



## FINAL REPORT FOR **VAN BUREN AVENUE CORRIDOR PLAN**



**Prepared for:**  
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Thank you to the following agencies for committing time and resources, allowing for the completion of this corridor study.



City of Cheyenne Planning and Development  
City of Cheyenne City Engineering



Cheyenne Metropolitan Planning  
Organization



Laramie County Public Works



Laramie County School District #1



Wyoming Department of Transportation

# DISCLAIMER

Y2 Consultants and the Cheyenne Metropolitan Planning Organization, City of Cheyenne, and Laramie County have developed this report for the use of the MPO and the City of Cheyenne to support planning efforts and future design for Van Buren Avenue. Some additional data collection and validation, and design refinement will be required during the final design phase, and some plan recommendations may change or be altered during final design.

*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.*

# OVERSIGHT COMMITTEES

During the course of the project, meetings were held with the steering committee members. These meetings occurred at milestones to discuss critical design related issues. Members of the steering committee represented the public agencies that would be affected by the outcome of the project. Agencies present at the steering committee meetings were as follows:

- Cheyenne Metropolitan Planning Organization
- City of Cheyenne Engineering
- City of Cheyenne Planning and Development
- Laramie County Public Works
- Laramie County School District #1
- Wyoming Department of Transportation

Steering committee members were informed of the consultant’s findings and provided oversight in decision-making to guide the project to successful completion. The consultant team also provided presentations to the Technical Advisory Committee, Citizens’ Advisory Committee, and Policy Committee to inform and address concerns or questions they had regarding the project’s direction.

# OTHER CONTRIBUTING AGENCIES

Other agencies that participated, provided information, or otherwise contributed to the study include:

- Cheyenne Board of Public Utilities
- Cheyenne Transit Program
- United States Postal Service
- Cheyenne Police Department

Also, thank you to Laramie County School District #1, specifically Dildine Elementary School, for use of their school facilities for public meetings.

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# LIST OF ABBREVIATIONS

BHE – Black Hills Energy  
BOPU – Board of Public Utilities  
CAD – Computer-aided design  
CBU – Center Box Unit  
CFS – Cubic Feet per Second  
CTP – Cheyenne Transit Program  
FEMA - Federal Emergency Management Agency  
FHWA – Federal Highway Administration  
GIS – Geographical Information System  
LiDAR-Light Detection and Ranging  
LOS – Level of Service  
MHFD – Mile High Flood District  
MPH - Miles per hour  
MPO – Metropolitan Planning Organization  
NRCS - Natural Resources Conservation District  
NTMP – Neighborhood Traffic Management Program  
RCP – Reinforced Concrete Pipe  
ROW – Right of Way  
RSA – Road Safety Audit  
UDC – Unified Development Code  
USDA - United States Department of Agriculture  
USPS – United States Postal Service  
VPD – Vehicles per Day  
WYDOT – Wyoming Department of Transportation

# PHASE 1

## Introduction

The Van Buren Avenue Corridor Plan is focused on Van Buren Avenue between Dell Range Boulevard and US-30 (Lincolnway). The Cheyenne Metropolitan Planning Organization (MPO) conducted this planning study to inventory existing conditions, propose alternative solutions, and create a plan that solves existing corridor issues and considers future changes to the corridor.

The existing Van Buren streetscape is a mix of old and new facilities in various states of repair. Some sections lack curb, gutter, or sidewalk, while in other locations the pavement is worn out or concrete drains are cracked, drainage is poor, or sidewalks are broken and heaving. Rapid development on the east side of Cheyenne makes this the right time to address these issues and plan the future streetscape.

Project goals included the following:

- Safety – Reduce speeds throughout the corridor while accommodating projected increased traffic. This is especially focused on higher speed areas from the corridor terrain mixed with higher pedestrian zones.
- Accommodate all modes of travel – Provide space and infrastructure for pedestrians and bicyclists to share the corridor safely with motor vehicles.
- Reduce Speeds – Implement solutions that reduce speed without impeding maintenance.
- Ease of Maintenance – Solutions shall not impede snow removal, street sweeping, trash removal services, or other maintenance operations.
- Cost Effective – Provide short-term and mid-term solutions to allow for near term implementation that doesn't require corridor reconstruction. Long-term solutions that will create a lasting corridor that meets the needs of the neighborhood and travelers for years to come.

The Van Buren Avenue Corridor Plan will help guide future safety and design improvements and budget decisions along the corridor.

## Existing Conditions

### CORRIDOR

The project corridor along Van Buren Avenue is 3,400 linear feet or just over 0.6 miles. The north extent of the corridor is at the intersection of Van Buren Avenue and Dell Range Boulevard. The southern extent is at the intersection of Van Buren Avenue and US-30 (Lincolnway Avenue). The Van Buren corridor is currently a mix of City and County properties. Van Buren itself is annexed into the City, but many of the lots are in the County and so are many of the connecting streets. There is a mixture of surfacing materials on the connector streets, mainly gravel and asphalt. As redevelopment occurs, the mixture of surfacing materials should be homogenized.



Figure 1: Van Buren Avenue Corridor Study Area Aerial



## TOPOGRAPHY

The terrain along Van Buren Avenue generally slopes toward the south, from 6030 feet at Dell Range Boulevard Blvd. to 5980 feet at US-30. The average slope is about 1.5%. The lowest point is 5976 feet at the existing concrete valley pan drain south of Carter Road. South of the drain, there is a significant hill up to Laramie Street and it comes back down where the corridor meets with US-30.

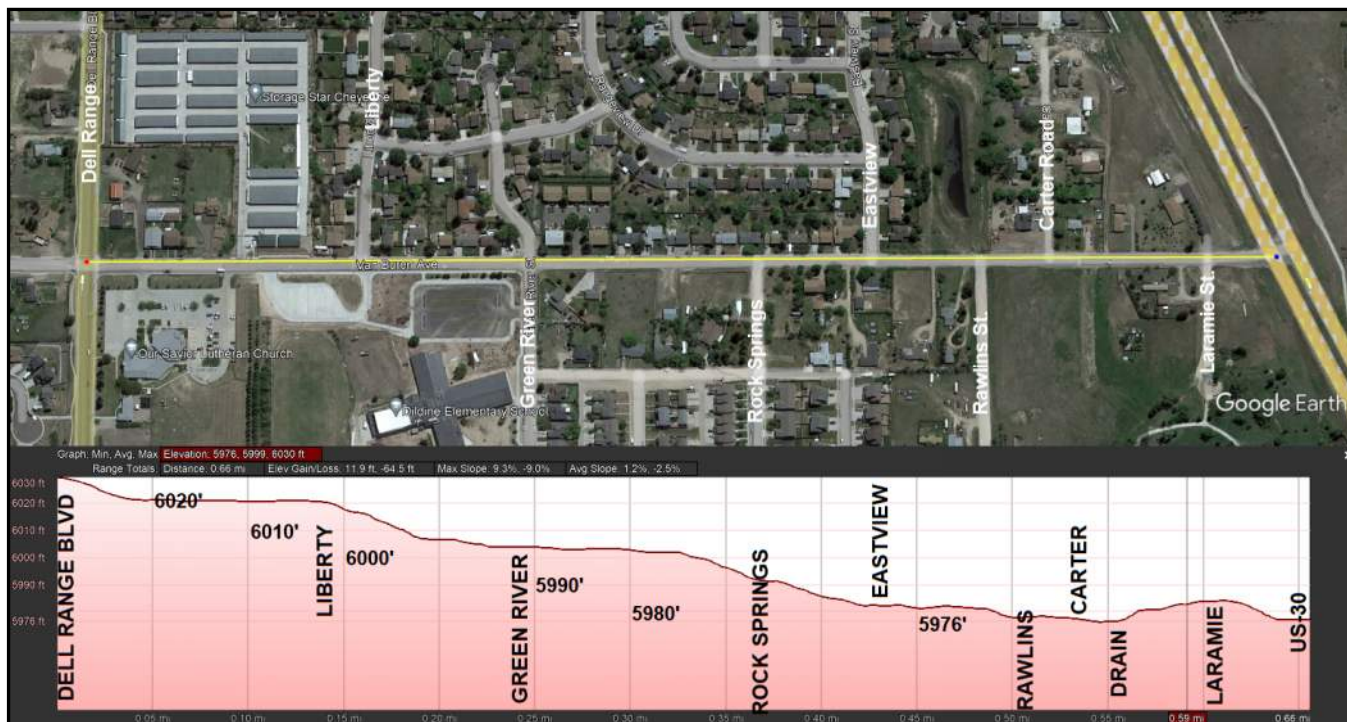


Figure 2: Van Buren Avenue Corridor Topography

The hill on Laramie Street reduces vertical sight distance. Also, the steep downhill towards the intersection with US-30 promotes increased driving speeds and makes for a more difficult and abrupt stop at the intersection for drivers who are exceeding the speed limit. Also, this area has been reported to ice up in the winter, potentially leading to failed stops at the intersection and contributing to the accident tally at this location. Lowering the hill at Laramie Street is difficult due to existing access onto Van Buren at this location. The access located at 5208 Laramie Street, on the north side of Van Buren, is particularly problematic because the access already has a very steep grade.

## ZONING AND LAND USE

The Van Buren corridor is primarily zoned for residential use and includes a mix in residential development density from low to high. However, other zoning designations exist along the corridor, including:

- Public Use zoning – Dildine Elementary and a detention pond serving Imperial Valley.
- Community Business zoning – An undeveloped lot on the southwest corner of the corridor.
- Commercial zoning – The corridor includes a couple of commercial lots as well.
- Mixed Use Employment Emphasis zoning – An existing storage facility with this designation exists on the corridor.
- In addition, future land use for the corridor mirrors existing land use.
- See Figure 3 for the area zoning and descriptions of all the zoning types within the corridor.

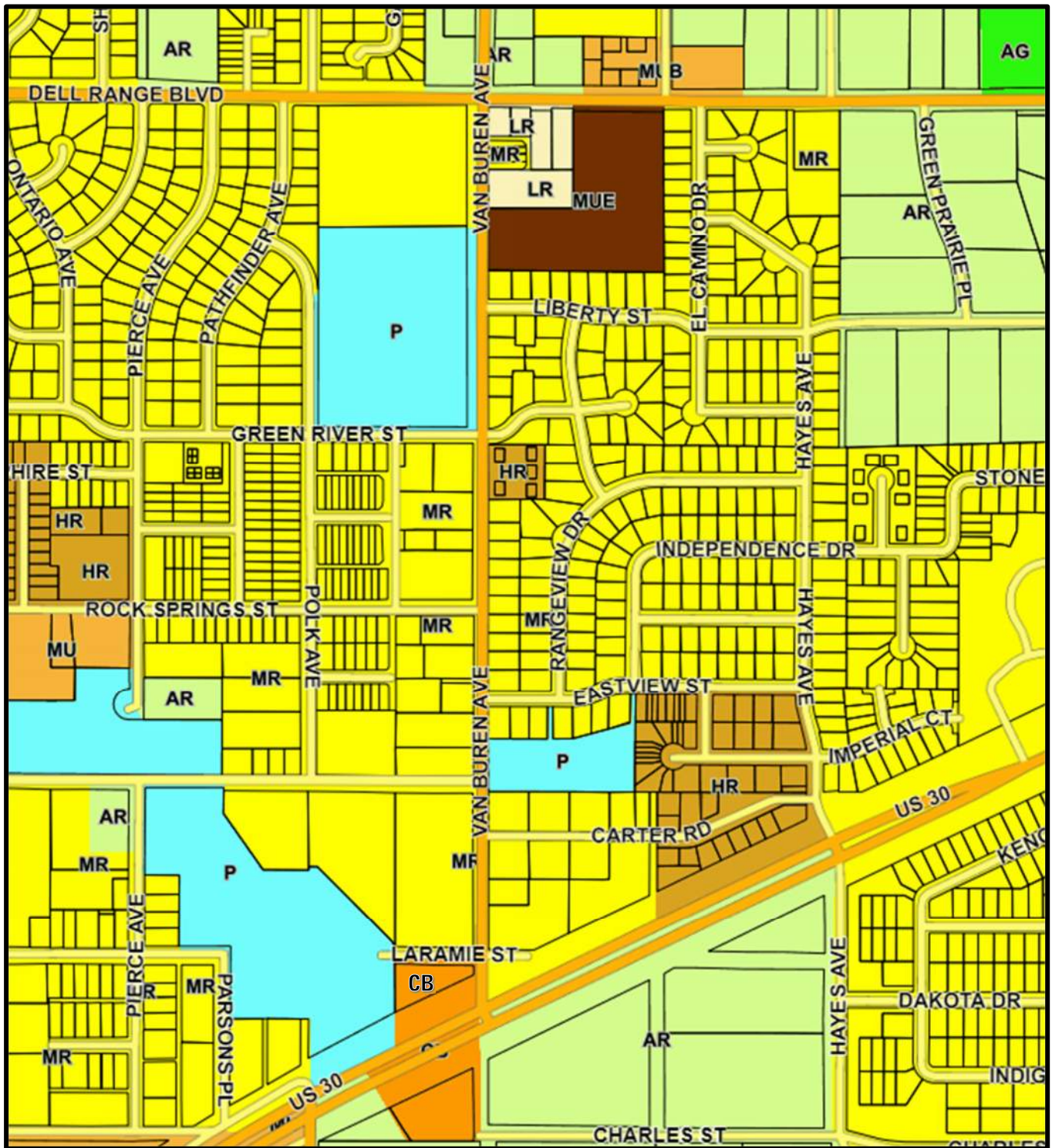


Figure 3: Corridor Zoning from Cheyenne - Laramie County Cooperative GIS Database

### **MUE: Mixed Use Employment Emphasis**

Zoning intended to provide a diverse mix of Employment, Light Industrial, and Civic uses integrated into a campus-like environment. The single MUE lot along the corridor is a self-storage facility.

### **AR: Agricultural Residential**

Zoning is intended to provide agricultural uses on large lots that typify a rural lifestyle. Both areas of agricultural residential zoning are located just to the north and south of the study corridor. These areas largely coincide with County Pockets and will

likely have zoning changes once they are annexed. Also, parcels with this zoning are located just outside the corridor study area.

### **HR: High Density Residential**

Zoning is intended for a range of higher density, urban residential lots and building types within a neighborhood. There is one lot with this zoning along the corridor, just south of Green River along the east side of the corridor.

### **LR: Low Density Residential**

Zoning is intended for a mix of lower density dwellings. There is a small pocket of this in the northeast corner of the study corridor.

### **MR: Medium Density Residential**

Zoning is intended for a mix of density and dwelling types within a neighborhood. This zoning makes up the majority of the corridor.

### **CB: Community Business**

Zoning is intended for a Retail, Employment, Service and Civic uses. There are two lots on the west side of Van Buren Avenue, South of Laramie St. and North of US 30 zoned this way. Both lots are undeveloped.

### **P: Public**

Zoning is intended for public sites, buildings and uses where activities conducted provide service to the public, including educational facilities, recreational areas, and community service facilities. Dildine Elementary and the Imperial Valley Open Space/Detention Pond area are zoned public in the project corridor.

## **SOILS**

The United States Department of Agriculture (USDA) Natural Resources Conservation District (NRCS) soil survey for the project area was utilized to provide the information on soils in the area. A summary of site soils is presented in the table below. The soil map is displayed on the next page (See Figure 4). The entire soil survey is included in Appendix A.

