



High Plains Road Corridor Study



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AVI, p.c
October, 2016

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ACKNOWLEDGEMENTS

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Cheyenne Metropolitan Planning Organization

Technical Advisory Committee
Citizens Advisory Committee
High Plains Road Steering Committee

Laramie County

County Commissioners
Planning Commission
Laramie County Planning and Development Office

Community

Interested Stakeholders
Property Owners
Business Owners
Area Residents

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1.0 INTRODUCTION

Various areas in South Cheyenne and Laramie County have begun to develop and redevelop in the last several years. In 2009, Granite Peak Development, LLC from Casper, WY began the development of a 7,200 acre industrial rail park named the Cheyenne Logistics Hub at Swan Ranch. This facility is strategically located at the crossroads of the two interstates and two national rail lines which intersect in a region southwest of Cheyenne. Consequently, this multi-modal freight facility attracts businesses utilizing either or both rail and truck. The impetus for the entire development was the design and construction of two key components. The first was a private/ public partnership which secured funding for the design and construction of adjacent roadways including Clear Creek Parkway. The second was a Wyoming Department of Transportation (WYDOT) funded project which developed and constructed an interchange on I-25 near the BNSF rail line. This interchange named High Plains Road serves as a gateway into Cheyenne and the state of Wyoming. The High Plains Interchange was designed with roundabouts at the ramp termini. It is located on a topographic high point so that a future roadway leg could be extended to the east and bridge over the BNSF rail line.

Until the recent decline in energy related oil, gas, and mineral extraction, steady growth in the number of industrial companies had increased along with development within the Rail Park. Additionally, industrial growth has been accompanied by an increase in high tech industries moving into Laramie County at two other Cheyenne LEADS Business Parks. As the community continues to experience growth, the existing transportation system will not be sufficient to accommodate all the expansion.

A number of important transportation connections in the southern Cheyenne roadway network, south of College Drive, have not been completed or planned. The need for an east west connector between College Drive and Terry Bison Road has been evident for quite some time as potential developments adjacent to this area have begun to emerge. High Plains Road, is one of the designated connections. It was identified in the Cheyenne Area Master Transportation Plan, PlanCheyenne to connect on I-25 somewhere in the vicinity of the historic Speer Road and extend east to South Greeley Highway.

The boundaries of the High Plains Road Corridor Study are I-25 to the west, Highway 85 to the east, Terry Ranch Road to the south, and South College Drive to the north. The boundary is illustrated in **Figure 1.1 Corridor Study Area and Vicinity Map.**

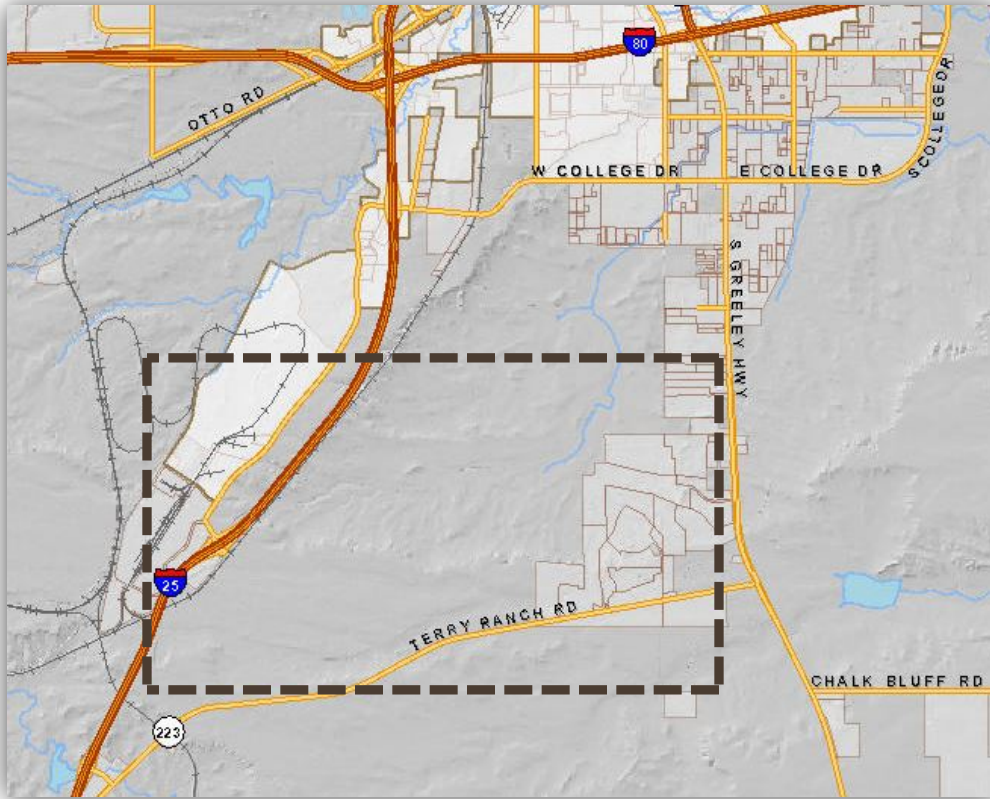


Figure 1.1 Corridor Study Area and Vicinity Map

The primary purpose of this project is to create a comprehensive and practical planning document that guides and promotes future development of the corridor and surrounding area. After discussion with the key members of the County, City, and MPO staff, the goal of the project was to create a 35% design plan for the future development of High Plains Road that met the following criteria:

- Sensitive to the current land use and property owners,
- Serves all transportation users,
- Adaptable.

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

- The Cheyenne Metropolitan Planning Organization,
- Laramie County Planning,
- Laramie County Public Works,
- Cheyenne Urban Planning,

- City Engineering,
- Black Hills Energy,
- City of Cheyenne Board of Public Utilities,
- City of Cheyenne Greenway and Trails Coordinator,
- WYDOT District #1,
- WYDOT Planning.

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2.0 GLIMPSE

The Glimpse section of the plan provides a summary of the existing roadway and planning area.

History

Based on the Cheyenne – Laramie County Cooperative GIS Database Search/ Interactive Mapping Site, the first recorded plat of High Plains Road a.k.a. Speedway Drive was the Cathcart Subdivision recorded on August 5, 1987 from U.S. 85/ South Greeley Highway ROW to the west approximately 914' showing a 80' right-of-way along the north boundary of the Cathcart Subdivision **Figure 2.1 Cathcart Subdivision Plat with an 80' Right-of-way width**. Prior to platting, the roadway was used by local ranchers, property owners, and businesses as a shared access road. Other platting continued to the west in the more developed east portion of the corridor with the Final Plat of Speedway Subdivision and Re-Plat of Tract 8 of Cathcart Subdivision recorded in September 29, 2009 (**Figure 2.2 Speedway Subdivision and Replat of Tract 8 of Cathcart Subdivision**). This plat illustrated a right-of-way width varying from about 90' to 120' from west right-of-way line on U.S. Highway 85/ South Greeley Highway to 1,345.9' west. The Cheyenne Power Park plat abuts the east side of the Cathcart Subdivision Plat and was recorded as a Planned Unit Development (PUD) in March 2, 2015 (**Figure 2.3 Final Plat Cheyenne Power Park 50' Right-of-way south of Section Line 20 and 29**). This plat dedicated 50' of right-of-way south of the section line between Section 20 and 29. The right-of-way for High Plains Road north of the section line between Section 20 and 29 was established by legal/ deed on an unplatted parcel. Based on the Cheyenne Power Park Planned Unit Development Plat, the right-of-way north of the section line varies from approximately 31.63' on the east to 39.68' on the west sides of the unplatted parcel. Please see **Appendix H** for recorded plats and road reservation documentation.

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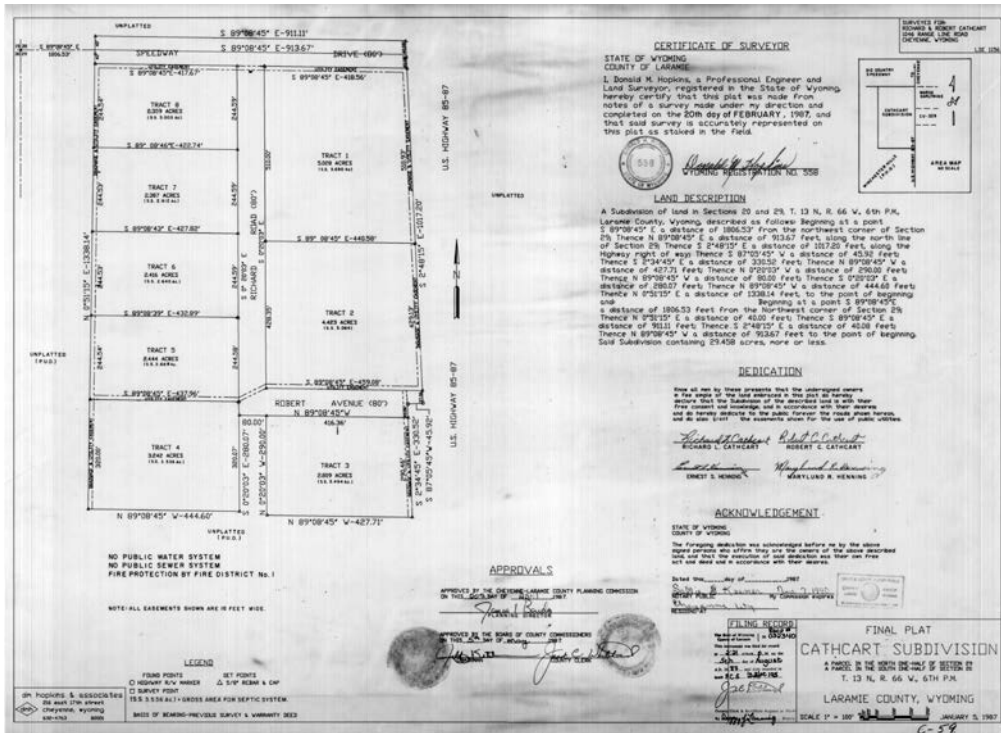


Figure 2.1 Cathcart Subdivision Plat with an 80' Right-of-way width

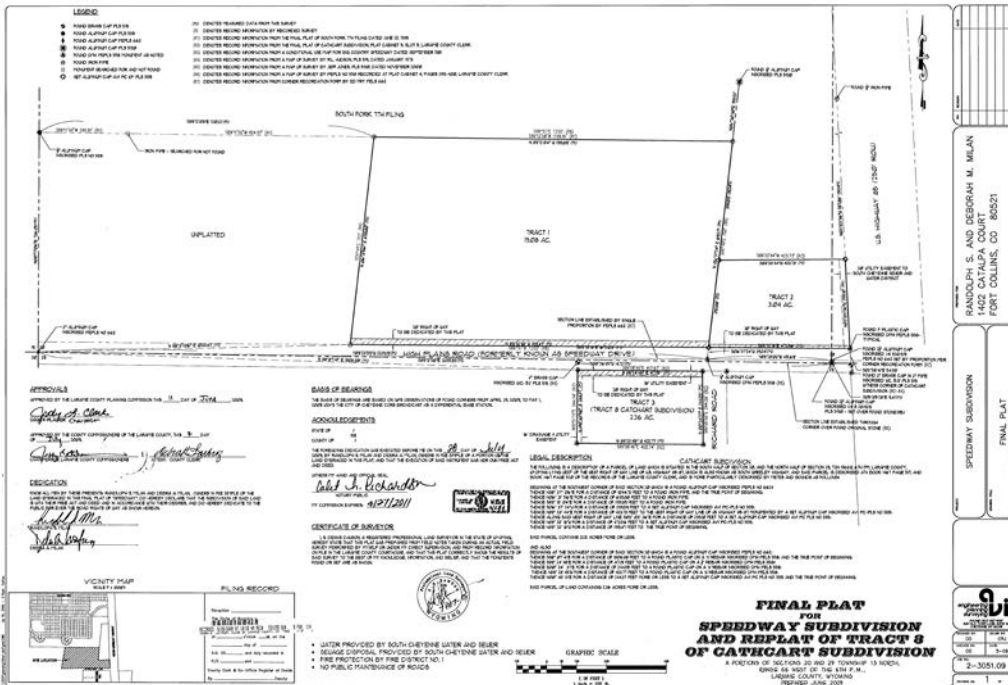


Figure 2.2 Speedway Subdivision and Replat of Tract 8 of Cathcart Subdivision

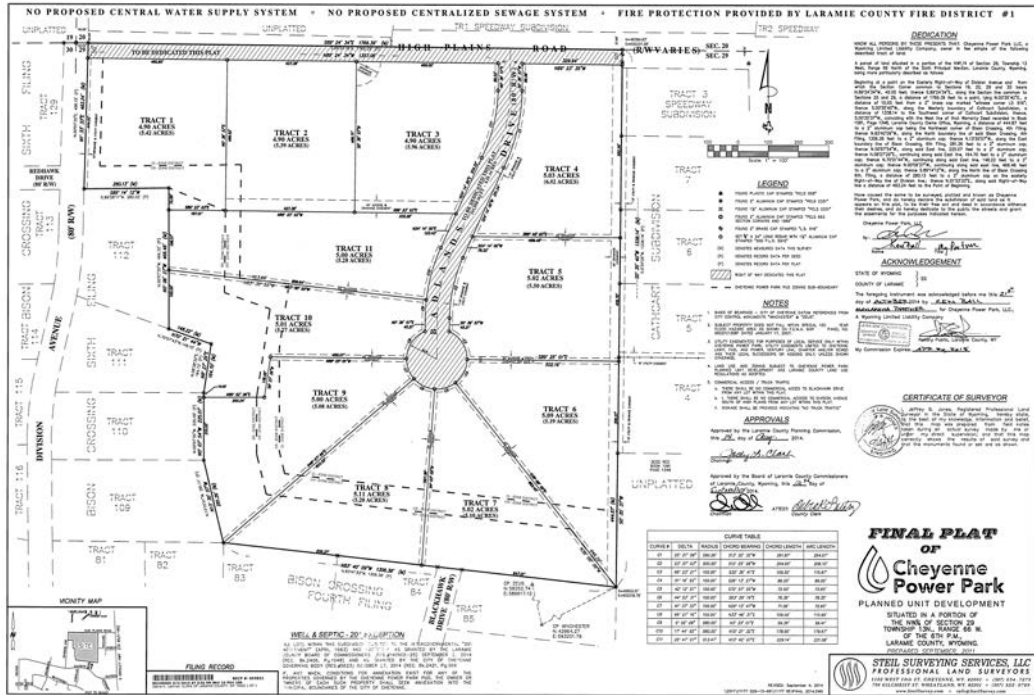


Figure 2.3 Final Plat Cheyenne Power Park 50' Right-of-way south of Section Line 20 and 29

Existing Corridor and Boundary Conditions

Today the High Plains Road corridor is essentially incomplete in the platted areas on the far east of the corridor study where it connects to U.S. 85/ South Greeley Highway and is comprised of pavement surfaces varying from asphalt, gravel, dirt, and nonexistent. In particular, the varying sections are summarized below.

U.S. 85/ South Greeley Highway to Big Country Speedway.
At the intersection where High Plains Road meets Highway 85, there is an intersection consisting of South Greeley Highway Service Road, U.S. Highway 85/ South Greeley Highway, and an unnamed road accessing Palomino Industries on the east side of highway. The Service Road transitions from 45 mph to 30 mph at the intersection. Highway 85 has a posted speed limit of 65 at the aforementioned intersection, and the unnamed road accessing Palomino industries has no posted speed limit. As Shown in **Figure 2.4 High Plains west of U.S. 85/ South Greeley Highway Looking east** High Plains Road is



Figure 2.4 High Plains west of U.S. 85/ South Greeley Highway Looking east

currently a two-lane asphalt road with significant potholes and wear throughout the section. The asphalt portion ends past the west side of the first Speedway Storage approach where it transitions into a gravel road (**Figure 2.5 High Plains Road at Speedway Storage looking northeast**). There are 3 gates into the Speedway Storage Facility, only one of which appears to be frequently used. Directly west of the Speedway track resides a building and a "pit" area. Both the Building and the Pit area have separate access drives through chain link security gates.



Figure 2.5 High Plains Road at Speedway Storage looking northeast

High Country Speedway to Division Avenue. After the west Big Country Speedway approach, High Plains Road is a gravel road which transitions to a dead-end cul-de-sac (See **Figure 2.6 High Plains Road at west property line of Big Country Speedway looking northeast** and **Figure 2.7 High Plains Road at west cul-de-sac looking west**). The roadway continues with a two-track access dirt road which eventually dead ends at an old and dilapidated ranch home north and east of the Bison Crossing Residential.



