Lander Area Study

Study Report

Transportation Plan for US 287 and North 2nd Street

Lander, WY

December 9, 2016

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Prepared for:

Fremont County
City of Lander
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Executive Summary

The partner agencies, Fremont County, the City of Lander, and the Wyoming Department of Transportation (WYDOT) have initiated a study of two roadway corridors adjacent to the City of Lander: US 287 and Second Street. The purpose of the study is:

- Evaluate current operations in the roadway corridors
- Review development and access management procedures
- Create corridor plans that will result in improvements in safety and efficiency
- Recommend measures that could improve handling of development proposals and increase regulatory compliance

Roadway analysis found that corridor safety could be enhanced with addition of a center left turn lane, addition of bike lanes and selected access management changes. Those changes have been recommended for implementation.

Tools to enhance the development review process have also been recommended, including some potential changes to the Fremont County subdivision regulations and the use of official mapping by the City of Lander.

An implementation plan was presented, including the following tasks:

- Update the Fremont County subdivision regulations to adopt access management and design standards.
- Establish official mapping of the US 287 and Second Street corridors within the Lander extraterritorial area.
- Begin development of a project on US 287 to add center turn lanes, pedestrian/bicycle facilities, and access improvements.
- Begin development of a project on Second Street to add center turn lanes, pedestrian/bicycle facilities, and access improvements.

Background

Lander, Wyoming, and the surrounding areas of Fremont County, represent some of the demographic and economic changes that are facing many communities in the American West. Traditional economic drivers like agriculture, natural resources, and tourism have been joined in recent years by adventure tourism and development to serve new residents seeking to live closer to outdoor activities.

Two ways that the Lander area has experienced these demographic and economic changes are through increased demand for residential development and bicycle/pedestrian facilities in the rural area surrounding the Lander city limits. Two routes in particular have felt these pressures in recent years, US 287 and North Second Street.

Three public agencies, Fremont County, the City of Lander, and the Wyoming Department of Transportation (WYDOT), have partnered to study the portions of these routes adjacent to the City with the highest demand. This study will:

- inventory the existing roadway characteristics,
- analyze traffic operations and safety,
- evaluate current development procedures,
- consider bicycle/pedestrian needs,
- prepare corridor plans, and
- provide recommendations to address current and future needs.

Methodology

Roadway inventory and analysis are based on data provided by the partner agencies, with field verification by HDR. Traffic operations were analyzed using procedures of the Highway Capacity Manual (HCM), as implemented in the Highway Capacity Software (HCS), developed under the direction of the Federal Highway Administration (FHWA). The Wyoming Access Manual, edition 2014, was applied as the standard for access spacing on US 287, and was used as a reference in analysis of North Second Street. The Design Manual and Traffic Studies Manual issued by the Wyoming Department of Transportation (WYDOT), the FHWA, and the Transportation Research Board (TRB) were also applied in this study.

Traffic forecasts were prepared based on growth factors developed in the Lander Master Plan, 2012 and adjusted to the appropriate time periods.

National Performance Goals

Federal regulations have established national performance goals for Federal Highway programs, including the planning programs that helped to fund this study. The six performance goals that apply to this study are listed below, followed by statements describing how they apply to the study.

- Safety – to achieve significant reduction in traffic fatalities and serious injuries on all public roads. *Access management techniques used in this study have been shown to reduce crashes. Also, providing special bicycle/pedestrian facilities can reduce crashes involving those users.*

- Infrastructure Condition – to maintain the highway infrastructure and system in a state of good repair. *While the recommendations of this study don't materially affect the physical state of the roadway system, they can help to improve traffic operations.*
- Congestion Reduction – to achieve a significant reduction in congestion on the National Highway System. *Access management techniques used in this study have been shown to reduce congestion. Also, providing special bicycle/pedestrian facilities can improve overall roadway operations.*
- System Reliability – to improve the efficiency of the surface transportation system. *Access management techniques used in this study have been shown to improve the efficiency of the roadway system.*
- Freight Movement and Economic Vitality – to improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development. *The congestion reduction recommendations of this study will also benefit freight flows. Economic development is attracted to communities that have safe, efficient roadways that serve all users, as a compliment to their other attributes.*
- Environmental Sustainability – to enhance performance of the transportation system while protecting and enhancing the natural environment. *The recommendations of this study may allow existing roadways to function longer into the future, reducing the demand for additional roadway facilities. Providing attractive bicycle/pedestrian facilities can encourage users to use these alternative travel modes, reducing their environmental impacts.*

Roadway Inventory

Data were gathered to describe the two road corridors being studied. Pertinent characteristics of the roadways are listed below:

- US 287
    - Project limits – Lander city limits to the top of Lander Hill, about 1.8 miles
    - Traffic volume – average 5100 vehicles per day
    - Functional classification – principal arterial on WYDOT system
    - Shoulder width – 8'
    - Lane width – 12'
    - Truck percentage – 8%
    - Access density – average 23 accesses per mile
    - Free flow speed – 68 mph
    - Speed limit – 65 mph
    - Percent no passing – NB 65%, SB 72%
    - Right-of-way – variable 120' to 450' (near Lander Hill)
- 2nd Street
    - Project limits – Lander city limits to O'Brien Road, about 2.2 miles
    - Traffic volume – average 1700 vehicles per day
    - Functional classification – major pagecollector
    - Shoulder width – 2'

- Lane width – 12’
- Truck percentage – 2%
- Access density – average 23 accesses per mile
- Free flow speed – 48 mph
- Speed limit – 45 mph
- Percent no passing – NB 21%, SB 21%
- Right-of-way – variable 60’ to 100’.

The right-of-way figures shown above are from record drawings of Highway 287 and North 2nd Street provided by Fremont County. The Right of Way on Highway 287 is 120’ and increases in width to accommodate the large cuts on Lander Hill. For this study the Right of Way is assumed to be 120’ for the full length of the study area (as the wider Right of Way at Lander Hill is not useful in determining typical roadway cross sections). The Right of Way on North Second Street is 60’ wide until the PC of the first curve encountered moving north along the Corridor (near the northern edge of the City of Lander property contain the Sewer Lagoons). The Righto f Way transitions from 60’ to 100’ at this location and remains 100’ wide going north to O’Brien Road.

Each access point on the two corridors was inventoried; the access inventories are provided in the Corridor Access Management and Operations Plans section of this document, along with recommended dispositions.

Crashes for the two corridors were reported by WYDOT for the period from 2011 through September, 2016. WYDOT Crash Reports can be found in Appendix Part 6. The crashes are summarized in **Table 1:**

Table 1: Corridor Reported Crashes, 2011-2016

CORRIDOR	TOTAL CRASHES	INJURY CRASHES	FATAL CRASHES
US 287	66	13	0
SECOND ST	14	6	0

Crash rates are addressed in the Roadway Network Analysis section of this document. Copies of the WYDOT crash reports are provided in the Appendix.

Roadway Network Analysis

Observations of traffic volumes provide an understanding of the general nature of traffic, but are insufficient to indicate either the ability of the street network to carry additional traffic or the quality of service provided by the street system. For this reason, the concept of *level of service* (LOS) was developed to correlate numerical traffic operational data to subjective descriptions of traffic performance at intersections. Each lane of traffic has delay associated with it and therefore a

correlating LOS. The delay for each of these lanes leads to the calculation of the LOS for the entire intersection. LOS categories range from LOS "A" (best) to "F" (worst) as shown in **Table 2**.

Table 2: Level of Service Description

Level of Service	SIGNALIZED Intersection Control Delay (sec.)	UNSIGNALIZED Intersection Control Delay (sec.)	Intersection LOS Description
A	<=10.0	<=10.0	Free flow, insignificant delays.
B	10.1-20.0	10.1-15.0	Stable operation, minimal delays.
C	20.1-35.0	15.1-25.0	Stable operation, acceptable delays.
D	35.1-55.0	25.1-35.0	Restricted flow, regular delays.
E	55.1-80.0	35.1-50.0	Maximum capacity, extended delays. Volumes at or near capacity. Long queues form upstream from intersection.
F	>80.0	>50.0	Forced flow, excessive delays. Represents jammed conditions. Intersection operates below capacity with low volumes. Queues may block upstream intersections.

Source: *Highway Capacity Manual,* Transportation Research Board, 2010

Analyses of the two-lane rural level of service were conducted for both the 2016 and 2036 time periods. The Level of Service analysis sheets can be found in Appendix Part 5. The analysis results in **Table 2**, show good overall levels of service on Second Street now and at the 20-year horizon year (LOS A for all analysis periods). US 287, however, reaches the lower acceptable limit of LOS D by 2036. This constitutes an initial flag that additional lanes may be needed on US 287 beyond the 20-year planning horizon. It is likely that during that 20-year period the City will continue to grow and a project will be needed to extend the urban arterial street section further into the rural area. The existing 5-lane urban cross-section within the city limits is expected to provide adequate vehicle capacity for new development if extended into new urbanizing area.

Table 3: Level of Service Results

	2016		2036	
CORRIDOR	AM PEAK HOUR	PM PEAK HOUR	AM PEAK HOUR	PM PEAK HOUR
US 287	C	C	D	D
SECOND ST.	A	A	A	A

There are indications of crash problems needing correction in both study area corridors. WYDOT has identified a portion of the US 287 corridor as having a high score based on the number and/or severity of crashes. In this case, the crashes are primarily related to vehicles hitting deer or other animals. Guidance from the Federal Highway Administration indicates that measures such as special animal fencing, special signing, and driver warning systems can reduce animal crashes. Providing wider clear zones along the roadway can also reduce animal crashes by providing drivers better visibility of animals

approaching the roadway. Public Comment about the safety for left-hand turns onto major side roads such as Rosewood Avenue were also received. Because of the proximity of Rosewood Avenue to Lander Hill, sight distance for traffic turning left and not having a location outside of the normal movement of traffic (such as a left-hand turning lane) have caused at least one rear end collision at this intersection. One of the public comments received by email about this intersection had a photo showing the accident.

The cause of crashes on Second St. are more varied, although 5 of the 14 reported crashes involved drivers operating erratically or carelessly or driving too fast for conditions. One crash involved a vehicle striking a bicyclist and public input provided many more reports of high bicycle use and close calls between vehicles and bicyclists. The possibility of vehicle-bicycle crashes can be reduced by providing either wide shoulders or separated bicycle facilities along roadways that are frequented by bicyclists.

The WYDOT Traffic Studies Manual provides guidance on installation of auxiliary turn lanes. The Manual, excerpted below, describes the benefits of left turn lanes.

"Left-turn lanes, installed in the center of the roadway, are intended to remove left-turning vehicles from the through traffic flow. This reduces the frequency of rear-end collisions at locations where there is significant left-turn ingress activity, such as major driveways and public road intersections." –Traffic Studies Manual, 2011.

The Manual guidelines were applied to the access points on US 287, based on apparent land uses and trip generation figures calculated using the ITE Trip Generation Manual, 9th Edition. The left turn lane analysis indicated that three locations on US 287 met the criteria for installation of left turn lanes for northbound traffic (see the Corridor Access Management & Operations Plan section for maps and more information):

- 3 – Frontage Road
- 24 – Private Road
- 34 – Rosewood Avenue

Fremont County does not have similar guidelines for installation of left turn lanes, but when the WYDOT guidance is applied to locations on Second St., one location satisfies the criteria:

- 24 – Contractor's shop

No locations appear to satisfy the criteria for auxiliary right turn lanes on either corridor, based on trip generation. The Fremont County highway shop on US 287, however, may satisfy the right turn lane criteria during heavy summer operations or during snow events.

Access management will be discussed in more detail in later sections of this report, but the high number of closely-spaced access points on both corridors leads to the belief that safety on both corridors could be enhanced with the installation of a continuous two-way left turn lane. Numerous research studies show that a continuous two-way left turn lane can significantly reduce crashes. The partner agencies may consider this measure, based on project priorities and available funding.

Environmental Considerations

A desktop review of the study corridors shows that any projects that result from this study may be completed largely within the existing right-of-way and along the existing alignments. Therefore, it is likely that projects will be processed under the Categorical Exclusion provisions of the environmental regulations. No title 4f or 6f lands have been identified along either route. Native American cultural resources are likely in this part of Wyoming, but no additional disturbance is expected beyond that associated with the previous road-building.

Development Procedures

Staff from the partner agencies has indicated that access points on the study corridors have been installed without the necessary permits in recent years. In addition, access points have been installed that violate Wyoming regulations. Improperly installed access points lead directly to diminished road safety and increased delay for road users. Staff point to the need for better inter-agency cooperation in the development process and stronger tools to handle the potential negative public effects of development.

The following measures are examples of actions that local and state governments have taken to address similar situations:

- Require access certification on plat. This provision would require a signature box on any plat of land subdivision for the signature of the agency with jurisdiction over access. For roads under WYDOT jurisdiction, the signature would certify that the applicant had received the required access permit. Similarly, access permits and certifications could be required from the City Engineer or County Transportation Department. The plat can not be accepted without the

certifying signature. This provision could be added to Chapter 3, Section 5B of the Fremont County Simple Subdivision Regulations.

- Revise the Road Design Standards in the Fremont County Simple Subdivision Regulations. The Standards currently contain a provision that reads: "*Intersections – 'T' intersections preferred over 4-way; should be aligned within ten (10) degrees of perpendicular within 100 feet of the intersection; shall have a 125 foot minimum offset."* The 125' offset between adjacent T-intersections is now considered substandard, even in an urban environment. Four-way intersections have been shown to be safer than two T-intersections with this small spacing. Adoption of the WYDOT standard for rural minor collectors and rural local roads, either by insertion in the Design Standards or by reference, would result in safer operations. Note that land that has already been subdivided will likely have to be grandfathered under the new access standards, but that new subdivisions would be required to comply. The WYDOT access standards are reproduced below:

Table 4 – Access Spacing, minimum separation distances in feet per side

Access Type	Field	Residential	Commercial	Major
Field	220	220	330	660
Residential	220	440	660	660
Commercial	330	660	1320*	1320*
Major	660	660	1320*	1320*

* If two State highways intersect, then an access may be allowed less than the above distances but at a minimum of 660'.

