Final Report for:

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

Prepared for and in coordination with

CHEYENNE MPO

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

Cheyenne Wyoming

Final Report
Acknowledged Receipt November, 2017

"The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation."

RESOLUTION NO. 5892

ENTITLED: **"A RESOLUTION ACKNOWLEDGING RECEIPT OF THE CONVERSE DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN AND THE CONVERSE AVENUE 35% DESIGN PLAN."**

WHEREAS, Converse Avenue and Dell Range Boulevard are principal arterials that intersect in northeast Cheyenne, Wyoming; and

WHEREAS, the Converse Avenue/Dell Range intersection experiences some of the highest traffic volumes and largest number of crashes within the Cheyenne urban area; and

WHEREAS, the Cheyenne Metropolitan Planning Organization (MPO) retained HDR on June 14, 2016 to develop the *Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan;* and

WHEREAS, the project was reviewed by the following agencies and organizations: the Cheyenne MPO, the City of Cheyenne Planning, Public Works and Engineering Departments, Cheyenne Police and Fire and Rescue Departments, Laramie County Emergency Management Agency, the City of Cheyenne Board of Public Utilities, Black Hills Energy, WYDOT, City Council members, Cheyenne Transit, Parks and Greenway; and

WHEREAS, public input was received from interviews with area business owners, two public meetings, on-line surveys and social media posts;

WHEREAS, the *Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan* provides short-term recommendations for improving the function and safety of the intersection along with pedestrian facility improvements;

WHEREAS, the *Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan* provides preliminary design for the Converse Avenue reconstruction, stormwater infrastructure, Greenway and sidewalk infrastructure; and

WHEREAS, the Cheyenne MPO Technical and Citizens' Advisory Committees reviewed the *Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan* and made a recommendation to the MPO Policy Committee to adopt; and

WHEREAS, the City of Cheyenne Planning Commission held a public meeting on October 16, 2017, accepted public comments, and voted to send the *Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan* to the City of Cheyenne Governing Body for their consideration.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF CHEYENNE, WYOMING:

THAT, the City of Cheyenne Governing Body hereby acknowledges receipt of the *"the Converse Dell Range Intersection Traffic Safety Plan and the Converse Avenue 35% Design Plan"* dated July 24, 2017.

PRESENTED, READ AND ADOPTED THIS 27th **DAY OF** November **, 2017.**

Marian J Orr, Mayor

(Seal)

ATTEST:

Carol Intlekofer, City Clerk

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1. Introduction

The Dell Range-Converse intersection is located in the northeast portion of the city of Cheyenne, as shown in Figure 1.1. This intersection connects two major routes in the city. Dell Range Boulevard is a four-lane principal arterial that connects from Yellowstone Road on the west to the developing eastern portions of the city. Dell Range Boulevard also provides connectivity to the most intensive retail development in Cheyenne, which includes the Frontier Mall. Converse Avenue is a four-lane principal arterial south of Dell Range Boulevard and a minor arterial north of Dell Range Boulevard. Converse Avenue provides connectivity from Lincolnway on the south, which provides access to downtown Cheyenne, to the developing northern portion of the city. The airport creates a barrier between the neighborhoods to the east of downtown. This causes increased traffic volumes on Converse Avenue, with predominately left turns onto Dell Range Boulevard from Converse Avenue. The confluence of these two roadways creates this major intersection, which is known for being the most congested and highest crash occurrence intersection in the city, possibly even the state.

The Converse Avenue corridor between Storey Boulevard and Ogden Road was constructed in 2003. Planning and preliminary design for the corridor between Ogden Road and Dell Range Boulevard is included in this study to complete the corridor between Storey Boulevard and Dell Range Boulevard.

Figure 1-1 - Study Location

HDR Engineering, Inc. was hired to prepare the Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan.

1.1. Existing Conditions

The current configuration of the Converse Dell Range intersection includes an exclusive left-turn lane and exclusive right-turn lane in each direction, except for the northbound approach that includes two exclusive left-turn lanes. Also, the eastbound right-turn lane is channelized. The intersection is signalized, with split phasing for the northbound and southbound approaches and a flashing yellow arrow for the eastbound left-turn and westbound left-turn movements. This signal operates in coordination along Dell Range Boulevard, with the coordinated corridor limits extending from College Drive on the east to Powderhouse Road on the west.

Existing traffic volumes for the AM, Midday, and PM peak hours were collected by the MPO earlier this year and provided to HDR for use in this project. The MPO also provided existing signal timing parameters for this intersection. This data is attached in Appendix C of this report. These traffic volumes, the intersection geometrics and the traffic signal timing parameters were loaded into the project's traffic operations analysis model. The model yielded LOS E, LOS C and LOS C for the AM, Midday and PM peak hours, respectively.

Crash statistics from 2006 to 2015 show a safety concern for this intersection. Within the past 10 years, there have been a total of 264 crashes at the Dell Range Boulevard and Converse Avenue intersection. During this time, approximately 147 people were injured, making this intersection one of the most dangerous intersections in the state of Wyoming. From 2007 to 2016, the crash rate at this intersection was 1.36. The predominate type of crashes, rear end collisions; have increased approximately 20% over this period. In addition to rear end collisions, angle crashes doubled between 2014 and 2015 and 90% of all crashes in this intersection occurred when vehicles were traveling in the East – West direction. On average, 67% of all crashes in the last ten years that occurred at the Dell Range - Converse intersection had reported property damage.

As part of the Converse / Dell Range Intersection Traffic Safety Plan Project; the Converse Avenue corridor has also been included and a 35% design effort performed. The construction of Converse Avenue from Ogden Road extending to the north and connecting to Storey Boulevard consists of a 55' wide road with 12' lanes and a center turn lane. A 10' wide concrete Greenway path exists on the west side of the road and a 5' wide sidewalk on the east side. The remaining segment of corridor from Ogden Road heading south to the intersection with Dell Range Boulevard remains in its existing condition; lacking adequate bicycle & pedestrian connectivity and necessitating roadway improvements to meet growing needs for additional traffic operational capacity and safety. The right-of-way through this section of the corridor is 100' wide. The existing street cross section consists of two 12-feet wide travel lanes and a 12-feet wide turn center turn lane. Curb and gutter is present on the east side of the road with an attached sidewalk, varying in width from 4 to 5 feet. The west side of the corridor contains a dirt shoulder and a drainage ditch located approximately 20 to 30 feet from the edge of the travel lane. Only one marked cross walk exists along the corridor, at the Dell Range Boulevard intersection.

1.2. Project Purpose

The purpose of this study is to evaluate existing and future traffic operations and safety for the Converse and Dell Range intersection and the Converse Avenue corridor between Dell Range and Ogden Road. The following are the project goals for this study:

Develop alternatives and a 35% design plan for a preferred alternative for the reconstruction of the Converse and Dell Range intersection the will improve safety and operations for motorists, pedestrians and bicyclists.

Develop a 35% design plan for the completion of Converse Avenue between Dell Range and Ogden for all modes and storm sewer.

2. Public Outreach and Meetings

A major component to this study was informing the public and obtaining public input for the evaluation of intersection alternatives and preliminary design. HDR worked with the Cheyenne MPO to conduct a comprehensive public outreach program that included two public open houses, online surveys, social media, media blasts, comment forms and one-on-one meetings to inform the public and gather input.

A project steering committee was also formed to assist and guide the project. The steering committee members are shown in Table 2-1. A total of four formal steering committee meetings were conducted during the course of the study. A summary of the public open houses and steering committee meetings are discussed below.

Table 2-1 - Steering Committee Roster

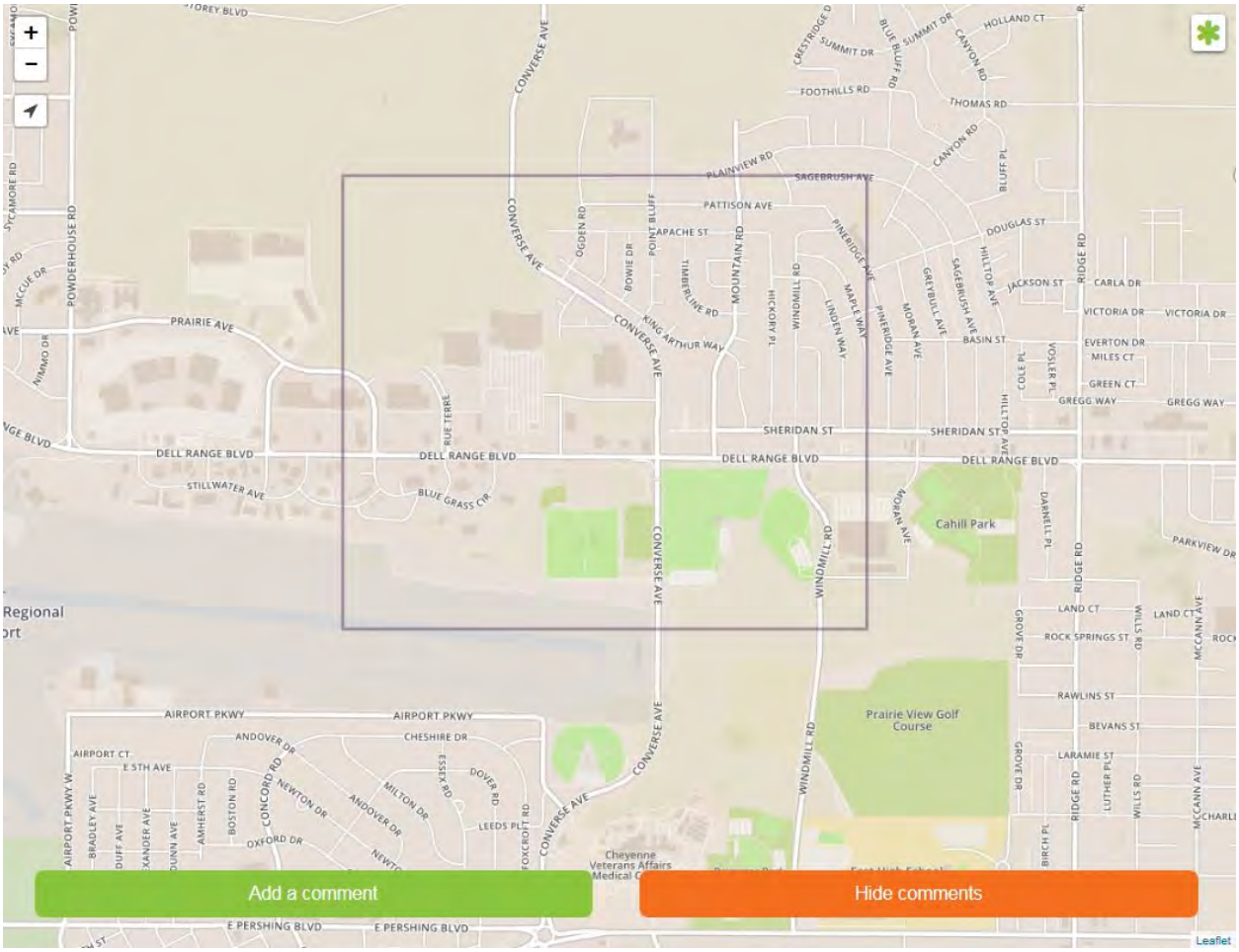
Organization	Name
Cheyenne MPO	Tom Mason
Cheyenne MPO	Nancy Olson
Cheyenne MPO	Sreyoshi Chakraborty
City Public Works	Craig LaVoy
City Engineering	Nathan Beauheim
BOPU	Brad Brooks
BOPU	Linda Gunter
WYDOT	Kevin McCoy
WYDOT	Mark Wingate
City Council	Jeff White
City Council	Dr. Mark Rinne
City Council	Jim Brown
Cheyenne Police Dept.	Sergeant John Gay
Cheyenne Police Dept.	Officer George Trammell
City Planning	Brandon Cammarata
Cheyenne Transit Program	Renae Jording
Transit	Keith McQueen - sub
Greenway and Trails	Jeff Wiggins
Parks and Recreation	Jason Sanchez
EMA	Matt Butler
Black Hills Energy	Jef McMann
Fire and Rescue	Chief Martin
HDR	Brandon Gebhart
HDR	Todd Mattson
HDR	John Seyer
HDR	Jason Kjenstad

2.1. Social Media, Online Surveys and Newspapers

Extensive efforts by the MPO and HDR were employed to incorporate social media tools to engage public input. The Cheyenne MPO Facebook page and webpage were used to inform the public of the project, gather comments, announce public meetings and provide links to surveys. Email transmissions were also used to inform stakeholders of upcoming events. Advertisements were also published in Wyoming Tribune Eagle and Trader Shoppers Guide. Additionally, KGWN Cheyenne and KFBC Radio shared notices of the open house meetings.

During the course of the study, online surveys were developed to garner public input as well as an online mapping tool to allow the public the opportunity to identify the locations of their concerns and identify or comment on what these concerns were. A screen shot of the online mapping tool is shown in Figure 2-1 - Online Mapping Tool. The results of the surveys and the four comments received from the online mapping tool are shown in Appendix D.

Figure 2-1 - Online Mapping Tool



The MPO website was also updated throughout the project to allow the public and stakeholders the opportunity to review the progress of the project, provide comments, view presentations and display materials from open house meetings and animations of traffic operations of the alternatives being evaluated.

2.2. Public Open House #1

The first public open house was conducted on September 13, 2016 at Anderson Elementary. The purpose of this meeting was to introduce the project components and need for improvements to the public, present preliminary examples for possible design solutions, as well as receives the community

members' input and priorities regarding the project. A series of displays were presented to the public that included;

- History & Project Context
- Safety Issues at the Intersection
- Existing capacity Issues at the Intersection
- About the Project: Mobility & Access, Drainage, Overall Goal
- Project Area Map
- Project Criteria - Public Input
- Design Concept Examples (Dual Left-Turn Lanes, Modern Round About, Continuous Flow Intersections, etc.)
- Timeline & Community Involvement (Project Scope, Intended Outcomes, & Public Resources)

Public attendees were also invited to view an animated presentation that included videos of possible design solutions for the intersection, speak with project team members, read & receive a Project Fact Sheet, provide their 4 most important outcomes of the project at the intersection, and fill out additional comment forms.

Comment Summary

During the public open house, participants were invited to provide written comments. Comments were also received through Facebook and an on-line mapping tool. Thirteen comment cards were received from the open house participants. Many of the comment cards contained multiple comments. Five comments were generated with the online tool and multiple comments were made via Facebook. In all, 92 comments were collected and reviewed and are included in Appendix D.

The comments were then categorized into 16 categories to evaluate what the public perception was as far as issues or possible resolutions to issues perceived with the existing intersection. Nine comments were not applicable to issues at this intersection and were excluded. Table 2-2 shows how each of the comments was categorized and the percentage of comments associated with each category.

Table 2-2 - Issue Identification

Category	Number of Comments	Percent of Comments
No Issue	8	10%
Against Roundabout at this location	17	20%
Signal Timing/issues	9	11%
Reduce congestion via alt. routes	5	6%
Lane configuration	6	7%
Red Light Camera/Violation Enforcement	11	13%
Driver Behavior/education	7	8%
Pro – Roundabout at this location	3	4%
Reduce Speed	4	5%
Bike/Ped Connectivity	3	4%
Emergency Vehicles	1	1%
Noise Pollution	1	1%
Funding/cost	2	2%
Construction Time	1	1%
Drainage	1	1%
Alternate Intersection design	4	5%

From the comments, it appears that a majority of the respondents welcome or encourage some version of improvement to the intersection. Many of the adverse comments made about the possibility of a roundabout were very direct. However, no negative or adverse comments were made about alternate intersection designs. Four comments were made that liked the idea of alternate intersection designs, including three comments that liked the continuous flow alternative presented at the public open house.

Many of the respondents indicated that the intersection could be improved by lane configuration alterations, signal alteration, enforcement and speed reduction.

Additional Comments

Thirteen additional comment forms were filled out and given back to project team members. The project also received feedback via the online comment web tool as well as comments on Facebook. Some common themes expressed in all three forms include:

- Necessity of project
    - Consensus on the need for the project, most respondents agreed that changes are necessary at the Converse Ave./Dell Range Blvd. intersection
- Safety concerns
    - For pedestrians and bicyclists, respondents included various suggestions for possible ways to increase safety
    - Many respondents expressed the issues with left-hand turns at the Converse/Dell Range intersection, in addition to other left-hand turns near the project boundaries

    - Red light traffic violations, along with issues of quick green rotations, reported as common and dangerous at the intersection, some respondents suggested installing a camera to help reduce drivers running the lights (blue-light indicators are in place)
- Lack of efficiency
    - Left-hand turn permissions at the Converse & Dell Range signals, and other signals along Dell Range reported to be long and inefficient
- Business Impacts
    - Request for project team and planners to be mindful of the business owners and residents in order to alleviate the effects of construction around the project area
- Concerns
    - Possibility of a roundabout – respondents had concern over the effectiveness and cost for this option
    - Noise and pollution resulting from the intersection –request for the possibility of mitigating these effects
    - Lack of a grade separated pedestrian/bicycle crossing across Converse Avenue between Dell Range and Point Bluff.

2.3. Public Open House #2

The second public open house was conducted March 1, 2017. A presentation was given of the top three alternatives and the no-build option. A Facebook Live stream of the presentation was made available on the Cheyenne MPO Facebook page. The public attendees were invited to provide additional comments and complete a survey card or online survey.

Twenty six people attended this open house. Five comment cards were received at the open house and three people completed the online survey. Of these responses, 3 people preferred the modern roundabout alternative, 3 people preferred the dual left turn alternative, and 2 people preferred the current intersection with Short Term Improvements. Of these responses 5 people indicated that they would support the funding and implementation of the preferred alternative and 3 indicated that they would like to reassess the need in 10-years.

2.4. Local Stakeholder Engagement

Emails and letters were sent to businesses and residents near the project area. These letters informed the local stakeholders of the project, invited them to public meeting and to participate in the online tools used for the project.

One-on-one meetings were also conducted for some of the residents and businesses in the immediate vicinity of the intersection to inform them of the project and allow them to provide input.

3. Intersection Alternatives Development and Analysis

The development of alternatives was based on the steering committee's and public's understanding of the intersection's deficiencies and the project's needs. Below is a description of this process.

3.1. Identification of Deficiencies

In order to establish the current conditions of the Dell Range – Converse intersection, a model of the existing geometry was developed. The results concluded that the existing intersection with current traffic volumes functions at a LOS E in the AM, which is considered poor and a LOS C during the Mid-day and PM peaks. If the intersection stays in its current configuration, it is projected that the level of service will only get worse due to increased traffic volumes. In addition to a continuance of poor level of service, the crash potential could also increase.

3.2. Alternatives Development

The alternatives that were analyzed for this intersection originated from HDR's proposal and were refined and finalized by the Steering Committee. The citizens of Cheyenne have been open to unique ideas that will maximize capacity and enhance safety at the Dell Range – Converse intersection. Currently, there are alternative designs in place around the City of Cheyenne; the multi-lane roundabout at the Converse-Pershing-19th intersection, and the diverging diamond interchange (DDI) at I-25 & College Drive. With these in mind as well as the conversations with City staff and citizens, HDR has developed seven alternative designs for the Dell Range-Converse intersection.

The list of alternatives is as follows:

1. Short Term Improvements
2. Dual Left-Turn Lanes
3. Modern Roundabout
4. Continuous Flow Intersection – Full
5. Continuous Flow Intersection – Modified
6. ThruTurn Intersection – Signals
7. ThruTurn Intersection – Roundabouts

Below are a brief description and a figure that illustrates each alternative.

Short Term Improvements. The option to not make any significant improvements provides a benchmark against which all other alternatives can be measured. The No-Build represents the conditions of the intersection in the future without major improvements, although some minor improvements or other previously committed improvements can be made. For this project, it was assumed that widening of the north leg would occur such that the split phasing will be eliminated and right-turn arrows will be added that will indicate to drivers that right turns are protected during the green time of the corresponding left-turn (i.e. the northbound right-turn movement would be given a green arrow simultaneously with the westbound left-turn movement).

The Dell Range Boulevard Corridor Study (Ayres Associates, 2016 a.) provided recommendations to this intersection. The preferred alternative to address pedestrian safety in this report was a grade separated crossing near Dry Creek to the west of the intersection. This report also recommends this alternative as the preferred pedestrian improvement for this alternative.

Another recommended improvement was to reconstruct the eastbound Dell Range right turn lane to follow an urban design that attempts to tame traffic. This report did not re-evaluate this recommendation.

Dual Left-Turn Lanes. This reconstruction alternative includes improving on the No-Build by adding a second left-turn lane to the eastbound, southbound and westbound approaches. The projected westbound left-turn volumes indicate that dual lefts may be warranted, and providing a second southbound left-turn lane is simple geometry since the northbound approach leg already has dual lefts; both receiving legs of these turn movements already have two lanes. The eastbound left-turn movement is not as simple, given that the north leg has only one receiving lane. The traffic volumes for this movement are fairly low, so consideration was given to keeping this movement as a single left-turn lane. See Figure 3-1.

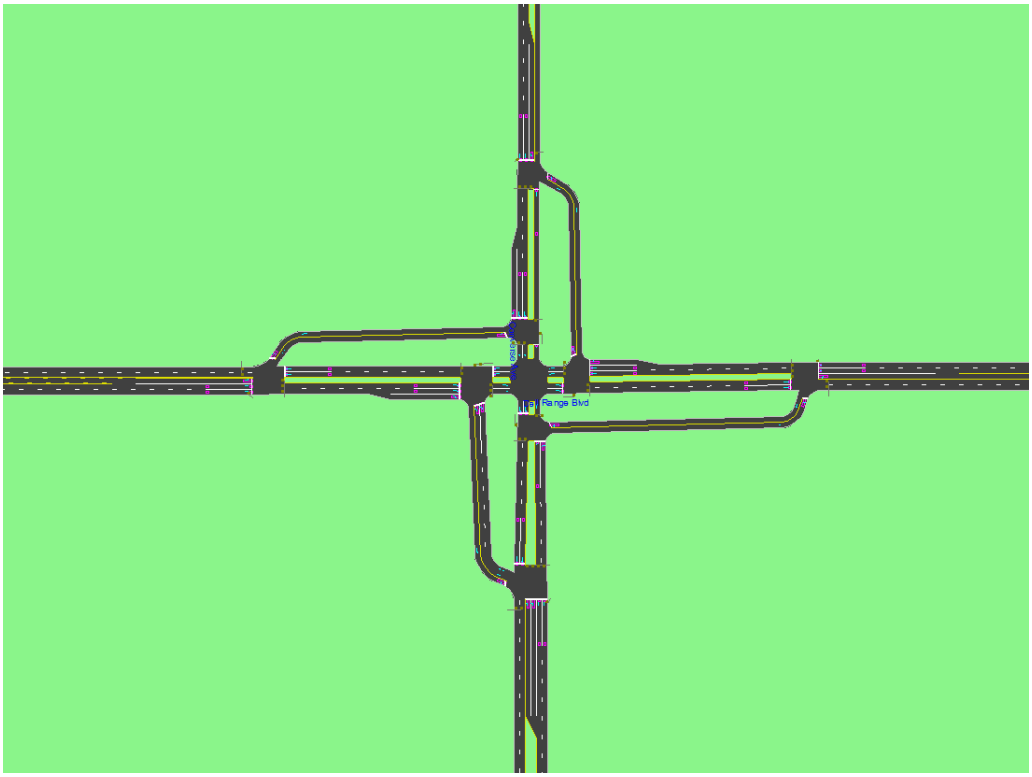
Figure 3-1- Dual Left Turn Lanes

Modern Roundabout. The modern roundabout was conceived as a viable option given the city's familiarity with roundabouts, the large percentages of left turns on some legs, the known safety benefits of roundabouts, and the fact that the crash history indicates that the conflict between thru movements and the opposing left-turn movements experience a persistence of crashes. This would be a multi-lane roundabout, possibly with three approach lanes from the south. See Figure 3-2.

Figure 3-2 - Modern Roundabout

Continuous Flow Intersection – Full. A continuous flow intersection (CFI) provides left-turn movements that are removed from the intersection for the benefit of reducing conflict points at the primary intersection and increasing the intersection's capacity. The left turns occur upstream of the primary intersection so that they can turn onto the approaching cross street at the same time as the opposing through movements. This alternative provides five two-phase signalized intersections that control traffic as it passes through the "intersection complex." See Figure 3-3.

Figure 3-3 - CFI - Full



Continuous Flow Intersection – Modified. The differences between the CFI-Modified alternative and the CFI-Full intersection are represented in the number of displaced left-turn movements. Based on volumes and crash history, the northbound left turns and the westbound left turns are the two movements that need additional capacity and conflict point mitigation. The traffic volumes at the other two left-turn movements are far less impactful to capacity and safety. In addition, modifying the CFI in this manner takes advantage of available right-of-way without impacting existing businesses. See Figure 3-4.

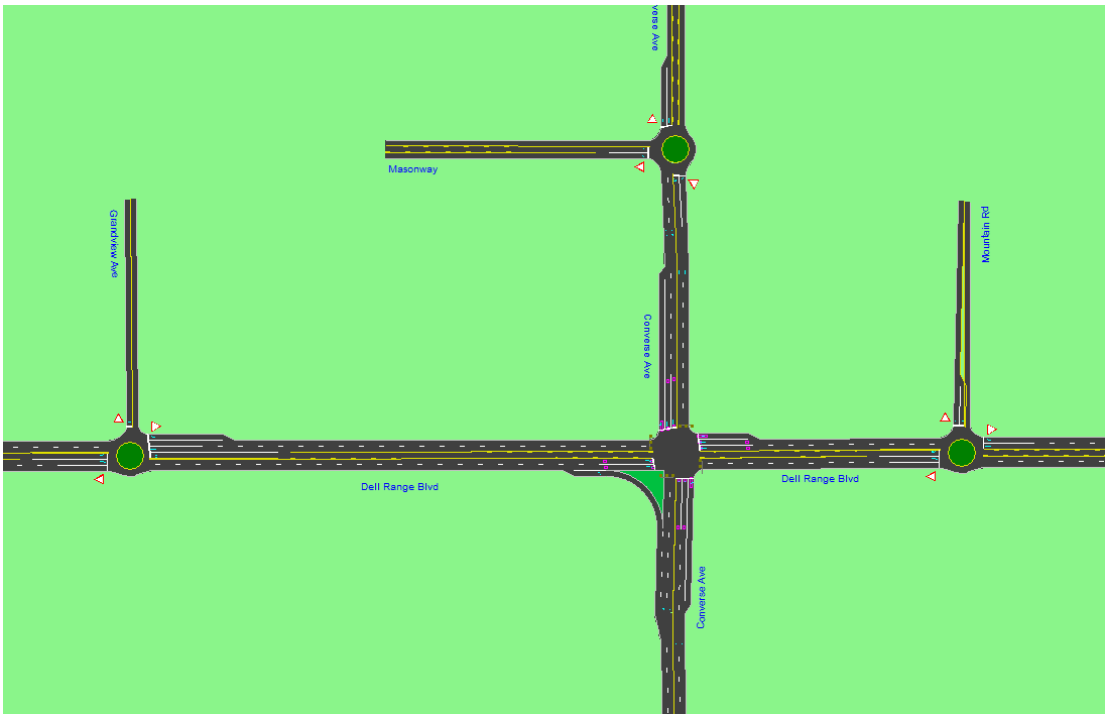
Figure 3-4 - CFI - Modified

ThruTurn Intersection – Signals. The ThruTurn intersection offers similar intersection capacity benefits as the CFI in that left turns do not occur at the primary intersection. The difference is that traffic wishing to make a left turn must make a different maneuver at the intersection and make a turn at a downstream intersection before reaching its final destination. As an example, to make a northbound left turn, traffic would proceed north through the intersection along Converse Avenue to the Masonway intersection where this traffic would make a U-turn, followed by a right-turn onto westbound Dell Range Boulevard. The "outlier" intersections would have minor geometric changes made to them to accommodate the U-turn movement, and those intersections would be signalized. See Figure 3-5.

Figure 3-5 - Thru Turn with Signals

ThruTurn Intersection – Roundabouts. This iteration of the ThruTurn intersection would provide modern roundabouts at the outlier intersections instead of traffic signals. This alternative would facilitate the U-turn movements effectively without introducing three new traffic signals. See Figure 3-6.

Figure 3-6 - Thru Turn with Roundabouts



3.3. Decision Matrix Development

An initial meeting was conducted with the steering committee to present a list of possible intersection alternatives and identify key issues and concerns to be used in the evaluations of these alternatives. A list of possible concerns were generated and presented to the committee to determine the most critical concerns of the committee that should be considered in comparing and evaluating alternatives. A ranking of the top issues were developed.

The first Public Open House, stakeholder meetings, one-on-one meetings and social media tools were also used to develop a list of issues in regards to the intersection and corridor. A compilation of the steering committee meeting and public input were used to develop criteria for a decision matrix to aid in the comparison of alternatives. The ranking of key issues from this compilation is presented below:

Table 3-1- Ranking of Key Issues

Issue	Rank
Safety	1
Ease of Use	2
Congestion/Queuing	3
Emergency Vehicle	4
Cost	5
Drainage	6
Business Access	7
Developed Land Acquisition	7
Undeveloped Land Acquisition	9

3.4. Alternatives Analysis

The seven alternatives were evaluated against the evaluation criteria. The criteria were established based on the values that the steering committee expressed to the design team and what the public shared at the first public open house. These criteria included:

1. Safety
2. Ease of Use
3. Congestion/Queuing
4. Business Access
5. Drainage
6. Land Acquisition

Initially, the alternatives were analyzed using the criteria of improved safety, ease of use, and reduction of congestion and queuing. The results of this analysis were presented to the steering committee to refine the alternatives down to three final alternatives. The congestion/queuing criterion was analyzed quantitatively using operations analysis software, as described below. The safety criterion was based on how effectively each alternative would reduce the overall number of conflict points. As such, this criterion was evaluated initially quantitatively, although some results were tweaked qualitatively. The ease of use criterion was evaluated qualitatively based on the complexity of the intersection, with consideration given to out-of-direction travel and how well pedestrians and bicyclists could maneuver through the intersection. Below is a description of how the alternatives were evaluated against these three criteria.

Safety. As noted above, this criterion was evaluated initially based on the number of conflict points within the intersection for each alternative. Given that some alternatives involve just the Dell Range-Converse intersection, while others involve the Mountain Road, Masonway and Grandview Avenue intersections, it's important that we include all four intersections in each

alternative. Given these considerations, below are the total numbers of conflict points for each alternative:

- No-Build = 59
- Dual Left-Turn Lanes = 59
- Modern Roundabouts = 35
- CFI – Full = 44
- CFI – Modified = 54
- ThruTurn – Signals = 38
- ThruTurn – Roundabouts = 28

Ease of Use. The Ease of Use criterion was evaluated with a qualitative approach. This approach considered the familiarity of local drivers and complexity of the intersection for all modes of travel, including vehicular traffic, pedestrian and bicycle traffic and emergency vehicle maneuverability.

Congestion/Queuing. The Trafficware, Synchro and SimTraffic software suite were used to analyze the operations for all of the alternatives, except for the modern roundabout alternatives; the modern roundabouts were analyzed using Rodel. Models for the AM peak, MD peak, and PM peak, using projected 2040 volumes, were developed for all alternatives. The future-year volumes were based on ADTs from the Dell Range Boulevard Corridor Study (Ayres Associates, 2016 a.) and the estimated Section 20 (Ayres Associates, 2016 b.)development patterns.

The primary focus of the analysis was the functionality of the Dell Range Boulevard and Converse Avenue intersection (DR-C). Currently, it is a signalized, four-legged intersection. Dell Range Boulevard has two, through lanes and one left-turn lane in the EB and WB directions. There is a designated right-turn lane in the WB direction onto NB Converse Ave. The SB leg has two through lanes, a designated right-turn lane, and one left-turn lane. The NB leg has one through lane, a designated right-turn lane, and two left-turn lanes onto WB Dell Range. Currently, the intersection functions as a LOS E during the AM peak and a LOS C during the MD and PM peak with an average delay of 39.9 seconds

- Short Term Improvements:
  The No-Build model was built using the existing intersection configuration and the 2040 volumes. In order to improve the functionality of the intersection, the signal timing was optimized for each peak hour. This adjustment improved the intersection's function during the AM peak from an LOS E to an LOS C. However, the LOS during the MD and PM peak declined to an LOS D. The average delay for the no-build model is approximately 35.6 seconds. Therefore, in order to see LOS improvement for all peak periods, the intersection's configuration will need to be altered.

- Dual Left-Turn Lanes:
  Due to the large amount of left turns in all directions, there is considerable delay due to the limited amount of left turn storage. A second left turn lane was added to SB Converse Ave, WB Dell Range Blvd, and EB Dell Range Blvd. The EB and WB directions have fewer left turns than that of the NB and SB directions. However, the through traffic along Dell Range Blvd is almost five times more than the through traffic along Converse Ave. Therefore, the left turn storage length for WB Dell Range Blvd was increased from 90 feet to 150 feet. This will assist in alleviating the through traffic delay as well as the left turn delay. After finalizing the configuration and optimizing the signal timing, the intersection functioned as an LOS C for all peak periods with an average delay of 29.4 seconds.
- Modern Roundabout:
  The roundabout model configuration consists of two circulating lanes throughout the entire roundabout. In the EB direction, there will be three approach lanes: one left-through lane, one designated through only lane, and one designated right turn only lane. The designated right turn only lane will be a bypass lane to SB Converse Ave. In the NB direction, there will be three approach lanes: one designated left turn only lane, one left-through lane, and one right-through turn lane. There will be three circulating lanes in the south-east quadrant to accommodate the three NB approach lanes and all legs will have two exit lanes. The LOS for the roundabout during all peak periods is an LOS A with an average delay of 5.6 seconds.
- Continuous Flow Intersection (Full):
  The CFI model configuration eliminates all left turns that occur at the Dell Range-Converse intersection. All left turns will occur ahead of the DR-C intersection. There will be a signalized intersection where the left turns will occur and cross over the opposing traffic lanes in order to bypass the main intersection. This bypass will provide storage for the left turns and allow for more green time to be dedicated to the through traffic. The left turns will access their target street at a connection point that will be placed after the main intersection. Once the timing was optimized and coordinated for all four legs, the CFI performed at a LOS C for all peak periods with an average delay of 29.6 seconds.
- Continuous Flow Intersection (Modified):
  The modified CFI model configuration is very similar to that of the full CFI model configuration. However, instead of eliminating left turns at the intersection for all four legs of the intersection, only two legs have left turns that occur ahead of the intersection. For the modified model configuration, the WB and NB left turns will bypass the main intersection. The WB left turn movement exceeds 300 left turns during the AM peak and the NB left turn movement exceeds 300 left turns during the PM peak; both movements have between 700 – 900 left turns during all three peaks. Once the timing was optimized and coordinated, the modified CFI performed at an LOS C for all peak periods with an average delay of 26.3 seconds.
- ThruTurn Intersection (Signals):
  The signalized ThruTurn model has a similar approach to the CFI model; eliminate the left turns at the Dell Range-Converse intersection. However, instead of the left turns bypassing

the DR-C intersection, left turns will be prohibited at the intersection. Therefore, vehicles wanting to turn left onto Converse Ave from Dell Range Blvd, or vise versa, will have to travel through the intersection and use either the Dell Range-Mountain intersection, Dell Range-Grandview intersection, or the Converse-Masonway intersection to make a U-turn. Vehicles will be able to turn right at the DR-C intersection once they have completed the U-turn. This ThruTurn model uses signals at all four of the intersections. Once all of the timing was optimized and coordinated, the model performed at an LOS B for the AM and MD peaks and an LOS C for the PM peak with an average delay of 16.4 seconds.

- ThruTurn Intersection (Roundabouts):
  The roundabout thruturn model has the same configuration as the signalized thruturn model, but will be using roundabouts instead of signals at the three intersections of Dell Range-Mountain, Dell Range-Grandview, and Converse-Masonway. Due to the use of two different modeling programs, Rodel and Syncro, for this alternative, the delays for both modeling programs had to be accounted for in the overall delay results. Once the delay was calculated correctly, the alternative performed at an LOS B for all peak periods with an average delay of 14.0 seconds.

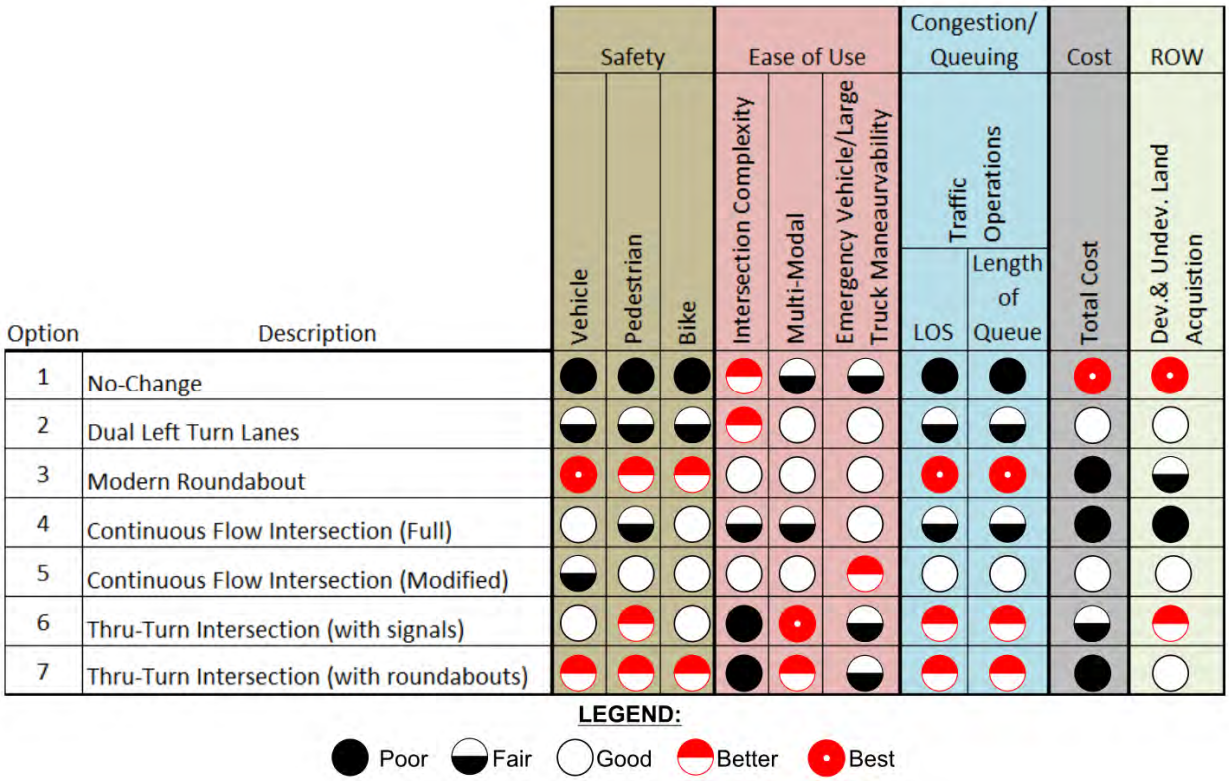
Based solely on the results from the models, the modern roundabout performed the best in terms of LOS and delay. The ThruTurn models performed the second best, with the modified CFI coming in third best overall. The Dual Left Turns alternative is a conventional design that also performed well. The worst results came from the Current Intersection with Short Term Improvements model. This solidifies the fact that the Dell Range-Converse intersection needs an alternative intersection design to alleviate current and future delay. See Table 3-2 for the LOS and delay results for all seven alternatives.

Table 3-2 - Intersection LOS and Delay

Alternative	AM Peak		MD Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Short Term Improvements	C	27.1	D	37.8	D	42.0
Dual Left Turns	C	26.2	C	32.3	C	29.6
Modern Roundabout	A	3.3	A	7.6	A	5.9
CFI - Full	C	31.1	C	29.8	C	27.9
CFI - Modified	C	22.1	C	26.0	C	30.8
ThruTurn - Signals	B	10.9	B	13.7	C	24.5
ThruTurn - Roundabouts	B	11.1	B	12.8	B	18.1

These analyses where then used to populate the decision matrix shown Figure 3-7 .

Figure 3-7 - Decision Matrix



This matrix was presented and discussed with the MPO and the Steering Committee. The purpose of this meeting was to present the traffic analyses for all alternatives, present the preliminary decision matrix and determine the preferred alternatives. A concise decision for a preferred alternative was not able to be made. It was decided that three alternatives and the no-build alternative would be presented at the second open house, and further evaluation of the three alternatives to determine land and property impacts were needed. The top three alternatives were the dual left turns (see Figure 3-8), modern roundabout (see Figure 3-9), and the modified continuous flow (see Figure 3-10). Conceptual designs were developed for the three alternatives. These concepts were discussed by the group again and a ranking by the present Steering Committee members ranked the Modified Continuous Flow Intersection the highest, followed by the Dual Left Turn and lastly the Modern Roundabout Current intersection with Short Term Improvements alternative was not included in this ranking. Conceptual designs are shown below:

Figure 3-8 - Dual Left Concept

Figure 3-9 - Modern Roundabout Concept

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

Figure 3-10 - CFI Modified Concept

A comparison of the pros and cons of each of these alternatives is presented in the table below;

Table 3-3 - Alternative Pros and Cons Comparison

	Dual Left Turns	Modern Roundabout	CFI - Modified
Pros	• Most conventional alternative • Lowest Cost of Remaining Alternatives • Anticipated to be least impactful to existing right-of-way	• Mitigates crash potential • Provides highest capacity	• Mitigates most noted safety concerns • Provides needed capacity enhancements • Meets project goals with relatively conventional geometry • Signalization at Mountain Road
Cons	• Doesn't mitigate noted safety concerns • Doesn't provide needed capacity enhancements	• Highest cost alternative • Most right-of-way & directly impacts private business • Extensive retaining walls • Impacts Ped. Bridge • Perceived most difficult for Pedestrians & Bicycles	• Doesn't mitigate all noted safety concerns • Impacts to Pedestrian Bridge Abutment

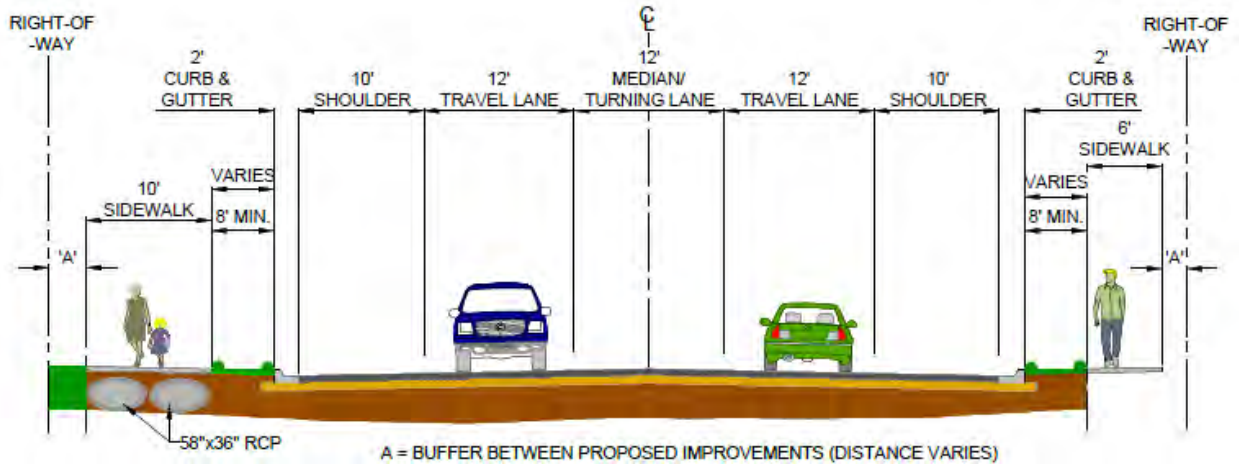
4. 35% Design

Converse Avenue 35% design between Ogden Road and Dell Range Boulevard has been performed in accordance with guidelines from the City of Cheyenne Unified Development Code, AASHTO Policy on Geometric Design of Highways and Streets (2011), and guidance from local governing agencies in the area. The 35% design is attached in Appendix A.

4.1. Typical Sections

The roadway "cross-section" or "typical section" was determined based on the roadway's functional classification of Minor Arterial. This functional classification meets the forecasted traffic volume demands as well as matches the existing Converse Avenue section from Ogden Road to Storey Boulevard. The typical section is anticipated to transition into the Converse Avenue / Dell Range Boulevard Intersection "No-Build" option at this time. Future transitions, including the intersection with Masonway, should be re-evaluated and design to match the corresponding intersection design option selected. The typical section as presented during the study process is shown in Figure 4-1 - Typical Section

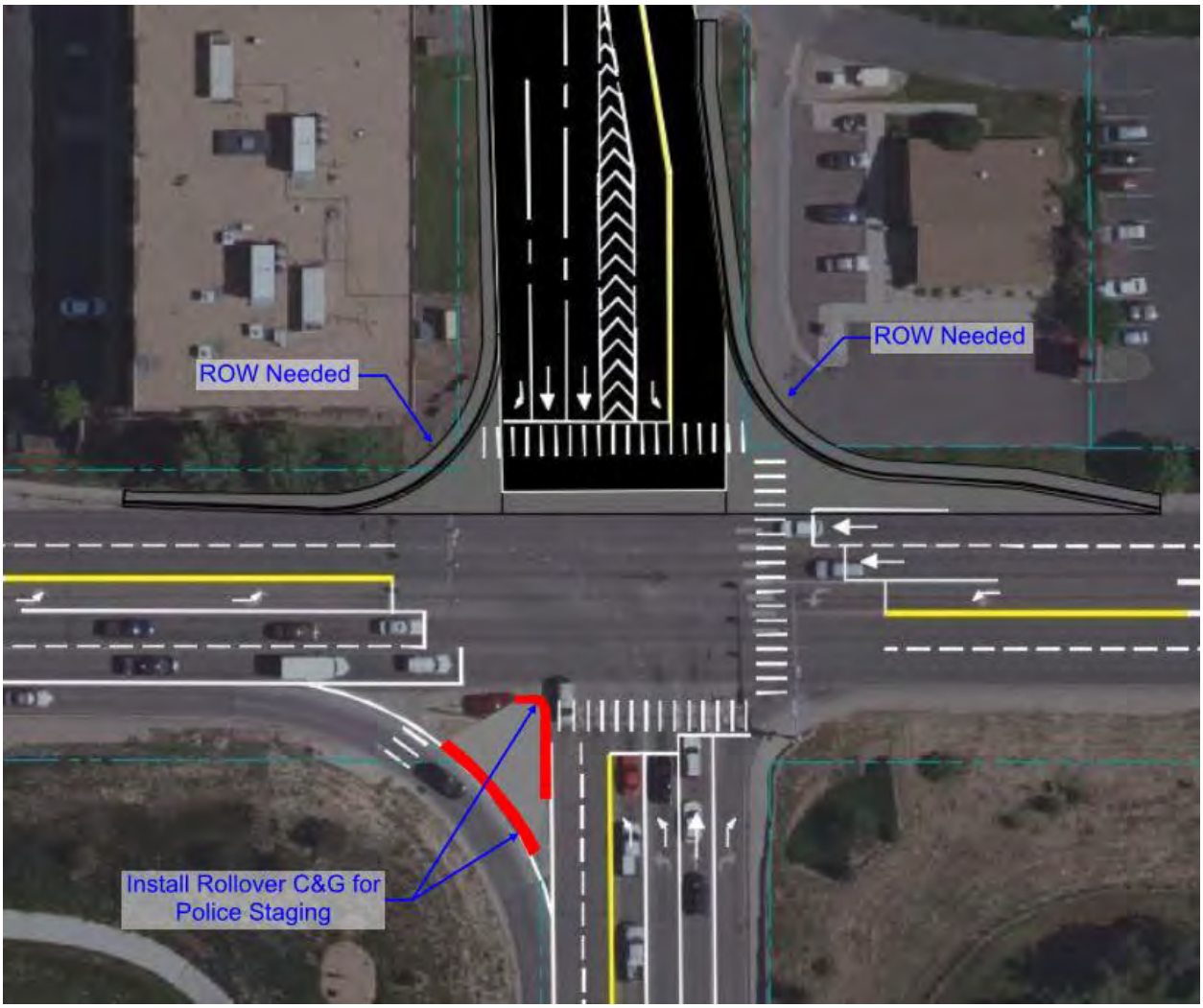
Figure 4-1 - Typical Section



4.2. Right-of-Way (ROW) and Control of Access

The ROW width along the Converse Avenue Corridor is approximately 100' wide from Ogden Road to Dell Range Boulevard. The impacts associated with construction of the new corridor section of Converse Avenue are anticipated to be minimal at this time. Existing ROW in the study area is anticipated to be sufficiently wide to accommodate the 2-Lane w/ median roadway section, including necessary landscaping boulevard(s), and necessary re-grading of southern open drainage ditch section when drainage is placed into the buried storm sewer. This includes the addition of sidewalk along the south and west side of the alignment to connect to existing Cheyenne Greenway routes. It is anticipated, however, that minor areas of right-of-way will be needed to construct the Short-Term Improvements alternative to the north side of the Converse Avenue and Dell Range Boulevard Intersection; see Figure 4-2.

Figure 4-2 - ROW Impacts



The existing Control of Access is not anticipated to be modified as all accessing approaches and streets provide connectivity to residential neighborhoods and adjacent businesses. Existing regulations will provide the framework for proper access management if additional development occurs within the corridor.

4.3. Posted Speed Limits and Design Speed

The posted speed limit of the Converse Avenue corridor study area is 30 mph between Dell Range Boulevard and Ogden Road and increases to 40 mph north of Ogden Road. The design speed of the roadway between Dell Range Boulevard and Ogden Road is 35 mph due to the horizontal curve, but is currently posted at 30 mph. An increase in the posted speed limit beyond 35 mph would require advisory signage for the curve. Given the residential nature of this section of road, the recommended speed limit should remain at 30 mph.

The Dell Range Boulevard evaluation is limited to the extents of potential new intersection layout alternatives; however, currently the posted speed limit on this roadway is 40 mph. It is anticipated that the speed limit will remain at 40 mph.

4.4. Pedestrian and Bicycle Facilities

The adjacent area land use is primarily residential; and as a result, the demand for adequate pedestrian and bicycle travel routes is a key item for consideration. The City of Cheyenne's "Greater Cheyenne Greenway" master plan and goal identifies "10' wide, grade separated, detached, reinforced concrete paths" as a goal to establish routes for non-motorized traffic independent of on-street transportation facilities. The Greenway provides a safe and connected transportation system. Currently the Greenway is discontinuous in this area and by planning a Greenway route along the Converse Avenue Corridor, two separate sections of existing Greenway can be joined, as shown in Figure 4-3

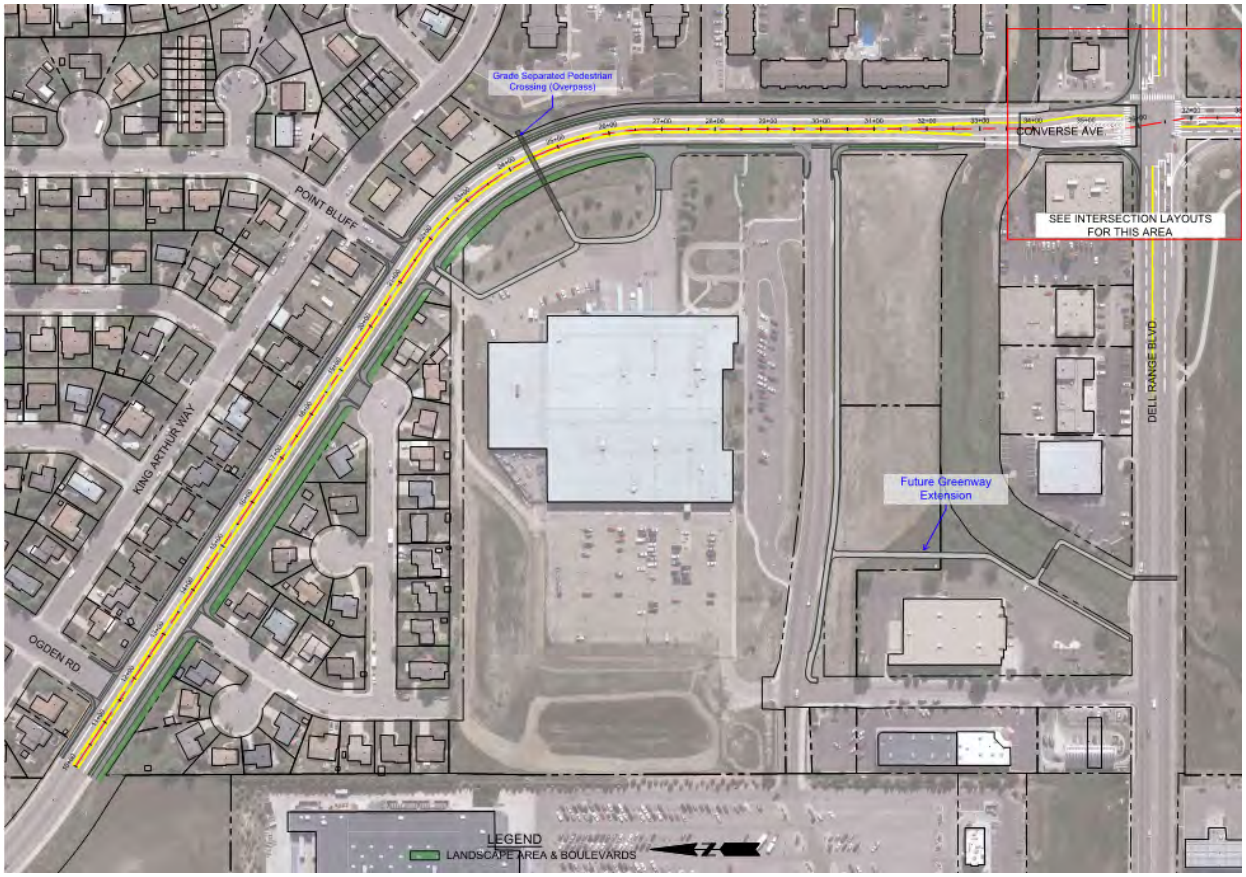
Figure 4-3 - Greenway Map

The improvements to the corridor also extend beyond the addition of a detached, designated, Greenway route. The roadway area will also have dedicated, 10' wide, shoulder areas adjacent to the traveled way that can also be used by bicyclists; currently no shoulder areas are present and only a small 4' sidewalk is available on the north and east side of the corridor. Existing corridor conditions can be seen in Figure 4-4.

Figure 4-4 - Corridor Existing Condition

During the public involvement process, citizens expressed concern that grade separated pedestrian crossings should be provided directly north of the Converse Avenue and Dell Range Boulevard intersection. Demand for this grade separated crossing stems from the high traffic volumes at this intersection and the lack of at-grade crossing facilities. Tentative placement an overhead pedestrian crossing near the center of the Converse Avenue corridor improvement area was also identified; and is also shown on Figure 4-5. The Dell Range Corridor Study (Ayres Associates, 2016 a.) also recommends a grade separated crossing near Grandview Avenue as shown.

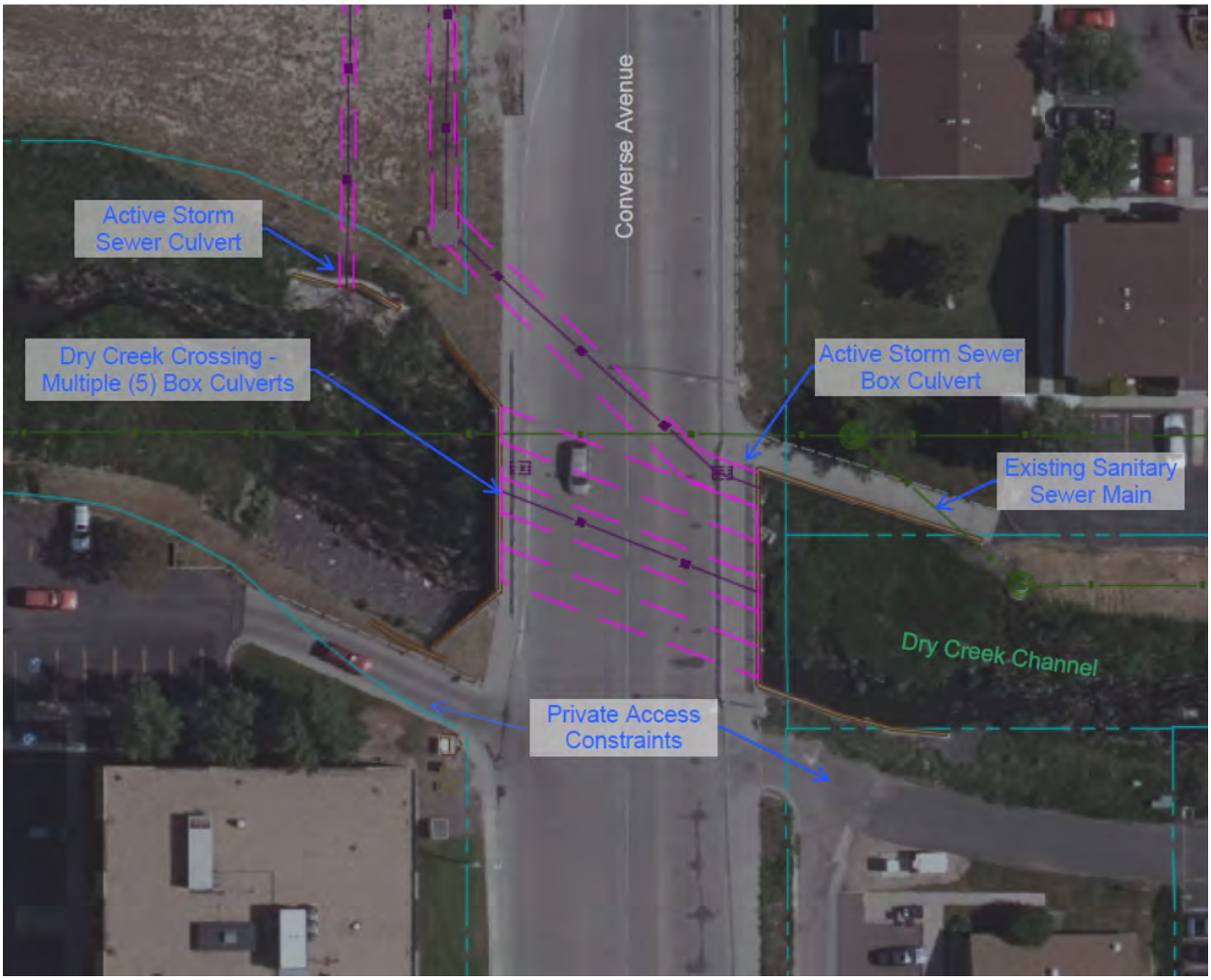
Figure 4-5 - Grade Separated Pedestrian Crossings



A grade separated crossing along Dry Creek under Converse Avenue would be very problematic. Because of the relatively good condition of the existing road crossing which consists of five concrete box culverts and a storm sewer box culvert, a bridge replacement is not recommended in this study. As such, the ability to incorporate a below grade crossing is complicated by the existing creek crossing. The creek crossing consists of six concrete box culverts. Five of the culverts convey stream flow and one (the northern most) box is a continuation of the existing storm sewer piping. The northern most box culvert is only accessible on the downstream side of the creek crossing. The upstream side is connected to the existing storm water piping and not accessible as a pedestrian tunnel. This also complicates using the adjacent box as a pedestrian tunnel because pedestrians would have to cross the active storm sewer flow on the downstream side of the crossing to exit the channel. Complications on the south side of the creek crossing are created by the close proximity of the accesses and buildings on the south side of the intersection and on both, the east and west sides of Converse Avenue. Figure 4-6 - Grade Separated Crossing Issues – Grade Separated Crossing Issues illustrates the issues with a below grade crossing.

Section 7 Conclusions of this report recommend that the pedestrian crossing at the Converse Avenue and Dell Range Boulevard intersection be improved to facilitate a better pedestrian crossing at this intersection. A future evaluation of an overhead grade separated crossing, as indicated above, is also recommended. If the existing Dry Creek crossing is replaced in the future, the planning should include the incorporation of a pedestrian crossing, but this is not feasible at this time.

Figure 4-6 - Grade Separated Crossing Issues



5. Drainage

A drainage study was conducted for the Converse Avenue corridor between Ogden Road and the Dry Creek Bridge north of Dell Range Boulevard. The scope of the analysis focused on converting the existing drainage channel that parallels Converse Avenue to a subsurface system with reconstruction and expansion of the roadway. Because the current intersection with Short Term Improvements alternative emerged as the preferred option for the near term, drainage features at the Converse/Dell Range intersection were not modified or changed. The original storm sewer through this area was installed in 1992 (based on City GIS data). Converse Avenue was reconstructed more recently from Ogden Road to

the north. The design flows for the study were provided by the City and recommendations are based on the 100-year peak discharges at specific concentration points along the existing drainage ditch.

The drainage analysis recommended the following pipe sizes, which are incorporated in the 35% designs in Appendix A:

- 8'x5' Concrete Box Culvert: connect to the existing 8'x6' Box Culvert and extend north to the Point Bluff intersection. The reduction in the box culvert height is needed to provide adequate cover over the box. The capacity is still sufficient for the flows evaluated.
- Dual 48" Reinforced Concrete Pipe: from the Point Bluff intersection and extending north to the Ogden Road intersection; the dual 48" trunk line should be connected to the 6 inlets on the north side of the intersection and the existing dual 36" RCP Arch pipes that continue north.

6. Environmental Considerations

A technical memorandum was prepared describing the methods and results of an environmental screening to identify any major obstacles that would need to be addressed in environmental documentation required for the project. This technical memorandum also provides a place of initiation for the National Environmental Policy Act (NEPA) process and documentation. The purpose of this environmental screening is to provide a review of existing databases, a synthesis of input from regulatory agencies, desktop evaluations, recommendations for detailed studies, and potential mitigation needs.

Environmental resources present were analyzed for the project. This screening does not evaluate the following resources because no adverse, long-term impacts as a result of the project are anticipated: air quality, energy, environmental justice, public facilities, visual impacts, and water quality.

Preliminary agency scoping letters were sent to agencies on October 12, 2016 to the following agencies:

- US Army Corps of Engineers
- US Fish and Wildlife Service
- Federal Emergency Management Agency
- Natural Resources Conservation Service
- WY Game and Fish Department
- WY State Historic Preservation Office
- WY Department of Environmental Quality
- Laramie County Public Works
- Laramie County Board of County Commissioners
- Laramie County Conservation District
- City of Cheyenne Engineer's Office
- WY Office of Homeland Security

Based on the agency responses and the environmental analysis, a summary of potential impacts was prepared and are shown in Table 6-1;

Table 6-1 - Environmental Impact Summary

Resource	Summary of Impacts from the Alternatives
Land Use	Consistent with Land Use Plans
Section 4(f) and 6(f)	Alternatives 2-7 would impact Section 4(f) properties and would require additional coordination. It is anticipated that a *de minimis* determination would be needed, meaning that all measures were considered to avoid, minimize, mitigate, and enhance the Section 4(f) properties and the project would not adversely affect the activities, features, or attributes qualifying the property for protection under Section 4(f). The official with jurisdiction, the City of Cheyenne, would need to concur to be a *de minimis* finding. Additional coordination would need to occur with the Wyoming State Parks Office for impacts to Section 6(f) properties.
Farmland	No impacts are anticipated.
Floodplains	Designated floodplain is present and additional coordination with the local Floodplain Administrator would be needed.
Wetlands and Other Waters of the U.S.	Potential jurisdictional aquatic resources are present in the Study Area. An aquatic resources inventory would need to be completed to permit any impacts to jurisdictional aquatic resources.
Cultural Resources	The area has been disturbed it is unlikely that cultural resources are located in the area. No further identification effort is needed unless the project footprint changes.
Wildlife	No impacts are anticipated.
Threatened and Endangered Species	Multiple threatened or endangered species are potentially in the Study Area according to IPaC guidance. However, USFWS stated that the project is in compliance with the Endangered Species Act of 1973. Additional coordination should occur with this office if any new information indicates there may be effects to protected species and their habitats
Noise	Project is expected to be a Type I project according to WYDOT guidance and therefore would require a noise analysis before impacts can be determined.

During implementation of a project, additions work would need to be completed to further assess impacts of the projects on environmental resources. The following identifies specific work that would likely be required:

- Aquatic Resources Inventory – This field survey would need to be completed to permit impacts to jurisdictional waters of the U.S. with the U.S. Army Corps of Engineers.
- Noise Study – A noise study would need to be completed to analyze impacts of the alternatives on the residences and businesses in the area.
- Section 4(f) and 6(f) Resources Impact Analysis – Coordination would be needed with the City of Cheyenne if the preferred alternative would impact parks or recreation areas. Early coordination would be ideal to incorporate minimization efforts or if mitigation is required.
- Floodplain Coordination – Additional coordination with the local floodplain administrator would be needed to coordinate impacts to the floodplain or floodway.

7. Conclusion

The analysis methodology, the resulting output, the public input and recommendations from the design team were presented to the Steering Committee and the MPO Technical Committee. The preferred intersection alternative from this entire process was the Modified Continuous Flow Intersection. Given that funding for this project did not make the sixth-penny ballot initiative in May, 2017, and that the funding source for this project is uncertain in the foreseeable future, the short term improvements to the existing intersection should be incorporated until the preferred alternative can be funded.

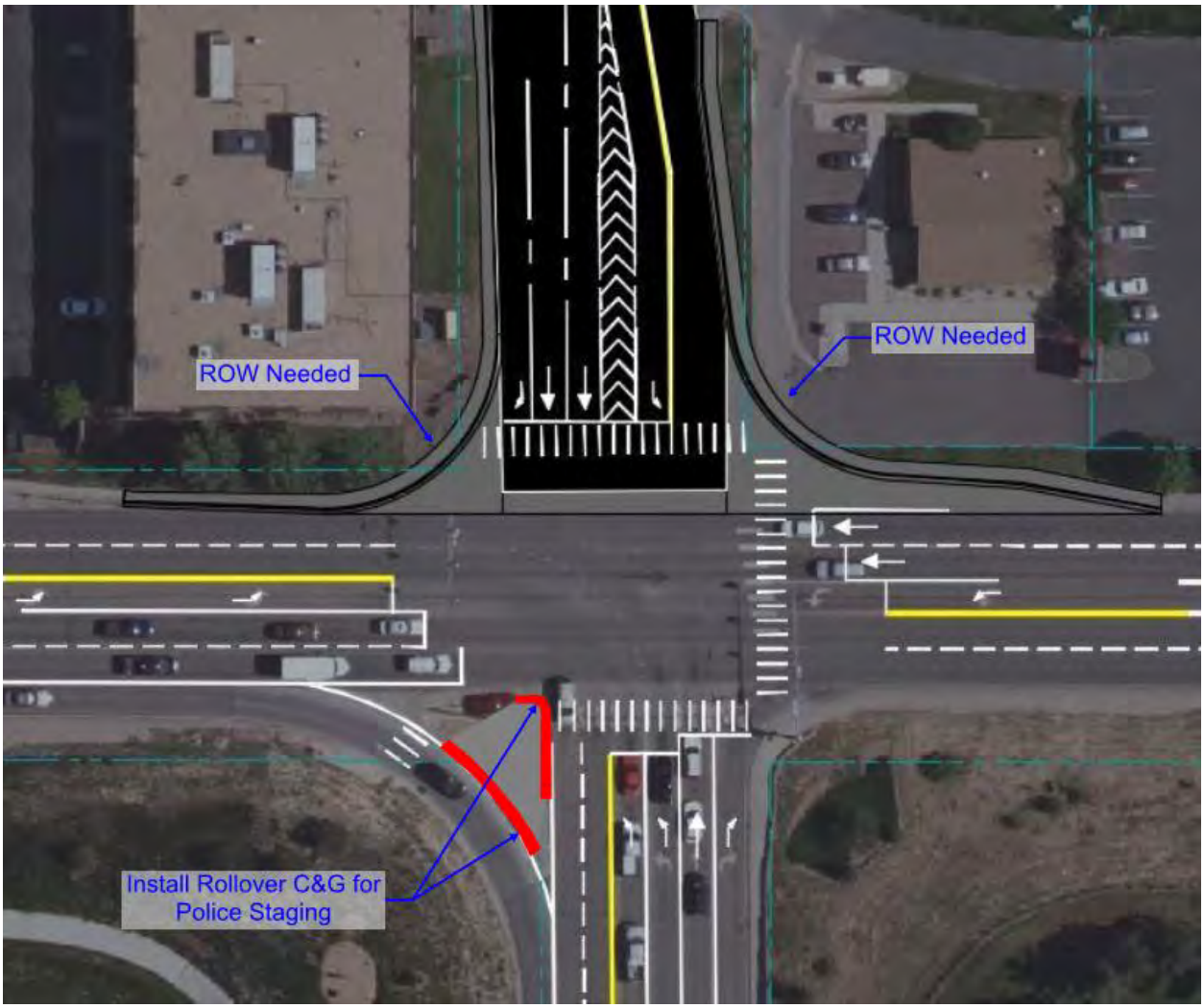
At this time, it is recommended that the improvements derived for the Short Term Improvements alternative be constructed to improve safety and functionality until a funding source for the preferred alternative become available. The recommended improvements were incorporated into the 35% design and the Engineer's Opinion of Probable Costs and include;

- Restriping the north leg to shift the southbound left-turn lane to the east
- Eliminate the split phasing for the north-south approaches
- Optimize the signal timing, including adding right-turn overlaps for the northbound right turn, the southbound right turn, and the westbound right turn
- Add supplemental left-turn heads for the eastbound and the westbound approaches
- Increase the curb-and-gutter radius in the northwest and northeast corner to better accommodate truck traffic
- Providing a staging location for law enforcement to monitor the intersection
- Provide 10 feet wide pedestrian crossings on the north, east and south legs of the intersection with stop bars. Pedestrian crossing times should be evaluated to ensure that it satisfies the current MUTCD standard for a 3.5 feet per second pedestrian speed.
- Stagger stop bars to move waiting vehicles out of the south bound left turn, west bound left turn, and north bound left turn movements as illustrated in Figure 7-1- Short Term Improvements.

Safety improvements will be realized inherently when the overall corridor improvements identified in this study and previous studies are completed. Improved connectivity and dedicated pedestrian and bicycle facilities will provide improved safety conditions when compared to existing conditions such as the creation of a grade separated Greenway crossing at Dry Creek, near Grandview Avenue.

Additionally, future analysis of a grade separated crossing along Converse Avenue between Dell Range and Point Bluff is recommended based on comments received during the public meeting process. Additionally, some improvement to traffic operations and a general increase in intersection safety will be realized by completing the Short Term Improvements alternative.

Figure 7-1- Short Term Improvements



Another recommendation is for the City to consider the purchase of a portion of, or the entire parcel of land on the northeast corner of the intersection. This would provide the needed land for the recommended improvements of the Short Term Improvements alternative and the preferred Modified Continuous Flow Intersection. This land could also be used to assist with traffic and law enforcement efforts at this intersection. A safe and visible staging area for law enforcement vehicle parking and observations could be incorporated on this land.

8. Engineer's Opinion of Probable Cost

The costs for the project were developed using average bid prices from projects previously bid in the City of Cheyenne, the City of Gillette, and WYDOT in Laramie County and historical HDR project experience using present 2017 dollars. Bid items have been compiled based on the best available knowledge of typical street reconstruction / rehabilitation and needs; specialty items that are large unknowns at this time such as ROW acquisition, traffic signal equipment upgrades (if needed), final surfacing material, any complications associated with the Dry Creek bridge crossing, and potentially even a grade separated pedestrian crossing would be captured in the 30% contingency that is indicated on the cost estimate. The contingency was developed from the American Association of Cost Estimators tables to apply an appropriate amount of contingency for our level of design. These costs do not include ROW acquisition, additions to the Dry Creek Bridge or grade separated pedestrian crossings. The Engineer's Opinion of Probable Cost, $4,944,918, was developed to reflect the costs associated with 35% designs for the Converse Avenue corridor and includes the work associated with the Short Term Improvements alternative. Additionally the costs for the Short Term Improvements alone are $546,871 and have been provided separately for reference. These costs are attached in Appendix B of this report.

9. Works Cited

Ayres Associates. (2016 a.). *Dell Range Boulevard Corridor Study Powder House Road to College Drive.* Cheyenne, Wyoming: Cheyenne Metropolitan Planning Organization.

Ayres Associates. (2016 b.). *Dell Range Boulevard Corridor Study Phase II - Section 20.* Cheyenne, Wyoming: Cheyenne Metropolitan Planning Organization.

Appendix A

35% Design

CHEYENNE MPO

Plans for Proposed

CONVERSE/DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVE. 35% DESIGN

LARAMIE COUNTY, WYOMING

Location Map

Plans By:

HDR ENGINEERING, Inc.

1720 CAREY AVE.
SUITE 612
CHEYENNE, WYOMING 82001
(307) 778-9500
FAX: (307) 778-9501

Professional Engineer
TODD MATTSON
15048
PRELIMINARY
Date
WYOMING

I, TODD MATTSON, hereby certify that these plans were prepared by me, or under my direct supervision and that I am a duly registered engineer under the laws of the State of Wyoming.

TODD MATTSON WY No. 13119 Date

Index of Sheets

Drawing indicates general utility locations only. Neither the correctness or completeness of locations are guaranteed.