Figure 2.6 High Plains Road at west property line of Big Country Speedway looking northeast

Division Avenue to East Right-of-way of BNSF Railroad. The area west of Division Avenue consists of open land utilized as livestock grazing land for cattle and sheep. This land is currently not platted and is owned by Clear Creek Land Company, Swan Ranch LLC, Leticia C. Sara, and Michael James Sara. The terrain consists of rolling vegetative terrain. Access to these agricultural lots is primarily through unnamed dirt/ two track roads (See **Figure 2.8 BNSF Railroad Right-of-way looking east from I-25**). A road named York Avenue runs from College Drive south through the property of Leticia C Sara and dead ends. York Avenue begins at College Drive as an asphalt road, changing to a dirt road just south of the residential lots along College.



Figure 2.7 High Plains Road at west cul-de-sac looking west

BNSF Railroad to I-25 Roundabout. The exit from Interstate 25 consists of two single lane roundabouts at High Plains Road. Each roundabout has 3 egress and ingress options. As previously mentioned, the roundabouts were constructed on I-25 by WYDOT in 2010 (See **Figure 2.9 Interstate 25 Overpass and Off/ On Ramps (Roundabouts)**).

Historical Review

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

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

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

Utilities

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

- Black Hills Energy: Overhead Electric, Overhead Transmission Electrical, Underground Natural Gas Line;
- U.S. Department of Energy Western Area Power Authority (WAPA): Overhead Transmission Electric;
- Wyoming Rural Electric Association: Overhead Electric;
- Century Link: Underground telephone;
- Magellan: 8" Petroleum Pipeline;
- South Cheyenne Water and Sewer District;
- City of Cheyenne Board of Public Utilities (BOPU).

Further development of the corridor will require wet and dry utility infrastructure to be expanded and coordinated with the individual entities to support future development. Water and sewer utilities are not immediately available in the corridor area with the exception of a small section on the northeast



Figure 2.8 BNSF Railroad Right-of-way looking east from I-25



Figure 2.9 Interstate 25 Overpass and Off/ On Ramps (Roundabouts)

side beginning at Division Avenue to South Greeley Highway. That area is served by the South Cheyenne Water and Sewer District (SCWSD). Future water and sewer development of this area would likely be served by the BOPU as the SCWSD is not allowed to serve or expand outside their current boundary without City of Cheyenne and BOPU approval.

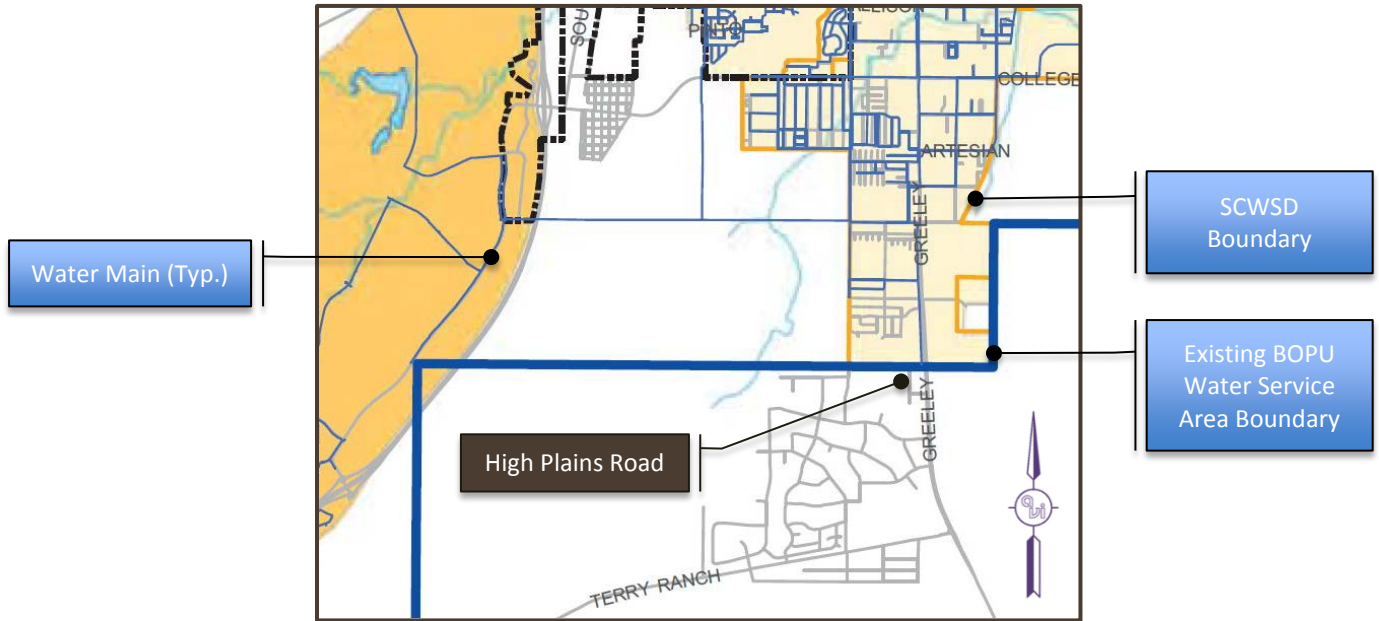


Figure 2.10 Water Service Area and Existing Distribution Lines

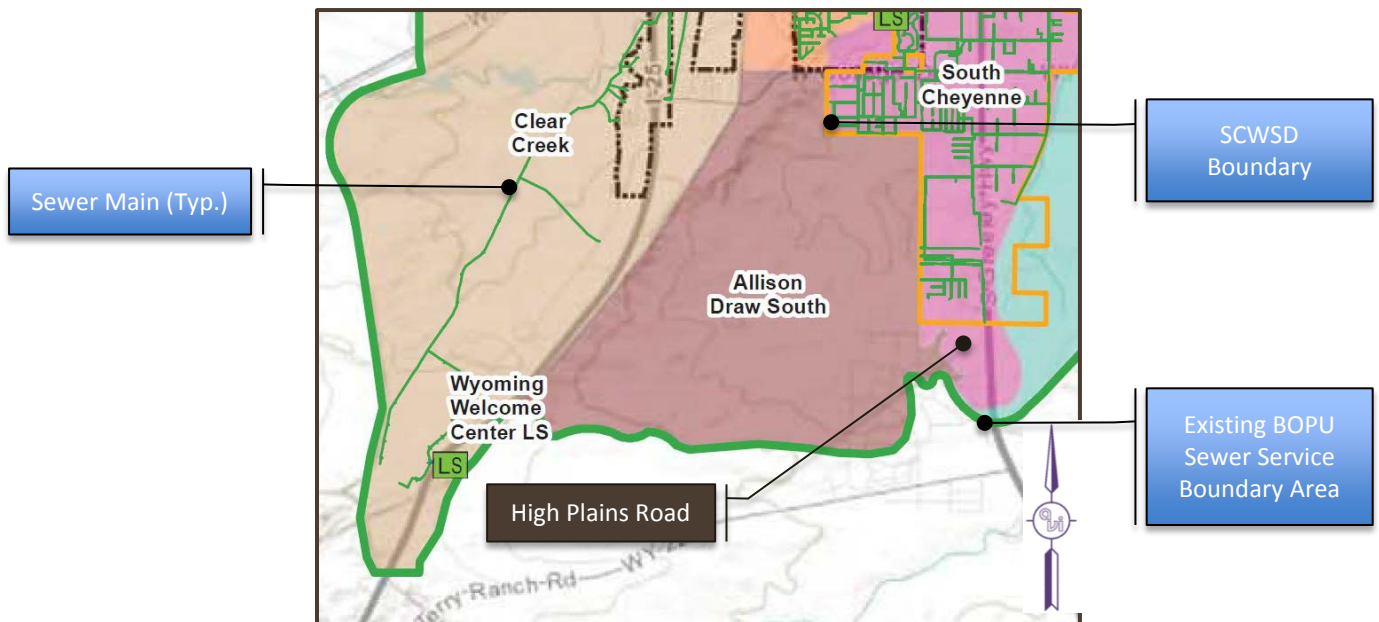


Figure 2.11 Sewer Service Boundaries, Existing Collection System

Adjacent water and wastewater distribution and collection lines, as well as, service area boundaries are illustrated in the excerpt figures from the *2013 Cheyenne Water and Wastewater Master Plans* by HDR for the City of Cheyenne Board of Public Utilities (BOPU) and shown in **Figure 2.10 Water Service Area and Existing Distribution Lines** and **Figure 2.11 Sewer Service Boundaries, Existing Collection System**.

This corridor area is unique in the fact that it appears to be used only for livestock grazing however, it is laced with a myriad of underground and overhead utility mains. See **Figure 2.12 Dry Utility Constraints**, for the schematic locations of the known utilities in the corridor area.

At this level of the corridor study, the utility companies that posed potential conflicts or crossings were notified of the planning project. They were specifically asked about any special requirements required for possible crossings or boundary conditions of a future roadway in the area. Based on those conversations, it appears that one specialized coordination effort may be required of a future project and is noted below.

Western Area Power Administration (WAPA). WAPA conveyed that once a roadway design is complete to a point that the horizontal and vertical alignment of the road will not change at the easement crossing, a Right-of-Way Use Application is required to be submitted. See **Appendix H "APPENDIX LETTER"** for documents provided by WAPA, including a GIS Map, Transmission Line Plan and Profile, and Right-of-Way Use Application. The GIS map shows approximate distances from the roadway to WAPA's structures, these will need to be verified in the application. Once the Right-of-Way Use Application is submitted to WAPA, it will take approximately 2-4 weeks for processing. Commonly, there are no fees associated with the submittal of the Application. Following the review, if WAPA has no comments or necessary revisions, a License Agreement will be granted for the proposed roadway to cross the existing WAPA Easement. On behalf of WAPA, Brian Pederson will be responsible for the aforementioned crossing; his contact information is provided below:

Contact: Brian Pederson, SR/WA, Realty Specialist
Western Area Power Administration
U.S. Department of Energy, Rocky Mountain Region, Lands Department
PO Box 3700, Loveland CO 80539
970-461-7220.

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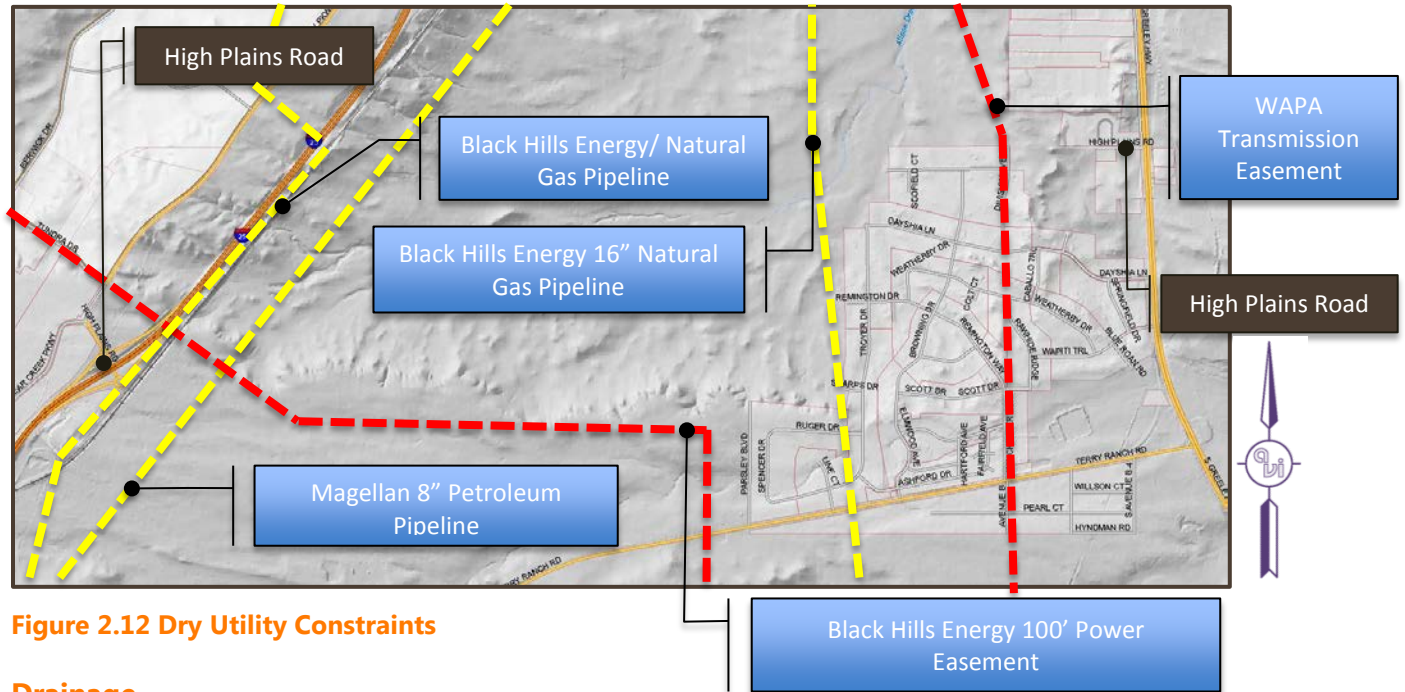


Figure 2.12 Dry Utility Constraints

Drainage

A Portion of the High Plains Road Corridor study area is within the Federal Emergency Management Agency (FEMA) regulated Allison Draw floodplain as shown on Flood Insurance Rate Map (FIRM), Panel 1354 of 1650, Map Number 56021C1354F, Effective January 17, 2007 (<https://msc.fema.gov/portal>).

Areas near Allison Draw drainage appear to be within Zone A while a majority of the corridor area is within the Unshaded Zone X. The Zone A is Special Flood Hazard Area (i.e. SFHA) subject to inundation by the 1% annual chance flood where no base flood elevations have been determined while the Unshaded Zone X are classified to be outside the 0.2% annual chance floodplain. Future projects depicting the development of the roadway will require a Floodplain Development Permit through the Laramie County Planning Department and City of Cheyenne depending on annexation status. Detailed hydraulic and hydrologic modeling efforts along with sound engineering judgment will be critical to overall success of the future final plan development. A FEMA FIRM excerpt showing the area of the study is shown in **Figure 2.13 FEMA Panel 1354 of 1650, Map Number 56021C1354F**.

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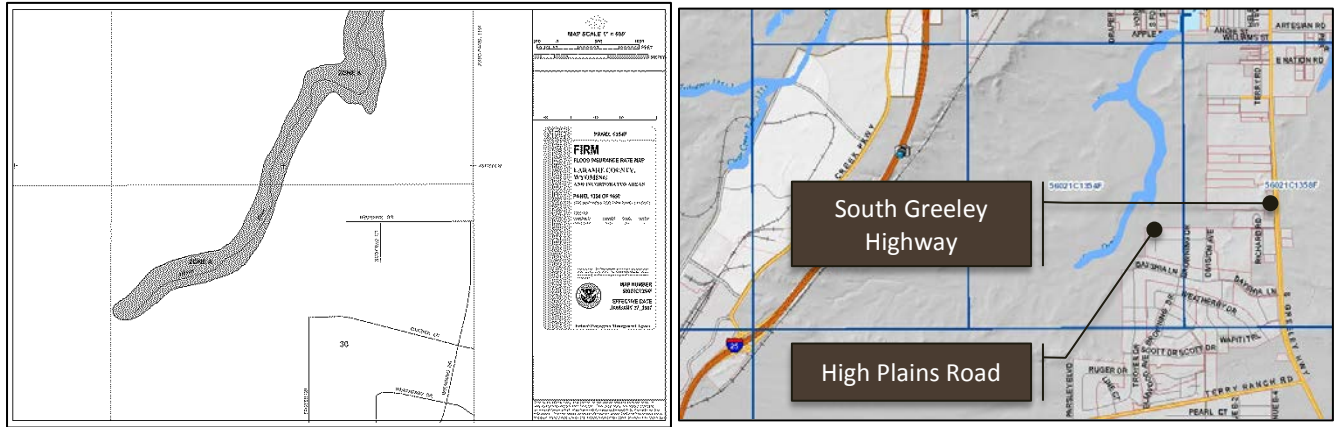


Figure 2.13 FEMA Panel 1354 of 1650, Map Number 56021C1354F and Vicinity Map

Bicycle Transportation

Currently there are no bike lanes, multiuse paths, or formal trails within the corridor boundary. However, it should be noted that High Plains Road was designated a “Bikeway Development Subject to Future Roadway Paving or Construction” in the *September 2012 Cheyenne On-street Bicycle Plan and Greenway Plan Update*. See the excerpt from the plan in **Figure 2.14 Existing and Proposed Bike and Trail Network**

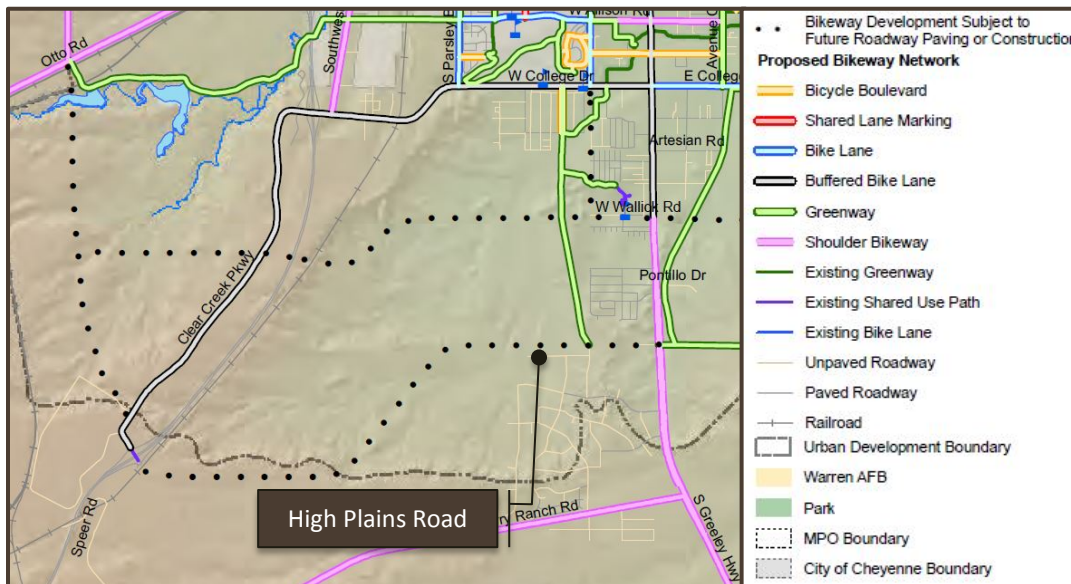


Figure 2.14 Existing and Proposed Bike and Trail Network

Transit

Based on existing corridor use and conditions no transit has been utilized to date. Based on a review of the long range direction of the transit system illustrated in the Cheyenne Transit Program Five-Year Transit Development Plan, it appears that no additional routes have been planned in this area. The nearest Cheyenne Transit Program (CTP) stop is at the intersection of U.S. Highway 85/ South Greeley Highway and West Wallick Road approximately one mile north of corridor location. Future need for transit will depend on the development of the corridor, land use densities, and surrounding boundary conditions.