- Hold regular plan review meetings. Meetings may be scheduled at whatever interval is appropriate for timely handling of land use proposals and should include representatives of the City, County, and State to facilitate coordination of access and other issues.
- Consider implementing Traffic Impact Study requirements for County roadways. The WYDOT Access Manual devotes a section of requirements for a special study for land use proposals that generate a significant number of trips. This provision could be adopted by inclusion or reference and would provide a means to focus the attention of developers and decision-makers on the safety impacts of large developments.
- Consider using official mapping. Wyoming law allows cities to establish official maps outside of the city limits to help provide for orderly development. The official maps may be used to establish planned land uses, or establish planned roadway characteristics such as right-of-way widths and access spacing. While much of the land fronting the study corridors has been established as residential with scattered commercial uses, the official map can help protect the existing residences from further commercial intrusion and create a framework for orderly urban growth. Growth scenarios in the existing Lander comprehensive plan may be successfully implemented using official mapping as one of the City's planning tools.

Public Input

A public meeting was held on July 14, 2016 to present this study project and gather public input on transportation needs in the study corridors. A digest of the comments and the public meeting sign-in sheets are provided in the Appendix. The most common comment topics are discussed below:

- Need to accommodate pedestrian, bicyclists, and other non-motorized users (10 comments) – a few commenters requested a separated pedestrian/bicycle path, which would provide the best safety for non-motorized users, but would be considerably more expensive. The majority of commenters requested widened shoulders with a rumble strip along the vehicle lane line to alert drivers that stray onto the shoulder. The pedestrian/bicycle lane would require special signing and pavement marking. Several commenters also requested that the pedestrian/bicycle facilities be extended north on US 287 to Milford because of a popular bicycle loop from North 2nd, Along Lower North Fork, and back to Lander along Highway 287 .
- Speed control and enforcement (6 comments) – Commenters asked for better enforcement of the existing 45 mph speed limit on Second St., while others asked that the existing 65 mph speed limit on US 287 be lowered within the study area because of the higher incidence of turning traffic, presence of pedestrians and bicyclists, and history of crashes and close-calls.
- Need for left turn lanes (7 comments) – Drivers have experienced either crashes or close calls waiting to turn left into local streets or driveways. The US 287/Rosewood Avenue intersection was mentioned several times in the comments as a location needing a left turn lane.

A second public meeting was held on November 16, 2016 to present the study findings and gather public input on the recommendations and implementation plan. A digest of the comments and the public meeting sign-in sheets are provided in the Appendix. Discussion and comments at the public meeting included the following items:

- Most attendees liked the recommended roadway cross-section which included pedestrian/bicycle lanes adjacent to the roadway, while a few expressed interest in a multi-use trail on separate alignment within the right-of-way.
- There was additional discussion of the proper speed limit on the study corridors and the proper way to set speed limits.
- Provide safety education for cyclists using bike lanes.

Pedestrian and Bicycle Considerations

Comments at the initial public meeting for this study overwhelmingly addressed current pedestrian and cyclist use in the study corridors and called for improved non-motorized facilities. Lander's large population of outdoor enthusiasts have made these two corridors part of a loop for regular training and recreation.

The City of Lander has established a system of on- and off-street bicycle routes and multi-use trails that intersect with the two study corridors, allowing use of the corridors for longer trips. The Lander Greenway Committee has been active in encouraging development of pedestrian and bicycle facilities in

and around the community. The Lander Greenway Plan has been developed through interaction with the Greenway Committee and has been adopted by the City of Lander (copy provided in the Appendix).

A proposal included in the public comments called for a paved shoulder at least 6' wide with a rumble strip along the vehicle lane edge line. The paved shoulder could operate as a bicycle/pedestrian lane as well as a traditional roadway shoulder and would satisfy current guidance for planning non-motorized facilities in rural areas. Pavement marking and signing should be used according to the Manual on Uniform Traffic Control Devices (MUTCD) to alert motorists to the presence of non-motorized users. Facilities that see significant bicycle use need additional maintenance to prevent the buildup of sand, gravel, and debris hazards. On rural roads, this maintenance usually involves periodic inspection and seasonal sweeping on the shoulder.

Corridor Access Management and Development Plans

Each of the study corridors would benefit from improved access management and focused planning to address expected needs. Access management for corridors with existing small land subdivisions can be tricky; while access standards may require long access spacing, property owners still possess a land right of access to the adjacent roadway. In some cases, frontage roads may be used to consolidate existing access points and reduce the impact on the roadway. However, frontage roads may not be possible when existing buildings are close to the right-of-way. Frontage roads can also pose operational and safety problems if they need to intersect with existing local roads that themselves intersect with a main highway.

Inventories of the access points along each of the study corridors are provided in the following sections, along with recommended dispositions for each access point. Typical cross-sections for development of roadway improvements have been provided for each corridor.

US 287

The access inventory for the US 287 corridor is shown in **Table 5** and the location of each access point is shown in **US 287 Corridor Maps 1-5**. Typical cross-sections for the US 287 corridor are shown in **Figures 1-3**.

The proposed cross-sections were developed to provide the operational and safety benefits of the two-way center left turn lane and the bike lane service requested by the public. A detached bikeway is also possible within the existing right-of-way, but would present design, maintenance, and drainage complications and come at a higher cost than the bike lane alternative.

Second Street

The access inventory for the Second Street corridor is shown in **Table 6** and the location of each access point is shown in **Second Street Corridor Maps 1-6**. Typical cross-sections for the Second Street corridor are shown in **Figures 4 and 5.**

Several cross-section alternatives were developed for Second Street, each including a two-way center left turn lane and bike facilities. The bike facility options include 6' bike lanes, a 7' bike lane with a 5'

pedestrian path (similar to the cross-section planned for the Mortimer Lane Phase 1 project), and an 8' detached multi-use lane. Portions of the Second Street corridor have a right-of-way only 60' wide. It appears that only the urban roadway section would fit into this limited right-of-way; all of the other improvement alternatives would not allow enough room for development of drainage ditches along the roadway. All the improvement alternatives would be possible in the portions of Second Street with 100' right-of-way. The 6' bike lane alternative, however, provides the service requested by the public without extra cost or design, maintenance and drainage complications.

TABLE 5 - ACCESS INVENTORY

LANDER AREA STUDY

US 287

POINT	LOCATION	SIDE	ACCESS TYPE	DISPOSITION
0	0	BOTH	CITY LIMITS	(NO ACTION)
1	217'	LEFT	PUBLIC ROAD (WESTERN AVE.)	RETAIN EXISTING INTERSECTION
2	688'	RIGHT	PUBLIC ROAD (FOX PARK CIR.)	RETAIN EXISTING INTERSECTION
3	688'	LEFT	FRONTAGE ROAD	RETAIN EXISTING ACCESS
4	1040'	RIGHT	FIELD ENTRANCE	RETAIN UNTIL PROPERTY DEVELOPED
5	1237'	LEFT	FREMONT COUNTY PIONEER MUSEUM	EXTEND FRONTAGE ROAD, ELIMINATE ACCESS
6	1388'	RIGHT	PUBLIC ROAD (STOCK RD.)	RETAIN EXISTING INTERSECTION
7	1467'	RIGHT	RESIDENTIAL DRIVEWAY	CONSOLIDATE AT ACCESS 6
8	2288'	LEFT	FIELD ENTRANCE	MOVE TO OPPOSITE #11
9	2370'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
10	2462'	RIGHT	MRM 2.35	(NO ACTION)
11	64'	RIGHT	PUBLIC ROAD	RETAIN EXISTING INTERSECTION
12	330'	RIGHT	FREMONT COUNTY TRANSPORTATION	CONSOLIDATE WITH #11 AT PROPERTY LINE
13	556'	LEFT	PRIVATE ROAD	RETAIN EXISTING INTERSECTION
14	585'	RIGHT	FRONTAGE ROAD	RETAIN EXISTING INTERSECTION
15	1159'	RIGHT	COMMERCIAL DRIVEWAY	RETAIN EXISTING ACCESS
16	1399'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
17	1412'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
18	1667'	RIGHT	RESIDENTIAL DRIVEWAY	RETAIN EXISTING ACCESS
19	1855'	LEFT	PUBLIC ROAD	RETAIN EXISTING INTERSECTION
20	1977'	LEFT	PAINT MARKER	(NO ACTION)
21	619'	RIGHT	RESIDENTIAL DRIVEWAY	CONSOLIDATE WITH #22 AT PROPERTY LINE
22	836'	RIGHT	RESIDENTIAL DRIVEWAY	CONSOLIDATE WITH #21 AT PROPERTY LINE
23	1117'	RIGHT	RESIDENTIAL DRIVEWAY	CONSOLIDATE AT ACCESS 25
24	1148'	LEFT	PRIVATE ROAD	RETAIN EXISTING INTERSECTION
25	1177'	RIGHT	PRIVATE ROAD	RETAIN EXISTING INTERSECTION
26	1294'	LEFT	PRIVATE ROAD	RETAIN EXISTING INTERSECTION
27	1419'	RIGHT	MRM 3	(NO ACTION)
28	277'	LEFT	COMMERCIAL DRIVEWAY (BUILDING MAT'LS.)	RETAIN EXISTING INTERSECTION
29	997'	LEFT	COMMERCIAL DRIVEWAY (JUNKYARD)	MOVE TO OPPOSITE # 32
30	1161'	LEFT	COMMERCIAL DRIVEWAY (JUNKYARD FE)	ELIMINATE - ALT. ACCESS AVAILABLE
31	1215'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
32	1308'	RIGHT	PUBLIC ROAD (LONGVIEW LN.)	RETAIN EXISTING INTERSECTION
33	1319'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
34	1683'	LEFT	PUBLIC ROAD (ROSEWOOD AVE.)	RETAIN EXISTING INTERSECTION
35	1899'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
	2014'	LEFT	PAINT MARKER	(NO ACTION)
36	163'	RIGHT	RESIDENTIAL DRIVEWAY	RETAIN EXISTING ACCESS
37	249'	LEFT	FIELD ENTRANCE	RETAIN EXISTING ACCESS
38	652'	LEFT	FIELD ENTRANCE	NOT A CONSTRUCTED ACCESS POINT
39	1742'	RIGHT	RESIDENTIAL DRIVEWAY	RETAIN EXISTING ACCESS
40	2615'	BOTH	PUBLIC ROAD (DOANE LN.)	RETAIN EXISTING INTERSECTION


7
6
5
4
2
3
1
US 287 CORRIDOR
Map 1
13
Lander City Limits


US 287 CORRIDOR
Map 2
20
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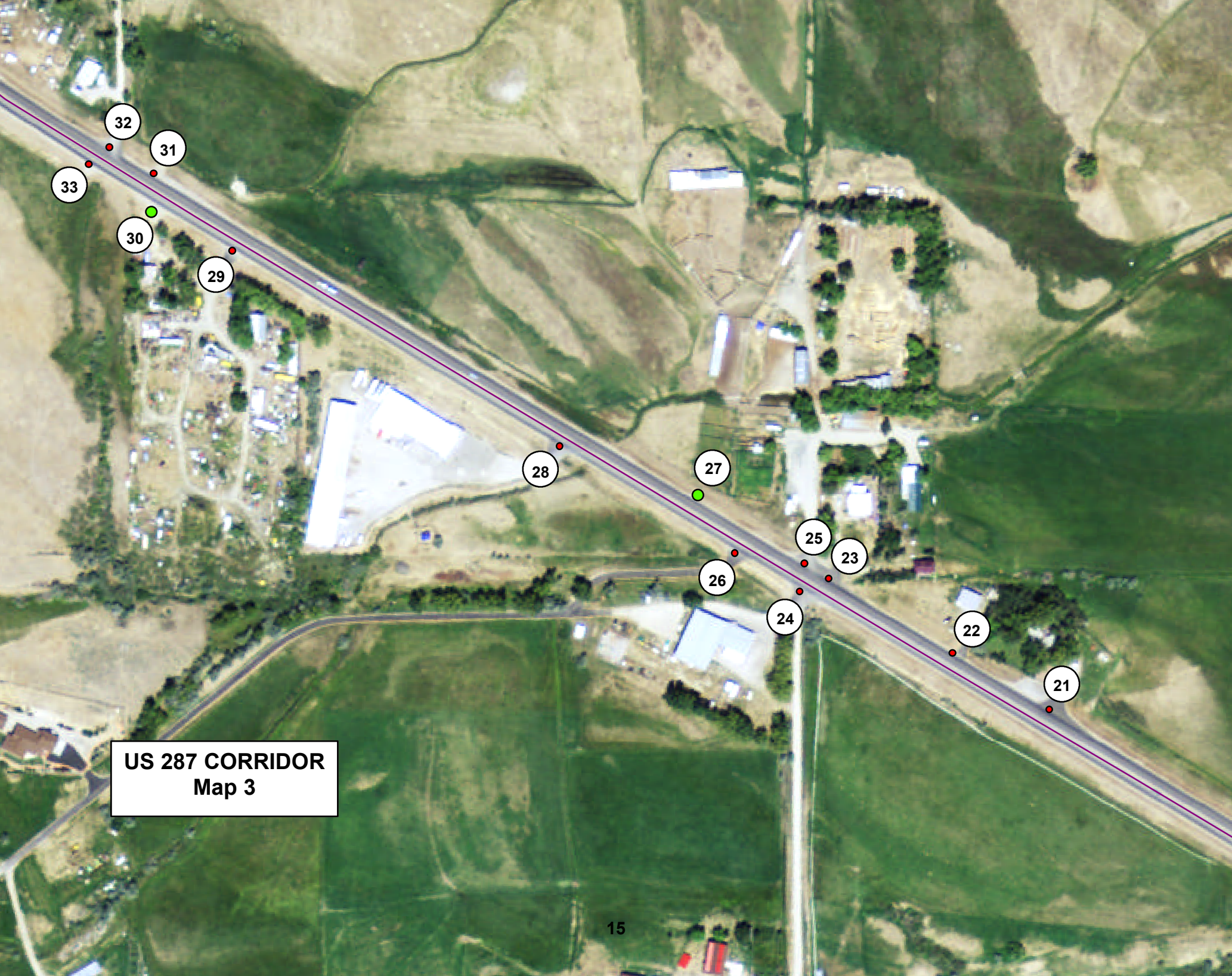
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US 287 CORRIDOR
Map 3


US 287 CORRIDOR
Map 4
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US 287 CORRIDOR
Map 5