Table 1: Soil Characteristics Summary

| <b>Soil Map Unit Number</b> | <b>Soil Group Name</b>                           | <b>Soil Description</b>   |
|-----------------------------|--|---|
| <b>104</b>                  | Ascalon loam, cool, 0-6% slopes                  | Sandy clay loam. It was originally stream deposited and then reworked by the wind. This is a well-drained soil with good water infiltration. This soil covers approximately 300' on the northern portion of the corridor. |
| <b>142</b>                  | Manter sandy loam, 0-6% slopes                   | Fine sandy loam. The soil was derived from sedimentary rock, deposited by streams and reworked by the wind. This is a well-drained soil. This soil covers the southern 400 feet of the corridor.                          |
| <b>184</b>                  | Urban land-Ascalon complex, 0-6% slopes          | Sandy clay loam. The soil was deposited by streams from sandstone. This is a well-drained soil. Approximately 1,000 feet in the southern half of the corridor is covered by this soil.                                    |
| <b>189</b>                  | Urban land-Poposhia-Trimad complex, 3-15% slopes | Silt loam. The soil was deposited by stream flow from sandstone, siltstone, and shale. The northernmost part of the corridor along with most of the north half is covered by this soil.                                   |





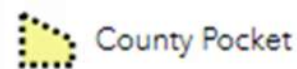
Figure 4: Project Site Soil Map



## COUNTY POCKET ANNEXATION

In 2022, the Cheyenne City Council identified annexation of County Pockets as a priority. County pockets are unincorporated areas of land surrounded by the City (Connor White 2022). Please see Figure 5 for County Pockets along the study corridor. There are pockets to the north, along the corridor, and to the south. It is anticipated that the Van Buren Avenue County Pockets will be annexed within the next two years. This process has already been initiated at the time of this study with the annexation of 4612 Van Buren Avenue, which is located north of Dell Range Boulevard. Annexations are City-initiated, and property owners will not be responsible for typical annexation and zoning costs. Properties annexed into the City will have access to City utilities and services and pay City-standard rates for utilities. Improvements are not being requested of landowners being annexed as part of this initiative.

Figure 5: County Pockets Along Van Buren Avenue Corridor



## Nearby Influences on and Future Use of the Van Buren Corridor

In the Connect 2045 Transportation Update completed in December of 2020, Van Buren Avenue is planned as a *Major Collector* from US-30 north to Four Mile Road. Both US-30 and Dell Range Boulevard are planned as *Principal Arterials*. Rawlins Street is planned as a *Minor Collector*.

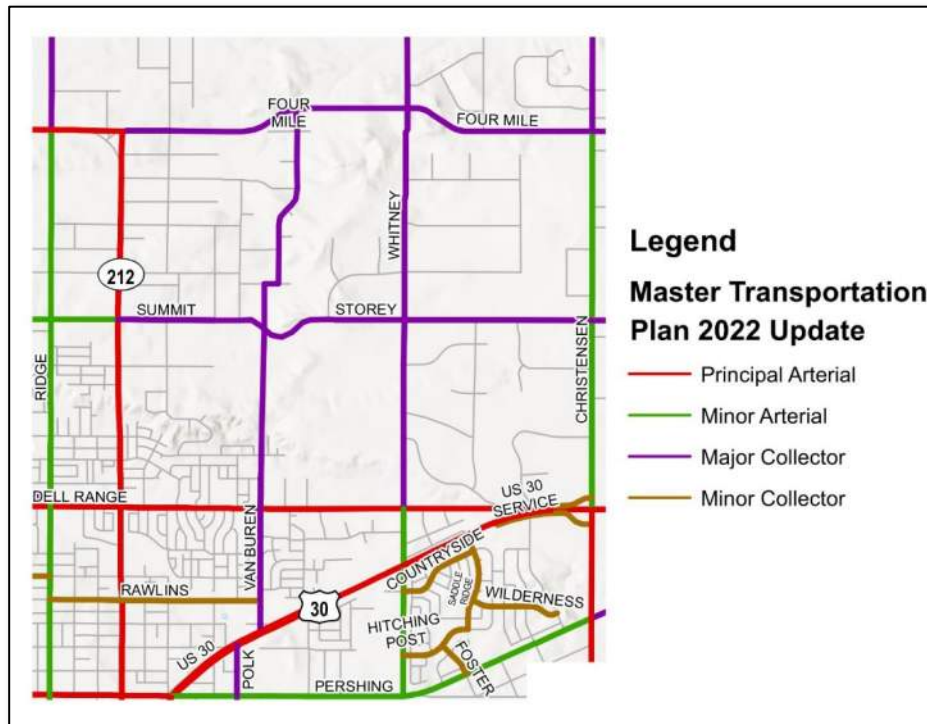


Figure 6: Planned Corridor Classification from the Cheyenne Area Master Transportation Plan 2022 Update

There are several projects that are under development at the time of this report that will influence the Van Buren Avenue corridor and have driven the need for this study.

### WHITNEY RANCH SUBDIVISION

The Whitney Ranch Subdivision is currently being developed and has a direct impact on the corridor. The boundaries of the subdivision are shown in Figure 7. The subdivision will create traffic demand on Van Buren Avenue north of Dell Range Boulevard where it is minimal at this point. Some of this traffic is expected to extend south into the project study area as families with elementary students utilize Dildine Elementary and commuters use the corridor to get to US-30. Phases III and IV, which push the subdivision as far east as Whitney Road, are under development as well. Phase IV construction is anticipated to start as early as 2023.

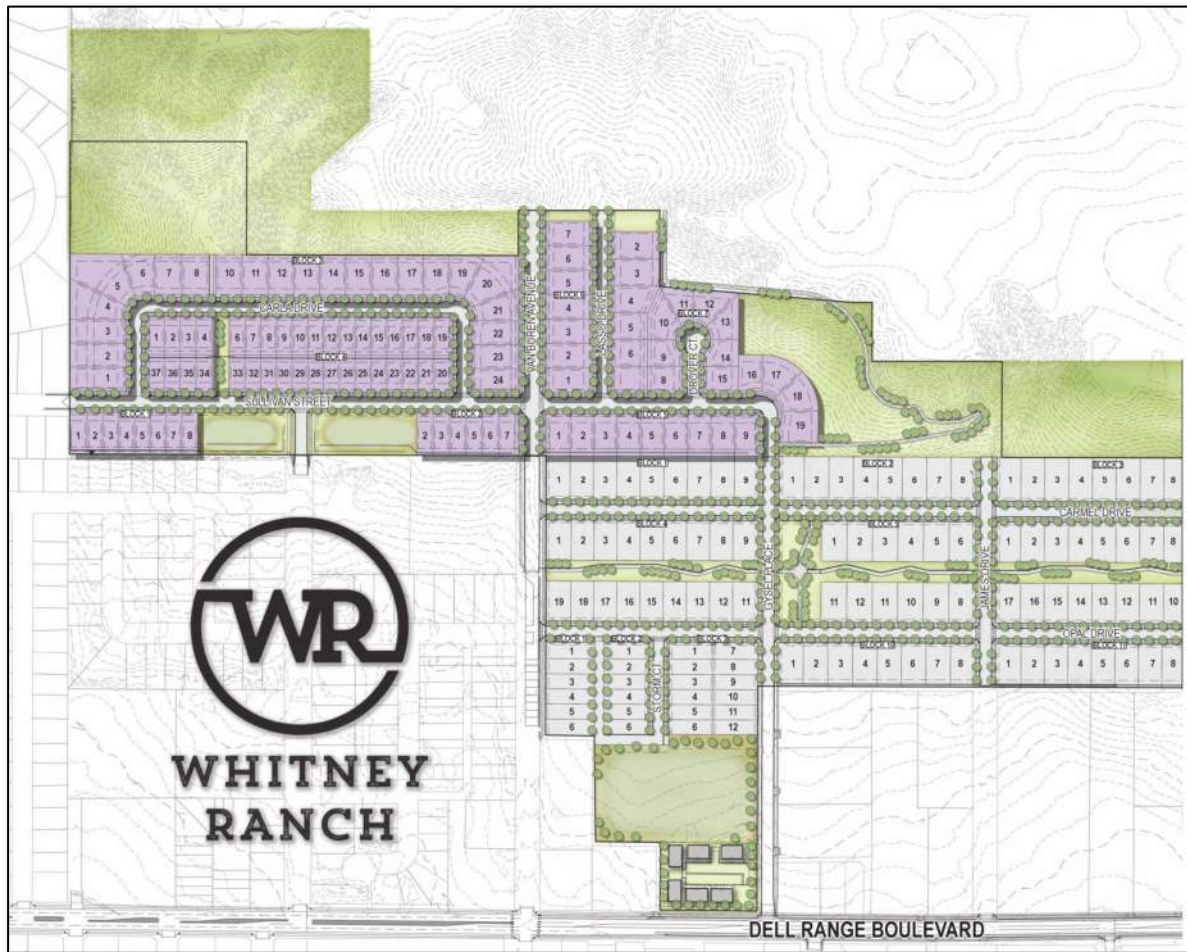


Figure 7: Whitney Ranch Subdivision Map Layout

## MEADOWLARK ESTATES

This project is another residential development in the project area. It is located east of Van Buren Avenue on the northeast side of the corner of Whitney Road and Dell Range Boulevard. The second filing was submitted to the City in 2021 and will contribute additional traffic in the area.

## DELL RANGE – VAN BUREN IMPROVEMENTS

Van Buren Avenue will be directly affected by the Dell Range – Van Buren Improvements. The project includes utility upgrades adjacent to and within the study corridor. Waterlines will be upgraded along Dell Range Boulevard. Sanitary sewer will be upgraded along Dell Range Boulevard, turn south along Green Prairie Place, and then run west along Green Meadow Drive.

Included in this project are stormwater infrastructure improvements. A new, underground stormwater line is to be run along Dell Range Boulevard, turn south, and run down Van Buren Avenue, then turn west along Rawlins Street and outlet into Dry Creek. The Roadway and Utility plans for the storm sewer propose a 42-inch diameter reinforced concrete pipe (RCP) to be placed underground with stormwater inlets and manholes placed along the alignment. Stormwater flow along Van Buren Avenue has historically been surface runoff. This will allow for a new way to manage stormwater flows along the corridor. Construction on this project is anticipated to start in 2023. Additional discussion of this work and how it affects this study is discussed in the Drainage sections below. The roadway and utility plans produced by AVI p.c. dated November 2022, were incorporated into the 35% design. Please note that the location of the storm sewer system is approximate on the plans in this study.

## US-30 RECONSTRUCTION

The Wyoming Department of Transportation (WYDOT) is developing construction plans for US-30 from the intersection with Pershing Boulevard and extends 5.40 miles east to Archer. It is anticipated that this project will be let out for construction in 2024. The existing typical section of US-30 on the south end of the project corridor has two lanes running each direction (northeast and southwest) with a variable median width in between the separated travel directions. The shoulders are of a varied and minimal width.

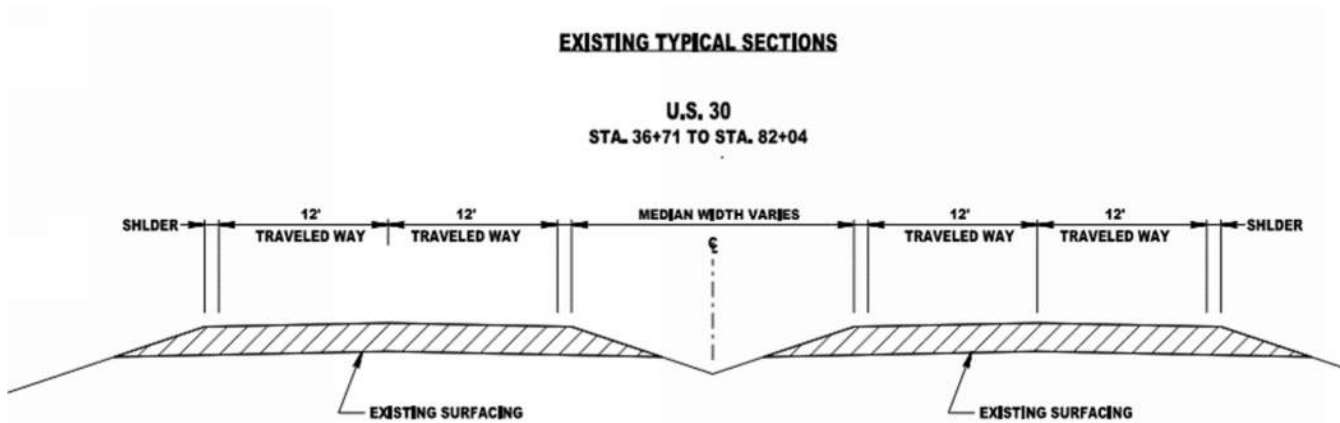


Figure 8: Existing Typical Section of US-30 Where it Intersects with Van Buren Avenue

The proposed cross section of US-30 will include the same two traveled way lanes for each direction of traffic. There will also be turn lanes (as appropriate) and wider shoulders. There will be a defined 20-foot wide median with curb and gutter. Also, the southernmost 150 feet of Van Buren Avenue will be reconstructed to tie into the new US-30. This reconstruction will square up the intersection more, as it is not currently situated perpendicular to US-30. Also, drainage at the intersection will be improved with the replacement of two existing corrugated metal pipe (CMP) culverts with three new culverts. The intersection plan and profile from the WYDOT plans are excerpted in Figure 9.



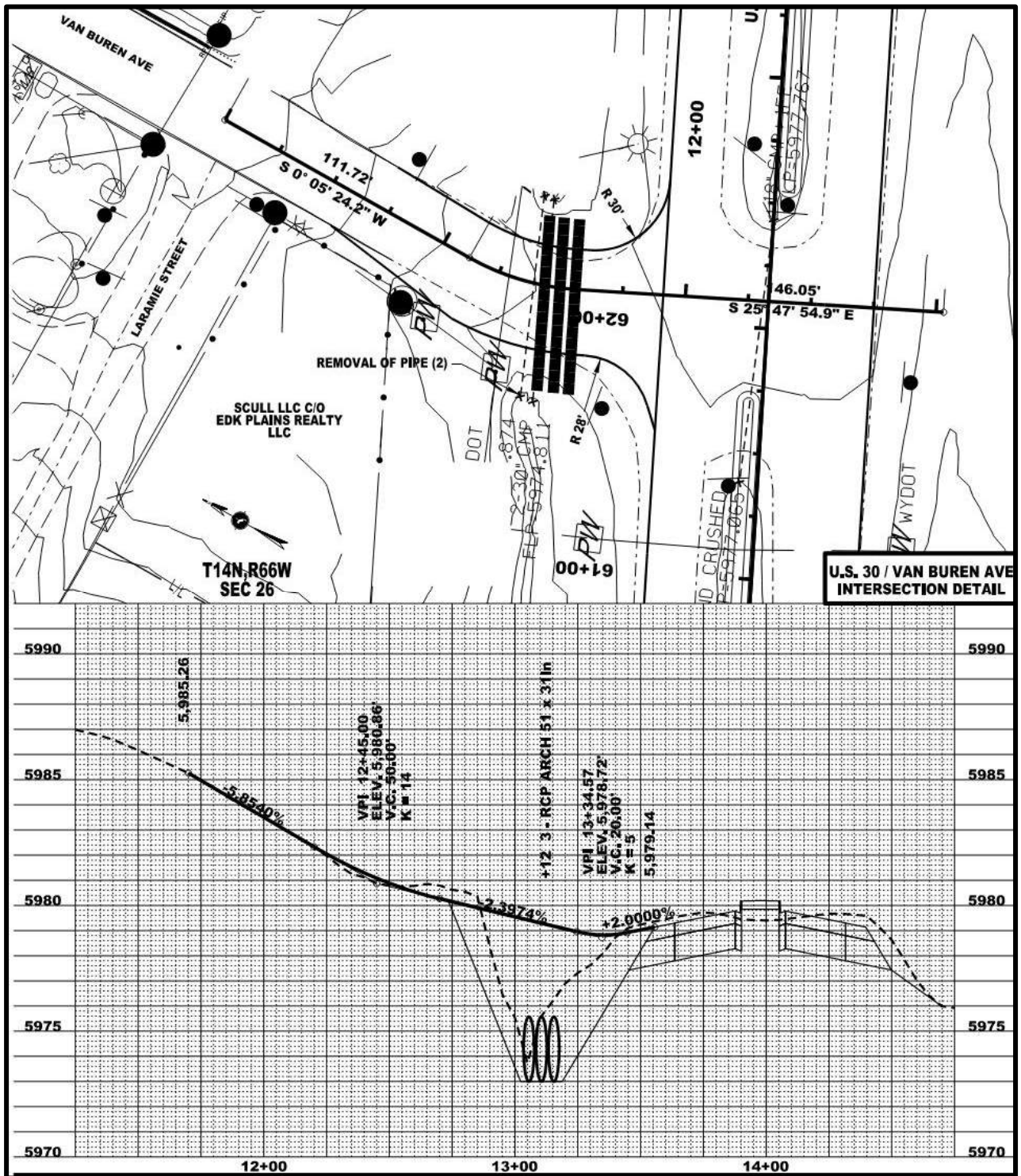


Figure 9: WYDOT Detail of Van Buren Avenue and US-30 Intersection

## DELL RANGE BOULEVARD RECONSTRUCTION

This City of Cheyenne project is slated for 2025. Dell Range Boulevard is to be reconstructed from the current three lane typical section (one traveled way each direction and a left turning lane) to a five-lane section on the west side of the intersection of Dell Range Boulevard and Van Buren Avenue (two lanes traveling west, two traveling east, and a left turning lane). To the east of the intersection Dell Range Boulevard will transition back to a three-lane section. The proposed design will have a traffic signal.

