big Al's Automotive and Exhaust (ITE Code 942, Automotive Care Center; 4 bay)
- Elite Upholstery, Mid City Auto (ITE Code 942, Automotive Care Center; 0.5 bay each)
- Big Al's Towing (ITE Code 942, Automotive Care Center; 1 bay)
- Unique Wood Designs and Pinnacle Cabinet & Millwork (ITE Code 140, Manufacturing; 20 total employees)
- Alpine Cleaning Dial-a-maid (ITE Code 770, Business Park; 10 employees)
- New Business Park (ERA) = 3,000 SF Office Bldg.
- Manufacturing (Unknown) = 5 Employees
- Distribution 5% US 30 Service Road, 75% Woodhouse Extension, 10% Hinesley Road, 5% Woodhouse (north), 5% Haunted Road (north).

The proposed 34.49 acres of land is being utilized as follows:

	Land Use	Percentage (%)	<u>Acres</u>
•	Vacant Land	35.2%	12.13
•	Residential	43.8%	15.01 (6 du)
•	Office Park	6.0%	2.20
•	Manufacturing	6.0%	2.06
•	Automotive Care Center	9 <u>.0%</u>	<u>3.09</u>
		100%	34.49



Table 3 2040 Trip Generation Foster Tracts

Description/ITE Code	Units	(peak hou			-	Generatio of adjacer			Expected Units	Total	Generated [•]	Trips	Total Distribution of Trips				
Description/112 code Units		Weekday	AM	РМ	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out	
Business Park 770	Employees	4.04	0.45	0.39	85%	15%	22%	78%	20.0	81	9	8	8	1	2	6	
Manufacturing 140	Employees	2.13	0.40	0.36	73%	27%	44%	56%	20.0	43	8	7	6	2	3	4	
Single Family Homes 210	DU	9.57	0.75	1.01	25%	75%	63%	37%	6.0	57	5	6	1	3	4	2	
Office Park 750	KSF ²	11.42	1.71	1.48	89%	11%	14%	86%	3.0	34	5	4	5	1	1	4	
Automobile Care Center 942	Service Bays	12.48	1.52	2.17	68%	32%	NA	NA	6.0	75	9	13	6	3	NA	NA	
										290	36	39	25	10	9	16	

Future Average Week Day Trips a day to/from Foster Tracts Area = 290 trips/ day

AM Peak Hour = 36 Trips/ hour

AM Peak Hour (Ingress) = 25 Trips/ hour

AM Peak Hour (Egress) = 10 Trips/ hour

PM Peak Hour = 39 Trips/ hour

PM Peak Hour (Ingress) = 9 Trips/ hour

PM Peak Hour (Egress) = 16 Trips/ hour

Woodhouse Road at U.S. 30 Peak Hours 2014 Horizon

AM Peak Hour (Ingress) = 25 Trips/ hour x 0.75 = 19 Trips

PM Peak Hour (Egress) = 16 Trips/ hour x 0.75 = 12 Trips

Full Buildout/ Redevelopment Traffic Generation

Full buildout/ redevelopment projected traffic generation was based on planning and engineering judgement with the framework for redevelopment based on conversations with existing business regarding future expansion, known future business development, and hypothetical potential for the Foster Tracts Area beyond the design horizon year using the *PlanCheyenne* future land use plan (Laramie County version). The future land use is mixed use commercial. In accordance with the current Laramie County Land Use Regulations, the closest zoning is MU or mixed use. It is intended to encourage rehabilitation and ruse of existing buildings and is a mix of residential an commercial uses.



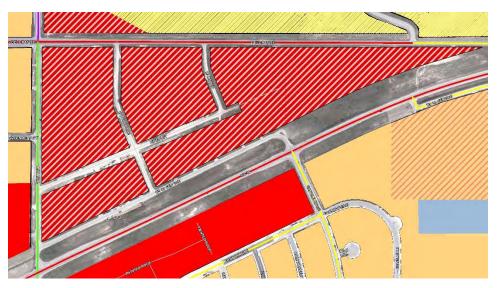


Figure 3Future Land Use PlanCheyenne (Laramie County Version)

Full Buildout Traffic Assumptions

Distribution 5% US 30 Service Road, 75% Woodhouse Extension, 10% Hinesley Road, 5% Woodhouse (north), 5% Haunted Road (north).

The proposed 34.49 acres of land is being utilized as follows:

	<u>Land Use</u>	<u>Units</u>	Expected Units	<u>Acres</u>
•	Vacant Land	0	0	0.0
•	Business Park	Employees	20	4.49
•	Residential (SFH)	DU	5 DU	12.0
•	Resd. Condo/ Townhomes	DU	8 DU	8.0
•	Daycare Center	KSF ²	2 KSF	2.0
•	Serv. Stat. w/ Conv. Mkt	FUEL Position	4	3.0
•	Office Park	KSF ²	6	7.0
•	Manufacturing	Employees	20	2.0
•	Automotive Care Center	Bays	6	<u>2.0</u>
				39.49



Table 4 Full Buildout Trip Generation Unknown Year

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates (peak hours are for peak hour of adjacent street traffic)							Expected Units	Total	Generated	Trips	Total Distribution of Trips				
Description/112 code	Onits	Weekday	АМ	РМ	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	PM In	PM Out	
Business Park 770	Employees	4.04	0.45	0.39	85%	15%	22%	78%	20.0	81	9	8	8	1	2	6	
Manufacturing 140	Employees	2.13	0.40	0.36	73%	27%	44%	56%	20.0	43	8	7	6	2	3	4	
Single Family Homes 210	DU	9.57	0.75	1.01	25%	75%	63%	37%	5.0	48	4	5	1	3	3	2	
Daycare Center 565	KSF ²	74.06	12.18	12.34	53%	47%	47%	53%	2.0	148	24	25	13	11	12	13	
Office Park 750	KSF ²	11.42	1.71	1.48	89%	11%	14%	86%	6.0	69	10	9	9	1	1	8	
Serv.Station w/ Conven.Mkt 945	Fuel Position	162.78	10.16	13.51	50%	50%	50%	50%	2.0	326	20	27	4	4	6	6	
Automobile Care Center 942	Service Bays	12.48	1.52	2.17	68%	32%	NA	NA	6.0	75	9	13	6	3	NA	NA	
	Tota										85	94	47	26	27	39	

Full Buildout Average Week Day Trips a day to/from Foster Tracts Area = 788 trips/ day

AM Peak Hour = 85 Trips/ hour

AM Peak Hour (Ingress) = 47 Trips/ hour

AM Peak Hour (Egress) = 26 Trips/ hour

PM Peak Hour = 94 Trips/ hour

PM Peak Hour (Ingress) = 27 Trips/ hour

PM Peak Hour (Egress) = 39 Trips/ hour

Woodhouse Road at U.S. 30 Peak Hours Full Buildout

AM Peak Hour (Ingress) = 47 Trips/hour x 0.75 = 36 Trips

PM Peak Hour (Egress) = 39 Trips/ hour x 0.75 = 30 Trips



Metropolitan Planning Organization

Conclusion

The proposed extension of Woodhouse Road with auxiliary lanes for a full movement intersection shows an increase of approximately 9.05%/ year in AM Peak Hour and a 9.52%/ year increase in PM Peak Hour traffic diverted from the Whitney Road to US 30 Service Road connection to the Woodhouse Road extension into U.S. 30 through year 2040. Fully buildout/ rehabilitation from existing 2019 to an unknown horizon year shows an approximate increase in AM Peak Hour from 10 vehicles to 36 vehicles and PM Peak Hour from 6 to 30 vehicles. A summary of the anticipated volumes is shown in *Table 5 Anticipated Traffic Volumes at Intersection of U.S. 30 w/ Woodhouse Road* below.

It appears based on the low anticipated growth of the development in the next twenty years and beyond, that it is operationally feasible to connect Woodhouse Road to U.S. 30 with minimal operational impact to U.S. 30. Some operational difficulties may or may not occur at final buildout depending on future posted speed limits and surrounding signalization, but this will likely occur well beyond the service life of the proposed U.S. 30 improvements.

Table 5 Anticipated Traffic Volumes at Intersection of U.S. 30 w/ Woodhouse Road

Description	Units	2019	2040	Full Buildout/ Rehabilitation
AM Peak Hour In	Vehicles	10	19	36
PM Peak Hour Out	Vehicles	6	12	30
Daily Total	Average Daily Traffic (ADT)	129	218	591





Wyoming Department of Transportation Access Application

Property Owner (Permittee)		Applicant or Agen	it (if different from P	roperty Owner)
Laramie Co	unty		Cheyenne MPC)
Business (if applicable)		Business (if applic	cable)	·-
Mailing Address		Mailing Address	.	
310 West 19th	Street		2101 O'Neil Aven	ue
City Cheyenr	e	City	Cheyenne	
State Wyoming	Zip Code 82001	State Wy	oming	Zip Code 82001
Phone Number 307.633.4	302	Phone Number	307.638.4385	
E-mail Address dbumann@laramie	county.com	E-mail Address	tcobb@cheyennemp	oo.org
Property Address of Requested Access	(if known) Approximately RM	/ MP 367.34		
Located on Highway ML 56B		Side of Highway	⊠n □s	□ E □ W
Approximately 0.64 fe	et/mile (circle: N S E	W) from Mile	post/Intersection 366	.70 End Divided Section
	Legal Descri	iption		
County Subdivision Foster Tracts	Block Lot	Section	Township 25	Range 66W
	Access requ	ested		
■ New Access	☐ Temporary Access	☐ Change in Ac	· · · · · · · · · · · · · · · · · · ·	Removal of Access
	ppropriate box if requesting a ne			
⊠ Major	☐ Commercial	☐ Resider	ntial	☐ Field
Does the property owner own or have a	ny interests in the adjacent prop	erty?	⊠ No	☐ Yes
If yes, please describe:				
Are there other existing or dedicated pu	blic streets, roads, highways or	access easements b	ordering or within th	e property?
□ No ☒ Yes	If yes, list them on your plans	and indicate the pr	roposed and existing	access points
I, the undersigned property owner, requof-way at the above property, subject 13, Access Facilities, approved by the W.S. 24-6-101 through W.S. 24-6-111	o the rules and regulations cont Transportation Commission of	tained in the "Rule Wyoming and pro	es and Regulations, C mulgated by authorit	eneral Section, Chapter
If an access permit is issued to you, the			•	·
Applicant or Agent Signature for Perm	ttee		2/14/19	
Applications for access permits will be law as owning all or the major interest of-way or proposed highway.				
Property Owner Signature)		Date	
Butai	ahr.		2/14/19	

Form M-3A, Application for permit to Construct Access Driveway must be submitted to your local Wyoming Department of Transportation Maintenance Foreman. He will review and then submit all necessary paperwork to the District Traffic Engineer for processing. The applicant must submit two copies of the M-3A form filled in and signed by the individual, partnership, corporation, qualified agent, or other body recognized by law as owning all or the major interest in the property abutting the highway right of way or proposed highway. The planned property ingress or egress must be indicated as one of the following:

- <u>Field (Minor) Access.</u> An entrance to and/or exit from a field or unoccupied property if the access is not used daily throughout the year. Daily use for only a few weeks a year still qualifies as field access.
- Residential Access. An access providing entrance to and/or exit from residential dwelling(s) for exclusive use and benefit of those residing therein.
- <u>Commercial Access.</u> An entrance into and/or exit from any business, commercial development, cultural/institutional complex, public establishment, or any development serving 10 or more family residences.
- <u>Major Access.</u> Any access that generates more than 50 trip ends in any hour of a typical day or is a public street or access.

A business letter shall accompany the application. The letter should have a heading: including name, address, and telephone number of the above owner or owners, estimate of daily traffic, and state what you propose to do, (EX: where you intend to construct the access, when the work will be started, an estimate of completion time).

A drawing or a sketch showing sufficient dimensions shall be submitted with the application. Which clearly indicates the character and extent of the proposed work to include all or part the following?

- Proposed access.
- Land description to include the <u>Section</u>, <u>Township</u>, and <u>Range</u>
- The location of all existing or proposed buildings, stands, pumps, retaining walls, and other physical features which
 affect the access location.
- · Property lines, dimensions, and existing accesses.
- All drainage which affects the access location.
- All accesses outside of the property but within 330 feet (urban), 660 feet (rural) of the property line.
- · Off street parking locations which may affect access location.
- Radii of proposed accesses.

If Right-of-Way fence is involved, you are required to install brace panels on either side of the access. If you require a cattleguard, it must be located on the private property and installed and maintained by you. If a drainage problem will be created, a minimum of an 18" diameter CMP will be required under the proposed access. The length of the CMP must enable construction of 8:1 side slopes on the approach shoulders.

Note: In order to expedite the processing of your application, the location of the proposed access should be clearly indicated both on your drawing and/or sketch (by Highway Route and distance to a Milepost number) and marked at the actual site with highly visible markings for the field location and inspection.

If you have any questions concerning your access application please feel free to contact the District office.



Whitney Road and East Dell Range Intersection

The Cheyenne Metropolitan Planning Organization (MPO) is currently managing the Whitney Road and East Dell Range/US 30 Corridor Plans. Both Corridor Plans' study areas include the Whitney Road and East Dell Range intersection.

The Whitney Road Corridor Study, initiated at the end of 2017, initially recommended a single lane roundabout as a long-term solution for the intersection. The recommendation was based on a safety assessment, 2016 traffic counts and analysis documented in the City approved Whitney Ranch Traffic Impact Assessment. However, the traffic study did not estimate the redistribution of future traffic with the Christianson Road extension to Interstate 80.

Subsequently, the traffic analysis conducted for the East Dell Range and US 30 Corridor Study, initiated in the Fall of 2018) utilized 2017/18 traffic counts and a traffic analysis which assumed future traffic would be redistributed when Christianson Road was extended south. This more recent traffic analysis suggests the previously recommended intersection at Whitney Road and East Dell Range could accommodate a single lane roundabout as an interim solution. However, at full build-out of the Whitney Ranch development, the single lane roundabout would need additional right-turn lanes for the southbound and eastbound approaches to meet acceptable traffic operations.

The East Dell Range and US 30 Corridor Team was asked to assess a signalized intersection as an alternative to the proposed single lane roundabout. This memorandum summarizes the operational and urban design opportunities and challenges associated with a potential roundabout and an alternative traffic signal for the East Dell Range and Whitney Road intersection.

Operational Assessment

A year 2040 traffic operations assessment was conducted for Whitney Road and East Dell Range intersection. The alternatives evaluated included the current configuration of the intersection; a single lane roundabout; a single lane roundabout with eastbound and southbound additional right-turn slip ramps; and, a signalized intersection with left-turn and a shared through and right-turn travel lane on each approach. The level of service (LOS) and delay analysis is shown below.

Traffic LOS and Delay

2040	Two-V Co	Conditions Way Stop Introl y (LOS)	Round	Lane labout (LOS)	Roundabo SB Rig	Lane out w/ EB & ht Turn / (LOS)	_	alized ection
Movement	AM	PM Delay	AM	PM Delay	AM	PM Delay	AM	PM
	Delay	(LOS)	Delay	(LOS)	Delay	(LOS)	Delay	Delay
	(LOS)		(LOS)		(LOS)		(LOS)	(LOS)
Overall	-	-	19.9 (C)	45.5 (E)	11.9 (B)	31.8(D)	33.7(C)	27.5(C)
NB Approach	>300	>300	ı	-	-	ı		
EB Approach	8.8 (A)	8.5 (A)	-	-	-	-		
WB Approach	8.0 (A)	9.1 (A)	-	-	-	-		
SB Approach	>300	>300	-	-	-	-		





The analysis shows the signalized intersection and the roundabout with additional right turn lanes meet the minimum traffic operation expectation in both the AM and PM peak hours. The roundabout operates at an LOS D with an overall delay of 31. 8 seconds in the PM peak hour. The signalized intersection operates slightly better with an LOS C with an overall delay of 27. 5 in the PM peak hour.

The 95th percentile queuing analysis for both alternatives shows shorter queue lengths with the signalized intersection. The traffic signal alternative maintains approximately 300' shorter queues in the peak direction when compared to the roundabout.

Vehicle Queuing

Queue Length (95 th percentile)	One Lane F	Roundabout	One Lane Ro w/ EB & SB		•	alized section
Movement	AM (ft)	PM (ft)	AM (ft)	PM (ft)	AM (ft)	PM Delay (ft)
NB left	-	-	-	-	#168'	#134'
NB Through	45'	789'	45'	789'	134'	#451'
EB Left	-	-	-	-	28'	m23'
EB Through	98'	897'	46	259'	82'	#599'
EB Right	-	-	10'	18'	-	-
WB Left	-	-	-	-	m21'	m10'
WB Through	180'	175′	180'	175′	#506'	355'
SB Left	-	-	-	-	56'	#107'
SB Through	397'	172′	147'	98'	#452'	318′
SB Right	-	-	15'	7'	-	-

^{# 95}th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles. m Volume for 95th percentile queue is metered by upstream signal.

Land Use and Urban Design Assessment

The Whitney Road and East Dell Range intersection is situated within Cheyenne's and Laramie County's high growth corridors. While currently rural in character, the land uses surrounding the intersection are transitioning into a more suburban development pattern. Whitney Ranch and Saddle Ridge are the two largest developments influencing land use and traffic changes occurring in the area.

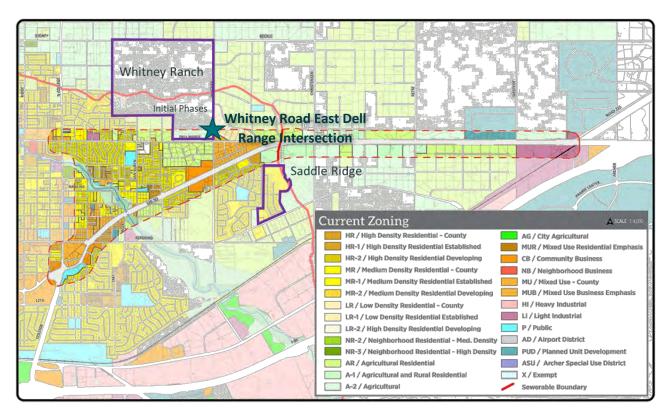
A zoning and infrastructure assessment of the area shows Whitney Road will function as the City of Cheyenne's eastern boundary for many years. Sewer service expansion in the area is limited east of Whitney Road. Furthermore, most of the properties east of Whitney Road are large lot residential parcels and likely not to redevelop. The Whitney Road and East Dell Range intersection will function as a gateway between the urban and suburban patterns of development within Whitney Ranch, the City of Cheyenne with the more rural development pattern of Laramie County.

Between the two alternatives a roundabout presents a stronger gateway and urban design opportunity for transitioning land uses than a signalized intersection. The roundabout creates a physical transition between the higher travels speeds anticipated in rural areas east Whitney Road and the lower traffic speeds in the more suburban pattern west of Whitney Road. The roundabout balances mobility demands while providing a distinctive place-making opportunity.





Zoning and Sewer Services Map



Opportunities (Pros)

Signalized Intersection

- Maintains LOS B in the AM peak and an LOS C in the PM peak hour
- Maintains shorter vehicle queue lengths
- Provides a safer physical condition than the current intersection condition
- Provides most comfortable pedestrian and bicycle crossing of the intersection
- Lower capital costs when compared to the roundabout

Roundabout

- Maintains LOS B in the AM peak and an acceptable LOS D in the PM peak hour with only a 4 second of additional overall delay when compared to the signalized intersection
- Maintaining lower traffic speeds with fewest conflict points making it the safest alternative
- Presents a long-term aesthetic and urban design gateway opportunity
- Presents a physical traffic calming opportunity transitioning higher rural travel speeds to slower suburban travel speeds
- The roundabout balances mobility demands while providing a distinctive place-making opportunity





Challenges (Cons)

Signalized Intersection

- Higher speeds and more conflict points when compared to the roundabout
- Limited aesthetic and urban design gateway opportunities
- Provides traffic control, not traffic calming in transitioning from higher rural travel speeds to slower suburban travel speeds

Roundabout

- Less comfortable intersection crossing for pedestrians and bicyclists
- Lower traffic LOS and a 4 second higher overall delay when compared to the signalized intersection
- Longer vehicle queues than a signalized intersection
- Higher capital costs than a signalized intersection



Table 1 – Study Area Intersections LOS Results

			Exis	sting	N	40 lo ements	W	40 ith ements
Intersection	Existing Control	Movement	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
Dell Range Blvd & College Dr (#1)	8	Overall	28.6 C	36.8 D	94.8 F	186.6 F	33.7 C	52.2 D
	STOP	Northbound Approach	15.5 C	16.9 C	>300 F	>300 F	-	-
		Eastbound Left	8.2 A	8.1 A	9.9 A	11.8 B	-	-
Dell Range Blvd & Van Buren Ave (#2)		Westbound Left	8.1 A	8.7 A	8.5 A	10.7 B	-	-
, ,	STOP	Southbound Approach	14.1 B	13.8 B	171.5 F	>300 F	-	-
	2	Overall	-	-	-	-	18.9 B	19.4 B
	STOP	Northbound Approach	13.4 B	15.8 C	21.9 C	38.0 E	21.9 C	38.0 E
Dell Range Blvd &		Eastbound Left	0.0 A	8.0 A	9.2 A	9.5 A	9.2 A	9.5 A
El Camino Dr (#3)		Westbound Left	7.6 A	8.5 A	8.2 A	10.4 B	8.2 A	10.4 B
	STOP	Southbound Approach	0.0 A	10.3 B	16.8 C	23.3 C	16.8 C	23.3 C
	STOP	Northbound Approach	0.0 A	18.2 C	0.0 A	0.0 A	0.0 A	0.0 A
Dell Range Blvd &		Eastbound Left	0.0 A	8.1 A	9.2 A	9.5 A	9.2 A	9.5 A
James Dr (#4)		Westbound	0.0	0.0	0.0	0.0	0.0	0.0
	STOP	Left Southbound Approach	A 12.1 B	0.0 A	A 17.7 C	30.8 D	15.2 C	A 18.2 C
	STOP	Northbound Approach	18.8 C	23.3 C	>300 F	>300 F	-	-
		Eastbound Left	7.8 A	7.7 A	8.8 A	8.5 A	-	-
		Westbound Left	7.5 A	8.1 A	8.0 A	9.1 A	-	-
Dell Range Blvd & Whitney Rd (#5)	STOP	Southbound Approach	14.4 B	13.0 B	>300 F	>300 F	-	-
Tillialoy Na (#0)	(3)	Overall (Single Lane)	-	-	-	-	19.9 C	45.5 E
	()	Overall (Single Lane EB & SB RT)	-	-	-	-	11.9 B	31.8 D
	8	Overall	-	-	-	-	33.7 C	27.5 C
US-30 & N College Dr (#6)	3	Overall	28.4 C	35.3 D	49.8 D	91.4 F	27.3 C	54.6 D
US-30 & E Pershing Blvd (#7)	8	Overall	18.6 B	20.3 C	32.4 C	72.5 E	30.2 C	44.0 D

			Exis	sting	N	40 lo ements	W	40 ith ements
Intersection	Existing Control	Movement	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
	STOP	Northbound Approach	10.5 B	15.6 C	22.7 C	36.8 E	10.6 B	22.2 C
		Eastbound	10.4	8.4	14.1	10.7	DNE	DNE
US-30 & Polk Ave (#8)		Left Westbound	8.2	10.9	9.1	17.9	DNE	DNE
TOIR AVE (#0)		Left Southbound	A 17.6	B 24.3	A 36.9	97.5	16.7	12.7
	STOP	Approach	C	C	E	F	C	В
		Eastbound Left	10.8 B	8.7 A	18.8 C	15.8 C	-	-
US-30 &	STOP	Southbound	17.5	13.2	136.8	18.7	_	-
Van Buren Ave (#9)		Approach	С	В	F	С	22.7	23.8
	8	Overall	-	-	-	-	C C	C C
	STOP	Northbound Approach	23.5 C	33.1 D	86.3 F	233.3 F	9.8 A	13.8 B
US-30 &		Eastbound Left	9.5 A	8.3 A	12.1 B	10.2 B	12.1 B	10.1 B
Hayes Ave (#10)		Westbound	7.9	9.3	8.4	12.6	8.4	12.6
		Left Southbound	A 13.4	A 17.3	A 22.3	39.7	A 18.9	В 11.9
	STOP	Approach	B	С	C C	E	C	В
	STOP	Northbound Left	37.0 E	28.3 D	>300 F	>300 F	-	-
		Northbound Through/Right	18.1 C	21.3 C	43.0 E	>300 F	-	-
		Eastbound	9.0	7.9	10.6	10.5	_	-
US-30 & Whitney Rd (#11)		Left Westbound	7.7	8.7	8 7.9	9.5		
		Left Southbound	A 20.7	A 35.9	A 181.6	A >300	-	-
	STOP	Approach	20.7 C	35.9 E	161.6 F	>300 F	-	-
	8	Overall	-	-	-	-	20.3 C	19.3 B
	STOP	Northbound Approach	18.9 C	14.0 B	30.8 D	20.1 C	8.9 A	10.1 B
US-30 &		Eastbound	0.0	0.0	8.7	8.0	DNE	DNE
Saddle Ridge Trail		Left Westbound	7.5	8.5	7.8	9.1	7.8	9.2
(#12)		Left Southbound	A 12.9	A 14.0	A 14.5	A 16.6	A 10.2	A 9.3
	STOP	Approach	12.9 B	14.0 B	14.5 B	16.6 C	10.2 B	9.3 A
	STOP	Northbound Approach	13.2 B	12.2 B	0.0 A	0.0 A	-	-
US-30 &		Eastbound	8.4	7.6	8.7	8.0	-	-
Dell Range Blvd (#13)		Left Westbound	7.4	0.0	0.0	0.0	-	-
	CTOE	Left Southbound	14.5	A 18.2	A 26.5	A 177.5		
	STOP	Approach	В	С	D	F	-	-

			Exis	sting	N	40 lo ements	W	40 ith ements
Intersection	Existing Control	Movement	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
			LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)	LOS (Delay)
	3	Overall	-	-	-	ı	10.0 A	24.8 C
	STOP	Northbound Left	- DNE	- DNE	>300 F	245.5 F	-	-
		Northbound Through/Right	- DNE	- DNE	21.0 C	150.0 F	ı	-
US-30 &		Eastbound Left	8.6 A	8.3 A	9.1 A	9.0 A	ı	-
Christensen Rd (#14)		Westbound Left	- DNE	- DNE	8.5 A	10.2 B	-	-
(#14)		Southbound Left	- DNE	- DNE	26.6 D	>300 F	-	-
	STOP	Southbound Approach	15.2 C	11.0 B	53.7 F	33.6 D	-	-
	3	Overall	-	ı	-	ı	34.7 C	22.1 C
	STOP	Northbound Approach	13.0 B	15.1 C	23.3 C	26.0 D	23.3 C	26.0 D
US-30 &		Eastbound Left	8.2 A	7.9 A	8.7 A	8.5 A	8.7 A	8.5 A
Reese Ave (#15)		Westbound Left	7.5 A	8.3 A	8.0 A	9.2 A	8.0 A	9.2 A
	STOP	Southbound Approach	12.0 B	10.9 B	14.9 B	14.6 B	14.9 B	14.6 B
US-30 &		Eastbound Left	8.1 A	7.9 A	8.4 A	8.6 A	8.4 A	8.6 A
Westedt Rd (#16)	STOP	Southbound Approach	11.1 B	10.5 B	14.1 B	16.2 C	14.1 B	16.2 C
	STOP	Northbound Approach	12.5 B	14.1 B	18.6 C	27.8 D	18.6 C	27.8 D
US-30 &		Eastbound Left	7.7 A	7.4 A	8.0 A	7.7 A	8.0 A	7.7 A
Archer Pkwy (#17)		Westbound Left	7.7 A	8.1 A	8.1 A	8.6 A	8.1 A	8.6 A
	STOP	Southbound Approach	13.1 B	11.3 B	14.8 B	14.2 B	14.8 B	14.2 B

DNE = Does Not Exist

HCM 6th Signalized Intersection Summary 1: College Drive & Dell Range Boulevard

2017-2018 Existing AM.syn 10/18/2018

Movement EB1	Movement Lane Configurations		-	-								-	
1	Lane Configurations	E	E87	EBR	Wel	WBT	WBR	MBL	NBT	NBR	SBL	igs	SBR
100 23 113 264 115 443 166 265 214 77 101 322 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	The second secon	Jr.	4	*	k	4		*	43		¥.	47	
10 23 113 264 115 443 166 266 214 77 101 322 100 100 100 100 100 100 100 100 100 1	Traffic Volume (veh/n)	23	113	364	115	443	166	265	214	11	101	325	76
100 100 100 100 100 100 100 100 100 100	Future Volume (veh/h)	23	113	264	115	443	166	285	214	11	101	322	76
100 100 100 100 100 100 100 100 100 100	Initial O (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
150 100	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Section Sect	Parking Bus, Adj	180	100	1.00	1.00	1.00	100	8	1.00	1,00	1.00	100	1.00
1575 1575	Work Zone On Approach		S			No.			No			S.	
28 120 0 151 487 193 358 306 143 125 382 282 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, wehildlin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
9, 2, 2, 3, 4, 6, 5, 5, 6, 6, 9, 1, 6, 8, 6, 1, 7, 0, 70, 0, 5, 4, 6, 1, 6, 1, 8, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	Adj Flow Rate, vehith	28	120	0	151	487	193	358	306	143	125	362	104
9, 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.82	0.94	0.92	97.0	16:0	98.0	0.74	0.70	0.54	0.81	680	0.73
256 428 453 651 256 455 674 308 421 552 610 1601 1600 1007 031 031 031 031 032 034 034 034 034 034 034 034 034 034 034	Percent Heavy Veh. %	2	cv	ev	2	2	2	2	2	2	2	2	2
150 0.09 0.00 0.07 0.31 0.31 0.18 0.34 0.34 0.34 0.09 0.024 1510 1575 1335 1500 2037 825 1500 1395 912 1500 2301 1510 1575 1335 1500 1496 1411 1500 1496 1411 1500 1496 1510 153 150 51 156 158 130 89 92 46 105 1510 153 100 51 156 158 130 89 92 46 105 1510 153 100 100 100 130 130 89 92 46 105 1511 1511 1511 1511 1511 1511 1511 1511 1511 1512 151 152 158 130 89 92 46 105 1512 1513 1528 1530 1530 1530 1530 155 158 130 1513 1528 1530 1530 1530 1530 1530 1530 1514 1515 1514 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 1515 151	Cap vehith	216	428		453	159	256	455	674	308	421	552	157
1500 1575 1335 1500 2037 876 1500 1996 912 1500 2301	Arrive On Green	0.01	0.00	000	0.07	0.31	0.31	0.18	0.34	0.34	0.08	0.24	0.24
150 1575 1385 1500 1486 1485 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1500 1486 1415 1	Sat Flow, vehilb	1500	1575	1335	1500	2002	826	1500	1986	912	1500	2301	652
1500 1575 1335 1500 1495 1425 1500 1496 1411 1500 1496 1411 1500 1496 1410 1500 1496 1411 1500 1496 1410 1400	Gro Volume(v), veh/h	28	120	0	151	347	333	358	228	221	125	234	232
1.0 5.3 0.0 5.1 156 158 130 8.9 9.2 4.6 10.5 1.0 1.0 1.0 5.3 0.0 5.1 156 158 130 8.9 9.2 4.6 10.5 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Gro Sat Flow(s) vehihlin	1500	1575	1335	1500	1496	1426	1500	1496	1415	1500	1496	1458
1.0 53 0.0 5.1 15.6 15.8 130 8.9 9.2 46 10.5 10.0 10.0 10.0 1.00 10.0 10.0 10.0	O Serve(g_s), s	1.0	5.3	0.0	s,	15.6	15.8	13.0	8.9	9.2	4.6	10.5	10.8
1.00 1.00 1.00 0.68 1.00 0.65 1.00 0	Cycle O Clear(g. c), s	1.0	5.3	00	5.1	15.6	15.8	13.0	8.6	92	9.6	10.5	10.8
216 428 455 465 443 455 506 477 421 389 0.133 0.238 0.33 0.75 0.75 0.75 0.75 0.76 0.75 0.76 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75	Prop in Lane	1.00		1.00	1.00		0.58	1.00		0.65	100		0.45
013 0.28 0.33 0.75 0.79 0.45 0.46 0.30 0.65 0.72 4.28 0.33 0.37 0.79 0.45 0.46 0.30 0.65 0.72 4.28 0.33 0.33 0.33 0.33 0.30 1.00 1.00 1.00	Lane Grp Cap(c), veh/h	216	428		453	465	443	455	909	477	421	359	320
272 428 455 445 445 455 506 477 452 359 697 097 000 100 100 100 100 100 100 100 100 10	V/C Ratio(X)	0.13	0.28		0.33	0.75	0.75	0.79	0.45	0.46	0.30	0.65	0.66
033 033 033 100 1100 1100 1100 1100 100	Avail Cap(c_a) vehin	272	428		453	465	443	455	909	477	452	359	350
097 097 000 100 100 100 100 100 100 100 100 10	HCM Platbon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	100	1.00	1.00
202 273 0.0 184 232 233 169 194 195 188 257 0.0 0.0 0.0 0.0 119 195 188 257 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Upstream Filter(I)	260	0.97	0.00	100	1.00	100	1 00	100	100	1 00	1.00	100
0.3 1.5 0.0 0.4 104 112 8.9 2.9 3.2 0.4 88 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	20.2	27.3	0.0	18.4	23.2	23.3	16.9	19.4	19.5	18.8	25.7	25.8
00 00 00 00 00 00 00 00 00 00 00 00 00	Incr Delay (d2), siveh	0.3	1.6	0.0	0.4	10.4	11.2	8.9	29	3.2	0.4	88	9.6
04 22 00 19 65 64 52 33 33 16 45 205 289 00 189 336 245 258 223 227 192 345 C C C C C B C 148 A 831 897 539 C C C C B C 107 298 96 249 180 225 67 278 45 45 45 45 45 45 5 66 112 7.1 73 150 128 30 178 C C C C C C C C C C C C C C C	Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
## 205 289 0.0 189 336 345 258 223 227 192 345 25 25 25 25 25 25 25 25 25 25 25 25 25	%ie BackOfO(50%), vehiln	0.4	2.2	0.0	61	9.5	6.4	5.2	3.3	33	1.6	4.5	4.5
20.5 28.9 0.0 18.9 33.5 34.5 25.8 22.3 22.7 19.2 34.5 C C C C C B C C C B C C C C B C C C C	Unsig. Movement Delay, s/veh		100000000000000000000000000000000000000		Water Comment		1						1
148 A 831 807 591 27.3 27.3 807 591 10.7 298 9.6 24.9 18.0 22.5 6.7 27.8 4.5 4.5 4.5 4.5 4.5 4.5 5 6 11.2 7.1 7.3 15.0 12.8 3.0 17.8 5 6 11.2 7.1 7.3 15.0 12.8 3.0 17.8 5 6 12.2 0.0 0.4 0.0 1.3 0.0 11	LnGrp Delay(d), siveh	20.5	28.9	0.0	18.9	33.6	34.5	25.8	223	22.7	19.2	34.5	35.3
148 A 831 807 273 273 239 273 C C C C C C C C C C C C C C C C C C C	LnGrp LOS	O	O		8	O	U	U	U	O	m	O	
27.3 31.3 23.9 23.9 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0 2.0	Approach Vol. vehith		148	×		83			807			591	
1 2 3 4 5 6 7 8 107 29.8 9.6 24.9 18.0 22.5 6.7 27.8 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 5 6 11.2 7.1 7.3 15.0 12.8 3.0 17.8 0.0 2.2 0.0 0.4 0.0 1.3 0.0 1.1 28.6 C. C.	Approach Delay, s/veh		27.3			31.3			23.9			31.6	Ì
107 298 95 249 180 225 67 7 1 2 3 4 5 45 45 45 45 45 245 45 245 67 245 67 245 67 245 67 245 67 245 245 245 245 245 245 245 245 245 245	Approach LOS		u	ľ	d	9			O			Ü	I
107 298 9.6 249 180 225 6.7 5 45 45 45 45 45 45 45 45 45 45 5 20 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Timer - Assumed Pits	-	2	*		20	g	1	80			1	Ī
4,5 4,5 4,5 4,5 4,5 4,5 4,5 4,5 5,5 5,5	Phs Duration (G+Y+Rc), s	10.7	29.8	9.6	24.9	18.0	225	6.7	27.8				ı
s 77 228 54 204 135 180 50 s 66 112 74 73 150 128 30 00 22 00 04 00 13 00 286	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
s 66 11.2 7.1 7.3 15.0 12.8 3.0 0.0 2.2 0.0 0.4 0.0 1.3 0.0 28.6 C	Max Green Setting (Gmax), s	1.7	23.8	5.1	20.4	13.5	18.0	5.0	20.5				į
00 22 00 04 00 13 286 C	Max Q Clear Time (g_c+11), s		11.2	7.1	7.3	15.0	12.8	3.0	17.8				
	Green Ext Time (p_c), s	0.0	2.2	0.0	0.4	0.0	13	00	1,1			į	
	intersection Summary												
	HCM 6th Ctrl Delay	þ		28.6						E			
	HCM 6th LOS			U									

Notes. Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Synchro 10 Report Page 1

HCM 6th Signalized Intersection Summary	1: College Drive & Dell Range Boulevard

2017-2018 Existing PM.syn	10/18/2018	
lized Intersection Summary	e & Dell Range Boulevard	

Movement	EBI	188	EBR	WBL	WBI	WBR	NBL	NBI	NBR	igs	SBI	SBR
Lane Configurations	K	4	¥.	k	47		¥~	4.		Je.	414	
Traffic Volume (veh/h)	93	438	353	25	333	120	401	401	144	196	240	T
Future Volume (veh/h)	93	438	353	27	339	120	401	401	144	196	240	25
initial O (Ob), veh	0	0	0	٥	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1 00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1,00	1:00	1 00	1.00	1:00	1.00	1.00	1.00	1.00	1 00	1.00	1.00
Work Zone On Approach		No			8			2			No	
Adj Sat Flow, vehhilin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	127	456	0	72	365	132	422	501	197	215	261	76
Peak Hour Factor	0.73	96'0	0.88	62.0	0.93	0.91	96'0	080	0.73	0.91	0.92	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
ap, vehih	329	483		192	623	222	484	633	248	307	552	157
Arrive On Green	0.02	0.10	0.00	0.05	0.29	0.29	0.16	0.30	0.30	0.10	0.24	0.24
Sat Flow, vehills	1500	1575	1335	1500	2162	177	1500	2101	822	1500	2298	655
Sro Volume(v), veh/h	127	456	0	772	251	246	422	356	342	215	168	169
Sm Sat Flow(s) veh/h/in	1500	1575	1335	1500	1496	1436	1500	1496	1427	1500	1496	1457
D Serve(q_s), s	4.4	21.6	0.0	2.5	10.8	11.0	12.1	16.4	16.5	7.5	7.2	7.5
Cycle O Clearfo o), s	4.4	21.6	0.0	2.5	10.8	110	121	16.4	16.5	1.5	7.2	7,5
Prop In Lane	1.00	1	1.00	1.00		0.54	1.00		0.58	1.00		0,45
ane Grp Cap(c), veh/h	329	483		192	431	414	484	451	430	307	328	350
//C Ratio(X)	0.39	0.94		0.38	0.58	0.59	0.87	0.79	0.80	0.70	0.47	0.48
Avail Cap(c, a), veh/h	329	483		214	431	414	484	451	430	307	389	350
HCM Platson Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100
Jostnean Filter(II)	0.97	0.97	000	1.00	100	100	1.00	001	1 00	1.00	1.00	1.00
Jniform Delay (d), siveh	18.7	33.1	0.0	20.1	22.8	22.9	20.7	24.0	24.1	21.5	24.4	24.5
ncr Delay (d2), s/veh	0.7	28.5	0.0	1.2	5.7	6.2	15.8	13.1	14.1	2.0	43	4
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00
Wie BackOfD(50%) vehiln	91	128	0.0	6.0	4.3	43	4.3	-	69	33	29	2
Jrisig. Movement Delay, s/veh												
InGrp Delay(d),s/veh	194	61.5	0.0	213	28.5	29.1	36.5	37.2	38.2	28.4	28.7	29.2
nGrp LOS	8	ш		ပ	O	O	0	۵	٥	O	ပ	
Approach Vol. vehih		583	A		599			1120			552	ì
Approach Delay, s/veh		523			27.9			37.2			28.8	
Approach LOS		a			ပ		ŧ	٥		Á	0	
Timer Assimed Phs		2	e	4	4	9	T	00		ŀ	ľ	
Phs Duration (G+Y+Rc) s	120	27.1	8.4	27.5	16.6	22.5	8.6	26.1			ľ	
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.6	5.0	21.9	12.1	18.0	5.3	21.6				
Max Q Clear Time (g_c+11), s		18.5	4.5	23.6	14.1	9.5	6,4	13.0				
Green Ext Time (p_c), s		1.7	0.0	0.0	0.0	12	0.0	2.0		Ŷ	ľ	i
Intersection Summary				Ē	ľ	K				Y		
HCM 6th Ctrl Delay		À	36.8	ı	Ž,		i	l	ĺ			

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and Intersection delay.

HCM 6th Signalized Intersection Summary 1: College Drive & Dell Range Boulevard

2040 Total AM.syn 10/30/2018

	\	t	*	*		/	_	_	•	ļ.	+	,
Movement	e	188	EBR	WBL	WBI	WBR	NBL	NBT	NBR	SBE	SBT	SBR
Lane Configurations	*	4	K	K	474		K	47		F	4.	
Traffic Volume (veh/h)	80	510	290	280	840	230	300	300	150	135	480	175
Future Volume (veh/h)	80	510	290	280	840	230	300	300	150	135	480	175
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.8		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1 00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00
Work Zone On Approach		No			No			2	1		9 N	
Adj Sat Flow, vehthfin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	87	543	0	304	913	185	326	326	130	147	522	125
Peak Hour Factor	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, vehih	183	399		286	299	162	327	644	252	37.1	575	137
Arrive On Green	0.02	0.08	000	0.13	0.32	0.32	0.14	0.31	0.31	0.07	0.24	0.24
Sat Flow, wet/th	1500	1575	1335	1500	2479	205	1500	2101	822	1500	2397	57.1
Grp Volume(v), veh/h	87	543	0	304	551	547	326	230	226	147	325	322
Srp Sat Flow(s), vehifuln	1500	1575	1335	1500	1496	1485	1500	1496	1427	1500	1496	1472
O Serve(g_s), s	3.2	19.0	0.0	9.5	24.2	24.2	10.5	9.5	9.8	5.5	15.8	16.0
Cycle O Clear(g_c), s.	3.2	19.0	0.0	9.5	24.2	24.2	10.5	9.5	9.8	5.5	15.8	16.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		0.58	1.00		0.39
ane Gro Capic), veh/h	183	338		286	482	478	327	459	438	371	328	353
V/C Rabo(X)	0.48	1.36		1.06	1.14	1.14	1.00	0.50	0.52	0.40	0.90	0.91
Avail Cap(c_a), vehilh	196	366		286	482	478	327	459	438	371	328	353
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Jostream Filter(I)	0.97	0.97	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	9	1.00
Uniform Delay (d), s/veh	22.2	34.4	0.0	20.4	25.4	25.4	21.2	21.3	21.4	19.8	27.7	27.7
ncr Delay (d2), sheh	1.9	177.5	0.0	70.8	86.4	87.0	48.6	3.9	4.3	0.7	28.6	30.0
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wile BackOfO(50%), vehiln	1.2	27.6	0.0	9.0	19.6	19.5	8.3	3.6	3.6	1.9	8.2	8.3
Unsig. Movement Delay, s/veh		0770	4		0	4 0 7 7	000	0.10	1	. 00		1
LnGrp Delay(d), siven	24.0	211.9	0.0	2.18	21118	1124	200	7:07	7.07	50.5	200) /C
Lugg LOS	اد	1		-	1 000	-	п	٥	اد	٥	101	الا
Approach Vol, veh/h	1	630	4		1402			787			467	
Approach Delay, S/ven	ı	5 CO			0 /0			40.0 0.0			2005	
Shippen too	l	ı	ľ					2		ı	2	ı
Timer - Assigned Phs		2	(*)	*1	9	9	T.	00				
Phs Duration (G+Y+Rc), s	10.0	27.5	14.0	23.5	15.0	22.5	8.8	28.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.5	23.0	9.5	19.0	10.5	18.0	2.0	23.5				
Max Q Clear Time (g_c+f1), s	7.5	11.8	11.5	21,0	12.5	18.0	5.2	26.2				
Green Ext Time (p_c), s	0.0	2.1	0.0	00	0.0	0.0	0.0	0.0		Ì	i	ı
Intersection Summary		i									ì	3
HCM 6th Chi Delay			876		To the second			b	1000	4		i
HOM 6th I On	l	l	u			l				l	l	
TI JUI PUI LOS												

Notes: Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay,

Synchro 10 Report Page 1

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HCM 6th Signalized Intersection Summary 1: College Drive & Dell Range Boulevard

2040 Total PM syn	10/30/2018	
M 6th Signalized Intersection Summary	Sollege Drive & Dell Range Boulevard	

	\	Ť	*	-		,	_	_	,	k.	•	,
Movement	EBI	EBI	EBR	WBE	WBI	WBR	MBL	NBI	NBR	SBI	SBT	SBR
Lane Configurations	*	4	R.	<i>j</i> _	₹		K	413		<u></u>	4	
Traffic Volume (veh/h)	260	096	415	235	292	245	485	520	275	270	325	200
Future Volume (veh/h)	260	096	415	235	765	245	485	520	275	270	325	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		8	8		9	8		9	9		9
Parking Bus, Adj	1.00	1 00	1.00	9	1 00	1.00	1.00	1.00	1 00	1.00	100	1.00
Work Zone On Approach		S S			2			2			S	
Adj Sat Flow, wethfulln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, vehith	283	1000	0	255	823	201	511	565	169	293	353	119
Peak Hour Factor	0.92	96'0	0.92	0.92	0.93	0.92	0.95	0.92	0,92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	8	2	2	2	2	-
Cap, vehih	191	546		196	827	202	328	621	185	523	603	200
Arrive On Green	0.02	0.11	00.00	0.07	0.35	0.35	0.07	0.27	0.27	20.0	0.27	0.27
Sat Flow, wehith	1500	1575	1335	1500	2384	585	1500	2272	118	1500	2207	733
Gro Volume(v), veh/h	283	1000	0	255	516	208	511	372	362	293	238	234
Gro Sat Flow(s), vehillifly	1500	1575	1335	1500	1496	1470	1500	1496	1453	1500	1496	1443
O Serve(g_s), s	5.0	26.0	0.0	5.0	25.8	25.8	5.5	18.0	18.1	5.5	10.3	10.6
Cycle O Clear(g. c), s	9.0	26.0	0.0	5.0	25.8	25.8	5.5	18.0	18.1	5.5	10:3	10.6
Prop In Lane	1.00		1.00	1.00		0.40	1.00		0.47	1.00		0.51
ane Grp Cap(c), veh/h	197	546		196	519	510	328	400	397	529	409	394
//C Ratio(X)	1.43	1.83		1.30	1.00	1.00	1.56	0.91	0.91	1.28	0.58	0.59
Avail Cap(c_a), veh/h	197	546		196	519	510	328	409	397	229	409	394
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1.00
Jpstream Filter(I)	26.0	0.97	000	1,00	1.00	1.00	100	1.00	1.00	1.00	1.00	1.00
Jniform Delay (d), s/veh	23.5	33.2	0.0	23.0	24.4	24.4	27.9	26.3	26.4	26.2	23.5	23.6
	221.5	381.1	0.0	167.5	38.5	38.9	265.5	26.5	87.2	155.0	5.9	9
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	68.6	0.0	10.6	14.0	13.8	27.8	9.1	0.6	117	41	4
Jusig. Movement Delay, s/veh												
InGrp Delay(d), s/veh	245.0	4143	0.0	190.5	623	63.3	293.3	529		181.2	29.5	30 1
-nGrp LOS	LL.	щ		ıL	ш	ш	ш	٥	٥	ш	O	
Approach Vol, veh/h		1283	Ø		1279			1245			765	
Approach Delay, s/veh		376.9			88.5			151.9			87.8	
Approach LOS	i	ш			ıL			ш.	ı	ì	L	ť
Timer - Assigned Phs	Too.	2	573		ä	9	T	8	١	Ť	i	
Phs Duration (G+Y+Rc), s	10.01	25.0	9.5	30.5	10.0	25 0	9.5	30.5		E		
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	ŀ	ı		
Max Green Setting (Gmax), s	5.5	20.5	2.0	26.0	5.5	20.5	9.0	26.0	18			
Max Q Clear Time (g_c+11), s	7.5	20.1	7.0	28.0	7.5	12.6	7.0	27.8		ı	ľ	
Green Ext Time (p_c). s	00	0.2	0.0	0.0	0.0	1.8	0.0	0.0		Ĭ	ı	1
Intersection Summary	Ķ	Ī			ì						H	-
010 10 10	l		4000	l	l				l	l	١	l
HCM 6th Ctr Delay	ı		186.6	Ì	ĺ	ı		l	i	Ì	l	i
			_									

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

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HCM 6th Signalized Intersection Summary 1: College Drive & Dell Range Boulevard

2040 Total AM_Improved,syn

							-					
ovenent	EBL	EBT	EBB	WEL	WBT	WBR.	NBE	NBT	NBR	SBL	SBI	SBR
ane Configurations	de	*	¥.	je.	44		#	**	W	je.	4	
raffic Volume (veh/h)	80	510	290	280	840	230	300	300	150	135	480	175
-uture Volume (veh/h)	80	510	290	280	840	230	300	300	150	135	480	175
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	Ì	1 00	1.00		1 00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	100	1.00	100	1.00	1 00	1.00	1.00	1.00	1.00	1.00	1.00
Nork Zone On Approach		S.			Se s			No			No	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	87	543	0	304	913	185	326	326	163	147	522	92
Peak Hour Factor	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	.2	2	2	2	53	2
Sap, veh/h	197	932		432	1022	207	469	720	321	353	693	122
Arrive On Green	0.02	0.10	000	0.16	0.41	0.41	90.0	0.24	0.24	0.09	0.27	0.27
Sat Flow, we'llh	1500	2993	1335	1500	2479	205	2910	2993	1335	1500	2544	447
3rp Volume(v), veh/h	87	543	0	304	551	547	326	326	163	147	306	308
Srp Sat Flow(s), veh/h/ln	1500	1496	1335	1500	1496	1485	1455	1496	1335	1500	1496	1495
2 Serve(g_s), s	3.5	15.6	0.0	11.7	30.8	30.9	5.5	8.4	9.5	6.5	16.8	17.0
Cycle Q Clear(g_c), s	3.5	15.6	0.0	117	30.8	30 9	5.5	8 4	9.5	6.5	16.8	17.0
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.30
ane Grp Cap(c), veh/h	197	932		432	617	612	469	720	321	353	407	407
//C Ratio(X)	0.44	0.58		0.70	0.89	0.89	0.70	0.45	0.51	0.42	0.75	0.76
Ivail Cap(c_a), veh/h	202	932		474	617	612	469	720	321	386	407	407
ICM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1 00	1.00	1.00	1.00	1.00	1.00	1.00
lpstream Filter(I)	0.97	0.97	0.00	0.44	0.44	0.44	1.00	100	100	1 00	1.00	1.00
Jniform Delay (d), s/veh	23.3	34.8	0.0	17.4	246	24.6	30.2	29.1	29.6	22.4	30.0	30.0
nor Delay (d2), s/veh	1,5	5.6	0.0	1.9	9.0	9.1	4.4	2.0	5.6	0.8	12.1	12.4
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	00	00	0.0	0.0	00	0.0	00	0.0	0.0
ile BackOfQ(50%),veh/ln	1.3	6.5	0.0	4.0	11.8	11.8	16	31	3.5	2.3	7.2	7.3
Insig. Movement Delay, s/veh								-	- Contraction of the Contraction			
nGrp Delay(d),s/veh	24.8	37.4	0.0	19.3	33.6	33.7	34.6	31.2	35.2	23.2	42.0	45.4
nGrp LOS	ပ	٥		8	O	U	O	U	۵	O	۵	
pproach Vol. vehilt		630	A		1402			815			761	h
pproach Delay, s/veh		35.6			30.5			33.3			38.5	
pproach LOS	ĺ	٥	Ì	١	ပ		i	0		l	0	
mer-Assigned Phs	Ť	23	m	4	20	9	Dr.	66	S. Carellin	R		
ths Duration (G+Y+Rc), s	12.8	26.2	18.5	32.5	10.0	29.0	9.4	41.6	17			
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	10.5	19.5	16.5	25.5	5.5	24.5	5.5	36.5				
Max Q Clear Time (g_c+11), s		11.5	13.7	17.6	7.5	19.0	5.5	32.9				
Green Ext Time (p_c), s	0.1	1.7	0.3	22	0.0	1.8	0.0	2.3				H
riersection Summary			H	H	T.		Ÿ	100		3		
CM 8th Chi Belav	İ	ŀ	33.7			ľ				i	Ï	H
ICM 6th LOS			ပ							ı	ı	ı

Notes. Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay,

Synchro 10 Report Page 1

HCM 6th Signalized Intersection Summary 1: College Drive & Dell Range Boulevard

2040 Total PM_Improved.syn 02/11/2019

Colorado Colorado				•				-					
100 100	Movement	183	183	EBR	WEL	WET	WBR	NBI	NBI	NBR	SBE	SBI	SBR
260 960 415 235 765 245 485 520 275 270 325 260 960 415 235 765 245 485 520 275 270 325 260 960 410 100	Lane Configurations	Ж.	*	Kin	¥	4.4		*** ***	44	****	je.	4	
260 960 415 235 765 245 485 520 275 270 325 100 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	Traffic Volume (veh/h)	260	096	415	235	765	245	485	520	275	270	325	200
100 100	Future Volume (veh/h)	260	960	415	235	765	245	485	520	275	270	325	200
100	Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
150	Ped-Bike Adj(A_pbT)	1.00		1,00	1.00		1.00	1.00		1.00	1.00		18
No. No.	Parking Bus, Adj	1.00	1:00	00:	1 00	1.00	100	188	1 00	1.00	1.00	1.00	1.00
157 157 <td>Work Zone On Approach</td> <td></td> <td>S</td> <td></td> <td></td> <td>9</td> <td></td> <td></td> <td>No</td> <td></td> <td></td> <td>No</td> <td></td>	Work Zone On Approach		S			9			No			No	
283 1000 0 255 823 201 511 565 136 293 355 122 12 2 <td>Adj Sat Flow, veh/h/In</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td> <td>1575</td>	Adj Sat Flow, veh/h/In	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
0.92 0.95 0.92 0.93 <th< td=""><td>Adj Flow Rate, veh/h</td><td>283</td><td>1000</td><td>0</td><td>255</td><td>823</td><td>201</td><td>511</td><td>595</td><td>136</td><td>293</td><td>353</td><td>152</td></th<>	Adj Flow Rate, veh/h	283	1000	0	255	823	201	511	595	136	293	353	152
2 2	Peak Hour Factor	0.92	96.0	0.92	0.92	0.93	0.92	0.95	0 92	0.92	0 92	0.92	0.92
259 114 246 834 204 578 682 30 274 467 1004 0.12 0.23 0.35 0.11 0.23 0.24 0.93 0.94 1.00 0.93 0.94 1.00	Percent Heavy Veh, %	2	2	2	2	2	2	2	N	2	2	2	2
004 012 0.02 0.03 0.35 0.04 0.02 0.02 0.04 0.05 0	Cap, vehih	259	1114		246	834	204	878	682	304	274	467	198
1500 2993 1335 1500 2384 582 2910 2993 1335 1500 20048 258	Arrive On Green	0.04	0.12	0.00	60.0	0.35	0.35	0.11	0.23	0.23	0.11	0.23	0.23
1500 1496 1355 516 508 511 565 136 233 256 1500 1496 1335 1500 1496 1470 1455 1436 1336 1335 1300 1505 236 0.0 8.5 30.8 30.8 9.5 16.2 7.9 9.5 144 100	Sat Flow, vehith	1500	2993	1335	1500	2384	582	2910	2993	1335	1500	2048	867
1500 1496 1335 1500 1496 1470 1455 1496 1335 1500 1496 105 296 0.0 8.5 30.8 30.8 9.5 16.2 79 9.5 144 100 1.00 1.00 8.5 30.8 30.8 9.5 16.2 79 9.5 144 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Grp Volume(v), veh/h	283	1000	0	255	516	508	511	565	136	293	256	249
105 296 0.0 85 308 308 95 162 79 95 144 105 296 0.0 85 308 308 95 162 79 95 144 105 296 0.0 0.5 308 308 95 162 79 95 144 108 0.40 1.00 1.00 1.00 1.00 1.00 109 0.33 0.33 1.04 0.99 0.99 0.98 0.88 0.45 274 341 103 0.37 0.09 0.09 0.09 0.00 1.00 1.00 1.00 250 114 0.0 272 280 280 282 331 293 301 324 250 171 0.0 272 390 391 152 112 47 737 412 20 0.0 0.0 0.0 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20 0.0 0.0 20	3rp Sat Flow(s), vehihin	1500	1496	1335	1500	1496	1470	1455	1496	1335	1500	1496	1419
105 296 0.0 85 308 308 95 162 79 95 144 100 100 100 100 100 100 100 101 100 100 104 0.99 0.98 0.88 0.83 0.45 107 102 0.90 1.04 0.99 0.99 0.88 0.83 0.45 107 0.75 103 0.33 0.33 0.33 0.30 1.00 1.00 1.00 1.00 103 0.37 0.30 0.09 0.09 0.00 1.00 1.00 1.00 100 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 100 0.0 0.0 0.0 0.0 0.0 0.0 0.0 100 0.15 0.0 0.1 0.0 0.0 0.0 100 0.15 0.0 0.1 0.0 0.0 0.0 100 0.15 0.1 0.1 0.1 0.0 100 0.1 0.1 0.1 0.0 0.0 100 0.1 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 0.0 100 0.1 0.0 100 0.1 0.0 0.0 100 0.0 0.0 100 0.1 0.0 0.0 100 0.	a Serve(g_s), s	10.5	29.6	0.0	8.5	30.8	30.8	9.5	16.2	7.9	9.6	14.4	14.8
1,00	Cycle Q Clear(g_c), s	10.5	29.6	0.0	8.5	30.8	30.8	9.5	16.2	7.9	9.5	14.4	14.8
100 101 102 103 103 104 105	Prop In Lane	1.00		1.00	1.00		0.40	1.00		1.00	1.00		0.61
109 0.90 1.04 0.99 0.99 0.88 0.83 0.45 1.07 0.75 0.75 0.39 0.31 0.33 0.33 0.30 0.90 0.99 0.88 0.83 0.45 1.07 0.75 0.39 0.39 0.39 0.39 0.39 0.39 0.39 0.34 0.45 0.47 0.75 0.33 0.33 0.33 0.30 0.30 0.90 0.90 0.90	-ane Grp Cap(c), veh/h	259	1114		246	524	515	278	682	304	274	341	323
259 1114 2 246 524 515 578 682 304 274 341 00 0.33 0.33 0.33 0.33 0.39 0.39 0.00 1.00 1.00 1.00 1.00 1.00 0.00 0.0	//C Ratio(X)	1 09	06 0		104	0.99	66 0	0.88	0.83	0.45	1.07	0.75	0.77
0.33 0.33 0.33 1.00 1.00 1.00 1.00 1.00	4vail Cap(c_a), veh/h	259	1114	ı	246	524	515	578	682	304	274	341	323
0.97 0.97 0.07 0.09 0.09 0.09 1.00 1.00 1.00 1.00 1.00	HCM Platoon Ratio	0.33	0.33	0.33	1 00	1,00	1.00	1.00	1 00	1.00	1.00	1.00	1.00
250 378 0.0 242 290 290 292 331 299 301 324 820 111 0.0 229 910 910 521 112 47 737 142 100 135 0.0 5.1 118 117 3.0 6.8 2.9 7.7 6.4 1080 489 0.0 5.1 380 382 444 443 346 1039 466 1283 A	Upstream Filter(I)	0.97	0.97	000	60 0	0.09	60 0	1.00	1.00	1.00	1.00	1.00	188
820 111 00 273 9.0 91 152 112 47 737 142 00 00 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Jniform Delay (d), s/veh	26.0	37.8	0.0	24.2	29.0	29.0	29 2	33.1	29.9	30.1	32.4	32.5
100 135 0.0 5.1 118 117 3.0 6.8 2.9 7.7 6.4 108.0 4.9 0.0 5.1 118 117 3.0 6.8 2.9 7.7 6.4 108.0 4.9 0.0 5.1 38.0 38.2 44.4 44.3 34.6 103.9 4.6 6.4 1283 A 1272	nor Delay (d2), s/veh	82.0	11.1	00	27.9	9.0	9.1	15.2	11.2	47	73.7	14.2	16.1
100 135 0.0 5.1 118 117 3.0 6.8 2.9 77 64 108.0 48.9 0.0 5.2.1 38.0 38.2 44.4 44.3 34.6 103.9 46.6 F D F D D D D C F D 1283 A 1279 1212 738 140 250 130 38.0 14.0 25.0 15.0 36.0 140 250 130 38.0 14.0 25.0 15.0 36.0 152 205 85 33.5 95 20.5 10.5 31.5 152 205 85 33.5 95 20.5 10.5 31.5 152 205 10.0 11.0 0.0 11.0 0.0 152 205 205 205 205 205 205 205 205 205 2	nitial Q Delay(d3),s/veh	0.0	0.0	00	0.0	00	0.0	00	0.0	0.0	0.0	0.0	0.0
100 489 0.0 521 380 382 444 443 346 1039 466 1283 A 1279 C F D D D C F D D C F D D D C F D D D C F D D D C F D D D C F D D D D	%ile BackOfQ(50%), veh/In		13.5	0.0	5.1	118	11.7	3.0	8.9	2.9	7.7	6.4	6.4
1080 489 00 521 380 382 444 443 346 1039 466 1030 1039 465 1039 465 1033 A 1279 1279 738 432 E D D D C F D D C F D D D C F D D D C F D D C F D D C F D D C F D D C F D D C F D C C F D D C C F D C C C C	Unsig. Movement Delay, s/ver	- 1											
1283 A 1279 D D D C 7 798 151.9	_nGrp Delay(d),s/veh	108.0	48.9	0 0	52.1	38.0	38.2	44.4	443	34.6	103.9	466	486
1283 A 1279 1772 1772 1772 1772 1772 1772 1772	Lugip LUS	-			L	واد	٥	٥		2	L	2	
61.9 40.9 43.2 14.0 250 130 380 140 250 150 360 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 95 20.5 85 335 95 20.5 10.5 31.5 11.5 18.2 10.5 31.6 11.5 16.8 12.5 32.8 0.0 1.0 0.0 1.2 0.0 1.1 0.0 0.0 52.2 52.2	Approach Vol, veh/h		1283	∢	i	1279		i	1212	ij	B	798	Į
140 250 130 380 140 250 150 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 10.5 11.5 18.2 10.5 31.6 11.5 16.8 12.5 0.0 1.0 0.0 1.2 0.0 1.1 0.0 52.2 D	Approach Delay, siven		613	١	l	40.9	ı	١	43.2		١	58.3	Ì
140 250 380 140 250 150 4.5 4.5 4.5 4.5 4.5 4.5 4.5 9.5 20.5 8.5 33.5 9.5 20.5 10.5 0.0 1.0 0.0 1.2 0.0 1.1 0.0 0.0 252	Approach LOS	i	ш	ŀ	Ì	a	i	ì	0		Ì	ш	ľ
140 250 130 380 140 250 150 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 9.5 205 85 335 95 20.5 10.5 11.5 10.0 1.2 0.0 1.1 0.0 52.2 D. S. S. S. S. S. S. S. S. S. S. S. S. S.	Timer-Assigned Phs	=	2	Ó	*	2	9	£	60		5		
4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5	Phs Duration (G+Y+Rc), s	14.0	25.0	130	38.0	14.0	25.0	15.0	36.0	d			
95 205 85 335 95 205 105 11.5 18.2 10.5 31.6 11.5 16.8 12.5 0.0 1.0 0.0 1.2 0.0 1.1 0.0 52.2 D	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
11.5 18.2 10.5 31.6 11.5 16.8 12.5 0.0 1.0 0.0 12 0.0 1.1 0.0 52.2 D	Max Green Setting (Gmax), s		205	8 2	33 5	9.2	20.5	10.5	315		7		
s 0.0 1.0 0.0 1.2 0.0 1.1 0.0 \$2.2 0	Max Q Clear Time (g_c+11), s		18.2	10.5	31.6	11.5	16.8	12.5	328		ı		I
umany. Jelay		0.0	10	00	1.2	00	-	0.0	0.0				į
Jelay	Intersection Summary												
	HCM 6th Ctrl Delay			523									
	HCM 6th LOS			۵									

Nates: Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC 2: Van Buren Avenue & Dell Range Boulevard

int Delay, siveh	2.3												
Movement	163	183	Æ	TBM	WBT	W89	ĕ	NBIT	NEW YEAR	感	SBT	SBR	
Lane Configurations	*	2.		1	42			+\$			4		
raffic Vol, veh/h		161	92	11	377	0	43	*	9	0	00		
-uture Vol. veh/h	-	161	16	17	377	0	43	4	9	0	00		
Conflicting Peds, #/hr	0	0	0		0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		1	None			None			None	5/4	10	None	
Storage Length	100	0	iji. L	100	(#				•	7.8	(9)	(*)	
Veh in Median Storage.	14 H	0	0		0	ľ	۸	-	•	^	-		
Grade %		0	9:	ě.	0	ž.	*	0	¥	*	0	*	
Peak Hour Factor	52	**	49	23	8	35	19	255	89	92	40	25	
Heavy Vehicles, %	2	2	2	~	7	2	2	2	2	2	2	2	
Mornt Flow	**	55	155	83	419	0	3	9	92	0	23	*	
Allen March	Table 1		Ĩ	Major2	H		Airord	b		Mnor2			
Conflicting Flow All	419	0	0	347	0	0	773	761	270	111	838	419	
Stage 1	202	4	X	M.	(4		278	278	*	483	483	28.	
Stage 2			*)¥)	źξ	ľ	495	483	2.0	294	355	[* 2]	
Intical Howy	4.12		K	4,12	*	٠	7.12	6.52	6.22	712	6.52	6.22	
Ortical Howy Stg 1	¥1	٠	*	e		*	6.12	5.52	8)	6.12	5.52		
Critical Howy Stg 2	ř				k	í	6.12	5.52		6.12	5.52		
	2.218		•	- 2218		٠	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1140	1	1	1212	4		316	335	769	314	305	634	
Stage 1	N.	96 i	(*)				728	680	4	585	553	3.0	
Stage 2	740	1	*	*	A.	*	929	553	¥	714	630		
Platoon blocked, %		(i)	•		*	*						100000	
Mov Cap-1 Maneuver	1140			1212	*	×	295	325	769	282	33	634	
Mov Cap-2 Maneuver	40	•00	*	10	***	7	405	417	•	407	391		
Stage 1			i	í	ì		725	677		88	239		
Stage 2				ar.	3		518	539	4	989	627		8
	1	П	Н	5	Н	Н		Ш	П	8	П		
vippreach:	8	1	I	9	ı	۱	ON I	ı	۱	9	ı		
HCM Control Delay, s HCM LOS	0		ı	0.0	ŀ	ŀ	000		ļ	- a	Ž		
		H		ı	s	ľ		ı		B	ı		
Minor LaneMajor Livrini		NELNI	183	EBT	EBR	WBI	WBT	WBR	VBR SBLn1		ŀ		
Capacity (vehifi)		439	1140	1	T	1212			418		l		
HCM Lane V/C Ratio		0.219	0	55	*	0.026	Å.		0.057	П	H		
HCM Control Delay (s)	ì	15.5	82	i	i	2	i	1	Z.	J	ı		
HCM Lane LOS		ပ	∢	•	•	×	1	(4)	B	1			
HCM 95th %the O(veh)		0.8	0	4	1	0	ì	-	0.2	i	l		

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HCM 6th TWSC

2017-2018 Existing AM.syn

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2017-2018 Existing PM.syn 10/18/2018

	4,7	l										
m Delay, Sven	-											
Novement	EBI	EBT	EBT EBR	V/8L	WBT	WBR NBL	NBL	MBT	MBR	SBL SBT		SBR
ane Configurations	#-	45.		MC.	42			+\$			4	
raffic Vol. vehilh	2	458	99	+	331	0	255	Ų,	10	0	m	
Future Vol. veh/h	2	458	92	**	331	0	88	\$	10	0	e	
Conflicting Peds, #/br	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	ü	20.	None			None			None	*	0	None
Storage Length	100	à		100	•		(4)	A1	.00	*	20	
Veh in Median Storage, #	*	0	٠		0		١	-	•		-	•
3rade, %	ľ	0	*	*	0			0	٠	Ċ	0	
Peak Hour Factor	8	8	85	25	85	35	63	62	42	92	æ	32
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Avmt Flow	*	809	16	**	88	0	8	00	24	0	90	4
Santa Minan	Table 1	ľ	ĺ	Carlot II		Ī	1	ł		Manage	ì	
Tow All	380	0	c	585	c	6	958	952	547	896	066	389
Stabe 1	1			1	ı		555	555		397	397	No.
Stage 2	٠		*	•	*		403	397	۲	571	593	
Cottoal Howy	4.12	i	1	4 12			7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1		(1	(*	•			6.12	5.52	•	6.12	5.52	
Critical Howy Sto 2	•	10		3	2	0.00	6.12	5.52		6.12	5.52	
	2.218	0.0		2.218	*		3.518	4.018	3.318	3.518	4.018	3.318
UNGL	1170			066	8	3	237	259	537	233	246	699
Stage 1		(*)	00		*	*	516	513	٠	629	603	34.5
Stage 2	27	01			ĺ		624	603	•	909	493	165
Platoon blocked, %		٠	*/3		77	4						
fov Cap-1 Maneuver	1178	-	ì	980	8	Ť	230	257	537	218	244	689
Mov Cap-2 Maneuver			1.5		10		358	367	4	341	355	110
Stage 1		1		i.	B	**	514	511	۱	627	1 69	
Stage 2	7/4	•	*			~	610	601		474	485	×
		ł	ı		ı	ı	ı		ı	ı	ľ	
Approach:	83		l	8			NB	Ŗ	R	SB		
HCM Control Delay, s.	0.1			0.1	ŧ	H	16.9	į		13.8		
HCM LOS							U			œ		
The Part of the Pa	Š	Ĭ		į	i	į	ı	į	ľ	į		
fmor Lanelillagor shart		NBLat	183	E81	EBR	WEL	WBIT	WBT WBR SBLn1	Sknl	H	Į.	k
Capacity (veh/h)		393	1170	ľ	i	066	i	li	420	ñ		
HCM Lane V/C Ratio	Ī	0.235	0.003			- 0.004		: (*)	- 0.028			
HCM Control Delay (s)	١	16.9	8.1		i.i	8.7			13.8	ij		
HCM Lane LOS		ပ	V	O.		A	0.0	0.	æ			
HCM 95th %tile O(veh)		6.0	0	1	×	0	18	(4)	0.1			