Prior to excavation contact:
ONE CALL OF WYOMING (1-800-849-2476 or 811)

EXISTING FIRE HYDRANT

EXISTING VALVE & BOX

EXISTING TEE

EXISTING REDUCER

EXISTING SLEEVE

EXISTING CROSS

EXISTING WATER MANHOLE

EXISTING DRINKING FOUNTAIN

EXISTING WATER SHUTOFF

EXISTING SPRINKLER HEAD

EXISTING SANITARY MANHOLE

EXISTING STORM MANHOLE/ JUNCTION BOX

EXISTING TELEPHONE MANHOLE/ JUNCTION BOX

EXISTING TELEPHONE PEDESTAL

EXISTING TRAFFIC MANHOLE/ JUNCTION BOX

EXISTING ELECTRIC MANHOLE/ JUNCTION BOX

EXISTING ELECTRIC PEDESTAL/ TRANSFORMER

EXISTING TRAFFIC SIGNAL LIGHT

EXISTING STREET LIGHT

EXISTING TRAIL LIGHT

EXISTING GUY WIRE ANCHOR

EXISTING POWER POLE

EXISTING HEDGE, BRUSH, SHRUBS, WOODS

30"

EXISTING DECIDUOUS TREE & SIZE

8"

EXISTING CONIFEROUS TREE & SIZE

EXISTING TREE STUMP

MB

EXISTING MAILBOX

EXISTING SIGN

EXISTING GAS METER

EXISTING APPROACH

EXISTING SIDEWALK

EXISTING DROP INLET

1400

EXISTING CONTOURS

12"W

EXISTING WATER MAIN & SIZE

12"ST

EXISTING STORM SEWER & SIZE

12"S

EXISTING SANITARY SEWER & SIZE

12"FM

EXISTING FORCE MAIN & SIZE

G

EXISTING GAS LINE

T

EXISTING UNDERGROUND TELEPHONE

FO

EXISTING FIBER OPTIC

CTV

EXISTING CABLE TELEVISION

UE

EXISTING UNDERGROUND ELECTRIC

OHE

EXISTING OVERHEAD ELECTRIC

SF/UE

EXISTING CITY OF SIOUX FALLS ELECTRIC

TR

EXISTING TRAFFIC

4"DT

EXISTING DRAIN TILE LINE AND SIZE

EXISTING SPLIT RAIL FENCE

EXISTING CHAIN LINK FENCE

EXISTING BARBED WIRE FENCE

EXISTING CENTERLINE

EXISTING PROPERTY LINE

EXISTING EASEMENT

EXISTING PROPERTY CORNER MONUMENT

T

EXISTING HORIZONTAL CONTROL

B

EXISTING VERTICAL CONTROL

BOTTOM SOIL BORING ELEVATION

REFUSAL SOIL BORING ELEVATION

WATER LINE SOIL BORING ELEVATION

1400
SB-1

SOIL BORING, EXISTING GROUND ELEVATION, AND NUMBER

1400
SUE

SUB-UTILITY EXPLORATION AND UTILITY ELEVATION

DIRECTION OF FLOW

MATERIAL FOR LINES:

VCP	VITRIFIED CLAY PIPE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	SOLID WALL POLYVINYL CHLORIDE PIPE
DIP	DUCTILE IRON PIPE
RCP	REINFORCED CONCRETE PIPE
CIP	CAST IRON PIPE
CIPP	CURED IN PLACE PIPE
PE	POLYETHYLENE PIPE
FRPM	FIBERGLASS REINFORCED POLYMER MORTAR PIPE

PROPOSED LIFT STATION

PROPOSED SANITARY MANHOLE

CO

PROPOSED CLEAN OUT

V

PROPOSED VALVE & BOX

T

PROPOSED TEE

X

PROPOSED CROSS

R

PROPOSED REDUCER OR INCREASER

S

PROPOSED SLEEVE

H

PROPOSED FIRE HYDRANT

90

PROPOSED 90° BEND

45

PROPOSED 45° BEND

22

PROPOSED 22 1/2° BEND

11

PROPOSED 11 1/4° BEND

SJP

PROPOSED S.J. PLUG

MJP

PROPOSED M.J. PLUG

Y

PROPOSED WYE

PROPOSED SIGN

PROPOSED CATCH BASIN

PROPOSED STORM SEWER JUNCTION BOX

PROPOSED STORM SEWER DROP INLET

PROPOSED STORM SEWER INTAKE

PROPOSED STORM SEWER FLARED END

PROPOSED TRENCHED SANITARY SEWER LINE

PROPOSED TRENCHLESS SANITARY SEWER LINE

PROPOSED STEEL CASING PIPE

8"

PROPOSED WATER MAIN

PROPOSED STORM SEWER

PROPOSED RIP RAP

PROPOSED PCC

PROPOSED ACC

1400

PROPOSED CONTOURS

Prepared For:

Prepared By:

HDR ENGINEERING INC.
1720 Carey Ave.
Suite 612
Cheyenne, WY 82001

HDR

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/6/2017	Print Date: 6/6/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

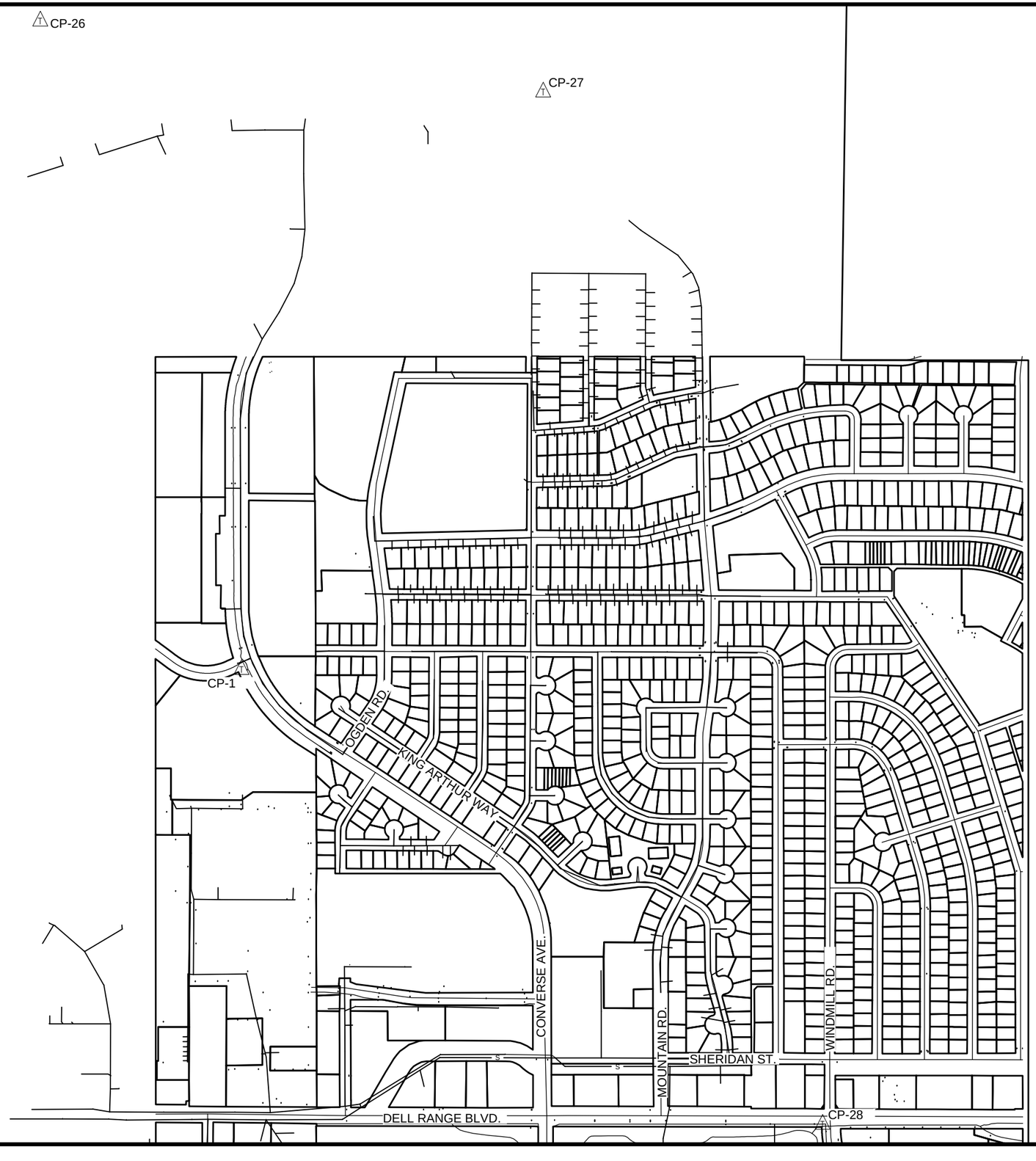
Project No. 10038796

Sheet Title:

GENERAL LEGEND

Sheet:

A.2



CONTROL POINTS				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	243149.417	759514.195	6068.44	IPINCIP /CP1
26	246648.129	758428.965	6252.61	YOD
27	246266.328	761141.939	6165.67	MUSTANG
28	240695.703	762650.660	6040.59	Del Range #3
31	240700.851	764368.360	6015.05	Dell Range 2
34	240722.189	756821.019	6074.63	DELL RANGE NO.6

COORDINATES AND VERTICAL ELEVATIONS BASED ON:
WYOMING STATE PLANE EAST (US FOOT) 1983 (NAD 83)
VERTICAL DATUM: NAVD88

Prepared For:

Prepared By:

HDR ENGINEERING INC.
1720 Carey Ave.
Suite 612
Cheyenne, WY 82001

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/6/2017	Print Date: 6/6/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

CONTROL POINTS

Sheet:

A.3

TOTAL ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	EST. QTY.	BID QTY.
0100.00	MOBILIZATION	LS	1	1
0100.00	FORCE ACCOUNT WORK	$$	1	$ 25,000.00
0100.00	CONTRACT BOND	LS	1	1
0100.00	CONTRACTOR TESTING	LS	1	1
1050.01	TEMPORARY TRAFFIC CONTROL	LS	1	1
1335.01	CONSTRUCTION STAKING	LS	1	1
1563.01	EROSION CONTROL AND STORMWATER MANAGEMENT	LS	5	6
2050.02	REMOVAL OF INLETS	EA	6	7
2050.03	REMOVE EXISTING FITTING	EA	9	10
2050.04	REMOVE FIRE HYDRANT	EA	3	4
2050.05	REMOVE VALVE	EA	8	10
2075.02	REMOVAL OF ASPHALT SURFACING	SY	489	500
2075.03	REMOVAL OF CONCRETE SURFACING	SY	18652	20000
2075.04	REMOVAL OF CURB AND GUTTER	LF	5192	5250
2210.05	IMPORTED BORROW EXCAVATION	CY	400	400
2210.02	UNCLASSIFIED EXCAVATION	CY	400	400
2231.01	CRUSHED BASE	TON	8657	9500
2280.02	TOPSOIL BORROW	CY	1500	1500
2512.031	PLANT MIX BITUMINOUS PAVEMENT, GRADING A	TON	4843	5000
2570.02	ADJUST SEWER MANHOLE	EA	4	5
2645.01	FIRE HYDRANT	EA	4	5
2665.0106	INSTALL 6" WATER MAIN	LF	300	300
2665.0112	INSTALL 12" WATER MAIN	LF	2800	2800
2665.02	INSTALL WATER FITTING	EA	12	12
2665.03	INSTALL WATER VALVE	EA	10	10
2665.04	WATER SERVICE 1"	EA	6	6
2725.01118	STORM SEWER MAIN, RCP, 18"	LF	272	275
2725.01124	STORM SEWER MAIN, RCP, 24"	LF	76	80
2725.01136	STORM SEWER MAIN, RCP, 36"	LF	95	100
2725.01148	STORM SEWER MAIN, RCP, 48"	LF	2013	2020
2725.01510	8 'x 5' CONCRETE BOX CULVERT	LF	520	520
2725.01511	8 'x 5' CONCRETE BOX CULVERT BEND SECTION	EA	4	4
2725.01512	8' X 6' CONCRETE BOX CULVERT BEND SECTION	EA	1	1
2725.01513	8' x 5' TO 8' x 6' CONCRETE BOX CULVERT REDUCER	EA	1	1
2725.0225	FLAT TOP MANHOLE, 6-10; DEEP, 60" DIA.	EA	1	1
2725.0325	CONICAL MANHOLE, 6-10; DEEP, 96" DIA.	EA	2	2
2725.0350	8' x 14' REINFORCED CONCRETE JUNCTION BOX	EA	2	2
2725.0360	18" x 48" RCP TEE SECTION	EA	2	2
2725.0418	FLARED END SECTION, RCP, 18" DIA.	EA	1	1
2725.0424	FLARED END SECTION, RCP, 24" DIA.	EA	1	1
2725.0610	TYPE "A" INLET	EA	10	10
2725.0650	WYDOT TYPE "B" INLET	EA	2	2
2725.0650	WYDOT TYPE "C" INLET	EA	2	2
2725.0650	WYDOT TYPE "D" INLET	EA	4	4
2805.02	SIGN PANELS	SF	500	500
2805.03	SIGN POST, SQ TUBULAR STL	EA	12	12
2815.00	PERMANENT STRIPING (THERMOPLASTIC)	LS	1	1
2900.01	LANDSCAPING	SF	3705	3750
2900.02	SEEDING	SF	2500	2500
2900.04	SODDING	SF	3705	3750
3330.0105	CURB AND GUTTER TYPE "A" (24 in)	LF	5711	5800
3340.01	CURB TURN FILLET	SF	3600	3600
3340.02	CONCRETE VALLEY GUTTER (8 in)	SF	558	575
3340.03	CONCRETE SIDEWALK (4 in)	SF	37902	38500
3340.07	DETECTABLE WARNING PLATE	EA	14	14

Prepared For:

Prepared By:
HDR ENGINEERING INC.
1720 Carey Ave.
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Cheyenne, WY 82001

Scale:

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Design Date: 6/7/2017	Print Date: 6/7/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION
LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:
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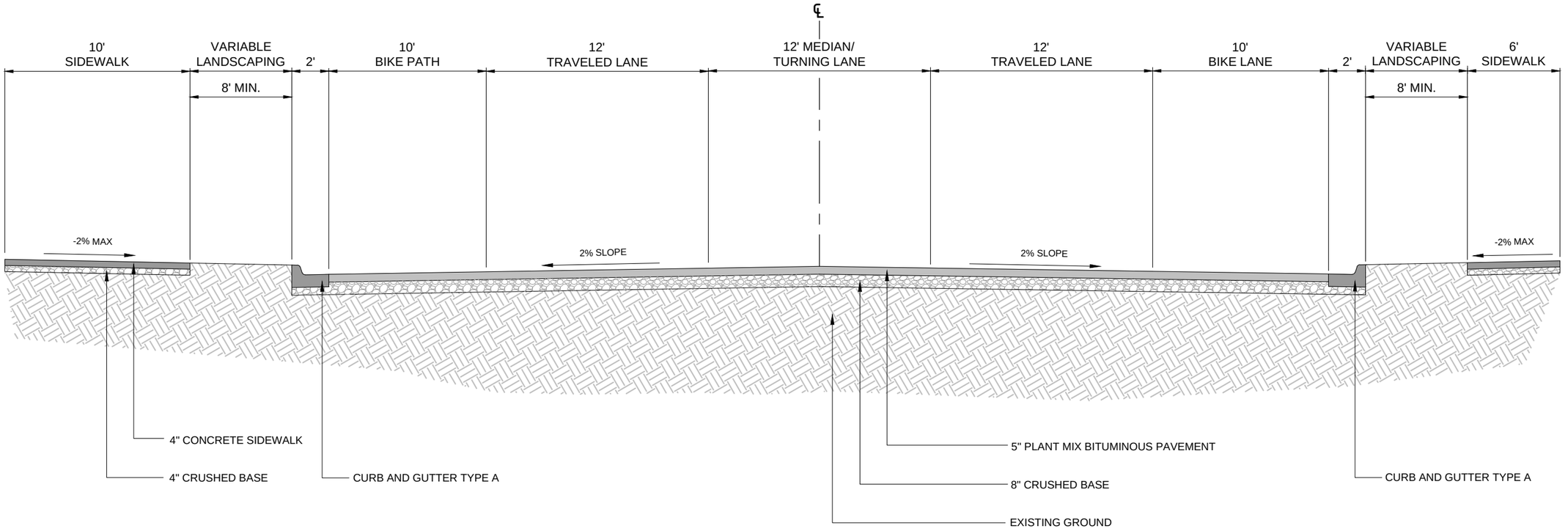
Sheet:
B.1



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Cheyenne, WY 82001

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Designed By: T.MATTSON	Drawn By: J.OAKLEY
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Internal Job No:	10038796
Surveyed By: N.FRASER	Survey Date: 8/2016
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CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

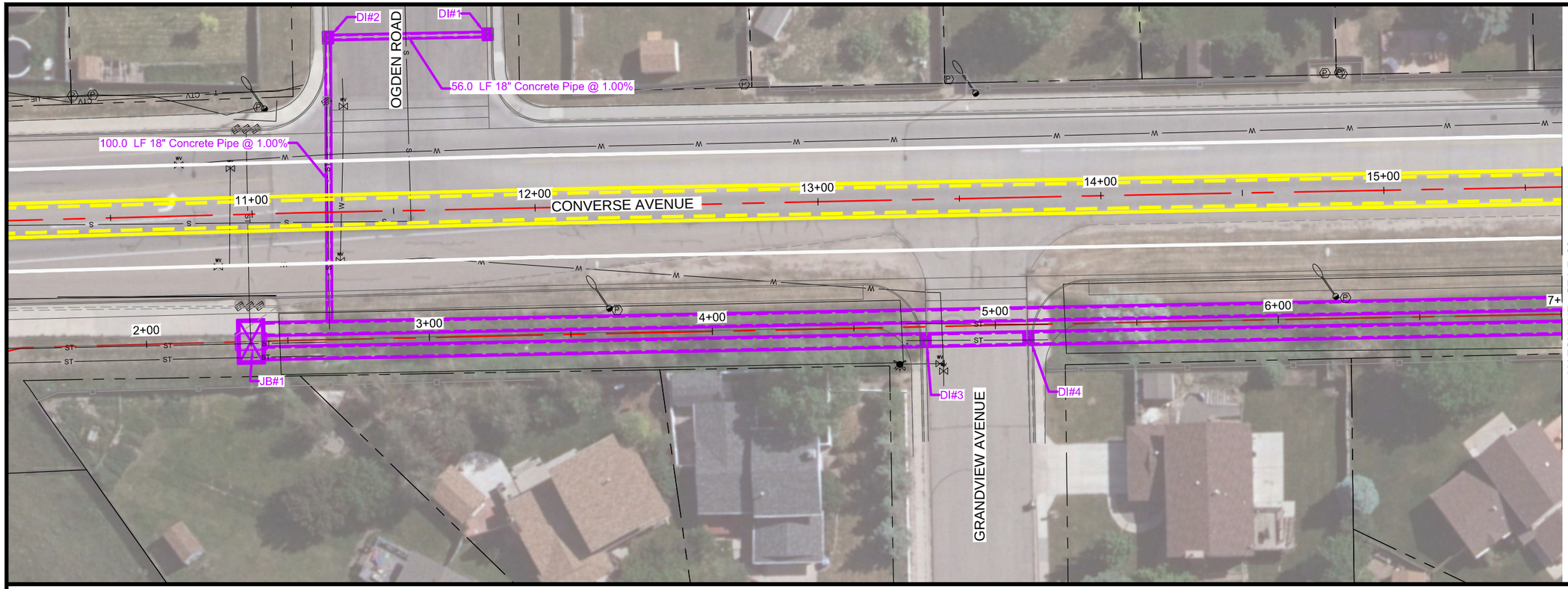
LARAMIE COUNTY, WYOMING

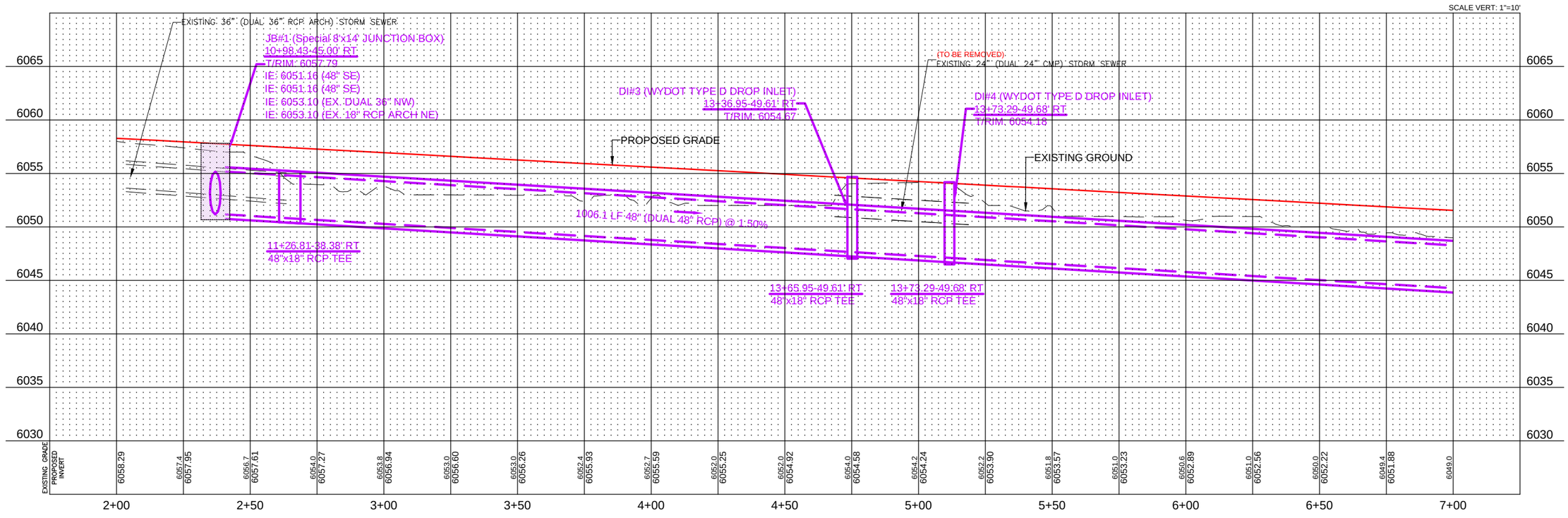
Project No. 10038796

Sheet Title:

TYPICAL SECTIONS

Sheet: C.1





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CONVERSE & DELL RANGE INTERSECTION
LARAMIE COUNTY, WYOMING

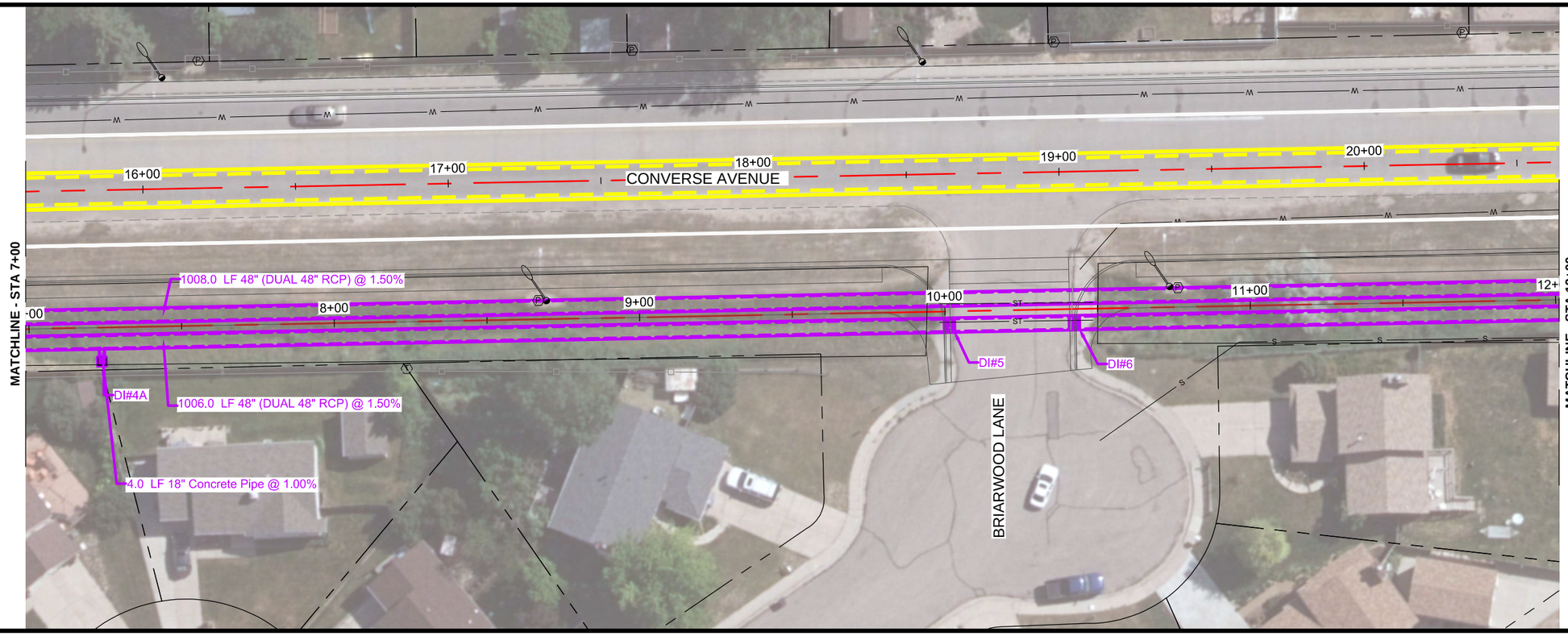
Project No. 10038796

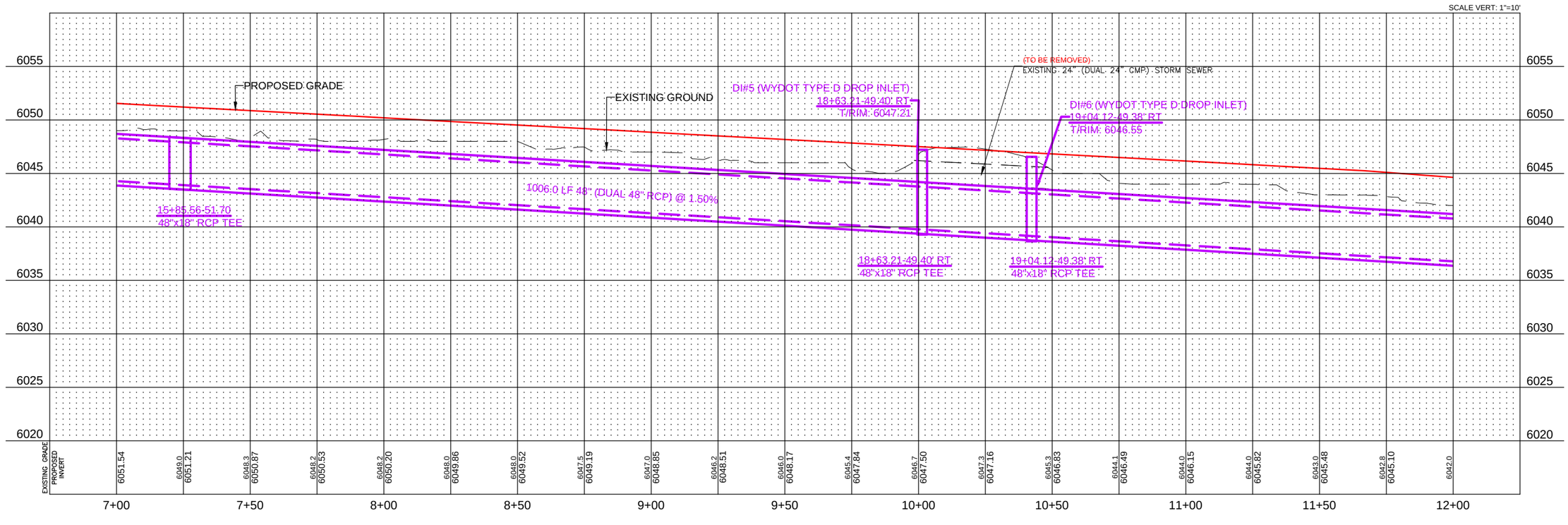
Sheet Title:

STORM SEWER PLAN AND PROFILE

Sheet:

I.1





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Suite 612
Cheyenne, WY 82001

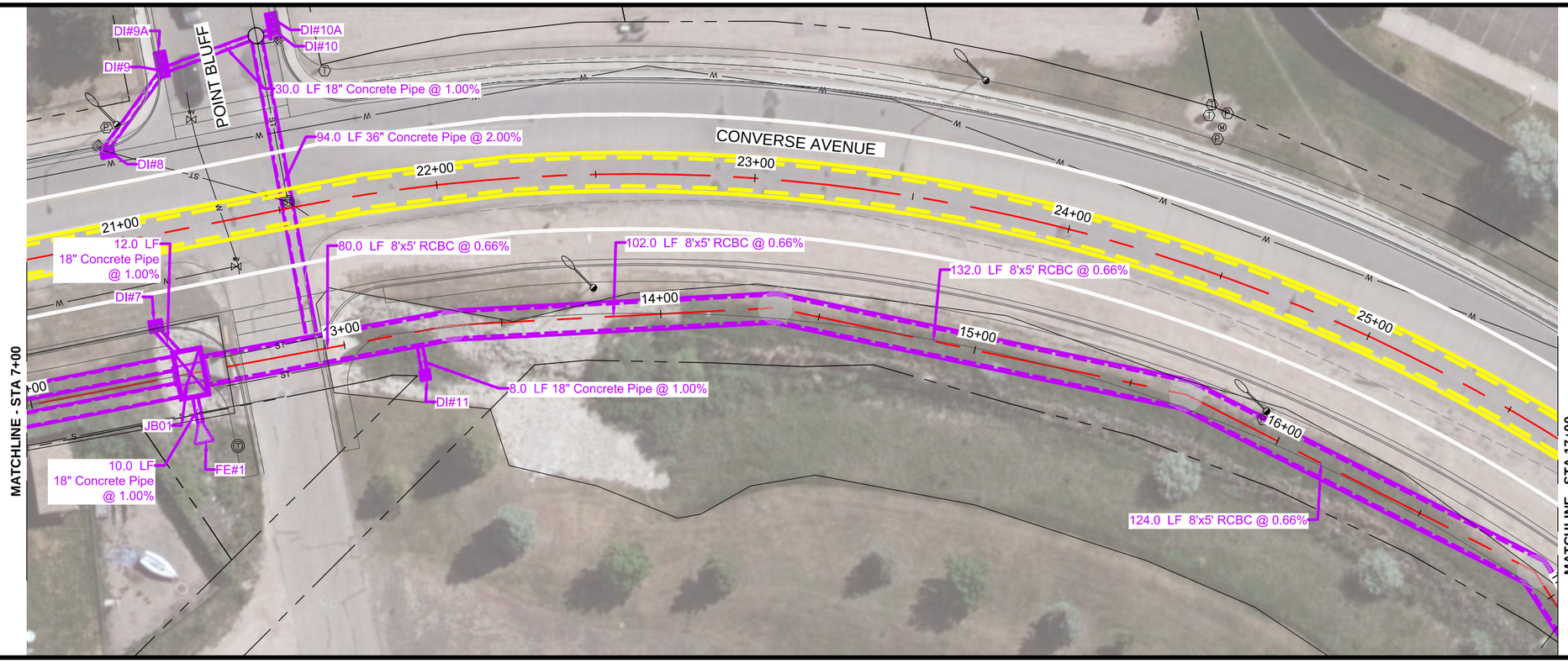
Scale:	
Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/7/2017	Print Date: 6/7/2017
Internal Job No:	10038796
Surveyed By: N.FRASER	Survey Date: 8/2016
Revisions:	

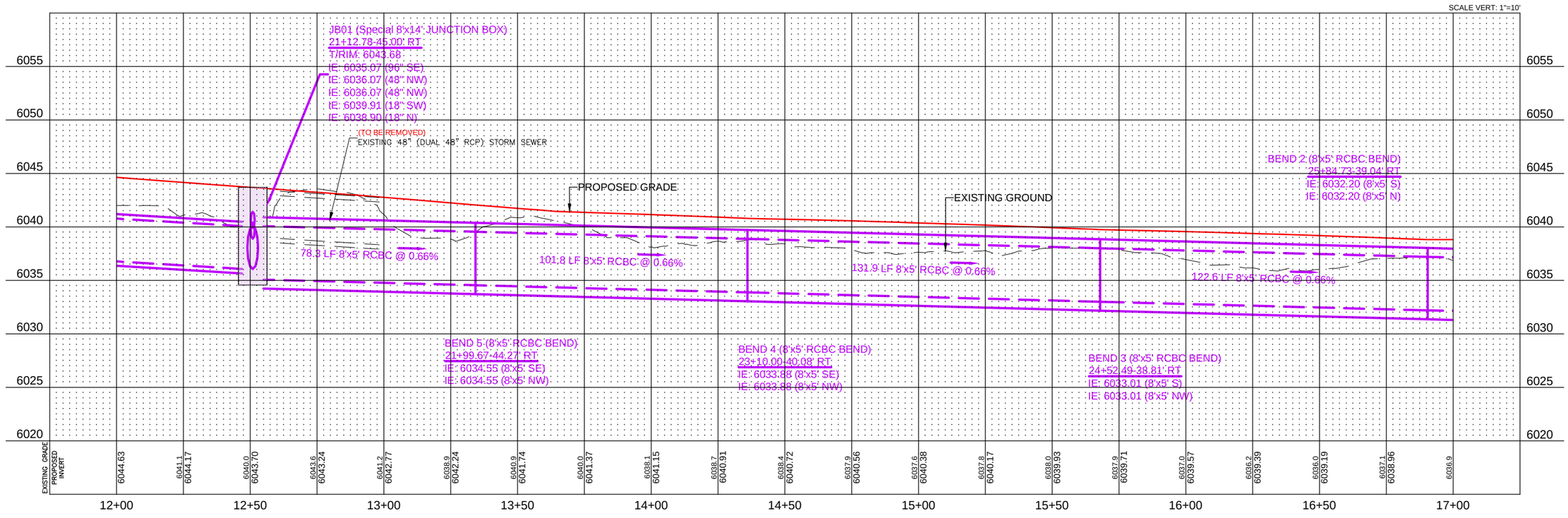
CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION
LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:
STORM SEWER PLAN AND PROFILE

Sheet:
I.2





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1720 Carey Ave.
Suite 612
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Prepared For:

Prepared By:

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/7/2017	Print Date: 6/7/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

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CONVERSE & DELL RANGE INTERSECTION
LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

STORM SEWER PLAN AND PROFILE

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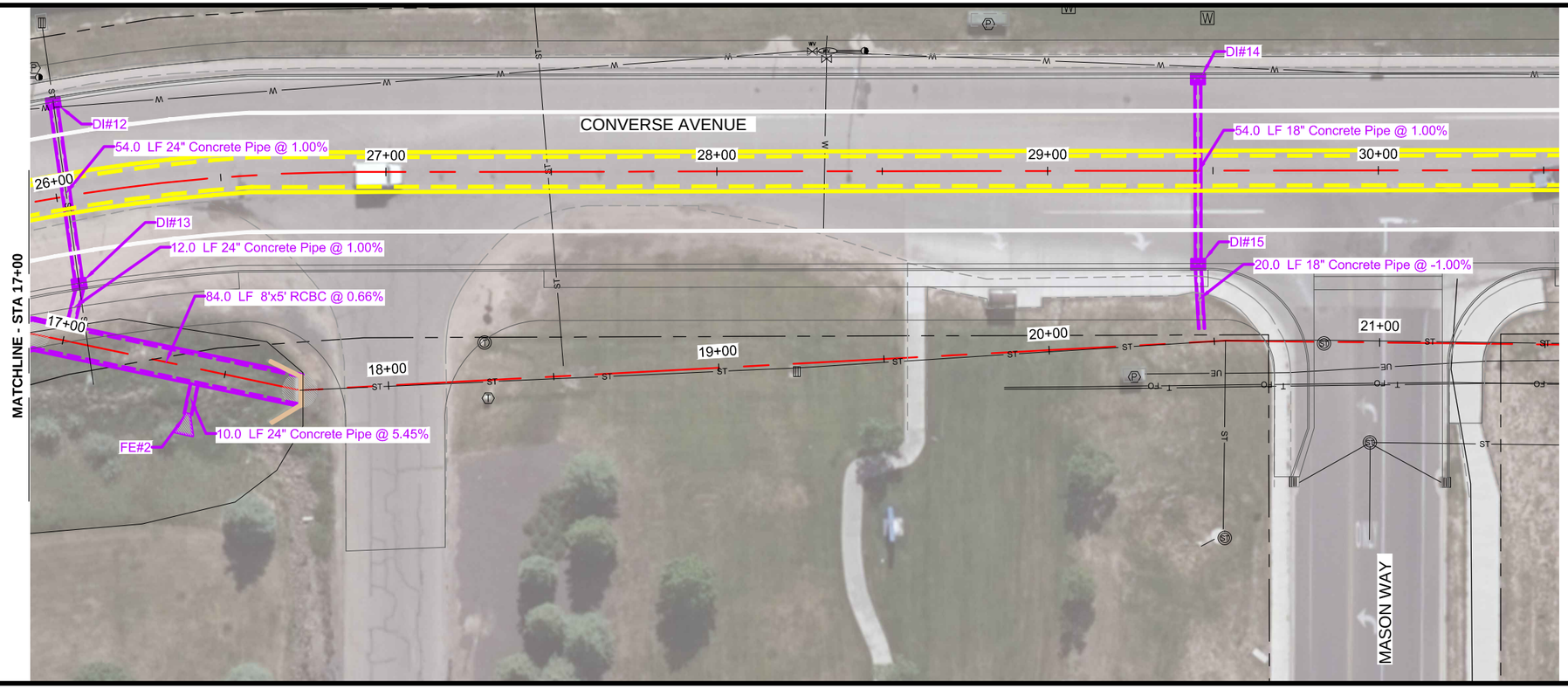
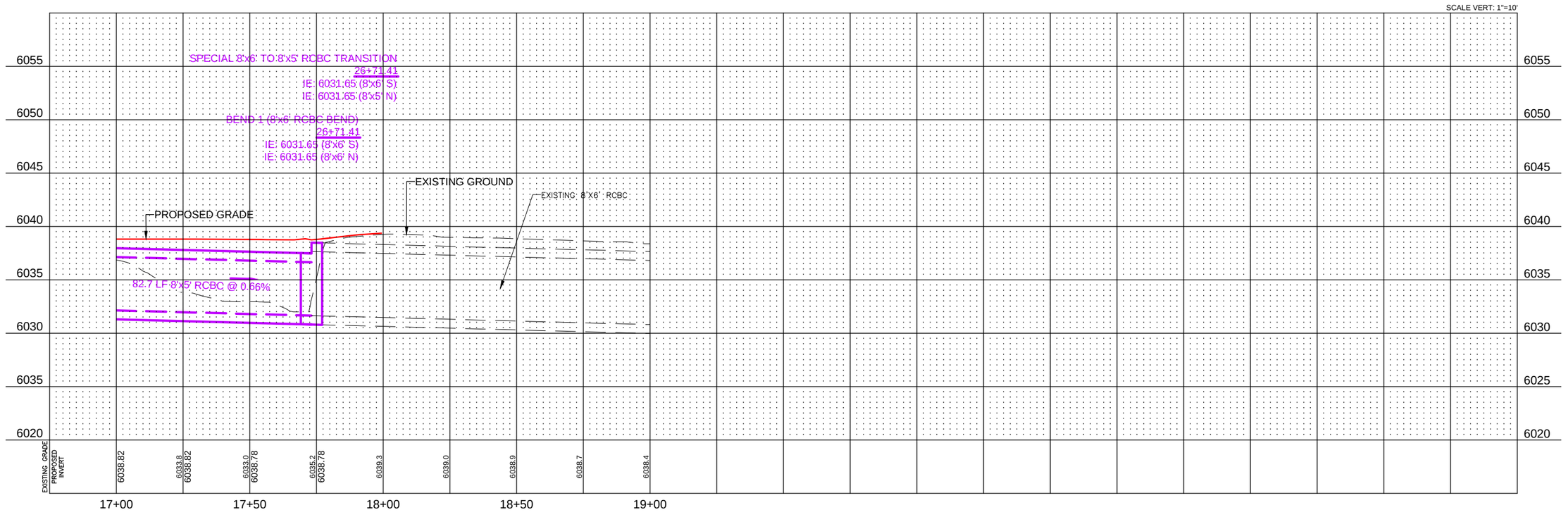
I.3





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Prepared By:

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Suite 612
Cheyenne, WY 82001

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Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/7/2017	Print Date: 6/7/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

Revisions:

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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

STORM SEWER PLAN AND PROFILE

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I.4

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PLOT DATE: 7/12/2017 1:33 PM Oakley, Julianna

Sheet: J.1

Sheet Title: OVERALL PAVEMENT PLAN

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Revisions:

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Survey Date: 8/2016

Internal Job No: 10038796
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Print Date: 7/12/2017

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Drawn By: J.OAKLEY

Scale:

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Cheyenne, WY 82001

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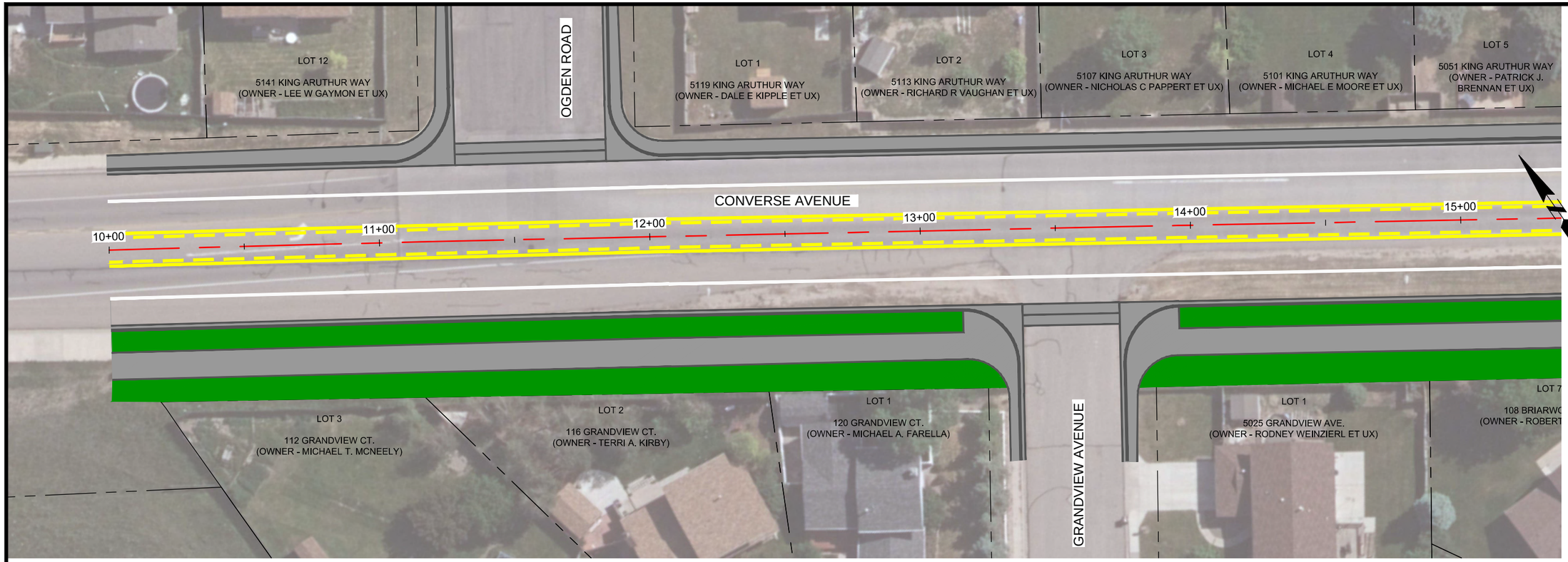

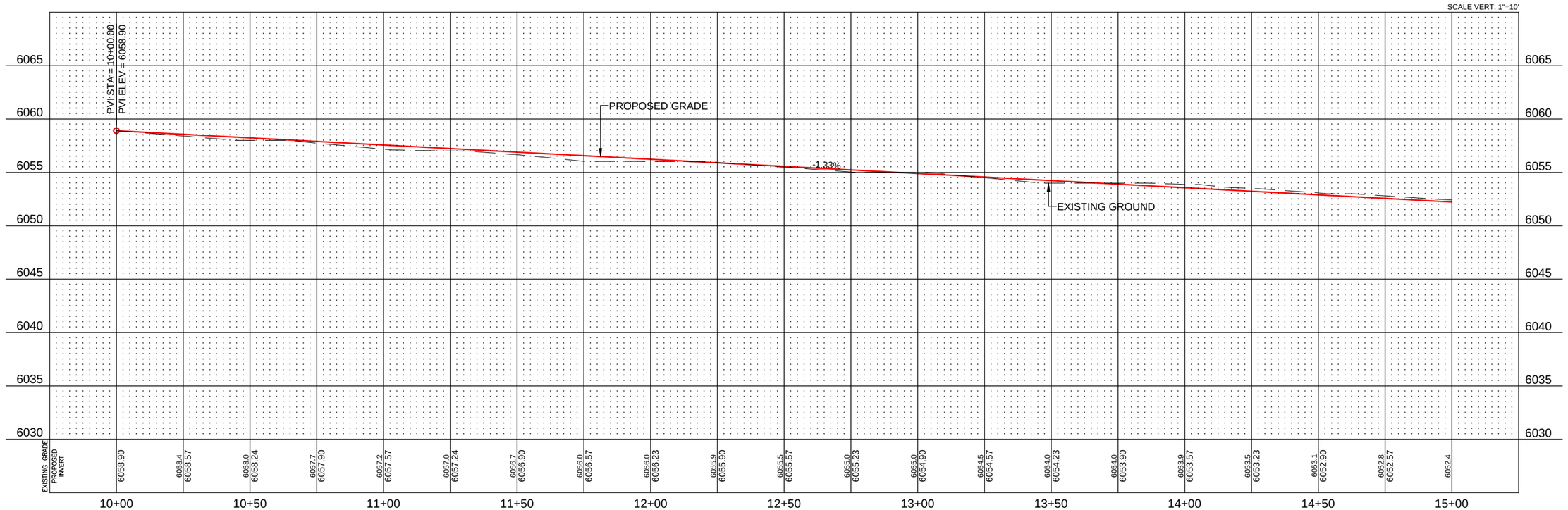

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Prepared For:

Prepared By:

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Cheyenne, WY 82001

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T.MATTSON	J.OAKLEY
Design Date:	Print Date:
7/19/2017	7/19/2017
Internal Job No:	10038796
Surveyed By:	Survey Date:
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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:
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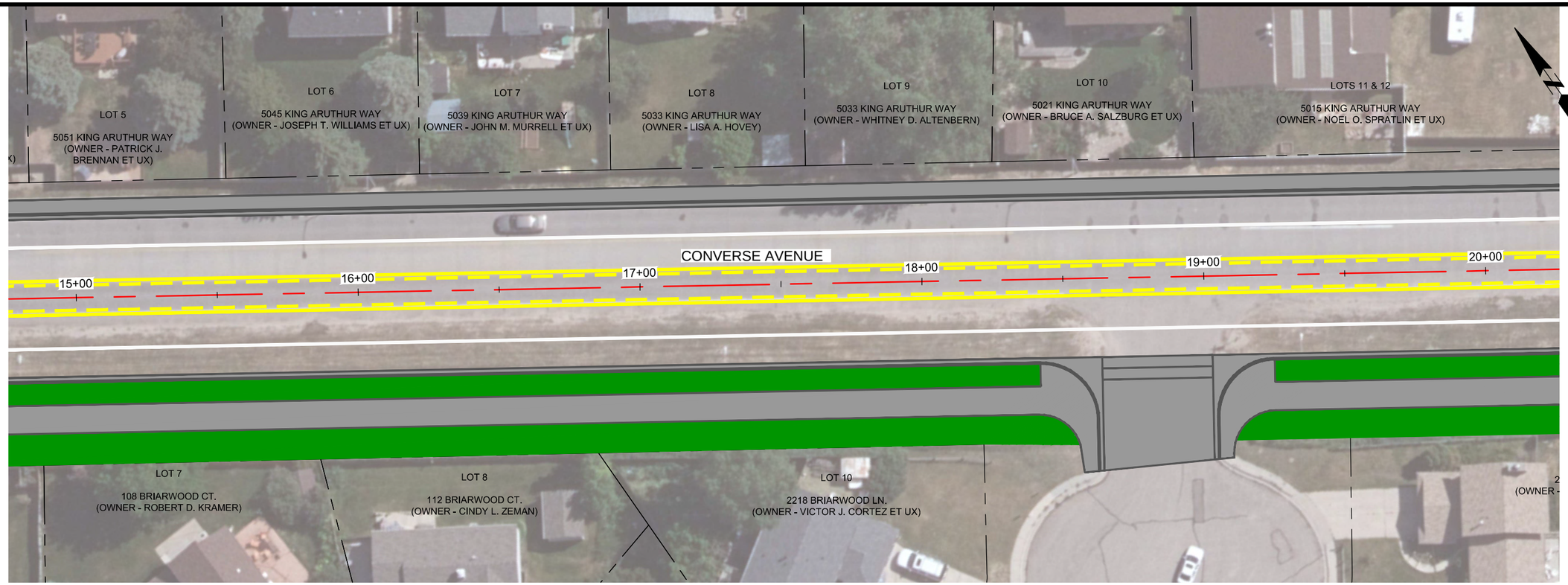
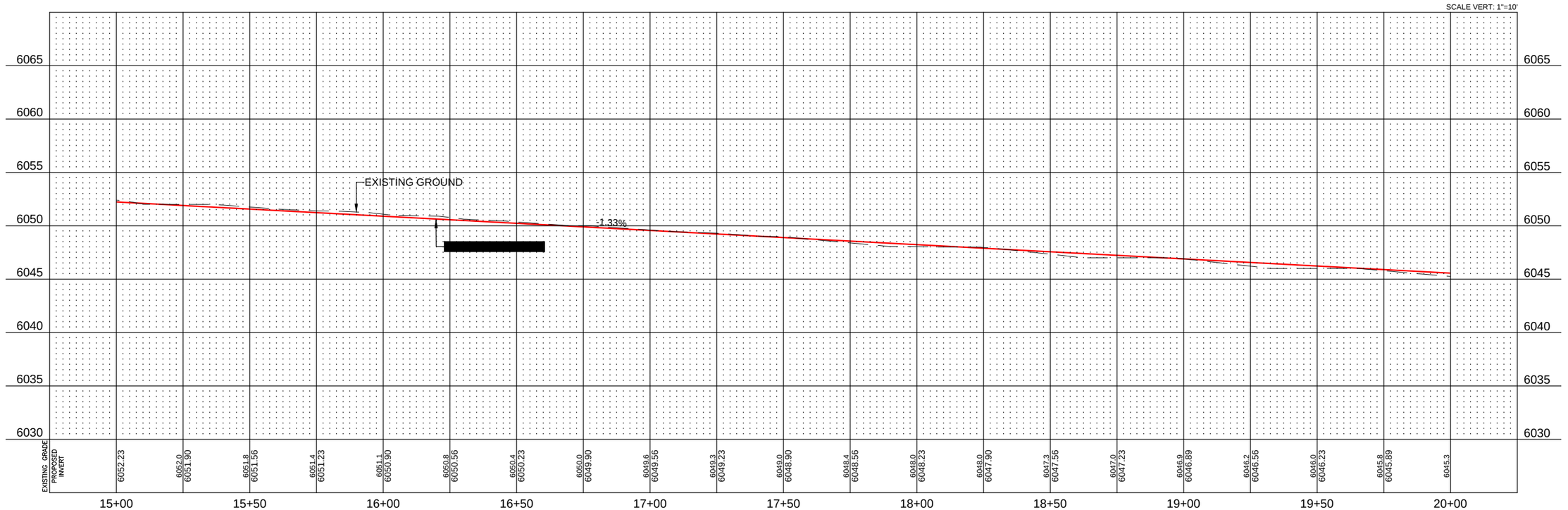
J.2





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Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:
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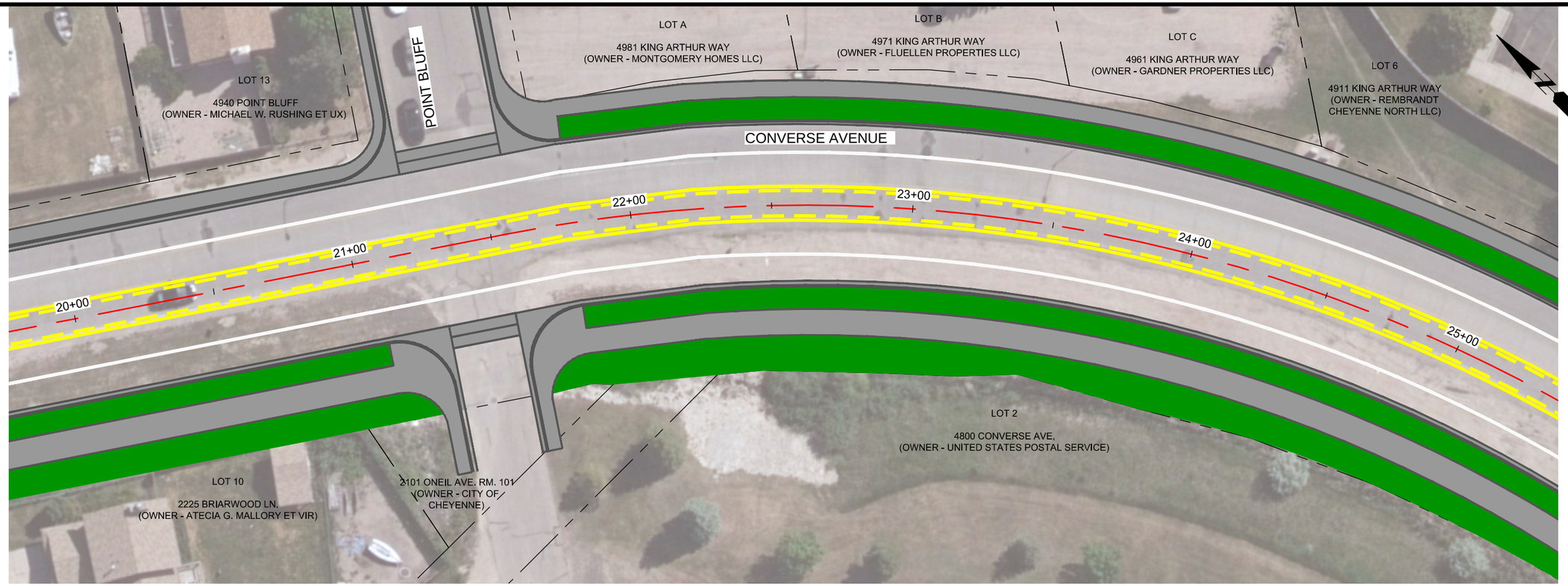

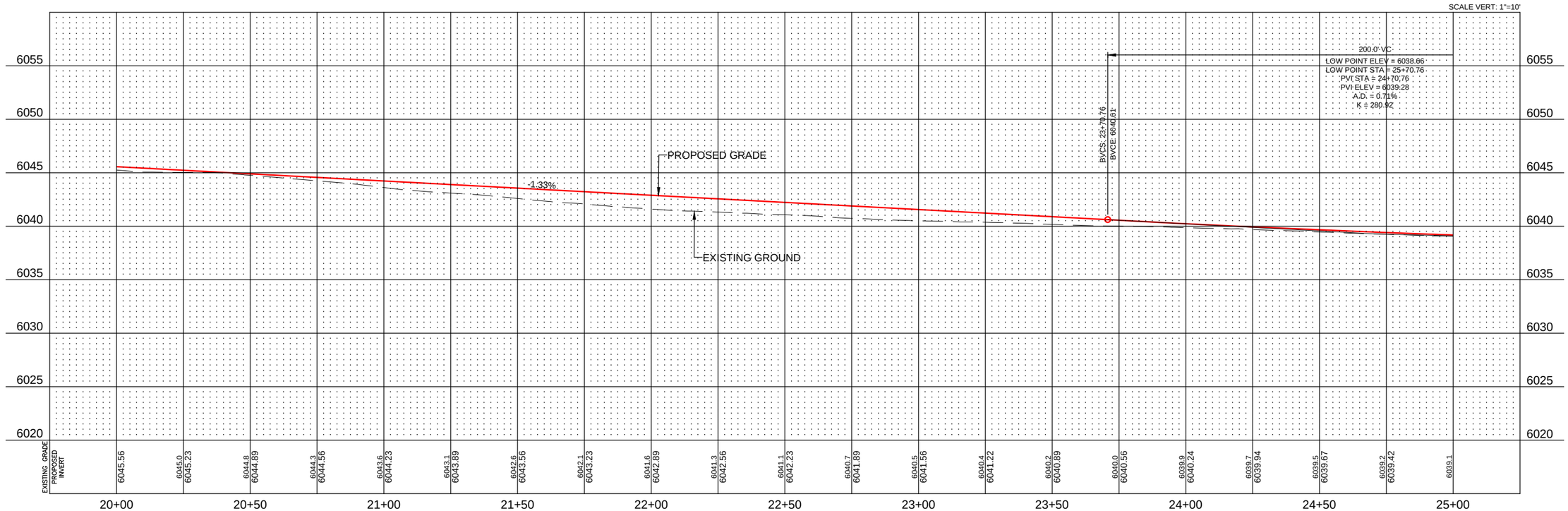

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Designed By: T.MATTSON	Drawn By: J.OAKLEY
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Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:
PLAN AND PROFILE STA 20+00 TO STA 25+00

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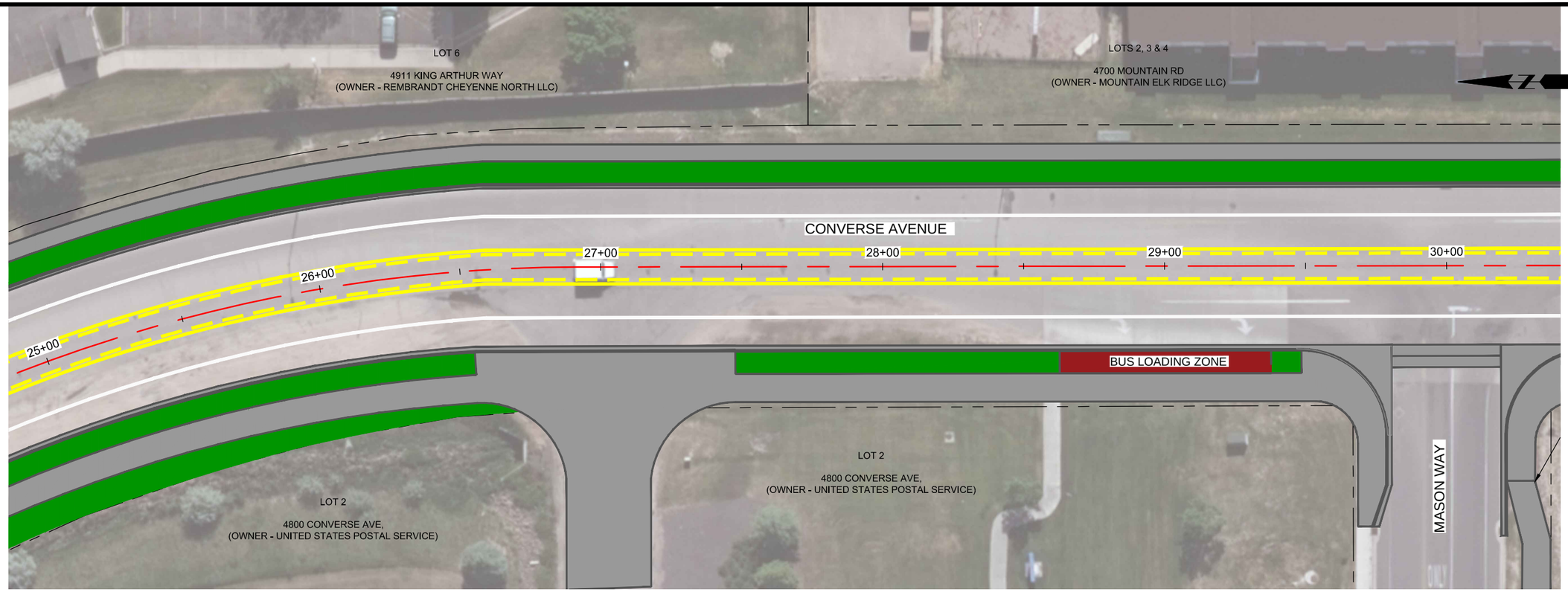

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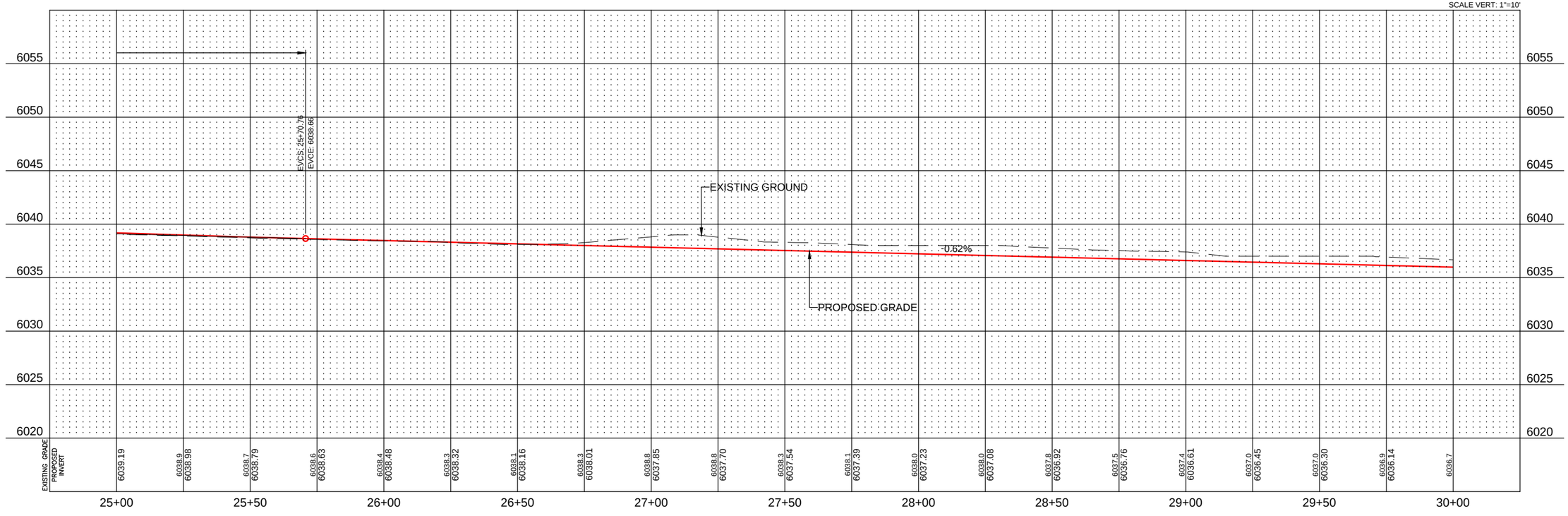

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Prepared By:

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 7/19/2017	Print Date: 7/19/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

PLAN AND PROFILE STA 25+00 TO STA 30+00

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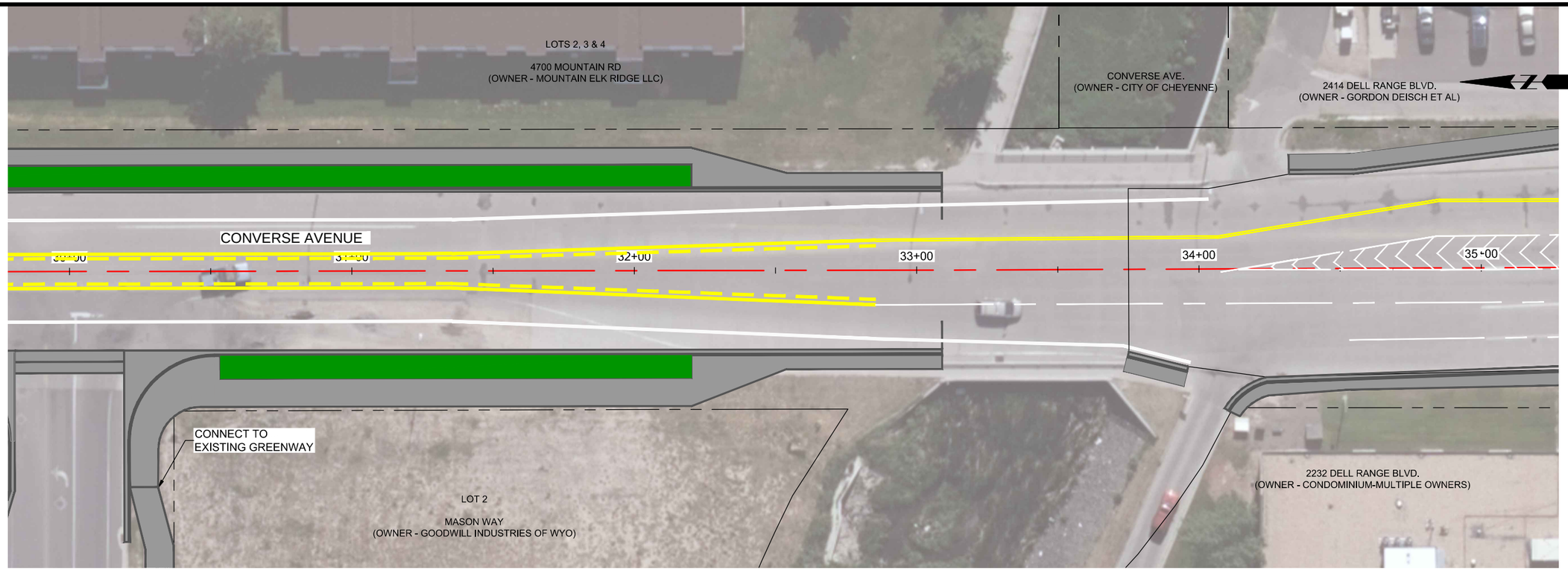

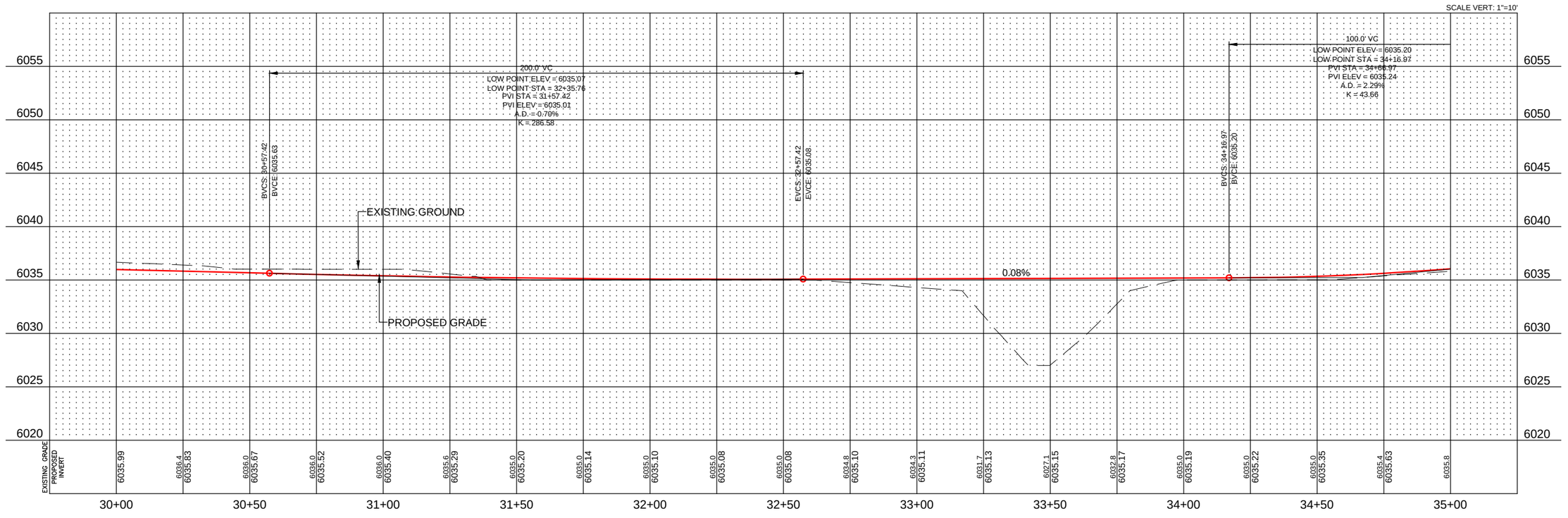

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Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

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CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

PLAN AND PROFILE STA 30+00 TO STA 35+00

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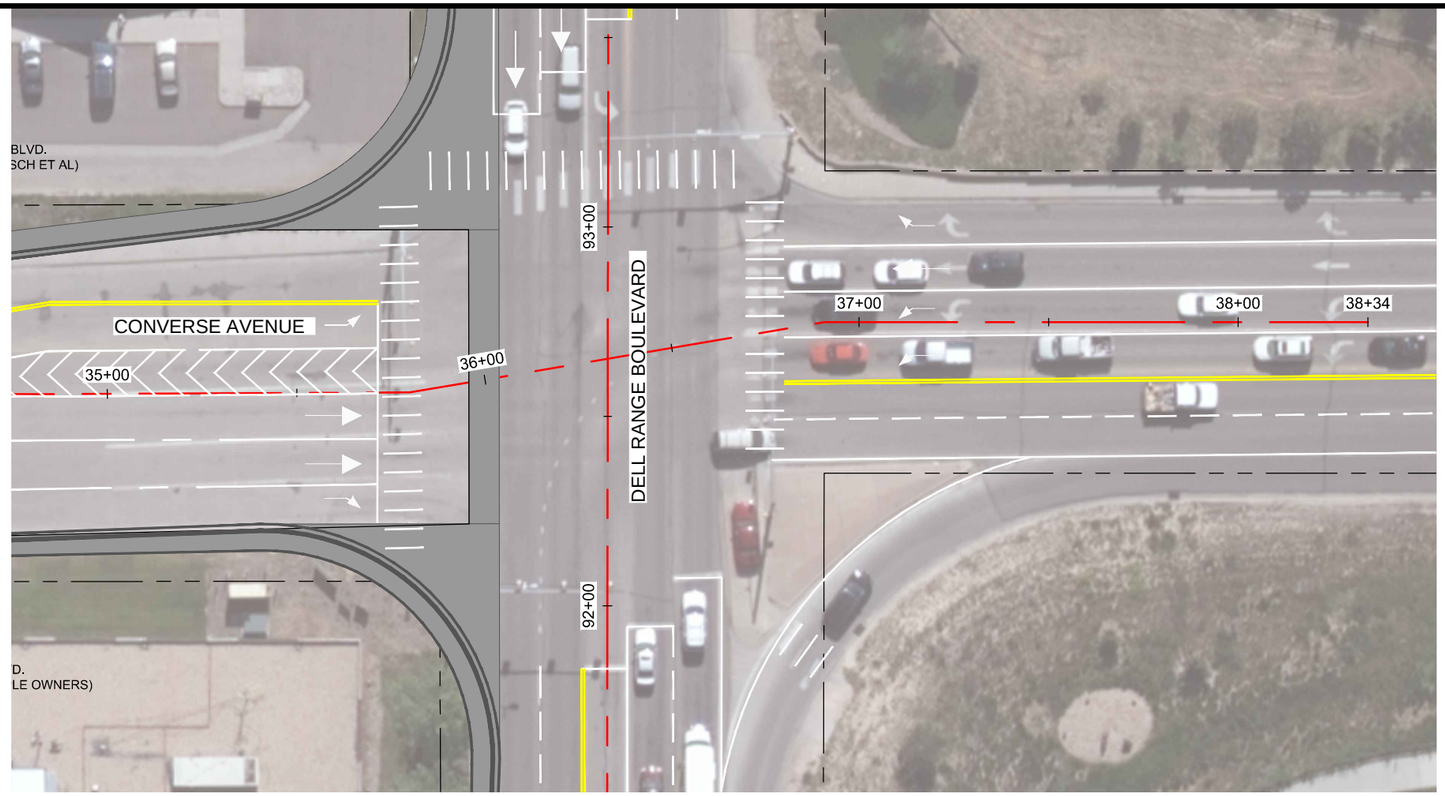

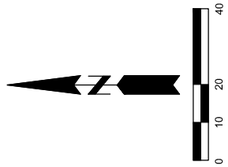

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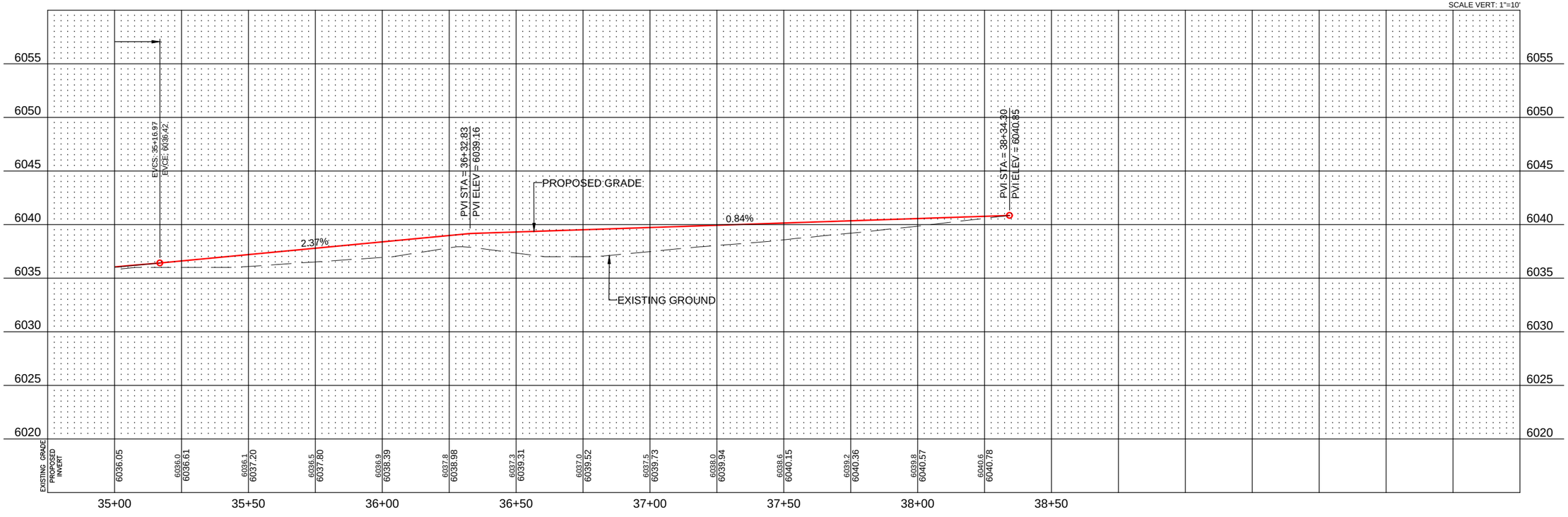