The introduction of a traffic signal will change the existing traffic pattern along Van Buren Avenue. Currently, it can be difficult to turn left (west) onto Dell Range Boulevard when proceeding north on Van Buren Avenue. The light will ease the turning movement onto and off of Van Buren Avenue. Also, traffic turning south from Dell Range Boulevard onto Van Buren Avenue will be in more of a cyclic pattern matching the signal timing, as opposed to the free flow of right turns that is the current design. Figure 10 shows the proposed layout from the 30% Design Concept, which is Appendix A of the 2019 Corridor Study for Dell Range Boulevard.

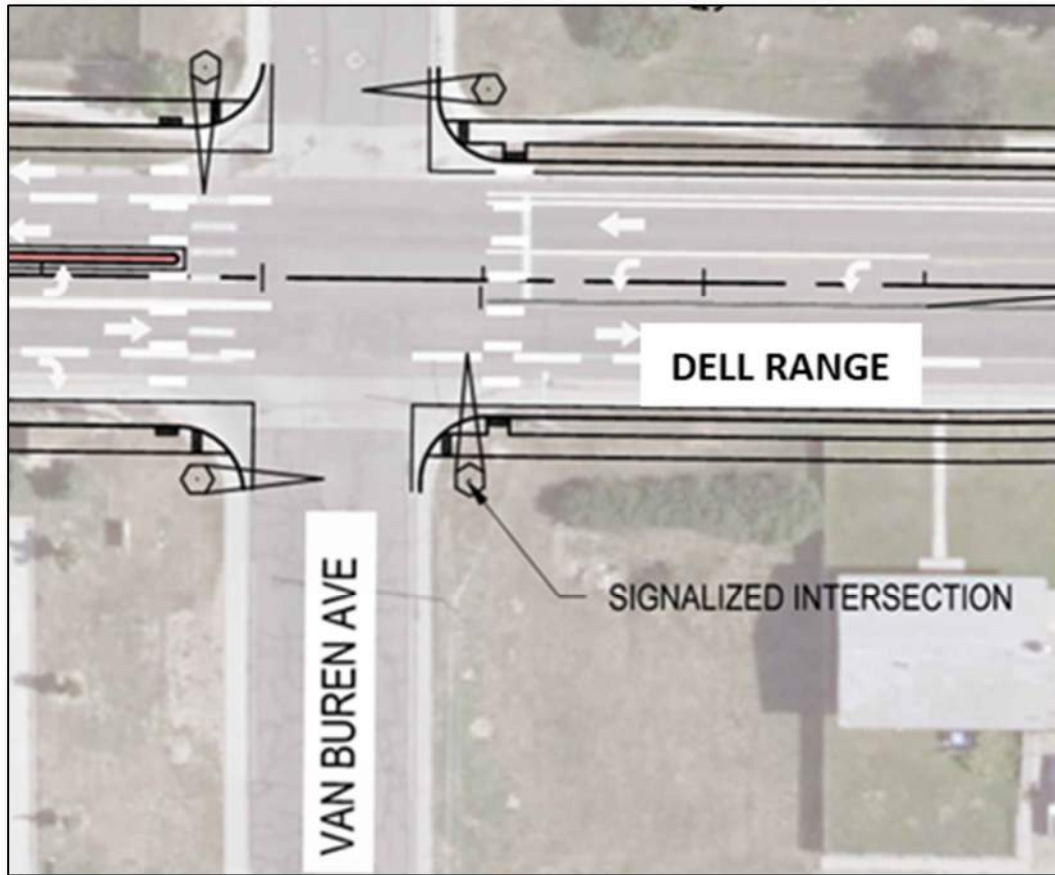


Figure 10: New Van Buren Avenue Ave and Dell Range Boulevard Blvd Intersection Layout

## VAN BUREN AVENUE EXTENSIONS

At the time of this study, the entirety of Van Buren Avenue starts on the south at the intersection with US-30. The northern extent of the paved section of Van Buren Avenue ends just north of Carmel Drive, within the Whitney Ranch Subdivision. There are plans to extend Van Buren Avenue north to Four Mile Road in three phases.

- Phase I – Extend Van Buren Avenue from Carmel Drive to Storey Boulevard. This is a developer funded project to occur in cooperation with the City.
- Phase II – Extend Van Buren Avenue from Storey Boulevard to Child Creek. This is expected to be completed somewhere in the 2036-to-2045-time frame.
- Phase III – Extend Van Buren Avenue from Child Creek to Four Mile Road. This is also not expected to be built until somewhere between 2036 to 2045.

The conceptual alignment of Van Buren Avenue north to Four Mile Road can be seen in Figure 6.



The existing Dry Creek Greenway interacts with the Van Buren Avenue corridor. Laramie Street at Van Buren Avenue is a gravel roadway to a gravel turnaround that acts as parking and access to the Dry Creek Greenway. Laramie Street extends less than 400 feet west from the intersection with Van Buren Avenue. The existing alignment of the Dry Creek Greenway is in the Federal Emergency Management Agency (FEMA) floodway. The pathway runs to the southeast from Laramie Street underneath US-30. From there it rises out of the floodway and branches both towards the east, paralleling US-30 and south along the east side of Polk Avenue.

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## OTHER NON-MOTORIZED CONSIDERATIONS

### CHEYENNE GREENWAY FOUNDATION

The Greater Cheyenne Greenway Map indicates that Van Buren Avenue is an On Street Bike route from Dell Range Boulevard to US-30. This is shown on the Greater Cheyenne Greenway GIS portal.



Figure 12: Greater Cheyenne Greenway Plans for Van Buren Avenue

### METROPOLITAN PEDESTRIAN PLAN (2010) CONSIDERATIONS FOR THE CORRIDOR

The Cheyenne MPO completed a city-wide Metropolitan Pedestrian Plan in 2010. The Van Buren Avenue corridor is in the East Central Cheyenne portion of the study. Dildine Elementary is a high pedestrian attraction for the project area. Other features that make the corridor attractive for pedestrian use is access to the Dry Creek Greenway. The pedestrian quality index in the area was considered moderate, which is a pedestrian level of service based on attractors, generators, and barriers. The intersection quality index along the corridor was also moderate. The route along Van Buren Avenue was depicted as a Priority Pedestrian Corridor in the Plan. The intersection of Van Buren Avenue and Dell Range Boulevard was considered a High Priority Intersection Improvement, which will be included in the intersection design for the Dell Range Boulevard reconstruction project. Sidewalks are the most fundamental element of the walking network. The Van Buren Avenue corridor is lacking in adequate sidewalk widths, except along the Dildine Elementary property itself. Figure 14 depicts the overall existing sidewalk condition of the corridor. Our survey work agrees with this diagram. The 35% for Van Buren Avenue design includes filling in the sidewalk gaps. The short and mid-term recommendations include prioritization of areas where smaller projects could be implemented for pedestrian travel improvement. The study also compared pedestrian infrastructure improvements across the metropolitan area. The Van Buren Avenue corridor was considered a moderate to high benefit to improve pedestrian accommodations. The highest benefits would occur from closure of critical pedestrian gaps, addressing immediate safety needs, and the improvement for many people by improving access to surrounding destinations. The Van Buren Avenue corridor as well as the Dell Range Boulevard and Van Buren Avenue intersection were recommended as a top priority project in the report.



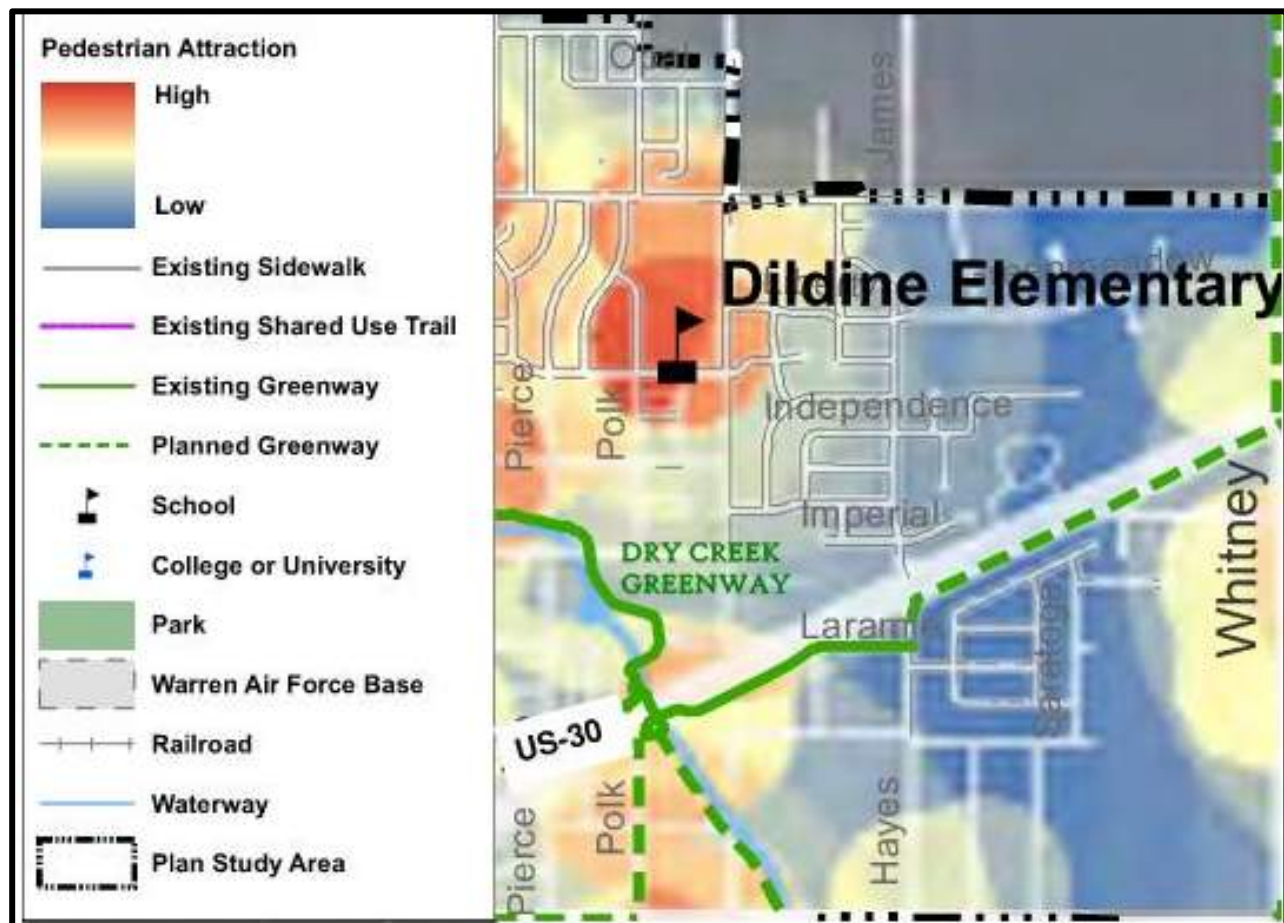


Figure 13: Composite Pedestrian Attractors, Van Buren Avenue Corridor (2010 Cheyenne Pedestrian Plan)



Figure 14: Pedestrian Infrastructure Updates Recommendations per 2010 Plan

## ***SAFE ROUTES TO SCHOOL PLAN (2010) CONSIDERATIONS***

The Dildine Elementary School building was remodeled, and the site was reconfigured in 2020 – 2021. Transportation issues with the site included congestion during school drop off and pick up. Kids were running across Van Buren Avenue in between buses and parents dropping off their kids. Traffic was backed up on Van Buren Avenue and nearby streets. The remodel provided separate bus parking on site. A southern parking lot with a drop off lane for parents was installed. Also, staff and teacher parking was provided on the west side of the school. This alleviated many of the concerns raised regarding the site in the 2010 Pedestrian Plan. The other remaining items to be addressed on the Van Buren Avenue corridor are insufficient or nonexistent sidewalks, high speeds, and the difficulty in pedestrian crossing of Dell Range Boulevard.

One of the remaining issues for this project and other sites in Cheyenne with schools, is the transportation method of students. Currently, there is a culture of parents dropping off students individually. This creates congestion and a more hazardous environment for school pick up and drop off. Parents are encouraged to utilize the school district bus system for transport of students to and from school if they live too far away to walk or ride their bikes. The school bus is the safest method of student transportation.



Figure 15: Reconfigured Dildine Elementary Site

## ***CHEYENNE ON-STREET BICYCLE PLAN AND GREENWAY PLAN***

The Cheyenne MPO together with Alta Planning + Design updated the Cheyenne On-Street Bicycle and Greenway Plan in 2012. At the time of the report, Van Buren Avenue was considered to have good access to the Dry Creek Greenway and have on-street bicycling facilities. Many of the streets in Cheyenne have adequate width to facilitate on-street bicyclists, but they are not striped to separate modes of traffic.

The plan also indicated that Rawlins and Green River Streets where they cross Van Buren Avenue should be bicycling boulevards. These are lower volume, lower speed streets that are optimized for bicycle travel and are designed for bicyclists who feel less comfortable riding with traffic. Treatments such as traffic calming, signage and marking, and intersection treatments are included in the bicycle boulevard design. This design is to encourage bicycle circulation and discourage non-local cut through traffic. At these intersections with Van Buren Avenue, treatments are included in the recommendations to promote the use of these areas as bicycle boulevard crossings and reduce speed and enhance safety.