2040 Total AM.syn 10/30/2018

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dovement	EBL	EBT	EBR	WBI	WBT	WBR	NBL	NBT	ABR	SBI	SBT	SBR
ane Configurations	F	24		F	42			¢.			4	
raffic Vol. veh/h	110	325	100	75	969	12	99	S	40	25	85	190
Future Vol. veh/h	110	325	100	25	9	15	9	20	8	52	88	190
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		•	None			None	N.		None		1	None
Storage Length	100	J.S.	Ĭ.	100		K		*	9	(*)	10	(8)
feh in Median Storage, #	*	0			0	•	1.		*	100	-	
Grade, %	*	0	*		0	*	*	0	٠	100	0	(6)
Peak Hour Factor	35	85	8	83	35	8	92	92	35	85	92	92
leavy Vehicles, %	2	2	2	2	2	~	2	7	7	7	2	2
furnt Flow	23	383	100	83	750	16	99	25	43	22	35	207
and the second second	3			Control	ı		Manual	ı		Constitution		
	100	ľ	٩	900	ľ	٩	7100	4 5 70	000	1010	1000	250
Conflicting Flow All	8	0	>	407	>	0	07/	9/61	400	1010	1024	00/
Stage 1		*		•	4	•	848	648		822	355	(4)
Stage 2	*	2	/ • /	•	(4)	(+1	1072	930	•	969	702	
Critical Holay	4.12			4.12	1		7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	(#)	ž.		*		*	6,12	5.52		6.12	5.52	*
Ontical Holwy Stg 2	4	8.		*		ľ	6.12	5.52	•	6.12	5.52	
ľ	2.218	*		2.218			3.518	4.018	3.318	3.518	4.018	3.318
ot Cap-1 Maneuver	847	i	i	1099		·	70	109	643	æ	102	407
Stage 1		(*	10		8	- 1	459	466	7.	324	349	
Stage 2	•	1	3		*	ï	267	346	(0	435	440	3.0
Platoon blocked, %		*	*		ia.							
lov Cap-1 Maneuver	#			1089		•	- 17	87	643	48	-81	407
Nov Cap-2 Maneuver	3.0	۰				*	-37	155		133	178	×
Stane 1		*	1	X		1	394	400		278	323	
Stage 2	*				•	*	87	320		299	378	
	H	H	i		H	H	ì	ı	H	i	Ŋ	
powert	83	d		NB.			88			-58	11	
ICM Control Delay, s	2	B		9.0						171.5		
ICM LOS	П	П				Н				ш		
		ı		ı	ı							
Trace Lase/Major Mwnt		MBEn1		189	888	WBL	WBT	WBRSBLni	SBLni			
apacity (vehili)	ı	٠	150	*	4	B	•	ľ	502			
ICM Lane V/C Ratio		•	0.141		¥.	0	*	ì	1.231			
ICM Control Delay (s)	ł	ľ	5.6			8.5	9	Y	1715		i	
ICM Lane LOS	ı	2	×	*		Н	11	XI	ı.			
			20			c			4			

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2040 Total PM.syn 10/30/2018

Configuration Fig. Fig. Web, WET WBT WBT NBT NBT NBT NBT NBT NBT NBT NBT NBT N	EBI FERT WEBL 285 825 85 65 285 825 85 65 7 0 0 0 Free Free Free 100 . Name 100 . 100 . 100 92.# . 0	100	п	Ì					
285 825 85 65 675 40 50 120 90 285 825 825 85 65 675 40 50 120 90 0 0 0 0 0 0 0 0 0 0 Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	285 825 85 65 288 85 65 85 65 70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				001	192	SBI	SBT	SBR
285 825 85 65 675 40 50 120 90 285 825 85 65 675 40 50 120 90 285 825 85 65 675 40 50 120 90 2 0 0 0 0 0 0 0 0 100 None 173 143 143 143 143 143 143 144	285 825 85 65 285 87 70 92 92 92 92 92 92	43			4			4	
Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	285 825 85 65 r 0 0 0 0 r 0 0 0 0 refere free free r 0 0 0 0 0 r 0 0 0 0 0 r 0 0 0 0 0 r 0 0 0 0	675	40	25	120	8	8	100	235
Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	675	40	20	120	8	8	9	235
Free Free Free Free Free Sup Stop Stop Sup age # - 0	Free Free Free - None - 100 -	0	0	0		0		0	0
100 None N	100 · None Storage, # · 0 · · or 92 92 92							Stop	Stop
100 100	Storage, #	N. P.		1	-			1	None
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Major Majo	% . 0 . 0 . our Factor 92 92 92 9	0	,	1	1	-			*
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Migori Majori Minori M	310 897 92 7	734	43	25	130	86	33	603	255
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777 0 0 989 0 0 2643 2482 943 247 2482 943 2482 943 2482 943 2442 943 263 1563 1563 1563 1563 1563 1563 1563 15	Mancl		W) June			nor2		
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2218 - 2218 - 3518 4,018 3318 3 839 - 699 - 15 -30 318 - 839 - 699 - 125 -20 318 - 839 - 699 - 125 -2 - 839 - 125 -2 - 839 - 125 -2 - 839 - 125 -2 - 839 - 138 - 138 - 839 - 138 - 8		0		85	5 52	-	6 12	5.52	12
839 699 -15 -30 318 839 699 -17 318 839 699 -17 318 839 109 89 109 839 109 839 109 839 899 109 839 109 839 899 899 89 109 9 118 899 899 9 1118 107 9 899 899 9 117 03 899 9 117 03 899	2 218	11.5						4 018	3.318
839 . 99917 318 EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB	830	(8						- 28	408
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB		*			172		334	358	171
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB	(6)	*		264	350	12	120	164	100
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB		*	ř						
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB	68 839	5	1		-17		*	- 16	408
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB		٠		125	- 2		88	- 28	
EB WB NB NB NB NB NB NB N		3		88	109	24	251	321	
EB V/B NB NB NB NB NB NB NB NB NB NB NB NB NB	9	3.0	•	59	314	:14		- 103	12
EB WB NB NB NB NB NB NB N		i		-	and the same	Š			
And Delay, s. 2.8 0.9 0.9 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	90			Q.K			8		
Tot Desay, s. 2.8. U.3 Tot Desay, s. 2.8. U.3 With Mart NiBurt EBL EBT EBR WBL WBT WBRSBunt WIC Ratio	0 0						3		
State Stat	tol Delay, s. 2.8		i	Ì	Ì				
. NBLn1 EBL EBT EBR W80 W87 WBR SBLn1	CMLOS			¥			*		
NBLn1 EBL EBT EBR WBC WBT WBRSBLIN 839 689 689 6.00 6			H					ı	
839 699 0.369 0.101	NBLn1 EBL EBT		iii	1000	VBR SE	H.m.I			3
- 0.369 - 0.101 - 118	×		669	1	1	1		j	
11.8 10.7 8 10.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1	- 0.369		101		٠				
1.7 0.3	- 1100	,	107	4		3		ľ	N
17 0.3 active exceeds 300s + Computation Not Defined	8	и	α	3		234			
acity S. Delay exceeds 300s + Computation Not Defined	11.		93	Į.	10	200			
ime exceeds capacity S. Delay exceeds 300s + Computation Not Defined									
a. Detay exceeds 200s T. Campulosion was Demen	AND DESCRIPTION OF THE PERSON	М	Came	10.00	Med Do	No. of London	A. A.	and relies	to the second
	7	а.	3	Uloseon	000	20		S S S S S S S S S S S S S S S S S S S	A COUNTY OF
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HCM 6th Signalized Intersection Summary 2: Van Buren Avenue & Dell Range Boulevard

2040 Total AM_Improved.syn 02/12/2019

	1	Ť	~	•		,	-	-	-		•	
pvement	EBI	EBI	EBS	WBL	WBT	WBR	BE	NBT	NBR	386	381	SBR
ane Configurations	jr.	47		je.	4		je.	42		je.	¢±.	
raffic Volume (vehlb)	110	325	100	7.5	069	15	99	8	49	25	88	190
-uture Volume (veh/h)	110	325	100	75	690	15	99	99	40	22	82	190
nitial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1,00		1.00	1.00		1.00
Parking Bus, Adj	100	1.00	1,00	1.00	1.00	1.00	100	1,00	1.00	1.00	100	1.00
Nork Zone On Approach		S			S			8			S	
Adj Sat Flow, vehhilm	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	120	353	109	82	750	16	65	54	43	22	92	142
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	ev	2	2	2	2	2	2	2	2	2	2
Sec. vehih	398	1146	349	538	1491	32	258	239	190	397	164	254
Arrive On Green	0.06	0.51	0.51	0.05	0.50	0.50	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1500	2260	889	1500	2996	28	1146	812	547	1298	829	862
Gro Volume(v), veh/h	120	232	230	82	375	391	65	0	16	22	0	234
Sto Sat Flow(s) wehithin	1500	1496	1451	1500	1496	1564	1146	0	1459	1298	0	1420
2 Serveig s), s	3.5	60	8.4	24	15.1	15.1	4.6	0.0	4.5	1.4	0.0	125
Cycle @ Clearto c), s	3.5	8.1	8.4	24	15.1	15.1	177	0.0	4.5	6.0	0.0	125
Prop in Lane	1.00		0.47	1.00		90.0	1.00		0.44	1.00		0.61
ane Gro Capic), vehilb	398	759	736	538	745	778	258	0	429	387	0	418
//C Ratio(X)	0.30	0.31	0.31	0.15	0.50	0.50	0.25	0.00	0.23	0.07	000	0.56
tvail Capic_a), vehih	403	759	736	557	745	877	258	0	429	397	0	410
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	1.00	9	1.00	1.00
pstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1,00	0.68	00:0	0.58	1 00	000	1.00
niform Delay (d), siveh	11.2	12.9	13.0	10.1	15.1	15.1	340	0.0	24.0	26.3	0.0	26.8
ncr Delay (d2), siveh	0.3	6:0	6.0	0.1	2.4	2.3	1.6	0.0	8.0	0.3	0.0	5.3
nitial O Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
alle BackOfO(50%),vehilin	1.1	2.8	28	8.0	5.3	9.6	1.4	0.0	16	0.5	0.0	4.7
nsig. Movement Delay, siveh			0.00				-	200	0.00000	100	-	
Grp Delay(d), sheh	11.5	13.8	13.9	10.3	17.6	17.5	35.6	0.0	24.8	26.6	0.0	32.2
nGrp LOS	В	В	8	В	В	В	٥	A	U	O	A	U
pproach Vol. vehith		285			848			162	ı		261	
pproach Delay, s/veh		13,4			16.8			29.5			31.6	
pproach LOS	ł	8	Ì	j	8			Ų	Į		ပ	Ĭ
mer - Assigned Phys		2	m	1971		9	E	8				Ę
ths Duration (G+Y+Rc), s		31.0	8.9	50.1		31.0	18.	49.3	i		h	
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
lax Green Setting (Gmax), s.		26.5	5.5	44.5		26.5	5.5	44.5				
Max Q Clear Time (g_c+11), s		19.1	4.4	10.4		14.5	52	1771				
Steen Est Time (p. c), s	k	0.4	0.0	3.1	i		0.0	5.3	į	ĺ		Ü
ansertion Committee	i								8	Ì	ì	
The second secon	1				i	l	١	١	l	۱	۱	I
THE CHAIN COLUMN			200									

Synchro 10 Report Page 1

HCM 6th Signalized Intersection Summary 2: Van Buren Avenue & Dell Range Boulevard

2040 Total PM_Improved.syn 02/12/2019

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The color of the	Movement	183	EBI	EBR	WBL	WBT	WBR	NBE	NBT	NBR	SBL	SBT	SBB
285 825 85 85 65 675 40 55 120 90 100 100 100 100 100 100 100 100 100	Lane Configurations	K	470		N.	47		k.	42		k.	(2	
285 825 85 85 65 675 40 50 120 90 30 100 100 100 100 100 100 100 100 100	Traffic Volume (vehift)	285	825	88	89	675	40	8	120	96	30	100	235
100 100 100 100 100 100 100 100 100 100	Future Volume (veh/h)	285	825	82	99	675	40	20	120	6	8	100	235
100	Initial O (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	٥
1.00 1.00	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1,00		1.8
1575 1575	Parking Bus, Adj	1.00	1.00	1.00	1 00	1.00	100	1 00	1,00	1.00	1,00	1.00	1.00
1575 1575	Work Zone On Approach		No			S			8			No	
310 887 92 71 724 32 54 190 65 33 109 65 34 109 65 34 109 65 35 109 62 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Sat Flow, vehil/In	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
0.82 0.82 0.82 0.82 0.82 0.82 0.82 0.82	Adj Flow Rate, veh/h	310	897	92	71	734	32	54	130	99	33	109	125
488 1549 155 62 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	26.0	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.65	0.92
488 1549 159 349 1415 62 184 227 118 227 169 1013 1016 0.013 0.013 0.014 0.024	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1500 2740 284 0.48 0.48 0.24 0	Cap, vehilh	488	1548	159	320	1415	B	184	237	118	223	166	183
1500 2740 281 1500 9221 127 1146 961 455 1188 669	Arrive On Green	0.13	0.56	0.56	0.05	0.48	0.48	0.24	0.24	0.24	0.24	0.24	0.24
Purhlin 1510 490 499 71 376 390 54 0 165 33 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sat Flow, wehlfh	1500	2740	281	1500	2921	127	1146	166	495	1188	699	768
vehicin 1500 1426 1524 1500 1435 1188 0 Cl. S 86 191 191 21 156 156 156 174 00 103 123 00 Cl. S 86 191 191 21 156 156 174 00 103 128 0 Lywehr 468 845 861 350 725 752 184 0 355 227 0 Lywehr 0.63 0.58 0.20 0.52 0.52 0.52 0.00 0.55 0.15 0.00 Hysh 1.00	Grp Volume(v), veh/h	310	490	499	71	376	390	54	0	195	33	0	234
See 191 191 21 156 156 40 00 103 23 00	Grp Sat Flow(s), vehilish	1500	1496	1524	1500	1496	1552	1146	0	1486	1188	0	1437
8 6 191 191 21 156 156 174 0.0 103 126 0.0 488 845 845 813 359 725 722 184 0 355 227 0 6.63 0.58 0.58 0.20 0.52 0.52 0.00 0.55 0.15 0.00 707 845 861 389 725 752 184 0 355 227 0 707 100 1.00 1.00 1.00 1.00 1.00 1.00 1.	Q Serve(g_s), s	8.6	19.1	19.1	2.1	15.6	15.6	4.0	0.0	10.3	2.3	0.0	13.3
1.00 0.18 1.00 0.08 1.00 0.33 1.00 0.48 845 881 359 725 752 184 0 355 227 0 0 0.05 0.05 0.05 0.05 0.05 0.05 0.05	Cycle O Clearing c), s	8.6	161	19.1	2.1	156	15.6	17.4	0.0	10.3	12.6	0.0	13.3
488 845 861 359 725 752 184 0 355 227 0 0 053 058 058 020 055 052 050 055 055 055 050 053 058 058 020 055 052 050 055 055 050 050 053 058 058 050 050 055 055 050 050 050 050	Prop In Lane	1.00	100	0.18	1.00		0.08	1.00		0.33	1.00		0.53
0.63 0.58 0.58 0.20 0.52 0.29 0.00 0.55 0.15 0.00 0.00 1.00 1.00 1.00	Lane Gro Cap(c), wehith	488	845	981	350	725	752	184	0	355	227	0	343
707 845 861 389 725 752 184 0 355 227 0 0 0.00 1.00 1.00 1.00 1.00 1.00 1.00	V/C Ratio(X)	0.63	0.58	0.58	0.20	0.52	0.52	0.29	00'0	0.55	0.15	00'0	0.68
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	4vail Cap(c, a), wehilh	202	845	198	386	725	755	184	0	355	223	0	343
0.30 0.30 0.30 1.00 1.00 1.00 0.43 0.00 0.43 1.00 0.00 1.07 1.27 1.27 1.27 1.27 1.27 1.27 1.27 1.2	HCM Platpon Ratio	1,00	100	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100
10.7 12.7 12.7 11.3 16.0 16.0 390 0.0 30.0 355 0.0 0.4 6.9 6.9 6.9 6.3 6.2 5.7 7.2 6.0 2.6 1.3 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Upstream Filter(I)	0:30	0.30	030	1.00	1.00	1.00	0.43	000	0.43	100	000	100
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Uniform Delay (d), s/veh	10.7	12.7	12.7	11.3	16.0	16.0	39.0	0.0	30.0	35.5	0.0	31.1
25 60 61 07 55 57 12 00 00 00 00 00 00 00 00 00 00 00 00 00	Incr Delay (d2), siveh	9.4	6.0	6.0	0.3	2.6	2.5	17	0.0	2.6	11.3	0:0	10.5
25 60 61 07 55 57 12 00 39 07 00 111 135 135 116 186 185 408 00 226 389 00 1299	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 135 135 115 186 185 408 0.0 326 369 0.0 1299	Nie BackOfO(50%), vehlin		0.9	6.1	0.7	5.5	5.7	1.2	0.0	3.9	0.7	0.0	5.5
111 135 135 115 186 185 408 0.0 326 369 0.0 1829 837 249 267 13.0 18.0 34.4 41.0 13.0 18.0 15.9 48.1 45.5 45.5 45.5 45.5 45.5 45.5 45.5 45	Unsig. Movement Delay, s/ve	1	1000000		20000	200							0,000
B B B B B D A C D 1299 837 249 13.0 18.0 34.4 13.0 18.0 34.4 13.0 18.0 25.0 15.9 48.1 25.0 25.0 15.9 48.1 21.5 24.	LnGrp Delay(d), sweh	101	13.5	13.5	116	18.6	18.5	40.8	0.0	32.6	36.9	00	41.6
1259 837 249 130 180 344 18 B B C C 2 3 4 6 7 8 250 87 553 260 159 481 45 45 45 45 45 215 55 485 215 245 305 219 4 1 211 153 106 176 194 B B	LinGrp LOS	æ	8	В	80	8	8	G	¥	U	O	A	۵
13.0 18.0 34.4 B B C C 2.0 8.7 55.3 26.0 15.9 48.1 4.5 4.5 4.5 4.5 4.5 4.5 215 55 485 215 245 30.5 19.4 4.1 21.1 15.3 10.6 17.6 0.3 0.0 7.4 0.7 0.8 4.0	Approach Vol. vehith		1289			837			249			267	
2 3 4 6 7 8 260 87 553 260 159 481 45 45 45 45 45 45 215 65 485 215 245 305 194 4.1 21.1 15.3 106 176 0.3 0.0 74 0.7 0.8 4.0	Approach Delay, s/veh		13.0		i	18.0			34.4	۱		41.0	ij
2 3 4 6 7 260 87 55,3 250 159 45 4,5 4,5 4,5 4,5 4,5 4,5 10,6 194 4,1 21,1 15,3 10,6 10,6 10,9 10,9 10,9 10,9 10,9 10,9 10,9 10,9	Approach LOS	i	æ	l	ł	œ	ı	l	O	ļ	i	0	ı
260 87 553 250 159 45 45 45 45 215 215 55 485 215 245 245 245 245 245 245 245 245 245 24	Timer - Assigned Phs		8	3	•	ŀ	9	120	8		ŀ	I	
45 45 4.5 4.5 4.5 4.5 4.5 1.5 1.5 6.5 485 7.15 24.5 10.6 7.4 0.7 0.8 10.6 10.6 10.6 10.6 10.6 10.6 10.6 10.6	Phs Duration (G+Y+Rc), s		26.0	8.7	55,3		26.0	15.9	48.1			Á	
215 65 485 215 245 194 4.1 21.1 15.3 10.6 0.3 0.0 74 0.7 0.8 194 B	Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
19.4 4.1 21.1 15.3 10.6 0.3 0.0 7.4 0.7 0.8 19.4 19.4 19.4	Max Green Setting (Gmax), s		21.5	6.5	48.5		21.5	24.5	30.5				ă
0.3 0.0 7.4 0.7 0.8 19.4 8	Max Q Clear Time (g_c+11), s	- 00	19.4	4.1	21.1		15.3	10.6	17.6				
, A	Green Ext Time (p_c), s		0.3	0.0	7.4	i	0.7	0.8	40			H	
	ntersection Summany		ļ			-	3		Ì	Ì			
	HCM 6th Ctrl Delay		į	19.4	ł				1		i	۱	H
	HCM 6th LOS			œ									

HCM 6th TWSC 3: El Camino Drive/Gysel Place & Dell Range Boulevard	rive/G	sysel	Place	∞ □		ange	Boul	evard	_		207	7-201	2017-2018 Existing AM.syn
intersection						П							
Int Delay, s/veh	1.6			Н	П								
Movement	留	EBI	EBR	WBL	WBT	WBR	NEK	NBT	NEK	SBI	SBI	SBR	THE PERSON NAMED IN
Lane Configurations	j <u>k</u> -	2.		p.	42			4			4	1	
Traffic Vol. veh/h	0	135	22	+	379	0	48	0	0	0	0	0	
Future Vol. veh/h	0	135	22	-	379	0	48	0	0	0	0	0	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	*		None			None	9		None	1		None	
Storage Length	100			100	*	٠	8			7.0	1	at.	
Veh in Median Storage, #	井田	0	14	0	0	2	9	-	**	(8)	Ť	*	
Grade, %	*	0	(4)	٠	0	100	٠	0	345	*	0	iti.	
Peak Hour Factor	85	75	79	25	26	92	8	85	35	85	35	35	
Heavy Vehicles, %	2	7	2	2	2	2	2	2	2	2	2	2	
Mymt Flow	0	180	28	4	391	0	10	0	0	0	0	0	
Lacy Alfron	Majort		10	1900			Modil		7	Mmm2	Į	ľ	
Conflicting Flow All	391	0	-	208	ľ	0	593	593	194	593	209	391	
State 1	(0)		2.		2	ď	194	198		399	399	1	
Stane 2		1/4	734	.)*	3.5	10.0	366	388	72	194	208		
Critical Honv	412	(6	74	4.12	3.6	,	7.12	6.52	622	7.12	6.52	6.22	
Critical Hdwy Stg 1	•		æ	9.	.*.	2	6.12	5.52	74	6.12	5.52		
Critical Hdwy Sta 2			A	*	A	1	6.12	5.52		6.12	5.52		
Follow-up Hdwy	2.218	•	*	2.218	*	!	3.518		3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1168		0	1363		ŀ		418	847	417	411	658	
Stage 1		ľ			•	•	808	740		627	602	,	
Stage 2	į.		K	(e)		·	627	602		808	730		
Platoon blocked, %		•	,		2.5	į.							
Mov.Cap-1 Maneuver	1168	-	\$4	1363	CA.	4	416	417	847	416	410	658	Belly St
Mov Cap-2 Maneuver	7	*	٨	•			504	487	*	505	483	,	
Stage 1	•		×			*	808	740	(4)	627	009	v	
Stage 2		*	A		*	ý,	625	900	*	808	730	•	
	ă			۱	I		ı	ı	i	N	ï		
Shoomark .	E.	l	ij	W.	l	ř	MR	Į	ð	or or	ļ	Ĭ	
HCM Control Delay s	i.		ı	6	ı	A	13.4		ľ	C	h	h	
HCM LOS		ŀ	ı		l	li	œ	ŀ	П	A	ı		
	8	ı		ı	١		١		8		١		
Minor Lane Major Myrt		WBLa1	田田	EBT	EBR	WBE	WBT	WBRISBLHI	Binl	Ş	ij	Ŗ	
Capacity (veh/h)		504	1166		i,	1363	Ca.	ii.	20				
HCM Lane V/C Ratio		0.151				0.003	7.0	*	(*)				
HCM Control Delay (s)		13.4	0			7.6	Ä	*	0	ğ		ì	CAN THE PARTY
HCM Lane LOS		œ	⋖	(1)	(*)	*	(4)	(6)	4	H			
HCM 95th %the O(veh)		0.5	0		E.	0	8	1	*	ŀ		i	THE STREET

Synchro 10 Report Page 1

HCM 6th TWSC 3: El Camino Drive/

2017-2018 Existing PM.syn	10/18/2018
ith TWSC	amino Drive/Gysel Place & Dell Range Boulevard

nt Delay, s/veh	-												
Novement	183	193	E88	WB	Mel	WER	NBL	NBT	MBR	385	188	SBR	
ane Configurations	Ac-	**		M-	42.			+}			4		
raffic Vol. veh/h	-	416	21	-	292	0	88	0	0	0	0	A Charles	
-uture Vol. veh/h	-	416	10	•	292	0	38	0	0	0	0	-	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None	100		None			None		, A	None	
Storage Length	100	14.	2	100			100	9	7	1.5	2.5		
Jeh in Median Storage	100	0	٠	1	0		٠	-	1		***	*	
Scade %	•	0	*		0	•	*	0	٠		o		
Jose Hour Earthr	36	2	88	36	RU	60	13	60	60	60	65	35	The second
deann Vahirlee %	3 0	c	3 0			,		,		,			
Avmt Flow	4	478	8	4	38	0	23	0	0	0	0	4	
Boottlace	Magnet	ı	Ī	Jaior2			finest	ľ		Minor2	5		
Conflicting Flow All	365	0	0	538	0	0	891	889	208	88	919	365	
Stade 1		100	i A	M	32	10	516	516	8	373	373		
Stage 2		9	(5)	,	14	TV.	375	373	×	516	546		
Critical Hdwy	4.12	9	1.5	4.12	*	×	7.12	6.52	6.22	712	6.52	6.22	
Critical Howy Stg 1	*	¥	*	*		41	6.12	5.52	¥.	6.12	5.52	*	
Intros Hdwy Stg 2	×	8	1	*	8		6.12	5.52	100	6.12	5.52	V.	
ollow-up Hdwy	2.218	19/	*	2218	*		3.518	4.018	3.318	3.518	4.018	3.318	
ot Cap-1 Maneuver	1194	Y		1030		ì	263	282	2995	200	273	089	
Stage 1	9	1	5.5	10		ć.	545	534	9	648	618		
Stage 2	•	i.		ď.			949	618		545	518	÷.	
Platoon blocked, %			jŧ.		9	4						- 477	
lov Cap 1 Maneuver	1194		đ	1030	*	-	260	280	565	393	592	980	
fov Cap-2 Maneuver		*)	(8)	Ŷ	*	*	384	386	*	385	376		
Stage 1		×	2	*		٠	250	532	ľ	949	919		
Stage 2	•)	*	*	•	1	•	640	616	•	240	516		
	١	k	ı	ł	ı				Ì	ì	ì	i.	
porcech	8		H	8%			NB NB		Į.	88		i	
CM Control Delay, s	0.1			0.1			158			103	ı		
ICM LOS							ပ			ന	H		
		Ĭ.						9				ĕ	
finor Lanethlajor Mymi		NBERT	EBI	EBI	EBR	WEL	WBIT	WBRSBLn	lu ig	H			
Capacity (veh/h)		384		ř		1030	*		989				
HCM Lane V/C Ratio		0.136	0.003			0.004	(8)		9000				
HCM Control Delay (s)		15.8	œ	8	-	8.5		ľ	10.3	Ę			
HCM Lane LOS		ပ	V	?	*	V	è	,	œ				

HCM 6th TWSC 3; El Camino Drive/Gysel Place & Dell Range Boulevard

2040 Total AM.syn 10/30/2018

Int Delay, s/veh	ŀ		I			١	I					
Movement Configurations	7											
Lana Configurations	88	EBI	E88	Wei	WET	WBR	MBI	NBT	NBR	SE	199	SBR
	k	,3		K	-2			43			42	
Traffic Vol. veh/h	10	350	98	12	200	10	59	0	2	\$	0	15
Future Vol. veh/h	9	350	8	15	200	2	92	0	10	55	0	15
Conflicting Peds, #Ihr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized		11	None			None	*	10	None			None
Storage Length	100	3.5	,	100		10	200	1	j†	(2)		4
Veh in Median Storage #	*	0	ž		0	×	٨	1	it.	O	-	4
Grade %	٧	0	٠	•	0	٠	,	0	ŧ	1	0	
Peak Hour Factor	65	65	25	65	15	65	92	92	25	35	6	25
Heavy Vehicles. %	2	7	2	2	2	2	2	7	7	7	7	2
Munt Flow	Z	380	33	16	722	:	1	0	Ξ	16	0	16
Major/Minor M.	Bor1		1	Major			MinorT			Minor?		
Conflicting Flow All	733	0	0	413	0	0	1187	1184	397	1184	1195	728
State 1	ie.	i	t	4	10	30	419	419		760	760	-
Stage 2	(*)		ř	٠	40	*	768	765	*	454	435	4
Cribcal Howy	4.12	.7:	8	4.12		•	7.12	6.52	6.22	7.12	6.52	6.22
Critical Howy Stg 1	•	*	*	*	ř	•	6.12	5.52	•	6.12	5.52	
Critical Hdwy Stg 2		•		100			6.12	5.52		6.12	5.52	4
Follow-up Hdwy 2	2.218	-1.	٠	2.218	74	•	3.518		3.318	3.518	4.018	3,318
Pot Cap-1 Maneuver	872			1146	1		165	189	652	166	188	423
Stage 1		02	(*	٠	74	98	612	290	ı.	388	414	
Stage 2	٠	17	4/	*	#	.*	394	412		809	280	
Platoon blocked, %	1710	*	٠		(4)	60				-		2000
Mov Cap+1 Maneuver	872	11	200	1146	*	ř	155	184	652	160	181	423
Mov Cap-2 Maneuver	200	10	*/	1	•	٠	271	294	٠	282	294	-
Stage 1			1	ì	Ĭ	66	604	582	î	393	408	
Stage 2		15	•	0	9	4	374	406	*	290	572	
		ı	ı		ı	ŀ	ı	ı		ı		
Approach	E8	Ĭ		BM.		l	N8	ı	ı	SB		
HCM Control Delay, s	0.2			0.2			21.9			16.8		
HCM LOS							ပ			O		
THE REAL PROPERTY.		ľ				l	ľ	ı	l	l	ľ	
Minor transitioner Mymi.	2	NBLn1	H	EBT	ä	WBI	WBT	WBR SBLn1	BE-11			
Capacity (vehin)	H	294	872	*	ľ	1146			338			
HCM Lane V/C Ratio	Ĭ		0.012	*	٠	0.014		•	0.096			
HCM Control Delay (s)		21.9	9.2	N.	ř	8.2		100	16.8			
HCM Lane LOS		ပ	∢			A	9	84	ပ			
HCM 95th %tile O(veh)	H	Ž.	O			0		*	63	ı	b	

Synchro 10 Report Page 1

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HCM 6th TWSC 3: El Camino Drive/Gysel Place & Dell Range Boulevard

2040 Total PM.syn 10/30/2018

rations	Anatoment	1011	FEE		2000			X	ă		Ž	ž		
March Marc	NUMBER OF THE PARTY OF THE PART	4	9	003	1		5	100	•	9	ś	3	2000	ł
10 20 855 70 20 710 20 50 0 20 15 0 20 20 20 20 20 20 20	ane Configurations	r	1			£			4			\$		
Major Majo	raffic Vol. vehilh	20	855	20	8	710	20	20	0	30	15	0	50	
Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Future Vol. vehith	20	822	2	20	710	30	20	0	20	2	0	20	
Free Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Conflicting Peds, #.hr	0	٥	0	0	0	ø	0		9	0	0	0	
Mone	Sign Control	Free	Free	Free	Free	Free	Free			Stop	Stop	Stop	Stop	
100	RT Channelized	110	٥	None		¥.	None	12	W	None			None	
Name	Storage Length	100	7.		100	*		(9)	(2)	9	9	*	4	
92 92 92 92 92 92 92 92 92 92 92 92 92 9	feh in Median Storage.	· 转	0	•	·	0			-		4	T		
10	Grade. %		0	٠	ê	0	٠	٠	0	Ÿ		0	•	
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	65	S	65	92	85	8	92	35	65	65	8	92	
Majort Majort Minort Minort Minort Majort Majort Minort Majort Minort M	leavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Major 2 Minor 1 Major 2 Minor 1 Minor 2 Minor 1 Minor 2 Minor 2 Minor 2 Minor 3 Mino	Myrrit Flow	22	600	92	2	1112	22	135	0	22	16	0	22	S
794 0 0 1005 0 0 1849 1849 967 1849 1876 778 4.12 1011 1011 8 27 728 27 72 6 27 72 6 5 2 6 2 7 7 6 5 2 6 2 7 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7	Aajor/Minor M	Borr			2006			linori	Į.		linore	H		8.
4.12	Conflicting Flow All	2 6	0		1005	0	0		1849	296	1849	1876	783	
# 172	Stage 1	121	1	8		ă.	0	1011	1011	×.	827	827	×	
4.12	Stage 2	*0	8	•	*	C	٠	838	838		1022	1049	je)	
2218	Orbical Hiday	4.12	ľ	1	4,12		٠	7.12	6.52	622	7.12	6.52	6.22	
2218	Critical Hdwy Stg 1		7	•	•	. •	(0)	6.12	5.52	•	6.12	5.52	0.00	
2218	Artical Howy Stg 2	2				92	4	6 12	5.52			5.52		
F 827 - 689 - 57 74 308 57 72 394 F 827 - 689 - 51 70 308 51 68 304 F 827 - 689 - 51 70 308 51 68 304 F 827 - 689 - 51 70 308 51 68 304 F 827 - 689 - 51 70 308 51 68 304 F 828 - 51 70 308 51 68 304 F 928 - 528 304 F 928 324 F 928 325		2.218	i.Co		2.218	256)*			3.318			3,318	
## 827	of Cap-1 Maneuver	827	8	4	689	3	*	25	74	308	24	7.5	394	
## 827	Stage 1	.*			24) ((á)		588	317	•	366	386	*	
## 827	Stage 2	iti	,	100	IV.	*	>	361	385		582	304		N 25 N
627	Platoon blocked, %		8	7.0		ΝÜ	*		į					
EB WB NB SBLD1 NBINI ERI ERI ERI WB WBI WBI SBLD1 183 827 689 - 234 0416 0206 - 1042 - 0163 8 9.5 - 104 - 233 E A B B C C	fov Cap-1 Maneuver	827	i	1000	689	1	i	- 51	20	308	51	89	394	ļ
EB WB NB SB 233 0.2 0.3 38 233 1. MBIN ERI EBI EBI WEL WET WERSBlirt 1. B3 827 689 234 0.416 0.026 - 0.032 - 0.163 1. B 95 - 104 - 233 1. B 95 - 104 - 233 1. B 95 - 0.1 - 0.1	Nov Cap-2 Maneuver	10	/*		54	(4)	000	157	181	•	152	174	:(*)	
E8 WB NB SB 233 370 2.288 0.2 0.3 38 2.33 3.0	Stage 1	S.	2		4	Si.	9	281	388	4	356	374		
10.2 0.3 38 10.5 10.	Stage 2	(*	ĬŢ.	*	4	26	•	330	370		258	596		
0.2 0.3 NB NB NB NB 0.2 NB NB NB NB NB NB NB NB NB NB NB NB NB		Н	ı		ı	ı	1	I	ı		ı	ı		
0.2 0.3 58 E E E E E E E E E E E E E E E E E E	pproach	83			WB			B			SB			
H MBIN ER EST EBR WBL WRT WBR SBINT 183 827 - 689 - 234 0.416 0.026 - 0.032 - 0.163 8 9.5 - 10.4 - 23.3 E E - 0.1 - 0.1 - 0.6	ICM Control Delay, s	0.2			0.3	i		8			533	ı		
183 827 689 689 689 6416 0026 - 0.032	HCM LOS				ı			ш			U	ķ		
183 827 689 689 6416 0.026 6 7 6032 6 7	finer Carellager Hand		Bin	Ø	188	EBR	WBI		WBRS	Blut	ı			
0.416 0.026 - 0.032	apacity (vehill)		183	827	1	*	689	i	i	234				
38 9.5 · 10.4 · E A · B · B · B · B · B · B · B · B · B ·	HCM Lane V/C Ratio		0.416	0.026	٠	•	0.032	(A		0.163				
1.9 01 · · 0.1	+CM Control Delay (s)		38	9.5	4	A	10.4	4	23	23.3				
1.9 0.1 - 1.0 0.1 - 1	HCM Lane LOS		ш	×	114	(14	œ	78	(P	ပ				
	HCM 95th %tile O(veh)		1.9	0	ř	*	5	i i	2	9.0		ı		

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HCM 6th TWSC 3: El Camino Drive/Gysel Place & Dell Range Boulevard

2040 Total AM_Improved.syn 02/11/2019

	•											
Int Delay, s/veh	24											
Movement	Œ	193	EBR	1100	WBT	WBR	NBE	NBT	NBR	SBi	SBT	SBR
Lane Configurations	AC"	43.		N.	42			+\$			4	
Traffic Vol. vehih	10	350	30	15	700	2	99	0	10	15	0	15
Future Vol, veh/h	5	350	30	13	700	10	99	0	10	15	0	15
Conflicting Peds, #fbr	0	0	0	0	0	0	0	9	0	0	0	0
	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	1		None	*		None			None			None
Storage Length	100		•	100	90	(*)	5*7	٠	(*)		(1)	٠
Veh in Median Storage.	*	0	1	*	0	*:	2.	-	8	•	ď	*
Grade, %	.5	0	٠	*	0	,	#1	0		*	0	•
Peak Hour Factor	92	92	92	92	26	92	35	92	85	35	35	35
Heavy Vehicles, %	2	2	2	2	8	2	2	2	7	2	2	2
Mymt Flow	E	380	33	92	722	Ξ	F	0	F	19	0	16
Maintaine M.	1	ı		Cole		Ī	finish	ľ	Ē	Coverin		å
Flow All	733	c	c	413	0	0	1187	1184	397	1184	1195	728
Stane 1	1			•		170	419	419		260	760	
Stage 2	17		72	ľ	4	ľ	768	765	ľ	424	435	•
Critical Hours	4.12		¥	4.12	*	×	7.12	6.52	6.22	7.12	6.52	6.22
Critical Howy Stg 1		*	•	(A)	*	.93	6.12	5.52	A	6.12	5.52	*1
Critical Howy Stg 2	2	*			•		6.12	5.52	i	6.12	5.52	ě
	2.218	*	•	2.218			3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	872			1146	ï	1	165	189	652	166	186	423
Stage 1		9	ä			æ	612	590	110	398	414	ji t
Stage 2	×	*	14	4	ľ	*	364	412	*	809	280	
Platoon blocked, %		*	•)4.	(*)			100000			1000
Mov Cap-1 Maneuver	872	×	10	1146	×	٠	155	18	652	8	181	423
Mov Cap-2 Maneuver			9		41	*	271	294	r <u>u</u> r	282	294	*
Stage 1		ř	S	*	ľ	63	99	285	6	393	408	
Stage 2	7)	*	•	•	٠	,	374	406	1	280	572	ļ
	ř	ľ	ı	į	į	ı	Ì				ı	
Approach	83	H		WB			NB NB	ď		SB		
HCM Control Delay, s	0.2			0.2		8	21.9			16.8		
HCM LOS							ပ			ပ		
			ı								ı	
Minoritase/Najor/Mynt		VBLn1	EBI	EBT	EBR	WBI	WBI	WBR SBLn1	BENT	ŀ	E	
Capacity (veh/h)		294	8772	ň		1146	ľ		338			
HCM Lane V/C Ratio		0.277	0.012	٠	*	0.014	7	*	960.0			
HCM Control Delay (s)		21.9	8.5	*		8.2	ľ	ľ	16.8	į		
HCM Lane LOS		ပ	∢	¥9	<u>*</u> 2	ď	73	40	O	ı	I	
HCM 95th %Ne O(veh)		1	0	i i	Ĭ	0	i	ì	0.3		ı	

Synchro 10 Report Page 1

HCM 6th TWSC 3: El Camino Drive/Gysel Place & Dell Range Boulevard

2040 Total PM_Improved.syn

beamon	io	100	901	di	TOTAL	0011	NDS	Not	CON	ida	100	600	
WELLEN	d	100	1	0		500	JOH	100	O	00	00	1000	
ane Configurations	*	2,		K -	,2			+‡			4		
raffic Vol. vehith	8	855	20	39	710	20	8	0	20	15	0	50	
-uture Vol. veh/h	20	855	20	20	710	20	20	0	20	15	0	20	
Conflicting Peds, #/tr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	ľ		None			None		16	None	OX.		None	
Storage Length	100	*	٠	100	*	*		*	A	ŧ.	•	•	
Jeh in Median Storage.	*	0	-		0	9	ř	+	1	1.		7	
Starte %		C		•	c	1		-		•	c		
Grade Library	8	c	00	00	6	00	co	000	00	CO	00	0.0	
lower Validies 67	4 0	9 6	, c	9 0	, ,		1 0	, 0	9 6	2	, 0		
himt Flow	30 00	070	785	30	217	33	7		33	45.	4 6	22	
	1	ì		1		1	5				•	1	
AstriAlnor N	Majort			Major2			Minori			Minor2			1
Conflicting Flow All	794	0	0	1005	0	0	1849	1849	196	1849	1876	783	
Stage 1	72	1	10	0.0		2.5	1011	1011	A	827	827		
Stage 2				13.	1.		838	838	*	1022	1049	÷	
Critical Howy	412	1	9	4.12			7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	٠	•		•	•		6.12	5.52		6.12	5.52	1	
Critical Hdwy Sto 2			1				612	5.52	0	6 12	5.52	1	
	2.218	29	1.0	2218	9	9	3.518		3.318	3.518		3,318	
uver	827	(4		689	0	-	2.1	7.4	308	57		394	
Stage 1	1	٠		SI.	18		289	317	*	366	386	Œ.	
Stage 2	٩	•	V	(2)	10	H	361	382	•	282	304	1000	
Platoon blocked, %		*	1										
fov Cap-1 Maneuver	827	*	×	689		1	- 51	20	308	19	88	394	
Aov Cap-2 Maneuver	•		*		٠		157	181	٠	152	174	100	
Stage 1			1	1	to	1	281	308	K	356	374	-	
Stage 2	4	4		*			330	370		258	236		
phroach	89			8//	*		NB			SB			
HCM Control Delay, s	0.2	M		0.3			38			23.3	1		
HCM LOS							ш			O			
		B	ě			H	ì	F					
Inor Lane Major Muni		Neint	EBE	183	883	WBE	WBI	WBR SBLn1	SBEnt	ľ	H		
apacity (veh/h)		183	827	17.	*	689	i	7.0	234				
HCM Lane V/C Ratio			0.026	.53	ľ	0,032		k	0				
4CM Control Delay (s)		8	9.6		-	10.4			23.3				
HCM Lane LOS		ш	<	,		B	•	(4)	O				
CM 95th %tile Q(veh)		6	0.1	e e	100	H			9.0		Ì		100

HCM 6th TWSC 4: Dell Range Boulevard & James Drive

THE SOUTH THE											Ì		
nt Delay, s/veh	0.2												
fovement	EBL	EBT	EBR	WEE	WEIT	WBR	M	NBT	NBR	SBL	SBT	SBR	
ane Configurations	ľ	+\$			4			+\$			4	*	
raffic Vol. veh/h	0	134	0	0	383	0	0	0	0	-	0		
-uture Vol. veh/h	0	134	0	0	381	0	0	0	0	*	0	•-	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	200
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
ST Channelized			None	i	3	None	1	(6)	None	iř.		Norse	
Storage Length)(i		7.9	1/2			6	1.0	٠		(*)	1.00	
/eh in Median Storage	7£	0	(*)	it.	0	i	14	0	•		0	*	
Srade, %	*	0	(1)	Ů	0			0	٠	(8)	0	٠	
Peak Hour Factor	92	7	92	35	96	55	35	85	92	52	35	22	
leavy Vehicles, %	7	2	2	2	2	~	2	2	64	5	24	N	
Avmt Flow	0	88	0	0	397	0	0	0	0	4	0	4	
(applylings	1	1	Ī	Aaior2	8		Fines			Mnor2	è		
Conflicting Flow All	397	0	0	189	0	G	588	286	188	286	286	397	
Stage 1		. (*	0	518		76	186	189	X	397	397	- 12	
Stage 2	(A)	-(6)	.*.	2		١	399	397		189	189	•	
Ontool Howy	4.12	0		4.12	1	×	7.12	6.52	6.22	7.12	6.52	6.22	
Intical Howy Stg 1	٠	.*:	.51	27		ľ	6.12	5,52	٠	6,12	5.52	•	
Intical Houry Stg 2	٠	×		*1		ŕ	6.12	5.52	•	6.12	5.52		
ollow-up Hdwy	2.218		r	2.218	ě	١			3,318		4.018	3.318	
ot Cap-1 Maneuver	1162		15	1385	4	Ä	421	422	853	422	422	652	
Stage 1	i k	COP.	iit.	J.	Ü	,	813	74	•	629	603	000 000 000	
Stage 2	0	Se.	9	*	Ř	ii.	627	603	9	813	744		
latoon blocked, %			*		*	(8)							
Nov Cap-1 Maneuver	1162	v	٨	1385		*	418	422	853	422	422	652	
Nov Cap-2 Maneuver	A)	2.0	*		•	÷	418	422	*	422	422	8	
Stage 1		(6)	~	i	100	2	813	744	8	629	603		
Stage 2	٠	•	•				623	603	•	813	744		
	ı		H	ı		ı			i				
percach	88		b	WB			BN			SB			
ICM Control Delay, s	0	Ī		0			0	i	Ē	121			
HOM LOS						7	A			മ			
		i		ľ			ı	ì		į,	ı		
fings LaneMajor filmt	Į.	NBLn1	EBL	EBI	EBR	WBL	WBT	WBR SBLn1	Blint	l	B		
Sapacity (veh/h)		×	1162	۲	8	1385	*	A	512				
HCM Lane V/C Ratio		*	8:	3	9	i	•	¥2	0.016				
+CM Control Delay (s)		0	0	Š		0		Ĭ	121				
HCM Lane LOS		×	⋖) O	(∢	(0)		œ				
ICM 95m %be Q(veh)		34	0	Ž,	3	0		1	0	i	ł		

Synchro 10 Report Page 1

HCM 6th TWSC 4: Dell Range Boulevard & James Drive

2017-2018 Existing AM.syn

2017-2018 Existing PM.syn

in Dollay, or soil	5									ļ			
Novement	E81	EBT	E86	WE	HB.	WBR	18	NBT	MBR	SBE	SBT	SEE	
Lane Configurations		4			4			+\$			4		
raffic Vol. weh/h	Ī	412	0	0	294	0	Ť	0	0	0	0	0	
Future Vol. veh/h	*	412	0	0	294	0	-	0	0	0	0	0	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		A	None	i		None	A	•	None	4	1	None	
Storage Length		(8)	٠	*		ř	Œ	76	,	T.		•	
Veh in Median Storage, #	*	0	S.	2	0	ō	0	0	0	A	0	1	
Grade. %		0		×	0		^	0	٠	*	0	9	
Pe类 Hour Factor	25	96	92	85	75	65	25	92	35	85	92	25	The second second
Heavy Vehicles, %	2	2	8	~	2	2	2	~	2	2	2	2	
Avril Flow	4	458	0	0	392	0	*	0	0	•	0	0	
Sale/Mine	Mainel		Ī	Capital	Ė	Ē	Minnell	ľ		Minut			1
low All	392	0	0	458	0	0	858	858	458	858	858	392	
Stane 1		ľ	T/s	0			466	466	(*)	365	385		THE PERSON
Stage 2	٠	2	(2)	*		٠	392	392	it.	466	466	ě	
Ontical Howy	4.12	X	100	4.12	200	1	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1		*	*	٠	-	٠	6.12	5.52	*	6.12	5.52	٠	
Orthoral Holary Stg 2			,			i	6.12	5.52		6.12	5.52	12	The second second
-ollow-up Hdwy	2 218	*	e e	2.218	0			4.018	3.318			3.318	
Pot Cap-1 Maneuver	1167	67		1103		0	277	3 60	603	23.2	767	657	
Stage 1		29	1.5			14	577	582	+	633	909		
Stage 2	ľ	2	A.C	4		8	633	909	on L	23.7	299	28.60	
Platoon blocked, %		20			-	į.					3		
Nov Cap-1 Maneuver	1167	*1	Š	1103	Ġ	21	276	293	603	576	293	657	
Nov Cap-2 Maneuver	*	*25	20	*	70	0	276	293	*3	276	293	*1	
Stage 1	M		i	P		i	574	526		630	909		
Stage 2	:(0)		2		1		633	908	4	574	528	a	
		ı	į		ı	ł			ı	ì			
Appresch	EB	i		WB		×	NB	K		SB			The second second
HCM Control Delay, s	0.1			0			18.2			0			
HCM LOS							O	ı		<			
Amor Lane Major Munit	18	NBLn1	EBI	189	EBR WBL	WB	WBT	WRT WRRSBLn1	8En1				
Capacity (vehili)		276	1167	100		1103	ľ	302				-	
HCM Lane V/C Ratio			0.003	٠	2	*	*)	90	*				
HCM Control Delay (s)	1	18.2	8.1	0	0	0			0	į.			
HCM Lane LOS		ပ	×	A		A	ğ	ey.	Þ				

2040 Total AM.syn 10/30/2018

HCM 6th TWSC 4: Dell Range Boulevard & James Drive

nt Delay, s/veh	0.4												
Novement	183	Ħ	EBR WBI	WBI	WBT	WBR	150	NBT	簽	SBL	SBT	SER	
ane Configurations		4			4			4			4		
raffic Vol. vehih	-00	365	0	0	710	10	0	0	0	45	0	15	
-uture Vol. veh/h	2	365	0	0	710	w	0	0	0	S	0	15	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None	•		None	ľ		None	i i		None	
Storage Length	٠		÷	90		*	*	*	¥.	٠	**	۰	
Veh in Median Storage.	*	0	1	ľ	0		7	0	*	2	0		
Grade, %	ř	0		×	0		*	0	*	£	0	+:	
Peak Hour Factor	65	65	92	35	8	92	35	65	92	92	35	65	
Heavy Vehicles, %	7	7	2	7	2	2	7	2	7	7	7	2	
Avnt Flow	뀨	397	0	0	740	Y)	0	0	0	r.	0	16	
and the state of t	ì	ı	i			Ī	1	ì	G	9	1		
Town All	7AE	•	9	207	c	9	1170	1164	207	4469	1122	7.83	
Change Town All	2	•	2	i i	2	N.	410	410	2	763	743	2	
Stane 2	٠				2	,	751	745		419	419		
Critical Houv	4.12	3		4 12			7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Sto 1	į		٠		٠	*	6.12	5.52		6.12	5.52		
Critical Hiday Stg 2	8				1		6.12	5.52		6.12	5.52		
	2.218	•		2 218	.}(• 0		3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	863		4	1162	•		170	194	652	172	195	415	
Stage 1	(12	74	*) X	je.	612	230		407	422	•	
Stage 2	×	72	14		100		403	421	4	612	989		
Platoon blocked, %			*		(8)	*			- 11000				
Nov Cap-1 Maneuver	863	40	*	1162		1.00	161	161	652	170	192	415	
Nov Cap-2 Maneuver	•		×	*	*5	*:	161	56	٠	170	192		
Stage 1		ľ		ľ		ľ	602	281		400	422		
Stage 2	ì	Ì	ì		ì	1	387	451		905	284	10	
	l	ı	ı	۱	ì	Į.		Š.					
(opiosch	8	١	1	WB	9	ď	8	3		88	1		
4CM Control Delay, s	0.2		d	0		d	0	ı	-	17.7	e		
HCM LOS	١	1	1	۱	۱	1	⋖		1	O	۱		
			2		1		3	The second	1		П	H	
WHAN LESSERACION WINTER		0.0	400	8	500	1162	9	MAN	200		ı	į	
HCM Lane VIC Ratio	l		0 013	ľ		7611			0.071		ļ		
-CM Control Delay (s)	ı	0	6.0	0		0			17.7		i i		
HCM Lane LOS	ı	×	A	A	ľ	×	ľ		ပ		l.	l	
HCM 95th %file O(veh)			0		(4)	0	6	1	0.5				

Synchro 10 Report Page 1

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HCM 6th TWSC 4: Dell Range Boulevard & James Drive

2040 Total PM.syn 10/30/2018

	0.5												
The sometimes	ä	ia	9	ā	Mart	IDN CON	157	No.	COL	ē	100	Cop	
morement	101	9	Š				1	•	1	1	•	6	
Lane Configurations		+			‡	1		4			4		
Traffic Vol. vehih	20	870	0	0	152	10	0	0	0	vo	0	15	
Future Vol., veh/h	70	870	0	0	735	2	0	0	0	S	0	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	a	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		(4)	None	11	٧	None			None	343	'n	None	
Storage Length	٠	*	٠	*	*	(40)	a	ě	٠	0	*	į	
Veh in Median Storage, #	*	0	1	•	0	ř		0		93	0		
Grade. %	ľ	0	'	•	0	•	١	0	٠		0	d	
Peak Hour Factor	6	65	65	65	65	65	65	92	65	65	65	65	1000
Heavy Vehicles %	2	2	2	2	2	2	2	2	2	2	2	2	ŀ
Murrit Flow	22	946	0	0	799	Œ	0	0	0	40	0	16	
Major/Minor	Majorf	l	١	Major2	h		Minort	l		Minor2	i		
Conflicting Flow All	810	0	0	946	0	0	1803	1800	946	1795	1795	805	
Stage 1				1		B	8	990		808	802	- 65	
Stage 2	*		**		•7	٠	813	810	×	980	066	*0	
Critical Hdwy	4.12			4.12	-	ř	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	₹.						6.12	5.52	•	6.12	5.52	(e)	
Critical Hdwy Stg 2				-		9	6.12	5.52	-	6.12	5.52	Taylor.	
Follow-up Hdwy	2,218	0.0		2.218	×.	14	3.518	4.018	3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	816	*	41.	725	8	×	62	80	317	62	8	382	
Stage 1	5(6)		(9)	*		*	297	324	٠	376	368		
Stage 2	•		Ľ	М	8	41	372	383	*	282	324	747	
Platoon blocked, %		147	.*1:		*	4							
Mov Cap-1 Maneuver	816	1		725		ì	29	75	317	88	76	382	
Mov Cap-2 Maneuver		1		٠		•	27	75	4	29	75		
Stage 1	•	90		1	8		580	306	o.	335	382		
Stage 2		14	2		(8)		356	383	(e)	280	300	4	
	ı	ı	9	ì		8							
Approach	E8			WB.	ŀ	H	NB	ŀ	١	SB	B		
HCM Control Delay, s	0.5			0			0			30.8			
HCM LOS							∢			۵			
			ı	×		l			ķ.	ļ	ĕ		
Minor Lane Flagor Mymt		NBLDI	函	Ħ	EBR	WBI	WET	WBR SBLn1	Bl. n.1		l		
Capacity (vehift)	V		816		×	725		ľ	161	ł			
HCM Lane V/C Ratio		*	- 0.027	*	•	٠	٠		0.135				
HCM Control Delay (s)		0	9.5	0		0			30.8				
HCM Lane LOS		A	×	¥	3	A	4	9	۵				
THE PARTY NAMED IN COLUMN						4							

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HCM 6th TWSC 4: Dell Range Boulevard & James Drive

ntersection												
int Delay, s/veh	0.4											
osement	EBL	EBT	EBB	WEL	WET	WBR	M	NBT	NBR	SBL	SBT	SBR
ane Configurations	h-	ž,		F	45			4			4	
raffic Vol. veh/h	10	385	0	0	210	5	0	0	0	S	0	15
Future Vol. veh/h	10	365	0	0	710	2	0	0	0	10	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
ign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None		4	None			None	1		None
Storage Length	100	72	(*	100	(•	*		7.0	2		***
eh in Median Storage. #	1 #8	0	Ħ.		0	H		-		10		*
Grade, %	•	0	12.	ř.	0	12	100	0	*	*	0	Ŷ
Peak Hour Factor	92	85	- 65	35	96	35	63	92	92	35	65	25
leavy Vehicles, %	2	2	2	2	2	2	2	8	2	64	~	2
vmt Flow	=	397	0	0	240	9	0	0	0	2	0	91
ajor/Minor	Majort			Tajor2			Minort	9		Minor2		I
Conflicting Flow All	745	0	0	397	0	0	1170	1164	397	1162	1162	743
Slage 1	(6)	4	1	ě		II.	419	419	(8)	743	743	000000
Stage 2	٠	95	5 * 7		•	•	751	745	(*)	419	419	•
Critical Howy	4.12	*	1	4.12	100	A.	7.12	6.52	6.22	7.12	6.52	6.22
Critical Howy Stg 1	٠	6	81	*	9	•	6.12	5.52	£	6.12	5.52	0.
Critical Hidwy Stg 2	í			1	1		6.12	5.52		6.12	5.52	100
ollow-up Hdwy	2.218			2,218		ľ		4.018	3,318	3.518	4.018	3.318
Pot Cap-1 Maneuver	863			1162	34	=	170	194	652	172	195	415
Stage 1	0.4	39	33	ď	0	172	612	280	Œ.	407	422	X
Stage 2	×	Œ.	St.	1		4	403	421	X	612	280	
Platoon blocked, %		(9)	*									
fov Cap+1 Maneuver	863		**	1162	8		162	191	652	170	192	415
Nov Cap-2 Maneuver	٠	90	*/:	*	•		780	303	F	293	307	200
Stage 1					1	19	804	582		402	422	
Stage 2	i i	(4)	1.0	٠	0	(a)	387	421) v ?	604	582	
				ì							i	
pproach	8			WB		Î	WB.			88		
ICM Control Delay, s	0.2		8	0			0			15.2		
HCM LOS							A			U		
		f		ì								
Inor Lane Major Myrm	h	NBLnt	E8	EBT	EBR	WE	WBT	WBRSBLn	BLAT	ŀ		
apacity (veh/h)		10	863	8	8	1162	1	.0	376			
CM Lane V/C Ratio		9	0.013	Ť	•	9/	**	•	- 0.058			
CM Control Delay (s)	100	0	8.2	7	1	0	i	i	15.2	y	j	
CM Lane LOS		∢	∢	•	•	∢	88		ပ			
CM 95th %ale O(veh)	-		0	2		0	4	9	0.2		ı	SHARM

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HCM 6th TWSC 4: Dell Range Boulevard & James Drive

2040 Total AM_Improved.syn

2040 Total PM_Improved.syn

III Dollay, of toll	2												
Vovement	E8F	189	EBR	WBI	WBT	WBR	NBL	NBT	NBR	Ħ	188	SBR	
Lane Configurations	*	24		de.	-2			+1			4		
raffic Vol. veh/h	50	870	0	0	735	10	0	0	0	\$	0	12	
Future Vol. veh/h	20	870	0	0	735	10	0	0	0	2	0	15	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	3	2	None			None	i	7	None	8		None	
Storage Length	100	03.	71	100	•	٠	7.	0.		8			
/eh in Median Storage. #	*	0	0		0	18.	0	-	2	8	-	26	
Grade, %	*	0	2		0	A	(*)	0		*	0	245	
Peak Hour Factor	92	35	65	26	82	26	65	92	92	85	88	92	
Heavy Vehicles. %	2	2	2	2	2	2	2	2	2	2	2	2	
Ayna Flow	22	946	0	0	799	=	0	0	٥	40	G	16	
	ě												
Addressing Class All	040	٩	٩	200	٥	6	1903	1000	240	1705	4205	200	
Cross 1	200	9	>	2		0	200	000	2	200	200	000	
Chart o				1		1	040	040		000	000		
y abelo		•	1	. 5		*	013	010	. 50	SS 5	88		
orinces many	7 +	١	١	71.4		¥1	7117	20.0	0.22	Cale	70'0	0.26	
Critical Howy Stg 1	£	ŧ.	e:	2	ì	è	21.9	295	2	6.12	2.52		
Sntitual Howy Stg 2	í			Ì						6.12			
-ollow-up Hdwy	2.218		1	2.218	/4	(4)			3,318	3,518	- 11	3,318	
Pot Cap-1 Maneuver	816	1	7	725	1	4	62	8	317	62	8	382	-
Stage 1)S.	0.5		iii	ΞĀ	297	324	e.	376	395	TV.	
Stage 2	8	28	٥	3	11	ii.	372	393	at.	262	324	2	
Platoon blocked, %)*c	۸		*	(ā)							
Nov Cap-1 Maneuver	816	8	17.1	725	N.	*	88	20	317	19	82	382	
Aov Cap-2 Maneuver	ř	87	10	2		i.	168	191	*;	175	195		
Stage 1	ľ	ľ	ľ	1	ľ	4	289	316		366	395		
Stage 2					•		326	393	2	289	315	,	
							ı	H					
pproach	88			WB			NB NB			88	F		4
+CM Control Delay, 5	0.2			0			0			18.2			
HCM LOS							A			O			
TO ANN	ı				ı	ı	l	į.		H	۱	ļ	
finor Langiliagor Myrmt		NBLINT	Ħ	Ħ	H	EBR WBL	WBT	WRT WBR SBLn1	BLn1		H		
apacity (veh/h)		1	816	×	•	725	•	*	382				
HCM Lane V/C Ratio			0.027	•	٠	ĸ	٠	•	0.074				
ICM Control Delay (s)	H	0	9.5			0	Ì		18.2	H	ļ	1	The second second
HCM Lane LOS		×	×		•	4	•		ပ				

HCM 6th TWSC 5: Whitney Road & Dell Range Boulevard

1 64 44 208 11 64 44 4 208 11 64 44 4 208 11 64 44 4 208 11 64 44 4 208 60 60 60 60 60 60 60	nt Delay, s/veh	2,8												
An Free Free Free Free Free Free Free Fre	Oversent	Ħ	EB1	EBR	WE	WBT	WBR	ME	NBI	NB0	蒉	SBI	SSS	
11 64 44 4 208 12 1 64 44 4 208 14 1 64 44 4 208 Free Free Free Free Free 125	ane Configurations	h-	£,			4			+\$			4		
11 64 44 4 208	affic Vol. vehilh	Ŧ	3	44	7	208	60	89	22	2	2	110	80	
Free Free Free Free Free Free Free Fre	rture Vol. veh/h	=	9	4	4	208	m	80	22	2	2	110	8	
Free Free Free Free Free Free Free Fre	onflicting Peds, #7hr	0	0	0	0	0	0	0	0	0	0	0	0	
125	gn Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
125	T Channelized		il.	None	ı		None	×		None	ľ	(0)	None	
Storage # 0	orage Length	125	٠		٠		٠	(8)	17.	•	*		*	
6 69 80 61 50 84 6 2 2 84 7 6 80 72 8 248 Majori 1 200 0 152 0 1 4.12 4.12 4.12 2 2.18 2.218 wer 1304 1429	eh in Median Storage.	-	0		*	0	(1)	4		8	Å	Ī	ė	
6 69 80 61 60 84 6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	rade, %	8.	0	•	•	0	٠	99	0	•	8)	0	×	
Majort Majort Major 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Bak Hour Factor	69	8	6	20	8	22	72	2	52	20	6/	80	
16 80 72 8 248 1860r1 1860r2 2 248 2 218 2	eavy Vehicles, %	7	2	7	2	7	2	7	7	7	7	7	2	
A12 4.12 4.12 4.12 4.12 4.12 4.12 4.12 4.	VITT Flow	92	80	72	00	248	12	133	8	00	4	139	100	
260 0 0 152 0 412 412 2218 2218 1 1304 1429 er 1304 1429 er 1304 1429 er 1304 022 NMB S 07 02 60 0384 0.012 (6) 188 7.8 1 6 0		Parket.		1	Cinin)	ŀ	Î	Mont			Front	H	Ì	
412 412 2218 2218 1 304 1429 er 1304 1429 er 7 304 0.02 with NBLn1 EBL EBT ESR with NBLn1 EBL EBT ESR to 0.354 0.012 (5) 188 7.8 c C A	1	260	c		152	0	0	538	424	116	436	454	254	
412 4.12 . 4.12	Stane 1	ľ	5	1	1	04	0	148	148	3	270	270		The second second
412 412 412 1218 1 1304 1429 1429 1429 1429 1429 1429 1429 142	Stane 2					•	,	390	276	٠	166	184		
2218 . 2218	nife of Heliuv	117	ľ		612		1	717	6.52	663	717	653	6 32	
2218 - 2218 - 1429 - 14	ritical Hrtuv Sto 1	7		ľ			9	6 12	5.52		6 12	5.52		
2218 - 2218 - 1429 - 14	the House Circ 2					10	ľ	6.5	5 83		610	623	23800	
er 1304 1429 er 1304 1429 er 207 022 s 07 02 to 0.384 0.012 to 0.384 0.012 to 0.384 0.012 to 0.384 0.012		2 218	10		2.218			3 518		3 318	3.518	4 018	3.318	
EE 1304 1429 of 2017 0.22 s 0.7 0.22 to 0.354 0.012 to 0.354 0.012 to 0.354 0.012 to 0.354 0.012 to 0.354 0.012	IVPE	1304	1	-	1429		3	454		980	531	502	785	
EE WE EEI EER WE AVT 304 - 0.2 AVT 304 - 0.5	Stage 1	•	Ø.	14	•	19	35	855	775	Į.	736	989		
EB WB ST 0.2 C A	Slage 2	2.5	3.4	3	-	S	(4)	634	682	ě	836	747	2	
er 1304 - 1429 -	atoon biocked, %		•			*		ı						
Maneuver Pet	ov Cap-1 Maneuver	1304			1429	730	*5	314	512	936	489	492	785	
Pe 2	ov Cap-2 Maneuver	.5		٠	4	6	*	368	553		571	545	*	
## PER WIR TO Delay, s 0.7 0.2 ### Alabor Munit NBL-11 EBL EBT EBR WIR VIC Ratio 0.344 0.012 ### Alabor IS 188 7.8 ###	Stage 1	*	27	*		Š	×	845	992		727	189		
EB WB WB MB MB MB MB MB M	Stage 2		i		•	r	•	437	677	4)	789	738	(6)	
### WE TO Delay \$ 0.7 0.2 ### And TO Delay \$ 0.7 0.2 ### And TO Delay \$ 0.0 0.354 0.012		ı	ł		1	١	ł	Ì	ì		ŀ	i.	١	-
Inf Delay, s 0.7 0.2 Inf Sport Monte NRLn1 EBI EBI EBI eBI eBI VICE Ratio 0.354 0.012 Inf Delay (s) 188 7.8 Skills Over C A Skills Over C A Skills Over C C A Skills Over C C C A Skills Over C C C C C C C C C C C C C C C C C C C	proach	88			WB			S.			88			
Missor Murri Nistral EBL EBT EBR eelth) 407 1304 VIC Ratio 0.354 0.012	CM Control Delay, s	0.7			0.2			18.8		H	144			
0.54 0.02	CM LOS							O			8	ľ		
0.364 0.012 188 7.8 +						H			H		h	H	k	
407 1304	inor tranefission filterit		Marn1	183	EBT	EBR	WBL	WBT	WBR SBLn1	Blut	I	i		
0.364 0.012 · · · · · · · · · · · · · · · · · · ·	apacity (vehith)		407	1304	4.	*	1429	(6)	.50	624				
(a) (s) 188 7.8 C A	CM Lane VIC Ratio		0.364	0.012	*	٠	9000	*	• 3	0.39				
C A .	CM Control Delay (s)	Es.	18.8	7.8	ì	Ŕ	15	0		14.4				
CIPIT OCH Willia Owight T G. O	CM Lane LOS		O	×	ř	٠	⋖	∢	•	œ				
A A A MINISTER WAS A MANUAL WAY	CM 95th %tile Q(veh)		16	0	4	9	0	3	1	.8	1	ı	Ì	