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Prepared By:

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Designed By: T.MATTSON	Drawn By: J.OAKLEY
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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

PLAN AND PROFILE STA 35+00 TO STA 38+34

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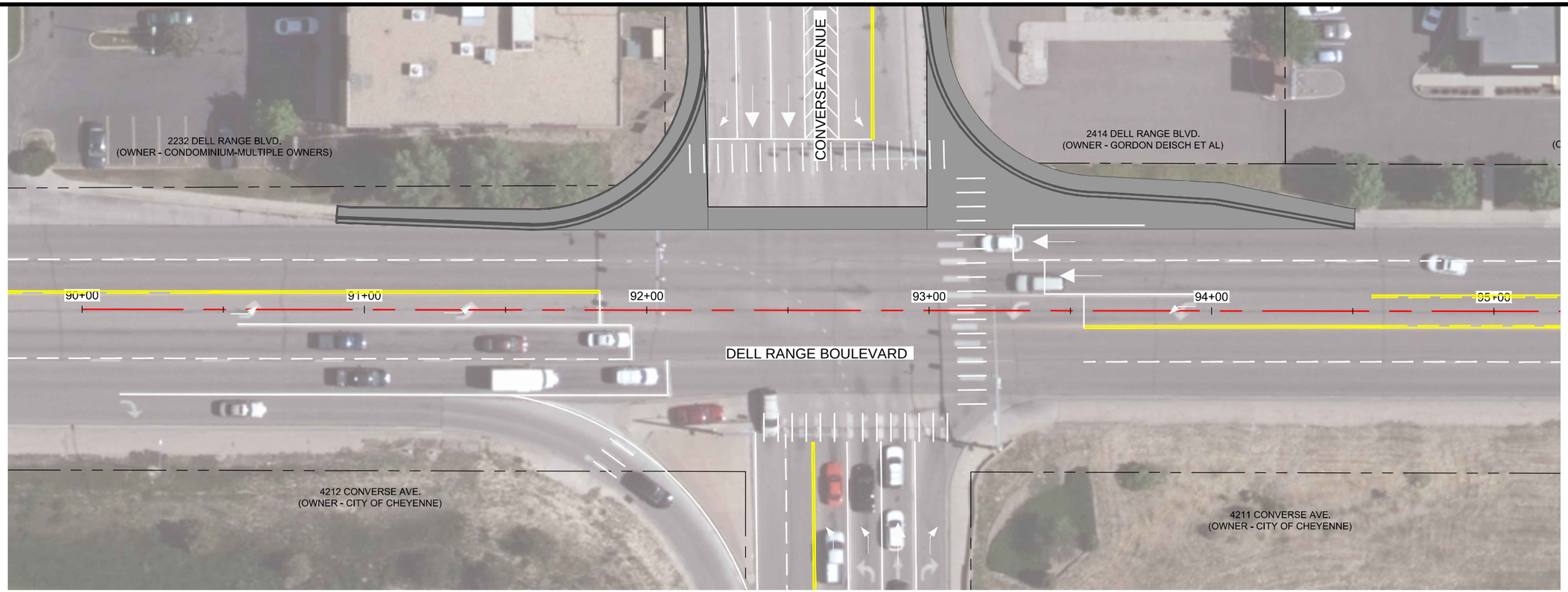

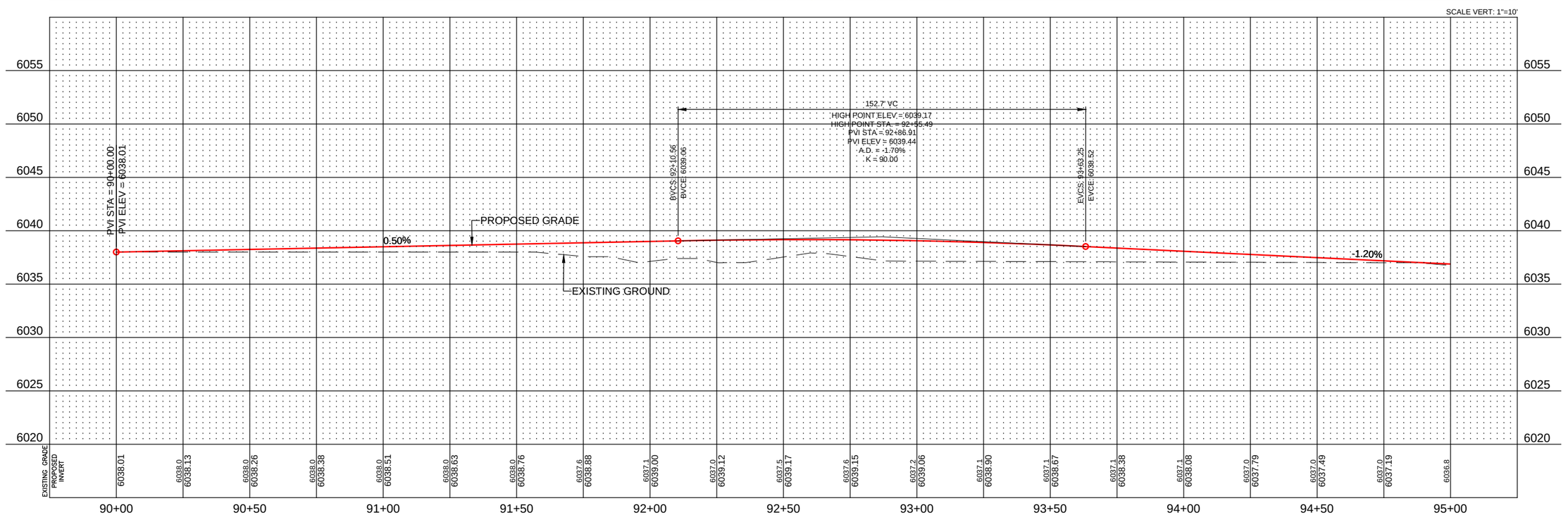

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Prepared For:

Prepared By:

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

PLAN AND PROFILE STA 90+00 TO STA 95+00

Sheet:

J.8

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PLOT DATE: 7/19/2017 5:09 PM Mattson, Todd

Appendix B

Engineer's Opinion of Probable Cost

CITY OF CHEYENNE MPO

CONVERSE AVENUE & DELL RANGE BOULEVARD 35% DESIGN

ENGINEER'S ESTIMATE (35%)

ITEM NO.	ITEM	UNIT	QUANTITY FOR ESTIMATE	BIDDING	
				UNIT PRICE	ITEM COST (QUANT. X UNIT PRICE)
100.00000	MOBILIZATION	LS	1	$ 275,000.00	$ 275,000.00
100.00000	FORCE ACCOUNT WORK	$$	1	$ 50,000.00	$ 50,000.00
100.00000	CONTRACT BOND	LS	1	$ 20,000.00	$ 20,000.00
100.00000	CONTRACTOR TESTING	LS	1	$ 25,000.00	$ 25,000.00
1050.01000	TEMPORARY TRAFFIC CONTROL	LS	1	$ 20,000.00	$ 20,000.00
1335.01000	CONSTRUCTION STAKING	LS	1	$ 25,000.00	$ 25,000.00
1563.01000	EROSION CONTROL AND STORMWATER MANAGEMENT	LS	6	$ 15,000.00	$ 90,000.00
2050.01000	REMOVAL OF TRAFFIC SIGNALS	EA	3	$ 1,500.00	$ 4,500.00
2050.02000	REMOVAL OF INLETS	EA	7	$ 1,000.00	$ 7,000.00
2075.02000	REMOVAL OF ASPHALT SURFACING	SY	500	$ 4.00	$ 2,000.00
2075.03000	REMOVAL OF CONCRETE SURFACING	SY	20000	$ 5.50	$ 110,000.00
2075.04000	REMOVAL OF CURB AND GUTTER	LF	5250	$ 3.75	$ 19,687.50
2210.05000	IMPORTED BORROW EXCAVATION	CY	400	$ 28.00	$ 11,200.00
2210.02000	UNCLASSIFIED EXCAVATION	CY	400	$ 30.00	$ 12,000.00
2231.01000	CRUSHED BASE	TON	9500	$ 30.00	$ 285,000.00
2280.02000	TOPSOIL BORROW	CY	1500	$ 12.00	$ 18,000.00
2512.03100	PLANT MIX BITUMINOUS PAVEMENT, GRADING A	TON	5000	$ 90.00	$ 450,000.00
2570.02000	ADJUST SEWER MANHOLE	EA	5	$ 500.00	$ 2,500.00
2725.01118	STORM SEWER MAIN, RCP, 18"	LF	275	$ 70.00	$ 19,250.00
2725.01124	STORM SEWER MAIN, RCP, 24"	LF	80	$ 85.00	$ 6,800.00
2725.01136	STORM SEWER MAIN, RCP, 36"	LF	100	$ 200.00	$ 20,000.00
2725.01148	STORM SEWER MAIN, RCP, 48"	LF	2020	$ 300.00	$ 606,000.00
2725.01510	8 'x 5' CONCRETE BOX CULVERT	LF	520	$ 900.00	$ 468,000.00
2725.01511	8 'x 5' CONCRETE BOX CULVERT BEND SECTION	EA	4	$ 10,000.00	$ 40,000.00
2725.01512	8' X 6' CONCRETE BOX CULVERT BEND SECTION	EA	1	$ 12,500.00	$ 12,500.00
2725.01513	8' x 5' TO 8' x 6' CONCRETE BOX CULVERT REDUCER	EA	1	$ 12,500.00	$ 12,500.00
2725.02250	FLAT TOP MANHOLE, 6-10; DEEP, 60" DIA.	EA	1	$ 7,000.00	$ 7,000.00
2725.03250	CONICAL MANHOLE, 6-10; DEEP, 96" DIA.	EA	2	$ 8,500.00	$ 17,000.00
2725.03500	8' x 14' REINFORCED CONCRETE JUNCTION BOX	EA	2	$ 17,500.00	$ 35,000.00
2725.03600	18" x 48" RCP TEE SECTION	EA	2	$ 5,000.00	$ 10,000.00
2725.04180	FLARED END SECTION, RCP, 18" DIA.	EA	1	$ 1,200.00	$ 1,200.00
2725.04240	FLARED END SECTION, RCP, 24" DIA.	EA	1	$ 1,750.00	$ 1,750.00
2725.06100	TYPE "A" INLET	EA	10	$ 3,750.00	$ 37,500.00
2725.06500	WYDOT TYPE "B" INLET	EA	2	$ 4,000.00	$ 8,000.00
2725.06500	WYDOT TYPE "C" INLET	EA	2	$ 4,250.00	$ 8,500.00
2725.06500	WYDOT TYPE "D" INLET	EA	4	$ 3,800.00	$ 15,200.00
2805.02000	SIGN PANELS	SF	500	$ 30.00	$ 15,000.00
2805.03000	SIGN POST, SQ TUBULAR STL	EA	12	$ 650.00	$ 7,800.00
2815.00000	PERMANENT STRIPING (THERMOPLASTIC)	LS	1	$ 15,000.00	$ 15,000.00
2900.01000	LANDSCAPING	SF	3750	$ 7.50	$ 28,125.00
2900.02000	SEEDING	SF	2500	$ 1.50	$ 3,750.00
2900.04000	SODDING	SF	3750	$ 3.50	$ 13,125.00
3330.01050	CURB AND GUTTER TYPE "A" (24 in)	LF	5800	$ 22.00	$ 127,600.00
3340.01000	CURB TURN FILLET	SF	3600	$ 12.00	$ 43,200.00
3340.02000	CONCRETE VALLEY GUTTER (8 in)	SF	575	$ 10.00	$ 5,750.00
3340.03000	CONCRETE SIDEWALK (4 in)	SF	38500	$ 6.00	$ 231,000.00
3340.07000	DETECTABLE WARNING PLATE	EA	14	$ 300.00	$ 4,200.00
4040.01200	DRILLED CAISSON	LF	60	$ 250.00	$ 15,000.00
4040.07500	TRAFFIC SIGNAL LIGHT POLE STEEL (40' MAST ARM)	EA	3	$ 15,000.00	$ 45,000.00

SUBTOTAL	$	3,307,637.50
CONTINGENCY (30%)	$	992,291.25
ENGINEERING (15%)	$	644,989.31
TOTAL	$	4,944,918.06

INTERSECTION SHORT TERM IMPROVEMENTS ONLY					
ITEM NO.	ITEM	UNIT	QUANTITY FOR ESTIMATE	BIDDING UNIT PRICE	BIDDING ITEM COST (QUANT. X UNIT PRICE)
100.00000	MOBILIZATION	LS	1	$ 30,000.00	$ 30,000.00
100.00000	FORCE ACCOUNT WORK	$$	1	$ 10,000.00	$ 10,000.00
100.00000	CONTRACT BOND	LS	1	$ 3,000.00	$ 3,000.00
100.00000	CONTRACTOR TESTING	LS	1	$ 7,500.00	$ 7,500.00
1050.01000	TEMPORARY TRAFFIC CONTROL	LS	1	$ 10,000.00	$ 10,000.00
1335.01000	CONSTRUCTION STAKING	LS	1	$ 5,000.00	$ 5,000.00
1563.01000	EROSION CONTROL AND STORMWATER MANAGEMENT	LS	1	$ 3,500.00	$ 3,500.00
2050.01000	REMOVAL OF TRAFFIC SIGNALS	EA	3	$ 2,000.00	$ 6,000.00
2050.02000	REMOVAL OF INLETS	EA	3	$ 1,250.00	$ 3,750.00
2075.02000	REMOVAL OF ASPHALT SURFACING	SY	1760	$ 4.00	$ 7,040.00
2075.04000	REMOVAL OF CURB AND GUTTER	LF	650	$ 4.00	$ 2,600.00
2231.01000	CRUSHED BASE	TON	1210	$ 30.00	$ 36,300.00
2512.03100	PLANT MIX BITUMINOUS PAVEMENT, GRADING A	TON	660	$ 90.00	$ 59,400.00
2725.01136	STORM SEWER MAIN, RCP, 36"	LF	80	$ 250.00	$ 20,000.00
2725.06100	TYPE "A" INLET	EA	4	$ 3,750.00	$ 15,000.00
2815.00000	PERMANENT STRIPING (THERMOPLASTIC)	LS	1	$ 10,000.00	$ 10,000.00
3330.01050	CURB AND GUTTER TYPE "A" (24 in)	LF	650	$ 23.00	$ 14,950.00
3340.01000	CURB TURN FILLET	SF	3000	$ 12.00	$ 36,000.00
3340.02000	CONCRETE VALLEY GUTTER (8 in)	SF	650	$ 12.00	$ 7,800.00
3340.03000	CONCRETE SIDEWALK (4 in)	SF	2760	$ 6.00	$ 16,560.00
3340.07000	DETECTABLE WARNING PLATE	EA	4	$ 350.00	$ 1,400.00
4040.01200	DRILLED CAISSON	LF	60	$ 250.00	$ 15,000.00
4040.07500	TRAFFIC SIGNAL LIGHT POLE STEEL (40' MAST ARM)	EA	3	$ 15,000.00	$ 45,000.00
			SUBTOTAL		$ 365,800.00
			CONTINGENCY (30%)		$ 109,740.00
			ENGINEERING (15%)		$ 71,331.00
			TOTAL	$	546,871.00

Appendix C

Technical Memoranda

A. Dell Range – Converse Avenue Intersection Alternatives Analysis Tech Memo
B. Drainage Design Tech Memo
C. Preliminary Environmental Consideration Tech Memo

Memo

Date:	Friday, January 13, 2017
Project:	Dell Range-Converse Intersection and 35% Design Plan
To:	Brandon Gebhart
From:	John Seyer
Subject:	Dell Range-Converse Intersection Alternatives Analysis Tech Memo

This technical memorandum documents the process of developing and evaluating alternatives for improvements to the Dell Range Boulevard & Converse Avenue intersection, as well as selection of the preferred alternative.

I. Existing Conditions

The Dell Range-Converse intersection is located in the northeast portion of the city of Cheyenne. This intersection connects two major routes in the city. Dell Range Boulevard is a four-lane major arterial that connects from Yellowstone Road on the west to the developing eastern portions of the city. Dell Range also provides connectivity to the most intensive retail development in Cheyenne, which includes the Frontier Mall. Converse Avenue is a four-lane minor arterial that provides connectivity from Lincolnway on the south, which provides access to downtown Cheyenne, to the developing northern portion of the city. The confluence of these two roadways creates this major intersection, which is known for being the most congested and highest crash occurrence intersection in the city, possibly even the state.

The current configuration of the intersection includes an exclusive left-turn lane and exclusive right-turn lane in each direction, except for the northbound approach that includes two exclusive left-turn lanes. Also, the eastbound right-turn lane is channelized. The intersection is signalized, with split phasing for the northbound and southbound approaches and a flashing yellow arrow for the eastbound left-turn and westbound left-turn movements. This signal operates in coordination along Dell Range Boulevard, with the coordinated corridor limits extending from College Drive on the east to Powderhouse Road on the west.

Existing traffic volumes for the AM, Midday and PM peak hours were gathered by the City earlier this year and provided to HDR for use in this project. The City also provided existing signal timing parameters for this intersection. These traffic volumes, the intersection geometrics and the traffic signal timing parameters were loaded into the project's traffic operations analysis model. The model was run and the results yielded LOS E, LOS C and LOS C for the AM, Midday and PM peak hours, respectively.

Crash statistics from 2006 to 2015 show a safety concern for this intersection. Within the past 10 years, there have been a total of 264 crashes at the Dell Range Boulevard and Converse Avenue intersection.

During this time, approximately 147 people were injured, making this intersection one of the most dangerous intersections in the state of Wyoming. From 2006 to 2015, rear end collisions have increased approximately 20%. On average, 67% of all crashes that occurred at the Dell Range - Converse intersection within the past 10 years had reported property damage. In addition to rear end collisions, T-Bone/right angle crashes have doubled between 2014 and 2015. This could attribute to why over 90% of all crashes in this intersection occurred when vehicles were traveling in the East – West direction.

II. Alternatives Development and Analysis

The development of alternatives was based on the steering committee's understanding of the intersection's deficiencies and the project's needs. Below is a description of this process.

Identification of Deficiencies. In order to establish the current conditions of the Dell Range – Converse intersection, a model of the existing configuration was developed. The results concluded that the existing intersection with current traffic volumes functions at a LOS E in the AM, which is considered poor and a LOS C during the MD and PM peaks. If the intersection stays in its current configuration, it is projected that the level of service will only get worse due to increased traffic volumes. In addition to a continuance of poor level of service, the safety conditions of this intersection will also decrease. The Dell Range – Converse intersection is already considered one of the most dangerous intersections in the state, as mentioned in the safety discussion above, and if no improvements are made to the intersection, this intersection very well could become the most dangerous intersection in the state.

Alternatives Development. The alternatives that were analyzed for this intersection originated from HDR's proposal and were refined and finalized by the Steering Committee. The citizens of Cheyenne have been open to unique ideas that will maximize capacity and enhance safety at the Dell Range – Converse intersection. Currently, there are three alternative designs in place around the City of Cheyenne: the Vandehei corridor (the City's first experiment with a traffic calming corridor), the multi-lane roundabout at the Converse-Pershing-19th intersection, and the diverging diamond interchange (DDI) at I-25 & College Drive. With these in mind as well as the conversations with City staff and citizens, HDR has developed seven alternative designs for the Dell Range-Converse intersection.

The list of alternatives is as follows:

1. No-Build
2. Dual Left-Turn Lanes
3. Modern Roundabout
4. Continuous Flow Intersection – Full
5. Continuous Flow Intersection – Modified
6. ThruTurn Intersection – Signals
7. ThruTurn Intersection – Roundabouts

Below are a brief description and a figure that illustrates each alternative.

No-Build. The option to not make any significant improvements provides a benchmark against which all other alternatives can be measured. The No-Build represents the conditions of the intersection in the future without major improvements, although some minor improvements or other previously committed improvements can be made. For this project, it was assumed that widening of the north leg would occur such that the split phasing will be eliminated and right-turn arrows will be added that will indicate to drivers that right turns are protected during the green time of the corresponding left-turn (i.e. the northbound right-turn movement would be given a green arrow simultaneously with the westbound left-turn movement).

Dual Left-Turn Lanes. The first build alternative includes improving on the No-Build by adding a second left-turn lane to the eastbound, southbound and westbound approaches. The projected westbound left-turn volumes indicate that dual lefts may be warranted, and providing a second southbound left-turn lane is simple geometrically since the northbound approach leg already has dual lefts; both receiving legs of these turn movements already have two lanes. The eastbound left-turn movement is not as simple, given that the north leg has only one receiving lane. The traffic volumes for this movement are fairly low, so consideration was given to keeping this movement as a single left-turn lane.

Modern Roundabout. The modern roundabout was conceived as a viable option given the city's familiarity with roundabouts, the large percentages of left turns on some legs, and the fact that the crash history indicates that the conflict between thru movements and the opposing left-turn movements experience a persistence of crashes. This would be a multi-lane roundabout, possibly with three approach lanes from the south.

Continuous Flow Intersection – Full. A continuous flow intersection (CFI) provides left-turn movements that are removed from the intersection for the benefit of reducing conflict points at the primary intersection and increasing the intersection's capacity. The left turns occur upstream of the primary intersection so that they can turn onto the approaching cross street at the same time as the opposing through movements. This alternative provides five two-phase signalized intersections that control traffic as it passes through the "intersection complex."

Continuous Flow Intersection – Modified. The differences between the CFI-Modified alternative and the CFI-Full intersection are represented in the number of displaced left-turn movements. Based on volumes and crash history, the northbound left turns and the westbound left turns are the two movements that need additional capacity and conflict point mitigation. The traffic volumes at the other two left-turn movements are far less impactful to capacity and safety. In addition, modifying the CFI in this manner takes advantage of available right-of-way without impacting existing businesses.

ThruTurn Intersection – Signals. The ThruTurn intersection offers similar intersection capacity benefits as the CFI in that left turns do not occur at the primary intersection. The difference is that traffic wishing to make a left turn must make a different maneuver at the intersection and make a turn at a downstream intersection before reaching its final destination. As an example,

to make a northbound left turn, traffic would proceed north through the intersection along Converse Avenue to the Masonway intersection where this traffic would make a u-turn, followed by a right-turn onto westbound Dell Range Boulevard. The "outlier" intersections would have minor geometric changes made to them to accommodate the u-turn movement, and those intersections would be signalized.

ThruTurn Intersection – Roundabouts. This iteration of the ThruTurn intersection would provide modern roundabouts at the outlier intersections instead of traffic signals. This alternative would facilitate the u-turn movements effectively without introducing three new traffic signals.

Alternatives Analysis. The seven alternatives were evaluated against the evaluation criteria that were listed in the (memo). The criteria were established based on the values that the steering committee expressed to the design team and what the public shared at the first public open house. These criteria included:

1. Safety
2. Ease of Use
3. Congestion/Queuing
4. Business Access
5. Drainage
6. Land Acquisition

Initially, the alternatives were analyzed using the criteria of improved safety, ease of use, and reduction of congestion and queuing. The results of this analysis were presented to the steering committee to refine the alternatives down to three final alternatives. The congestion/queuing criterion was analyzed quantitatively using operations analysis software, as described below. The safety criterion was based on how effectively each alternative would reduce the overall number of conflict points. As such, this criterion was evaluated initially quantitatively, although some results were tweaked qualitatively. The ease of use criterion was evaluated qualitatively based on the complexity of the intersection, with consideration given to out-of-direction travel and how well pedestrians and bicyclists could maneuver through the intersection. Below is a description of how the alternatives were evaluated against these three criteria.

Safety. As noted above, this criterion was evaluated initially based on the number of conflict points within the intersection for each alternative. Given that some alternatives involve just the Dell Range-Converse intersection, while others involve the Mountain Road, Masonway and Grandview Avenue intersections, it's important that we include all four intersections in each alternative. Given these considerations, below are the total numbers of conflict points for each alternative:

- No-Build = 59
- Dual Left-Turn Lanes = 59
- Modern Roundabouts = 35
- CFI – Full = 44

- CFI – Modified = 54
- ThruTurn – Signals = 38
- ThruTurn – Roundabouts = 28

Ease of Use. The Ease of Use criterion was evaluated with a qualitative approach. This approach considered the complexity of the intersection for all modes of travel, including vehicular traffic and pedestrian and bicycle traffic.

Congestion/Queuing. The Synchro/SimTraffic software suite was used to analyze the operations for all of the alternatives, except for the modern roundabout alternatives; the modern roundabouts were analyzed using Rodel. Models for the AM peak, MD peak, and PM peak, using projected 2040 volumes, were developed for all alternatives. The future-year volumes were based on ADTs from the Dell Range Corridor Study and the estimated Section 20 development patterns.

The primary focus of the analysis was the functionality of the Dell Range Boulevard and Converse Avenue intersection (DR-C). Currently, it is a signalized, four-legged intersection. Dell Range Boulevard has two through lanes and one left-turn lane in the EB and WB directions. There is a designated right-turn lane in the WB direction onto NB Converse Ave. The SB leg has two through lanes, a designated right-turn lane, and one left-turn lane. The NB leg has one through lane, a designated right-turn lane, and two left-turn lanes onto WB Dell Range. Currently, the intersection functions as a LOS E during the AM peak and a LOS C during the MD and PM peak with an average delay of 39.9 seconds.

- No-Build:
  The No-Build model was built using the existing intersection configuration and the 2040 volumes. In order to improve the functionality of the intersection, the signal timing was optimized for each peak hour. This adjustment improved the intersection's function during the AM peak from an LOS E to an LOS C. However, the LOS during the MD and PM peak declined to an LOS D. The average delay for the no-build model is approximately 35.6 seconds. Therefore, in order to see LOS improvement for all peak periods, the intersection's configuration will need to be altered.

- Dual Left-Turn Lanes:
  Due to the large amount of left turns in all directions, there is considerable delay due to the limited amount of left turn storage. A second left turn lane was added to SB Converse Ave, WB Dell Range Blvd, and EB Dell Range Blvd. The EB and WB directions have fewer left turns than that of the NB and SB directions. However, the through traffic along Dell Range Blvd is almost five times more than the through traffic along Converse Ave. Therefore, the left turn storage length for WB Dell Range Blvd was increased from 90 feet to 150 feet. This will assist in alleviating the through traffic delay as well as the left turn delay. After finalizing the

configuration and optimizing the signal timing, the intersection functioned as an LOS C for all peak periods with an average delay of 29.4 seconds.

- Modern Roundabout:
  The roundabout model configuration consists of two circulating lanes throughout the entire roundabout. In the EB direction, there will be three approach lanes: one left-through lane, one designated through only lane, and one designated right turn only lane. The designated right turn only lane will be a bypass lane to SB Converse Ave. In the NB direction, there will be three approach lanes: one designated left turn only lane, one left-through lane, and one right-through turn lane. There will be three circulating lanes in the south-east quadrant to accommodate the three NB approach lanes and all legs will have two exit lanes. The LOS for the roundabout during all peak periods is an LOS A with an average delay of 5.6 seconds.

- Continuous Flow Intersection (Full):
  The CFI model configuration eliminates all left turns that occur at the Dell Range-Converse intersection. All left turns will occur ahead of the DR-C intersection. There will be a signalized intersection where the left turns will occur and cross over the opposing traffic lanes in order to bypass the main intersection. This bypass will provide storage for the left turns and allow for more green time to be dedicated to the through traffic. The left turns will access their target street at a connection point that will be placed after the main intersection. Once the timing was optimized and coordinated for all four legs, the CFI performed at a LOS C for all peak periods with an average delay of 29.6 seconds.

- Continuous Flow Intersection (Modified):
  The modified CFI model configuration is very similar to that of the full CFI model configuration. However, instead of eliminating left turns at the intersection for all four legs of the intersection, only two legs have left turns that occur ahead of the intersection. For the modified model configuration, the WB and NB left turns will bypass the main intersection. The WB left turn movement exceeds 300 left turns during the AM peak and the NB left turn movement exceeds 300 left turns during the PM peak; both movements have between 700 – 900 left turns during all three peaks. Once the timing was optimized and coordinated, the modified CFI performed at an LOS C for all peak periods with an average delay of 26.3 seconds.

- ThruTurn Intersection (Signals):
  The signalized ThruTurn model has a similar approach to the CFI model; eliminate the left turns at the Dell Range-Converse intersection. However, instead of the left turns bypassing the DR-C intersection, left turns will be prohibited at the intersection. Therefore, vehicles wanting to turn left onto Converse Ave from Dell Range Blvd, or vise versa, will have to travel through the intersection and use either the Dell Range-Mountain intersection, Dell Range-Grandview intersection, or the Converse-Masonway intersection to make a U-turn.

Vehicles will be able to turn right at the DR-C intersection once they have completed the U-turn. This ThruTurn model uses signals at all four of the intersections. Once all of the timing was optimized and coordinated, the model performed at an LOS B for the AM and MD peaks and an LOS C for the PM peak with an average delay of 16.4 seconds.

- ThruTurn Intersection (Roundabouts):
  The roundabout thruturn model has the same configuration as the signalized thruturn model, but will be using roundabouts instead of signals at the three intersections of Dell Range-Mountain, Dell Range-Grandview, and Converse-Masonway. Due to the use of two different modeling programs, Rodel and Syncro, for this alternative, the delays for both modeling programs had to be accounted for in the overall delay results. Once the delay was calculated correctly, the alternative performed at an LOS B for all peak periods with an average delay of 14.0 seconds.

Based solely on the results from the models, the modern roundabout performed the best in terms of LOS and delay. The ThruTurn models performed the second best, with the modified CFI coming in third best overall. The worst results came from the No-Build model. This solidifies the fact that the Dell Range-Converse intersection needs an alternative intersection design to alleviate current and future delay. See Table 1 for the LOS and delay results for all seven alternatives.

Table 1: Dell Range Boulevard and Converse Avenue Intersection Alternatives Analysis

Alternative	AM Peak		MD Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
No-Build Revision	C	27.1	D	37.8	D	42.0
Dual Left Turns	C	26.2	C	32.3	C	29.6
Modern Roundabout	A	3.3	A	7.6	A	5.9
CFI - Full	C	31.1	C	29.8	C	27.9
CFI - Modified	C	22.1	C	26.0	C	30.8
ThruTurn - Signals	B	10.9	B	13.7	C	24.5
ThruTurn - Roundabouts	B	11.1	B	12.8	B	18.1

III. Recommendations

The analysis methodology, the resulting output, the public input and recommendations from the design team were presented to the Steering Committee and the MPO Technical Committee. The preferred intersection alternative from this entire process was the Modified Continuous Flow Intersection. Given that funding for this project did not make the sixth-penny ballot initiative in May, 2017, and that the funding source for this project is uncertain in the foreseeable future, the short term improvements to the existing intersection should be incorporated until the preferred alternative can be funded.

At this time, it is recommended that the improvements derived for Current Intersection with Short Term Improvements alternative be constructed to improve safety and functionality until a funding source for the preferred alternative become available. The recommended improvements were incorporated into the 35% design and the Engineer's Opinion of Probable Costs and include;

- Restriping the north leg to shift the southbound left-turn lane to the east
- Eliminate the split phasing for the north-south approaches
- Optimize the signal timing, including adding right-turn overlaps for the northbound right turn, the southbound right turn, and the westbound right turn
- Add supplemental left-turn heads for the eastbound and the westbound approaches
- Increase the curb-and-gutter radius in the northwest and northeast corner to better accommodate truck traffic

Safety improvements will be realized inherently when the overall corridor improvements identified in this study and previous studies are completed. Improved connectivity and dedicated pedestrian and bicycle facilities will provide improved safety conditions when compared to existing conditions such as the creation of a grade separated Greenway crossing at Dry Creek, west of the Converse Avenue and Dell Range Boulevard intersection. Additionally, future analysis of a grade separated crossing along Converse Avenue between Dell Range and Point Bluff is recommended based on comments received during the public meeting process. Additionally, some improvement to traffic operations and a general increase in intersection safety will be realized by completing the Current Intersection with Short Term Improvements alternative.

APPENDIX

EXISTING TRAFFIC COUNTS

Study Name 1601827
Start Date 4/19/16
Start Time 7:00 AM
Site Code 16026

Type Road
lassification All

	CONVERSE AVE Southbound				DELL RANGE BLVD Westbound				CONVERSE AVE Northbound				DELL RANGE BLVD Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	32	52	11	0	63	118	12	0	19	22	17	0	6	31	18	0	401
7:15 AM	31	78	7	0	97	110	21	0	36	29	33	0	2	41	24	0	509
7:30 AM	25	62	15	0	95	122	34	0	31	36	27	0	4	55	31	0	537
7:45 AM	30	65	11	0	99	156	19	0	59	46	21	0	1	58	31	0	596
8:00 AM	22	54	9	0	60	112	20	0	50	44	19	0	8	42	33	0	473
8:15 AM	18	50	13	0	45	120	22	0	38	31	20	0	7	61	21	0	446
8:30 AM	32	39	16	0	41	113	38	0	52	30	20	0	10	68	34	0	493
8:45 AM	27	36	15	0	36	126	26	0	53	23	23	0	6	73	30	0	474
	108	259	42	0	351	500	94	0	176	155	100	0	15	196	119	0	
11:00 AM	40	36	23	0	40	179	24	0	69	35	24	0	9	142	62	0	683
11:15 AM	35	38	15	0	32	170	37	0	83	50	57	0	4	164	58	0	743
11:30 AM	38	34	26	0	30	186	23	0	84	57	48	0	13	213	63	0	815
11:45 AM	39	55	14	0	40	210	33	0	80	39	37	0	11	179	96	0	833
12:00 PM	37	47	17	0	28	216	39	0	79	56	59	0	18	186	88	0	870
12:15 PM	43	55	42	0	53	240	33	0	72	41	43	0	10	205	100	0	937
12:30 PM	41	56	30	0	62	272	37	0	90	51	40	0	19	216	87	0	1001
12:45 PM	41	65	15	0	56	215	28	0	85	38	21	0	15	177	92	0	848
	162	223	104	0	199	943	137	0	326	186	163	0	62	784	367	0	
3:00 PM	38	50	5	0	28	130	20	0	71	42	35	0	14	210	80	0	723
3:15 PM	41	47	9	0	22	142	31	0	75	43	39	0	13	185	82	0	729
3:30 PM	40	45	13	0	35	172	31	0	92	63	33	0	14	221	83	0	842
3:45 PM	46	56	14	0	36	203	33	0	89	45	38	0	12	206	78	0	856
4:00 PM	50	47	15	0	33	161	36	0	82	51	47	0	17	207	83	0	829
4:15 PM	44	47	19	0	32	170	18	0	88	56	38	0	16	211	78	0	817
4:30 PM	38	63	12	0	36	160	34	0	80	60	51	0	10	256	82	0	882
4:45 PM	34	49	27	0	37	171	35	0	84	53	43	0	14	224	81	0	852
5:00 PM	43	49	12	0	31	147	41	0	90	69	45	0	16	228	114	0	885
5:15 PM	47	49	20	0	32	154	24	0	71	71	64	0	17	221	88	0	858
5:30 PM	46	40	20	0	50	179	21	0	74	86	59	0	18	217	80	0	890
5:45 PM	27	38	8	0	38	177	29	0	83	62	57	0	15	193	21	0	748
	170	187	79	0	150	651	121	0	319	279	211	0	65	890	363	0	

Study Name 1601930
Start Date 4/19/2016
Start Time 7:00 AM
Site Code 16026

Type Road
lassification Lights

	MOUNTAIN RD Southbound				DELL RANGE BLVD Westbound				MOUNTAIN RD Northbound				DELL RANGE BLVD Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	3	0	33	0	0	179	2	0	0	0	0	0	11	75	0	0	303
7:15 AM	5	0	40	0	0	200	2	0	0	0	0	0	15	87	0	0	349
7:30 AM	0	0	41	0	0	223	4	0	0	0	0	0	14	104	0	0	386
7:45 AM	0	0	43	0	0	243	7	0	0	0	0	0	7	100	0	0	400
8:00 AM	0	0	26	0	0	173	9	0	0	0	0	0	7	80	0	0	295
8:15 AM	3	0	32	0	0	160	7	0	0	0	0	0	11	92	0	0	305
8:30 AM	5	0	27	0	0	181	3	0	0	0	0	0	14	109	0	0	339
8:45 AM	1	0	19	0	0	179	1	0	0	0	0	0	9	103	0	0	312
	8	0	157	0	0	845	15	0	0	0	0	0	47	366	0	0	
11:00 AM	3	0	29	0	0	231	8	0	0	0	0	0	19	181	0	0	471
11:15 AM	1	0	17	0	0	233	10	0	0	0	0	0	23	242	0	0	526
11:30 AM	4	0	20	0	0	221	9	0	0	0	0	0	28	267	0	0	549
11:45 AM	3	0	15	0	0	270	5	0	0	0	0	0	24	248	0	0	565
12:00 PM	0	0	16	0	0	273	6	0	0	0	0	0	36	260	0	0	591
12:15 PM	2	0	38	0	0	294	7	0	0	0	0	0	24	290	0	0	655
12:30 PM	3	0	34	0	0	359	8	0	0	0	0	0	15	280	0	0	699
12:45 PM	0	0	35	0	0	277	3	0	0	0	0	0	14	246	0	0	575
	5	0	123	0	0	1203	24	0	0	0	0	0	89	1076	0	0	
3:00 PM	3	0	17	0	0	169	5	0	0	0	0	0	24	249	0	0	467
3:15 PM	4	0	16	0	0	201	3	0	0	0	0	0	25	232	0	0	481
3:30 PM	3	0	31	0	0	224	11	0	0	0	0	0	32	267	0	0	568
3:45 PM	2	0	24	0	0	258	9	0	0	0	0	0	34	258	0	0	585
4:00 PM	4	0	23	0	0	224	1	0	0	0	0	0	30	279	0	0	561
4:15 PM	1	0	17	0	0	234	10	0	0	0	0	0	25	266	0	0	553
4:30 PM	2	0	28	0	0	212	6	0	0	0	0	0	38	313	0	0	599
4:45 PM	1	0	28	0	0	229	7	0	0	0	0	0	39	274	0	0	578
5:00 PM	1	0	28	0	0	207	5	0	0	0	0	0	40	309	0	0	590
5:15 PM	8	0	19	0	0	195	7	0	0	0	0	0	42	300	0	1	572
5:30 PM	1	0	32	0	0	242	9	0	0	0	0	0	35	311	0	0	630
5:45 PM	4	0	37	0	0	236	11	0	0	0	0	0	36	235	0	0	559
	11	0	107	0	0	873	28	0	0	0	0	0	156	1194	0	1	2291

Study Name 1601929
Start Date 4/20/16
Start Time 7:00 AM
Site Code 16026

Type Road
lassification Lights

	GRANDVIEW AVE Southbound				DELL RANGE BLVD Westbound				GRANDVIEW AVE Northbound				DELL RANGE BLVD Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	2	0	1	0	0	175	2	0	0	0	0	0	4	62	0	0	246
7:15 AM	1	0	0	0	0	178	4	0	0	0	0	0	4	80	0	0	267
7:30 AM	1	0	3	0	0	198	8	0	0	0	0	0	2	81	0	0	293
7:45 AM	2	0	3	0	0	240	7	0	0	0	0	0	9	100	0	0	361
8:00 AM	1	0	6	0	0	166	6	0	0	0	0	0	6	103	0	0	288
8:15 AM	2	0	5	0	0	172	9	0	0	0	0	0	2	99	0	0	289
8:30 AM	3	0	6	0	0	189	7	0	0	0	0	0	9	108	0	0	322
8:45 AM	2	0	11	0	0	196	10	0	0	0	0	0	9	121	0	0	349
	8	0	20	0	0	767	29	0	0	0	0	0	26	410	0	0	
11:00 AM	7	0	12	0	0	265	14	0	0	0	0	0	8	220	0	0	526
11:15 AM	1	0	16	0	0	281	16	0	0	0	0	0	10	270	0	0	594
11:30 AM	5	0	17	0	0	270	17	0	0	0	0	0	14	262	0	0	585
11:45 AM	5	0	23	0	0	259	15	0	0	0	0	0	12	288	0	0	602
12:00 PM	4	0	22	1	0	288	13	0	0	0	0	0	14	255	0	0	597
12:15 PM	4	0	22	0	0	283	23	0	0	0	0	0	11	266	0	0	609
12:30 PM	3	0	20	0	0	355	14	0	0	0	0	0	17	273	0	0	682
12:45 PM	2	0	10	0	0	304	15	0	0	0	0	0	13	269	0	0	613
	13	0	74	1	0	1230	65	0	0	0	0	0	55	1063	0	0	
3:00 PM	7	0	15	0	0	243	13	0	0	0	0	0	7	308	0	0	593
3:15 PM	5	0	8	0	0	246	11	0	0	0	0	0	9	291	0	0	570
3:30 PM	5	0	13	0	0	250	13	0	0	0	0	0	6	283	0	0	570
3:45 PM	5	0	15	0	0	274	17	0	0	0	0	0	11	243	0	0	565
4:00 PM	4	0	14	0	0	254	15	0	0	0	0	0	18	328	0	0	633
4:15 PM	12	0	16	0	0	242	18	0	0	0	0	0	24	317	0	0	629
4:30 PM	2	0	19	0	0	235	22	0	0	0	0	0	12	308	0	0	598
4:45 PM	3	0	17	0	0	294	15	0	0	0	0	0	11	321	0	0	661
5:00 PM	6	0	23	0	0	293	17	0	0	0	0	0	7	344	0	0	690
5:15 PM	4	0	14	0	0	324	19	0	0	0	0	0	14	355	0	0	730
5:30 PM	6	0	16	0	0	281	29	0	0	0	0	0	6	344	0	0	682
5:45 PM	4	0	10	0	0	275	18	0	0	0	0	0	12	282	0	0	601
	19	0	70	0	0	1192	80	0	0	0	0	0	38	1364	0	0	2521

Study Name 1601931
Start Date 4/19/2016
Start Time 7:00 AM
Site Code 16026

Type Road
lassification Lights

	CONVERSE AVE Southbound				MASONWAY Westbound				CONVERSE AVE Northbound				MASONWAY Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	0	79	3	0	0	0	0	0	11	22	0	0	4	0	17	0	136
7:15 AM	0	109	13	0	0	0	0	0	11	31	0	0	5	0	15	0	184
7:30 AM	0	90	9	0	0	0	0	0	24	40	0	0	5	0	23	0	191
7:45 AM	0	88	17	0	0	0	0	0	27	36	0	0	8	0	19	0	195
8:00 AM	0	67	7	0	0	0	0	0	16	41	0	0	6	0	12	0	149
8:15 AM	0	63	13	0	0	0	0	0	22	48	0	0	3	0	23	0	172
8:30 AM	0	62	19	0	0	0	0	0	24	44	0	0	7	0	23	0	179
8:45 AM	0	51	11	0	0	0	0	0	35	21	0	0	16	0	27	0	161
	0	354	46	0	0	0	0	0	78	148	0	0	24	0	69	0	
11:00 AM	0	46	13	0	0	0	0	0	31	35	0	0	14	0	38	0	177
11:15 AM	0	34	23	0	0	0	0	0	35	48	0	0	14	0	47	0	201
11:30 AM	0	45	14	0	0	0	0	0	39	45	0	1	12	0	51	0	207
11:45 AM	0	67	18	0	0	0	0	0	29	64	0	0	17	0	32	0	227
12:00 PM	0	46	20	0	0	0	0	0	42	79	0	0	24	0	53	0	264
12:15 PM	0	98	22	0	0	0	0	0	39	51	0	0	21	0	44	0	275
12:30 PM	0	82	20	0	0	0	0	0	56	53	0	0	19	0	56	0	286
12:45 PM	0	62	26	0	0	0	0	0	40	41	0	0	21	0	53	0	243
	0	288	88	0	0	0	0	0	177	224	0	0	85	0	206	0	
3:00 PM	0	41	19	0	0	0	0	0	21	56	0	0	21	0	48	0	206
3:15 PM	0	43	20	0	0	0	0	0	36	51	0	1	16	0	47	0	214
3:30 PM	0	34	26	0	0	0	0	0	43	63	0	0	24	0	51	0	241
3:45 PM	0	51	26	0	0	0	0	0	38	58	0	0	24	0	57	0	254
4:00 PM	0	38	29	0	0	0	0	0	37	66	0	0	30	0	67	0	267
4:15 PM	0	48	30	0	0	0	0	0	30	64	0	0	27	0	55	0	254
4:30 PM	0	49	21	0	0	0	0	0	35	67	0	0	32	0	57	0	261
4:45 PM	0	53	23	0	0	0	0	0	34	70	0	0	30	0	52	0	262
5:00 PM	0	50	24	0	0	0	0	0	47	87	0	0	32	0	45	0	285
5:15 PM	0	64	27	0	0	0	0	0	28	88	0	0	21	0	48	0	276
5:30 PM	0	50	28	0	0	0	0	0	21	76	0	1	22	0	46	0	244
5:45 PM	0	43	17	0	0	0	0	0	24	74	0	0	23	0	31	0	212
	0	216	95	0	0	0	0	0	144	312	0	0	115	0	202	0	1044

Study Name 1601932
Start Date 4/19/2016
Start Time 7:00 AM
Site Code 16026

Type Road
lassification Lights

	POINT BLUFF Southbound				CONVERSE AVE Westbound				POINT BLUFF Northbound				CONVERSE AVE Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	35	1	4	0	0	17	7	0	0	1	0	0	1	50	1	0	117
7:15 AM	31	0	5	0	2	25	9	0	0	0	0	0	2	85	0	0	159
7:30 AM	40	0	7	0	1	25	18	0	0	0	0	0	5	61	1	0	158
7:45 AM	19	3	3	0	0	30	15	0	0	0	0	0	5	82	4	0	161
8:00 AM	15	0	5	0	0	23	21	0	0	0	0	0	9	50	0	0	123
8:15 AM	22	0	3	0	1	22	26	0	0	0	1	0	10	54	0	0	139
8:30 AM	25	0	11	0	0	35	30	0	0	0	1	0	7	55	0	0	164
8:45 AM	22	0	2	0	0	61	40	0	0	0	0	0	4	39	0	0	168
	105	3	20	0	3	103	63	0	0	0	0	0	21	278	5	0	
11:00 AM	19	0	4	0	0	33	15	0	0	0	2	0	5	36	0	0	114
11:15 AM	9	0	5	0	3	45	13	0	0	0	0	0	4	48	1	0	128
11:30 AM	16	0	7	0	1	43	11	0	0	0	0	0	4	40	0	0	122
11:45 AM	27	0	5	0	1	44	30	0	0	0	0	0	5	61	0	0	173
12:00 PM	18	0	5	0	1	53	42	0	0	0	3	0	14	41	1	0	178
12:15 PM	44	0	6	0	0	55	21	0	0	0	0	0	6	79	0	0	211
12:30 PM	38	0	10	0	0	47	26	0	0	0	0	0	3	62	0	0	186
12:45 PM	24	0	2	0	1	44	18	0	0	0	0	0	6	60	0	0	155
	127	0	26	0	2	199	119	0	0	0	3	0	28	243	1	0	
3:00 PM	14	0	1	0	1	46	24	0	0	0	3	0	6	48	0	0	143
3:15 PM	16	1	2	0	3	41	20	0	3	0	1	0	5	42	1	0	135
3:30 PM	13	0	5	0	7	57	24	0	0	0	0	0	6	44	1	0	157
3:45 PM	28	0	3	0	4	55	20	0	0	0	0	0	2	38	1	0	151
4:00 PM	17	0	7	0	5	60	28	0	1	1	1	0	3	41	3	0	167
4:15 PM	25	0	2	0	6	56	27	0	0	0	0	0	8	47	2	0	173
4:30 PM	18	0	2	0	2	56	26	0	0	1	0	0	3	41	1	0	150
4:45 PM	24	2	2	0	3	72	25	0	0	1	1	0	6	42	1	0	179
5:00 PM	16	1	5	0	2	80	38	0	1	0	1	0	8	53	0	0	205
5:15 PM	15	0	4	0	2	74	33	0	0	1	0	0	3	47	0	0	179
5:30 PM	17	1	1	0	1	66	30	0	0	0	0	0	6	63	0	0	185
5:45 PM	21	0	5	0	2	61	35	0	1	0	0	0	5	40	0	0	170
	72	4	12	0	8	292	126	0	1	2	2	0	23	205	1	0	

Study Name 1601933
Start Date 4/19/2016
Start Time 7:00 AM
Site Code 16026

Type Road
lassification Lights

	OGDEN RD Southbound				CONVERSE AVE Westbound				OGDEN RD Northbound				CONVERSE AVE Eastbound				
Start Time	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
7:00 AM	3	0	6	0	0	18	2	0	0	0	0	0	0	47	0	0	76
7:15 AM	5	0	7	0	0	27	5	0	0	0	0	0	5	80	0	0	129
7:30 AM	7	0	9	0	0	31	3	0	0	0	0	0	7	60	0	0	117
7:45 AM	12	0	18	0	0	32	1	0	0	0	0	0	4	79	0	0	146
8:00 AM	12	0	9	0	0	24	1	0	0	0	0	0	6	44	0	0	96
8:15 AM	13	0	18	0	0	23	3	0	0	0	0	0	5	48	0	0	110
8:30 AM	8	0	12	0	0	34	1	0	0	0	0	0	4	45	0	0	104
8:45 AM	3	0	11	0	0	25	1	0	0	0	0	0	5	39	0	0	84
	36	0	43	0	0	114	10	0	0	0	0	0	22	263	0	0	
11:00 AM	3	0	3	0	0	31	3	0	0	0	0	0	1	41	0	0	82
11:15 AM	1	0	5	0	0	36	4	0	0	0	0	0	6	47	1	0	100
11:30 AM	2	0	5	0	0	44	3	0	0	0	0	0	10	41	0	0	105
11:45 AM	8	0	5	0	0	41	4	0	0	0	0	0	8	58	0	0	124
12:00 PM	5	0	8	0	0	52	5	0	0	0	0	0	17	45	0	0	132
12:15 PM	32	0	26	0	0	58	1	0	0	0	0	0	7	53	0	0	177
12:30 PM	7	0	10	0	0	53	2	0	0	0	0	0	4	60	0	0	136
12:45 PM	4	0	5	0	0	42	3	0	0	0	0	0	5	60	0	0	119
	52	0	49	0	0	204	12	0	0	0	0	0	36	216	0	0	
3:00 PM	3	0	3	0	0	46	2	0	0	0	0	0	6	49	0	0	109
3:15 PM	1	0	5	0	0	43	4	0	0	0	0	0	3	50	0	0	106
3:30 PM	5	0	6	0	0	58	2	0	0	0	0	0	3	45	0	0	119
3:45 PM	5	0	5	0	0	51	7	0	0	0	0	0	5	41	0	0	114
4:00 PM	2	0	3	0	0	60	6	0	0	0	0	0	7	47	0	0	125
4:15 PM	3	0	5	0	0	51	4	0	0	0	0	0	6	57	0	0	126
4:30 PM	3	0	2	0	0	59	3	0	0	0	0	0	10	46	0	0	123
4:45 PM	4	0	4	0	0	60	6	0	0	0	0	0	8	50	0	0	132
5:00 PM	5	0	4	0	0	80	8	0	0	0	0	0	12	60	0	0	169
5:15 PM	4	0	2	0	0	69	8	0	0	0	0	0	9	75	0	0	167
5:30 PM	3	0	2	0	0	65	3	0	0	0	0	0	7	61	0	0	141
5:45 PM	3	0	7	0	0	62	2	0	0	0	0	0	6	42	0	0	122
	16	0	12	0	0	274	25	0	0	0	0	0	36	246	0	0	

CRASH DATA

Intersection	M.P	Date - Time	Report Number	Num Injured	Num Killed	Lighting Cond	Road Cond	Intersection Type	Collision Type	Roadway Junction	First Harmful Event	Human Factor Drv 1	Human Factor Drv 2	Activity Prior Drv 1	Activity Prior Drv 2	Direction Veh 1	Direction Veh 2	Type Veh 1	Type Veh 2
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/13/2006 0:00	600312	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/23/2006 0:00	601574	2 Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/9/2006 0:00	602350	No Injuries	No Fatalities	Darkness Lighted	Snow	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Slowing	Stopped in Traffic	South	South	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/28/2006 0:00	604105	1 Injury	1 Fatality	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Heavy Truck GT 26000
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/2/2006 0:00	604039	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	Failed to Yield ROW	Turning Left	Straight Ahead	West	East	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/15/2006 0:00	604515	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Other	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/12/2006 0:00	607041	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	Unknown	Straight Ahead	Stopped in Traffic	Unknown	Unknown	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/21/2006 0:00	606741	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	No Improper Driving	Slowing	Stopped in Traffic	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/4/2006 0:00	607107	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	Unknown	Stopped in Traffic	Turning Right	North	North	Passenger	Heavy Truck GT 26000
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/7/2006 0:00	607832	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/24/2006 0:00	608248	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/5/2006 0:00	609066	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/23/2006 0:00	610134	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	Failed to Yield ROW	Straight Ahead	Turning Left	East	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/20/2006 0:00	611778	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	Unknown	Straight Ahead	Turning Left	East	North	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/27/2006 0:00	612368	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	MC GT 150 cc
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/2/2006 0:00	612847	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Disregarded Traffic Signs	Failed to Yield ROW	Straight Ahead	Turning Left	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/16/2006 0:00	613615	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Turning Left	East	South	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/30/2006 0:00	614423	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/30/2006 0:00	614391	6 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/31/2006 0:00	614392	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Unknown	Intersection Related	Utility Pole or Light Support	Unknown	Null value	Straight Ahead	Null value	West	Null value	Passenger	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/2/2006 0:00	614437	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Direction not Specified	Intersection	Motor Vehicle in Transport on Roadway	Disregarded Traffic Signs	No Improper Driving	Straight Ahead	Straight Ahead	West	South	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/5/2006 0:00	614961	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/12/2006 0:00	614927	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Direction not Specified	Intersection Related	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Stopped in Traffic	West	South	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/15/2006 0:00	614966	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Straight Ahead	West	West	MC GT 150 cc	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/24/2006 0:00	615504	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/26/2006 0:00	616092	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/28/2006 0:00	616154	No Injuries	No Fatalities	Dusk	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/30/2006 0:00	616119	1 Injury	No Fatalities	Dawn	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/29/2006 0:00	617965	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/1/2006 0:00	618175	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Turning Left	Straight Ahead	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/2/2006 0:00	618216	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/6/2006 0:00	618282	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	Southwest	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/15/2006 0:00	620473	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	Unknown	Stopped in Traffic	Straight Ahead	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/25/2006 0:00	619618	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/30/2006 0:00	620147	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	Disregarded Traffic Signs	Turning Left	Straight Ahead	Southwest	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/2/2006 0:00	620197	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Legacy - Starting in traffic	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/2/2006 0:00	620201	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/17/2006 0:00	621312	1 Injury	No Fatalities	Darkness Lighted	Snow	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/18/2006 0:00	621383	1 Injury	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Stopped in Traffic	North	North	Passenger Van	Passenger
		Total Crashes (2006) => 39															**Total Single-Car Crashes (2006) => 1**		
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/2/2007 0:00	700180	No Injuries	No Fatalities	Darkness Lighted	Snow	Four Way Intersection	Unknown	Intersection Related	Utility Pole or Light Support	Unknown	Null value	Turning Right	Null value	West	Null value	Passenger	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/4/2007 0:00	700183	3 Injuries	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	Failed to Yield ROW	Straight Ahead	Turning Left	East	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/17/2007 0:00	701229	No Injuries	No Fatalities	Dawn	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger Van	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/23/2007 0:00	701290	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/26/2007 0:00	701823	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/26/2007 0:00	703732	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Disregarded Traffic Signs	Unknown	Turning Left	Straight Ahead	East	West	Passenger	Unknown
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/4/2007 0:00	704473	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Turning Left	Straight Ahead	East	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/6/2007 0:00	704524	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Turning Left	Turning Left	North	North	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/10/2007 0:00	704573	2 Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/3/2007 0:00	705926	3 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/2/2007 0:00	707743	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/9/2007 0:00	707861	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/19/2007 0:00	707995	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	Unknown	Turning Left	Straight Ahead	West	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/25/2007 0:00	708658	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	West	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/1/2007 0:00	709460	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/11/2007 0:00	709622	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/18/2007 0:00	710385	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/22/2007 0:00	710426	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/1/2007 0:00	711066	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	Passenger	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/30/2007 0:00	712878	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Stopped in Traffic	Straight Ahead	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/30/2007 0:00	712881	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	Unknown	Stopped in Traffic	Straight Ahead	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/11/2007 0:00	713531	4 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/30/2007 0:00	715277	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger Van	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/12/2007 0:00	715486	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Turning Left	Straight Ahead	East	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/17/2007 0:00	715885	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/24/2007 0:00	716543	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	North	North	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/27/2007 0:00	716621	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Other	Intersection	Motor Vehicle in Transport on Roadway	Disregarded Traffic Signs	No Improper Driving	Straight Ahead	Turning Left	East	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/7/2007 0:00	716276	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Slowing	Slowing	West	West	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/15/2007 0:00	717319	3 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Slowing	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/9/2007 0:00	719325	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	Unknown	Straight Ahead	Stopped in Traffic	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/24/2007 0:00	720445	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	Unknown	Stopped in Traffic	Straight Ahead	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/27/2007 0:00	720750	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/1/2007 0:00	721031	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/26/2007 0:00	723753	No Injuries	No Fatalities	Daylight	Slush	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Backing	West	West	Pickup	Passenger Van
		Total Crashes (2007) => 34																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/3/2008 0:00	200805721	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Straight Ahead	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/22/2008 0:00	200806799	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/23/2008 0:00	200806918	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Straight Ahead	West	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/26/2008 0:00	200806858	4 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Negotiating a Curve	West	East	SUV	Light Truck
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/11/2008 0:00	200808394	4 Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/15/2008 0:00	200811641	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/3/2008 0:00	200812800	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Other Improper Action	Failed to Yield ROW	Turning Left	Straight Ahead	West	South	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/28/2008 0:00	200814549	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	East	South	Passenger	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/2/2008 0:00	200816134	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Unknown	Unknown	Straight Ahead	Straight Ahead	East	South	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/8/2008 0:00	200816288	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/12/2008 0:00	200818147	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/20/2008 0:00	200818647	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Turning Left	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/23/2008 0:00	200818858	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Keep Proper Lane	No Improper Driving	Turning Right	Stopped in Traffic	East	North	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/3/2008 0:00	200819608	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/24/2008 0:00	200819369	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/17/2008 0:00	200820607	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	Unknown	Straight Ahead	Straight Ahead	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/20/2008 0:00	200820517	No Injuries	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/21/2008 0:00	200820603	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Turning Left	Straight Ahead	West	West	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/24/2008 0:00	200823084	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection Related	Motor Vehicle in Transport on Roadway	Null value	Null value	Turning Left	Turning Right	Null value	Null value	Null value	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/21/2008 0:00	200821929	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/16/2008 0:00	200822261	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/18/2008 0:00	200822250	1 Injury	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Pickup	SUV
		Total Crashes (2008) => 22																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/16/2009 0:00	200902165	2 Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection Related	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	Northeast	West	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/21/2009 0:00	200902371	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/23/2009 0:00	200900724	2 Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	East	North	Passenger	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/27/2009 0:00	200902758	2 Injuries	No Fatalities	Daylight	Snow	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Slowing	Stopped in Traffic	South	South	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/17/2009 0:00	200902019	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	No Improper Driving	Turning Left	Straight Ahead	East	West	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/28/2009 0:00	200904152	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Sideswipe Same Direction Passing	Intersection	Motor Vehicle in Transport on Roadway	Failed to Keep Proper Lane	No Improper Driving	Straight Ahead	Turning Left	North	North	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/10/2009 0:00	200906138	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	Following too Close	Straight Ahead	Straight Ahead	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/11/2009 0:00	200906140	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/13/2009 0:00	200906188	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Heavy Truck GT 26000	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/28/2009 0:00	200906662	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/11/2009 0:00	200908633	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Make UTurn	Straight Ahead	Southwest	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/20/2009 0:00	200907623	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	East	Southeast	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/22/2009 0:00	200908028	1 Injury	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	West	East	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/23/2009 0:00	200907832	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/27/2009 0:00	200907839	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Not a Collision with 2 Vehicles in Transport	Intersection	Other Non-Collision MC Loss of Control	Improper Turn or No Signal	Null value	Turning Right	Null value	West	Null value	MC GT 150 cc	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/28/2009 0:00	200908035	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	Following too Close	Straight Ahead	Straight Ahead	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/3/2009 0:00	200909477	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Unknown	Straight Ahead	East	South	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/20/2009 0:00	200910361	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Null value	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/24/2009 0:00	200910925	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Unknown	No Improper Driving	Straight Ahead	Slowing	West	West	Passenger Van	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/30/2009 0:00	200911143	4 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Turning Left	Slowing	West	West	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/22/2009 0:00	200912523	No Injuries	No Fatalities	Daylight	Dry	T Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Slowing	West	West	SUV	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/31/2009 0:00	200913178	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Parked	Slowing	East	East	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/8/2009 0:00	200912748	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/3/2009 0:00	200919530	No Injuries	No Fatalities	Darkness Lighted	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	Erratic or Reckless or Careless or Aggressive	Backing	Straight Ahead	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/3/2009 0:00	200919533	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Stopped in Traffic	Straight Ahead	Null value	South	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/8/2009 0:00	200919627	1 Injury	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	Southwest	East	Pickup	Passenger

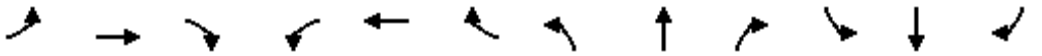
Intersection	M.P	Date - Time	Report Number	Num Injured	Num Killed	Lighting Cond	Road Cond	Intersection Type	Collision Type	Roadway Junction	First Harmful Event	Human Factor Drv 1	Human Factor Drv 2	Activity Prior Drv 1	Activity Prior Drv 2	Direction Veh 1	Direction Veh 2	Type Veh 1	Type Veh 2
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/10/2009 0:00	200919834	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Right	Straight Ahead	Northwest	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/14/2009 0:00	200919880	No Injuries	No Fatalities	Darkness Lighted	Ice or Frost	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Negotiating a Curve	Straight Ahead	West	East	Passenger	Passenger
		Total Crashes (2009) => 28																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/15/2010 0:00	201002177	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	West	South	Null value	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/28/2010 0:00	201000944	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Null value	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/20/2010 0:00	201002096	No Injuries	No Fatalities	Daylight	Snow	Four Way Intersection	Sideswipe Same Direction Passing	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Slowing	East	East	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/20/2010 0:00	201003317	No Injuries	No Fatalities	Darkness Lighted	Snow	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Unknown	Straight Ahead	West	West	Unknown	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/6/2010 0:00	201002715	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Turning Left	Slowing	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/10/2010 0:00	201003923	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/20/2010 0:00	201003820	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	West	East	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/3/2010 0:00	201003839	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Sideswipe Same Direction Passing	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Straight Ahead	South	South	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/6/2010 0:00	201004894	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/22/2010 0:00	201005979	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Sideswipe Same Direction Passing	Intersection Related	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Backing	Straight Ahead	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/14/2010 0:00	201006713	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	Following too Close	Slowing	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/14/2010 0:00	201006708	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/18/2010 0:00	201006768	No Injuries	No Fatalities	Dusk	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Changing Lanes	Stopped in Traffic	East	East	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/19/2010 0:00	201006891	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/1/2010 0:00	201007918	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/8/2010 0:00	201007415	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	West	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/11/2010 0:00	201008023	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Turning Left	East	West	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/24/2010 0:00	201008224	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Right	Straight Ahead	South	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/8/2010 0:00	201008949	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection Related	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Slowing	Northwest	South	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/17/2010 0:00	201009672	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/19/2010 0:00	201011245	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	MC GT 150 cc	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/27/2010 0:00	201012927	2 Injuries	No Fatalities	Dusk	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Null value	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/29/2010 0:00	201013255	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/1/2010 0:00	201013895	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Backing	Straight Ahead	West	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/22/2010 0:00	201019548	3 Injuries	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Speeding	Failed to Yield ROW	Entering a Traffic Lane	Turning Left	East	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/13/2010 0:00	201015952	No Injuries	No Fatalities	Darkness Lighted	Ice or Frost	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Pickup	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/13/2010 0:00	201015984	1 Injury	No Fatalities	Dawn	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Stopped in Traffic	Straight Ahead	North	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/19/2010 0:00	201016078	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Straight Ahead	Straight Ahead	North	West	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/19/2010 0:00	201016793	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/27/2010 0:00	201017416	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	Following too Close	Slowing	Straight Ahead	West	West	Heavy Truck GT 26000	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/4/2010 0:00	201017753	No Injuries	No Fatalities	Darkness Lighted	Dry	Y Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Slowing	Slowing	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/14/2010 0:00	201018737	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/15/2010 0:00	201018739	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/18/2010 0:00	201019048	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	Unknown	West	Heavy Truck GT 26000	Passenger
		Total Crashes (2010) => 34																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/2/2011 0:00	201100015	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Entering a Traffic Lane	Straight Ahead	West	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/15/2011 0:00	201101260	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Slowing	Turning Left	East	North	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/18/2011 0:00	201101915	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	Unknown	East	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/19/2011 0:00	201101191	No Injuries	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/27/2011 0:00	201101674	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/11/2011 0:00	201102923	2 Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	East	West	Passenger	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/17/2011 0:00	201102729	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Leaving a Traffic Lane or Parking	Straight Ahead	North	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/19/2011 0:00	201103887	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Unknown	Straight Ahead	West	West	Unknown	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/26/2011 0:00	201103850	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Turning Right	Stopped in Traffic	West	West	SUV	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/27/2011 0:00	201103688	No Injuries	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection Related	Motor Vehicle in Transport on Roadway	Failed to Keep Proper Lane	No Improper Driving	Turning Left	Stopped in Traffic	West	South	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/10/2011 0:00	201103975	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Turning Left	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/26/2011 0:00	201105886	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Slowing	Stopped in Traffic	East	East	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/5/2011 0:00	201106802	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Overtaking or Passing	Stopped in Traffic	East	East	SUV	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/21/2011 0:00	201108168	1 Injury	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	West	West	SUV	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/2/2011 0:00	201109223	2 Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/24/2011 0:00	201110052	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Speeding	No Improper Driving	Straight Ahead	Slowing	North	North	Heavy Truck GT 26000	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/26/2011 0:00	201110132	4 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Slowing	North	North	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/27/2011 0:00	201110243	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	Southwest	East	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/12/2011 0:00	201110803	5 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	MC GT 150 cc	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/3/2011 0:00	201111879	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/6/2011 0:00	201112489	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	West	South	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/16/2011 0:00	201112682	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Negotiating a Curve	Stopped in Traffic	East	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/27/2011 0:00	201113987	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Negotiating a Curve	Straight Ahead	Northeast	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/28/2011 0:00	201113175	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Sideswipe Same Direction Passing	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/23/2011 0:00	201114397	3 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Not a Collision with 2 Vehicles in Transport	Intersection Related	Guardrail Face	Erratic or Reckless or Careless or Aggressive	Null value	Straight Ahead	Null value	North	Null value	Passenger	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/1/2011 0:00	201114617	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Changing Lanes	Straight Ahead	East	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/11/2011 0:00	201115238	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	North	North	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/17/2011 0:00	201115596	2 Injuries	No Fatalities	Darkness Unlighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/11/2011 0:00	201117564	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	SUV	Passenger
		Total Crashes (2011) => 29																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/5/2012 0:00	201200085	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	Northeast	West	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/13/2012 0:00	201200593	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Unknown	Stopped in Traffic	North	North	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/27/2012 0:00	201200931	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Sideswipe Same Direction Passing	Intersection	Motor Vehicle in Transport on Roadway	Failed to Keep Proper Lane	Failed to Keep Proper Lane	Turning Right	Overtaking or Passing	West	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/10/2012 0:00	201201679	No Injuries	No Fatalities	Darkness Lighted	Ice or Frost	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Negotiating a Curve	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/28/2012 0:00	201202910	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	Following too Close	Straight Ahead	Straight Ahead	North	North	Heavy Truck GT 26000	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/25/2012 0:00	201205161	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/30/2012 0:00	201206641	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	No Improper Driving	Following too Close	Straight Ahead	Turning Left	West	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/9/2012 0:00	201208865	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/13/2012 0:00	201207044	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/4/2012 0:00	201208954	1 Injury	No Fatalities	Unknown	Sand on Dry Pavement	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Changing Lanes	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/20/2012 0:00	201212621	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Disregarded Traffic Signs	No Improper Driving	Straight Ahead	Turning Left	West	North	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/8/2012 0:00	201212957	3 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	East	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/31/2012 0:00	201214543	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Other Improper Action	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/5/2012 0:00	201216050	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	South	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/13/2012 0:00	201214838	1 Injury	No Fatalities	Dusk	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Negotiating a Curve	Straight Ahead	East	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/20/2012 0:00	201215201	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/21/2012 0:00	201215680	2 Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/27/2012 0:00	201217162	No Injuries	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/28/2012 0:00	201217318	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Entering a Traffic Lane	Stopped in Traffic	East	East	Pickup	SUV
		Total Crashes (2012) => 19																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/26/2013 0:00	201303534	1 Injury	No Fatalities	Darkness Lighted	Snow	Four Way Intersection	Not a Collision with 2 Vehicles in Transport	Intersection Related	Raised Median or Curb	Drove too Fast for Conditions	Null value	Straight Ahead	Null value	East	Null value	Passenger	Null value
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/20/2013 0:00	201305879	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Entering a Traffic Lane	Stopped in Traffic	East	East	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/25/2013 0:00	201305784	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/6/2013 0:00	201305997	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	No Improper Driving	Straight Ahead	Turning Left	East	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/8/2013 0:00	201306002	1 Injury	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Straight Ahead	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/21/2013 0:00	201306461	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/28/2013 0:00	201308261	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Stopped in Traffic	Northwest	Northwest	Null value	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/1/2013 0:00	201306881	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Entering a Traffic Lane	Stopped in Traffic	East	West	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/30/2013 0:00	201308265	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	West	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/1/2013 0:00	201308259	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Slowing	East	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/26/2013 0:00	201309379	No Injuries	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/5/2013 0:00	201309854	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	West	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/8/2013 0:00	201315023	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	Erratic or Reckless or Careless or Aggressive	Straight Ahead	Turning Left	South	East	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/4/2013 0:00	201315966	No Injuries	No Fatalities	Darkness Lighted	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Backing	Stopped in Traffic	East	East	Passenger	Passenger
		Total Crashes (2013) => 14																	
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/5/2014 0:00	201400204	2 Injuries	No Fatalities	Darkness Lighted	Ice or Frost	T Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Turning Left	Straight Ahead	West	East	Heavy Truck GT 26000	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	1/7/2014 0:00	201400203	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/1/2014 0:00	201401445	No Injuries	No Fatalities	Daylight	Snow	T Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Straight Ahead	West	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/5/2014 0:00	201401792	No Injuries	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Turning Left	Stopped in Traffic	South	South	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/24/2014 0:00	201403907	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Sideswipe Opposite Direction Meeting	Intersection Related	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Turning Right	Turning Left	North	South	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/2/2014 0:00	201405896	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/14/2014 0:00	201406439	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Sideswipe Same Direction Passing	Intersection Related	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	East	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/17/2014 0:00	201406445	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	West	East	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/10/2014 0:00	201407806	No Injuries	No Fatalities	Daylight	Dry	T Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Avoiding MV	Avoiding MV	Straight Ahead	Straight Ahead	South	South	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/22/2014 0:00	201408059	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear to Front Normally Backing	Intersection Related	Motor Vehicle in Transport on Roadway	Improper Backing	No Improper Driving	Turning Left	Other	North	South	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/13/2014 0:00	201409089	No Injuries	No Fatalities	Daylight	Water Standing or Running	Four Way Intersection	Sideswipe Same Direction Passing	Intersection	Motor Vehicle in Transport on Roadway	Failed to Keep Proper Lane	No Improper Driving	Straight Ahead	Straight Ahead	Unknown	South	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	7/29/2014 0:00	201409703	1 Injury	No Fatalities	Daylight	Wet	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Entering a Traffic Lane	Straight Ahead	East	South	SUV	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/7/2014 0:00	201410441	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger Van	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/9/2014 0:00	201411775	No Injuries	No Fatalities	Daylight	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Turning Left	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/12/2014 0:00	201411880	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Head On Front to Front	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Unknown	Straight Ahead	West	East	Unknown	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/27/2014 0:00	201414470	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	MC GT 150 cc	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/31/2014 0:00	201414266	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	Unknown	Straight Ahead	Stopped in Traffic	North	Unknown	Null value	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/6/2014 0:00	201416462	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	East	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/11/2014 0:00	201416676	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Same Direction Front to Side	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Slowing	Straight Ahead	West	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/31/2014 0:00	201417947	No Injuries	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Turning Left	Turning Left	West	West	Pickup	Passenger
		Total Crashes (2014) => 20																	