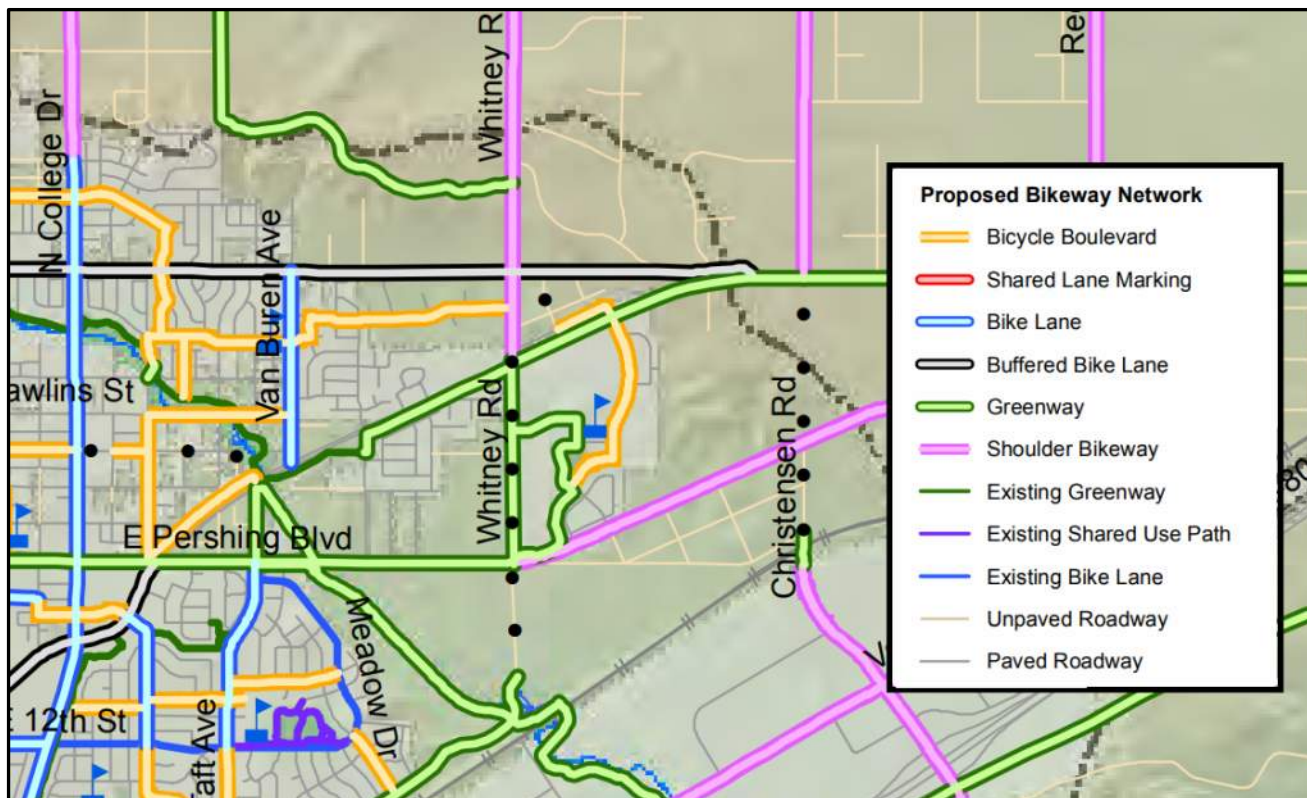


Figure 16: Proposed Bikeway Network in Van Buren Avenue Area from 2012 Bicycle and Greenway Plan

## ***NEIGHBORHOOD TRAFFIC MANAGEMENT PROGRAM (NTMP)– VAN BUREN AVENUE 2015***

Citizens living along Van Buren Avenue submitted a request for a traffic calming project in the fall of 2014, which resulted in this report. Many of the same concerns were expressed at that time as during this study:

- Speeding
- Accidents – especially at the intersection of US-30
- Lack of pedestrian amenities and safety

NTMP projects have a formula and need to generate at least 60 points to become fully eligible for the program. Generators include speeding, traffic volume, crashes, and pedestrian parameters. Van Buren Avenue generated 56 points at the time of the study and was therefore not considered eligible for the NTMP program. However, some improvements to the school zone signage and placement were implemented. Also, a marked crosswalk was installed at Liberty Street. This study was also recommended at that time for the fiscal year 2016-2017.

## **Survey**

The Van Buren Avenue Corridor was surveyed to establish the existing Right of Way (ROW) widths. The existing plats were collected and reviewed and can be found in APPENDIX B – SURVEY PLATS. Field work and investigation of monuments from the plats was incorporated into the Computer-Aided Drafting (CAD) files. The results of this effort are summarized in Figure 17. Recommendations on ROW widths for the corridor are also shown in the figure and discussed below.



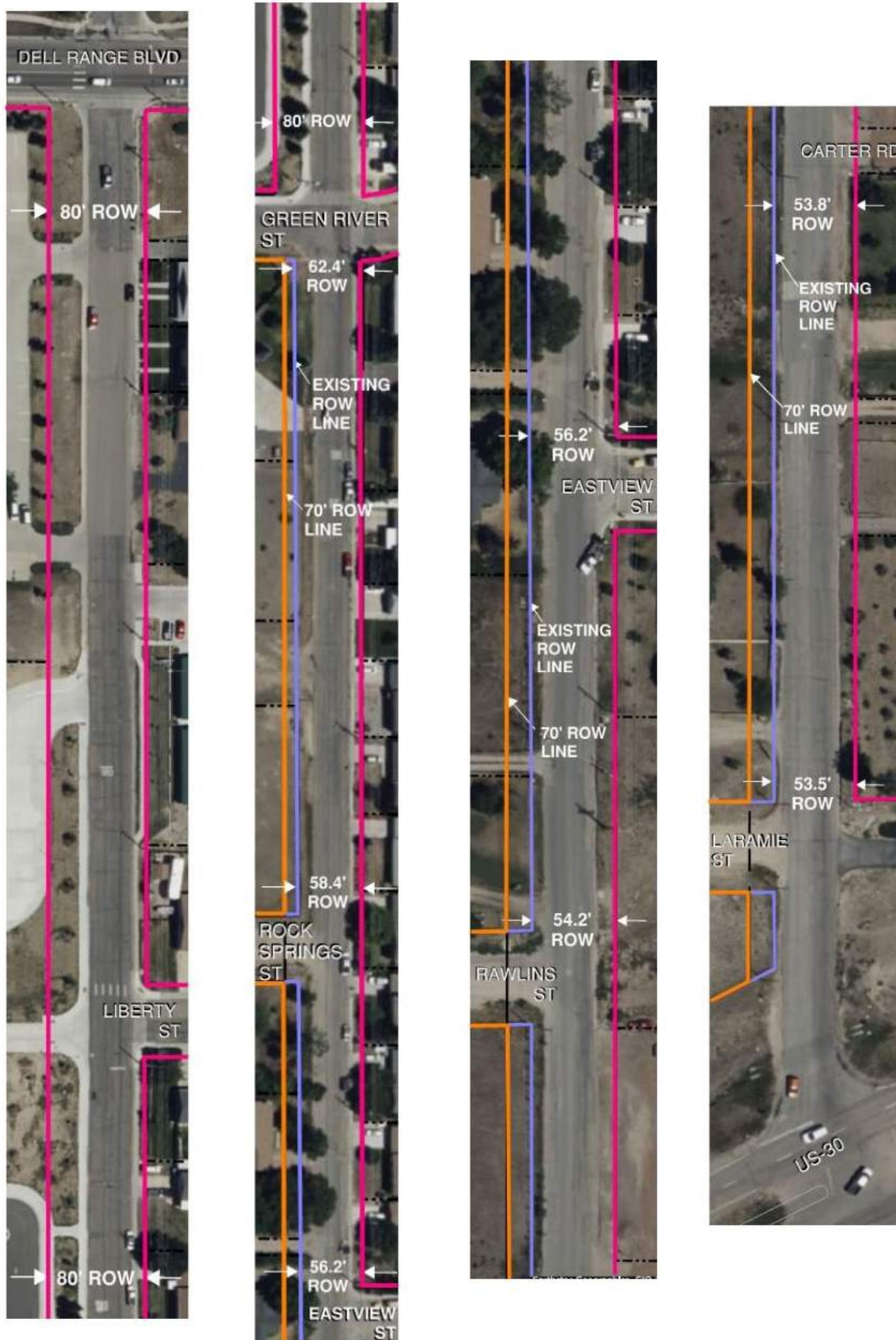


Figure 17: Existing ROW Along Van Buren Avenue and Proposed 70' ROW Line

## **SURVEY RESEARCH RESULTS**

The width of the right-of-way within the corridor is unusual as it varies from 80 feet in the northern limits to approximately 50 feet at the intersection with US-30. The east boundary of the Van Buren Avenue right-of-way is controlled by the W-1/16<sup>th</sup> Section Subdivision line of Section 26, T14N, R66W while the west boundary is described in various subdivision plats. Beginning on the north extent of the corridor, the Imperial Subdivision Plat describes an 80-foot right-of-way between Dell Range Boulevard and Green River Street. However, the corridor south of Green River Street is not a fixed width as it follows the boundaries of the section subdivision lines. Beginning on the south line of the NW¼ NW¼ Section 26, T14N, R66W, also being the northeast corner Tract 320 of Sunnyside Addition 7<sup>th</sup> Filing, the width of the right-of-way is 62.4 feet. On the north side of Rawlins Street, also being the southeast corner Tract 321 of Sunnyside Addition 7<sup>th</sup> Filing, the right-of-way width is 54.2 feet and reduces to 52.55 feet at the southeast corner Tract 257 of Sunnyside Addition 6<sup>th</sup> Filing. The Van Buren Avenue ROW at the intersection with US-30 is a proportional width as created by the subdivision plats.

## **SURVEY FIELD WORK**

Land surveying activities included field investigation for land surveying monuments, existing conditions, and utility locations. Special attention was given to finding monuments necessary to establish the W-1/16<sup>th</sup> Section Subdivision line of Section 26, T14N, R66W and block corners of the subdivision plats mentioned above to identify the right-of-way conditions through the corridor. Consideration was given to the Record of Survey Plat for the Cheyenne US 30 Pershing Boulevard as recorded in Book 2768 at Page 2621 when describing the dimensions and survey record for the intersection of Van Buren Avenue and US-30.

## **FUTURE SURVEY WORK RECOMMENDATIONS**

For future surveys, it is recommended that the first item is a retracement of at least the W-1/2 of Section 26 T14N R66W, and the whole section, if the Quarter-Corners are not able to be located. The right-of-way is dimensioned from the W-1/16<sup>th</sup> line, where the east boundary is the W-1/16<sup>th</sup> line. Determining where the north line of the section is would also determine the north boundary of the corridor as it is bounded by the Dell Range Boulevard right-of-way, which is based off the north section line.

The second recommendation would be to reestablish or relocate the block corners along the corridor for Imperial Valley, Sunnyside Addition 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> filings, Minnie French Addition, Debilyn Estates, and Del-Van Storage Park. This would close any gaps on the east boundary of the right-of-way, and it would also determine the west boundary of the right-of-way. Further, it would verify there are no encroachments on the west boundary of the right-of-way. In order to determine where the south boundary of the corridor is located, it would be necessary to determine the north boundary of US 30 which may be on a curve that would require extra attention.

Another general recommendation would be to have a better understanding of where the water lines, sewer and storm sewer lines are located to incorporate those in the design of the road. It is also recommended, depending on the engineering plans, to collect surface elevation data to help with the grading and drainage designs. It is recommended that control points are established to assist in the design and construction of the road.

There is an undescribed 16 feet on the east side of Van Buren Avenue Ave, between the properties located at 3611 and 3701 Van Buren Avenue. The 16-foot strip falls onto Tract 241 from the Sunnyside Addition 6<sup>th</sup> filing. Tract 241 is split among the properties, 5208 Laramie St (Book 1334 Page 1220), 3611 and 3701 Van Buren Avenue (Book 2684 Page 734; Book 1271 Page 458), Carter Road (a Private Road; Book 10 Page 118 of the plat cabinet), and 5216 Carter Road (Book 2297 Page 1275). These deeds do not fully describe the Tract, and it is recommended for future surveys to resolve this issue.

## **ROW RECOMMENDATIONS**

Discussions with the steering committee resulted in a proposed ROW width of 70-feet south of Green River. The desired 80-foot ROW does not continue for the entire length of the Van Buren Avenue corridor. A 70-foot width conforms to the Unified Development Code (UDC). This project is modifying the street design to best fit all facilities of operation on a road network.

The design provides a balance between providing amenities such as full width sidewalks, bike lanes, landscaping strips, and parking on one side of Van Buren Avenue, without acquiring the full 80-foot width. However, cost estimates are provided for both options of 70- and 80-foot widths for comparison.

## Utilities

UCS was subcontracted to aid in the location of utilities along the project corridor. The following sections discuss the utilities located and included in the CAD file. Storm sewer infrastructure is discussed in the drainage section of this report.

The following considerations and assumptions were made relating to known utility infrastructure adjacent to and within the Van Buren Avenue right of way:

- Known utility owners were contacted within the corridor to obtain information on existing utility infrastructure. Those entities include:
  - Board of Public Utilities (BOPU) for water and sewer
  - City of Cheyenne for storm sewer
  - Black Hills Energy (BHE) for electricity and gas
  - Bluepeak, Centurylink, and Charter Communications for communications
- It is assumed that the information we received from the entities is reasonably complete.
- UCS provided markings for dry utilities, which were included in the survey data gathered. Valves and manholes were also surveyed. The information was put into the CAD files and checked with the GIS information provided by the City and BOPU as well as verification in the field, through photos, Laramie County GIS aerial photography, and Google Earth.
- It is assumed that the utility information obtained and mapped for this project is sufficient for the 35% design for the project.
- Additional utility information collection and verification is recommended for 100% design and construction along the corridor in the future.

## COMMUNICATIONS

Communication utilities include telephone and fiber optic utilities lines and components. From Dell Range Boulevard south to Liberty Street, lines run along the east and west sides of the corridor. The line along the west side of Van Buren Avenue runs south to the Dildine Elementary property and then kicks west to connect to the school building. Various connections were located along the east part of the corridor down to Liberty Street. From Liberty Street to Rawlins Street communications utilities are on the east side of the corridor. There are two lines surveyed that cross Van Buren Avenue at the intersection with Rawlins Street.

There is a telephone line that runs along the west side of Van Buren Avenue down to Laramie Street. According to the US West records, the line ends at Laramie Street and does not proceed farther south.

The design takes the locations of the communications utilities into account, especially on the southern part of the corridor where street widening will be required. When full design and construction is implemented along the corridor, it is recommended that these utility locations be reconfirmed.

## SANITARY SEWER

The BOPU provided Geographical Information System (GIS) for the sanitary sewer system along the project corridor. The sanitary sewer system flows to the south. The mainline is mapped as an 8-inch diameter pipe. There is an increase in diameter from 8-inch to 15-inch at the intersection of Van Buren Avenue and Eastview Street. There is a tie in at the intersection with Rawlins Street. It appears that this allows some of the flow to proceed west down Rawlins Street before turning south. Carter Road ties in with a 15-inch line as well. The sewer then turns west towards Dry Creek in the 3608 Van Buren Avenue Parcel, turns to the southwest and joins with a 30-inch line from the west. After the confluence of those lines, the sanitary sewer proceeds



south and southeast, roughly parallel to Dry Creek. County pocket properties south of the westerly turn of the sanitary sewer do not appear to be connected to the City sewer system.

## **WATER**

A 12-inch water main runs along the western edge of Van Buren Avenue. The main line extends just south of the intersection of Rawlins Street and then ends. At Rawlins Street it tees and then runs towards the east and turns south again at Pierce Avenue. The main line running north of the Dell Range Boulevard and Van Buren Avenue intersection is an 8-inch line. There are several 8-inch lines that tee off the 12-inch line along Van Buren Avenue. There are 8-inch ties to the north of the Dell Range Boulevard and Van Buren Avenue intersection, at the self-storage facility, Liberty, Green River, and Eastview Streets.

Eight fire hydrants are located along the study corridor. Four of them are located between Green River Street and Dell Range Boulevard. The other four are located between Green River and Rawlins Streets. There are no other hydrants located south of Rawlins Street. It is recommended that as parcels are annexed into the City and utilities are extended to the existing county pockets that additional fire hydrants be installed to meet the minimum spacing requirements.

## **ELECTRICAL POWER LINES**

The corridor is primarily fed electricity via overhead power lines. The lines run along the east side of the road from Dell Range Boulevard south to just north of Rawlins Street. From just south of Rock Springs Street to US-30, an overhead power line runs along the west side of the corridor. Thus, there is a section of road, approximately 350 feet long, that has overhead lines running on both sides of the right of way with some lines run over Van Buren Avenue. On the south end of the corridor, power transitions from overhead to underground and appears to run parallel with US-30.