Synchro 10 Report Page 1

HCM 6th TWSC 5: Whitney Road &

2017-2018 Existing AM.syn 10/18/2018

d & Dell Range Boulevard
Range E
l & Dell
y Road
5: Whitne

2017-2018 Existing PM,syn

nt Delay, s/veh	7.5												
cyement	EBE	181	88	MA	WBI	WIBE	19	NBT	NBR	SBL	185	SBR	
ane Configurations	*-	.2			4			4			4		
raffic Vol. veh/h	62	224	110	es.	139	4	86	28	62	2	8	44	
-uture Vol, vefv/h	62	224	110	m	139	4	\$	78	m	7	99	44	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		6	None	ľ	0	None	i	W	None	١	V	None	
Storage Length	125	•		*	*:		*	à)	*	*	*		
Jeh in Median Storage.	100	0		ľ	0	10		÷	15	X	Ť	*	
Stade %	ľ	0	ľ	•	0	1	•	0	ľ	ľ	0		
Peak Hour Eactor	88	60	20	75	83	29	78	85	89	20	80	73	
leavy Vehicles. %	2	2	2	2	2	0	2	2	2	2	2	2	
Avmi Flow	72	243	138	*	167	00	121	96	80	4	52	09	
Sincolline (1)	Samuel	1	-	Main	ł		Mond	ľ		Money	8		
low All	175	0	0	382	P	0	692	640	313	889	705	171	
Stane 1		ľ	1	1	15:	1	457	457		179	179		
Stane 2	ľ	ľ	1	2 .		1	27.6	183	ľ	500	528		
Tritical Hotel	62.0		H	4.15			10	6 52	60.9	7 12	6.52	6633	1
refice Hour Chr.		•				ľ	612	5 53		8 13	5.53		
Carter Heline Cris 2		0			i i		6.03	0	•	F. 12	5,52	12	
follow-in Hrlav	2 218	356	10*	2 2 1 8	*	100	3.518		3.318	3 518	4 018	3318	
Pot Cap-1 Maneuver	1401		OX.	1176	A		358	383	727	360	361	873	
Stage 1	٠				25	7	583	568	×	823	751	e de	
Stage 2	Ê		100	4	•	ř	768	748		547	625	*/	
Platoon blocked, %			**		*2	*							
fov Cap-1 Maneuver	1401	k	•	1176	8	87	288	371	727	787	Ħ	873	
Nov Cap-2 Maneuver	٠	٠	•	•			392	437	•	356	415		
Stage 1			0		1		88	539	C	182	748		
Stage 2			13	1		•	662	745	9	422	205	100	
		Н		П		ı		П	П				
Domosch	B	ı	ı	WB	I		8			SS			
HCM Control Delay, s	12			0.2			23.3		F	13	ı		
HCM LOS					1		ပ	ŀ		m	ı		
TO STATE OF THE PERSON NAMED IN COLUMN NAMED I	П	10000	1	0	1	1	1000	SHARE		Ш			
Inor Langildapr from		MBLU	IRI		EDK	MEN	9	WOK SBLD	Brui	J			
Sapacity (vehith)		417	1401	92	20	1176	9		202	ı	Ē		
HCM Lane V/C Ratio	ı	0.539	ö	•	•	0.003	•	•	0.206	ï	ı		
+CM Control Delay (s)		23,3	7.7	•		œ	٥		13	i	g		
HCM Lane LOS		O	V	je.	3	٧	V	8	œ				
Contraction of the Party of the													

Intersection	Y	L						r					
heh	141.3												
Movement	E	EBI	EBR	MBE	WBT	WBR	NBIC	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	*	42	-	Į.	4			4		0.00	4		
Traffic Vol. veh/h	70	225	8	52	460	8	110	130	10	99	385	105	STREET, SQUARE,
Future Vol. veh/h	2	225	8	52	460	8	110	170	2	92	382	105	
Conflicting Peds. #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
Ki Channelized	, 50		None		1	None	•		None			None	
Storage Length		•	*	*	1	1		Ì	•	•	•	đ.	
Veh in Median Storage.	· 林	0	(4)		0	Ŷ	*		٠	×	-	•	
Grade, %	e.	0	٠	•	0	7.0		0	* 1		0	* 9	
Peak Hour Factor	35	25	35	85	35	35	35	8	35	35	35	35	
Heavy Vehicles, %	2	2	7	C)	7	CV	2	2	2	5	~	7	
Mwrit Flow	92	245	to.	27	200	57	23	2	=	17	40	77	
Texas Missa		ı		500	į	Ī	2	ì	Ī	Towns 1	ŝ		
	543	٩	6	222	9	٩	1202	4030	080	4445	4060	522	
Connecting Flow As	3	9	>	335	>	-	207	020	607	200	000	770	
otage			•	1	•	•	040	202	•	000	NO.	,	
2 adeio		1	•		7	1	740	200		500	101		
Critical Howy	4.16	۲	×	7 6	t.	71.	717	760	77.0	7.16	20.0	27.0	
Critical Howy Stg 1	i.		١	9	2	le .	P 12	20.0	**	21.0	200	×	
7.5	ì		٠			1		200		21.0	70.0		
	2,218	1	٠	2.218	•	1		4 018	3 318	3.518	4	3.318	
Pot Cap-1 Maneuver	1026		3	1227	•		142	231	150	185	3	555	
Stage 1	¥.	24	×	39	31	*	595	24	*	503	205	(*)	
Stage 2	W.			*	i	8	328	481		527	252	it.	
Platoon blocked, %	1000000	(0)	(*)		(*)	٠							
Mov Cap-1 Maneuver	1026	*	(†) 	1227	¥		No.	201	750	8	- 201	555	
Mov Cap-2 Maneuver	7.	i).	٠	9	*	,	37	289	•	199	-313	٠	
Stage				1	٠	P.	551	Š	1	466	486		Annual Control of the Control
Stage 2	4	(a)	0.00	(4)		9	- 38	475	4	314	5		
	i	ij											
Anproach	E8		ł	M8	ľ		88	ŀ		88	ŝ	ŀ	
HCM Control Delay s.	16		1	0.4				L	8	5.4427			
HCM LOS		ı	ı		ı	ı	18	ı		ı	ı	ı	
	i			i		Ĺ	l			ı		Ľ	THE PERSON NAMED IN
Africe Canalitiane Home	Ì	Man	123	FRT	FRE	WRI	WRIT	WRR SHIP	Hant	I	ı	Ì	
Canada (vahib)		ľ	1076	ľ	ľ	1223	ľ		318		h		
HCM I and W/C Patio	ı	1	0.07A	1	1	0.00	ľ	1	1 807	ı	ı	ı	
HOW Control Dalay fel	H		800			2000	9	4	5.4427		Ď		THE PERSON NAMED IN
HCM Lane LOS	ŀ		V	•	,	4	V	HETA.	1	ı			
HCM 95th %tile O(veh)	i	-	0.2	3		1.0			412			l	
INTERNATIONAL PROPERTY OF THE	l	l		ŀ	l		l	l					

Synchro 10 Report Page 1

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HCM 6th TWSC 5: Whitney Road & Dell Range Boulevard

2040 Total PM.syn 10/30/2018

footment	æ	FRI	FRR	MBI	WRIT	WAR	NRI	NET	NBR	SBI	SBT	See	
NATURE IN	-	•	Total Control		•		4		1	5		-	
ane comigurations	-	•	40.00		2	-		ŧ		-	1	***	
ratio voi, venin	100	200	49	Ī	3	100	3	400	2	8	ę	3	
-uture Vol. veh/h	100	200	145	15	300	100	125	460	0	8	345	60	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		7.	None	8	1	None			None		018	None	
Storage Length	125	*			,			٠	•	٠	3		
Jeh in Median Storage.	1	0	9		0	*		-	•				
Grade %	•	0	4.	*	0	(0)		0	*	*	0	5.00	
Peak Hour Factor	65	65	65	65	65	65	65	65	65	65	65	65	
Heavy Vehicles. %	2	2	2	2	2	2	2	2	~	7	7	2	
dumt Flow	109	543	158		326	109	136	200	11	83	375	98	
Assert Minus	Hain!	ŝ		Maioro	Ī		Anna			Mente	ì		
Now All	435	0	0	701	0	0	1473	1307	622	1509	1332	381	
Stage 1							840	840	K	413	413		
Stage 2	•			*	*	٠	633	467		1096	919		
Critical Hdwy	4.12		*	4.12	1	*	7.12	6.52	6.22	7.12	6.52	6.22	10
Critical Howy Sto 1	•	•	,		,	1	6.12	5.52		6.12	5.52		
Critical Houry Sto 2	13	-		102	4		612	5.52		6 12	5.52		
	2 218	-9		2 218		1			3.318		4.018	3.318	
uver	1125			896	*			- 160			- 154	999	
Stage 1			*		*		360	- 381	٠	616	594	7.85	
Stage 2		-	183	2	×	80	468	299	•	528	-350	(4)	
Platoon blocked, %		j.	(X)		À	*							
Nov Cap-1 Maneuver	1125	1		988	*			141-	487	*	- 136	999	THE PERSON NAMED IN
Aov Cap-2 Maneuver	•		•		•	٠	- 30	- 239	*	16	- 234		
Stage 1	1	O.		2	The second		325	- 344		929	280	n se	
Stage 2		9	1	2		•	146	549	1	3	-316	100	
mensels:	SE SE			and a			ARR			8			
HCM Control Delay s				0.3	Ü								
HCM LOS							ě			151			
					Ļ	ŀ		E			ě		
Amor Lane Major Mumit		NBInt	盟	E81	EBB	ME	WET	WBR SBLn1	HI III				
apacity (veh/h)		1	1125	10.0	15	968		1					
+CM Lane V/C Ratio		٠	0.097	7	٠	0.018		*	•				
HCM Control Delay (s)		i	8.5		1	6	0	×	1				
HCM Lane LOS		3		S.		V	A	74	33				
HCM 95th %tile Q(veh)		ea.	0.3		2	0	1	1	(*				

Synchro 10 Report Page 1

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MOVEMENT SUMMARY

♥ Site: 101 [2040 Total AM]

Dell Range Blvd and Whitney Road Site Category: (None) Roundabout

love	ment Pe	Movement Performance - Vehicles	- Vehi	cles								
Mov ⊡	Turn	Demand Flows	lows	Deg	Average	Level of Service	95% Back	95% Back of Queue	Prop Overled	Effective Ston Bate	Aver. No	Average
	-	wetvin	*	o/v	Carro	a a la la la la la la la la la la la la	TE TE	and the second		Oille doile	200	
outh	South: Whitney Road	Road										
3	2	120	3,0	0,355	8.0	LOSA	1.8	45.1	0.59	0.53	0.59	32.7
89	Σ	185	3.0	0,355	8.0	LOSA	1.8	45.1	0.59	0.53	0.59	32.6
18	R2	7	3.0	0,355	9.0	LOSA	1.8	45 1	0.59	0.53	0.59	31.8
Approach	ach	315	3.0	0,355	0.8	LOSA	1.8	45.1	0.59	0.53	0.59	32.6
ast: [Jell Rang	East: Dell Range Boulevard										
	7	27	3.0	0,635	13.9	LOS B	7,0	180,1	92.0	0,91	1,23	30.9
9	11	200	3.0	0,635	13.9	LOS B	7,0	180.1	92.0	0.91	1.23	30.9
16	R2	43	3,0	0,635	13.9	LOS B	7,0	180,1	920	0.91	1.23	30.1
Approach	ach	571	3,0	0,635	13,9	FOS B	7.0	180,1	920	0.91	1.23	30.8
orth:	North: Whitney Road	Road										
	7	11	3.0	0.888	37.1	LOSE	15.5	396.7	1.00	1.64	2.89	23.4
	Ε	418	3.0	0.888	37.1	LOSE	15.5	396.7	1,00	1.64	2.89	23,4
14	R2	114	3.0	0.888	37.1	LOSE	15,5	396.7	1,00	1.64	2.89	22,9
Approach	ach	603	3.0	0,888	37.1	LOSE	15.5	396.7	1,00	1.64	2.89	23,3
est.	Dell Ran	West: Dell Range Boulevard	-									
2	7	92	3.0	0.523	12.2	LOS B	3.8	98.0	0.73	0.85	1,05	31,3
	Ţ	245	3.0	0,523	12.2	FOS B	3.8	0.86	0,73	0.85	1,05	31.2
12	R2	87	3.0	0,523	12.2	LOS B	3.8	98.0	0.73	0.85	1,05	30,4
Approach	ach	408	3.0	0.523	12.2	LOSB	3,8	980	0,73	0.85	1.05	31,1
II Vel	All Vehicles	1897	3.0	0.888	19.9	2 SO1	15,5	396.7	08'0	1.07	1.62	28.2

Site Level of Service (LOS) Method: Delay & vic (HCM 8), Site LOS Method is specified in the Parameter Settings dialog (Site tab), Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and vio ratio (degree of saturation) per movement.

LOSF will result if vio > 1 insepaction of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vio not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies Gap-Acceptance Capacity. Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

♥ Site: 101 [2040 Total PM]

Dell Range Blvd and Whitney Road Site Category: (None) Roundabout

Move	ment Pe	Movement Performance - Vehicles	e - Veh	icles								
Mov	Tum	Demand Flows Total HV	Flows	Deg Saln	Average Delay	Level of Service	95% Back of Queue Vehicles Distance	of Queue Distance	Prop Queued	Effective Stop Rate	Aver. No Cycles	Average Speed
South	South: Whitney Road	Road		-								
9	2	136	3.0	1 049	75.6	LOSF	30.8	789 4	1,00	2,37	5.21	16.7
6	Ε	200	3.0	1 049	75.6	LOSF	30.8	789.4	1.00	2.37	5.21	16.7
18	R2	£	3.0	1.049	75.6	LOSF	30.8	789.4	1,00	2.37	5,21	16.5
Approach	ach	647	3.0	1 049	75.6	LOSF	30.8	789.4	1.00	2.37	5.21	16.7
East: [Jell Rang	East: Dell Range Boulevard	-									
_	7	16	3,0	0.719	22,6	COSC	6.8	174.6	0.86	1,16	1,77	27,6
9	Ξ	326	3.0	0,719	22,6	LOSC	6.8	174.6	0.86	1,16	1,77	27,6
16	R2	109	3.0	0 719	22,6	COSC	8.9	174.6	0.86	1,16	1,77	26.9
Approach	ach	451	3.0	0,719	22,6	COSC	8.9	174.6	0.86	1,16	1,77	27.4
North:	North: Whitney Road	Road										
7	7	18	3,0	0.647	15.4	LOSC	6.7	172.1	0.80	1.02	1,38	30.0
4	F	375	3.0	0.647	15.4	COSC	6.7	172,1	0.80	1,02	1,38	30.0
14	R2	65	3.0	0.647	15.4	COSC	6.7	172.1	0.80	1,02	1,38	292
Approach	ach	527	3,0	0,647	15.4	COSC	6.7	172,1	0.80	1 02	1,38	29.9
West:	Dell Rang	West: Dell Range Boulevard	þ									
ß	L2	109	3,0	666 0	53 9	LOSF	35.0	897,3	1.00	2.18	4,12	19.9
2	ī	543	3,0	666 0	53.9	LOSF	35.0	897,3	1,00	2.18	4,12	19,9
12	R2	158	3.0	666 0	53.9	LOSF	35.0	897,3	1,00	2.18	4 12	19.6
Approach	ach	810	3.0	666 0	53.9	LOSF	35.0	897.3	1,00	2.18	4.12	19,8
All Vehicles	hicles	2435	3.0	1.049	45.5	LOSE	35.0	897.3	0.93	1.79	3,38	21.4

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement to Vehicle movement LOS values are based on average delay and vic ratio (degree of saturation) per movement. LOS Fervil result if vic > 1 irrespective of movement dalay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Somula policy is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies. (3a.PAcceptance Departer). Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 ♥ Site: 101 [2040 Total AM w EB/SB RTL]

Dell Range Blvd and Whitney Road Site Category: (None) Roundabout.

enl P	Movement Performance - Vehicles	e - Veh	icles								ľ
Tum	Demand Flows Total HV	Flows HV	Deg Sath	Average Delay	Level of Service	95% Back of Queue Vehicles Distance	of Queue Distance	Prop Queued	Effective Aver No Stop Rate Cycles	Aver No Cycles	Average Speed
Vhitney	South: Whitney Road			-							-
7	120	3.0	0.355	0.8	LOSA	1.8	45,1	0.59	0.53	0.59	32.7
ĭ	185	3.0	0.355	0.0	LOSA	1.8	45 1	0.59	0.53	0.59	32.6
22	Ξ	3.0	0.355	0.8	LOSA	1.8	45.1	0.59	0.53	0.59	31.8
Approach	315	3.0	0.355	0 8	LOSA	1.8	45.1	0.59	0.53	0.59	32.6
ell Rang	East: Dell Range Boulevard	70									
7	27	3,0	0.635	13.9	LOSB	0'2	180,1	0.76	0.91	123	30.8
Ξ	200	3.0	0.635	13.9	LOS B	7.0	180,1	92.0	0.91	123	30.9
R 2	43	3.0	0 635	13.9	LOS B	7,0	180.1	92.0	0.91	1.23	30.1
Approach	571	3,0	0 635	13.9	LOS B	7,0	180,1	92'0	0.91	1,23	30.8
North: Whitney Road	Road										
7	71	3,0	0.650	16.5	LOS C	5.7	146.9	0.80	1,03	1,46	29 7
Ξ	418	3.0	0.650	16.5	OS C	5.7	146.9	0 80	1.03	1.46	29.6
R2	114	3.0	0.152	6.4	LOSA	90	14.6	0.57	0.55	0.57	33.2
Approach	603	3.0	0.650	14.6	LOS B	2.7	146.9	0.75	0.94	1.29	30.2
ell Ran	West: Dell Range Boulevard	2									
2	76	3,0	0.377	8,7	LOSA	1.8	45.9	0.61	0,62	0,65	32.8
Ξ	245	3,0	0.377	8.7	LOSA	1.8	45,9	0.61	0,62	0,65	32.7
R2	87	3,0	0.102	5.2	LOSA	0,4	8 6	0.51	0.44	0.51	33.8
Approach	408	3,0	0.377	6.7	LOSA	1.8	458	0.59	0.58	0.62	32.9
All Vehicles	1897	3.0	0.650	11.9	LOS B	7.0	180.1	0.69	0.78	1.01	31.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6), Site LOS Method is specified in the Parameter Settings dialog (Site lab),

Foundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are taken as Sign Control.

LOS F will result if vic > 1 insepective of movement delay and vic ratio (degree of saturation) per movement.

LOS F will result if vic > 1 insepective of movement delay value (does not apply for approaches and instruction).

Roundabout Capacity World: US HCM 6.

Roundabout Capacity Model: US HCM 6.

HCM Bobs formula depton is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SIDRA INTERSECTION 18 1 Copyright © 2000-2018 Ascelle and Associates Py Ltd 1 sidrasolutions.com popmisation: Killer H-ORN 8. ASSOCIATES INC 1 Processed Presents of 2.019 12:58:39 PM Project. K-LDR - PublicSecrit@6615001_Earls Pall Range Control Sudy/Traffick.najvsiSdra at Def Range & Whitney Roundabout sip@

MOVEMENT SUMMARY

♥ Site: 101 [2040 Total PM w EB/SB RTL]

Dell Range Blvd and Whitney Road Site Category: (None) Roundabout

Movem	ent Pe	Movement Performance Vehicles	e Vehi	icles								
Mov T ID	Tum	Demand Flows Total HV	Flaws HV	Deg Safn	Average Defay	Level of Service	95% Back Vehicles	95% Back of Queue Vehicles Distance	Prop Queued	Effective Stop Rate	Aver No Cycles	Average Speed mpn
South: Whitney Road	/hitney	Road		-								
8	7	136	3.0	1.049	75.6	LOSF	30.8	789.4	1 00	2.37	5.21	16.7
	ī	200	3.0	1,049	75.6	LOSF	30.8	789 4	1 00	2.37	5.21	16.7
18	R2	Ξ	3.0	1,049	75 6	LOS F	308	789.4	1.00	2 37	521	16.5
Approach	Ē	647	3.0	1.049	75.6	LOSF	30.8	789.4	1.00	2.37	5.21	16.7
East: Del	II Rang	East: Dell Range Boulevard	77									
_	- 27	16	3.0	0,719	22 6	LOSC	6,8	174.6	0.86	1.16	1.77	27.6
. 9	7	326	3.0	0,719	22.6	COS C	6.8	174.6	0.86	1,16	1.77	27.6
16	22	109	3.0	0,719	22 6	COSC	6.8	1746	0 86	1,16	1,77	26.9
Approach	£	451	3.0	0.719	22.6	LOS C	6.8	1746	0.86	1.16	1.77	27.4
North: Whitney Road	hitney	Road										
_	7	87	3.0	0.522	11.0	LOS B	3.8	97.5	0.68	0.78	96'0	31.8
	Ξ	375	3.0	0.522	11.0	LOS B	3.8	97.5	0.68	0.78	96 0	31.8
14	R2	65	3.0	0 074	8,4	FOSA	0.3	7.0	0.48	0.39	0.48	34.0
Approach	ء	527	3.0	0.522	10.3	LOS B	3.8	97.5	0.65	0.73	0.90	32.0
West: De	al Ran	West: Dell Range Boulevard	ъ									
מו	7	109	3.0	0.741	18.5	LOS C	10.1	259.2	0,85	1.18	1.73	28.9
	Ξ	543	3.0	0.741	18.5	DSOT	10.1	259.2	0.85	1.18	1.73	28.8
12	R2	158	3.0	0 179	5.9	LOSA	0.7	182	0 52	0.46	0.52	33.5
Approach	F	810	3.0	0.741	16.0	LOS C	101	2592	0.78	20	1.49	29,6
All Vehicles	8	2435	3.0	1.049	31.8	LOS D	30.8	789.4	0,83	1.35	2.40	24.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6), Site LOS Method is specified in the Parameter Settings dialog (Site tab), Roundabout LOS Method: Same as Sign Control,

Vehicle movement LOS values are based on average delay and vio ratio (degree of saturation) per movement.

LOSF will result if wor's I imprepeditive or finovement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (vio not used as specified in HCM 6).

Roundabout Capacity Model: US HOM 6.

HOM Delay formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM 6th Signalized Intersection Summary 5: Whitney Road & Dell Range Boulevard

2040 Total AM_Improved.syn 02/1/2019

	1	Ť	>	4	ţ	1	•	-	4	٠	→	*
ovement	Ħ	199	EBR	Wet	WBT	WBR	NBC	NBI	NBR	SBL	IBS	SBR
ane Configurations	Jan-	42		K	2,		J.	43		je.	¢2	
raffic Volume (vehith)	20	225	80	22	460	40	110	170	0	92	382	105
Future Volume (veh/h)	20	225	80	52	460	40	110	170	10	9	385	105
nitial O (Clb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.0	1.00		1.00	1.00		1.8
arking Bus, Adj	100	1.00	1 00	100	1.00	1.00	1.00	1.00	1.00	1.00	1:00	1.00
Nork Zone On Approach		S.			No			No			No	I
Adj Sat Flow, vehilhfin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, vehith	92	245	87	22	200	43	120	185	E	71	418	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	5	2	2	5	2	2	2	2	2	2
ap, vehih	214	549	195	448	268	64	186	283	32	426	250	101
Arrive On Green	90.0	0.49	0.49	0.40	0.40	0.40	0.13	0.13	0.13	0.41	0.41	0.41
Sat Flow, vehilh	1500	1110	394	1048	1430	123	839	1472	88	1187	1282	248
Srp Volume(v), veh/h	76	0	332	27	0	543	120	0	196	Z	0	488
3rp Sat Flow(s), vehihlin	1500	0	1504	1048	0	1553	668	0	1559	1187	0	1530
2 Serve(g_s), s	2.6	0.0	12.9	1.5	0.0	29.2	10.6	0.0	10.2	4.1	0.0	25.9
Cycle O Clear(g_c), s	2.6	0.0	12.9	5.7	0.0	29.2	36.5	0'0	10.2	14.3	0.0	25.9
Prop In Lane	1.00		0.26	1.00		0.08	1.00		90.0	1.00		0.16
ane Grp Cap(c), veh/h	214	0	744	448	0	219	186	0	632	426	0	621
//C Ratio(X)	0.36	0.00	0.45	90'0	00.00	0.88	0.65	00'0	0.31	0.17	0.00	0.80
wall Cap(c_a), vehilh	235	0	744	448	0	517	186	0	632	426	0	621
+CM Piatoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1 00	1 00	1,00
pstream Filter(!)	1.00	000	1,00	100	0.00	1.00	0.94	00:0	0.94	1.00	0.00	1 8
Iniform Delay (d), siveh	19.4	0.0	14.8	19.4	0.0	25.1	52.5	0 0	27.6	24.0	0.0	236
icr Delay (d2), stveh	1.0	0.0	9	0.3	0.0	16.4	15.1	0.0	12	0.8	0.0	10.6
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
We BackOfQ(50%), vehilin	6.0	0.0	4.6	0.4	0.0	13.0	3.7	0.0	4.6	1.2	0.0	107
Insig. Movement Delay, s/veh												
nGrp Delay(d), sheh	20.4	0.0	16.7	19.7	0.0	41.6	9.79	0.0	28.8	24.8	0.0	34.2
nGp LOS	ပ	V	8	æ	V	٥	ш	A	ပ	ပ	V	O
pproach Vol, veh/h		408			570			316			270	
Approach Delay, s/veh		17.4			40.6			43.5			33.0	
pproach LOS	ï	8		I	0	H		0		I	O	
mer - Assigned Phs	II.	2		4		9	7	80				ľ
Phs Duration (G+Y+Rc), s		41.0		49.0	I	41.0	8.8	40.2		i	ı	Ì
Change Period (Y+Rc), s	П	4.5		4.5		4.5	4.5	4.5				
fax Green Setting (Gmax), s		38.5		5 17	N.	36.5	5.5	34.5				
Aax Q Clear Time (g_c+11), s		38.5		14.9		27.9	4.6	31.2				
Sreen Ext Time (p_c), s	ı	0.0		2.2	ì	2.3	0.0	1.2				
of other Committee	Ì	ļ		Ì	l		į			Ì	1	
Dear Car Clariffer	ı		4.00		ı	ı	I	I	ı	ı	ı	ı
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Synchro 10 Report Page 1

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HCM 6th Signalized	hitney Road & Dell
HCM 6	5: Whit

2040 Total PM_Improved.syn

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Novement	189	E81	EE	WBL	WBT	WBR	NBL	NBT	NBR	SBE	TBS	SES
ane Configurations	K	ęź.		k	¢\$		F	43		je.	42	
raffic Volume (vehifi)	100	200	145	15	300	100	125	460	10	88	345	9
Future Volume (veh/h)	100	200	145	15	300	100	125	460	0	80	345	99
initial Q (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		9	1.00		1.00
Parking Bus, Adj	1.00	1:00	1.00	1.00	100	1.00	100	1,00	1.00	1.00	1.00	100
Nork Zone On Approach		8			S.			No			No	
Adj Sat Flow, vehibitin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	109	543	131	16	326	82	136	200	11	87	375	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	5	2	2	2	2	2	2	2	2	2	2
Cap, wehith	340	620	150	166	482	121	223	909	13	255	516	89
Arrive On Green	90'0	0.51	0.51	0.40	0.40	0.40	0.79	0.79	0.79	0.39	0.39	0.39
sat Flow, vehith	1500	1226	296	764	1215	306	676	1535	35	688	1308	227
3rp Volume(v), veh/h	109	0	674	16	0	408	136	0	511	87	0	440
3rp Sat Flow(s), vehilhin	1500	0	1522	192	0	1520	646	0	1569	688	0	1534
2 Serve(g_s), s	3.7	0.0	35.4	1.7	0.0	19.9	12.6	0.0	17.8	7.8	0.0	21.9
Cycle O Clearing c), s	3.7	0.0	35.4	27.3	0.0	19.9	34.5	0.0	17.8	25.6	0.0	21.9
Prop In Lane	1.00		0.19	1.00		0.20	1.00		0.02	1.00		0.15
ane Gro Cap(c), vehilh	340	٥	769	166	0	603	223	0	619	597	0	605
//C Ratio(X)	0.32	0.00	0.88	0.10	00.0	0.68	0.61	0.00	0.83	0.34	0.00	0.73
twail Cap(c_a), wehith	343	0	769	166	0	603	223	o	619	555	0	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	200	2.00	1.00	1.00	8
Josteam Filter(I)	1.00	000	1 00	1.00	000	180	0.76	0.00	0.76	1.00	00:0	1 00
Jniform Delay (d), s/veh	16.2	0.0	19.7	36.2	0.0	22.4	20.1	0.0	7.6	32.1	0.0	23.1
ncr Delay (d2), siveh	0.5	0.0	13.3	12	0.0	8.0	6	0.0	9 6	3.6	0.0	7.5
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ie BackOfO(50%),vehfin	1.2	0:0	14.3	0.4	0.0	7.8	2.8	0.0	4.1	1:0	0.0	8.8
Jusig. Movement Delay, s/veh	1						-					
.nGrp Delay(d) siveh	16.8	0.0	33.1	37.4	00	28.4	29.5	0.0	17.0	35.7	0.0	30.6
nGp LOS	8	4	O	٥	4	O	O	×	633	٥	A	٥
Approach Vol. vehilh		783			424			647		k	275	į
Approach Delay, s/veh		30.8			28.7			19.6	i	ì	31.5	N
Approach LOS		O		ı	O		ı	8			Q.	
Times - Assigned Phs		2		•		140	1	60				
Phs Duration (G+Y+Rc) s		40.0		200		40.0	8.6	40.2				o i
Change Period (Y+Rc), s		4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		35.5		45.5		35.5	5.5	35.5				
Max Q Clear Time (g_c+11), s	10	36.5		37.4		27.6	5.7	29.3				
Green Ext Time (p_c), s		0.0	i	5.9	Ġ	2.0	0.0	*			ļ,	l
ntersection Summany			į	į	i	ı		1				
HCM 6th Ctri Delay			27.5					ı	ŀ	ł		
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HCM 6th Signalized Intersection Summary 6: College Drive & US-30 /US-30

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HCM 6th Signalized Intersection Summary 6: College Drive & US-30 /US-30

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10 10 10 10 10 10 10 10	fosensent	183	ä	688	WBL	WBI	WBR	NBI	NBT	NBR	SBL	SBT	SBR
Sign 141 59 267 413 10 83 401 146 7 488 141 59 267 413 10 83 401 146 7 488 141 59 267 413 10 83 401 146 7 488 140 100	ane Configurations	k	**	¥.	K	*	K	K	**	×.	r	47	
10	raffic Volume (veh/h)	28	141	8	267	413	0	83	401	146	7	488	85
100	uture Volume (veh/h)	28	141	29	267	413	10	83	401	146	7	488	85
100 100 100 100 100 100 100 100 100 100	iitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
100 100	ed-Bike Adj(A_pbT)	1.00		1.00	1.00		1 00	1.00		1.00	1.00		1.00
No. No. No. No. No. No. No. No. No. No. 1575 1	arking Bus. Adi	100	1.00	100	1.00	1.00	100	1 00	1.00	1 00	160	1 00	1.00
1575 1575 <th< td=""><td>Vork Zone On Approach</td><td></td><td>8</td><td></td><td></td><td>No.</td><td></td><td></td><td>S</td><td></td><td></td><td>S</td><td></td></th<>	Vork Zone On Approach		8			No.			S			S	
63 153 0 250 449 11 90 438 159 8 530 622 022 022 022 023 023 023 023 023 023 0	di Sat Flow, vehithin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
0.92 0.92 0.92 0.92 0.92 0.93 0.93 0.93 0.93 0.93 0.93 0.93 0.93	di Flow Rate, vehih	63	153	0	280	449	Ξ	90	436	159	80	530	92
2 2	eak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
483 1137 611 270 863 385 232 659 610 024 024 038 010 12.2 610 012 2802 1335 1500 2893 1335 1500 2893 1335 1500 2893 1335 1500 2893 1335 1500 2893 1335 1500 2893 1335 1500 2893 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1406 1406 1406 1406 1406 1406 1406 1406	뵨	2	2	2	2	2	2	2	2	2	2	2	2
150 289 120 0.12 0.46 0.46 0.06 0.29 0.29 0.01 0.24 150 2893 1335 1500 2893 1335 1500 2551 150 1496 1335 1500 1496 1335 1500 1436 150 1496 1335 1500 1496 1335 1500 1439 150 1496 1335 1500 1496 1335 1500 1439 150 1496 1335 1500 1496 1335 1500 1439 150 1496 1335 1500 1496 1335 1500 1439 150 1496 1335 1500 1496 1335 1500 1439 150 130 140 100 100 100 100 100 100 150 130 1496 1335 1500 1496 1335 1500 1496 150 130 1496 1330 1496 133 149 140 140 140 150 100 100 100 100 100 100 100 100 150 100 100 100 100 100 100 100 100 150 100 100 100 100 100 100 100 100 150 100 100 100 100 100 100 100 150 100 100 100 100 100 100 100 150 100 100 133 152 134 135 246 267 258 239 150 130 130 150 130 130 100 150 130 130 150 130 130 130 150 130 130 130 130 130 150 130 130 130 130 130 150 130 130 130 130 130 150 130 130 130 130 130 150 130 130 130 130 130 150 130 130 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 130 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150 150 130 130 130 150 150	ap, veh/h	483	1132	ı,	169	1370	611	200	863	382	232	609	105
150	mive On Green	0.04	0.38	0.00	0.12	0.46	0.45	90:0	0.29	0.29	0.01	0.24	0.24
150 153 0 290 449 11 90 435 159 8 310 150 146 1335 150 148 1335 150 148 1335 150 148 1335 150 148 1335 150 148 1335 150 148 148 1335 150 148 1	at Flow, wehilt	1500	2993	1335	1500	2993	1335	1500	2993	1335	1500	2551	441
150 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1339 1496 1	ro Volume(v), veh/h	63	153	0	290	449	Ξ	8	436	159	60	310	312
23 30 0.0 10.3 8.6 0.4 3.9 10.9 8.7 0.4 179 23 3.0 0.0 10.3 8.6 0.4 3.9 10.9 8.7 0.4 179 463 1132 691 1370 611 200 665 365 232 357 613 104 103 100	m Sat Flow(s) velyfylin	1500	1496	1335	1500	1496	1335	1500	1496	1335	1500	1496	1496
23 30 00 103 86 0.4 35 105 87 0.4 179 100 100 100 100 100 100 100 100 110 0.14 0.42 0.33 0.02 0.46 85 385 222 357 602 1132 691 1370 611 200 863 385 222 357 602 1132 691 1370 611 200 100 100 100 100 100 100 110 100 0.00 100 100 100 100 100 100 100	Serve(q s), s	2.3	3.0	0.0	10.3	8.6	0.4	3.9	10.9	8.7	0.4	17.9	18.1
1,00	vole O Clearin c) s	2.3	3.0	0.0	10.3	9.8	0.4	3.9	10.9	8.7	0.4	17.9	181
433 1132 691 1370 611 200 853 385 232 387 613 014 014 023 014 014 023 014 014 014 013 014 014 014 014 014 014 014 014 014 014	rop in Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.29
0.13	ane Gro Cap(c), veh/h	483	1132		169	1370	611	200	863	382	232	357	357
662 1132 691 1370 611 296 863 385 492 401 100 1100 1100 1100 1100 1100 1100	/C Ratio(X)	0.13	0.14		0.42	0.33	0.02	0.45	0.51	0.41	0.03	0.87	0.87
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	vail Cap(c_a), veh/h	602	1132		169	1370	119	296	863	388	405	401	401
1400 100 000 100 100 100 100 100 100 100	CM Platoon Ratio	1.00	1,00	1.00	1.00	1.00	9	1.00	1.00	1.00	1.00	1.00	1.00
15.7 18.3 0.0 12.8 15.6 13.3 24.6 26.7 25.9 25.8 32.9 0.1 0.2 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	pstream Filler(II)	100	1 00	00.0	1.00	1,00	1.00	1.00	1.00	1,00	1 00	1.00	1:00
01 02 00 04 06 01 16 05 07 01 167 00 00 00 00 00 00 00 00 00 00 00 00 00	niform Delay (d), s/veh	15.7	18.3	0.0	12.8	15.6	13.3	24.6	26.7	25.9	25.8	329	32.9
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	or Delay (d2), siveh	0.1	0.2	0.0	0.4	90	0.1	97	0.5	0.7	0.1	16.7	17.4
158 (86 0.0 132 162 134 262 272 266 258 495 8	itial O Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
158 185 0.0 132 162 134 262 272 266 258 495 16 B B B B B C C C D 216 A 750 685 630 178 150 269 630 178 150 269 09 18 C C C D 20 D 21 C C D 22 C C D 24 C C C D 25 C C D 26 C C D 27 C C D 28 C C C D 49 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C D 40 C C C C C D 40 C C C C D 40 C C C C D 40 C C C C D	de BackOfO(50%),veh/ln	8.0	44	0.0	3.3	5.9	0.1	**	3.9	28	0.1	8.0	60
158 186 0.0 132 162 134 262 272 266 25.8 49.5 216	nsig. Movement Delay, s/veh		- Control	-	-	and the same		100000			20000	000000	
B B B C C C C C C C	nGrp Delay(d); siveh	15.8	18.6	0.0	13.2	16.2	13.4	26.2	27.2	56.6	25.8	49.5	50.3
216 A 750 686 178 150 26.9 1 2 3 4 5 6 7 8 54 304 156 386 9.9 26.0 85 45.7 45 45 45 45 45 45 45 11.1 241 111 25.7 12 25.7 24 111 257 14 43 106 0.0 26 00 08 0.1 14 0.1 26 284 284 4 0.1 26 0.0 28 0.0 14 0.0 26	nGrp LOS	В	В		8	В	8	O	O	O	O	٥	۵
17.8 15.0 26.9 8 B C C 1 2 3 4 5 6 7 8 54 30.4 15.6 38.6 9.9 25.0 8.5 45.7 11.1 24.1 11.1 25.7 11.1 24.1 11.1 25.7 2.4 12.9 12.3 5.0 5.9 20.1 4.3 10.6 0.0 2.6 0.0 0.8 0.1 1.4 0.1 2.6 28.4	pproach Vol, veh/h		216	A		750			685		ı	630	ii
1 2 3 4 5 6 7 8 6 7 8 54 5 6 7 8 6 7	pproach Delay, siveh		17.8			150			26.9			49.6	
54 304 156 386 9.9 260 8.5 4 45 45 45 45 4.5 4.5 4.5 11.1 24.1 11.1 24.1 11.1 24.1 11.1 24.1 11.1 20.0 5.0 5.9 20.1 4.3 0.0 2.6 0.0 0.8 0.1 1.4 0.1 28.4	pproach LOS	Ĭ	8	,	ı	6	i	Ì	O			0	
54 304 156 386 99 250 85 45 45 45 45 11 257 111 257 111 11 11 11 11 11 11 11 11 11 11 11 1	erse . Archard Phe		689	672	78	10	9	7	00	ì	Ĭ	ľ	
45 45 45 45 45 45 45 45 45 11.1 24.1 11.1 25.7 11.1 24.1 11.1 2.5 10.0 26 00 08 01 14 0.1 28.4 23 12.5 28.4	hs Duration (G+Y+Rc) s	5.4	39.4	15.6	38.6	66	26.0	8.5	45.7	k			
11.3 24.1 11.1 25.7 11.1 24.1 11.1 24.1 11.1 24.1 11.1 24.1 11.1 26.0 0.0 5.9 20.1 4.3 10.0 2.6 0.0 0.8 0.1 1.4 0.1 28.4	hange Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	ı		ı	
24 129 123 50 5.9 20.1 4.3 0.0 2.6 0.0 0.8 0.1 1.4 0.1 28.4	lax Green Setting (Gmax), s	11.1	24.1	11.1	25.7	1111	24.1	1111	25.7				Ī
0.0 26 00 08 01 14 0.1	lax Q Clear Time (g_c+1), s	2.4	12.9	123	5.0	5.0	20.1	4.3	10.6				
mmany Delay	ireen Ext Time (p_c), s	0.0	2.6	0.0	0.8	0.1	1.4	0.1	26	į	ł	Ì	Ĭ
Delay	Mercection Summan	į		1	ł	ì		j	Ĭ		B	ě	
delay	Cat Sh Chi Dolmi	l	١	7.06	i		ŀ		ļ				
	TOW OUT CALL ENERSY	l	Ì	4.02	l	l	ł	ļ		l	ŀ		Ì

Note: Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Synchro 10 Report Page 1

Synchro 1¢ Report Page 1

Movement	EBE	EBI	EBR	WBL	WBT	WBR	NBI	MBT	NBR	SBE	SBT	BS
Lane Configurations	*	++	R.	K	**	be.	K	*	×.	<u> </u> -	44	
Traffic Volume (veh/h)	138	472	109	211	243	1	119	169	328	83	202	121
Future Volume (veh/h)	138	472	109	211	243	1	119	169	329	53	507	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	8		100	1 00		1,00	1 00		100	1.00		8
Parking Bus, Adj	1.00	1.00	100	1.00	100	1.00	1.00	1.00	180	1,00	1.09	1.0
Work Zone On Approach		9			9			S			8	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	150	513	0	229	264	00	129	751	358	32	551	132
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.82	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	5	2	2	2	
Cap, veh/h	561	1037		444	1136	205	225	913	407	153	612	146
Arrive On Green	0.08	0.35	0.00	0.12	0.38	0.38	90.08	0.31	0.31	0.03	0.26	0.26
Sat Flow, vehih	1500	2993	1335	1500	2993	1335	1500	2993	1335	1500	2336	257
Gra Volume(v), veh/h	150	513	0	229	264	80	129	751	358	32	343	340
Gro Sat Flow(s), veh/h/ln	1500	1496	1335	1500	1496	1335	1500	1496	1335	1500	1496	1472
Q Serve(q. s), s	5.7	12.2	0.0	8.6	5.4	0.3	5.4	21.0	22.9	1.4	20.0	20.1
Cycle O Clearlo c), s	5.7	12.2	0.0	8.6	5.4	0.3	5.4	21.0	22.9	1.4	20.0	20.1
Prop In Lane	1.00		1.00	1.00	ı	1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	561	1037		444	1136	205	225	913	407	163	385	376
V/C Rafio(X)	0.27	0.49		0.52	0.23	0.05	0.57	0.82	0.88	0.20	06.0	0.90
Avail Cap(c, a), wehilh	619	1037	8	453	1138	205	289	913	407	305	401	36
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	100	1.00	000	100	1.00	1.00	100	1.00	1.00	1,00	1.00	1.00
Uniform Delay (d), s/veh	16.2	23.2	0.0	16.1	19.0	17.4	23.5	29.0	29.7	25.1	32.4	32.4
Incr Delay (d2), s/veh	0.3	11	0.0	1.0	0.5	0.1	2.3	6.1	19.3	90	219	23
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfO(50%), vehilin	1.9	44	0.0	29	1.9	0.1	20	8.0	93	0.5	6.9	ď
Unsig. Movement Delay, s/veh						į						
LnGrp Delay(d), siveh	16.5	249	0.0	17.1	19.5	17.5	25.8	35.2	49.0	25.6	543	55,5
LnGrp LOS	æ	U		80	8	8	O	0	O	U	۵	
Approach Voi, vehilh	i	663	∢		201	i		1238			715	i
Approach Delay, s/veh		23.0			18.4			38.2	ì		53.6	
Approach LOS	Í	O		ı	œ	i	Ì	0	ì	ì	۵	į
Timer - Assumed Phs.		2	es		9	9	2	10		i		H
Phs Duration (G+Y+Rc), s	7.3	32.0	15.1	35.7	11.7	27.5	12.1	38.7				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	11.1	24.1	11.1	25.7	111	24.1	1111	757	Ĭ		į	ï
Max Q Clear Time (g_c+11), s	3.4	24.9	10.6	14.2	7.4	22.1	1.7	7.4				
Green Ext Time (p_c), s	0.0	00	0.0	2.6	0.1	6.0	61	.5	ı		ė	į
Intersection Summary	e la						1	k				
HCM 6th Carl Delay	1	ļ	35.3	ı	۱			ı	ı	į		1
HCM 6th LOS			٥									

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HCM 6th Signalized Intersection Summary 6: College Drive & US-30 /US-30

2040 Total AM.syn 10/31/2018

Care Continue (cells) Care	80 445 80 445 80 445 0 0 1.00 1.00 1.575 1575 0 484	₩81 44	WER	NBE	NBI	NBR	SBL	SBT	SBR
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130 285 1 130 285 1 100					‡	*	1	47	
ach (100 0 0 0 100 11 00			45	115	900	280	10	200	125
ach 100 0 0 1 100		Ц	45	115	009	280	10	200	125
ach 1575 1575 11 100 100 1 1 100 100 1 1 100 1 1 1 1		0	0	0	0	0	0	0	0
ach 100 100 1 ach 1575 175 11 141 310 0.92 0.92 0.92 0.2 289 992 0.92 0.08 0.33 0.1500 2993 11 141 310 289 992 1500 2993 11 141 310 100 100 1100 0.31 0.49 992 100 100 1100 0.31 0.49 992 100 1100 0.31 0.49 992 100 1100 0.31 0.49 992 100 1100 0.31 0.49 992 100 100 100 100 100 100 100 100 100 10			1.00	1.00		1.00	1,00		1.00
Annalys 111 221 224 45 101 201 201 201 201 201 201 201 201 201			1.00	1.00	1.00	1.00	1.00	100	1.00
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141 310 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.9			1575	1575	1575	1575	1575	1575	1575
% 289 992 0 9 2 9 2 2 2 2 2 2 2 2 2 2 2 2 2			46	125	652	304	11	761	136
% 28 92 8 1	0,92 0,92	0.92	0.92	0.92	0 92	0.92	0 92	0 92	0.92
289 992 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			2	2	2	2	2	2	2
1500 0.33 0 1500 (486 17 1500 (486 17 5.5 7.0 1.00 289 992 1.00 0.31 352 992 1.00 100 0.31 1.00 100 0.31 1.00 100 0.31 1.0			498	196	993	443	185	629	121
1500 2993 11 1500 1496 13 5.5 7.0 1.00 100			0.37	0.08	0.33	0.33	0.01	0.27	0.27
141 310 1496 17 1500 1496 17 17 17 17 17 17 17 17 17 17 17 17 17	1335 1500	2993	1335	1500	2993	1335	1500	2537	453
1500 1496 11 5.5 7.0 1.00 1.00 2.89 992 0.49 992 1.00 0.31 352 992 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.0	П	821	49	125	652	304	11	449	448
5.5 7.0 1.00 2.89 992 0.49 0.31 3.52 70 1.00 100 1	1335 1500		1335	1500	1496	1335	1500	1496	1493
Co), s 5.5 7.0 1 1 2 1 2 2 2 4 3 2 3 4 4 1 2 4 3 4 4 5 3 4 4 5 3 4 4 5 3 4 4 5 4 5 4		21.3	2.2	5.2	16.8	17.7	0.5	24.1	24.1
1,00 289 992 0,48 1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,0			2.2	5.2	16.8	17.7	0.5	24.1	24.1
289 992 0.49 0.31 3.5 992 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0			1.00	1.00		1.00	1.00		0.30
0.49 0.31 352 992 1.00 1.00 0 19.3 224 19.3 224 0.0	537		498	196	993	443	185	401	400
352 992 1,000 1,000 1,000 1,000 19.3 22.4 13 0.8 0.0 0.0 19 2.5 0.0 2.5 45 45 1111 24.1 2.5 197 1	0.90		0.10	0.64	99.0	69.0	90.0	1.12	1.12
1,000 1,000	537		498	265	993	443	350	401	400
11.00 1.00 0 19.3 22.4 0.0 0.0 1.9 2.5 0.0 2.2 0.0 2.2 2.2 4 5.7 34.4 11.1 24.1 2.5 19.7 0.0 2.2		100	1.00	1.00	1.00	1.00	1.00	1.00	1.00
193 224 173 08 00 00 19 26 206 232 C C C 451 224 25 344 1 25 344 1 25 197 1			1 00	1.00	1 00	1 00	1 00	1.00	1.00
113 0.8 00 0.0 19 2.5 206 23.2 C C C 451 224 45 111 24.1 25 197 1	1		18.4	23.4	25.7	26.0	24.1	33.0	33.0
100 000 000 000 000 000 000 000 000 000	0.0 18.3	H	0.4	3.4	1.6	4.4	0.1	81.8	82.0
19 25 C C C C C C C C C C C C C C C C C C		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
226 23.2 C C C 451 22.4 C C 3.2 1 2 344 1 4.5 4.5 11.1 24.1 2.5 19.7 1	H	7.9	0.7	1.9	0.9	0.9	0.2	17.5	17.5
206 232 C C C 451 224 224 7 344 11 2 45 45 11 2 197 1	- 1		300						Table 1
C C C 451 224 224 57 344 45 45 1111 241 25 197	42	78	18.8	26.9	27.3	30.4	242	114.7	114.9
451 224 6 6 7 45 45 45 45 111 241 25 197 00 22			B	O	٥	O	O	-	-
224 C C 344 45 4,5 1111 24.1 25 19,7 00 22.	¥	1354			1081			806	Í
1 2 45 44 111 241 25 19.7 0.0 2.2		33.4			28.1	I		113.7	I
5.7 344 4.5 4.5 11.1 24.1 2.5 19.7 0.0 2.2		S	d	ı	O	1	ı	u_	
57 344 45 45 111 241 25 197 00	3	US.	49	Di	89				
45 45 111 24.1 25 19.7 0.0 2.2	15.6 34.3	11.5	28.6	11.9	38.1			Ĭ	
11.1 24.1 2.5 19.7 0.0 2.2			4.5	4.5	4.5				
2.5 19.7 0.0 2.2	11.1 25.7		24.1	1113	25.7				I
0.0 2.2			26.1	7.5	23.3				
The state of the s			0.0	0,1	2		ı		1
intersection on many									H
HCM 8th Cht Delaw	49.8		İ		ı	ı	ı	l	
	0								
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NAMES. Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Synchro 10 Report Page 1

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HCM 6th Signalized Intersection Summary 6: College Drive & US-30 /US-30

2040 Total PM.syn 10/31/2018

	4	†	~	1	ļ	4	•	←	4	٨	-	*
Movement	193	EBI	EBR	WBL	WBT	WBR	ĕ	NBT	NBR	SBI	SBT	888
Lane Configurations	*	++	R	F	*	k	K	\$	R.	F	47	
Traffic Volume (veh/h)	250	920	145	380	200	38	155	1030	265	40	745	180
Future Volume (wehuh)	250	950	145	390	700	35	155	1030	595	40	745	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		8
Parking Bus, Adj	1.00	1.00	100	100	1,00	100	1.00	1,00	1.00	1.00	1.00	1.00
Work Zone On Approach		S			No			S			Se Se	
Adj Sat Flow, vehihilm	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	272	1033	0	424	761	38	168	1120	158	43	810	0
Peak Hour Factor	0.92	0.92	0.92	0.92	26'0	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	cv	2	2	2	2	2	2
Cap, vehih	261	888		255	1054	470	556	1047	467	136	176	0
Arrive On Green	90.0	0.30	000	0.12	0.35	0.35	20.0	0.35	0.35	0.04	0.31	0.00
Sat Flow, veh/h	1500	2993	1335	1500	2993	1335	1500	2003	1335	1500	3071	0
Gra Volume(v), veh/h	272	1033	0	424	761	38	168	1120	158	43	810	0
Gro Sat Flow(s), wet fulln	1500	1496	1335	1500	1496	1335	1500	1496	1335	1500	1496	0
O Serve(g_s), s	5.5	26.7	0.0	10.5	19.9	1.7	6.5	31.5	7.9	1.7	22.9	0.0
Cycle Q Clear(g. c), s	5.5	26.7	0.0	10.5	19.9	1.7	6.5	31.5	7.9	1.7	22.9	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.00
Lane Grp Cap(c), weh/h	261	888		255	1054	925	229	1047	467	135	941	0
V/C Ratio(X)	1.04	1.16		1.66	0.72	0.08	0.73	1.07	0.34	0.32	0.86	0.00
Avail Cap(c_a), vehilh	261	888		255	1054	470	558	1947	467	138	1047	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	100	000	1 00	1.00	100	1,00	90	1.00	100	1.00	0.00
Uniform Delay (d), s/veh	32.6	31.6	0.0	22.2	25.3	19.4	23.6	29.3	21.6	24.0	29.0	0.0
Incr Delay (d2), s/veh	67.0	858	0.0	315.0	4.3	0.3	116	48.3	0.4	1.3	6.9	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%sie Back.OfQ(50%),veh/in	8.3	19.9	0.0	25.8	7.4	9.0	30	17.8	24	9.0	88	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	2.66	117.5	0.0	337.2	29.6	19.8	35.2	77.6	220	25.3	359	0.0
LnGrp LOS	u	LL.		ш	O	æ	0	L	O	O	۵	A
Approach Vol. veh/h		1305	٧		1223			1446			883	
Approach Delay, s/veh		113,8			135,9			9.99			35.4	
Approach LOS	ě	u	H	Ä	iL.	ı		ш	ł		G	ī
Timer - Assigned Phs	-	2	65	180	45	9	1	80	8			E
Phs Duration (G+Y+Rc) s	7.8	36.0	15.0	31.2	11.0	32.8	10.0	36.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	ı			
Max Green Setting (Gmax), s	6.5	31.5	10.5	23.5	6.5	31.5	5.5	28.5	ľ		i	
Max Q Clear Time (g_c+1), s	3.7	33.5	12.5	28.7	8.5	24.9	7.5	21.9				1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.0	0.0	2.9			Ĭ	
NA PARTICIPATION OF THE PARTIC							1					

User approved pedestrian interval to be less than phase max green. Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Intersection Summers HCM 6th Ctrl Delay HCM 6th LOS

HCM 6th Signalized Intersection Summary 6: College Drive & US-30 /US-30

2040 Total AM_Improved.syn

	4	†	<u> </u>	1	ļ	1	*	—	•	۶	→	*
Mouersent	EBI	EBT	EBR	WBL	WEI	WBR	NBI	NBT	NBR	188 S	SBI	SER
Lane Configurations	ķ.	44	۴.	N.	44	Yc.	¥"	奉奉	W	¥	4-4-	Pt.,
Traffic Volume (veh/h)	130	285	88	445	755	45	115	009	280	10	200	125
Future Volume (veh/h)	130	285	8	445	755	45	115	900	280	10	200	125
Initial O (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1 00		1 00	00	2000	8	100		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	100	9	1.00	100	1.00	9.	1.00	1.00	1.00	1.00
Work Zone On Approach		8	H		2	-		9			S S	Ì
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	141	310	0	484	821	49	125	652	304	11	191	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	27.1	1070		1037	1219	244	195	1031	009	187	909	404
Arrive On Green	0.05	0.36	000	0.10	0.41	0.41	0.05	0.34	0.34	0.01	0.30	0.30
Sat Flow, veh/h	1500	2993	1335	2910	2993	1335	1500	2993	1335	1500	2993	1335
Grp Volume(v), veh/h	141	310	0	484	821	49	125	652	304	H	761	136
Grp Sat Flow(s), veh/h/ln	1500	1496	1335	1455	1496	1335	1500	1496	1335	1500	1496	1335
Q Serve(g_s), s	5.5	7.4	0.0	10.3	22.4	2.3	5.5	18.3	16.2	0.5	23.8	7.9
Cycle Q Clear(g_c), s	5.5	7.4	0.0	10.3	22.4	23	5.5	18.3	16.2	9.8	238	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	27.1	1070		1037	1219	544	195	1031	009	187	908	404
V/C Ratio(X)	0.52	0.29		0.47	0.67	0.09	0.64	0.63	0.51	0.06	0.84	0.34
Avail Cap(c_a), veh/h	271	1070	ĺ	1037	1219	544	195	1122	E	250	1122	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	8	1.00
Upstream Filter(I)	1 90	1 00	0.00	100	1.00	100	1 00	1.00	1.00	1.00	100	1.00
Uniform Delay (d), s/veh	223	23.0	0.0	16.6	24.2	18.2	26.1	27.5	19.6	24.6	32.6	27.1
Incr Delay (d2), s/veh	1.8	0.2	0.0	0.3	3.0	0.3	7.0	1.0	0,7	0.1	4.9	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.2	27	0.0	3.4	8.2	0.7	2.3	6.5	5.0	0.2	0.6	2.5
Unsig. Movement Delay, s/veh				1								
LnGrp Delay(d),s/veh	24.1	23.7	0.0	170	27.2	18.6	33.0	28.5	203	24.7	37.5	27.6
LnGrp LOS	O	ပ		В	U	മ	O	ပ	ပ	O	۵	O
Approach Vol. veh/h		451	ď	í	1354			1081		ı	806	H
Approach Delay, s/veh		23.8			23.2			26.7		Ì	35.8	ľ
Approach LOS	l	ပ	Ì	ı	ပ	۱		ပ	١	i	۵	Ī
Tumor Assumed Plac	**	0	013	**	140	(0)	T.	œ				
Phs Duration (G+Y+Rc), s	5.8	38.9	15.0	40.2	10.0	34.8	10.0	45.2		1		
Change Period (Y+Rc), s	4.5	4.5	4	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	2.5	37.5	10.5	28.5	5.5	37.5	5.5	33.5				
Max Q Clear Time (g_c+I1), s		20.3	12.3	9.4	7.5	25.8	7.5	24.4				
Green Ext Time (p_c), s	0.0	5.3	0.0	19	0.0	4.5	0.0	3.9		Ì	į	Ġ
Intersection Summary		ì									ì	
HCM 6th Chi Delay	į	i	27.3	i								n
HOM 6th LOS	l	l	3	l	l					ŀ	l	l
200 000			,									

Notes Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Synchro 10 Report Page 1

ary	
CM 6th Signalized Intersection Summa	ge Drive & US-30 /US-30
HCM 6th	6: Colleg

2040 Total PM_Improved.syn 02/11/2019

Lancontage Fig. F		١.	ì	•	•			-	-	-		Þ	
1,	Moderneni	183	183	188	WBI	WEI	WBB	NBI	NBT	MBR	8	SBT	SBR
250 660 145 380 700 35 155 1030 565 40 745 100 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations	J.	44	¥.	新	**	K.	K	44	¥	y.	**	*
250 950 145 390 700 35 155 1030 595 40 745 100 100 100 100 100 100 100 100 100 10	Fraffic Volume (veh/h)	250	980	145	330	200	35	155	1030	595	40	345	180
100 100 100 100 100 100 100 100 100 100	-uture Volume (veh/h)	250	950	145	390	700	35	155	1030	265	40	745	180
1,00 1,00 1,00 1,00 1,00 1,00 1,00 1,00	nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	٥	0	0
100 100	Ped-Bike Adj(A_pbT)	1.00		1,00	1.8	-	1 00	100	and the same of th	1 00	1.00		1.00
No. No.	Parking Bus, Adj	100	90	1.00	100	1.8	188	1 00	8	1.00	1 00	1.00	1.8
1575 1575	Work Zone On Approach		S			2			2			2	
272 (1933	Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
0.92 0.93 0.03 <td< td=""><td>Adj Flow Rate, veh/h</td><td>272</td><td>1033</td><td>0</td><td>454</td><td>761</td><td>88</td><td>168</td><td>1120</td><td>451</td><td>43</td><td>810</td><td>196</td></td<>	Adj Flow Rate, veh/h	272	1033	0	454	761	88	168	1120	451	43	810	196
2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.95	0.92	0.92	0.92
383 1053 407 1003 447 196 1032 574 124 977 150 150 0.2993 1335 2910 2993 1335 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 1002 2993 135 299 1100 1000 1000 1000 1000 1000 1000	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1,0 0.36 0.00 0.09 0.34 0.03 0	Cap, veh/h	303	1063		407	1003	447	196	1032	574	124	216	434
1500 2993 1335 2310 2993 1335 1500 2993 1335 1500 2993 1335 1500 2993 1335 1500 2993 1335	Arrive On Green	0.10	0.36	0.00	0.00	0.34	0.34	0.05	0.34	0.34	0.03	0.32	0.32
103 0	Sat Flow, veh/h	1500	2993	1335	2910	2993	1335	1500	2993	1335	1500	2993	1335
1500 (496 1335 (455 1496 1335 (500 1496 1435 (500 1496 1435 (500 1496 1435 (500 1496 1435 (500 1436 1436 (500 1436 1436 (500 1436 1436 (500 1436 (500 1436 (500 1436 (500 (500 1436 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500 (500	Srp Volume(v), veh/h	272	1033	0	424	761	38	168	1120	451	43	810	196
105 340 0.0 85 227 13 55 345 291 19 251 105 340 0.0 85 227 19 55 345 291 19 251 105 340 0.0 100 1.00 1.00 1.00 1.00 1.00 1.00	Srp Sat Flow(s), wehrhin	1500	1496	1335	1455	1496	1335	1500	1496	1335	1500	1496	1335
105 340 00 85 227 19 55 345 291 19 251 100 31 063 40 100 100 100 100 100 100 303 1063 407 1003 477 196 1032 574 124 303 1063 407 1003 477 196 1032 574 124 303 1063 407 1003 477 196 100 100 100 100 100 100 100 100 100 100	2 Serve(g_s), s	10.5	34.0	0.0	8.5	22.7	1.9	5.5	34.5	29.1	1.9	25.1	11.6
1100 1100 1100 1100 1100 1100 1100 110	Cycle O Clear(q_c) s	10.5	34.0	0.0	8.5	22.7	1.9	5.5	345	29.1	1.9	25.1	11.6
333 1053 407 1003 447 195 1032 554 124 972 303 1053 0033 1053 407 1003 447 195 1032 574 147 1017 100 100 100 100 100 100 100 100 1	Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
0.90 0.97 1.04 0.76 0.08 1.08 0.79 0.35 0.83 (9.30 1.053 0.053 1.053 0.053 1.053 0.053 1.053 0.053 1.053 0.0	.ane Grp Cap(c), veh/h	303	1063		407	1003	447	196	1032	574	124	972	434
333 1053 407 1003 447 195 1032 554 147 1017 100 100 100 100 100 100 100 100 1	//C Ratio(X)	06.0	0.97		1.08	0.76	0.08	0.86	1.08	0.79	0.35	0.83	0.45
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Avail Cap(c_a), veh/h	303	1063		407	1003	1447	196	1032	574	147	1017	454
1100 1100 0.00 1100 1100 1100 1100 1100	+CM Platbon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1 00	1.00	1.00
26.1 318 0.0 270 296 227 318 228 245 284 312 273 216 0.0 0.555 54 0.0 22 539 71 16 58 80 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Jostream Filter(I)	1.00	1.00	0.00	8	1.00	100	1.00	1.00	1.00	100	1.00	1.00
2773 216 0.0 555 54 0.4 222 539 771 16 58 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Jniform Delay (d), s/veh	26.1	31.8	0.0	27.0	29.6	22.7	31,8	328	24.5	26.4	31.2	26.7
6.5 15.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	nor Delay (d2), s/veh	27.3	21.6	00	55.5	2.4	0.4	29.5	539	T.	1.6	2.8	0.7
55 15 0 0.0 6.3 8.7 0.7 3.5 198 9.9 0.7 3.6 3.6 3.6 3.6 3.7	nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 D D F D C E F C C D D F D C E F F C C D D F D C E F F C C D D F D C E F F C C D D F D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C E F F C C D D C C D C C D C C D C C D C C D C C C D C C C D C C C D C C C D C C C D C C C D C C C C D C C C D C C C D C C C C D C C C C D C C C C D C C C C D C C C D C C C C D C C C C D C C C C D C C C C D C C C C D C C C C D C C C C D C C C C C D C C C C C D C C C C C C C D C C C C C C C D C C C C C C D C C C C C C D C C C C C C C D C C C C C C C C C C D C	Wile Back Of O(50%), vehin		15.0	0:0	6.3	8.7	2.0	3.5	19.8	66	0.7	9.6	3.7
534 00 82b 231 010 86b 31b 280 31 180 180 180 180 180 180 180 180 180 18	Jnsig Movement Delay, s/veh		4			1	4	1000	8		1000		100
1305 A 1223 1739 1739 1739 1739 1739 1739 1739 173	nGrp Delay(d), s/ven	53.4	53.4	0.0	979	32.0	3	0//0	200	310	0.07	37.1	27.5
1305 A 1223 1739 1334 51,1	nGrp LOS	٥	0		-	2	ن	"	L	U	U	2	3
534 511 699 1 2 3 4 5 6 7 8 8 0 390 130 400 100 370 150 380 45 45 45 45 45 45 45 45 45 50 345 85 340 55 340 105 320 00 00 00 00 00 00 35 00 3.1	Approach Vol, veh/h		1305	ď		1223			1739	l		1049	
1 2 3 4 5 6 7 8 8 8 8 8 9 9 13.0 40.0 10.0 37.0 15.0 38.0 8 8 8 9 9 13.0 40.0 10.0 37.0 15.0 38.0 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Approach Delay, s/veh	۱	534			51.1			669		1	34.9	1
80 380 130 400 10.0 37.0 15.0 5 7 6 7 7 8 8 9 9 130 40.0 10.0 37.0 15.0 15.0 38 9 38.5 34.0 5.5 34.0 10.5 39 38.5 10.5 38.0 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Approach LOS	ì	٥			۵		į	щ			O	Ì
8.0 39.0 13.0 40.0 10.0 37.0 15.0 45.5 45 45 45 45 45 45 45 45 45 45 45 45 45	Imer - Assigned Phs		2	m	*2	99	(4)	p44	00		i		7
45 45 45 4,5 4,5 4,5 4,5 4,5 5,5 5,0 5,0 5,0 0,0 0,0 0,0 0,0 3,5 0,0 5,5 5,0 0,0 0,0 0,0 0,0 3,5 0,0 0,0 0,0 0,0 3,5 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0,0 0	Phs Duration (G+Y+Rc), s	8.0	39.0	13.0	40.0	10.0	37.0	15.0	38.0		l		
50 345 85 340 55 340 105 39 365 105 360 75 27.1 125 00 00 00 0.0 0.0 3.5 0.0 54.6 D	Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
3.9 36.5 10.5 36.0 7.5 27.1 12.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 0.0 0.0 3.5 0.0 0.0 5.4 6.	Max Green Setting (Gmax), s		34.5	8.5	34.0	5.5	34.0	10.5	32.0				Ī
0.0 0.0 0.0 0.0 3.5 0.0 54.6 D	Max Q Clear Time (g_c+11), s		36.5	10.5	36.0	7.5	27.1	12.5	24.7				
mmary Delay	Green Ext Time (p_c), s		0.0	0.0	0.0	0.0	3.5	0.0	3.1	į	i		
Delay	Intersection Summany		Ĭ						ļ		i		Ĭ
	HCM 6th Ctrl Delay		Ì	546	1								Ī
	HCM 6th LOS			۵									

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Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 7: US-30 & Pershing Boulevard

2017-2018 Existing AM.syn 10/30/2018

HCM 6th Signalized Intersection Summary 7: US-30 & Pershing Boulevard

2017-2018 Existing PM.syn 10/30/2018

Potomoral	1000	102	002	10.00	TANK	MED	NAME:	ANGT	OHN	100	507	8
MOVEMENT	100	0	YOU	101	, and	NO.	NO.	NO.	NON	100	00	COOL
Lane Configurations		•	r.	,-	ŧ	E.		‡	_	-	t	-
Traffic Volume (veh/fi)	116	140	32	186	408	4	40	186	19	~	445	460
Future Volume (veh/h)	116	140	32	186	408	4	40	186	79	2	445	460
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	9
Ped-Bike Adj(A_pbT)	1,00		1.00	1.00		1.00	1 00		1.00	1.00		1.00
Parking Bus, Adj	1 00	1.00	1.00	1.00	1 00	1 00	1.00	1 00	1.00	1.00	1,00	1.00
Work Zone On Approach		No			S _O			No			S.	
Adj Sat Flow, veh/h/ln	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	126	152	0	202	443	0	43	202	98	2	484	200
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	239	458		346	871		382	1823	813	714	1823	813
Arrive On Green	0.29	0.29	000	0.29	0.29	0.00	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, wehith	947	1575	1335	1235	2993	1335	5772	2993	1335	1661	2993	1335
Grp Volumety), veh/h	126	152	0	202	443	0	43	202	98	2	484	200
Grp Sat Flow(s), veh/h/ln	947	1575	1335	1235	1496	1335	572	1496	1335	1001	1496	1335
Q Serve(g_s), s	11.5	8.9	0.0	13.8	11.1	0.0	3.4	2.5	2.4	0.1	6.8	21.1
Cycle Q Clear(g_c), s	22.6	9.9	0.0	20.6	11.1	0.0	10.2	2.5	2.4	5.6	6.8	21.1
Prop In Lane	1.00		1.00	1.00		1 00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	239	458		346	871		385	1823	813	714	1823	813
V/C Ratio(X)	0.53	0.33		0.58	0.51		0.11	0.11	0.11	0.00	0.27	0.62
Avail Cap(c_a), veh/h	404	733		562	1393		382	1823	813	E.	1823	813
HCM Platoon Ratio	1.00	1.00	1.00	1 00	1.00	1.00	1,00	1,00	1.00	1.00	1.00	1,00
Upstream Filter(I)	1 00	1.00	0.00	1.00	1 00	00.00	1.00	1.00	1.00	1.00	1.00	100
Uniform Delay (d), s/veh	36.0	25.0	0.0	33.1	26.6	0.0	10.6	7.4	7.4	7.9	8.2	11.0
Incr Delay (d2), s/veh	1.8	0.4	0.0	1.6	0.5	0.0	9.0	0.1	0.3	0.0	0.4	3.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ite BackOKO(50%),veh/ln		2.6	0.0	4.2	3.9	0.0	0.5	0.8	0.7	0.0	2.1	6.3
Unsig. Movement Delay, s/veh		ļ			Ì							
LnGrp Delay(d), s/veh	37.8	25.5	0.0	34.7	27.0	0.0	11.2	7.5	9.7	7.9	8.6	145
LnGrp LOS	۵	O		O	O		B	A	A	A	V	B
Approach Vol, veh/h		278	A		645	∢		331	l		986	B
Approach Delay, s/veh		31.0			29.4			8.0			11.6	
Approach LOS	ł	C)	i		O			Ø	i		œ	
Timer - Assigned Phs	ă.	2	Ĭ	*		9		co			8	1
Phs Duration (G+Y+Rc), s	N.	59.3		30.7		59.3		30.7				
Change Period (Y+Ro), s		4.5		4.5		4.5	١	4.5				
Max Green Setting (Gmax), s.		39.1		41.9	i	39.1	ı	41.9		i		
Max Q Clear Time (g_c+11), s		12.2		24.6		23.1		22.6			Ì	
Green Ext Time (p. c), s		2.1	2	1.3		4.9		3.6	i			
macsection Summary	ŀ	1	Į	į	ļ	ľ	į		i j	,		
HOM 6th Chi Dolan	ł	l.	201		I				ĺ			Ì
			200									

643 0.48 1335 1.100 1.000 1.00

5.8

333

197

85 2 2 2 454 897

575 No 582 582 0.92

00 575 S 82 092 092

575 92 442 92 92

355

Adj Flow Rate, vehih Peak Hour Factor

S75

8.8

988

87 0 0 0

88

88

088

Initial Q (Qb), veh Ped-Bike Adj(A_pbT)

Parking Bus, Adj Work Zone On Approach

Adj Sat Flow, vehilhilin

18 18

535

259

119 9 0

105

Traffic Volume (vehih) Future Volume (vehih)