Environmental

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

Traffic Safety

Crash data was provided by WYDOT for each of the key intersections along the corridor for the time period beginning on January 1, 2011 and ending on January 1, 2015. The number of crashes ranged from a total of three at the I-25 On/ Off Ramps at High Plains Road and zero at the intersection of U.S. 85/ South Greeley and High Plains Road. Given the low number of crashes, the team concludes that there are no crash problems on the corridor at this time. However, based on regulatory speed of U.S. 85/ South Greeley (i.e. 65 mph) and observation, the interrelationship of the South Greeley Service road and intersection pose the highest risk for potential safety concerns on the corridor. The crash data is detailed in **Appendix E** and summarized in **Table 2.1 (4) Four Year Crash Summary for Key Intersections**.

Table 2.1 (4) Four Year Crash Summary for Key Intersections

Type	High Plains Road	
	Interstate 25	South Greeley Highway
	Number of Crashes	
Sideswipe	-	-
Rear End	-	-
Head-on	-	-
Other	3	0
Total	3	0
PDO	3	0
Injury	0	0

Existing Land Use and Zoning

Land Use in the corridor study area varies but, is mainly comprised of agricultural in combination with agricultural residential, planned unit development (i.e. estate lot residential and light industrial). The current Zoning Map is illustrated in **Figure 2.15 2015 Zoning Map**.

The following zoning uses are currently within the corridor area:

City Zoning: Description:

- CB Community Business
- PUD Planned Unit Development
- P Public
- AR Agricultural Residential
- A2 Agricultural

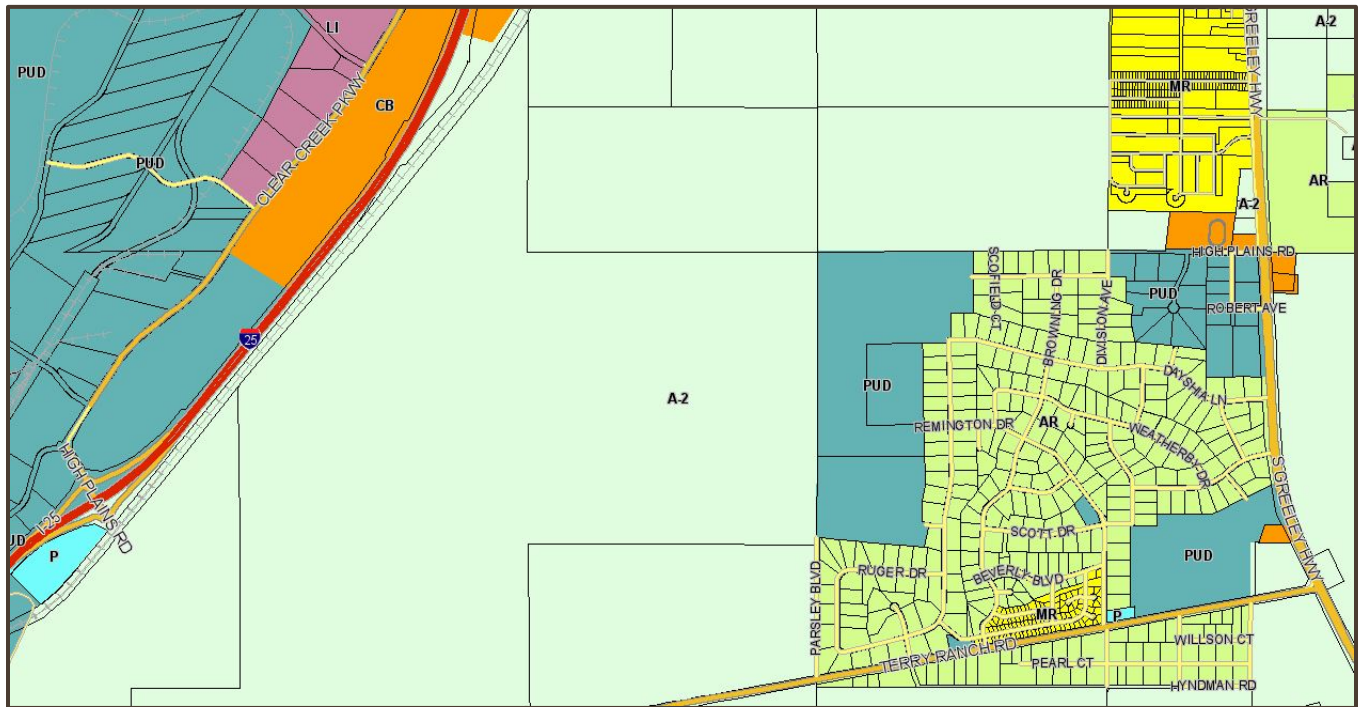


Figure 2.15 2015 Zoning Map

3.0 COLLABORATION

The Collaboration phase of the study provided an avenue for defining the opportunities and constraints of the corridor, as well as, framing the key planning considerations, which shaped the plan.

The High Plains Road Corridor Plan relied heavily upon public and stakeholder participation. The process involved open house format meetings with residents, business owners, developers, and land owners, as well as, project Steering Committee, Planning Commission, Cheyenne Metropolitan Planning Organization Technical Advisory Committee, Cheyenne Metropolitan Planning Organization Citizen Advisory Committee, and Individual Landowner meetings. **Table 3.1 Public Outreach Matrix** summarizes the avenues used and dates in the collaboration process of the project.

Table 3.1 Public Outreach Matrix

Activity	Date(s)
Stakeholder one-on-one Meeting(s)	July 2, 2015; April 19, 2016; April 29, 2016; June 27, 2016;
Steering Committee (2)	October 6, 2015; January 12, 2016
MPO Technical Advisory Committee (2)	February 17, 2016; September 14, 2016
MPO Citizen’s Advisory Committee (1)	September 15, 2016
Public Open House (1)	May 18, 2016
Laramie County Planning Commission	November 10, 2016
City of Cheyenne Planning Commission	November 21, 2016
Laramie County Board of County Commissioners	December 6, 2016
MPO Policy Committee	December 14, 2016

Steering Committee

The first collaboration component involved enlisting the Steering Committee. The committee was comprised of the following staff and key stakeholders from the MPO/ City/ County/ WYDOT and other agencies:

- Tom Mason, Cheyenne Metropolitan Planning Organization,
- Nancy Olson, Cheyenne Metropolitan Planning Organization,

- James Sims, Cheyenne Metropolitan Planning Organization,
- Sreyoshi Chakraborty, Cheyenne Metropolitan Planning Organization,
- Brandon Cammarata, City of Cheyenne,
- Jeff Wiggins, City of Cheyenne,
- John Hall, City of Cheyenne,
- Nathan Beauheim, City of Cheyenne,
- Mike Luna, City of Cheyenne City Council,
- Brad Brooks, Board of Public Utilities,
- Dan Cooley, Laramie County Planning,
- Rob Geringer, Laramie County Public Works,
- Buck Holmes, Laramie County Commissioner,
- Dennis Auker, Laramie County School District #1,
- Jef McMann, Cheyenne Light, Fuel, and Power,
- Randy Griesbach, WYDOT District,
- Mark Wingate, WYDOT Planning,
- Scot Montgomery, WYDOT Patrol
- Bonnie Reider, South Cheyenne Community Development Association,
- Ann Bowers, Fehr & Peers,
- Daryl Johnson, AVI, P.C.,
- Brad Emmons, AVI, P.C.,
- Trey Rinne, AVI, P.C.,
- Tom Cobb, AVI, P.C.

The Steering Committee met two (2) times throughout the course of the project to guide the consultant team, review project information, provide insight, discuss public and stakeholder involvement, and collaborate to make decisions about the plan direction and recommendations. Meeting minutes, as well as, the agendas and presentations can be found in **Appendix B**.

One-on-one Meetings

The second collaboration component involved stakeholder one-on-one individual meetings with several adjacent property owners. The purpose of the meetings was to solicit input and ideas for the roadway alignment and associated components. An extensive effort was made to speak with the primary landowners. The team believes that the success of this and future planning efforts will be contingent upon creating a solid foundation with the primary land owners within the study area. We believe the beginning of the foundation could be created through open and transparent communication. After many different avenues and efforts were utilized to contact the four (4) primary landowners, the following meetings were conducted:

Meeting No. 1: July 2, 2015: 7:00 a.m. to 8:00 a.m.

Meeting attended by Doug Samuelson and Bruce Perryman, AVI, P.C. The meeting was conducted at Warren Livestock, LLC, 1961 U.S. 85 North/ Torrington Highway, Cheyenne, WY 82009.

Meeting No. 2: April 19, 2016: 11:00 a.m. to 12:30 p.m.

Meeting attended by Letica Sara, Randall Draves, John Watkins, Daryl Johnson, AVI, P.C., Brad Emmons, AVI, P.C., and Tom Cobb, AVI, P.C. The meeting was conducted at 1103 Old Town Lane, Suite 100.

Meeting No. 3: April 29, 2016: 11:00 a.m. to 12:00 p.m.

Meeting attended by Jeff Deisch, Daryl Johnson, AVI, P.C., Tom Cobb, AVI, P.C. The meeting was conducted at 1103 Old Town Lane, Suite 100.

Meeting No. 4: June 27, 2016: 10:00 a.m. to 11:30 a.m.

Meeting attended by Doug Samuelson – Swan Ranch, LLC, Bruce Perryman, AVI, P.C., Tom Cobb, AVI, P.C. The meeting was conducted at 1103 Old Town Lane, Suite 100.

The agenda of the meetings were as follows:

- Introduction
- Goals of the Project
- Three alignment alternatives and typical section
- Do you have any suggested alternatives?
- Other comments, questions or concerns?

Three alternative alignments and a typical section were presented to the landowners are shown on **Figure 3.1 Preliminary Alignment Alternatives** and **Figure 3.2 Proposed Conceptual Typical Section**.

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HIGH PLAINS ROAD CORRIDOR STUDY

COLLABORATION

October, 2016

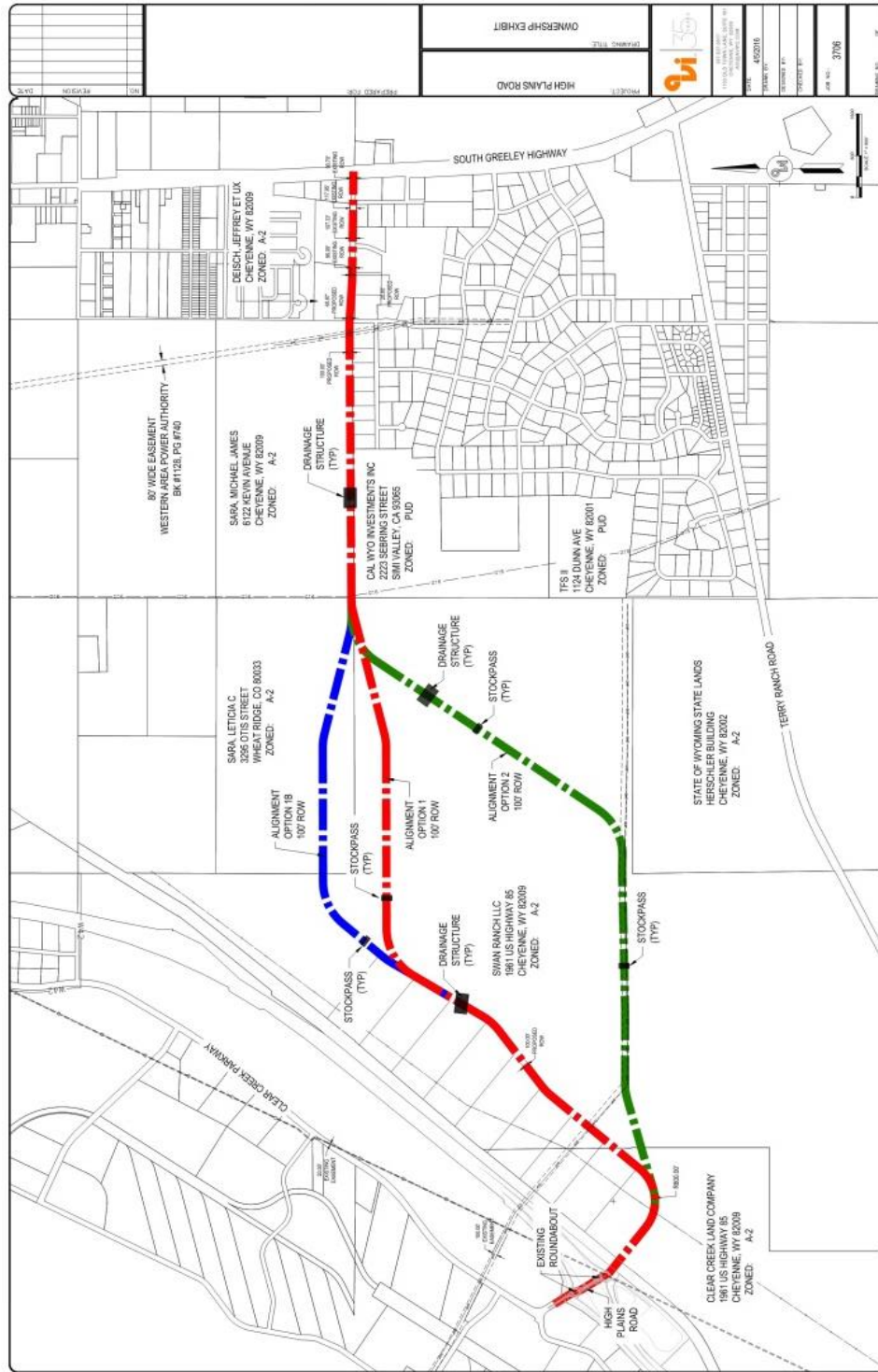


Figure 3.1 Preliminary Alignment Alternatives

TYPICAL ROADWAY SECTION - 2 LANE RURAL ASPHALT

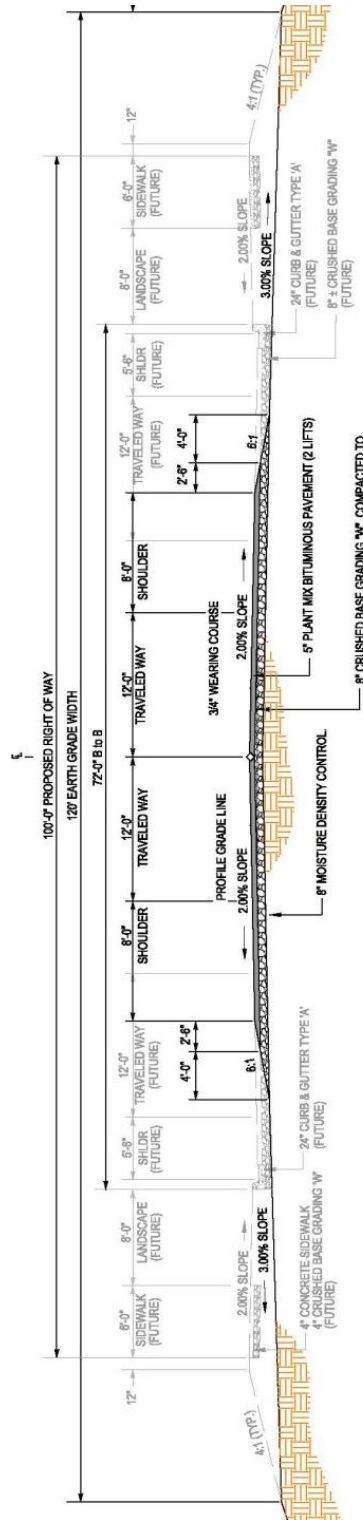


Figure 3.2 Proposed Conceptual Typical Section

Summary of one-on-one Stakeholder Meetings

The purpose of these stakeholder meetings was to discuss and document perceptions of the proposed roadway corridor, any issues or needs that the stakeholders believed were relevant to the Study and of which the project team should be made aware. These include perceptions of potential benefits and impacts from the project, perceptions of existing conditions, access needs, and any other location-specific issues.