The southern portion of the corridor has limited ROW. Per the UDC a collector is to have a minimum ROW width of 70 feet. The southern portions (as discussed further in the survey section) are as narrow as 50 feet. Due to this limited ROW, there are utilities and other infrastructure obstructing a full width collector corridor for Van Buren Avenue. The overhead power lines are one of these obstacles. As can be seen in the picture below, power lines and pad mounted equipment are located adjacent to the existing roadway. These will have to be relocated to accommodate the future 70-foot typical section. Electrical locates are proposed on the west side of the corridor from Rawlins Street down to Laramie Street.



Figure 18: Existing Electrical Utility Infrastructure along the Van Buren Avenue Corridor

BHE was contacted to discuss the corridor study and options for dealing with the power lines. The Construction Manager, Jeff McMann, provided background information on the agreement nature between the utility and the City. Powerline relocation could be accomplished in one of three ways:

1. The existing overhead infrastructure would be rebuilt at the edge of the new ROW lines. This is the simplest and most cost-effective alternative for BHE.
2. The existing overhead infrastructure would be converted to underground. This could be at the request of the City of Cheyenne because the City is the controlling authority. In this instance, the City would have to provide easements for the lines and pad-mounted equipment. This option is more expensive than option 1. The costs are passed on to the Cheyenne rate payers. The City can help with facilitation and costs for this option to reduce the pass on rate increases to the utility users.
3. Rerouting and converting the utility to underground would be the third option. This is the most expensive option. Again, easements would be required. Aid in lowering costs to the utility users would also be acceptable.

BHE also requests two years of notice prior to the start of any project to deal with planning and obtaining supplies for a project of this size.

The plans incorporate relocation of the overhead powerlines according to option 1. The powerlines in the 35% design plans are shown in the 8-foot landscaping strip between the detached sidewalk and the top back of curb.

## **GAS**

Natural gas is provided along the corridor by BHE. From Van Buren Avenue to Green River Street, the gas line runs in the western third of the asphalt section. Just north of Green River Street, the main line shifts over to the eastern third of the asphalt section of the road. The gas line was mapped to just south of Laramie Street where it ended. It appears that each lot has its own gas service. There are currently plans to relocate to the west side of Van Buren Avenue from Dell Range to Rawlins. This has been noted in the 35% plans. The gas line will not provide any obstacles horizontally for upgrading the corridor. When the corridor is reconstructed, the gas line will have to be considered for areas where the elevation of the road is proposed to change.

## **EXISTING AND NEAR FUTURE DRAINAGE CONDITIONS**

The Van Buren Avenue Corridor is located within the Dry Creek Drainage Basin. The Dry Creek Basin has strict drainage requirements due to limited capacity where it flows under the Union Pacific Railroad at the southeast corner of East Park. As additional development is made in the Dry Creek Basin, the City of Cheyenne requires that sites undergoing redevelopment meter flow for the 100-year post development storm down to the 20-year pre-development storm flow rate. This means that as surrounding areas are redeveloped and as sites are redeveloped, the peak runoff rate should continue to decrease.

The existing stormwater infrastructure is limited to surface runoff in curb and gutter on the north side of the corridor. The presence of curb and gutter lessens proceeding south along the corridor. There is one stormwater inlet on the corridor on the east side of the road at the intersection with Rawlins Street. This inlet ties into the existing stormwater line that runs to Dry Creek. There are three culverts that were found to run north-south along the corridor. Two of them are for driveway accesses and one is located at the intersection of Rawlins Street and Van Buren Avenue. There are two culverts that run east-west in the ditch north of the intersection with US-30. The existing culverts are corrugated metal pipe and will be replaced with 3 RCP culverts when US-30 is reconstructed (see Figure 9).

The County Supplied Light Detection and Ranging (LiDAR) (Laramie County 2021) contours were used to delineate the catchment areas for the project. The delineated basins are shown in Figure 19. The drainage area contributing to the Van Buren Avenue flow begins approximately 1,500 feet north of the intersection of Van Buren Avenue and Dell Range Boulevard. The existing topography and curb and gutter section creates a relatively narrow drainage basin. Just to the west of Van Buren Avenue, stormwater flows westward and into Dry Creek. Along the east side of Van Buren Avenue from Dell Range Boulevard to Rawlins Street the stormwater flow drains into the stormwater detention pond that was built as part of the Imperial Valley Subdivision. This stormwater pond currently ties into an existing underground stormwater pipe that outlets into Dry Creek. Areas farther east flow to the east and do not directly affect the drainage in this corridor.

The drainage area calculated on Van Buren Avenue using the above information is 23.2 acres. The highest elevation is located on the north side of the area at 6085 feet. The lowest elevation is 5980 feet, and it occurs approximately 70 feet south of Carter Road. The average slope is about 2% proceeding south. South of this outlet, the grade of Van Buren Avenue goes uphill for 340 feet. This area also flows to the low spot on Van Buren Avenue. South of the crest of the hill, stormwater flows south and into the US-30 open ditch drainage system. An impervious area of 30% was used for calculating the peak stormwater runoff. This impervious percentage is in line with the 1988 Dry Creek Drainage Master Plan and is conservative for the ultimate development condition. A peak runoff for the developed condition for a 100-year storm was calculated at 48.6 cubic feet per second (CFS). See Appendix C for Drainage Calculations.

The Dell Range – Van Buren Improvements project will directly affect the volume of stormwater runoff on the outlet point of Van Buren Avenue. As part of this study, the proposed storm water infrastructure has been incorporated into the plans. There are 6 inlets that will be installed along the Van Buren Avenue corridor. Two will be installed on the north side of the intersection with Liberty Street and two more will be installed on the northside of the Green River Street intersection. Another inlet will be located on the northeast side of the Rock Springs Street intersection. Finally, another inlet will be installed southeast of the Eastview Street intersection.

The proposed outlets will greatly reduce the surface flow rate from storms on Van Buren Avenue. Existing street capacity calculations were calculated according to the Mile High Flood District (MHFD) Chapter 7 Guidance, "Streets, Inlets, and Storm



Figure 19: Existing Drainage Basins in the Van Buren Avenue Corridor Area



Drains". It was found that there are several flatter spots in the existing profile of the road that would allow overtopping of the curb (or a depth of at least 6") in the minor and major storms. This indicated that improvements to the road profile are needed. Once the Dell Range – Van Buren stormwater improvements are installed, the minor storm will not exceed the curb capacity. The proposed inlets will essentially eliminate minor storm flow (10-year storm) along the corridor. The 10-year peak flow in the basin is 12.3 CFS and the designed inlet capacity for the six inlets along the corridor is 14.4 CFS.

The major storm, 100-year event, will create stormwater runoff volumes that are greater than the capacity of the new stormwater infrastructure. The Dell Range – Van Buren Improvements report estimated 23.3 CFS at the low spot in Van Buren Avenue. The calculations performed for this report resulted in a very similar number of 24.3 CFS at the same point. The recommended stormwater design addresses this overflow rate in the Phase 2 section of this report.

## Traffic and Safety Analysis

### TRAFFIC MODEL

The Cheyenne MPO traffic model was utilized for this study. The model traffic volumes for 2019 and 2045 are shown in the figure below. In the 2019 condition, there was very little traffic on Van Buren Avenue north of Dell Range Boulevard, since there were only a few houses at the time. Traffic volumes are projected to increase from almost negligible numbers to 2,830 vehicles per day (vpd) by 2045. The northern two thirds of the corridor, between Dell Range Boulevard and Rawlins Street, is predicted to see an increase in daily traffic of 2,200 vpd. The increase in traffic is approximately 1,000 vpd between Rawlins and Laramie Streets. South of Laramie Street, the increase is about 400 vpd. The peak traffic along the corridor is predicted to be under 4,300 vpd in 2045.



Figure 20: Cheyenne MPO 2045 (Top Number) and 2019 (Bottom Number) Traffic Volumes

### SPEEDING

The Cheyenne MPO conducted a speed study on the corridor for north bound and south bound traffic. The locations of the speed study were south of Dell Range Boulevard, north of Green River Street, north of Rock Springs Street, north of Rawlins Street, and north of Laramie Street. The speed study was conducted from August 31, 2022, through September 15, 2022. Speeding is

common along the 30 MPH corridor. Locations with the highest measured 85<sup>th</sup> percentile speeds are north of Rawlins (42.2 MPH) and at Green River (39.7 MPH) Streets. Southbound speeds tend to be higher – perhaps due to downhill grades. The intersections of Green River and Rawlins Streets are a focus in the recommendations for reducing speed. This is due to the more apparent speeding at these locations and the delineation of the intersections as bicycle boulevards in the 2012 Bicycle and Greenway plan.

## INTERSECTION ANALYSIS

Under the 2022 analysis period, the northbound approach to Dell Range Boulevard is currently experiencing a Level of Service (LOS) of D due to drivers attempting to turn left onto Dell Range Boulevard from Van Buren Avenue. The installation of a traffic signal will improve this level of service in the future. The intermediate intersections along the corridor (Green River Street to Laramie Street) function at a LOS of A or B through 2045. The intersection at US-30 projects an LOS of C in 2045 for vehicles turning onto the WYDOT road from Van Buren Avenue. The intersection analysis only requires changes at the Dell Range Boulevard intersection, which are planned for another project.

## CORRIDOR CRASH HISTORY

The Wyoming Department of Transportation (WYDOT) Highway Safety Crash Data Analysis was contacted regarding crashes and incidents along the corridor. Years 2012 through 2021 were obtained to analyze the crash history and patterns.

**Intersection of US-30 and Van Buren Avenue:** This intersection had 22 crashes between January 2012 and December 2021 (see Figure 21), including six injury crashes (red circles) causing ten injuries, and 16 property damage crashes (green circles), giving a 37.5% injury rate. There were ten angle crashes, six rear-end crashes, and four run-off-road crashes. Eighteen crashes were coded as ‘intersection related.’

Injury crashes occurred as follows:

1. A southbound rear end crash on February 10, 2012, resulting in one possible injury. It was dark and snowing and the road surface was icy/snowy.
2. On October 3, 2013, a westbound driver entered the median and collided with a sign support, resulting in one possible injury. It was daylight, the weather was clear, and the road surface was dry.
3. An eastbound angle crash on September 19, 2014, resulted in one suspected minor injury.
4. On May 13, 2016, an eastbound driver turned north and failed to yield to a westbound driver on US-30 causing an angle crash and three possible injuries. It was daylight, the weather was clear, and the road surface was dry.
5. On Sept 4, 2019, a westbound vehicle left the roadway while avoiding another vehicle and struck a sign support, resulting in three suspected minor injuries. It was daylight, the weather was clear, and the road was dry.
6. On February 20, 2020, a westbound driver turned right without signaling and collided with another westbound vehicle, resulting in an angle crash and one possible injury. It was daylight, the weather was clear, and the road was dry.

**Intersection of Dell Range Boulevard and Van Buren Avenue:** This intersection had three crashes between January 2012 and December 2021 with no apparent pattern. The single injury crash occurred as follows:

1. An angle crash on May 8, 2018, resulted in two suspected minor injuries. A northbound driver sped through the stop sign and collided with an eastbound vehicle. It was daylight, the weather was clear, and the road was dry. Alcohol was reported.

**The Van Buren Avenue Corridor:** The corridor had three reported property damage crashes between January 2012 and December 2021. They occurred as follows:

1. On Jun 28, 2019, a southbound driver rear-ended another southbound vehicle near Laramie Street. There was no injury. It was daylight, the weather was clear, and the road was dry.

2. On May 8, 2018, a northbound driver ran off the road and struck a mailbox north of Rawlins Street. It was daylight, the weather was clear, and the road was dry.
3. On Nov 7, 2020, a northbound driver was speeding / reckless and struck a vehicle parked on the east side of the road north of Eastview Street. It was dark, the weather was clear, and the road was dry. Alcohol was reported.



Figure 21: Crash History Map



# ROAD SAFETY AUDIT

A Road Safety Audit was conducted on Tuesday morning, November 22, 2022. Participants included the following Individuals:

|                           |                                      |                            |
|---------------------------|--------------------------------------|----------------------------|
| • Mr. Gary Grigsby PE     | Traffic Engineer                     | Y2 Consultants             |
| • Ms. Adrienne Lemmers PE | Design Engineer                      | Y2 Consultants             |
| • Mr. Ed Waddell          | Transportation Planner               | Y2 Consultants             |
| • Mr. Chris Gleckler      | Customer Service Supervisor          | US Postal Service          |
| • Ms. Daniell Kramer      | Mail Carrier, Van Buren Avenue Route | US Postal Service          |
| • Sgt. Ryan Trimble       | Sergeant                             | Cheyenne Police Department |
| • Officer J. Monnett      | Patrolman                            | Cheyenne Police Department |

Participants met first near the intersection of Van Buren Avenue and US-30, which has the highest number of injury and property damage crashes along the corridor. Participants discussed public safety experience and concerns at the intersection and on US-30, as well as postal carriers and customers along Van Buren Avenue. The study team also contacted adjacent businesses for comment.

Road Safety Audit (RSA) participants began the evaluation at the Van Buren Avenue US-30 intersection and proceeded north to Green River Street.

In general, the police stated that inattention and laziness are the largest problems that police encounter with drivers. The police also noted that City of Cheyenne traffic enforcement police only have two or three officers on duty and patrolling within the city limits at a given time.

General Recommendations:

- The speed limit along the entire street should remain at 30 MPH. During school periods, the speed should be reduced to 20 MPH near the school.
- There should be better striping along the entire corridor.
- Drainage depressions could be retained for speed control.
- Photo enforcement in school zones or along the entire corridor may help with speeding.
- Feedback speed signs are helpful for slowing most people down.
- The entire street should have curb and gutter on both sides.

## Public Participation – Meeting #1

The first public meeting was held on January 25, 2023, from 6:00pm to 7:30pm at Dildine Elementary School (4312 Van Buren Avenue). Eighteen members of the public attended the event. Interactive posters were set up in the meeting room. These posters provided potential solutions for different aspects of the corridor. The public was invited to take stickers and vote on which options they preferred. Pictures of the posters along with the sticker “votes” are included in Appendix D.

### Drainage Options

Subsurface (inlets) versus surface drainage was presented. Six stickers were placed on the subsurface option, while none were placed on the surface drainage option.

### Speed Options

Mid-to-long term options were presented. These options included crosswalk marking and signage, bump outs (like those detailed for downtown Cheyenne), reduced curb radii, and drain pans. All the speed options, except the drain pans, had three to four stickers placed on them.

Short-term speed options were also placed on a poster. Those options included improved striping, camera speed enforcement, feedback speed signs, and increased signage along the corridor. The striping and feedback sign both had four stickers. The camera speed enforcement had one, and increased signage had none.

**Non-Motorized Options**

Mid-to-long term options were provided. This included multi-use pathways (such as a greenway type design), sidewalk installation and infill (as recommended in the 2010 Pedestrian Plan, see Figure 14), and a mini roundabout. The sidewalk and multi-use pathway each received one sticker. Five stickers were placed on the mini-roundabout option.

Short term non-motorized options included signage and marking for shared bike and traffic lanes as well as dedicated bike lanes. The bike lanes that were separated from traffic lanes were preferred with six stickers to none on the shared usage.

Aerial images of the corridor were laid out on tables and participants were invited to write comments on them. One of the aerials received a comment about drainage issues for cross streets at the intersection with Eastview Street and another note called out winter snowplow and icing issues at the low spot concrete valley pan just south of Carter Road.

**Website and Survey**

A Social Pinpoint Website was built for the project to provide additional opportunities for public engagement. The website is hosted at the following address, or use of the QR code:

<https://y2consultants.mysocialpinpoint.com/van-buren-avenue-corridor-plan>



The website hosted an interactive GIS map of the corridor, surveys, a forum, announcement of public meetings, and information on progress of the project phases.