Figure 1 – US 287 Existing Cross-section

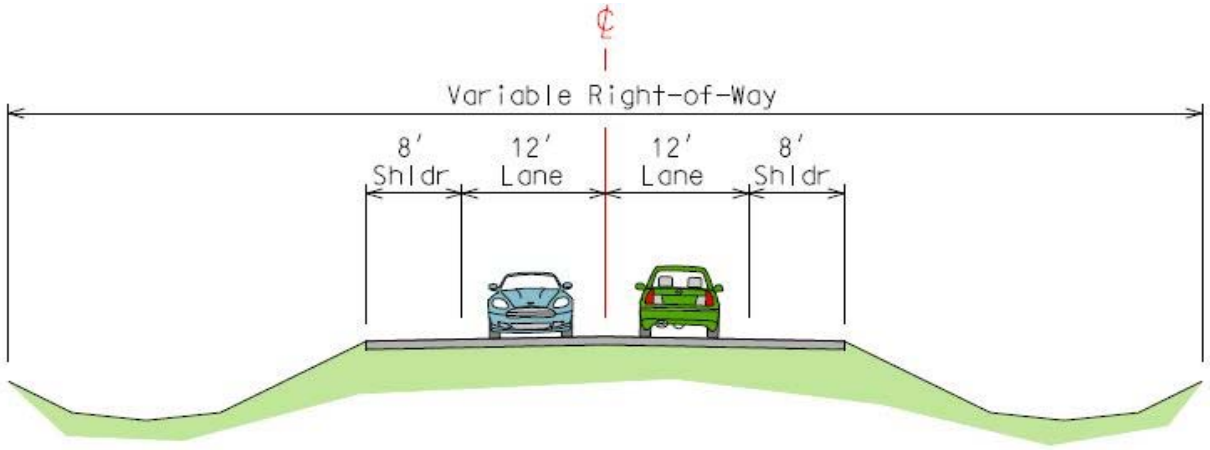


Figure 2 – US 287 Proposed Rural Cross-section

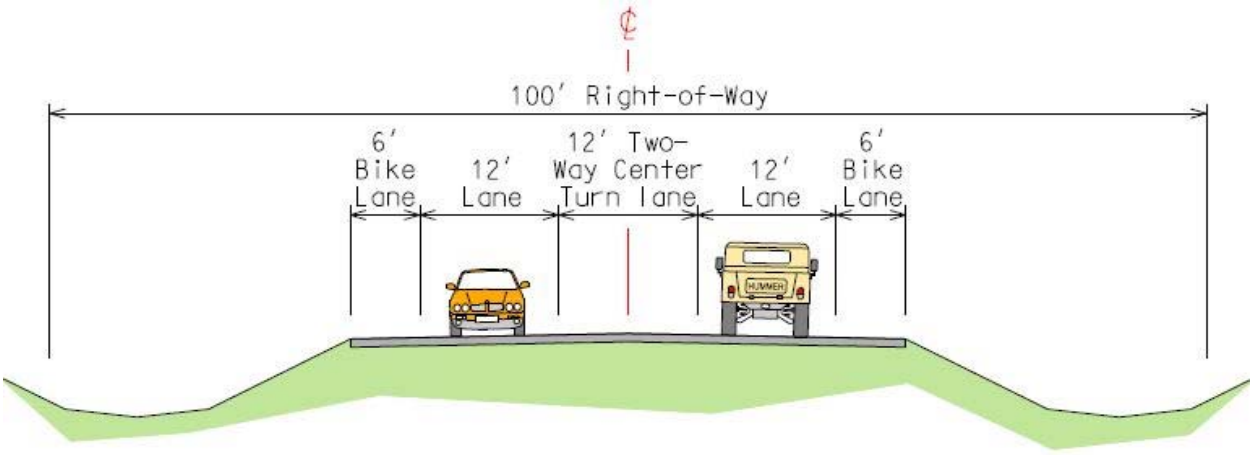
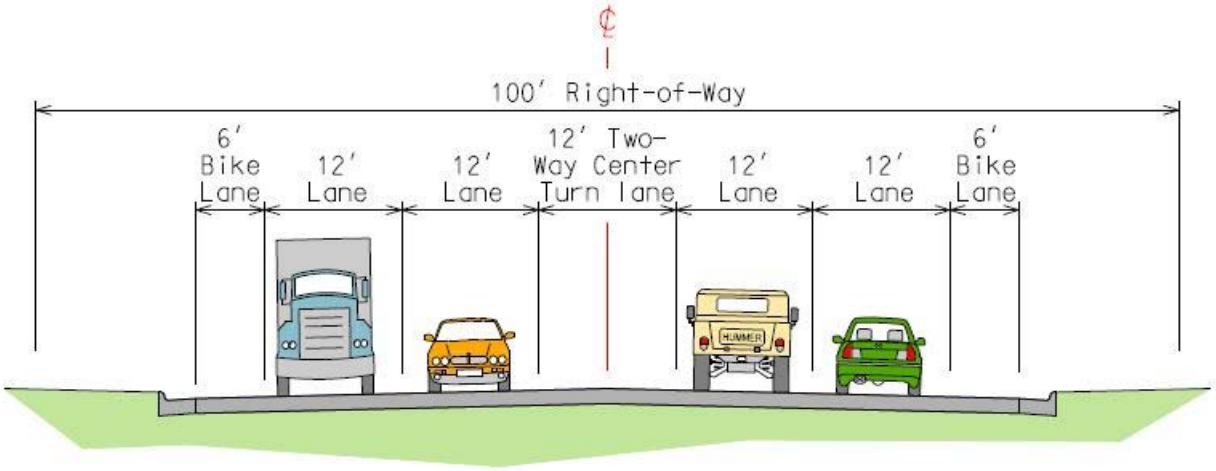


Figure 3 – US 287 Proposed Urban Cross-section



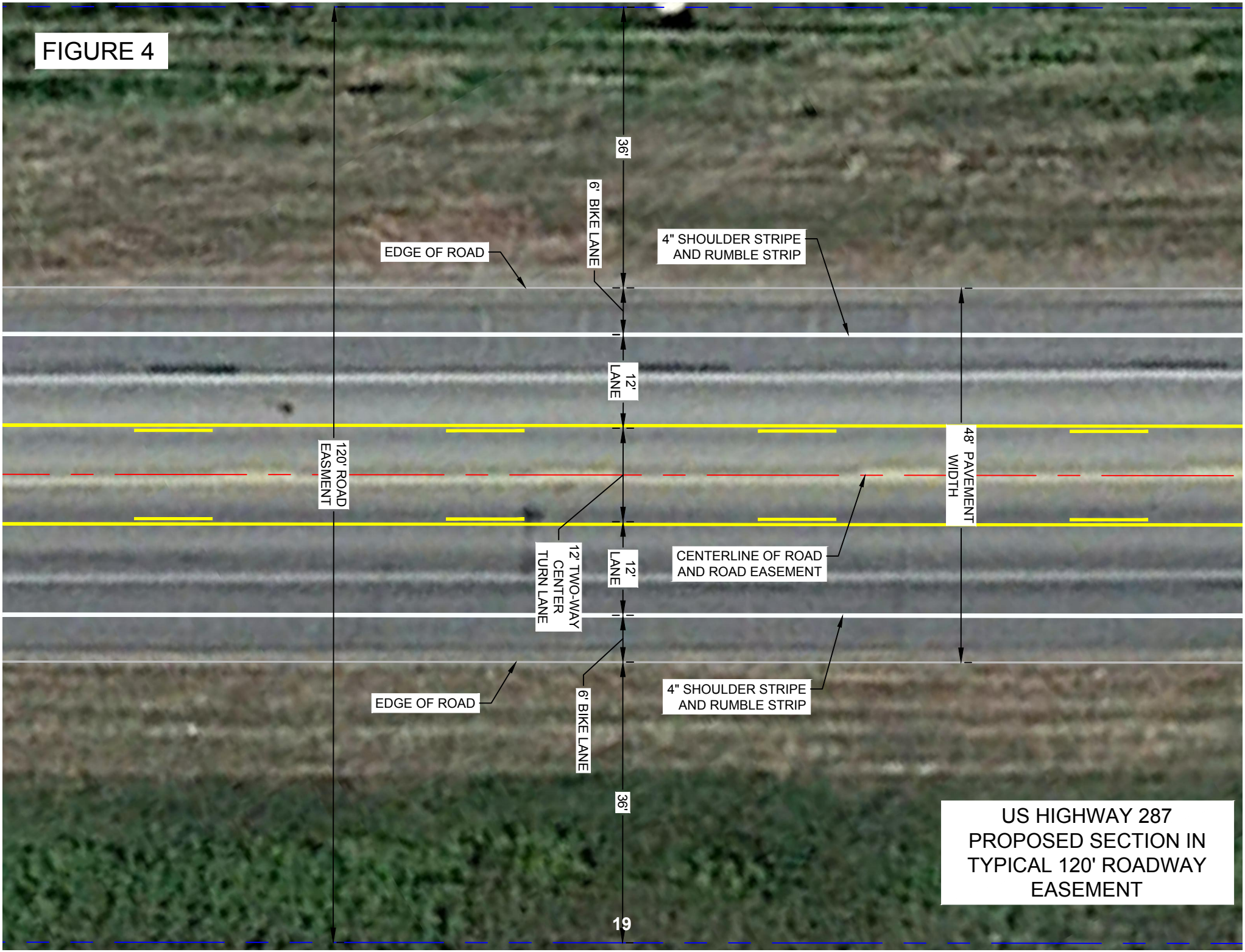


FIGURE 4
36'
6' BIKE LANE
EDGE OF ROAD
4" SHOULDER STRIPE AND RUMBLE STRIP
12' LANE
120' ROAD EASEMENT
48' PAVEMENT WIDTH
12' TWO-WAY CENTER TURN LANE
12' LANE
CENTERLINE OF ROAD AND ROAD EASEMENT
EDGE OF ROAD
6' BIKE LANE
4" SHOULDER STRIPE AND RUMBLE STRIP
36'
US HIGHWAY 287
PROPOSED SECTION IN
TYPICAL 120' ROADWAY
EASEMENT
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TABLE 6 - ACCESS INVENTORY

LANDER AREA STUDY

2ND STREET

POINT	LOCATION	SIDE	ACCESS TYPE	DISPOSITION
0	0	BOTH	CITY LIMITS	(NO ACTION)
1	39'	RIGHT	COMMERCIAL DRIVEWAY	ELIMINATE - ALT. ACCESS AVAILABLE
2	47'	LEFT	RESIDENTIAL DRIVEWAY	MOVE TO OPPOSITE A ST.
3	171'	RIGHT	COMMERCIAL DRIVEWAY	RETAIN EXISTING ACCESS
4	179'	LEFT	COMMERCIAL DRIVEWAY (WESTERN WYOMING CONST.)	RETAIN EXISTING ACCESS
5	389'	LEFT	COMMERICAL DRIVEWAY (WESTERN WYOMING CONST.)	ELIMINATE - ALT. ACCESS AVAILABLE
6	561'	RIGHT	PUBLIC ROAD (INDUSTRIAL PARK RD.)	RETAIN EXISTING INTERSECTION
7	623'	LEFT	COMBINED (MINI STORAGE/RESIDENTIAL DRIVEWAY)	MOVE TO OPPOSITE #6
8	1311'	LEFT	PRIVATE ROAD	RETAIN EXISTING INTERSECTION
9	1879'	RIGHT	COMBINED (COMMERCIAL/RESIDENTIAL DRIVEWAY)	ELIMINATE - ALT. ACCESS AVAILABLE
10	2113'	LEFT	FIELD ENTRANCE	RETAIN EXISTING ACCESS
11	2534'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
12	2704'	LEFT	UNUSED ACCESS	ELIMINATE - ALT. ACCESS AVAILABLE
13	2811'	LEFT	FARM ENTRANCE	RETAIN EXISTING ACCESS
14	3491'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
15	3495'	RIGHT	FIELD ENTRANCE	RETAIN EXISTING ACCESS
16	4126'	RIGHT	WIDENED SHOULDER (BUS PICK-UP?)	ELIMINATE - ALT. ACCESS AVAILABLE
17	4155'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
18	4239'	RIGHT	PUBLIC ROAD (SAWMILL RD.)	RETAIN EXISTING INTERSECTION
19	4562'	LEFT	UNIMPROVED SECTION LINE	RETAIN EXISTING ACCESS
20	4576'	RIGHT	PUBLIC ROAD (DUTCH ED LN.)	RETAIN EXISTING INTERSECTION
21	4817'	LEFT	COMMERCIAL DRIVEWAY	RETAIN EXISTING ACCESS
22	4888'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
23	5036'	RIGHT	RESIDENTIAL DRIVEWAY	ALIGN WITH #24
24	5123'	LEFT	COMMERCIAL DRIVEWAY (CONTRACTOR'S YARD - WIDE ACCESS W/PARKING	ALIGN WITH #23, NARROW TO 36'
25	5323'	LEFT	COMMERCIAL DRIVEWAY (CONTRACTOR'S YARD)	ELIMINATE - ALT. ACCESS AVAILABLE
26	5350'	RIGHT	COMMERCIAL DRIVEWAY	ELIMINATE - ALT. ACCESS AVAILABLE
27	5766'	LEFT	(NO ACCESS)	(NO ACTION)
28	5869'	RIGHT	PUBLIC ROAD (MORGAN LN.)	CONSOLIDATE WITH #31 OPPOSITE # 30
29	5875'	LEFT	PRIVATE ROAD	CONSOLIDATE WITH #30
30	5928'	LEFT	PUBLIC ROAD (MEADOWLARK LN.?)	RETAIN EXISTING INTERSECTION
31	5933'	RIGHT	RESIDENTIAL DRIVEWAY	CONSOLIDATE WITH #28
32	6217'	LEFT	COMMERCIAL DRIVEWAY	RETAIN EXISTING ACCESS
33	6475'	RIGHT	RESIDENTIAL DRIVEWAY (TWO HOUSES)	RETAIN EXISTING ACCESS
34	7213'	RIGHT	RANCH ENTRANCE	RETAIN EXISTING ACCESS
35	7213'	LEFT	PUBLIC ROAD (DEL RAY ?)	RETAIN EXISTING INTERSECTION
36	7372'	LEFT	RESIDENTIAL DRIVEWAY	CONSOLIDATE WITH #37 AT PROPERTY LINE
37	7492'	LEFT	RESIDENTIAL DRIVEWAY	CONSOLIDATE WITH #36 AT PROPERTY LINE
38	8345'	LEFT	PUBLIC ROAD (DEL RAY DR.)	RETAIN EXISTING INTERSECTION
39	8538'	RIGHT	RANCH ENTRANCE	MOVE OPPOSITE #40
40	8607'	LEFT	PRIVATE ROAD (PARTIALLY DEVELOPED)	RETAIN EXISTING INTERSECTION
41	9031'	LEFT	RESIDENTIAL DRIVEWAY	RETAIN EXISTING ACCESS
42	9329'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
43	9615'	RIGHT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
44	9729'	LEFT	RANCH YARD	RETAIN EXISTING ACCESS
45	9813'	LEFT	RANCH YARD	ELIMINATE - ALT. ACCESS AVAILABLE
46	9920'	RIGHT	RANCH ENTRANCE	RETAIN EXISTING ACCESS
47	10206'	LEFT	RANCH ENTRANCE	RETAIN EXISTING ACCESS
48	10503'	LEFT	FIELD ENTRANCE	ELIMINATE - ALT. ACCESS AVAILABLE
49	11161'	LEFT	PUBLIC ROAD (O'BRIEN RD.)	RETAIN EXISTING INTERSECTION