The team indicated to the groups or individuals that based on an original July 25, 2015 meeting with Swan Ranch, LLC that the northern most alignment (Alignment #1B) was recommended as it was the best scenario for the land owner's current sheep operation.

In order to allow for stakeholders to speak freely and in confidence, no quotations are attributed to the questions and concerns. Additionally, these notes are based on AVI, P.C. understanding of the meeting(s).

- They appreciated the team coming to them in a small setting and listening to their input.
- Most agreed with the primary goals identified.
- Concerns/ Questions:
 - When will they begin construction on this roadway?
 - Direct costs to property owners?
 - Will right-of-way be purchased? If so, how much?
 - Access control.

Specific Comments:

- Swan Ranch, LLC utilizes the land for grazing, water, and wintering for approximately 1,500 head of sheep. A roadway adjacent to the BNSF railroad would cut access to valuable winter sheep ground. The areas in the lower valley fill with snow and are not useable to the sheep operation.
- 1,500 head of sheep will not cross a small opening stockpass.
- Coyotes frequent the areas in ephemeral drainage areas. Since coyotes are classified as predators, under Wyoming Law, these animals can be taken year round. Roadways in the area will hinder efforts to remove the predator from the sheep operations.
- Sheep dogs are utilized with the sheep operation in the area. Swan Ranch, LLC is apprehensive to mixing roadway vehicles in the open grazing areas. Many dogs have been hit or perceived as lost in areas that are similar. When perceived lost, animal control takes the animal to a shelter. The dogs are highly trained and an expensive investment.

Q: When will they begin construction on this roadway?

First, AVI discussed the fact that this study is a planning project only. The High Plains Corridor Study is to be a conceptual plan which conveys the visions of the community and stakeholders with

supplemental engineering and planning recommendations for safety, drainage, and future development. A typical project is comprised of common components including Planning, Design, and Construction. The corridor study is one of the first steps of this project process. The primary element common to all the components is that public/ community involvement throughout all aspects of a project from Planning through and including Construction. Many additional opportunities will be available to the stakeholders as the project continues to evolve.

The impetus for an actual construction project on any part of the corridor is most likely dependent upon the primary landowners and how they proceed with the development of their land. Other avenues are possible but, not as likely could be dedicated special purpose taxes, etc.

Q: Direct costs to property owners?

No direct costs impact the land owners for this project other than normal property and county taxes which you currently pay. The planning project was funded through Cheyenne Metropolitan Planning Organization (MPO). The MPO is funded by the three jurisdictions including federal funds through the Wyoming Department of Transportation (WYDOT), City of Cheyenne, and Laramie County.

Q: Will right-of-way be purchased and if so, how much?

First, AVI reiterated that the most likely beginning of any project is development which occurs by an individual landowner. This avenue would require platting of land in to lots and roadways. Dedication of roadway corridors like High Plains Road would occur through that process.

Finally, if a corridor was developed through the public process, right-of-way would be assessed based on market value at the time and fair market value would be offered to the land owner.

Q: Access control.

High Plains Road is currently classified as minor arterial. Access to and from a future roadway corridor will be governed by the classification and based on the jurisdictional regulations where the road resides. For instance, the current Laramie County Land Use Regulations state access will be limited. The City of Cheyenne Unified Development Code stipulates that minimum intersection spacing is 660' and minimum access separation to corners and other accesses is 330'.

Public Open House

The third structural component involved an open house style forum for stakeholder and public comment. A drop-in style open house public meeting was conducted during the project. AVI led the public involvement process with assistance and contributions from all the team members. The meetings were advertised through various media including newspaper, web, and mail post cards.

The Open House was conducted on May 18, 2016 from 5:00 p.m. to 7:00 pm. Thirty-nine people were listed on the Sign-In-Sheet as attending the meeting. The objectives of the open house were as follows:

- Introduce the project and purpose.

- Obtain input and comment on the following:
 - Proposed conceptual alignment options based on the direction of landowner meetings
 - Proposed Conceptual Typical Section and Future Ultimate Typical Section.
- Solicit additional comments and ideas.

The open house was organized into two identical workshop areas comprised of exhibits showing the proposed Conceptual Typical Sections and Conceptual Roadway Alignment Options. A detailed aerial overview of the north alignment was also presented. Breaking the public into two identical workshop areas allowed more one on one conversations and interactions with people. This was an attempt to ensure that the public in attendance was allowed to speak freely and get to know the people working on the corridor plan. A separate place was provided for the public to write comments and to answer a written survey.

Planning and Engineering consultants from AVI, City of Cheyenne, MPO, Laramie County Planning, and WYDOT were present to receive public comment. Information and input was collected using three different avenues; direct communication with a team member (i.e. consultant, City staff member, and WYDOT), having the public write comments on Post-it® notes and placing them on large planning area maps, and filling out a written survey.

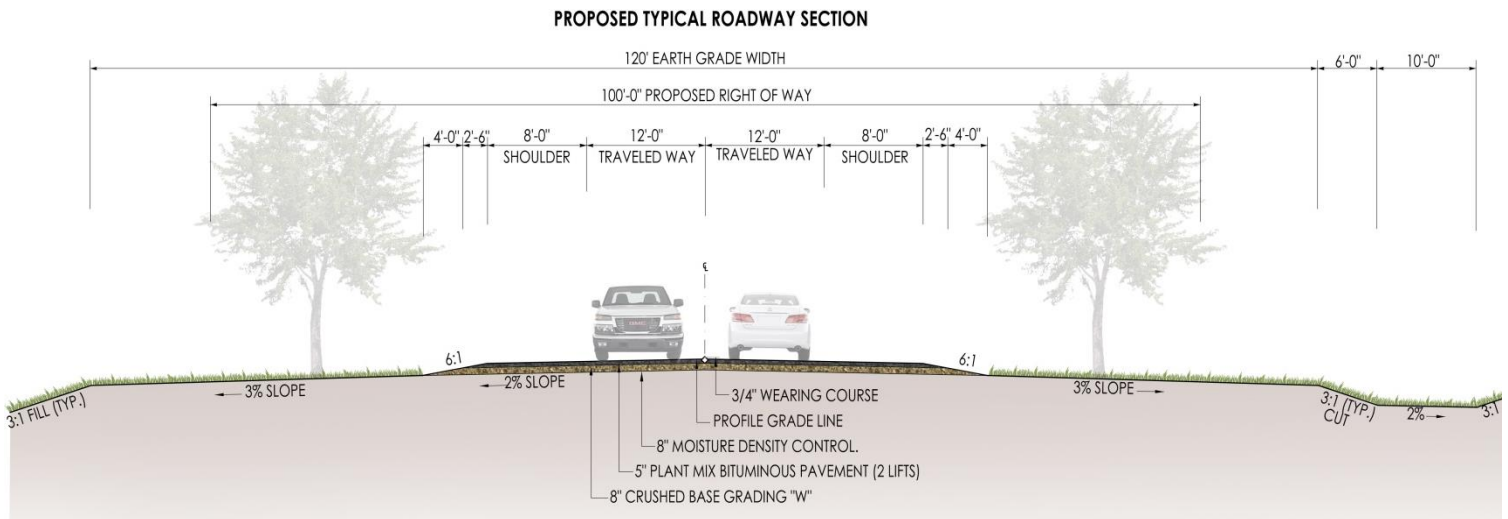
Overview

Twelve (12) participants of the thirty-nine (39) listed on the sign-in sheet provided written survey comments or a 30.8% response rate. The written survey responses were entered and the results are included in the following charts by the category that they relate to. Of the survey respondents, fifty percent (50%) considered themselves to be a home owner in the area, thirty-three point three percent (33.3%) were potential route users, and eight point three percent (8.3%) considered themselves business owners in the area. The following questions were specifically asked to be commented and summary of the results follows the question.

Q: Rate the importance of the following modes based on what you consider to be the most important design consideration for High Plains Road: Volume of Traffic, Higher Traffic Speeds, Lower Traffic Speeds, Pedestrians, and Bicycles? A scale was provided As Very Important to Accommodate to Most Important to Discourage of each mode. The most important modes to accommodate in order from most to least were as follows based on a weighted average:

- Bicycles
- Lower Traffic Speeds
- Pedestrians
- Volume of Traffic,
- Higher Traffic Speeds.

Q: Please rate the Proposed Typical Roadway Section for High Plains Road shown below:



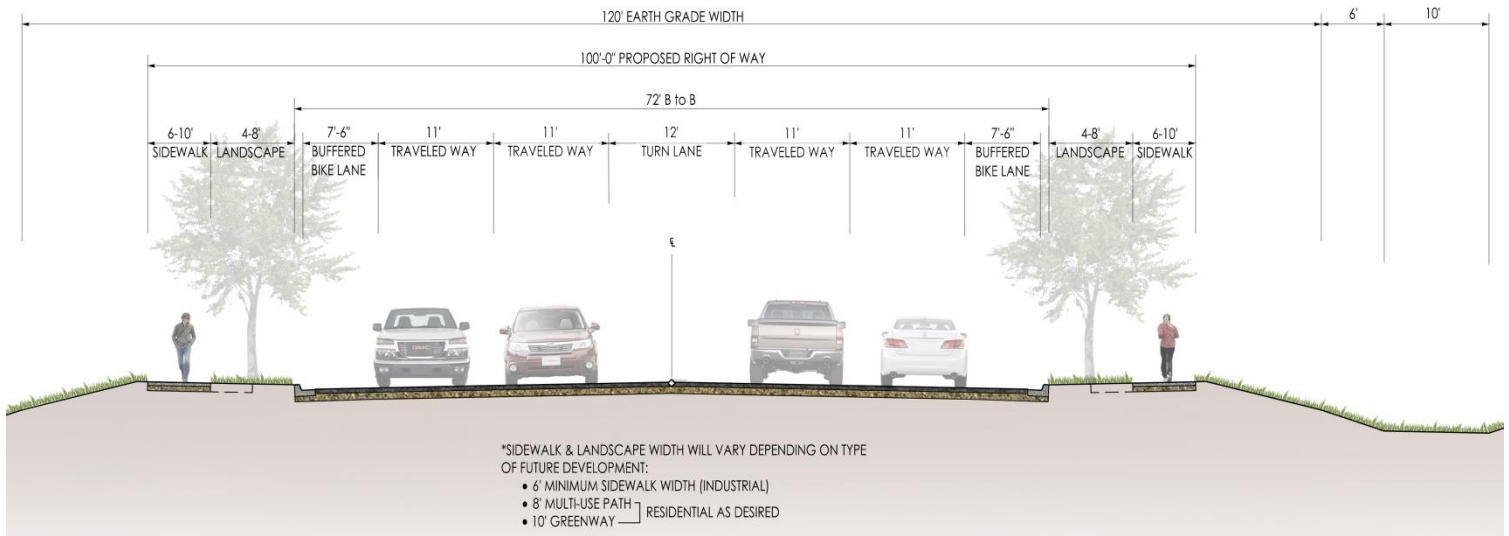
The response to this typical was very positive. Sixty (60.0%) either definitely liked or liked the proposed conceptual typical section with twenty (20.0%) indicating they had no opinion. Twenty (20.0%) indicated they definitely did not like this roadway typical. The following additional comments were furnished about the section:

- The section would be more likeable with sidewalks.
- Don't want heavy (semi-truck) traffic
- Would like to see an area for passing lanes and a pedestrian/ bike area close to town.

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Q: Please rate the Future Ultimate Typical Roadway Section for High Plains Road shown below:

FUTURE ULTIMATE TYPICAL ROADWAY SECTION



The response to this typical section was seventy (70.0%) either definitely liked or liked the proposed conceptual typical section with thirty (30.0%) indicating they did not like or definitely did not like this roadway typical. The only additional comment was that the section would be more likeable with sidewalks.

The following additional comments were furnished about the section:

- Don't want an "Interstate Expressway" near my home.
- Don't want any intersections connected to our peaceful neighborhood.

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

Based on our interpretation of the additional comments, the following summarizes the general theme of the content received.

Summary of General Themes

General Comment Theme	Responses
Concerned about the impact of higher traffic volumes around the rural residential properties.	16.7% (2)
Concerned about the effect of property values in the adjacent rural residential areas.	16.7% (2)
Concerned about drifting snow impacts to the proposed roadway and adjacent properties.	25.0% (3)
Concerned about the potential truck by-pass of the Port-of-Entry on I-25.	8.3% (1)

Detailed survey results for the written survey information were entered into the computer system by the consultants after the open house. The public had the option of entering the survey electronically through the Survey Monkey® web link. The link was provided on the MPO website. Refer to **Appendix C** for exhibits, sign in sheets, and individual comment cards.

Cheyenne Metropolitan Planning Organization (Committee Meetings)

The fourth type of collaboration component involved presenting developmental increments and soliciting input from the established Cheyenne Metropolitan Planning Organization’s Technical Committee, and Citizen’s Advisory Committee.

Laramie County Planning Commission

The fifth type collaboration component of the project involved presenting the project and recommendations to the Laramie County Planning Commission.

Reference

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

4.0 PROFILE

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

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

Foundation 1: Future Land Use Plan

The Future Land Use Plan is a long-range growth-focused map that provides the basis to guide future development in the Laramie County urban area. The map focuses on areas where new development will likely occur in the future and some redevelopment areas. The Land Use for this area was not revised and was used as the basis for future traffic volumes. **Figure 4.1 Future Land Use 2040 Detail Area** for additional information and reference. Based on the future land use map, the adjacent land is anticipated to become comprised of the following land uses:

- Mixed-use Commercial
- Mixed-use Employment
- Urban Residential
- Mixed-use Residential
- Urban Transition Residential

Foundation 2: Key-Planning Considerations

The Glimpse, Collaboration, and Profile phases of the project provide a framework for the future land development and corridor vision of the various stakeholders. The High Plains Road Corridor area has the potential to grow and develop as additional utility and roadway infrastructure become connected and are appropriately sized for future capacity needs. The following planning considerations have been identified in the Glimpse and Collaboration phases of the project which shaped the corridor plan:

General

- Minimize impacts to nearby residential properties and businesses.
- Minimize or eliminate impacts to underground pipelines and overhead transmission lines.
- Provide provisions for drainage structures in natural drainage areas.
- Minimize impacts to property utilized for livestock management.

Traffic Safety and Operation

- Provide bike lanes as recommended by the *September 2012 Cheyenne On-street Bicycle Plan and Greenway Plan Update*.
- Build a roadway cross section that enhances travel efficiency and accommodates all modes of transportation.
- Incorporate design features within the roadway cross section, alignment, and vertical profile to mitigate snow drifting, improving visibility, and reducing slush and ice. Where impractical to include design features to mitigate snow movement, utilize snow fence.
- Provide peak hour intersection operations with a minimum Level of Service (LOS) C as minimum through horizon year 2040.
- Where appropriate, provide for proper turning widths at intersection to accommodate a conventional single unit truck (SU-40), conventional school bus (S-Bus-36), and interstate semi-trailer combination (WB-67).

Roadway Connectivity

- Review options to promote development in undeveloped open space.
- Review existing roadways and provide additional or enhanced street connectivity.
- Attempt to maintain existing commercial and residential access approaches.
- Review options to develop future corridor intersections at Division Avenue and Parsley Blvd.