Intersection	M.P	Date - Time	Report Number	Num Injured	Num Killed	Lighting Cond	Road Cond	Intersection Type	Collision Type	Roadway Junction	First Harmful Event	Human Factor Drv 1	Human Factor Drv 2	Activity Prior Drv 1	Activity Prior Drv 2	Direction Veh 1	Direction Veh 2	Type Veh 1	Type Veh 2
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/1/2015 0:00	201501313	1 Injury	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Sideswipe Opposite Direction Meeting	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	SUV	MC GT 150 cc
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	2/23/2015 0:00	201502302	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Negotiating a Curve	Straight Ahead	South	East	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/11/2015 0:00	201503222	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Stopped in Traffic	Stopped in Traffic	West	West	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	3/25/2015 0:00	201503462	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Changing Lanes	Straight Ahead	North	East	Passenger	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/14/2015 0:00	201504184	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Turning Left	South	North	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/28/2015 0:00	201504723	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	West	South	SUV	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	4/30/2015 0:00	201504818	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	East	West	Heavy Truck GT 26000	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	5/14/2015 0:00	201505369	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Turning Left	Stopped in Traffic	West	West	Pickup	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/13/2015 0:00	201506696	2 Injuries	No Fatalities	Dawn	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	South	East	Null value	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/13/2015 0:00	201506701	No Injuries	No Fatalities	Daylight	Dry	T Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Ran Red Light	No Improper Driving	Straight Ahead	Straight Ahead	West	South	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/14/2015 0:00	201506700	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	SUV	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	6/27/2015 0:00	201507255	No Injuries	No Fatalities	Daylight	Dry	T Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Improper Turn or No Signal	No Improper Driving	Straight Ahead	Straight Ahead	East	West	Passenger	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/11/2015 0:00	201509513	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Turning Left	Stopped in Traffic	North	North	SUV	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	8/21/2015 0:00	201510220	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection	Motor Vehicle in Transport on Roadway	No Improper Driving	No Improper Driving	Straight Ahead	Straight Ahead	North	North	Null value	SUV
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/1/2015 0:00	201510523	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Improper Backing	No Improper Driving	Turning Left	Stopped in Traffic	Unknown	West	MC GT 150 cc	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/22/2015 0:00	201511633	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Negotiating a Curve	Stopped in Traffic	North	North	Passenger	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/26/2015 0:00	201511725	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Slowing	Straight Ahead	Northwest	West	SUV	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	9/26/2015 0:00	201511727	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	10/25/2015 0:00	201513173	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Angle Right Front to Side includes Broadside	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Negotiating a Curve	Straight Ahead	East	West	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/3/2015 0:00	201513492	2 Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Erratic or Reckless or Careless or Aggressive	No Improper Driving	Backing	Stopped in Traffic	East	East	SUV	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/6/2015 0:00	201513596	No Injuries	No Fatalities	Daylight	Dry	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Stopped in Traffic	West	West	Pickup	Pickup
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/16/2015 0:00	201514453	1 Injury	No Fatalities	Darkness Lighted	Wet	Four Way Intersection	Rear End Front to Rear	Intersection Related	Motor Vehicle in Transport on Roadway	Following too Close	No Improper Driving	Straight Ahead	Slowing	East	East	Null value	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	11/23/2015 0:00	201514653	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Straight Ahead	Straight Ahead	South	East	Pickup	Passenger
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/2/2015 0:00	201515619	No Injuries	No Fatalities	Darkness Lighted	Dry	Four Way Intersection	Angle Front to Side Opposing Direction	Intersection	Motor Vehicle in Transport on Roadway	Failed to Yield ROW	No Improper Driving	Turning Left	Straight Ahead	East	West	SUV	Passenger Van
Cheyenne - DELL RANGE BLVD at CONVERSE AVE	N/A	12/17/2015 0:00	201516528	No Injuries	No Fatalities	Daylight	Ice or Frost	Four Way Intersection	Angle Same Direction Front to Side	Intersection Related	Motor Vehicle in Transport on Roadway	Drove too Fast for Conditions	No Improper Driving	Straight Ahead	Stopped in Traffic	North	North	SUV	SUV

Total Crashes (2015) => 25

LEVEL OF SERVICE CALCULATION SHEETS

EXISTING

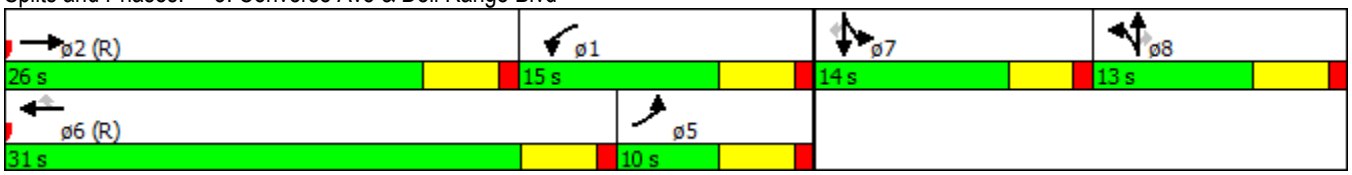


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	196	119	351	500	94	176	155	100	108	259	42
Future Volume (vph)	15	196	119	351	500	94	176	155	100	108	259	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	80		60	200		200	80		80
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			334			176			255			266
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	16	213	129	382	543	102	191	168	109	117	282	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	213	129	382	543	102	191	168	109	117	282	46
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			Free			6			8			7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	8	8	8	7	7	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	19.9		9.9	19.9	19.9	21.9	21.9	21.9	9.2	9.2	9.2
Total Split (s)	10.0	26.0		15.0	31.0	31.0	13.0	13.0	13.0	14.0	14.0	14.0
Total Split (%)	14.7%	38.2%		22.1%	45.6%	45.6%	19.1%	19.1%	19.1%	20.6%	20.6%	20.6%
Maximum Green (s)	5.1	21.1		10.1	26.1	26.1	8.1	8.1	8.1	9.8	9.8	9.8
Yellow Time (s)	3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9	4.2	4.2	4.2
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0			
Flash Dont Walk (s)		10.0			10.0	10.0	12.0	12.0	12.0			
Pedestrian Calls (#/hr)		0			0	0	0	0	0			
Act Effct Green (s)	5.1	21.2	68.0	10.1	34.2	34.2	8.3	8.3	8.3	9.6	9.6	9.6
Actuated g/C Ratio	0.08	0.31	1.00	0.15	0.50	0.50	0.12	0.12	0.12	0.14	0.14	0.14
v/c Ratio	0.12	0.19	0.08	1.46	0.31	0.12	0.46	0.75	0.26	0.47	0.57	0.10
Control Delay	31.6	17.8	0.1	253.2	11.3	0.8	31.9	51.6	1.5	33.6	32.1	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	17.8	0.1	253.2	11.3	0.8	31.9	51.6	1.5	33.6	32.1	0.5
LOS	C	B	A	F	B	A	C	D	A	C	C	A
Approach Delay		12.0			100.2			31.9			29.2	
Approach LOS		B			F			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 68			
Actuated Cycle Length: 68			
Offset: 53 (78%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.46			
Intersection Signal Delay: 58.8		Intersection LOS: E	
Intersection Capacity Utilization 54.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd

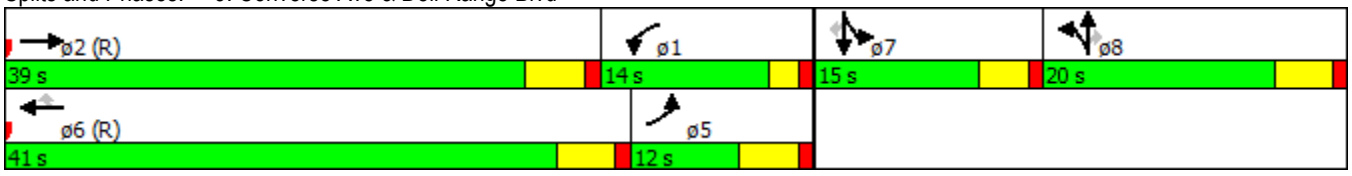


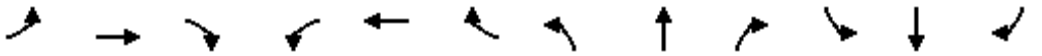
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	784	367	199	943	137	326	186	163	162	223	104
Future Volume (vph)	62	784	367	199	943	137	326	186	163	162	223	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	80		60	200		200	80		80
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			255			136			177			145
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	67	852	399	216	1025	149	354	202	177	176	242	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	852	399	216	1025	149	354	202	177	176	242	113
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	Free	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			Free			6			8			7
Detector Phase	5	2		1	6	6	8	8	8	7	7	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	20.9		9.9	20.9	20.9	19.9	19.9	19.9	9.2	9.2	9.2
Total Split (s)	12.0	39.0		14.0	41.0	41.0	20.0	20.0	20.0	15.0	15.0	15.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	13.6%	44.3%		15.9%	46.6%	46.6%	22.7%	22.7%	22.7%	17.0%	17.0%	17.0%
Maximum Green (s)	7.1	34.1		11.0	36.1	36.1	15.1	15.1	15.1	10.8	10.8	10.8
Yellow Time (s)	3.9	3.9		2.0	3.9	3.9	3.9	3.9	3.9	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		3.0	4.9	4.9	4.9	4.9	4.9	4.2	4.2	4.2
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0			
Flash Dont Walk (s)		10.0			10.0	10.0	10.0	10.0	10.0			
Pedestrian Calls (#/hr)		0			0	0	0	0	0			
Act Effct Green (s)	6.8	35.7	88.0	11.0	40.1	40.1	13.7	13.7	13.7	10.6	10.6	10.6
Actuated g/C Ratio	0.08	0.41	1.00	0.12	0.46	0.46	0.16	0.16	0.16	0.12	0.12	0.12
v/c Ratio	0.49	0.59	0.25	0.98	0.64	0.19	0.66	0.70	0.45	0.83	0.57	0.36
Control Delay	51.7	23.0	0.4	96.2	21.9	4.5	41.3	48.4	9.3	68.6	42.1	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	23.0	0.4	96.2	21.9	4.5	41.3	48.4	9.3	68.6	42.1	6.8
LOS	D	C	A	F	C	A	D	D	A	E	D	A
Approach Delay		17.6			31.6			35.5			43.4	
Approach LOS		B			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 88			
Actuated Cycle Length: 88			
Offset: 6 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 29.2		Intersection LOS: C	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



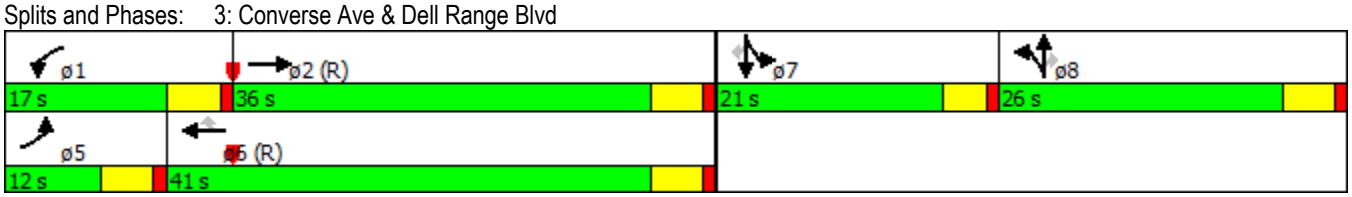


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	890	363	150	651	121	319	279	211	170	187	79
Future Volume (vph)	65	890	363	150	651	121	319	279	211	170	187	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	80		60	200		200	80		80
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			227			120			229			181
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	71	967	395	163	708	132	347	303	229	185	203	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	967	395	163	708	132	347	303	229	185	203	86
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		7	7	
Permitted Phases			Free			6			8			7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	8	8	8	7	7	7
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	20.9		9.9	20.9	20.9	20.9	20.9	20.9	20.2	20.2	20.2
Total Split (s)	12.0	36.0		17.0	41.0	41.0	26.0	26.0	26.0	21.0	21.0	21.0
Total Split (%)	12.0%	36.0%		17.0%	41.0%	41.0%	26.0%	26.0%	26.0%	21.0%	21.0%	21.0%
Maximum Green (s)	7.1	31.1		12.1	36.1	36.1	21.1	21.1	21.1	16.8	16.8	16.8
Yellow Time (s)	3.9	3.9		3.9	3.9	3.9	3.9	3.9	3.9	3.2	3.2	3.2
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		4.9	4.9	4.9	4.9	4.9	4.9	4.2	4.2	4.2
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag	Lag	Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	7.0	35.0	100.0	11.8	41.9	41.9	19.7	19.7	19.7	14.7	14.7	14.7
Actuated g/C Ratio	0.07	0.35	1.00	0.12	0.42	0.42	0.20	0.20	0.20	0.15	0.15	0.15
v/c Ratio	0.57	0.78	0.25	0.78	0.48	0.18	0.51	0.83	0.46	0.71	0.39	0.22
Control Delay	63.7	35.8	0.4	68.7	24.3	5.8	38.5	57.9	7.9	56.0	40.3	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	35.8	0.4	68.7	24.3	5.8	38.5	57.9	7.9	56.0	40.3	1.3
LOS	E	D	A	E	C	A	D	E	A	E	D	A
Approach Delay		27.4			29.1			37.2			39.4	
Approach LOS		C			C			D			D	

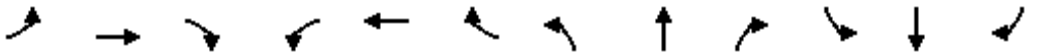
Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 48 (48%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 31.6		Intersection LOS: C	
Intersection Capacity Utilization 72.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



LEVEL OF SERVICE CALCULATION SHEETS

2040 NO-BUILD

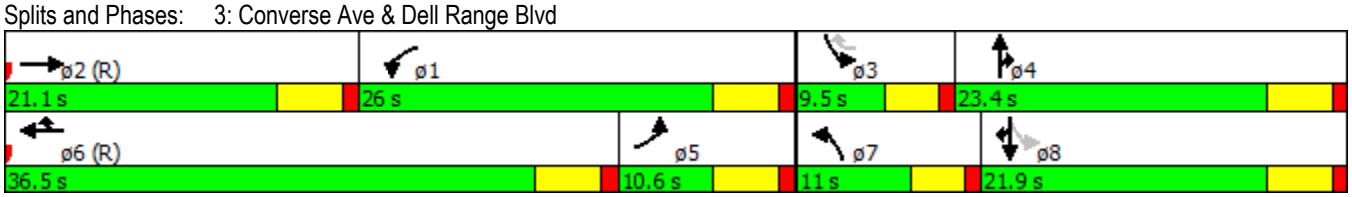


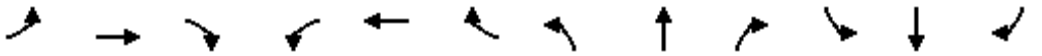
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	275	130	360	590	130	190	200	120	160	460	45
Future Volume (vph)	30	275	130	360	590	130	190	200	120	160	460	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	90		90	285		285	300		300
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.526		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	980	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			284			141			217			217
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	33	299	141	391	641	141	207	217	130	174	500	49
Shared Lane Traffic (%)												
Lane Group Flow (vph)	33	299	141	391	641	141	207	217	130	174	500	49
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	custom	Prot	NA	Prot	pm+pt	NA	Prot
Protected Phases	5	2		1	6	6	7	4	4	3	8	8
Permitted Phases			Free			3				8		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	19.9		9.9	19.9	19.9	9.2	21.9	21.9	9.2	21.9	21.9
Total Split (s)	10.6	21.1		26.0	36.5	36.5	11.0	23.4	23.4	9.5	21.9	21.9
Total Split (%)	13.3%	26.4%		32.5%	45.6%	45.6%	13.8%	29.3%	29.3%	11.9%	27.4%	27.4%
Maximum Green (s)	5.7	16.2		21.1	31.6	31.6	6.8	18.5	18.5	5.3	17.0	17.0
Yellow Time (s)	3.9	3.9		3.9	3.9	3.9	3.2	3.9	3.9	3.2	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		4.9	4.9	4.9	4.2	4.9	4.9	4.2	4.9	4.9
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		10.0			10.0	10.0		12.0	12.0		12.0	12.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	5.7	17.5	80.0	20.4	38.5	46.7	7.1	17.3	17.3	22.7	16.1	16.1
Actuated g/C Ratio	0.07	0.22	1.00	0.26	0.48	0.58	0.09	0.22	0.22	0.28	0.20	0.20
v/c Ratio	0.26	0.39	0.09	0.87	0.38	0.14	0.68	0.54	0.25	0.52	0.70	0.10
Control Delay	40.7	29.0	0.1	49.8	15.1	1.7	48.1	32.9	1.6	26.1	35.5	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	29.0	0.1	49.8	15.1	1.7	48.1	32.9	1.6	26.1	35.5	0.4
LOS	D	C	A	D	B	A	D	C	A	C	D	A
Approach Delay		21.2			25.1			31.2			30.9	
Approach LOS		C			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 27.1		Intersection LOS: C	
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



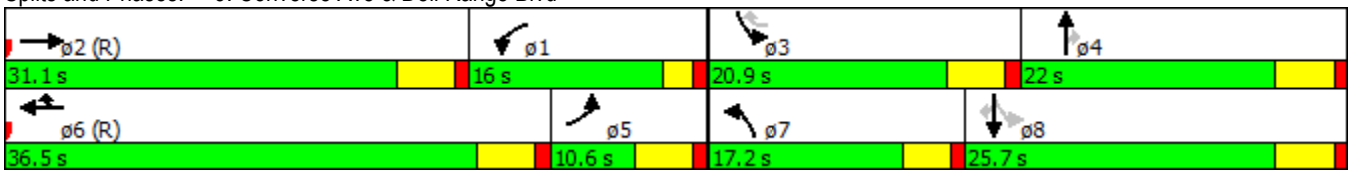


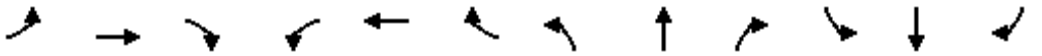
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	850	390	215	1050	190	350	300	190	210	420	110
Future Volume (vph)	85	850	390	215	1050	190	350	300	190	210	420	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	90		90	285		285	300		300
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.190		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	354	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			252			124			207			193
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	92	924	424	234	1141	207	380	326	207	228	457	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	924	424	234	1141	207	380	326	207	228	457	120
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1	1	1	1	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	50	50	50	50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50	50	50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turn Type	Prot	NA	Free	Prot	NA	custom	Prot	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6	6	7	4		3	8	
Permitted Phases			Free			3			4	8		8
Detector Phase	5	2		1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	20.9		9.9	20.9	20.9	9.2	19.9	19.9	20.9	19.9	19.9
Total Split (s)	10.6	31.1		16.0	36.5	36.5	17.2	22.0	22.0	20.9	25.7	25.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Split (%)	11.8%	34.6%		17.8%	40.6%	40.6%	19.1%	24.4%	24.4%	23.2%	28.6%	28.6%
Maximum Green (s)	5.7	26.2		13.0	31.6	31.6	13.0	17.1	17.1	16.0	20.8	20.8
Yellow Time (s)	3.9	3.9		2.0	3.9	3.9	3.2	3.9	3.9	3.9	3.9	3.9
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		3.0	4.9	4.9	4.2	4.9	4.9	4.9	4.9	4.9
Lead/Lag	Lag	Lead		Lag	Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	Max	None	None
Walk Time (s)		5.0			5.0	5.0		5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		10.0			10.0	10.0		10.0	10.0	10.0	10.0	10.0
Pedestrian Calls (#/hr)		0			0	0		0	0	0	0	0
Act Effct Green (s)	5.7	26.2	90.0	13.0	31.6	47.6	12.7	17.1	17.1	37.0	21.1	21.1
Actuated g/C Ratio	0.06	0.29	1.00	0.14	0.35	0.53	0.14	0.19	0.19	0.41	0.23	0.23
v/c Ratio	0.82	0.90	0.27	0.92	0.92	0.23	0.79	0.93	0.44	0.57	0.55	0.23
Control Delay	91.2	43.4	0.4	78.8	41.0	3.2	50.1	70.1	8.1	23.9	33.4	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.2	43.4	0.4	78.8	41.0	3.2	50.1	70.1	8.1	23.9	33.4	1.8
LOS	F	D	A	E	D	A	D	E	A	C	C	A
Approach Delay		33.8			41.6			47.7			26.0	
Approach LOS		C			D			D			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 37.8		Intersection LOS: D	
Intersection Capacity Utilization 78.4%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



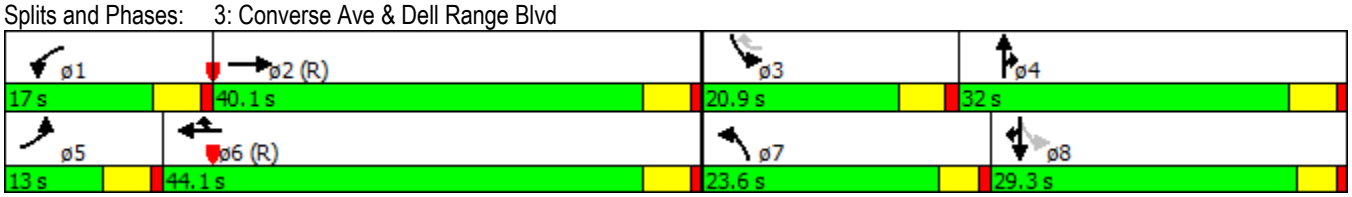


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	980	390	170	835	185	360	420	250	205	340	100
Future Volume (vph)	75	980	390	170	835	185	360	420	250	205	340	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	90		90	285		285	300		300
Storage Lanes	1		1	1		1	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.97	1.00	1.00	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	3433	1863	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.146		
Satd. Flow (perm)	1770	3539	1583	1770	3539	1583	3433	1863	1583	272	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173			133			214			116
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			605	
Travel Time (s)		21.1			11.0			5.8			13.8	
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
Adj. Flow (vph)	82	1065	424	185	908	201	391	457	272	223	370	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	1065	424	185	908	201	391	457	272	223	370	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	custom	Prot	NA	Prot	pm+pt	NA	Prot
Protected Phases	5	2		1	6	6	7	4	4	3	8	8
Permitted Phases			Free			3				8		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	5	2		1	6	6	7	4	4	3	8	8
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.9	20.9		9.9	20.9	20.9	20.2	20.9	20.9	20.9	20.2	20.2
Total Split (s)	13.0	40.1		17.0	44.1	44.1	23.6	32.0	32.0	20.9	29.3	29.3
Total Split (%)	11.8%	36.5%		15.5%	40.1%	40.1%	21.5%	29.1%	29.1%	19.0%	26.6%	26.6%
Maximum Green (s)	8.1	35.2		12.1	39.2	39.2	19.4	27.1	27.1	16.0	25.1	25.1
Yellow Time (s)	3.9	3.9		3.9	3.9	3.9	3.2	3.9	3.9	3.9	3.2	3.2
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost 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
Total Lost Time (s)	4.9	4.9		4.9	4.9	4.9	4.2	4.9	4.9	4.9	4.2	4.2
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	Max	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	7.8	35.2	110.0	12.1	41.8	62.7	17.1	27.1	27.1	42.7	27.4	27.4
Actuated g/C Ratio	0.07	0.32	1.00	0.11	0.38	0.57	0.16	0.25	0.25	0.39	0.25	0.25
v/c Ratio	0.66	0.94	0.27	0.95	0.68	0.21	0.73	1.00	0.49	0.69	0.42	0.23
Control Delay	74.0	52.8	0.4	103.3	32.3	5.1	52.7	83.8	12.1	37.1	37.0	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	52.8	0.4	103.3	32.3	5.1	52.7	83.8	12.1	37.1	37.0	7.0
LOS	E	D	A	F	C	A	D	F	B	D	D	A
Approach Delay		39.8			38.3			55.6			32.3	
Approach LOS		D			D			E			C	

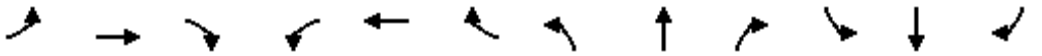
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 42.0		Intersection LOS: D	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



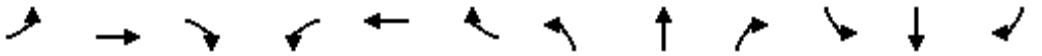
LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **DUAL LEFT-TURN**



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	275	130	360	590	130	190	200	120	160	460	45
Future Volume (vph)	30	275	130	360	590	130	190	200	120	160	460	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.4	4.0	5.0	5.6	5.6	5.0	5.6	5.6	5.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	299	141	391	641	141	207	217	130	174	500	49
RTOR Reduction (vph)	0	0	0	0	0	93	0	0	98	0	0	38
Lane Group Flow (vph)	33	299	141	391	641	48	207	217	32	174	500	11
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			6			8			4
Actuated Green, G (s)	2.0	16.1	75.0	11.8	25.7	25.7	10.0	18.4	18.4	7.7	16.3	16.3
Effective Green, g (s)	2.0	16.1	75.0	11.8	25.7	25.7	10.0	18.4	18.4	7.7	16.3	16.3
Actuated g/C Ratio	0.03	0.21	1.00	0.16	0.34	0.34	0.13	0.25	0.25	0.10	0.22	0.22
Clearance Time (s)	5.0	5.4		5.0	5.6	5.6	5.0	5.6	5.6	5.0	5.4	5.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	88	738	1538	524	1178	527	444	444	377	342	747	334
v/s Ratio Prot	0.01	0.09		c0.12	c0.19		c0.06	0.12		0.05	c0.15	
v/s Ratio Perm			c0.09			0.03			0.02			0.01
v/c Ratio	0.38	0.41	0.09	0.75	0.54	0.09	0.47	0.49	0.08	0.51	0.67	0.03
Uniform Delay, d1	35.9	25.3	0.0	30.2	19.9	16.7	30.0	24.3	21.8	31.9	26.9	23.1
Progression 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
Incremental Delay, d2	2.7	1.7	0.1	5.7	1.8	0.3	0.8	0.8	0.1	1.2	2.3	0.0
Delay (s)	38.6	27.0	0.1	35.9	21.7	17.1	30.8	25.1	21.9	33.1	29.2	23.2
Level of Service	D	C	A	D	C	B	C	C	C	C	C	C
Approach Delay (s)		19.8			25.9			26.5			29.7	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	21.2
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

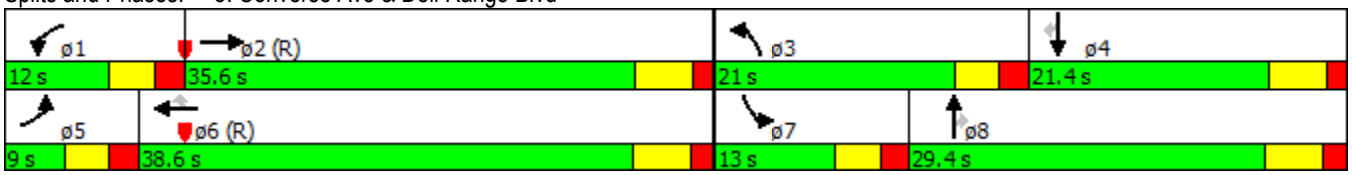


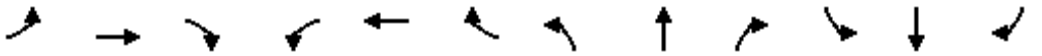
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	850	390	215	1050	190	350	300	190	210	420	110
Future Volume (vph)	85	850	390	215	1050	190	350	300	190	210	420	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	150		90	285		285	300		300
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			213			153			213
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			401	
Travel Time (s)		21.1			11.0			5.8			9.1	
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
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	92	924	424	234	1141	207	380	326	207	228	457	120
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	924	424	234	1141	207	380	326	207	228	457	120
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			Free			6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.4		10.0	21.6	21.6	21.0	21.6	21.6	9.0	21.4	21.4
Total Split (s)	9.0	35.6		12.0	38.6	38.6	21.0	29.4	29.4	13.0	21.4	21.4
Total Split (%)	10.0%	39.6%		13.3%	42.9%	42.9%	23.3%	32.7%	32.7%	14.4%	23.8%	23.8%
Maximum Green (s)	4.0	30.2		7.0	33.0	33.0	16.0	23.8	23.8	8.0	16.0	16.0
Yellow Time (s)	3.0	3.9		3.0	3.9	3.9	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	1.5		2.0	1.7	1.7	2.0	1.7	1.7	2.0	1.5	1.5
Lost 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
Total Lost Time (s)	5.0	5.4		5.0	5.6	5.6	5.0	5.6	5.6	5.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0		0	0
Act Effct Green (s)	4.8	31.2	90.0	8.0	36.4	36.4	14.5	21.8	21.8	8.0	15.5	15.5
Actuated g/C Ratio	0.05	0.35	1.00	0.09	0.40	0.40	0.16	0.24	0.24	0.09	0.17	0.17
v/c Ratio	0.52	0.77	0.28	0.79	0.82	0.28	0.71	0.74	0.42	0.77	0.77	0.27
Control Delay	53.3	32.0	0.4	62.0	31.6	3.8	43.4	42.4	11.3	58.6	45.2	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	32.0	0.4	62.0	31.6	3.8	43.4	42.4	11.3	58.6	45.2	1.5
LOS	D	C	A	E	C	A	D	D	B	E	D	A
Approach Delay		24.1			32.4			35.8			42.5	
Approach LOS		C			C			D			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 32.3		Intersection LOS: C	
Intersection Capacity Utilization 71.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



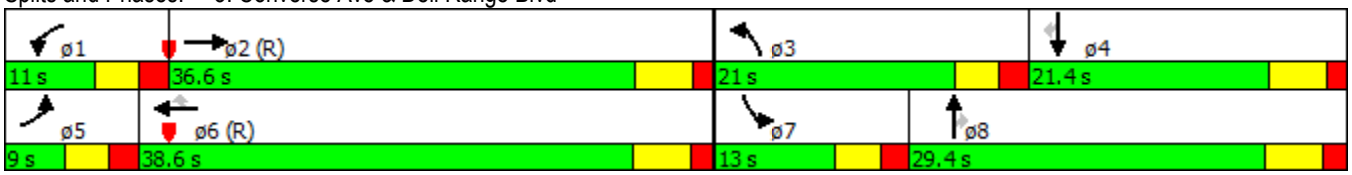


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	980	390	170	835	185	360	40	250	205	340	100
Future Volume (vph)	75	980	390	170	835	185	360	40	250	205	340	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	120		150	150		90	285		285	300		300
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3335	3438	1538	3335	3438	1538	3335	1810	1538	3335	3438	1538
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			281			213			153			213
Link Speed (mph)		35			35			40			30	
Link Distance (ft)		1084			566			342			401	
Travel Time (s)		21.1			11.0			5.8			9.1	
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
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Adj. Flow (vph)	82	1065	424	185	908	201	391	43	272	223	370	109
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	1065	424	185	908	201	391	43	272	223	370	109
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes			Yes							
Headway 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
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	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 1 Queue (s)	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 1 Delay (s)	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 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA	Free	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases			Free			6			8			4
Detector Phase	5	2		1	6	6	3	8	8	7	4	4
Switch Phase												
Minimum Initial (s)	4.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	4.0	4.0	4.0
Minimum Split (s)	9.0	21.4		10.0	21.6	21.6	21.0	21.6	21.6	9.0	21.4	21.4
Total Split (s)	9.0	36.6		11.0	38.6	38.6	21.0	29.4	29.4	13.0	21.4	21.4
Total Split (%)	10.0%	40.7%		12.2%	42.9%	42.9%	23.3%	32.7%	32.7%	14.4%	23.8%	23.8%
Maximum Green (s)	4.0	31.2		6.0	33.0	33.0	16.0	23.8	23.8	8.0	16.0	16.0
Yellow Time (s)	3.0	3.9		3.0	3.9	3.9	3.0	3.9	3.9	3.0	3.9	3.9
All-Red Time (s)	2.0	1.5		2.0	1.7	1.7	2.0	1.7	1.7	2.0	1.5	1.5
Lost 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
Total Lost Time (s)	5.0	5.4		5.0	5.6	5.6	5.0	5.6	5.6	5.0	5.4	5.4
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0		0	0
Act Effct Green (s)	5.0	32.9	90.0	7.3	37.1	37.1	14.6	20.8	20.8	8.0	14.4	14.4
Actuated g/C Ratio	0.06	0.37	1.00	0.08	0.41	0.41	0.16	0.23	0.23	0.09	0.16	0.16
v/c Ratio	0.44	0.85	0.28	0.69	0.64	0.27	0.72	0.10	0.58	0.75	0.68	0.26
Control Delay	49.6	34.8	0.4	55.5	25.1	3.5	43.8	26.2	17.9	57.3	42.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	34.8	0.4	55.5	25.1	3.5	43.8	26.2	17.9	57.3	42.0	1.5
LOS	D	C	A	E	C	A	D	C	B	E	D	A
Approach Delay		26.3			26.1			32.7			40.5	
Approach LOS		C			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 29.6		Intersection LOS: C	
Intersection Capacity Utilization 68.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Converse Ave & Dell Range Blvd



LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **MODERN ROUNDABOUT**

Scheme Summary

Control Data

Control Data and Model Parameters

Dell Range-Converse Roundabout	2040 Synthetic Flow Profile (veh)
2040 Volumes	5 min Time Slice
Rodel-Win1	Queuing Delays (sec)
Right Hand Drive	Daylight conditions
AM Peak Hour	Peak 60/15 min Results
Full Geometry	Output flows: Vehicles
English Units (ft)	50% Confidence Level

Available Data

Entry Capacity Calibrated	No
Entry Capacity Modified	No
Crosswalks	No
Flows Factored	No
Approach/Exit Road Capacity Calibrated	No
Accidents	No
Accident Costs	No
Bypass Model	Yes
Bypass Calibration	No
Global Results	Yes

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Converse Ave SB	0	0	24.00	2	30.00	2	164.00	66.00	30.00
2	Dell Range Blvd EB	90	0	24.00	2	30.00	2	164.00	66.00	30.00
3	Converse Ave NB	180	0	36.00	3	45.00	3	164.00	66.00	30.00
4	Dell Range Blvd WB	270	0	24.00	2	30.00	2	164.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Converse Ave SB	250.00	33.00	2	30.00	2	24.00	2
2	Dell Range Blvd EB	250.00	33.00	2	30.00	2	24.00	2
3	Converse Ave NB	250.00	33.00	2	30.00	2	24.00	2
4	Dell Range Blvd WB	250.00	48.00	3	30.00	2	24.00	2

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	Converse Ave SB	0	1.000	0	1.000	20.00	3584	0	24.00	3584	0
2	Dell Range Blvd EB	0	1.000	0	1.000	36.00	5377	0	24.00	3584	0
3	Converse Ave NB	0	1.000	0	1.000	20.00	5377	0	24.00	3584	0
4	Dell Range Blvd WB	0	1.000	0	1.000	36.00	3584	0	24.00	3584	0

Bypass Geometry

Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	Dell Range Blvd EB	Free	130	24	2	12	1	36	3

Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	Dell Range Blvd EB	12	1	0	130	66.0003 6538	30	3	Converse Ave NB	2	2

Bypass Entry Capacity Modifiers and Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Calibration	
		Capacity + or -	Cross Walk Factor	Intercept + or -	Slope Factor
2	Dell Range Blvd EB	0	1.000	0	1.000

Traffic Flow Data (veh/hr)

2040 AM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers	
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor
1	Converse Ave SB	0	160	460	45	0	5.0	1.00
2	Dell Range Blvd EB	0	30	275	0	130	5.0	1.00
3	Converse Ave NB	0	190	200	120	0	5.0	1.00
4	Dell Range Blvd WB	0	360	590	130	0	5.0	1.00

2040 AM Peak Synthetic Flow Profile - Timeslice 5 mins

Leg	Leg Names	Flow Ratios			Flow Times		
		Ratio 1	Ratio 2	Ratio 3	Time 1	Time 2	Time 3
1	Converse Ave SB	0.750	1.125	0.750	0	30	60
2	Dell Range Blvd EB	0.750	1.125	0.750	0	30	60
3	Converse Ave NB	0.750	1.125	0.750	0	30	60
4	Dell Range Blvd WB	0.750	1.125	0.750	0	30	60

Operational Results

2040 AM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	665		1140		360	1551		0.4473	
2	Dell Range Blvd EB	Free	305	130	980	0	825	1641	1264	0.1920	0.1042
3	Converse Ave NB	None	510		465		950	2890		0.1814	
4	Dell Range Blvd WB	None	1080		420		555	1986		0.5627	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	5.09		5.09	3.17		A		A
2	Dell Range Blvd EB	Free	2.84	0.00	1.99	0.77	0.00	A	A	A
3	Converse Ave NB	None	3.36		3.36	1.46		A		A
4	Dell Range Blvd WB	None	5.51		5.51	5.36		A		A

2040 AM Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	748		1281		405	1472		0.5148	
2	Dell Range Blvd EB	Free	343	146	1101	0	927	1573	1264	0.2191	0.1152
3	Converse Ave NB	None	573		523		1068	2841		0.2032	
4	Dell Range Blvd WB	None	1214		472		624	1960		0.6292	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	5.72		5.72	3.17		A		A
2	Dell Range Blvd EB	Free	3.00	0.00	2.10	0.77	0.00	A	A	A
3	Converse Ave NB	None	3.46		3.46	1.46		A		A
4	Dell Range Blvd WB	None	6.12		6.12	5.36		A		A

Approach Flow Profile

2040 AM Peak - Approach Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	44.77	29.28	34.33	72.71
5 - 10	50.11	32.78	38.43	81.37
10 - 15	54.83	35.87	42.05	89.05
15 - 20	58.66	38.37	44.99	95.27
20 - 25	61.37	40.14	47.06	99.66
25 - 30	62.76	41.06	48.14	101.93
30 - 35	62.76	41.06	48.14	101.93
35 - 40	61.37	40.14	47.06	99.66
40 - 45	58.66	38.37	44.99	95.27
45 - 50	54.83	35.87	42.05	89.05
50 - 55	50.11	32.78	38.43	81.37
55 - 60	44.77	29.28	34.33	72.71
Peak 15 min	62.30	40.75	47.78	101.18
Peak 60 min	55.42	36.25	42.50	90.00

Exit Flow Profile

2040 AM Peak - Exit Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	24.22	55.51	63.92	37.35
5 - 10	27.10	62.08	71.49	41.78
10 - 15	29.65	67.94	78.23	45.72
15 - 20	31.73	72.69	83.71	48.92
20 - 25	33.20	76.06	87.59	51.19
25 - 30	33.97	77.82	89.61	52.37
30 - 35	33.98	77.86	89.65	52.38
35 - 40	33.23	76.15	87.68	51.22
40 - 45	31.78	72.85	83.89	48.99
45 - 50	29.71	68.11	78.43	45.80
50 - 55	27.15	62.26	71.69	41.86
55 - 60	24.26	55.63	64.05	37.40
0-60	360	825	950	555
%Trucks	5.00	5.00	5.00	5.00

Global Results

Performance and Accidents

2040 AM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	2560	130	2690
Capacity	veh/hr	8068	1264	9332
Average Delay	sec/veh	4.66	0.00	4.43
L.O.S. (Signal)	A – F	A	A	A
L.O.S. (Unsig)	A – F	A	A	A
Total Delay	veh.hrs	3.31	0.00	3.31

Scheme Summary

Control Data

Control Data and Model Parameters

Dell Range-Converse Roundabout	2040 Synthetic Flow Profile (veh)
2040 Volumes	5 min Time Slice
Rodel-Win1	Queuing Delays (sec)
Right Hand Drive	Daylight conditions
Off Peak	Peak 60/15 min Results
Full Geometry	Output flows: Vehicles
English Units (ft)	50% Confidence Level

Available Data

Entry Capacity Calibrated	No
Entry Capacity Modified	No
Crosswalks	No
Flows Factored	No
Approach/Exit Road Capacity Calibrated	No
Accidents	No
Accident Costs	No
Bypass Model	Yes
Bypass Calibration	No
Global Results	Yes

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Converse Ave SB	0	0	24.00	2	30.00	2	164.00	66.00	30.00
2	Dell Range Blvd EB	90	0	24.00	2	30.00	2	164.00	66.00	30.00
3	Converse Ave NB	180	0	36.00	3	45.00	3	164.00	66.00	30.00
4	Dell Range Blvd WB	270	0	24.00	2	30.00	2	164.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Converse Ave SB	250.00	33.00	2	30.00	2	24.00	2
2	Dell Range Blvd EB	250.00	33.00	2	30.00	2	24.00	2
3	Converse Ave NB	250.00	33.00	2	30.00	2	24.00	2
4	Dell Range Blvd WB	250.00	48.00	3	30.00	2	24.00	2

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	Converse Ave SB	0	1.000	0	1.000	20.00	3584	0	24.00	3584	0
2	Dell Range Blvd EB	0	1.000	0	1.000	36.00	5377	0	24.00	3584	0
3	Converse Ave NB	0	1.000	0	1.000	20.00	5377	0	24.00	3584	0
4	Dell Range Blvd WB	0	1.000	0	1.000	36.00	3584	0	24.00	3584	0

Bypass Geometry

Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	Dell Range Blvd EB	Free	390	24	2	12	1	36	3

Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	Dell Range Blvd EB	12	1	0	130	66.0003 5904	30	3	Converse Ave NB	2	2

Bypass Entry Capacity Modifiers and Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Calibration	
		Capacity + or -	Cross Walk Factor	Intercept + or -	Slope Factor
2	Dell Range Blvd EB	0	1.000	0	1.000

Traffic Flow Data (veh/hr)

2040 OFF Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers	
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor
1	Converse Ave SB	0	210	420	110	0	5.0	1.00
2	Dell Range Blvd EB	0	85	850	0	390	5.0	1.00
3	Converse Ave NB	0	350	300	190	0	5.0	1.00
4	Dell Range Blvd WB	0	215	1050	190	0	5.0	1.00

2040 OFF Peak Synthetic Flow Profile - Timeslice 5 mins

Leg	Leg Names	Flow Ratios			Flow Times		
		Ratio 1	Ratio 2	Ratio 3	Time 1	Time 2	Time 3
1	Converse Ave SB	1.000	1.000	1.000	0	30	60
2	Dell Range Blvd EB	1.000	1.000	1.000	0	30	60
3	Converse Ave NB	1.000	1.000	1.000	0	30	60
4	Dell Range Blvd WB	1.000	1.000	1.000	0	30	60

Operational Results

2040 OFF Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	740		1615		575	1284		0.5920	
2	Dell Range Blvd EB	Free	935	390	845	0	1510	1717	1264	0.5529	0.3086
3	Converse Ave NB	None	840		1145		1025	2317		0.3684	
4	Dell Range Blvd WB	None	1455		735		1250	1832		0.8179	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	8.19		8.19	4.26		A		A
2	Dell Range Blvd EB	Free	4.55	0.00	3.21	3.02	0.00	A	A	A
3	Converse Ave NB	None	4.89		4.89	2.92		A		A
4	Dell Range Blvd WB	None	8.88		8.88	8.67		A		A

2040 OFF Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	740		1615		575	1284		0.5921	
2	Dell Range Blvd EB	Free	935	390	845	0	1510	1717	1264	0.5529	0.3086
3	Converse Ave NB	None	840		1145		1025	2317		0.3684	
4	Dell Range Blvd WB	None	1455		735		1250	1832		0.8181	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	8.23		8.23	4.26		A		A
2	Dell Range Blvd EB	Free	4.56	0.00	3.22	3.02	0.00	A	A	A
3	Converse Ave NB	None	4.90		4.90	2.92		A		A
4	Dell Range Blvd WB	None	8.95		8.95	8.68		A		A

Approach Flow Profile

2040 OFF Peak - Approach Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	61.67	110.42	70.00	121.25
5 - 10	61.67	110.42	70.00	121.25
10 - 15	61.67	110.42	70.00	121.25
15 - 20	61.67	110.42	70.00	121.25
20 - 25	61.67	110.42	70.00	121.25
25 - 30	61.67	110.42	70.00	121.25
30 - 35	61.67	110.42	70.00	121.25
35 - 40	61.67	110.42	70.00	121.25
40 - 45	61.67	110.42	70.00	121.25
45 - 50	61.67	110.42	70.00	121.25
50 - 55	61.67	110.42	70.00	121.25
55 - 60	61.67	110.42	70.00	121.25
Peak 15 min	61.67	110.42	70.00	121.25
Peak 60 min	61.67	110.42	70.00	121.25

Exit Flow Profile

2040 OFF Peak - Exit Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	47.91	125.82	85.41	104.16
5 - 10	47.91	125.82	85.41	104.16
10 - 15	47.92	125.83	85.41	104.17
15 - 20	47.92	125.83	85.42	104.17
20 - 25	47.92	125.83	85.42	104.17
25 - 30	47.92	125.83	85.42	104.17
30 - 35	47.92	125.83	85.42	104.17
35 - 40	47.92	125.83	85.42	104.17
40 - 45	47.92	125.83	85.42	104.17
45 - 50	47.92	125.83	85.42	104.17
50 - 55	47.92	125.83	85.42	104.17
55 - 60	47.92	125.83	85.42	104.17
0-60	575	1510	1025	1250
%Trucks	5.00	5.00	5.00	5.00

Global Results

Performance and Accidents

2040 OFF Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	3970	390	4360
Capacity	veh/hr	7150	1264	8414
Average Delay	sec/veh	6.89	0.00	6.27
L.O.S. (Signal)	A – F	A	A	A
L.O.S. (Unsig)	A – F	A	A	A
Total Delay	veh.hrs	7.59	0.00	7.59

Scheme Summary

Control Data

Control Data and Model Parameters

Dell Range-Converse Roundabout	2040 Synthetic Flow Profile (veh)
2040 Volumes	5 min Time Slice
Rodel-Win1	Queuing Delays (sec)
Right Hand Drive	Daylight conditions
PM Peak Hour	Peak 60/15 min Results
Full Geometry	Output flows: Vehicles
English Units (ft)	50% Confidence Level

Available Data

Entry Capacity Calibrated	No
Entry Capacity Modified	No
Crosswalks	No
Flows Factored	No
Approach/Exit Road Capacity Calibrated	No
Accidents	No
Accident Costs	No
Bypass Model	Yes
Bypass Calibration	No
Global Results	Yes

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	Converse Ave SB	0	0	24.00	2	30.00	2	164.00	66.00	30.00
2	Dell Range Blvd EB	90	0	24.00	2	30.00	2	164.00	66.00	30.00
3	Converse Ave NB	180	0	36.00	3	45.00	3	164.00	66.00	30.00
4	Dell Range Blvd WB	270	0	24.00	2	30.00	2	164.00	66.00	30.00

Circulating and Exit Geometry

Leg	Leg Names	Inscribed Diameter D	Circulating Width C	Circulating Lanes nc	Exit Width Ex	Exit Lanes nex	Exit Half Width Vx	Exit Half Width Lanes nvx
1	Converse Ave SB	250.00	33.00	2	30.00	2	24.00	2
2	Dell Range Blvd EB	250.00	33.00	2	30.00	2	24.00	2
3	Converse Ave NB	250.00	33.00	2	30.00	2	24.00	2
4	Dell Range Blvd WB	250.00	48.00	3	30.00	2	24.00	2

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	Converse Ave SB	0	1.000	0	1.000	20.00	3584	0	24.00	3584	0
2	Dell Range Blvd EB	0	1.000	0	1.000	36.00	5377	0	24.00	3584	0
3	Converse Ave NB	0	1.000	0	1.000	20.00	5377	0	24.00	3584	0
4	Dell Range Blvd WB	0	1.000	0	1.000	36.00	3584	0	24.00	3584	0

Bypass Geometry

Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	Dell Range Blvd EB	Free	390	24	2	12	1	36	3

Bypass Entry and Exit Geometry (ft)

Leg	Leg Names	Entry Geometry						Leg	Leg Names	Exit Lanes	
		Eb	neb	Lb	Lt	Rb	Phib			nex	Nmx
2	Dell Range Blvd EB	12	1	0	130	66.0003 3792	30	3	Converse Ave NB	2	2

Bypass Entry Capacity Modifiers and Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Calibration	
		Capacity + or -	Cross Walk Factor	Intercept + or -	Slope Factor
2	Dell Range Blvd EB	0	1.000	0	1.000

Traffic Flow Data (veh/hr)

2040 PM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers	
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor
1	Converse Ave SB	0	20	340	100	0	5.0	1.00
2	Dell Range Blvd EB	0	75	980	0	390	5.0	1.00
3	Converse Ave NB	0	360	420	250	0	5.0	1.00
4	Dell Range Blvd WB	0	170	835	185	0	5.0	1.00

2040 PM Peak Synthetic Flow Profile - Timeslice 5 mins

Leg	Leg Names	Flow Ratios			Flow Times		
		Ratio 1	Ratio 2	Ratio 3	Time 1	Time 2	Time 3
1	Converse Ave SB	0.750	1.125	0.750	0	30	60
2	Dell Range Blvd EB	0.750	1.125	0.750	0	30	60
3	Converse Ave NB	0.750	1.125	0.750	0	30	60
4	Dell Range Blvd WB	0.750	1.125	0.750	0	30	60

Operational Results

2040 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	460		1365		680	1425		0.3378	
2	Dell Range Blvd EB	Free	1055	390	530	0	1295	1894	1264	0.5750	0.3127
3	Converse Ave NB	None	1030		1075		900	2376		0.4534	
4	Dell Range Blvd WB	None	1190		855		1250	1773		0.7006	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	4.56		4.56	1.96		A		A
2	Dell Range Blvd EB	Free	4.30	0.00	3.14	4.23	0.00	A	A	A
3	Converse Ave NB	None	6.25		6.25	5.81		A		A
4	Dell Range Blvd WB	None	6.89		6.89	8.07		A		A

2040 PM Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	Converse Ave SB	None	517		1533		764	1330		0.3930	
2	Dell Range Blvd EB	Free	1186	438	596	0	1455	1857	1264	0.6461	0.3457
3	Converse Ave NB	None	1158		1208		1011	2264		0.5204	
4	Dell Range Blvd WB	None	1338		961		1405	1721		0.7946	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	Converse Ave SB	None	5.06		5.06	1.96		A		A
2	Dell Range Blvd EB	Free	4.87	0.00	3.55	4.23	0.00	A	A	A
3	Converse Ave NB	None	6.99		6.99	5.81		A		A
4	Dell Range Blvd WB	None	8.35		8.35	8.07		A		A

Approach Flow Profile

2040 PM Peak - Approach Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	30.97	97.28	69.34	80.11
5 - 10	34.66	108.88	77.61	89.66
10 - 15	37.93	119.14	84.92	98.12
15 - 20	40.58	127.47	90.86	104.98
20 - 25	42.45	133.35	95.05	109.81
25 - 30	43.42	136.38	97.21	112.32
30 - 35	43.42	136.38	97.21	112.32
35 - 40	42.45	133.35	95.05	109.81
40 - 45	40.58	127.47	90.86	104.98
45 - 50	37.93	119.14	84.92	98.12
50 - 55	34.66	108.88	77.61	89.66
55 - 60	30.97	97.28	69.34	80.11
Peak 15 min	43.09	135.37	96.49	111.48
Peak 60 min	38.33	120.42	85.83	99.17

Exit Flow Profile

2040 PM Peak - Exit Flows (Veh / Hour)

Time Slice	Converse Ave SB	Dell Range Blvd EB	Converse Ave NB	Dell Range Blvd WB
0 - 5	45.74	87.11	60.57	84.10
5 - 10	51.15	97.39	67.76	94.06
10 - 15	55.97	106.56	74.14	102.93
15 - 20	59.88	114.00	79.32	110.13
20 - 25	62.66	119.28	82.99	115.24
25 - 30	64.12	122.08	84.90	117.91
30 - 35	64.17	122.19	84.94	117.97
35 - 40	62.77	119.54	83.07	115.38
40 - 45	60.08	114.47	79.46	110.39
45 - 50	56.19	107.06	74.29	103.21
50 - 55	51.35	97.83	67.89	94.33
55 - 60	45.88	87.38	60.65	84.28
0-60	680	1295	900	1250
%Trucks	5.00	5.00	5.00	5.00

Global Results

Performance and Accidents

2040 PM Peak Global Performance

Parameter	Units	Entries	Bypasses	Total
Arrive Flows	veh/hr	3735	390	4125
Capacity	veh/hr	7467	1264	8731
Average Delay	sec/veh	5.70	0.00	5.16
L.O.S. (Signal)	A – F	A	A	A
L.O.S. (Unsig)	A – F	A	A	A
Total Delay	veh.hrs	5.91	0.00	5.91

LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **FULL CONTINUOUS FLOW**

CFI_Full Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	30	31.2	30	28.9	30	15.0
EBT	275	11.7	275	14.7	0	0.0
EBR	130	0.1	130	0.1	0	0.0
WBL	360	16.9	360	54.5	360	8.0
WBT	590	13.5	590	5.0	0	0.0
WBR	130	0.1	130	0.1	0	0.0
NBL	190	28.3	190	20.5	190	5.0
NBT	200	14.1	200	15.0	0	0.0
NBR	120	0.1	120	0.1	0	0.0
SBL	160	18.4	160	23.3	160	14.7
SBT	460	14.1	460	8.0	0	0.0
SBR	45	0.0	45	0.0	0	0.0

Composite Intersection

	vol	delay
EBL	30	75.1
EBT	275	26.4
EBR	130	0.2
WBL	360	79.4
WBT	590	18.5
WBR	130	0.2
NBL	190	53.8
NBT	200	29.1
NBR	120	0.2
SBL	160	56.4
SBT	460	22.1
SBR	45	0.0

Tot	31.3

CFI_Full Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	85	28.5	85	45.5	85	5.8
EBT	850	16.5	850	20.1	0	0.0
EBR	390	0.4	390	0.4	0	0.0
WBL	215	17.6	215	41.8	215	8.4
WBT	1050	19.2	1050	11.6	0	0.0
WBR	190	0.2	190	0.2	0	0.0
NBL	350	15.6	350	19.6	350	11.6
NBT	300	15.0	300	5.8	0	0.0
NBR	190	0.2	190	0.2	0	0.0
SBL	210	18.7	210	23.0	210	20.1
SBT	420	13.1	420	8.4	0	0.0
SBR	110	0.1	110	0.1	0	0.0

Composite Intersection

	vol	delay
EBL	85	79.8
EBT	850	36.6
EBR	390	0.8
WBL	215	67.8
WBT	1050	30.8
WBR	190	0.4
NBL	350	46.8
NBT	300	20.8
NBR	190	0.4
SBL	210	61.8
SBT	420	21.5
SBR	110	0.2

Tot	29.8

CFI_Full Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	75	26.7	75	46.9	75	5.7
EBT	980	17.0	980	16.6	0	0.0
EBR	390	0.4	390	0.4	0	0.0
WBL	170	20.3	170	43.3	170	11.1
WBT	835	15.5	835	9.9	0	0.0
WBR	185	0.2	185	0.2	0	0.0
NBL	360	13.5	360	19.8	360	9.9
NBT	420	19.3	420	5.7	0	0.0
NBR	250	0.2	250	0.2	0	0.0
SBL	205	21.5	205	24.4	205	16.6
SBT	340	13.3	340	11.1	0	0.0
SBR	100	0.1	100	0.1	0	0.0

Composite Intersection

	vol	delay
EBL	75	79.3
EBT	980	33.6
EBR	390	0.8
WBL	170	74.7
WBT	835	25.4
WBR	185	0.4
NBL	360	43.2
NBT	420	25.0
NBR	250	0.4
SBL	205	62.5
SBT	340	24.4
SBR	100	0.2

Tot	27.9

LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **MODIFIED CONTINUOUS FLOW**

CFI_Modified Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	30	11.5	0	0.0	0	0.0
EBT	580	13.0	275	1.7	0	0.0
EBR	130	0.5	130	0.1	0	0.0
WBL	360	25.4	360	0.4	360	14.2
WBT	590	24.0	0	0.0	0	0.0
WBR	130	1.5	0	0.0	0	0.0
NBL	190	14.7	190	28.0	190	0.0
NBT	400	19.2	0	0.0	0	0.0
NBR	120	1.0	120	0.1	0	0.0
SBL	160	14.3	0	0.0	160	1.7
SBT	460	17.3	460	14.2	0	0.0
SBR	45	0.2	0	0.0	0	0.0

Composite Intersection

	vol	delay
EBL	30	11.5
EBT	580	14.7
EBR	130	0.6
WBL	360	40.0
WBT	590	24.0
WBR	130	1.5
NBL	190	42.7
NBT	400	19.2
NBR	120	1.1
SBL	160	16.0
SBT	460	31.5
SBR	45	0.2

Tot	22.1

CFI_Modified Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	85	14.4	0	0.0	0	0.0
EBT	1785	17.2	850	3.5	0	0.0
EBR	390	0.8	390	0.4	0	0.0
WBL	215	21.7	215	0.2	215	19.8
WBT	1050	32.8	0	0.0	0	0.0
WBR	190	3.8	0	0.0	0	0.0
NBL	350	15.6	350	24.9	350	0.0
NBT	600	31.9	0	0.0	0	0.0
NBR	190	0.9	190	0.2	0	0.0
SBL	210	49.1	0	0.0	210	3.5
SBT	420	22.4	420	19.8	0	0.0
SBR	110	2.9	0	0.0	0	0.0

Composite Intersection

	vol	delay
EBL	85	14.4
EBT	1785	20.7
EBR	390	1.2
WBL	215	41.7
WBT	1050	32.8
WBR	190	3.8
NBL	350	40.5
NBT	600	31.9
NBR	190	1.1
SBL	210	52.6
SBT	420	42.2
SBR	110	2.9

Tot	26.0

CFI_Modified Delay Calculations

HDR Engineering, Inc.

7/23/2017

Ancillary Intersections

From outside in

	Int. 1		Int 2		Int 3	
	vol	delay	vol	delay	vol	delay
EBL	75	18.0	0	0.0	0	0.0
EBT	2035	26.3	980	3.6	0	0.0
EBR	390	0.8	390	0.4	0	0.0
WBL	170	27.2	170	2.2	170	27.3
WBT	835	29.0	0	0.0	0	0.0
WBR	185	4.3	0	0.0	0	0.0
NBL	360	19.0	360	12.7	360	0.0
NBT	840	46.6	0	0.0	0	0.0
NBR	250	0.9	250	0.2	0	0.0
SBL	205	59.6	0	0.0	205	3.6
SBT	340	21.2	340	27.3	0	0.0
SBR	100	3.9	0	0.0	0	0.0

Composite Intersection

	vol	delay
EBL	75	18.0
EBT	2035	29.9
EBR	390	1.2
WBL	170	56.7
WBT	835	29.0
WBR	185	4.3
NBL	360	31.7
NBT	840	46.6
NBR	250	1.1
SBL	205	63.2
SBT	340	48.5
SBR	100	3.9
Tot		**30.8**

LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **THRU-TURN WITH SIGNALIZED INTERSECTIONS**

Through-Turn Intersection Delay Calculations - Signal

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	3430	8.9	3430	23.5
2	1305	11.5	1115	11.2
3	1820	16.9	1300	13.0
4	1690	8.5	1660	8.5
5	0	0.0	0	0.0
Tot		11.0		16.5

Through-Turn Intersection Delay Calculations - Signal

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	5220	11.3	5220	25.8
2	1880	21.8	1530	18.7
3	3390	21.3	2965	17.9
4	2810	11.7	2725	11.3
5	0	0.0	0	0.0
Tot		15.4		19.9

Through-Turn Intersection Delay Calculations - Signal

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	5120	21.0	5120	36.3
2	1935	16.1	1745	15.3
3	3255	15.1	2735	13.9
4	2730	6.1	2700	5.9
5	0	0.0	0	0.0
Tot		15.7		21.7

LEVEL OF SERVICE CALCULATION SHEETS

2040 BUILD ALTERNATIVES - **THRU-TURN WITH ROUNDABOUTS**

Through-Turn Intersection Delay Calculations - Roundabouts

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	3430	8.9	3430	19.9
2	1305	3.5	1115	3.3
3	1820	5.5	1300	5.1
4	1690	3.0	1660	3.0
5	0	0.0	0	0.0
Tot		6.0		11.1

Through-Turn Intersection Delay Calculations - Roundabouts

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	5220	11.3	5220	20.9
2	1880	4.5	1530	4.5
3	3390	10.8	2965	10.3
4	2810	4.5	2725	4.5
5	0	0.0	0	0.0
Tot		8.8		12.8

Through-Turn Intersection Delay Calculations - Roundabouts

System Delay - All Ints				
	w/o EDTT		with EDTT	
	vol	delay	vol	delay
1	5120	21.0	5120	34.3
2	1935	5.5	1745	5.4
3	3255	8.6	2735	8.4
4	2730	5.2	2700	5.2
5	0	0.0	0	0.0
Tot		12.3		18.1

Memo

Date: Thursday, June 08, 2017

Project: Cheyenne MPO – Converse and Del Range Intersection

To: Cheyenne MPO

From: HDR

Subject: Drainage Design

The drainage study location consists of the Converse Avenue corridor between Ogden Road and the Dry Creek Bridge north of Del Range Boulevard in northcentral Cheyenne, Wyoming. The intersection of Converse Avenue and Del Range Boulevard was evaluated for intersection options as part of the overall study. Since the No Build Alternative emerged as the preferred option, drainage improvements are not included for the intersection.

The scope of the project includes reconstruction of the Converse Avenue roadway and utility improvements. The original storm sewer through this area was installed in 1992 (based on City GIS data). Converse Avenue was reconstructed more recently from Odgen Road to the north.

There is an existing roadside drainage channel paralleling Converse Avenue on the west side of the roadway with several culvert crossings at intersecting streets. The existing roadway has a curb on the east side, but the west side is able to shed runoff directly into the channel. Design flows for the roadside drainage ditch were provided by the City with the intent to convert it to a subsurface system when this section of Converse Avenue is reconstructed and widened. These design flows are shown in Table 1.

Table 1. Peak Runoff at selected concentration points along the Converse Avenue roadside ditch.

Location	Peak Discharge (cfs)				
	5-Year	10-Year	25-Year	50-Year	100-Year
Converse Avenue at Dry Creek	54	89	157	251	380
Converse Avenue at Point Bluff	44	78	154	249	376
Converse Avenue at Ogden Road	16	47	104	182	280

At Point Bluff and continuing south, the roadside ditch is intercepted by an 8’x6’ concrete box culvert which discharges directly into Dry Creek. The majority of drainage infrastructure required with the project will be installed between Ogden Road and Point Bluff. The project study location is shown in Figure 1.

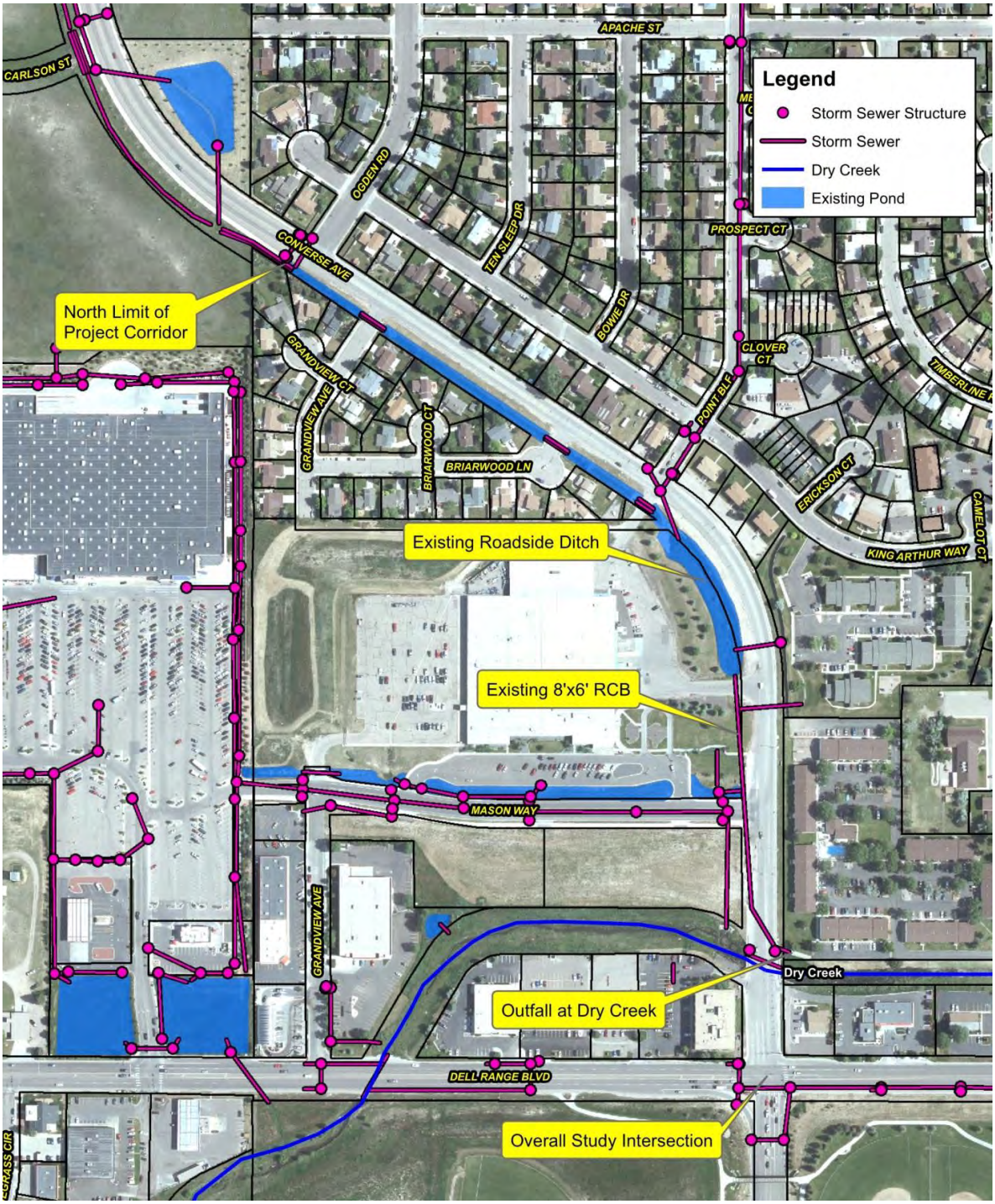


Figure 1. Project Study Location.

The existing roadway section south of Odgen Road is shown in Figure 2 and includes the following:

- 3 lanes
- Curb & gutter on the east side
- Asphalt shoulder on the west side
- Drainage ditch on the west side

Figure 2. Existing roadway section for Converse Avenue (facing north).

The proposed roadway section for Converse Avenue between Odgen Road and the Dry Creek Bridge is shown in Figure 3 and includes the following:

- Curb & gutter on both sides
- 3 x 12 foot lanes with 10 foot outside bike lanes on both sides
- Varying boulevards with sidewalk on both sides
- Existing drainage ditch will be converted to a subsurface system

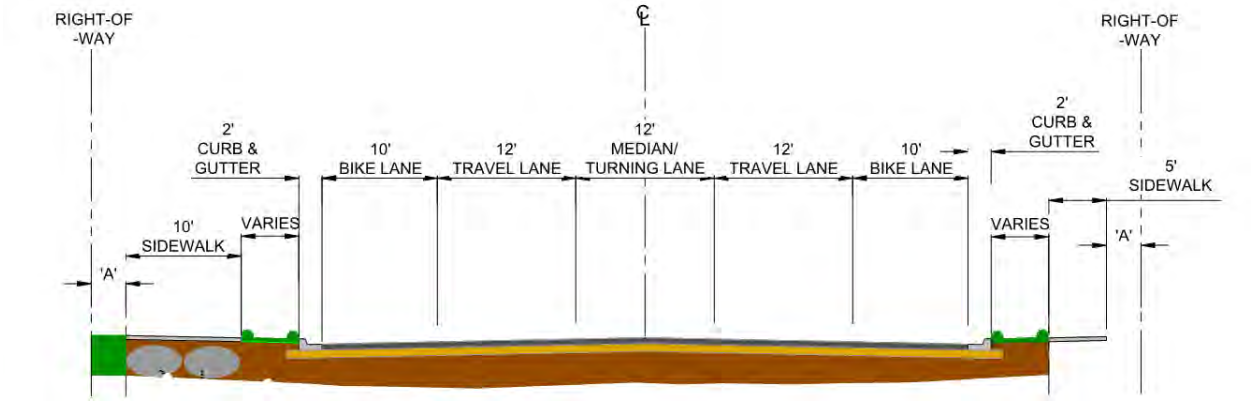


Figure 3. Proposed roadway section for Converse Avenue (facing north).

The existing 8'x6' box culvert on the south end of the corridor appears to have excess capacity for the design flows. However, when using the FEMA regulatory 100-year water surface elevation in Dry Creek as the tailwater condition, the existing box culvert is at full capacity. For the preliminary design of the subsurface drainage system, it was assumed that the 100-year event is coincident with the regulatory 100-year event in Dry Creek. This downstream tailwater elevation was assumed to be 6032.5 based on the 2007 FEMA Flood Insurance Study. Excerpts from the Flood Insurance Study are included in Appendix A.

Using the design flows provided by the City for the 100-year event, the following pipe sizes are recommended for replacing the existing drainage channel:

- 8'x5' Concrete Box Culvert: connect to the existing 8'x6' Box Culvert and extend north to the Point Bluff intersection
- Dual 48" Reinforced Concrete Pipe: from the Point Bluff intersection and extending north to the Ogden Road intersection; the dual 48" trunk line should be connected to the 6 inlets on the north side of the intersection and the existing dual 36" RCP Arch pipes that continue north.

Figure 4 shows the design profile of the layout that was analyzed with Autodesk Storm and Sanitary. The Hydraulic Grade Line (HGL) is generally contained below the ground surface with some potential for surcharging at the Dry Creek outfall and at the north end where the flow needs to transition from the channel to the pipe conveyance. Detailed plan and profile layouts for the storm sewer are included in Appendix B.

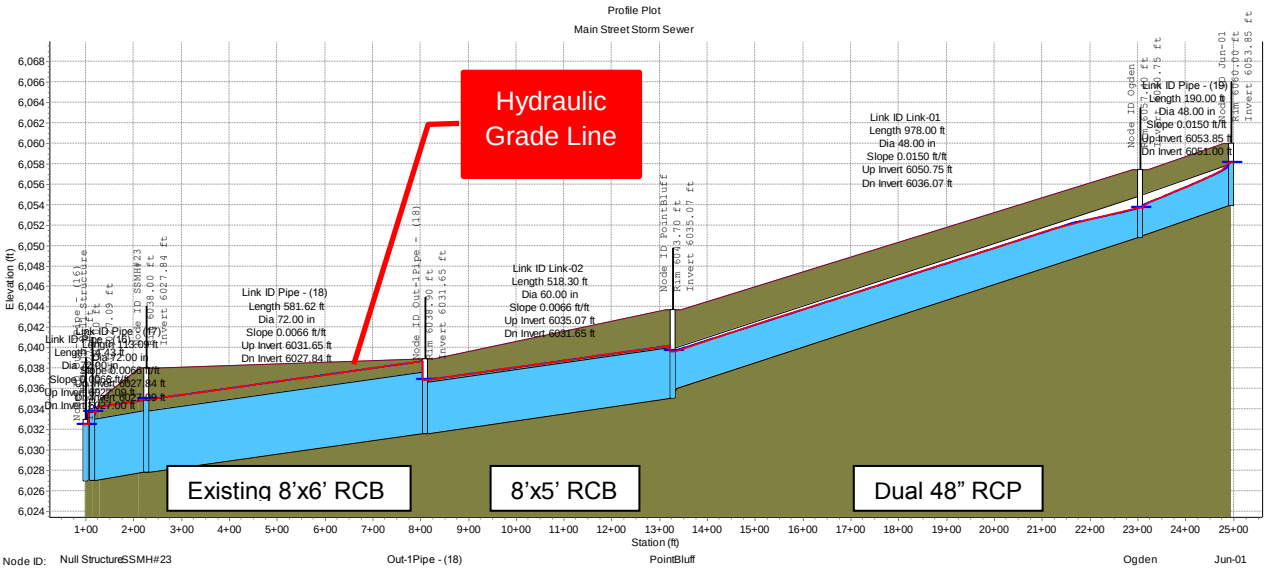


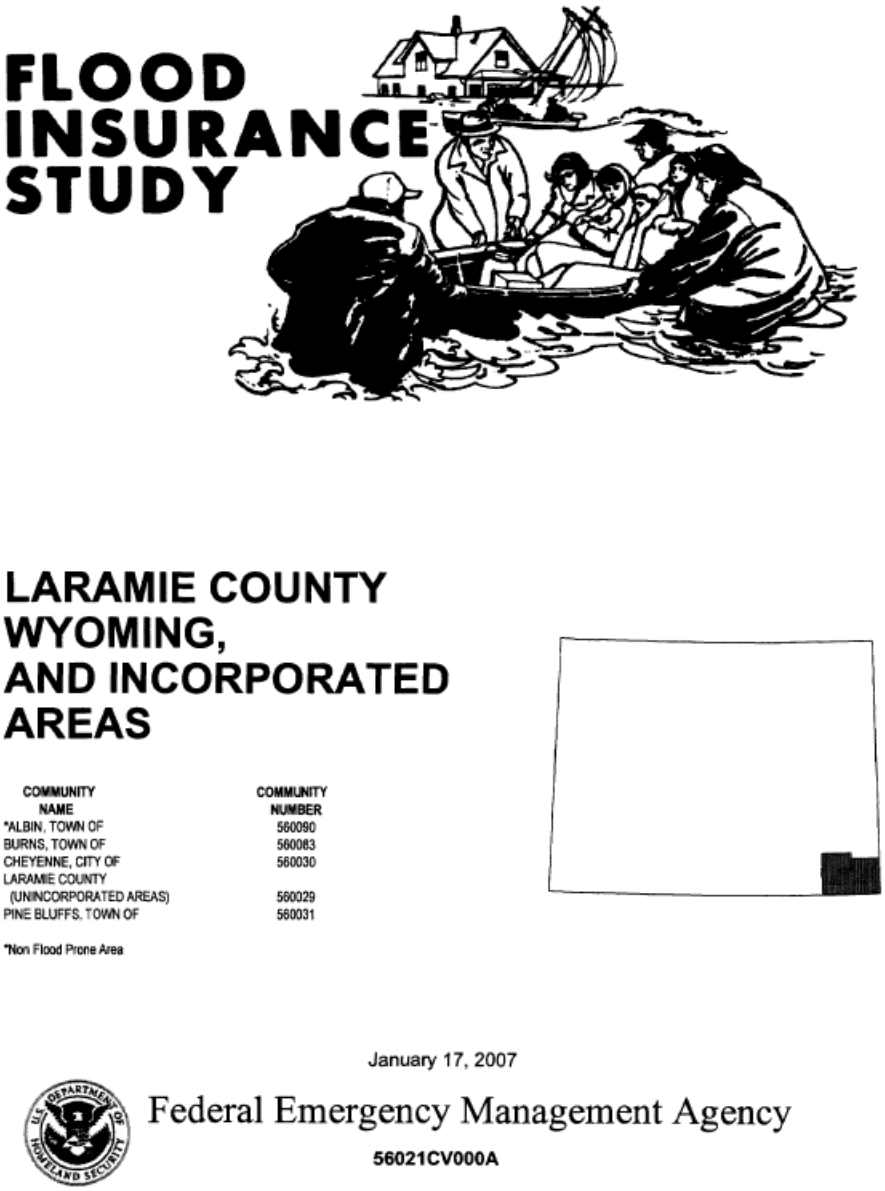
Figure 4. Design profile for storm sewer trunline (replacing existing drainage ditch).