8
7
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2
1
21
Lander City Limits
2ND STREET CORRIDOR
Map 1


14
15
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10
9
2ND STREET CORRIDOR
Map 2


26
25
24
23
22
21
20
19
18
17
16
2ND STREET CORRIDOR
Map 3
23


35
34
33
32
30
31
29
28
27
2ND STREET CORRIDOR
Map 4
24


41
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39
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37
36
2ND STREET CORRIDOR
Map 5


49
48
47
46
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44
43
42
26
2ND STREET CORRIDOR
Map 6

Figure 5 – Second Street Existing Cross-section

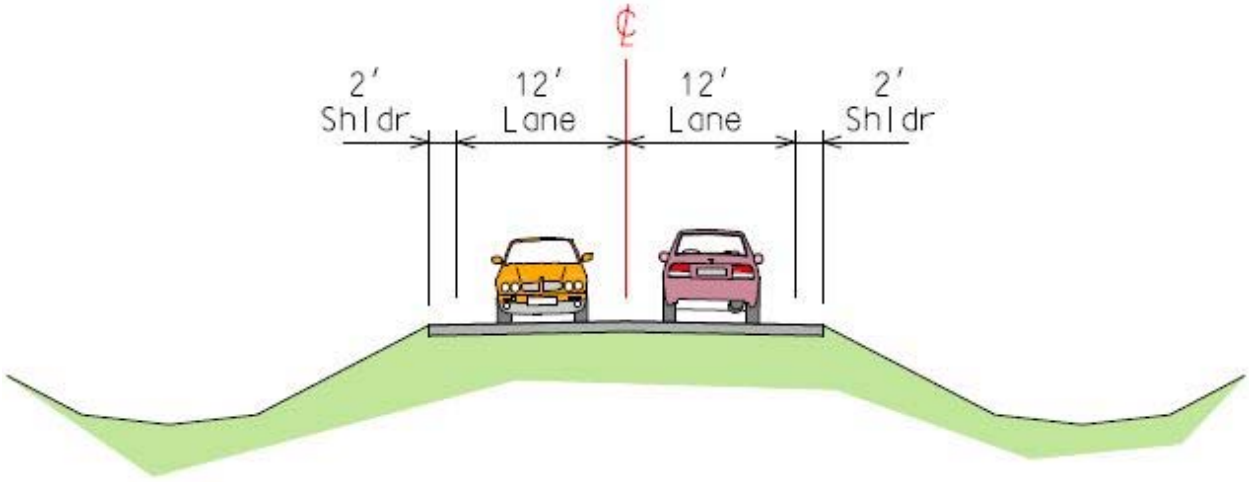


Figure 6 – Second Street Proposed Rural Cross-section

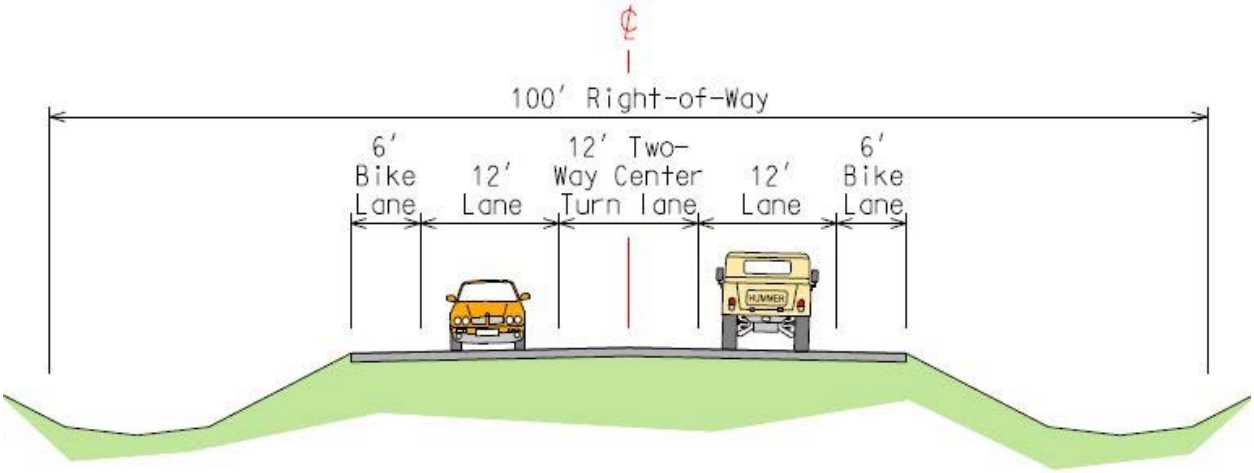
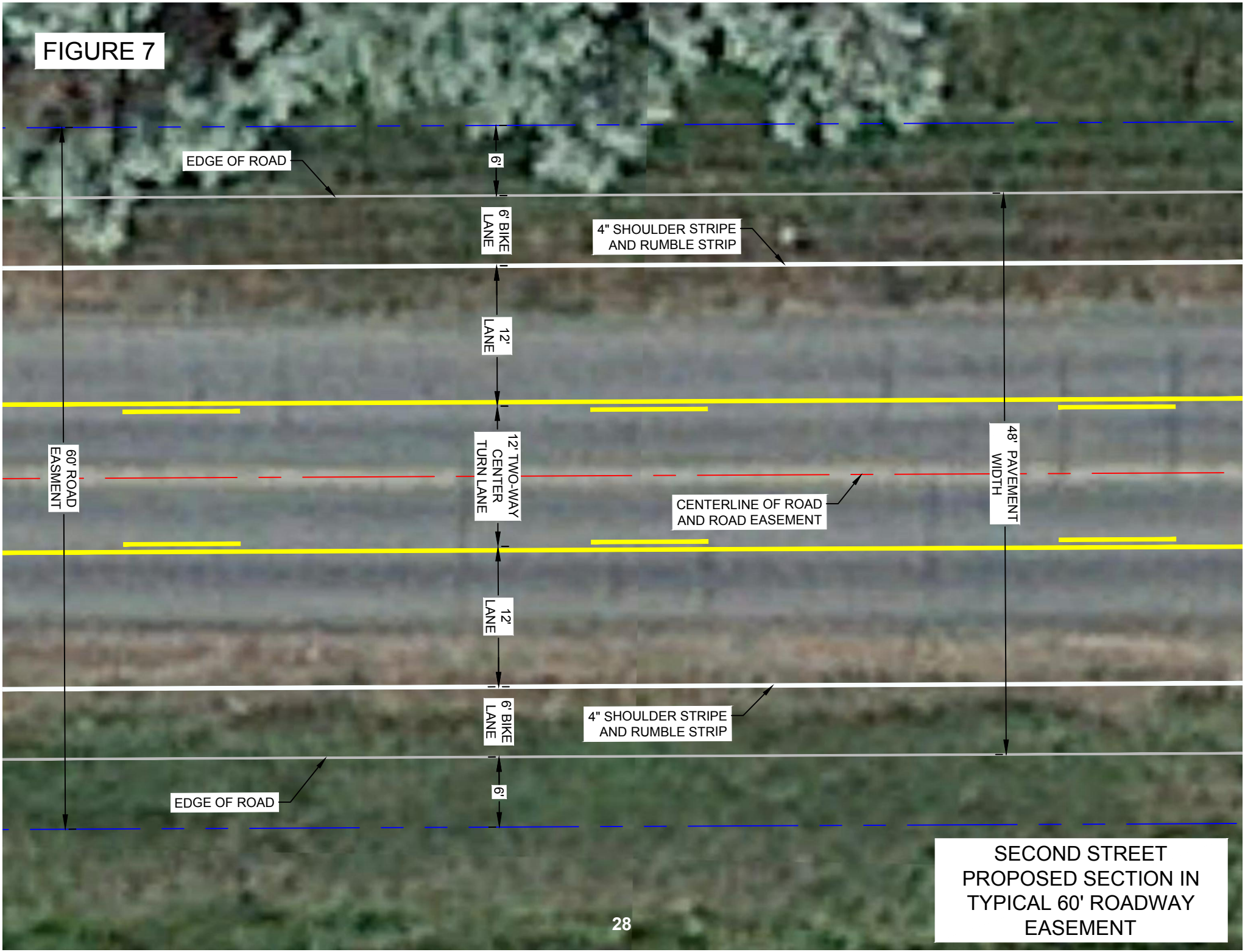


FIGURE 7



SECOND STREET PROPOSED SECTION IN TYPICAL 60' ROADWAY EASEMENT

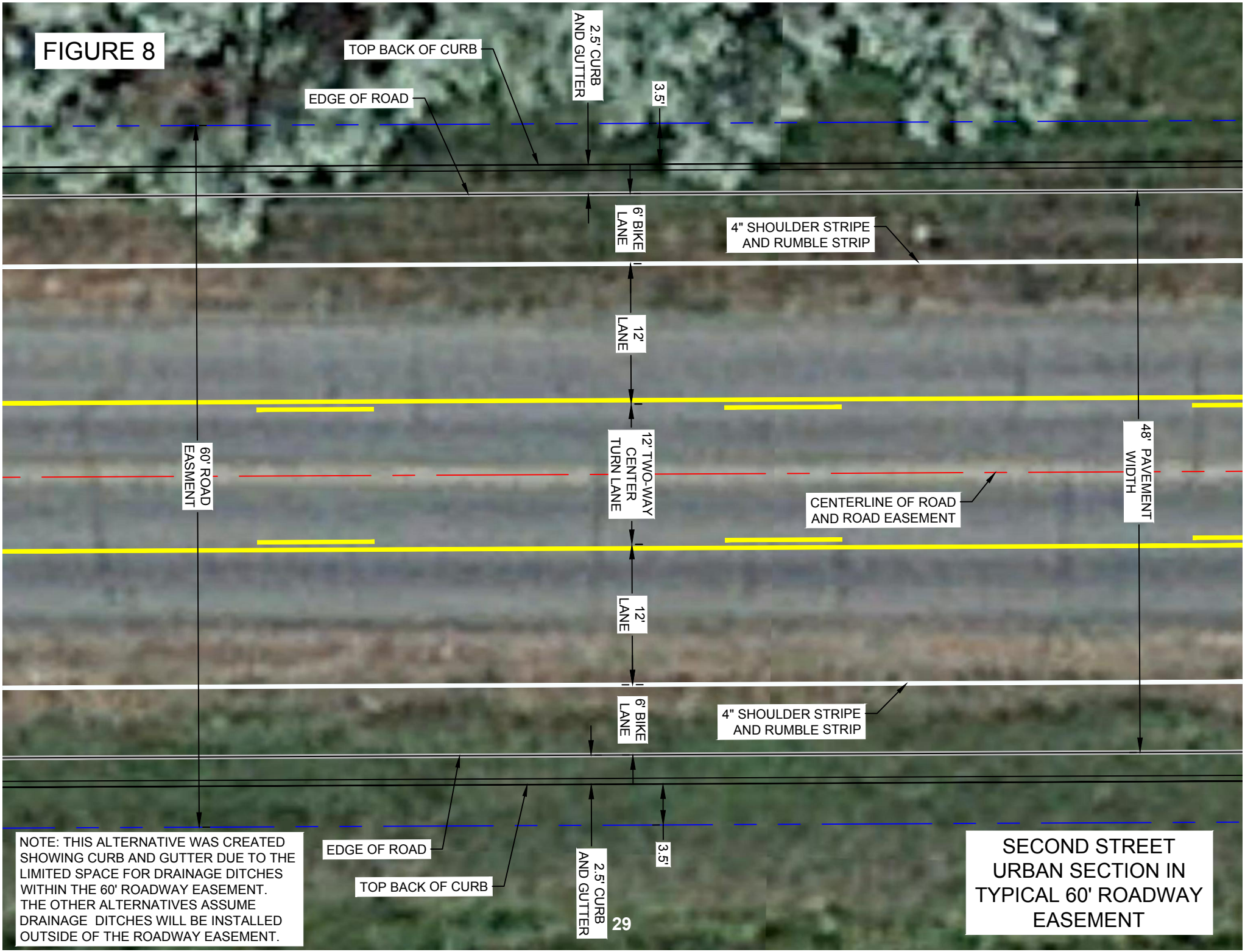


FIGURE 8
TOP BACK OF CURB
2.5' CURB AND GUTTER
EDGE OF ROAD
3.5'
6' BIKE LANE
4" SHOULDER STRIPE AND RUMBLE STRIP
12' LANE
60' ROAD EASEMENT
12' TWO-WAY CENTER TURN LANE
CENTERLINE OF ROAD AND ROAD EASEMENT
48' PAVEMENT WIDTH
12' LANE
6' BIKE LANE
4" SHOULDER STRIPE AND RUMBLE STRIP
EDGE OF ROAD
TOP BACK OF CURB
2.5' CURB AND GUTTER
3.5'
NOTE: THIS ALTERNATIVE WAS CREATED SHOWING CURB AND GUTTER DUE TO THE LIMITED SPACE FOR DRAINAGE DITCHES WITHIN THE 60' ROADWAY EASEMENT. THE OTHER ALTERNATIVES ASSUME DRAINAGE DITCHES WILL BE INSTALLED OUTSIDE OF THE ROADWAY EASEMENT.
SECOND STREET URBAN SECTION IN TYPICAL 60' ROADWAY EASEMENT