2 0.48 993

0.48

0.00

0.00

2 0.42 575

472 0.42 1097

Amive On Green

Percent Heavy Veh, %

197 197 197 198 198 198 198 198

582 582 11.3 11.3

0 0 0 0 0

129 092 2 261 129 947 1115 319 947 1100 048 341 114 144 00.0

0.00 0.00

20 4 20 4 20 4

355

Grp Volume(v), veh/h Grp Sat Flow(s), veh/hiln

O Serve(g_s), s Cycle Q Clearig_c), s

1442 0.23 1.00 1.00 1.36 0.0 2.0 2.0

0.40 1.00 1.00 15.0 0.0 0.0 3.8

0.00 0.67 1.00 1.00 21.2 21.2 21.2 21.2 7.5

1.00 0.75 0.75 1.00 1.00 5.4 8.4

Avail Capic a) vehilh HCM Platoon Ratio

Lane Grp Cap(c), veh/h

000000

0000000

14 0 B 508

18.9

15.4

15.8

17.8

0.0

16.9

35.5

0.0

23.3

32.9

Unsig Movement Delay, s/veh LnGrp Delay(d),s/veh Initial Q Delay(d3), s/veh %ie BackOfQ(50%), veh/in Upstream Filler(I) Uniform Delay (d), siveh Incr Delay (d2), siveh

864 15.9

22.8

C 797

Approach Delay, s/veh Approach LOS

Approach Vol, veh/h

42.1 4.5 41.9 33.9

47.9 4.5 39.1 13.8 2.9

421 445 419 35.1 25

47.9 4.5 13.3 5.6

Change Period (Y+Rc), s Max Green Setting (Greax), s Max Q Clear Time (g_C+1), s Green Ext Time (p_C), s

14.3

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay

Synchro 10 Report Page 1

Synchro 10 Report Page 1

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

O

HCM 6th LOS

20.3

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HCM 6th Signalized Intersection Summary 7: US-30 & Pershing Boulevard

2040 Total AM.syn 10/31/2018

2040 Total PM.syn

HCM 6th Signalized Intersection Summary

7: US-30 & Pershing Boulevard

10/31/2018

1575 239 0.92

575 S

No 1326 0.92

370 370 370

1575

810 810 0.92

> 1575 522 0.92

Ped-Bik Adj(A_bt)
Parking Bus, Adj
Work Zone On Approach
Adj Sias Forw, Weithten
Adj Flow Rate, vehith
Persent Hour Factor
Percent Hour Factor
Gap, wehith
Antive On Green

168

20.43

0.43

571

0.43

0.43 493

1413

0.47 673

0.00

744 0.47 1575

1335

902 22.2 22.2

1326 1496 38.5

370

810 1575 42.5 42.5

Sat Flow weith Gry Volume(v), weith Gry Sat Flow(s), weithin Q Serve(g. s), s Cycle Q Clear(g.c) s Prop In Lane

168 673 673 673 80 210 80 80 80 80

8 8 8 8

0.70 1.00 21.1 21.1 0.0 0.0

> 1.00 25.8 34.9 0.0 0.0

> 680808

1.00 45.0 0.0 0.0

Upstream Filter(I) Uniform Delay (d), s/veh Incr Delay (d2), s/veh

Lane Grp Capic), vehith V/C Ratio(X)
Avail Capic_a), vehith HCM Platoon Ratio

1413 143 143 22

744 1100 1100 100 238 589 569

8 8

24.4

1 99

26.9

60.6

81.5

0.0

14.4

8.625

0.0

83.6

8 76

Initial Q Detay(d3), siveh Sile BackOfQ(50%), vehilin Unsig, Movement Detay, siveh 24.2

56.4

538

1332

Approach Vol. vehith Approach Delay, s/veh

nGrp LOS

47.0 42.5 44.5

430 45 46 5 40 5 40 5

45 425 44.5

40.5

Max Green Setting (Gmax) s Max Q Clear Time (g_c+11), s Green Ext Time (p_c), s

Change Period (Y+Rc), s

880

\$ 80 CC

25 50 0 00 to

5 8 a 6 8 8 mg

5 6 0 0 0

Lane Configurations
Traffic Volume (vehth)
Future Volume (vehth)
Initial Q (Qb), veh

088

0 2 6

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Movement	EBI	EBI	EBR	WBE	WBI	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	K	*	¥c.	F	‡	R	*	*	R.	K.	*	*
Traffic Volunte (vet//h)	180	185	100	245	535	30	160	440	105	20	930	590
Future Volume (veh/h)	180	185	100	245	535	8	160	440	105	20	930	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1,00	1,00	1.00	1.00	1 00	1.00	1.00	100	1.00	1.00	1.60
Work Zone On Approach		No			8			શ			8	
Adj Sat Flow, vehill/in	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, vehith	961	201	0	266	582	0	174	478	114	22	1011	641
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	588	640		458	1217		151	1476	699	408	1476	629
Arrive On Green	0.41	0.41	0.00	0.41	0.41	0.00	0.49	0.49	0.49	0.49	0.49	0.49
Sat Flow, vehilh	833	1675	1335	1181	2993	1335	305	2893	1335	825	2993	1335
Grp Volume(v), veh/h	196	201	0	566	582	0	174	478	114	22	1011	8
Grp Sat Flow(s), vehithin	833	1575	1335	1181	1496	1335	305	1496	1335	825	1496	1335
Q Serve(g_s), s	20,4	7.8	0.0	17.8	12.9	0.0	21.1	8.7	4.3	1,5	23.3	42.1
Cycle Q Clear(g_c), s	33.3	7.8	0.0	25.6	12.9	0.0	44.4	8.7	43	10.2	23.3	42.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), vehift	299	640	j	458	1217	l	121	1476	659	408	1476	659
V/C Ratio(X)	0.65	0.31		0.58	0.48		1.15	0.32	0.17	0.05	0.68	0.97
Avail Cap(c, a), vehilh	348	733		527	1393		151	1476	629	408	1476	689
HCM Platoon Ratio	1 00	1,00	1,00	9	9	1.00	1.00	1.00	1.00	1.00	1.00	100
Upstream Filter(I)	1.00	100	0.00	1 00	1.00	0.00	1 00	1.00	1.00	1.00	1.00	1 00
Uniform Delay (d), s/veh	31.9	18.2	0.0	56.9	19.7	0.0	40.0	13.7	12.6	16.8	17.4	22.2
Incr Delay (d2), siveh	3.5	0.3	0.0	1.2	0.3	0.0	120.1	9.6	9.0	0.3	26	29.1
Initial Q Detay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	00	00	0.0	00	00	0.0	0.0
%sle BackOfQ(50%),vehilin	4.3	2.8	0.0	5.0	4.4	0.0	8.4	2.9	13	03	8.0	17.4
Unsig. Movement Delay, s/veh										1		1
LnGrp Delay(d), siveh	35.4	18.4	0.0	28.1	20.0	0.0	0.0 160.1	14.3	132	17.1	20.0	513
LuGrp LOS	۵	œ		O	œ		u.	80	æ	œ	O	۵
Approach Vol. vehith	H	397	A	I	848	×		166			1674	
Approach Delay, s/veh		26.8			22.5			47.3			32.0	
Approach LOS	ľ	O		ı	ပ	ì	ì	0	ı	ı	O	Ī
Timen - Assisted Phys	ł	2	i	78	3	9		8	ı		E	Ī
Phs Duration (G+Y+Rc), s		48.9		41.1		48.9		1411		ŀ		
Change Period (Y+Ro), s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		39.1	Ì	41.9	i	39.1	ŀ	41.9	ě	ì		i
Max Q Clear Time (g_c+11), ≤		46.4		35.3	ŀ	44.1		27.6				
Green Ext Time (p_c), s	K	0.0	ľ	13	ř	0.0	ŧ	4.4	į	Ĭ	į	Ä
Intersection Summary		Ē	į		ď		į	ł	į	ľ	١	Ī
Constitution Constitution	l	l		ŀ	١	h	ŀ		į	Ì	į	I
HCM 6th LOS			275									Ī

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay,

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Synchro 10 Report Page 1

Synchro 10 Report Page 1

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay

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HCM 6th Ctrl Delay HCM 6th LOS

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HCM 6th Signalized Intersection Summary 7: US-30 & Pershing Boulevard

2040 Total AM_Improved,syn 02/11/2019

Lane Configurations		4	1	-	1	Į.	4	•	—	•	J	→	*
180 185 100 245 535 30 160 440 105 20 390 160 440 105 20 390 160 440 105 20 390 160 440 105 20 390 160 440 105 20 390 160 100	Concenent	EBI	183	EBR	ME	WBT	WBR	NBI	NBT	NBR	SBL	SBT	SBR
180 185 100 245 535 30 650 440 105 20 330 100	Lane Configurations	M	李奉	H.	¥.	44	*	je.	44	¥:	k"	4-	R.
180 185 100 245 535 30 160 440 105 20 330 100	Traffic Volume (veh/h)	180	185	100	245	535	30	160	440	105	20	930	290
100	Future Volume (veh/h)	180	185	100	245	535	30	160	440	105	20	930	280
100 100 100 100 100 100 100 100 100 100	IniBat Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
1575 1575	Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
1575 1575	Parking Bus, Adj	1.00	1 00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	1.00
1575 1575	Work Zone On Approach		No			No			No			No.	
196 201 0 266 582 0 174 478 114 22 1011 3	Adj Sat Flow, vetvhilin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
h, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Adj Flow Rate, veh/h	196	201	0	266	582	0	174	478	114	22	1011	380
eh, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Color Colo	Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
1500 2011 0.22 0.00 0.01 0.22 0.00	Cap, veh/h	202	538		381	671		240	1690	754	454	1358	909
1500 2993 1335 1500 2893 1335 1500 2893 1335 825 2893 1399	Arrive On Green	90.0	0.18	0.00	0.11	0.22	000	90.0	0.56	0.56	0.45	0.45	0,45
welvin 196 201 0 266 582 0 174 478 114 22 1011 welvin (500 1456 135 1500 150 153 1500 150	Sat Flow, vehilh	1500	2993	1335	1500	2983	1335	1500	2893	1335	825	2993	1335
verbrin 150 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1500 1496 1335 1496 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 13 251 14 37 13 251 13 251 14 351 13 251 14 351 14 351 14 351 14 351	Grp Volume(v), veh/h	196	201	0	266	582	0	174	478	114	22	1011	380
Secondary Seco	Grp Sat How(s) wehilvin	1500	1496	1335	1500	1496	1335	1500	1496	1335	825	1496	1335
City S 55 53 00 95 669 00 55 74 37 13 25.1 10 veh/h 202 538 381 671 240 690 754 449 1388 10 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0	Q Serve(g_s), s	5.5	5.3	0.0	9.5	16.9	0.0	5.5	7.4	3.7	1.3	25.1	19.6
1,00 1,00	Cycle Q Clear(g_c), s	5.5	5.3	0.0	9.6	16.9	0.0	5.5	7.4	3.7	1.3	25.1	19.6
p(g) veh/h 202 538 381 671 240 1690 754 454 1388 p(s) veh/h 202 538 671 240 1690 754 454 1388 a), veh/h 205 615 070 037 073 028 015 005 100	Prop In Lane	1.00	I	1.00	1.00		1.00	1.00		1.00	1.00	i	1.00
0.97 0.37 0.70 0.87 0.73 0.28 0.15 0.05 0.74 0.75 0.87 0.75 0.28 0.15 0.05 0.74 0.75 0.87 0.75 0.28 0.15 0.05 0.754 0.75	Lane Grp Cap(c), veh/h	202	538		381	671		240	1690	754	454	1358	909
202 615 381 748 240 1890 754 454 1388 140 140 140 140 140 140 140 140 140 140	V/C Ratio(X)	0.97	0.37	i	0.70	0.87		0.73	0.28	0.15	0.05	0.74	0.63
100 100 100 100 100 100 100 100 100 100	Avail Cap(c_a), veh/h	202	615		381	748		240	1690	754	454	1358	909
100 100 000 100 100 100 100 100 100 100	HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1,00	1 00	1.00	1 00	1 00
35.9 32.5 0.0 29.0 33.6 0.0 18.0 10.1 9.3 13.8 20.3 16.1 0.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Upstream Filter(I)	1.00	1.00	0.00	1 00	1.00	00.00	1.00	1.00	1 00	1.00	1.00	1.00
541 04 00 55 98 00 105 04 04 02 37 00 00 00 00 00 00 00 00 00 00 00 51 19 00 20 69 00 24 24 11 03 89 900 329 00 345 435 00 285 106 9.7 140 240 2 F C D D C B A B C B C B C B A B C C C C	Uniform Delay (d), s/veh	35.9	32.5	0.0	29.0	33.6	0.0	18.0	10.1	9.3	13.8	20.3	18.8
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Incr Delay (d2), s/veh	54.1	0.4	0.0	5.5	8.6	0.0	10.5	0.4	0.4	0.2	3.7	4.9
61 1.9 0.0 2.0 6.9 0.0 2.4 2.4 1.1 0.3 8.9 elb 90.0 32.9 0.0 34.5 43.5 0.0 28.5 10.6 9.7 14.0 24.0 24	Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
900 329 00 345 4315 0.0 285 106 9.7 14.0 24.0 F C C D C B A B C B A 848 A 766 1415 61.1 40.7 415 7.5 18.9 5.53 14.0 20.7 10.0 4.7 4.5 4.5 4.5 4.5 4.5 5.40 24.7 5.40 0.0 0.8 0.0 6.5 0.0 1.3	%ile BackOfQ(50%) vehiln	88	1.9	0.0	5.0	6.9	0.0	2.4	2.4	Ξ	0.3	8.9	6.5
F C C D C B A B C B11	Unsig. Movement Delay, siver		300	0.0	34.5	43.5	00	28.5	10.6	2.6	140	24.0	23.6
397 A 848 A 766 611 40.7 611 40.7	LnGro LOS	L	O		U	٥		O	В	A	В	ပ	O
611 40.7 145 E D B B 2 3 4 5 6 7 8 7 8 553 140 20.7 100 453 100 24.7 45 45 45 45 45 45 4.5 8 94 115 73 75 27.1 75 18.9 40 0.0 0.8 0.0 6.5 0.0 1.3	Approach Vol, veh/h		397	V		848	A	ji N	766			1413	Ī
2 3 4 5 7 8 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	Approach Delay, s/veh		61.1			40.7			14.5			23.8	
2 3 4 5 6 7 7 100 453	Approach LOS		ш			0		i	æ	į		O	
\$53 140 207 100 453 100 45 45 45 45 45 45 45 \$ 94 115 73 75 271 75 40 00 08 00 65 00 C	Timer - Assigned Phs		2	ŕ	4	10	9	1	60	Ĭ			i
45 45 45 45 45 45 45 45 45 85 85 85 85 85 85 85 85 85 85 85 85 85	Phs Buration (G+Y+Rc), s		55.3	14.0	20.7	100	45.3	10.0	24.7				P
s 485 95 185 55 295 55 s 94 115 73 75 27.1 7.5 30.2 C	Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				ı
s 94 115 73 75 271 75 40 0.0 0.8 0.0 6.5 0.0 30.2 C	Max Green Setting (Gmax), s		48.5	9.6	18.5	5.5	38.5	5.5	22.5	i	i	i	i
\$ 40 00 08 00 65 00 30.2 C	Max Q Clear Time (g_c+11), s		9.4	115	7.3	12	27.1	7.5	18.9		ı	ı	Ì
	Green Ext Time (p_c), s	j	40	0.0	0.8	0.0	6.5	0.0	. .			1	ĺ
Delay	Intersection Summally	H	I	Ī	ı	١			Ä				3
	HCM 6th Cld Delay		l	30.2	ł	ı		ı		i			
	HCM 6th LOS			O									

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

Synchro 10 Report Page 1

HCM 6th Signalized Intersection Summary 7: US-30 & Pershing Boulevard

2040 Total PM_Improved_syn

			,									
Movement	BE	EBI	EBR	WBI	WBI	WBR	MBI	MBT	NBR	38	381	SBR
ane Configurations	36°	*	Win	<u>k</u>	李安	¥)k;m	#	¥C_	¥.	**	¥2
rraffic Volume (veh/h)	480	745	140	155	340	22	135	1220	240	25	830	220
Future Volume (veh/h)	480	745	140	155	340	25	135	1220	240	52	830	220
nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	100	1.00	1.00	1.00	1.00	1.00	100	1.00
Work Zone On Approach		2			No.			No		1	2	41.00
Adj Sat Flow, vehillin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	522	810	0	168	370	0	147	1326	261	27	902	239
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	7	2
Cap, veh/h	454	929		225	497		206	1399	624	¥	1083	483
Arrive On Green	0.22	0.31	00.0	0.07	0.17	00.0	90.0	0.47	0.47	0.36	0.36	0.36
Sat Flow, vehih	1500	2993	1335	1500	2993	1335	1500	2993	1335	322	2993	1335
Grp Volume(v), veh/h	522	810	0	168	370	0	147	1326	261	27	905	239
Sr Sat Flow(s) veh/h/ln	1500	1496	1335	1500	1496	1335	1500	1496	1335	322	1496	1335
2 Serve(g_s), s	19.5	23.0	0.0	6.5	10.6	0.0	5.0	38.1	11.7	3.9	24.8	12.5
Cycle Q Clear(q c), s	19.5	23.0	0.0	6.5	10.6	0.0	5.0	38.1	11.7	32.6	24.8	12.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
ane Grp Cap(c), veh/h	454	929		225	497		206	1399	624	25	1083	483
//C Ratio(X)	1.15	0.87		0.75	0.74		0.71	0.95	0.45	0.29	0.83	0.49
Avail Cap(c_a), veh/h	454	1047		225	615		206	1399	624	\$	1083	483
HCM Platoon Ratio	1,00	1.00	1.00	1.00	1.00	1.00	1 00	1.00	1.00	1.00	1 00	1 00
Jpstream Filter(I)	1 00	100	0.00	1.00	1.00	00:00	1.00	1.00	1.00	100	1.00	1.00
Uniform Delay (d), s/veh	25.7	29.3	0.0	32.7	35.7	0.0	22.9	22.9	15.9	44.0	26.2	22.3
nor Delay (d2), s/veh	90.2	7.5	0.0	12.8	3.8	0.0	11.1	14.5	2.1	7.5	7.5	3.6
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/In	19.1	8.9	0.0	1.8	4.1	0.0	2.4	15.2	3.7	0.8	9.6	4.3
Unsig Movement Delay, s/veh	-	1									200	200
LnGrp Delay(d),siveh	115.9	36.9	0.0	45.5	39.6	0.0	33.9	37.4	17.9	51.5	33.8	25.9
LnGrp LOS	ш	O		٥	0		O	۵	8	٥	U	0
Approach Vol, veh/h		1332	×		238	A		1734	Ĭ		1168	i
Approach Delay, siveh		67.8			414			34.2		1	32.6	i
Approach LOS	l	ш	ı	H	٥	Ĭ	i	9		١	ω	ĺ
Timer Assigned Phs		~	(*)	٧	3	9	**	00	ľ		Ì	
Phs Duration (G+Y+Rc), s		46.6	110	32.4	9.5	37.1	240	19.4				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		388	6.5	31.5	5.0	29.0	19.5	18.5		Î		Ī
Max Q Clear Time (g_c+11), s		40.1	8.5	25.0	7.0	34.6	21.5	12.6				Ì
Green Ext Time (p_c), s		0.0	0.0	2.9	0.0	0.0	0.0	1.2	i	ğ		Ì
Intersection Summary		1			į		Ġ					
HCM 6th Chi Delay			44.8			i				l	l	

Notes: Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC 8: Polk Avenue/Service Road & US-30

ntersection												
Int Delay, s/veh	0.4											
Movement	83	183	EBR	WEL	WBT	WBR	Net	NBI	NBR	THE S	581	Ser
Lane Configurations	je.	*		pr-	4			4			4	
Traffic Vol. veh/h	CV	300	0	13	196	22	Ť	0	40	40	2	
Future Vol. veh/h	2	300	0	60	296	22	*	0	ω	w	2	6
Conflicting Peds, #Ihr	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	(A)	1	None			None	0	×	None		3	None
Storage Length	125	12.	ľ	75	1	A	•		4	Ē	9	
Veh in Median Storage, #	t t	0		•	0	*	*	-	2		1	
Grade. %	8	0	•	*	0	٨	٠	0	•	•	0	
Peak Hour Factor	17	2	12	96	38	55	88	80	88	80	80	80
Heavy Vehicles, %	7	2	2	7	7	7	7	7	7	7	7	7
Mont Flow	က	417	0	61	1018	23		0	7	(0)	e	11
Wajor/Minor N	(Sport			Majori			linort			Stoots.	H	
Conflicting Flow All	1041	0	0	417	0	0	972	1502	500	1283	1491	521
Stage 1		91	•			•	423	423		1068	1068	
Stage 2	(*)	*	Ť		(4)	A.	546	1079	ė.	215	423	¥i
Critical Howy	47.4	1		4,14			7.54	6.54	6.94	7.54	159	6.94
Critical Hdwy Stg 1			ľ				6.54	5.54	•	6.54	5.54	
Critical Holay Stg 2	*	×		0	1		8.54	5.54	A	6.54	553	
Follow-up Hdwy	2.22			2.22	₹¥	^	3.52	4.02	3,32	3.52	4.02	3.32
Pot Cap-1 Maneuver	25	it.	18	1138	M.	24	207	121	797	122	123	200
Stage 1	(*)	*	7*	٠	74	٠	579	989	2.5	237	296	*
Slage 2	*	13		4	•	2	488	293		191	989	•
Platoon blocked, %		1.	*		40	Ä						
Mov Cap-1 Maneuver	664	1		1138	1	i.	197	118	797	119	120	200
Mov Cap-2 Maneuver	•	•		٠		•	322	220	5	198	222	
Stage 1	0	N.	0	0	•	19.	576	583	13	235	291	
Stage 2	91	ne.			7/4	(4	465	288	17	757	583	7/4
						V						
Approach	EB		Ŀ	WB			NB			88		
HCM Control Delay, \$	0.1	H	8	0.1			10.5			17.6	ı	
HCM LOS							æ			ပ		
Marie and Marie			Š		H				Į		ľ	Ì
Minor Late Magn Numi		MBLn1	183	183	EBR	18/1	WBT	WBRSBtm	Beni		ď,	
Capacity (vehifi)		899	799		1	1138		*	306			
HCM Lane V/C Ratio		0.012	0.004			0.017	•	•	0.065			
HCM Control Delay (s)		10.5	10.4		100	8.2	7	۰	17.6	ľ	ı	i
HCM Lane LOS		00	œ		-	A	•	æ	U			
HCM 95th %tile O(veh)		0	0	-		0.1	10	24	0.2			
		,							ó			

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HCM 6th TWSC 8: Polk Avenue/Service Road & US-30

2017-2018 Existing AM.syn 10/18/2018

2017-2018 Existing PM.syn 1018/2018

III Delay, Seell	2												
foundations	ä	122	800	EGO WAS	MPT	dam	2	NOT	AIDO CEL	ш	Cor	des	
ANEINEWI CALLED	100	ŀ		4	1	5		1	ź	и.	100	000	
ane Configurations		1		-	4			\$			4		
raffic Vol. vehilh	4	845	0	82	473	13	5	S.	43	23	=	00	
Future Vol. veh/h	4	845	3	82	473	13	2	S	43	22	1	œ	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Chamelized			None		100	100		WA.	None	N.		None	OH THE PERSON
Storage Length	125	*	0	75	*		2.	2.		1			
/eh in Median Storage, #	**	0			0	X	*		9	4	-	1	- Contract - Contract
Grade, %	*	0		٠	0	*	#1	0	1	4	0	٠	
Peak Hour Factor	79	79	22	98	35	95	78	78	282	10	25	10	
Heavy Vehicles, %	7	7	2	7	2	2	2	2	7	2	2	2	
Avmt Flow	47	1070	প	33	498	7	00	1D	28	43	22	9	
Najprolytinor W	Majori	3		Valor2			Minorit		6	Amor?			
Conflicting Flow All	512	0	0	0 1074	0	0	1404	1656	537	1115	1651	256	
Stage 1		*	×	1			1082	1082		567	567		THE REAL PROPERTY.
Stage 2	(8)	*	*	*	A.	*	322	574		548	1084		
Critical Hdwy	414		1	414		ľ	7.54	654	6.94	7.54	6.54	694	- Table
Critical Hdwy Stg 1				٠	ľ		6.54	5.54		6.54	5.54		
Critical Hiday Stg 2	4			¥		*	6.54	5.54	1	6.54	5.54	4	
Follow-up Hdwy	2.22		9	2.22		•	3.52	4.02	3.32	3.52	4.02	3.32	
Pot Cap-1 Maneurer	1050	18	*	645		•	66	26	488	163	86	743	
Stage 1	14	7.	10	•	1,8	10.	232	292		476	505		
Stage 2	۰			•	Å	×	999	501	٠	488	291		
Platoon blocked, %		(A)				30							
Nov Cap-1 Maneuver	1050		Š	645		ľ	85	8	488	135	93	743	
Mov Cap-2 Maneuver		17	*	K			100	203		256	191		
Stage 1	3.5					*	231	291	9	474	481	*	
Stage 2	100	7	i de	4	/4		591	477		451	290	()+	
		Ī	Ī	l		ı	H	i	ı			į	
pproach	8			WB			NB.			SB		U	
HCM Control Delay, s	0			9.0			15.6			24.3			
HCM LOS							O			ပ			
						ì							
linor Lane/Major Muth		Bini	E81	181	EBR	NB.	WBI	WBR SBLn	Strif				1000
apacity (veh/h)		404	1050	i	16	645	ì	ľ	997	ı			
HCM Lane V/C Ratio		0.159	0.005			0.047			0.302				
HCIA Control Delay (s)		15.6	84			10.9			24.3			K	
HCM Lane LOS		U	٧	•	000	α	,	- 1	c				
						3			>				

o. Poik Avenue/Service Road & US-30													
and the state of t											ı		
Int Delay, s/veh	0.8						l,		Ý	ı		l l	
Movement	Ħ	EBI	EBB	WBL	VBT	WBR	NBL	NBI	NBT ABR	S	SBT	See	
Lane Configurations	-	42		K	415			42			4		
Fraffic Vol. veh/h	2	630	9	25	1500	8	5	9	10	10	2	15	TOTAL PARKET
Future Vol. veh/h	S	630	ın	52	1500	8	S	w	10	2	S	15	
Conflicting Peds, #thr	0	0	0	0	0	0	0	0	0	0	0	0	No. of Lot
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	N.	1	None	i.	ii.	None	11		None			None	THE RESERVE
Storage Length	125	•	1/4	75	*		٠		4	4		(*	
/eh in Median Storage.	# 6	0			0	1	*	-	4	(6)	=		
Grade, %		0	4	4	0	25		0	•	*	0	10	
Peak Hour Factor	35	35	8	96	98	38	35	35	92	92	85	85	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
dvmt Flow	150	989	9	38	1579	32	\$	5	Ŧ	=	w	16	Market Street
Laper Marce	Majort		1	1400	i		Minor1		- 50	Sec. 2			
Conflicting Flow All	1611	0	0	069	0	0	1542	2361	345	2002	2347	806	
Stage 1					(6)	H.	698	869		1647	1647	10	
Stage 2	1,0	*		100); (×	844	1663	4	355	700		
Critical Hdwy	4.14	8	*	4.14		4	7.54	6.54	6.94	7.54	9.54	9 84	
Critical Hdwy Stg 1	2			(4)	٠		6.54	5.54	*	6.54	5.54	90	
Critical Holary Stg 2	Y	À		14)	*		6.54	5.54		95.9	5.54		
Follow-up Hdwy	2.22	*	*	2.22	•		3.52	4.02	3,32	3.52	4.02	3.32	
Pot Cap-1 Maneuver	401		i	900			78	35	651	8	99	325	
Stage 1	٠		É	×	1.	P.	397	440	•	103	155		
Stage 2				VA L		1	324	152	2	635	440	21	
Platoon blocked, %		1	//4		(i)	ji.	1	1	1				
Mov Cap-1 Maneuver	401	×	•	900		(4)	8	Z	651	32		325	
Mov Cap-2 Maneuver	*	1.0	•	*		i.t.	18	109	•	88	1	(*)	
Stage 1	000	×	•	A	100	(0)	383	435		102	121	le.	
Stage 2			T	¥.	Mir	.*	288	148	i.	609		e	

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. 0.225 . 0.225 . 36.9 . E

- 900

225 401 0.097 0.014 22.7 14.1 C B 0.3 0

Capacity (vetuh)
HCM Lane V/C Ratio
HCM Control Delay (s)
HCM Lane LOS
HCM 195th %ile O(weh)

HCM Control Delay s HCM LOS

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HCM 6th TWSC 8: Polk Avenue/Service Road & US-30

2040 Total PM.syn 10/30/2018

Su													
Lane Configurations Traffic Vol. vehin	EBI	EBI	EBR	18/	WBT	WBR	NBI	NBT	MBR	SBE	581	SBR	
Traffic Vol. vehih	×	44		F	44			÷			ŧ		
Property and the same of the	'n	1705	urs.	40	1015	8	40	2	25	8	12	15	
Future Vol. ven/n		1705	S	49	1015	2	10	S	55	8	5	13	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control F	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
paz	K		None	O. N.		None	4		None	×	1	None	
Storage Length	125	٠		75	1.5		A		A	90		•	
Veh in Median Storage #	1	0	*		0		×	-	A	٨	-		
Grade. %	¥	0	٠	*	0	*		0	*	*	0	:	
Peak Hour Factor	65	26	92	98	95	98	92	65	92	92	35	60	
Jeavy Vehicles %	~	2	2	2	0	2	2	2	~	2	2	2	
Avril Flow	2	853	10	45	1068	51	40	10	69	33	16	16	
the files	H	F		Chie			Page 1		Ī	Crown 2	ĵ		
-low All	1089	0	0	1858	ľ	0	2492	3039	929	2102	3031	545	
П	•	×	**	3	*		1866	1866	10	1163	1163		Marine Land
Stage 2	à	9	×	. *	.51		626	1173	٠	939	1868	·	
	4.14	a.	×	4.14	X		1.55	6.54	6.9	157	6.54	6.94	
Critical Howy Stg 1	÷	£	*	.*	*!	*	6.54	5.54	*	6.54	5.54	*	
Critical Howy Stg 2	٠	X	×		1		6.54	100	i	6.54	5.52		
ı	2 22	١	•	2.22			3.52	4.02	332	3.52	4 02	3.32	
uver	636	۰	80	322		2	15	13	269	98	- 13	482	
	a			ľ	17	104	75	121	•	202	267	10	
Stage 2	*	(*	1.0	18	i,		439	284	×	284	120	9	
Platoon blocked, %		(#.	×).*.								
92	636			322	*		10	11	568	-20	=	482	
Mov Cap-2 Maneuver	.(*)	.00	Y	P.	*	14.	28	76	90	93	28	7.00	
Stage 1	6	١	×	1)	1	×	74	120	×	205	232		
Stage 2	¥.	٠					343	230	i	509	119		
Anneset	Æ	н		WB			NB.	ı		SB	H		
HCM Control Delay s	c	ı	I	0.7			8.56		l	97.5	L		
HCM LOS		ı	ı		Н		ш	ı		ш			
Company of the Control of the Contro		ı		H		V.	ş		B	ı	ř	i	
Minor Lanel Major Mymt	N	NELET	8	19	HER	WBI	WBT	WBT WBR SELDT	Mar I	ŀ		K	
Canacity (veh/h)		182	636	ľ	ľ	322	•		26				
HCM Lane V/C Ratio	0	0.388	0.009			0.131	1	A	0	ŀ			
HCM Control Delay (s)	L	36.8	10.7	*		17.9	ì		97.5	l	ľ	į	
HCM Lane LOS	ı	w	œ		"	O	*	•	u				
HCM 95th %tile Q(veh)	1	-3	0		M	0.4	Y		33				
	١	١			ı	ı		١		١	ı		

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HCM 6th TWSC 8: Polk Avenue/Service Road & US-30

intersection.	i											
Int Delay, s/veh	0.2											
Movement	183	183	588	WB	WBI	WBT WBR	NBI	NBT	NBR	SBL	SBT	SBR
Lane Configurations		42			4				×.			ĸ.
Fraffic Vol. veh/h	0	630	9	0	1500	33	0	0	9	0	0	12
-uture Vol. veh/h	0	630	w	0	1500	8	0	0	9	0	0	15
Conflicting Peds, #/hr	0	0	0	0	G	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None			None			None	*	Ŧ	None
Storage Length	(#.	11+:					1.4		0		1	0
Veh in Median Storage.		0	,	000	0	٠	ij.	•	ox T		-	A
Grade, %	٠	0	œ.		0		*	0		30	0	è
Peak Hour Factor	85	35	25	88	98	8	65	92	92	35	35	92
Heavy Vehicles, %	~	2	7	cı	~	2	2	2	2	2	N	2
Avmt Flow	0	989	S	0	1579	32	0	0	÷	C	0	16
Asio/Minre	Majord		2	Major	ľ		Mineral	١	Ī	Minne	ļ	Ì
low All		0	0			0	9	11.	345	22	8	806
State 1	0	18	ii.		3	360	16.	(6	13	3	8	à
Stage 2)*(*		-	٠	*	٠	*	2.	*	•
Critical Hdwy	*	*	1.	2	6	6	×		6.94	ì		6.94
Critical Hdwy Stg 1	٠	15	*	٠			*	٠	٠	*		
Critical Howy Str 2	,									×		4
-ollow-up Hdwy	(10)	(20)	(7)		74	24	7.	.0	3.32	2	8	3.32
Pot Cap-1 Maneuver	0		e.	0		24	0	0	3	0	0	325
Stage 1	0	18	7.	0		¥	0	0	18	0	0	À
Stage 2	0	it.		0	٩	28.	0	٥	i.	0	0	١
Platoon blocked, %		۰				:						
Mov Cap-1 Maneuver	.01		ì	×	8		8	6	651	ľ	1	325
Mov Cap-2 Maneuver	٠	•	*/	*		•	*	٠	٠	•	•	
Stage 1	ì		7	0	ì	Î	K		2	"		
Stage 2	(10)	3	3.		9	2	74	a			3	2
Aptroach	8			MB MB			NB.			88		
HCM Control Delay, s	0			0	E		10.6			16.7	h	
HCM LOS		,	ř		P		8		ì	O		j
Amor Lane Major Mymt		NBLn1	E	EBR	WBI	EBR WBT WBRSBLn1	BLut					
Capacity (weh/h)		651	7	3			325					
HCM Lane V/C Ratio	Ĭ	0.017	•	*	•		0.05					
HCM Control Delay (s)		10.6	ì		Ĭ		16.7					
HCM Lane LOS		00	ð,	Į.	14	24	U	ı	ı	۱	ı	
HOM 95th %ale O(veh)		0					0.5	ì			ì	

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2040 Total AM_Improved.syn 02/11/2019

HCM 6th TWSC 8: Polk Avenue/Service Road & US-30

2040 Total PM_Improved.syn

III Deldy, Syvell	5											
Movement	183	EBT	80	3	1811	WBR	MBL	NBT	NBR	195	SBI	SBR
ane Configurations		42			4				*			×
raffic Vol. veh/h	0	1705	40	٥	1015	8	0	0	35	0	0	15
-uture Vol. veh/h	0	1705	3	0	1015	20	0	0	22	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	N.		None	Y		None	•		Norse	0	12	None
Storage Length	*	(2)	٠	4	(4)	A	*	117	0		à	0
/eh in Median Storage, #	1. 株	0		i.	0	(8)	9)	-	7/		1	
Grade, %	*	0	ř	٠	0	À	*	0		•	0	٠
Peak Hour Factor	92	92	35	35	35	95	35	35	35	85	92	92
Heavy Vehicles, %	7	7	7	7	7	2	7	7	7	7	7	2
Avmt Flow	0	1853	10	0	1068	21	0	0	8	0	0	9
Rajonfilmon	MajorT	H		Major2	B	5	Minori			Minor2		
Conflicting Flow All	*	0	0	*	i.	0	20	15	929	×	9	545
Stage 1	×		*	×	٠		×		H	•	1	×
Stage 2	Y	27	*	٠	•		ě	*	ř	٠	4	
Critical Howy	*	*		1	•	1			6.94		i	\$6.94
Critical Hdwy Stg 1	*		8		•	i.	j.	٠	•		٠	I ko
Critical Holay Stg 2	3.9	1			10	M.	9	1	20	9	4	
Follow-up Hdwy	17	11,7	*	/4	216	<u>(</u> ()	()¢_	51.*	3.32		114	3.32
Pot Cap-1 Maneuver	0	22	1	0		A	0	0	569	0	0	482
Stage 1	0)¥.	0	*	90	0	0	•	0	0	٠
Stage 2	0	11	*	0	•	*	0	0	•	0	0	
Platoon blocked, %		đ.			٠	(4)						
Anv Cap-1 Maneuver	9	ř	÷		ij	í	Ì	K	269	î		482
Nov Cap-2 Maneuver		3	6			E	10	١	•		100	
Stage 1	ľ				14	(4)	(3)	3.0	٠	9		4
Stage 2	S#			1	34	34	æ	iit.	Z.		7/4	74
				I	ľ			ı	ı	ľ		
Approxich	E8			WB	H	ì	9			SB		
HCM Control Delay, s.	0			0			222	P		12.7		
HCM LOS	. 1	ħ		Ę	1	i	ပ			m	è	
Airor Lane Major Myrrit	W	MBLn1	183	EBR	WBT	WBT WBR SBLn1	Bru!			10)		
apacity (wehith)		592	1	ľ	ľ	1	482					
HCM Lane V/C Ratio		0 222	ľ	ľ			0.034		ŀ			
HCLA Control Delay (s)		22.2	88	7.		0	127	ł	í	ľ		
HCM Lane LOS		ပ	-	1/4	14	(9	œ	ı				
							9					

9: US-30 & Van Buren Avenue	Bure	n Ave	enue				10/18/2018
Intersection				J,	ı		
Int Delay, s/veh	2,8						
Movement	83	E81	WBI	WBR	SBL	SBR	
Lane Configurations	A.	*	4		2		
Traffic Vol. vehilh	Z	228	859	10	6	134	CONTRACTOR OF THE PARTY OF THE
Future Vol. veh/h	R	228	829	2	o	134	
Conflicting Peds, #fhr	9	0	0	0	o	0	THE RESERVE THE PERSON NAMED IN
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	100	None	14	None		None	THE PROPERTY OF THE PERSON NAMED IN
Storage Length	100		141		0	(*)	
Veh in Median Storage, #	1.00	0	0	٠	-		
Grade. %	•	0	0	è	0	*:	
Peak Hour Factor	8	80	8	62	98	92	
Heavy Vehicles, %	7	2	7	7	2	2	
Mymt Flow	8	385	954	16	18	176	Name and Address of the last
Section 1	1						
ш	and a		months C.		700		
Conflicting Flow All	920	0	*	0	1265	485	
Stage 1		3	*	Ä	982		
Stage 2		4	¥	١	303		
Critical Holay	4.14	*		¥.	6.84	6.94	
Critical Hdwy Stg 1	Ú	*	ě	*	5.84	*:	
Critical Hdwy Stg 2	V	Ĭ	ň		5.84	*1	
Follow-up Hdwy	2.22	•	٠	٠	3.52	3.32	
Pot Cap-1 Maneuver	902	1	1	a I	161	828	
Stage 1		100		9	331	1.*	
Stage 2	0	4	12	A	723		DESCRIPTION OF PERSONS ASSESSED.
Platoon blocked, %			íø.				
Mov Cap-1 Maneuver	200	-			143	528	THE RESERVE AND DESCRIPTIONS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN CO
Mov Cap-2 Maneuver	1	*	90		236	*.	
Stage 1	ľ		•	É	294		
Stage 2	•		١	•	723		
	ı			ľ	B		
Augroach	82		WB		88		A STATE OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON ADDRESS OF T
HCM Control Delay, s	24		0		17.5		
HCM LOS					ပ		

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Capacity (vehn)
HCM Lane V/C Ratio
HCM Control Delay (s)
HCM Lane LOS
HCM 95th %tile Cl(veh)

Synchro 10 Report Page 1

HCM 6th TWSC 9: US-30 & Van Buren Avenue

2017-2018 Existing PM.syn

THE COUNTY OF THE PARTY OF THE							
Int Delay, s/veh	13						
Movement	83	83	WBT	WBR	SBI	SBR	
Lane Configurations	*	\$	4.		*		
raffic Vol. veh/h		31.2	363	2	19	75	
Future Vol. veh/h	143	716	353	15	16	75	
Conflicting Peds, #fbr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized				None	3	None	
Storage Length	100	*		*	0		
Veh in Median Storage, #	*	0	0	18	-	4	
Grade. %	*	0	0	*	0	*	
Peak Hour Factor	88	88	88	S,	80	75	THE RESERVE OF THE PARTY OF THE
Heavy Vehicles, %	2	2	2	2	2	2	
North Flow	4	842	397	28	R	8	
WaterMinor	Maior1		Major2.		Minor2		
low All	425	0	3.	0	1154	213	
State 1			(8)		411	٠	
Stage 2	٠	٠	ş	*	743	1	
Critical Hdwy	4.14		×		6.84	6.94	
Critical Hdwy Stg 1	*	٠	*	*	5.84	٠	
Critical Houry Stg 2		1	-		5.84		
Follow-up Hdwy	2 22	0.0()	2.0	4	3.52	3.32	
Pot Cap-1 Maneuver	1131	1	.9		190	792	
Stage 1	8.	+	19.	*	638	70	
Stage 2	•		N.	100	431	100	
Platoon biocked, %		٠	90	*	100		
Mov Cap-1 Maneuver	1131	0	×	3	163	795	
Mov Cap-2 Maneuver	**	*)	97	*9	225		
Stage 1	i	i	-	1	547		
Stage 2			*	٠	431		
	ı						
concach	88		WB		83		
HCM Control Delay, s	1.4		0		13.2		
HCM LOS		I		-	œ		
fron Canelifiagor Mornt		EBE	E81	WBT	WBR SBLn1	Bln1	
Capacity (veh/h)		1131	10.	12		258	
HCM Lane V/C Ratio		0.142	ľ	9.	•	0,215	
HCM Control Delay (s)		8.7			U	13.2	
HCM Lane LOS		<		,	٥	œ	
TOTAL PROPERTY OF THE PARTY OF		4				2000	

HCM 6th TWSC 9: US-30 & Van Buren Avenue

2040 Total AM.syn 10/30/2018

9: US-30 & Van Buren Avenue

HCM 6th TWSC

2040 Total PM.syn 10/30/2018

380 1415

3.7

Int Delay, s/veh

Free

Traffic Vol. vekyh
Future Vol. vekyh
Conflicting Peds. #/hr
Sign Control
RT Channelized

92 92

913

Conflicting Flow All Stage 1 Stage 2

Storage Length 100
Veh in Median Storage. # Grade, % Peak Hour Factor 92
Heavy Vehicles, % 2
Mont Flow 413

mersection							
nt Delay, s/veh	19.9						
Novement	88	EBI	MBI	WBR	芸	SBR	
ane Configurations	K	*	44		>		
Traffic Vol. veh/h	160	470	1250	155	22	305	
-uture Vol. veh/h	160	470	1250	155	12	305	
Conflicting Peds, #Arr	0	0	0	0	0	0	San State of the San State of San San San San San San San San San San
Sign Control	Free	Free	Free	Fræ	Stop	Stop	
RT Channelized		None	5	None	7	None	
Storage Length	9	*	Ţ.	٠	0		
Veh in Median Storage, #	禁	0	0	7.00	8	10.	
Grade, %	(8)	0	0		0	(4)	
Peak Hour Factor	85	85	92	35	83	65	
Heavy Vehicles, %	2	2	2	2	2	2	
Myrmit Flow	174	15	1359	55	10	333	
Name of College	3	1	Company	-	Control	ì	
Confliction Class All	15.07	9	The same	6	2007	784	
State 1	4	201	8	100	1443	5	
Stade 2	×	æ) is	909	*	
Critical Howy	4.14			*	6.84	6.94	
Critical Hdwy Stg 1	*	50	8	1.0	5.84	٠	
Ontical Holmy Stg 2	20	ľ	1	-	5.84		
Follow-up Hdwy	2.22			٠	3.52	3.32	
Pot Cap-1 Maneuver	435	4		19	89	346	
Stage 1	i (r	Ų.	Œ		184	1/4	
Stage 2	*	*		*	208	ā	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE P
Platoon blocked, %	1	*	ē	*			
Mov Cap-1 Maneuver	432		8	4	83	346	
Mov Cap-2 Maneuver	*:	30	Ř	*	8	٠	
Stage 1	i	i	N.	1	110		
Stage 2	Ň	ì	Ì	•	208)	
	ŀ	ì		ı		ì	
Approach	82	Š	WB		88	3	THE PARTY OF THE P
HOM Control Delay, s	4.8	×	0		136.8		
HCM LOS					u.		
	ı	ı					
Without Easter Martil		Ħ	H	WBT	WBT WBR SBLIN	L Y	
Capacity (vehin)		432	V.	A.	T.	305	
HCM Lane V/C Ratio		0.403	•	0.00	•	1 152	
HCM Control Delay (s)		18.8				136.8	
HCM Lane LOS		ပ	•	1		ш	
HCM 95th %tile O(veh)		6	3	8	14	9	

2 22

Critical Howy Stg 1
Critical Howy Stg 1
Critical Howy Stg 2
Follow-up Howy
Pot Cap-1 Maneurer
Stage 1
Stage 2

. 11 551 . 302 . . 158 .

Mov Cap-1 Maneuver Mov Cap-2 Maneuver Platoon blocked, %

Stage 1 Stage 2

SB 7

3.3

Approach HCM Control Delay, c HCM LOS

742 0.557 15.8

HCM Lane V/C Ratio
HCM Control Defay (s)
HCM Lane LOS
HCM 95th %title O(weh)

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HCM 6th Signalized Intersection Summary 9: US-30 & Van Buren Avenue

2040 Total AM_Improved.syn 02/11/2019

	1	†	~	4	ļ	1	•	—	•	•	→	*
Anvenent	8	183	EBR	WBI	WBI	WBR	NBE	NBT	NBR	SBL	SBI	SBR
ane Configurations	۳	4.4		k	4		j.	£,		j.	¢\$	
raffic Volume (vehih)	160	470	15	20	1250	155	100	30	10	20	20	302
-uture Volume (veh/h)	9	470	12	20	1250	155	9	8	9	ଛ	ഹ	302
nitial O (Ob), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		00	100		9	9		9	100		18
Parking Bus, Adj	1.00	100	1.00	100	1.00	8	1.00	1.00	1.00	1.00	1.00	1.00
Nork Zone On Approach		No			S.			8			No	-
Adj Sat Flow, vehihilin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, vehilh	174	511	16	22	1359	103	109	22	Ξ	22	10	169
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Sap, vehilh	246	2022	99	586	1629	123	185	204	102	338	80	268
Arrive On Green	0.07	0.69	0.69	0.58	0.58	0.58	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, vehilth	1500	2962	93	876	2820	213	1211	166	495	1376	39	1302
Grp Volume(v), veh/h	174	258	569	22	719	743	109	0	33	22	0	174
Sp Sat Flow(s), wehilfuln	1500	1496	1558	876	1496	1537	1211	0	1486	1376	0	1341
2 Serve(g_s), s	3.9	5.7	5.7	1.0	35.2	35.6	7.8	0.0	1.6	1.2	0.0	10.7
Syde O Clearlg. c), s	3.9	5.7	5.7	1:0	35.2	35.6	18.5	0.0	1.6	2.8	0.0	10.7
Prop In Lane	1.00		0.06	1.00		0.14	1.00		0.33	1.00		0.97
are Grp Cap(c), veh/h	246	1039	1082	586	864	888	185	0	308	338	0	276
//C Ratio(X)	0.71	0.25	0.25	0.04	0.83	0.84	0.59	0.00	0.11	0.07	0.00	0.63
Avail Cap(c_a), vehith	305	1039	1082	586	864	888	185	0	305	338	0	276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1,00	1.8	1.00	1.00	1.00	1.00	1.8	1.00
Jpstream Filter(I)	100	100	1.00	8	100	100	1.00	0.00	1.00	0.83	000	0.83
Jniform Delay (d), s/veh	18.7	5.1	5.1	8.2	15.4	15.5	41.2	0.0	29.0	30.2	0.0	32.6
nor Delay (d2), s/veh	5.5	9.0	0.5	0.1	8.2	9.2	4.8	0.0	0.2	0.3	0.0	8.8
nitial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
kile BackOfQ(50%), vehilin	2.5	1.6	1.7	0.2	129	13.3	2,6	0.0	9.0	0,4	0.0	4.1
Jnsig. Movement Delay, s/veh												
nGrp Delay(d), s/veh	24.3	9.9	9.9	8.4	246	24.8	46.0	0.0	292	30.5	0.0	41.5
nGrp LOS	ပ	ď	٧	V	ပ	U	۵	A	O	O	V	O
Approach Vol. vehills		707			1484			142			196	ŀ
Approach Delay, s/veh		10.3			24.5			42.1			40.2	
Approach LOS	Ì	80		ı	O	ı	ì	۵			٥	ĺ
Inner - Assigned Phs	3	2		70	I	9	17	8				F
Phs Duration (G+Y+Ro) s		23.0		0.29		23.0	10.5	58.5				i
Change Period (Y+Rc), s		4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		18.5		62.5		18.5	9.5	48.5				Ų
Max Q Clear Time (g_c+1), s		20.5		7.7		12.7	5.9	37.6				
Green Ext Time (p_c), s	ı	0.0	ĺ	3.6	ij	0.5	0.1	7.2	ļ	i		Ì
Wester from Summary	1	ŧ		Ĭ								Ī
Car Cat Out Dolon	ı	ľ	200	l	1	l	l	ŀ	l			I

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HCM 6th Signalized Intersection Summary	9: US-30 & Van Buren Avenue
HCM 6th 5	9: US-30 8

	4	†	~	>	ļ	4	•	-	4	٠	→	*
Movement	æ	EBI	EBR	WBI	WBT	WBR	190	NBT	188	B	188	SBR
Lane Configurations	je-	434		¥e-	4.		¥.	£,		je-	¢±	
Traffic Volume (wehith)	400	1415	15	25	820	20	85	52	10	15	52	255
Future Volume (veh/h)	400	1415	15	52	820	20	22	22	10	15	52	255
Initial Q (Qb), veh	0	0	O	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	100	1,00	1.00	1 00	1.00	1.00	1.00	1.00	100
Work Zone On Approach		2			S			S			S	
Adj Sat Flow, vehilhlin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	435	1538	16	27	891	22	9	27	1	16	27	168
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, vehih	488	1873	19	195	1415	33	167	219	89	333	88	241
Arrive On Green	0.17	0.62	0.62	0.03	0.47	0.47	0.21	0.21	0.21	0.23	0.21	0.21
Sat Flow, vehilis	1500	3034	35	1500	2984	74	1188	1064	433	1370	189	1175
Grp Volume(v), veh/h	435	758	796	27	447	466	99	0	38	16	0	195
Gro Sat Flow(s) vehiling	1500	1496	1569	1500	1496	1562	1188	0	1691	1370	0	1364
O Serve(g_s), s	12.3	35.4	35.5	8.0	20.1	20.1	4.4	0.0	1.9	6.0	0.0	11.9
Cycle Q Clear(g_c), s	123	35.4	35.5	8.0	20.1	201	16.4	0.0	1.9	27	0.0	51
Prop In Lane	1.00		0.02	1.00		0.09	1.00		0.29	1.00		0.86
Lane Grp Cap(c), vehih	488	923	696	195	709	741	167	0	308	333	0	280
V/C Ratio(X)	0.89	0.82	0.82	0.14	0.63	0.63	0.36	00'0	0.12	0.05	000	0.70
Avail Cap(c_a), wehith	ä	923	696	230	502	741	101	0	308	83	0	280
HCM Platoon Ratio	1.00	100	1.00	1.00	100	8	8	9	1.00	1.00	8	- 8
Upstream Filter(I)	1.00	100	100	00	100	100	100	000	1.00	090	000	0.50
Uniform Delay (d), siveh	14.2	13.4	13.4	14.5	17.7	17.7	40.7	0.0	29.1	30.3	0.0	33.1
Incr Delay (d2), siveh	113	8.	7.8	0.3	4.2	4.0	13	0.0	0.2	0.2	0.0	83
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0 0	0.0	0.0
%ile BackOfO(50%) vehifin	2.8	12.4	129	03	7.4	11	13	0.0	0.7	0.3	0.0	4.5
Unsig. Movement Delay, s/veh	100											
LnGrp Delay(d),siveh	26.1	21.5	21.2	14.8	51.0	21.8	450	00	293	30.4	0.0	41.4
LnGrp LOS	O	O	O	8	O	U	۵	V	O	U	Y	
Approach Vol. vehih		1989			940	Ì		88		V	211	
Approach Delay, s/veh		22.4			21.7			37.1			40.6	
Approach LOS	8	Ú			O	V	İ	٥	h	8	۵	
Timer-Assumed Phs		2	3	4	Ę	9	70					
Phs Duration (G+Y+Rc) s		23.0	7.0	60.09		23.0	19.8	47.2				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				ı
Max Green Setting (Gmax), s	in	18.5	5.1	523		18.5	24.5	33.5				
Max Q Clear Time (g_c+11), s	40	18.4	2.8	37.5		13.9	14.3	22.1				
Green Ext Time (p_c), s		0.0	0.0	1.6	ļ	0.5	÷	4.5			H	
Influence from Summon		۱	į	ŀ	į	ŀ		ļ	I		ļ	
TOTAL DEPO PORTING		ı	4	۱	l	ı			1		ı	ı
The same of the sa			200									

HCM 6th TWSC 10: Hayes Avenue & US-30

Intersection Int Delay, s/veh

2017-2018 Existing AM.syn 10/18/2018

Majoriffichi	Majori		1	Majorz	ļ		Nance 1	ı		Sings 5	I		
Conflicting Flow All	791	0	0	293	C	0	745	1140	131	1020	1170	396	
Stage 1	(*		M.	N. Carlot	W.	2/4	325	325	×	813	813		
Stage 2		5.	Ø			114	420	815		202	357	4	
Critical Hdwy	4.14	*	Ā	4.14	4	·	7.54	6.54	6.94	7.54	6.54	6.94	
Critical Hdwy Stg 1	*	it.	•		à	(4)	6.54	5.54	*:	6.54	5.54	T	
Critical Hdwy Stg 2		•		•	١	*	6.54	5.54	ð	654	5.54		
Follow-up Hdwy	222		٠	2.22	٠		3.52	4.02	3.32	3.52	4.02	3.32	
Pot Cap-1 Maneuver	825			1265		•	302	200	894	191	192	603	
Stage 1		2	2	9		-14	661	648	ji.t	339	390	76	
Stage 2	10	ist	01	(e	T.F	(6	-88	388	2	776	627		
Piatoon blocked, %		18	*		Ü	*							
Mov Cap-1 Maneuver	828		*	1265	•	•	227	190	884	169	33	603	
Mov Cap-2 Maneuver	Y		*		77	140	326	282	*	265	291	2.3	
Stage 1	2		1	2		*	635	623	*	326	386		
Stage 2	•	•	•		i	ľ	449	382	v	705	603		
	ı	Ĭ	į	l	ı	ı	ı	ı	ı	ı	ı	i	
Approach	8	1	i	WB	4	Ī	NB	í	Ì	88	J		
HCM Control Delay, s	60		i	0.1	g	j	23.5			13.4			
HCM LOS							U			80			
		i	×		Ğ	ľ		ı			ľ		
Minor Lane Major Myrit		NEEDS	EBE	EBI	EBB	WBL	WBT	WBR SBLn1	Bini	K	h		
Capacity (veh/h)		341	825	ı	ľ	1265	100	×	564				
HCM Lane V/C Ratio		0.435	0.039	*	6	0.01	[#]	٠	0.241				
HCM Control Delay (s)		23.5	8.5	S.	i	19	•)		13.4			i	
HCM Lane LOS		O	×			A	*	£	œ				
HPM 95th 95th O(veh		2.1	0			0	•	22	60				

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HCM 6th TWSC 10: Hayes Avenue

30
& US-
Avenue 8
yes

2017-2018 Existing PM.syn 10/18/2018

int Delay, s/veh	4.7												
	ě	400	902	9		2011	100.0	2012	2001	100	400	000	
Movement	202	CO	EDM	NO.	101	1100	701	ICN	NOW	700	200	200	
.ane Configurations	*	ŧ	W.	F	1			1			4		
raffic Vol. veh/h	91	999	82	9	278	9	41	17	-	9	20	20	
Future Vol. veh/h	91	999	82	9	278	9	41	17	7	0	20	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	BIX.	-	None	4		None			None		100	None	
Storage Length	100	2	150	25		**	30	1			-	(á)	
Veh in Median Storage.	155	0	*	2	0	A	1		7.	4	-		
Grade. %	*	0	*		0	٠	٠	0	۲	٠	0	×	
Peak Hour Factor	7	28	52	38	88	75	99	42	88	38	F	83	
Heavy Vehicles, %	0	2	2	2	7	7	2	2	2	2	2	2	
Numt Flow	138	651	ğ	9	316	00	9	9	12	40	82	99	-
KajorAlinor	Majord	i	N.	Major2	I		Mindel			Jimor2			
Conflicting Flow All	324	0	0	755	0	0	1111	1263	326	954	1363	162	
Slage 1	1	1	*		P#3	23.	206	200		352	352		
Stage 2	(2)		9	à.	:4:	*	204	356		602	1011	(A)	
Ortical Howy	4.14	7,		4,14	¥		7.54	6.54	6.94	35	6.54	6.94	
Critical Holwy Stg 1	*	!	٠	•	٠	*	6.54	5.54	*	6.54	5.54		
Sribcal Howy Stg 2		×	3	-	1	4	6.54	5.54	0	6.54	5.54	×	A
Follow-up Hdwy	2.22	3	3	222	7	2.4	3.52	4.02	3.32	3.52	4.02	3.32	
Pot Cap-1 Maneuver	1233	Z		851		100	#	99	670	213	147	854	
Stage 1	7.8	15.				7.8	297	353	1.	638	630	740	
Stage 2	*	7	•		•	×	511	628	8	453	315	*	
Platoon blocked, %			*		*	40							
Mov Cap-1 Maneuver	1233	Ì	2	851	6.	í	125	148	670	166	22	854	
Mov Cap-2 Maneuver	٠		•	٠			211	238		259	215		
Stage 1	ľ	1	ľ				366	316	ř	572	618	(4)	
Stage 2	2	•	3	9	1	1	878	616		348	282	354	
V.	ı	ì					1		i				
Approach	83			WB	ŀ	b	88	ĺ	1)	SB			
HCM Control Delay, 5	1.2	í		0.4			33.1			17.3			
HCM LOS					1		۵			ပ	i		
Ainor Lanes Asion North		NBLni	番	EBI	88	WEL	WBT	WBR SBLn1	1978				
Capacity (veh/h)		238	1233	ľ	, a	851	i	17	397				
HCM Lane V/C Ratio		0.474	0.104	•	٠	0.019	*	•	0.262				
HCM Control Delay (s)		33.1	83	16	200	93		*	17.3				
HCM Lane LOS		മ	V.	4		¥	2	**	ပ				
						Ì							

HCM 6th TWSC 10: Hayes Avenue & US-30

2040 Total AM.syn

Movement 7.9 Move	None None 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	The same that th	MBF NBF NBF NBF NBF NBF NBF NBF NBF NBF N	Story 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	\$5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	San 155 155 156 0 Stop None 2 2 2 2 2 158 158
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ons \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Free 92 2 2 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5					
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Free Free Free Free Free Free Free Fre	None None 92 2 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5					
Free Free Free Free Free Free Free Free	None 92 92 2 2 2 2 2 2 2 3 5 5 5 5 5 5 5 5 5 5 5		"Z			
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100 - 150 25 Storage, # - 0 0 or 92 92 92 92 9 9 % 2 2 2 2 2 2 2 Magor1 Magor2 All 1255 0 0 505 or 43 414 414 fig1 222 or 50 - 1056 souver 550 - 1056 souver 550 - 1056	0.00			159 126 133		6.9
Sicrage. # 0 - 0 or 92 92 92 92 92 N 2 2 2 2 2 S 2 2 2 2 S 3 2 2 2 2 S 43 478 27 5 125 NI 1255 0 0 505 4.14 4.14 1.55 0.22 - 2.22 0.05 0.22 - 2.22 0.05 0.05 0.05 0.05 0.05 0.05 0.05	2.2.6			159 126 133 33 34 55		6.9
No. No.	92.2			159 126 133 33		6.9
92 92 92 92 92 92 92 92 92 92 92 92 92 9	22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			159 126 33		69 69
2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0 0			159 126 33		6.9
43 478 27 5 125 Majori 1255 0 505 4.14 4.14 2.22 - 2.22 7 550 - 1056 61 - 1056	6			159 128 33		6.9
Majort Majord 1255 0 0 505 1 1255 0 0 505 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0					6.9
Majort Majord 1255 0 0 505 125 125 127 127 127 127 127 127 127 127 127 127	0					6.9
1255 0 505 414 (114 222 222 7 550 1056 er 550 1056			- TO 1/2			6.9
414 414 414 - 414 - 222 - 222 - 222 - 222 - 650 - 1056 - 675		The same of the sa				8.9
414 414 222 222 522 122 6 550 1056 6 550 1056	******	200 - HOL	- III 1/ III	117		9
4.14 4.14 5.22 2.22 2.22 5.50 6.65 6.65 6.65 6.65 6.65 6.65 6.65		200 - 1000	福			8 9
2.22 . 2.22 6. 850 . 1058 er 550 . 1056		21111	- 150			
2.2 2.2. 5.50		21170	150	60		
2.22 . 2.22 1. 550 . 1056 				6.54		*
550 1056 6 50 1056	3			3.32 3.52		3.32
EN 550 11056		140	76 7	762 71	73	426
er 550 - 1056		478	202	- 180	239	,4
er 550 - 1056		431	239	- 652	493	(8)
er 550 · · · 1056						
		- 78	70 7	762 58	19 8	426
Stage 2	*	160	151	134	Г	
Stage 2		441	467	166		
		254	238	- 565		
			i	ă		
Approach EB WB		NB	Ì	SB		
HCM Control Delay, s 1 0		86.3	3	223		
HCM LOS		u.		O		
		l	i		Ī	
Minor EaneMajor Munt. NBLn1 EBI EBI EBR	BR WBL	WET	WBR SBLn1	of.	H	
169	- 1056	A	9	384		
Ratio 0.835 0	- 0.005	21	- 0.466	99		
66.3	8.4		. 2	22.3		
ш	Α,			v		
O(veh) 5.8 0	0	v	E	2.4		
		ı			١	

Synchro 10 Report Page 1

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HCM 6th TWSC 10: Hayes Avenue & US-30

2040 Total PM.syn 10/30/2018

mersection													
nt Delay, s/veh	11.6												
fovement	ď	183	EBB	18	WBT	WER	NBM	MBT	MBR	SBI	SBI	SBR	The latest and the la
ane Configurations	*	‡	*	r	44			4			4		
raffic Vol. vehith	140	1170	110	0	200	10	55	52	10	10	25	98	
uture Vol. veh/h	140	1170	110	9	902	우	22	52	9	10	52	85	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
T Channelized	×	70	None		0	None	•		None	×	SIT	None	
Storage Length	100	*1		52	*	*	()	4	*	90.	*0	.5	
Jeh in Median Storage	*	9			0	7	ř	-					
Srade, %		0		*	0	٠		0	í		0		
Peak Hour Factor	35	Si		35	35	35	8	35	65	35	65	35	
teavy Vehicles, %	2	2		2	2	2	2	2	2	2	8	2	
Avril Flow	152	1272		11	191	7	99	27	T	Ŧ	27	36	

Conflicting Flow All 7	١									-	000	
State 1	772 0	0	1392	0	0	1992	2370	636	1743	2485	386	
200	1	X	*	A	5	1576	1576	i.	789	789	N.	
Stage 2	41	*	£	.50	•	416	794	153	954	1696	20	
Critical Howy 4	14		4.14	i		7.54	6.54	96.94	7.54	8.54	6.94	
Critical Hdwy Stg 1		1	. 2	į		6.54	5.54	1	6.54	5.54	n.	
Critical Howy Stg 2			3.	1	2	6.54	35.5	4	8.54	5.54	The same	
	2.22	(() *	2.22	12	()	3.52	4.02	3.32	3.52	4.02	3.32	
uver	839	X	487		8	-36	35	421	22	58	612	
Stage 1	*	٠	*	(2)		115	168	•	350	400	*	
Stage 2		*			100	585	398	*	278	147	14 10	
Platoon blocked, %		11		21.	Ė							
ы	839	7	487	1	*	- 20	12-	421	35	- 23	612	
Mov Cap-2 Maneuver		•	٠			72			111	88	·	
Stage 1	4	ľ	18	*	3	8.	138	(0)	287	391		
Stage 2	94. Si	9	2	-	3	452		9	178	120	i.	
				Ħ								
Apprisach	EB		WB			BN			88			
HCM Control Delay, s	12		0.2			233.3			39.7			
HCM LOS						ш			ш	ı		
							i		ł			
Annu Lane Major Mirmt	NELDI	EB	EBI	EBR	WBL	WBT	WEL WET WERSELF	8Err1	ı			
Sapacity (vehift)	85	838	2	11	487			229				
HCM Lane V/C Ratio	1.151		*	*	0.022	٠	٠	0.57				
+CM Control Delay (s)	233.3	10.2	1		126	1	٠	38.7				
HCM Lane LOS	11		2	2	œ	Ä	Ġ.	ш				
4CM 95th %ale Q(veh)	69	0.7	22		0.1	24	110	3.2	ı	I	d	
Votes			Ē	1	1			4	Ĭ.			