Appendix A – FEMA Flood Insurance Study Excerpts

Appendix B – Drainage Plan and Profile Layouts

Appendix A

FEMA Flood Insurance Study Excerpts



FLOOD INSURANCE STUDY

LARAMIE COUNTY WYOMING, AND INCORPORATED AREAS

COMMUNITY NAME	COMMUNITY NUMBER
*ALBIN, TOWN OF	560090
BURNS, TOWN OF	560083
CHEYENNE, CITY OF	560030
LARAMIE COUNTY (UNINCORPORATED AREAS)	560029
PINE BLUFFS, TOWN OF	560031

*Non Flood Prone Area

January 17, 2007

Federal Emergency Management Agency

56021CV000A

Figure A1. 2007 FEMA Flood Insurance Study for Laramie County.

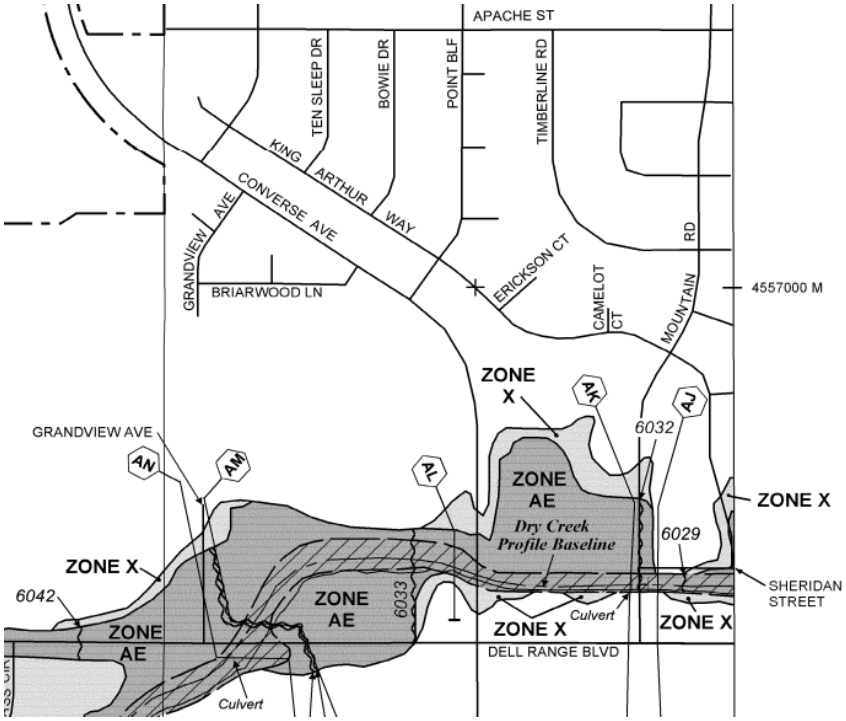


Figure A2. FEMA Flood Insurance Rate Map from the 2007 Flood Insurance Study.

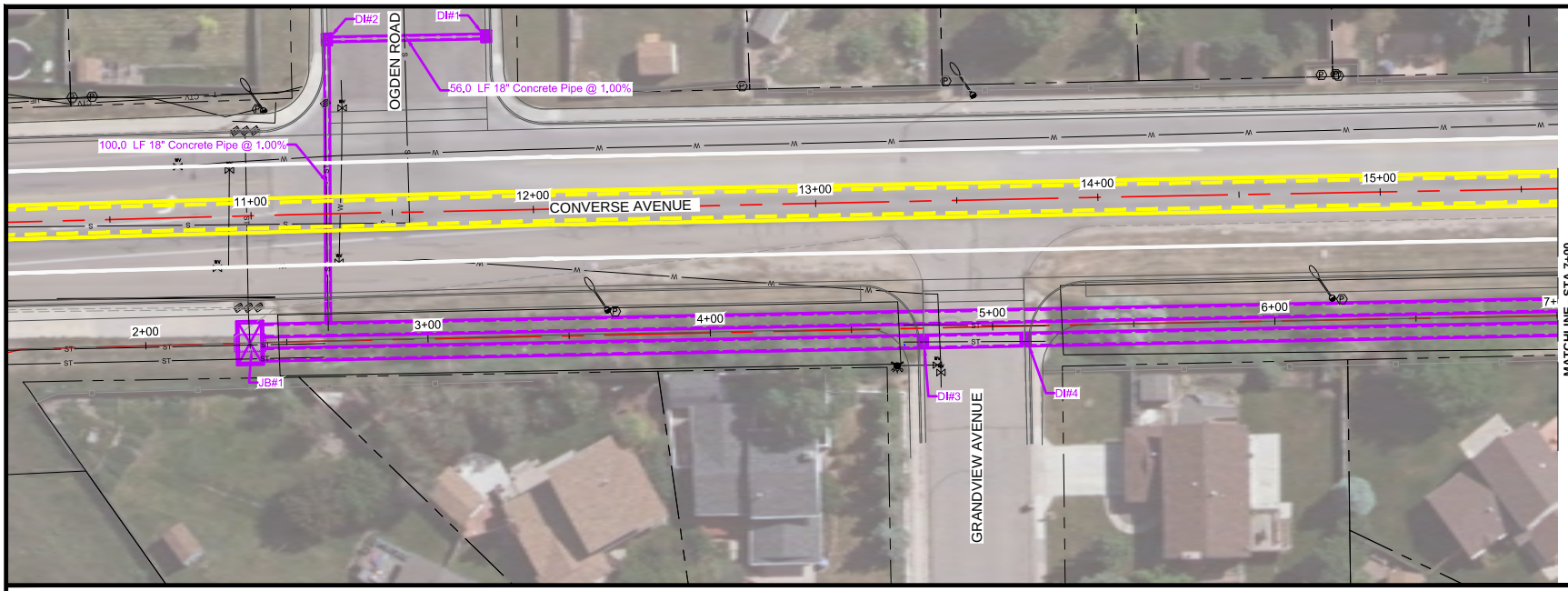
FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 1988)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Dry Creek (Continued)								
AA	25,830	85	460	6.0	6,004.5	6,004.5	6,004.9	0.4
AB	25,940	85	611	4.5	6,006.3	6,006.3	6,006.7	0.4
AC	26,700	62	314	8.8	6,011.1	6,011.1	6,012.0	0.9
AD	26,810	62	466	5.9	6,013.7	6,013.7	6,014.6	0.9
AE	27,470	35	202	13.7	6,016.5	6,016.5	6,016.6	0.1
AF	28,310	60	291	8.7	6,020.6	6,020.6	6,021.3	0.7
AG	29,035	56	223	11.3	6,024.9	6,024.9	6,024.9	0.0
AH	29,120	62	452	5.6	6,027.3	6,027.3	6,027.3	0.0
AI	29,490	53	219	11.5	6,028.2	6,028.2	6,028.2	0.0
AJ	29,925	63	324	7.0	6,029.2	6,029.2	6,030.2	1.0
AK	30,030	63	502	4.5	6,032.1	6,032.1	6,033.1	1.0
AL	30,740	100	393	5.8	6,032.5	6,032.5	6,033.4	0.9
AM	31,640	77	255	8.9	6,034.9	6,034.9	6,034.9	0.0
AN	31,805	278	1,946	1.2	6,041.8	6,041.8	6,041.8	0.0
AO	32,595	110	397	5.4	6,041.6	6,041.6	6,041.6	0.0
AP	34,155	83	227	9.5	6,046.2	6,046.2	6,046.2	0.0
AQ	34,370	97	243	10.1	6,057.0	6,057.0	6,057.0	0.0
AR	35,030	76	312	7.8	6,059.1	6,059.1	6,059.9	0.8
AS	35,110	69	232	10.5	6,066.0	6,066.0	6,066.0	0.0
AT	35,475	112	373	6.5	6,067.9	6,067.9	6,068.1	0.2
AU	36,960	50	193	10.8	6,071.6	6,071.6	6,071.6	0.0
AV	38,200	79	240	8.7	6,077.3	6,077.3	6,077.6	0.3
AW	38,590	90	1,339	2.0	6,087.2	6,087.2	6,087.2	0.0
AX	39,480	100	1,113	2.4	6,087.3	6,087.3	6,087.3	0.0
AY	40,850	129	930	2.9	6,093.9	6,093.9	6,094.0	0.1
AZ	41,160	150	243	8.9	6,095.6	6,095.6	6,096.1	0.5

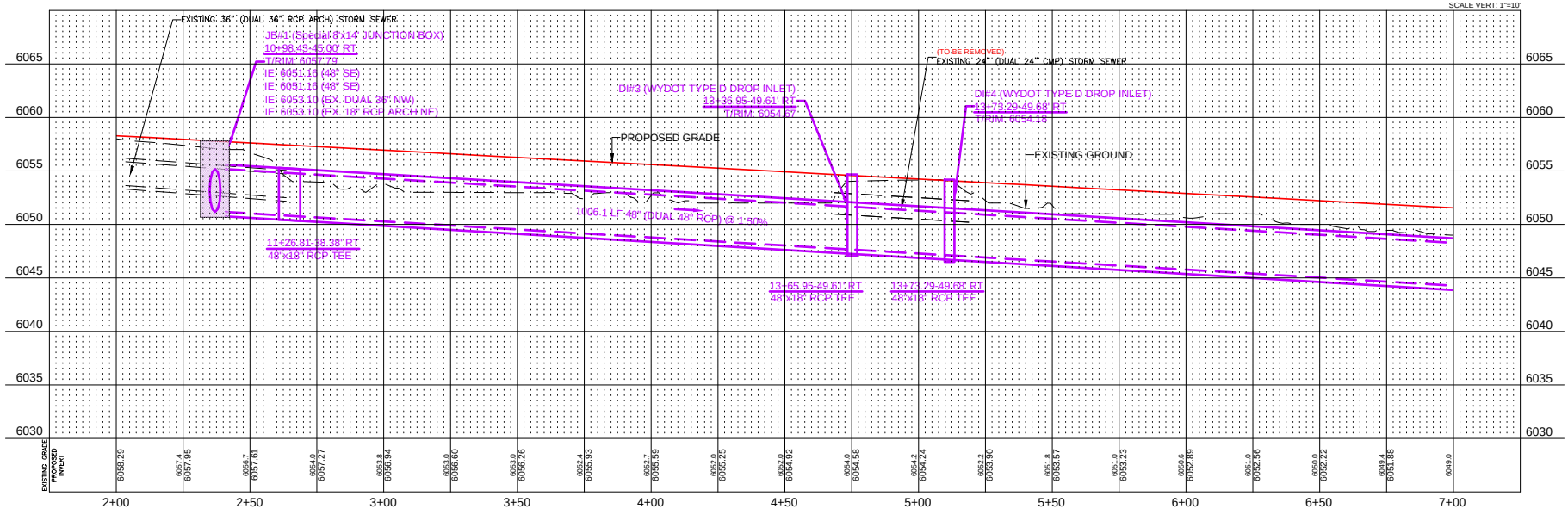
[1] Feet above confluence with Crow Creek.

Figure A3. FEMA Base Flood Elevations from the 2007 Flood Insurance Study.

Appendix B

Drainage Plan and Profile Layouts





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1720 Carey Ave.
Suite 612
Cheyenne, WY 82001

Prepared For:

Prepared By:

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 6/7/2017	Print Date: 6/7/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 8/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

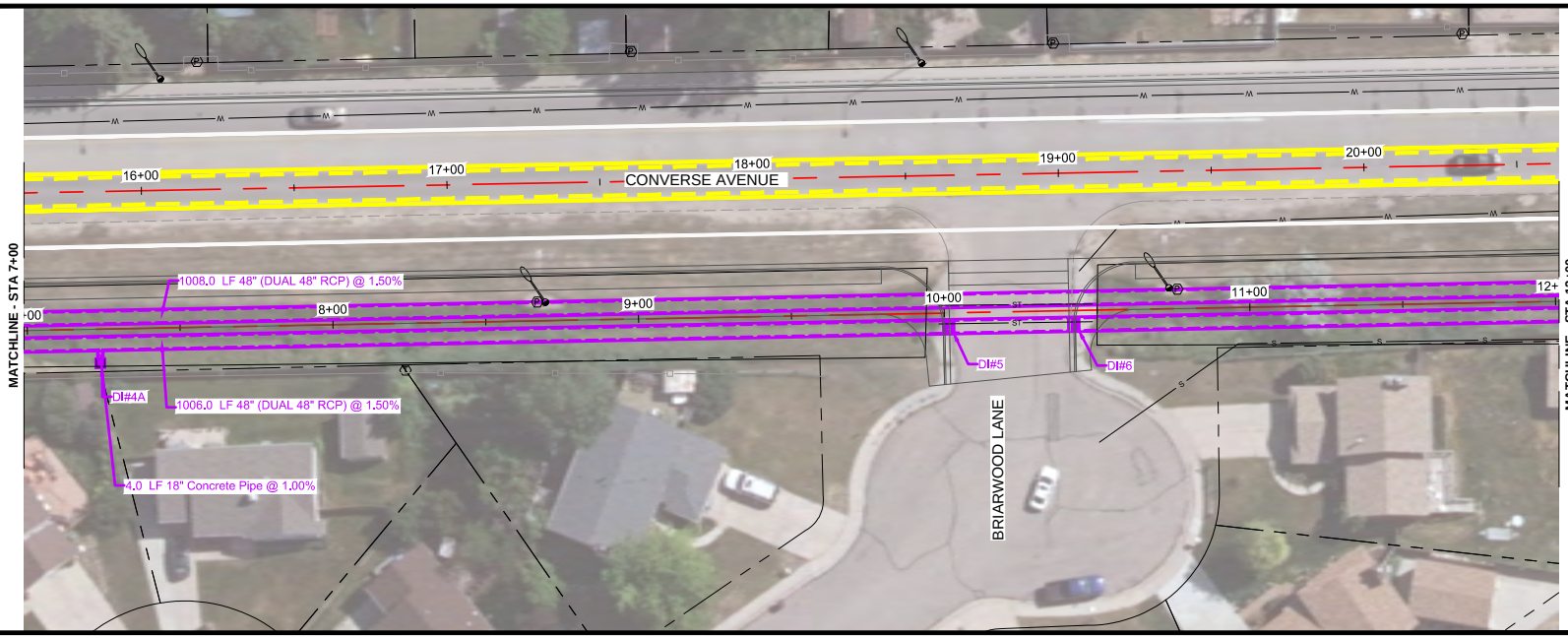
Project No: 10038796

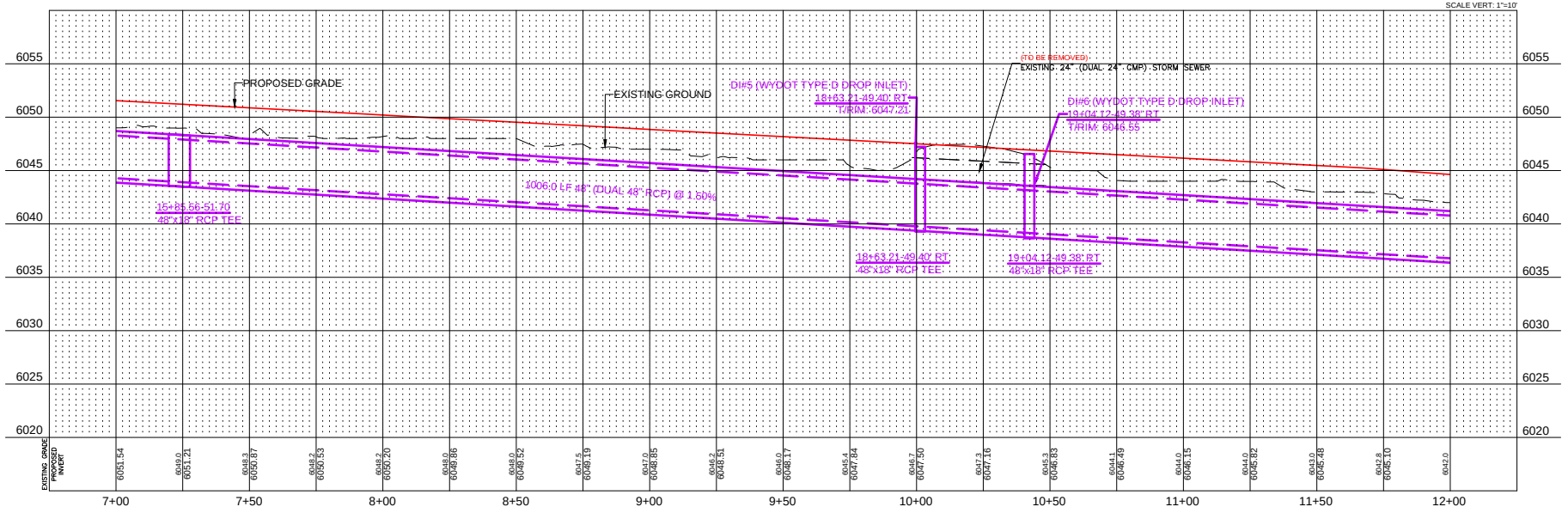
Sheet Title:

STORM SEWER PLAN AND PROFILE

Sheet:

I.1





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CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

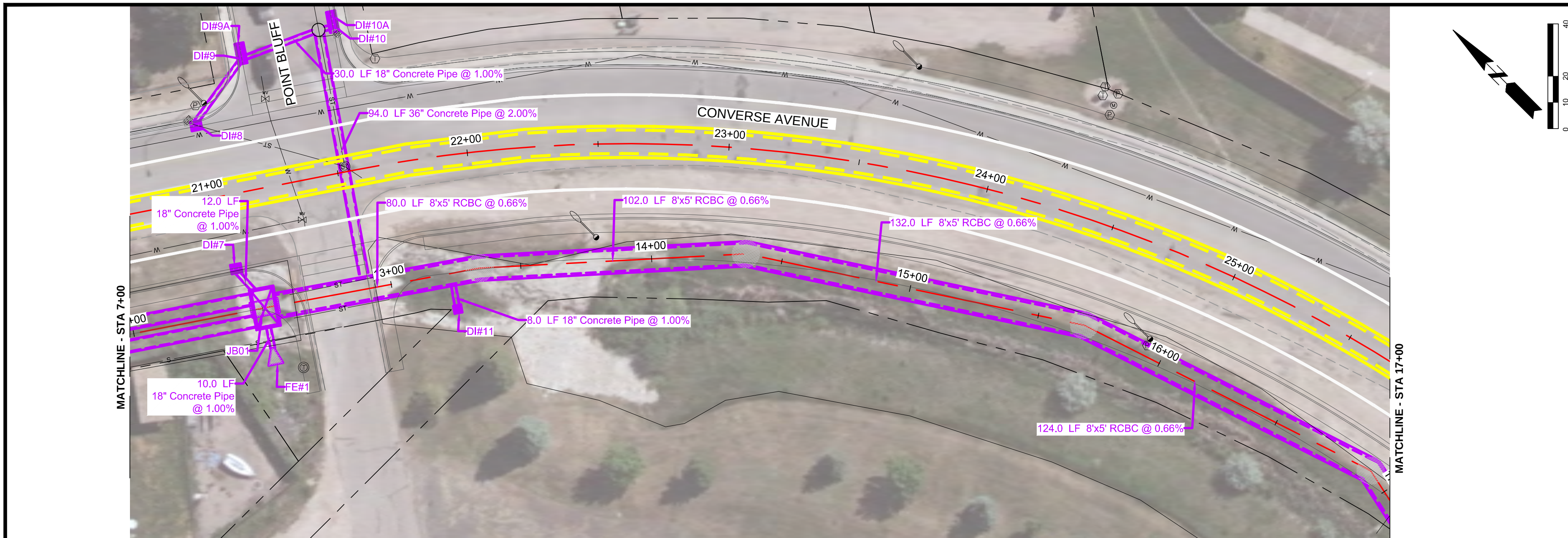
Project No: 10038796

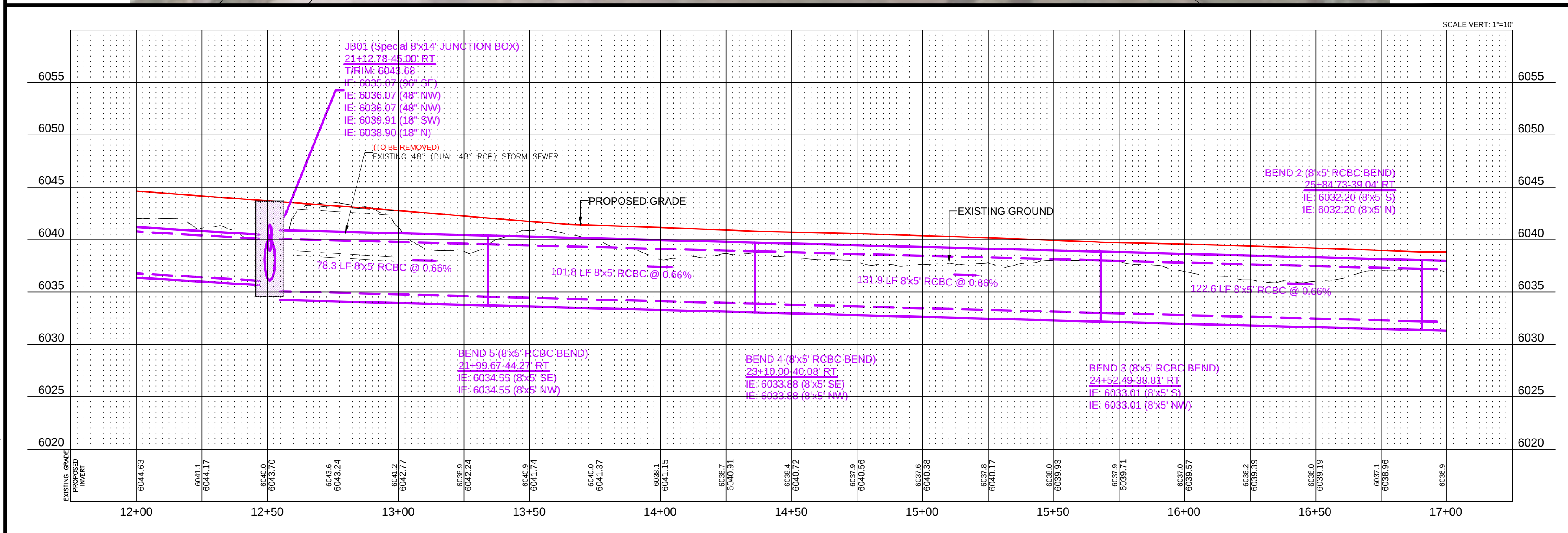
Sheet Title:

STORM SEWER PLAN AND PROFILE

Sheet:

I.2





Prepared For:

Prepared By:

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HDR

Scale:

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Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

STORM SEWER PLAN AND PROFILE

Sheet:

I.3

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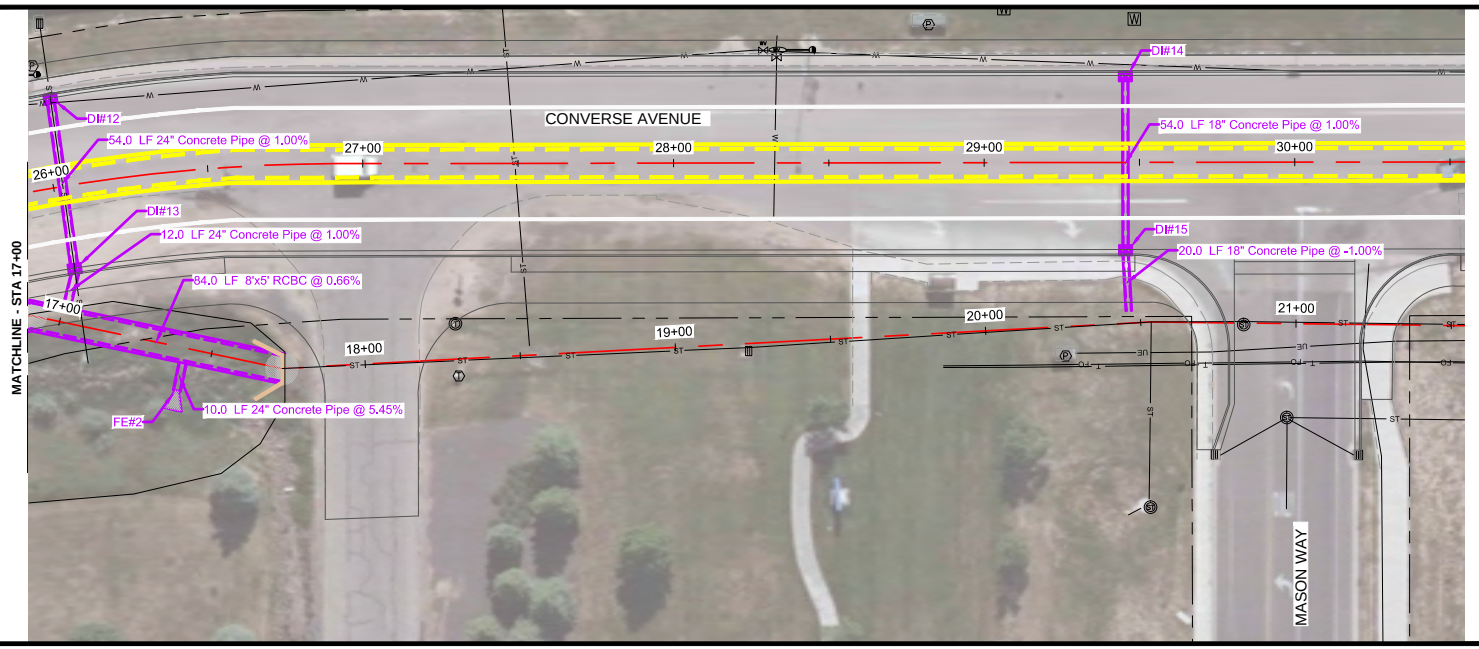

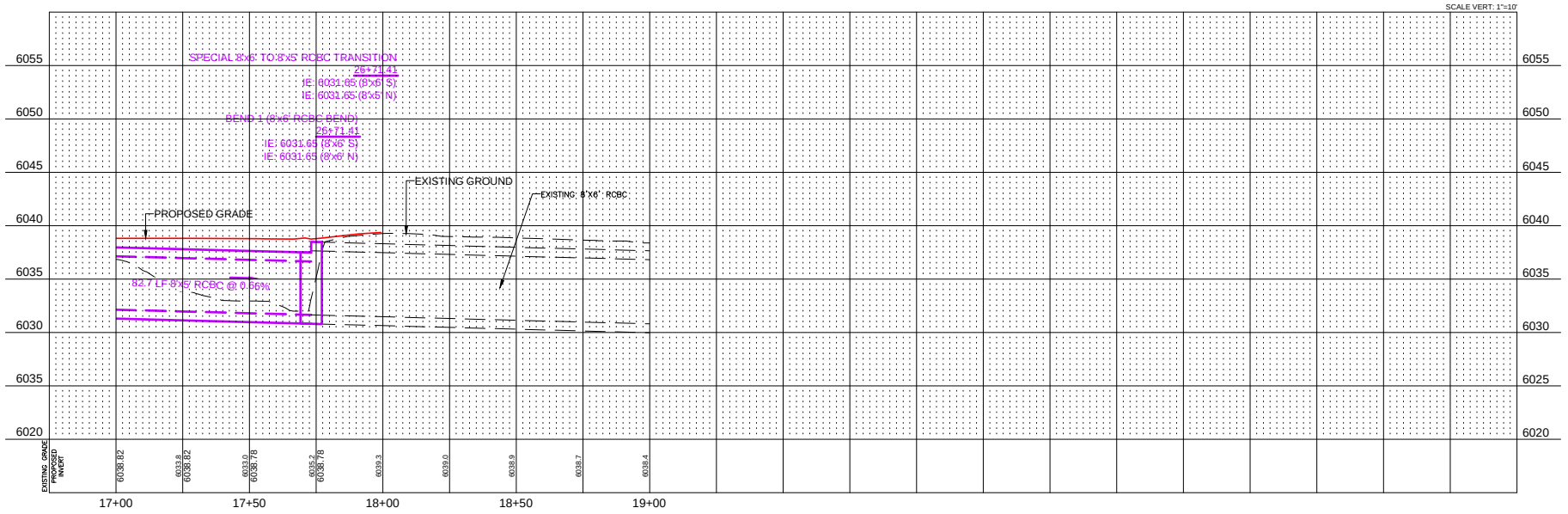

HDR ENGINEERING INC.
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Prepared By:

Scale:

Designed By:	Drawn By:
T.MATTSON	J.OAKLEY
Design Date:	Print Date:
6/7/2017	6/7/2017

Internal Job No: 10038796

Surveyed By:	Survey Date:
N.FRASER	8/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION
LARAMIE COUNTY, WYOMING

Project No: 10038796

Sheet Title:

STORM SEWER PLAN AND PROFILE

Sheet:

I.4

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PLOT DATE: 6/7/2017 10:46 AM Oakley, Julianna

Memo

Date:	June 2017
Project:	Dell Range-Converse Intersection and 35% Design Plan
To:	Cheyenne MPO
From:	HDR
Subject:	Preliminary Environmental Considerations Memo – 35% Design

1 Introduction

This technical memorandum provides brief methods and results of an environmental screening to identify any major obstacles that would need to be addressed in environmental documentation required for the project. This technical memorandum also provides a place of initiation for the National Environmental Policy Act (NEPA) process and documentation. The purpose of this environmental screening is to provide a review of existing databases, a synthesis of input from regulatory agencies, desktop evaluations, recommendations for detailed studies, and potential mitigation needs.

2 Project Background

The City of Cheyenne (the City) and the Cheyenne Metropolitan Planning Organization (MPO) are initiating a study to review alternatives to improve safety at the intersection of Converse Avenue and Dell Range Boulevard. This intersection is experiencing high crash rates and degrading capacity, particularly as development has grown along Dell Range Boulevard and areas to the north. The goal of this project is to increase safety for motorists and pedestrians, while improving mobility through the intersection.

The alternatives that were analyzed for this intersection are described in the Dell Range-Converse Intersection Alternatives Analysis Tech Memo (HDR 2017). The seven alternative designs for the Dell Range-Converse intersection considered are:

1. No-Build
2. Dual Left-Turn Lanes
3. Modern Roundabout
4. Continuous Flow Intersection – Full
5. Continuous Flow Intersection – Modified
6. ThruTurn Intersection – Signals
7. ThruTurn Intersection – Roundabouts

The general footprint for each of these alternatives was used to identify any major issues associated with each alternative and summarized for each resource.

3 Environmental Resources

Environmental resources present were analyzed for the project. This screening does not evaluate the following resources because no adverse, long-term impacts as a result of the project are anticipated: air quality, energy, environmental justice, public facilities, visual impacts, and water quality. The study area is shown in Figure 1.

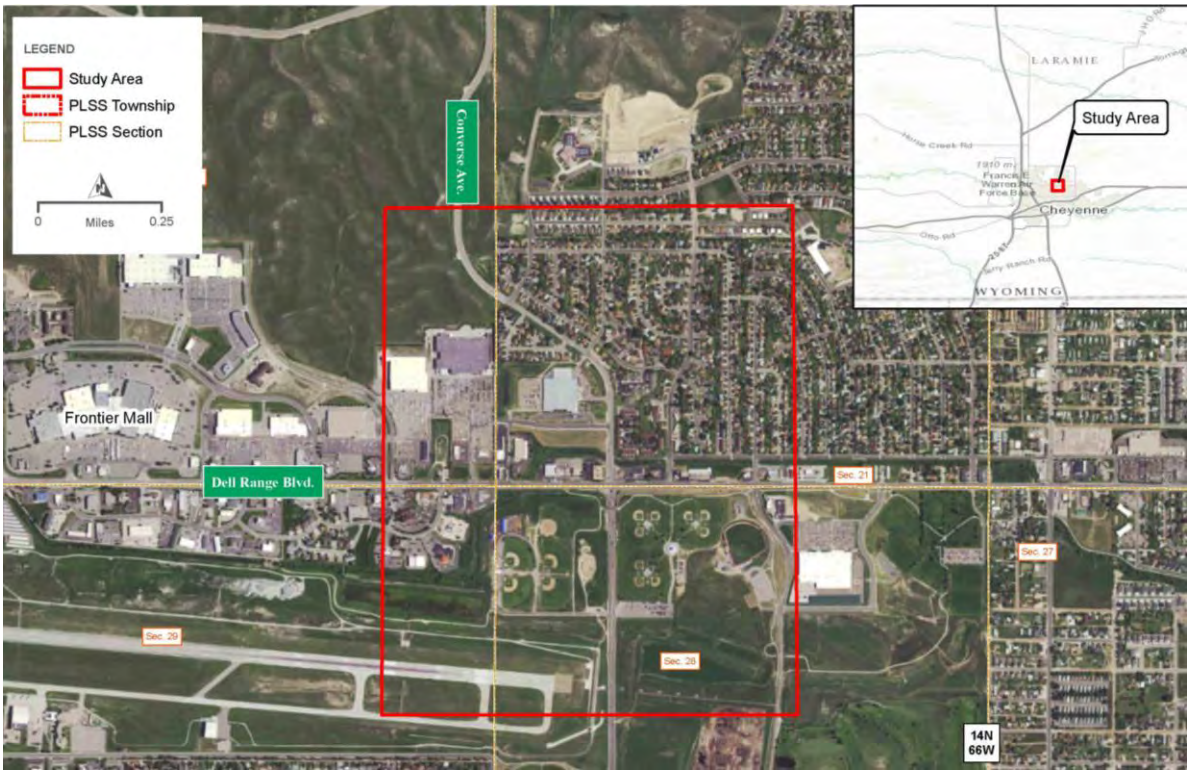

Figure 1. Study Area

3.1 Land Use

3.1.1 Existing Conditions

The land use in the Study Area is primarily urban, with businesses and recreational sports fields. Relevant land use plans for the area include the Parks and Recreation Master Plan, the 2016 Dell Range Corridor Study, and the 2012 Cheyenne Area On-Street Bicycle Plan and Greenway Plan Update.

3.1.2 Impacts of Alternatives

Alternatives 1-7 would be consistent with land use plans for the area.

3.2 Section 4(f) and 6(f)

3.2.1 Existing Conditions

Section 4(f) requires that the USDOT determine whether a proposed project would adversely affect a Section 4(f) resource. If a program or project would affect a Section 4(f) resource, all feasible and prudent ways of avoiding this impact must be evaluated. However, if FHWA

determines that the use of the 4(f) property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) would have a *de minimis* impact, evaluation of feasible and prudent avoidance alternatives would not be required.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 was established to protect Federal investments and maintain high-quality recreation resources (NPS 2008). The National Park Service administers Section 6(f), which protects parks and recreation areas that were acquired, developed, or rehabilitated, even in part, with the use of any Federal land and water grant funds. All Federal agencies must comply with Section 6(f) (16 USC 4601-4 to -11 et seq., as amended).

Section 6(f) states that no lands that have been paid for in part or in entirety by Federal land and water grants can be converted to non-park or non-recreation uses without the approval of the National Park Service or Wyoming State Parks Office. This approval would be granted only if the action is in compliance with the state recreation plan and an area of equal fair market value and usefulness is substituted for the land being removed from park and/or recreation use (16 USC 4601 4 to 11 et seq., as amended).

Section 4(f) and 6(f) properties in the Study Area include:

- Cheyenne Junior League Baseball Complex
- Dutcher Baseball Complex
- Greenway and Shared Use Paths

3.2.2 Impacts of Alternatives

Alternative 1 would not impact Section 4(f) or 6(f) properties. Alternatives 2-7 would impact Section 4(f) properties and would require additional coordination. It is anticipated that a *de minimis* determination would be needed, meaning that all measures were considered to avoid, minimize, mitigate, and enhance the Section 4(f) properties and the project would not adversely affect the activities, features, or attributes qualifying the property for protection under Section 4(f). The official with jurisdiction, the City of Cheyenne Parks and Recreation Department, would need to concur to be a *de minimis* finding.

Additional coordination would need to occur with the Wyoming State Parks Office for impacts to Section 6(f) properties.

3.3 Farmland

3.3.1 Existing Conditions

No prime or unique farmland soils were identified in or near the study area using the soil survey data for Campbell County. NRCS confirmed that there are no prime or unique soils within the area and no further action was needed regarding the Farmland Protection Policy Act (NRCS 2016).

3.3.2 Impacts of Alternatives

No impacts to prime or unique farmland.

3.4 Floodplains

3.4.1 Existing Conditions

Designated floodplain is present within the western and northern portions of the Study Area.

3.4.2 Impacts of Alternatives

A scoping response from FEMA Region 8 Center of the Denver Federal Center was received noting that the project is located in the special Flood Hazard Area and that portions also include floodway (FEMA 2016). Additional coordination would occur with the local floodplain administrator to determine the extent of impacts after further design.

3.5 Wetlands and Other Waters of the U.S.

3.5.1 Existing Conditions

The Study Area includes Dry Creek and adjacent wetlands as well as potential wetlands in the Dry Creek flood control channel.

3.5.2 Impacts of Alternatives

The project may have the potential to affect jurisdictional aquatic resources (waters of the U.S.) which would require a permit under Section 404 of the Clean Water Act. This project would typically fall under a Nationwide Permit for linear transportation projects (NWP 14) if losses of waters of the U.S. are less than 0.5 acre. The U.S. Army Corps of Engineers recommended an aquatic resources inventory to assist in additional discussion on the aquatic resources present in the Study Area (USACE 2016).

3.6 Cultural Resources

3.6.1 Existing Conditions

Section 106 of the National Historic Preservation Act directs federal agencies to take into account the effects of their undertakings on historic properties. In addition, consideration of historic and cultural resources is required pursuant to NEPA. Through coordination with the Wyoming State Historic Preservation Office, they determined that the area of disturbance has a low probability of containing historic properties and not further identification efforts are warranted (SHPO 2016).

3.6.2 Impacts of Alternatives

No impacts are anticipated. In the case of inadvertent finds during construction, work in the area will be halted immediately, the federal agency and SHPO staff be contacted, and the materials be evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional qualification Standards (48 FR 22716, Sept. 1983).

3.7 Wildlife

3.7.1 Existing Conditions

The Study Area is urban with commercial businesses in the vicinity of the project. The WY Game and Fish commented that they have no terrestrial wildlife or aquatic concerns pertaining to this project (WYGFD 2016).

3.7.2 Impacts of Alternatives

No impacts are anticipated.

3.8 Threatened and Endangered Species

3.8.1 Existing Conditions

Federal threatened and endangered species are regulated by Section 7(c) of the Endangered Species Act of 1973 (16 USC 1531 et seq.). USFWS maintains a list of species determined to be threatened or endangered. According to the Information for Planning and Consultation (IPaC) website, the following species are listed as threatened or endangered and would potentially be present in the Study Area (IPaC 2017):

- Least Tern
- Piping Plover
- Whooping Crane
- Pallid Sturgeon
- Colorado Butterfly Plant
- Western Prairie Fringed Orchid
- Preble's Meadow Jumping Mouse

The Study Area is primarily existing roadways and manicured park areas. Dry Creek and potential wetlands are present in the Study Area.

3.8.2 Impacts of Alternatives

No Effects to threatened or endangered species are anticipated. The US Fish and Wildlife Service stated that based on the project description and location, this project is in compliance with the Endangered Species Act of 1973. Additional coordination should occur with this office if any new information indicates there may be effects to protected species and their habitats (USFWS 2016).

3.9 Noise

3.9.1 Existing Conditions

This project is anticipated to be a Type I project, depending on final determination of funding and based on the WYDOT Noise Analysis and Abatement Policy guidance (WYDOT 2011). For this project area, the majority of the activity categories directly adjacent to the proposed construction are primarily F and G. There are also few receptors that are E^3 (restaurants). Residences occur beyond these businesses to the east and may also be considered.

The Activity Leq(h) for Category E^3 is 72 and Activities F and G have no Leq(h). The Activity Leq(h) for B^3 is 67.

3.9.2 Impacts of Alternatives

A noise impact analysis has not been completed. This would need to be completed during preliminary design for the project. It is anticipated that construction period noise impacts would be temporary and of limited duration and therefore have minimal to no impacts to the area.

4 Agency Scoping

Preliminary agency scoping letters were sent to agencies on October 12, 2016 to the following agencies:

- US Army Corps of Engineers
- US Fish and Wildlife Service
- Federal Emergency Management Agency
- Natural Resources Conservation Service
- WY Game and Fish Department
- WY State Historic Preservation Office
- WY Department of Environmental Quality
- Laramie County Public Works
- Laramie County Board of County Commissioners
- Laramie County Conservation District
- City of Cheyenne Engineer's Office
- WY Office of Homeland Security

Responses received are summarized below and noted in their respective resource sections in Section 3. Original responses are included in Attachment A.

Table 1. Agency responses received

Agency	Response
FEMA	Part of the project is located in the Special Flood Hazard Area, and portions also include floodway. Any alteration in the floodway, either size or depth of the Base Flood Elevation requires the application of 44CFR65.12. This would require a Conditional Letter of Map Revision if there is any increase in the base flood elevation. It is the responsibility of the City of Cheyenne to monitor development in their Special Flood Hazard Areas including floodways. Please contact the City Engineers office for further clarification.
NRCS	There are no soils which are Important Farmland located in the Study Area. We do not believe the work will adversely impact Prime Farmland and no further action with regard to FPPA is required.
US Army Corps of Engineers	The project may have the potential to affect jurisdictional aquatic resources (waters of the U.S.) which would require a permit under Section 404 of the Clean Water Act. This project would typically fall under a Nationwide Permit for linear transportation projects (NWP 14) if losses of waters of the U.S. are less than 0.5 acre. We recommend an aquatic resources inventory be completed.
USFWS	Based on the project description and location, this project is in compliance with the Endangered Species Act of 1973. Additional coordination should occur with this office if any new information indicates there may be effects to protected species and their habitats.
WGFD	We have no terrestrial wildlife or aquatic concerns pertaining to this project.
WY SHPO	The area of disturbance has a low probability of containing historic properties and not further identification efforts are warranted. In the case of inadvertent finds during construction, work in the area will be halted immediately, the federal agency and SHPO staff be contacted, and the materials be evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional qualification Standards.
LCCD	LCCD has no issues or permitting requirements for the project. We do have soils information for that area if you need it for your project.

5 Summary of Impacts

Table 2. Summary of Impacts

Resource	Summary of Impacts from the Alternatives
Land Use	Consistent with Land Use Plans
Section 4(f) and 6(f)	Alternatives 2-7 would impact Section 4(f) properties and would require additional coordination. It is anticipated that a *de minimis* determination would be needed, meaning that all measures were considered to avoid, minimize, mitigate, and enhance the Section 4(f) properties and the project would not adversely affect the activities, features, or attributes qualifying the property for protection under Section 4(f). The official with jurisdiction, the City of Cheyenne Parks and Recreation Department, would need to concur to be a *de minimis* finding. Additional coordination would need to occur with the Wyoming State Parks Office for impacts to Section 6(f) properties.
Farmland	No impacts are anticipated.
Floodplains	Designated floodplain is present and additional coordination with the local Floodplain Administrator would be needed.
Wetlands and Other Waters of the U.S.	Potential jurisdictional aquatic resources are present in the Study Area. An aquatic resources inventory would need to be completed to permit any impacts to jurisdictional aquatic resources.
Cultural Resources	The area has been disturbed it is unlikely that cultural resources are located in the area. No further identification effort is needed unless the project footprint changes.
Wildlife	No impacts are anticipated.
Threatened and Endangered Species	Multiple threatened or endangered species are potentially in the Study Area according to IPaC guidance. However, USFWS stated that the project is in compliance with the Endangered Species Act of 1973. Additional coordination should occur with this office if any new information indicates there may be effects to protected species and their habitats
Noise	Project is expected to be a Type I project according to WYDOT guidance and therefore would require a noise analysis before impacts can be determined.

6 Conclusions

The following work would need to be completed to further assess impacts of the projects on environmental resources in preliminary design for the project:

- Aquatic Resources Inventory – This field survey would need to be completed to permit impacts to jurisdictional waters of the U.S. with the U.S. Army Corps of Engineers.
- Noise Study – A noise study would need to be completed to analyze impacts of the alternatives on the residences and businesses in the area.
- Section 4(f) and 6(f) Resources Impact Analysis – Coordination would be needed with the City of Cheyenne Parks and Recreation if the preferred alternative would impact parks or recreation areas. Early coordination would be ideal to incorporate minimization efforts or if mitigation is required.
- Floodplain Coordination – Additional coordination with the local floodplain administrator would be needed to coordinate impacts to the floodplain or floodway.

7 References

Cheyenne MPO. Plan Cheyenne. Parks & Recreation Master Plan. Available online at http://www.cheyennecity.org/DocumentCenter/Home/View/1629.

Cheyenne MPO. Plan Cheyenne. 2016 Dell Range Corridor Study. Available on line at http://www.plancheyenne.org/dell-range-corridor-study/.

Cheyenne MPO. Plan Cheyenne. Cheyenne Area On-Street Bicycle Plan and Greenway Update. http://www.plancheyenne.org/cheyenne-area-on-street-bicycle-plan-and-greenway-plan-update/. Accessed 7/20/2016

Federal Emergency Management Agency (FEMA). Region 8 Center at the Denver Federal Center. Agency scoping response. Dated November 23, 2016.

Laramie County. WY Floodplain Interactive Map. Cheyenne/Laramie County Cooperative GIS. Program. https://maps.laramiecounty.com/floodplainmap/.

National Resources Conservation Service. Agency scoping response. Dated October 18, 2016.

State Historic Preservation Office (SHPO). Agency scoping response. Dated October 19, 2016.

US Army Corps of Engineers. Agency scoping response. Dated November 1, 2016.

US Fish and Wildlife Service. Agency scoping response. Dated October 19, 2016.

Wyoming Department of Transportation. 2011. Noise Analysis and Abatement Policy. Effective July 13, 2011. Available online at http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Environmental_Services/Documents/2011%20Noise%20Analysis%20and%20Abatement%20Policy.pdf

Wyoming Department of Transportation. Local Public Agency (LPA) Info. Available online at http://www.dot.state.wy.us/home/engineering_technical_programs/environmental_services/LPA.html. Accessed 7/20/2016

Wyoming Game and Fish Department. Agency scoping response. Dated October 19, 2016.

USDA

United States Department of Agriculture

NRCS
Natural Resources Conservation Service

Casper State Office

100 East B Street
Suite 3001
Box 33124
Casper, WY 82602

Voice 307.233.6750
Fax 855.415.3404

October 18, 2016

Brandon Gebhart, P.E.
HDR Project Manager
HDR Engineering, Inc.
1720 Carey Ave., Suite 612
Cheyenne, WY 82001-4429

Dear Mr. Gebhart:

The Natural Resources Conservation Service (NRCS) has reviewed the **Cheyenne Streets, Intersection of Converse Avenue and Dell Range Blvd., Laramie County, Wyoming-Agency Scoping Project** proposal dated 10/12/2016.

The Agriculture and Food Act of 1981, (Public Law 97-98) containing the Farmland Protection Policy Act (FPPA)—Subtitle I of Title XV, Section 1539-1549, is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency.

Please find enclosed an NRCS Soil Survey Map, soils reports and maps indicating areas of Important Farmlands and hydric soils. The important Farmlands map has been enclosed for your aid in determining if an AD-1006 form, Farmland Impact Conversion Rating Form is needed for this project. Typically, this form is required on projects that convert farmlands into non-farmland uses, which have federal dollars attached to the project. Areas committed to or already in urban development are not subject to FPPA.

It appears that there are no soils which are Important Farmland located within the Project Area. As such, we do not believe the work will adversely impact Prime Farmland and no further action with regard to FPPA is required on your part. See the website link below for more information on the Farmland Protection Act, and a copy of the AD-1006 form, with instructions.

The NRCS Soil Survey Map identifies all soil map units in the project area. The soil reports provide selected soil properties, and interpretations, i.e. flooding hazard, limitations for roads, and dwellings, soil layers with USDA textures, and engineering classifications. The limitation ratings for the selected uses, i.e. roads and streets, range from not limited to very limited. Somewhat limited to very limited rating does not preclude the intended land use, however it does identify limitations for the use, which may require corrective measures, and increase costs, and require continued maintenance.

The NRCS Soil Survey is a general planning tool and does not eliminate the need for an onsite investigation. If you have any questions concerning the soils or interpretations for this project please contact me at (307) 233-6784 or email, james.bauchert@wy.usda.gov.

NRCS - Farmland Protection Policy Act Website:
http://www.nrcs.usda.gov/programs/fppa/

Sincerely,

JAMES BAUCHERT
State Soil Scientist

Enclosures:

Custom Soil Resource Report for Riverton Area, Wyoming: Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping

Cc: Astrid Martinez – State Conservationist

United States Department of Agriculture

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

Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping

October 18, 2016

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 (http://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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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Contents

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.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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 8, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2013—Aug 14, 2013

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

Laramie County, Wyoming, Western Part (WY721)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
145	Merden silty clay loam, 0 to 3 percent slopes	20.7	3.5%
162	Poposhia-Trimad complex, 3 to 15 percent slopes	45.4	7.6%
184	Urban land-Ascalon complex, 0 to 6 percent slopes	4.6	0.8%
188	Urban land-Poposhia complex, 0 to 6 percent slopes	370.9	62.2%
189	Urban land-Poposhia-Trimad complex, 3 to 15 percent slopes	154.7	25.9%
Totals for Area of Interest		**596.3**	**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

145—Merden silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3j6c
Elevation: 5,000 to 6,500 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: Not prime farmland

Map Unit Composition

Merden and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merden

Setting

Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A1 - 0 to 12 inches: silty clay loam
A2 - 12 to 24 inches: silty clay loam
Cg - 24 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 8 percent
Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 10.0
Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: SALINE SUBIRRIGATED (15-17SP) (R067XY242WY)
Hydric soil rating: Yes

Minor Components

Somewhat poorly drained soils
Percent of map unit: 10 percent
Landform: Draws, swales
Hydric soil rating: Yes

162—Poposhia-Trimad complex, 3 to 15 percent slopes

Map Unit Setting
National map unit symbol: 3j6x
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: Not prime farmland

Map Unit Composition
Poposhia and similar soils: 50 percent
Trimad and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poposhia

Setting
Landform: Alluvial fans, fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone, siltstone and shale

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 25 inches: silt loam
H3 - 25 to 60 inches: silt loam

Properties and qualities
Slope: 3 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 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

Description of Trimad

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 3 inches: loam
H2 - 3 to 10 inches: gravelly loam
H3 - 10 to 34 inches: very gravelly loam
H4 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 6 to 15 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: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: LOAMY (15-17SP) (R067XY222WY)
Hydric soil rating: No

Minor Components

Piezon

Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 5 percent
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

188—Urban land-Poposhia complex, 0 to 6 percent slopes

Map Unit Setting

National map unit symbol: 3j7r
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: Not prime farmland

Map Unit Composition

Urban land: 65 percent
Poposhia and similar soils: 25 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poposhia

Setting

Landform: Alluvial fans, fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone, siltstone and shale

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 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
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
Hydric soil rating: No

Minor Components

Blazon

Percent of map unit: 5 percent
Hydric soil rating: No

Piezon

Percent of map unit: 5 percent
Hydric soil rating: No

189—Urban land-Poposhia-Trimad complex, 3 to 15 percent slopes

Map Unit Setting

National map unit symbol: 3j7s
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: Not prime farmland

Map Unit Composition

Urban land: 60 percent
Poposhia and similar soils: 15 percent
Trimad and similar soils: 15 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Poposhia

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Alluvium derived from sandstone, siltstone and shale

Typical profile

H1 - 0 to 6 inches: silt loam
H2 - 6 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 10 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 12.0 inches)

Interpretive groups
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Trimad

Setting
Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Gravelly alluvium derived from igneous and sedimentary rock

Typical profile
H1 - 0 to 3 inches: loam
H2 - 3 to 10 inches: gravelly loam
H3 - 10 to 34 inches: very gravelly loam
H4 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities
Slope: 6 to 15 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: 35 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.1 inches)

Interpretive groups
Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Piezon
Percent of map unit: 5 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 5 percent
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

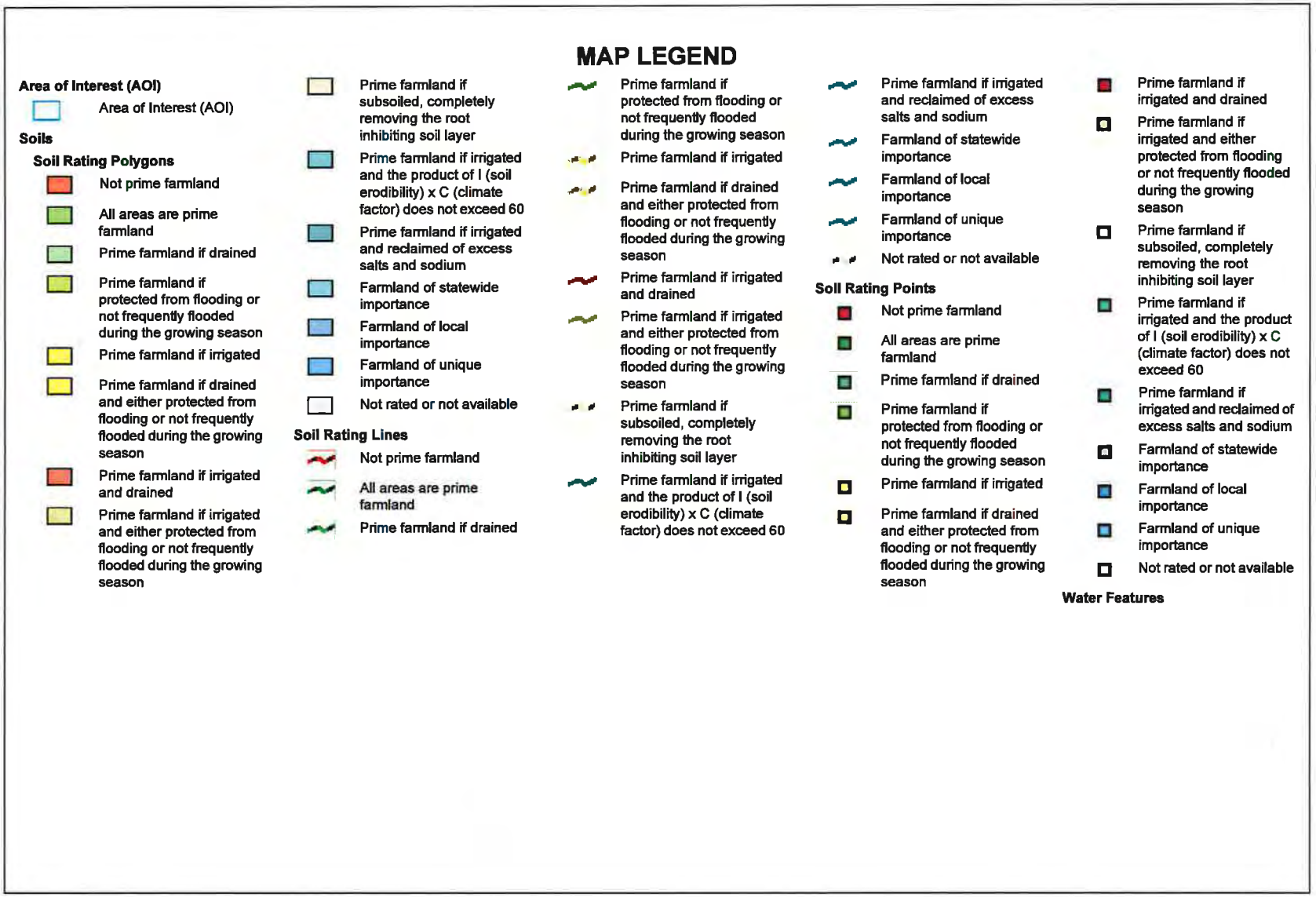
Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Farmland Classification (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping)

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Map—Farmland Classification (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency ...


MAP LEGEND
Area of Interest (AOI)
Area of Interest (AOI)
Soils
Soil Rating Polygons
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Soil Rating Lines
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Soil Rating Points
Not prime farmland
All areas are prime farmland
Prime farmland if drained
Prime farmland if protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
Prime farmland if irrigated and drained
Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
Prime farmland if subsoiled, completely removing the root inhibiting soil layer
Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
Prime farmland if irrigated and reclaimed of excess salts and sodium
Farmland of statewide importance
Farmland of local importance
Farmland of unique importance
Not rated or not available
Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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 8, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 10, 2013—Aug 14, 2013

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.

Table—Farmland Classification (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping)

Farmland Classification— Summary by Map Unit — Laramie County, Wyoming, Western Part (WY721)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
145	Merden silty clay loam, 0 to 3 percent slopes	Not prime farmland	20.7	3.5%
162	Poposhia-Trimad complex, 3 to 15 percent slopes	Not prime farmland	45.4	7.6%
184	Urban land-Ascalon complex, 0 to 6 percent slopes	Not prime farmland	4.6	0.8%
188	Urban land-Poposhia complex, 0 to 6 percent slopes	Not prime farmland	370.9	62.2%
189	Urban land-Poposhia-Trimad complex, 3 to 15 percent slopes	Not prime farmland	154.7	25.9%
Totals for Area of Interest			**596.3**	**100.0%**

Rating Options—Farmland Classification (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping)

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Land Classifications

This folder contains a collection of tabular reports that present a variety of soil groupings. The reports (tables) include all selected map units and components for each map unit. Land classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Prime and other Important Farmlands (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping)

This table lists the map units in the survey area that are considered important farmlands. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation's food supply.

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from

precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

For some of the soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

A recent trend in land use in some areas has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally, this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Report—Prime and other Important Farmlands (Cheyenne Streets, Converse Ave and Dell Range Blvd-Agency Scoping)

Prime and other Important Farmlands–Laramie County, Wyoming, Western Part		
Map Symbol	**Map Unit Name**	**Farmland Classification**
145	Merden silty clay loam, 0 to 3 percent slopes	Not prime farmland
162	Poposhia-Trimad complex, 3 to 15 percent slopes	Not prime farmland
184	Urban land-Ascalon complex, 0 to 6 percent slopes	Not prime farmland

Prime and other Important Farmlands–Laramie County, Wyoming, Western Part		
Map Symbol	**Map Unit Name**	**Farmland Classification**
188	Urban land-Poposhia complex, 0 to 6 percent slopes	Not prime farmland
189	Urban land-Poposhia-Trimad complex, 3 to 15 percent slopes	Not prime farmland

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
WYOMING REGULATORY OFFICE
2232 DELL RANGE BOULEVARD, SUITE 210
CHEYENNE WY 82009-4942

REPLY TO
ATTENTION OF

November 1, 2016

Wyoming Regulatory Office

Brandon Gebhart
HDR
1720 Carey Avenue, Suite 612
Cheyenne, Wyoming 82001

Dear Mr. Gebhart:

This letter is in response to a request for comment we received from your office on October 17, 2016, concerning a study examining drainage and roadway improvements for the intersection of Converse Avenue and Dell Range Boulevard in Cheyenne Wyoming.

The U.S. Army Corps of Engineers (Corps) regulates the placement of dredged and fill material into wetlands and other waters of the United States as authorized by Section 404 of the Clean Water Act (33 U.S.C. 1344). The term "waters of the United States" has been broadly defined by statute, regulation, and judicial interpretation to include all waters that were, are, or could be used in interstate commerce such as streams, reservoirs, lakes and adjacent wetlands. The Corps regulations are published in the *Code of Federal Regulations* as 33 CFR Parts 320 through 332. Information on Section 404 program requirements in Wyoming can be obtained from our website http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/Wyoming.aspx.

Based on the preliminary information provided, the Cheyenne Metropolitan Planning Organization, in coordination with the Federal Highway Administration and the Wyoming Department of Transportation, seeks to study potential environmental impacts associated with operational and safety improvements for the intersection of Converse Avenue and Dell Range Boulevard in Cheyenne. The study area identified in Figure 1 appears to include Dry Creek and adjacent wetlands as well as potential wetlands in the Dry Creek flood control channel. There is not enough specific information to determine whether or not the project will impact wetlands or other waters of the U.S. The project *may* have the potential to affect jurisdictional aquatic resources (waters of the U.S.) which would require a Department of the Army permit under Section 404 of the Clean Water Act. These types of projects generally fall under a Nationwide Permit 14 for Linear Transportation Projects if losses of waters of U.S. are less than 0.5 acres. We recommend that an aquatic resources inventory, which includes a wetland delineation, be conducted to guide planning efforts to avoid and minimize impacts to aquatic resources to the maximum extent practicable. When more information is available regarding the project and potential waters of the U.S, you or the proponent may submit a pre-construction notification for a nationwide permit or an application for a standard permit when a final plan is available.

Please contact us should you have additional questions regarding aquatic resources or compliance with Section 404 of the Clean Water Act (33 U.S.C. 1344). You may contact me at (307) 772-2300 or paige.m.wolken@usace.army.mil concerning future project review and reference file number NWO-2016-02159. Thank you for your interest in cooperating with requirements of the U.S. Army Corps of Engineers' regulatory program.

Sincerely,

Paige M. Wolken
Project Manager
Wyoming Regulatory Office

RECEIVED OCT 14 2016

U.S. FISH AND WILDLIFE SERVICE

Based on the information provided, you may consider this project to be in compliance with the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.* The project should be reanalyzed by our office if any new information indicates there may be effects to protected species or their habitats.

Date: 10/19/16 Signature: [signature]

FOR Field Supervisor
U.S. Fish and Wildlife Service - Wyoming ES Office
5353 Yellowstone Road, Suite 308A
Cheyenne, WY 82009
Phone: (307) 772-2374
Fax: (307) 772-2358

WY17CPA0007

October 12, 2016

Mr. Tyler Abbott
Field Supervisor Wyoming Field Office
US Fish and Wildlife Service
5353 Yellowstone, Ste 308A
Cheyenne, WY 82009

RE: Cheyenne Streets, Intersection of Converse Avenue and Dell Range Blvd., Laramie County, Wyoming – Agency Scoping

Dear Mr. Abbott,

The Cheyenne Metropolitan Planning Organization (MPO), in coordination with the Federal Highway Administration (FHWA) and the Wyoming Department of Transportation (WYDOT), is initiating scoping to study the potential environmental impacts associated with operational and safety improvements for the intersection of Converse Avenue and Dell Range Boulevard in Cheyenne, Wyoming. Information received as part of this project scoping will be used to prepare an environmental review document to identify areas of concern that would need to be addressed or further evaluated in the next phase of the project. HDR Engineering, Inc. (HDR) has been hired by the Cheyenne MPO to conduct scoping and early data collection.

The purpose of the project is to study the existing intersection of Converse Avenue and Dell Range Avenue and determine safety improvements as well as drainage and roadway improvements for a portion of Converse Avenue. Figure 1, attached, displays the Study Area where potential improvements would occur.

HDR, on behalf of the Cheyenne MPO, is seeking information from federal, state, and local resource agencies concerning potential effects from the project. We are requesting information from your agency on the resource(s) under your jurisdiction in the study area that could be affected by the project, identify the issues that you feel require analysis in the environmental document, and determine if any permits and approvals are required from your agency for project construction.

In order for the project's environmental documentation to move forward, we are requesting a response by November 7, 2016. Please contact Brandon Gebhart, HDR Project Manager, by phone at (307) 757-9002 or by email at Brandon.Gebhart@hdrinc.com with any questions or comments regarding this request.

Sincerely,
HDR

Brandon Gebhart

Brandon Gebhart, P.E.
HDR Project Manager

hdrinc.com

1720 Carey Avenue, Suite 612, Cheyenne, WY 82001-4429
(307) 778-9500

Attachment: Figure 1. Project Location

cc: Tom Mason, Director, Cheyenne MPO
Nancy Olson, Transportation Planner II, Cheyenne MPO
Jessica Brisbois, HDR

1720 Carey Avenue, Suite 612, Cheyenne, WY 82001-4429
(307) 778-9500

WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4699

wgfd.wyo.gov

October 19, 2016

WER 13872.00
HDR Inc.
Cheyenne Streets
Intersection of Converse Avenue
and Dell Range Boulevard
Agency Scoping
Laramie County

Brandon Gebhart
HDR Project Manager
1720 Carey Avenue, Suite 612
Cheyenne, WY 82001

Dear Mr. Gebhart:

The staff of the Wyoming Game and Fish Department (WGFD) has reviewed the Agency Scoping for the Cheyenne Streets-Intersection of Converse Avenue and Dell Range Boulevard project. We offer the following comments for your consideration. We have no terrestrial wildlife or aquatic concerns pertaining to this project.

Thank you for the opportunity to comment. If you have any questions or concerns, please contact Amanda Withroder, Staff Biologist, at (307) 473-3436.

Sincerely,

Mary Flanderka
Habitat Protection Supervisor

MF/aw/ns

cc: USFWS
Martin Hicks, WGFD, Laramie Region
Corey Class, WGFD, Laramie Region
Bobby Compton, WGFD, Laramie Region
Chris Wichmann, Wyoming Department of Agriculture, Cheyenne

ARTS. PARKS. HISTORY.
Wyoming State Parks & Cultural Resources

State Historic Preservation Office
2301 Central Ave., Barrett Bldg. 3rd Floor
Cheyenne, WY 82002
307-777-7697
FAX: 307-777-6421
http://wyoshpo.state.wy.us

October 19, 2016

Brandon Gebhart, P.E.
HDR Project Manager
1720 Carey Avenue, Suite 612
Cheyenne, WY 82001-4429

Re: Cheyenne Streets, Intersection of Converse Avenue and Dell Range (SHPO File # 1016ECK006)

Dear Mr. Gebhart:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. Following 36 CFR Part 800, we find that the proposed undertaking is in an area of previous disturbance and has a low probability of containing historic properties, as defined in 36 CFR § 800.16(l)(1). No further identification efforts are warranted.

There is a possibility that buried prehistoric or historic materials may be discovered during the undertaking and we recommend the Federal Highway Administration and/or Wyoming Department of Transportation incorporate the following stipulation in the project permit:

> If any cultural materials are discovered during construction, work in the area should halt immediately, the federal agency and SHPO staff be contacted, and the materials be evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

Please refer to SHPO project #1016ECK006 on any future correspondence regarding this undertaking. If you have any questions, please contact Beth King at 307-777-6179.

Sincerely,

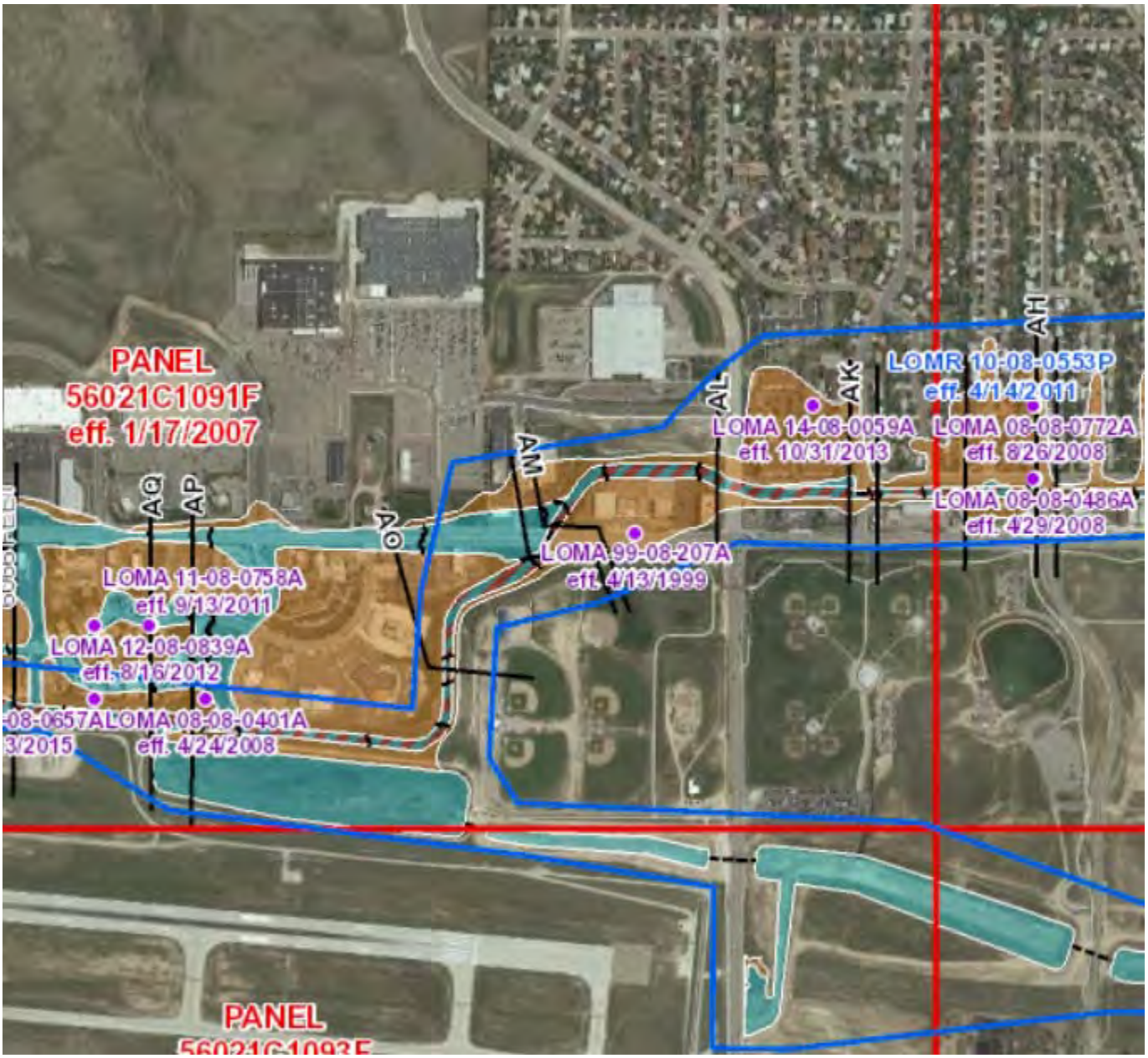
Elizabeth C. King

Elizabeth C. King

From: Herrera, Diana B [mailto:Diana.Herrera@fema.dhs.gov]
Sent: Wednesday, November 23, 2016 12:24 PM
To: Gebhart, Brandon
Subject: Cheyenne Streets-Converse Avenue and Dell Range Blvd

Brandon:

My apologies for the late respond. Your correspondence came in while I was on deployment. But, I did want to respond to this project. It appears that part of your project is located not only in the Special Flood Hazard Area, but portions also include floodway. Any alteration in the floodway, either size or depth of the Base Flood Elevation requires the application of 44CFR65.12. This would require a Conditional Letter of Map Revision if there is any increase in the base flood elevation.



It is the responsibility of the City of Cheyenne to monitor development in their Special Flood Hazard Areas including floodways. Please contact the City Engineers office for further clarification.

Should you have any questions, please feel free to contact me.

Diana B. Herrera, CFM
Sr. Regional Insurance Specialist
FEMA Region 8
Denver Federal Center
PO Box 25267
Denver, CO 80225-0267
303-235-4988 Office
720-480-8338 Cell
Diana.herrera@fema.dhs.gov

From: Jim Cochran [mailto:jcochran@lccdnet.org]
Sent: Tuesday, October 18, 2016 9:29 AM
To: Gebhart, Brandon
Subject: Intersection Study

Brandon, Laramie County Conservation District has no issues or permitting requirements for a project at the intersection of Conserse Avenue and Dell Range. We do have soils information for that area if you need it for your project.

Thanks

Jim Cochran
District Manager
Laramie County Conservation District

Appendix D

Public Open Houses

- Public Open House #1 – September 13, 2016
  - Advertisement
  - Open House Meeting Report
  - Sign-in Sheets
  - Survey Monkey Results
  - Comment Forms
  - Comment Summary
  - Displays
- Public Open House #2 – March 1, 2017
  - Advertisement
  - Sign-in Sheets
  - Open House #2 Presentation
  - Survey Monkey Results
  - Comment Forms
  - Displays

PUBLIC MEETING NOTICE

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

Join the Discussion

TUESDAY, SEPT. 13

5 P.M. DOORS OPEN

PUBLIC MEETING 5:30 TO 7 P.M.

ANDERSON ELEMENTARY SCHOOL

2204 PLAINVIEW ROAD, CHEYENNE, WY 82009

CALL NANCY AT 307-638-4385

LEARN MORE ONLINE

CAN'T MAKE IT? DETAILS ONLINE AT PLANCHEYENNE.ORG

PROJECT CONSULTANTS

PROJECT DETAILS

Converse Ave. and Dell Range Blvd. is one of the busiest and crash prone intersections in Wyoming. This is why the Cheyenne MPO, with the direction of the City, has made studying and redesigning areas of Converse Ave. between Dell Range Blvd. and Ogden Road a priority. Congestion, as well as bicycle and pedestrian conditions, are also part of the project. The effort will result in preliminary designs that improve safety, operations, and storm water control on the roadway.

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Converse & Dell Range Public Meeting #1 – Meeting Report

OPEN HOUSE MEETING INFORMATION

Public Open House
Tuesday Sept. 13, 2016; 5:00 p.m. – 7:00 p.m.
Anderson Elementary School
2204 Plain View Road, Cheyenne, WY 82009

Figure 1: Meeting Attendees identify their most important criteria for the Converse/Dell Range intersection

PROJECT BACKGROUND

The Cheyenne MPO is currently in the preliminary stages of the Converse/Dell Range project, which includes an evaluation of alternatives using grading criteria to develop a preferred alternative using engineering, traffic planning, and public input.