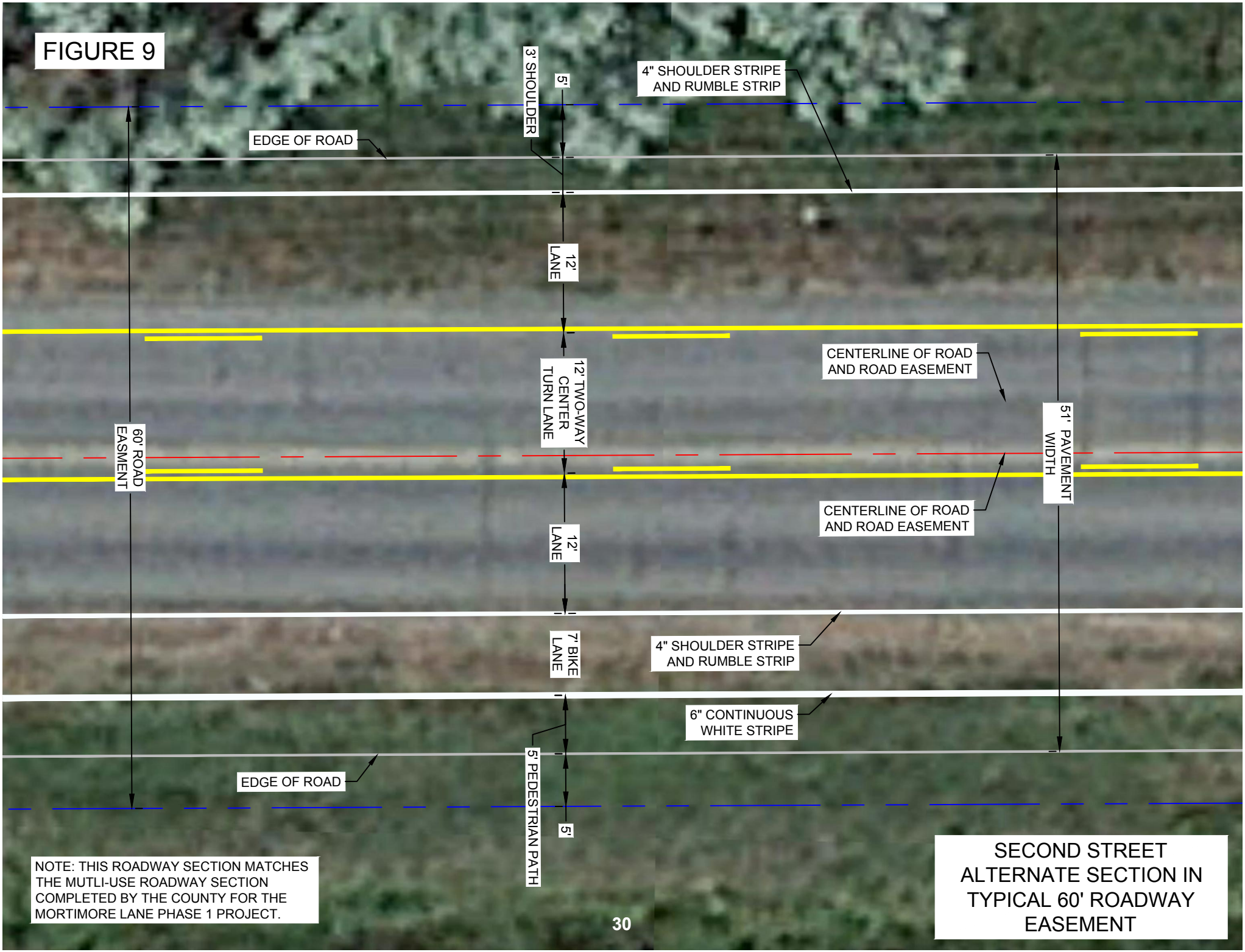


FIGURE 9
3' SHOULDER
5'
4" SHOULDER STRIPE AND RUMBLE STRIP
EDGE OF ROAD
12' LANE
12' TWO-WAY CENTER TURN LANE
CENTERLINE OF ROAD AND ROAD EASEMENT
60' ROAD EASEMENT
51' PAVEMENT WIDTH
CENTERLINE OF ROAD AND ROAD EASEMENT
12' LANE
7' BIKE LANE
4" SHOULDER STRIPE AND RUMBLE STRIP
6" CONTINUOUS WHITE STRIPE
EDGE OF ROAD
5' PEDESTRIAN PATH
5'
NOTE: THIS ROADWAY SECTION MATCHES THE MUTLI-USE ROADWAY SECTION COMPLETED BY THE COUNTY FOR THE MORTIMORE LANE PHASE 1 PROJECT.
SECOND STREET ALTERNATE SECTION IN TYPICAL 60' ROADWAY EASEMENT

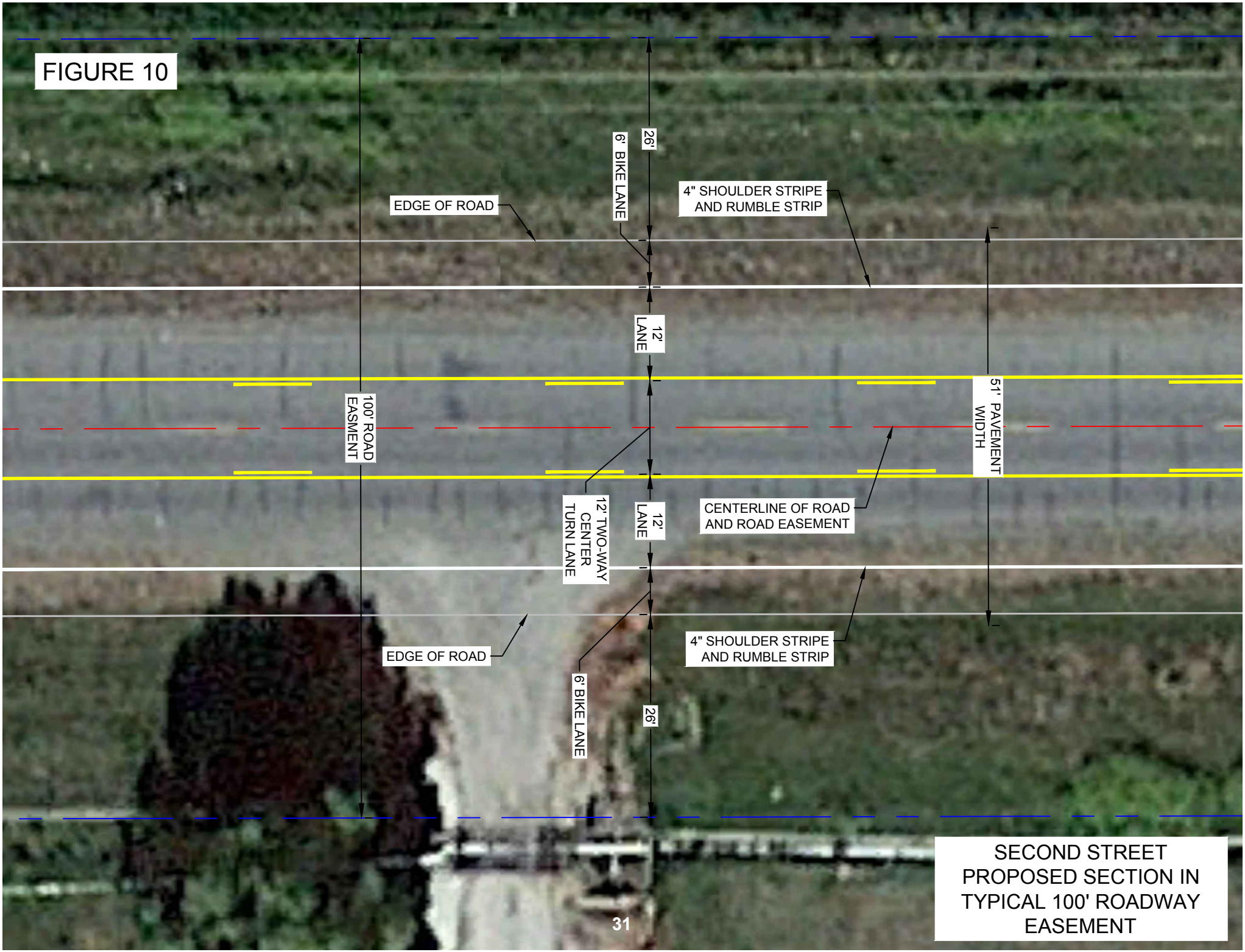


FIGURE 10
26'
6' BIKE LANE
EDGE OF ROAD
4" SHOULDER STRIPE AND RUMBLE STRIP
12' LANE
100' ROAD EASEMENT
51' PAVEMENT WIDTH
12' TWO-WAY CENTER TURN LANE
12' LANE
CENTERLINE OF ROAD AND ROAD EASEMENT
EDGE OF ROAD
4" SHOULDER STRIPE AND RUMBLE STRIP
6' BIKE LANE
26'
SECOND STREET PROPOSED SECTION IN TYPICAL 100' ROADWAY EASEMENT

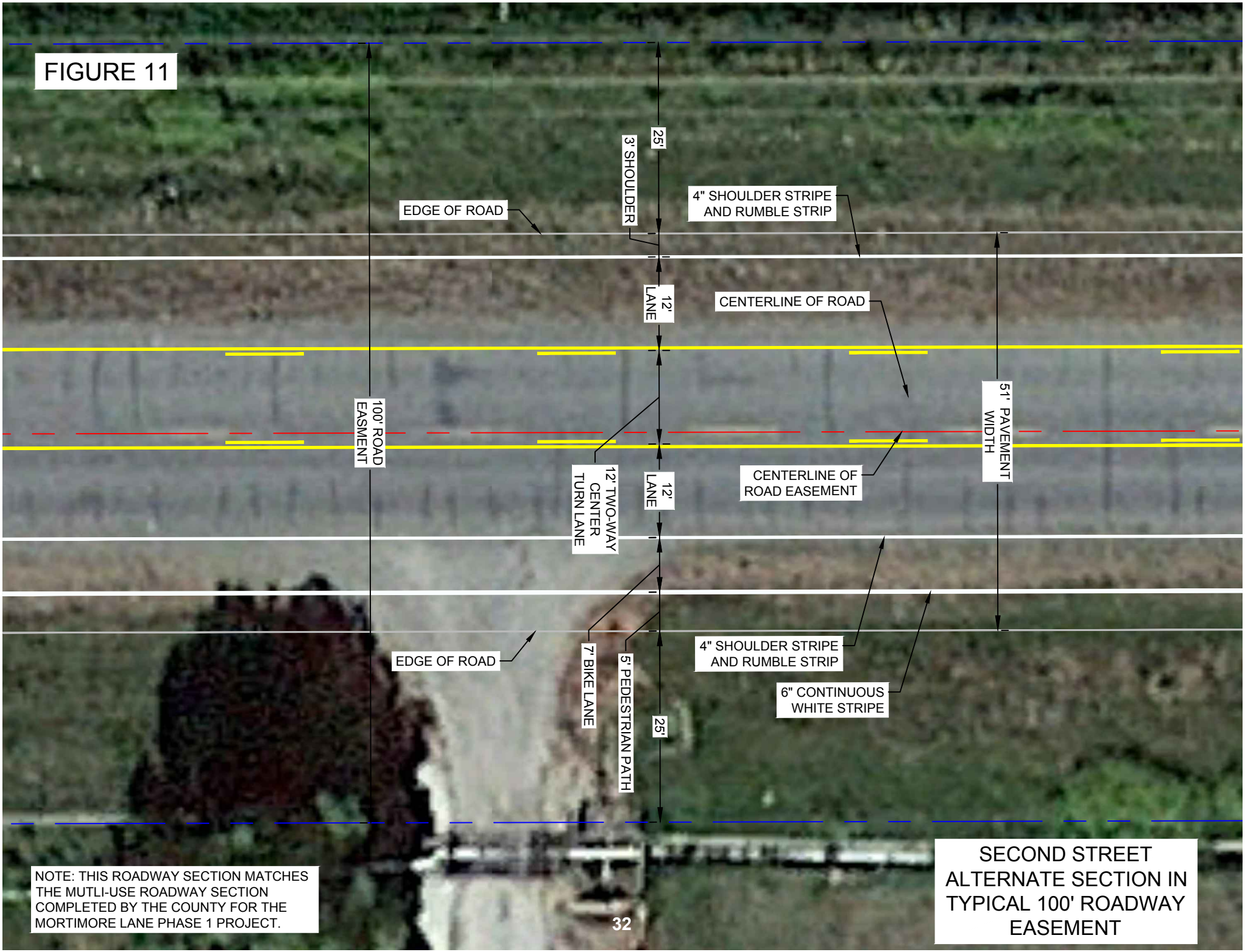


FIGURE 11
25'
3' SHOULDER
EDGE OF ROAD
4" SHOULDER STRIPE AND RUMBLE STRIP
12' LANE
CENTERLINE OF ROAD
100' ROAD EASEMENT
51' PAVEMENT WIDTH
12' TWO-WAY CENTER TURN LANE
12' LANE
CENTERLINE OF ROAD EASEMENT
EDGE OF ROAD
7' BIKE LANE
5' PEDESTRIAN PATH
4" SHOULDER STRIPE AND RUMBLE STRIP
6" CONTINUOUS WHITE STRIPE
25'
NOTE: THIS ROADWAY SECTION MATCHES THE MUTLI-USE ROADWAY SECTION COMPLETED BY THE COUNTY FOR THE MORTIMORE LANE PHASE 1 PROJECT.
SECOND STREET ALTERNATE SECTION IN TYPICAL 100' ROADWAY EASEMENT