The first survey had 25 responses between responses on the Social Pinpoint site (12 responses) and those that filled out the survey at the meeting (13 responses). Speeding, child safety, sidewalks and streetlights were of the highest concern to residents along the corridor. Mailbox access was also mentioned by multiple citizens. The intersections of greatest safety concern were Dell Range Boulevard and US-30, on the north and south ends of the project respectively. The surveys are included in their entirety in Appendix D.

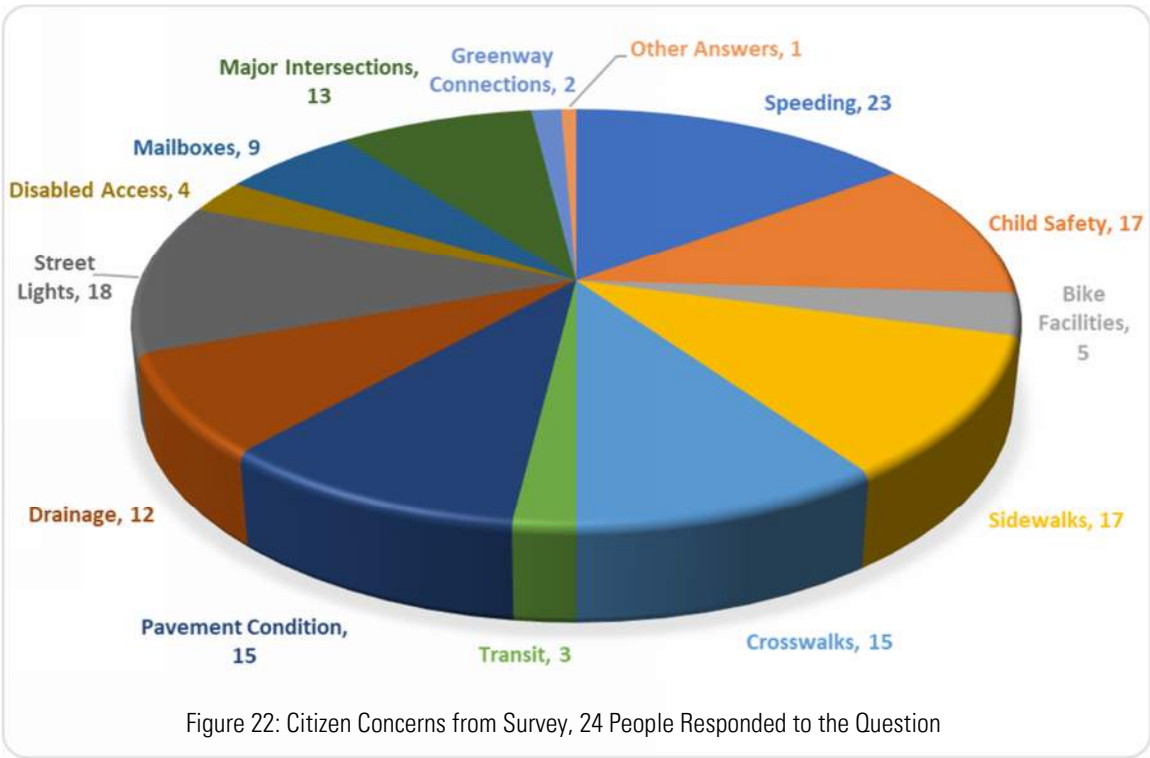


Figure 22: Citizen Concerns from Survey, 24 People Responded to the Question

## PHASE 2

### Public Participation – Meeting #2

The second public meeting was held on June 1, 2023, from 6:00pm to 7:30pm at Dildine Elementary School (4312 Van Buren Avenue). The attendance was similar to the first meeting, with 18 people from the public attending the meeting. The public was invited to discuss comments and concerns with Y2 Consultants, the Cheyenne MPO, Laramie County Public Works, City Engineering and City Planning Offices. A presentation of the project design highlights was given. This included requirements for ROW from Green River Street to US-30, typical sections, the proposed roundabout and drainage.

Multiple residents mentioned speed tables as a solution for reducing vehicle velocities. However, this type of solution is not installed on major collectors in Cheyenne.

Another survey was presented to the public both at the meeting and on the website. There was a total of 12 responses to the survey. The first question of the survey was whether participants felt that sufficient opportunity had been given to provide input on the project. Eleven people responded to the question. Ten felt they had been given sufficient opportunity and one did not. An open-ended question regarding whether concerns had been addressed or not was asked. A couple of respondents did not like the additional amenities of the bike lanes, sidewalks, and landscaping. Maintenance of the sidewalks (shoveling the snow) and the landscaping strip was a concern. Concerns over speed and the mailboxes were mentioned, which is similar to the first public meeting.

There was a comment stating that the proposed improvements would, “require removing well-established Trees and Landscaping”. Care was taken in the design and layout to preserve most trees along the corridor. Also, the reduced expansion of ROW (to 70 feet instead of 80 feet) limited the amount of required tree removal. This project is only a 35% design, full design will take into account the existing trees and landscaping to minimize both disturbance and cost.

The mini roundabout had received good feedback in the first public meeting. However, five out of 11 respondents responded positively toward the proposal, 6 out of 11 responded negatively to it at the second meeting. There was another suggestion of speed bumps being used instead of a roundabout. About half of the respondents felt that drainage had been adequately addressed on the corridor and others did not.

### Corridor Recommendations

The following sections break out the major plan recommendations for the Van Buren Avenue Corridor. They have been broken out according to the timeframe in which they can be implemented. Short-term recommendations are lower cost, lower disturbance type items that can be incorporated. These short-term recommendations can be incorporated into the mid-term recommendations as well. Mid-term recommendations include higher cost and higher disturbance type projects. They are smaller construction projects that would not include the entire corridor. Long-term recommendations include reconstruction of the corridor and short to mid-term recommendations can be included as well with these options.

### SHORT-TERM IMPROVEMENT RECOMMENDATIONS

#### **STRIPING**

It is recommended that the entire corridor be striped. This requires no destructive or invasive type construction. Striping could be used to retrofit existing streets to accommodate bike lanes via the “Road Diet” option. This striping scenario provides better bicyclist accommodations both on the corridor and at the intersection of bicycle boulevards. Figure 23 shows the typical striping layout for the fully reconstructed corridor. Similar striping can be accommodated with the existing pavement as discussed below.



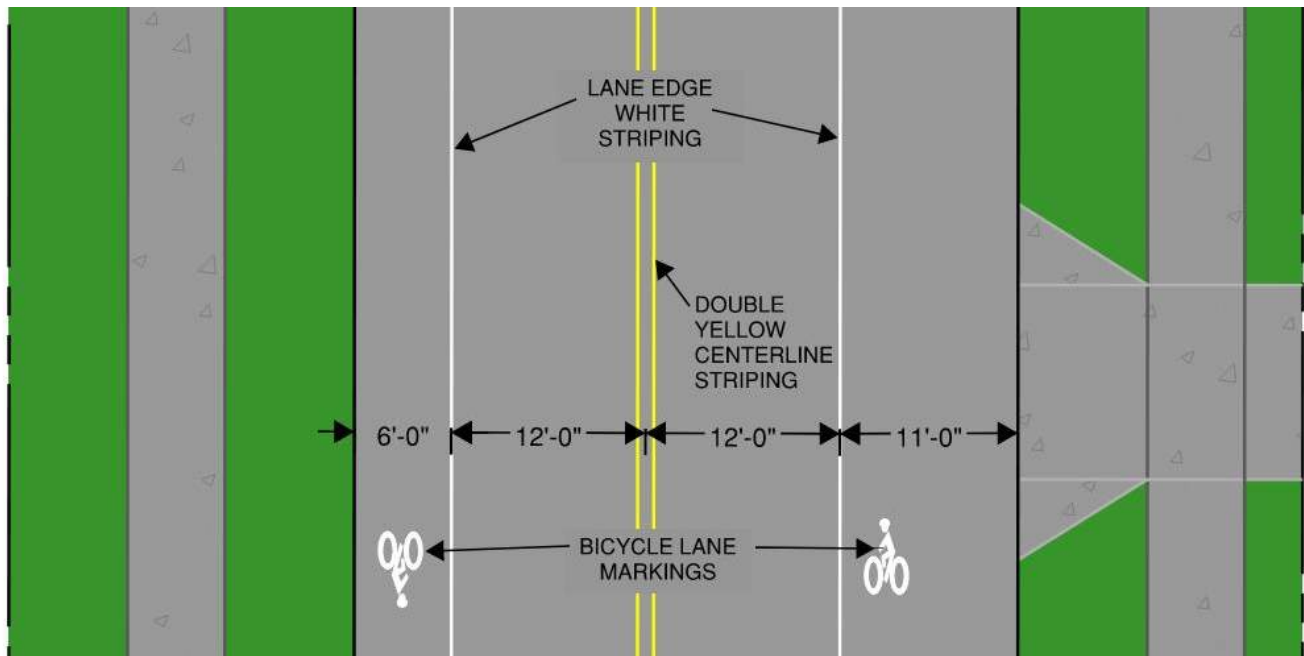


Figure 23: Typical Striping for the Van Buren Corridor

Implementation of pavement striping on roadways is another option for speed reduction, and there are many benefits to using this technique. Some of the most prominent benefits are low costs, low detriment to emergency services, no impact on drainage, and they can easily be removed or changed if the need arises. One study, *Roadway Striping as a Traffic Calming Option*, focuses on striping centerlines, edge lines, medians, chokers, chicanes, and speed “humps” without the physical bump. These pavement striping techniques reduce the driver’s perceived width of the roadway. The seemingly smaller width of the road causes drivers to reduce their speed. The study states that “a combination of both centerline and edge line striping is the most effective method of reducing the overall travel way width of the roadways.” Striped medians, chokers, chicanes, and speed humps are other options for reducing perceived roadway width that don’t require different horizontal or vertical alignments of the roadway. According to the study, “traffic calming striping can typically result in speed reductions of approximately one to seven miles per hour depending on the situation.”

A report from the Federal Highway Administration, *Factors Influencing Operating Speeds and Safety on Rural and Suburban Roads*, also details speed reduction treatments on suburban roadways. Some of the techniques from the report that are applicable to this project are transverse markings, optical speed bars, and speed limit on pavement markings. Transverse markings are transverse bars painted across the travel lane that are spaced progressively closer together, which creates the illusion that the driver is increasing their speed and will slow down. Transverse markings marginally reduce 85<sup>th</sup> percentile speeds. Optical speed bars are very similar to transverse markings, but they are placed on the edge of the lane and are only 12-18 inches in size. Optical speed bars have been shown to reduce 85<sup>th</sup> percentile speeds by 0-5 mph. The technique of painting the speed limit on the pavement is meant to remind drivers of the speed limit. These speed limit markings have been shown to reduce 85<sup>th</sup> percentile speeds by 1 mph. This method of speed reduction is proposed near Rawlins Street. Pavement markings near the elementary school would be confusing due to the variable speed limits depending on when school is in session or not.

From Dell Range Boulevard south to Green River Street, the existing width from back of curb to back of curb is 39 to 40 feet wide. This would allow for a double yellow centerline stripe, as well as white striping on the outside of each lane. An eleven-foot shared parking and bike lane could be provided on the east side of the road and a 4-to-5-foot bike lane could be provided on the west side of the road.

Part of the short-term striping enhancements recommendation is to restripe the pedestrian crossing at Green River Street and Van Buren Avenue. On top of reapplying the thermoplastic for the crossing, additional "SLOW" markings are proposed on the roadway prior to stop bars and markings to aid motorists in seeing and adhering to the need to slow down for pedestrians.

South of Green River Street, the pavement width varies. Curb and gutter is usually present on the east side of the road and the width from the edge of asphalt to the back of curb is typically 34-feet. These sections would allow for yellow centerline striping as well as a white stripe west of the southbound travel lane for a 10-foot parking area. This could also serve as a mixed bike lane but is narrower than what is recommended in the UDC. Delineating parking on the west side of the street would alleviate parking on both sides of the road that reportedly reduces the roadway width to one-lane as has been reported by some residents.

In sections of the corridor south of Green River Street where there is no curb and gutter, the pavement width is about 37 feet wide from edge of asphalt to edge of asphalt. This would allow centerline striping, a mixed parking and bike lane on the west side, and a narrow shoulder on the east side of the road that could provide additional room for bicyclists.

## **FEEDBACK SPEED SIGN**

As stated previously, speed reduction is desired on the corridor to enhance the safety of the students nearby, bicyclists and the general public. The intersection of Van Buren and Rawlins experiences the highest speeds within the corridor according to the speed study. A feedback speed sign is recommended for the Rawlins intersection. This type of improvement will help with those drivers who don't realize how fast they are traveling. A sign for both north- and southbound traffic would be optimal. However, if only one sign were to be implemented, a feedback speed sign for the southbound traffic would be the most beneficial.



Figure 24: Variable Speed Sign

## **CROSSWALKS**

There are existing crosswalks at Liberty and Green River Streets. It is recommended that these crosswalk markings be maintained. Also, at Green River Street, "SLOW" pavement markings or yield triangles could be implemented to aid in bringing additional driver attention to the crosswalk. This area is currently experiencing significant speeding and is adjacent to the school, so additional markings may reduce driver speed and increase driver awareness.

It is also recommended to install crosswalk markings and signs at Laramie Street. The long-term improvement recommendations and 35% design include sidewalks and bike lanes that will terminate at this location and direct non-motorized traffic west down Laramie Street toward the Dry Creek Greenway. It is undesirable for non-motorized traffic to attempt to cross US-30 since there is an existing underpass located on the Dry Creek Greenway and the speed limit is 55 MPH on US-30.

## **MID-TERM IMPROVEMENT RECOMMENDATIONS**

### **STREET TREES:**

The term "street trees" refers to trees located within the right of way. Street trees have many benefits, one of which is reducing the speed of drivers. One study, *The Street Tree Effect and Driver Safety*, found that streets lined with trees reduced speeds and were perceived to be safer by the drivers. The study also states that "for the suburban landscape, the presence of trees significantly dropped the cruising speed of drivers by an average of 3.02 mi/hr. Faster drivers and slower drivers both drove slower with the presence of trees." These reduced speeds lead to less severe accidents, and overall safer streets for drivers and pedestrians. Street trees do require irrigation and maintenance. It is proposed that street trees are incorporated into the intersection area as redevelopment occurs. Those trees that would be installed as part of the redevelopment would be the property owner's responsibility to plant and maintain.