MEETING SUMMARY

42 members of the community attended the introduction meeting for the Converse Avenue and Dell Range Blvd. project. The meeting attendees were presented with 9 displays pertaining to the project, a station that presented examples of possible design solutions, and an interactive activity which allowed for the attendees to provide their most important criteria relating to the project.

Additionally, all members of the community had the opportunity to provide feedback by utilizing an interactive web tool available on the Cheyenne Metropolitan Planning Organization's website, which allowed for users to identify any specific problem areas within the project boundaries and list the issues associated. It also allowed visitors to just make comments.

The Open House Feedback tools consisted of:

- Comment forms and email addresses were provided for attendees to give unstructured feedback to the project team
- A display board in which attendees were invited to place a sticker beside their 4 most important criteria for the project
- The project webpage hosted an interactive web tool in which all respondents could pinpoint specific problems within the project area

PURPOSE

Introduce the project components and need for improvements to the public, present preliminary examples for possible design solutions, as well as receive the community members' input and priorities regarding the project.

Members of the project team presented information about the project and answered questions, in the first of two public meetings. Suggestions and concerns about the project voiced by the meeting participants were collected through the use of comment forms and an interactive web tool, for incorporation into project development.

FORMAT

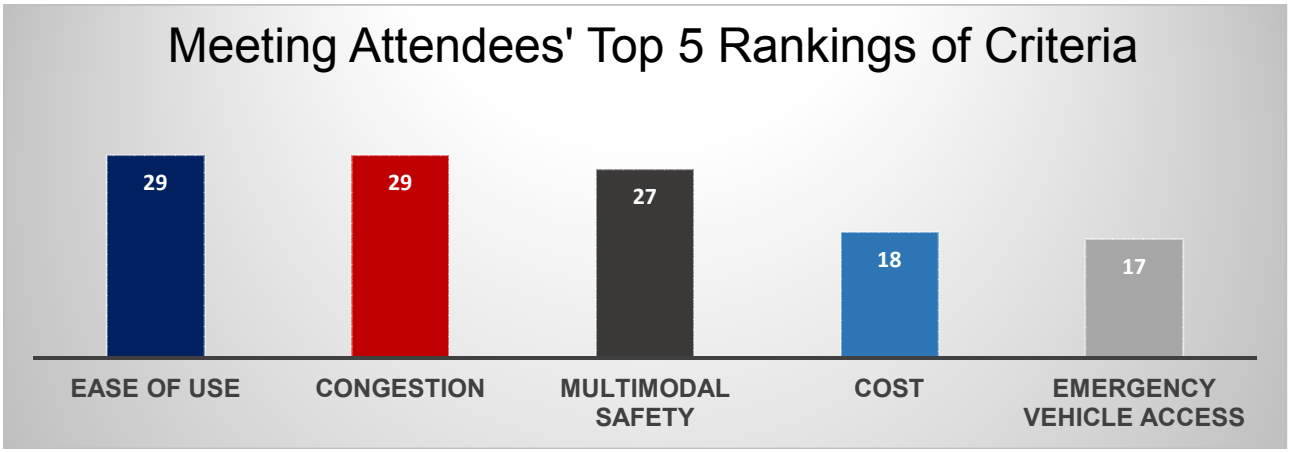
The open house included exhibits including 9 boards covering the following topics:

1. Welcome & Introduction to the Project
2. History & Project Context
3. Safety Issues at the Intersection
4. Capacity Issues at the Intersection
5. About the Project: Mobility & Access, Drainage, Overall Goal
6. Project Area Map
7. Project Criteria - Public Input
8. Design Solution Examples (Dual Left-Turn Lanes, Modern Round About, Continuous Flow Intersections, etc.)
9. Timeline & Community Involvement (Project Scope, Intended Outcomes, & Public Resources)

At the public meeting, attendees were also invited to view an animated presentation that included videos of possible design solutions for the intersection, speak with project team members, read & receive a Project Fact Sheet, provide their 4 most important outcomes of the project at the intersection, and fill out additional comment forms.

CRITICAL FEEDBACK

The display exercise allowed the meeting attendees to vote for their 4 most important criteria. Combined, the 37 attendees reported the following 5 as the most important considerations:



ADDITIONAL COMMENTS

Thirteen additional comment forms were filled out and given back to project team members. The project also received feedback via the online comment web tool as well as comments on Facebook. Some common themes expressed in all three forms include:

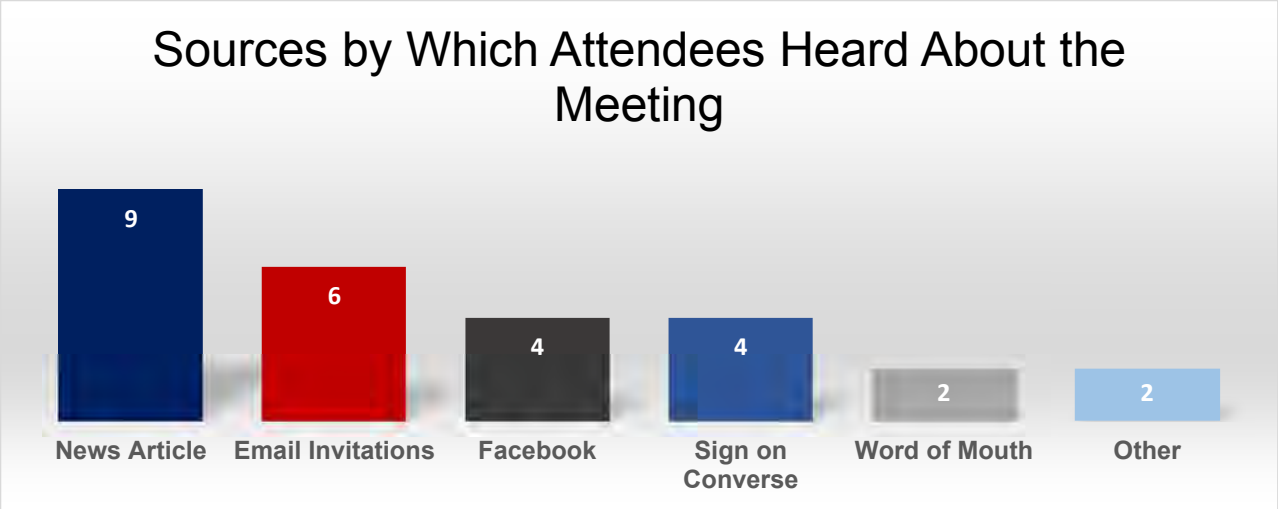
- **Necessity of project**
  - Consensus on the need for the project, most respondents agreed that changes are necessary at the Converse Ave./Dell Range Blvd. intersection
- **Safety concerns**
  - For pedestrians and bicyclists, respondents included various suggestions for possible ways to increase safety
  - Many respondents expressed the issues with left-hand turns at the Converse/Dell Range intersection, in addition to other left-hand turns near the project boundaries
  - Red light traffic violations, along with issues of too fast of green rotations, reported as common and dangerous at the intersection, some respondents suggested installing a camera to help reduce drivers running the lights
- **Lack of efficiency**
  - Left-hand turns at Converse & Dell Range, and along Dell Range into the various businesses reported to be long and inefficient
- **Business Impacts**
  - Request for project team and planners to be mindful of the business owners and residents in order to alleviate the effects of construction around the project area
- **Concerns**
  - Possibility of a roundabout – respondents had concern over the effectiveness and funding for this option
  - Noise and pollution resulting from the intersection –request for the possibility of mitigating these effects

MEETING PROMOTION

Notice of this meeting was conducted in the following ways:

- An email invitation was sent to numerous residents, stakeholders, and citizens of Cheyenne
- Notice of the meeting was placed on the Cheyenne Metropolitan Planning Organization's home webpage: http://www.plancheyenne.org/
- The Cheyenne MPO created an event on Facebook: https://www.facebook.com/events/1370033159691262/ This was shared by their Facebook page: https://www.facebook.com/Cheyenne-Metropolitan-Planning-Organization-MPO-1749329741981557/
- Advertisements for the meeting were published in:
    - *Traders Shoppers Guide* (September 9, 2016)
    - *Wyoming Tribune Eagle* (September 7 & 11, 2016)
- News sources (including the following) also shared the notice for the meeting
    - *KGWN Cheyenne* - http://www.kgwn.tv/content/news/Changes-Could-Be-Coming-To-The-Converse-And-Dell-Range-Intersection-392631001.html
    - *Wyoming Tribune Eagle* - http://www.wyomingnews.com/news/local-briefs/article_630cdaae-7586-11e6-9b3b-cfb07e87a543.html
    - *KFBC Radio* - http://www.kfbcradio.com/changes-coming-for-converse-and-dell-range-intersection/

The meeting sign-in sheets provided data regarding which sources were most effective when alerting the public to the meeting. The attendees reported the following sources as most informing:



10

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
~~Eric~~ Victor Ciccone	5442 Hilltop, Chey, WY		___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) TRADERS; WEEKEND
Joseph Williams	5045 King Arthur Way 82009	williams2@bresnan.net	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth X Other (please specify) notice on Governor
Keith Mitchell	112 Timberline ct	K5OTM@Yahoo.com	___ Facebook ___ Email Invitation ✓ News Article ___ Word-of-mouth ___ Other (please specify)
DICK KRAHENBUHL	2000 APACHE ST	RKRAHENBUHL@YAHOO.COM	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
REN HARNE	2379 WILDCAT RD	RENHARNE@BRESNAN.NET	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
James A. Martin	5314 Myhear Ave	jmartin@cheyennecity.org	___ Facebook ✓ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Jan Spires		jspires@cheyennecity.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Mike Weiland	5118 Sagebrush Ave	Mweiland@bresnan.net	___ Facebook ___ Email Invitation ___ News Article ✓ Word-of-mouth ___ Other (please specify)
Randy Krapfl	7720 Big Sky	KRAPFLS@BRESNAN.NET	___ Facebook ___ Email Invitation ✓ News Article ___ Word-of-mouth ___ Other (please specify)
Patrick Collins	2634 Dell Range	Patrick@bicyclestation.com	___ Facebook X Email Invitation X News Article ___ Word-of-mouth ___ Other (please specify)

~~10~~ (9)

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
James Sims	2101 O'Neil Ave	jsims@cheyennecity.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) staff
Frank Cole			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Nathan Beamheim	2101 O'Neil	nbeamheim@cheyennecity.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Tom Mason	2101 O'Neil	TMason@cheyennempo.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ X Other (please specify)
* Buddy Tennant	158 Rio Verde	buddy-tennant@yahoo.com	___ X Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Johnny Powers	1319 E 20th #3	JonathonBravo306@gmail.com	___ X Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Kelly Hafner	1024 Whispering Hills	~~Kelly~~ kellyh@beamheimkenyinvers.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Chris Tits	3913 E. 6th St	CJT.2s1974@Gmail.com	___ X Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Lee Woofenden	4724 Mountain Rd. #604	leewoof@leewoof.net	___ Facebook ___ X Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
JEFF RAYMENT	2323 Council Bluff	jeffrayment@gmail.com	___ Facebook ___ Email Invitation ___ ✓ News Article ___ Word-of-mouth ___ Other (please specify)

(4)

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
Derek Nissen	2108 Pattison Ave Cheyenne, WY 82009	wyonissen@bresnan.net	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth X Other (please specify) Board on Converse
ANN MURRAY	2312 Council Bluff 82009	amurray101@hotmail.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) Big sign on Converse
Darci Hendon	1040 Lafayette Blvd, Cheyenne 82009	DMHendon@juno.com	X Facebook X Email Invitation X News Article ___ Word-of-mouth ___ Other (please specify)
Tony Laird	2916 Thomas Rd Cheyenne WY 82009	lairdtony@hotmail.com	___ Facebook X Email Invitation X News Article ___ Word-of-mouth ___ Other (please specify)
Peter Laybourn	515 E 25th Cheyenne	petelaybourn@qwestoffice.net	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
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			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
LYNDA HELLER JOHN HELLER	5033 Hickory Pl Cheyenne 82009	n7tfm@hotmail.com	___ Facebook ___ Email Invitation ✓ News Article ___ Word-of-mouth ___ Other (please specify)
Heath Erickson Boston	4212 Converse Ave	Heath@Borderlinepowersports.net	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth X Other (please specify) called
Kevin + Debbie McCoy	4734 Cactus Wy	kevin.mccoy@wyogov	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth X Other (please specify)
Stephen Van Court	2309 Plain View Rd	steveinwyo@hotmail.com	___ Facebook ___ Email Invitation ✓ News Article ___ Word-of-mouth ___ Other (please specify)
Marian Orr	3421 Warren Ave	marian@marianorr.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
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CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
Larry Atwell	917 Mylar Park Dr Cheyenne, WY 82001	lcatwell@msn.com	___ Facebook X Email Invitation X News Article ___ Word-of-mouth ___ Other (please specify) ________
Pat & Rob Deball	5231 Bowie Dr	R. Deball @ Q.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ✓ Other (please specify) Sign on Converse
Jeff Wiggins		jwiggins@cheyennecity.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ________
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ________
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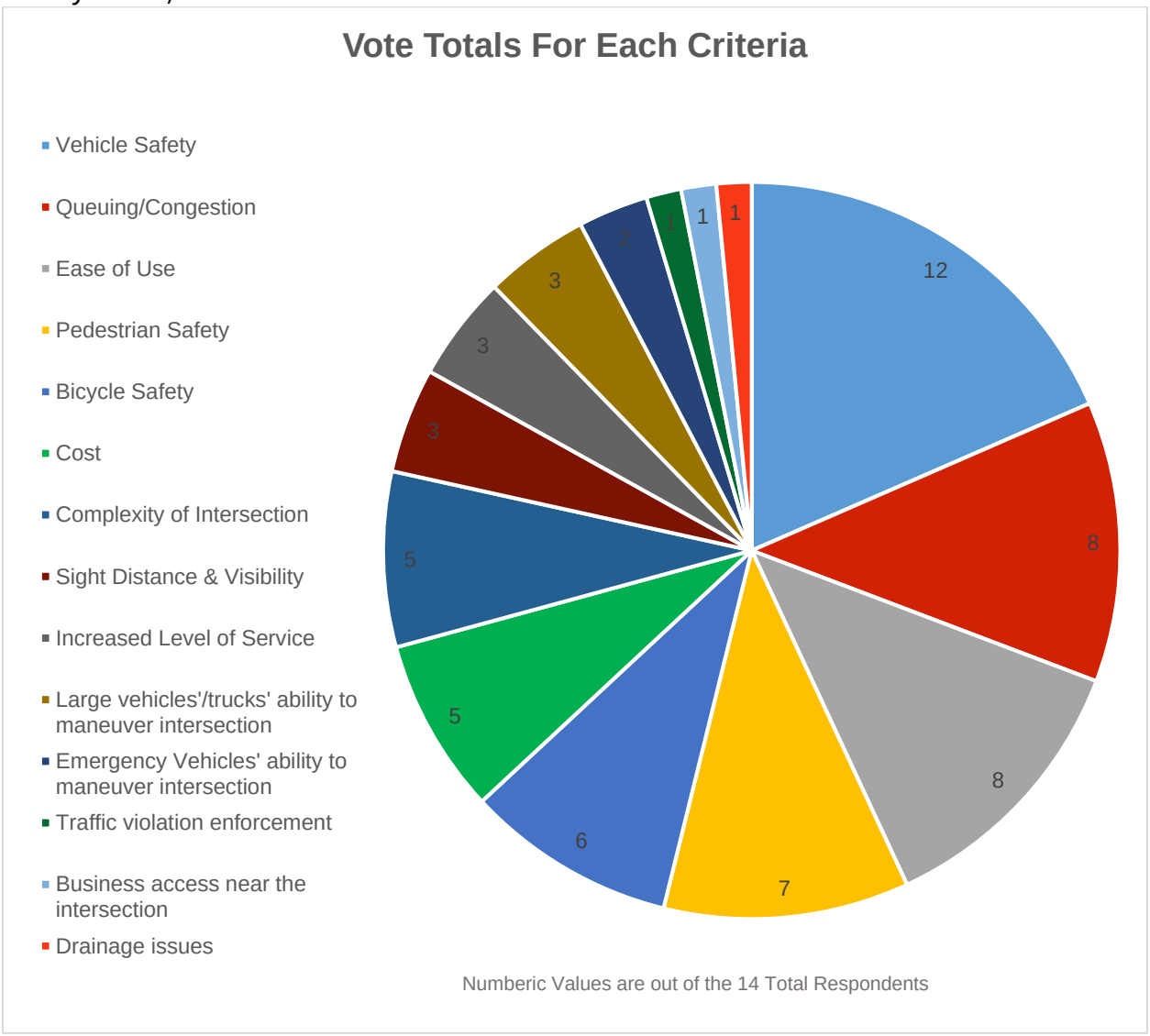
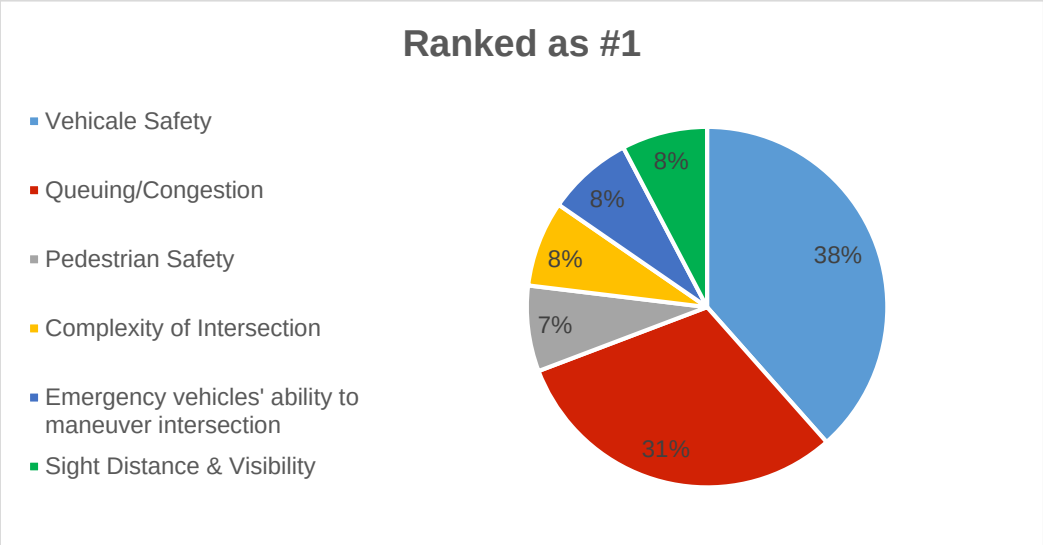
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ________
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ________
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ________

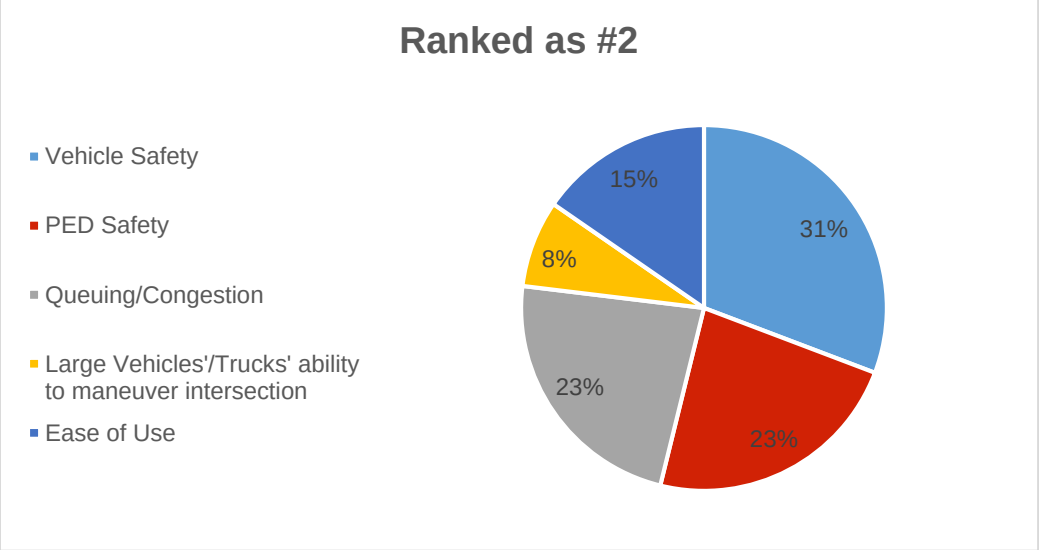
Evaluation Criteria Ranking
Steering Committee Survey- August 12, 2016

Total Number of Respondents: 14 (1 respondent chose to rank only 1 Criteria- Vehicle Safety as #1)

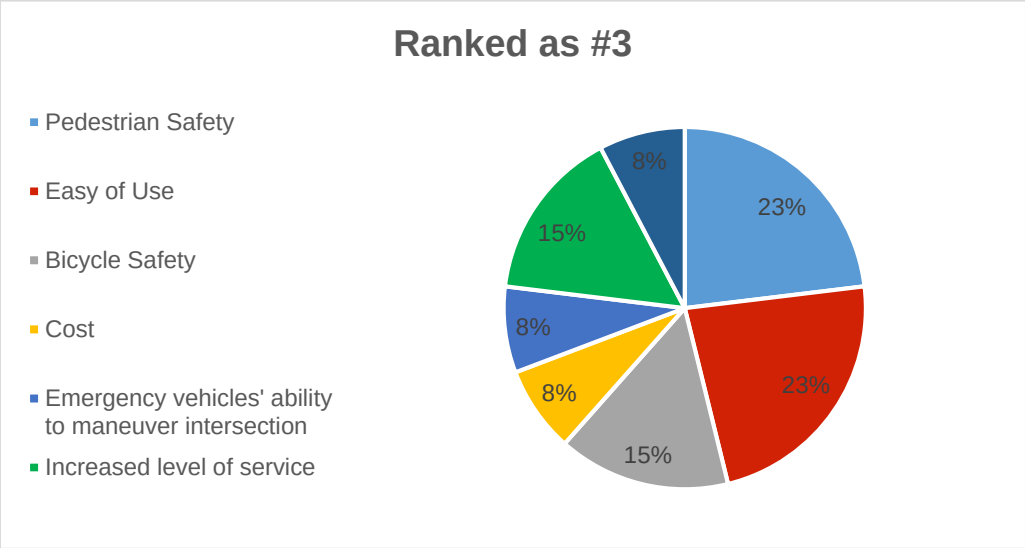


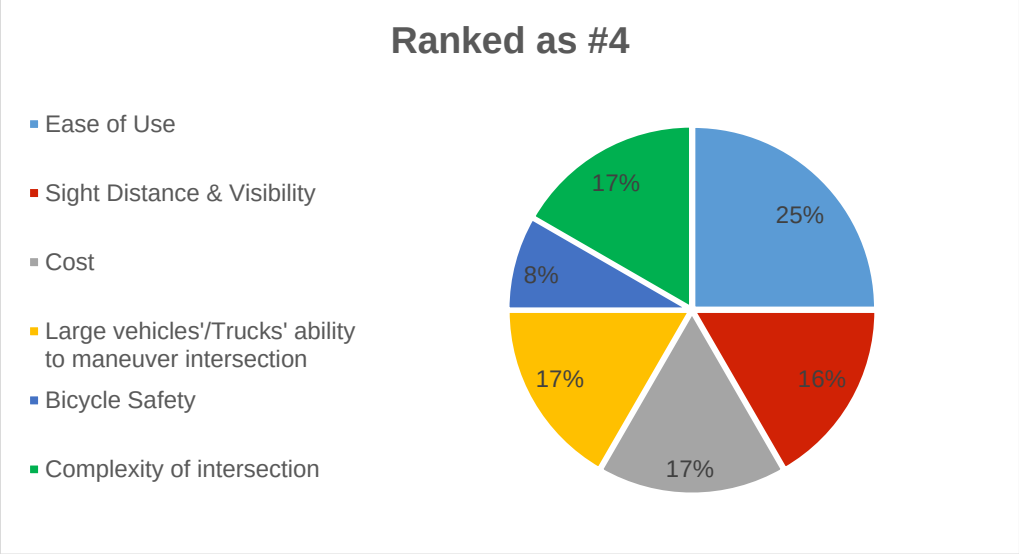
Evaluation Criteria Ranking
Steering Committee Survey- August 12, 2016



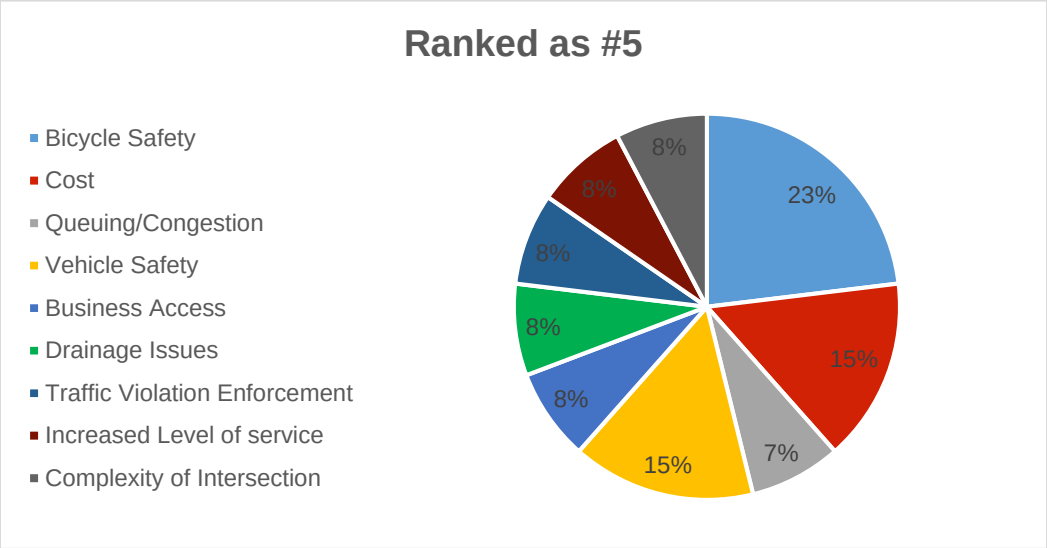


Evaluation Criteria Ranking
Steering Committee Survey- August 12, 2016





Evaluation Criteria Ranking
Steering Committee Survey- August 12, 2016



Evaluation Criteria Ranking
Steering Committee Survey- August 12, 2016

When asked "*Are there any other criteria not listed that should be considered when evaluating the alternatives?*"

- Only one respondent chose to answer, their response was: "*No Response*"

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

INSTALL A RED LIGHT CAMERA FOR CONVERSE + DEL RANGE INTERSECTION. CITY ORDINANCE WITH $25 FINE FOR EACH OFFENSE (NOT A MOVING VIOLATION AGAINST LICENSE). BIG SIGNS ONE BLOCK BEFORE INTERSECTION WARNING OF RED LIGHT CAMERA. EFFECT: SLOW DOWN TRAFFIC, REDUCE RED LIGHT RUNNING, REDUCE ACCIDENTS.

ADVANTAGE: MINIMAL COST TO IMPLEMENT.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- 1 Multimodal Safety
- 2 Ease of Use
- ___ Cost
- ___ Business Access
- 3 Emergency Vehicle Access
- 4 Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

I don't think people are understanding what "Multimodal" means - no one even walks the greenway routinely so it's doubtful they will walk a redesigned Converse/Dell Range intersection. People are focusing on safety but even that placard is somewhat lacking on specifics ie double accidents b/t 2014-2015 - from what to what?

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- ___ Multimodal Safety
- 3 Ease of Use
- 1 Cost
- ___ Business Access
- 2 Emergency Vehicle Access
- ___ Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

camera gives tickets on Red
exits at moraz at mesard's light
Ogden finished to storey
mandatory during classes.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- ___ Multimodal Safety
- ✓ Ease of Use
- ___ Cost
- ___ Business Access
- ✓ Emergency Vehicle Access
- ✓ Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ✓ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

Like the CFI solution. Concerned a round a bout may not pass in a 6th penny.

As a small business person, concerned with the time it takes to do the construction. City engineer's office needs to be congnisant of cost of construction on business.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

___ Multimodal Safety
___ Ease of Use
___ Cost
___ Business Access
___ Emergency Vehicle Access
___ Congestion
___ Undeveloped Land Acquisition
___ Developed Land Acquisition
___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

M.Y. 2 ¢'s ON THIS intersection is work must start
next Spring to save the Traffic flow, as I
have seen several close calls on T-Bone accidents
& Cars/Trucks not stopping in time for Emergency
Vechicles & Drainage issues must be considered
as the flood of 85 blocked the intersection
& traffic was slowed as it tried to go there
to reach other areas. The intersection should
be rebuilt now, not 2 or 3 yrs into the future!!!

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- 1 X Multimodal Safety
- 1 X Ease of Use
- 2 Cost
- ___ Business Access
- 1 Emergency Vehicle Access
- ___ Congestion
- 3 Undeveloped Land Acquisition
- 2 Developed Land Acquisition
- 3 Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

Noise & Pollution mitigation
Live on Converse side of King Arthur (5045)
18 wheelers leaving Postal Service are gearing up to go up the grade towards 40 mph all.
— lot is immediately adjacent to sidewalk + Road. — Doubt if code would allow today to build because of noise - Request separation of Road from back fence, trees, grass, greenway on our side etc. — Over.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- 1 Multimodal Safety
- 2 Ease of Use
- ___ Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- 3 Congestion
- 4 Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

The City needs to find the funding for the project

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

___ Multimodal Safety

___ Ease of Use

___ Cost

___ Business Access

___ Emergency Vehicle Access

___ Congestion

___ Undeveloped Land Acquisition

___ Developed Land Acquisition

___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

Take a look at traffic plan for multi family development on west side of Converse, behind ~~existing~~ that - At peak hour the left turn lane from Converse to Carlson will extend all the way to Ogden - look at dual left onto Carlson.

B: Ks are not encouraged on Dell Range initially, so multi modal isn't such a concern, but need to maintain pedestrian flow.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- ___ Multimodal Safety
- 2 Ease of Use
- ___ Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- 1 Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

Sidewalk at Del Runge coming from Converse is not safe for pedestrians

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

A non-grade (bridge or tunnel) ped/bike crossing across Converse north of Dell Range would remove much of the foot/bicycle traffic from the intersection

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- X Multimodal Safety
- X Ease of Use
- ___ Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- X Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- X Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

(3) Better signage to direct traffic to proper lane

(2) Better driver education

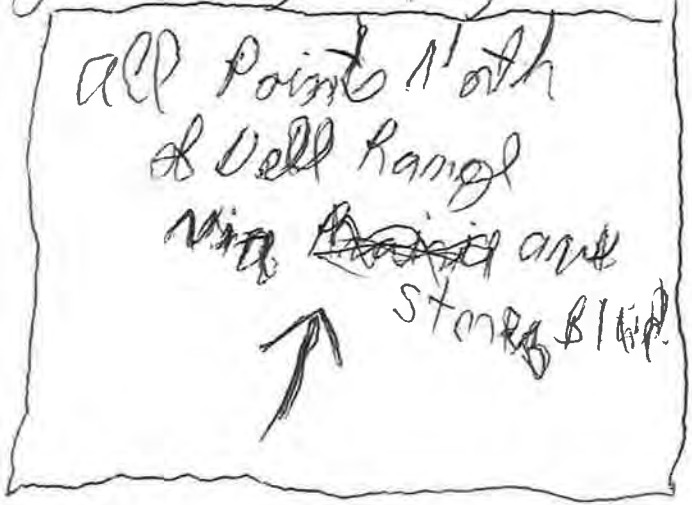
(1) Increase distracted driver fines

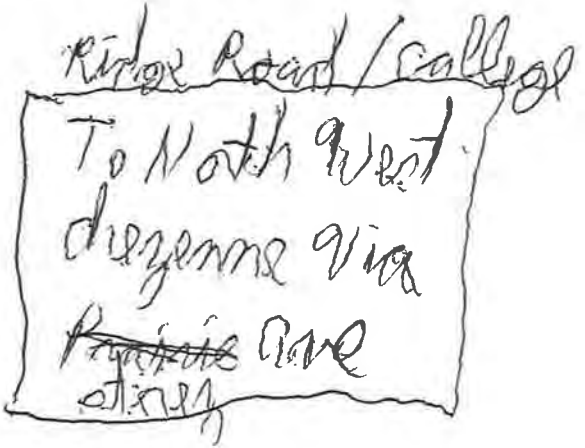
RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- ___ Multimodal Safety
- 2 Ease of Use
- ___ Cost
- ___ Business Access
- 1 Emergency Vehicle Access
- 3 Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- 4 Drainage Issues

(on Walk Bridge heading North)





Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

I like the continuous flow intersection (top right in example). Concerned about building on north side of Dell Range. Also concerned about education in these proposals.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- 1 Multimodal Safety
- 2 Ease of Use
- 3 Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- ___ Congestion
- ___ Undeveloped Land Acquisition
- 4 Developed Land Acquisition
- ___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

Widening of Converse north of Mesonway is a great idea

Left turns on East bound DR are often un-nerving

two lanes of left turns from west bound DR to southbound Converse is a good idea

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

___ Multimodal Safety
___ Ease of Use
___ Cost
___ Business Access
___ Emergency Vehicle Access
___ Congestion
___ Undeveloped Land Acquisition
___ Developed Land Acquisition
___ Drainage Issues

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

I think the safety would be enhanced by the utilization of automated enforcement with red light cameras. I believe this might require a change in state statutes to allow their use. Left turns should be prohibited at Mountain/Dell Range to avoid signalization.

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- 2 Multimodal Safety
- 3 Ease of Use
- 4 Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- 1 Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

Comment Summary

During the public open house, participants were invited to provide written comments. Comments were also received through Facebook and an on-line mapping tool. Thirteen comment cards were received from the open house participants. Many of the comment cards contained multiple comments. Five comments were generated with the online tool and multiple comments were made via Facebook. In all, 92 comments were collected and reviewed.

The comments were then categorized into 17 categories to evaluate what the public perception was as far as issues or possible resolutions to issues perceived with the existing intersection. Nine comments were not applicable to issues at this intersection and were excluded. The table below shows how each of the comments was categorized and the percentage of comments associated with each category.

Category	Number of Comments	Percent of Comments
No Issue	8	10%
Against Roundabout	17	20%
Signal Timing/issues	9	11%
Reduce congestion via alt. routes	5	6%
Lane configuration	6	7%
Red Light Camera/Violation Enforcement	11	13%
Driver Behavior/education	7	8%
Pro - Roundabout	3	4%
Reduce Speed	4	5%
Bike/Ped Connectivity	3	4%
Emergency Vehicles	1	1%
Noise Pollution	1	1%
Funding/cost	2	2%
Construction Time	1	1%
Drainage	1	1%
Alternate Intersection design	4	5%

From the comments, it appears that a majority of the respondents welcome or encourage some version of improvement to the intersection. Many of the adverse comments made about the possibility of a roundabout were very direct. However, no negative or adverse comments were made about alternate intersection designs. Four comments were made that liked the idea of alternate intersection designs, including three comments that like the continuous flow alternative presented at the public open house.

Many of the respondents indicated that the intersection could be improved by lane configuration alterations, signal alteration, enforcement and speed reduction.

Compiled Comments

Facebook Comments

September 2
Michael Pannell That junction is no major issue whatsoever

Sept. 3

Judi Gore Just please don't put in a traffic circle there

Gina Hammock I think this intersection is far too large for a round-about. People are already afraid of and confused about the one at Pershing and Converse. (I think that one works great most of the time when people pay attention to the get in the right lanes etc.) but I see one at Dell Range and Converse being a nightmare. The problem is more with impatient drivers that think a red light means "three more cars may go through the light"

Steve Elkins They need turning arrows properly timed at that intersection for the east/ westbound traffic to avoid time consuming delays and accidents

Sept. 4

Lori Sponhour Lewis I think people are just spoiled with the amount of traffic in Cheyenne. Sometimes you just have to wait.

George Smith Quit putting bussiness on Del Strange and the traffic will reduce – DUH

Leslie Vallee Whatever you do just do not put another stupid roundabout there ‘cause you'll only make that intersection worse being that people in this town don't know how to properly drive in them

Don Pedersen Use alt routes, avoid converse, Pershing and converse Del Range. Use Story more and put up a light at story and ridge

Dustin Nelson Ha like you'll listen. You apparently think the one behind the mall needs a circle jerk. Please just fire your selves and go away. Let someone with a brain in there

Fernandez Eddie Fix that stupid traffic light situation that was put on College and Campstool. This has got to be the only city in the US with a double right turn at a 3 lane T. It should be a double left turn. And why there's a traffic light on the Eastbound offramp from I-80 onto College and not one on the Westbound offramp makes me always question the intelligence of who decides these things for our city. Morons.

> Troy Rice That would be a State Hwy, those decissions come from WYDOT.

Naomi Ruth Hilgren There is absolutely nothing wrong with that intersection! Just make sure lights are timed probably

Liberty Robbins Please don't make another ring of death, I mean roundabout.

> Cheryl Korbach Please!!! No more roundabouts.
>
> "Ring of Death" 😂😂😂

Therese Ruiz The only thing I don't get about the intersection is when going north, the two lanes turn into four. Stay in the left lane to be in the left most turn lane. But the right lane gets the other left turn lane, the straight, as well as the right. Design seems odd.
Otherwise... No changes needed. Think timing is ok. (Being from much larger cities... The traffic in Cheyenne is nearly non existent. We have to grow and have growing pains at some point).

Sept. 5

Lois B. Hansen Cameras and fines to deter people from running the red lights. There's no good reason for all the accidents here except idiotic drivers.

> Gina Hammock Amen to that!

Dana Schabel Heying No more roundabouts! There is too much large vehicle traffic (semis, buses, trailers, etc) that goes through there to make a roundabout feasible. Fix the timing of the lights and simply understand that human nature makes people do stupid things, and we all know you can't fix stupid.

Abi Aldrich Paytoe Gbayee Well the input I called in a couple years ago about simply adjusting the lines coming down converse to dell range going north fell on deaf ears, but again if the two lanes split into two lanes each instead of the left lane splitting into one and the right into three, it would be a significant improvement.

Mark Sprengeler Not interested in seeing another circle of death there.

Ross Thompson Gee wizz, can you say " roundabout"!

Sept. 6

Trent Eastman Have all the lights on del range change at the same time.

Amii Gilmore i truly think the excessive red light running in this town links to the left turn lanes continuing on caution while the main lanes go red- this conditions people to continue to go when red lights pop. I have driven all over the US, and nowhere else do you encounter this. Even when left turns get dedicated green arrows AFTER main lanes stop, there is a brief full stop before they get to go again to enforce the all stop on red.

Carrie Schimelpfenig I agree and I really think having extended length yellow lights like Fort Collins might help decrease the amount of red light running. That would have to occur at every light in town though, not just here

Amanda Jagoditsh Not a maintenance issue but sure do wish folks in the right lane (aka the Wal-Mart lane) would remember not to block intersecting roads. If a cop is looking to meet a ticket quota, could do it in half an hour on a Saturday at the intersection of Dell Range and Mountain Rd.

Doug Rupp We don't need another suicide circle.

Victor Spencer m.youtube.com/watch?v=IZhJBYvWnKA

Dottie Reichert I agree we should go back to green left turn arrows. The yellow lights do no good, just like waiting for traffic on a green light. You cannot turn left on a yellow light until traffic clears. Went through Kansas City, Mo.. and Rogers Bentonville, Ark this summer and saw no yellow left turn signals.

Amber L. Thomas Don't fix what's not broken! Yeah you sit there for a minute or so, but we are in Cheyenne Wy! I see nothing wrong

Like · Reply · Message · 4 · September 6 at 8:14pm

Sept. 7

Aaron Willmarth Longer SB lights. People turning left (east) often have to sit through two cycles (or three) just to make the turn when it's busy. Traffic coming from Walmart exacerbates this and will only get worse with the goodwill.

Sept. 9

Rocky Bolin How many wrecks have happened there since the lights were changed, and what caused them?

Ron Bailey Stay away from Del Range

Alisha Jones Like many others have said, please don't put a roundabout there. That'd be hell to try and make it through without getting hit by some moron who has no patience or doesn't understand what lane to be in. Can't even count the amount of times I've almost been taken out in the Pershing/Converse roundabout.

Jim Rolf Drive through it every day - at least once. Used to do that at 19th and Converse until they put that horrible runaround down there. Hope they don't mess up this intersection the way they did that one.

Carla Sanders Winkler Looks like the general consensus from the public is NO roundabout. Let's see if they really listen now, I have my doubts.

DeeJay Stewart Honestly it's only the giant dip on converse that bothers me. It's otherwise a fairly efficient intersection

DeeJay Stewart And roundabouts are amazing... if you're not an absolute imbecile. This town just needs some driving education.

Eric V Neuman No roundabout I have seen big issue on converse and Pershing Blvd roundabout cause on southbound to make turn is making long time to southbound turn Ned make better with stop signs or warning light like that

Brandon Rood Start enforcing traffic laws. Cheyenne has more drivers getting away with running red lights than anywhere I've been. Why? Nobody tickets them when they do. Cell phone usage by drivers is also a problem, because that law is not enforced. The intersection is not the problem, the idiots driving through it is.

Adam Coulson Nope. Not stuck in traffic. Traffic flows quite smoothly through that intersection. I see the biggest priority as making sure that intersection is left alone.
Sept 12

Mary Throne It is a scary and busy intersection. No idea how to make it better.

Vicki Colucci Bloethner ROUNDABOUT IT!

Kathy Everingim I think this intersection is well done. The traffic lights maintain a good flow of the traffic. The problem is the drivers. Apparently people don't understand that you are supposed to stop when the light turns red. I see people running a red light there constantly. I see it
all over this town. Lots of people drive like they've never heard of traffic regulations. You can't fix stupid!

Roger Bensley full vertical loops E W bound traffic w/ barrel roll corkscrew jumps for N-S off dell range & converse would use a standard Evil Knievel style take off ramps and landings thru the loops w/ fireworks!!!

Sheila Loney A traffic circle would be terrible here. There Is nothing wrong with this Intersection. Quit running red lights, bam, no wrecks.

Sara Williams Drop the speed limit?
The intersection isn't that bad as long as people aren't speeding or blowing through red lights.
Or drop the speed and insert some rumble strips.?

Paul Sanchez That would be really nice but I think that shy and needs to focus on more curb appeal and more things to do downtown is kind of a joke

Lou Ann Ehmke Seriously your thinking of another round about..No way those things are horrible and they don't slow traffic up a bit.. You are looking for more accidents and the trucks coming into the post office and walmart won't make it. I don't agree with this.

Comment Cards at Open House

Take a look at traffic plan for multi family development on west side of Converse, behind Walmart.

At peak hours the left turn lane from Convers to Carlson will extend all the way to Ogden – look at dual left onto Carlson.

Bikes are not encouraged on dell range intentionally, so multi-modal isn't such a concern, but need to maintain pedestrian flow.

A non-grade (bridge or tunnel) ped/bike crossing across Converse north of Dell Range would remove much of the foot/bicycle traffic from the intersection.

Better signage to divert traffic to Prairie Avenue. (Examples given)

Better driver education

Increase distracted driver fines.

I like the continuous flow intersection (top right in example).

Concerned about buildings on the north side of Dell Range

Also concerned about education in the examples

I think the safety would be enhanced by the utilization of automated enforcement with red light cameras. I believe this might require a change in state statutes to allow their use.

Left turns should be prohibited at Mountain/Dell Range to avoid signalization

Install a red light camera for Converes/Dell Range intersection

City ordinance with $25 fine for each offense (not a moving violation against license)

Big signs before intersection warning of red light camera. Effect: slow down traffic, reduce red light running, reduce accidents. Advantage: minimal cost to implement.

I don't think people are understanding what "multimodal" means – no one even walks the greenway routinely so I'm doubtful they will walk redesigned Converse/Dell Range intersection. People are focusing on safety but eve that placard is somewhat lacking on specifics i.e. double accidents between 2014-2015 – from what to what?

Camera gives tickets on Red exit at Moran at Menard's light.

Odgen finished to Storey

Mandatory driving classes

My 2 cents on this intersection is work must start next spring to ease the traffic flow, as I have seen several close call on T-bone accidents

Cars and Trucks not stopping in time for emergency vehicles

Drainage issues must be considered as the flood of 85 blocked the intersection and traffic was slowed as it tried to go through to reach other areas

The intersection should be rebuilt now, not 2 or 3 years into the future.

Noise pollution must be mitigated. Live on Converse side of King Arthur, 18 wheelers leaving Postal Service are gearing up towards 40 mph – lot is immediately adjacent to sidewalk and road – doubt if code would allow today to build because of noise – Request separation of road from back fence, trees, grass and Greenway on our side etc – sidewalk at Dell Range coming from Converse is not safe for pedestrians

The City need to find the funding for the project.

Widening of converse north of Masonway is a great idea

Left turns on east bound Dell Range are often unnerving

Two lanes of left turns from west bound Dell Range to southbound Converse is a good idea

Like the CFI solution – concerned a roundabout may not pass in a 6th penny.

As a small business person, concerned with the time it takes to do the construction. City engineer's office needs to be cognizant of cost of construction on business.

Online Tool.

Type: Multimodal Safety
Comment: Dell Range is too wide all the way through. I think 10-foot lanes would be great, both to slow down traffic (hopefully reducing some of the congestion) and to allow some space on both sides of the road for sidewalk improvements. In particular, it'd be great if we could plant a row of trees all the way down the road (similar to Pershing west of Evans) as a way to close the road in a little bit and slow traffic down even more.
Date Posted: 2016-10-06

Type: Ease of Use
Comment: One thing I have noticed is that the time for left turns from dell range to converse can be very short. The other day the turn signal never came and I found myself out in the intersection as it turned red trying to get across.
Date Posted: 2016-09-12

Type: Multimodal Safety
Comment: A bike underpass at Converse and Dell Range, with bike facilities on the other side, could connect to the ridge up on Storey. It's low-traffic and scenic up there, making it a great place to extend the greenway. It would also make it possible to extend the greenway to points farther north, like the soccer fields on Ridge and along Four Mile.
Date Posted: 2016-10-06

Type: Business Access
Comment: I find that if I have to turn left to get into a business on dell range and it isn't at a light, it can be lengthy and dangerous. For example to get into the shopping center where coldstone is or where the jeweler is on the west side of converse. Sometimes I find my self consciously trying to approach from the right to avoid the left turn but since there's not a lot of streets to the north that are easily accessible this can be time consuming and require a lot of

parking lot maneuvering.
Date Posted: 2016-09-12

Type: Congestion
Comment: I don't know the best way to re-impose the grid system on the neighborhoods north of Dell Range, but having a tight grid is really good as a means of preventing congestion in the neighborhoods downtown. Either way, it seems like you'd have to start with the areas served by Anderson and Buffalo Ridge, and figure out how to incorporate them into the larger street network. It may help to zone for tight single-family residential development (resembling downtown) in the remaining area north of Dell Range, and tying the new neighborhoods into ones already existing. Either way, it seems like it would be key to have residential streets be no wider than 3 or 3.5 cars in order to slow down traffic, keep the neighborhoods safe and walkable, and ensure that any through traffic was respectful.
Date Posted: 2016-10-06

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Welcome

THANKS FOR JOINING US

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

THERE WILL BE NO FORMAL PRESENTATION

History & Project Context

UNION PACIFIC RAILROAD DEPOT, 1897

CHEYENNE FRONTIER DAYS PARADE, 1960s

DELL RANGE BLVD. AND CONVERSE AVE. INTERSECTION, 2014

HISTORY

The City of Cheyenne, once just a small railroad town, serves as the capital of Wyoming with a population of more than 60,000 and an urban area of more than 90,000 residents. Because of its strategic location, the city attracts tourists and visitors, as well as people relocating due to the culture that makes Cheyenne a wonderful place to call home.

The Cheyenne Metropolitan Planning Organization (MPO) was created to help manage transportation planning projects in the growing city by the governor of Wyoming in 1981. The Cheyenne MPO is responsible for developing transportation policies and coordinating with citizens and the various agencies involved in long-range transportation planning and project development.

The Cheyenne MPO recognizes that Converse Ave. and its intersection at Dell Range Blvd. need improvements. The land use around the intersection over time has become widely diverse with residential coexisting with heavy commercial development that includes a large number of shopping, dining, and entertainment establishments. Because of these factors, the Cheyenne MPO has taken up the task of updating the current transportation solution to better serve the residents, business owners, and the traveling public.

PROJECT CONTEXT

More than 34,000 vehicles travel through the Dell Range Blvd. and Converse Ave. intersection daily. This intersection not only experiences some of the highest traffic volumes in the state, but it also has the highest number of crashes within the Cheyenne urban area.

In the past 10 years, there have been 264 reported crashes at this intersection. Because of the high volume and safety risks, the Dell Range Blvd. and Converse Ave. intersection also poses difficulty and limitations to pedestrians and bicyclists trying to traverse it.

There are also residential and business access conflicts, storm water issues, and environmental concerns due to the advanced age of the corridor and intersection design.

Problem: Safety

264 TOTAL CRASHES

HAVE OCCURRED IN THE PAST 10 YEARS AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION MAKING IT ONE OF THE *MOST DANGEROUS INTERSECTIONS* IN THE STATE OF WYOMING

2006-2015

IN 2006

26%

OF TOTAL NUMBER OF CRASHES AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION WERE *REAR END COLLISIONS*

IN 2015

44%

OF TOTAL NUMBER OF CRASHES AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION WERE *REAR END COLLISIONS*

2006-2015 AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

188 TOTAL CRASHES

TRAVELING IN THE EAST/WEST DIRECTION

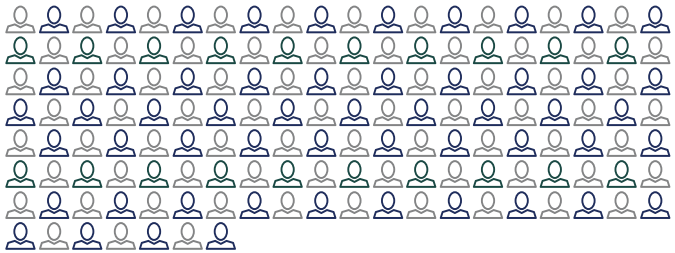
22 TOTAL CRASHES

TRAVELING IN THE NORTH/SOUTH DIRECTION

67%

OF CRASHES ON AVERAGE IN THE PAST 10 YEARS HAD *PROPERTY DAMAGE* AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

2006-2015



147 PEOPLE INJURED

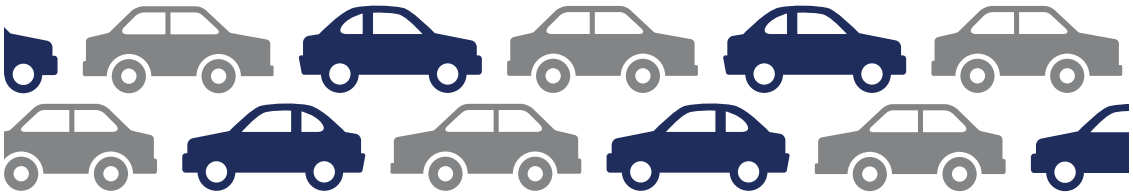
IN A TOTAL OF 88 INJURY CRASHES OVER THE PAST 10 YEARS AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

2006-2015

T-BONE/RIGHT ANGLE CRASHES

HAVE *DOUBLED* BETWEEN 2014 AND 2015 AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

Problem: Capacity



34,184 VEHICLES

TRAVEL THROUGH THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION EACH DAY MAKING IT ONE OF THE *BUSIEST INTERSECTIONS* IN THE STATE OF WYOMING

2015

TODAY AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

31.3 SECONDS

OF DELAY PER VEHICLE ON AVERAGE TODAY GIVING IT ONE OF THE WORST LEVEL OF SERVICE GRADES IN THE STATE OF WYOMING

IN 2040 AT THE CONVERSE AVE. AND DELL RANGE BLVD. INTERSECTION

45.4 SECONDS

OF DELAY PER VEHICLE ON AVERAGE IN 2040 WILL DROP THE LEVEL OF SERVICE RANK DOWN AN ENTIRE GRADE

AVERAGE DELAY PER VEHICLE

	TODAY	IN 2040
AT CONVERSE & MASONWAY	14.9 SECONDS	25.0 SECONDS
AT CONVERSE & POINT BLUFF	12.7 SECONDS	18.0 SECONDS
AT CONVERSE & OGDEN	10.6 SECONDS	12.9 SECONDS
AT DELL RANGE & MOUNTAIN	20.4 SECONDS	23.1 SECONDS
AT DELL RANGE & GRANDVIEW	14.5 SECONDS	13.8 SECONDS

190%

INCREASE IN TRAFFIC VOLUME AT CONVERSE SOUTH OF OGDEN ESTIMATED IN 2040

22%

INCREASE IN TRAFFIC VOLUME EAST OF CONVERSE ON DELL RANGE ESTIMATED IN 2040

18%

INCREASE IN TRAFFIC VOLUME AT CONVERSE SOUTH OF DELL RANGE ESTIMATED IN 2040

About the Project

CONVERSE AVE. AT DELL RANGE BLVD.

NARROW SIDEWALKS ON DELL RANGE BLVD.

EXISTING PEDESTRIAN BRIDGE ON CONVERSE AVE.

EXISTING CONDITIONS ON CONVERSE AVE.

MOBILITY & ACCESS

The Cheyenne MPO is embarking on a plan to improve the mobility for all modes of transportation through the Dell Range Blvd. and Converse Ave. intersection including, biking, walking, driving, and public transportation.

Another component of the project will be to develop preliminary planning and design to extend the recently constructed Converse Ave. from Ogden Road to the Dell Range Blvd. and Converse Ave. intersection.

The project is made up of three parts:

1. Develop and analyze alternative designs for the Converse Ave. and Dell Range Blvd. Intersection. This work includes an evaluation of alternatives using grading criteria to develop a preferred alternative using engineering, traffic planning and public input.

2. Estimate costs and develop preliminary designs and for the work needed on Converse Ave. between Dell Range Blvd. and Ogden Road and for the Converse Ave. and Dell Range Blvd. intersection preferred alternative.

3. The project team will also consider how other roadways are affected by congestion and bicycle and pedestrian conditions, as well as residential and business access.

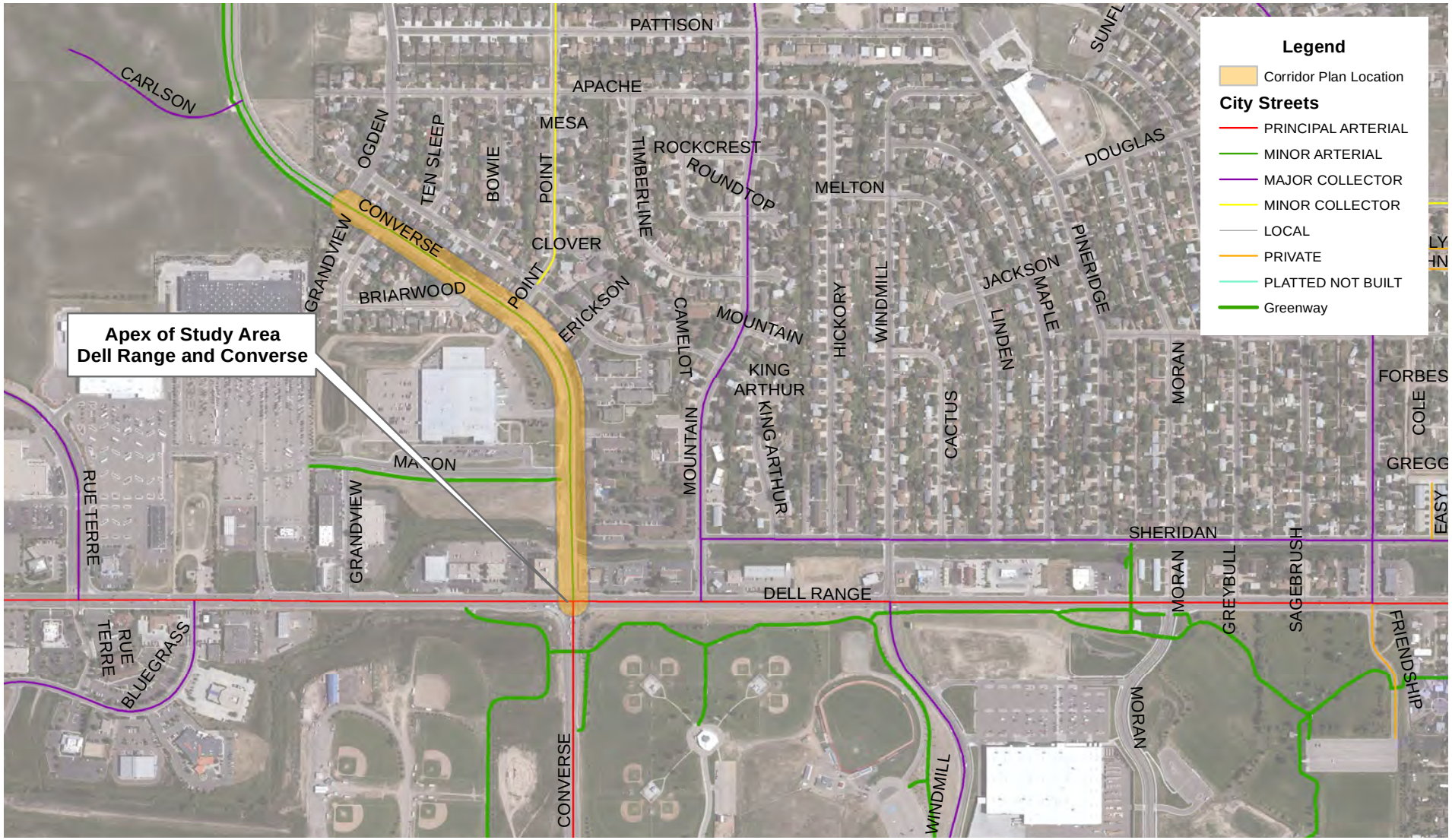
DRAINAGE

The plan will also evaluate storm water and environmental concerns. The 35% level design for a roadway and storm sewer plan for Converse Ave. from Dell Range Blvd. is at the location of where the newer built Converse Ave. ends at Ogden Road. This existing section was never fully completed and is deteriorating. The existing condition is a three lane 35 ft. paved sections of Converse Ave. with curb and gutter on the east side with a large swale on the west side. Construction of the Greenway extension and other improvements will likely require placing this swale underground in a storm sewer.

GOAL

Create preliminary designs that identify ways to improve safety, congestion, operations, and mobility of the roadways and through intersections.

Project Area



What is Most Important to You?

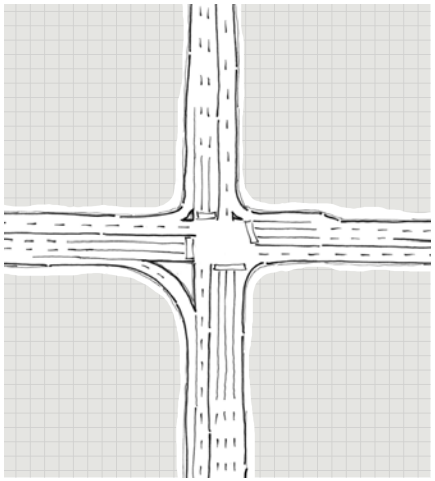
Place a checkmark sticker next to the **four criteria** that matter to you most. Your vote helps us to prioritize the screening criteria.

- MULTIMODAL SAFETY
- EASE OF USE
- COST
- BUSINESS ACCESS
- CONGESTION
- UNDEVELOPED LAND ACQUISITION
- DEVELOPED

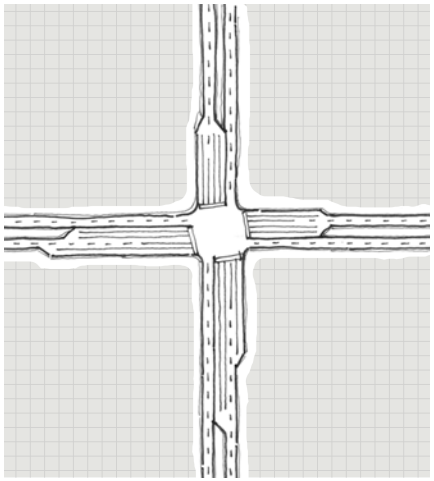
Design Solution Examples

There are many design solutions that could work for the Converse Ave. and Dell Range Blvd. Intersection. Below are some examples worth noting in no particular order:

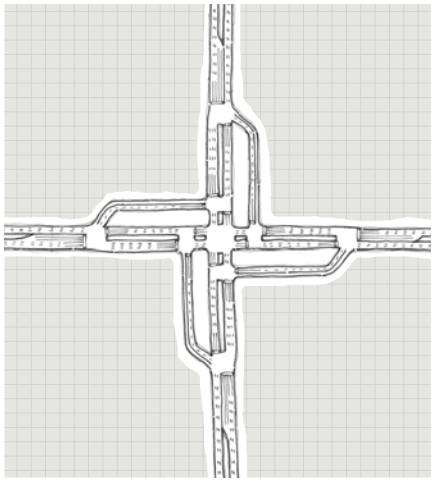
CURRENT INTERSECTION DESIGN



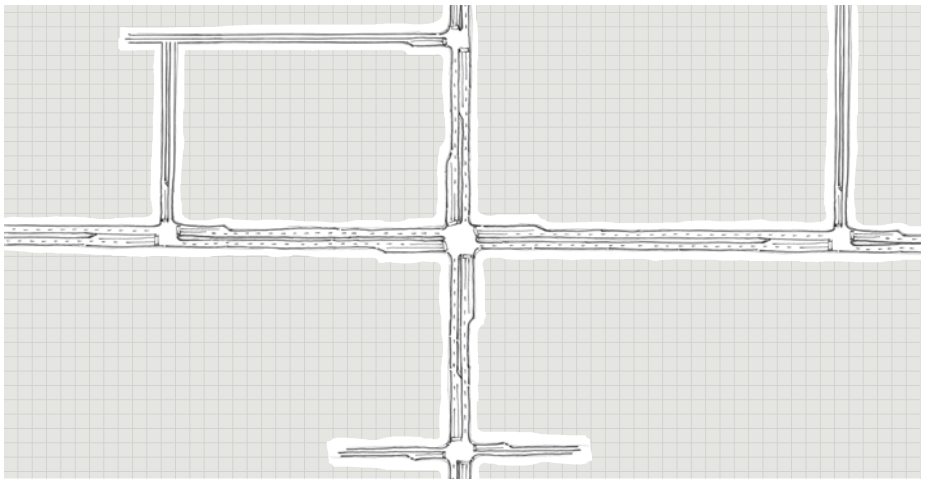
PROTECTED-ONLY LEFT-TURN PHASING



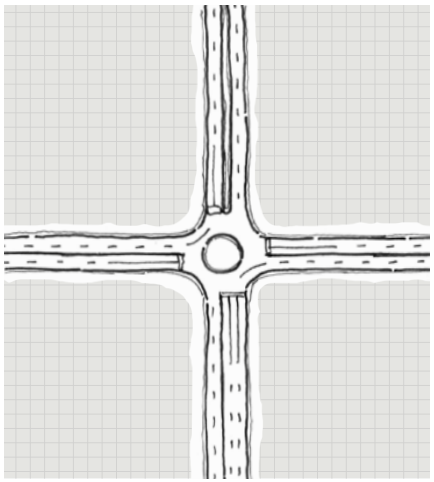
DUAL LEFT-TURN LANES



CONTINUOUS FLOW INTERSECTION (CFI)



THRU-TURN INTERSECTION



MODERN ROUNDABOUT

OTHER

WE WANT TO KNOW YOUR IDEAS!

PLEASE FILL OUT A COMMENT CARD

How to Get Involved In the Converse/Dell Range Project

We value your input and your feedback! We'll be reaching out to the community to help understand what's most important to you on the roadway and what changes are needed to make your trip better. To be a part of the planning process you may attend a public meeting, take a survey, join the discussion on Facebook, or contact one of our project representatives.

TIMELINE

Community Engagement
Ongoing

Public Meeting 1
Fall 2016

Traffic Analysis
Fall & Winter 2016

Predictive Safety Modeling
Fall & Winter 2016

Public Meeting 2
Winter 2016

Converse Ave. Roadway/ Drainage Design
Winter 2016-Spring 2017

Environmental Review
Spring 2017

INTENDED PROJECT OUTCOMES

When complete, the plan will set the course for how the City of Cheyenne uses available funds to improve the intersection and roadway. The goal of the plan is two-fold: To improve safety for motorists, bicyclists and pedestrians traveling on and around Converse Ave. and Dell Range Blvd. while also improving the roadway's drainage infrastructure.

PROJECT SCOPE

There will be an extension of Converse Ave. from Dell Range Blvd. to Ogden Road including the Greenway.

- ✓ There will be several viable Converse/Dell Range intersection design options that promote improvement.
- ✓ There will be a new and more efficient storm water system in place along Converse Ave.
- ✓ We are also developing accurate cost estimates to construct all the improvements.

LEARN MORE

Find us Online
PlanCheyenne.org

Facebook
Cheyenne Metropolitan Planning Organization - MPO

Additional Questions
Call Nancy at 307-638-4385

PUBLIC MEETING NOTICE

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

Join the Discussion

WEDNESDAY, MARCH 1, 2017

5 TO 7 P.M.

5:30 P.M. SHORT PRESENTATION

ANDERSON ELEMENTARY SCHOOL

2204 PLAINVIEW ROAD, CHEYENNE, WY 82009

CALL NANCY AT 307-638-4385

LEARN MORE ONLINE

CAN'T MAKE IT? DETAILS ONLINE AT PLANCHEYENNE.ORG

PROJECT CONSULTANTS

MEETING DETAILS

The project team will present the current project status and possible solutions to the complex issues associated with this intersection.

PROJECT DETAILS

Converse Ave. and Dell Range Blvd. is one of the busiest and crash prone intersections in Wyoming. This is why the Cheyenne MPO, with the direction of the City, has made studying and redesigning areas of Converse Ave. between Dell Range Blvd. and Ogden Road a priority.

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
ED WADDELL	5227 FISHING BRG. CHEYENNE	edmundwaddell@hotmail.com	___ Facebook ___ Email Invitation ___ News Article ✓ Word-of-mouth ___ Other (please specify) ______
Ron Olsen	2320 Dell Range	Ron@RonOlsen.biz	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______
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			___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify) ______

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

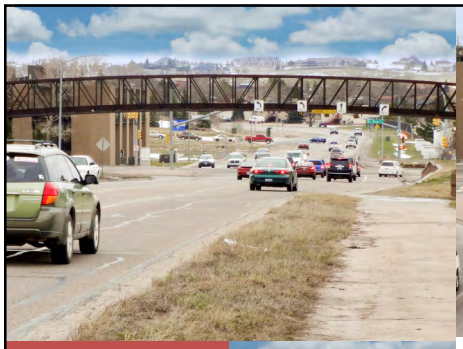
Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
Wendy Braund	3716 Corey Ave Cheyenne WY 82001	wendybraund@gmail.com	___ Facebook ___ Word-of-mouth ___ Email Invitation X Other (please specify) MPO Citizens Comm. Advisory ___ News Article
Gay, John	415 W. 18th St. Cheyenne Police	—	___ Facebook ___ Word-of-mouth ___ Email Invitation X Other (please specify) Steering Committee ___ News Article
Kevin + Deborah McCoy	4734 Cactus Way Cheyenne, WY 82009		___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article
Jeff Wiggins		jwiggins@cheyennecity.org	___ Facebook ___ Word-of-mouth ✓ Email Invitation ___ Other (please specify) ___ News Article
Dianna Sanchez	5227 Fishing Bridge Cheyenne 82009		___ Facebook ~~___ Word-of-mouth~~ ___ Email Invitation ___ Other (please specify) ___ News Article
Al Simpson	300 Garfield 212 82001		___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) X News Article
			___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article
			___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article
			___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
Dear Lund	5501 Po/AR	netafcms@gmail	___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ✓ News Article _____
Gene Palen	510 East 22nd	GRPalen@GMail.Com	___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article _____
MARY JANE PALEN	510 E. 22nd St	grPALEN@GMail.com	___ Facebook ___ Word-of-mouth ✓ Email Invitation ___ Other (please specify) ___ News Article _____
Frank Cole			___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article _____
CHARLES DeFORD	743 VANDEHEI AVE		___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ✓ News Article _____
Nathan Beamheim	2101 O'Neil		___ Facebook ✓ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article _____
Jim & Charlotte Dockter	2332 Apache		___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ✓ News Article _____
Bob Spires	2515 Foothills Rd.		✓ Facebook ___ Word-of-mouth ✓ Email Invitation ___ Other (please specify) ___ News Article _____
BRUCE PERRYMAN	1921 Hawkenweld	Perrymanc@vipc.com	___ Facebook ___ Word-of-mouth ___ Email Invitation ___ Other (please specify) ___ News Article _____

CHEYENNE METROPOLITAN PLANNING ORGANIZATION

Name (First, Last)	Address (Street, City, Zip)	Email Address	How did you hear about this meeting? (Please check source)
Buddy Tennant	150 Rio Verde Circle	buddy-tennant@yahoo.com	✓ Facebook ✓ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Jim Coomes	2372 Pattison Ave	jkcoom@bresnan.net	___ Facebook ___ Email Invitation ___ News Article ✓ Word-of-mouth ✓ Other (please specify) Ad in paper
Diane O'Meara	5300 Ogden Rd 82009	dioneara43@gmail.com	___ Facebook ✓ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Lee Wofenden	4734 Mountain Rd #504 82009	leewaf@leewaf.net	___ Facebook ✓ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Rich Merrill	11515 Doc Holliday Loop Cheyenne, WY 82009	richmerrillpe@gmail.com	___ Facebook ✓ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
DICK KRAHENBUHL	2000 APACHE ST 82009	RKRAHENBUHL@YAHOO.COM	___ Facebook ___ Email Invitation ✓ News Article ___ Word-of-mouth ___ Other (please specify)
Jan Spires	2515 Foothills	jspires@cheyennecity.org	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ✓ Other (please specify)
JEFF RAYMENT	2323 Council Bluff	jeffrayment@gmail.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ___ Other (please specify)
Boyd Wiggam	2537 Plain View	bwiggam@yahoo.com	___ Facebook ___ Email Invitation ___ News Article ___ Word-of-mouth ✓ Other (please specify) Electronic, Roadside sign

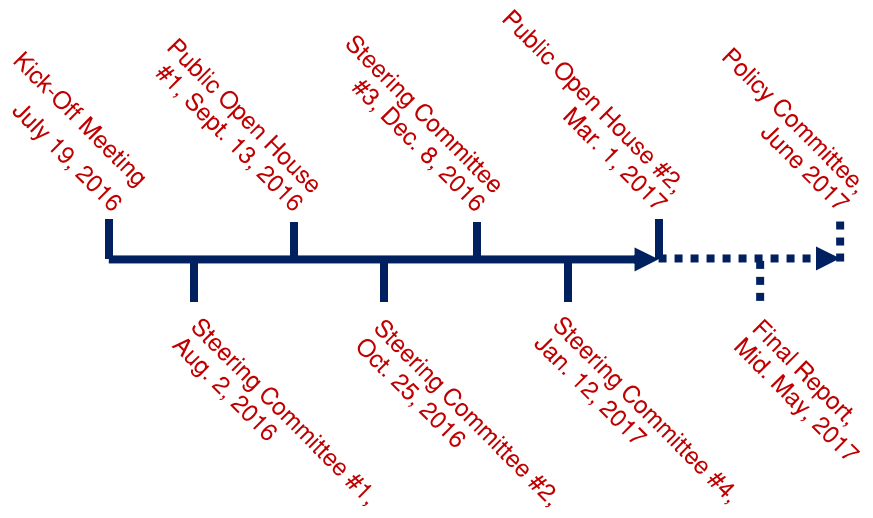


Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

Project goals are to: Improve safety, functionality, and mobility of the Converse/Dell Range intersection and corridor.