- Volume exceeds capacity S. Delay exceeds 300s + Computation Not Defined 1. All major volume in platoon

Synchro 10 Report Page 1

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HCM 6th TWSC 10: Hayes Avenue & US-30

ntersection												
nt Delay, s/veh	1.9											
Tovernent	Ħ	EBI	883	Wei	Wet	WBP	NBL NBI	100	MBR	is	SBT	SBR
ane Confiningtions	Æ	**	k	K	42				k			×
raffic Vol vehilh	9	440	38	w	5	4	0	~	30	0	0	155
inture Vol. wehilb	40	440	35	w	1150	40	0	C	0	C	0	155
Confliction Parks #/hr	C	0	0	G	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stoo	Stoo	Stoo	Stop	Stoo
RT Channelized	0.4	7	None	1		None	4	EX.	None		S.	None
Storage Length	200	(2)	150	200		*	æ	(4)	0	.3		0
eh in Median Storage.		0	7		0			-	9.	V.	-	N.
Grade, %	*	0	*	•	0	*		0	*		0	ě
Peak Hour Factor	92	92	92	85	35	92	92	92	92	26	100	92
leavy Vehicles, %	7	2	2	7	7	2	7	2	2	2	2	2
tvmt Flow	\$3	478	23	5	1250	V)	0	0	Ξ	0	0	168
	Ž			5	ł	e I	Sec.	ŀ	Ī	9		
	Jojour			Metoric			HDOE!		000	71701111		000
conflicting Flow All	1799	9	0	202	0	0		•	239	•	•	979
Stage 1	8	R	7	1		•	(4)	۲		8	•	v
Stage 2	*	*	Ž.	•	٠	*	Ť	*	×		1	
Ontical Howy	4/14	×	•	4.14	I.	ř.	A)	٧	6.94	1	+)	6.94
Critical Hdwy Stg 1	¥.	* 7	Ť	•			٠	•	•	١	•	
Critical Holmy Stg 2		1		120	N.	1	(4)	0.		4		
ollow-up Hdwy	2 22	3	•	2.22	ă	a	3	Ø	3.32	8	100	3.32
Pot Cap-1 Maneuver	980	1.0		1056	4	1	0	0	762	0	0	426
Stage 1	×	18			12	(A)	0	0	*	0	0	
Stage 2	(8)	ď.	•			G.	0	0	*	0	0	×
Platoon blocked, %		*			1	*						
fov Cap-1 Maneuver	220	ř	×	1056	•	6	1	9	762	1	*	426
lov Cap-2 Maneuver	٧	٠	٠	ė			٠	٠	٠	٠	•	٠
Stage 1			16				*		23		1	1
Stage 2	*		•	9	1	SA .		*	ia.	i.T		14
Mendell	ä			MR			2		ı	5		
JOHN Control Delay of	-			C			0		l	180		
HCM LOS				2			Y	П	П	O		
							- 4					
linor LaneMajor Mymt		MBL D.	ă	B	88	WBI	WB	WBR SBLIN	Sern!	Ť,		
apacity (veh/h)	l	762	220	V.	1	1056	(0)		426		I	
4CM Lane V/C Ratio	lí	0.014	0.079		•17	0.005	٠		- 0.395			
ICM Control Delay (s)		86	121	*		8	100	83	183		Ĭ	
4CM Lane LOS		ď	œ	9	٩	⋖	4	2	ပ			
HCM 95th %tile O(veh)		•	0			0		ď	6			

Synchro 10 Report Page 1

HCM 6th TWSC 10: Hayes Avenue & US-30

2040 Total AM_Improved.syn

2040 Total PM_Improved.syn

All Manuer 2 % % % % % % % % % % % % % % % % % %	transfer and trans		ı										
## EBI EBI WEI WEI WEI NBI NBI NBI SEL SET 120 1170 110 10 700 110 0 0 10 0 0 120 1170 110 10 700 110 0 0 10 0 0 Free Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	int Delay, s/veh	12											
170 170 160	Overtient	ø	183	EBS	WBI	WBT	WBR	NBE	NBT	NBR	SBE	SBI	SHR
120 170 110 10 700 10 0 0 0 0 0 0 0 0	ane Configurations	ŊC-	\$	K.	F	44				k.			×
120 1170 110 10 700 10 0 0 10 0 0 0 0 0 0	affic Vol. veh/h	120	1170	110	10	200	10	0	0	10	0	0	85
Free Free Free Free Free Stop	sture Vol. veh/h	120	1170	110	10	700	9	0	0	2	0	0	82
Free Free Free Free Free Stop	onflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
200 - 150 200 - None None None - Non	gn Control	Fee	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
200 - 150 200	T Channelized	19	*	None	I	*	None			None	Oppor		None
999.# • 0 • 0 • 1 • 0 • 1 92 29 92 92 92 92 92 92 92 120 1272 120 11 761 11 0 0 11 0 0 772 0 0 1392 0 0 • 0 0 0 0 0 414 • 414 • • 636 • • 0 0 1889 • 487 • 0 0 0 0 0 0 0 1899 • 421	orage Length	200	•	120	200	(8)	(*)	(8)		0	•	٠	0
150 1272 120 11 761 11 0 0 13 0 0 0 0 0 0 0 0 0	th in Median Storage,	1	0	*	•	0	*		-	0	8	-	×
92 92 92 92 92 92 92 92 92 92 92 92 92 9	ade. %	*	0		ì	0		•	0	•	*	0	×
2 2 2 2 2 2 2 2 2 2	ak Hour Factor	65	65	65	65	65	65	65	65	65	65	65	65
130 1272 120 11 761 11 0 0 11 0 0 0 Majort Majort Mithod Mithod Mithod 772	aw Vehicles. %	7	2	2	2	2	2	2	2	2	2	2	2
Major Major Mino	mi Flow	5	1272	2	#	191	=	0	0	=	0	0	35
7772 0 0 1392 0 0 636 636 636		Line	E		Saior?	J	Ī	Liou	Į		E COURT		l
4.14		772	0	0	1392	0	0	*	95	636	9	4	386
414 414 699 699 699 699 699 699 699 699 699 69	Stage 1	*			(4	(4)		*		×	×		
## 839	Stage 2	.*:	*	ŕ	4	٠	*	٠	8	*	•	*	•
222	theal Hdwy	4 14	,	٠	4.14	36	*	*		6.94	1		6.94
222	tical Hdwy Stg 1	•	•		٠	ř		1				Ė	·
222	tical Hdwy Stg 2	(4)		8			10	9	3		74		4
FEB WB NB SBL01 S 0.9 0.025 0.151 O 0.05 0.155 O 0.05 0	Ilow-up Hdwy	222	ij,		222	114	(()	(/*	M.	3.32	ů.	Più.	3.32
EB WWB NB SBLn1 S 09 0.002 O 002 O 002 O 002 O 002 O 002 O 002 O 002 O 002 O 002 O 002 O 003 O	Cap-1 Maneuver	839		8	487	4	200	0	0	421	0	0	612
## 859 487 610 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Stage 1			*	1	*		0	0	,	0	0	×
EB WB NB SB 119 B B B B B B B B B B B B B B B B B	Stage 2		7	9	•	•	×	0	0	*	0	0	٨
EB WB NB 119 B B B B B B B B B B B B B B B B B	stoon blocked, %		Ť			*	•						
EB WB NB SB 119 EB WB NB SB 119 EB B B B B B B B B B B B B B B B B B B	w Cap-1 Maneuver	838	Ĭ	í	487		Ĭ	i	7/	423		·	612
EB WB NB SB NB SB NB SB NB SB NB SB NB SB NB N	w Cap-2 Maneuver	×		•	r		•		b		•	1	
EB VVB NB SB 119 B NG SB 149 NB SB 149 B B B B B B B B B B B B B B B B B B B	Stage 1	9	r.	8	ľ	1881	030	S.	M	0	4	211	4
Hays 0.9 0.2 13.8 B FT MWI WEI WEI WEI WEI WEI WEI WEI WEI WEI W	Stage 2	7.8	77.	<u>)</u>	54	(A)	•	74	1.5	/4	4	74	•
Feb. Wildle Wil			ľ	ı		1	ı		ı	ı			
Ray, s 0.9 0.2 13.8 In Taum HBL mi EBL EBT EBR WBL WBT WBR-SBLni A21 829 - 487 612 Radio 0.026 0.155 - - 0.151 Hay (s) 13.8 10.1 1.2.6 - 11.9 B B B B B B Covery 0.1 0.5 0.1 0.5	projecti	2		1	WB			ğ			3	i	
Reference Refe	CM Control Delay, s	6.0	ı		0.2			13.8			11.9	ı	
F.Movrit MBL 11 EBL EBT EBR WEL WET WBR SB AST AND 0.026 0.155 0.0022 0.0 fay (s) 138 fúl 12.5 0.0021 0.00 0.00 0.00 0.00 0.00 0.00 0.	W LOS	ľ	Ĭ	ì	ľ	94	ì	0		Ŕ	a	Ĭ	
Azirio 0.026 0.155 - 0.022 - 0 Jay (s) 138 101 12.5 - 0.092 Azirio 0.036 0.155 - 0.032 - 0 Azirio 0.156 - 0.032 - 0 Azirio 0.156 - 0.032 - 0 Azirio 0.156 - 0.032 - 0	ove Langillaine Hum		Rint	183	FRI	FRR	WE		WRR	12		ı	
Tario 0.026 0.155 - 0.022 - 0 0.026 0.156 0.000	cacity (vehift)	П	475	830		1	487			619	H	à	
lay(s) 13.8 101 12.6 100 100 100 100 100 100 100 100 100 10	M Lane V/C Ratio			0.155)	0000	1	1	0.153	ı	١	ŀ
B B B B	M Control Delay fs.	b		101	4	ľ	126		1	6	ľ	H	
Oliveri 0.1 0.5 - 0.1 × -	M Lane LOS		60	œ	14	::14	œ	i.	ľ	œ	ı	ı	
	M. 95th Wille Olvehi		0	9.0	1	1.00	0	98	7.	0.5		1	Ì

HCM 6th TWSC 11: Whitney Road & US-30

							100000					
fovernent		183	EBR	WIBI	WBI	WBR	NBL	Ę	MBR	3	8	SBK
ane Configurations	AC.	+	×	r	+	k.	F	2,			4	
saffic Vol. web/h	32	119	3	67	205	83	46	49	m	4	23	131
uture Vol. veh/h	32	119	33	m	502	33	46	49	67	4	53	131
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	Y	A	None	A	*	None			None			None
Storage Length	375	100	375	375	90	375	100		¢		10	(14)
eh in Median Storage.	75	0			0	(4	*	=	10	180	-	٠
Frade %	12	0	74	٠	0	*	14.	0		*	0	(*)
Peak Hour Factor	80	23	48	88	88	29	11	89	75	8	99	7.4
leavy Vehicles, %	C	2	2	2	2	7	2	7	2	2	2	2
Avril Flow	8	175	99	00	591	98	8	22	*	80	48	111
Southing M.	TO SE	H		200	В		Minori	i		Moor?		
Conflicting Flow All	647	0	0	240	0	0	1003	918	175	933	927	591
Stage 1	1		•	×	51		555	255		209	209	
Stage 2			//4	£(4	39	3.0	748	663		328	320	1110
Critical Holay	4.12		**	4.12	20.	**	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	•	Ä	*	9	19	2	6.12	5.52	٠	6.12	5.52	*
Critical Hdwy Stg 2	9	×	16		×	1	6.12	5.52	ě.	6.12	5.52	1
	2.218	4	٠	2.218	N)	.5	3.518	4.018	3.318	3.518	4.018	3,318
ot Cap-1 Maneuver	939		Ů	1327	*	i	221	272	868	246	268	201
Stage 1	0	*	40		•	i	749	969		483	486	a• :
Stage 2	1		Î			ď	404	459		687	652	,
Platoon blocked, %		U a			æ	ď	۱	۱		1		
lov Cap-1 Maneuver	636			1327	19	11.	124	259	888	198	255	203
Nov Cap-2 Maneuver					*		171	340	4	323	360	
Stage 1	×	*	76	00	i	å	717	999	0	462	483	d)
Stage 2	•		*	*	*	*	235	456	*	284	624	
enter and the	8		П	din	ı	ı	2		Ì	3		
CM Control Delay s	2		H	ē	I	h	28.4	i		20.7	h	ŀ
CM LOS			П		П	П	۵	j.		ပ	Н	
linos Lare Major Murril	1	NBL n1 NBL n2	BLH2	E	EBIL	EBR	WBL	WBI	WBR-SBLHT	TH/IBS		
apacity (veh/h)		121	351	626	ă!	1	1327		•	459		
+CM Lane V/C Ratio		0.349	0.217	0.043			0.006	(4)	•	- 0.508		
+CM Control Delay (s)		37	18.1	6			7.7	· Al	×	20.7	ì	į
HCM Lane LOS		ш	ပ	¥	*	*	⋖		×	U		١
JOHN GEST OF STATE OF STATE		4	9.0	-	ŀ	ľ	-		ľ	a		

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HCM 6th TWSC 11: Whitney Road & US-30

2017-2018 Existing AM.syn 10/18/2018

2017-2018 Existing PM.syn 10/18/2018

nt Delay, s/veh	9.6											
forement	55	H	H	8	188	25	S	183	MBD	8	281	388
The Contractions	A	4	4	H	4	\$	*				4	
ane compurations	-	-	- (-	-		7	2. 8	ě		ł	2
raffic Vol. vehin	QQ.	žě.	ò	3	0	đ	S,	8	0	ż	č	3
Future Vol., veh/h	88	392	67	8	178	4	3	88	9	17	7	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None		1	None		•	None	10	(1)	None
Storage Length	375	•	375	375	*	375	100	4	٠	*	9	*
Jeh in Median Storage	137	0	×		0	ě	Ì	+	×		=	
Stade %		c	ľ	ľ	c	ľ	ľ	c		i	c	
Gloue, 76	0	000	00	33	63	88	30	6	E.	ŭ	7.8	7.8
Jones Vehicler 62	9 6	2 5	2 6	3 6	,	3 0	2 0	e c	9 0	٠,	,	,
Avmt Flow	128	422	72	6	28	4 10	49	7.5	12	88	88	72
	1	l	Ī	5	į	Ì	franci	ì	Ī	Const	ł	
Confiction Flow All	100	c	6	404	0	9	1131	1050	432	1122	1116	184
Stron 1	2	•	0.0				678	678		355	366	
State 2	1	1				1	453	372		756	750	
Tritical Holes	417	1		4.12	7		7 12	6.52	622	7.12	6.52	622
Official Howy Sto 1		ľ	ľ		ľ	ľ	6.12	5.52	•	6.12	5.52	
Otheral Houve Sto 2	3	0				10	6.12	5.52	i	6 12	5.52	
ollow-up Hdwy	2.218		,	2.218	-	TO.	3.518	4.018	3.318	3.518	4.018	3.318
of Cap-1 Maneuver	1384	٠	.15	1070	8		181	227	632	183	208	858
Stage 1	•		<u></u>			٠	442	452		653	623	٠
Stage 2		×		1		î	286	619	(0)	400	419	100
Platoon blocked, %					•	-						
lov Cap-1 Maneuver	1384		٠	1070	9	N.	100	189	632	126	173	828
Aov Cap-2 Maneuver		2,5	*	,	٠	٠	194	279	1	175	240	
State 1	i	ì	i	Y			401	410	*	593	250	13/10/
Stage 2		30	31		9	94	409	286	((*)	294	380	
			8			d						
pproach	#		Ē	WB	b	b	9			88	ľ	
HCM Control Delay s	91 9		ı	2.8			23.6			35.9		
HCM LOS			Г				O			w		
	ľ		ı	Ç	g	'n	l	k	ı	Š	r	
finor LanesMasor Mymit		NBLnT NBL n2	VBI n2	H	EBT	EBR WBL	WBL	WBT	WBT WBR SBLm1	1911 1911		
anacity (veh/h)	ŀ	194	303	1384	*	ľ	1070	ľ		394		
HCM Lane V/C Ratio		0.205	0	0.093		٠	- 0.085	•	•	0.643		
ICM Control Delay (s)	10	28.3	213	7.9			8.7	O.	i.	38.9		
HCM Lane LOS		۵	U	*	*	•	A	3	2.0	ш		
ICM 95th %tile Q(veh)	(u	0.7	17	0.3			0.3	14	it.	¥		

HCM 6th TWSC 11: Whitney Road & US-30

Int Delay, s/veh	47.7											
Movement	m	EBI	88	WBH	WBI	WBR	NBI.	NBT	NBR	SB	SBI	See
Lane Configurations	3 6-	4	V	K	*	W.	N-	42			·Ž	
Traffic Vol. vehith	180	235	40	2	675	45	70	99	10	9	40	410
Future Vol., veh/h	180	235	9	S	675	45	20	92	S	чC	40	410
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None			None		98	None			None
Storage Length	375	7	375	375	(45)	375	100	R*E				á
Veh in Median Storage,	* .	0	B		0	(1)	*	-	-	8		٠
Grade, %	٠	0	٠	٠	0	٠	*/	0	2	•	0	i)
Peak Hour Factor	35	65	92	65	81	92	35	35	35	92	35	25
Heavy Vehicles, %	2	2	~	2	2	2	2	~	2	2	2	2
Myrrit Flow	196	385	43	40	734	84	16	F	5	ů,	¥	446
Major/Minor M	Majori	b	8	Aapor2	Ì		Thorit			Amor?		ŀ
Conflicting Flow All	783	0	0	238	0	0	1660	4 4 6	255	1451	1434	734
Stage 1	2.	31.	3	ì	4	A	647	647	7	744	744	4
Stage 2	ŧ	*	•	*	80		1013	793		707	690	*
Critical Hotay	412	۲	ě	4.12		ľ	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1				74		ľ	6.12	5.52		6.12	5.52	
Critical Holay Stg 2	2	Š.		Y	3	N.	6.12	5.52	10	6 12	5.52	2
Į.	2 218	3		2 218	114			4.018	3.318			3.318
uver	835	4	*	1263	4	100		133	784			-420
Stage 1	×	٠	٠	•	(4)	٠	460	467	*	407	421	
Stane 2	٠	T		V	ě	*	288	400		426	446	
Platoon blocked. %		1			١	١						l
Mov Cao-1 Maneuver	835	ľ		1263			i	101	784	88	102	~ 420
Mov Cap-2 Maneuver		3.0				í	- ~ -403	158		15	216	
Stage 1		•			•	54	352	357	2	311	419	
Stage 2	79	1,0	•	/4	N/	94	*	398	*	260	341	974
Kanasanah	e	Н	Н	9		П	9	ı		0		ı
HCM Control Dalow e	6.9	ł	ı		ı		2			181 6		
HCM LOS	*	ŀ	ŀ	N. I		ı	ľ			L		
	Ĭ	b	ľ			Ĥ		3	i	la la	ľ	Ì
Special and Paper Special	2	Co ICH TO SEN	64.63	ä	ä	9	idil	MART	URD COLL	10		
Capacity (sobility)	۱		169	358			1053			384		
LICAL Land VIII Davie	l			3000		ĺ	200	ĺ		900		
TOWN LAIRE VIOLEGE		- 10		407.0			4000	1	. 10	067.		
Tom Confee Leady (5)	l	1	7 1	000		1		1		0,10		
HOM Lane LOS		•	п 5	20 5	q	×.	K (•	,	L .		ı
HOM Som Water U(ven)		٠	5	6.0	l.	٠	5	۱	٠	577		
Medoc		I										

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HCM 6th TWSC 11: Whitney Road & US-30

2040 Total AM syn 10/30/2018

2040 Total PM.syn 10/30/2018

And the control of the control of the control of verifing the control of verifing the control of	Movement	E	FRI	588	WHI	WRT	WER	NRI	NRT	MAR	ia.	THE	SAR
Integral and the fire Fire Fire Fire Fire Stop Stop Stop Stop Stop Stop Stop Stop		b	4		A	4	,			THE PERSON NAMED IN	5		CHILL
Old weekin 470 630 90 40 310 65 45 75 15 25 95 Old weekin 470 630 90 40 310 65 45 75 15 25 95 Old weekin 470 630 90 40 310 65 45 75 15 25 95 Application Stronger 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Lane Configurations	-	•	L	•	•	•	•	1		1	4	
Color Colo	Traffic Vol. vehith	470	630	8	9	310	65	45	75	15	53	95	370
Main Main	Future Vol. vehilh	470	630	90	40	310	92	45	75	15	25	95	370
Interior Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	٥	0	0	0
Interioral 175 None None None None None None None None	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Length 375 375 375 100	RT Channelized			None	4	100	None	-	9	None	1	N	None
March Major Majo	Storage Length	375		375	375		375	100				934	(e
% % 0	Jeh in Median Storage,	1	0		18	0		22	-	10	18	-	2
via Factor 92 93 93 94 97 92	Grade, %	Ů	0	٠		0	8	•	0		4	0	
2	Peak Hour Factor	92	93	63	92	18	92	35	25	26	62	82	25
611 677 97 43 320 71 49 82 16 27 103 Minor Minor Minor Minor Minor	leavy Vehicles, %	2	2	2	2	2	2	2	N	2	2	2	2
Minor Minor Minor Minor Minor Minor	Aymt Flow	211	677	6	43	320	-	49	82	16	27	103	402
391 0 0 774 0 0 2393 2176 677 2203 2202 412	ABjor/Minor N	[agr.]	1		Day?		Ī	Findel			Lines 2		
412	Conflicting Flow All	391	0	0	774	0	0	2393	2176	677	2203	2202	320
412 - 412 - 614 477 1796 1796 412 - 612 552 622 712 652 2218 - 2218 - 512 552 612 552 2218 - 3218 - 3518 4018 3318 3518 4018 1168 - 842 - 117 148 - 45 52 84 1168 - 842 - 177 149 - 43 - 24 1168 - 842 - 174 - 1443 - 28 42 - 1 - 74 - 1443 - 28 43 556 - 1 - 74 EB WB NB NB SB NB SB SB 350 568 42 - 1 - 74 17 168 - 842 - 1 - 74 55754 0437 - 0.052 - 1 5754 0437 - 0.052 - 1 5754 0437 - 0.052 - 1 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74 1199 528 - 1 - 74	Stage 1	1	*				2	1699	1699	100	406	408	
412 412 712 652 622 712 652 2218 612 552 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 552 2218 712 612 612 2218 712 612 221	Stage 2		•				ľ	8 6	477		1797	1796	
2218	Artical Howy	4.12	*		4,12	A		7.12	6.52	6.22	7.12	6.52	5.22
1168	Critical Hdwy Stg 1	*	*		8	10	,	6.12	5.52	•	6.12	5.52	×
1188 842 - 2218 3518 4018 3318 3518 4018 - 2218 - 2218 - 2518 4018 3318 3518 4018 - 231 -45 453 32 -45 - 24 45 453 32 -45 - 25 451 102 132 - 25 453 - 24 - 25 453	Critical Holay Stg 2					i i	×	6.12	5.52	1	6.12	5.52	
1168 842 23 -45 453 32 -45 117 148 622 588 118 842 - 23 -45 453 32 -45 118 842 - 24 119 528 - 24 12 4 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 -43 28 14 14 168 842 - 1 -74 17 1168 - 84		2 218	•		2218	(4)							3.318
1168 842 24 72 74 - 14 6.22 5.88 1168 842 25 453 24 72 72 72 72 72 72 72 72 72 72 72 72 72	of Cap-1 Maneuver	1168		8	842			- 23	-46	453	33	-45	721
1188 842 -24 72 73 74 -14 -24 72 72 73 -24 72 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 73 -24 74 -44 -43 -28 -24	Stage 1		7.0		4	20	29	117	148		622	598	
1168	Stage 2	#	it	4	41	3	9.	433	999	Ž.	102	132	
168 942 -24 72 72 45 453 -24 72 74 -14 -43 -28 66 83 -28 -28 66 83 -28 -28 66 83 -28 -	Platoon blocked, %		*	*		(8)	*						
EB WB NB SB.n1 - 43 ~ 28 - 44 - 43 ~ 28 - 45 - 44 - 43 ~ 28 - 41 - 74 - 44 - 43 ~ 28 - 42 - 1 - 74 - 1 - 74 - 74	Aov Cap-1 Maneuver	1168	-	0	845		(4)	1	-25	453	1	- 24	121
EB WB NB SB SB 42 - 1 - 74	Nov Cap-2 Maneuver	*	*/		¥	100	*	74	- 14		-43	~ 28	(*)
EB WB NB S88 -1 -74 42 1	Stage 1	1	1		-	-		99	83		350	999	1
4.2 I NB NB NB SB SB NB NB NB NB NB NB NB NB NB NB NB NB NB	Stage 2		•	9				149	528	0	ī	- 74	
4.2 I	pproach	83			WB	ľ		N8			ES	8	
# NBLn1NBLn2 EBL EBT EBR Wat WBT WBR SBun 17 1168 - 842 - 5754 0.437 - 0.052 - 5.554 0.437 - 0.052 - 9.5 - 129 2.3 - 0.2	ICM Control Delay, s	4.2			-						1		
**************************************	HCM LOS										,		
A NBLANDIAZ ERI EBT EBT WBT WBT SBLAT 17 1168 - 842 5.754 0.437 - 0.052 9.5													
17 1168 - 842 - 5734 0.437 - 0.052 - 52687 6105 - 9.5 - 9.5 - 129 2.3 - 0.2	finor LaverMajor Myrm	H	BLnin	181.42	EBI	EBT	EBR	WBL	WBT	WBRS	BLn1	l	
\$7261 0.437 - 0.052 - \$7261 0.5 9.5 - \$7261 0.5 9.5 - \$7261 0.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9	Sapacity (vehth)			11	1168			842	*	X.	Œ.		
\$28876 105 95	ICM Lane V/C Ratio		7);		0.437	1 (2)		0.052	9.	ř.			
Q(veh) 129 23 02	ICM Control Delay (s)		S	587.6	10.5	i		8.5		Ÿ			
- 129 23	ICM Lane LOS	ı	Y	L	8			A	Ð	ė			
	ICM 95th %tile O(veh)		4	129	23	100	Ci	62	1	3	4		

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호드

Summary	
Intersection (US-30
Signalized I	ey Road &
CM 6th	: Whitn

2040 Total AM_Improved.syn

ss futh) (hhh) (Tro proach hhin	8	TOT	ERR	WRI	TOTAL	00/11		NOT	NBR	SBL		-
		107		-	MEN	WOW	NE	MOI			198	SBR
	k-	*	P.	K	**	K.	K	2,		je.	4	*-
	180	235	40	40	525	45	210	110	20	S	40	410
	180	235	4	35	525	45	210	110	c	LC.	40	410
	0	0	0	0	0	0	0	0	0	0	0	9
	1.00		1.00	1.00		1.00	1.00		1 00	1.00		1.00
	1,00	1.00	1.00	1,00	1.00	1.00	1.00	1.00	1 00	1.00	1,00	9
		8			2			S S			8	
	575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
	196	255	43	S	571	49	228	120	S	S	43	283
rea hour ractor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
h, %	2	2	2	2	2	2	2	2	2	2	2	7
Cap, vehilh	462	1746	6/1	267	1347	109	384	475	20	406	488	423
Arrive On Green 0	0.08	0.58	0.58	0.45	0.45	0.45	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h 18	200	2993	1335	1081	2993	1335	1054	1501	83	1266	1575	1335
Grp Volume(v), veh/h	196	255	43	S	571	49	228	0	125	က	43	283
in in	200	1496	1335	1081	1496	1335	1054	0	1584	1266	1575	1335
Q Serve(g_s), s	6.0	3.5	1.2	0.2	11.7	6.	17.5	0.0	5.3	0.3	1.7	16.5
s (2	6.0	3.5		0.2	11.7	6	19.2	0.0	5.3	9.9	13	16.5
	1.00		1.00	1.00		1.00	1.00		0.04	1.00		8
Lane Grp Cap(o), vehith	462	1746	2779	295	1347	601	394	0	495	400	488	423
	0.42	0.15	90.0	0.01	0.42	0.08	0.58	00.00	0.25	0.01	60'0	0.67
Avail Cap(c_a), vehth	482	1746	67.1	267	1347	601	394	0	495	406	499	423
	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.8
Upstream Filter(I)	100	1.00	1.00	1.00	1.00	1:00	1,00	0.00	1.00	0.51	0.51	0.5
Uniform Delay (d), s/veh	11.6	8.5	00	13.7	16.8	14.1	28.3	0.0	22.8	24.9	21.6	26.7
Incr Delay (d2): s/veh	9.0	0.2	0	0.0	10	0.3	-	0.0	12	0.0	0.2	43
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
iln.	1 9	17	0.4	0.1	4.0	90	4.9	0.0	2.1	0.1	0.1	95
ay. s/veh									7000			
LnGrp Delay(d),s/veh	12.2	8.7	8.2	13.7	17.8	14.4	34.4	0.0	24.1	24.9	218	30.9
LnGrp LOS	8	A	¥	8	8	8	O	A	O	ပ	O	0
Approach Vol. wehlh		484			625			353			331	
Approach Delay, s/veh		10.1			17.5			30.8			29.7	
Approach LOS	I	8			80			U	Town I		S	Ĭ
Timer - Assumed Phs		2				9	7	60			ij	
Phs Duration (G+Y+Ro), s		33.0		57.0	į,	33.0	12.0	45.0			2	
Change Period (Y+Rc), s		4.5	١	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	V	28.5		525		28.5	1.5	40.5				
Max Q Clear Time (q. c+11), s		21.2		5.5		18.5	8.0	13.7				
Green Ext Time (p. c), s.		1.0	I	2.0		6.0	0.0	4.3		8		
Indiana and have Colomos See				1				1				I
LOW SH CH Dolow			202									l
HOM CHI CALLOS			200								l	ı

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HCM 6th Signalized Intersection Summary 11: Whitney Road & US-30

	### ### ### ### #####################	#8 8 ° 00 ° 5							100	•	7
50 to 8		F-88-55	WBL	WET	WER	192	MET	NBR	Spe	SBT	SBS
50 %		88.85	k	44	'n.	F.	¢		K	*	PL.
to see		8 0 0 5	40	235	88	115	98	16	22	99	370
act.		0 8 8	40	235	65	115	95	15	52	95	370
act &		1.00	0	0	0	0	0	0	0	0	0
50 g		1,00	1.00		1.00	1.00		1.00	1.00		1,80
act a			1.00	1.00	1,00	100	1 00	1.00	100	001	1.00
*				No			No			No	
*		1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
or Veh, %		26	43	242	11	125	103	16	27	103	236
veh, %		0.93	0.65	0.97	0.92	0.92	0.92	0.92	0.92	0.92	6.92
n veh/h		2	2	2	2	23	2	2	2	2	C
n veh/h		838	312	666	446	300	362	96	349	429	383
veh/h		0.63	0.33	0.33	0.33	0.27	0.27	0.27	0.09	0.09	0.09
veh/h		1335	969	2993	1335	1039	1331	207	1273	1575	1335
		97	43	242	11	125	0	119	27	103	239
Gro Sat Flow(s), vehilhlin 1500		1335	969	1496	1335	1039	0	1538	1273	1575	1335
	П	2.6	3.9	5.3	3.4	7.6	0.0	5.5	1.8	5.5	15.6
5(): 8	8.6	2.6	3.9	5.3	3.4	15.2	0.0	5.5	7.3	5.5	15.6
Prop In Lane 1.00		1.00	1.00		1.00	1.00		0.13	1.00		1.00
o(c), veit/h	1879	838	312	686	9449	300	Ö	419	349	459	363
Ī		0.12	0.14	0.24	0.16	0.42	0.00	0.28	0.08	0.24	99'0
Avail Cap(c_a), vehith 898		838	312	866	446	300	0	419	349	429	383
0	12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I) 1.00	۹	1.00	1.00	1 00	8	1.00	00:0	1 00	990	0.65	0.65
Uniform Delay (d), s/veh 11.5		6.7	21.3	21.7	21.1	31.8	0.0	25.8	35.7	32.3	36.9
Incr Delay (d2), siveh 1,7	99	0.3	6.0	9.0	0.8	4.2	000	17	0.3	6.0	6.0
Initial Q Delay(d3), s/veh 0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Ö
%ile BackOfO(50%), vehiln 5.8		2.0	0.7	139	Ħ	27	0.0	22	0.6	22	9
lay, s/veh		-	-				-		100000000000000000000000000000000000000		1000
y(d),s/veh 13	8.6	7.0	222	22.3	21.9	36.1	00	27.5	36,0	33.2	429
LnGrp LOS B	A	A	U	O	U	٥	A	O		O	
Approach Vol. vehilh	1285		Ti R	320		į	244			369	M
Approach Delay, s/veh	10,3			22.2			31.9			39.6	ì
Approach LOS	æ	Ų		Ü		00	O			0	
Times - Assumed Phs	64		*2	1	9	74	60		Ī		
Phs Duration (G+Y+Rc), s	290	ľ	61.0		29.0	26.5	34.5		200		۱
Change Period (Y+Rc), s	4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	245		56.5		24.5	31.5	20.5	u de			
Max Q Clear Time (g_c+11), s	17.2		11.8		17.6	20.6	7.3				
Green Ext Time (p. c) s	0.7	į	5.9		0.9	1.4	1.3		o a	E	
plemetion Summan									Ì	ļ	
Desperator Contents		46.5									h

HCM 6th TWSC 12: Saddle Ridge Trail/Service Road & US-30

Lare Configurations Teatr. Vol. with Future Vol. with Future Vol. weith Conficting Peits, #frt Sign Control RT Chamelized RT Chamelized Storage Length Vehir Median Storage #	EB *											
ms may make orage	AC.	EBI	EBS	WEL	WBI	WBR	MBE	NBT	NBR	部	188	585
#I/hr	•	*	k.	1	41			+‡			4	
age:	0	88	41	23	407	e	140	15	62		NT.	2
#Ill.	0	88	4	23	407	m	140	55	m	-	4	2
torage.	0	0	0	0	0	0	0	0	0	0	0	0
torage	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Storage, 4		äŧ	None	×	To the same of	None	A.		None	N.		None
Storage, 4	325	(8)	150	300	1	٠	Х	y	.*			
Grade, %		0			0	*		-				•
	ŧ.	0			0	*	*:	0	ŧ	*	0	2
Peak Hour Factor	86	8	06	87	87	81	25	8	*	33	35	35
Heavy Vehicles, %	2	2	2	2	7	7	7	~	7	7	7	7
Mymt Flow	0	86	46	32	468	es	167	18	*	9	Ξ	9
Makerilliner	MajorT	ľ		Pior?	ŀ		Medel			Minor?	i	
Conflicting Flow All	471	0	0	144	0	0	628	621	86	654	999	470
State 1	۰		20	*			88	86		525	522	
Stage 2	*	(*)		*	¥.	*	530	523	*:	132	14	47
Critical Hidwy 4	112	١	*	4.12	×		7.12	6,52	6.22	7.12	6.52	622
Critical Hdwy Stg 1	٠	٠		٠		٠	6.12	5.52	٠	6.12	5.52	
Critical Howy Stg 2	X		e e	3			612	5.52	*	6.12	5.52	
	2.218	3.0		2.218	ż		3.518	4.018	3.318	3.518	4.018	3.318
uver	1001	EŤ.	17	1438			395	403	928	380	380	594
Stage 1	ji)	ļģ.	7.2		ila -	4	806	814		238	531	ı
State 2	(4)	31		.00	î	18	533	930	72	871	778	2
Platoon blocked, %		*	٠		(A)	:						
Mov Cap-1 Maneuver 1	1001	ň	1	1438	•	ř	378	386	858	362	373	594
Mov Cap-2 Maneuver	٠	*	*	*		٠	440	449	*	447	438	
Stage 1		1		1	i	1	806	814	1	88	525	
Stage 2	À		٠	•	4		203	520	3.5	849	778	14.
	B		ă.			ì			į			ł
Approach	83	H		WB		F	NB	h	×	SB		
HCM Control Delay, s	0	Ä		0.4	H		18.9			129	ij	i
HCM LOS							ပ			œ		
		ij	ä	ů	ä	E	Ī	ı	H		ğ	
Minor Lane Major Numit	Z	NBLnI	183	EBI	EBR WB	WBE	WBT	WBR SBLn	Bini			į
Capacity (veh/h)		445	1601	16	ľ	1438	18	ľ	475			
HCM Lane V/C Ratio	9	0.423	•	•		0.018		ľ	0.042			
HCM Control Delay (s)		681	0			7.5	(6)		12.9	i	d	I
HCM Lane LOS		ပ	A	(3)		A	×	•	8			
HCM 95th %tile O(veh)	Ē.	2.1	0		22	0.1	24	100	0.0	Į.		Ì

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HCM 6th TWSC 12: Saddle Ridge Trail/Service Road & US-30

2017-2018 Existing AM.syn

2017-2018 Existing PM.syn

		-	-		44	2		41618	5	1	-	-	
November	10	B	HOK	MOR	WB	N GA	Noc	IGN	HON	Self	190	SER	
ane Configurations	*	*	W-	F	42			4			4		
raffic Vol. veh/h	0	326	115	1	140	0	29	6	1	2	13	-	
Future Vol. veh/h	0	326	115	7	140	0	67	o	-	2	13	-	
Conflicting Peds, #ftr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None	i		None	()	7.	None		0	None	
Storage Length	325	*	150	300	14			95			714		
Jeh in Median Storage.	200	0			0	0	1		Š	i	1	4	The Part of the Pa
Grade %	•	c			c	•	١	c	•	1	C	,	
Dook Hour Earton	10	ŏ	ě	22	20	90	30	8	96	V	40	90	
Heavy Vehicles %				•			3 6	3 0		0		0	
Avmt Flow	0	402	142	00	167	0	18	10	(0	w	33	m	The second
		١						١					
	Majdri			Major2			Minort	i		Minore			
Conflicting Flow All	167	0	0	544	0	0	603	585	402	965	727	167	
Stage 1	*				i i	4	402	402	8	183	183		
Stage 2	*	*		4	\$ (*	201	183	•	482	544	¥	
Critical Holmy	4,12	77		4.12		AY.	7,12	6.52	6.22	7.12	6.52	6.22	
Critical Howy Stg 1	٠		٠	٠	*	*	6.12	5.52	7)	6.12	5,52	Ä	
Sritical Holmy Stg 2	12					Ì	6.12	5.52	ď	6.12	5.52	X	
Follow-up Hdwy	2 218			2.218	3	ì			3.318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1411			1025	14		411	423	F	374	321	877	
Stage 1	je.	(17.		•	100	7.6	625	900	*	818	748	¥	
Stage 2	3	7	7	No.	Ä	4	108	748	i	288	519	100	
Platoon blocked, %			0		14	٠		1					
Nov Cap-1 Maneuver	1411	ľ	×	1025	٠	X	383	420	648	361	348	877	
fov Cap-2 Maneuver	*	*/	i	•/		•	484	489	7	447	423	i.	
Stage 1	K	1	1			-	625	909		818	742		
Stage 2	100	12	(4)			(4)	758	742		548	519	(7 . 8)	
	ì	ł	ı	ı	١	ı	í	1	ŀ				
pproach	88			WB	R		NB			88			7
HCM Control Delay, s	0	H		0.4	Ä	H	14	i		14			L. T.
HCM LOS							m			œ			
STREET, SQUARE, SALES		9	ı		Ř				k			No.	-
Anor Lane Major Ment		NBL _{n1}		183	EBT EBR WBL	WBL	WBT	WBR SBLn1	Bini				
Separaty (veh/h)		495	1411	i	ľ	1025		1	440		1		
HCM Lane V/C Ratio		0.195	1		٠	0.008	٠		0.091				
+CM Control Delay (s)		14	0			8.5	1		14	1	P.		A HOSPITA
HCM Lane LOS		cc	V	ľ		A	200		α	ı			

HCM 6th TWSC 12: Saddle Ridge Trail/Service Road & US-30

2040 Total AM syn 10/30/2018

nt Delay, s/veh	6.7											
fovement	EBI	Ħ	2633	WHE	WBT	WBR	NBL	NBI	NBR	SE	SBIT	SBR
.ane Configurations)C	4-	K	*	,2			4			4	
raffic Vol. veh/h	S	188	32	8	535	9	185	50	ç	5	2	S
Future Vol. veh/h	w	185	55	30	535	'n	185	20	32	S	S	2
Conflicting Peds. #7x	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
2T Channelized		1	None	4		None	٧	,	None			None
Storage Length	325	19	150	300		•		12.	*		10	04
eh in Median Storage.	100	0		4	0	3	*	5	0	٠	-	
Srade %	2	0		٠	0	*	*	0	*	٠	0	
Dask Hour Eartor	92	6	8	65	65	65	8	65	6	65	60	20
leavy Vehicles %	2	2	2	2	2	2	2	2	2	2	2	2
fumt Flow	w	201	99	83	585	S	201	22	in	40	V)	40
(appellinge	Majort			Maior2	B		Minort	B		Minor?	H	
Conflicting Flow All	587	0	0	261	0	0	867	864	201	906	922	585
Stage 1			3		ı		211	211	٠	159	99	100
Stage 2					TK.	38	656	653		255	271	,
Critical Howy	4:12	8	14	4.12	240	.#	7.12	6.52	6.22		6.52	6.22
Critical Hdwy Stg 1			•	•	٠		6.12	5.52	4	6.12	5.52	
Critical Hdwy Stg 2		8	ľ	14	ľ	*	6.12	5.52	*		5.52	
М	2.218			2.218	*	*		4.018	3.318		4.018	3.318
of Cap-1 Maneuver	888		t	1303		9	273	292	840	257	270	511
Stage 1	•			٠	\$5 6 7		191	728	8	457	465	3
Stage 2		3	3		0	*	454	484	A	749	685	34
Platoon blocked, %			12.4		14	(4						
Anv Cap-1 Maneuver	886	8	*	1303	100	11	192	283	840	238	262	511
Aov Cap-2 Maneuver	*			*	(*)	(8)	354	368	8	351	356	×
Stage 1	:5	2		4	41	*:	787	724	(4)	455	453	
Stage 2		£	à i	ė.	*	*	433	452	*	718	682	•6
	ı	ä	ı	H	R	m	Ö,		N	ı	N	
toprojech	89			WB	R	Ĭ,	#			SB	ľ	
+ICM Control Delay, s	0.5	ı	ı	0.4	ı	H	30.8			14.5		
HCM LOS		8			ı		0		ı	œ	ı	
Inoctars/Asioc/Avril		NBLat	ä	EBI	EBR	WBE	MB.	WBR SBLn1	18En1	Н	Ш	ı
Capacity (veh/h)		360	886		ľ	1303	-	8	394			
HCM Lane V/C Ratio			900.0	(4)	(*)	0.025			0.041	П		
+CM Control Delay (s)		30.8	8.7	161		7.8	17)	8	14.5	l		
+CM Lane LOS		Ω	⋖		*	-C	20	•	æ			
Contract Action Contracts		43	0	۰	•	0		ľ	ď			

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HCM 6th TWSC 12: Saddle Ridge Trail/Service Road & US-30

2040 Total PM.syn

nt Delay, s/ven	5.6												
Iosement	183	æ	BB	HB	WBT	WBR	ES.	NBY	MBR	83	SBT	SBR	
ane Configurations	*	4	×	×	43			+3			4		
raffic Vol. weh/h	40	515	150	9	320	10	96	15	20	'n	20	90	
-uture Vol. veh/h	49	515	150	9	320	w	8	12	2	S	20	ı,	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None			None			None	٨		None	
Storage Length	325		150	300	.*,		*	Ä	*	×		*	
Jeh in Median Storage,	**	0	Ä	K	0	1	t	-	N.	42	-		
Srade, %		0	6	٨	0	2	*	0	٠	٠	0		
Peak Hour Factor	85	85	85	92	25	92	66	35	Si	8	8	35	
leavy Vehicles, %	7	7	2	7	2	2	2	2	2	2	2	2	
Avmt Flow	5	299	163	=	348	42	88	16	=	us.	22	un	
Amort Minor N	Majort	ŀ		Maior2	ŀ		Mittors	ŀ		Minor?			
low All	353	0	0	723	0	0	956	945	280	1038	1106	351	
Stage 1	18	740		(1)		9.*	270	570		373	373		
Stage 2		*	*	*	*	9	386	375	*	999	733		
Critical Howy	4 12	5	1	4.12	1	3	712	6.52	6.22	712	6.52	6.22	
Critical Hdwy Stg 1		*	٠	*		•	6.12	5.52	٠	6.12	5.52		
Critical Hdwy Stg 2					0		6.12	5.52		6 12	5.52		
-ollow-up Hdwy	2 218		19	2.218		9	3.518	4.018			4.018	3.318	
Pot Cap-1 Maneuver	1206			879			238	262	528	508	210	69.2	
Stage 1			٠	11	*	*	909	505	À	648	618	•	
Stage 2	A		*	8			637	617	*	449	426		Complete of
Platoon blocked, %		*	(*)		*	()							
Aov Cap-1 Maneuver	1206			879		t	223	258	528	195	506	692	
Mov Cap-2 Maneuver	ě.		•	**	*	7	349	367		312	313		
Stage 1			-	Y	i	*	26	503		845	610		
Stage 2	1			•		•	602	609	*	454	424	•	
-	20	Н		OTT	Н	ı	02		ı	8	Н		
JOHn Control Dollar e	10	ı	ı	5	l	ı	20.1	ŀ	I	16.6	ı		
HCM LOS			ı		ŀ	ı	O	ı	ı	O	ı		
		Ĭ	ı	ı	U	H		ı	ì		H	į	
Anor Lane Major Myrmt		NBLn1	EBI:	EBI	188	WBE	WET	WBR SBLn1	BLnT	li	ĥ		
apacity (vehifi)		362	1200	(4)	1.	879		1	344				
+CM Lane V/C Ratio		0.345	0.005	50	'	0,012		•0	- 0.095				
HCM Control Delay (s)	ı	20.1	00	1	i	9.1	Y		16.6	H	i		
HCM Lane LOS		ပ	A		*	4	4	-	U				
7													

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ntessentina	ŀ	ŀ						М	j		ı		
nt Delay, s/veh	0.4												
fovensent	EBL	EBT	2883	MAX	WBT	WBR	NBI	NBT	NBR	SBI	SBI	SBR	No. of the last
ane Configurations		ŧ	W.,	-	4				¥.			y.	
reaffic Vol. veh/h	0	185	55	30	535	5	0	0	10	0	0	6	2
-uture Vol. veh/h	0	185	55	8	535	2	0	0	ın	0	0	w	
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	(*	10	None	-		None			None	alt		None	
Storage Length	(1+)	19	150	300		12	×		0		*	0	
/eh in Median Storage, #	10	0	81		0	140	*	-	0.0	120	-	100	
Grade, %		0	3 6	7	0	4		0	(N)		0	9	
Peak Hour Factor	35	85	35	35	Sŧ	35	92	35	85	92	8	25	
Heavy Vehicles, %	2	CV	e	ev	2	2	2	CV	cv	ev	c.	2	
Avmit Flow	0	301	8	ee	285	9	0	0	w	c	0	w	Marie Marie
SportMinor 13	ajort			Major2		**	Mencer			Minor2	i		
Conflicting Flow All	9	0	0	797	0	0	74	300	5	51.	392	294	
Slage1	*	•	×.	×		1	•	18	ř	20.	14	3	
Stage 2	(#	(*	(2)	Ţ		12	4:	*	×	iti	7		
Critical Hdwy	Æ	•	ě	4.14	100		4	6	6.94	31	7	6.94	
Chtical Hdwy Stg 1	99	83	50	Ti	2	10	80	*3	*	20	20	9	
Interest Howy Stg 2				i	3	-	ń	1	i	•		1000	
ollow-up Hdwy	3543		(<u>*</u>)	2 22	•	٠	91	(4)	332	: (X.	3.32	
of Cap-1 Maneuver	0	10	d†	1300	S.	4	0	0	935	0	0	702	
Stage 1	0	9		*		•	0	0		0	0	.0	
Stage 2	0	*	i.	Ţ.	3	ř	0	0		0	0	×	
Platoon blocked, %		20	ż						2011000				
fov Cap-1 Maneuver		٠	•)	1300	*		8	(4)	935	. si	•	702	The state of the s
Mov Cap-2 Maneuver	10	£:		*	•	į.	\$0	10	٠	10	•	9	
Stage 1		i e	ľ	ľ	1	ľ	·	1	i e	H			
Stage 2						4	٠		٠	(*)		(*)	
	ı	i											No. of Persons
opreach	æ		H	8//	ď	ŀ	NB.	ì	l.	88	B		
ICM Control Delay s	0			0.4		r	8.9	Į.		102			
CM LOS		k					4	11	ш	œ			1000
finor LanesMajor Munt.	i	WE INT	183	288	MBI	WBT	WBR SBLn1	BLn1	ä	li	H		
apacity (veh/h)		935	*	1	1300	14.		702					
HCM Lane V/C Ratio	П	9000	3.1	•	0.025		•	0.008	۱	Н	П		
ICM Control Belay (s)		50	i		7.8	6		10.2	A	ä	Ü	i	
HCM Lane LOS		4	*	1	⋖ ;	4	١	m •	1				
HOM 95th %ale O(veb)		3	4	•	0	1	4	0					

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HCM 6th TWSC 12: Saddle Ridge Trail/Service Road & US-30

2040 Total PM_Improved.syn 02/11/2019

in count, or co	0.6												
Movement	EBE	EBI	EBR	WEL	WBI	WBR	NBI	NBT	NBR	381	SBT	SBR	2
ane Configurations		ŧ	W.	F	4				HE.			*	
saffic Vol. vehith	0	515	150	10	320	2	0	0	01	0	0	2	EG ANGE
Future Vol., veh/h	0	515	150	10	320	S	0	0	9	0	0	90	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	2	×	None	2	7	None	01	2	None		8	None	The second
Storage Length	1.0	198	150	300	1/4	7.4		i t	0	100		0	
Veh in Median Storage, #	7 熟	0			0		ă I	**	97.	į.	=		
Grade, %	٠	0	97		0	74	٠	0	2.	*	0	**	
Peak Hour Factor	35	65	35	65	83	35	82	26	25	26	26	25	
Heavy Vehicles, %	2	7	2	2	7	7	7	7	2	2	2	2	
Avmt Flow	0	999	53	F	348	LC.	0	0	=	0	0	45	
Sacriffice h	Materia	ì	Ī	Major?	Ī	3	Marel			Constant of	į		
Conflicting Flow All	•	0	0	723	0	0	ar.	24	280		(171	
Stage 1	0.0			1				()			100		
Stage 2	190	2.5	7		-		1		G#s	8	ě		
Control Howy	X	٠	*	4.14			X	×	6.94	*	0	6.94	
Critical Hdwy Stg 1	(2	ă:	*	41	*	9.7	۲		*		¥7	
Critical Howy Stg 2	•):	*	*		d	×.		*	i	t			
Follow-up Hdwy	,	P	•	2.22	٠	i.	ř.	•	3.32	٠		3.32	
Pot Cap-1 Maneuver	0	4	•	875			0	0	717	0	0	835	
Stage 1	0	SIR.	112		TI &	114	0	0	Sit.	0	0		
Stage 2	0	*	ľ		74		0	0		0	0	4	
Platoon blocked, %		(8)	(5)										
Nov Cap-1 Marseuver	٠	•	ř	875		ŀ	٨	۰	717	×	ě	835	
Nov Cap-2 Maneuver	¥	75	*		ä	*	£	10	ž.	*	*	(4)	
Stage 1	i		ľ	*	ř	¥	K	č	A)		1		
Stage 2	٠	•	:	٠	•	•	٠	٠	•	٠		*	
	ì	N	ı		Į	ì	ı	H	ģ	i	ı		
pproach.	EB			WB		Ì	NB			88			
ICM Control Delay, s.	0			0.3			10.1			9.3			
HCM LOS	1	1					8			<	1		
	ı	١	1	ı	ł					۱			
AnortaneMajor Munt		NBLn1	EBT	EBR WBI	WEL	WET	WBR SBLn1	Stof	H	Ē	E		
Sapacity (veh/h)	A	717	ľ		875	•	ľ	835					
HCM Lane V/C Ratio		0.015	22		0.012	101	TA .	- 0.007					
+CM Control Delay (s)		10.1	Ĭ		9.2	i	R	83				Ĭ	
HCM Lane LOS		æ	:		A	•		4		ı	l		

HCM 6th TWSC 13: Dell Range Boulevard & US-30

nt Delay, s/veh	2.4												
foremost	ä	102	000	5	TOWN	dom	MDI	NO.	Non	100	CBT	CBD	
WASHING .	2			4	,	1	2	1	ŝ	1	4	-	
ane Configurations	c.	2.	1	٢	-	۲.		\$	-	0.0	‡		
raffic Vol. veh/h	-	6	0		378	198	0	5	0	62	0	10	
Future Vol. veh/h	7	6	0	-	378	198	0	7	0	62	0	10	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channeirzed	IK.	7	Normal			E	(0)		None			None	
Storage Length	350	12		325		325	×	20	9	9	,		
Jeh in Median Storage	107	0	4		0		14		ř		٠		
Grade %	25	0		•	0	٠	*	0	*		0	×	
Peak Hour Factor	50	18	S	25	79	87	26	20	35	78	92	20	10 SAL 10
leavy Vehicles %	2	7	2	2	2	2	2	~	2	2	2	2	4
fymt Flow	54	122	0	1	478	228	0	NT.	0	22	0	20	
Lace Mines	Mann	ě	Ī	Carrell	ľ	ſ	Minorit	ľ		Minor	E		- The line
low All	478	0	0	112	0	0	929	646	112	648	646	478	
State 1	12	12			28	-	160	160		486	486		
Stage 2	*	į.		٠)(4	34	496	486	*	162	160	*	
Critical Houv	4.12	1	2	4.12	*		7.12	6.52	6.22	7.12	6.52	6.22	
Critical Howy Stg 1		*		٠	*	*:	6.12	5.52		6.12	5.52	٠	
Critical Hdwy Stg 2	1.0	×				×	6.12	5.52		6.12	5.52		
	2218	*	-	2.218	*	V	3.518	4.018	3.318	3.518	4.018	3.318	
of Cap-1 Maneuver	1084	1		1478		0	379	380	7	383	390	285	
Stage 1				•	590) -	0	842	268	9	563	55		
Stage 2	3	2			1	0	256	35	Ta.	840	766		
Platoon blocked, %		81	4		(4)								
Nov Cap-1 Maneuver	1084	4		1478	10)		328	380	941	373	380	287	
Nov Cap-2 Maneuver	*	*	•	740	(*)	(8)	433	442	*	456	452	¥	
Stage 1	10			•	×	(*)	823	749		221	549		k
Stage 2			*	*	*	٨	236	549	i,	817	749	•	100000000000000000000000000000000000000
		ķ				ı	1	ı	ŀ		ı		
uproach	8	į	ľ	WB	I	Ì	8	K	Ì	83			
HCM Control Delay, s	15			0.1			13.2			14.5			
HCM LOS			ł		1		œ		ı	m			
Incoll sealifaint found	П	NRIMI	ä	CRT	EBB	WBI	WRT	WRTSRint	П	۱			
anarity (vehib)	۱	442	1903		•	1478		477		ı			
HCM Lane V/C Ratio	ı	0.009				0.003	*	0.209					
+CM Control Delay (s)		13.2	8.4	(0)	*	7.4	71	14.5					
HCM Lane LOS		œ	×		.+1	ď	20	œ					
ICM 95th %tile Q(veh)		0	0	i	**	0	ł	0.8	i	ä	١		

Synchro 10 Report Page 1

HCM 6th TWSC 13: Dell Range Bou

2017-2018 Existing AM.syn 10/18/2018

US-30
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2017-2018 Existing PM.syn 10/18/2018

III neigh, sveil	-												
hovement	83	183	EBS	WBL	WBI	WBR	MR	NBI	NBB	SBI	SBT	SBR	
ane Configurations	*	.2		-	4	¥		+\$			4		
raffic Vol. wehith	P=	306	0	0	147	140	**	-	0	209	*	50	
Future Vol. vefvh	7	306	0	0	147	5	•	=	0	500	4	s.	
Conflicting Perts, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	0		None			Free			None		1	None	
Storage Length	350	41	140	325	*	325	•		•	100	*0	.00	
Jeh in Median Storage.	1 H	0		0	0		-		i	٠	•-		
Grade. %		0	•	•	0	•		0	٠		0	(0)	
Peak Hour Factor	25	80	60	92	83	282	25	25	85	98	20	29	
leavy Vehicles, %	2	2	2	2	2	2	2	2	2	8	2	2	
lynt Flow	12	344	0	0	111	179	~	4	0	243	00	00	
Saint Minor	Mainel		Ī	Maior	ľ		Annorth		77	Minor2	A		
low All	177	0	0	344	0	0	223	545	344	547	545	177	
Stage 1	ľ		×	*	3:	0	368	368	1	111	111	Sec.	
Stage 2	٠	٠	*			*	185	177	*	370	368		
Critical Hdwy	4.12		1	4 12	li		7.12	6.52	6.22	7.12	6.52	5.22	
Critical Hdwy Stg 1			•	(*)	. •	. *	6.12	5.52	•	6.12	5.52	2.0	
Intical Houry Stg 2		a	100	12	2	8	6.12	5.52	1	6.12	5.52	and a	
ollow-up Hdwy	2.218	11.	.30	2.218	9.8	78.		4.018	3.318	3.518	4.018	3,318	
ot Cap-1 Maneuver	1399	7X		1215	Z,	0	444	446	669	448	446	999	
Stage 1	•	*	(*)	55	.*	0	652	621	(4)	825	753	•	
Stage 2	í	8	×			0	817	153	ŀ	650	621		
Platoon blocked, %		A.	**		it.								
lov Cap-1 Maneuver	1399		×	1215	ï	i	432	442	669	442	442	998	
Nov Cap-2 Maneuver	•		٠	٠	i		517	504	1	522	505	,	
Stage 1	i		ř	10	ď	0	646	615	20	818	753	7	
Stage 2	1	ì	9		*	9	801	753		940	615		
			Ŋ,	ľ	ı	ı	I	П	ı	П			
ppreach	EB			WB			B	11		88			
HCM Control Delay, s	0.3		ı	0			12.2		Ц	18.2			
HCM LOS					1	١	æ	1	١	U			
	Ĭ				ä	ı		ì	ŝ	8			
Anor Lanethajor Mymt		NBEnt	EBL	183	E88	1816	WBT SBLn	Birni	H	H			
Capacity (veh/h)	h	510	1399	ľ	ľ	1215		528		3			
HCM Lane V/C Ratio		0.016	-	*	1		٠	0.491					
HCM Control Delay (s)		12.2	7.6	TE I	T.	0	u.	18.2					
HCM Lane LOS		8	A	2		V	•	U					
The second living the second s													

HCM 6th TWSC 13: Dell Range Boulevard & US-30

2040 Total AM syn 10/30/2018

HCM 6th TWSC 13: Dell Range Boulevard & US-30

2040 Total PM.syn 10/30/2018

Int Delay, s/veh	6.3											
Movement	183	183	883	WBI	WBIT	WBR	N8T	MBT	NBR	ills:	188	SBR
Lane Configurations	K-	.2		*	4	*		¢			¢\$	
Traffic Vol. vehilh	9	185	0	0	535	480	0	0	0	210	0	15
Future Vol, veh/h	10	185	0	0	535	480	0	0	0	210	0	15
Conflicting Peds, #hr	٥	0	O	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	i te	ar.	None		4	Free	00	(1)	None		3	None
Storage Length	350		0	325	*	325	(*)	×	11	٠		1
Veh in Median Storage, #	# 0	0	1	3	0	(4)	0	-	*		-	•
Grade, %	*:	0	*		0	×	٠	0	*	*	0	
Peak Hour Factor	92	35	92	35	8	65	35	92	35	6	6	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	7	2	7	2
Myrret Flow		201	9	0	285	255	0	0	0	228	0	16
Majorontinor	Magni	9		7 PORT			Mindel	200		MINONE	000	-
Conflicting Flow All	790	0	0	S	0	0	813	802	707	805	802	285
Stage 1			*	•	*	×	223	223		285	285	•
Stage 2	*	•,	Ť	*	¥	*	280	282		223	223	
Critical Hdwy	4,12	1	٠	4.12	-		7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1			1		ř	e	6.12	5.52		6.12	5.52	
Critical Holary Stg 2	1				4	10		5.52	1		552	
Follow-up Hdwy	2 218	11.2	i.	2.218	114	T.	3.518		3.318		4.018	3,318
Pot Cap-1 Maneuver	892	*	9	1371		0	297	316	840	301	316	513
Stage 1	(8)		3	*	721	0	780	719	j.t	488	499	*
Stage 2	*	A	T	3	R	0	464	499	ti	780	7119	N.
Platoon blocked, %		*)	٠		*							
Mov Cap-1 Maneuver	385		-	1371	1	1	285	313	840	588	313	513
Mov Cap-2 Maneuver) *)			(*)		(4)	381	397		366	401	
Stage 1	9	8	8	120		S.	771	711		494	88	6
Stage 2	ea.	*	X.	7.	74		478	499	3.0	111	711	114
			V.				Ī	63 =		ļ	ğ	
Approach	8			WB		1	NB	Ы	l	SB		
HCM Control Delay, s	0.4			0			0			26.5		
HCM LOS							¥			C		
The second second		i	Í		į	ľ	ľ					N
Misor Lanelliagor Marti	j	MBLat	Ħ	183	883		WBTS	VBT SBLm1				
Capacity (vehili)	7		665	1	Ť	1371		405				
HCM Lane V/C Ratio		1	0.011	÷				0.604				
HCM Control Delay (s)		0	8.3		(4)	0	*	26.5				
HCM Lane LOS		V	ď	i.e	i i i	ď	14	۵				
HCM 95th %tile O(veh)	0	2	0	3	8	0		3.8				

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Synchro	

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Lane Configurations 1	Jovernent	EBE	EBI	EBR	WBL	MBI	WER	NBI	IBN	MER	3	SBI	SBK
Colorection	ane Configurations)c	42		K	*	N		4			4	
Coling	raffic Vol. vehilh	10	900	0	0	325	375	0	0	0	435	0	10
monthlogory Mannul Pedis #Mint 0 <th< td=""><td>uture Vol. veh/h</td><td>0</td><td>200</td><td>0</td><td>0</td><td>325</td><td>375</td><td>0</td><td>0</td><td>0</td><td>435</td><td>0</td><td>10</td></th<>	uture Vol. veh/h	0	200	0	0	325	375	0	0	0	435	0	10
Interior Free Free Free Free Free Stop Stop Stop Stop Stop Interior Free Free Free Free Free Free Free F	onflicting Peds, #/hr	0	0	0	0	0	0	0	0	6	0	0	0
Professionary Professionar	ign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Length 350 - 325 - 1	T Channelized		*	None		W.	Free	•		None			None
Pedician Storage, #	torage Length	350	1		325	٠	325	18			M		
Water Each 9 0	eh in Median Storage.	1	0	1	1	0			=	8	A		
Felicin 92 92 92 92 92 92 92 92 92 92 92 92 92	rade, %	*	0	*	•	0	*	*	0	Ť		0	*
hicks, % 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	eak Hour Factor	8	35	92	8	35	85	35	35	35	35	26	95
11 543 0 0 353 418 0 0 0 473 0 1 1	eavy Vehicles, %	7	2	2	2	2	7	2	2	2	2	2	2
Flow All 353 0 0 543 0 0 924 918 543 918 35 95 95 95 95 95 95 95 95 95 95 95 95 95	lymt Flow	Ξ	553	0	0	353	408	0	0	0	473	0	
Flow All 353 0 0 543 0 0 924 918 543 918 918 35 95 95 95 95 95 95 95 95 95 95 95 95 95		ajor1	b		tajor2	B		thori			line2	H	
pe 2	onflicting Flow All	323	0	-	543	0	0	924	918	543	918	918	353
9e 2	Stage 1	×	*	Ğ	Till Control	16.	(4	585	585	100	353	353	27
wy 4,12 - 4,12 - 1,12 6,52 6,22 7,12 6,52 6,22 7,12 6,52 6,22 6,12 6,12 6,12 6,12 6,12 6,12 6,1	Stage 2	5.5	٠			(4)		359	353	ě	565	585	390
Wy Sig 1 612 552 612 552 How ys Sig 2	nitical Hdwy	4.12	,11	1	4.12	ă.	T.	7.12	6.52	6.22	7.12	6.52	6.22
Washington Fig. 552 642 542	ritical Hdwy Stg 1	2.5	97	•	V	¥0	٠	6.12	5.52	6	6.12	5.52	*:
Holwy 2,216 - 2,216 - 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3318 3518 4,018 3518	ribcal Hdwy Stg 2		ď			8	×	6.12	5.52	•	6.12	5.52	
Maneuver 1206 - 1026 - 0 550 272 540 -252 272 69 64 631 562 562 564 64 631 562 562 564 64 631 562 562 564 64 631 562 562 564 64 631 562 562 563 563 563 563 563 563 563 563 563 563		2.218	*		2.218		(*)						3.318
Pe 1	of Cap-1 Maneuver	1206	114	1	1026	e e	0	250	272		-252	272	169
Pe 2.	Stage 1	(C.)	ŊŶ.		iá	4	0	510	208	٠	99	631	
Manever 126	Stage 2		×	ě	٠	1	0	629	631	8	510	808	
Maneuver 1206 - 1026 - 244 270 540 - 250 270 69 Maneuver	latoon blocked, %												
Maneuver	lov Cap-1 Maneuver	1206		•)	1026	B	B	244	270	240	-250	922	691
Pe 2	ov Cap-2 Maneuver	•	•	•	i	٠	٠	366	374	v	- 372	376	
Pe 2 649 631 655 503 Pe 2 F F F F Per 2 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3 Per 3	Stage 1		ľ	*	•	1		505	503	i	828	631	
EB WB NB NB NB NB NB NB N	Stage 2	31	•			1		649	631		202	203	
A A A A A A A A A A A A A A A A A A A	povoach	83		E	WB	B		NB			83	d	
A A A A A Full CS A A Building A A A Building A A Building A Build	CM Control Delay, s	0.2			0		H	0			177.5		
12/8	CM LOS							Y			ш.		
1 NB.11 EBL EBR WBL WBL VB VB VB VB VB VB VB VB VB VB VB VB VB												1	
. 1206	mor Laneil/lajor/Mumi	h	BLai	H		EBR	WBL	WBTS	Blai	l	H		
. 0.009	apacity (veh/h)	i	1	1206	1	ř	1026	×	376				
0 4 0 0 4 0	CM Lane V/C Ratio		2/3	60000	a)	\$ 0	ř		1.286				
C(veh) A A A .	CM Control Delay (s)		0	80		P	0		177.5				
. 0 0 .	CM Lane LOS		∢	×			A	0.00	u.				
	CM 95th %tile O(veh)		12	0	4	9	0	3	21.8			2	

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HCM 6th Signalized Intersection Summary 13: Dell Range Boulevard & US-30

2040 Total AM_Improved.syn 02/11/2019

Movement Lane Configurations Traffic Volume (veh/h)	83	FRI	520	idm	WBT						100	Caso
Lane Configurations Traffic Volume (veh/h)		-	ĕ	70.4		1,000	ME	181	NBR	ž	100	90
Traffic Volume (veh.fh)	k	43		*	++	¥.	r	43		E	42	
The state of the s	10	185	10	10	535	480	10	0	10	210	0	15
Future Volume (veh/h)	9	185	10	9	535	480	10	0	10	210	0	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	100	100	1 00	1 00	1.00	1.00	1.00	1.00	1.00	1.00	1,00
Work Zone On Approach		8			S			S _O			8	
Adj Sat Flow, vehithlin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	Ξ	201	1	11	582	0	=	0	1	228	0	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	7	2	2	2	2	2	2
Cas, well-	630	1908	104	823	1978	H	401	0	319	406	0	319
Arrive On Green	0.66	0.66	99.0	1.00	1.00	0.00	0.24	000	0.24	0.24	000	0.24
Sat Flow, vehilb	833	2886	157	1170	2993	1335	1397	0	1335	1404	0	1335
Gra Volume(v), veh/h	=	104	108	=	582	-	=	c	=	278	0	16
Gro Sat Flow(s) wetshilln	833	1496	1547	1170	1496	1335	1397	0	1335	1404	0	1335
O Serveta s) s	0.4	23	23	0.0	0.0	0.0	9.0	0.0	9.0	13.4	0.0	0.8
Cycle O Clearfa ch. s	10.4	23	2.3	23	0.0	0.0	14	0.0	9.0	14.0	0.0	8.0
Pron In I are	100		0.10	100	2	1 00	100		100	100	3	100
ane Go Capic) while	630	080	1023	873	1978		401	0	319	406	· B·	310
V/C Ratio(X)	0.02	0.10	0.11	0.01	0.29	ı	0.03	000	0.03	0.56	000	0.05
Avail Capic at vehilh	630	686	1023	823	1978	i	401	0	319	406	0	319
HCM Platoon Ratio	1 00	1 00	1.00	2 00	2 00	2.00	100	1 00	1 00	100	100	1.00
Inchesm Eliteriii	1.00	1.00	100	0.10	0.10	9.00	100	000	100	100	000	1 00
Uniform Dalay (d) shigh	5.2	ur.	r.	0	00	0.0	28.0	00	26.3	31.6	0.0	26.4
Inter Dollar (42) chak	. 0	000	co	0		0		0	000	4	0	9 6
Inc Color (us) Sven		9 6	9 0	9 0	30	3 6		0 0	9 0	0 0	3 6	200
imba o Delay(do), sven	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0	0.0	0.0
Wie Back(#O(50%) vehiln	0.1	0.7	0.7	0.0	0.0	0.0	0.7	0.0	0.2	9	0.0	0
Unsig. Movement Delay, s/ven	Н	4	4.4				949	4	4	44.0	44	2
uncap tretaylol/siven	0	0	00		5	8	000	00	0.07	7/0	00	100
rugib FOS	Y	4	4	4	Y		U	4	U	٥	A	٥
Approach Vol. veh.h.		223			593	es.		22			244	B
Approach Delay, s/veh		5.7		h	0.1	ı	N	26.8			36.5	۱
Approach LOS		<	A	l	V	ļ	۱	U		ŀ	۵	ſ
Timer - Assimed Phs		2		97	9	(E)	Ì	oc.				
Phs Duration (G+Y+Rc), s		26.0		84.0		26.0		64.0	V		ı	
Change Period (Y+Rcl. s		4.5		4.5		4.5		4.5				
Max Green Setting (Gmax), s		21.5	į	59.5	ð	21.5	į	59.5			Ī	ı
Max O Clear Time (a c+11). s		3.4		4.3		16.0		4.3				ı
Green Ext Time (p. c), s		0.0		1.4	I	0.4	Ĭ	4.7		9	ķ	H
Column Section Column		l		ı	į	١					ı	ı
mersection summany		ı	į	ı		I	Ì	ı				ı
HCM 6th Ctrl Delay		į	10.0								į	
HCM 6th LOS			¥									

Notes
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

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HCM 6th Signalized Intersection Summary 13: Dell Range Boulevard & US-30