Dry and Wet Utilities

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

Cooperation

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

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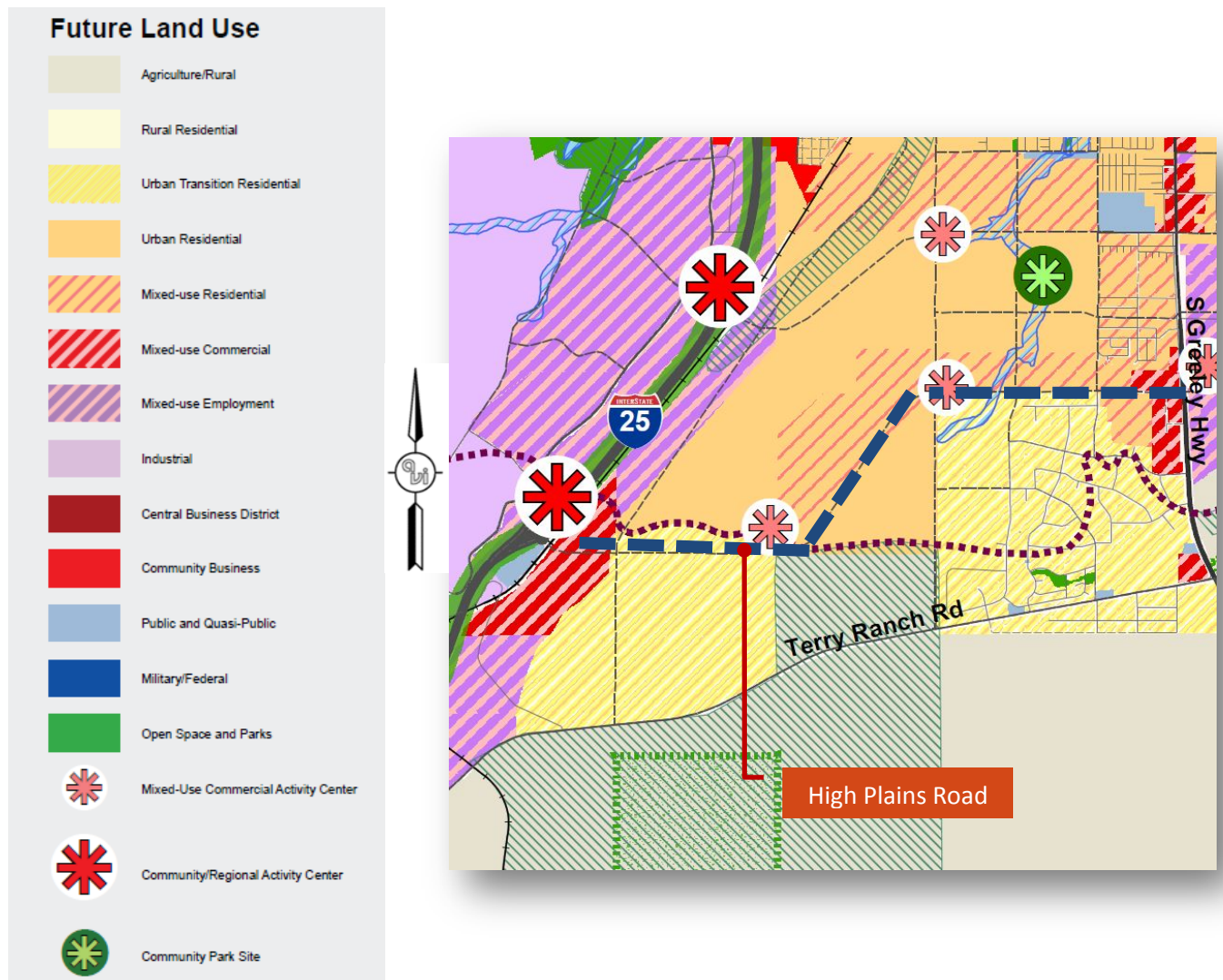


Figure 4.1 Future Land Use 2040 Detail Area

Foundation 3: Potential Funding Mechanisms

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

- A clear vision, taking into account the market and economic reality;
- A proactive strategy for reinvestment (public and private);
- Education of general public and potential developers;
- Calculated strategy to attract investment and remove barriers;
- Quantifiable leveraged public investment;
- Fiscally and economically responsible phasing plan;

- Equalization of economic risk vs. reward;
- On-going project support (political).

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

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

Foundation 4: Environmental Constraints

The following environmental checklist was reviewed for the corridor in order to identify any areas of environmental concern that may need to be addressed in future development of the corridor plan, roadway design, and construction. Please See the Environmental Review prepared by Western EcoSystems Technology, Inc. (WEST) in **Appendix F** for additional detail.

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Table 4.1 Environmental Review Corridor Checklist

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environment				
Threatened or Endangered Species	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Further investigation will be required during final design but not anticipated to be a factor. Review of area and U.S. Fish & Wildlife website. Unofficial US fish and Wildlife Service online database suggests that eight species have potential habit on site; black-footed ferret, Colorado butterfly plant, least tern, pallid sturgeon, piping plover, Preble’s meadow jumping mouse, western prairie fringe orchid, and whooping crane. While these species have some potential, it is unlikely they are present. However, specific species/habitat surveys may be required once an alignment is selected.
Wildlife Corridors	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Further investigation will be required during final design but not anticipated to be a factor. Based on WGFD GIS data, no wildlife corridors cross or are in the area.
Invasive Species	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Further investigation will be required during final design but not anticipated to be a factor.
Wetland Areas	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	The NWI has identified numerous wetlands near the Preferred Alignment. Further investigation will be required during final design. Once final design and access are available, a jurisdictional waters delineation should be performed to verify the presence or absence of wetlands and other aquatic resources.

HIGH PLAINS ROAD CORRIDOR STUDY

PROFILE

October, 2016

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environment (Continued)				
Riparian Areas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	Observation
100-Year Floodplain	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	FEMA website and County GIS review. There is a potential that the Preferred alignment will cross Zone A floodplain of Allison Draw west of Redhawk Drive. (see Glimpse: Drainage; Figure 2.13)
Clean Water Act Sections 404/401 Waters Of The United States	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Not applicable	WYDEQ identified no Class I waters, but further detailed design/layouts will be needed to determine what if any permits will be required from the Army Corps of Engineers and WYDEQ-WQD.
Prime Or Unique Farmland	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Ascalon soils were found in the area and are considered Prime Farmland if irrigated. However, this soil was identified on the far east end where there is already a high level of development.

HIGH PLAINS ROAD CORRIDOR STUDY

PROFILE

October, 2016

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Natural Environment (Continued)				
Wild and Scenic Rivers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	The National Wild and Scenic River System database confirmed no Wild and Scenic Rivers are on site or within visual range of High Plains Road.
Visual Resources	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation and public process. Visual leisure in the case is "open space/aerial". Although this is subjective it may have impacts throughout the corridor.
Designated Scenic Road/Byway	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Cultural Resources				
Archaeological Resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Formal survey was not completed; however, the Disturbed nature of the area would suggest that it is unlikely to find surface deposits. Buried artifacts may be possible. Formal surveys are likely once an alternative is selected.

HIGH PLAINS ROAD CORRIDOR STUDY

PROFILE

October, 2016

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Cultural Resources (Continued)				
Historical Resources	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Section 4(f) and Section 6(f) Resources				
Section 4(f)1 Wildlife and / or Waterfowl Refuge	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	No impacts are anticipated based on observation.
Section 4(f) Historic Site	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	A section 106 Study will be required to determine potential impacts however, the area was not listed on the SHPO website.
Wild and Scenic Rivers	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	The National Wild and Scenic River System database confirmed no Wild and Scenic Rivers are on site or within visual range of High Plains Road.

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

HIGH PLAINS ROAD CORRIDOR STUDY

PROFILE

October, 2016

Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Section 4(F) And Section 6(F) Resources (Continued)				
Section 4(f) Park	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Section 6(f)2 Resource	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	
Human Environment				
Existing Development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Existing approaches, fences and right-of-way will be necessary to complete the project based on the preliminary plan.
Planned Development	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Potential development is anticipated on underdeveloped properties based on discussions with adjacent boundaries.

² Section 6(f) of the Land and Water Conservation Fund Act

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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Human Environment (Continued)				
Displacements	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Possible impacts to adjacent homeowners north of Redhawk Drive.
Access Restriction	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Neighborhood Continuity	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Community Cohesion	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Public Involvement process.

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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Physical Environment				
Title VI/Environmental Justice Populations ³	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	
Utilities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation See Section Glimpse; Utilities.
Hazardous Materials	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Observation
Sensitive Noise Receivers ⁴	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	Adjacent Neighborhoods

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

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

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Resource or issue	Is the resource or issue present in the area?	Are impacts to the resource or issue involvement possible?	Are the impacts mitigable?	Discuss the level of review and method of review for this resource or issue and provide the name and location of any study or other information cited in the planning document where it is described in detail. Describe how the planning data may need to be supplemented during NEPA.
Physical Environment (Continued)				
Air Quality	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	
Energy	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Not applicable	

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5.0 DESIGN

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

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

Roadway Concept Alternatives

The methodology employed to develop the conceptual roadway “typical” alternatives was evaluated using a multi-modal framework as a base. At intersections and other locations with unique design challenges (e.g. driveways, areas with limited sightline, etc.), special designs and modifications may be needed to address issues of road geometry, adjacent land uses, traffic volumes and other characteristics. The High Plains Road Corridor Study evaluated conceptual improvement alternatives for the roadway segments and streetscape with the following governing parameters:

- What are the existing and future adjacent conditions and uses?
- What movements and interactions will take place on the corridor?
- What is the corridor vision of the stakeholders?
- *City of Cheyenne Unified Development Code (UDC)* typical section for Minor Arterial
- *The Laramie County Land Use Regulations* typical section for Minor Arterial.

Design Guide Criteria

- Roadway Classification: Minor Arterial
- Minimum Design Speed: 45 mph
- Lane Width: 11-12 foot
- Clear Zone Width: 24 to 28 feet (ADT > 6,000), 1V:5H to 1V:4H
20 to 22 feet (ADT > 6,000), 1V:6H
AASHTO Roadside Design Guide
(Officials A. A., Roadside Design Guide, 2011))
- Stopping Sight Distance: 360 feet
- Passing Sight Distance: 700 feet
- Crest Vertical Curve: K = 175 (Passing Sight Distance)
K = 79 (Stopping Sight Distance)
- Sag Vertical Curve: K = 79 (Stopping Sight Distance)

Design Guide Criteria (Continued):

- Grade (Max./ Min.): 6%/ 0.5%
- Design Vehicle: WB-40 (Intermediate Semitrailer) Division Avenue and Parsley;
WB-67 (High Plains Road)
- Horizontal Curve: R = 1051' minimum (Adverse Crown),
- Drive Lane Transitions: S>40 mph; L = WS = W(45), L=W(60)

Table 5.1 Ultimate Typical Section Jurisdictional Comparison

Description	Laramie County (Minor Arterial) (1)	City of Cheyenne (Minor Arterial) (2)	2011 AASHTO (3)
Travel Lane**	(2) – 12'	(2-4) – 12'	10' – 12'
Turn Lanes	12' (3)	12'	-
Parking **	none	none	11'
Roadway Width	48'	48'	Volume
Sidewalk/ Pedestrian Area	8'	6'	-
Parkway/ Tree Lawn	8'	8'	-
Bike Lane/ Shoulder**	2-6'	2 – 6'	4' – 8'
Volume Capacity (ADT)	3,500 – 15,000	7,500 – 32,000	Over 2,000

Footnotes:

(#) - ##' indicates total number of element within corridor cross section

(1) *Laramie County Land Use Regulations* (County, 2011)

(2) *City of Cheyenne Unified Development Code* (Cheyenne, 2013)

(3) *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011)

Cross Sectional Elements

Lane Widths

As shown in **Table 5.1 Ultimate Typical Section Jurisdictional Comparison**, lane width requirements vary between the jurisdictional entities from ten to twelve (10-to-12) feet. According to AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2011) and our experience, smaller lane widths may be used in more constrained areas where truck and bus volumes are relatively low and where speeds are less than 45 mph. Lane widths of eleven (11) feet wide are extensively used

in urban arterial street designs while twelve (12) foot wide lanes are desirable on high speed, free flowing principal arterials.

After extensive discussion between the design team and Steering Committee, we recommend the use of twelve (12) foot wide travel lanes on High Plains Road.

Curbs and Shoulders

Shoulders are desirable on any roadway. According to *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011) shoulders contribute to reducing crash frequencies by creating maneuver room and providing space for immobilized vehicles. They also serve as speed-change lanes for vehicles turning into local driveways or farm/ ranch approaches and provide for snow storage for plowed snow.

The type and location of curbs affect driver behavior and safety. Curbs serve many purposes including drainage control, roadway edge delineation, delineation of pedestrian walkways, and access control. Although curbs are not considered fixed objects in the context of a clear zone obviously, they will have an effect on impacting or overriding car movements.

After discussion within the public, design team, and Steering Committee, due to low volume and surrounding boundary conditions which would initially be found with this corridor, we recommend a rural cross section for the initial proposed typical roadway section incorporating an 8 foot shoulder without curb and gutter. However, we recommend the use of curb and gutter on the Future Ultimate Typical Section on High Plains Road as the corridor becomes more developed. Curb and gutter will provide better access control and pedestrian delineation for pedestrian.

Bicycle and Pedestrian Facilities

Bicycling has becoming increasingly popular in Cheyenne as a means of transportation and recreation. A recent increase in completed bicycle facility striping projects demonstrates that fact. Additionally, even to the casual observer, those roadways where facilities have been placed have seen increased use. Consequently, as a part of providing a more continuous, safe and efficient bicycle system, the *City of Cheyenne Unified Development Code* (Cheyenne, 2013), *Laramie County Land Use Regulations* (County, 2011), and *Cheyenne On-Street Bicycle Plan and Greenway Plan Update* (Group, 2012) have emphasized the accommodation of safe, efficient, and convenient movement of vehicles, bicycles, and pedestrians when development occurs. A Bike Lane is defined as a designated area of the roadway favored or exclusive to bicyclists. Designation is usually by striping, signage, and pavement markings. Specifically, the following criterion has been identified for the corridor: "Bikeway Development Subject to Future Roadway Paving or Construction."

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

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

After discussion and evaluation by the public, design team, and Steering Committee, we recommend the use of an eight (8) foot shoulder for the Proposed Typical Section and an eight (8) foot buffered bike lane for the Future Ultimate Typical Section. The initial shoulder can be utilized for bicyclists but, would not be designated as a bike lane at this time. The recommended design is illustrated in **Figure 5.2 Proposed Typical Section (Looking East)** and **Figure 5.3 Proposed Future Ultimate Typical Section (Looking East)**.

Medians

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

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

- **Raised Medians.** A raised median is used in urban streets where it is desirable to control or restrict mid-block left turns and cross maneuvers. Installing a raised median can result in the following benefits:
 - Improve traffic safety
 - Restrict left-turn and crossing maneuvers to specific locations or certain movements
 - Increase capacity and reduce delays
 - Provide a pedestrian refuge area (minimum of six (6) feet wide).
 - AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2011) recommends that intersection median turn lanes have a minimum medial separator of four (4) feet between turning lane and opposing traffic. Additionally, they recommend that with wider medians, consideration should be given to offsetting the left-turn lanes to provide maximum visibility between opposing traffic volumes.

- **Flush Medians.** Flush medians are surface painted medians that can be traversed. (Although they discourage left-turn and crossing maneuvers by their striping configuration, they do not prevent left turns because the median can be easily crossed).
- **Two-way Left-turn Lanes.** Two-way left-turn lanes (TWLTL) are flush medians that may be used for left turns by traffic from opposing directions on the street. AASHTO (Officials A. A., A Policy on Geometric Design of Highways and Streets, 2011) recommends the use of a TWLTL on arterials with numerous cross streets, commercial, residential drives, or where it is impractical to limit left turn movements.

After discussion and evaluation by the public, design team, and Steering Committee, we recommend the use of all type of medians on the corridor. As indicated previously, the plan recommends incremental or phased development of the proposed typical section. This would entail the initial installation of Flush Medians at the major intersections of Parsley Boulevard, Division Avenue, and South Greeley Highway with TWLTL and Raised Medians eventually installed when the Future Ultimate Typical Section is implemented.

Auxiliary Lanes (Speed-Change Lanes)

The existing corridor would be governed under the jurisdiction of WYDOT and Laramie County. The following criteria were reviewed for the corridor:

- City of Cheyenne Criteria (Cheyenne, City of Cheyenne Unified Development Code, 2013)
- Laramie County Criteria (County, 2011)

Left Turn Lane

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

Right Turn Lane (Deceleration)

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

Table 5.2 Jurisdictional Deceleration Auxiliary Lane Length for Left Turns

Design Speed	Stop Condition	10 -15 MPH Turns	Minimum Decel Lane Taper Ratio
	Decel	Decel	
City of Cheyenne (1)			
45	375	350	13:1
55	485	350	13:1
Laramie County (2)			
45	375	350	13:1
55	435	405	15:1
AASHTO (3)			
40	275	-	8:1 to 15:1
50	425	405	15:1
60		605	
70		820	
WYDOT (4)			
40		(AASHTO)	150' (12.5:1)
50		(AASHTO)	150' (12.5:1)
NCHRP (5)			
45	-	410 [340]	45:1
50	-	500 [415]	50:1
65	-	810 [700]	65:1

Footnotes:

(1) *Laramie County Land Use Regulations* (County, 2011)

(2) *City of Cheyenne Unified Development Code* (Cheyenne, 2013)

(3) *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2011)

(4) *WYDOT Pavement Marking Manual* (Program, 2012)

(5) *NCHRP Report 780 Design Guidance for Intersection Auxiliary Lanes*

(Board, NCHRP Report 780 Design Guidance for Intersection Auxiliary Lanes, 2014); [###]: Constrained Areas

Careful consideration was given to the proposed conceptual alternatives to use the safest and most practical deceleration length on the corridor.