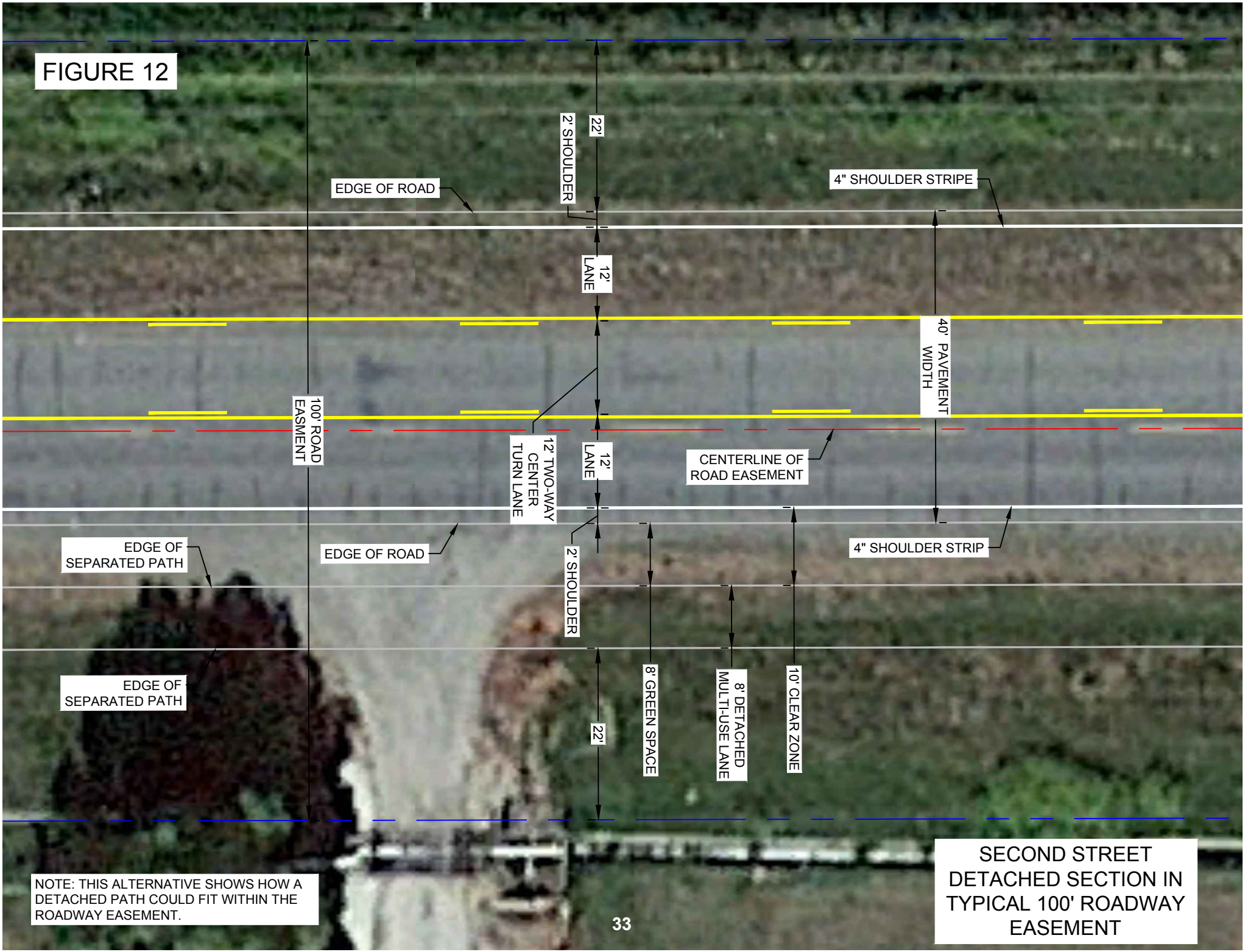


FIGURE 12
2' SHOULDER
22'
EDGE OF ROAD
4" SHOULDER STRIPE
12' LANE
40' PAVEMENT WIDTH
100' ROAD EASEMENT
12' TWO-WAY CENTER TURN LANE
12' LANE
CENTERLINE OF ROAD EASEMENT
EDGE OF SEPARATED PATH
EDGE OF ROAD
2' SHOULDER
4" SHOULDER STRIP
EDGE OF SEPARATED PATH
22'
8' GREEN SPACE
8' DETACHED MULTI-USE LANE
10' CLEAR ZONE
NOTE: THIS ALTERNATIVE SHOWS HOW A DETACHED PATH COULD FIT WITHIN THE ROADWAY EASEMENT.
SECOND STREET DETACHED SECTION IN TYPICAL 100' ROADWAY EASEMENT

Recommendations and Implementation Plan

An analysis of the US 287 and Second Street corridors has resulted in findings in three areas of inquiry and potential improvements to enhance safety and efficiency in each corridor. Each topic is addressed separately, as follows:

Access Management

An inventory of access points in each roadway corridor has allowed identification of opportunities for consolidation and elimination of some of the existing access points (**Tables 5 and 6**). It is recommended that each of these access improvements be made when opportunities arise, either through roadway reconstruction or through negotiations with willing landowners. The procedural changes listed below should also be considered to provide better compliance with access regulations in future development.

Roadway Improvements

Each of the roadways is expected to experience safety and operational benefits through the addition of a center two-way left turn lane. Also, the addition of shoulder bicycle/pedestrian lanes will allow the roadways to better serve growing demand. These improvements are subject to agency project priorities and available funding. Typical cross-sections and plan view figures for these recommended improvements are shown in **Figures 1-4 for Highway 287 and Figures 5-12 for North 2nd Street**. The recommended cross-sections include the center two-way left turn lane and 6' bike lanes in each direction. These are recommended as the alternatives that best meet design standards for bicycle facilities without extra cost or design, maintenance, or drainage complications. As the City of Lander expands, extension of the 5-lane urban cross-section is recommended in the newly urbanized area, augmented with bicycle lanes and sidewalks (see **Figure 3**).

Speed limits for the corridors should be reviewed as part of project development. Use of a tool such as USLIMITS2, an online application sponsored by the Federal Highway Administration, is recommended to provide complete consideration of the needs of all roadway users.

Procedures

A review of development regulations and procedures revealed some opportunities for improvement. Recommendations for each opportunity are provided below:

- Require access certification on plat. *Consider adoption of this procedure in the Fremont County subdivision regulations. Any change in regulations will require legal review, public discussion, and County Commission approval.*
- Revise the Road Design Standards. *Consider adoption of this procedure in the Fremont County subdivision regulations. Any change in regulations will require legal review, public discussion, and County Commission approval.*

- Hold regular plan review meetings. *This recommendation can be implemented by staff in the near term to facilitate communication and thorough vetting of development proposals.*
- Consider implementing Traffic Impact Study requirements for County roadways. *Consider adoption of this procedure in the Fremont County subdivision regulations. Any change in regulations will require legal review, public discussion, and County Commission approval.*
- Consider using official mapping. *This recommendation can be initiated by staff as a City planning activity, but should be approved by City Council, with concurrence by the County Commission.*

Implementation of the findings and recommendations of this study can be accomplished through the tasks shown in the following table:

Table 7 – Implementation Plan

TASK	TIME FRAME
Update the Fremont County subdivision regulations to adopt WYDOT access spacing standards for rural roadways. Update design standards to meet recommendations of American Association of State Highway and Transportation Officials (AASHTO)	Short-term
Establish official mapping along the US 287 and Second Street corridors within the Lander extra-territorial area to: • Restrict the number of driveways per lot • Locate driveways away from intersections • Encourage residential access from local streets instead of highways • Increase minimum lot frontage on major roads • Promote a connected street system	Short-term
Begin project development along the US 287 corridor within the study area. The proposed project should include the following features: • Center left turn lane • Pedestrian and bicycle facilities • Access improvements • Review of speed limit	Medium-term
Begin project development along the Second Street corridor within the study area. The proposed project should include the following features: • Center left turn lane • Pedestrian and bicycle facilities • Access improvements • Review of speed limit	Medium-term

APPENDIX

Access Management Guide

Public Meeting Comment Digest

Public Meeting Sign-in Sheets

Lander Greenway Map

Level of Service Analysis Sheets

WYDOT Crash Reports

APPENDIX

PART 1

Access Management Guide

Access Management Guide

Supplement to

Lander Area Study

Background

Access Management is a term used to describe the control of the number, spacing, and design of driveways and other access points onto roadways to maintain the safety and efficiency of the transportation system. The *Access Management Manual* (Transportation Research Board, 2nd Edition, 2014) defines access management as:

> *"Access management is the coordinated planning, regulation, and design of access between roadways and land development. It encompasses a range of methods that promote efficient and safe movement of people and goods by reducing conflicts on the roadway system and at its interface with other modes of travel."*

Access management techniques are being used by state and local governments to protect the publics' investment in the transportation system. The *Access Management Manual* states the primary reasons for employing access management:

> *"An effective access management program can reduce crashes by 50%, increase roadway capacity by 23% to 45%, and reduce travel time and delay by 40% to 60%."*

The *Manual* further explains that the basic methods of implementing access management include:

- Short and long-range planning
- Policies, directives, and guidelines
- Access management regulations
- Acquisition of access rights
- Land development regulations
- Development review and impact assessment
- Geometric design
- Internal and intergovernmental coordination

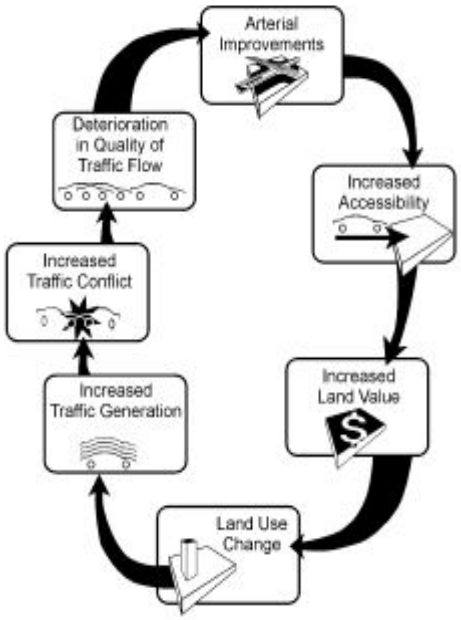
Local governments usually implement access management through regulation of land development and permitting procedures. The *Manual* describes these activities:

> *"Subdivision regulations govern the division of land into lots, blocks, and public ways and can ensure proper street layout in relation to existing or planned roadways, adequate space for emergency access and utilities, and internal access to subdivision lots. Overlay regulations can be used to add access management requirements onto specific corridors. Form-based codes integrate urban design objectives into the regulatory program and can be used to implement access and circulation networks in urban districts appropriate to the functional level of abutting roadways."*

The Federal Highway Administration (FHWA) controls access to the Interstate Highway System and strongly supports State and Local efforts to implement access management on roadways within their jurisdictions. Most states, including Wyoming, have customized access management programs to fit state needs and conditions. Local government response to access management has been variable, with

larger cities integrating access management into their land use regulations and permitting practices while less populous local governments have been slower to adopt access management. Generally, local governments have found that as development pressure has increased, the need for more orderly regulation has also increased.

History has shown that disorderly development has led to infrastructure problems, including congested, unsafe roadways. In some cases, this has taken the form of a cycle of roadway obsolescence where development has created the need for roadway improvements which in turn spur more development, more congestion and safety problems, and the rapid need for more roadway improvements. Careful planning and access regulation can slow or break this cycle of roadway obsolescence.



Roadway Obsolescence Cycle (source: Access Management Manual 2009)

Wyoming DOT (WYDOT) Access Management Practices

WYDOT has promulgated access management rules which have the force of law on roadways under WYDOT jurisdiction. These rules are supplemented by the WYDOT Access Manual, which provides guidance on the application of the rules.

The WYDOT Access Manual provides technical background on the application of access management in Wyoming, along with application criteria. The Manual provides some specific background on the application of access management in developing rural areas:

> *"In rural areas, especially areas that have housing developments with 2 to 10 acre lots, granting access to all houses abutting the roadway soon lowers the level of service and safety of the roadway due to the numerous turning movements.* ***The lack of effective access management and the proliferation of accesses is a major factor leading to the***

deterioration of highway safety and efficiency. *An example of what good access control can accomplish is the interstate system. The interstate system is 50 plus years old and still has a good level of service despite the increase in traffic volumes. This is due to access control. If non-interstate rural roadways had even a portion of this type of access control, the problems of low level of service and safety would be much less."*

WYDOT requires an approved access permit for construction, reconstruction, or alteration of any access on roadways under their jurisdiction (generally roadways with Federal or State designation). The WYDOT access regulations define allowable access spacing, control, and design features and should be consulted to determine the feasibility of any access proposal. In particular, WYDOT specifies the allowable spacing between access points for rural, urban, and urban fringe areas. Access spacing criteria are provided for reference in the following tables (refer to WYDOT Access Manual for full details). Access proposals that do not meet the required criteria may be required to share access with an adjoining parcel or use other roadways or access easements to reach the highway.

RURAL ARTERIAL ACCESS SPACING

(MINIMUM SEPARATION DISTANCES IN FEET PER SIDE)

ACCESS TYPE	FIELD	RESIDENTIAL	COMMERCIAL	MAJOR
FIELD	330	330	660	1320
RESIDENTIAL	330	660	1320	1320
COMMERCIAL	660	1320	2640	2640
MAJOR	1320	1320	2640	2640

RURAL COLLECTOR AND LOCAL ROAD ACCESS SPACING

(MINIMUM SEPARATION DISTANCES IN FEET PER SIDE)

ACCESS TYPE	FIELD	RESIDENTIAL	COMMERCIAL	MAJOR
FIELD	220	220	330	660
RESIDENTIAL	220	440	660	660
COMMERCIAL	330	660	1320	1320
MAJOR	660	660	1320	1320

URBAN AREA ACCESS SPACING

(MINIMUM SEPARATION DISTANCES IN FEET PER SIDE)

ACCESS TYPE	SPEED RANGE (MPH)	FIELD	RESIDENTIAL	COMMERCIAL	MAJOR
FIELD	<=30	330	330	330	330
	35-45	330	330	330	330
	50-55	330	330	660	660
RESIDENTIAL	<=30	330	330	330	330
	35-45	330	330	330	330
	50-55	330	660	660	660
COMMERCIAL	<=30	330	330	330	330
	35-45	330	330	660	660
	50-55	660	660	1320	1320
MAJOR	<=30	330	330	330	330
	35-45	330	330	660	660
	50-55	660	660	1320	1320

URBAN FRINGE AREA ACCESS SPACING

(MINIMUM SEPARATION DISTANCES IN FEET PER SIDE)

ACCESS TYPE	SPEED RANGE (MPH)	FIELD	RESIDENTIAL	COMMERCIAL	MAJOR
FIELD	<=30	220	220	330	330
	35-45	220	220	330	330
	50-55	220	220	330	660
RESIDENTIAL	<=30	220	330	330	330
	35-45	220	330	330	330
	50-55	220	440	660	660
COMMERCIAL	<=30	220	330	330	330
	35-45	330	330	660	660
	50-55	330	440	1320	1320
MAJOR	<=30	220	330	330	330
	35-45	330	330	660	660
	50-55	660	660	1320	1320

The above criteria apply when an applicant seeks a permit to build a new access point or modify an existing access point. In addition, WYDOT may require that any development or access that generates 50 or more peak hour trips complete a traffic impact study as part of the permit process. The traffic impact study evaluates the effects of the proposed access on roadway safety and efficiency and provides the information WYDOT needs to make a decision regarding the access application. Details of the access design are also regulated through the state access rules.

Since access issues are intimately involved with the land uses served by the access point, the access permitting process works most effectively when it occurs in conjunction with development regulation, which is under the jurisdiction of cities and counties. This is particularly true when a traffic impact study is involved because the impact study requires input data from the local government and adjacent land uses may be affected by traffic generated on the proposed access point.