2040 Total PM_Improved.syn 02/1/2019

Approximation Fig. Est Figh Wig Wig Wig Wig Wig Wig Wig Wi		1	Ť	>	-	ļ	1	•	-	•	۶	-	*
1	Adversent	EBL	183	EBB	MBI	MBI	WER	NBL	NBT	NBR	SBI	SBT	SBR
10 560 10 10 325 375 10 0 10 435 0 10 435 0 10 500 10 10 10 10 10 10 10 10 10 10 10 10 1	ane Configurations	æ	24		K	*	×	A.	43		je-	42	
10 500 10 10 325 375 10 0 10 435 0 1 10 0 10 0 10 0 10 0 10 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	raffic Volume (veh/h)	10	200	10	10	325	375	10	0	10	435	0	10
100 10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	uture Volume (veh/h)	10	200	10	9	325	375	10	0	10	435	0	9
100 100 100 100 100 100 100 100 100 100	nitial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
110 110 110 110 110 110 110 110 110 110	Ped-Bike Adj(A_pbT)	1.00		1,00	1.00		1,00	1.00		1.00	9.		1.00
No No No No No No No No No No No No No N	arking Bus, Adj	1.60	1.00	1.00	1.00	1.00	8	100	100	1.00	1 00	18	1.00
1575 1575 1575 1575 1575 1575 1575 157	Vork Zone On Approach		8			S			S			_S	
11 543 11 11 353 0 11 0 11 473 0 12 0 12 0 12 0 12 0 12 0 12 0 12 0 1	Adj Sat Flow, vehit/In	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92	dj Flow Rate, veh/h	=	543	=	=	353	0	=	0	41	473	0	-
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	eak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
394 988 20 233 991 878 0 764 878 0 0 1033 3033 0.23 0.11 0.11 0.11 0.15 0.05 0.05 0.05 0.05	ercent Heavy Veh, %	2	2	2	5	2	2	2	2	2	2	2	2
0.33 0.33 0.33 0.11 0.11 0.00 0.57 0.00 0.57 0.00 0.57 0.00 0.12 0.12 0.13 0.11 0.11 0.11 0.00 0.57 0.00 0.57 0.00 0.12 0.12 0.13 0.11 0.11 0.11 0.11 0.11 0.11 0.11	an vehili	304	983	20	233	186		878	0	764	878	0	764
1028 3000 61 884 2993 1335 1404 0 1335 1404 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	urive On Green	0.33	0.33	0.33	0.11	0.11	0.00	0.57	0.00	0.57	0.57	0.00	0.57
11 271 283 11 383 0 11 0 11 473 0 102 1128 1456 1554 854 1456 1335 1404 0 1335 1404 0 1336 1405 1108 134 134 145 99 0.0 0.3 0.0 0.3 197 0.0 106 134 134 134 145 99 0.0 0.6 0.0 0.3 197 0.0 130 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	at Flow, veh/h	1028	3000	91	854	2993	1335	1404	0	1335	1404	0	1335
1028 1456 1554 654 1456 1335 1404 0 1335 1404 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0	im Volume(v), veh/h	11	271	283	11	353	0	11	0	11	473	0	11
0.8 13.4 13.4 1.1 9.9 0.0 0.3 0.0 0.3 19.7 0.0 10.0 13.4 13.4 13.4 14.5 9.9 0.0 0.5 0.0 0.3 20.1 0.0 10.0 13.4 14.5 9.9 0.0 0.5 0.0 0.3 20.1 0.0 0.3 20.4 10.0 10.0 1.00 1.00 1.00 1.00 1.00 1	in Sat Flow(s), veh/lufin	1028	1496	1564	854	1496	1335	1404	0	1335	1404	0	1335
106 134 134 145 99 00 0.6 0.0 0.3 201 0.0 100 134 134 145 99 0.0 0.6 0.0 0.0 1.00 304 499 513 233 981 878 0 764 878 0 304 490 513 233 981 878 0 764 878 0 304 490 513 233 981 878 0 764 878 0 306 490 513 233 981 878 0 764 878 0 400 100 100 107 100 100 100 100 100 418 248 398 314 0.0 84 0.0 0.0 0.0 52 54 53 59 314 0.0 84 0.0 0.0 0.0 52 54 54 53 40 0.0 0.0 0.0 0.0 0.0 55 54 54 54 54 54 54 560 340 321 0.0 85 0.0 0.0 57 57 57 57 57 57 58 59 51 51 52 54 59 51 52 54 54 54 54 50 51 52 54 54 54 54 50 51 52 54 54 54 54 50 51 51 52 54 51 51 52 54 54 54 51 51 52 54 54 54 51 51 52 54 54 51 51 52 54 54 54 51 51 52 54 54 51 51 52 54 51 51 52 54 51 51 52 54 51 51 52 51 51 52 54 51 51 52 51 51 52 51 51 52 51 51 52 51 51 51 51 51 51 51 51	Serve(g_s), s	0.8	13.4	13.4	17	6.6	0.0	0.3	0.0	0.3	19.7	0.0	0.3
100 0.04 100 1.00 1.00 1.00 1.00 1.00 1.	yde Q Clearlg c) s	10.6	13.4	13.4	14.5	6.6	0.0	9.0	0.0	0.3	20.1	0.0	0.3
354 459 513 233 981 878 0 754 878 0 304 459 515 253 981 878 0 754 878 0 304 495 515 253 981 878 0 0 054 000 1100 100 100 033 033 033 100	rop in Lane	1.00		0.04	1.00		1.00	1.00		1.00	1.00		1.00
0.04 0.55 0.55 0.05 0.36 0.01 0.00 0.01 0.054 0.00 0.01 0.054 0.00 0.01 0.00 0.01 0.054 0.00 0.01 0.00 1.00 1.00 1.00 1.00 1.0	ane Grp Cap(c), veh/h	304	490	513	233	981		878	0	197	878	0	764
344 499 513 233 981 878 0 764 878 0 0 100 100 100 100 100 100 100 100 10	/C Ratio(X)	0.04	0.55	0.55	0.05	0,36		0.01	0.00	0.01	0.54	000	0.0
1100 100 100 033 033 100 100 1100 1100	vail Cap(c_a), wehilh	304	480	513	233	981		878	0	197	878	0	784
1.00 1.00 1.00 0.74 0.74 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0.00 1.00 0	CM Platoon Ratio	1,8	1.80	1.00	0.33	0.33	0.33	1.00	1.00	1,00	1.00	1.00	1.00
27.8 24.8 24.8 39.8 31.4 0.0 8.4 0.0 8.3 12.6 0.0 0.2 4.4 4.2 0.3 0.8 0.0	(pstream Filter(I)	1.00	1.00	100	0.74	0.74	00.0	1.00	000	100	1.00	000	1.00
02 44 42 03 08 00 00 00 00 24 00 00 00 00 00 00 00 00 00 00 00 00 00	Iniform Delay (d), s/veh	27.8	24.8	24.8	39.8	31.4	0.0	8.4	0.0	8.3	12.6	0.0	83
00 00 00 00 00 00 00 00 00 00 00 00 00	nor Delay (d2), s/veh	0.5	7.7	4.2	03	0.8	00	00	0.0	0.0	2.4	0.0	0.0
25 54 03 40 00 01 00 01 62 C C C C D C A A B S5 55 555 384 A 22 556 340 550 340 567 340 550 340 567 340 550 340 578 24 5 45 584 221 584 221 584 221 584 221 584 221 585 340 585 340 585 340 586 340 587 340 587 340 588 3 150 588 4 150 5	nitial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2 C C C D C A A A B 65 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	sile BackOfO(50%) vehiln		5.2	5.4	0.3	4.0	0.0	0.1	0.0	0.1	6.2	0.0	0
20 291 400 321 0.0 85 0.0 83 150 0.0 20 20 20 20 20 20 20 20 20 20 20 20 20	insig. Movement Delay, s'veh	L.	in the latest designation of the latest desi				-		1				
C C C D C A A A B 555 384 A 22 255 384 C C C C C C C C A A A B 22 255 384 C C C C A A A B 22 25 C C A A A B 22 C C A A A B 22 C C A A A B 22 C C C A A A B 22 C C C C C A A B 22 C C C C C C C C C C C C C C C C C	nGrp Delay(d),s/veh	28.0	292	29.1	40.0	32.1	0.0	8.5	0.0	8.3	15.0	0.0	83
291 324 A 22 291 324 84 C C C A 560 340 560 340 45 45 45 45 45 45 515 295 516 295 517 295 518 295 518 295 519 295 748 221 165 C C C A 45 46 45 47 45 48 221 165 C C C C C C C C C C C C C C C C C C C	nGrp LOS	O	S	U	۵	O		A	V	¥	8	¥	×.
281 32.4 8.4 C C A 2 4 6 8 8 8 560 340 560 340 4.5 4.5 4.5 4.5 51.5 29.5 51.5 29.5 2.6 15.4 22.1 16.5 0.1 2.9 1.6 1.9	pproach Vol. veh/h		505			385	¥		22			484	Į
2 4 6 8 560 340 560 340 45 45 45 45 515 285 515 295 26 154 221 165 248 76 19	approach Delay, s'weh		29.1			32.4	۱		8,4			14.8	i
2 4 6 560 340 560 45 45 45 515 245 515 26 154 221 248 221 248 221 248 221	pproach LOS	١	Q			O	ŀ	ŀ	HC.			60	
56.0 34.0 56.0 54.5 4.5 4.5 54.5 54.5 54.5 54.5 54.5	imer Assigned Phs	1	è				9		60			3	
45 4.5 4.5 2.1 2.6 15.4 22.1 1.6 2.9 2.1 2.1 2.9 2.1 2.9 2.1 2.9 2.1 2.9 2.1 2.9 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1 2.1	ths Duration (G+Y+Rc), s		56.0		340		26.0		340				
515 295 515 26 154 221 0.1 29 1.6 248	Change Period (Y+Rc), s		4.5		4.5		4.5		4.5				
2.6 15.4 22.1 0.1 2.9 1.6 24.8 C.	lax Green Setting (Gmax), s	1	515		29.5	ų.	515		29.5				ı
248 748 C.C. C.C. C.C. C.C. C.C. C.C. C.C. C.	Aax Q Clear Time (g_c+11), s	52	2.6		15.4		22.1		16.5				
rinmary Delay	Green Ext Time (p., c), s	H	0.1		53		16	H	18				ì
Delay	Mersection Summary			X			ř					Ī	ľ
	HCM 6th Chf Belav		ľ	248	ľ	i	ı	ı					Ī
	ICM 6th LOS			U	l			ŀ					ı

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC 14: US-30 & Christensen Road

Intersection		t				ľ	The state of the s
Int Delay, s/veh	3.1						
Movement	163	183	WBI	1	88	SBP	
Lane Configurations	jic	-	£.		N. A.		
Traffic Vol, veh/h	15	127	209	4	9	135	The second secon
Future Vol, veh/h	15	127	509	4	9	135	
Conflicting Peds, #/hr	0	0	0	0	0	0	STREET, STREET
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	•	None		None		None	TANKS OF THE PARTY
Storage Length	325			A	0		
Veh in Median Storage, #	#	0	0	i	-		
Grade, %	ť	0	0	*	0	ľ	
Peak Hour Factor	87	87	9	91	85	82	
Heavy Vehicles, %	2	2	2	2	5	2	
Myrrat Flow	17	146	559	*	7	165	
Idagor/Minor A	Majori		Major2		Mrset2	F	
Conflicting Flow All	563	0	200	0	741	561	
Stage 1		2	14	14	261		STATE OF THE PERSON NAMED IN COLUMN NAMED IN C
Stage 2	***	•	(4)	*	180		
Critical Holay	4.12	×	*	8	6.42	6.22	
Critical Hdwy Stg 1	20	•	, A	*	5.42	I,	
Critical Holwy Stg 2		1	and and	-	5.42		
Follow-up Hdwy	2 2 1 8				3.518	3	
Pot Cap-1 Maneuver	1008	4		16	38	527	
Stage 1		0	4	*	571	. 1	*
Stage 2	V		4	×	821		THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.
Platoon blocked, %		*	À	*		1	
Mov Cap-1 Maneuver	1008		V.		377	527	
Mov Cap-2 Maneuver	i		•	٠	454		
Stage 1				•	58	i	
Stage 2	*	3		134	821	,	
						ı	
Approach	83		WB		SB	ľ	
HCM Control Delay, s	6.0		0		15.2		
HCM LOS					U		
	Ş	Ì	Ì			ī	
Minor Lane Major Myrtt		Ħ	183	181	WBR SBLm1	SBE	
Capacity (vehth)		1008		2		524	
HCM Lane V/C Ratio		0,017	•	*\5		0.328	
HCM Control Delay (s)		9.0	1		8	15.2	では、日本のでは、日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日
HCM Lane LOS		A		4	9		
HCM 95th %ile O(veh)		0		6	(6)	1.4	

Synchro 10 Report Page 1

HCM 6th TWSC 14: US-30 & Christensen Road

2017-2018 Existing AM.syn 10/18/2018

2017-2018 Existing PM.syn 10/18/2018

nt Delay, s/ven	-						
Schoment	22	FRY	WRIT	WRR	8	SRR	
	1	4	4		1		
ane Configurations	-	-	1	100	-	2000	
raffic Vol. vehilh	86	425	268	1	2	20	
Future Vol, veh/h	98	425	268	-	2	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized		None		None		None	
Storage Length	325	*	90	ė	0	*	
Veh in Median Storage, #	八熟	0	0	7	Ī	X	
Grade, %		0	0	ì	0		
Peak Hour Factor	85	82	62	79	80	18	THE PERSON NAMED IN COLUMN 2 IS NOT THE OWNER.
Heavy Vehicles, %	2	2	2	2	2	2	
Avmt Flore	120	518	339	-	2	95	THE RESERVE THE PERSON NAMED IN
Esperition	Majort	Ī	Major?		Minor	ı	
Conflicting Flow All	340	0		0	1098	340	
Stage 1	i	8	¥.	1	340		
Stage 2	ľ		•	K	758	•	
Critical Hdwy	4.12	•	1		6.42	6.22	THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN
Critical Hdwy Stg 1	1			7.	5.42		
Critical Hdwy Stg 2	i			•	5.42		
-ollow-up Hdwy	2.218		24	74	- 3.518	3.318	
Pot Cap-1 Maneuver	1219		4	(4)	235	702	
Stage 1		•	(4)	×	721		
Stage 2	•			٠	463	ě	
Platoon blocked, %		,	ě.	è			
Nov Cap-1 Maneuver	1219	*			212	705	
Vlov Cap-2 Maneuver	1	4	4	74	286	į.	
Stage 1	•			.(6	650	Et	
Stage 2		•		34	463		
							THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN
pproach	83		WB	ĥ	SB	1	
HCM Control Delay, s	1.5		0		-		
HCM LOS					m		
	i	ä	h	15	H	H	
Anor Love Major Ment	200	Ħ	188	EBT WRT WRR SBLn1	MBR	SBLn1	
apacity (vehih)	į,	1219	ľ	100		999	
+CM Lane V/C Ratio	ľ	0.098	(9)	1.0		0.097	
+CM Control Delay (s)		8.3		1		1	
HCM Lane LOS		4	2.0	0.	(2)	60	

HCM 6th TWSC 14: US-30 & Christensen Road

14: US-30 & Christensen Road

HCM 6th TWSC

2040 Total PM.syn 10/30/2018

Stop

Stop

Stop 100

Stop 125

> Free 150

Free o

105

Int Delay, s/veh

325

Traffic Vol, vehih 105
Conflicting Pets, #firr 10
Sign Control Free
RT Chamelized Storage Length 325
Veh in Median Storage, #
Grade, %
Pesik Hour Factor 92
Haavy Vehicles, % 2

100

23 2

24 45

293

923

549

Conflicting Flow All

4.52

Stage 2
Critical Hdwy
Critical Hdwy Sig 1
Critical Hdwy Sig 2
Follow-up Hdwy 2
Pot Cap-1 Maneuver

2040 Total AM.syn 10/30/2018 158 145 4888° 889 100 22 23 ෂ සි සි ප Stop 100 260 38 150 8 Lane Configurations 7
Traffic Vol. wehn 35
Future Vol. wehn 35
Conflicting Peds. #hr 0
Sign Control
Sign Control
Storage Lenetized 325
Veh in Median Storage # Peak Hour Fattor 92
Heavy Vehicles, % 2
Mymt Flow 38 304.8 Int Delay, siveh

Conflicting Flow All 685 0 391 0 1502 1385 342 1407 1423 674 Shage 1 - - - - - 418 -	Sacriffinds A	Majori		N	Major2	H	N	Minort			Minor?	H		
412 418 418 456 956 956 412 412 412 412 412 412 412 412 412 412	Conflicting Flow All	685	0	0	391	0	0	1502	1385	342	1407	1423	674	
412	Stage 1		ä	II.	74	74	90	418	418	3	956	926		
4.12	Stape 2	il*	•		¥.	(*)	96	1084	867	٠	451	467		
2218	Infical Hdwy	4.12			4.12	×	×	7.12	6.52	6.22	7.12	6.52	6.22	
2218	Critical Hdwy Stg 1	327	٠	٠	:4:	(*)	*	6.12	5.52		6.12	5.52	* E	
2218	Critical Hdwy Stg 2		1	×		A	Y		5.52	•	6.12	5.52	0.00	
908 1168 100 143 701 117 138 138 138 138 138 138 138 138 138 138	-ollow-up Hdwy	2.218	•	-	2.218	*	٧		4.018		3.518	4.018	3.318	
908 116836 120 701 85 11556 204 186 20556 204 186 20556 204 186 20556 204 186 20556 204 186 20556 204 186 20556 204 186 20556 204 186 20556 204 186 205 538 105 205 538 105 205 538 105 205 538 105 205 538 105 205 538 105 205 538 105 205 205 205 205 205 205 205 205 205 2	Pot Cap-1 Maneuver	806	ŀ		1168	H			143		117	136	455	
908 . 116836 120 701 85 11586 204 . 188 20556 204 . 188 20556 204 . 188 20556 204 . 188 20556 204 . 188 20556 204 . 188 20556 204 . 188 20556 204 . 101 293 . 505 53856 204 . 115 \$ 16023 \$ 516 \$ F \$ F \$ F \$ F \$ F \$ F \$ F \$ F \$ F \$	Stage 1	٠	(0)		•	990			591	-	310	336	e.	
908 . 1168 36 120 701 85 115 - 56 204 . 188 205 - 58 56 297 295 - 101 293 . 505 538 EB WB NB SB SB SB SB SB SB SB SB SB SB SB SB SB	Stage 2	1			5		ii.	-263	333	ì	288	562		
908 . 116836 120 701 85 115 56 204 . 188 205 56 204 . 188 205 56 204 . 188 205 101 293 505 538 101 293 505 538 101 293 505 538 101 293 505 538 101 293 505 538 101 203 101	Patoon blocked, %			(A		74	(4							
EB WB NB NB NB NB NB NB 15 S S S S S S S S S S S S S S S S S S	Abv Cap-1 Maneuver	806	8	T.	1168	K	7.0	- 36	120	701	98	115	455	
EB WB NB NB NB NB NB NB NB NB NB NB NB NB NB	Aov Cap-2 Maneuver	٠		×	4	*	*)	- 56	204	4	188	205	*:	
EB WB NB NB NB NB NB NB N	Stage:1		×	ľ	٠	*	*	586	999	ľ	297	295		
rid Delay, s 0.8 1.5 \$ 1502.3 rid Delay, s 0.8 1.5 \$ 1502.3 rid Delay, s 0.8 1.5 \$ 1502.3 rid Delay, s 0.8 290 908 1.05 1.05 rid Delay (s) \$ 1967.2 21 9.1 85 1.05 rid Delay (s) \$ 1967.	Stage 2	* (i	•	1	**	٠	•	- 101	293		505	538		
roi Delay, s 0.8 1.5 \$ 1602.3 roi Delay, s 0.8 1.5 \$ 1602.3 roi Delay, s 0.8 1.5 \$ 1602.3 F F F F F F F F F F F F F F F F F F F			Ø	ı	ij	ı		ı	ě	Ì	H	ł	Š	
roi Delay, s 0.8 1.5 \$ 1602.3 roi Delay, s 0.8 15 5 1602.3 reality	pproach	83			WB			88	ř	H	SB		3	
F F F F F F F F F F F F F F F F F F F	+CM Control Delay, s	0.8	ł		15		S	602.3			516			
MI NBLINBLIZ EBL EBT EBR WBL WBT WB 56 220 908 168 5047 0.225 0.042 0.121 3 \$1967 2 21 9.1 8.5 6.5 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1	HCM LOS							u.		V	ш.			
5. 290 908 1168 5.047 0.225 0.042 0.121 5.047 0.225 0.042 0.121 6.12 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.2 6.	linox Lanelliajor Mvm		BLentin	BLn2	EBI	199	88	WEI	WET	WBR	BEnl	SHLn2		
5.047 0.225 0.042 - 0.121 - 0.	Capacity (veh/h)		98	290	806	×	ľ	1168	ľ		188	310		
0 \$1967.2 21 91 - 85 F F C A - A - B S S S S S S S S S S S S S S S S S S	+CM Lane V/C Ratio	40	.047		0.042	(*))*(0.121	*	*	0.116	0.824		
F C A · · A ·	+CM Control Delay (s)	5.1	67.2		9.1	×	.*:	8.5	8		26.6	53.7		
317 0.8 0.1	HCM Lane LOS		11.	O	ď	*	53	ď	•	•	۵	12		
	+CM 95th %tile O(veh)		31.7	0.8	0.1	8	ì	0.4		Ì	2	fin.		

0 1727 1662 777 1795 1800 541 - 1005 1005 - 549 549 - -- 722 557 - 1146 153 - - 612 552 622 772 552 6.22 - 612 552 - 612 552 - - 612 552 612 552 - - 518 4.08 3318 3518 4.08 3318 - - 281 319 - 458 468 - - 418 462 - 242 272 - - 418 462 - 242 272 - - 418 462 - 242 272 - - 100 47 397 458 468 - - 418 462 - 242 272 - - 100 47 397 458 468 - - 418 462 - 242 272 - - 418 462 - 242 272 - - 100 47 397 458 468 - - 612 552 - - 613 552 - - 70 613 552 -

- 2.218

-36 - 80 397 - 12 66 541 -108 172 - -15 144 - . 258 283 - 407 432 - . -281 428 - 70 242 - .

258

740

Platoon blocked, % Mov Cap-1 Maneuver 1021 Mov Cap-2 Maneuver -

Stage 1 Stage 2

Stage 1 Stage 2

8 5 L

6.0

Approach
HCM Control Delay, s
HCM LOS

Synchro 10 Report Page 1

+ Computation Not Defined * All major volume in platoon

S. Delay exceeds 380s

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Synchio 10 Report Page 1

. 15 268 . 1.087 0.548 \$6077 33.6 . F D

- 740 - 0.073 - 10.2 - 8 - 0.2

108 244 1021 1.258 1.158 0.112 245.5 150 9

F F A

HCM Lane VIC Ratio HCM Control Delay (s) HCM Lane LOS HCM 95th 7stie Q(veh)

+ Computation Not Defined

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HCM 6th Signalized Intersection Summary 14: US-30 & Christensen Road

2040 Total AM_Improved.syn 02/11/2019

Idouenent EBI Lane Configurations Transfer Volume (vehin) 35 Future Volume (vehin) 35 Future Volume (vehin) 36 Ped-Bike Adji Ap D 100 Ped-Bike Ad	35 35	HBI	EBR	- Indian	TOWN.	-			-	ē	SBT	CBB
ch 1.1		ŀ		9	ign	WER	NBI	MBI	NBR	70	-	- 1000
		4-	¥	K	23		M	¢2		k.	42	
ch 15	35	270	90	130	610	20	260	38	25	8	90	145
1.0 1.0 1.0 1.0 1.0		270	90	130	610	20	260	R	25	20	90	145
ach	0	0	0	0	0	0	0	0	0	0	0	0
ach	8		1.00	1 00		100	1.00		9	1.00		1.00
ach	.00	8	100	1 00	1 00	1 00	1 00	1.00	100	1 00	1 00	100
		2	ı	ı	Se .			8			Š	
		575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
		293	88	141	663	22	283	88	27	22	88	125
	Ĭ	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
avy Veh, %		2	2	2	2	2	2	2	2	2	2	2
	b	884	749	477	723	24	331	290	206	492	213	272
	m	0.19	0.19	0.48	0.48	0.48	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h 150	Ď	1575	1335	993	1516	20	1158	857	609	1337	629	802
Grp Volume(v), veh/h 3	38	293	86	141	0	685	283	0	65	22	0	223
Gm Sat Flow(s), vehin/in 150		575	1335	993	0	1566	1158	0	1465	1337	0	1431
		14.5	5.5	8.9	0.0	36.6	19.5	0.0	2.8	1.0	0.0	11.0
Cycle O Clear(g_c), s		4.5	5.5	15.9	0.0	36.6	30.5	0.0	2.8	3.8	0:0	11.0
Prop In Lane 1.0			1.00	1.00		0.03	1.00		0.42	1.00		0.56
Lane Grp Cap(c), veh/h 18		884	749	477	0	747	331	0	497	492	0	485
		0.33	0.13	0.30	0.00	0.92	0.85	0.00	0.13	0.04	00.00	0.46
Avail Cap(c, at, wehth 25		884	749	477	0	747	331	0	497	492	0	485
po		0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Unstream Filter(I) 0.88		.88	0.88	1.00	0.00	1.00	1.00	0.00	1.00	1.00	00.00	1.00
Uniform Delay (d), s/veh 19.		22.0	18.3	18.9	0.0	21.9	36.3	0.0	20.6	21.9	0.0	23.3
Incr Delay (dZ), s/veh 0.		6.0	0.3	1.6	0.0	18.0	23.5	0.0	0.5	0.5	0.0	3.1
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		6.3	1.8	2.2	0.0	16.1	8.4	0.0	1.0	0.3	0.0	4.0
ay, s/veh						1						
LnGrp Delay(d),s/veh 19	19.7	22.9	18.7	20.5	0.0	39.8	59.9	0.0	21.1	22.1	0.0	26.4
	В	ပ	В	ပ	A	0	Ш	A	O	U	¥	O
Approach Vol, veh/h		429			826			348			245	l
Approach Delay, s/veh	~	21.6			36.5			52.6			26.0	
Approach LOS		ပ			٥	1		۵	ı	i	O	
Timer - Assumed Phs	B	2	ļ			9	11.	00		i	ĺ	ī
Phs Duration (G+Y+Rc). s	6	35.0		55.0	1	35.0	7.6	47.4				
Change Period (Y+Rc), s		4.5	l	4.5	l	4.5	4.5	4.5	ı	ŀ	l	ĺ
Max Green Setting (Gmax), s	(*)	0.5		50.5	ľ	30.5	7.5	38.5	ě	þ	Š	i
Max Q Clear Time (q. c+l1), s		32.5		16.5		13.0	3.1	38.6	l		ı	ľ
Green Ext Time (p_c), s		0.0	E	22	ě	13	0.0	0.0	ě	ĺ	١	Ä
The state of the s	l		į	Ì	Ì			ı	ł	Ì		
THE SCOOL STREET BY		I						ì				Ī
HCM 6th Cut Delay		I	34.7	i	i							Ĭ

A 129 29,7

33.5 0.0

00 803 893

19.5 B 1037 17.1

Approach Vol. vehith Approach Delay, s/veh

Approach LOS

4.5 4.5 46.5 26.9 4.1

9.2 4.5 6.5 0.0

62.0 4.5 57.5 30.1 5.9

280 45 235 162 12

Timer - Assigned Phis Phis Daration (G+V+Rc), is Change Period (Y+Rc), is Max Green Setting (Gmax), is Max O Clear Time (g_c+Ht), is Green Ext Time (g_c+Ht), is

Ingrection Summary HCM 6th Ctrl Delay HCM 6th LOS

Synchro 10 Report Page 1

Summary	
Intersection 5	hen Road
ignalized	14. LIS-30 & Christenson Boad
HCM 6th S	14.115.2
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2040 Total PM_Improved,syn

	4	†	<u> </u>	1	ļ	1	•	←	•	۶	→	*
Movement	EBI	EBT	EBR	WRE	WET	WBR	TEN	NBI	NBR	198	188	SS
Lane Configurations	r-	4	¥.	*	¢		¥	43		r	42	
Traffic Volume (velvih)	105	280	270	95	490	12	125	135	135	15	8	85
Future Volume (veh/h)	105	580	270	20	490	15	125	125	135	15	20	82
nitial Q (Qb), veh.	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1,00	1.00	1.00	1.00	1.00	1.00	1,00	1.00	1.00	1,00	1.00
Nork Zone On Approach		2			No			S			S	
Adj Sat Flow, vehibilin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	114	630	293	54	533	16	136	138	114	16	55	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.92	0.92	8 92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	2	2	2	2	2	2	2	2
Sap, veh/h	404	1006	883	278	816	52	334	202	173	202	180	196
Arrive On Green	0 04	0,43	0.43	0.54	0.54	0.54	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, vehith	1500	1575	1335	909	1521	46	1280	792	999	1130	688	752
3rp Volume(v), veh/h	114	630	293	54	0	549	136	0	250	16	0	113
Srp Sat Flow(s), veh/h/ln	1500	1575	1335	909	0	1567	1280	0	1456	1130	0	1440
Serve(g_s), s	2.9	28.1	13.2	5 9	0.0	22.5	8.6	0.0	13.8	1.2	0.0	5.7
Cycle Q Clear(g_c), s	2.9	28.1	13.2	24.9	0.0	22.5	14.2	0.0	13.8	14.9	0.0	5.7
hop in Lane	1 00		1.00	1.00		0.03	1.00		0.46	1.00		0.52
ane Grp Cap(c), veh/h	404	1006	853	278	0	841	334	0	380	202	0	376
//C Ratio(X)	0.28	0,63	0.34	0.19	0.00	0,65	0.41	00.00	99.0	0.08	0.00	0.30
(vail Cap(c_a), vehih	434	1006	853	278	0	841	334	0	380	202	0	376
HCM Platoon Ratio	29.0	29'0	290	1.00	1.00	1.00	1,00	1.00	1.00	1.00	1,00	1.00
pstream Filter(I)	0.74	0.74	0.74	1.00	00.00	1 00	1.00	00.00	1.00	1.00	0.00	1.00
Iniform Delay (d), siveh	114	17.3	13.1	22.4	00	149	32.4	0.0	29.7	36.3	0.0	26.7
nor Delay (d2), s/veh	0.3	22	0.8	1.6	0.0	3.9	3.7	00	9.8	0.8	0.0	2.0
nitial Q Delay(d3), siveh	00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
sile BackOfD(50%),vehiln	6.0	11.2	4.4	6.0	00	8.3	2.9	0.0	99	0.4	0.0	2.1
Insig. Movement Delay, siveh												
nGp Delay(d),s/veh	11.7	19.5	13.9	24.0	0.0	18.8	36.0	0.0	38.3	37.1	0.0	787
nGrp LOS	8	8	8	O	∢	æ	۵	A	۵	۵	V	ပ
management Vot market		4000			CAN			HARM			400	

HCM 6th TWSC 15: Reese Road & US-30

						-						
lovernent	183	H	æ	WBI	WBT	WBR	NBL	181	MBR	SBE	SBI	SBR
ane Configurations	k-	*	¥.	p.	*	k.		+‡			4	
raffic Vol. veh/h	01	86	17	63	403	0	12	4	4		0	7.5
uture Vol. veh/h	တ	8	17	3	403	0	12	4	4		9	72
Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
3T Channelized		Á	None	0		None	١		None		•	None
Storage Length	325	*	325	325	*	325	*.		*	(a)		*
leh in Median Storage.	3	0		at i	0	K	F.	-		,	Ī	
Grade, %	*	0	*	*	0	٠	9.	0	٠	ě	٥	٠
Peak Hour Factor	88	88	88	95	35	98	K	71	7	80	8	8
leavy Vehicles, %	7	2	7	2	2	7	2	7	5	2	2	2
funt Flow	9	1	19	69	424	C	11	9	9	-	00	8
Sajor/Minor M	Bior4			Jaio12	F		Amount			Minor2	ľ	
Conflicting Flow All	424	0	0	130	0	0	610	561	111	577	280	424
Stane 1	9	*	Ě	1	*	(8)	131	131	8	430	430	0
Stage 2	Ċ	*	*	٠	*	ľ	479	430	٠	147	150	*
Antical Hiday	4.12		•	4.12	*	*	7.12	6.52	6.22	7.12	6.52	6.22
Intical Hdwy Stg 1	.		٠	•	*	ľ	6.12	5.52	*	6.12	5.52	9.5
Intical Howy Stg 2	L	7	•		ì	*	6.12	5.52			5.52	
	2.218		i	2.218	•	•	3.518	4.018	3,318		4.018	3.318
of Cap-1 Maneuver	1135	1	i	1455		1	407	436	942	428	456	630
Stage 1	1	100	114	1	(E#	ľ	873	788	•	603	583	
Stage 2	٨	3.		ľ	OX E	*	268	583	*	856	773	0
Platoon blocked, %		1	*		*	(*)						
fov Cap-1 Maneuver	1135		i.	1455	*		342	431	942	418	421	630
Nov Cap-2 Maneuver			10	*	٠	ľ	406	485	•	496	484	97
Stage 1	ì			•			865	781		288	282	ı
Stage 2	1			i	ľ		480	582	i	837	992	*
	B	ı	l	H	N	ı	ı	i	1	ì	ı	ı
ntroach	83			WB			NB NB			SB		ı
CM Control Delay, s	9.6			0.1			13			12		
HCM LOS		ı			i		80	ı		80	۱	
												f
Inc. Lanchtajor Mym		NBLn1	Ħ	EBT	EBR	WBL	WBT	WBRSBLn1	SELIT	ä		
apacity (veh/h)	Ų	476	1135		100	1456	ľ	٠	614		E	
CM Lane V/C Ratio				(A)		0.002	33		0.161			
CM Control Delay (s)		2	8.2		i	1.5	Š		12			
HCM Lane LOS		œ	A			A	*	٠	œ			
Course Or other Course College		0.0	•			c			20			

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HCM 6th TWSC 15: Reese Road & US-30

2017-2018 Existing AM.syn 10/18/2018

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MEGSECTION					۱		ļ	M		Ì	ł		
nt Delay, s/veh	2.2												
fovement	S	183	ERR	188	WBT	WBR	W	192	NBR	SBL	SBI	SBR	
ane Configurations	*	*	10:	F	*	Vic.		+\$			4		
raffic Vol. velvh	8	385	13	4	198	7	16	12	2	m	-	22	
Future Vol. veh/h	64	385	13	4	198	2	19	12	14	က	-	22	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	o	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None	*	*1	None			None	X+1		None	
Storage Length	325	٠	325	325	50	325	9.	ál.	*	*0	70	ħ	
Veh in Median Storage,	# 10	0	(K)	٠	0	*		-	٠	e	***		
Srade, %		0		٠	0		*	0	٠	0.0	0	ic.	
Peak Hour Factor	180	87	F0	200	30	22	22	75	75	58	23	99	
leavy Vehicles, %	2	2	7	7	7	7	7	7	2	2	2	2	
Numt Flow	7.4	443	15	io.	254	0	23	16	19	io.	2	z	
Major/Minor	Majort			Major2	ì		Minori			Minor2	B		
Conflicting Flow All	257	0	0	458	0	0	875	858	443	880	870	254	
Stage 1	Š	(6)		*	17.	5	591	591	*)	264	264		Con la Maria
Stage 2	•	*.		,85 1	*	9	284	267	•	616	909	20	
Critical Hdwy	4.12		ŕ	4.12	è	ì	7.12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	ľ						6.12	5.52		6.12	5.52		
Critical Hdwy Stg 2		(0)	•	J.	1		6.12	5.52	1	6.12	5.52		
Follow-up Hdwy	2.218	(/6	((*	- 2218	0.5		3.518	4.018	3,318	3.518	4.018	3.318	
Pot Cap-1 Maneuver	1308	8	×	1103	M)	8	270	294	615	568	290	785	
Stage 1	*	*	•	5.5	*		493	494	*	741	9	ē.	
Stage 2		A	9)	£	71	8	723	989		478	487	(4)	The state of the s
Platoon blocked, %		ė.	*			•							
Nov Cap-1 Maneuver	1308		*:	1103	76	×	245	276	615	240	202	785	
Nov Cap-2 Maneuver	2	10		10	.*		349	363		336	364		
Stage 1	1		30			3	465	466	81	686	687		
Stage 2			(i.e	1(*	17	¥.	687	685	•	422	429		
opmachi	æ		H	848			NB.			200	P		- No. of the least
HCM Control Delay, s	101			0.2	ŀ	E	151			10.9			
HCM LOS						Ì	O	t		œ			10000
Amor Lane Major Mymt		NBLnt EBL	E81	E81	883	WB	WBI	WBT WBR SBLn1	3Birn1	H			
Sapacity (veh/h)	h	413	1308			1103	ì		999				
HCM Lane V/C Ratio		0.136		**	*	0.005	•		- 0.061				
HCM Control Delay (s)		151	7.9	*		83	1	SEP.	10.9	ľ	ď		4
HCM Lane LOS		O	1	2	3	A	q		03	1			
+CM 95th %4ie O(veh)		9.6	0.2		07	0			0.2	ğ	ı		

Intersection														
State	ntersection		ı		t	ŀ		ļ	ı			١		
Fig. Eat Fig. Well Well Well Nell	nt Delay, s/veh	3.4												
Ons	fovement	EB	183	EBB	WEL	WBT	WBR	NBL	NBT	NBR	SE	SBT	SBR	
15 255 35 30 550 5 60 5 5 5 10	ane Configurations	K-	4	N.	*	4	R		÷			4		
Harmonia 15 255 35 30 550 5 60 5 5 5 10 Harmonia Harmoni	reffic Vol. vehih	15	555	35	30	989	2	8	2	50	10	2	98	
High D	Future Vol. veh/h	15	255	35	30	550	w	90	w	w	w	2	38	
Free Free Free Free Free Stop	Conflicting Peds. #Arr	0	0	0	0	0	0	0	0	0	0	0	0	
Name	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
325 325 325 325	RT Channelized	N.	1	None	2		None	0		None			None	
9c. # 0	Storage Length	325		325	325		325	×	58		12		34	
10 10 10 10 10 10 10 10	Veh in Median Storage	* 株	0	3		0	•	0	-	*		2		
92 92 92 95 95 95 92 92 92 92 92 92 92 92 92 92 92 92 92	Srade, %		0	*	*	0	*	**	0	**	*	0	*	
15 2 2 2 2 2 2 2 2 2	Peak Hour Factor	35	35	85	96	88	32	85	8	35	92	8	36	
Magort Magor2 Manuel Minusco Manuel Minusco Manuel Minusco Manuel Minusco Manuel Minusco M	Heavy Vehicles, %	~	2	2	7	2	2	2	~	2	N	2	2	
Majort	furt Flow	18	277	88	33	579	S	9	S	S	10	H	103	
Majorit Majo														
## 1990 11 12 12 12 13 13 13 13		lajort	h	i	/Asjor2			Inori			Amor?			The last section in
4.12	Conflicting Flow All	584	0	0	315	0	0	1012	957	277	976	990	579	
4.12	Stage 1	٠	ľ					300	309	511	643	643	Ç(1	
#12	Stage 2	*		Ð,		i i	90	703	848	(8)	333	347		
2218	Critical Hidwy	4.12		·	4.12	-		7.12	6.52	6.22	7.12	6.52	6.22	
2218 2218 512 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.518 4.018 3.18 2.018 3.18 3.18 3.18 3.18 3.18 3.18 3.18 3.	Critical Hdwy Stg 1	* /	•	٠	*			8.12	5.52	*		5.52		
2218 - 2218 - 318 3318 3518 4018 3318 3518 4018	32	8	100	×	1							5.52		
### 1245		2.218	<u>y</u>	•		-				3.318		4.018		
er 991 - 742 - 701 660 - 462 468 er 991 - 7245 - 165 247 762 219 236 511 er	Pot Cap-1 Maneuver	99	12		1245	11	10	218	258	162	230	246		
er 991 - 1745 - 165 247 752 219 236 511 635 61 631 635 61 631 635 61 631 635 61 631 635 61 631 631 631 631 631 631 631 631 631	Stage 1	315)Ť.			12	14	701	990	1	462	468	12	
FIRST SET 1745	Stage 2	2	t.	*	S.	4	×	428	466	31	681	635	**	
991 - 1245 - 156 247 762 239 236 511 234 344 - 337 340 234 344 - 337 340 600 649 - 455 456 600 649 - 455 456 325 454 - 660 625 325 454 - 660 625 325 454 - 660 625 325 454 - 660 625 325 454 - 660 625 325 454 - 660 625	Platoon blocked, %		(*)	*		120	100				1	100		
EB WB NB SBLn1 11 NBLn1 EB EB WB WB WB WB SBLn1 272 991 1245 481 273 867 689 649 665 625 14 9 660 625 15 991 1245 681 273 87 7 8 7 149 C A A A B B	Nov Cap-1 Maneuver	66		•	1245	26	*	165	247	762	219	236	515	Name and Address of the Owner, where
EB WB NB SB 149 1 NBL11 EBL EBT WBL WBT WBR SBL11 222 991 - 1245 - 0249 233 87 - 025 - 149 C A A - A - B - 149 C A - A - A - B - 149	Mov Cap-2 Maneuver	1/	*/	1	*	Ø.	i	254	344	*	337	340	v	
EB WB NB SB 149 04 04 233 149 07 272 991 1755 1755 1755 1755 1755 1755 1755	Stage 1	i		i		Ĭ	1	9	649	ì	455	456		
EB WB NB 0.4 0.3.3 0.4 0.4 23.3 C C 2.2.9 2.2.3 9.1 1245 461 2.7.2 9.9 1245 461 2.7.2 0.9 1245 461 2.7.3 0.16 0.025 0.029 C A A B B B	Stage 2	.(*)				94		325	454		999	625		
## NB NB NB 0.4 23.3 C C C C C C C C C C C C C C C C C C			i				I		a		i			
0.4 0.4 23.3 C C A A 23.3 C C C A C C C C C C C C C C C C C C C	Approach	8	ı	ŀ	WB		î	NB		13	SB	D		
C C C C C C C C C C C C C C C C C C C	HCM Control Delay, s	0.4	ı		0.4			23.3	ı		14.9			
Aguin MBLn1 EBU EBT EBR Wall WBT WBR 222 991 - 1245	HCM LOS							ပ			æ			
Aguin Millian EBB EBB WALL WBT WBR 272 991 - 1245 -		Ĭ	ı			į,			ı	k		ı		
232 991 - 1245 - 2340 - 1245 - 2340 - 1245 - 2341 8.7 - 8 - 2341 8.7 - 8 - 2441 8.7 - 2411 8.7 - 2411 8.7 - 2411 8.7 - 2411 8.7 - 24	Amor LanelMajor Mvm		(BEn1	Ħ	EBI	EBB	WBI	WBT	WBRS	8En1	H	N	ĺ	
(apr(s) 23.3 8.7 8	apacity (veh/h)		272	188	0		1245			481				
lay(s) 23.3 8.7 · · 8 · · · C A · · · A · · ·	HCM Lane V/C Ratio			0.016	*	•	0.025	٠		0.249				
A A	+CM Control Delay (s)		23.3	8.7		A C	00	16	×	149	k	8		
	HCM Lane LOS		O	Þ	4	4	٨	ğ	Ø.	00				

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HCM 6th TWSC 15: Reese Road & US-30

2040 Total PM.syn 10/30/2018

	ì												
Movement	EB	EBI	EBR	WBL	WBT	WBR	NBI.	NBT	NBR	SEE	SBT	SBR	State No.
Lane Configurations	K	4	W.	K	4			¢\$			4		
Traffic Vol. vehilh	98	220	90	30	400	40	90	15	8	2	40	33	
Future Vol. veh/h	82	550	8	30	400	ίΩ	20	15	20	2	ß	30	
Conflicting Peds, #flyr	0	0	0	0	0	0	0	0	G	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	ar,	7	None		U,	None	Ĭ	37	None		4	None	
Storage Length	325		325	325	54	325	9	et.	Ć.	1	•	•	
Veh in Median Storage. #	1	0	4	1	0		197	~	8	1	-		
Grade, %	*	0		é	0	٠	8	0	9	À	0		
Peak Hour Factor	82	92	65	65	26	92	92	35	85	92	65	65	
Heavy Vehicles, %	8	ev	2	2	2	2	2	~	2	2	2	2	
Myrret Flow	35	869	31	88	435	un	¥	9	22	'n	w	æ	
Train Minor	Tariet I	ŀ	Ī	Control			Francis	ì	•	Minkelly	ı		
low All	440	-	-	969	ľ	٥	1305	1288	598	1351	1381	435	
Stage 1		i.	100	72			782	787		201	201		
Stage 2		•		•	(4)		523	506	*	820	880		
Critical Hdwy	4.12	15	8	4.12		×	7.12	6.52	229	7.12	6.52	6.22	
Critical Hdwy Stg 1		7)	٠	٠	*	•	6.12	5.52	1	6.12	5.52	*.	
Critical Hdwy Stg 2					41	g	6.12	5.52		6.12	5.52	ī	
Follow-up Hdwy	2.218			2.218		((*)	3.518	4.018	3,318	3.518	4.018	3,318	
Pot Cap-1 Maneuver	1120		4	900	*		137	164	205	127	144	621	
Stage 1	0.5	*	×.	2.4	M.	(*)	387	405	51	552	543		
Stage 2	ah S	8	1		18	ė	537	240		322	365		
Platoon blocked, %		٠	•		(i)	*							
Mov Cap-1 Maneuver	1120	١	8	900	ř	100	116	145	2005	105	127	621	STATE STATE
Mov Cap-2 Maneuver	*0	10	•	•	4		223	247	•	200	227	e.	
Stage 1						ľ	355	332	0	507	523		
Stage 2		*		•		(*)	485	220		298	332	è	
	i	ł	į	ı	۱	i	ı	ì	ı	N			
Approach	88			WB	DX		SW.			88			
HCM Control Delay, s				9.0			92			14.5			
HCM LOS	è		8	ŀ		ŀ	۵	Ė		m			
Minor Lanelitajor Mvmt		MBLmI	EBE	188	EBB	WBE	WBT	WBR	IBR SBLn1				
Capacity (vehiti)	i	292	1120		(4)	800	(1)	35	420				
HCM Lane V/C Ratio		0.353	0.082		×	0.036	K	*;	0.104	ŀ			
HCM Control Delay (s)		38	8.5			9.2		ř	14.6		a		
HCM Lane LOS		۵	×	•		A	3.03	22.	60				
SECURIOR SPINSON PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN SAFETY AND ADDRESS	I	I											

Synchro 10 Report Page 1

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HCM 6th TWSC 15: Reese Road & US-30

	t S												
- Designation of	ē	101	200	0	100	0000	iQ.	NOT	Odly	ğ	too	000	
MARCHINE	200	Ĉ.	VO.	100	9	1	1000	1		3	1		
Lane Configurations	•	4	c.	-	+		į	\$	į	5	ŧ	4174	
Traffic Vol, webth	15	255	32	8	220	V)	8	9	47	S	10	8	
Future Vol. veh/h	15	255	32	30	550	io.	90	w	ĸ	(C)	2	98	
Conflicting Peds, #thr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Chantelized			None		1	None	at.	3	None			None	
Storage Length	325	(A)	325	325		325	121		×	*	(6)	2)	
Veh in Median Storage	1199	0	•	ů.	0	*	7	-		٠	-	8	
Grado %	•	0		•	0			0	١	٠	0		
Deal Hour Earthr	400	63	00	9	50	¥	65	8	8	65	65	65	
Heavy Vehicles %	2	0	2	2	2	~	~	2	7	2	7	7	
Munit Flow	99	277	88	35	579	40	88	43	49	5	Ξ	103	
The state of the s	3		4	Change	ı	0	Prince			Jime?	ŀ	ì	
Conficting Flow All	ERA	C	6	315	c	c	1012	957	77.7	976	066	579	
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Crane 2	3	ľ	1	9	2	1	703	648		333	347	٠	
Princip Lifera	C1 V		1	412		1	40	659	6.23	7 13	6 59	623	
Critical Houv Sto 1	,	ı.	1		'	ľ	6 12	5.52		6.12	5.52		
Certical House Chan				1	1	2	6 17	649	N	613	5.52		The same of the sa
Follow-in Hour	2 218	ľ	•	2 218	٠.	1	3.518	4.018	3.318		4.018	3.318	
Pot Can-1 Managemen	100		8	1945	ľ	Ĭ	218	258	762		246	515	
Stane 1		•	1		i,	ľ	701	099		462	468		
Stane 2	0	ř	.4	.00	k.		428	466	8	189	635		
Platoon blocked %			*	ı	.*.								
Moy Cap-1 Maneuver	991	4	4	1245	.5.	100	165	247	762	219	236	515	
Mov Cap-2 Maneuver	ŝ	*	(A)	*	*		254	344	*	337	340		
Stage 1	*	2	é	í		1	9	848	*	455	458		
Stage 2	*		*	•53	*	•	325	454		999	625	ė,	
	K	s.	i	ì	ı	H	ŀ		ļ	H			
Approach	83	H	K	WB			180		8	88	H		
HCM Control Delay, s	0.4	ı		9.0		d	23.3			14.9			
HCMLOS							ပ			œ			
			ı	ı	B					ı	8		
Minor Lane/Rajor Munit		MECOT	193	EBI	EBR	WEL	WBI	WBR SBLn	Bini	l	ı	K	
Capacity (vet/h)		272	166	ľ	0.	1245			481				
HCM Lane V/C Ratio		0.28	0.016	(*)	*	0.025			0.249				
HCM Control Delay (s)		23.3	8.7	•	*	00	Ĭ	•	14.9				
HCM Lane LOS		ပ	¥	*	*:	4		i	œ				
HCM 95th %tile Q(veh)		ï	0.1			0	1			Ĭ	ı	Ì	

Synchro 10 Report Page 1

HCM 6th TWSC 15: Reese Road & US-30

2040 Total AM_Improved.syn 02/11/2019

2040 Total PM_Improved.syn	02/11/2019
	0

Language Language	Int Delay, s/veh	2,9											
migurations % <th< th=""><th>Movement</th><th>8</th><th>EBT</th><th>EBR</th><th>WBL</th><th>WEL</th><th>WBR</th><th>N</th><th>NBI</th><th>MBR</th><th>188</th><th>SBT</th><th>SBR</th></th<>	Movement	8	EBT	EBR	WBL	WEL	WBR	N	NBI	MBR	188	SBT	SBR
oc, weith 85 550 90 30 400 5 50 15 20 5 3 OL, weith 85 550 90 30 400 5 50 15 20 5 5 3 OL, weith 85 550 90 30 400 5 50 15 20 5 5 3	Lane Configurations	*	*	k.	je:	4	*		+\$			4	
Cut wehth 85 550 90 30 400 5 50 15 20 5 5 30 and peacs. #Thr 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Vol., veh/h	88	550	8	8	400	10	8	15	20	3	S	30
Interpretation of the control of the	Future Vol. veh/h	82	550	8	30	400	10	S	15	50	2	2	93
tedian Strange, # 1	Conflicting Peds, #fhr	0	0	0	°	0	0	0	0	0	0	0	0
Trength 325 - 325 - 325 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
Length 325 - 325 325 - 325 - 1 fedian Storage, # 0 - 0 - 1	RT Channelized		(6)	None	1	2	None	ľ	85	None	*	to	None
Fedian Strange, # 0 - 0 - 1 - 1 - 1 Fedian Strange, # 0 - 0 - 0 - 1 Fedian Strange, # 0 - 0 - 0 - 1 Fedian Strange, # 0 - 0 - 0 - 0 - 0 - 0 Fedian Strange, # 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 - 0 - 0 Fedial # 0 - 0 Fedial # 0 - 0 F	Storage Length	325	*	325	325	٧,	325		٠		*	•	
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unr Factor 92	Grade, %	•	0		Ţŧ.	0		4	0			0	100
1,000, 0,000,	Peak Hour Factor	92	35	88	35	26	Si	35	35	35	35	35	35
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440	Asior/Minor	Banci	ŀ	Ī	Najor2	i		Loui	ľ		fmort?	Ŋ	
412	Conflicting Flow All	440	0	0	969	0	0	1305	1288	598	1351	1381	435
412 - 412 - 712 652 622 77 8 680 880 880 881 8 712 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 652 622 77 8 622	State 1	1	ľ	i	î	3		782	782	×	501	20	
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2218 - 2218 - 3518 4018 3318 3518 4018 3311 1120 - 360 - 116 145 502 652 543	Critical Hdwy Stg 1		.70	2.6	٠	(ř	6.12	5.52	-19	6 12	5.52	V.
2218	Critical Hdwy Stg 2	*	22	110	"	12	02	6.12	5.52		6.12	5.52	74.
1120		2.218	.19.	it.	2.218			3.518		3.318	3.518	4.018	3,318
1120 - 900 - 116 145 502 563 565 172 62 573 540 - 355 365 365 365 365 365 365 365 365 365	Pot Cap-1 Maneuver	1120	3	1	900	•	×	137	164	205	127	144	621
1120	Stage 1		*	*	1		4	387	405	1	552	543	100 100 100 100 100 100 100 100 100 100
1120	Stage 2	100	.(*)	57	ř	2		537	240	*	355	365	
1120	Platoon blocked, %		¥/3	*			•		H				
EB WB NB SB 146 SB 335 TH NBLAT EBL EBT EBR WBL WBT WBRSBLAT A 200 227 EB WB NB SB 520 289 335 TO SE 1120 56 26 145 D B B B SB 520 289 335 TO SE 1120 56 26 145 TO SE 1120 900 420 TO SE 1120 900 900 420 TO SE 1120 900 900 900 900 900 TO SE 1120 900 900 900 900 900 900 TO SE 1120 900 900 900 900 900 900 900 900 900 9	Mov Cap-1 Maneuver	1120	ľ	·	906		1	116	145	205	165	127	621
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EB WB NB SB S20 239 335 1 1 0.6 76 146 B B B SB SB SB SB SB SB SB SB SB SB SB	Stage 1	4			3	4		355	372		201	523	A
EB WB NB NB NB NB	Stage 2	()	3.	9.8	§ .	1	•	482	250	*	238	338	ě
THE OPE THE THE THE THE THE THE THE THE THE TH	A PARTY NAMED IN COLUMN TO PARTY NAMED IN COLU	8	Н	Н	O/A		Н	NO.	П	Н	8	П	1
70 NBLAT ERI. EST ERR WRQ. WRT WBRSBG,n1 262 1120 900 420 0353 0.082 - 0.036 - 0.104 26 8.5 - 9.2 14.6 15 0.3 - 0.1 - 0.8 8 15 0.3 - 0.1 - 0.1 - 0.2 8 15 0.3 - 0.1 - 0.2 8 15 0.3 - 0.2 8 15 0.3 - 0.2 8 15 0.3 - 0.2 8 15 0.3 - 0.2 8 15 0.3 - 0.2 8 15 0.3 - 0.2 8	LICIA Control Dolour	-	H	ı	9.0		l	×	I	I	14.5	ı	ı
70 NBLn1 ERL EST ESR WBL MBT WBR SE 262 1150 900 0.353 0.082 - 0.036 - 0.036 5 8 5 9 2 8 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	HCM LOS	1	Н	Н		П	П	۵	Н	Н	m	Н	
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262 1120 990 00 00 00 00 00 00 00 00 00 00 00 0	Minor Lane Major Mirm		Blat		EBI	EBR	NB.	MBI	N BB	Rin		ı	
0.553 0.082 0.036	Capacity (veh/h)		262		ì	i	900	1	I	420		ł	
26 52 52 54 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	HCM Lane V/C Ratio		0.353	o l		. 72	0.036		ĺ	0.104	8	è	
Olivelii 1.5 0.3 0.1 0	HOM CORDO DELAY (5)		9 0	0 4	1		N A		10	e ac	ı	١	
	HOM CARE COS		155	0.3	×	*	0.1		1	0.3	B	į	

Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Sveh. 1.1 Introdely, Webh. 6 93 33 6 7 39 Introdely, Webh. 6 93 33 6 7 39 Introdely, Webh. 6 93 33 6 7 39 Introdely, Webh. 6 93 33 6 7 39 Introdely, Webh. 6 93 33 6 7 39 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 8 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introdely, Webh. 9 94 Introduction Delay, S. 0.5 Introduction Delay		I	I			ı		
11 1.0	ntareartem				ļ	۱		
Fig. Fig.	nt Delay, s/veh	=						
Free Free Free Slop Free Free Free Slop Free Free Free Slop Free Free Free Free Free Free Free Fr	Movement	E	EBI	WBT	WBR	SBI	SBR	
### 6 99 353 6 7 Fee Free Free Free Sup	Lane Configurations	ķ~	*	¢±		X.		
### Free Free Free Stop 7 7 7 7 7 7 7 7 7	Traffic Vol. vehih	9	66	323	0	-	39	
High D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Future Vol, vehith	9	66	353	10	-	38	
Free Free Free Slop	Conflicting Peds, #/hr	0	0	0	0	0	0	
325 None None 1 None 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Sign Control	Free	Free	Free	Free	Stop	Stop	
225	RT Champelized		None		None		None	STREET, STREET
rege. # - 0 0 - 1 1 1 1 1 1 1 1 1 1	Storage Length	325		*	14	0	H.	
S	Veh in Median Storage	き	0	0	/4	-		
Majori Majori Minori Majori Ma	Grade. %		0	0	¥	0		
1	Peak Hour Eactor	85	85	65	92	88	888	The state of the s
116 384 7 8 8 18 19 19 19 19 19 1	Heavy Vehicles %	0	0	٥	0	2	2	
Approx Mages Manages	Avnt Flow	-	116	384	1	00	44	The second secon
14707 Minor								
391 0 0 518 - 1 308 412 - 1 308 - 1 412 - 1		faior!		Spic 2		Sinor2		
4.12	Conflicting Flow All	391	0		0	518	388	
412 130 412 542 2218 542 1218 542 1168 686 1168 686 1168 686 117 682 118 682 111 682 111 682 111 682 111 682 111 682 111 682 111 682 111 682 111 682 111 682 111 682 111	Stage 1	*	at.	8	76	388		THE REAL PROPERTY OF THE PERSON NAMED IN
4.12 6.42 2.218 3.518 1168 3.518 1168 686 687 	Stage 2	9.0	٠	•	i.	130	•	
2218	Critical Fidwy	412	×	8	×	6.42	6.22	
1188 5.42 1188 518 1188 686 1188 576 1188 682 111 896 111 896 111 896 111 896 111 896 111 896 111 896 111 896 111 896 111	Critical Hdwy Stg 1	*	7/	•	ř	5.42		
1228 3518 168 686 686 686 687 682 682 682 682 682 682 682 682 682 682 682 682 682 682 682 682 682 682 682		•	i		2			
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1168	Pot Cap-1 Maneuver	1168	á			518	099	
1168	Stage 1	<u>(</u> *)		*	12	989	(14.)	
FR	Stage 2	32	0	٠	A	968		
1169 515 66 2 682 2 682 2 682 2 682 2	Platoon blocked, %		ě.		Œ.			
EB WB SB B B B B B B B B B B B B B B B B	Mov Cap-1 Maneuver	1168	*	ě		515	099	The state of the s
EB WB SB B B B B B B B B B B B B B B B B	Mov Cap-2 Maneuver	**	*	•	•	576		
EB WB SB B B B B B B B B B B B B B B B B	Stage 1	H		100	1	682		
0.5 0 11.1 B 8 8 1 11.1 B 8 1 11.1 B 8 1 11.1 B 8 1 11.1 B 8 1 11.1 B 8 1 1 11.1 B 8 1 1 11.1 B 8 1 1 11.1 B 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Stage 2	:0:		(0)		896	(90)	
0.5 0 11.1 B B C 11.1		ı		ı				
05 0 111 B B B 1118 B B 1118 B B B B B B B B	Antiroteth	8	Ī	WB	ŀ	8		
EEL EET WET WERSELD 1168 0.006 0.006 8.1 1.1 1.1	HCM Control Delay &	0.5	L	c	L	E		
1158	HCM LOS				П	89		
1158 0.006 0.006 0.006 0.006 0.006 0.006 0.006 0.000 .			ı	ı				
1168	Minor Lanelitagor Mvm	Ļ	田	EBI	WBT	WBRS	Bint	
0.006 - 0.08 8.1 - 11	Capacity (vehin)		1168		1	1	646	The second secon
lay(s) 8.1 11	HCM Lane V/C Ratio		9000	•	20	*	0.081	
×	HCM Control Delay (s)		00	9	1		11.1	
	HCM Lane LOS	ı	ď	9	4		œ	

Synchro 10 Report Page 1

HCM 6th TWSC 16: US-30 & Westedt Road

2017-2018 Existing PM.syn 10/18/2018

Int Delay, s/veh	6.0						
Movement	Ħ	EBI	EBT WBT WBR	WER	SBL	SBR	
Lane Configurations	le.	*	42		*		
Traffic Vol. vehith	37	321	204	4	1	19	THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN
Future Vol. veh/h	37	321	204	4	47	48	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized	11	None		None		None	
Storage Length	325				0	*	
Veh in Median Storage, #		0	0		-		
Grade, %	*	0	0	*	0	×	
Peak Hour Eactor	8	88	76	19	69	69	
Heavy Vehicles, %	2	2	2	23	~	2	
Avmit Flow	49	401	268	W)	9	56	
Assochinor.	Majori	Ī	Major2		Minor2	j	The Association and the State of the State o
Conflicting Flow All	273	0		0	764	27.1	
Stage 1	A.		74	N	271	11	
Stage 2	ot.			*	493	٠	
Critical Howy	4.12	*	6		6 42	6.22	
Critical Hdwy Stg 1		•	•		5.42	٠.	
Critical Hoby Stg 2	er. G			18	5.42	1	
Follow-up Hdwy	2.218	3	•	Ça I	3.518	3,318	
Pot Cap-1 Maneuver	1290	1.	*	4	372	768	
Stage 1	*		10	*	775	٠	
Stage 2	1	6	ŕ	٠	614		
Plateon biocked, %		*	(2)	. 4		1	
Aov Cap-1 Maneuver	1290	2		٠	359	292	
Nov Cap-2 Maneuver	•	•	1	•	452	*/	
Stage 1	7		Ϊ		747		
Stage 2			1	4	614	3.5	
	i		ł	ı,		1	
Approach	EB		WB	ì	SB		A THE RESERVE AND ADDRESS OF THE PARTY OF TH
HCM Control Delay, s	8.0		0		10.5		
HCM LOS					80		
	ï		ĺ	ı	ı		
Amor LanelMajor Mymt		苗	183	WBT	WET WERSELN!	SEL n.	
Capacity (wehith)		1290	Č	×	*	189	
HCM Lane V/C Ratio		0.036	٠	41	*1	0.047	
HCLA Control Delay (s)		7.9	j		ì	10.5	
HCM Lane LOS		A	4	1		œ	
The state of the s							

HCM 6th TWSC 16: US-30 & Westedt Road

2040 Total AM.syn 10/30/2018

Supplemental Suppl							
-	183	183	WBI	WBR	SB	SBR	
差	K-	4-	,±		1		
海	20	225	415	20	40	115	
Æ	20	225	415	2	4	115	
		0	0	0	0	0	THE REAL PROPERTY AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO IS NAMED IN C
	Free	Free	Free	Free	Stop	Stop	
	3	None	8	None		None	
Storage Length 3	325		(*)	4	0	si*	
Veh in Median Storage, #		0	0	k	-	٠	
		0	0	(4)	0	103	
Peak Hour Factor	35	8	92	85	35	35	
Heavy Vehicles, %	7	7	7	2	7	2	
Mynut Flow	33	245	451	22	43	125	
Major Major 1	15	i	300		Minch 2		
Conflicting Flow All 4	473	0	74	0	751	462	
Stage 1	-		JV.		462		THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.
Stage 2	029	8		58	289		
	4.12	8	110	(*	6.42	6.22	THE REPORT OF THE PARTY OF THE
Critical Hdwy Stg 1	×	•		(4)	5.42	٠.	
Critical Hdwy Stg 2	Y		-	*	5.42		
Follow-up Hdwy 2.2	2.218	*	•	TO .	3.518	3,318	
tuver	680		i	•	378	909	
Stage 1	i	٠		ie:	634		
Stage 2			•	a	290	7/	
Platoon blocked, %			114	3			
	680	*	34	9	370	009	
Mov Cap-2 Maneuver	ě		*	Œ	474	*	
Stage 1	72	V	*	*	621		
Stage 2	ĕ		(6)	9.0	260	2.	
			H	į	ľ		
Approach	83	H	88	-	88		
HCM Control Delay, s (1.0	1	0	NO.	14.1		
HCM LOS					æ		
				Į			THE RESERVE TO SERVE THE PARTY OF THE PARTY
Minor Lase/Major/Munit	F	EBE	EBI	WBT	WBR SBLn1	Servi	
Canacity (untilb)		1089			2	198	
HCM Lane V/C Ratio		0.02	*	*		0.3	
HCM Control Delay (s)		8.4	•			14.1	
HCM Lane LOS		×		90	*	œ	
HCM 95th %tile Olvehi		0.1	•	-	i	23	THE REAL PROPERTY AND INCOME.