## **DRAINAGE DESIGN**

The estimated peak flow rate at the low point in Van Buren Avenue is estimated to be 24.3 CFS. It is proposed that two Type A single inlets be installed at the low point of Van Buren Avenue to direct the stormwater flow towards Dry Creek. Each Type A inlet has a capacity of 9.7 CFS in a sump situation. This would provide a drainage capacity of 19.4 CFS. This is under the peak runoff rate but given the hydrographs for the Type II rainfall distributions that occur in Cheyenne (USDA 2019), this peak flow

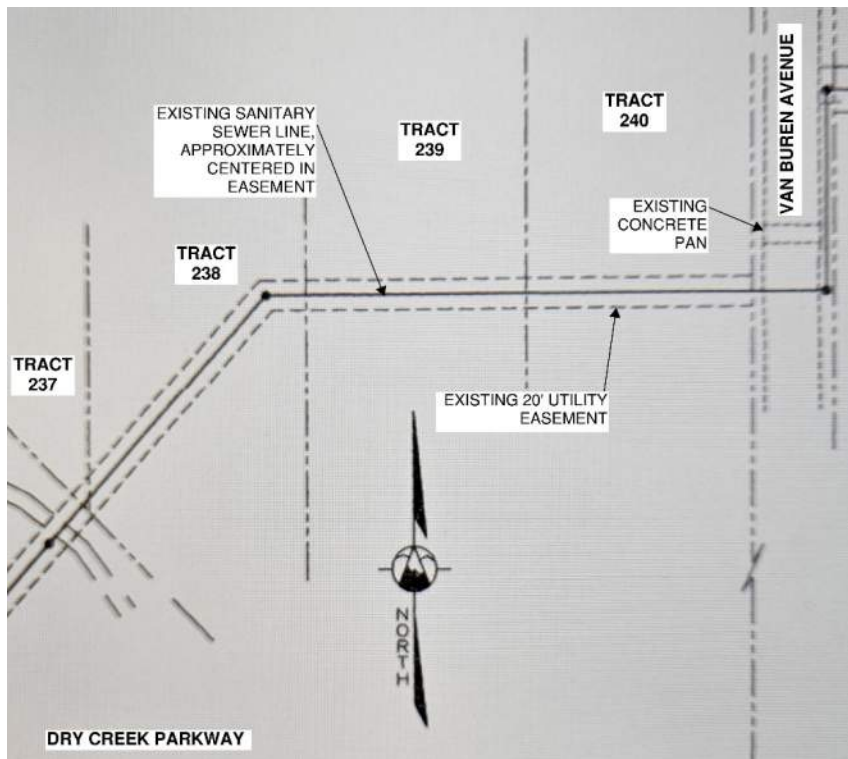


Figure 25: Existing Utility Easement to Dry Creek Parkway

only occurs for a very limited period of time. This layout will properly drain the road, while not being over designed. Also, the improved profile slopes along the corridor will increase the capacity of the curb and gutter system, preventing overtopping of the curb in a 100-year storm.

The two inlets would tie into a manhole each with 18-inch pipe. A 24-inch pipe would outlet the manhole and flow west and then southwest. There is an existing 20-foot utility easement that crosses Tracts 237 through 240 of the Sunnyside Addition, 6<sup>th</sup> Filing. There is an existing sewer main that runs along the approximate center of the easement. If the proposed stormwater infrastructure can be placed in this easement, no new easements would have to be obtained for this utility. An excerpt from the easement is shown in Figure 25. The easement is included in its entirety in Appendix B.

## GREEN RIVER SPEED REDUCTION – MINI-ROUNDAABOUT

At the intersection of Van Buren Avenue and Green River Street, a mini roundabout is proposed in this plan. A 35% design is presented. A mini roundabout is proposed at this intersection for several reasons:

1. This is a higher speed area of the corridor. The mini roundabout is designed to promote slower speeds in the intersection area. The mini roundabout design speed is less than 20 miles per hour (MPH). Therefore, overall safety of the corridor will be improved. A roundabout provides higher capacity and fewer delays than an all way stop, thereby slowing traffic down without impeding it. The LOS for Green River Street with the proposed roundabout will improve it from a LOS B for east and west bound traffic to LOS A for all four approaches.
2. The intersection is at the south corner of Dildine Elementary. The roundabout will enhance safety for school children and other non-motorist travelers through the intersection. Safety is enhanced through slower motorist speeds and enhanced visual cues and clear markings for crossing pedestrians. Enhanced marking to the existing crosswalk was proposed in the short-term improvements. This will improve on those enhancements for crossing by slowing the intersection traffic down all together. Also, with the splitter island outside of the inscribed circle, pedestrians only have to deal with one traffic lane at a time. It is proposed that school crossing be emphasized on the north leg of the roundabout to reduce the need for multiple crossing guards before school begins and right after it lets out.
3. Green River Street is marked as a Bicycle Boulevard in future Cheyenne plans. This works in tandem with that goal. The slower speeds allow bicyclists to travel with motorists (or on the sidewalks as pedestrians, depending on their comfort and skill).
4. The mini roundabout will allow for safe and efficient travel of large vehicles, buses, and emergency vehicles. The center island will be completely traversable. The island is a deterrent for smaller vehicles, causing them to drive slower around the intersection, but will not impede larger vehicles that utilize the corridor.
5. The mini roundabout will be aesthetically appealing. The nonlinear geometry and opportunities for landscaping strips to aid disadvantaged pedestrians in finding the crossings, as well as lighting options, will provide the opportunity for a visually pleasing intersection.



6. The roundabout will be cost effective. The mini roundabout will work within the 80-foot ROW north of the intersection and 70-foot ROW south of the intersection and not require additional ROW for its implementation. It is noted that the vertical design will have to work within the ROW limitations.
7. The roundabout will work with the existing drainage patterns and not cause ponding in the intersection.
8. The intersection will be low maintenance. There will be no traffic signals.
9. The distance between this intersection and other controlled intersections (Dell Range Boulevard and US-30) is sufficient that the addition of a mini roundabout will not impede traffic flow.

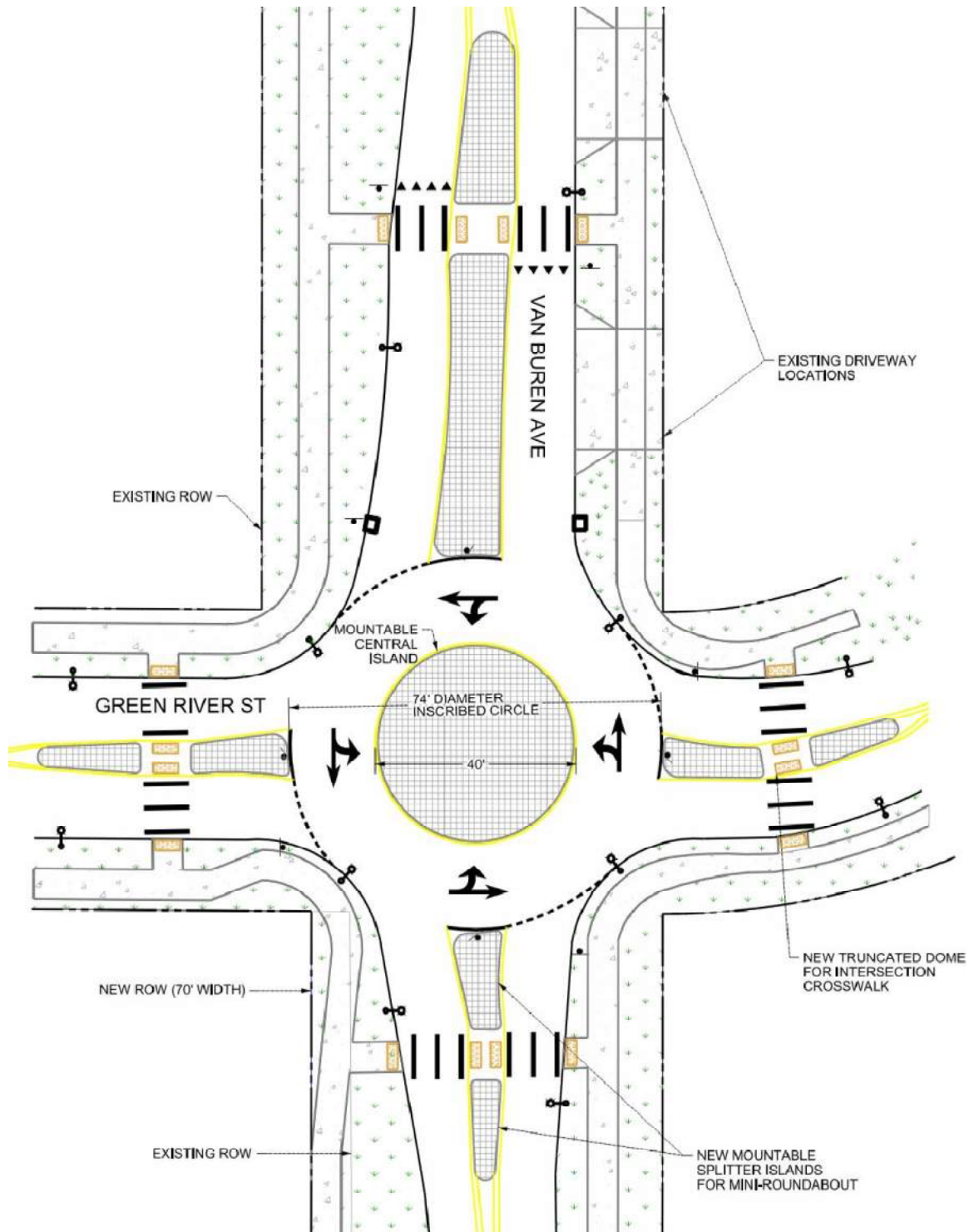


Figure 26: Green River Roundabout

At Rawlins Street: A mini roundabout, similar to the one being proposed at Green River Street, is not warranted at the intersection of Van Buren Avenue and Rawlins Street due to the minimal traffic on Rawlins Street. If a roundabout was implemented at this intersection, it could decrease safety due to the fact that regular drivers on Van Buren Avenue may speed through the roundabout because they are not expecting traffic coming from the Rawlins Street leg.

## Long-Term Improvement Recommendations

Long-term improvement recommendations include purchasing ROW south of Green River Street and reconstruction of the entire corridor. The entire corridor will have a 12-foot wide north and southbound travel lane. Curb and gutter will extend the length of the corridor, except on the south end where the project ties into the US-30 project. Six-foot sidewalks are recommended along both sides of the road and will mostly be detached. Landscaping and bike lanes have been included for the future corridor design as well. The stormwater inlets that are part of the Dell Range – Van Buren Improvements will have to be relocated during the reconstruction of Van Buren Avenue. Implementation of the long-term recommendations is shown in the 35% plans.

### HORIZONTAL DESIGN ELEMENTS (PLAN VIEW)

#### *INTERSECTION WITH DELL RANGE BOULEVARD*



Near future (2025) plans for Dell Range Boulevard include a traffic signal at Van Buren Avenue. The proposed design includes centering the horizontal alignment in the existing 80-foot ROW. The existing roadway is pushed towards the east side of the ROW and a left turn lane is incorporated at the traffic signal.

The existing Van Buren Avenue alignment south of Dell Range Boulevard was pushed to the east to align with the ROW and alignment of Van Buren Avenue north of the intersection. The 35% design in this plan shows Van Buren south of Dell Range centered in the existing ROW. This may cause a through lane offset of more than 5' through the intersection, which may require the removal of the 8-foot tree lawn on the southeast corner of the Van Buren and Dell Range intersection to properly configure the lanes.



Figure 27: Existing and Proposed Tie in to Dell Range Boulevard

#### *TYPICAL SECTION: DELL RANGE BOULEVARD TO GREEN RIVER STREET*

The existing 80-foot right of way on the northern section of the corridor (from Dell Range Boulevard to Green River Street) allows for a full collector cross section. A 12-foot wide north and southbound travel lane will be incorporated for the entire corridor. To the west of the southbound lane will be a dedicated bike lane. On the east side of the northbound lane, an 11-foot shared parking and bike lane is proposed. Parking is proposed only on the east side of the typical in this area because the Lutheran Church and Dildine Elementary encompass the west side of this section. Both facilities have ample on-site parking, which negates the need for parking on the west side of the Van Buren Avenue. Both sides of the road will have a full curb and gutter section. There will be 6-foot detached sidewalks with an 8-foot landscaping area in between the top back of curb and the sidewalk.

**VAN BUREN AVENUE**  
DELL RANGE BLVD TO GREEN RIVER STREET

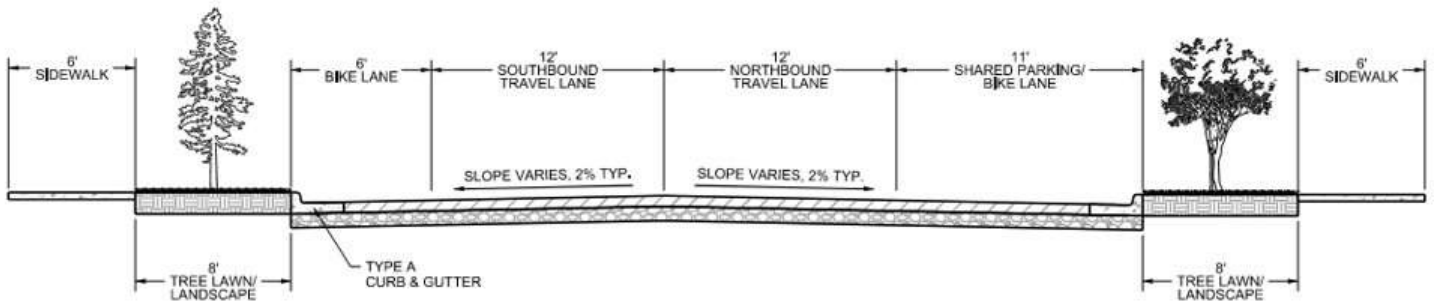


Figure 28: Typical Section, Dell Range Boulevard to Green River Street

***TYPICAL SECTION: GREEN RIVER STREET TO RAWLINS STREET***

**VAN BUREN AVENUE**  
GREEN RIVER STREET TO RAWLINS STREET

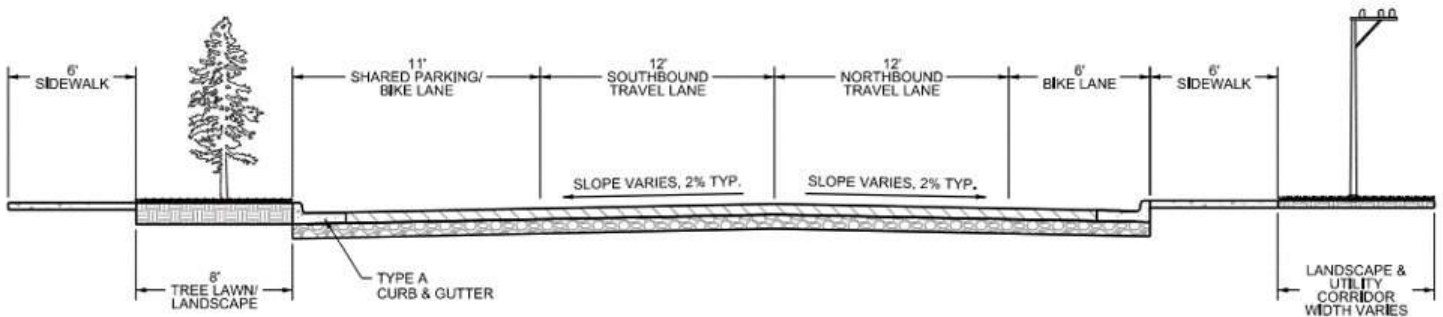


Figure 29: Typical Section Green River Street to Rawlins Street

The road typical from Green River Street south to Rawlins Street is almost a mirror image of the typical section north of Green River Street. The shared parking/bike lane is being swapped with the dedicated bike lane. The reasons for this change are:

1. One of the reasons for higher speeds on the corridor are the appearance of a straight, wide section of asphalt. Switching the parking lane from the east to the west side of the road will create visual changes along the corridor, keeping drivers engaged and reducing their tendency to “zone out” and drive faster unintentionally.
2. The east side of the corridor in this section has numerous concrete driveways and this layout reduces impacts and changes to those existing driveways.

Another noted change with this section is the attached sidewalk. The overhead powerlines are located adjacent to the existing east ROW line, which is not proposed to change. Providing an attached sidewalk will save the need to relocate the east side overhead power lines in this area.