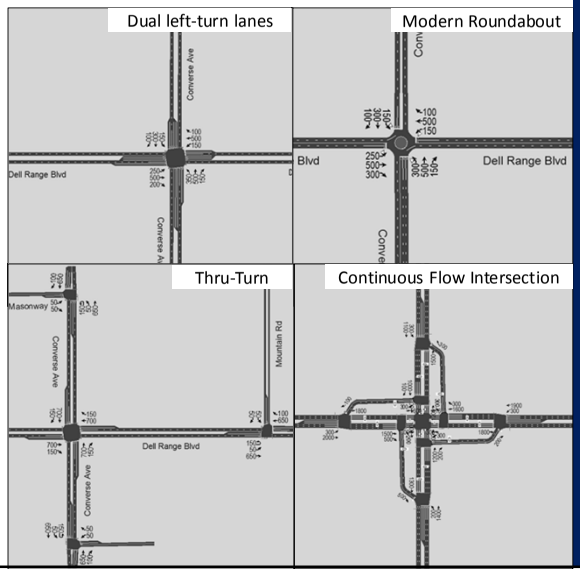
- Develop and Evaluate Intersection Alternatives
- 35% Design for Converse Corridor and the Recommended Converse/Dell Range Intersection
- Evaluate Environmental Issues

PROJECT TIMELINE



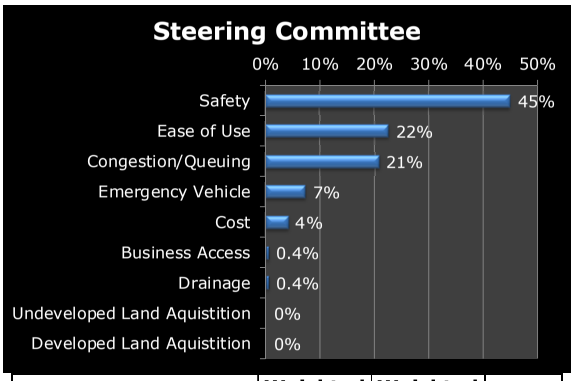
STEERING COMMITTEE MEETING #1

- What are the issues or Concerns
- Introduction to potential alternatives
- Introduce plan and direction for the study
- Began Development of Decision Matrix



NO4

STEERING COMMITTEE CRITERIA RESULTS



Issue/Concern	Weighted Points	Weighted Average	Rank
Safety	100	45%	1
Ease of Use	50	22%	2
Congestion/Queuing	46	21%	3
Emergency Vehicle	16	7%	4
Cost	9	4%	5
Business Access	1	0.4%	6
Drainage	1	0.4%	6
Undev. Land Aquistition	0	0%	8
Dev. Land Aquistition	0	0%	8

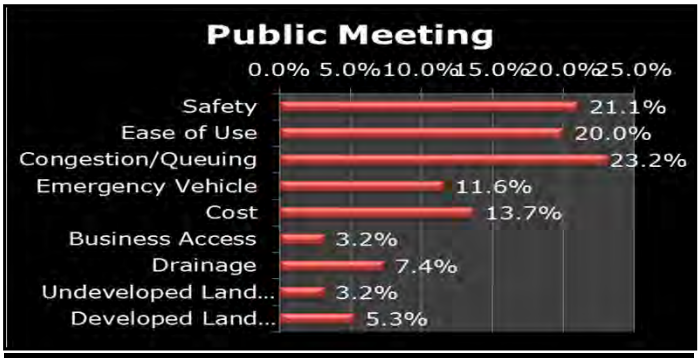
PUBLIC OPEN HOUSE #1

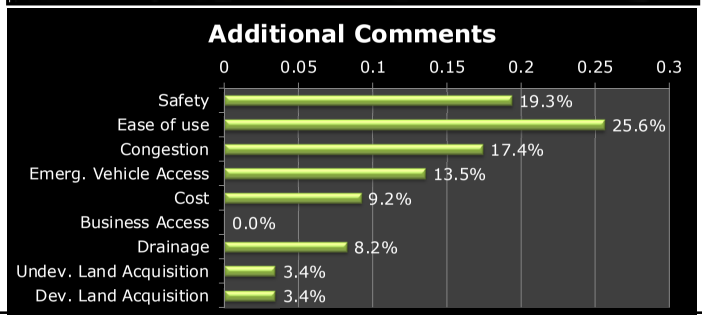
- **42 Attendees**
- **Presented Multiple Potential Viable Alternatives**
- **Provided Animated Examples to Illustrate Vehicular Movements**
- **Obtained Comments and Surveys**
- **Obtained Feedback to Determine Important Evaluation Criteria**

Slide 6

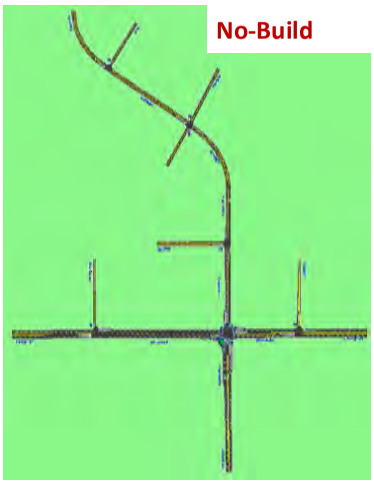
NO4 Can you make all text bigger in graph and table?
Nancy Olson, 2/22/2017

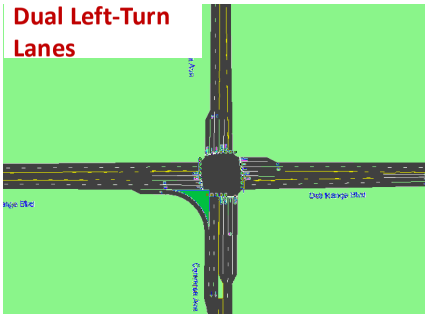
PUBLIC OPEN HOUSE #1

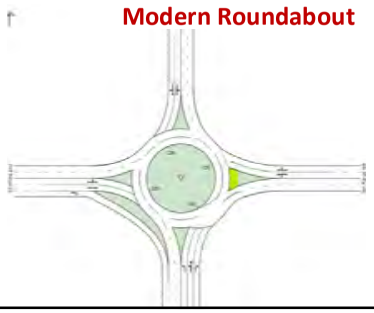




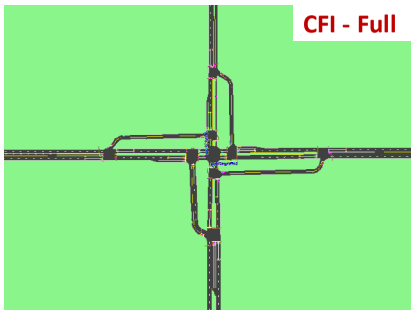
STEERING COMMITTEE MEETING #2

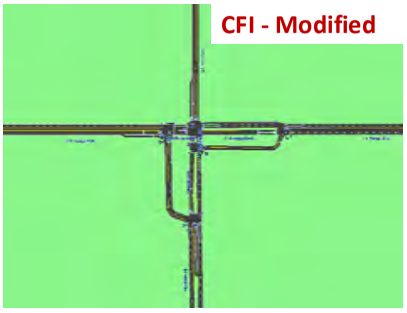


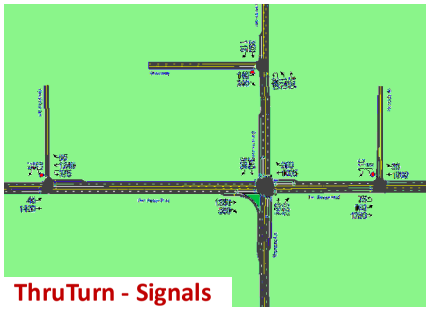


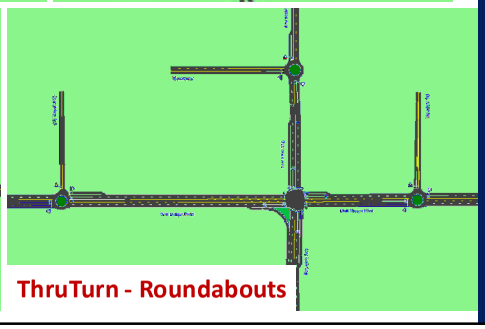


STEERING COMMITTEE MEETING #2









INITIAL DECISION MATRIX

Option	Description	Safety			Ease of Use			Congestion/Queuing		Emerg. Vehicle	Cost		
		Vehicle	Pedestrian	Bike	Intersection Complexity	??	Emergency Vehicle/Large Truck Maneauvability	Traffic Operations: LOS	Traffic Operations: Length of Queue		Total Cost		
1	No-Change												
2													
3													
4													
5													
6													

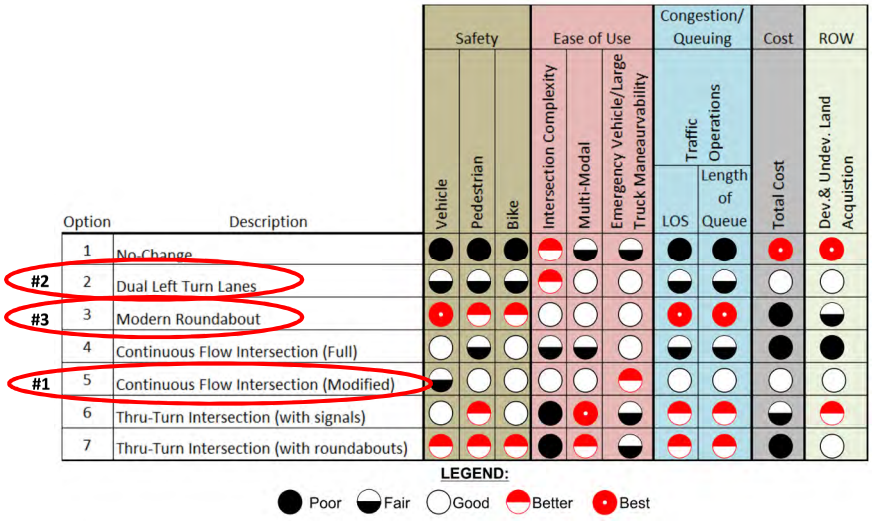
Issue	Steering Committee Rank	Public Meeting Rank	Public Mtg Comment Card Rank	Total Rank
Safety	1	2	2	1
Ease of Use	2	3	1	2
Congestion/Queuing	3	1	3	3
Emergency Vehicle	4	5	4	4
Cost	5	4	5	5
Drainage	6	6	6	6
Business Access	6	8	8	7
Developed Land Aquistition	8	7	7	7
Undeveloped Land Aquistition	8	8	7	9

STEERING COMMITTEE MEETING #3

Preliminary Operations Analysis

Alternative		Dell Range Blvd & Converse Ave					
		AM		MD		PM	
		LOS	Delay	LOS	Delay	LOS	Delay
1	No-Build	D	39.8	D	43.5	D	44.8
2	Dual Left Turns	C	26.2	C	32.3	C	29.6
3	Modern Roundabout	A	5.5	A	8.9	A	6.0
4a	CFI - Full	D	45.4	C	29.5	C	29.3
4b	CFI - Modified	C	28.3	C	30.6	D	39.8
5a	ThruTurn - Signals	C	29.6	C	29.6	C	34.6
5b	ThruTurn - Roundabouts	C	28.4	C	28.3	C	33.7

STEERING COMMITTEE MEETING #3



STEERING COMMITTEE MEETING #4

STEERING COMMITTEE MEETING #4

STEERING COMMITTEE MEETING #4

COMPARISON OF ALTERNATIVES

Dual Left Turns

Modern Roundabout

CFI – Modified (#1 Rank)

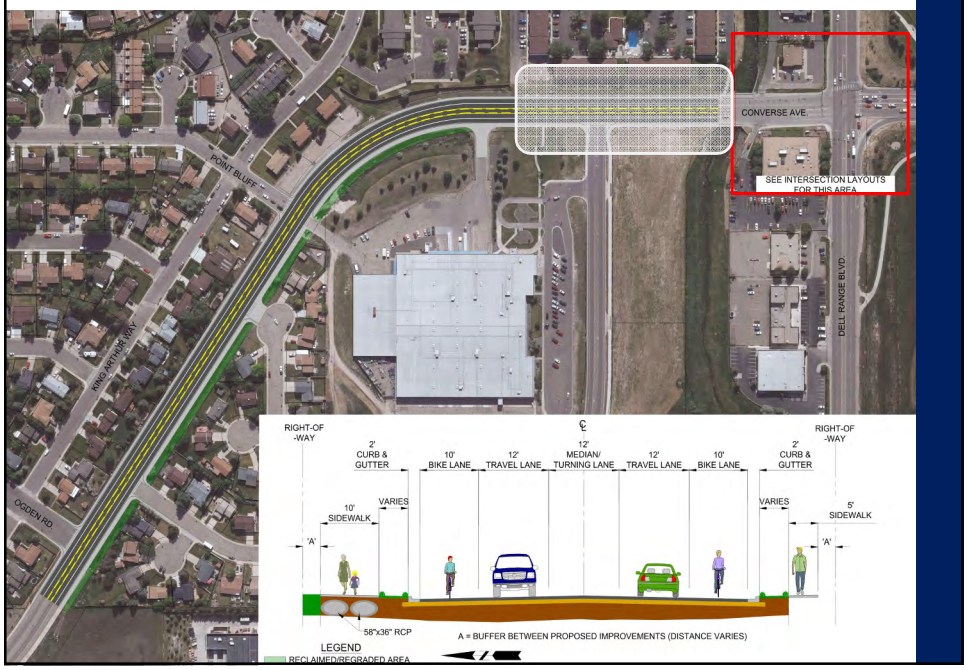
Pros

Dual Left Turns	Modern Roundabout	CFI – Modified (#1 Rank)
✓ Most conventional alternative ✓ Lowest Cost of Remaining Alternatives ✓ Anticipated to be least impactful to existing right-of-way	✓ Best mitigates noted safety concerns ✓ Provides highest capacity	✓ Mitigates most noted safety concerns ✓ Provides needed capacity enhancements ✓ Meets project goals with relatively conventional geometry ✓ Signalization at Mountain Road

Cons

Dual Left Turns	Modern Roundabout	CFI – Modified (#1 Rank)
✓ Doesn't mitigate noted safety concerns ✓ Doesn't provide needed capacity enhancements	✓ Highest cost alternative ✓ Most right-of-way & directly impacts private business ✓ Extensive retaining walls ✓ Impacts Ped. Bridge ✓ Perceived most difficult for Peds. & Bicycles	✓ Doesn't mitigate all noted safety concerns ✓ Impacts to west Pedestrian Bridge Abutment

CONVERSE AVE. 35% DESIGN



Questions?

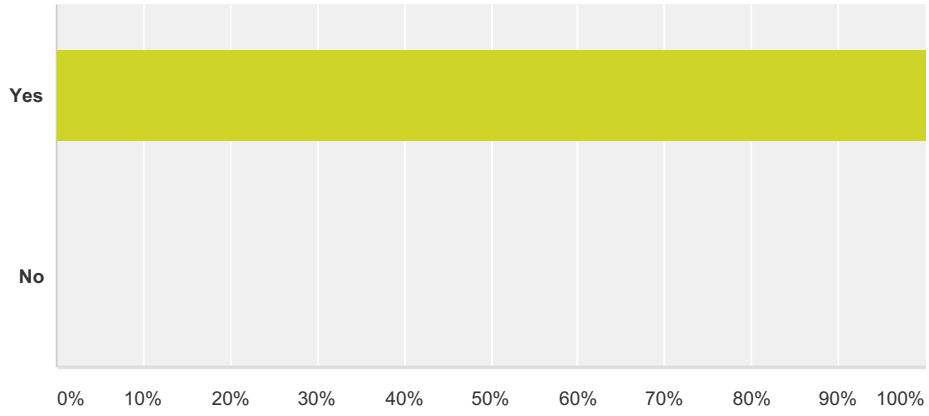
THANK YOU FOR JOINING US

We value your Feedback:

Find us Online:
www.plancheyenne.org
Facebook:
Cheyenne Metropolitan Planning Organization - MPO
Email:
Nancy: nolson@cheyennempo.org
Brandon: brandon.gebhart@hdrinc.com
Call: Nancy: 307-638-4385
Brandon: 307-757-9000
Or Complete a Survey/Comment Card

Q1 Do you feel improvements are needed to the Converse/Dell Range intersection to improve safety and function?

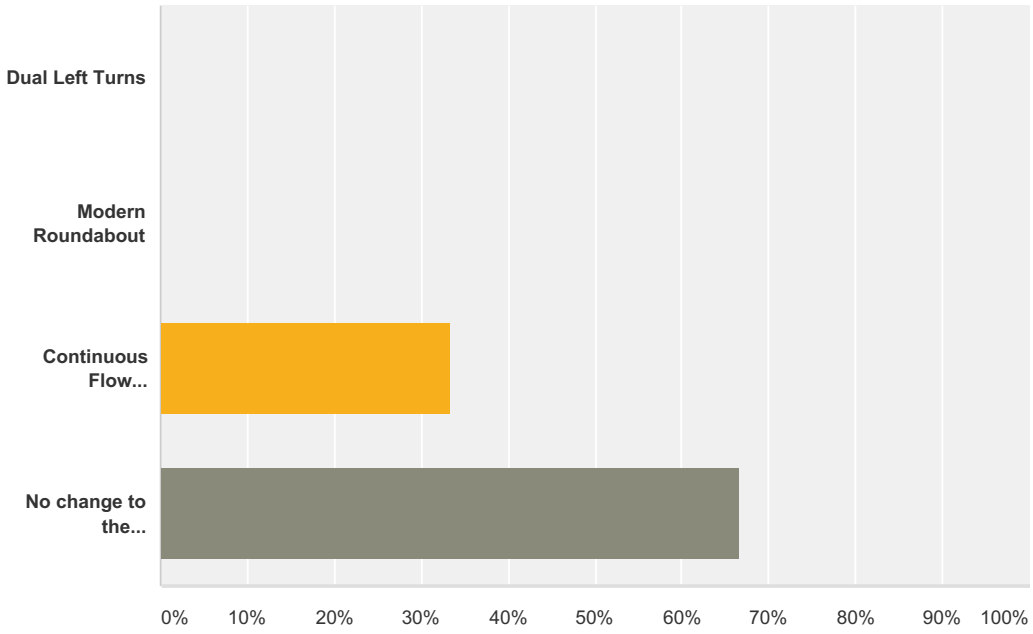
Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	**100.00%**	3
No	**0.00%**	0
Total		**3**

Q2 Which is your preferred alternative based on the information presented?

Answered: 3 Skipped: 0



Answer Choices	Responses	
Dual Left Turns	**0.00%**	0
Modern Roundabout	**0.00%**	0
Continuous Flow Intersection (CFI)	**33.33%**	1
No change to the intersection	**66.67%**	2
Total		**3**

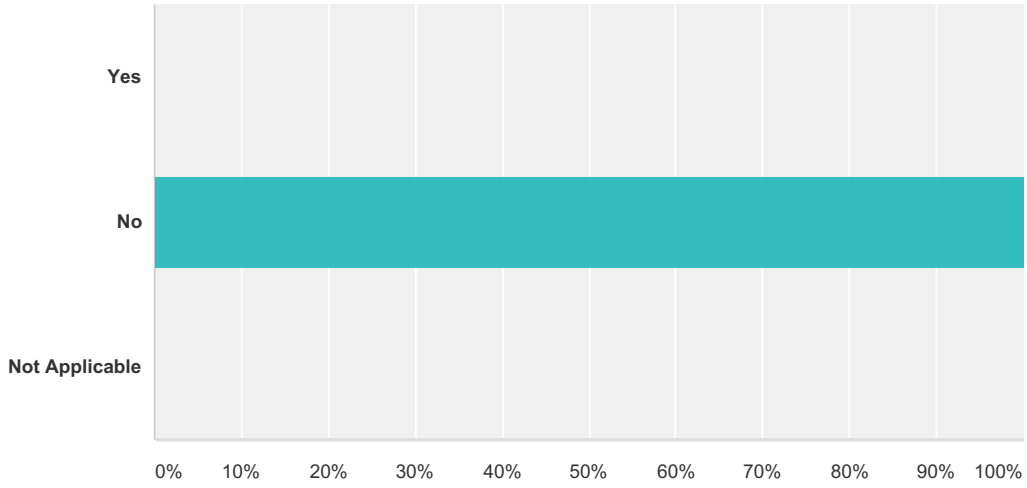
Q3 Please briefly explain why your preferred alternative would be the best choice to improve the safety and function of the intersection?

Answered: 3 Skipped: 0

#	Responses	Date
1	INSTALL TRAFFIC LIGHT AT WINDMILL. BETTER SPEED CONTROL. COMPLETE PLAN FROM OGDEN TO DELL RANGE ON CONVERSE.	3/11/2017 2:22 PM
2	I don't think that "major" improvements are needed. I live in the area and travel through it almost daily. There is congestion at peak times, but not all day. Safety can be improved by simple adjustments in traffic signals. Having dedicated E. W. N. S. movement thru the intersection will prevent most potential accidents. You may have to wait longer, but that would not be a problem for most motorist. Mountain Rd. should not be a right turn only onto Dell range.	3/2/2017 9:10 AM
3	A roundabout would be nice, but I suspect that the flow of traffic through that intersection would be too heavy for it to be practical, especially at peak times. So the CFI seems like a better alternative. I would also like to see the planned (per 1992 Greenway Master Plan) Greenway underpass under Dell Range at Dry Creek implemented as part of the overall intersection safety plan. No at-grade crossing will ever be entirely safe for pedestrians and bicyclists, and the heaviest ped/bike traffic crosses Converse Ave north of its intersection with Dell Range.	3/1/2017 1:54 PM

Q4 If you use the intersection as a pedestrian or cyclist: Do you feel safe as you cross the current intersection?

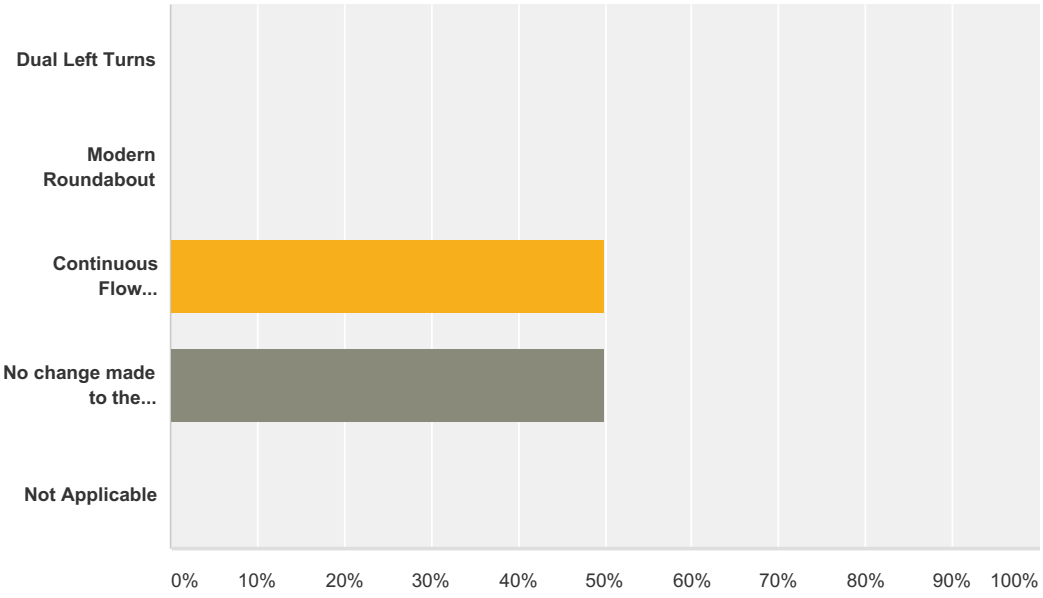
Answered: 2 Skipped: 1



Answer Choices	Responses	
Yes	**0.00%**	0
No	**100.00%**	2
Not Applicable	**0.00%**	0
Total		**2**

Q5 If you use the intersection as a pedestrian or cyclist: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

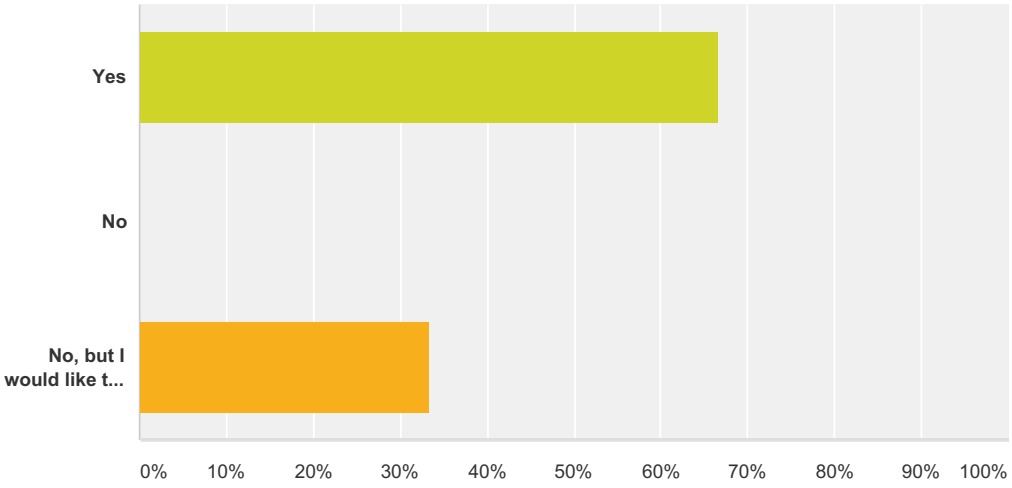
Answered: 2 Skipped: 1



Answer Choices	Responses	
Dual Left Turns	0.00%	0
Modern Roundabout	0.00%	0
Continuous Flow Intersection (CFI)	50.00%	1
No change made to the intersection	50.00%	1
Not Applicable	0.00%	0
Total		2

Q6 Would you support the funding and implementation of a project to improve the intersection?

Answered: 3 Skipped: 0



Answer Choices	Responses	
Yes	**66.67%**	2
No	**0.00%**	0
No, but I would like to reassess the need in 10 years	**33.33%**	1
Total		**3**

Comment Form

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

COMMENTS/SUGGESTIONS

PURSUE & REFINE THE ROUNDABOUT ALTERNATIVE.

We value your Feedback:

Find us Online:
www.PlanCheyenne.org
Facebook:
Cheyenne Metropolitan Planning Organization - MPO
Email:
Nancy: nolson@cheyennempo.org
Brandon: brandon.gebhart@hdrinc.com
Call: Nancy: 307-638-4385
Brandon: 307-757-9000
Or Mail a Survey/Comment Card to:
HDR Inc. c/o Brandon Gebhart
1720 Carey Ave. Suite 612
Cheyenne, WY 82001

Public Input Survey

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

1. Do you feel improvements are needed to the Converse/Dell Range Intersection to improve safety and function? ☒ Yes ☐ No

2. Which is your preferred alternative based on the information presented?

☐ Dual Left Turns ☐ Continuous Flow Intersection (CFI)
☒ Modern Roundabout ☐ No Change to the Intersection

3. Please briefly explain why your preferred alternative would be the best choice to improve safety and function of the intersection. IT WOULD REDUCE INSURIES AND FATALITIES.

4. If you use the intersection a **pedestrian or cyclist**: Do you feel safe as you cross the current intersection?

☐ Yes ☒ No ☐ Not Applicable

5. If you use the intersection as a **pedestrian or cyclist**: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

☐ Dual Left Turns ☐ Continuous Flow Intersection (CFI)
☒ Modern Roundabout ☐ No Change to the Intersection
☐ Not Applicable

6. Would you support the funding and implementation of a project to improve the intersection?

☒ Yes ☐ No ☐ No, but I would like to reassess the need in 10 years.

Comment Form

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

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2. Which is your preferred alternative based on the information presented?

☑ Dual Left Turns ☐ Continuous Flow Intersection (CFI)
☐ Modern Roundabout ☐ No Change to the Intersection

3. Please briefly explain why your preferred alternative would be the best choice to improve safety and function of the intersection. Cost. No great need to be anywhere quick in Cheyenne

4. If you use the intersection a **pedestrian or cyclist**: Do you feel safe as you cross the current intersection?

☐ Yes ☒ No ☐ Not Applicable

5. If you use the intersection as a **pedestrian or cyclist**: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

☒ Dual Left Turns ☐ Continuous Flow Intersection (CFI)
☐ Modern Roundabout ☐ No Change to the Intersection
☐ Not Applicable

6. Would you support the funding and implementation of a project to improve the intersection?

☐ Yes ☐ No ☒ No, but I would like to reassess the need in 10 years.

Comment Form

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☐ Modern Roundabout ☐ No Change to the Intersection

3. Please briefly explain why your preferred alternative would be the best choice to improve safety and function of the intersection. Brandon T. = Dual CFI = for Pedestrians

4. If you use the intersection a **pedestrian or cyclist**: Do you feel safe as you cross the current intersection?

☐ Yes ☒ No ☐ Not Applicable

5. If you use the intersection as a **pedestrian or cyclist**: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

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Comment Form

Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

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☐ Modern Roundabout ☐ No Change to the Intersection

3. Please briefly explain why your preferred alternative would be the best choice to improve safety and function of the intersection. _____

4. If you use the intersection a **pedestrian or cyclist**: Do you feel safe as you cross the current intersection?

☐ Yes ☒ No ☐ Not Applicable

5. If you use the intersection as a **pedestrian or cyclist**: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

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☐ Not Applicable

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☒ Yes ☐ No ☐ No, but I would like to reassess the need in 10 years.

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Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

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3. Please briefly explain why your preferred alternative would be the best choice to improve safety and function of the intersection. _____

4. If you use the intersection as a **pedestrian or cyclist**: Do you feel safe as you cross the current intersection?

☐ Yes ☐ No ☐ Not Applicable

5. If you use the intersection as a **pedestrian or cyclist**: Which one of the alternatives do you think would be best to improve bike and pedestrian safety?

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☑ Modern Roundabout ☐ No Change to the Intersection
☐ Not Applicable

6. Would you support the funding and implementation of a project to improve the intersection?

☑ Yes ☐ No ☐ No, but I would like to reassess the need in 10 years.

Welcome

THANKS FOR JOINING US

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN
& CONVERSE AVENUE 35% DESIGN PLAN

THERE WILL BE A FORMAL PRESENTATION AT 5:30

About the Project

CONVERSE AVE. AT DELL RANGE BLVD.

NARROW SIDEWALKS ON DELL RANGE BLVD.

NARROW SIDEWALKS ON DELL RANGE BLVD.

EXISTING CONDITIONS ON CONVERSE AVE.

PROJECT GOALS:

- Improve safety, functionality, and mobility of the Converse/Dell Range intersection and corridor
- Develop and Evaluate Intersection Alternatives.
- 35% Design for Converse Corridor and the Recommended Converse/Dell Range Intersection
- Evaluate Environmental Issues.

STATUS:

- Conducted an Open House
- Received Public Input from Open House, Social Media, Surveys and Comments
- Met with Nearby Businesses and local Stakeholders
- Four Steering Committee Meetings
- Developed a Final Decision Matrix.
- Identified a Potential Preferred Alternative

FEEDBACK:

We value your input and feedback.

To Learn More and Provide Feedback

Find us Online: PlanCheyenne.org
Facebook: Cheyenne Metropolitan Planning Organization - MPO
Email:
Nancy: nolson@cheyennempo.org
Brandon: brandon.gebhart@hdrinc.com
Call: Nancy: 307-638-4385
Brandon: 307-757-9000

Decision Matrix

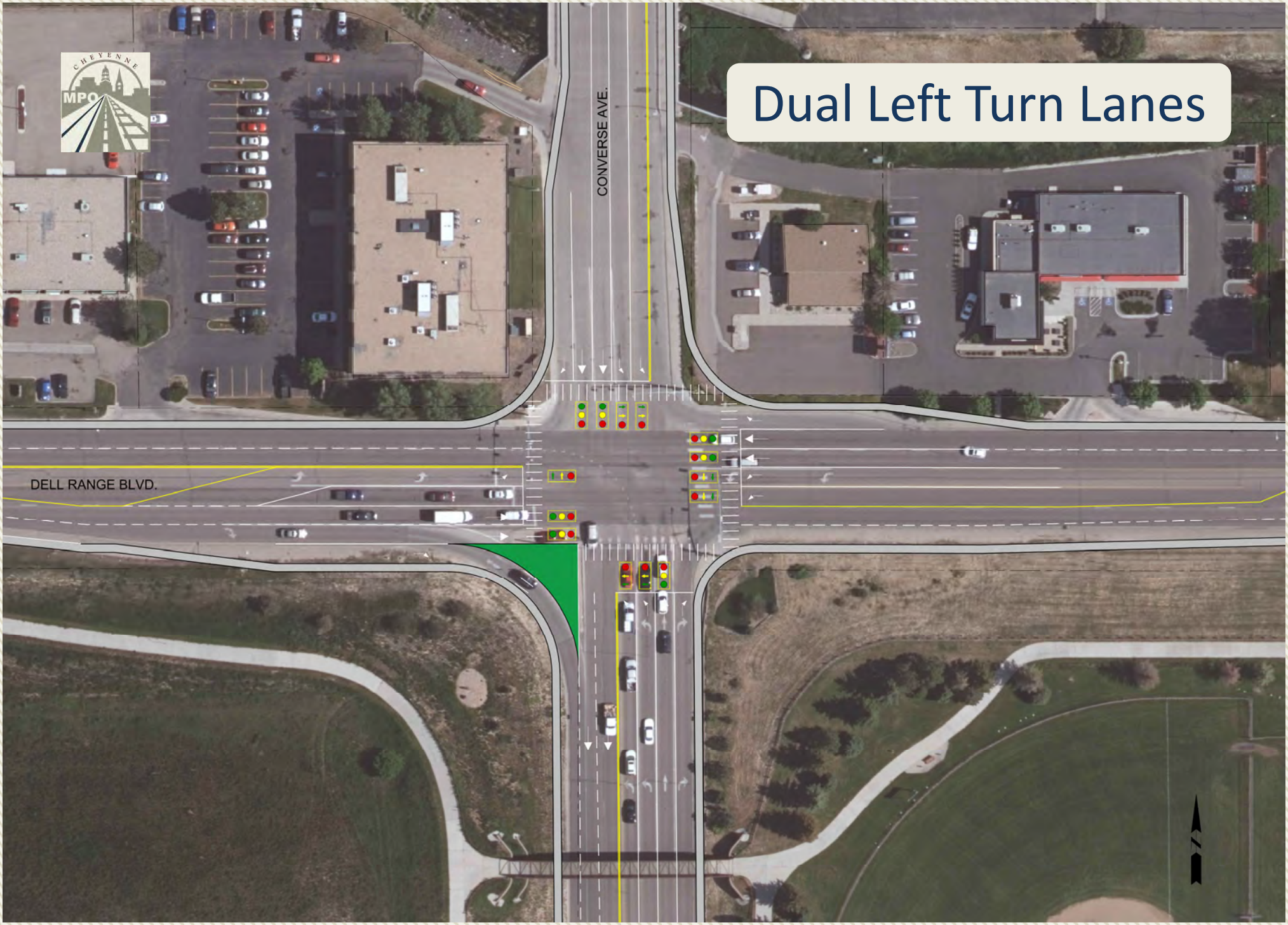
DECISION MATRIX DEVELOPMENT

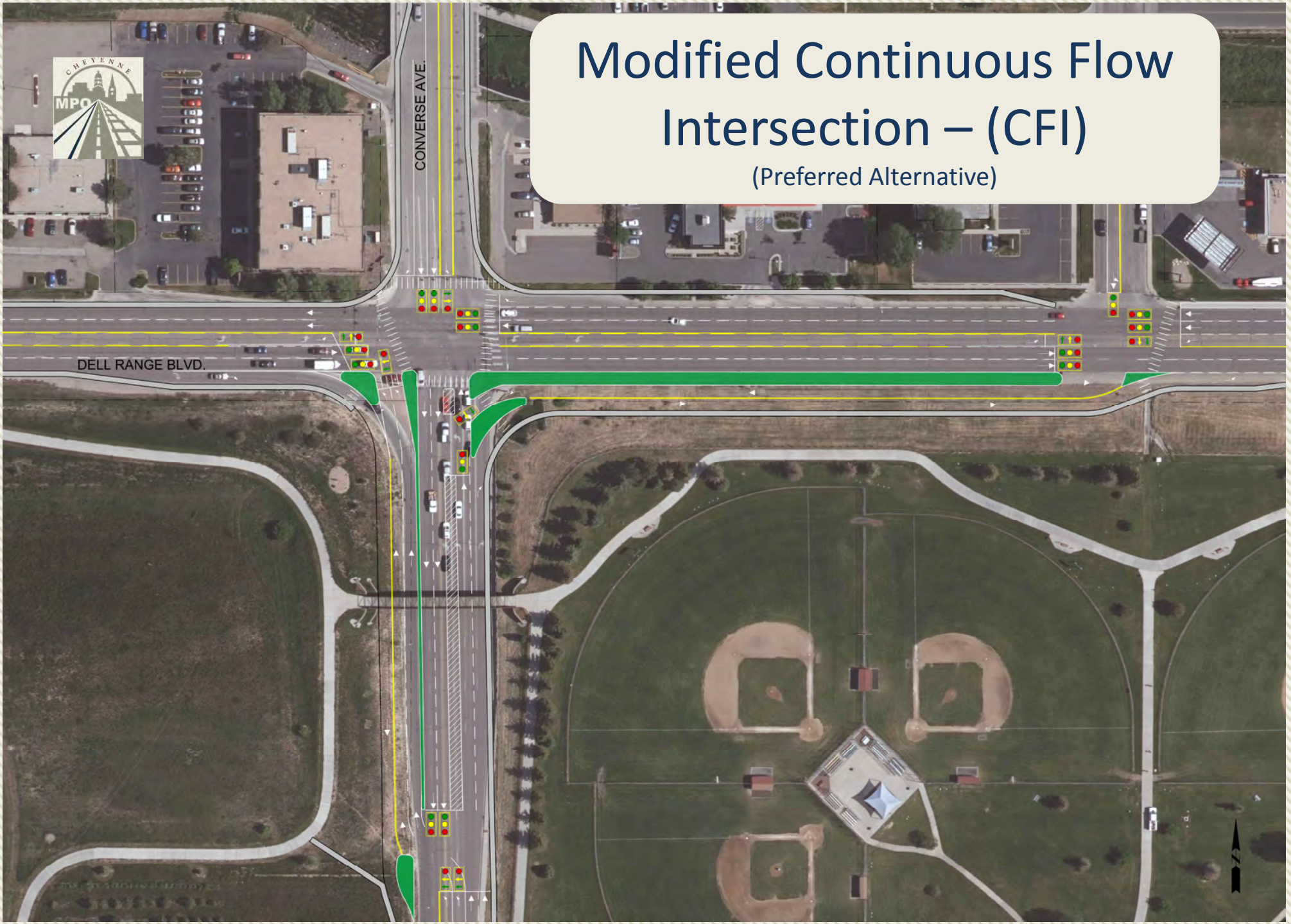
- Input from the Steering Committee, Public Open House, Social Media, Comments, Surveys and one-on-one discussions determined the criteria to be used to compare the list of alternatives.
- The Steering Committee and Engineers refined the matrix and ratings over several iterations.
- After Developing the Final Matrix – Three alternatives were further evaluated to determine the amount of land impacts.
- The Steering Committee ranked the top three preferred alternatives. The results of this ranking are:
  - Preferred – Modified Continuous Flow Intersection
  - 2nd Rank – Dual Left Turns
  - 3rd Rank – Modern Roundabout

		Safety			Ease of Use			Congestion/ Queuing		Cost	ROW
								Traffic Operations			
Option	Description	Vehicle	Pedestrian	Bike	Intersection Complexity	Multi-Modal	Emergency Vehicle/Large Truck Maneaurvability	LOS	Length of Queue	Total Cost	Dev.& Undev. Land Acquistion
1	No-Change	●	●	●	◓	◒	◒	●	●	◉	◉
2	Dual Left Turn Lanes	◒	◒	◒	◓	○	○	◒	◒	○	○
3	Modern Roundabout	◉	◓	◓	○	○	○	◉	◉	●	◒
4	Continuous Flow Intersection (Full)	○	◒	○	◒	◒	○	◒	◒	●	●
5	Continuous Flow Intersection (Modified)	◒	○	○	○	○	◓	○	○	○	○
6	Thru-Turn Intersection (with signals)	○	◓	○	●	◉	◒	◓	◓	◒	◓
7	Thru-Turn Intersection (with roundabouts)	◓	◓	◓	●	◓	◒	◓	◓	●	○

LEGEND:

● Poor ◒ Fair ○ Good ◓ Better ◉ Best


Dual Left Turn Lanes
CONVERSE AVE.
DELL RANGE BLVD.
N

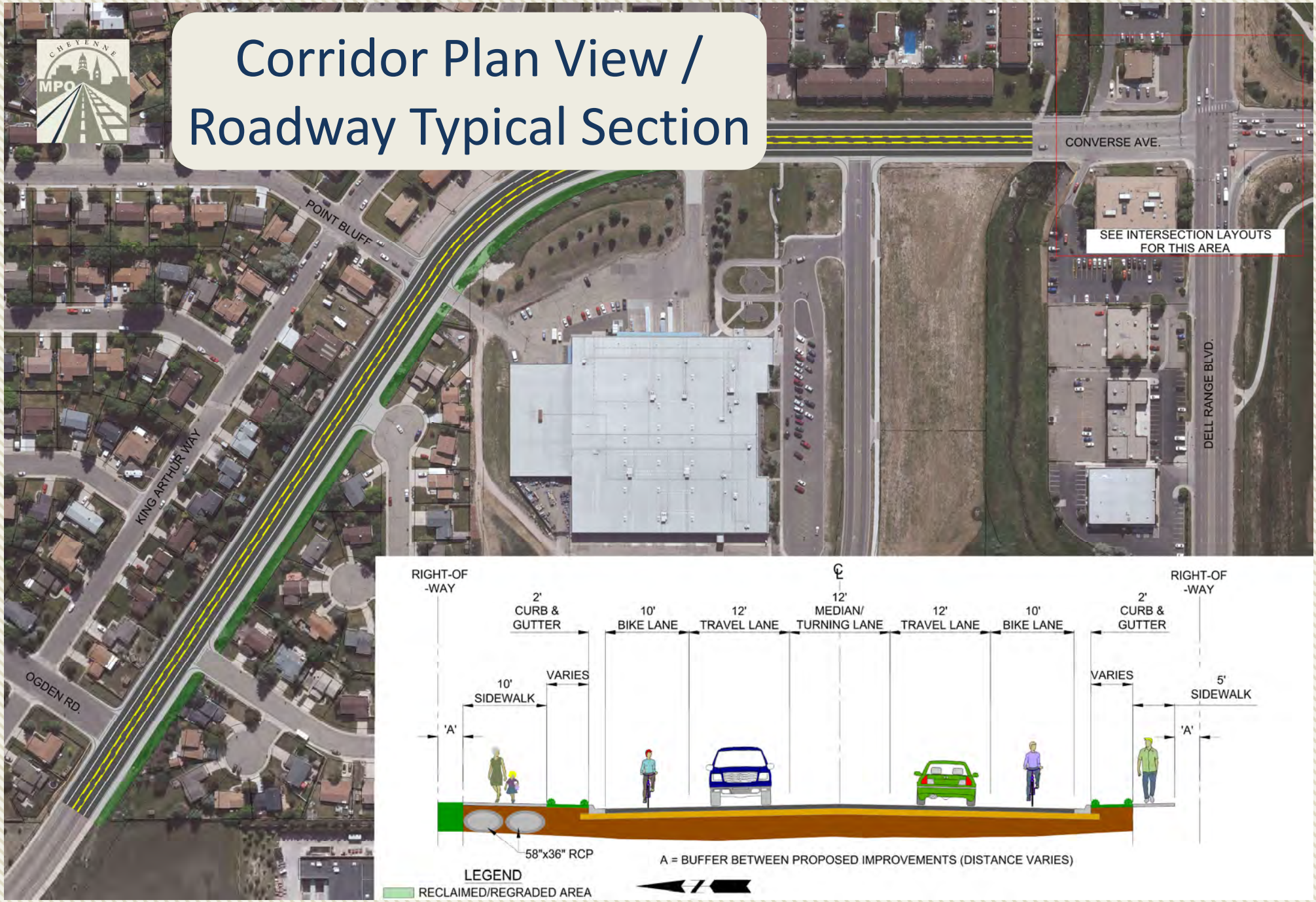


Modified Continuous Flow Intersection – (CFI)

(Preferred Alternative)

Modern Roundabout

Corridor Plan View / Roadway Typical Section



Appendix E

Meetings

- Steering Committee #1 – June 23, 2016
    - Meeting Agenda
    - Sign-in sheet
    - Presentation
    - Minutes
- Steering Committee #2 – October 25, 2016
    - Meeting Agenda
    - Sign-in sheet
    - Presentation
    - Minutes
- Steering Committee #3 – December 8, 2016
    - Meeting Agenda
    - Sign-in sheet
    - Presentation
- Steering Committee #4 – January 12, 2017
    - Sign-in sheet
    - Presentation
    - Minutes
- Technical Committee Presentation – May 17, 2017
    - Presentation

Mtg Minutes

Project:	Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan
Subject:	Pre-Kick Off Meeting
Date:	Thursday, June 23, 2016 3:00 PM
Location:	Cheyenne Office – Conference Call Dial-in: 1-866-583-7984 Conference Code: 1131765
Attendees:	Nancy Olson, Tom Mason, Brandon Gebhart John Seyer, Mike Oakley, Stephanie White

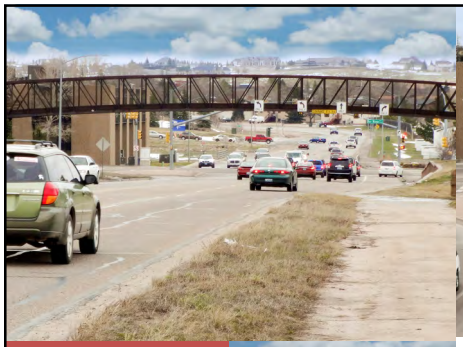
1. Introduction
2. Schedule
    a. Surveying
        i. Locates required prior to survey. Schedule week of June 27-July 1 depending on how long locates remain valid.
        ii. Survey will likely occur July 5-8 – Jack Studley
        iii. GIS data available from Jennifer Corso - jcorso@cheyennempo.org
    b. Traffic Analysis
        i. Data anticipated to be available within next 2 weeks (July 11)
        ii. Develop Graphic and Information for 1st Steering Committee Mtg. (see attached tentative schedule)
        iii. Traffic Data available from James Sims – jsims@cheyennempo.org
    c. Converse Roadway Design
        i. To follow Traffic Analysis and alternative development
    d. Environmental Review
        i. Follows Traffic Analysis and Roadway Design
    e. Public Involvement
        i. Public Open Houses
        ii. MPO, Steering Committee, and City
        iii. See attached Tentative Schedule
3. Public Involvement Goals and Concerns
    a. Early citizen, city department, and elected official involvement will assure an easier adoption process when the time comes,
    b. Accommodate all modes especially bike riders and pedestrians to cross Dell Range at Converse and Converse north of Dell Range

c. Educate the traveling public about any unfamiliar intersection designs early in the process if there is a high probability of selected recommendation.
d. Provide a summary of Plan Cheyenne to steering committee for further discussion.
e. Steering committee invitations will be electronic. Send to MPO for approval.

4. Future Meetings
    a. Scoping/Kick-off meeting
    b. Progress Meetings
    c. See attached
5. Data Needs
    a. Traffic Counts
    b. Crash Data
    c. Alternative to Consider – Software to use for analysis
    d. Drainage/Storm Flows - work with Mike Vinson to obtain data.
    e. Traffic Data will be available within next 2 weeks. Coordinate with James Sims, to obtain desired traffic Data.
    f. GIS data layers – Jennifer Corso, MPO GIS. jcorso@cheyennempo.org
6. Other
    a. Steering Committee Mtgs to be held at City Building Rm 208
    b. Public Meeting at Anderson Elementary, second choice if Buffalo Ridge Elementary
7. Next Meeting
    a. Attached
8. Actions
    a. MPO – determine survey permissions
    b. MPO – determine roundabout modeling software preference, SIDRA or RODEL
    c. Seyer – coordinate with James Sims to obtain Traffic Data.
    d. Gebhart/Oakley – work with Gary Anderson to develop of list of GIS layer requests.
    e. Gebhart – work with Gary Anderson to develop area of survey
    f. Gebhart – coordinate with Jim Fraley, Anderson Elementary for Public Meeting Location (not Fraley, Sean Gorman)
    g. Gebhart/Oakley/Anderson – request utility locates
    h. Gebhart – hydrology data from Mike Vinson.

Sign-In Sheet
Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan
Tuesday, August 02, 2016

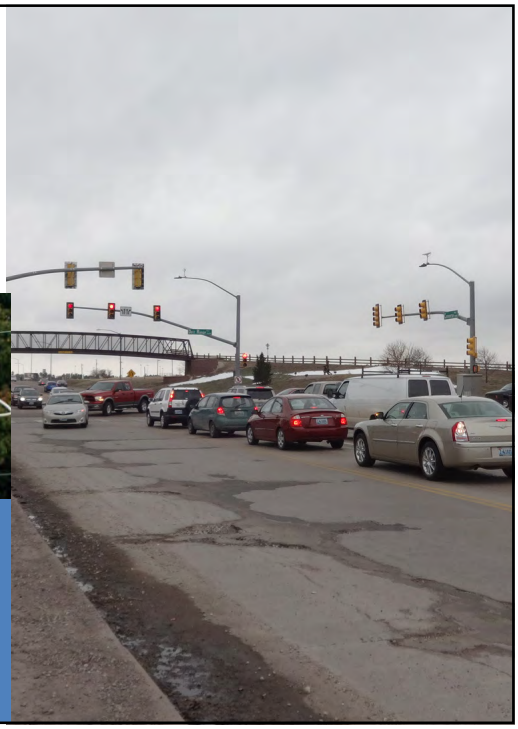
Organization	Name	Email	Phone Number	In Attendance?
HDR Project Team				
Project Manager	Brandon Gebhart	brandon.gebhart@hdrinc.com	307-757-9000	✓
Traffic Lead	John Seyer	john.seyer@hdrinc.com	970-416-4407	✓
Roadway Design	Mike Oakley	mike.oakley@hdrinc.com	307-228-6019	✓
Public Involvement	Stephanie White	stephanie.white@hdrinc.com	303-323-9788	✓
Steering Committee				
City Public Works	Craig LaVoy	clavoy@cheyennecity.org	637-6294	✓
City Engineering	Nathan Beauheim	nbeauheim@cheyennecity.org	638-4315	✓
BOPU	Brad Brooks	bbrooks@cheyennebopu.org		
BOPU	Linda Gunter	lgunter@cheyennebopu.org		✓ 4
WYDOT	Kevin McCoy	kevin.mccoy@wyo.gov	777-4178	✓
WYDOT	Mark Wingate	mark.wingate@wyo.gov	777-4150	✓
City Council	Jeff White	jwhite@cheyennecity.org	777-5739	✓
City Council	Dr. Mark Rinne	mrinne@cheyennecity.org	634-2646	✓
City Council	Jim Brown	jbrown@cheyennecity.org		
Cheyenne Police Dept.	Sergeant John Gay	jgay@cheyennepd.org		
Cheyenne Police Dept.	Officer George Trammell	gtrammell@cheyennepd.org		
City Planning	Brandon Cammarata	bcammarata@cheyennecity.org	638 4303	✓
Transit	Renae Jording	rjording@cheyennecity.org		
Transit	Keith McQueen - sub	kmcqueen@cheyennecity.org	631-0190	✓
Greenway and Trails	Jeff Wiggins	jwiggins@cheyennecity.org		
Parks and Recreation	Jason Sanchez	jsanchez@cheyennecity.org	638-4358	✓
~~EMS~~ EMA	Matt Butler	mbutler@laramiecounty.com	633-4335	✓
Black Hills Energy	Jef McMann	jef.mcmann@blackhillscorp.com		

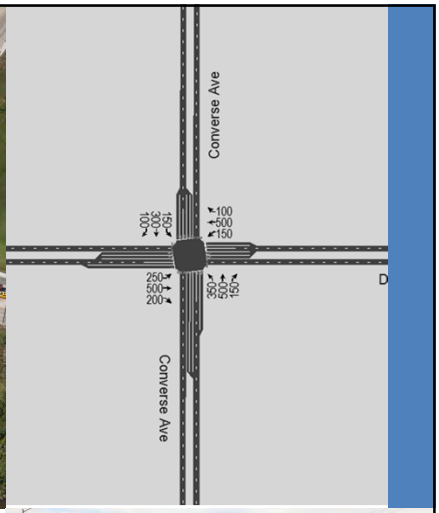


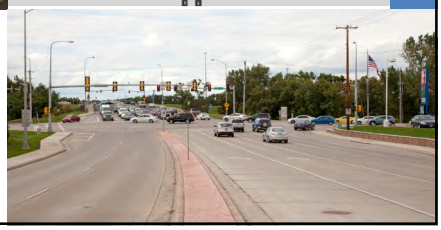
Converse/Dell Range
Intersection Traffic
Safety Plan & Converse
Avenue 35% Design Plan

In-depth analysis of the model will provide a comprehensive picture of the intersection challenges

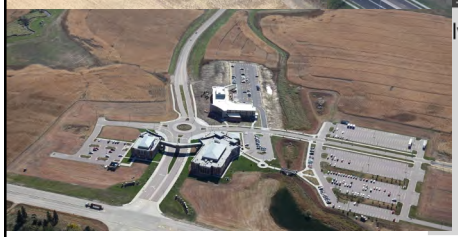
Protected-only left-turn phasing could provide an interim solution

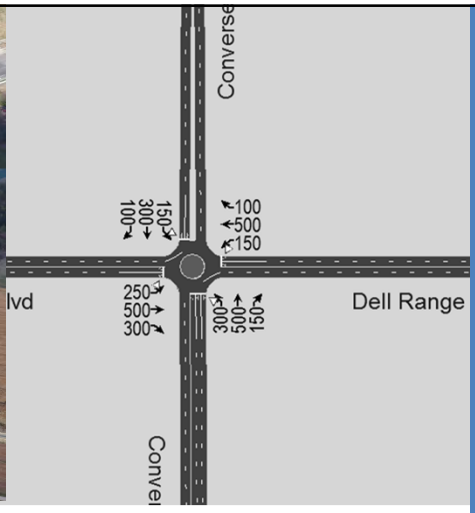




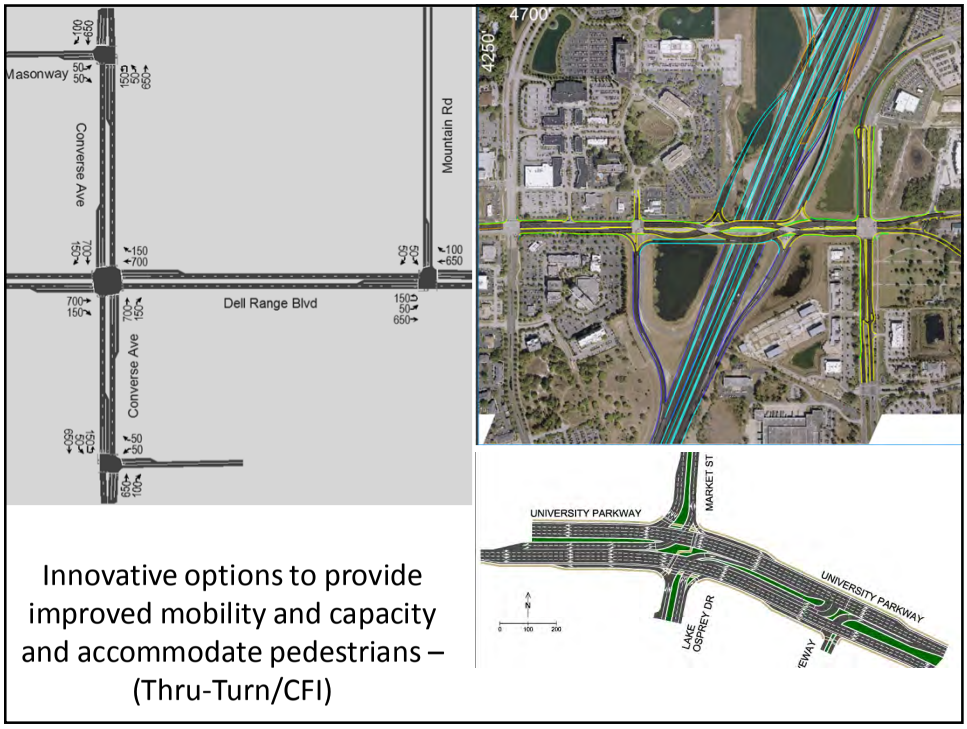


Dual left-turn lanes provide added left-turn capacity in a conventional configuration

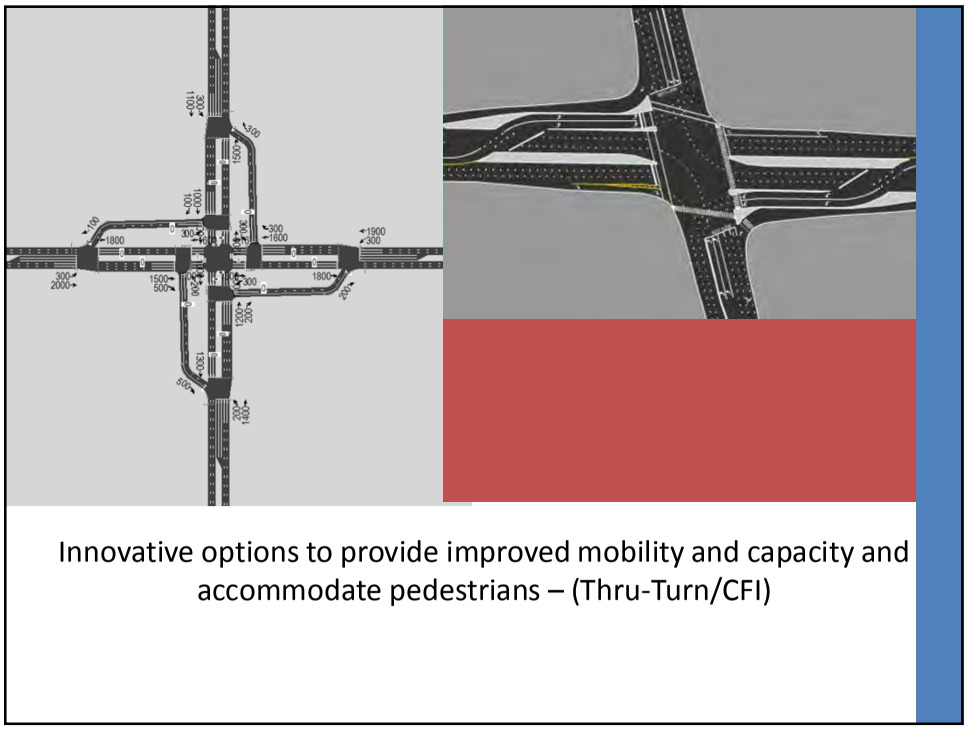




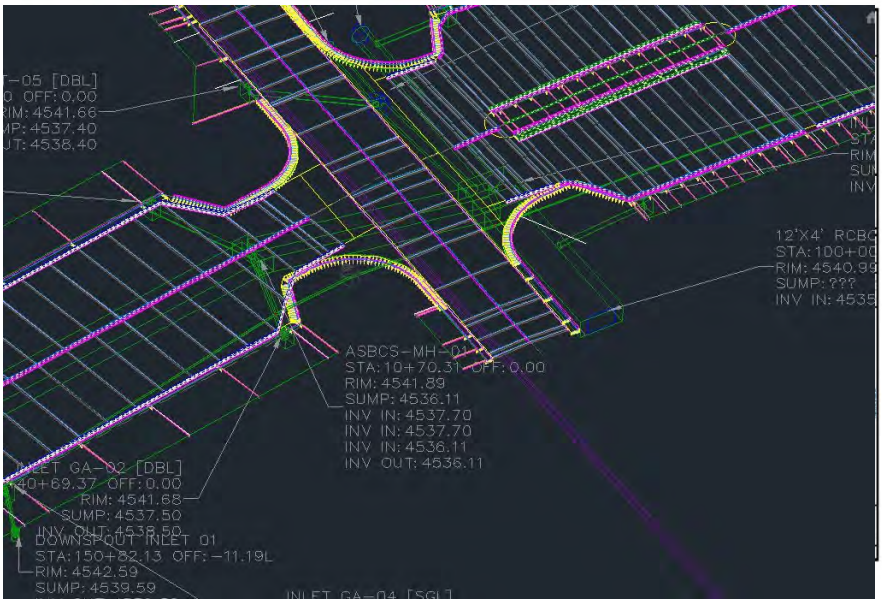
Modern roundabouts maximize intersection capacity and enhance safety, particularly for intersections with high left-turn volumes



Innovative options to provide improved mobility and capacity and accommodate pedestrians – (Thru-Turn/CFI)



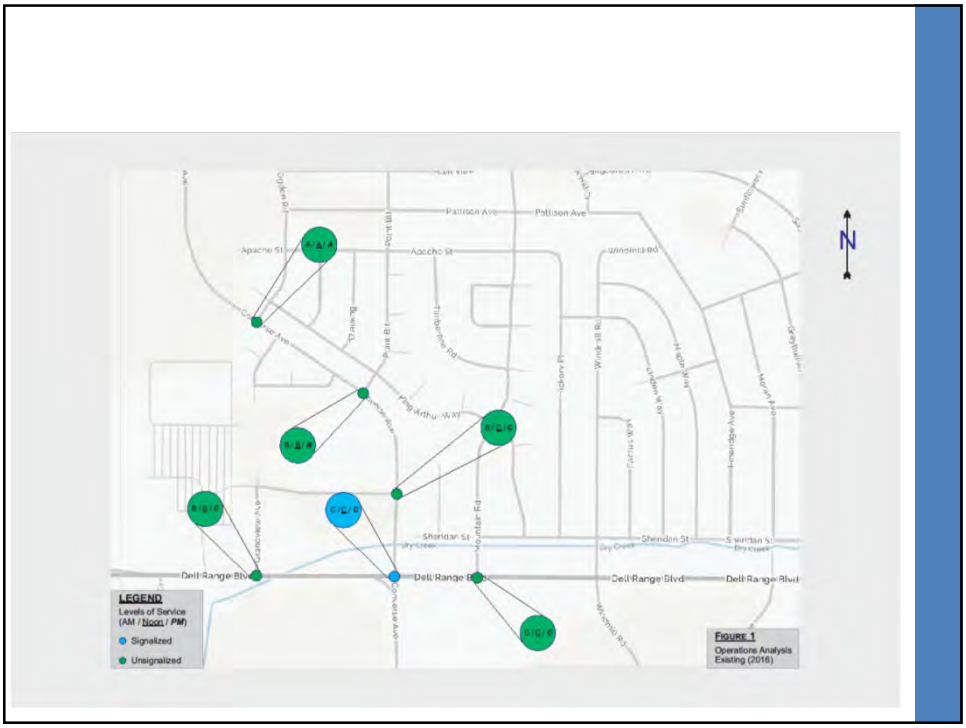
Innovative options to provide improved mobility and capacity and accommodate pedestrians – (Thru-Turn/CFI)

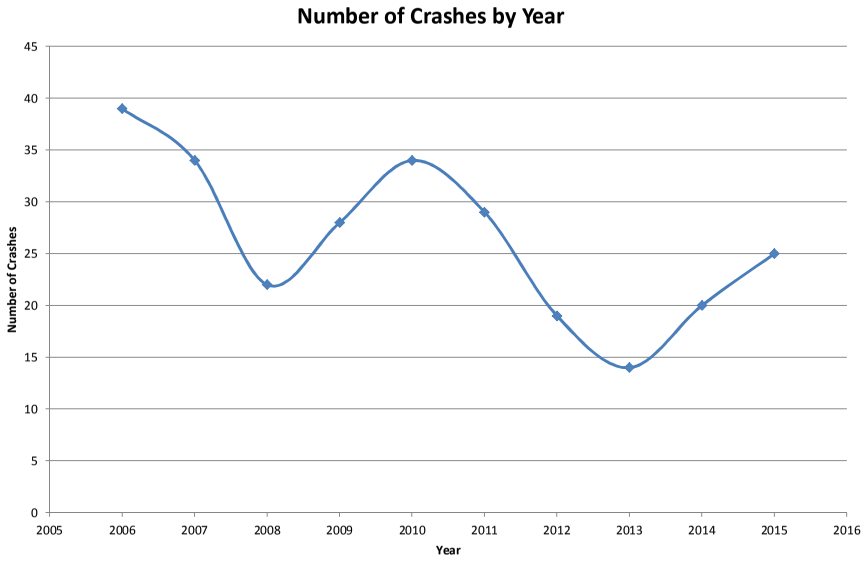


Converse/Dell Range Public Involvement Plan

HDR will use the new MPO Public Participation Plan as a guide for public involvement on this project and will use the following methods:

Method	Application	Assumptions	Schedule
Project Steering Committee	Two meetings will be held, one in advance of each public meeting	• MPO will be responsible for coordination including invitations, RSVPs and room reservations • HDR will be responsible for agenda, meeting materials, and minutes	• *July 19 – Project Team Meeting* • **August 2 - Steering Committee 1** • *August 23 – Project Team Conf Call* • **September 13 - Public Meeting 1** • *October 4 – Project Team Meeting* • **October 18 - Steering Committee 2** • *TBD – Project Team Conference Call* • **TBD – Public Meeting 2**
Social Media	Social media will be used to promote the public meetings and other input methods	• *West Edge Collective* will be responsible for the social media strategy and deployment • HDR will provide content	
Media Blasts	Press Releases will be used to promote public meetings and key project findings	• HDR will provide content • MPO will distribute to the press	
Display Advertisements	Newspaper Ads will be used to promote public meetings and associated input opportunities	• HDR will design the advertisement • MPO will be responsible for coordinating with newspaper to publish	
Email Lists	Email will be used to promote public meetings, public input opportunities and key project findings	• HDR will maintain project contact list and will use *Publicaster* for distribution • MPO will provide existing contact lists	**Notes:** • HDR will produce three content documents, one in advance of each public open house meeting and one at the conclusion of the project, to include web content, VMB text, social media text, key messaging, press releases and news advertisements. • Communication materials for each public meeting include: ✓ Electronic invitation flyers ✓ 200 double-sided, black and white project information sheets (100 for each meeting) ✓ 24 display boards (12 for each meeting) ✓ Sign-in sheets and staff nametags • HDR will produce two PowerPoint Presentation files (one at mid-point and one at project conclusion) for distribution to MPO Technical and Policy Committees as well as the Planning Commission and the City Governing Body; a maximum of 35 slides is assumed for each presentation.
Variable Message Boards	VMBs will be used at key intersections in advance of public meetings	• MPO will be responsible for coordination and management • HDR will provide content	
Project Information Sheets	These will be available on the website and at public meetings	• HDR will develop; these will serve as the public meeting handout as well.	
Website	The project website will be the primary online face of the project	• *West Edge Collective* will be responsible for developing and maintaining this site • HDR will provide content for the site • HDR will develop an online public meeting tool to be linked to the site during public meetings	
Public Meeting	Two open house meetings will be held, one early in the project to announce the effort and gather input on primary design considerations, and one at the end of the project to announce final design.	• HDR will plan the meetings and prepare all materials • MPO will coordinate venue and refreshments • HDR will produce a summary of each meeting including participation performance measures.	
Surveys	Electronic surveys will be used in tandem with both public open house meetings.	• HDR will use *Survey Monkey*.	


Pattison Ave
Apache St
Dell Range Blvd
Sheridan St
N
LEGEND
Levels of Service
(AM / Noon / PM)
Signalized
Unsignalized
FIGURE 1
Operations Analysis
Existing (2016)


Number of Crashes by Year
Number of Crashes
Year
0
5
10
15
20
25
30
35
40
45
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

Effective comparison matrix provides a complete picture of project impacts enabling efficient decision making

Option	Description	Meets Purpose and Need		Public Response	Construction		Traffic Operations and Safety				City	BNSF	Property Impacts						Environmental Impacts				Pedestrians	Construction Cost		
		Traffic Capcity	Railroad Grade Separation	Feedback via public meetings, comments, web site, survey	Maintenance of traffic during construction	Allows for phased construction	Traffic Operations (Year 2040)		Southeastern Avenue Through Traffic		Service road maintenance	BNSF acceptance	Total residential acquisitions	Partial residential acquisitions	Total commercial acquisitions	Partial commercial acquisitions	Access impacts after construction	Visual impacts	Rotary Park encroachment (3)	Norlin Park encroachment (3)	Wetland impacts	Floodplain impacts	Pedestrian access	Structure cost	Roadway cost	Total cost
							Worst LOS AM/PM	Worst Delay AM/PM (sec)	LOS AM/PM	Allows for future expansion									acres	acres	acres	acres		M $	M $	M $
A	Elevated intersection on existing SE Ave	yes	yes	good	moderate	yes	D/D	44/44	D	no	NA	good	7	0	2	0	major (2)	major	0.19	0.64	0	1.04	good	$12.5	$5.5	$18.0
B	Elevated intersection with SE Ave tunnels for through movements	yes	yes	good	poor	yes	D/D	44/43	A	no	NA	moderate	0	0	1	0	major	major	0.19	0.64	0	1.04	moderate	$15.1	$6.4	$21.5
C	Elevated intersection on shifted SE Ave	yes	yes	good	moderate	yes	D/D	44/44	D	no	Poor	moderate	1	0	0	0	moderate	major	0.19	0.64	0	1.04	good	$12.6	$6.2	$18.8
D	Elevated intersection with shifted SE Ave alignment and tunnels	yes	yes	good	poor	yes	D/D	44/43	A	no	Poor	moderate	1	0	1	0	major	major	0.19	0.64	0	1.04	moderate	$15.0	$6.7	$21.7
E	Expanded at-grade intersection	yes	no	moderate	good	yes	D/D	44/44	D	no	NA	poor	0	0	0	0	moderate	none	0.06	0.24	0	0.08	good	$1.7	$2.1	$3.8
F	Grade separation at 20th St/SE Ave	yes	yes	poor	moderate	yes	FF (1)	131/459	A	no	NA	good	2	0	1	0	major	moderate	0.19	0.64	0	1.04	moderate	$10.7	$5.7	$16.4
NB	No-build	no	no	poor	NA	NA	F/F	98/127	F	NA	NA	poor	0	0	0	0	NA	NA	0	0	0	0	good	NA	NA	NA

NA: Not Applicable
(1) At Cleveland Avenue/20th Street intersection; necessary improvements to provide LOS D are not feasible.
(2) Southeast quadrant property owners are open to acquisition for elimination of access to properties
Option recommended for elimination from further evaluation and ranking

(3) It is anticipated that the Project will provide long term benefits to Rotary Park and Norlin Park by improving the safety of vehicular and pedestrian access.

Construction cost does not include property acquisition costs.

Successful ranking of alternatives is based in weighted rankings developed from project stakeholder input

Table 1 - Relative Rankings Overall

Factor		Relative Weight	Alternate 1	Alternate 2	Alternate 3	Alternate 4	Alternate 5	Alternate 6	Alternate 7	Alternate 8
Project Cost		2	3	2	3	2	1	2	2	2
Bridge (See Below)		3	2	3	3	1	1	2	1	1
Utility Impacts		3	3	3	3	1	3	3	1	1
Environmental Review		1	1	1	1	3	2	1	2	3
ROW Impacts		2	1	3	1	2	3	2	2	2
Traffic Impacts (Constr)		1	1	2	1	2	1	1	2	2
Geometrics		3	1	2	1	1	3	2	2	2
Weighted Average			2.15	2.85	2.38	1.69	2.46	2.50	1.85	1.92
Relative Rank			4	8	5	1	6	7	2	3

Narrative on factor weighting
Project Cost: 1-lowest, 2-median cost, 3-highest cost. *(constructability, utility impacts, R.O.W aquastions)*
Bridge: 1-best ranking, 2-other rankings, 3-worst ranking
Utility Impacts: 1-avoid transmission lines, 2-some transmission impacts, 3-greatest impacts.
Environmental Impacts: 1-similar to EA preferred, 2-minimal impacts, 3-numerous environmental concerns
ROW Impacts: 1-no issues, 2-access issues, 3-property taking.
Traffic Impacts (Constr): 1-minimal disturbances, 2-partial closure, 3-highway/street closure
Geometrics: 1-best geometrics, 2-minor geometric issues, 3-worst geometrics

CHEYENNE MPO STEERING COMMITTEE MINUTES
August 2, 2016

I. Introductions & Purpose of the Steering Committee

- Nancy: You are all experts as well- your ideas are important and your feedback guides the process
- At critical points- you will help us go one way or another, possibly provide new ideas
- Stephanie: I view you as a beta test of the public, many of the questions I ask of you today I would like to ask the public- valuable to hear your answers first
    - Uncover new impacted individuals
    - We want to know about what you think about other intersections that have been built in this area.