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2040 Total PM.syn 10/30/2018 HCM 6th TWSC 16: US-30 & Westedt Road

HEROCCHICAL	ı	ľ					
nt Delay, s/veh	2						
Movement	Œ	EBI	WBT	WBR	381	SBS	
Lane Configurations	-	*	¢±		1		
fraffic Vol. vehith	38	200	405	20	8	95	
Future Vol. veh/h	95	200	405	8	33	20	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Stop	Stop	
RT Channelized		None	A	None	i	None	CONTRACTOR OF TAXABLE PARTY OF TAXABLE P
Storage Length	325	٠	¥.	×	0	740	
/eh in Median Storage, #	*	0	0	*	ħ		
Grade, %		0	0	٠	0		
Peak Hour Factor	35	35	92	65	85	35	
Heavy Vehicles, %	2	2	2	N	2	2	
Mymt Flow	103	543	440	22	×	25	
Tajor/Minor II.	Majort		Major2	1	Minor2		
Conflicting Flow All	462	0	(9)	0	1200	451	
Stage 1		A)	41	1	451	No. of the last	
Stage 2	4.	ŧ	*5	ŧ	749		
Critical Hdwy	412	ì			6.42	6.22	
Critical Hdwy Stg 1	,		0.*		5.42	3	
Critical Howy Stg 2	,	0	O.	9	5.42		
-cllow-up Hdwy	2.218	0€	()e	9	3.518	3.318	
Pot Cap-1 Maneuver	1099	*	24	*	204	809	THE PERSON NAMED IN COLUMN
Stage 1	•				642		
Stage 2	•	×	×		467	×	
Platoon blocked, %		(1)	X)	#			
Mov Cap-1 Maneuver	1099	×	2	"	185	809	
Mov Cap-2 Maneuver	*	•	*/	•	282		
Stage 1	n		*	ľ	285		
Stage 2	•				467		
		1	ŀ	k	i		
pproach	EB		WB		88		
ICM Control Delay, s	1.4		0		16.2		
HCM LOS		١	c	Ì	ပ		
Inor Lane Major Muni		H	183	EBT WBT	WBR SBLint	tint	
apacity (vehift)		1099	1	ľ		412	
HCM Lane V/C Ratio	ı	0.094	*	٠		0.224	
HCM Control Delay (s)		8.6	-	ll.		16.2	
HCM Lane LOS		ď,	3.5		0	v	
JOHN OCH STATE CALMEN	,	6.0		13	t)	80	

HCM 6th TWSC 16: US-30 & Westedt Road

Mersechon							
Int Delay, s/veth	2.8						
Movement	曲	181	WBI	WBR	BS	SBR	
Lane Configurations	Ar-	*	t,		2		
Traffic Vol. webilt	20	225	415	20	40	115	日の日本は日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日本の日
Future Vol. veh/h	20	225	415	20	8	115	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Free	Free	<u>F</u>	Free	Stop	Stop	
RT Channelized		None		None		None	STOCK BELLEVILLE OF THE PARTY O
Storage Length	325			4	0		
Veh in Median Storage, #	111	0	0	-	Ī	4	
Grade, %	51	0	0	•	0	٠	
Peak Hour Factor	92	25	85	8	92	92	
Heavy Vehicles, %	7	2	2	7	7	7	
Myrrat Flow	22	245	159	Ø	43	125	
Majoriffinor	Majort	i	Major2		Minor2		
Conflicting Flow All	473	0	(3)	0	751	462	
Stage 1	4	7.		W.	462) k	THE PROPERTY OF THE PARTY OF TH
Stage 2	*	٠		*	289	(4)	
Critical Hdwy	4.12	*			6.42	6.22	
Critical Hdwy Stg 1	٠	٠		٠	5.42	٠	
Critical Hobby Stg 2	*	٠	i		5.42	4	
Follow-up Hdwy	2.218	2		1	3.518	3.518 3.318	
Pot Cap-1 Maneuver	1089	C	*	Ä	378	900	DESCRIPTION OF THE REAL PROPERTY.
Stage 1	*) <u>*</u>		634	A	
Stage 2	381	•	0	*	760		Application of the last of the
Platoon blocked, %		.Ti	87				
Mov Cap-1 Maneuver	1089	7			370	900	THE REAL PROPERTY AND ADDRESS OF THE PARTY AND
Mov Cap-2 Maneuver	P			2	474	i	
Stage 1		2	3	1	621	×	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER.
Stage 2	lit	11.2	7		760	٠	
				Ī	ı	ı	
Approach	EB	H	WB		88	B	
HCM Control Delay, s	2.0	Ė	0	E	14.1	į	
HCM LOS					മ	H	
	ı	ı	ı	Į	ı		
Minor Landillagor Muni		EBI	EBI	EBT WBT WBR SBLn1	ABR.	Hul	
Capacity (wet/th)	H	1089		ř	ŕ	199	
HCM Lane V/C Ratio		0.02		•		0.3	
HCM Control Delay (s)		8.4			Y.	14.1	TOTAL STANSBURGEST
HCM Lane LOS	ı	<	×.	2	. 4	8	
HCM 95th %the Q(veh)		0.1		*	۰	13	THE RESIDENCE OF THE PARTY OF T

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HCM 6th TWSC 16: US-30 & Westedt Road

2040 Total AM_Improved.syn

2040 Total PM_Improved.syn

Feb. Feb. Visit	Int Delay, s/ven	2						
And the part of th	Movement	EB	EB1	187	WEG	SBI	SBR	
1	Lana Chofinications	×	4	4	THE REAL PROPERTY.	2		
### 95 500 405 20 35 #### 0 0 0 0 0 #### 0 0 0 0 0 #### 0 0 0 0	Toute Well while	30	200	Anc	90	40	93	
Free Free Free Stop 20 33 32 32 32 32 32 32	The same of the sa	3 2	300	200	8	3 6	8 5	
All 452 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	חמום אסי אפוווו	2	200	202	02	3	200	
Free Free Free Supervised Free Free Supervised Free Free Free Supervised Free Free Free Free Free Free Free Fr	Conflicting Peds, #/hr	0	0	0	٥	5	0	
325 None N	Sign Control	Free	Free	Free	Free	Stop	Stop	
325	RT Channelized	att	None		None	3	None	
All 462 0 0 10 0 10 0 10 0 10 0 10 0 10 0 10	Storage Length	325	•	4.0	79	0	•	
Majort Majore 100 Majort Majore 100 Majort Majore 100 Majort Majore 100 Majort Majore 100 Majort Majore 100 1 4,12	Veh in Median Storage	#	0	0	26	-	,	
No. 92 92 92 92 92 93 94	Grade W.		0	•	ľ	•	2	
Majort Majore Minner 103 643 440 22 32 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Glade, 78		2	9		9		
Majort Najor2 1749 All 462 0 1200 All 462 0 1200 452 218 149 1542 2 2218 1542 Wer 1099 1 542 Buver 1099 1 582 EB WB SB Lay 5 14 0 162 Charm EB EBI WB SB Ago 0.004 1 0	Peak Hour Factor	35	75	35	6	35	85	
Majort Major2 affronce All 462 0 - 0 1200 All 462 0 - 0 1200 1 4.12 - 6.42 9.1 - 6.42 9.2 2.218 - 5.42 9.2 2.218 - 5.42 9.4 - 2.218 - 5.42 9.5 - 7.49 9.1 - 6.42 9.2 - 2.18 9.3 - 0 169 9.4 - 0 162 9.4 - 0 162 9.5 - 0 165 9.6 - 0 165 9.7 - 0 162 9.8 - 0 165 9.	Heavy Vehicles, %	2	c	2	2	2	5	
All 462 0 1200 All 462 0 1200 4112 6.42 g1 4.12 6.42 g2 2.218 6.42 g2 2.218 6.42 g2 2.218 6.42 g3 6.42 g4 6.42 g6 6.42 g6 7.42 g6 7.42 g7 6.42 g7 6.42 g7 6.42 g8 6.42 g8 6.45	Myrrat Flow	183	S.	9	8	88	装	
All 462 0 1200 41 462 0 1200 412 1412 91 2.218 92 2.218 92 2.218 93 2.218 94 2.218 94 2.218 95 2.218 96 2.218 97 2.218 98 2.218 98 2.218 98 2.218 99 2.218 90 3.45 90		Saort		Dion?		CHUM9	i	
91 451 92 218 542 92 228 542 100 542 100 542 100 542 100 542 100 542 100 642	Conflicting Flow All	462	0		0	1200	451	
1 4.12 749 9.2 749 9.2 5.42 9.2 5.42 9.2 5.42 9.42 5.42 9.42	Chang 1	2	1	1		AES		
91 4.12 6.42 92 2.218 5.42 92 2.218 5.42 uver 1699 7.45 8.45 8.45 8.47 8.47 8.45 8.45 8.45 8.45 8.45 8.45 8.45 8.45	Siege							
1.4.12	Z abels		•		æ.			
91 5.42 92 . 2.18 5.42 uver 1098 5.42 %	Critical Hdwy	4.12	4	N. C.	*	6.42	6.22	
9.2 2.18 5.42 5.42 5.42 5.42 5.42 5.42 5.42 5.42	Critical Hdwy Stg 1	20	•	*	*	5.42	*	
2218 3518 3 204	Critical Hotavy Stg 2		1			5.42	٠	
wer 1089 204 % % % Suver 1089 467 Suver 1089 185 Suver 1089		2 218				3.518	3,318	
%	Mer	1099	1	3	-	204	808	
S, 467 Suver 1099 467 Suver 1099 185 Suver	Stane 1		1.		100	642		
## 189	Crone 2	2	1	9	16	457		
EB WB SB CC C C C C C C C C C C C C C C C C	Distant Montred &			1	Y P	2	r.	
EB WB SB SB SB SB	Figure Michigan, 70	0000				-	000	
EB WB SB SB SB SB	MOV Cap-1 Maneuver	200	200	ì	•	60	909	
EB WB SB Ays 14 0 62 C C C C C C C Agio 0.094 · · · ·	Mov Cap-2 Maneuver	*	٠		¥.	282		
189, s 14 0 16.2 C C C C C C C C C C C C C C C C C C C	Stage 1		0	1	-	582		
lay, s 14 0 16.2 C C C C C C C C C C C C C C C C C C C	Stage 2					467	0.0	
EB WB SB Lay, s 1.4 0 16.2 C C C C C C C C C C C C C		6				ı		
Lay, s 14 0 16.2 C C C C C C C C C C C C C C C C C C C						5		
lay, s. 1.4 0 16.2 C C Ratio 0.094 0 cay(s) 8.5	Approach	9		900		00		The second liver with the second liver with
C C C C C C C C C C C C C C C C C C C	HCM Control Delay, s	*		0		162		
R Momer EBL EBT WIST WER SI 1059 - 0 Ratio 0.094 - 0 Riay (s) & 6 A A	HCM LOS					O		
Action 1099 (34) (34) (35) (35) (35) (35) (4) (4)								STREET, SQUARE, SALES
adro 0.094 - 0	Howel monthson the		COL	COL	1000	004	- Dine	
1099 - 0 (apr (s) 8:6 - 0 A	WALL CAME IN THE PARTY OF THE PARTY.		ď	00	1071	200	DERI	
Ratio 0.094 - 0.	Capacity (veh/fit)		1689	*	•		412	
(s) (s) 8.6	HCM Lane V/C Ratio		0.094	•	41	*	0.224	
Α	HCM Control Delay (s)		8.6	1	ľ		16.2	
c	HCM and OC		V		ľ	ì		
が 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	LOW LAIG LOS		c			•	,	

HCM 6th TWSC 17: Archer Parkway & US-30

Int Delay, s/veh	3											
Movement	183	EBI	E88	Wei	WBT	WBR	NBI	NBT	MBR	SBL	188	SBR
Lane Configurations	K.	*	W.	-	42			+\$			4	
Traffic Vol. veh/h	~	35	æ	62	197	-	74	Ť	40	0	9	0
Future Vol. veh/h	2	33	8	13	197	,-	74	-	8	0	9	0
Conflicting Peds, #/hr	6	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	0	2	None	3		None	1		None	1		None
Storage Length	150	1	150	300	4	*		778	(*)			
Veh in Median Storage, 1	31	0	Ĭ	§	0	ř		-	۸			4
Grade, %	9	0	100	A	0	*	98	0		٠	0	*
Peak Hour Factor	20	202	20	87	8	87	87	87	87	75	15	75
Heavy Vehicles, %	2	c	ev	7	7	2	7	2		2	2	2
Mymt Flow	m	8	22	5	226		88	-	46	0	60	0
II Superficience	Ĭ		Ī	Const	ř	2	Monte	ı	Ĭ	Crown	Ţ	Ì
Ilow All	700	c	0	170	c	0	489	485	35	549	585	227
Slane 1	100		•		1		8	38	all.	469	400	
Stane 2		1/2	100	1/4	1	7.0	413	409	1	140	176	4
Critical Highw	4.12	**		4.12	*	i i	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1		(2)	7		*	(4)	6.12	5.52		6.12	5.52	٠
Critical Hdwy Stg 2	×	1	**	×			6.12	5.52		6.12	5.52	
	2 218	*	Ť	2218		٠	3.518	4.018	3.318	3.518	4,018	3.318
SANS	1341			1407			505	495	1018	446	423	812
Stage 1	E	*	*	*			956	848	١	619	969	*
Stage 2	1	1				2	919	888	2	863	753	3
Platoon blocked, %		01				9		1				
Mov Cap-1 Maneurver	1341			1407	24		473	462	1018	403	385	812
Mov Cap-2 Maneuver	2			ii.	*	*	502	490	•	486	452	٠
Stage 1	*	Œ.		¥	*	*	88	846		618	22/	4
Stage 2	150	2.	*	G			268	557	8	821	751	
		à	ı					ğ	ı	ľ		
Approach	88	H	ı	WB			8		i	88		
HCM Control Delay, s	0.1			22			12.5			13.1		
HCM LOS							œ			œ		
Minor Lene Major Mynt		NBLet	薑	EBI	EBR	WBL	WBT	WBRSBLnI	SBEnt			
Capacity (vehth)		609	1343	in.		1407			452			
HCM Lane V/C Ratio		0.217	0.002			0.065	(*)		0.018			
HCM Control Delay (s)		12.5	1.7	2	-	7.7	•	Ť	13.1			
HCM Lane LOS		æ	×				.*.		œ			
HOM Gath Ridle Olvehi		č	•			4						

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HCM 6th TWSC 17: Archer Parkway & US-30

2017-2018 Existing AM.syn 10/18/2018

2017-2018 Existing PM.syn 10/18/2018

ntersection				i	Î							
nt Delay, s/veh	5.9											
Aovement	Ħ	EB	ä	WBI	WBT	WBR	NB.	NBT	NBR	388	SBT	SBR
ane Configurations	jt.	*	失	5	42			4			4	
raffic Vol. vehith	-	170	101	95	87	60	121	0	8	~	m	io.
-uture Vol. veh/h	*-	170	101	28	84	m	121	0	8	(C)	m	S
Conflicting Peds, #fhr	0	0	0	0	0	0	٥	0	•	0	0	0
Sign Control	F188	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized			None			None	4 T		None		3	None
Storage Length	150	•	150	300	•	20	*	*(*	*	٠	(*)
Jeh in Median Storage	100	0	ľ	16	0			ī	N		T	
Grade. %	•	0	٠	ì	0	*		0	*	٠	0	٠
Peak Hour Factor	84	84	25	16	60	16	80	88	89	35	8	25
leavy Vehicles, %	7	2	2	2	2	2	2	2	2	N	2	2
furnt Flow	5	202	120	62	8	e	26	0	113	6	on .	12
Manor Minor	Majori			Major2	8		Minori	Ļ		MinorZ		Ì
How All	8	0	0	322	0	0	438	427	202	543	546	86
Stage 1	25		8		EA)		800	204	A.	222	222	MXX
Stade 2	*	à	*	¥.	*		234	223	٠	321	324	40
Critical Hithry	4 12		-	4 12	٠		712	6.52	6.22	712	6.52	6.22
Critical Howy Stg 1	Ď.	٠				٠	6.12	5.52	1	6.12	5.52	
Cotical Howy Stg 2		Ĭ		X	ř		6.12	5.52		6,12	5.52	
-ollow-up Hdwy	2.218		•	- 2218	5.4	2	3.518	4.018		3.518	4.018	3.318
7of Cap-1 Maneuver	1494	i i		1238	1	17	238	250	839	421	445	928
Stage 1		Ä	Si i		15	100	798	733	í.	780	720	*
Stage 2	ð	*		X	1		769	719	•	169	650	
Platoon blocked, %		(4)			(2)					- 1		
Nov Cap-1 Maneuver	1494	•		1238	*	ľ	484	493	836	200	422	858
Mov Cap-2 Maneuver	*	•	i).	**	90	*	566	546	•	447	478	
Stage 1	i	ı			ì		787	732	6	779	984	
Stage 2					(6)	nt:	710	683	ă.	238	649	,
The second of	9		П	ON.	П	ı	22	ı	H	ë	Г	
The state of the s	ľ		١	0	١	ľ		Į	ŀ	11.0	ľ	
TOW COUNTRY DELAY, S	2		ı	7.7	ı	h	2	ı		2 0	١	
HCM LOS	ĕ				3		۵	0		a		
Minor Lane/Major Mwmt		NBLnt	EBL	EBI	EBR	WE	WBI	WBR SBLn1	E u		H	
Capacity (vehifi)		657	1494	(4)	192	1238			504	F	١	
HCM Lane V/C Ratio		0.401	0.001	•	*1	0.05	*	•	0	ij	ı	
HCM Control Delay (s)		14.1	100		۱	00	ľ	ì	113		ı	
HCM Lane LOS		æ	¥	1	•	V	•	1	ന	ı	1	
HOW 95th %the Queh	-	6	0	4	3	92	4	4	0.2	١	l	O STATES

	l	l	l	l	l	l	l	l	l	l	l		
ntersection	١	ŀ	ľ	ľ	ľ	į	ļ.	ľ	ľ	ı	i		
Int Delay, s/veh	6.2												
Movement	EBL	183	EBR	WBL	WBT	WBR	MBL	NBT	MBR	SBL	387	SBR	
Lane Configurations	*	+	W _	*	, 1			ę			4		
Traffic Vol. vehih	40	125	15	105	310	2	138	w	135	2	0	5	
Future Vol. veh/h	w	125	140	105	310	10	120	SO.	135	ĸ	10	ĸ	
Conflicting Peds. #fhr	0	0	0	0	0	0	0	0	0	٥	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized		•	None			None			None	×	911	None	
Storage Length	150	*1	150	300	70			90	٠	*	*6		
Veh in Median Storage	31	0	*	7	0			Ī	*	20	T		
Grade, %			•	•	0			0	*	*	0	*	
Peak Hour Factor	92	92	35	8	8	92	85	35	8	8	8	85	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Mvmt Flow	3	136	152	114	337	up	130	C)	147	S)	4	30	
Haine Bearing	Ì	ı		5	1	ĺ	The said	ı	Ī	5	1	i	
	To the	i	Í	HIGHER	ľ		1	1	90,	S S	9		
Conflicting Flow All	347	5	0	997	0	2	77/	91/	3	8	8	₹	
stage 1	Ĭ	0.	•	4	è	2	146	146	Œ	200	200	ř	The Part of the Pa
Stage 2		£	97	•	•	•	226	220	•	238	38		
Critical Holay	4.12		·	4 12	*	1	7,12	6.52	6.22	7.12	6.52	6.22	
Critical Hdwy Stg 1	•	Ė	*	1	•	•	6.12	5.52	÷	6,12	5.52		
35		•	2		9	9	6.12				5.52		
	2.218	١	1	2.218	O.		3.518				4.018	3.318	
Pot Cap-1 Maneuver	1217	×	*	1274	ð	×	342	356	913	274	5	702	
Stage 1	(4)	(*)	(0)	ħ	*		857	922	٠	208	206	9	
Stage 2	*	1	*	ŝi	*	100	503	505	*	711	667	9	
Platoon blocked, %		•0	100		7.	**							
Nov Cap-1 Maneuver	1217		ì	1274	Į.	100	308	323	913	211	364	707	
Mov Cap-2 Maneuver				*			378	388	(4)	320	348	17	
Stage 1		((0)	(*	it.	ir.	1	884	773	•	306	463	3	Children Str. Asi
Stage 2	134	٠	•	t.	12.	•	444	480		280	664	7	
		ì		ı	X				i				
Approach	E8			WB			B			SB			The Part of the last
HCM Control Delay, s	0.1			8			18.6		Ġ	14.8			
HCM LOS							O			œ			
		ì	ı	ij	H	ı	ij	ì	i	N	8		
Minor Lanelskap skym		MELIT	EB	EBI	EBR	WEE	WBT	WBR SBLn1	BLn1	d	b	Į	
Capacity (vehifi)		544	1217	5	i	1274			388				The same
HCM Lane V/C Ratio		0.52	0.004	(1 <u>0</u>)	10	0.09			0.056				
HCM Control Delay (s)		18.6	00	4		80		a	14.8		ı	i	
HCM Lane LOS	ı	O	V	in.	7.5	K	4	34	œ		1		
HCM 95th %tile O(veb)		3	0	٠	4	03	4	8	0.2				

Synchro 10 Report Page 1

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HCM 6th TWSC 17: Archer Parkway & US-30

2040 Total PM.syn 1030/2018

Lane Configurations	Int Delay, s/veh	9.4												
Free Free Free Free Free Free Free Free	Movement	EBL	183	EBR	WEL	WBT	WBR	NBI	NBT	NBR	Š	SBI	SBR	
Free Free Free Free Free Stop	Lane Configurations	K-	4	k.	*	£,			4			4		
Free Free Free Free Stop 5 120 5 5 5 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Traffic Vol. veh/h	9	300	135	15	200	w	200	ın	120	10	2	2	
Free Free Free Free Stop	Future Vol. veh/h	w	300	135	75	200	10	200	5	120	ı.c	5	52	
Free Free Free Free Free Free Stop Stop Stop Stop Stop Stop Stop Stop	Conflicting Peds, #fhr	0	0	0	0	0	0	0	0	0	0	0	0	
150	Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
150 - 150 300 - 1 1	RT Channelized		23	None	-	-	None	11	i	None		13	None	
14 NBLrif EBL EBI EBI EBI EBI EBI EBI EBI EBI EBI EBI	Storage Length	150	20	150	300		٠	(14)	٠	•				
1,	Veh in Median Storage.	*	0	1		0	8	A	+	it	N.			-
Section Sect	Grade, %	90	0	*	*	0	*	×	0	7	*	O	4	
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Peak Hour Factor	35	92	92	35	92	85	65	85	25	32	66	- 26	1
Major I Major P	Heavy Vehicles, %	7	7	7	2	2	2	2	2	7	cv	2	2	
Major Major Minist Min	Mvmt Flow	40	326	147	83	2117	5	217	MP.	130	10	S	un	
222 0 0 473 0 0 725 722 326 861 887 22 412 - 412 - 736 38 38 384 384 412 - 412 - 712 652 622 712 652 62 2218 - 612 552 2218 -		- North	ř	1	Court	Ī		finish	ı		Const	ì		
4.12 - 4.12 - 5.395 336 386 884 884 4.12 - 4.12 - 5.12 552 6.12 5.52 2.218 - 2.218 3.516 4.018 3.318 4.018 3.31 2.318 - 2.218 3.516 4.018 3.318 4.018 3.31 2.318 - 2.218 3.516 4.018 3.318 4.018 3.31 2.318 - 2.218 3.40 3.40 3.518 4.018 3.318 2.318 - 3.40 3.53 715 275 291 82 2.318 - 2.218 3.21 2.28 8.28 2.318 - 3.32 3.44 3.32 3.44 3.32 3.45 3.02 3.54 3.44 3.22 7.15 2.10 288 3.45 3.47 3.25 7.15 2.10 288 3.48 3.47 3.25 7.15 2.10 288 3.49 3.47 3.29 3.44 3.20 3.54 4.80 3.41 3.22 7.15 2.10 288 3.41 3.22 7.15 2.10 288 3.42 4.19 3.02 3.54 4.24 4.19 3.02 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.24 4.19 3.20 3.54 4.25 3.77 3.78 3.77 3.78 3.78 3.78 3.77 3.78 3.77 3.78 3.78 3.78 3.77 3.78 3.77 3.78 3.78 3.78 3.77 3.78 3.77 3.78 3.78 3.77 3.78 3.77 3.78 3.77 3.78 3.78 3.77 3.78 3.77 3.78 3.77 3.78 3.78 3.77 3.78 3.77 3.78 3.78 3.78 3.78 3.78 3.78	1	222	0	0	473	C	c	7.75	722	325	R61	867	220	
4.12 - 4.12 - 7.12 6.52 6.22 7.12 6.52 6.22 6.12 6.52 6.12 6.12 6.12 6.12 6.12 6.12 6.12 6.1	Stage 1			15			114	336	335	3	384	384		Here was a second
472 - 412 - 712 6.52 6.22 7.12 6.52 6.2 2.248 2.218 6.12 5.2 6.12 5.2 2.248 2.218 5.12 6.3 6.12 5.2 2.248 2.218 5.16 4.018 3.318 3.518 4.018 3.3 1.347 1089 3.46 4.018 3.518 4.018 3.3 1.347 1089 678 642 - 639 611 6.35 610 - 639 611 6.35 610 - 639 611 6.35 610 - 639 611 6.35 610 - 639 611 6.35 610 - 639 611 6.35 610 - 639 611 6.35 612 613 614 6.35 613 614 6.36 623 613 6.37 6.39 6.36 635 6.38 635 6.38 635 6.38 635 6.39 635 6.30 635 6.30 635 6.30 631 6.30 633 6.30 635 6.	Stage 2	٠		18			٠	389	386	1	477	483	Y.	
2218 6.12 5.52	Critical Hdwy	4.12	1		4.12	ė		712	6.52	6.72	7 12	6.52	6.72	
2218 2218 512 552 612 552 1347 1089 340 4353 715 276 291 83 1347 1089 673 642 699 651 1347 1089 673 640	Critical Hdwy Stg 1	¥.	*	81	•		٠	6.12	5.52	8	6.12	5.52		
1347 1089 3516 4,018 3318 4,018 3318 4,018 3318 4,018 3318 4,018 3331	Critical Hdwy Stg 2				1		•	6.12	5.52	٠	6.12	5.52		
1347 1089 340 353 715 276 291 82 1347 1089 1347 1089 1347 1089 1347 1089 1347 1089 1347 1089 1347 1089 1347 1089 1347 1089 1347 1348 1347 1348 1347 1348 1347 1348 1347 1348 1347 1348 134	i	2 2 18			2.218		•	3.518	4.018		3.518	4.018	3.318	
1347 - 1089 - 314 325 715 210 268 82 1347 - 1089 - 314 325 715 210 268 82 1547 - 1089 - 314 325 715 210 268 82 155 513 564 605 551 EB WB NB NB SB 142 0.1 2.3 27.8 142 0.1 2.3 27.8 142 0.1 2.3 27.8 142 4 NBLn1 EBL EBT EBR WB WB SB n 142 0.1 8 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Pot Cap-1 Maneuver	1347			1089	3	N.	340	353	715	276	291	820	
1347 1089 134 325 715 210 288 82 134 325 715 210 288 82 135 115 115 135 115 115 135 115 115 135 115	Stage 1	(4	æ	11.5	97			829	642	Ti#	639	611	U.	
1347 1089 1314 225 775 210 288 82 142 163 163 163 163 143 164 164 164 144 164 164 164 144 164 164 164 145 164 164 146 164 164 164 146 164 164 147 168 168 168 148 168 168 168 148 168 168 168 148 168 168 168 148 168 168 168 148 168 168 168 148 168 168 168 148 168 168 148 168 168 148 168 168 148 168 168 148 168 168 148 168 148 168 168 148	Stage 2	*	٠	it	i	2		635	610	3	569	553	4	
1347 - 1089 - 314 325 715 210 268 82 - 424 419 - 302 384 - 675 539 - 635 665 - 578 564 - 460 551 - 178 578 564 - 460 551 - 178 578 564 - 460 551 - 178 578 564 - 460 551 - 178 578 578 564 - 460 551 - 178 578 578 578 - 462 - 178 578 578 578 585 - 178 578 578 578 585 - 178 578 578 578 585 - 178 578 578 578 585 - 178 578 578 578 585 - 178 578 578 578 578 585 - 178 578 578 578 578 585 - 178 578 578 578 578 578 - 178 578 578 578 578 578 - 178 578 578 578 578 578 - 178 578 578 578 578 - 178 578 578 578 - 178 578 578 578 - 178 578 578 - 178 578 578 - 178 578 -	Platoon blocked, %		W.	÷			٠							
EB WB NB SBL 142 0.1 2.3 2.78 142 0.1 2.3 2.78 142 0.1 2.3 2.78 142 0.1 49 1347 1089 1004 0.78 0.04 0.075 0.004 0.78 0.04 0.075 0.004 0.78 0.04 0.075 0.004	Mov Cap-1 Maneuver	1347	Ĭ		1089		*	314	325	715	210	268	820	THE PERSON NAMED IN
EB WB NB 588 645 565 EB WB NB 588 142 0.1 2.3 278 142 B B B B B B B B B B B B B B B B B B B	Mov Cap-2 Maneuver	٠	*	*	*	•		424	419	97	305	354	000	
EB WB NB SB 142 0.1 2.3 2.78 14.2 D B B 4 NBLn1 EBL EBI EBR WBL WBT WBR SBLn1 499 1347 1089 408 0.708 0.004 0.075 0.004 D A A C B B D A A C B	Stage 1	*	(0)	ř	Y	*		675	633		636	585		
# NBLn1 EBL E81 E8R WB! WBR SBLn1 498 1347 - 1089 - 408 0.778 0.004 2.78 1.7 2.8 5 - 0.04 2.78 1.7 2.8 5 - 0.04 2.78 1.7 2.8 5 - 0.04 2.78 1.7 2.8 5 - 0.04 2.8 5	Stage 2	٩	4	*	33	9		278	584	10	460	551	•	
6.1 2.3 27.8 D 6.1 2.3 27.8 D 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004 7.8 0.004 0.0075 0.004		9	ı	ì	,			ı		ì	i	ď	Š	
401 EBL EBI EBR WBL WBL WBRSBLit 1000 0.004 0.005 0.005 0.004 0.005 0.00	Approach	83	ļ	B	WB	ii		MB			88			
A NBLOT EBL EBT EBR WBL WBT WBRSBLOT 499 1347 1089 - 408 0.708 0.004 - 0.075 - 0.04 27 8 77 - 8.6 144.2 D A A A A A A A A A A A A A A A A A A	HCM Control Delay, 5	0.1			2.3			87.78			142			
499 1347 1089	HCM LOS							٥			œ			
4 NBuni EBL EBT EBR WBL WBT WBRSB 499 1347 1089 - 0.075 0.708 0.004 - 0.075 - 0.075 7.78 7.7 8.6 6														
499 1347 1089 0.708 0.004 0.075 278 77 8.6 8.6	Minor Lane Major Mvmt	H	EL ni	Ħ	EBT	EBR	MB	WBT	WERS	BLul				
0.708 0.004 0.075	Capacity (veh/h)		499	1347	ľ	×	1089	1	100	408				
278 77 · · 86 · · · D A · · · A · · ·	HCM Lane V/C Ratio			0.004	.t.		0.075	٠	٠	0.04				
D A A .	HCM Control Delay (s)	9		11			8.6		×	142	ě	W		THE RESERVE TO SERVE
	HCM Lane LOS		_	٥	,	7.2	٩			a		l		

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HCM 6th TWSC 17: Archer Parkway & US-30

ntersection	H		ä		f	Ä	k	H			i		
Int Delay, s/veh	6.2												
Mwement	EBI	EBI	EBR	WBL	WBT	WBR	MBI	NBI	NBR	SBL	SBT	SBR	
Lane Configurations	ğ.	*	W.	M	41			+1			4		
Traffic Vol. weh/h	5	125	140	105	310	2	120	10	135	50	10	10	
Future Vol. veh/h	w	125	140	105	310	w	120	w	135	'n	10	v)	
Conflicting Peds, #fbr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized			None		ř	None			None	•		None	
Storage Length	150	(a)	150	300	800	*	20.	*	*	(4)	(*)	*	
Veh in Median Storage.	State of	0	*	٠	0	1.5	i		ı	×	٦		
Grade, %	*	0	•	٠	0	*	,	0		٠	0	*	
Peak Hour Factor	92	8	Si	35	85	26	35	35	8	35	92	35	
Heavy Vehicles, %	7	2	7	7	7	7	~	2	2	~	2	2	
Myrrit Flow	w	136	152	14	337	so:	130	5	147	S	11	S	
Majov/Minor A	Saor1	H		Major2	H	١	Mindel	E	ĺ	Winds	I		
Conflicting Flow All	342	0	0	288	0	0	722	716	136	866	886	340	
Stage 1		ě	(*)	×	10	12	146	148	10	999	999	at.	
Stage 2		4		٠			976	270	٠	238	298	*	
Critical Holmy	4.12			4.12	*.		7.12	6.52	6.22	7.12	6.52	6.22	Wild Other
Critical Howy Stg 1	*	*	*	*	*	đ.	6.12	5.52		6.12	5.52	*:	
Critical Holmy Stg 2	*	ľ	i	٠	i		6.12	5.52		6.12	5.52		
Follow-up Hdwv	2.218	,	ľ	- 2218	1	•	3.518		3.318	(4.)	4 018	3.318	
Por Cap-1 Maneuver	1217			1274	(4)		342	358	913	274	291	702	
Stage 1	-	-	115	0	111	12	857	776	316	208	506		
Stage 2	(14		**		203	505	4	711	667		
Platoon blocked, %		•			.*	*							
Mov Cap-1 Maneuver	1217	100		1274	(4)	ľ	308	323	913	211	364	702	
Mov Cap-2 Maneuver	10	(a)		*	*	2	378	388	90	320	38	*//	
Stage 1		ľ	*	۰	ľ	ľ	854	773		206	461		
Stage 2		•	•	•	•	1.02	444	460	٠	290	664	•	
	H	ı			ı	ı				١	ı		
Approach	æ			WB			98			88		Ì	
HCM Control Delay, s	0.1			2		ı	18.6	J		14.8	0		
HCM LOS							O			00			
THE REAL PROPERTY.			ı	i	ı	H	ı				B		
Minor Lanell Raior Mynn	333	MELDI	183	183	EBR	WBI	WBI	WBRSBLni	BEni	ľ			
Capacity (vehth)		544	1217		ľ	1274		C.	388				
HCM Lane V/C Ratio		0.52	0.004	æ	*	0.09	*	*	0.056				
HCM Control Delay (s)		18.6	00			8	*/	ľ	14.8				
HCM Lane LOS		O	A	•	*	¥	1	•	œ				
HCM 95th %tile Q(veh)		m	0	Ĭ		03	2		0.2	H	ı		

Synchro 10 Report Page 1

HCM 6th TWSC 17: Archer Parkway & US-30

2040 Total AM_Improved.syn 02/11/2019

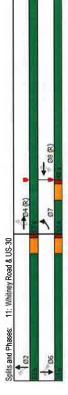
2040 Total PM_Improved.syn 0211/2019

Intersection									ľ				
Int Delay, s/veh	9.4												
Movement	183	183	EBR	WBL	WBT	WBR	NEW YEAR	MBI	MER	391	SBT	SBR	
Lane Configurations	15-	*	k.	4	42			1			4		
Traffic Vol. wehith	5	300	135	75	200	47	200	9	120	un.	40	2	
Future Vol. veh/h	ų,	300	135	75	200	40	200	w	120	45	นว	'n	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop	
RT Channelized	0.0		None			None	ST.	À	None			None	
Storage Length	150	*	150	300	*		*		**	*:	*	/#/	
Veh in Median Storage.	**	0		1	0		1	•	-	5	•		
Grade %	٠	0	,	:	0			0	•	•	0		
Peak Hour Factor	65	65	60	65	66	92	8	65	65	92	6	35	
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	
Myrrat Flow	ie,	326	147	83	217	un.	217	ü	130	up.	45	50	
Person Prace	1	l	1	Sala	١	•	Specific			Court	8		
Town All	223	0	•	47.2	-	9	302	722	326	964	798	220	
Cross 1	777	• (1)	0.0	275	>	>	325	336	250	284	38.	N#3	
Stane 2	ľ	ľ	ľ	ľ	ľ	ľ	380	388		477	287		
Criteral Hillan	4 12	1		2.52		-	7 12	6 57	603	712	6 53	623	-
Critical Hdwy Sto 1			1		1	ľ	6.12	5.52		6.12	5.52		
Critical Howy Stg 2		D.	ľ	ľ			612	5.52		612	5.52	a	
	2 218	31	3	2 2 1 8	8	1	3.518	4.018	3.318		4.018	3.318	
Pot Cap-1 Maneuver	1347	*	12	1089		11	340	353	715	276	730	820	
Stage 1		19	it.	*	ě	·	678	642	(9)	639	611	×.	
Stage 2	×	æ	*	۰	*		635	610	12	899	553	100	
Platoon blocked, %		(V)	100			740							
Mov Cap-1 Maneuver	1347	F.		1089	*	P	314	325	715	210	268	820	
Mov Cap-2 Maneuver	*	*	**	,		٠	424	419	٠	305	354		
Stage 1		Č*.			ĸ.	ľ	675	630		636	999		
Stage 2	74	38	3.	7		ï	578	284	9	460	551	0.00	
	ľ	ı			ı	ı	ı	ı	٩		ı		
Approach	æ			WB	l		BN	ŀ		SB			The second second
HCM Control Delay, s	0.1			2.3			872			14.2			
HCM LOS					١	П	٥	۱		œ	ł		
			l		ų.								
Minor LaneMajor Munt	ij	NELDI	EBL	EBI	E	WE	WBT	WBR SBLn1	Blui		ľ		
Capacity (veh/h)		499	1347	*	*	1089	800	ľ	408	k	ł		
HCM Lane V/C Ratio		0.708	0.004	*	8	0.075	•3	*0	0.0				
HCM Control Delay (s)		27.8	1.7	ě		9.8	Value of	i	14.2				
HCM Lane LOS		0	∢	•	•	4) > 1	œ	1			
HOM 95th %tie O(veh)		2.6	O	1	3	0.2	1	۱	0.1				

Timings 11: Whitney Road & US-30

2040 Total AM_Improved.syn 03/20/2019

See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough Configurations See Gough			٠	•				-			٠	
180 235 40 5 525 45 210 110 5 40 pm+pt NA Perm	ane Group	EBI	183	EBR	WBL	WBI	WBR	NBI	NBI	SBI	SBT	SBR
180 225 40 5 525 45 210 110 5 40 printal NA Perm Perm NA Perm Perm NA	ane Configurations	*	**	R.	×	**	¥.	*	¢.	M.	4	¥.
180 235 40 5 525 45 210 110 5 40 4	raffic Volume (vph)	180	235	40	90	525	45	210	110	5	40	410
protect NA Perm Perm NA Perm N	uture Volume (vph)	180	235	40	S	525	45	210	110	.c	8	410
7 4 4 8 8 2 2 6 6 6 7 4 4 8 8 8 2 2 6 6 6 7 4 4 8 8 8 2 2 2 6 6 6 7 4 4 8 8 8 2 2 2 6 6 6 7 4 4 8 8 8 2 2 2 6 6 6 7 50 50 50 50 50 50 50 50 50 50 50 120 570 570 450 450 450 330 330 330 330 133% 633% 633% 510% 510% 510% 310 310 330 133% 633% 633% 510% 510% 510% 310 310 310 310 10 10 10 10 10 10 10 10 10 10 10 10 10 10 00 00 00 00 00 00 00 00 00 00 00 10 00 00 00 00 00 00 00 00 00 00 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 147 70 17 10 155 26 354 242 356 367 10 00 16 10 10 10 10 10 10 10 10 10 10 10 10 10	um Type	pm+pt	NA	Perm	Perm	Z.	Perm	Perm	AZ AZ	Perm	NA	Perm
1	Protected Phases	7	4			60			8		Φ	
	emitted Phases	4		4	00		80	2	į	9	ĺ	9
S	Detector Phase	7	4	4	00	00	00	2	2	9	9	9
Section Sect	Switch Phase										Ì	١
Spärl (s) 9.5 22.5 23.5 33.0	finimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	2.0	2.0	2.0
(e) 12.0 \$7.0 \$7.0 \$7.0 \$45.0 \$45.0 \$33.0 \$33.0 \$33.0 \$33.0 \$33.0 \$33.0 \$33.0 \$35.0 \$45.0 \$45.0 \$45.0 \$35.0	finamum Split (s)	9.5	225	22.5	225	22.5	22.5	22.5	22.5	22.5	22.5	225
54 133% 533% 533% 513% 510% 510% 510% 510% 510% 510% 510% 510	otal Split (s)	12.0	57.0	57.0	45.0	45.0		33.0	33.0	33.0	33.0	33.0
Part Part	otal Solit (%)	13.3%	63.3%	63.3%	50.0%	50.0%	M	36.7%	36.7%	36.7%	36.7%	36.7%
Time (s) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	ellow Time (s)	3.5	3.5	3.5	3.5	3.5		3.5	3.5	3,5	3.5	3.5
Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	II-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0
Time (s) 45 45 45 45 45 45 45 45 45 45 45 45 45	ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead	odal Lost Time (s)	4.5	45	4.5	4.5	4.5	4.5	45	4.5	4.5	4.5	4.5
Optimize? Ves Ves Ves Notes Ves Max <th< td=""><td>ead/Lag</td><td>Lead</td><td></td><td></td><td>Lag</td><td>Lag</td><td>Lag</td><td></td><td></td><td></td><td></td><td></td></th<>	ead/Lag	Lead			Lag	Lag	Lag					
6 CMax CMax CMax CMax Max Max Max Max Max S 25 405 405 405 285 285 285 285 285 285 285 285 285 28	ead-Lag-Optimize?	Yes			Yes	Yes	Yes					
5 525 525 405 405 405 285 285 285 285 285 88 8 8 8 8 8 8 8 8	Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
8 0.58 0.58 0.45 0.45 0.45 0.32 0.32 0.32 0.32 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45	of Effet Green (s)	525	525	525	40.5	40.5	40.5	28.5	28.5	28.5	28.5	28.5
0 0.15 0.05 0.01 0.43 0.08 0.63 0.25 0.01 0.09 7 7.0 1,7 10.2 15.5 2.6 35.4 24.2 35.6 36.7 7 7.0 1,7 10.2 15.5 2.6 35.4 24.2 35.6 36.7 8 A A B B A D C D D B B A B C C C A B B A D C C C C C A B B A D C C C C C C A B B A D C D A D A B B A D C C C C C C C C A B B A D C C C C C C C C C C C C C C C C C C	ctuated gIC Ratio	0.58	0.58	0.58	0.45	0.45	0.45	0.32	0.32	0.32	0.32	0.32
7 70 17 102 155 26 354 242 356 367 00 00 00 00 00 00 00 00 00 00 00 00 00	/c Ratio	0.50	0.15	90.0	10.0	0.43	80.0	0.63	0.25	10'0	0.09	990
0 00 00 00 00 00 00 00 00 00 00 00 00 0	Control Delay	14.7	7.0	1.7	10.2	15.5	2.6	35.4	24.2	35.6	36.7	27.5
7 7.0 1,7 10.2 15.5 2.6 35.4 24.2 35.6 36.7 8.8 A B B A D C D D D B 9.6 14.4 31.4 28.4 A B B C C C C C C C C C C C C C C C C C	heue Delay	0.0	00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0
9.6 14.4 0 C 0 D 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	otal Delay	14.7	7.0	1.7	10.2	15.5	5.6	35.4	24.2	35.6	36.7	27.5
9.6 14.4 31.4 A B C C A EBRI and 8.WBTL, Start of Green Intersection LOS: B Intersection LOS: B Intersection Commo	SO	8	A	A	8	8	A	0	ပ	0	٥	O
A. 9.4 EBTL and 8.WBTL, Start 14%	approach Delay		9.6			14.4			31.4		28.4	
4 EBTL and 8 WBTL. Start	pproach LOS		¥	Ž	ă	8		i	O	į	O	
e4 EBTL and 8 WBTL. Start	ntersection Summary											
e 4 EBTL and 8 WBTL. Start	Vole Length 90			h		l		į				
4 EBTL and 8 WBTL, Start and 8 WBTL, Start and 8 WBTL, Start 4%	ctuated Cycle Length: 90			ı			d					
4%	Hiset, 0 (0%), Referenced	to phase 4	EBTL ar	M 8 WBT	L. Start	M Green			ij			
***************************************	latural Cycle: 60			Ì		١	I					
19.8 Ization 72.4%	control Type. Actuated Co.	ordinated	Ĭ	Ì	١	Ī	l	I	į		į	
	faximum v/c Ratio: 0.58					7	-					
	Hersection Signal Delay: 1	8.6	ì	Į		ntersectic	IN LOS: B	i	Š	l	l	
	Itersection Capacity Utiliza	ation 72.49			_	CU Level	of Service	S				



Synchro 10 Report Page 1

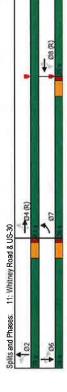
HCM 6th Signalized Intersection Summary 11: Whitney Road & US-30

ary 2040 Total AM Improved.syn	
section Summary	30

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Aovement	ER	EBI	EBB	WBE	WBT	WBR	NBI	NEIL	NBR	SBC	TBS	SBR
ane Configurations	*	**	*	k	**	K)C	42		J.	4	R
raffic Volume (vehuh)	180	235	40	9	525	45	210	110	9	ú	40	410
Future Volume (weh/h)	180	235	40	'n	525	45	210	110	5	S	40	410
nitial O (Ob), weh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00	ì	1.00	1.00	ı	8
Parking Bus, Adj	1.00	1.00	1.00	100	1.00	1 00	1.00	1.00	100	1.00	1.00	1.00
Nork Zone On Approach		9			No			No.			S.	
di Sat Flow, wehthin	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, vetv/h	196	255	43	2	571	49	228	120	\$	w	43	283
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	5	en	2	2	7	2	7	2	2
Cap, veh/h	462	1745	522	299	1347	109	394	475	20	406	499	423
Arrive On Green	80.0	0.58	0.58	0.45	0.45	0.45	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, wehith	1500	2993	1335	1081	2993	1335	1054	1501	63	1266	1575	1335
Srp Volume(v), veh/h	196	255	43	5	571	49	228	0	125	S	43	283
Srp Sat Flow(s), veh/h/lin	1500	1496	1335	1081	1496	1335	1054	0	1564	1266	1575	1335
Serve(g_s), s	0.9	3.5	1.2	0.2	11.7	1.9	17.5	0.0	5.3	0.3	1,7	16.5
Cycle O Clear(g_c), s	6.0	3.5	12	0.2	1117	1.9	19.2	0.0	53	5.6	1.7	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.04	1.00	10000	1.00
ane Gro Cap(c), vehilh	462	1746	779	299	1347	109	365	0	495	406	499	423
//C Ratio(X)	0.45	0.15	90.0	0,01	0.45	90.0	0.58	00.00	0.25	0.01	60.0	0.67
Avail Cap(c, a), wehrh	462	1746	779	299	1347	109	384	9	495	406	486	423
HCM Platoon Ratio	100	100	1.00	100	1.00	1.00	1.00	1.00	1.00	1.00	100	1,00
pstream Filler(I)	1 00	100	100	1.00	1 00	1 00	1.00	000	1.00	0.48	0.48	0.48
Iniform Delay (d), s/veh	11.6	8.5	8.1	13.7	16.8	14.1	28.3	0.0	22.8	24.9	21.6	26.7
nor Delay (d2), s/veh	9.0	0.5	0.1	0.0	1.0	0.3	6.1	0'0	1.2	0.0	0.5	4.0
nitial Q Delay(d3), siveh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ale BackOfQ(50%) vehiln	1.9	Ţ	9.4	0.1	4.0	9.0	6.5	0.0	2.1	0.1	9.0	5.6
insig. Movement Delay, s/veh												П
nGrp Delay(d), slveh	\$2.2	8.7	8.5	13.7	17.8	144	34.4	0.0	24.1	249	218	30.7
nGrp LOS	8	A	¥	B	B	80	U	A	U	U	O	٥
pproach Vol. vehilh		494		Į	828	Ì		353			331	
pproach Delay, s/veh		10.1			17.5			30.8			29.5	
pproach LOS	ı	œ	i		æ	l		U	ų.	ı	O	ï
mer - Assigned Phs	ļ	2	8		Ĭ	(d)	7	8	ì			
ths Duration (G+Y+Rc) s		33.0		0 /5		33.0	12.0	45.0				
Change Period (Y+Rc), s		4.5		4.5		4.5	4.5	4.5				
fax Green Setting (Gmax), s		28.5		52.5		28.5	7.5	40.5				
Max Q Clear Time (g_c+11), s		21.2		5,5		18.5	8.0	13.7				
seen Ext Time (p_c), s	ì	10		2.0	ŀ	6.0	0.0	43	ı	ı		i
of art short in Sommittee	Ì		I	Ç.	l	į			į	Ì		Ī
HICHOCOURING CONTINUES	۱	١	000000	ı	ı	ı	l	I	ı	Ì	۱	I
100000			0									

Timings

	1	†	<i>></i>	1	ţ	4	•	←	٠	→	•
ane Group	183	183	FBR	WBL	WBT	WBR	MBE	NBI	SBI	SBT	SBR
ane Configurations	K.	**	*	K	**	YL.	F	2	ĸ	+	r.
raffic Volume (vph)	470	630	90	40	235	99	115	95	25	88	370
-uture Volume (vph)	470	630	8	9	235	65	115	82	52	88	370
um Type	10+WD	¥	Perm	Perm	2	Perm	Perm	NA	Perm	NA	Perm
Protected Phases	7	4			00			2		w	
Permitted Phases	*	H	Ħ	80		00	2		6		9
Detector Phase	7	*4	4	80	80	60	2	2	9	40	9
Switch Phase	i										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	5,0
finimum Split (s)	9.5	225	22.5	22.5	225	22.5	22.5	22.5	22.5	22.5	225
otal Split (s)	36.0	61.0	61.0	25.0	25.0	25.0	29.0	29.0	29.0	29.0	29.0
otal Split (%)	40.0%	67.8%	67.8%	27.8%	27.8%	27.8%	32.2%	32.2%	32.2%	32.2%	32.2%
ellow Time (s)	3,5	3.5	3.5	3.5	3.5	3.5	3.5	33.55	3.5	3.5	3.5
J-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	10	1.0	1.0
ost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
otal Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
eaditag	Lead			Lag	Lag	Lag					
ead-Lag Optimize?	Yes			Yes	Yes	Yes					
Recall Mode	None	C-Max	C-Max	C-Max	C-Max	C-Max	Mex	Max	Max	Max	Max
Act Effet Green (s)	599	56.5	56.5	28.8	28.8	28.8	245	24.5	24.5	24.5	24.5
Actuated g/C Ratio	0.63	0.63	0.63	0.32	0.32	0.32	0.27	0.27	0.27	0.27	0.27
/c Ratio	0.75	036	0.11	0.22	0.25	0.15	0.43	0.28	60.0	0.24	190
Control Delay	19.0	80	3.8	9.7	6.1	3.5	32.4	26.0	25.5	27.1	126
Dueue Delay	0.0	0.0	0.0	0.0	0.0	0.0	00	0.0	0.0	0.0	0:0
otal Delay	19.0	68	3.9	9.7	6.1	3.5	32.4	26.0	25.5	27.1	12.6
S	60	45,	4	4	A	*	ပ	U	O	O	8
Approach Delay		12.6			6.0			29.3		16.0	
Approach LOS		00	ŧ	h	A	ğ	į	U	Ĭ	60	
ntersection Summary			H	Ų		j					
Syde Length 90	ă										
Continued Cycle, Referenced to phase 4 EBTL and 8:WBTL, Start of Green Outries Core.	to phase 4	EBTL at	14 8 WBT	L. Starte	I Green	H	į	4	ŀ	Į.	ł
Control Type: Actuated Coordinated	ordinated		ľ		ı	Ĭ	Ĭ	ı			ı
Maximum v/c Ratio: 0.75			ı	Ì				ı	1	١	
ntersection Signal Delay: 14.0	0.5			Ī	ntersectio	mersection LOS: 6					
September Canada Library on the 18					4						



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HCM 6th Signalized Intersection Summary 11: Whitney Road & US-30

2040 Total PM_Improved.syn 03/20/2019

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Movement	EBL	EBI	EBR	WBI	WBT	WER	NBI	NBT	MBR	SBI	SBI	EES.
Lane Configurations	ħ.	**	R.	N.	*	k.	Jr.	42		۳	4	×.
Traffic Volume (vehih)	470	630	96	40	235	99	115	98	15	52	8	370
Future Volume (veh/h)	470	630	8	4	235	65	115	95	15	52	95	370
Initial O (Ob), weh	0	0	0	o	0	٥	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1	1.00	1.00	1	100	1.00		1.00	1.00		1.00
Parking Bus, Adj	100	1.00	1.00	1.00	1:00	1.00	1.00	1 00	1.00	1 00	1.00	1,00
Work Zone On Approach		20			S			No			Š	
Adj Sat Flow, vehilini	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575	1575
Adj Flow Rate, veh/h	511	677	26	43	242	7	125	103	16	17	103	239
Peak Hour Factor	0.92	0.93	0.93	0.92	260	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh. %	2	2	2	2	CV	2	2	5	2	2	2	2
Cap, veh/h	33	1879	838	312	666	446	300	362	8	349	429	363
Arrive On Green	0.24	0.63	0.63	0.33	0.33	0.33	0.27	0.27	0.27	0.09	0.00	0.0
Sat Flow, vehih	1500	2993	1335	969	2993	1335	1039	1331	202	1273	1575	1335
Grp Volume(v), veh/h	511	677	46	43	242	71	125	0	119	12	103	239
Grp Sat Flow(s), veh/h/ln	1500	1496	1335	969	1496	1335	1039	0	1538	1273	1575	1335
Q Serve(g_s), s	18.6	9.6	2.6	3.9	5.3	3.4	6.7	0.0	5.5	1.8	5.5	15.6
Cycle Q Clear(g_c), s	18.6	8.6	2.6	3.9	5.3	3.4	15.2	0.0	5.5	7.3	5.5	15.6
Prop In Lane	1.00		1,00	1.00		1.00	1.00		0.13	1,00		1.00
Lane Grp Cap(c), vehith	739	1879	838	312	666	446	300	0	419	349	429	363
V/C Ratio(X)	0.69	0.36	0.12	0.14	0.24	0.16	0.42	0.00	0.28	0.08	0.24	99.0
Avail Cap(c_a), vehih	888	1879	838	312	666	446	300	0	419	349	458	363
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1 00	1.80	1 00	100	1.00	18	1,00	00.0	1.00	99.0	99.0	0.65
Uniform Delay (d), siveh	11.5	8.1	6.7	21.3	21.7	21.1	31.8	0.0	25.8	35.7	323	36.9
incr Delay (d2), s/veh	1.7	9.0	0.3	60	9.0	0.8	4.2	0.0	17	0.3	60	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%) vehilin	5.8	2.9	0.7	0.7	1.9	1.1	27	0.0	2.2	9.0	22	10
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),siveh	13.2	9.8	2.0	22.2	223	510	36.1	0.0	27.5	36.0	33.2	429
LnGrp LOS	æ	A	A	O	O	O	۵	ď	O	٥	U	
Approach Vol. vehih		1285			356			244			369	ì
Approach Delay, siveh		103		i	22.2	1		31.9			39.6	1
Approach LOS	6	8			ပ		į	O		ı	۵	g
Timer - Assigned Phs	I	2		9		9	7.	80	S	1	ľ	Ī
Phs Duration (G+Y+Ro), s		29.0		61.0		29.0	592	34.5				
Change Period (Y+Rc), s		4.5		4.5		4.5	4.5	4.5				
Max Green Setting (Grnax), s	10	24.5		999	i	245	31.5	26.5	ř			1
Max Q Clear Time (g_c+i1), s	60	17.2		11.8		17.6	20.6	7.3				
Green Ext Time (p_c), s	3	20		2.9		6.0	1.4	13		ľ		8
Intersection Similiary		ŀ		i		i i	8	ı,		ļ	I	R
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Queues 11: Whitney Road & US-30

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ane Group	Ħ	EBT	EBB	Well	WBT	WBP	NBI	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	255	43	S	57.1	49	228	125	5	43	446
vic Ratio	0.50	0.15	0.05	0.01	0.43	0.08	0.63	0.25	0.01	60'0	99.0
Control Delay	14.7	7.0	1.7	10.2	15.5	2.6	35.4	242	35.6	36.7	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	00
Total Delay	14.7	0'2	1.7	10.2	15.5	2.6	35.4	24.2	35.6	36.7	27.5
Queue Length 50th (III)	28	19	-	*	145	2	110	97	e	24	140
Queue Length 95th (ft)	S	28	0	m4	204	5	192	98	m4	m34	m193
Internal Unik Dist (ft)		1323			1938			1420		1506	
Turn Bay Length (ft)	375		375	375		375	100		150		200
Base Capacity (uph)	391	1738	795	419	1341	640	362	495	335	496	658
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductin	0	0	0	0	0	0	0	0	٥	0	0
Reduced v/c Ratio	0.50	0.15	0.05	0.01	6.43	0.08	0.63	0.25	0.01	0.09	0.68
ntersection Summary				١						i	

Queues 11: Whitney Road & US-30

2040 Total AM_Improved.syn

2040 Total PM_Improved.syn

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ann Group	EBE	188	EBS	WBE	WBT	WBR	NBIL	IBN	TIBS	SBT	SBR
ane Group Flow (vph)	511	677	26	43	242	7.1	125	119	27	103	402
ilc Ratio	0.75	0.36	0.11	0.22	0.25	0.15	0.43	0.28	60.0	0.24	19:0
Control Delay	19.0	00	3.9	6.7	6.1	3.5	32.4	26.0	25.5	27.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0:0	0.0	0.0	0.0	0.0
Total Delay	19.0	6.0	3.9	6	6.1	3.5	32.4	26.0	25.5	27.1	12.6
Queue Length 50th (ft)	88	22	0	-	7	0	23	46	53	23	8
Queue Length 95th (ft)	m227	m126	m15	53	88	20	112	98	m19	07m	m130
nternal Unik Dist (ft)		1323			1938			1420		1506	
Turn Bay Length (ft)	375		375	375		375	100		150		200
Sase Capacity (vph)	746	1870	872	187	984	476	562	424	289	427	655
Starvation Cap Reductin	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	Ö	0	0	0	0	9	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced vic Ratio	890	0.36	0.11	0.22	0.25	0.15	0.43	0.28	60.0	0.24	0.61

Synchro 10 Report Page 1



TO: Tom Cobb, PE – AVI, pc.

FROM: Joseph L. Henderson, PE, PTOE

DATE: June 11, 2018

RE: Summary of the Analysis Performed for the Whitney Road Corridor Study

Based on your request, I have performed the traffic engineering analysis for the Whitney Road Corridor Study. The following sections outline the assumptions used in the analysis and the results of the analysis.

Assumptions

- Saturation Flow Rate. The saturation flow rate was assumed to be 1,600 passenger cars / hour / lane based on Wyoming motorists' driving habits and data collected for the Yellowstone Road Corridor Traffic Signal Timing Project.
- **Peak Hour Factor.** The peak hour factor for the existing conditions was based on the data collected for the study. For the Year 2040, the peak hour factor was assumed to be 0.92 for all of the approaches at US 30 and Dell Range Boulevard. At Beckle Road, the peak hour factor was assumed to be 0.85 in the Year 2040.
- Signal Timing. At US 30, a 90 second cycle length was assumed for both peak hours with a 70/30 split. At Dell Range Boulevard, a 100 second cycle length was assumed with a 60/40 split during the morning peak hour and a 50/50 split during the evening peak hour.

Roadway Classifications

- Whitney Road. Minor arterial south of Dell Range Boulevard, Major Collector north of Dell Range Boulevard
- Dell Range Boulevard. Principal arterial
- **US 30.** Principal arterial
- The classifications are based on the Cheyenne <u>Urban Boundary and Functional</u> Classification Concurrence Map (Cheyenne MPO. September 29, 2015).

Speed Limits

- Dell Range Boulevard 45 MPH
- US 30 45 MPH

Traffic Count Data

 Peak hour traffic counts collected on April 4, 2017 were utilized to calculate the level of service for the existing conditions. Year 2040 peak hour counts were obtained from the Whitney Ranch Traffic Impact Study, Figure 11 (Kimley Horn. December 14, 2017). These counts were used in the analysis of the Year 2040 conditions.

Signal Warrants

- Dell Range Road. A traffic signal is not currently warranted but is expected to be warranted by the Year 2019. The peak hour warrant is expected to be satisfied during the evening peak hour assuming a straight-line increase from the existing peak hour volumes to the Year 2040 peak hour volumes.
- **US 30.** A traffic signal is not currently warranted but is expected to be warranted by the Year 2022. The peak hour warrant is expected to be satisfied during the evening peak hour assuming a straight-line increase from the existing peak hour volumes to the Year 2040 peak hour volumes.

Approach Laneage – Based on Year 2040 Volumes

- Figure 1 shows the laneage for each intersection assuming that Dell Range Boulevard is signalized. If Dell Range Boulevard is a roundabout, all of the approaches would have a single lane. At Whitney Road, Dell Range can operate acceptably in Year 2040 with one through lane in each direction.
- The intersection operation is summarized in Table 1.

Storage Lengths

• The storage lengths for the left and right turn lanes are summarized in Tables 2 and 3. Please note that the southbound through queue at Dell Range Boulevard is expected to be longer than the right turn lane.

Roundabout at Dell Range Boulevard

- I think that it's a good option for the following reasons:
 - It could be constructed now as compared to waiting for a signal warrant to be satisfied.
 - It might cost less than the signalized intersection.
 - o In the Year 2040, it is expected to operate better than the signalized intersection.

Attachments

c:\users\joetr\documents\projects\active\whitney road\project\word\whitney road traffic study memorandum.docx

Generated with PTV VISTRO

Figure 1. Lane Configuration and Traffic Control



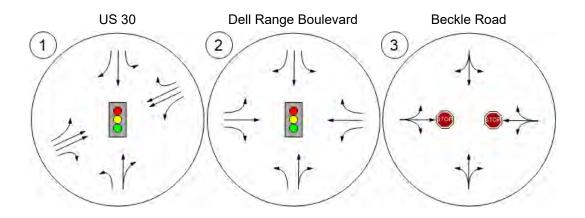


Table 1. Intersection Operational Summary

		Ex	isting		Year 2	040 - All Moveme	ents Stop at the St	top Line	Yea	ar 2040 - SBRT at	US 30 Does Not S	Stop
Signalized Intersection	M	orning	Eve	ening	Мо	ning	Eve	ning	Mor	ning	Eve	ning
	Delay	Los	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 30 / Whitney Road					24.57	С	19.93	В	10.04	В	10.06	В
Northbound Left Turn					25.63	С	29.14	С	42.68	D	43.07	D
Northbound Thru + Right Turn					23.07	С	25.17	С	38.61	D	37.36	D
Southbound Left Turn					25.45	С	28.33	С	41.34	D	41.38	D
Southbound Thru					22.54	С	25.34	С	37.03	D	37.80	D
Southbound Right Turn	_	Nie letere este e le c			53.27	D	47.7	D	0	А	0	А
Eastbound Left Turn		his intersection is c	urrently stop contro	olled.	20.52	С	18.15	В	6.41	А	7.35	А
Eastbound Thru					7.39	А	7.64	А	1.97	А	2.84	А
Eastbound Right Turn					6.95	А	6.62	А	1.83	А	2.44	А
Westbound Left Turn					12.92	В	15.45	В	4.9	А	7.1	Α
Westbound Thru					14.92	В	10.8	В	5.62	А	5.1	Α
Westbound Right Turn					11.38	В	9.82	A	4.27	А	4.61	А
Dell Range Boulevard / Whitney Road					38.46	D	29.11	С	38.46	D	29.11	С
Northbound Left Turn					42.09	D	34.47	С	42.09	D	34.47	С
Northbound Thru + Right Turn					31.62	С	46.04	D	31.62	С	46.04	D
Southbound Left Turn					31.02	С	39.81	D	31.02	С	39.81	D
Southbound Thru					87.75	F	33.31	С	87.75	F	33.31	С
Southbound Right Turn	_	his intersection is c	urrently eten centre	allad	29.99	С	22.5	С	29.99	С	22.5	С
Eastbound Left Turn		nis intersection is c	urrently stop contro	olled.	15.84	В	23.28	С	15.84	В	23.28	С
Eastbound Thru					10.55	В	19.51	В	10.55	В	19.51	В
Eastbound Right Turn					9.76	А	15.26	В	9.76	А	15.26	В
Westbound Left Turn					12.24	В	24.28	С	12.24	В	24.28	С
Westbound Thru					12.57	В	17.31	В	12.57	В	17.31	В
Westbound Right Turn					9.58	А	14.51	В	9.58	A	14.51	В
		Ex	isting		Year 2	040 - All Moveme	ents Stop at the St	top Line		Year 2	040 Total	
Stop Controlled Intersections	М	orning	Eve	ening	Mo	ning	Eve	ning	Mor	ning	Eve	ning
	Delay	Los	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 30 / Whitney Road		•	·				•				_	
Northbound Left Turn	22.96	С	20.8	С								
Northbound Thru + Right Turn	15.76	С	18.36	С	This is	tersection will be :						onaria
Southbound Left Turn + Thru + Right Turn	14.72	_						cenario	This in	tersection will be	signalized in this so	
Eastbound Left Turn		В	17.9	С	THIST	torocoulon will be	signalized in this si	cenario.	This in	tersection will be	signalized in this so	eriario.
	8.4	B A	17.9 7.79	C A	THIS	iorossion illinos	signalized in this si	cenario.	This in	tersection will be	signalized in this so	енано.
Westbound Left Turn	8.4 7.53				This ii		signalized in this si	cenario.	This in	tersection will be	signalized in this so	enano.
Westbound Left Turn Dell Range Boulevard / Whitney Road		A	7.79	A	THIS II		signalized in this si	cenario.	This in	tersection will be	signalized in this so	eriano.
		A	7.79	A	THS		signalized in this si	cenario.	This in	tersection will be	signalized in this so	енано.
Dell Range Boulevard / Whitney Road	7.53	A A	7.79	A A			signalized in this si				signalized in this so	
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn	7.53	A A B	7.79 8.19 21.11	A A								
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn	7.53 15 12.59	A A B B	7.79 8.19 21.11 13.28	A A C B								
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn	7.53 15 12.59 7.66	A A B B A	7.79 8.19 21.11 13.28 7.64	A A C B A								
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn	7.53 15 12.59 7.66	A A B B A	7.79 8.19 21.11 13.28 7.64	A A C B A								
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road	7.53 15 12.59 7.66 7.42	A A B B A A A	7.79 8.19 21.11 13.28 7.64 7.91	A A C B A A	This in	tersection will be :	signalized in this su	cenario.	This in	tersection will be	signalized in this so	enario.
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn	7.53 15 12.59 7.66 7.42	A A B B A A A	7.79 8.19 21.11 13.28 7.64 7.91	A A A A	This in 7.71	tersection will be :	signalized in this su	cenario.	This in 7.71	ttersection will be	signalized in this so	enario.
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn	7.53 15 12.59 7.66 7.42	A A B B A A A	7.79 8.19 21.11 13.28 7.64 7.91	A A A A A	7.71 7.3	tersection will be :	signalized in this su	cenario.	7.71 7.3	tersection will be	signalized in this so	enario. A A
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn + Thru + Right Turn	7.53 15 12.59 7.66 7.42 7.28	A A B B A A A A A A A A A A A A A A A A	7.79 8.19 21.11 13.28 7.64 7.91 7.48	A A A A	7.71 7.3 10.15 10.79	tersection will be : A A B B	7.47 7.54 9.89	A A A B	7.71 7.3 10.15	A A B B	7.47 7.54 9.89	A A A
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn Eastbound Left Turn + Thru + Right Turn	7.53 15 12.59 7.66 7.42 7.28 9.55	A A B B A A A A A A A A A A A A A A A A	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19	A A A A	7.71 7.3 10.15 10.79 Year 2	tersection will be : A A B B	7.47 7.54 9.89 11.06	A A A B	7.71 7.3 10.15 10.79	A A B B	7.47 7.54 9.89	enario. A A A B
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn Eastbound Left Turn + Thru + Right Turn Westbound Left Turn + Thru + Right Turn	7.53 15 12.59 7.66 7.42 7.28 9.55	B B A A A A A A A Ex	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19	A A A A A A A A A A A A A A A A A A A	7.71 7.3 10.15 10.79 Year 2	A A B B B	7.47 7.54 9.89 11.06	A A A B Boop Line	7.71 7.3 10.15 10.79	tersection will be A A B B	7.47 7.54 9.89 11.06	enario. A A A B
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn + Thru + Right Turn Westbound Left Turn + Thru + Right Turn RoundBourt	7.53 15 12.59 7.66 7.42 7.28 9.55	A A B B A A A A A A A A A A A A A A A A	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19 sting	A A C C B A A A A A A A A A A A A A A A	7.71 7.3 10.15 10.79 Year 2	tersection will be s	7.47 7.54 9.89 11.06 ints Stop at the Si	A A A B B cop Line	7.71 7.3 10.15 10.79	tersection will be A A B B Year 2	7.47 7.54 9.89 11.06	enario. A A A B
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn + Thru + Right Turn Westbound Left Turn + Thru + Right Turn Roundabout Dell Range Boulevard / Whitney Road	7.53 15 12.59 7.66 7.42 7.28 9.55	A A B B A A A A A A A A A A A A A A A A	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19 sting	A A C C B A A A A A A A A A A A A A A A	7.71 7.3 10.15 10.79 Year 2'	tersection will be : A A B B B J40 - All Movemening	7.47 7.54 9.89 11.06 ints Stop at the Stop	A A A B B cop Line ning LOS	7.71 7.3 10.15 10.79 Mor	A A B B Year 2	7.47 7.54 9.89 11.06 040 Total Evel	A A B B LOS
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn Eastbound Left Turn + Thru + Right Turn Westbound Left Turn + Thru + Right Turn	7.53 15 12.59 7.66 7.42 7.28 9.55	A A B B A A A A A A A A A A A A A A A A	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19 sting Eve	A A A A A A A A A A A A A A A A A A A	7.71 7.3 10.15 10.79 Year 2 Mo Delay 9.7	tersection will be : A A B B B 040 - All Movemening LOS A	7.47 7.54 9.89 11.06 ints Stop at the Stop	A A A B B Cop Line ning LOS C	7.71 7.3 10.15 10.79 Mor	A A B B Year 2	7.47 7.54 9.89 11.06 040 Total Evel Delay 16.92	A A A B B LOS C
Dell Range Boulevard / Whitney Road Northbound Left Turn + Thru + Right Turn Southbound Left Turn + Thru + Right Turn Eastbound Left Turn Westbound Left Turn Beckle Road / Whitney Road Northbound Left Turn Southbound Left Turn Eastbound Left Turn Westbound Left Turn + Thru + Right Turn Westbound Left Turn + Thru + Right Turn Roundsboutt Dell Range Boulevard / Whitney Road Northbound Approach	7.53 15 12.59 7.66 7.42 7.28 9.55	A A B B A A A A A A C C C C C C C C C C	7.79 8.19 21.11 13.28 7.64 7.91 7.48 9.19 sting Eve	A A A A A A A A A A A A A A A A A A A	7.71 7.3 10.15 10.79 Year 2' Mor	tersection will be : A A B B B O40 - All Movementing LOS A A	7.47 7.54 9.89 11.06 Ints Stop at the Stop	cenario. A A A B cop Line ning Los C C	7.71 7.3 10.15 10.79 Mor Delay 9.7 5.88	A A B B Vear 2	7.47 7.54 9.89 11.06 040 Total Evel Delay 16.92 23.27	A A A B LOS C C

Table 2. Deceleration Lane Lengths - All Approaches Stop at the Stop Line

Intersection	Movement ¹	Peak Hou	ır Volume		ntile Queue gth (ft)	Storage (ft) ⁶	Decel Length	Taper (ft) ⁷	Total (ft)
morocomon	Movement	AM	PM	AM	РМ	Otorage (it)	(ft)	raper (it)	10141 (11)
	Northbound Left Turn	61	41	45	33	50	375	156	425
	Southbound Left Turn	5	23	4	18	50	375	156	425
	Southbound Through			27	70				
	Southbound Right Turn	412	368	382	328	382	375	156	757
US 30 ^{2, 3}	Eastbound Left Turn	182	472	78	222	222	435	156	657
08 30 2,3	Eastbound Through			27	93				
	Eastbound Right Turn	41	89	1	26	50	435	156	485
	Westbound Left Turn	4	40	2	23	50	435	156	485
	Westbound Through			190	53				
	Westbound Right Turn	44	5	19	2	50	435	156	485
	Northbound Left Turn	106	125	85	82	85	375	156	460
	Southbound Left Turn	66	81	48	52	50	275	120	325
	Southbound Through			515	305				
Dell Range	Southbound Right Turn	106	59	83	39	83	275	120	358
Boulevard 4, 5	Eastbound Left Turn	15	83	9	65	65	435	156	500
	Eastbound Right Turn	59	146	24	80	80	435	156	515
	Westbound Left Turn	5	4	3	3	50	435	156	485
	Westbound Right Turn	41	99	17	52	50	435	156	485

Notes.

- 1. A stop condition is assumed on all approaches.
- 2. US 30 is classified as a principal arterial with a 50 MPH design speed.
- 3. Whitney Road is classified as a minor arterial north and south of US 30 with a 45 MPH design speed.
- 4. Dell Range Boulevard is classified as a principal arterial with a 50 MPH design speed.
- 5. Whitney Road is classified as a minor arterial south of Dell Range Boulevard with a 45 MPH design speed. North of Dell Range Boulevard, Whitney Road is classified as a major collector with a 35 MPH design speed.
- 6. The storage length is based on the 95th percentile queue length.
- 7. The taper lengths are based on a 12' wide turn lane. The taper length is included in the deceleration length.

Table 3. Deceleration Lane Lengths - SBRT at US 30 Does Not Stop

Intersection	Movement ¹	Peak Hou	ır Volume		ntile Queue th (ft)	Storage (ft) ⁶	Decel Length	Taper (ft) ⁷	Total (ft)
mersection	Movement	AM	РМ	АМ	РМ	Storage (II)	(ft)	raper (II)	Total (It)
	Northbound Left Turn	61	41	62	42	62	375	156	437
	Southbound Left Turn	5	23	5	23	50	375	156	425
	Southbound Through			36	90				
	Southbound Right Turn	412	368	0	0	0	375	156	375
	Westbound Accel Lane						760	156	760
US 30 ^{2, 3}	Eastbound Left Turn	182	472	28	104	104	435	156	539
	Eastbound Through			9	40				
	Eastbound Right Turn	41	89	1	12	50	435	156	485
	Westbound Left Turn	4	40	1	14	50	435	156	485
	Westbound Through			95	31				
	Westbound Right Turn	44	5	10	1	50	435	156	485
	Northbound Left Turn	106	125	85	82	85	375	156	460
	Southbound Left Turn	66	81	48	52	50	275	120	325
	Southbound Through			515	305				
Dell Range	Southbound Right Turn	106	59	83	39	83	275	120	358
Boulevard 4, 5	Eastbound Left Turn	15	83	9	65	65	435	156	500
	Eastbound Right Turn	59	146	24	80	80	435	156	515
	Westbound Left Turn	5	4	3	3	50	435	156	485
	Westbound Right Turn	41	99	17	52	50	435	156	485

Notes.

- 1. A stop condition is assumed on all approaches.
- 2. US 30 is classified as a principal arterial with a 50 MPH design speed.
- 3. Whitney Road is classified as a minor arterial north and south of US 30 with a 45 MPH design speed.
- 4. Dell Range Boulevard is classified as a principal arterial with a 50 MPH design speed.
- 5. Whitney Road is classified as a minor arterial south of Dell Range Boulevard with a 45 MPH design speed. North of Dell Range Boulevard, Whitney Road is classified as a major collector with a 35 MPH design speed.
- 6. The storage length is based on the 95th percentile queue length.
- 7. The taper lengths are based on a 12' wide turn lane. The taper length is included in the deceleration and acceleration lengths.