High Plains Road

Due to the proximity of access approaches, expected relatively lower speeds approaching intersections, a three-hundred and fifty (350) foot deceleration length was applied to the auxiliary lane development. If specific site conditions did not allow for the development of full deceleration lane, it was omitted and so noted. Additionally, for the identical reasons as previously noted, a 100' minimum taper was utilized for all the auxiliary lanes within the corridor. For a twelve (12) foot lane this equates to approximately an 8.33:1 and for an eleven (11) foot lane it equates to approximately a 9.1:1.

South Greeley Highway/ U.S. 85

The deceleration and taper lengths directly on South Greeley Highway were derived based on the *AASHTO* (Officials, A Policy on Geometric Design of Highways and Streets, 2011) and WYDOT criteria using a 60 mph design speed. The deceleration length utilized was six hundred and five (605) foot with a 150' taper length.

Right Turn Acceleration Lanes (South Greeley Highway). In accordance with the *Laramie County Land Use Regulations* (County, 2011), a right-turn acceleration lane and taper is required for any access with a projected peak hour turning volume greater than 50 vph when the posted speed on the adjoining roadway is 40 mph or greater. The taper length can be included within the acceleration length. Below is a comparison of the jurisdictional requirements from Laramie County and AASHTO.

Table 5.3 Jurisdictional Acceleration Lane Lengths for Auxiliary Lanes

Design Speed	Stop Condition	15 MPH Turns	Minimum Accel Lane Taper Ratio
	Accel	Accel	
Laramie County			
45	550	480	15:1
50	760	700	15:1
65	-	-	-
AASHTO			
45	560	490	300' (27.3:1/11')
50	720	660	300' (27.3:1/11')
55	960	900	300' (27.3:1/11')
60	1200	1140	300' (27.3:1/11')
65	1410	1350	300' (27.3:1/11')

Careful consideration was given to the proposed conceptual alternatives to use the safest and most practical acceleration and taper lengths on the corridor.

South Greeley Highway/ U.S. 85

The acceleration and taper lengths directly onto South Greeley Highway were based on the AASHTO (Officials, A Policy on Geometric Design of Highways and Streets, 2011) and WYDOT criteria using a 60 mph design speed. However, the distance between High Plains Road and the Cheyenne Christian Fellowship Church is only 1,000 feet. The acceleration length utilized will need to be combined with a deceleration lane for the church approach. We recommend a 1,200 foot acceleration lane and a 300 foot taper.

Future Traffic Volume Conditions

Traffic volume projections were developed for Year 2040 by Fehr and Peers to estimate the impacts of the traffic growth on the corridor. The analysis utilized the 2040 traffic volumes derived from the Cheyenne MPO 2040 travel model using the Vision Scenario. Projected traffic volumes for the corridor were developed based on the land use plan shown in **Figure 5.1 2040 Daily Traffic Volumes (Source: 2040 MPO Travel Model, Vision Scenario)**.

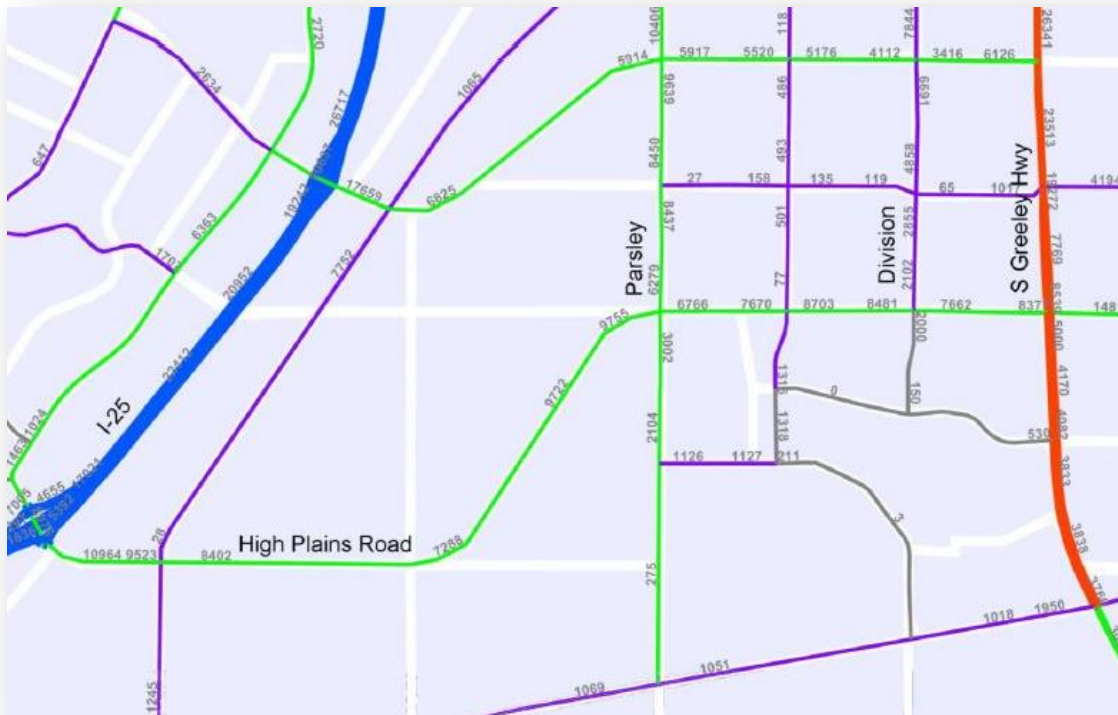


Figure 5.1 2040 Daily Traffic Volumes (Source: 2040 MPO Travel Model, Vision Scenario)

The 2040 projected traffic volumes on High Plains Road range from 6,800 to 11,000 vehicles per day (vpd) depending on the segment. Based on the forecasts, if constructed as a 2-lane minor arterial between I-25 and South Greeley Highway, High Plains Road would achieve no worse than a Level of Service (LOS) of C. This level exceeds the criteria established by the City of Cheyenne and Laramie County to achieve a LOS of D or better as specified in the *City of Cheyenne Unified Development Code* (Cheyenne, 2013) and the *Laramie County Land Use Regulations* (County, 2011).

Provision for Dry Utilities

As previously described in the study, some utilities are interlaced in the corridor area and are both underground and overhead. Obviously, newly installed utilities should desirably be located underground or at the edge of the right-of-way, when practical.

Based on the recommended right-of-way width of 100 feet, we recommend that new developments have dry utility facilities relocate underground within the corridor.

Recommended Conceptual Typical Section

After discussion with the design team and steering committee, it is recommended that the proposed conceptual typical section be completed in phases. The first phase would be comprised of a narrow two lane roadway with shoulders be built in conjunction with full earthwork or subgrade to accommodate an ultimate roadway width and amenities. This will allow for the roadway to be both funded and built incrementally as dictated by availability and need, respectively.

The recommended Typical Sections are illustrated in the following **Figure 5.2 Proposed Typical Section (Looking East)** and **Figure 5.3 Proposed Future Ultimate Typical Section (Looking East)**.

Should the landowner proceed to plan and develop a major industrial park it should be noted that the recommendations of this report are based on standard development densities for a 2040 horizon year. In the event a major freight company or similar type industry come into the area, the typical roadway cross-sections will need to be reevaluated to ensure they properly accommodate the actual traffic and vehicle conditions.

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DESIGN

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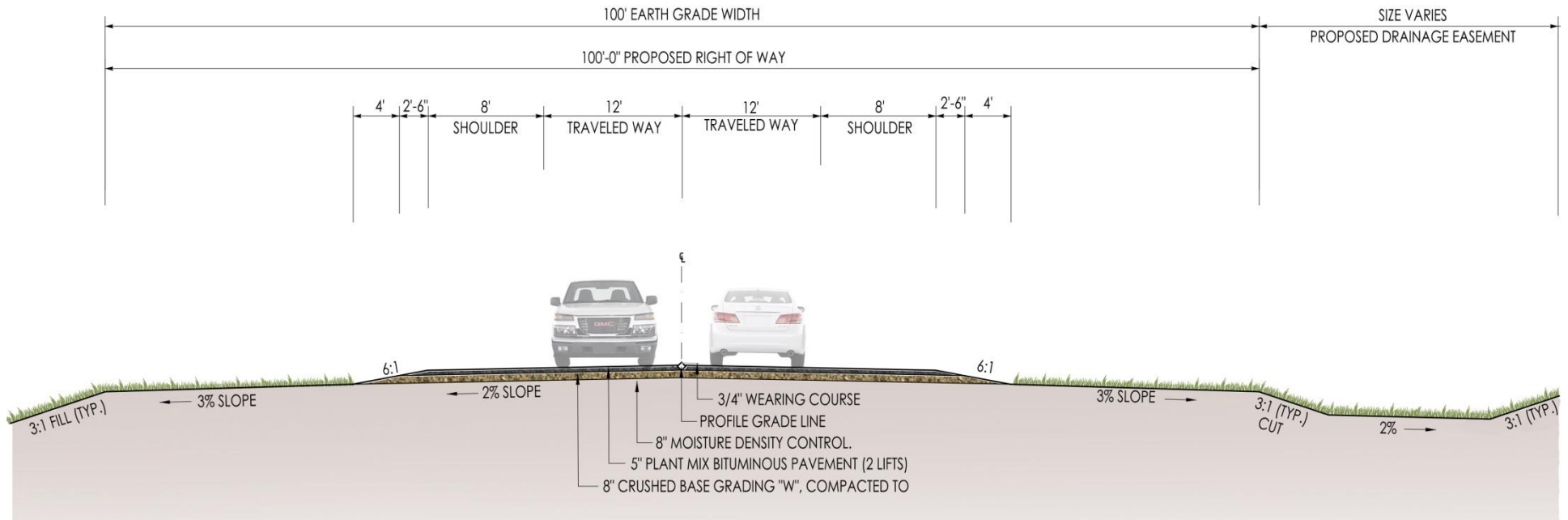


Figure 5.2 Proposed Typical Section (Looking East)

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DESIGN

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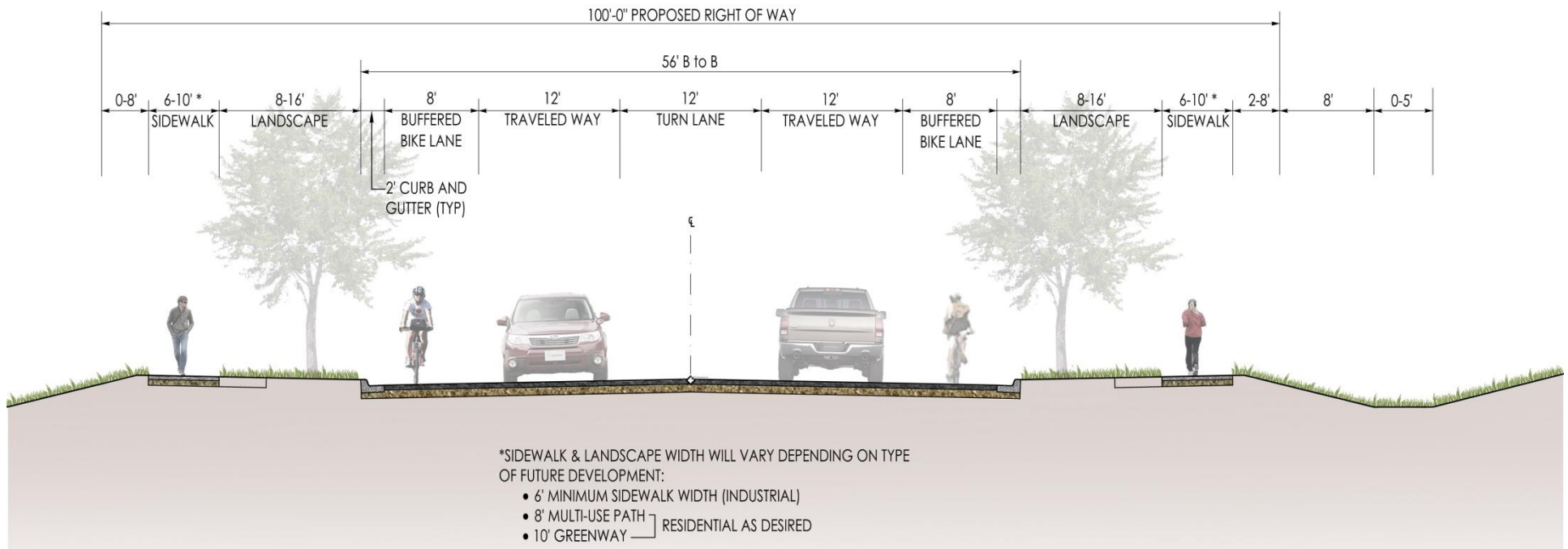


Figure 5.3 Proposed Future Ultimate Typical Section (Looking East)

Drainage and Detention

The requirements for drainage and detention for the City of Cheyenne and Laramie County differ in policy. We understand that the roadway at this time is in Laramie County however, it is within the City of Cheyenne Planning Area Boundary. The primary requirements for each jurisdiction are briefly outlined below:

Laramie County

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

City of Cheyenne

- *Detention.* Detention of stormwater shall be based on the more restrictive of the following:
 - No increase in peak discharge rates;
 - 100-year post-project peak rate no greater than the pre-project fifty (50) year release rate;

- The downstream conveyance capacity of a project;
- As provided for in Section 3.2.3.a.3(a). Drainage facilities shall be designed to, at a minimum, not adversely impact downstream properties. Proposals to increase downstream conveyance capacity of an area may be considered in-lieu of over-detention on a project, with justification.
- Drainage planning and design shall provide for stormwater detention based on a design storm up to a 100-year frequency. The design shall maintain post-development runoff rates to predevelopment rates for return periods up to a 50-year frequency.
- Emergency spillways shall be sized to convey the 100-year inflow peak. Spillway design velocities exceeding 5 fps shall require buried soil riprap.
- Embankments shall be no steeper than 4:1 below the 100-year water surface elevation and no steeper than 3:1 above the 100-year water surface elevation. The top width shall be 40 percent of the maximum dam height plus 4 feet.
- A 15 foot maintenance access with an 8 foot all weather surface shall be provided to assure access to all pond components.
- Post-construction Stormwater Best Management Practices (BMPs) are required to treat a minimum of the Water Quality Capture Volume (WQCV) as defined in the Urban Storm Drainage Criteria Manual (UDFCD) (Urban Drainage and Flood Control District, 2001 Revised 2008). The WQCV shall be added to the detention volumes up to the 50-year, and may be incorporated within the 100-year detention volume.
- *Drainage Conveyance.* Drainage conveyance system elements shall be based on the following minimum criteria for an minor arterial street:
 - Minor Storm
 - No curb overtopping and one 10 foot interior drive lane clear of spread
 - Maximum depth of 6 inches in cross pans, where allowed.
 - Major Storm (100-year)
 - Maximum depth of 12 inches in gutter flowline and cross street intersections.
 - *Channels (100 cfs or greater).* Design for the 100-Year frequency with one foot of free-

board. Maximum velocities 5 fps for erosive soils and 7 fps for non-erosive soils. Bank slopes 4:1 are desirable; steeper slopes require review and approval.

- *Storm Sewers.* Storm sewers shall not be designed to surcharge in the minor storm (surcharge is a depth of flow greater than 80 percent of the height). The maximum hydraulic head shall be 0.5 feet below the lip of drop inlets for the minor storm. The minor storm varies depending on zoning and land use from 2-Year to 10-Year.

The design team developed a conceptual drainage plan for the corridor. Due to the size of the right-of-way at 100 feet and level of design, planning level opportunities exist for improving the post development drainage adjacent to the corridor. After careful review, we recommend a combination of detention methods be implemented at the final design phase:

- Innovative drainage solutions be implemented gutter “turnouts” that direct stormwater to tree lawns to capture runoff (**Figure 5.5 Gutter Turnouts**);
- Roadside drainage that capture and treat water via longitudinal gravel beds, and the use of roadside ditches as linear detention/water quality facilities (**Figure 5.4 Linear / Conventional Detention**);
- Conventional offsite detention as available from adjacent landowners.