Access management issues are more complicated for WYDOT, however, when addressing existing access points. Access points may have been built without WYDOT review or permit, or may have been granted by a local government during subdivision review without WYDOT concurrence, or may have been in existence prior to WYDOT's access management rules. Attempting to create order from these existing accesses is called "retrofitting" the roadway access. While WYDOT may want to reduce the number or increase the spacing of these existing access points, they are often hindered by access rights of the existing property owners. Frequently, the only way to improve existing access situations is to purchase access rights from adjacent property owners or consolidate or mitigate access situations during a roadway reconstruction project. Negotiating access improvements with adjacent landowners can be one of the most expensive and time-consuming parts of project design and development for the responsible agency. For this reason, small access improvements are seldom undertaken unless requested by willing landowners. Rather, access negotiations tend to become part of the larger right-of-way negotiation and acquisition process for larger highway reconstruction processes. It is seldom possible to achieve access spacing criteria in retrofit situations because of access rights of small property owners. State DOT officials instead seek to include as many access-related safety improvements as possible into the project design.

Reconstruction projects, including those involving access improvements, follow through the project planning, development, design, bidding and construction process employed by state transportation departments. Each project must be included in the State Transportation Improvement Program (STIP) and be prioritized with all other state projects for funding. Approved projects receive a tentative construction year and project development and design is initiated. It is not uncommon for a project to take 5 years or more from the initial concept to final construction. Consensus and commitment from state and local officials is necessary to see a project through to completion.

Local Government Access Management Practices

Applying access management in cities and counties can be a complex undertaking, requiring revising planning documents and land use procedures. Some basic principles of local government access management, however, are contained in a publication, *"Ten Ways to Manage Roadway Access in Your Community" (Center for Urban Transportation Research, University of South Florida):*

- Lay the foundation for access management in your local comprehensive plan
- Restrict the number of driveways per lot
- Locate driveways away from intersections
- Connect parking lots and consolidate driveways
- Provide residential access through neighborhood streets
- Increase minimum lot frontage on major roads
- Promote a connected street system
- Encourage internal access to outparcels
- Regulate the location, spacing and design of driveways
- Coordinate with the Department of Transportation

Readers are referred to the *Access Management Manual, Ten Ways brochure* and other reference publications for detailed discussions of local government access actions.

Local government access management activities can be categorized as follows:

- Planning
- Subdivision and platting regulation
- Infrastructure design regulation
- Hybrid activities that overlap between planning and design

Each of these activity categories, and their application in Fremont County, is discussed in the following sections.

Planning

Comprehensive plans are used to analyze a community's assets and aspirations, forecasting future population and estimating that population's needs. Comprehensive plans establish a community's goals and objectives and determine what the community will need in terms of land use, transportation, water, sanitary sewer, storm sewer and drainage, solid waste disposal, parks and recreation, environmental protection, and other public goods. The transportation element of the comprehensive plan frequently establishes and maps the future extensions of the major streets system and establishes policies for the general design and management of the street system. These policies can include measures that integrate access management into local street development.

The Lander Master Plan 2012 includes policies aimed at creating a complete system of functional street classifications, with streets ranging from high capacity/low access arterials to low capacity/high access local streets. The Plan also establishes the need to provide cross-access between properties and corridor overlay districts to facilitate planning for the specific needs of individual roadway corridors.

Fremont County does not currently use comprehensive planning or zoning.

Subdivision and Platting Regulation

Subdivision and platting regulations facilitate orderly development, keep development in line with community goals, and help to prevent conflicts between neighbors. In relation to access management, subdivision regulations can establish minimum lot frontages and promote lot access through the local street system rather than on collector or arterial roadways. Subdivision and platting regulations can also help establish and promote permitting procedures for new access points.

Currently, the subdivision regulations for the City of Lander and Fremont County do not specify lot minimum frontage standards or prevent flag lot development on arterial or collector streets. While the regulations require a review of access prior to subdivision approval, neither the City nor County require the extra step of having an access approval certification signature on the plat before it can be filed and take legal effect. Neither entity has established a formal access permit process.

Infrastructure Design Regulation

Local governments frequently use design standards to establish the minimum acceptable conditions for the installation of public infrastructure. These design standards usually specify access spacing standards and details of driveway and intersection design. WYDOT encourages the adoption of their access standards by local governments to establish consistency throughout the transportation network.

Currently, the City of Lander specifies spacing of street intersections and provides minimum standards for various intersection design items. The design standards call for four-way intersections of local streets to be avoided and T-intersections encouraged. Driveway grade change and width are specified, but no specification exists for spacing of driveways.

Fremont County road design standards include some basic standards for road design, but don't include any spacing standards for driveways. Again, T-intersections are preferred over 4-way intersections, with 125' minimum intersection offset.

These local government design standards conflict with WYDOT recommendations and national access management research in several ways:

- The local government standards don't specify spacing standards for driveways
- Intersection spacing standards are less than WYDOT or national recommendations and in some cases don't provide sufficient offset for safe maneuvering or queuing
- Local government regulations don't require large commercial developments to provide details of their impact on the transportation system or require developers to identify and provide transportation improvements that occur because of their developments

Hybrid Activities

There are a number of activities that local governments may pursue that overlap across planning, subdivision regulation, and design standards to promote access management. Two of these activities are the creation of corridor plans and the creation of official maps. Corridor plans allow governments and the public to work together to identify a roadway corridor's transportation needs and plan the land uses and transportation facilities that will meet those future needs. Official maps, authorized by Wyoming law, allow cities to establish maps to reserve roadways for future use. Official maps are frequently used in conjunction with zoning overlay districts that detail special subdivision regulations and design specifications for the roadway.

Summary

Access management is a tool that can be used by all transportation agencies to help preserve the safety and efficiency of roadways. Numerous research studies have shown that proper management of access spacing and access-related roadway design reduce conflicts between all roadway vehicles and help to preserve the public's investment in transportation infrastructure.

References

There is an extensive library of materials related to access management for use by practitioners worldwide. The primary reference on the subject is the *Access Management Manual, Second Edition, 2014, Transportation Research Board, (ordering information at: http://www.trb.org/main/blurbs/153146.aspx)*. A useful primer on access management for local governments is *Ten Ways to Manage Roadway Access in Your Community, Center for Urban Transportation Research, University of South Florida (electronic copy provided).* A digest of publications and research papers on access management is maintained by the Transportation Research Board Access Management Committee (http://www.accessmanagement.info/resource). The WYDOT Access Manual is available at: http://www.dot.state.wy.us/files/live/sites/wydot/files/shared/Traffic%20data/Access_Manual_Final_2014.pdf

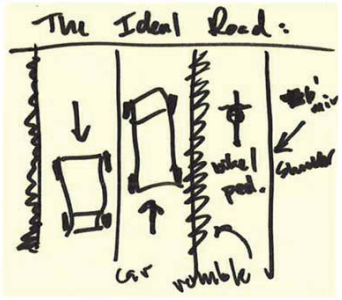
APPENDIX

PART 2

Public Meeting Comment Digest

Public Meeting Digest

Public Meeting/Open House July 19, 2016

Comments from North 2nd Street Maps	Comments from HWY 287 Maps	Comments from Comment Cards and Email				
		Comment	Hyperlink	Name	Address	Phone Number
Check out Lander Bicycling Club for #'s in participation in the Fremont Area Road Tour. 2015 - 200 even 2016 - 150	Dangerous Intersection at Rosewood Ave. There are major site-distance issues with the traffic coming off of Lander Hill. The big issue is left hand turns onto Rosewood Ave for vehilce moving north. Accidents have occured at this intersection.	Comment Card: Wider Shoulder (Bike Lane) Is Needed More on N. 2nd Than 287. Focus Is Too Narrow - Lane Should be Extended To Include Lower N. Fork All The Way To 287 At Milford. Speed Enforcement Is a Big problem Too - Posted At 45 But traffic Moves much Faster.	C:\pwworking\oma\d2244387\Comment Card_Robert Fay_2016_0719.pdf	Fay, Robert	217 Garfield, Lander, Wy. 82520	307-332-2542
Concerns: Standing water collects at the side of the Hwy. Breeds mosquitoes in summer. Risk for communiable disease.	Vehicles that are slow to make turns (L or R) either move out of the lane to be passed or are passed outside the lane. Both situations endanger other users in the shoulders; esp. cyclists.	Comment Card: Please consider providing a pedestrian/bicycle/cross-country ski/utility corridor along the entire route from city limits to Milford and return along 287 back to the city limits. Bicycling on this route leaves me feeling unsafe.	C:\pwworking\oma\d2244387\Comment Card_Jim Gores_2016_0719.pdf	Gores, Jim	505 Northridge, Riverton, Wy. 82501	307-856-6479
For etimated number of bicyleists, check Strava Heat Maps. It is a mobile phone app that tracks Bike rides.	Concerns: 65 mph from city limits to Milford - but there are more than 20 opportunities to turn off the road, slowing traffic. Then 65 again until Milford - too much stop and go (There was a second comment in agreemment with this assesment).	Comment Card: First, thank you for giving consideration to cyclists. I've ridden/lived in many states where cyclist are simply ignored. Second, I've ridden the Tour de Wyoming a few times now and WYDOT folks are always pros. Thanks for what y'all do.	C:\pwworking\oma\d2244387\Comment Card_Paul Primrage_2016_0719.pdf	Primage, Paul	1015 Cliff, Lander, Wy. 82520	307-438-1065
Tractors on road : Traffic To Fast To React.	Why doen't the Study extend to Milford?? Or to Shoshone Rose? Or to where WRIR territory begins??	Comment Card: Having served 8 yrs. On the Fremont Co. Planning Commission, I saw many sub-division proposals. Several of them required access to County Roads and occassionally state highways. From the County stand point there were very few access permits that were denied. I would like to see info. on how many access locations have been approved on the north second stretch that you are looking at.	C:\pwworking\oma\d2244387\Comment Card_Bob Joscia_2016_0719.pdf	Joslin, Bob	625 Buena Vista Rd. Lander, Wy. 82520	606-510-0299
100' Row To City Limited.	Suggestion: Make a LH Turning Lane for Entire Corridor within Study Area or beyond (to Milford maybe?).	Email Received by Steve Baumann on 7/18/2016:	C:\pwworking\oma\d2244387\E_(LAS Public Meeting_Comment)_Robert Laird_Study Group_2016_0718.msg	Laird, Robert	307-349-3335	rlaird@fremontmotors.com
100' Right of way. For study area there is an opportunity for wider shoulders/bike path w/o changing ROW.		Telephone Call Received by Steve Baumann 7/21/2016 (see email here):	C:\pwworking\oma\d2244387\E_(LAS Public Meeting_Comment)_Obrien Rd_Study Group_2016_0721.msg	Resident South of O'Brien Rd		
City water ends at Synapse.		Email about the intersection of HWY 287 and Rosewood Avenue from 7/22/2016:	C:\pwworking\oma\d2244387\E_(LAS Public Meeting_Comment)_Jared Kail_Study Group_2016_0722.msg	Jared Kail	196 Rosewood Ave	jared@wyominginc.com
There is a Bicycle Loop on N 2nd to Lower N. Fork to Tweed Lane, back to HWY 287. A longer Loop goes from N 2nd, to Lower North Fork to Milford at HWY 287 and Back to Lander.		Email about the intersection of HWY 287 and Rosewood Avenue from 7/25/2016:	C:\pwworking\oma\d2244387\E_(LAS Public Meeting_Comment)_Bookys_Study Group_2016_0725.msg	Albert & Terry Booky		abooky@wyoming.com
Cycling along this entire corridor is very dangerous. Vehicles pass unsafely providing little space for bikes to adjust for road surface hazards or detritus in the lane.		Email about the intersection of HWY 287 and Rosewood Avenue from 8/1/2016:	C:\pwworking\oma\d2244387\E_(LAS Public Meeting_Comment)_Elizabeth Kail_Study Group_2016_0801.msg	Elizabeth Kail		ekail@bresnan.net
There is a Sewer Main that runs from Tweed Lane over to North 2nd Street, near Pope Lane. This is a potential location for Development because of the Sewer Main.						
Sketch of Ideal Road: 						

Public Meeting Digest

Public Meeting/Open House November 16, 2016

Comments from North 2nd Street Maps	Comments from HWY 287 Maps	Comments from Comment Cards, Email, Via Phone Call				
		Comment	Hyperlink	Name	Address	Phone Number
Resident does NOT want Curb and Gutter on North 2nd Street within the 60' ROW section near Lander City Limits (**Between access points 7 & 8**)	Super elevation concern. (**Between points 34 & 37**) The road cross section feels odd and unsafe. (Cars feel like it might fly off road)	Education for cyclist on operating a bicycle on roadways. Proper reflection on rules of the road. (perhaps testing) a sticker for bicycle to show you know rules and passed a test.	Comment Card_Linda Miller_2016_1116.pdf	Linda Miller	1781 N 2nd. St. Lander, WY 82520	615-218-3979
Recommend: Safety education for Cyclist using cyclist/pedestrian lanes on road (**Noted by access point 11**)		Keep wide roads with turn lane for safety. A totally separated bike/pedestrian path would be safest. Like outside of Riverton starting at Beaver Creek & in Jackson Area.	Comment Card_Barbara Oaklear_2016_1116.pdf	Barbara Oaklear	800 Vance Drive Lander, WY 82520	307-349-4479
Referencing actual lanes on a track for running: On a track lanes are 3.5 ft wide. The Comment was that they would recommend 7 ft wide lane min along any proposed path passing so that cyclists & pedestrians could have room to pass within the path (**Noted between access points 34 & 39**)		On North Second plan - Would love to see a bike/pedestrian path SEPARATE from the vehicles roadway.	Comment Card_Ed Lee_2016_1116.pdf	Ed Lee	1055 Dabrich Ave. Lander, WY 82520	307-349-5849
Proximity of Bridge on Vessel Rd is to close to intersection of N. 2nd Street. Damaging bridge due to heavy Truck Traffic turning onto N. 2nd Street from Vessel Rd. (**Noted above access point 49**)		HDR Received Phone Call on Number 17. Caller owns property near O'Brien Road on North 2nd. There is an irrigation ditch on the west side of the road near the big white barn (**between access point 47 and 49**). County may run into trouble widening the road through this location. He is not willing to give up any more ROW/frontage along this section (the County ran into issues before trying to address this irrigation ditch). He also said that there is a 6' culvert crossing N 2nd Street at this location that was overtopped during the flood event that happened in Spring 2016. His Last Comment was to ask if the County/City had thought about extending the Sanitary Sewer to the North if North 2nd Street is ever re-built.		Tony Sprigs	2161 N. 2nd St. Lander, WY 82520	307-332-4672
There were concerns brought up about the speed along North 2nd Street. The concern is that if the Roadway is improved, the speed of traffic may increase. How speed limits are set by governing agencies was discussed. A Speed Study could be conducted after the improvements are made or duirng design Speed reconmendations should be made if the roadway is to have a speed limit under 55 mph						
Several attendees indicated interest in separated bike paths. Two attendees like the idea of a bike path with a separate alignment within the right-of-way.	Several attendees indicated interest in separated bike paths. Two attendees like the idea of a bike path with a separate alignment within the right-of-way.					
Several Attendees indicated they liked the reconmended alternative with 6' lanes on both sides of the road. They saw benefit in having bikes and pedestrians travel the same direction as traffic	Several Attendees indicated they liked the reconmended alternative with 6' lanes on both sides of the road. They saw benefit in having bikes and pedestrians travel the same direction as traffic					