## TYPICAL SECTION: RAWLINS STREET TO LARAMIE STREET

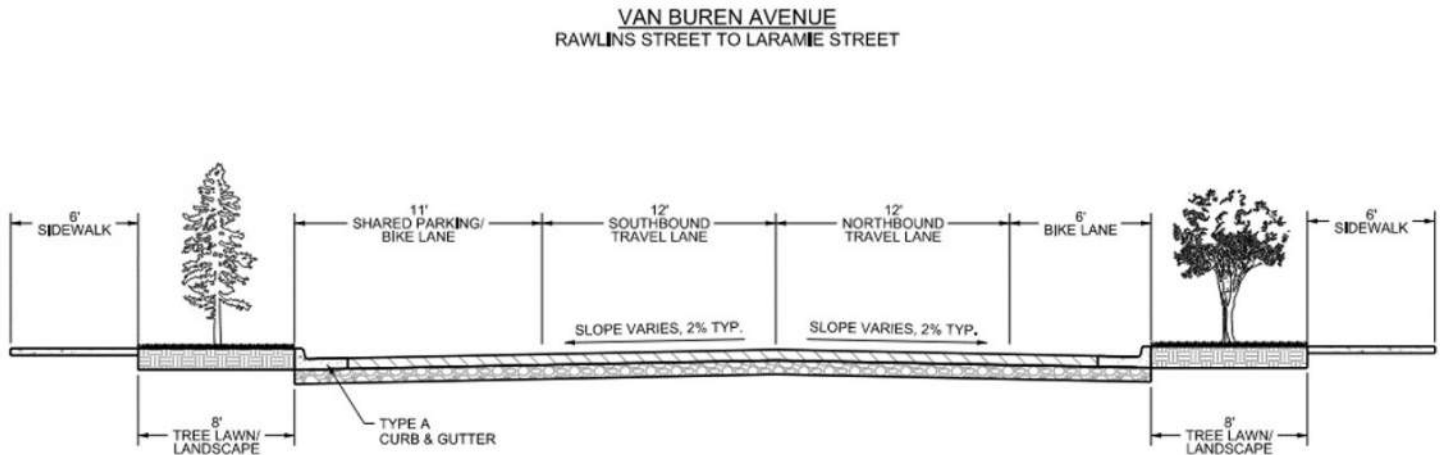


Figure 30: Typical Section from Rawlins Street to Laramie Street

The typical section from Rawlins Street to Laramie Street is very similar to the previous typical section (Green River to Rawlins Streets). The only change is that the sidewalk on the east side of the corridor is detached. Relocated overhead power poles are on the west side of the corridor and must be moved for the proposed improvements. Those overhead utilities will be relocated to the 8-foot tree lawn/landscape strip on the west side of the road.

### LARAMIE STREET TO US-30

There will be a design transition in the corridor at Laramie Street. The detached sidewalks and bike lanes will end and signage will direct non-motorized users toward the Dry Creek Greenway, west along Laramie Street. South of Laramie Street, the design ties into the proposed US-30 design.

### VERTICAL DESIGN ELEMENTS (PROFILE VIEW)

The existing profile was produced using the survey data collected in the field for utilities and limited site features. The existing manholes are in the center of the existing pavement along the corridor and were used to estimate the existing horizontal alignment. On the southern portion of Van Buren Avenue (south of Laramie Street), the Right of Way and Engineering plans dated June 15, 2022, for US-30 were utilized for the existing profile and to tie in the proposed Van Buren Avenue design. The US-30 project will be complete prior to long-term plans on Van Buren Avenue, and it was deemed appropriate to integrate that design as existing for this project. During Final design of Van Buren Avenue into US-30, the As-Constructed Plans for the US-30 project need to be referenced to ensure that the intersection design aligns horizontally and vertically with the reconstructed US-30.

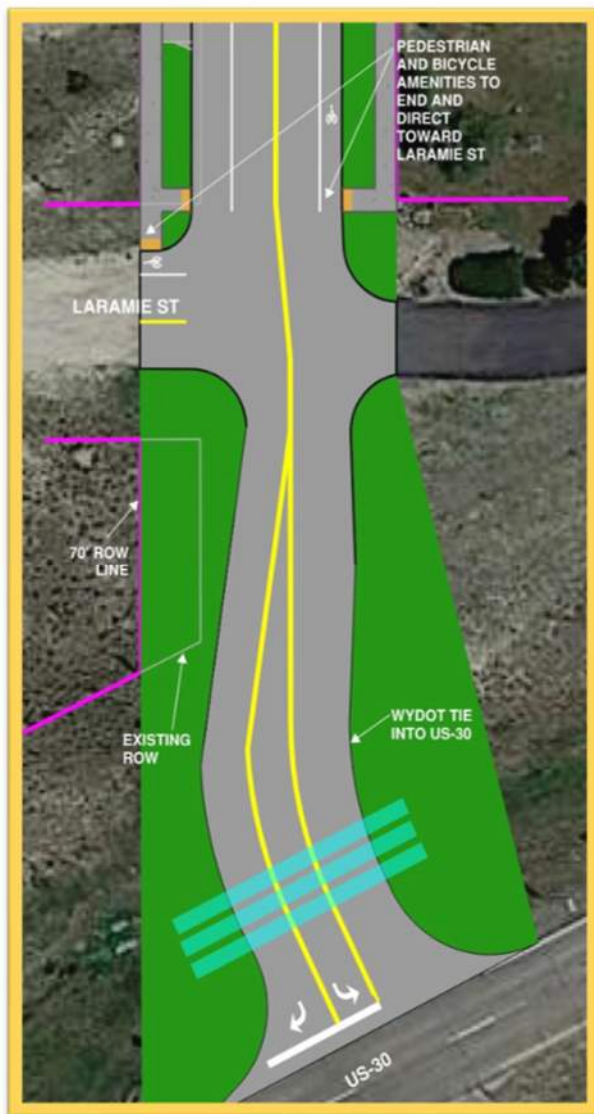


Figure 31: South Corridor Tie-In

The existing and proposed profiles are similar. The proposed design attempted to keep similar elevations along the corridor, to reduce the impacts to the existing driveways. The slopes in some of the flattest areas were smoothed out and kept at a minimum of 0.5%. This allows for improvement of drainage capacity and flow along the corridor (as discussed in the Drainage Design). Additionally, it is recommended in final design with a complete survey with the new stormwater inlets that are part of the Dell Range-Van Buren improvements, that the vertical profile be optimized to promote flow into the stormwater inlet locations.

## **ADDITIONAL DESIGN ITEMS**

### ***SIDEWALKS***

Six-foot sidewalks are proposed to be implemented along the entire corridor. The sidewalks will be detached, except for the east side of the corridor from Green River Street to Rawlins Street. This six-foot sidewalk will be attached to reduce the overhead power relocation costs.

The property platted as Del-Van Storage Park (4405 Van Buren Avenue) has a 20-foot easement on the western border adjacent to the Van Buren Avenue ROW dedicated to public landscape and open space. The existing sidewalk jogs into this easement, providing a 5±foot width sidewalk. The proposed design keeps the jog and use of this easement to allow for a wider landscape strip between the vehicle and bicycle pathways and the sidewalk itself. This provides an opportunity for more varied landscaping and some variation in the pathway for pedestrians.

### ***MAILBOXES***

The United States Postal Service (USPS) was contacted for input and attended the Safety Audit discussed previously. USPS representatives prefer Center Box Unit (CBU) mailboxes located on a side street away from heavy traffic for safety of the carriers and postal customers. USPS is transitioning away from individual roadside boxes, especially in urbanized areas. In coordination with WYDOT and the US-30 project, CBU's are proposed to be placed on the southwest side of the Laramie Street and Van Buren Avenue intersection. These CBU's will service addresses south of Green River Street on the Van Buren Avenue corridor. Mailboxes north of Green River Street are indicated adjacent to the properties in the 35% plans until the final decision is made on the possible replacement of the mailboxes with CBU's.

An existing CBU is located on Carter Road, approximately 40 feet east of the intersection with Van Buren Avenue. This unit could be expanded for additional users in the project area.

### ***STREETLIGHTS***

Several participants from the public have mentioned the need for lighting along the corridor. There are existing street lights on the power poles along the east side of the corridor from Dell Range Boulevard south to Eastview Street. South of Eastview Street, streetlights are not installed. The overhead power will have to be relocated on the west side of the corridor south of Eastview Street. It is recommended that luminaires be installed on these light poles at regular intervals. New luminaires are proposed with the roundabout design at Green River Street (discussed above). The proposed light locations are shown on the 35% plans.

### ***CHEYENNE TRANSIT PROGRAM***

The Cheyenne Transit Program (CTP) was contacted regarding future bus service along the Van Buren Avenue corridor. Currently, CTP has no plans for a fixed-route bus service along Van Buren Avenue. The Van Buren Avenue corridor will be served via an on-call, demand-response service. Disabled individuals will receive door-to-door service, and walkers will be picked up at a bus stop and taken to a fixed-route bus line. The CTP director indicated that they would like space reserved for a bus shelter, trash can and bike rack on the west side of Van Buren Avenue between Green River Street and Rock Springs Street. A concrete pad with dimensions of 18 foot by 10 foot has been reserved in the plans in the northwest corner of the intersection of Van Buren Avenue and Rock Springs Street in the 35% plans.

# COST ESTIMATES

Cost estimates were provided according to the recommendations of short, mid, and long-term recommendations. Appendix G contains the detailed cost calculations for each phase. WYDOT 2022 Weighted Average Bid Prices and RS Means Heavy Construction Cost Data were utilized as a base for item pricing for 2023. An interest rate of 3% was applied annually to provide estimated costs for 2035 and 2045.

## Short-Term

The short-term cost improvements cost estimate includes:

- Centerline and lane striping
- Two feedback speed signs near the Rawlins Street intersection
- Thermoplastic crosswalk markings and stop bars
- Painted markings including bicycle lane delineators, speed limit and slow markings

Table 2:Project Cost Table for Short-Term Improvements

| Short-Term Improvement Cost Estimate |          |
|--------------------------------------|----------|
| 2023                                 | \$43,100 |
| 2035                                 | \$61,400 |
| 2045                                 | \$82,500 |

## Mid-Term

Mid-term improvements in the cost estimate include:

- Installation of proposed drainage improvements
- Mini-Roundabout at the intersection of Green River Street and Van Buren Avenue. The cost estimate is a reconstruction of the intersection. A retrofit design could also be implemented to reduce mid-term costs.
- Professional services including survey, 100% design, permitting, and construction inspection are included in the price as well.

Table 3:Project Cost Table for Mid-Term Improvements

| Mid-Term Improvement Cost Estimate |           |
|------------------------------------|-----------|
| 2023                               | \$491,000 |
| 2035                               | \$700,050 |
| 2045                               | \$940,800 |

## Long-Term

ROW acquisition is part of the long-term plan for the corridor. The difference between a 70-foot and 80-foot ROW cost estimate was completed. It was estimated that a 70-foot ROW would be about \$201,000. The 80-foot ROW cost estimate is \$360,000. The 2022 Laramie County Assessor’s valuation of the land was considered for each lot that would be affected by the need for additional ROW.



The feedback signs at Rawlins Street, the mini-roundabout, and proposed drainage improvements were not included in the long-term costs since they were included in the mid and short-term recommendations. The total long-term costs include reconstruction of the corridor, per the 35% plans, including the ROW acquisition required for the 70-foot width south of Green River Street.

Table 4: Project Cost Table for Long-Term Improvements

| Long-Term Improvement Cost Estimate |             |
|-------------------------------------|-------------|
| <b>2023</b>                         | \$2,954,030 |
| <b>2035</b>                         | \$4,211,740 |
| <b>2045</b>                         | \$5,660,220 |

## REFERENCES

AVI P.C. Roadway & Utility Plans for Whitney Ranch Phase III Offsite Improvements. November 2, 2022.

Cheyenne Greenway Foundation. Greater Cheyenne Greenway Map. Accessed July 25, 2023 via <https://cheyennegreenwayfoundation.org>.

Cheyenne – Laramie County Cooperative GIS Database. Search/Interactive Mapping Site. Accessed February 7, 2023, via <https://greenwoodmap.com/laramie/>.

Cheyenne Metropolitan Planning Office. Cheyenne Area Mater Transportation Plan 2022 Update. Accessed February 7, 2023 via [http://www.plancheyenne.org/wp-content/uploads/2022/06/MTP\\_2022\\_FinalUpdate.pdf](http://www.plancheyenne.org/wp-content/uploads/2022/06/MTP_2022_FinalUpdate.pdf)

Cheyenne Metropolitan Planning Organization, Alta Planning. Cheyenne On-Street Bicycle Plan and Greenway Plan Update. June 2012.

Cheyenne Metropolitan Planning Organization, Alta Planning + Design and Summit Engineering. Cheyenne Metropolitan Area Pedestrian Plan. August 2010.

Cheyenne Metropolitan Planning Office in Cooperation with Kimley Horn. Connect 2045 Transportation Update. December 2020

Cheyenne Metropolitan Planning Office. East Dell Range Boulevard/US 30 Corridor Study. September 2019.

Cheyenne Metropolitan Planning Office. Cheyenne Greenway and Activities Map. Accessed February 17, 2023, via <http://www.plancheyenne.org/wp-content/uploads/2022/10/2022-Greenway.pdf>.

Cheyenne Metropolitan Planning Office. Neighborhood Traffic Management Program, Van Buren Avenue, Cheyenne, Wyoming. February 2015.

City of Cheyenne. City Pockets Annexation. Accessed January 4, 2023, via <https://www.cheyennecity.org/Your-Government/Departments/Planning-and-Development-Department/County-Pockets-Annexation>.

City of Cheyenne. Drainage Master Plan Dry Creek. Prepared by States West Water Resources, Eagle Consultants, and Intermountain Professional Services. November 1988.

City of Cheyenne. Greater Cheyenne Greenway. Accessed July 31, 2023 via <https://www.cheyennecity.org/Your-Government/Departments/Planning-and-Development-Department/Greater-Cheyenne-Greenway>.

Federal Highway Administration. Factors Influencing Operating Speeds and Safety on Rural and Suburban Roads. January 2015.

Front Range Stormwater & Floodplain Consulting. Whitney Ranch Phase 3 Offsite Improvements Final Drainage Analysis. September 23, 2022.

Kahn, Robert and Allison Kahn Goedecke. Roadway Striping as a Traffic Calming Option. September 2011.

Mile High Flood District. USDCM: Volume 1 – Management, Hydrology and Hydraulics. Chapter 6: Runoff. August 2018.

Mile High Flood District. USDCM: Volume 1 – Management, Hydrology and Hydraulics. Chapter 7: Streets, Inlets and Storm Drains. August 2018.

Naderi, Jody Rosenblatt, Byoung Suk Kweon, and Praveen Maghelal. The Street Tree Effect and Driver Safety. February 2008.

RSMeans Heavy Construction Cost Data. 2015.

Summit Engineering, LLC. Highway 30 Pedestrian Underpass Preliminary Design. October 26, 2022.

United States Department of Agriculture, Natural Resources Conservation District. Custom Soil Resource Report for Laramie County, Wyoming, Western Part, Van Buren Avenue Corridor Study. Downloaded January 4, 2023, via <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

United States Department of Agriculture, Natural Resources Conservation District. Part 630 Hydrology National Engineering Handbook. Chapter 4: Storm Rainfall Depth and Distribution. August 2019.

White, Connor. Van Buren Avenue Corridor Study Kickoff Meeting. December 1, 2022.

Whitney Ranch. Whitney Ranch Subdivision Map. Accessed February 12, 2013, via <https://livewhitneyranch.com/map/>.

Woolpert, Inc. Lidar Mapping Report for the U.S. Geological Survey. WY Laramie Lidar 2021 D21. January 2022.

Wyoming Department of Transportation. "2022 Weighted Average Bid Prices". January 2023.

Wyoming Department of Transportation. Cheyenne Streets US30/Pershing Blvd. – Archer Laramie County Right-Of-Way and Engineering Plans. June 15, 2022.

Wyoming Department of Transportation. WYDOT Highway Safety Crash Data Analysis – Intersection Crash History Reports created November 14, 2022 via [http://www.dot.state.wy.us/home/dot\\_safety/crash-data.html](http://www.dot.state.wy.us/home/dot_safety/crash-data.html).