Figure 5.5 Gutter Turnouts



Figure 5.4 Linear / Conventional Detention

Alignment Alternatives

Many different concepts were suggested, reviewed, and evaluated for consideration for the High Plains Road alignment from I-25 to South Greeley Highway during the study process. These included:

- Do Nothing.
- North alignment parallel to I-25 bearing east on the section line.
- North alignment parallel to I-25 bearing east above section and then onto the section line.
- North alignment parallel to I-25 bearing east below section and then onto the section line.
- South alignment parallel to I-25 directly connecting into Terry Ranch Road.

After careful consideration and vetting through the Steering Committee, the possible conceptual alternatives were narrowed to the following and illustrated in **Figure 5.6 Conceptual Alternative Alignments**.

Alternative 1: North Alignment. Utilize an alignment which runs parallel to I-25 and creates development land opportunities between the BNSF Right-of-way to the roadway and from the section line or the property line to the roadway. Topographic conditions determined the distances from the roadway to the right-of-way/ property lines.

Alternative 1A: Middle Alignment. An alignment similar to Alternative 1 above where the created runs parallel to I-25 and creates development land opportunities both from the BNSF Right-of-way to the roadway and from the section line or the property line to the roadway. This version produces developable land south of the section/ property line. Topographic conditions determined the distances from the roadway to the right-of-way/ property lines.

Alternative 2: Original Concept Alignment. An alignment which runs southwest to northeast and directly abuts the Black Hills Energy Utility Easement within the Swan Ranch, LLC property. The alignment curves to the north between transmission main poles and proceeds along a natural drainage path until bearing east into existing right-of-way reserved for High Plains Road.

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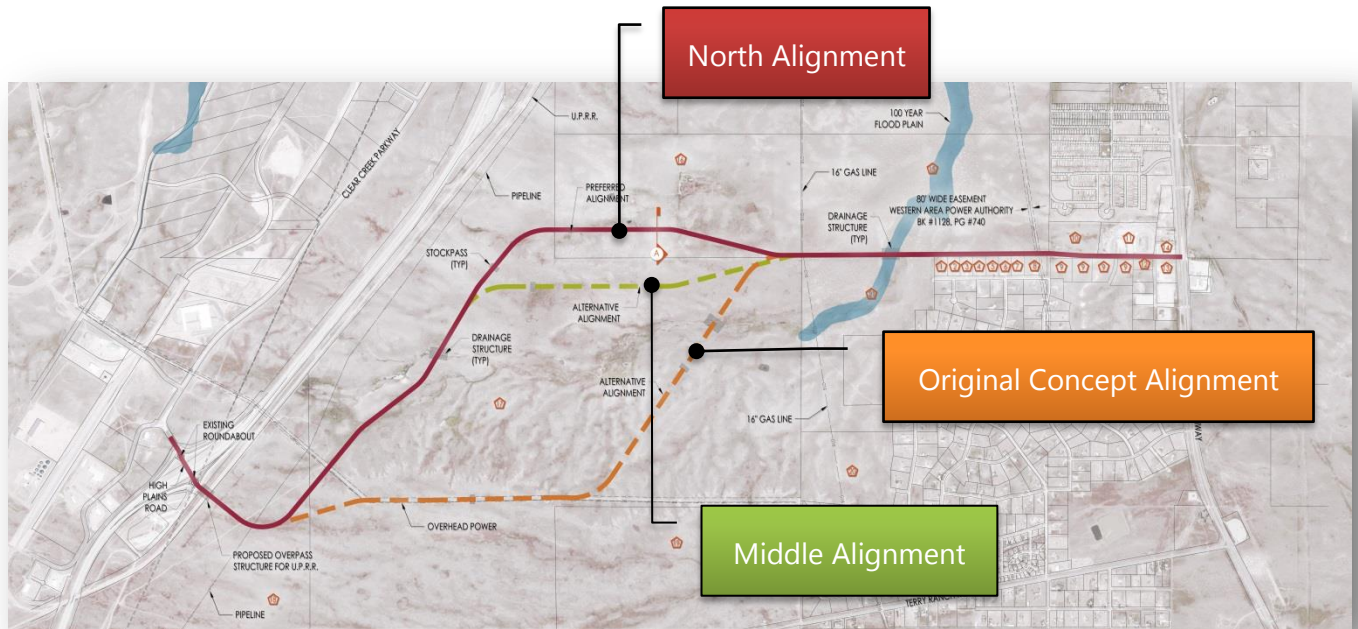


Figure 5.6 Conceptual Alternative Alignments

Conceptual Options and Recommended Alternative

As previously discussed, the goal of the recommended alternative was to create a practical alignment that resulted in a multi-modal corridor which fulfilled the following primary objectives:

- Is sensitive to the needs of the property owners,
- Serves all transportation users,
- Minimizes long term maintenance,
- Facilitates connectivity,
- Encourages economic development.

In order to properly evaluate the alternatives and ultimately make a recommendation, a systematic approach was utilized based on criteria developed from the primary purpose, goals, and objectives of the corridor. Fundamentally, the primary purpose of the High Plains Road Corridor extension is to facilitate inner road network connectivity and encourage economic development. Consequently, the following criteria were developed and used to determine the recommended alignment alternative.

Evaluation Criteria

- **Public Consensus.** Input from the public involvement process based on the written and verbal comments received and summarized in the Collaboration section of the study.
- **Direct Property Impacts.** The amount of relative negative impact of an alternative to existing

business or property based on physical impacts or changes in existing access points.

- **Adjacent Impacts.** Adverse impacts including the effects on neighborhoods, intersection proximity to other major roads by implementing or modifying the corridor.
- **Maintenance Cost.** This consists of operating costs and indirect costs for maintenance. Maintenance includes routine upkeep, replacements, snow removal. Indirect costs are unforeseen expenditures that may occur as a result of implementation of an alternative (e.g. impact cost to other roadways, etc.).
- **Meets the Project Purpose.** The alternative that best meets the project state of purpose to facilitate inner road network connectivity and encourage economic development.

The following **Table 5.4 Alignment Alternatives** summarizes the alternative analysis and identifies the preferred alternative based on the evaluation criteria. The weighted scoring is set up with one (1) being the least expensive and three (3) being the more expensive, one (1) being the best ranked or three (3) being the worst ranked, or one (1) being the most favorable and three (3) being the least favorable. Based upon the scoring criteria the option with the lowest average is the highest-ranking option.

Table 5.4 Alignment Alternatives

Criteria	Alternative 1 North Alignment	Alternative 1A North Alignment (South)	Alternative 2 Original Concept Alignment
Public Consensus	2	3	1
Direct Property Impacts	2	3	1
Adjacent Impacts	3	2	1
Maintenance Cost	1	2	3
Meets Goals and Objectives	1	1	1
Average	1.8	2.2	1.4

Table 5.4 provides an overall summary of the fundamental components reviewed throughout the corridor study. However, the table does not place a weight or value to each of the individual criteria listed. The value of a particular criterion is subjective and therefore depends on the perspective of the person assessing the measures. All the final proposed conceptual alternatives meet the goals, purpose, and objectives of the project. All alternatives received positive feedback from the public open house; however the final meeting with the most impacted landowner determined the recommendation.

The Swan Ranch, LLC utilizes a majority of the land within the corridor study area for grazing, water, and wintering of approximately 1,500 head of sheep. Based on several meetings with principal land owner of the Swan Ranch, LLC and Clear Creek Land Company, it became clear that the best alternative alignment with the least impact to the sheep operation was the Original Concept Alignment. Therefore, Alternative 2, the Original concept Alignment is recommended for implementation for the proposed corridor.

Right-of-way Requirements

During this preliminary design phase of the project, the team researched the Cheyenne/Laramie County GIS Cooperative (CLCGISC) website (Greenwood Mapping, 2015) and recorded documents in the Laramie County Clerk's office in order to identify potential needs for future right-of-way and easements. The purpose was two-fold; first, to identify available right-of-way and current ownerships and second, to commence open communication with the present landowners.

The planning and design team have made recommendations for right-of-way needs that are necessary to fulfill the goals of the project and minimize the impact to existing landowners. Please note that a Wyoming Professional Land Surveyor will be required to establish the centerline and proposed right-of-way along the corridor and determine the acreages required for the project

t. The following table and figures summarizes the parcels and ownerships which have been identified at the thirty-five (35) percent design level.

Table 5.5 Proposed Right-of-way

Parcel	Parcel No.	Property Address	Area (ACRES)	Owner	Address	Comments/ Reference
1	12670310000700	CLEAR CREEK PARKWAY	5.25	CLEAR CREEK LAND CO LLC	1961 US HWY 85 CHEYENNE, WY 82009	Figure 5.7 Parcel 1 Exhibit (Road)
2	12670220000700	I25 SERVICE ROAD	28.74	SWAN RANCH LLC	1961 US HWY 85 CHEYENNE, WY 82009	Figure 5.8 Parcel 2 Exhibit (Road)
3	13672440000200	2510 YORK AVE	1.00	LETICIA C SARA	3295 OTIS ST WHEAT RIDGE, CO 80033	Figure 5.9 Parcel 3 Exhibit (Road)
4	13661930000100	DIVISION AVE	12.47	MICHAEL JAMES SARA	6122 KEVIN AVE CHEYENNE, WY 82009	Figure 5.10 Parcel 4 Exhibit (Road)
5	13663020000400	REMINGTON DR	0.12	CAL WYO INVESTMENTS	2223 SEBRING ST SIMI VALLEY, CA 93065	Figure 5.11 Parcel 5 Exhibit (Road)
6	13662030000900	4836 S GREELEY HWY	1.49	JEFFREY DEISCH	3650 JOES RD CHEYENNE WY, 82009	

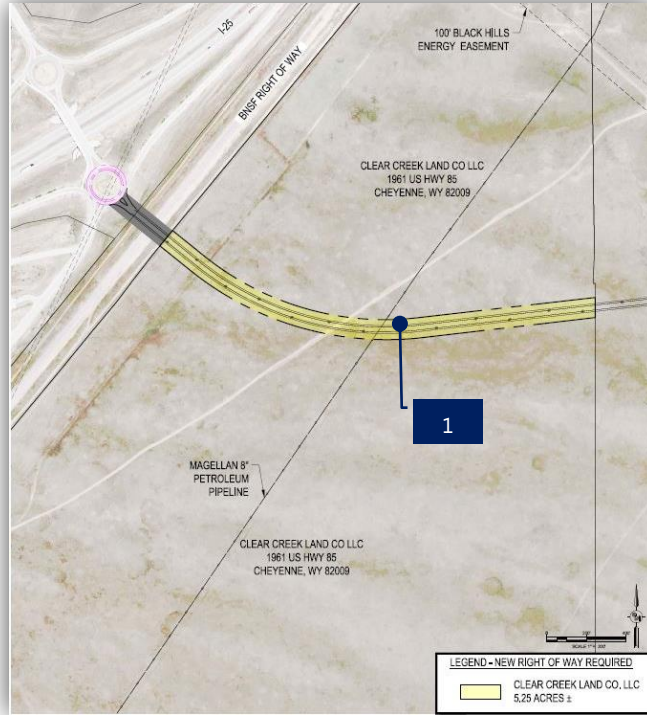


Figure 5.7 Parcel 1 Exhibit (Road)

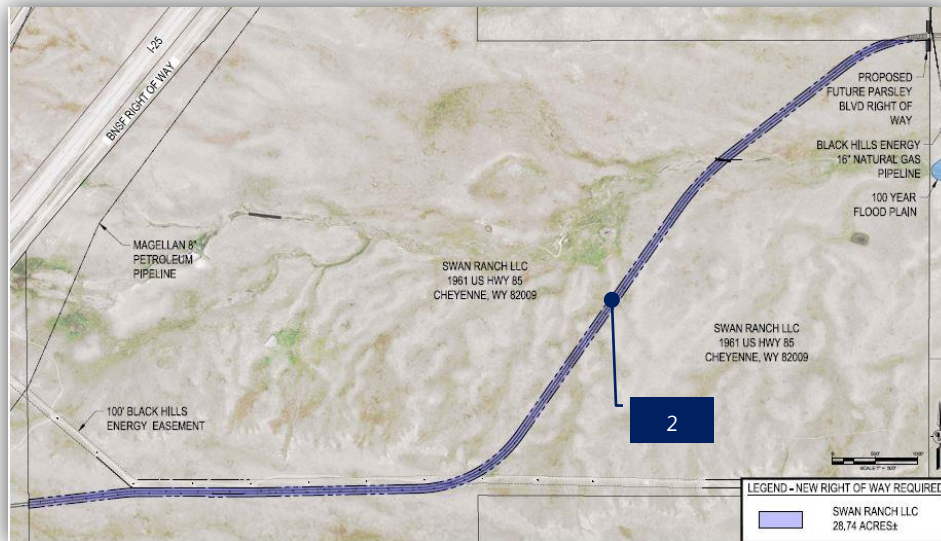


Figure 5.8 Parcel 2 Exhibit (Road)



Figure 5.9 Parcel 3 Exhibit (Road)

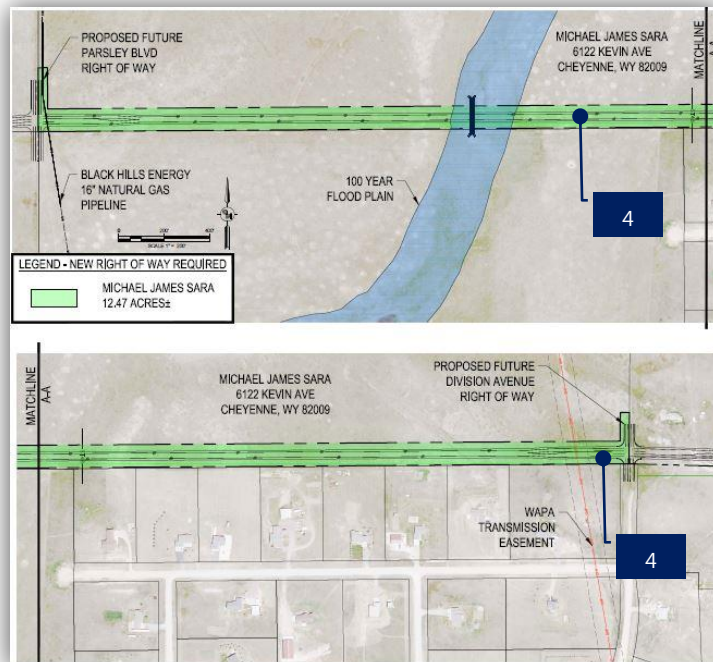


Figure 5.10 Parcel 4 Exhibit (Road)

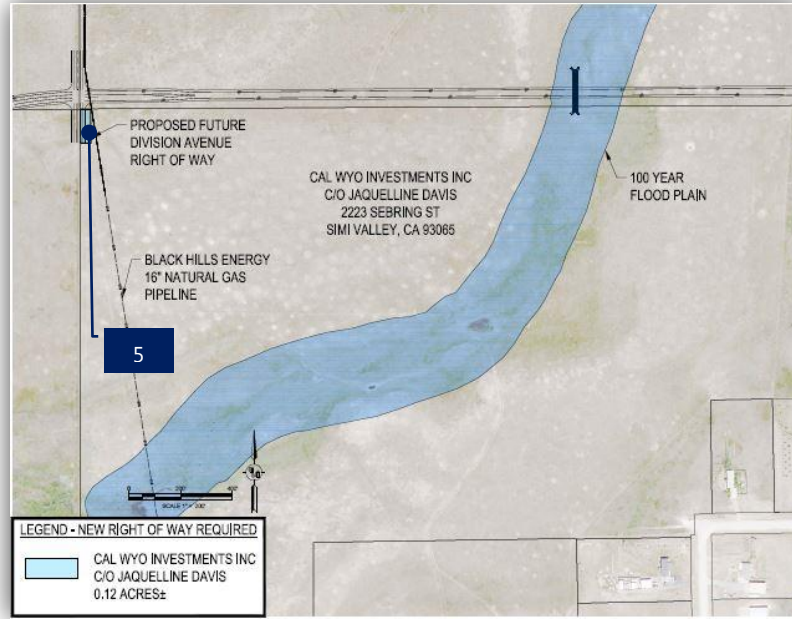


Figure 5.11 Parcel 5 Exhibit (Road)



Figure 5.12 Parcel 6 Exhibit (Road)

Post Development Drainage

The corridor, as previously described, is located within the Allison Drainage Basin. The entire contributory drainage area encompasses about 18 square miles (CH2M Hill, November 1988). Clear Creek is predominantly a rural basin but, will begin the process of urbanization. The topography in and around the study area generally slopes southwest to northeast on High Plains Road.