- Opinion game
    - Their opinions of College Dr. & 1-25 Intersection?
        - Odd, was taken aback, but once through thought "yeah it works"
        - Fairly quick to familiarize with
        - First time went through: "what am I doing?" second time- still confused but it's effective and it does move traffic through well
        - See people who are pretty confused
        - Compared to the old way it is so much quicker because no complex left turns
        - Same reaction- knew about it and was prepared but it still seemed odd, but it works pretty well
        - Agree- from pedestrian/bike perception- a little safer but still confusing, not entirely sure if you're supposed to cross
        - After doing it once it's clear how much better it is but if it's your first time it can be very difficult to figure out
        - HDR PM for this intersection loves it- wife says that she loves it- used to sit there for 2-3 minutes but much quicker now
        - Self-explanatory, haven't had a problem, works "fine in my opinion"
        - Maintenance issues with signals and clearing snow is a nightmare
        - Is snow removal in the travel lane an issue?
            - Mostly just sidewalk
        - Who takes calls on this intersection?
            - WY-DOT
            - People haven't called about it
            - Great public outreach at beginning of project and locals aware, calls the first week but nothing since
            - Truckers association- received well, moves trucks better
        - This intersection has issues with the truckers with blades so they cannot use this intersection
        - Keeps traffic from backing up on the ramp- more efficient

- Their opinions of the 19th/Pershing/Converse roundabout?
  - Feedback- generally everyone likes it
  - Crash problems but low severity (high number due to risk taking)
  - Seems like when people go through they speed up for some reason
    - Radar shows that they aren't speeding
  - It's fun to drive through there fast- used to take it often and the old way was much slower
    - Elderly patients are afraid of it- go out of their way to avoid it
    - Alleviates pressure
  - People forget to use turn signal when they're in it- people aren't following all of the rules… need to educate them how to use it
  - Brought the landscape features down but still difficult maintenance, snow removal can be dangerous- time of day is critical
  - Signaling- becomes a question of when is the best? Legislation has stepped in- what are everyone's opinion on what should be legal?
    - Always have to turn right but depends on when so it would help to turn on
    - People are mesmerized, watch traffic, then they realize that they need to get off and try to turn and cause problems
    - Video encourages right signal on exit
  - "If I enter from 19th, I put my left blinker on"
- Asking about safety of Converse & Dell Range intersection: rank on scale of 1-10 (10- great and 1-worst)
  - Safety of BIKES
    - 3.8 average score
  - Safety of PEDESTRIANS
    - 3.8 avg. score
  - Safety of CARS
    - Safest- score of 6
  - Clear that one of the biggest tasks for this project- safety! We will ask the larger public as well

II. Project Goals & Project Overview

- Goals
  - 35% design between Ogden and new intersection
  - Study this intersection: develop alternatives and come to preferred alternative
  - Implement a public involvement strategy
  - Develop and evaluate alternatives for intersection
- Overview
  - Analysis of the model: possible alternatives based on what we perceive as best ways to address issues believed to exist

- List of alternatives in proposal are not the only list
  - Perhaps left turn only implementation- more conventional
  - Providing additional left turn capacity with dual lanes on east and west and other directions if necessary
  - Modern roundabout could be a possibility- effective when it comes to left turn issues and safety
  - Looking back on other roundabouts- this community seems to be open minded with less conventional solutions
  - Through-turn- take left hand turn out of intersection and move it to later on
  - Continuous flow intersection- no left turns at central intersection but would occur upstream
  - Will get more into these ideas later
  - Also possibility- keep intersection as 2 phase intersection but put in roundabouts in 2 different sections
  - Remove left turn conflicts from main intersection and place elsewhere
  - Questions/issues open for sharing
- Some key issues:
  - Left hand turning- capacity deficiency and safety concern
  - Added- truck turning movements are too difficult because of geometry
  - Traffic going into Walmart and retail side (north)
- Land survey (part of 35% plan)
  - Scheduled to occur this week.
  - Have created a base map but they will come and verify elevations of starting point
  - Look for anything missing- give a solid idea of any issues that may arise
  - Analysis by John- will help with designing and will build a model and find impacts
  - Example of 3D model- shows utility conflict, sewers, gas lines, storm/existing water, etc.
    - Run interference checks
    - Allows to put together accurate quantities for cost estimating

- <u>John's explanation of issues</u>:
  - Preliminary analysis
  - Received traffic volumes and signal timings- has begun process
  - Levels of service: qualitative performance on a capacity level (standard school grading)

        - Acceptable range- C grade for the intersection as a whole- generally considered acceptable in an urban setting but we're bottom range of acceptability
        - Unsignalized- levels of service shows which areas suffer the most delay
        - Current state of the volumes provided show it functions in a somewhat acceptable way
    - Raw data by year of crashes
        - [chart in slide]
        - Would like to look at the relationship of number of crashes to other construction projects in that area
        - Understanding what we've done in the past to affect will help us moving forward
- Status update
    - Have started
    - Collected data from the city
    - Land surveys will start
    - City provided traffic analysis
    - John will look at numbers
    - Converse will follow 35% design plan
    - Public involvement plan is ongoing- starting now and will continue
    - Kick-off meeting
    - First public open house will be September 13

III. Public Process

- MPO- great Public Participation Plan
    - Seeks to match 1:1 level
    - Social media will be great
    - Traditional media blasts- press releases, public notices, display advertisement, email blasts
    - Variable message boards at peak times
    - Project information sheets- will be used as flyers, hold a lot of utility & have dual purpose
    - Website will be partnered with MPO and HDR
    - 2 public meetings
    - Electronic, paper, newspaper survey
    - Would like to reconvene steering committee after to evaluate all of the other public feedback we've gotten
- Project meetings will be ongoing as needed

IV. Current Areas of Input

- Evaluation matrix

  - This criteria will help to decide what the most important issues are- need the help of the steering committee
  - Traffic capacity
  - Queuing
  - Safety of various modalities- weight what's the most important to steering committee and the public as whole
  - Steering Committee will help to develop highest rank alternative
- Map activity: identify issues, (boundaries of study will go from a minimum from Mountain – east and west on Dell Range to Grandview, and are there any issues on Converse up to Ogden? Mark on map:
  - WHERE the issues occur
  - WHAT the issues are
  - WHAT could be the possible cause
- [Refer to filled out maps for more information]
- Results this provided
  - Sight distance and visibility
  - Queuing westbound and eastbound
    - Especially in afternoon and on Saturdays
  - Lack of bicycle facilities
  - PED and bikes throughout intersection
  - All left turners run red lights
  - Capacity!
  - Rear end crashes along Dell Range
  - Turning conflicts on east leg from overlap lefts at Mountain & Converse
  - Truck traffic- especially along north leg
  - Business access and access management
  - Aesthetics- road salt and high traffic deter desire to maintain landscaping
    - Attached sidewalks become a place to store snow/ice and gravel
    - Business owners don't manage
    - Sidewalks full of gravel in summer- dangerous for bicyclists
  - No serious flooding issues
  - Drainage issues
  - Right of way impacts (South property cheaper because it is City owned)
  - Construction costs
  - Impacts to the CBCs from the concrete to the north
  - Constructability
  - SW conditions (snow in winter, gravel/sand in summer)
  - Public education- some alternatives will require more-
  - Ease of use would be nice
  - Utility issues? – Any major impacts?

- Concluding thoughts
    - Land acquisition/cost- not introduced as factors by steering committee but important
        - Level must be determined
        - Some alternatives- would need to purchase land
        - Realty consultation might be helpful because some property more valuable than others but could be looked into (Nancy)
        - If best alternative for safety requires land acquisition then that's an important consideration
            - This is where it's imperative to weigh the variables
    - We will assign numbers to the issues in order to weigh what is most important (with your help)
    - Safety will be perceived by everyone as the most important (because the intersection is so dangerous) so it's likely that this will lead to the most possible public support
    - Without an improvement of safety the public will view this project as a failure
    - Improving efficiency and safety seem to be what will resonate best with public
    - Pershing/Converse/19th roundabout and Dell Range & Converse intersection are most dangerous intersections and they run into each other
    - What matters- number of crashes or severity of crashes?
    - Public awareness will help with funding and allows for more support
    - Not highest ranking but still important- practicality and constructability
    - Maintenance? (at current Converse & Dell Range intersection)
        - Not an issue- capacity
        - Enforcement is an issue- no proper place to watch the intersection
        - Further west on Dell Range- areas of growth are being negatively affected by the traffic
    - Aesthetics?
        - Worth talking about but get into cost

V. Next Meeting

- September 13 for Public Meeting (Trying to schedule at Anderson Elementary)

Agenda

Project:	Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan
Subject:	Steering Committee Meeting
Date:	Tuesday, October 25, 2016 2:00 PM
Location:	Laramie County Library
Attendees:	HDR, MPO and Steering Committee

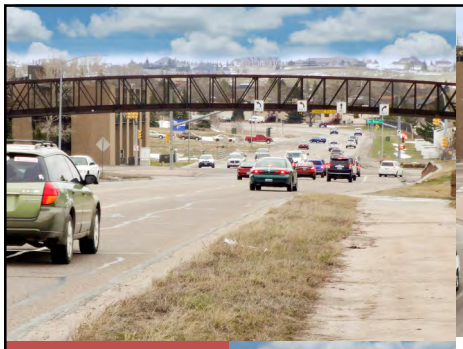
1. Welcome & Introductions
    a. Meeting Purpose
2. Status
    a. Surveying – Complete.
    b. Traffic Analysis – In progress
    c. Converse Roadway Design – to follow Traffic analysis
    d. Environmental Review – In progress
    e. Public Involvement – Public Open House complete
        i. Data/comments collected and compiled
3. Public Involvement Results
    a. Issues/Concerns
        i. Steering Committee
        ii. Public Open House
        iii. Comments
4. Traffic Analysis
    a. Preliminary Results
    b. Next Steps
5. Roundtable Discussion - Evaluation Matrix and Alternative Discussion
6. Future Meetings - Tentative
7. Adjourn

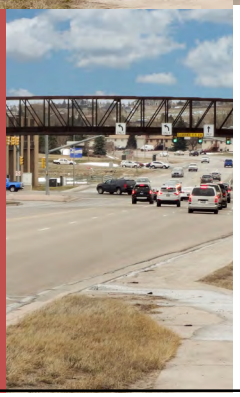
Steering Committee Roster Sign-In

Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan

Tuesday October 25, 2016

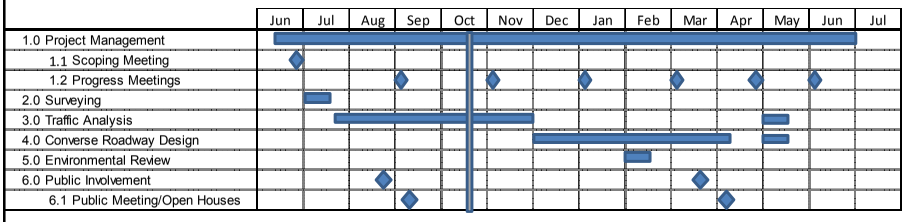
Organization	Name	Email	Phone Number	Steering Com. #1	Steering Com. #2
HDR Project Team					
Project Manager	Brandon Gebhart	brandon.gebhart@hdrinc.com	307-757-9000	X	X
Traffic Lead	John Seyer	john.seyer@hdrinc.com	970-416-4407	X	X
Roadway Design	Mike Oakley	mike.oakley@hdrinc.com	307-228-6019	X	
Public Involvement	Stephanie White	stephanie.white@hdrinc.com	303-323-9788	X	
Steering Committee					
Cheyenne MPO	Tom Mason	tmason@cheyennempo.org		X	
Cheyenne MPO	Nancy Olson	nolson@cheyennempo.org		X	
Cheyenne MPO	Sreyoshi Chakraborty	schakraborty@cheyennempo.org	638-4384	X	SC
City Public Works	Craig LaVoy	clavoy@cheyennecity.org	637-6294	X	CL
City Engineering	Nathan Beauheim	nbeauheim@cheyennecity.org	638-4315	X	NB
BOPU	Brad Brooks	bbrooks@cheyennebopu.org	637-6416		BAB
BOPU	Linda Gunter	lgunter@cheyennebopu.org	637-6497	X	
WYDOT	Kevin McCoy	kevin.mccoy@wyo.gov	777-4178	X	KMc
WYDOT	Mark Wingate	mark.wingate@wyo.gov	777-4180	X	
City Council	Jeff White	jwhite@cheyennecity.org	777-5739	X	JW
City Council	Dr. Mark Rinne	mrinne@cheyennecity.org	634-2646	X	
City Council	Jim Brown	jbrown@cheyennecity.org			
Cheyenne Police Dept.	Sergeant John Gay	jgay@cheyennepd.org	637 6552		
Cheyenne Police Dept.	Officer George Trammell	gtrammell@cheyennepd.org			
City Planning	Brandon Cammarata	bcammarata@cheyennecity.org	638-4303	X	
Transit	Renae Jording	rjording@cheyennecity.org			
Transit	Keith McQueen - sub	kmcqueen@cheyennecity.org	631-0190	X	
Greenway and Trails	Jeff Wiggins	jwiggins@cheyennecity.org			
Parks and Recreation	Jason Sanchez	jsanchez@cheyennecity.org	638-4358	X	
EMA	Matt Butler	mbutler@laramiecounty.com	633-4335	X	X
Black Hills Energy	Jef McMann	jef.mcmann@blackhillscorp.com			
Fire and Rescue	Chief Martin	jmartin@cheyennecity.org			
City Eng	James Sims	jsims@cheyennecityorg	638-4308		
City Plan	Craig LaVoy	clavoy@cheyennecity			
WYDOT	Tim Stark	Timothy.Stark@wyo.gov			





Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

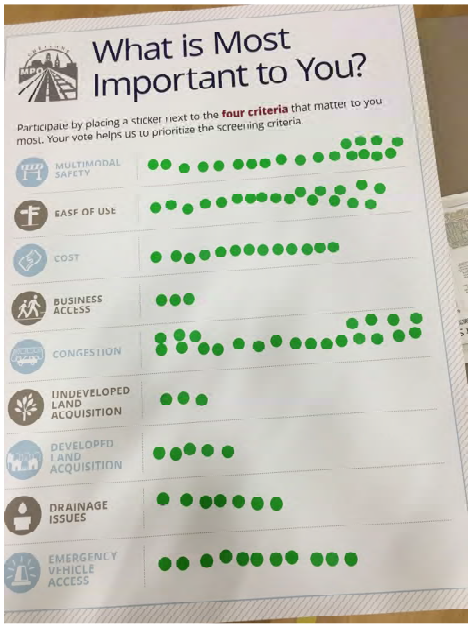
Status



Public Open House

- 42 Attendees
- 9 Display Boards
- Fact Sheet
- Access to Project Team Members
- Provide 4 important outcomes
- View possible alternatives
- Animated presentation of possible alternatives
- Provide written comments

Public Open House



Public Open House

Comment Form

CONVERSE / DELL RANGE INTERSECTION TRAFFIC SAFETY PLAN & CONVERSE AVENUE 35% DESIGN PLAN

COMMENTS / SUGGESTIONS

RANKING

Please rank your top four criteria that matter to you most by placing a 1, 2, 3, and 4 next to your selections.

- ___ Multimodal Safety
- ___ Ease of Use
- ___ Cost
- ___ Business Access
- ___ Emergency Vehicle Access
- ___ Congestion
- ___ Undeveloped Land Acquisition
- ___ Developed Land Acquisition
- ___ Drainage Issues

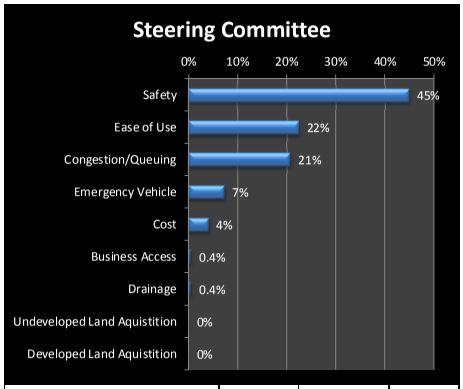
Steering Committee Results

Issue/Concern	User Ranking 1	2	3	4	5	Weighted Points	Weighted Average
Sight Distance and Visibility	1			2		**9**	**4%**
Safety							
Pedestrian	1	3	3		1	**27**	**12%**
Bike			2	1	3	**11**	**5%**
Vehicle	7	4			2	**53**	**24%**
Complexity of Intersection	1		1	3	1	**15**	**7%**
Large veh/truck turning maneauverability		2		2		**12**	**5%**
Ease of Use		2	3	3		**23**	**10%**
Congestion/Queuing	4	3		1	2	**36**	**16%**
Increased LOS			3		1	**10**	**4%**
Emergency Vehicle	1	1	1			**12**	**5%**
Traffic Violation enforcement			1		1	**4**	**2%**
Cost			1	2	2	**9**	**4%**
Business Access					1	**1**	**0%**
Drainage					1	**1**	**0%**
Undeveloped Land Aquistition						**0**	**0%**
Developed Land Aquistition						**0**	**0%**

Steering Committee Results

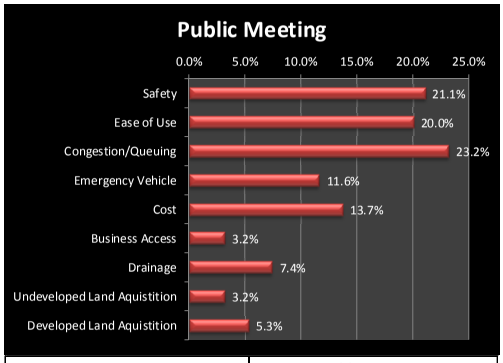
Issue/Concern	User Ranking 1	2	3	4	5	Weighted Points	Weighted Average	Condensed Category
Sight Distance and Visibility	1			2		9	4%	Safety
Safety								Safety
Pedestrian	1	3	3		1	27	12%	Safety
Bike			2	1	3	11	5%	Safety
Vehicle	7	4			2	53	24%	Safety
Complexity of Intersection	1		1	3	1	15	7%	Ease of use
Large veh/truck turning maneauverability		2		2		12	5%	Ease of Use
Ease of Use		2	3	3		23	10%	Ease of Use
Congestion/Queuing	4	3		1	2	36	16%	Congestion/Queuing
Increased LOS			3		1	10	4%	Congestion/Queuing
Emergency Vehicle	1	1	1			12	5%	Emergency Vehicle
Traffic Violation enforcement			1		1	4	2%	Emergency Vehicle
Cost			1	2	2	9	4%	Cost
Business Access					1	1	0%	Business Access
Drainage					1	1	0%	Drainage
Undeveloped Land Aquistition						0	0%	Undeveloped Land Aquistition
Developed Land Aquistition						0	0%	Developed Land Aquistition

Steering Committee Results



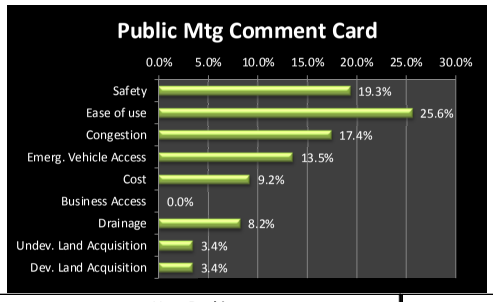
Issue/Concern	Weighted Points	Weighted Average	Rank
Safety	100	45%	1
Ease of Use	50	22%	2
Congestion/Queuing	46	21%	3
Emergency Vehicle	16	7%	4
Cost	9	4%	5
Business Access	1	0.4%	6
Drainage	1	0.4%	6
Undeveloped Land Aquistition	0	0%	8
Developed Land Aquistition	0	0%	8

Public Open House

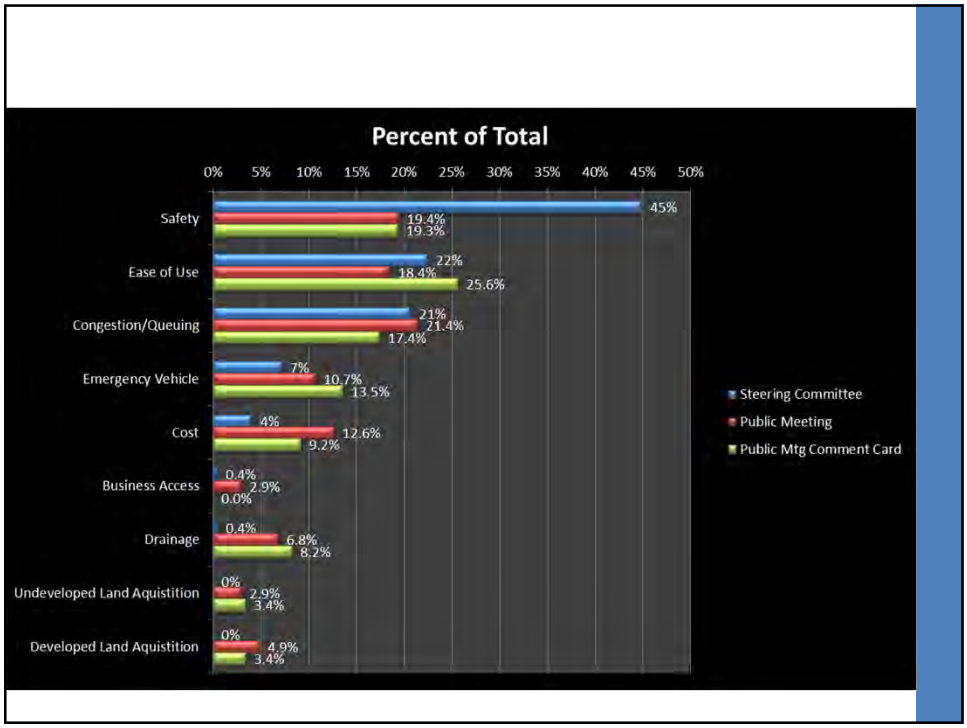


Issue	Public Meeting		
	Votes	Percentage	Rank
Safety	20	21.1%	2
Ease of Use	19	20.0%	3
Congestion/Queuing	22	23.2%	1
Emergency Vehicle	11	11.6%	5
Cost	13	13.7%	4
Business Access	3	3.2%	8
Drainage	7	7.4%	6
Undeveloped Land Aquistition	3	3.2%	8
Developed Land Aquistition	5	5.3%	7

Public Open House
Ranked Comment Card Response



Issue/Concern	User Ranking					Weighted Points	Weighted Average	Rank
	1	2	Unranked	3	4			
Safety	3	1	2	0	0	20	19.3%	**2**
Ease of use	0	5	3	2	0	26.5	25.6%	**1**
Congestion	2	0	2	2	1	18	17.4%	**3**
Emerg. Vehicle Access	1	1	2	1	0	14	13.5%	**4**
Cost	1	0	1	1	1	9.5	9.2%	**5**
Business Access	0	0	0	0	0	0	0.0%	**8**
Drainage	0	0	3	0	1	8.5	8.2%	**6**
Undev. Land Acquisition	0	0	1	0	1	3.5	3.4%	**7**
Dev. Land Acquisition	0	0	1	0	1	3.5	3.4%	**7**



Ranking the Results

Issue	Steering Committee Rank	Public Meeting Rank	Public Mtg Comment Card Rank	Total Rank
Safety	1	2	2	1
Ease of Use	2	3	1	2
Congestion/Queuing	3	1	3	3
Emergency Vehicle	4	5	4	4
Cost	5	4	5	5
Drainage	6	6	6	6
Business Access	6	8	8	7
Developed Land Aquistition	8	7	7	7
Undeveloped Land Aquistition	8	8	7	9

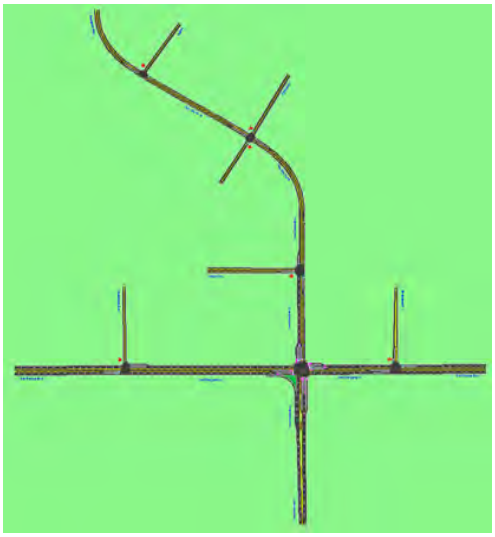
Additional Comments

Category	Number of Comments	Percent of Comments
Against Roundabout	17	20%
Red Light Camera/Violation Enforcement	11	13%
Signal Timing/issues	9	11%
No Issue	8	10%
Driver Behavior/education	7	8%
Lane configuration	6	7%
Reduce congestion via alt. routes	5	6%
reduce Speed	4	5%
Alternate Intersection design	4	5%
Pro - Roundabout	3	4%
Bike/Ped Conectivity	3	4%
Funding/cost	2	2%
Emergency Vehicles	1	1%
Noise Pollution	1	1%
Construction Time	1	1%
Drainage	1	1%
Reduce Congestion via design	0	0%

Preliminary Operations Analysis

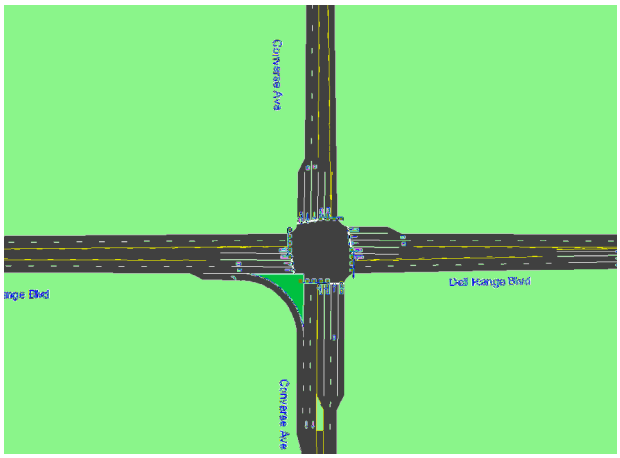
Alternative		Dell Range Blvd & Converse Ave					
		AM		MD		PM	
		LOS	Delay	LOS	Delay	LOS	Delay
1	No-Build	D	39.8	D	43.5	D	44.8
2	Dual Left Turns	C	26.2	C	32.3	C	29.6
3	Modern Roundabout	A	5.5	A	8.9	A	6.0
4a	CFI - Full	D	45.4	C	29.5	C	29.3
4b	CFI - Modified	C	28.3	C	30.6	D	39.8
5a	ThruTurn - Signals	C	29.6	C	29.6	C	34.6
5b	ThruTurn - Roundabouts	C	28.4	C	28.3	C	33.7

No-Build



	LOS	Delay
AM	D	39.8
MD	D	43.5
PM	D	44.8

Dual Left-Turn Lanes

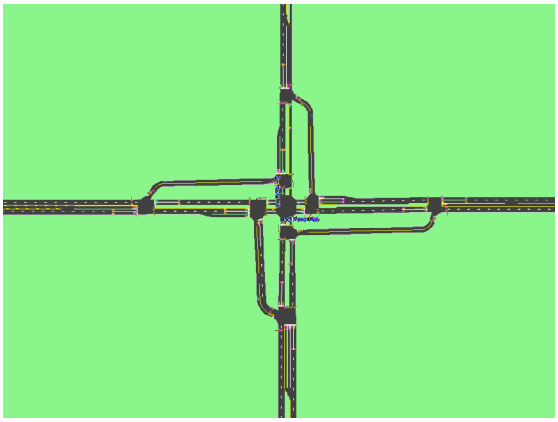


	Intersection	EBL		EBT		EBR		WBL		WBT		WBR		NBL		NBT		NBR		SBL		SBT		SBR	
Intersection	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)
Dell Range-Converse	C	26.2	C	34.4	C	27.2	A	0.1	D	45.8	C	21.9	A	0.6	C	33.2	C	27.3	A	2.5	D	37.3	C	31.3	A	0.3
Dell Range-Mountain	-	-	B	10.8	A	0	-	-	-	-	A	0	A	0	-	-	-	-	-	-	C	17.9	-	-	C	15.7
Dell Range-Grandview	-	-	A	9.4	A	0	-	-	-	-	A	0	A	0	-	-	-	-	-	-	B	11.3	-	-	B	11.3
Converse-Masonway	-	-	B	14.4	-	-	B	14.2	-	-	-	-	-	-	A	9.5	A	0	-	-	-	-	A	0	A	0
Converse-Point Bluff	-	-	A	7.9	A	0	A	0	A	8.6	A	0	A	0	B	13.4	B	13.4	B	13.4	C	17.0	C	17.0	C	17.0
Converse-Ogden	-	-	A	7.8	A	0	-	-	-	-	A	0	A	0	-	-	-	-	-	-	B	12.2	-	-	B	12.2

Modern Roundabout

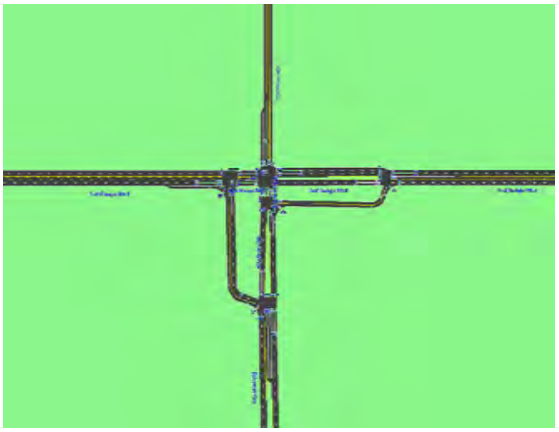
	LOS	Delay
AM	A	5.51
MD	A	8.88
PM	A	5.99

CFI - Full



	Intersection		EBL		WBL		NBL		SBL	
Intersection	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)
Dell Range-Converse	D	45.4	E	50.9	F	171.7	D	35.6	D	45.6

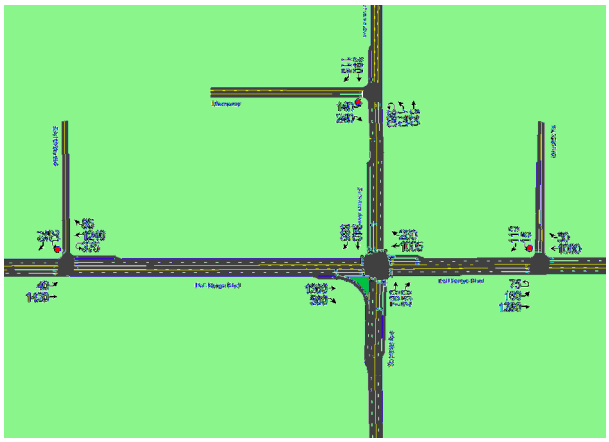
CFI - Modified



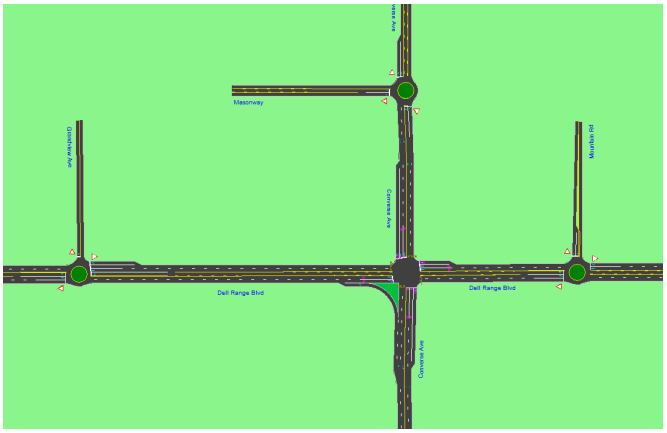
	Intersection		EBL		WBL		NBL		SBL	
Intersection	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)	LOS	Delay(s)
Dell Range-Converse	C	28.3	B	12.2	D	38.1	D	36.5	D	42.9

ThruTurn - Signals

	LOS	Delay
AM	C	29.6
MD	C	29.6
PM	C	34.6



ThruTurn - Roundabouts



	LOS	Delay
AM	C	28.4
MD	C	28.3
PM	C	33.7

Evaluation Matrix

Option	Description	Safety			Ease of Use			Congestion/Queuing		Emerg. Vehicle	Cost		
		Vehicle	Pedestrian	Bike	Intersection Complexity	??	Emergency Vehicle/Large Truck Maneaurvability	Traffic Operations: LOS	Traffic Operations: Length of Queue		Total Cost		
1	No-Change												
2													
3													
4													
5													
6													

Issue	Steering Committee Rank	Public Meeting Rank	Public Mtg Comment Card Rank	Total Rank
Safety	1	2	2	1
Ease of Use	2	3	1	2
Congestion/Queuing	3	1	3	3
Emergency Vehicle	4	5	4	4
Cost	5	4	5	5
Drainage	6	6	6	6
Business Access	6	8	8	7
Developed Land Aquistition	8	7	7	7
Undeveloped Land Aquistition	8	8	7	9

CHEYENNE MPO STEERING COMMITTEE MINUTES
October 25, 2016

I. Introduction

- Brandon opened the meeting and introduced John and Tim of HDR.
- Brandon also reminded everybody to sign in.
- The meeting was held at the Laramie County Library in the Sunflower Room. The meeting began at 2:00 p.m. and concluded at 3:00 p.m. An additional 30 minutes was utilized after the meeting to discuss the Prairie Avenue Roundabout project with the City of Cheyenne.
- The purpose of the meeting was to inform the steering committee the status and progress of the College Drive and Converse Intersection Study. This was also to include the traffic information generated so far.

II. Brandon's Power Point Presentation

- Brandon's information was focused on information obtained from the September 13th open house meeting held at Anderson School.
- 42 people attended
- 9 display boards provided
- Information provided for "Frequently Asked Questions"
- Access to the Project Team was provided
- Input
- Alternatives were presented
- Public was provided four dots to identify top issues
- 15 people filled out survey
- Steering Committee identified the following issues
    - Safety
    - Ease of Use
    - Congestion / Queuing
    - Emergency Vehicles
    - Cost
- Public identified the same issues but in a slightly different order
- Brandon suggested this same method to be used to determine the Preferred Alternative
- Total of 93 public comments were received
- Besides the comment form, additional mechanisms were also used
    - Facebook
    - Email
    - Mapping Tool

III. John's Power Point Presentation

- Presented the "Preliminary Operations Analysis"

- Presented the following alternative types of intersections
    - No Build
    - Dual Left Turns
    - 2 Lane Roundabout
    - Continuous Flow Intersection (CFI) Full
    - Continuous Flow Intersection (CFI) Modified
        - Due to land use to the north
    - Thru Turn Signals
    - Thru Turn Roundabouts
- Intersection analysis based on 2040 projected traffic volumes
- Nancy interjected that multimodal considerations must be kept in mind throughout the entire analysis

IV. Brandon Facilitates Discussion

- Brandon opened the session with the question, “How do we Proceed?”
- Brandon suggested two kinds of systems to be used in an evaluation matrix.
    - A quantitative numerical weighting system
    - A qualitative Consumer Report method
- It was suggested that cost be omitted from the analysis, but be tracked with each alternative
- Top three issues should be given the same weight, which are
    - Safety
    - Ease of Use
    - Congestion / Queuing
- It was also suggested that 4(f) and 6(f) resources to the south must also be considered throughout this process too.
- HDR agreed to go back and utilize the new filter and refine. Then consider the top three issues once again.
- The no build alternative will also minor improvements to the existing intersection.
- Nancy suggested that the multi modal considerations be lumped in with the issue of “ease of use”

V. Future Meeting

- It was suggested that the future meeting shall be held on December 8th. Location and time to be determined at a later date.

Agenda

Project:	Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan
Subject:	Steering Committee Meeting
Date:	Thursday, December 08, 2016 1:00 PM
Location:	2101 O'Neil Ave. Rm 208
Attendees:	HDR, MPO and Steering Committee

1. Welcome & Introductions
2. Alternatives Evaluation and Matrix
    a. Traffic Analysis
    b. Decision Matrix
    c. Criteria Weighting
    d. Preferred Alternative
3. Adjourn

Roster

Organization	Name	Email
HDR Project Team		
Project Manager	Brandon Gebhart	brandon.gebhart@hdrinc.com
Traffic Lead	John Seyer	john.seyer@hdrinc.com
Roadway Design	Mike Oakley	mike.oakley@hdrinc.com
Roadway Design	Todd Mattson	todd.mattson@hdrinc.com
Steering Committee		
City Public Works	Craig LaVoy	clavoy@cheyennecity.org
City Engineering	Nathan Beauheim	nbeauheim@cheyennecity.org
BOPU	Brad Brooks	bbrooks@cheyennebopu.org
BOPU	Linda Gunter	lgunter@cheyennebopu.org
WYDOT	Kevin McCoy	kevin.mccoy@wyo.gov
WYDOT	Mark Wingate	mark.wingate@wyo.gov
City Council	Jeff White	jwhite@cheyennecity.org
City Council	Dr. Mark Rinne	mrinne@cheyennecity.org
City Council	Jim Brown	jbrown@cheyennecity.org
Cheyenne Police Dept.	Sergeant John Gay	jgay@cheyennepd.org
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Transit	Renae Jording	rjording@cheyennecity.org
Transit	Keith McQueen - sub	kmcqueen@cheyennecity.org
Greenway and Trails	Jeff Wiggins	jwiggins@cheyennecity.org
Parks and Recreation	Jason Sanchez	jsanchez@cheyennecity.org
EMS	Matt Butler	mbutler@laramiecounty.com
Black Hills Energy	Jef McMann	jef.mcmann@blackhillscorp.com

Steering Committee Roster Sign-In

Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan

Tuesday October 25, 2016

Organization	Name	Email	Phone Number	Steering Com. #3
HDR Project Team				
Project Manager	Brandon Gebhart	brandon.gebhart@hdrinc.com	307-757-9000	X
Traffic Lead	John Seyer	john.seyer@hdrinc.com	970-416-4407	X
Roadway Design	Mike Oakley	mike.oakley@hdrinc.com	307-228-6019	
Roadway Design	Todd Mattson	todd.mattson@hdrinc.com	307-228-6008	X
Public Involvement	Stephanie White	stephanie.white@hdrinc.com	303-323-9788	
Steering Committee				
Cheyenne MPO	Tom Mason	tmason@cheyennempo.org		TM
Cheyenne MPO	Nancy Olson	nolson@cheyennempo.org		—
Cheyenne MPO	Sreyoshi Chakraborty	schakraborty@cheyennempo.org		SC
City Public Works	Craig LaVoy	clavoy@cheyennecity.org	637-6294	CL
City Engineering	Nathan Beauheim	nbeauheim@cheyennecity.org	638-4315	NB
BOPU	Brad Brooks	bbrooks@cheyennebopu.org		
BOPU	Linda Gunter	lgunter@cheyennebopu.org		
WYDOT	Kevin McCoy	kevin.mccoy@wyo.gov	777-4178	KMc
WYDOT	Mark Wingate	mark.wingate@wyo.gov	777-4180	MW
City Council	Jeff White	jwhite@cheyennecity.org	777-5739	JW
City Council	Dr. Mark Rinne	mrinne@cheyennecity.org	634-2646	
City Council	Jim Brown	jbrown@cheyennecity.org		
Cheyenne Police Dept.	Sergeant John Gay	jgay@cheyennepd.org	637 6551	JG
Cheyenne Police Dept.	Officer George Trammell	gtrammell@cheyennepd.org		
City Planning	Brandon Cammarata	bcammarata@cheyennecity.org	638-4303	
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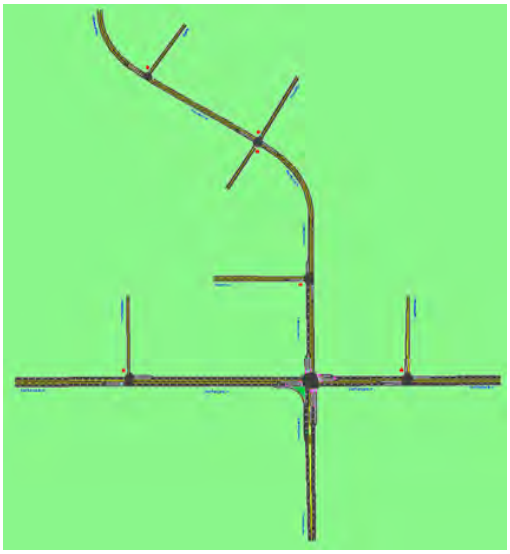
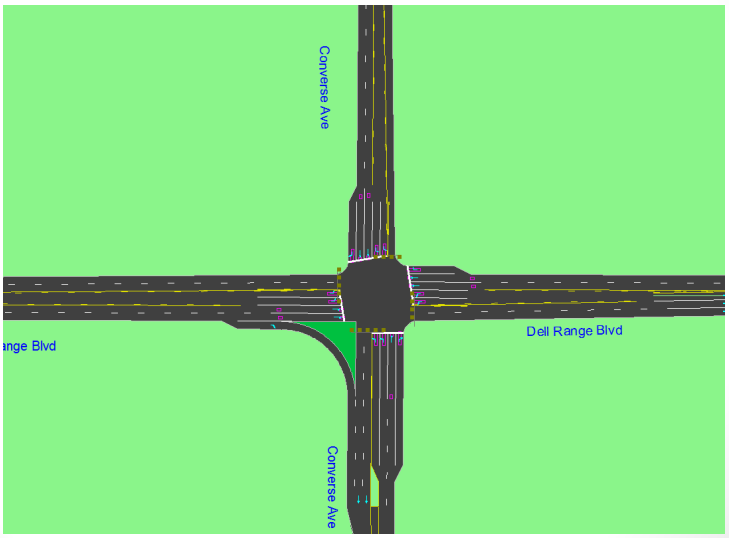
Transit	Keith McQueen - sub	kmcqueen@cheyennecity.org	631-0190	
Greenway and Trails	Jeff Wiggins	jwiggins@cheyennecity.org		JW
Parks and Recreation	Jason Sanchez	jsanchez@cheyennecity.org	638-4358	JS
EMA	Matt Butler	mbutler@laramiecounty.com	633-4335	MB
Black Hills Energy	Jef McMann	jef.mcmann@blackhillscorp.com		
Fire and Rescue	Chief Martin	jmartin@cheyennecity.org		

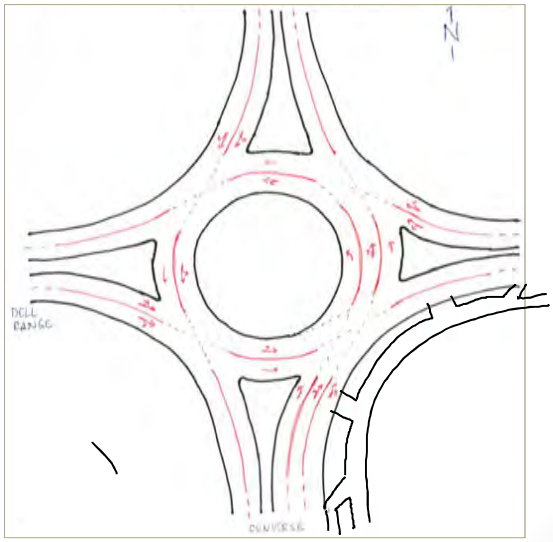
No-Build



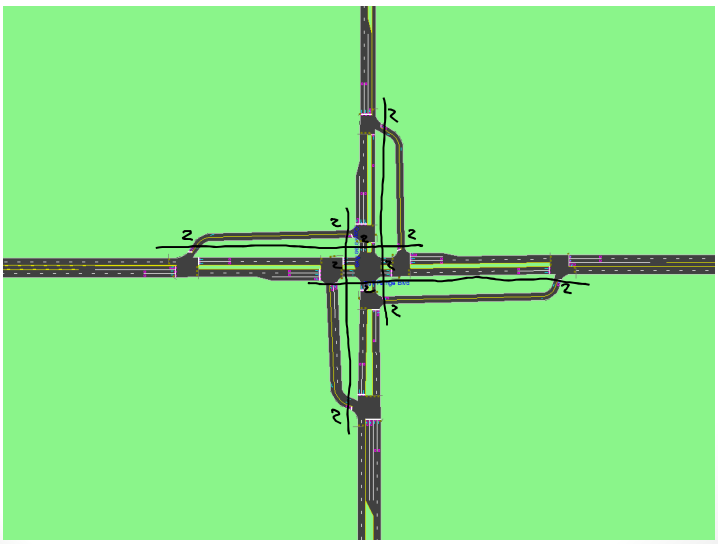
Dual Left-Turn Lanes



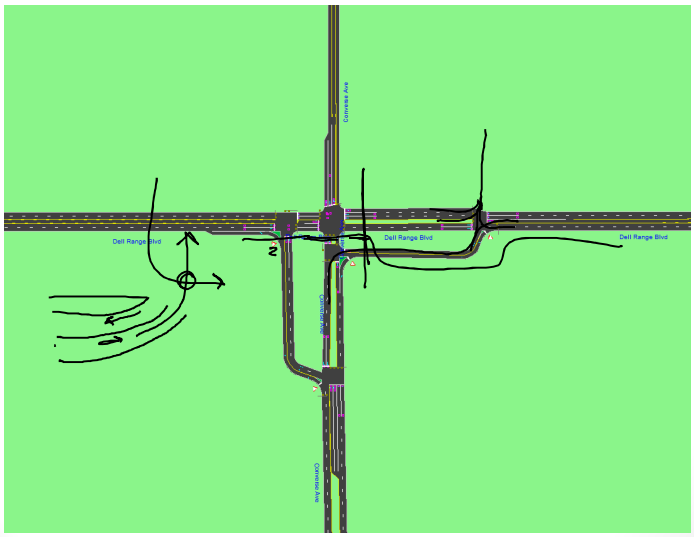
Modern Roundabout



CFI - Full

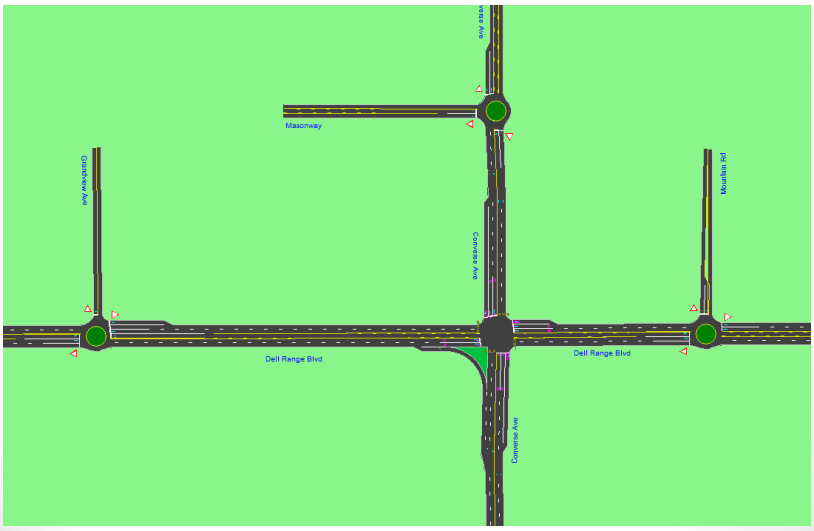


CFI - Modified



ThruTurn - Signals

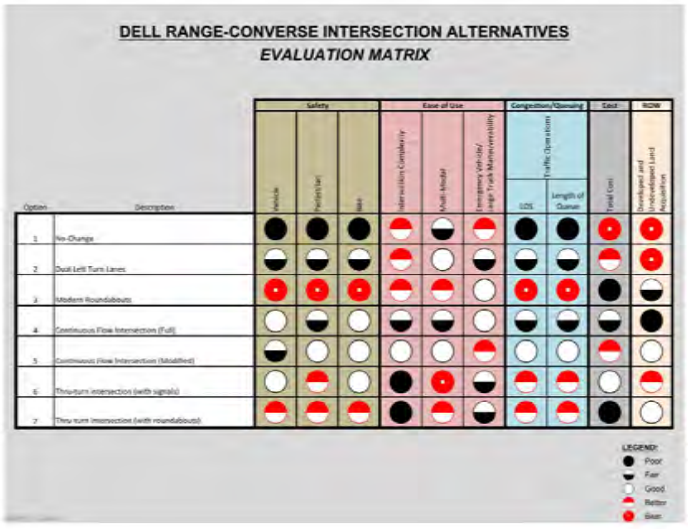
ThruTurn - Roundabouts

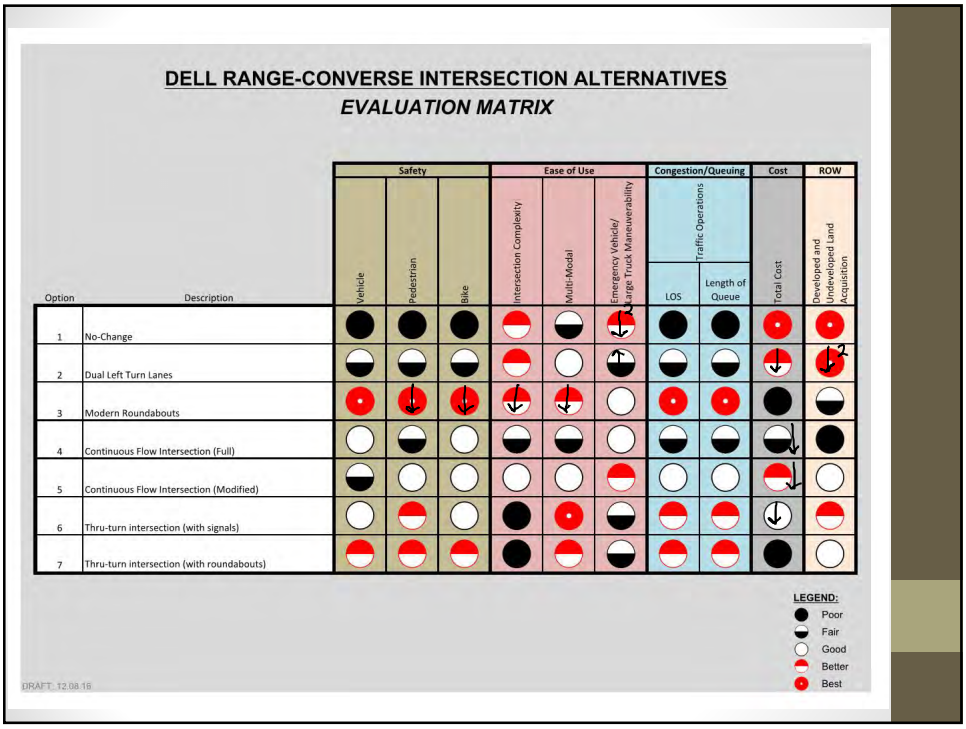


Preliminary Operations Analysis

Alternative		Dell Range Blvd & Converse Ave					
		AM		MD		PM	
		LOS	Delay	LOS	Delay	LOS	Delay
1	No-Build Revision	C	27.1	D	37.8	D	42.0
2	Dual Left Turns	C	26.2	C	32.3	C	29.6
3	Modern Roundabout	A	5.5	A	8.9	A	6.0
4a	CFI - Full	C	31.1	C	29.8	C	27.9
4b	CFI - Modified	C	22.1	C	26.0	C	30.8
5a	ThruTurn - Signals	B	10.9	B	13.7	C	24.5
5b	ThruTurn - Roundabouts	B	11.1	B	12.8	B	18.1

Preliminary Alternatives Evaluation Matrix





Steering Committee Roster Sign-In

Converse & Dell Range Intersection Traffic Safety Plan and Converse Avenue 35% Design Plan

Tuesday January 12, 2017

Organization	Name	Email	Phone Number	Steering Com. #4
HDR Project Team				
Project Manager	Brandon Gebhart	brandon.gebhart@hdrinc.com	307-757-9000	X
Traffic Lead	John Seyer	john.seyer@hdrinc.com	970-416-4407	X
Roadway Design	Mike Oakley	mike.oakley@hdrinc.com	307-228-6019	
Roadway Design	Todd Mattson	todd.mattson@hdrinc.com	307-228-6008	X
Public Involvement	Stephanie White	stephanie.white@hdrinc.com	303-323-9788	
Steering Committee				
Cheyenne MPO	Tom Mason	tmason@cheyennempo.org		X
Cheyenne MPO	Nancy Olson	nolson@cheyennempo.org		✓
Cheyenne MPO	Sreyoshi Chakraborty	schakraborty@cheyennempo.org		
City Public Works	Craig LaVoy	clavoy@cheyennecity.org	637-6294	
City Engineering	Nathan Beauheim	nbeauheim@cheyennecity.org	638-4315	NB
BOPU	Brad Brooks	bbrooks@cheyennebopu.org		
BOPU	Linda Gunter	lgunter@cheyennebopu.org	637-6497	LG
WYDOT	Kevin McCoy	kevin.mccoy@wyo.gov	777-4178	KMc
WYDOT	Mark Wingate	mark.wingate@wyo.gov	777-4180	MW
City Council	Jeff White	jwhite@cheyennecity.org	777-5739	
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Cheyenne Police Dept.	Officer George Trammell	gtrammell@cheyennepd.org		
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Transit	Keith McQueen - sub	kmcqueen@cheyennecity.org	631-0190	
Greenway and Trails	Jeff Wiggins	jwiggins@cheyennecity.org		
Parks and Recreation	Jason Sanchez	jsanchez@cheyennecity.org	638-4358	
EMA	Matt Butler	mbutler@laramiecounty.com	633-4335	MB
Black Hills Energy	Jef McMann	jef.mcmann@blackhillscorp.com		
Fire and Rescue	Chief Martin	jmartin@cheyennecity.org		X
Development Dept.	Susana Montana	smontana@cheyennecity.org	x4258	
JASON KSENGAD	HDR			X

DELL RANGE-CONVERSE INTERSECTION ALTERNATIVES

EVALUATION MATRIX

		Safety			Ease of Use			Congestion/Queuing		Cost	ROW
								Traffic Operations			
Option	Description	Vehicle	Pedestrian	Bike	Intersection Complexity	Multi-Modal	Emergency Vehicle/ Large Truck Maneuverability	LOS	Length of Queue	Total Cost	Developed and Undeveloped Land Acquisition
1	No-Change										
2	Dual Left Turn Lanes										
3	Modern Roundabouts										
4	Continuous Flow Intersection (Full)										
5	Continuous Flow Intersection (Modified)										
6	Thru-turn intersection (with signals)										
7	Thru-turn intersection (with roundabouts)										

LEGEND:

- Poor
- Fair
- Good
- Better
- Best

DRAFT: 12.08.16

Prepared For:

Prepared By:

HDR ENGINEERING INC.
1720 Carey Ave.
Suite 612
Cheyenne, WY 82001

Scale:

Designed By: T.MATTSON	Drawn By: J.OAKLEY
Design Date: 1/9/2017	Print Date: 1/9/2017
Internal Job No: 10038796	
Surveyed By: N.FRASER	Survey Date: 10/2016

Revisions:

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet Title:

INTERSECTION LAYOUT 3

Sheet:

3

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CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet: 2

Sheet Title: INTERSECTION LAYOUT 2

Surveyed By: N. FRASER
Survey Date: 10/2016

Revisions:

Internal Job No.: 10038796

Design Date: 1/9/2017

Print Date: 1/9/2017

Drawn By: T. MATTSON

Check By: J. OAKLEY

Scale:

Prepared By:

HDR ENGINEERING INC.
1720 Carey Ave.
Suite 612
Cheyenne, WY 82001

Prepared For:

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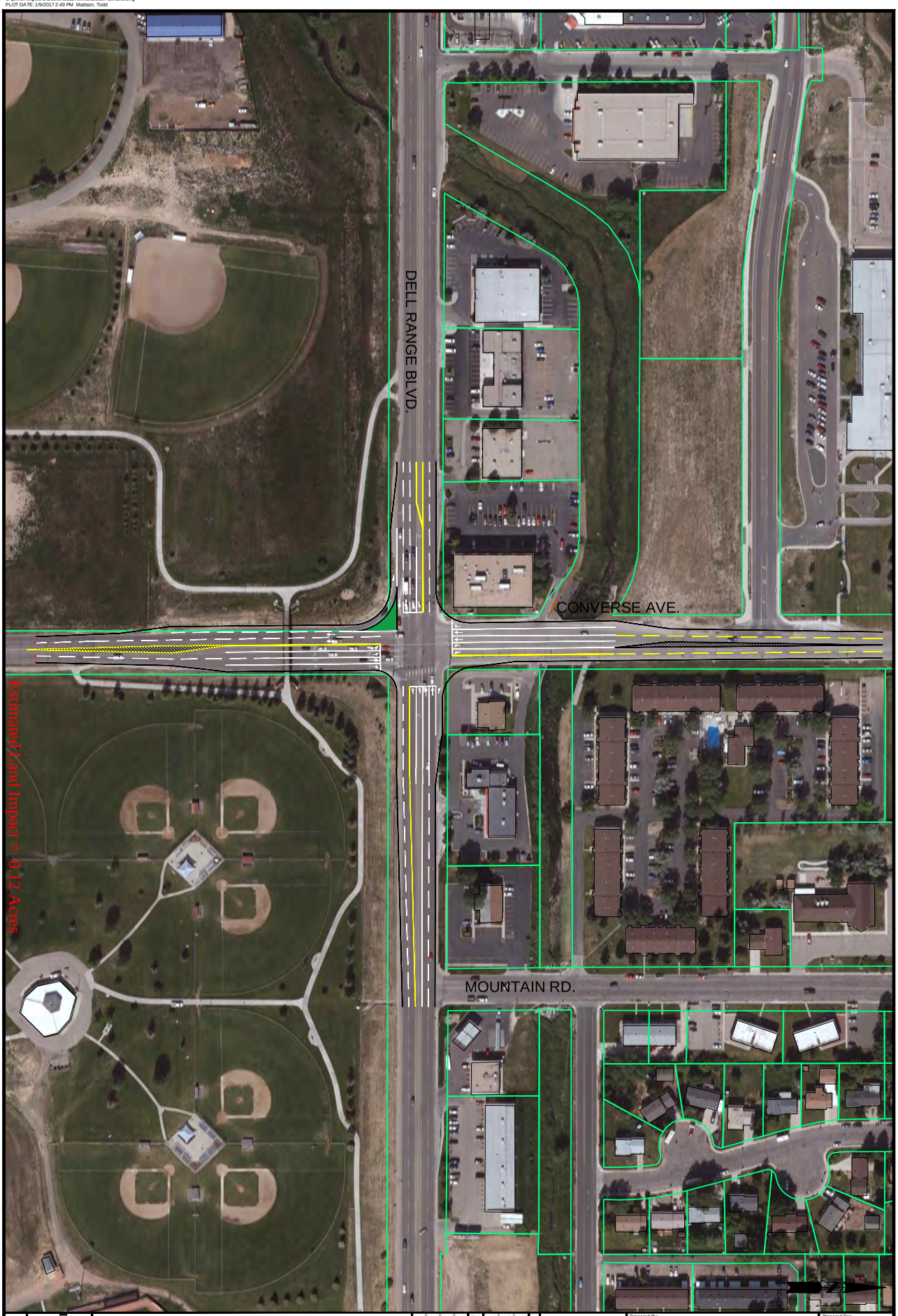

CHEYENNE MPO
CONVERSE & DELL RANGE INTERSECTION

LARAMIE COUNTY, WYOMING

Project No. 10038796

Sheet: 1

Sheet Title: INTERSECTION LAYOUT 1

Revisions:

Surveyed By: N. FRASER
Survey Date: 10/2016

Internal Job No.: 10038796
Design Date: 1/9/2017
Print Date: 1/9/2017

Drawn By: T. MATTSON
Check By: J. OAKLEY

Scale:

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1720 Carey Ave.
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Cheyenne, WY 82001

Prepared For:

CHEYENNE MPO STEERING COMMITTEE MINUTES
January 12, 2017

I. Introduction

- Brandon opened the meeting and introduced John Seyer, Jason Kjenstad and Todd Mattson of HDR.
- Brandon also reminded everybody to sign in.
- The meeting was held at the City Complex in the Planning Conference Room #104. The meeting began at 1:00 p.m. and concluded at 3:00 p.m.
- The purpose of the meeting was to review the updates to the evaluation matrix developed in Steering Committee Meeting 3 and to display the more detailed layouts for the dual left turns, modified CFI and roundabout alternatives.

II. John's Power Point Presentation

- Described the operation of the Dual Left Turns, Modified CFI and roundabout alternatives.
- Presented the final evaluation matrix and the fact that the three alternatives ranked the highest.
    - No Build – Provided no improvements, except that the turning radii could be improved to allow better truck turning movements
    - Dual Left Turns – Third Highest ranked. Turning radii would need modified to accommodate better truck turning movements
    - 2 Lane Roundabout – provided the best LOS, but also created the largest land/property impacts. Cost would be very high
    - Continuous Flow Intersection (CFI) Full – provided good LOS, but property impacts were very high.
    - Continuous Flow Intersection (CFI) Modified Good LOS, minimal property impacts, good safety, good ease of use.
    - Thru Turn Signals – good LOS, very complex intersection with high cost.
    - Thru Turn Roundabouts – good LOS, very high cost, complex intersection
- Explained that after Steering Committee Meeting #3 we were asked to provide layouts of the top three alternatives (Dual Left Turns, Modified CFI, and Roundabout) to visually identify property impacts and conflicts/issues with nearby intersections.

III. Todd – Presentation of the Layouts

- Dual Left Turns
    - Illustrated that this would have minimal property impacts
    - Adjusted the curb radii to accommodate WB-50 turn movements
    - Verified that only one northbound lane to the north is required.
- CFI – Modified
    - Attempted to keep the additional turning lanes as close to the existing travel lanes as possible.

- This would likely require some retaining wall on the south side of Dell Range.
- Discussed that this layout would likely fit under the pedestrian bridge, but that the lower portion of the west abutment may need to be modified. It was discussed that the bridge could likely be removed and reset if needed, not replaced or extended.
- Discussed the potential to modify the Mountain Road intersection to provide better movement for people traveling from northbound Converse Ave. to northbound Mountain Road or that the turn sequence for this movement would require the northbound Converse traffic to make a right hand turn at the existing intersection to get into proper placement to make a left on Mountain.

- Roundabout – Presented by John
  - Extensive property impacts to the south. Would likely require the purchase of the Vet clinic on the northeast corner and would require extensive retaining walls.
  - Appears to fit within the Pedestrian overpass.
  - Large impacts to the 4(f) and 6(f) resources to the south. Identified that this could create environmental permitting issues.
  - Discussed the probability that public perception/acceptance would be tough to overcome. This would likely affect both permitting and funding.

IV. Steering Committee Discussion

- Discussed the potential that legislation could eventually require signalization of roundabouts. Some communities no longer will consider multi-lane roundabouts because of this potential.
- T. Mason requested a vote of everyone's first and second place preferences. Results below:

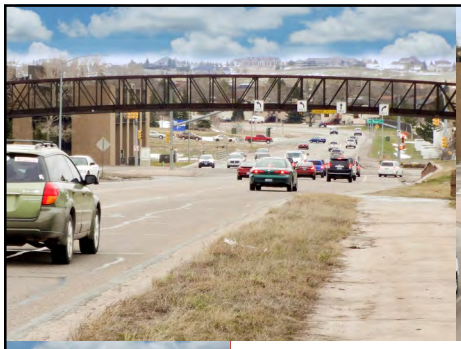
	1st Place Votes	2nd Place Votes
Dual Left Turns	1	5
Modern Roundabout	0	1
Modified CFI	6	1

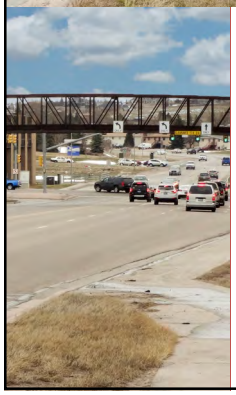
- Discussion: Development of next public open house
  - Presentation based – live streaming on Facebook
  - Present the work that has been done to date
    - Public Involvement
    - Development of Alternatives
    - Development of Evaluation Matrix
    - Traffic Analysis
    - Present entire list of alternatives

        - Present the three most preferred and the Preferred.
        - Allow public comments
      - N. Beauheim requested that we analyze how the CFI would impact signal coordination along Dell Range; the City will provide updated Synchro files for our use in this analysis
    - Discussion on Schedule – We discussed that this would require additional work to prepare for the next open house. It was determined that this is not an issue. Original schedule was developed assuming that 6th penny funding would be sought and the results were needed for this process. Because the project did not make the short-list, some of the urgency is no longer needed.

V. Future Meeting

- The next formal meeting will be an Open House Presentation, late February to early March. Present the intersection alternatives analysis and some preliminary corridor design.
- A final presentation of the final plan will be made at a future Planning Commission Meeting.
-





Presentation to the MPO Technical Committee

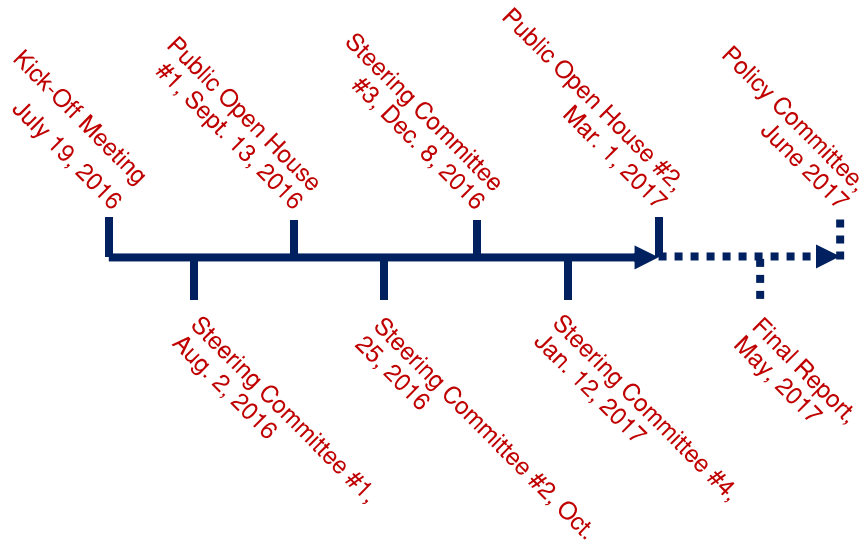
Converse/Dell Range Intersection Traffic Safety Plan & Converse Avenue 35% Design Plan

May 17, 2017

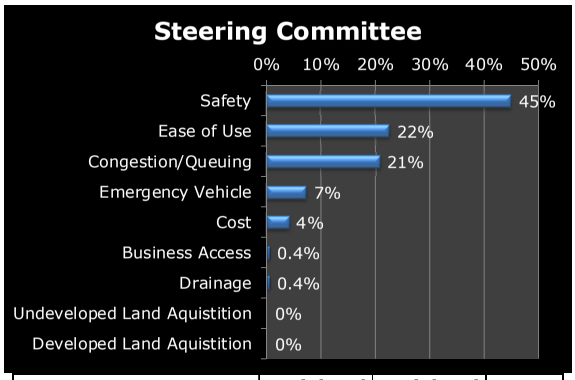
Project goals are to: Improve safety, functionality, and mobility of the Converse/Dell Range intersection and corridor.

- Develop and Evaluate Intersection Alternatives.
- 35% Design for Converse Corridor and the Recommended Converse/Dell Range Intersection
- Evaluate Environmental Issues.

Project Timeline

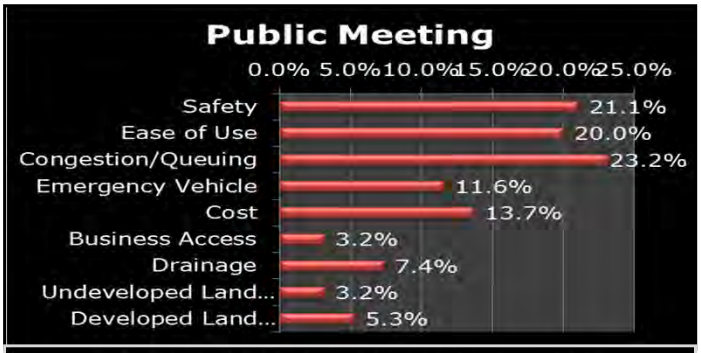


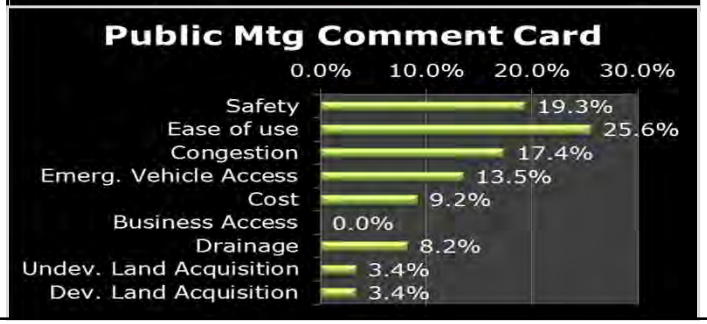
Steering Committee Criteria Results



Issue/Concern	Weighted Points	Weighted Average	Rank
Safety	100	45%	1
Ease of Use	50	22%	2
Congestion/Queuing	46	21%	3
Emergency Vehicle	16	7%	4
Cost	9	4%	5
Business Access	1	0.4%	6
Drainage	1	0.4%	6
Undev. Land Aquistition	0	0%	8
Dev. Land Aquistition	0	0%	8

Public Criteria Results





Initial Decision Matrix

		Safety			Ease of Use			Congestion/Queuing		Emerg. Vehicle	Cost
								Traffic Operations			
Option	Description	Vehicle	Pedestrian	Bike	Intersection Complexity	??	Emergency Vehicle/Large Truck Maneaurvability	LOS	Length of Queue		Total Cost
1	No-Change										
2	Dual Left Turns										
3	Modern Roundabout										
4	CFI - Full										
5	CFI - Modified										
6	ThruTurns - Signals										
7	ThruTurns - Roundabouts										

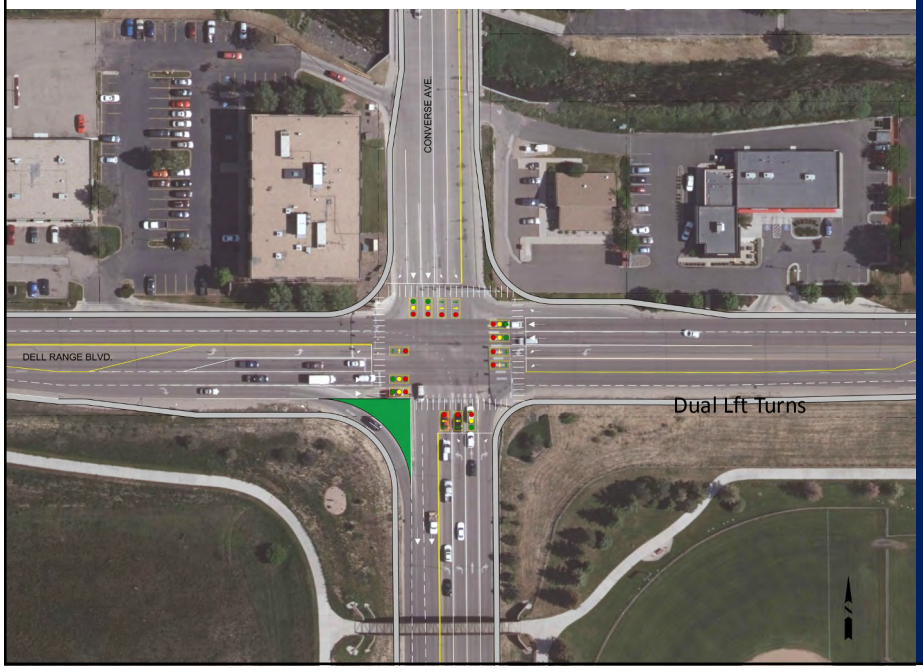
Issue	Steering Committee Rank	Public Meeting Rank	Public Mtg Comment Card Rank	Total Rank
Safety	1	2	2	1
Ease of Use	2	3	1	2
Congestion/Queuing	3	1	3	3
Emergency Vehicle	4	5	4	4
Cost	5	4	5	5
Drainage	6	6	6	6
Business Access	6	8	8	7
Developed Land Aquistition	8	7	7	7
Undeveloped Land Aquistition	8	8	7	9

Decision Matrix

Option	Description	Safety			Ease of Use			Congestion/ Queuing		Cost	ROW
		Vehicle	Pedestrian	Bike	Intersection Complexity	Multi-Modal	Emergency Vehicle/Large Truck Maneaurvability	Traffic Operations: LOS	Traffic Operations: Length of Queue	Total Cost	Dev.& Undev. Land Acquistion
1	No-Change	Poor	Poor	Poor	Better	Fair	Fair	Poor	Poor	Best	Best
2	Dual Left Turn Lanes	Fair	Fair	Fair	Better	Good	Good	Fair	Fair	Good	Good
3	Modern Roundabout	Best	Better	Better	Good	Good	Good	Best	Best	Poor	Fair
4	Continuous Flow Intersection (Full)	Good	Fair	Good	Fair	Fair	Good	Fair	Fair	Poor	Poor
5	Continuous Flow Intersection (Modified)	Fair	Good	Good	Good	Good	Better	Good	Good	Good	Good
6	Thru-Turn Intersection (with signals)	Good	Better	Good	Poor	Best	Fair	Better	Better	Fair	Better
7	Thru-Turn Intersection (with roundabouts)	Better	Better	Better	Poor	Better	Fair	Better	Better	Poor	Good

LEGEND: Poor, Fair, Good, Better, Best

Dual Left Turns Alternative



Modern Roundabout Alternative

Modern CFI Alternative

Comparison of Alternatives

Dual Left Turns

Modern Roundabout

CFI – Modified (#1 Rank)

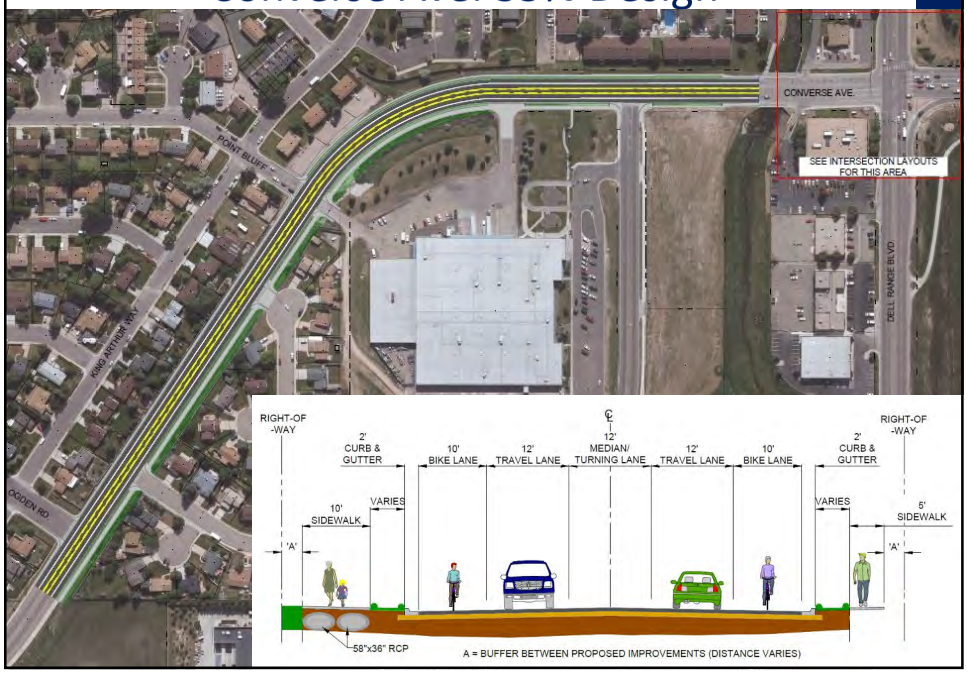
Pros

Dual Left Turns	Modern Roundabout	CFI – Modified (#1 Rank)
✓ Most conventional alternative ✓ Lowest Cost of Remaining Alternatives ✓ Anticipated to be least impactful to existing right-of-way	✓ Best mitigates noted safety concerns ✓ Provides highest capacity	✓ Mitigates most noted safety concerns ✓ Provides needed capacity enhancements ✓ Meets project goals with relatively conventional geometry ✓ Signalization at Mountain Road

Cons

Dual Left Turns	Modern Roundabout	CFI – Modified (#1 Rank)
✓ Doesn't mitigate noted safety concerns ✓ Doesn't provide needed capacity enhancements	✓ Highest cost alternative ✓ Most right-of-way & directly impacts private business ✓ Extensive retaining walls ✓ Impacts Ped. Bridge ✓ Perceived most difficult for Peds. & Bicycles	✓ Doesn't mitigate all noted safety concerns ✓ Impacts to west Pedestrian Bridge Abutment

Converse Ave. 35% Design



Dual Left Turns

CFI – Modified

No-Build

Recommendations

- Greater Cost warrant level of traffic ops improvements?
- Funding, Timing, Public Perception
  - Funding > 5yrs away
  - Revised Alt. Analysis (NEPA)
  - Prioritization affected by crashes, traffics projections, funding
- Recommend that Modified CFI and Dual Left-Turns be reanalyzed in Future
- No-Build Option with recommended improvements

No-Build Improvements

Questions?