Version 7.00-06

Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

Control Type: Roundabout Delay (sec / veh): 14.0 Analysis Method: **HCM 6th Edition** Level Of Service: В Analysis Period: 1 hour

Intersection Setup

Name	W	hitney Ro	ad	W	Whitney Road			ange Bou	levard	Dell Range Boulevard		
Approach	١	Northboun	d	S	outhboun	d	ı	Eastbound	d	Westbound		
Lane Configuration		+			+			+		+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]	0.00			0.00				0.00		0.00		
Crosswalk		Yes			Yes			Yes		Yes		

Volumes

Name	W	Whitney Road			hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard		
Base Volume Input [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	30	46	2	18	105	26	19	61	20	7	125	10
Total Analysis Volume [veh/h]	120	185	10	71	418	103	76	245	78	27	500	39
Pedestrian Volume [ped/h]		0			0			0			0	

Version 7.00-06

Intersection Settings

Number of Conflicting Circulating Lanes	1				1			1				
Circulating Flow Rate [veh/h]		367			607			485				
Exiting Flow Rate [veh/h]		492			282			678		305		
Demand Flow Rate [veh/h]	110	170	9	65	385	95	70	225	72	25	460	36
Adjusted Demand Flow Rate [veh/h]	110	170	9	65	385	95	70	225	72	25	460	36

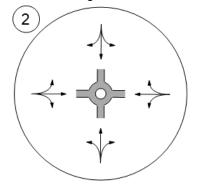
Lanes

Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	295	556	375	532
Capacity of Entry and Bypass Lanes [veh/h]	949	744	842	959
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	931	729	826	941
X, volume / capacity	0.31	0.75	0.44	0.55

Movement, Approach, & Intersection Results

Lane LOS	Α	С	В	В
95th-Percentile Queue Length [veh]	1.35	8.18	2.38	3.67
95th-Percentile Queue Length [ft]	33.66	204.51	59.43	91.65
Approach Delay [s/veh]	7.16	22.91	10.06	11.33
Approach LOS	Α	С	В	В
Intersection Delay [s/veh]		14	.03	
Intersection LOS		E	3	

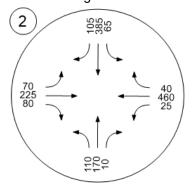






Report Figure 1f: Traffic Volume - Future Total Volume





Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

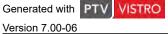
Control Type:RoundaboutDelay (sec / veh):13.3Analysis Method:HCM 6th EditionLevel Of Service:BAnalysis Period:1 hour

Intersection Setup

Name	W	hitney Ro	ad	W	Whitney Road			ange Bou	levard	Dell Range Boulevard		
Approach	١	lorthboun	d	S	Southbound			Eastbound	d	Westbound		
Lane Configuration		46		+				44		+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00			30.00	
Grade [%]	0.00			0.00				0.00		0.00		
Crosswalk		Yes		Yes				Yes		Yes		

Volumes

Name	Whitney Road			W	Whitney Road			ange Bou	levard	Dell R	levard	
Base Volume Input [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	30	46	2	18	105	26	19	61	20	7	125	10
Total Analysis Volume [veh/h]	120	185	10	71	418	103	76	245	78	27	500	39
Pedestrian Volume [ped/h]	·	0			0			0			0	



Intersection Settings

Number of Conflicting Circulating Lanes	1				1			1				
Circulating Flow Rate [veh/h]		367			607			485				
Exiting Flow Rate [veh/h]		492			282			678		305		
Demand Flow Rate [veh/h]	110	170	9	65	385	95	70	225	72	25	460	36
Adjusted Demand Flow Rate [veh/h]	110	170	9	65	385	95	70	225	72	25	460	36

Lanes

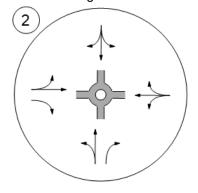
Overwrite Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1420.00	1420.00	1380.00	1420.00	1420.00	1380.00
B (coefficient)	0.00091	0.00091	0.00102	0.00091	0.00091	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	286	10	556	301	74	532
Capacity of Entry and Bypass Lanes [veh/h	1017	1017	744	914	914	959
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	997	997	729	896	896	941
X, volume / capacity	0.28	0.01	0.75	0.33	0.08	0.55

Movement, Approach, & Intersection Results

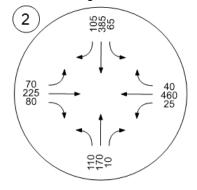
Lane LOS	Α	Α	С	Α	Α	В
95th-Percentile Queue Length [veh]	1.17	0.03	8.18	1.47	0.26	3.67
95th-Percentile Queue Length [ft]	29.21	0.68	204.51	36.65	6.55	91.65
Approach Delay [s/veh]	6.3	34	22.91	7.0	07	11.33
Approach LOS	ļ.	4	С	A	4	В
Intersection Delay [s/veh]			13	.25		
Intersection LOS			[3		

Report Figure 0: Lane Configuration and Traffic Control



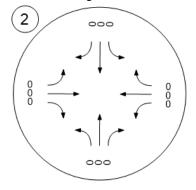


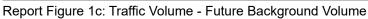




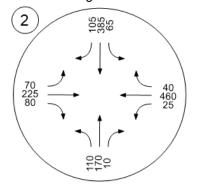
Report Figure 1b: Traffic Volume - In-Process Volume



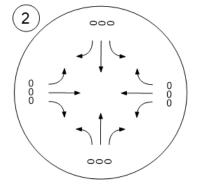




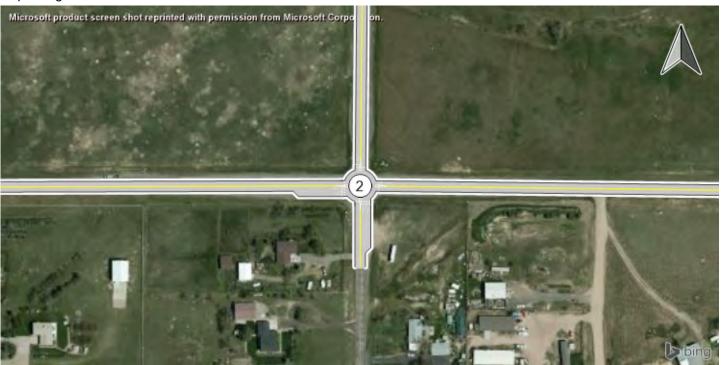


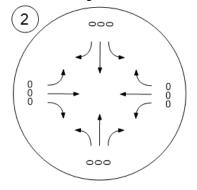






Report Figure 1e: Traffic Volume - Other Volume

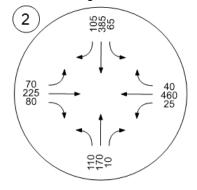






Report Figure 1f: Traffic Volume - Future Total Volume





Version 7.00-06

Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

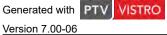
Control Type: Roundabout Delay (sec / veh): 9.9 Analysis Method: **HCM 6th Edition** Level Of Service: Α Analysis Period: 1 hour

Intersection Setup

Name	W	hitney Ro	ad	W	Whitney Road			ange Bou	levard	Dell Range Boulevard			
Approach	١	lorthboun	d	S	Southbound			Eastbound	d	V	Westbound		
Lane Configuration		+			46			44		+			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0	1	0	0	1	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00			30.00		30.00			
Grade [%]		0.00			0.00			0.00		0.00			
Crosswalk		Yes		Yes				Yes		Yes			

Volumes

Name	Whitney Road			W	Whitney Road			ange Bou	levard	Dell R	levard	
Base Volume Input [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	30	46	2	18	105	26	19	61	20	7	125	10
Total Analysis Volume [veh/h]	120	185	10	71	418	103	76	245	78	27	500	39
Pedestrian Volume [ped/h]	·	0			0			0			0	



Intersection Settings

Number of Conflicting Circulating Lanes	1				1			1			1			
Circulating Flow Rate [veh/h]		367			607			485			357			
Exiting Flow Rate [veh/h]		492		492			282		678			305		
Demand Flow Rate [veh/h]	110	110 170 9		65	385	95	70	225	72	25	460	36		
Adjusted Demand Flow Rate [veh/h]	110	170	9	65	385	95	70	225	72	25	460	36		

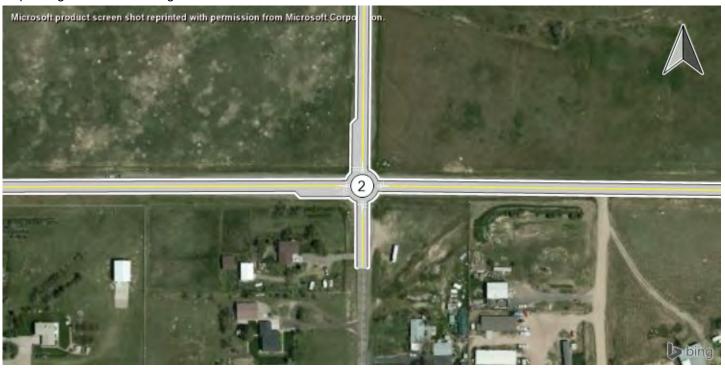
Lanes

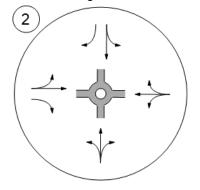
Overwrite Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1420.00	1420.00	1420.00	1420.00	1380.00
B (coefficient)	0.00102	0.00091	0.00091	0.00091	0.00091	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	295	460	97	301	74	532
Capacity of Entry and Bypass Lanes [veh/h	949	818	818	914	914	959
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	931	802	802	896	896	941
X, volume / capacity	0.31	0.56	0.12	0.33	0.08	0.55

Movement, Approach, & Intersection Results

Lane LOS	Α	В	Α	Α	Α	В				
95th-Percentile Queue Length [veh]	1.35	3.76	0.40	1.47	0.26	3.67				
95th-Percentile Queue Length [ft]	33.66	94.04	10.08	36.65	6.55	91.65				
Approach Delay [s/veh]	7.16	74	7.0)7	11.33					
Approach LOS	A B A									
Intersection Delay [s/veh]	9.85									
Intersection LOS	A									

Report Figure 0: Lane Configuration and Traffic Control

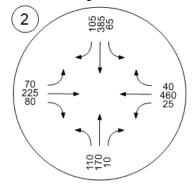






Report Figure 1f: Traffic Volume - Future Total Volume





Version 7.00-06

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

Control Type: Signalized Delay (sec / veh): 29.3 Analysis Method: HCM 6th Edition Level Of Service: С Analysis Period: 1 hour Volume to Capacity (v/c): 0.565

Intersection Setup

Name	Whitney Road			w	hitney Ro	ad	Dell R	ange Bou	levard	Dell R	12.00 12.00 12.00	
Approach	١	Northbound			outhboun	d	E	Eastbound	ł	V	Vestbound	d
Lane Configuration	٦ŀ				٦١٢			٦١٢		nir		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00		12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]	0.00				0.00		0.00			0.00		
Curb Present	No				No			No			No	
Crosswalk		No			No			No			No	

Volumes

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell R	ange Bou	levard
Base Volume Input [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	170	10	65	385	105	70	225	80	25	460	40
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	30	46	2	18	105	26	19	61	20	7	125	10
Total Analysis Volume [veh/h]	120	185	10	71	418	103	76	245	78	27	500	39
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing)	0			0			0			0	
v_di, Inbound Pedestrian Volume crossing r	n	0			0			0			0	
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing n	i 0			0			0					
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Version 7.00-06

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	10	30	0	10	30	0	10	60	0	10	60	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	9	35	0	11	37	0	10	19	0	35	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	40.0	40.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



Lane Group Calculations

Lane Group	L	С	L	С	R	L	С	R	L	С	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	36	28	36	28	28	56	49	49	56	47	47
g / C, Green / Cycle	0.36	0.28	0.36	0.28	0.28	0.56	0.49	0.49	0.56	0.47	0.47
(v / s)_i Volume / Saturation Flow Rate	0.10	0.11	0.05	0.24	0.07	0.07	0.14	0.05	0.02	0.29	0.03
s, saturation flow rate [veh/h]	1147	1561	1289	1575	1339	1037	1575	1339	1208	1575	1339
c, Capacity [veh/h]	207	438	378	435	370	394	772	656	589	744	633
d1, Uniform Delay [s]	39.96	29.23	29.49	34.69	28.21	25.40	15.16	13.73	15.58	19.65	14.30
k, delay calibration	0.11	0.11	0.11	0.19	0.11	0.50	0.11	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.12	0.61	0.21	11.28	0.36	0.99	0.21	0.34	0.14	3.89	0.17
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.53	0.41	0.17	0.89	0.26	0.18	0.29	0.11	0.04	0.62	0.06
d, Delay for Lane Group [s/veh]	42.08	29.85	29.71	45.97	28.57	26.39	15.36	14.07	15.72	23.54	14.47
Lane Group LOS	D	С	С	D	С	С	В	В	В	С	В
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	1.88	3.54	1.03	10.14	1.80	0.80	3.00	0.92	0.26	8.44	0.47
50th-Percentile Queue Length [ft/ln]	46.94	88.43	25.68	253.58	44.98	20.05	75.01	22.96	6.56	211.06	11.63
95th-Percentile Queue Length [veh/ln]	3.38	6.37	1.85	15.37	3.24	1.44	5.40	1.65	0.47	13.21	0.84
95th-Percentile Queue Length [ft/ln]	84.49	159.17	46.23	384.16	80.97	36.09	135.01	41.33	11.81	330.19	20.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	42.08	29.85	29.85	29.71	45.97	28.57	26.39	15.36	14.07	15.72	23.54	14.47	
Movement LOS	D	С	С	С	D	С	С	В	В	В	С	В	
d_A, Approach Delay [s/veh]		34.50 41.00						17.21			22.54		
Approach LOS	С				D			В			С		
d_I, Intersection Delay [s/veh]						29	.25						
Intersection LOS		С											
Intersection V/C		0.565											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft²/ped	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersection	n 0.000	0.000	0.000	0.000
Crosswalk LOS	F	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h	[620	660	300	800
d_b, Bicycle Delay [s]	23.81	22.45	36.13	18.00
I_b,int, Bicycle LOS Score for Intersection	2.036	2.459	2.165	2.419
Bicycle LOS	В	В	В	В

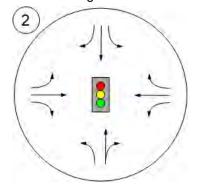
Sequence

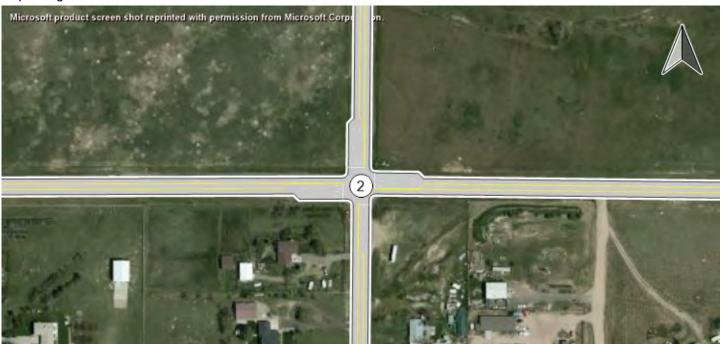
Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

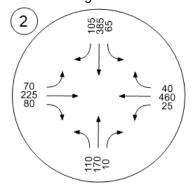


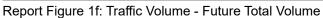




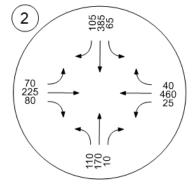












Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

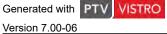
Control Type:RoundaboutDelay (sec / veh):28.7Analysis Method:HCM 6th EditionLevel Of Service:DAnalysis Period:1 hour

Intersection Setup

Name	w	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard		
Approach	١	lorthboun	d	S	Southboun	d	E	Eastbound	d	Westbound		
Lane Configuration		+			+			+		+		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]		0.00			0.00			0.00		0.00		
Crosswalk		Yes			Yes			Yes		Yes		

Volumes

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard		
Base Volume Input [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	34	125	2	22	94	15	27	136	35	4	82	24
Total Analysis Volume [veh/h]	136	500	10	87	375	59	109	543	142	16	326	98
Pedestrian Volume [ped/h]	olume [ped/h] 0			0			0			0		



Intersection Settings

Number of Conflicting Circulating Lanes		1			1			1				
Circulating Flow Rate [veh/h]		694			449			449			699	
Exiting Flow Rate [veh/h]		501		663			489			601		
Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90
Adjusted Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90

Lanes

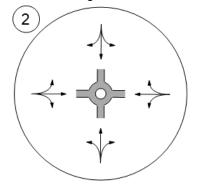
Overwrite Calculated Critical Headway	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1380.00	1380.00	1380.00
B (coefficient)	0.00102	0.00102	0.00102	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	606	489	746	414
Capacity of Entry and Bypass Lanes [veh/h	681	874	874	677
Pedestrian Impedance	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	667	856	856	664
X, volume / capacity	0.89	0.56	0.85	0.61

Movement, Approach, & Intersection Results

Lane LOS	Е	В	D	С
95th-Percentile Queue Length [veh]	16.75	3.74	14.28	4.54
95th-Percentile Queue Length [ft]	418.87	93.44	357.04	113.56
Approach Delay [s/veh]	46.89	12.31	31.12	16.88
Approach LOS	E	В	D	С
Intersection Delay [s/veh]		28	.67	
Intersection LOS		[)	

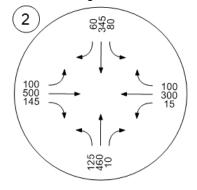






Report Figure 1f: Traffic Volume - Future Total Volume





Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

Control Type:RoundaboutDelay (sec / veh):16.9Analysis Method:HCM 6th EditionLevel Of Service:CAnalysis Period:1 hour

Intersection Setup

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard			
Approach	١	Northboun	d	S	outhboun	d	ı	Eastbound	l	Westbound			
Lane Configuration		4r			+			4		+			
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	1	0	0	0	0	0	1	0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Speed [mph]		30.00			30.00		30.00			30.00			
Grade [%]		0.00			0.00			0.00			0.00		
Crosswalk		Yes			Yes			Yes		Yes			

Volumes

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard		
Base Volume Input [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	34	125	2	22	94	15	27	136	35	4	82	24
Total Analysis Volume [veh/h]	136	500	10	87	375	59	109	543	142	16	326	98
Pedestrian Volume [ped/h]	olume [ped/h] 0			0			0			0		

Intersection Settings

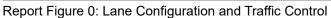
Number of Conflicting Circulating Lanes		1			1			1					
Circulating Flow Rate [veh/h]		694			449			449			699		
Exiting Flow Rate [veh/h]		501			663			489			601		
Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90	
Adjusted Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90	

Lanes

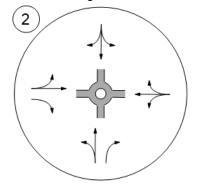
Overwrite Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1420.00	1420.00	1380.00	1420.00	1420.00	1380.00
B (coefficient)	0.00091	0.00091	0.00102	0.00091	0.00091	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	597	10	489	612	134	414
Capacity of Entry and Bypass Lanes [veh/h	756	756	874	944	944	677
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	741	741	856	926	926	664
X, volume / capacity	0.79	0.01	0.56	0.65	0.14	0.61

Movement, Approach, & Intersection Results

Lane LOS	D	Α	В	В	Α	С		
95th-Percentile Queue Length [veh]	10.00	0.04	3.74	5.36	0.49	4.54		
95th-Percentile Queue Length [ft]	249.90	0.92	93.44	133.89	12.35	113.56		
Approach Delay [s/veh]	25.	.96	12.31	12.	62	16.88		
Approach LOS	[)	В	E	3	С		
Intersection Delay [s/veh]								
Intersection LOS	С							

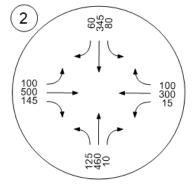




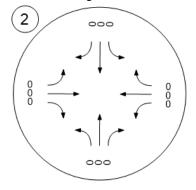


Report Figure 1a: Traffic Volume - Base Volume





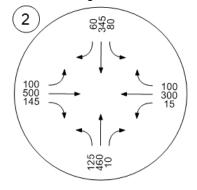






Report Figure 1c: Traffic Volume - Future Background Volume

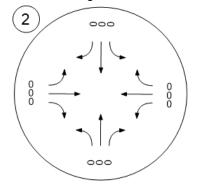






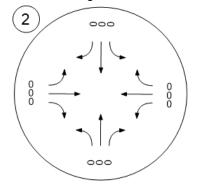
Report Figure 1d: Traffic Volume - Net New Site Trips



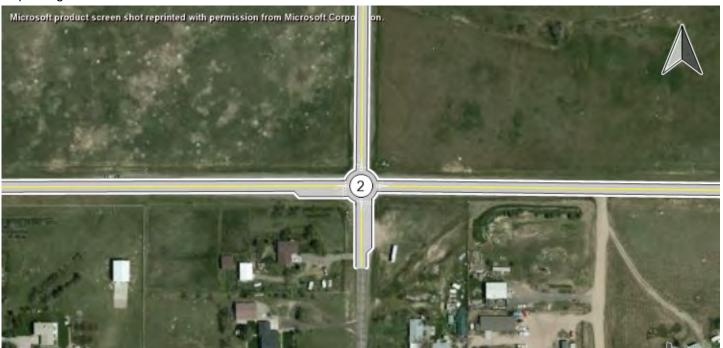




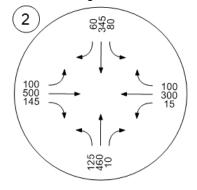




Report Figure 1f: Traffic Volume - Future Total Volume



Dell Range Boulevard



Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

Control Type:RoundaboutDelay (sec / veh):21.8Analysis Method:HCM 6th EditionLevel Of Service:CAnalysis Period:1 hour

Intersection Setup

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard			
Approach	١	lorthboun	d	S	outhboun	d	E	Eastbound	d	Westbound			
Lane Configuration		off Thru Right			46			46		+			
Turning Movement	Left	eft Thru Right			Thru	Right	Left	Thru	Right	Left	Thru	Right	
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Pocket	0	0	0	0	0 0 1		0 0 1			0	0	0	
Pocket Length [ft]	100.00	100.00	100.00	100.00 100.00 100.00			100.00 100.00 100.00			100.00	100.00	100.00	
Speed [mph]		30.00			30.00			30.00		30.00			
Grade [%]		0.00			0.00			0.00		0.00			
Crosswalk		Yes			Yes			Yes		Yes			

Volumes

Name	W	hitney Ro	ad	w	hitney Ro	ad	Dell R	ange Bou	levard	Dell R	ange Bou	levard
Base Volume Input [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	34	125	2	22	94	15	27	136	35	4	82	24
Total Analysis Volume [veh/h]	136	500	10	87	375	59	109	543	142	16	326	98
Pedestrian Volume [ped/h]	·	0			0			0		·	0	

Intersection Settings

Number of Conflicting Circulating Lanes		1			1			1				
Circulating Flow Rate [veh/h]		694			449			449				
Exiting Flow Rate [veh/h]		501			663			489		601		
Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90
Adjusted Demand Flow Rate [veh/h]	125	460	9	80	345	54	100	500	131	15	300	90

Lanes

Overwrite Calculated Critical Headway	No	No	No	No	No	No
User-Defined Critical Headway [s]	4.00	4.00	4.00	4.00	4.00	4.00
Overwrite Calculated Follow-Up Time	No	No	No	No	No	No
User-Defined Follow-Up Time [s]	3.00	3.00	3.00	3.00	3.00	3.00
A (intercept)	1380.00	1420.00	1420.00	1420.00	1420.00	1380.00
B (coefficient)	0.00102	0.00091	0.00091	0.00091	0.00091	0.00102
HV Adjustment Factor	0.98	0.98	0.98	0.98	0.98	0.98
Entry Flow Rate [veh/h]	606	434	56	612	134	414
Capacity of Entry and Bypass Lanes [veh/h	681	944	944	944	944	677
Pedestrian Impedance	1.00	1.00	1.00	1.00	1.00	1.00
Capacity per Entry Lane [veh/h]	667	926	926	926	926	664
X, volume / capacity	0.89	0.46	0.06	0.65	0.14	0.61

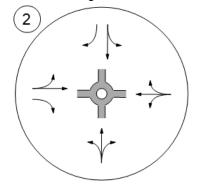
Movement, Approach, & Intersection Results

Lane LOS	Е	Α	Α	В	Α	С
95th-Percentile Queue Length [veh]	16.75	2.52	0.19	5.36	0.49	4.54
95th-Percentile Queue Length [ft]	418.87	63.07	4.65	133.89	12.35	113.56
Approach Delay [s/veh]	46.89	8.	91	12.	62	16.88
Approach LOS	Е	,	4	E	3	С
Intersection Delay [s/veh]			21	.81		
Intersection LOS			(<u> </u>		_

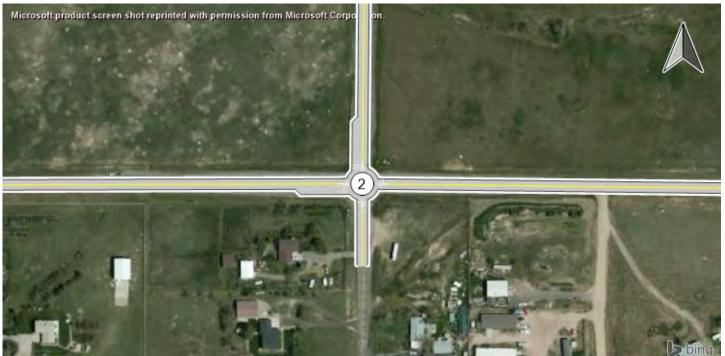
Report Figure 0: Lane Configuration and Traffic Control



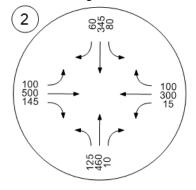
Dell Range Boulevard



Report Figure 1f: Traffic Volume - Future Total Volume



Dell Range Boulevard



Cheyenne, WY

Intersection Level Of Service Report Intersection 2: Dell Range Boulevard

Control Type:SignalizedDelay (sec / veh):32.3Analysis Method:HCM 6th EditionLevel Of Service:CAnalysis Period:1 hourVolume to Capacity (v/c):0.623

Intersection Setup

Name	W	hitney Ro	ad	w	hitney Ro	ad	Dell R	ange Bou	levard	Dell Range Boulevard		
Approach	١	lorthboun	d	S	outhboun	d	E	Eastbound	I	V	Vestbound	d
Lane Configuration		Left Thru Right			חור			٦١٢		alr		
Turning Movement	Left	- 			Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00 12.00 12.00			12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	125.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]		30.00			30.00			30.00		30.00		
Grade [%]		0.00			0.00			0.00		0.00		
Curb Present		No			No			No		No		
Crosswalk		No		No				No		No		

Volumes

Name	W	hitney Ro	ad	W	hitney Ro	ad	Dell R	ange Bou	levard	Dell R	ange Bou	levard
Base Volume Input [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	125	460	10	80	345	60	100	500	145	15	300	100
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000	1.0000	1.0000	0.9000
Total 15-Minute Volume [veh/h]	34	125	2	22	94	15	27	136	35	4	82	24
Total Analysis Volume [veh/h]	136	500	10	87	375	59	109	543	142	16	326	98
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing)	0			0			0			0	
v_di, Inbound Pedestrian Volume crossing r	n	0			0			0			0	
v_co, Outbound Pedestrian Volume crossing)	0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing n	ni	0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0	_		0	_		0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Version 7.00-06

Intersection Settings

Located in CBD	No
Signal Coordination Group	•
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lag	-	-	Lag	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	10	30	0	10	30	0	10	60	0	10	60	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	21	46	0	10	35	0	12	35	0	9	32	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	10	0	0	10	0	0	10	0	0	10	0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
l2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	Yes		No	Yes	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	40.0	40.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0



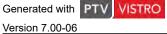
Version 7.00-06

Lane Group Calculations

Lane Group	L	С	L	С	R	L	С	R	L	С	R
C, Cycle Length [s]	100	100	100	100	100	100	100	100	100	100	100
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
I1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	44	35	44	34	34	48	42	42	48	39	39
g / C, Green / Cycle	0.44	0.35	0.44	0.34	0.34	0.48	0.42	0.42	0.48	0.39	0.39
(v / s)_i Volume / Saturation Flow Rate	0.11	0.30	0.08	0.22	0.04	0.09	0.32	0.10	0.02	0.19	0.07
s, saturation flow rate [veh/h]	1161	1569	1061	1575	1339	1173	1575	1339	995	1575	1339
c, Capacity [veh/h]	334	556	229	537	456	436	667	567	267	620	527
d1, Uniform Delay [s]	33.80	29.72	39.50	27.82	22.64	25.25	24.37	18.43	32.68	22.72	19.72
k, delay calibration	0.11	0.36	0.11	0.50	0.11	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.69	12.06	0.92	5.97	0.11	1.23	7.95	0.95	0.40	2.71	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.37	0.84	0.35	0.64	0.12	0.23	0.75	0.23	0.06	0.48	0.17
d, Delay for Lane Group [s/veh]	34.49	41.78	40.42	33.79	22.76	26.48	32.32	19.39	33.08	25.43	20.42
Lane Group LOS	С	D	D	С	С	С	С	В	С	С	С
Critical Lane Group	No	Yes	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	1.80	11.93	1.13	7.70	0.88	1.39	11.09	2.06	0.20	5.64	1.45
50th-Percentile Queue Length [ft/In]	44.89	298.23	28.27	192.38	22.03	34.64	277.34	51.43	5.12	141.03	36.25
95th-Percentile Queue Length [veh/ln]	3.23	17.59	2.04	12.24	1.59	2.49	16.56	3.70	0.37	9.54	2.61
95th-Percentile Queue Length [ft/ln]	80.80	439.84	50.89	306.11	39.65	62.36	413.90	92.57	9.21	238.41	65.25



Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	y for Movement [s/veh] 34.49 41.78 41.78		40.42	33.79	22.76	26.48	32.32	19.39	33.08	25.43	20.42	
Movement LOS	С	D	D	D C C		С	С	В	C C C		С	
d_A, Approach Delay [s/veh]	40.25				33.66			29.20		24.60		
Approach LOS	D C			С			С					
d_I, Intersection Delay [s/veh]	32.29											
Intersection LOS	С											
Intersection V/C	0.623											

Other Modes

g_Walk,mi, Effective Walk Time [s]	0.0	0.0	0.0	0.0	
M_corner, Corner Circulation Area [ft²/ped]	0.00	0.00	0.00	0.00	
M_CW, Crosswalk Circulation Area [ft²/ped	0.00	0.00	0.00	0.00	
d_p, Pedestrian Delay [s]	0.00	0.00	0.00	0.00	
I_p,int, Pedestrian LOS Score for Intersection	n 0.000	0.000	0.000	0.000	
Crosswalk LOS	F	F	F	F	
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000	
c_b, Capacity of the bicycle lane [bicycles/h] 840	620	620	560	
d_b, Bicycle Delay [s]	16.82	23.81	23.81	25.92	
I_b,int, Bicycle LOS Score for Intersection	2.540	2.350	2.766	2.228	
Bicycle LOS	В	В	С	В	

Sequence

	_			_		_											
Ī	Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
I	Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ī	Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ī	Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

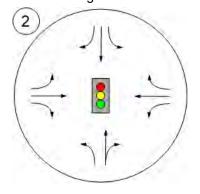




Report Figure 0: Lane Configuration and Traffic Control



Dell Range Boulevard

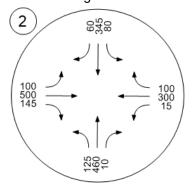




Report Figure 1f: Traffic Volume - Future Total Volume



Dell Range Boulevard





WHITNEY ROAD CORRIDOR PLAN

APPENDIX F: ENVIRONMENTAL

August 2020

APPENDIX F Environmental





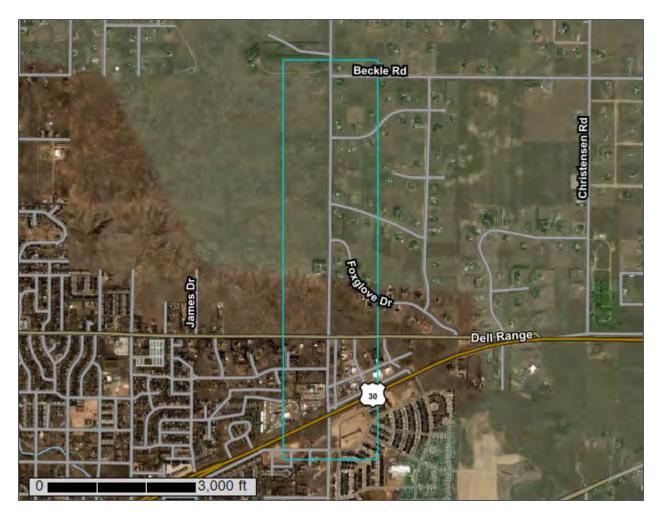


NRCS

Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Laramie County, Wyoming, Western Part

Whitney Road Corridor Study



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2 053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

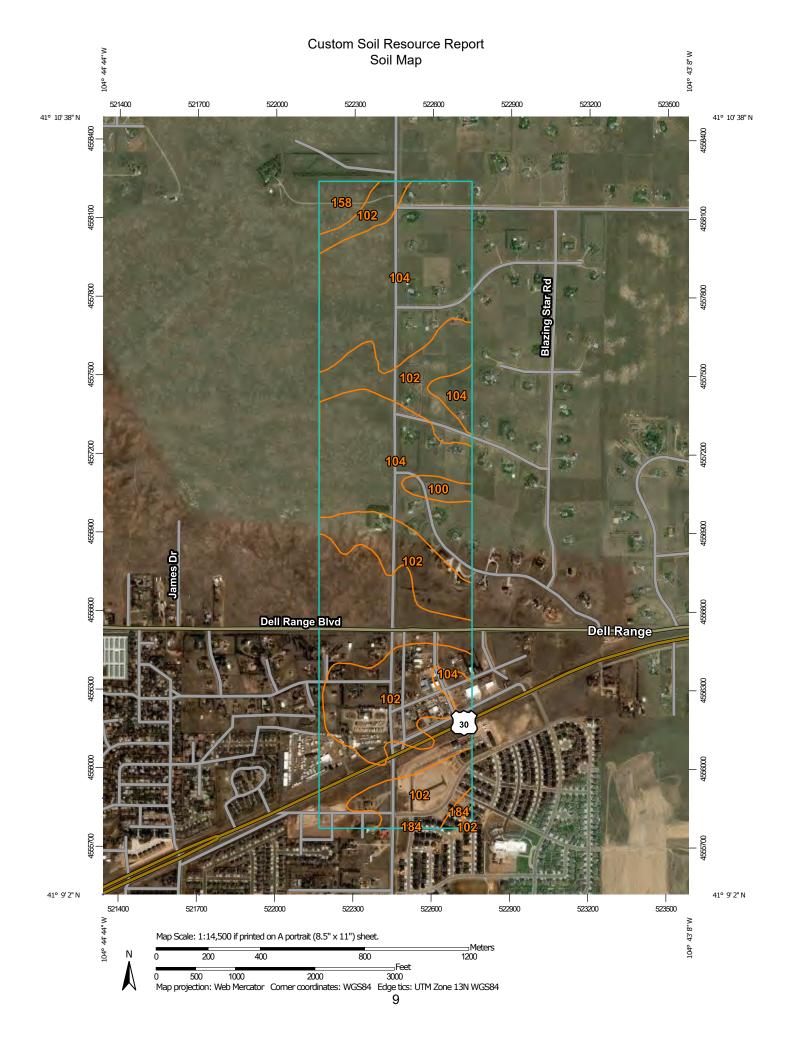
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



MAP LEGEND

Area of Interest (AOI)

Area

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

-

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

(**0**) B

Blowout

 \boxtimes

Borrow Pit

Ж

Clay Spot

 \Diamond

Closed Depression

×

Gravel Pit

00

Gravelly Spot

0

Landfill Lava Flow

٨

Marsh or swamp

衆

Mine or Quarry

0

Miscellaneous Water
Perennial Water

0

Rock Outcrop

+

Saline Spot

. .

Sandy Spot

-

Severely Eroded Spot

Sinkhole

6

Slide or Slip

Ø

Sodic Spot

OLIVE

8

Spoil Area Stony Spot

60

Very Stony Spot

Ø

Wet Spot Other

Δ

Special Line Features

Water Features

~

Streams and Canals

Transportation

Rails

~

Interstate Highways

US Routes

~

Major Roads

~

Local Roads

Background

100

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24.000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Laramie County, Wyoming, Western Part Survey Area Data: Version 11, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 22, 2016—Apr 5, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI		
100	Albinas loam, 0 to 6 percent slopes	5.0	1.4%		
102	Altvan-Dix complex, 6 to 10 percent slopes	123.0	34.2%		
104	Ascalon loam, cool, 0 to 6 percent slopes	221.5	61.6%		
158	Poposhia silt loam, 0 to 6 percent slopes	7.5	2.1%		
184	Urban land-Ascalon complex, 0 to 6 percent slopes	2.2	0.6%		
Totals for Area of Interest	'	359.4	100.0%		

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Laramie County, Wyoming, Western Part

100—Albinas loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 3j4x Elevation: 4,100 to 6,500 feet

Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 115 to 125 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Albinas and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Albinas

Setting

Landform: Alluvial fans, terraces, draws

Down-slope shape: Linear Across-slope shape: Linear Parent material: Loamy alluvium

Typical profile

A - 0 to 3 inches: loam

Bt - 3 to 25 inches: sandy clay loam

Bk - 25 to 60 inches: loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 15 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: LOAMY (15-17SP) (R067XY222WY)

Hydric soil rating: No

Minor Components

Ascalon

Percent of map unit: 10 percent

Ecological site: LOAMY (15-17SP) (R067XY222WY)

Hydric soil rating: No

102—Altvan-Dix complex, 6 to 10 percent slopes

Map Unit Setting

National map unit symbol: 2tlq8 Elevation: 4,800 to 6,330 feet

Mean annual precipitation: 13 to 19 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 115 to 135 days

Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Altvan and similar soils: 60 percent Dix and similar soils: 30 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Altvan

Setting

Landform: Interfluves on alluvial fans

Landform position (two-dimensional): Summit Landform position (three-dimensional): Interfluve

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Parent material: Loamy alluvium over tertiary aged sandy and gravelly alluvium

Typical profile

A - 0 to 9 inches: loam

Bt1 - 9 to 13 inches: sandy clay loam Bt2 - 13 to 25 inches: sandy clay loam Btk - 25 to 28 inches: sandy clay loam 2C - 28 to 80 inches: very gravelly sand

Properties and qualities

Slope: 6 to 8 percent

Depth to restrictive feature: 28 to 34 inches to strongly contrasting textural

stratification

Natural drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.20 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.1 to 2.0

mmhos/cm)

Available water storage in profile: Low (about 3.7 inches)

Interpretive groups

Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: Loamy (Ly) 12-17" PZ (R067AY122WY)

Hydric soil rating: No

Description of Dix

Setting

Landform: Interfluves on alluvial fans

Landform position (two-dimensional): Backslope, shoulder

Landform position (three-dimensional): Side slope, nose slope, crest

Down-slope shape: Convex, linear Across-slope shape: Convex, linear

Parent material: Tertiary aged sandy and gravelly alluvium

Typical profile

A - 0 to 10 inches: very gravelly sandy loam C1 - 10 to 28 inches: very gravelly coarse sand C2 - 28 to 80 inches: very gravelly coarse sand

Properties and qualities

Slope: 6 to 10 percent

Depth to restrictive feature: More than 80 inches Natural drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 1 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.1 to 2.0

mmhos/cm)

Available water storage in profile: Very low (about 1.9 inches)

Interpretive groups

Land capability classification (irrigated): 7s Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: Gravelly (Gr) 12-17" Precipitation Zone (R067AY112WY)

Hydric soil rating: No

Minor Components

Wages

Percent of map unit: 10 percent

Landform: Interfluves

Landform position (two-dimensional): Summit Landform position (three-dimensional): Interfluve

Down-slope shape: Linear Across-slope shape: Linear

Ecological site: Loamy (Ly) 12-17" PZ (R067AY122WY)

Hydric soil rating: No

104—Ascalon loam, cool, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2tlp8 Elevation: 5,400 to 6,550 feet

Mean annual precipitation: 13 to 19 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 115 to 135 days

Farmland classification: Farmland of statewide importance, if irrigated

Map Unit Composition

Ascalon, cool, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon, Cool

Setting

Landform: Interfluves

Landform position (two-dimensional): Summit Landform position (three-dimensional): Interfluve

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Wind-reworked sandy alluvium

Typical profile

Ap - 0 to 6 inches: loam

Bt1 - 6 to 12 inches: sandy clay loam Bt2 - 12 to 19 inches: sandy clay loam Bk - 19 to 35 inches: sandy clay loam

C - 35 to 80 inches: loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 to 6.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.1 to 2.0

mmhos/cm)

Sodium adsorption ratio, maximum in profile: 1.0

Available water storage in profile: Moderate (about 8.2 inches)

Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B

Ecological site: Loamy (Ly) 12-17" PZ (R067AY122WY)

Hydric soil rating: No

Minor Components

Altvan

Percent of map unit: 8 percent

Landform: Interfluves

Landform position (two-dimensional): Summit Landform position (three-dimensional): Interfluve

Down-slope shape: Linear Across-slope shape: Linear

Ecological site: Loamy (Ly) 12-17" PZ (R067AY122WY)

Hydric soil rating: No

Wages

Percent of map unit: 7 percent

Landform: Interfluves

Landform position (two-dimensional): Summit Landform position (three-dimensional): Interfluve

Down-slope shape: Linear Across-slope shape: Linear

Ecological site: Loamy (Ly) 12-17" PZ (R067AY122WY)

Hydric soil rating: No

158—Poposhia silt loam, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 3j6s Elevation: 6,500 to 7,500 feet

Mean annual precipitation: 15 to 17 inches
Mean annual air temperature: 41 to 45 degrees F

Frost-free period: 90 to 115 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Poposhia and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poposhia

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear

Parent material: Silty alluvium derived from sandstone and shale

Typical profile

A - 0 to 6 inches: silt loam
Bk - 6 to 60 inches: silt loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: B

Ecological site: LOAMY (15-17SP) (R067XY222WY)

Hydric soil rating: No

Minor Components

Piezon

Percent of map unit: 8 percent

Ecological site: LOAMY (15-17SP) (R067XY222WY)

Hydric soil rating: No

Blazon

Percent of map unit: 7 percent

Landform: Hills

Landform position (two-dimensional): Summit, shoulder

Hydric soil rating: No

184—Urban land-Ascalon complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 3j7m Elevation: 5,000 to 6,500 feet

Mean annual precipitation: 15 to 17 inches Mean annual air temperature: 45 to 48 degrees F

Frost-free period: 115 to 125 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 65 percent

Ascalon and similar soils: 25 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Alluvial fans, fan remnants

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Alluvium derived from sandstone

Typical profile

H1 - 0 to 8 inches: loam

H2 - 8 to 24 inches: sandy clay loam

H3 - 24 to 60 inches: loam

Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to

high (0.60 to 2.00 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum in profile: 10 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0

mmhos/cm)

Available water storage in profile: High (about 10.3 inches)

Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: B Hydric soil rating: No

Minor Components

Altvan

Percent of map unit: 5 percent

Hydric soil rating: No

Wages

Percent of map unit: 5 percent

Hydric soil rating: No

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IPaC Information for Planning and Consultation u.s. Fish & Wildlife Service

Last login June 05, 2019 03:42 PM MDT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Whitney Road Corridor

LOCATION

Laramie County, Wyoming



DESCRIPTION

Future

reconstruction of existing roadway and potential realignment north of Dell Range Blvd.

Local office

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NOT FOR CONSULTATION

Wyoming Ecological Services Field Office

(307) 772-2374

(307) 772-2358

5353 Yellowstone Road, Suite 308a Cheyenne, WY 82009-4178

http://www.fws.gov/wyominges/

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Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Log in to IPaC.
- 2. Go to your My Projects list.
- 3. Click PROJECT HOME for this project.
- 4. Click REQUEST SPECIES LIST.

Listed species

¹ and their critical habitats are managed by the <u>Ecological Services Program</u> of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact <u>NOAA Fisheries</u> for <u>species under their jurisdiction</u>.

- Species listed under the <u>Endangered Species Act</u> are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the <u>listing status page</u> for more information.
- 2. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

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Mammals

NAME STATUS

Preble's Meadow Jumping Mouse Zapus hudsonius preblei

There is **final** critical habitat for this species. Your location is outside the critical habitat.

https://ecos.fws.gov/ecp/species/4090

Threatened

Birds

NAME STATUS

Least Tern Sterna antillarum

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/8505

Endangered

Piping Plover Charadrius melodus

There is **final** critical habitat for this species. Your location is outside the critical habitat.

https://ecos.fws.gov/ecp/species/6039

Threatened

Whooping Crane Grus americana

There is **final** critical habitat for this species. Your location is outside the critical habitat.

https://ecos.fws.gov/ecp/species/758

Endangered

Fishes

NAME STATUS

Pallid Sturgeon Scaphirhynchus albus

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/7162

Endangered

Flowering Plants

NAME STATUS

Colorado Butterfly Plant Gaura neomexicana var. coloradensis

There is **final** critical habitat for this species. Your location is outside the critical habitat.

https://ecos.fws.gov/ecp/species/6110

Threatened

Ute Ladies'-tresses Spiranthes diluvialis

No critical habitat has been designated for this species.

https://ecos.fws.gov/ecp/species/2159

Threatened

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Western Prairie Fringed Orchid Platanthera praeclara No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669 **Threatened**

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act

¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described <u>below</u>.

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds
 http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the <u>USFWS Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ <u>below</u>. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the <u>E-bird data mapping tool</u> (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found <u>below</u>.

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For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

https://ecos.fws.gov/ecp/species/1626

Burrowing Owl Athene cunicularia

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737

Cassin's Sparrow Aimophila cassinii

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9512

Chestnut-collared Longspur Calcarius ornatus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680

Lark Bunting Calamospiza melanocorys

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Oct 15 to Jul 31

Breeds Mar 15 to Aug 31

Breeds Aug 1 to Oct 10

Breeds May 1 to Aug 10

Breeds Jan 1 to Aug 31

Breeds May 10 to Aug 15

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Lesser Yellowlegs Tringa flavipes

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9679

Long-billed Curlew Numenius americanus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/5511

Mccown's Longspur Calcarius mccownii

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9292

Semipalmated Sandpiper Calidris pusilla

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Whimbrel Numenius phaeopus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Willow Flycatcher Empidonax traillii

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

https://ecos.fws.gov/ecp/species/3482

Breeds Apr 1 to Jul 31

Breeds elsewhere

Breeds May 1 to Aug 15

Breeds elsewhere

Breeds elsewhere

Breeds Apr 20 to Aug 5

Breeds May 20 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

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How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.

- 2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
- 3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ()

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (I)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

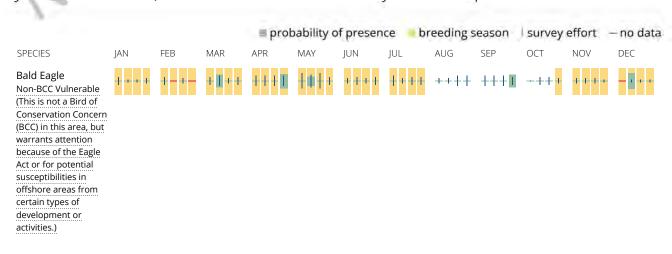
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

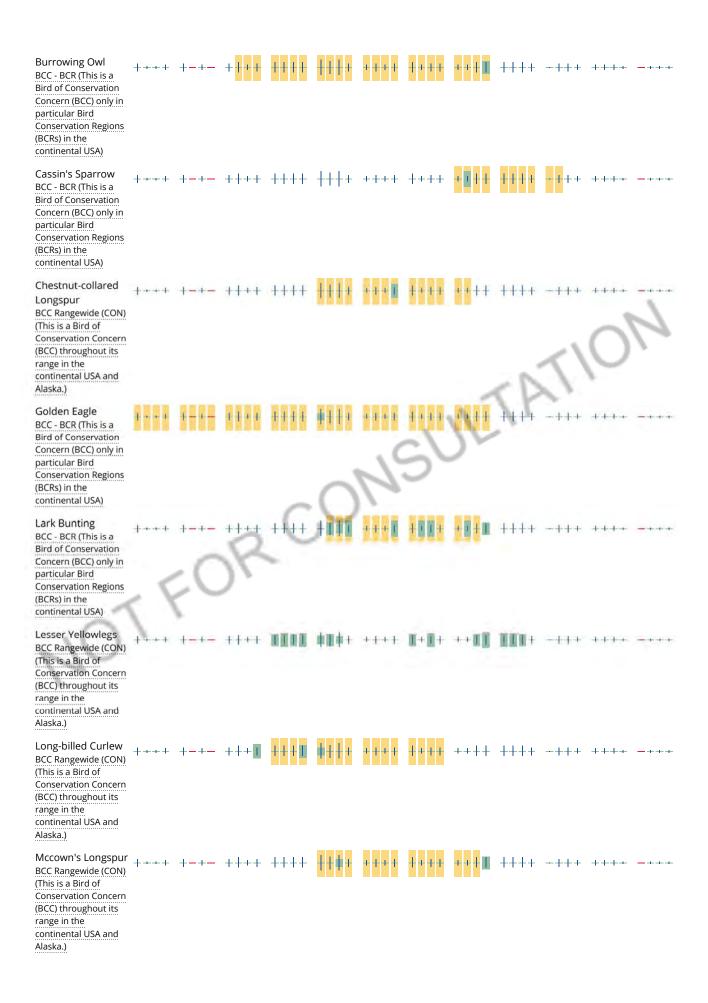
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

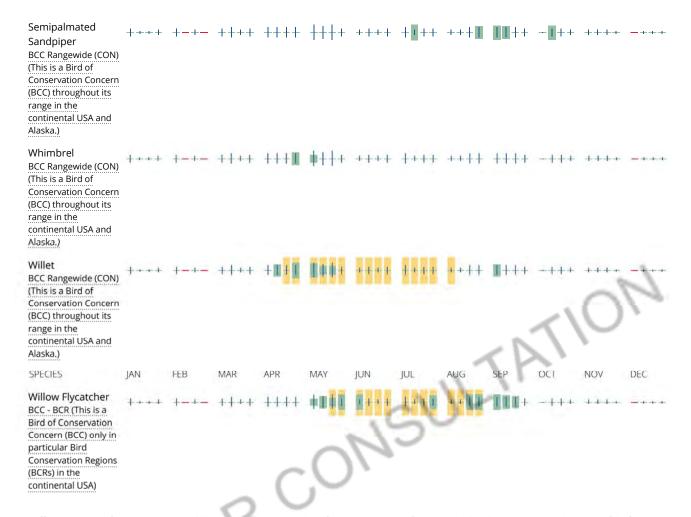
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern (BCC)</u> and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the <u>AKN Phenology Tool</u>.

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What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- 3. "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the <u>Eagle Act</u> requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the <u>Northeast Ocean Data Portal</u>. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the <u>NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.</u>

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

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The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers</u> <u>District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

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FRESHWATER EMERGENT WETLAND

PEM1A

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Wyoming Ecological Services Field Office 5353 Yellowstone Road, Suite 308a Cheyenne, WY 82009-4178 Phone: (307) 772-2374 Fax: (307) 772-2358

http://www.fws.gov/wyominges/



In Reply Refer To: June 05, 2019

Consultation Code: 06E13000-2019-SLI-0332

Event Code: 06E13000-2019-E-00908 Project Name: Whitney Road Corridor

Subject: List of threatened and endangered species that may occur in your proposed project

location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ES) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Please feel free to contact us if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. We also encourage you to visit the Wyoming Ecological Services website at https://www.fws.gov/wyominges/species endangered.php.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 et seq.), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

We also recommend you consider the following information when assessing impacts to federally listed species, as well as migratory birds, and other trust resources:

Colorado River and Platte River Systems: Federal agencies must consult with the Service under section 7 of the ESA for projects in Wyoming that may lead to water depletions or have the potential to impact water quality in the Colorado River system or the Platte River system, because these actions my affect threatened and endangered species inhabiting the downstream reaches of these river systems. In general, depletions include evaporative losses and/or consumptive use of surface or groundwater within the affected basin, often characterized as diversions minus return flows. Project elements that could be associated with depletions include, but are not limited to: ponds, lakes, and reservoirs (e.g., for detention, recreating, irrigation, storage, stock watering, municipal storage, and power generation); hydrostatic testing of pipelines; wells; dust abatement; diversion structures; and water treatment facilities. For more information on consultation requirements for the Platte River species, please visit https://www.fws.gov/platteriver/.

Migratory Birds: The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations. Except for introduced species and some upland game birds, almost all birds occurring in the wild in the United States are protected (50 CFR 10.13). On December 22, 2017, the Department of the Interior Solicitor's Office issued an opinion that the MBTA's prohibitions on pursuing, hunting, taking, capturing, killing, or attempting to do the same apply only to affirmative actions that have as their purpose the taking or killing of migratory birds, their nests, or their eggs.

While the opinion (M-37050) states that the MBTA prohibition on the taking or killing of migratory birds applies only to deliberate acts, project activities should avoid, to the extent possible, sensitive periods and habitats to conserve healthy populations of migratory birds. See our website for more information and example conservation measures at https://www.fws.gov/wyominges/species_migratory.php. Guidance for minimizing impacts to migratory birds for projects that include communication towers can be found at https://www.fws.gov/birds/management/project-assessment-tools-and-guidance/guidance-documents/communication-towers.php.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; Eagle Act) prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, destruction, or killing. Eagle nests are protected whether they are active or inactive. Removal or destruction of nests, or causing abandonment of a nest could constitute a violation of the Eagle Act. Projects affecting eagles may require development of an eagle conservation plan (https://www.fws.gov/ecological-service/es-library/pdfs/Eagle_Conservation_Guidance-Module%201.pdf). Additionally, wind energy projects should follow the wind energy guidelines (https://www.fws.gov/ecological-service/energy-development/wind.html) for minimizing impacts to migratory birds and bats.

In addition to MBTA and the Eagle Act, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Wyoming Ecological Services Field Office 5353 Yellowstone Road, Suite 308a Cheyenne, WY 82009-4178 (307) 772-2374

Project Summary

Consultation Code: 06E13000-2019-SLI-0332

Event Code: 06E13000-2019-E-00908

Project Name: Whitney Road Corridor

Project Type: TRANSPORTATION

Project Description: Future reconstruction of existing roadway and potential realignment north

of Dell Range Blvd.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.16392224438905N104.73370846633676W



Counties: Laramie, WY

06/05/2019

Endangered Species Act Species

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an
office of the National Oceanic and Atmospheric Administration within the Department of
Commerce.

Mammals

NAME STATUS

Preble's Meadow Jumping Mouse Zapus hudsonius preblei

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/4090

Birds

NAME STATUS

Least Tern Sterna antillarum

Endangered

Population: interior pop.

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8505

Piping Plover Charadrius melodus

Threatened

Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except

those areas where listed as endangered.

There is **final** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/6039

Whooping Crane Grus americana

Endangered

Population: Wherever found, except where listed as an experimental population

There is **final** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/758

Fishes

NAME STATUS

Pallid Sturgeon Scaphirhynchus albus

Endangered

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME

Colorado Butterfly Plant Gaura neomexicana var. coloradensis

Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/6110

Ute Ladies'-tresses Spiranthes diluvialis

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159

Western Prairie Fringed Orchid Platanthera praeclara

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

DDEEDING

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described <u>below</u>.

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the <u>USFWS</u> <u>Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ <u>below</u>. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the <u>E-bird data mapping tool</u> (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Jul 31
Burrowing Owl <i>Athene cunicularia</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Mar 15 to Aug 31

https://ecos.fws.gov/ecp/species/9737

BREEDING NAME **SEASON** Cassin's Sparrow Aimophila cassinii Breeds Aug 1 to This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions Oct 10 (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9512 Chestnut-collared Longspur Calcarius ornatus Breeds May 1 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Aug 10 and Alaska. Breeds Jan 1 to Golden Eagle Aquila chrysaetos This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions Aug 31 (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/1680 Lark Bunting Calamospiza melanocorys Breeds May 10 This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions to Aug 15 (BCRs) in the continental USA **Breeds** Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9679 Long-billed Curlew Numenius americanus Breeds Apr 1 to This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA **Jul 31** and Alaska. https://ecos.fws.gov/ecp/species/5511 Mccown's Longspur Calcarius mccownii Breeds May 1 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Aug 15 and Alaska. https://ecos.fws.gov/ecp/species/9292 Breeds Semipalmated Sandpiper Calidris pusilla This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. Breeds Whimbrel *Numenius phaeopus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA elsewhere and Alaska. https://ecos.fws.gov/ecp/species/9483 Willet *Tringa semipalmata* Breeds Apr 20 This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA to Aug 5 and Alaska.

BREEDING NAME **SEASON**

Willow Flycatcher *Empidonax traillii*

Breeds May 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions to Aug 31 (BCRs) in the continental USA

https://ecos.fws.gov/ecp/species/3482

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

- 1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
- 2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
- 3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

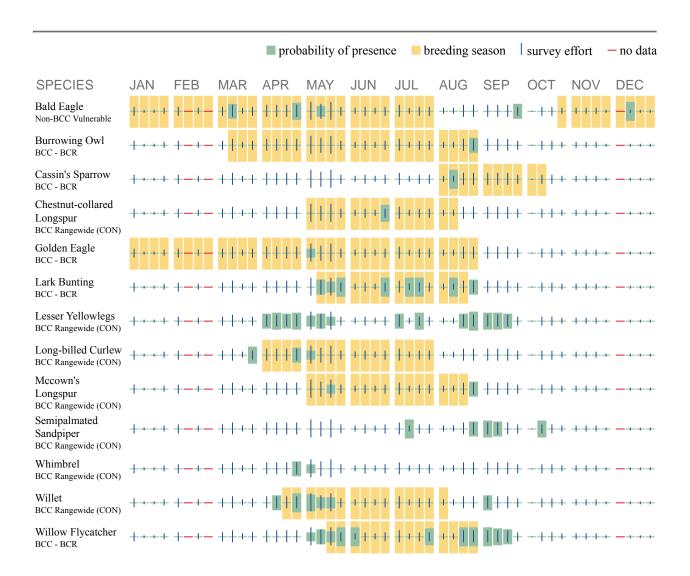
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern</u> (<u>BCC</u>) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey, banding, and citizen science datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the <u>AKN Phenology Tool</u>.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- 3. "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical

Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

PEM1A

WHITNEY ROAD CORRIDOR PLAN

APPENDIX G: ADDITIONAL

August 2020

APPENDIX G Additional Information





BOARD APPROVAL BY THE BOARD OF COMMISSIONERS FOR LARAMIE COUNTY

Approval Date:

October 17, 2006

UNP-C

WHEREAS, the applicant, Rocky Mountain Pipeline System, LLC, has requested approval for a Crude Oil Pipeline on the following described real property within Laramie County: portions of Sections 1, 2, 3, and 4, T.13N.; Sections 2, 11, 14, 23, 26, 35 and 36, T.14N.; Sections 3, 4, 10, 11, 12, 13, 24, 25 and 36, T.15N.; Sections 3, 9, 10, 16, 21, 28, 33, T.16N.; Sections 4, 9, 16, 21, 28, 33 and 34, T.17N.; Sections 3, 10, 15, 22, 27, 33 and 34, T18N.; Sections 2, 11, 14, 22, 23, 27 and 34*all in R.66W., 6th P.M., Laramie County, Wyoming (located beginning at the Frontier Refinery traversing easterly within the UPRR right of way paralleled to the north side of Campstool Rd. to Converse Rd., thence continuing easterly within the Campstool Rd. right of way on the north side of the road, thence north within the westerly portion of the Whitney Rd. right of way to the UPRR right of way. Thence continuing northerly to the westerly portion of Whitney Rd. to Pershing Ave., thence continuing northerly within the western portion of the Whitney Rd. right of way to Iron Mountain Rd., at that point crossing Whitney Rd. at a northeasterly direction leaving the public right of way and continuing north to the Laramie/Platte County line); and

WHEREAS, the notification requirements in Sections 74.000 Board Approval Process for Uses Requiring Public Hearings and 55.050(b) Highpower Transmission Lines, Water Pipelines over 12"in diameter, and Energy Pipelines. of the Zoning Ordinance and the purpose listed in Section 50.050(c) have been met; and

WHEREAS, all other rules and regulations set forth by "The Chevenne and Laramie County Zoning Ordinance 1988" and amendments thereto, apply to this Board approval; and particularly Section 55.060 Utility Regulations; and

WHEREAS. The Board of Commissioners for Laramie County has granted this Board Approval, to permit the property to be used for the purpose requested.

NOW, THEREFORE, IT IS ORDERED THAT the above-described property may be used for the purpose requested, it being understood and agreed that this use must be commenced within one (1) year of the date of issuance of this approval, and that an intentional change from the approved plan for said use shall revoke this approval whereupon the general zoning ordinance regulations shall govern this use and development of said property.

Diane Humphrey, Chair Board of Commissioners

and the second

Debra K. Lathrop, County Gerk

cc: Owner

Agent File (UNP-C)

RECORDED 10/31/2006 AT 3:32 PM REC# 460462 3K# 1976 PG# 1815

Received And Approved As To Form Only By The Coupty Attorney

T.19N.

STATE OF WYOMING LARAMIE COUNTY:

I hereby certify that this is a true and complete copy of the document filed in this office and admitted to record on 10.31 3006, Reception 460 462 in Book 19.716, Page(s)

Debra K. Lathrop Laramie County Clerk

BY

Deputy

PLEASE RETURN TO: CONOCO INC. POWAG, ML-1178 P O. BOX 4763 HOUSTON, TX 77210

066026 RECE YEC LARAMIE COUNTY CHEYENHE, WY.

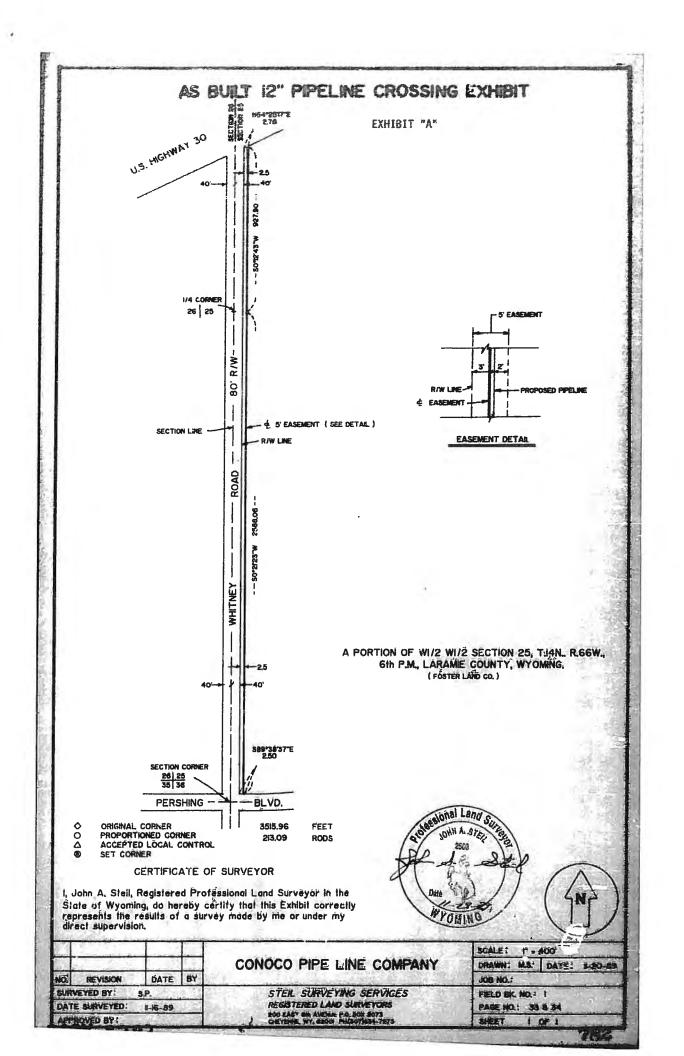
Right of Way Agreement (Standard Form)

'90 JAN 11 PM 2 10

780

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STATE OF WYO MINES	
COUNTY OF LARAMIE	
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My commission expires:	
Signature, Notary Publ	ic .





Submitted By:



www.avipc.com avi@avipc.com

AVI CHEYENNE:

1103 Old Town Lane; Suite 101

Cheyenne, Wyoming 82009

P: 307.637.6017 F: 307.632.9326

AVI FORT COLLINS:

2290 E Prospect Road, Suite 5

Fort Collins, Colorado 80524

P: 970.420.0086 F: 307.632.9326

RESOLUTION NO. 201006 - 12

ENTITLED: "A RESOLUTION ADOPTING THE WHITNEY ROAD CORRIDOR PLAN."

WHEREAS, Whitney Road between U.S. Highway 30 and Dell Range Boulevard is classified as a Minor Arterial and between Dell Range Boulevard and Storey Boulevard is classified as a Collector, all with jurisdictional responsibility currently by Laramie County; and

WHEREAS, Whitney Road between U.S. Highway 30 and Storey Boulevard is a narrow County Road and carries over 3,200 vehicles a day; and

WHEREAS, population growth around the east side of Cheyenne and the surrounding Laramie County urban area is causing traffic volumes to increase beyond the road's capacity and the property adjacent to Whitney Road known as Whitney Ranch, a 579-acre future subdivision is now under development; and

WHEREAS, other roads and highways in the vicinity were also recently adopted and certified in 2019 to determine their future road needs due to the existing and projected population growth and included in the plan entitled *East Dell Range Boulevard/U.S. 30 Corridor Study*; and

WHEREAS, the Cheyenne Metropolitan Planning Organization (MPO) retained AVI, p.c. February 27, 2017 to develop the *Whitney Road Corridor* Plan, and

WHEREAS, the Whitney Road Corridor Plan identified and addressed roadway deficiencies, traffic safety problems, traffic volume growth, multimodal needs, environmental constraints, and aligned roadway functionality and character with planned land uses and desired character; and

WHEREAS, the *Whitney Road Corridor Plan* and resulting preliminary design provides the partner agencies (city, county and state) and the developer of Whitney Ranch with a strategy of investments to meet the transportation and utility need along the corridor into the future; and

WHEREAS, the Cheyenne Metropolitan Planning Organization has programmed Federal STP-Urban funds for the reconstruction of Whitney Road from the north U.S. Highway 30 right-of-way, north to and including the Dell Range intersection in 2021; and

WHEREAS, the Wyoming Department of Transportation has funds programmed to reconstruct U.S. Highway 30 including the proposed intersection of Whitney Road and U.S. Highway 30 in 2024; and

WHEREAS, public involvement for the project consisted of two well attended public open houses, (November 8, 2017 and June 28, 2018) and two on-line surveys using SurveyMonkey[©] to gather feedback on issues and recommendations; and

WHEREAS, the plan was developed with the help of a Jurisdictional Steering Committee, numerous one-on-one meetings with local residences and businesses, and two presentations each to the City and County Planning Commissions during the plan's development; and

WHEREAS, the Cheyenne MPO Technical and Citizens' Advisory Committees reviewed the Whitney Road Corridor Plan and recommended adoption by the MPO Policy Committee; and

WHEREAS, the Laramie County Planning Commission held a public hearing on September 24, 2020, accepted public comments, and recommended that the Board of Commissioners approve the *Whitney Road Corridor Plan*.

NOW, THEREFORE, BE IT RESOLVED BY THE LARAMIE COUNTY BOARD OF COMMISSIONERS, LARAMIE COUNTY, WYOMING:

THAT, the Laramie County Board of Commissioners hereby adopts the "Whitney Road Corridor Plan" dated August 2020.

THAT, the "Whitney Road Corridor Plan" amends the Cheyenne Area Master Transportation Plan.

THAT, this resolution shall become effective after its passage and approval.

FURTHERMORE, BE IT RESOLVED, that the "Whitney Road Corridor Plan" will be used as guidance for the future design and reconstruction of Whitney Road between U.S. Highway 30 and Storey Boulevard.

PRESENTED, READ AND ADOPTED THIS ____ DAY OF _____, 2020.

BOARD OF LARAMIE COUNTY COMMISSIONERS

Chairman

ATTEST:

Debra Lee, Laramie County Clerk

Received and approved as to form:

Laramie County Attorney's Office

Approved as to
form only:
anf
Date: 9/18/20

RESOLUTION NO. 6095

ENTITLED: "A RESOLUTION CERTIFYING THE WHITNEY ROAD CORRIDOR PLAN."

WHEREAS, Whitney Road between U.S. Highway 30 and Dell Range Boulevard is classified as a Minor Arterial and between Dell Range Boulevard and Storey Boulevard is classified as a Collector, all with jurisdictional responsibility currently by Laramie County; and

WHEREAS, Whitney Road between U.S. Highway 30 and Storey Boulevard is a narrow County Road and carries over 3,200 vehicles a day; and

WHEREAS, population growth around the east side of Cheyenne and the surrounding Laramie County urban area is causing traffic volumes to increase beyond the road's capacity and the property adjacent to Whitney Road known as Whitney Ranch, a 579-acre future subdivision is now under development; and

WHEREAS, other roads and highways in the vicinity were also recently adopted and certified in 2019 to determine their future road needs due to the existing and projected population growth and included in the plan entitled *East Dell Range Boulevard/U.S. 30 Corridor Study*; and

WHEREAS, the Cheyenne Metropolitan Planning Organization (MPO) retained AVI, p.c. February 27, 2017 to develop the *Whitney Road Corridor Plan*, and

WHEREAS, the Whitney Road Corridor Plan identified and addressed roadway deficiencies, traffic safety problems, traffic volume growth, multimodal needs, environmental constraints, and aligned roadway functionality and character with planned land uses and desired character; and

WHEREAS, the Whitney Road Corridor Plan and resulting preliminary design provides the partner agencies (city, county and state) and the developer of Whitney Ranch with a strategy of investments to meet the transportation and utility need along the corridor into the future; and

WHEREAS, the Cheyenne Metropolitan Planning Organization has programmed Federal STP-Urban funds for the reconstruction of Whitney Road from the north U.S. Highway 30 right-of-way, north to and including the Dell Range intersection in 2021; and

WHEREAS, the Wyoming Department of Transportation has funds programmed to reconstruct U.S. Highway 30 including the proposed intersection of Whitney Road and U.S. Highway 30 in 2024; and

WHEREAS, public involvement for the project consisted of two well attended public open houses, (November 8, 2017 and June 28, 2018) and two on-line surveys using SurveyMonkey to

gather feedback on issues and recommendations; and

WHEREAS, the plan was developed with the help of a Jurisdictional Steering Committee, numerous one-on-one meetings with local residences and businesses, and two presentations each to the City and County Planning Commissions during the plan's development; and

WHEREAS, the Cheyenne MPO Technical and Citizens' Advisory Committees reviewed the Whitney Road Corridor Plan and recommended adoption by the MPO Policy Committee; and

WHEREAS, the City of Cheyenne Planning Commission held a public hearing on September 21, 2020 and accepted public comments.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF CHEYENNE, WYOMING:

THAT, the City of Cheyenne Governing Body hereby certifies the "Whitney Road Corridor Plan" dated August 2020.

THAT, the "Whitney Road Corridor Plan" amends the Cheyenne Area Master Transportation Plan.

THAT, this resolution shall become effective after its passage and approval.

FURTHERMORE, BE IT RESOLVED, that the "Whitney Road Corridor Plan" will be used as guidance for the future design and reconstruction of Whitney Road between U.S. Highway 30 and Storey Boulevard.

PRESENTED, READ, AND ADOPTED THIS 12th DAY OF October, 2020.

Marian J. Orr, Mayor

(Seal)

ATTEST:

Kristina F. Jones, City Clerk