Initially we recommend that the roadway drainage criteria utilize the requirements of the *Laramie County Land Use Regulations 2011 (County, 2011)*. Drainage planning and design shall provide for stormwater detention based on a design storm up to a one-hundred (100) year frequency. Post development design requirements shall be for a system to maintain total contributory site discharge at no greater than a pre-development (i.e. historic) fifty (50) year release rate for a 100 year storm event. Additionally, at a minimum drainage conveyance system elements shall be based on the following criteria for an arterial street:

- Minor Storm (5-year) – No curb overtopping and one interior drive lane clear
- Major Storm (100-year) – Maximum depth 12" above gutter flow line, 6" flow across street intersections.

The design team developed conceptual drainage plan opportunities for the High Plains Road Corridor. The layout outlined planning level opportunities for improving the post develop drainage along the corridor. Four (4) independent drainage conveyance storm system paths have been developed. A brief summary of the systems and critical constraints are outlined **Figure 5.16 Conceptual Drainage Opportunities** for illustration.

Conceptual Storm Sewer Trunk Line E-1. This basin roughly encompasses High Plains Road from South Greeley Highway to a high point west of the current Big Country Speedway Race Track. The proposed profile mimics the existing topography which creates a low point for the basin on South Greeley Highway. The conveyance system would require a series of inlets at locations along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above. The proposed stormwater detention pond would likely need to be located at the southwest corner of the intersection of South Greeley and High Plains Road owned by the Wyoming Department of Transportation (WYDOT). The pond would then discharge south by surface discharge conveyance into the undeveloped right-of-way of South Greeley Highway. This option would require permitting by WYDOT and a landscaping agreement for the detention pond improvements in the right-of-way.

Conceptual Storm Sewer Trunk Line W-1. This basin roughly encompasses High Plains Road from a natural high point west of the current Big Country Speedway Race Track to Allison Draw. The proposed profile mimics the existing topography which creates a couple of low points within the profile. The conveyance system would require a series of inlets at the low point locations and along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above. The runoff would then be conveyed to a stormwater detention pond either on the north or south side of the

proposed roadway and discharge into the Allison Draw drainage way. See **Figure 5.16 Conceptual Drainage Opportunities**.

Conceptual Storm Sewer Trunk Line W-2. This basin roughly encompasses High Plains Road from a natural draw drainage way 5000' west of Allison Draw to Allison Draw. The proposed profile also mimics the existing topography which runs southwest to northeast. The conveyance system would require a series of inlets along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above. The runoff would then be conveyed to a stormwater detention pond either on the north or south side of the proposed roadway and discharge directly into the Allison Draw drainage way. See Figure 5.16 Conceptual Drainage Opportunities for additional information.

Conceptual Storm Sewer Trunk Line W-3. This basin roughly encompasses High Plains Road from I-25 approximately 12,500' east to natural drainage draw and low point. The proposed profile follows the existing topography which runs southwest to northeast. The conveyance system would require a series of inlets along the roadway necessary to capture runoff to meet the minor and major conveyance criteria outlined above. The runoff would then be conveyed to a stormwater detention pond either on the west or east side of the proposed roadway and discharge directly into the natural drainage way until reaching Allison Draw. See **Figure 5.16 Conceptual Drainage Opportunities** Error! Reference source not found. for additional information.

Special Features

Planting Barriers. One of the concerns firmly expressed by the rural subdivision Bison Crossing was the possible impacts to the properties related to increased noise and subjective visual obstruction by the construction of the High Plains Road corridor.

Consequently, the design team has proposed the use of a combination of an earth berm and dense planting barriers to help mitigate the possible impacts to the rural subdivision. This noise barrier is an obstacle placed between the noise source and a receiver which interrupts the path of noise. The effectiveness of a barrier is dependent on the mass and height of the barrier, and its distance from the noise source and receiver. To be most effective a barrier must block the "line of sight" between the highest point of a noise source (e.g. truck exhaust stack) and the highest part of the receiver (e.g. household window) as outlined in the guidelines from the U.S. Department of Transportation Federal Highway Administration (Administration, 2011).

A prototypical concept is shown in **Figure 5.13 Planting Barrier Prototypical Detail** and **Figure 5.14 Planting Barrier Vicinity Map** for illustration purposes. The barrier is recommended to be placed with the construction project on the individual owner's property using a construction easement. Furthermore, we recommend that the individual property owners maintain the plantings. The topography and proposed vertical profile places the roadway below the existing housing properties.

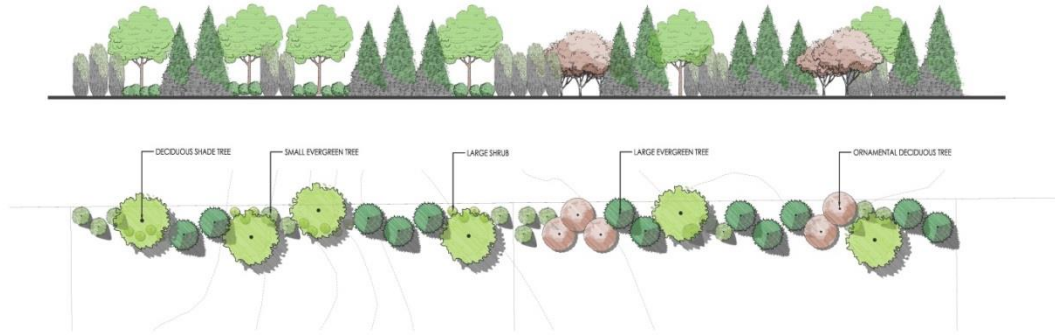


Figure 5.13 Planting Barrier Prototypical Detail



Figure 5.14 Planting Barrier Vicinity Map

Snow Fence. Another concern expressed about the future construction of the High Plains Road corridor was snow drifting due to the natural topography and predominant wind direction. Every effort was made in this design to incorporate design features within the roadway cross section, alignment, and vertical profile to mitigate snow drifting, improving visibility, and reducing slush and ice. However, in some areas, it was impractical to include such design features to mitigate snow movement. Consequently, we recommend that those areas utilize snow fence as a mitigation method. The basic design benefits are illustrated in **Figure 5.15 Porous and Solid Snow Fence Drift Comparison** from

the *Design Guidelines for the Control of Blowing and Drifting Snow* by Ron Tabler of Tabler & Associates (Tabler, 1994). Benefits include reductions in

- Snow removal costs
- Accidents
- Property damage
- Road closures
- Pavement maintenance.

As the design develops, it will be possible to perform an economic analysis to determine the cost/benefit ratio of including snow fence as an element of the design.

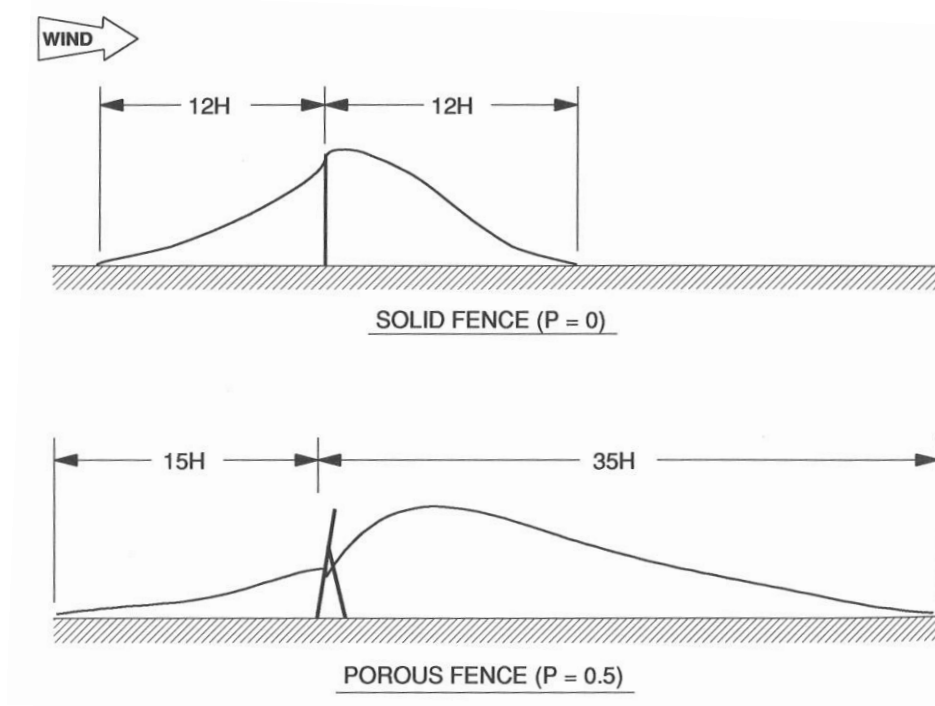


Figure 5.15 Porous and Solid Snow Fence Drift Comparison

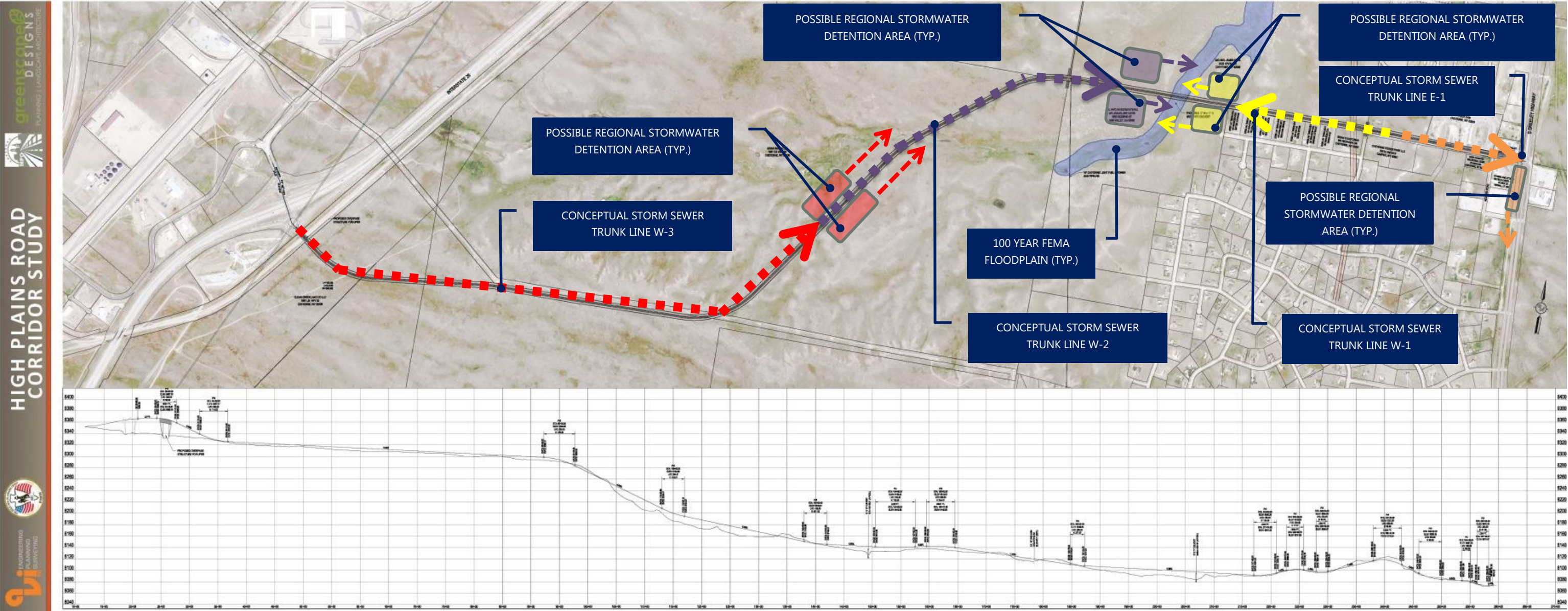


Figure 5.16 Conceptual Drainage Opportunities

Engineer's Opinion of Probable Costs and Funding Options

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

Table 5.6 Cost Estimates

Description of Area	Construction Cost	Right-of-way Cost	Engineering (1)	Contingency (30%)	Total	For Estimate
Proposed Typical Roadway and Earthwork	\$14,822,124	-	\$1,482,212	\$4,446,637	\$20,750,974	\$20.8 M
Proposed Ultimate Roadway	\$3,424,276	-	\$342,428	\$1,027,283	\$4,793,987	\$4.80 M
Wet Utilities	\$2,115,163	-	\$211,516	\$634,549	\$2,961,228	\$3.0 M
High Plains Road Total						\$28.6 M

Footnotes:

1. Engineering estimated at 10% of Total Construction costs.
2. Cost Estimates were developed using data from the 2014 & 2015 Weighted Average Bid Prices, compiled by WYDOT; Colorado Department of Transportation (CDOT) 2014 & 2015 Cost Data Book, compiled by the Engineering Estimates and Marketing Analysis Unit; Typical Costs from historical AVI project experience.
3. Quantities are based on the Conceptual Improvement Plan layouts. Please see **Appendix A** for additional information.

AVI recommends that future costs from the present 2016 dollars be updated using the *United States Department of Labor and Bureau of Labor Statistic* (Labor, 2013). Quantities are based on the Conceptual Improvement Plan layouts. Please see **Appendix A** and **Appendix D** for additional information.

Funding Options

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

Summary of Corridor Recommendations

The overall recommendations are specifically designed to address all modes of transportation, and safety needs of the High Plains Road Corridor. All recommendations have been examined carefully to ensure practicality, functionality, sustainability, and successful implementation. The physical layout of the improvements are detailed on the following pages and can be found in the corridor plans shown in **Appendix A**. Detailed cost estimates are shown in **Appendix D**.

General Recommendations

- Implement Typical Section(s) along the corridor as development occurs
- Reserve right-of-way as development occurs during the site and platting process
- Further Explore Opportunities as area develops to Provide Roadway Storm Water Detention/ Retention Features/ Facilities.
- Implement Priority Projects as funding resources become available or development becomes the catalyst.
- Review and remove access to Tract 2, Speedway Subdivision. Due to limited traffic on High Plains Road at the time of the development of Tract 2, Speedway Subdivision, temporary access was approved until such time as the County determines that a change is required due to safety reasons or when High Plains Road is funded for construction (See Memorandum of Agreement in **Appendix H**).

RESOLUTION NO. W206-15

ENTITLED:

A RESOLUTION ADOPTING THE HIGH PLAINS ROAD CORRIDOR STUDY

WHEREAS, the 2040 Roadway Vision Plan from *PlanCheyenne*, included a future minor arterial (High Plains Road) that extends from I-25, at the High Plains Interchange, east to U.S. 85 (South Greeley Highway); and

WHEREAS, the primary purpose of this planning project was to develop a thirty-five percent multi-modal corridor plan that solidifies the alignment of the future High Plains Road; and

WHEREAS the goals of the project were to address the needs of the property owners, while promoting regional roadway connectivity for all transportation users, and accommodate future development; and

WHEREAS, the Cheyenne Metropolitan Planning Organization (MPO) retained AVI p.c. on January 13, 2015 to develop the *High Plains Road Corridor Plan*; and

WHEREAS, the planning project was reviewed with oversight by a steering committee comprised with members from the following agencies or organizations: Cheyenne MPO, Laramie County Planning, Laramie County Public Works, City Urban Planning, City Engineering, Black Hills Energy, Cheyenne Board of Public Utilities, the Cheyenne Greenway and Trails Coordinator, WYDOT District 1 Engineer, and WYDOT Planning; and

WHEREAS, public input was obtained through the MPO website with one survey on the High Plains Road page, one public Open House, and four one-on-one meeting opportunities with area landowners; and

WHEREAS, the *High Plains Road Corridor Plan Study* provides design criteria and recommendations for road cross sections, proposed right-of-way acquisitions, pedestrian and bicycle facilities; and

WHEREAS, the *High Plains Road Corridor Plan Study* provides a cursory Environmental Review of the prairie lands that the future corridor will traverse; and

WHEREAS, the *High Plains Road Corridor Plan Study* provides design criteria and recommendations for opportunities to provide storm water conveyance facilities along and through the roadway alignment; and

WHEREAS, the Cheyenne MPO Technical and Citizen's Advisory Committees reviewed the Plan and recommended adoption by the MPO Policy Committee on November 16 and 17 respectively; and

WHEREAS, the Laramie County Planning Commission held a Public Hearing on November 10, 2016, accepted public comments, and accepted the plan, recommending that the Laramie County Board of Commissioners approve the *High Plains Road Corridor Plan*.

20 -

NOW THEREFORE BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF LARAMIE COUNTY, WYOMING, that the Board of Commissioners adopts the *High Plains Road Corridor Plan* and agrees to use the Plan as guidance for the future development of High Plains Road.

PRESENTED, READ AND ADOPTED this 6th day of December, 2016.

BOARD OF LARAMIE COUNTY COMMISSIONERS

R. N. Buck Halmes
, Chairperson

ATTEST:

Debra K. Lee
Debra Lee, Laramie County Clerk
Approved as to form:

Date

12/7/2016

Mark T. Voss
Mark T. Voss, Laramie County Attorney

Date

11/28/16