APPENDIX

PART 3

Public Meeting Sign-in Sheets

Lander Area Study

Public Meeting/Open House #1

July 19, 2016

Lander City Hall

Sign-in Sheet (Please Print)

#	Name	Property/Business Name	Mailing Address	Phone #
1	Erik Smith	WYDOT	P.O. Box 929 Lander, WY. 82520	307-332-4151
2	Kevin McCoy		5300 Bishop Cheyenne	307-777-4178
3	Jennifer Hudson Shaff	City of Lander Planning Commission	541 Wood St. Lander, WY. 82520	307-332-5074
4	Rita & Mark Peterson		230 Dutch Ed Lane Lander, WY. 82520	307-332-6877
5	Dan Hudson	Lander, Planning Commission	384 So. 3rd Lander, WY. 82520	307-332-4003
6	Dave Pendleton	Fremont County Transportation	450 N. 2nd St. Lander, WY. 82520	307-332-1040
7	Dick Hudson	City of Lander	450 Parks Lander, WY. 82520	307-714-1277
8	Jared Kail	Rosewood hills	196 Rosewood Ave.	307-438-3432
9	Jim Gores	Self	505 Northridge Riverton WY. 82501	307-856-6479
10	David Myers	HDR	325 Main Street, P.O. Box 467 Lander, WY. 82520	307-851-5076
11	Paul Primrage		1015 Cliff St. Lander WY. 82520	307-438-1065

Lander Area Study

Public Meeting/Open House #1

July 19, 2016

Lander City Hall

12	Sam Hartpence		477 South 5th, Lander, WY. 82520	307-438-3319
13	Robert Fay		217 Garfield, Lander, WY. 82520	307-332-2542
14	Steve Baumann	County Planning	2140 Squaw Creek Rd. Lander, WY. 82520	307-332-1079
15	S & M Robert			
16	Liz Lighter		260 Cascade St. Lander, WY. 82520	307-335-5140
17	Bob Joslin		3016 BuenaVista Rd. Lander, WY. 82520	602-510-0299
18	Eric Concannon		477 Amoerth St. Lander, WY.82520	307-438-0305

Lander Area Study

Public Meeting/Open House #2

November 16, 2016

Lander City Hall

Sign-in Sheet (Please Print)

#	Name	Property/Business Name	Mailing Address	Phone #
1	Margy Irvine		1070 McDougall Dr. Lander, WY. 82520	307-332-9714
2	John Schmadn		3826 US 287 W. Lander, WY. 82520	307-332-2673
3	Alvin H. Miller		1781 N. 2nd Lander, WY. 82520	615-218-3979
4	Linda Miller		1781 N. 2nd Lander, WY. 82520	615-218-3979
5	Michael Cheek		30 Meandering Way Lander, WY. 82520	307-349-8824
6	Steve Baumann	Fremont County Planner		307-349-2900
7	Fred Groenke		2232 N. 2nd Lander, WY. 82520	438-1416
8	RaJean Strube Fossen	Lander City	240 Lincoln St. Lander, WY. 82520	307-332-2870
9	Erik Smith	WYDOT		307-332-4151
10	Tom Cox		12 Del-Ray Dr. Lander, WY. 82520	438-0076
11	Jenna Mayer	County 10		
12	Shannon Rochelle		316 Estate Dr. Lander, WY. 82520	307-349-5303

Lander Area Study

Public Meeting/Open House #2

November 16, 2016

Lander City Hall

13	Robert Fay		217 Garfield Lander, WY. 82520	307-332-2542
14	Trey Warren	Lander	695 Washakie St. Lander, WY. 82520	307-349-2023
15	Mary Ann Jones		2289 N. 2nd St. Lander, WY. 82520	307-332-4271
16	Tom Jones			
17	Beth Estes		504 Amoretti St. Lander, WY. 82520	315-569-1197
18	David Neary		504 Amoretti St. Lander, WY. 82520	315-251-5345
19	Barbara Oakley		800 Vance Dr. Lander, WY. 82520	307-349-4479
20	Tom Bowen		28 Pinto Ln. Lander, WY.82520	307-332-6203
21	James Thomas	WYDOT		307-349-1134
22	Ed Lee		1055 Dabich Ave. Lander, WY. 82520	307-349-5849
23	Jennifer McCarty	Cocomm Elect	41 Iiams Rd. Lander, WY. 82520	307-332-9102
24	Mike Quinn		952 Hobson St. Lander, WY. 82520	307-349-1574

APPENDIX

PART 4

Lander Greenway Map

Lander Greenway

Existing On-Street Routes

Existing Off-Street Routes

Proposed Routes

(Routes subject to landowner consent)

- Safe Routes to Schools

- Greenways

CITY OF LANDER

STREET MAP

FREMONT COUNTY, WYOMING

SCALE: 1"= 1000'

APPENDIX

PART 5

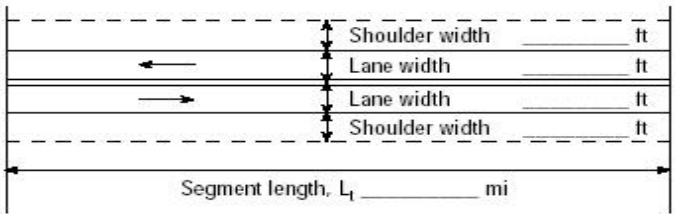
Level of Service Analysis Sheets

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*US 287*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/LANDER HILL*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTYU*
Analysis Time Period	*PEAK, NB*	Analysis Year	*2016*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *65%*

% Trucks and Buses , P_T *8 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *250*veh/h

Opposing direction vol., V_o *250*veh/h

Shoulder width ft *8.0*

Lane Width ft *12.0*

Segment Length mi *1.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.4*	*1.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.969*	*0.969*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*293*	*293*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*68.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*62.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*54.4 mi/h*
		Percent free flow speed, PFFS	*87.4 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.992*	*0.992*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*286*	*286*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*30.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*54.9*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*

Volume to capacity ratio, *v/c*	*0.17*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1647*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1687*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*87.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*284.1*
Effective width, Wv (Eq. 15-29) ft	*28.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.00*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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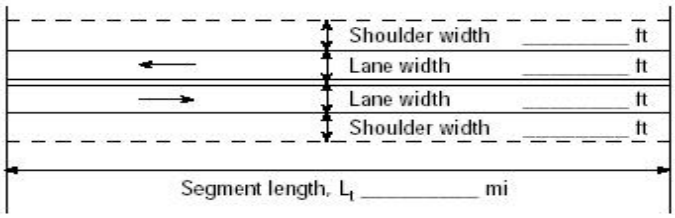
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*US 287*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/LANDER HILL*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTYU*
Analysis Time Period	*PEAK, SB*	Analysis Year	*2016*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *72%*

% Trucks and Buses , P_T *8 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *250*veh/h

Opposing direction vol., V_o *250*veh/h

Shoulder width ft *8.0*

Lane Width ft *12.0*

Segment Length mi *1.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
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Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.969*	*0.969*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*293*	*293*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*68.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*62.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*54.4 mi/h*
		Percent free flow speed, PFFS	*87.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
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Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*286*	*286*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*30.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*55.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*58.6*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*

Volume to capacity ratio, *v/c*	*0.17*
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General Information		Site Information	
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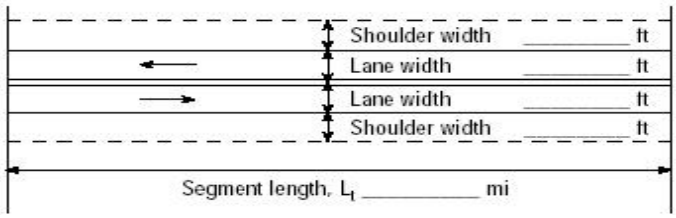
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/LANDER HILL*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTYU*
Analysis Time Period	*PEAK, NB*	Analysis Year	*2036*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *65%*

% Trucks and Buses , P_T *8 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *420*veh/h

Opposing direction vol., V_o *420*veh/h

Shoulder width ft *8.0*

Lane Width ft *12.0*

Segment Length mi *1.7*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.984*	*0.984*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*485*	*485*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*68.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*62.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.5 mi/h*
		Percent free flow speed, PFFS	*84.3 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*477*	*477*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*39.7*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.3*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*

Volume to capacity ratio, *v/c*	*0.29*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1673*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.3*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*477.3*
Effective width, Wv (Eq. 15-29) ft	*28.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.26*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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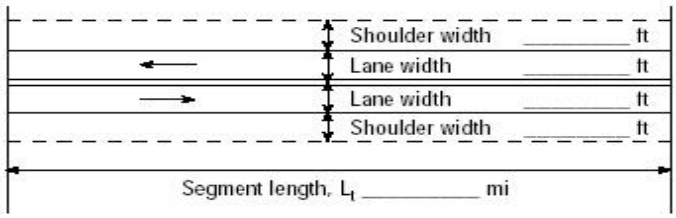
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*US 287*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/LANDER HILL*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTYU*
Analysis Time Period	*PEAK, SB*	Analysis Year	*2036*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☑ Class I highway ☐ Class II highway ☐ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Analysis direction vol., V_d	*420*veh/h
Opposing direction vol., V_o	*420*veh/h
Shoulder width ft	*8.0*
Lane Width ft	*12.0*
Segment Length mi	*1.7*
Peak-hour factor, PHF	*0.88*
No-passing zone	*72%*
% Trucks and Buses , P_T	*8 %*
% Recreational vehicles, P_R	*0%*
Access points *mi*	*23*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.2*	*1.2*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.984*	*0.984*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*485*	*485*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*68.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*2.3 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*62.3 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*52.4 mi/h*
		Percent free flow speed, PFFS	*84.2 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*1.000*	*1.000*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*477*	*477*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*49.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*40.0*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.4*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*D*

Volume to capacity ratio, *v/c*	*0.29*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1673*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*84.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*477.3*
Effective width, Wv (Eq. 15-29) ft	*28.00*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*3.26*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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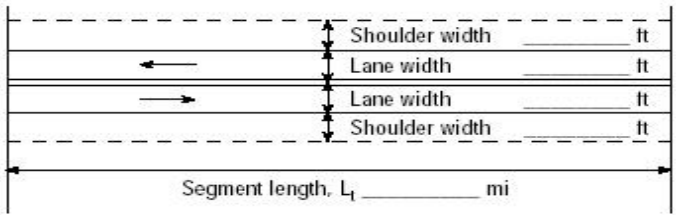
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*SECOND STREET*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/O'BRIAN RD.*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTY*
Analysis Time Period	*PEAK, NB*	Analysis Year	*2016*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *21%*

% Trucks and Buses , P_T *2 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *90*veh/h

Opposing direction vol., V_o *90*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *2.1*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.982*	*0.982*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*104*	*104*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*48.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*39.7 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*37.9 mi/h*
		Percent free flow speed, PFFS	*95.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*	*0.998*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*102*	*102*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*11.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*26.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*

Volume to capacity ratio, *v/c*	*0.06*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1669*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1697*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*102.3*
Effective width, Wv (Eq. 15-29) ft	*21.70*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.23*
Bicycle level of service (Exhibit 15-4)	*B*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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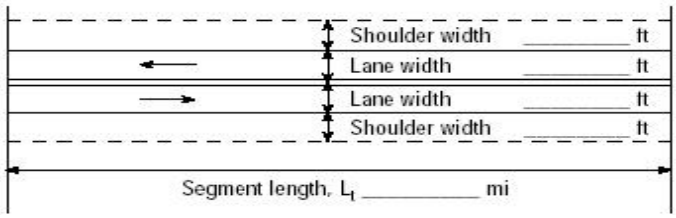
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*SECOND STREET*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/O'BRIAN RD.*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTY*
Analysis Time Period	*PEAK, SB*	Analysis Year	*2016*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *21%*

% Trucks and Buses , P_T *2 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *90*veh/h

Opposing direction vol., V_o *90*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *2.1*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.9*	*1.9*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.982*	*0.982*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*104*	*104*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*48.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*39.7 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*37.9 mi/h*
		Percent free flow speed, PFFS	*95.6 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*	*0.998*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*102*	*102*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*11.8*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*30.1*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*26.9*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*

Volume to capacity ratio, *v/c*	*0.06*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1669*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1697*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*95.6*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*102.3*
Effective width, Wv (Eq. 15-29) ft	*21.70*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.23*
Bicycle level of service (Exhibit 15-4)	*B*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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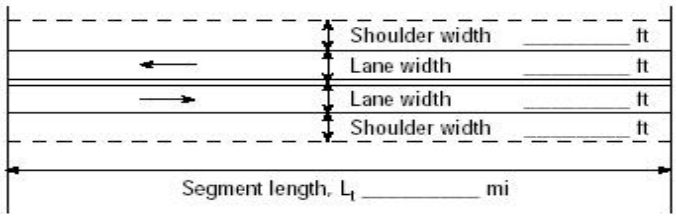
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*SECOND STREET*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/O'BRIAN RD.*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTY*
Analysis Time Period	*PEAK, NB*	Analysis Year	*2036*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *21%*

% Trucks and Buses , P_T *2 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *115*veh/h

Opposing direction vol., V_o *115*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *2.1*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.984*	*0.984*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*133*	*133*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*48.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, FFS=S_{FM}+0.00776(*v*/ $f_{HV,ATS}$)		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*39.7 mi/h*
		Average travel speed, ATS_d=FFS-0.00776($v_{d,ATS}$ + $v_{o,ATS}$) - $f_{np,ATS}$	*37.2 mi/h*
		Percent free flow speed, PFFS	*93.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*	*0.998*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*131*	*131*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*14.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*33.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*31.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*

Volume to capacity ratio, *v/c*	*0.08*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1673*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1697*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*130.7*
Effective width, Wv (Eq. 15-29) ft	*19.95*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.72*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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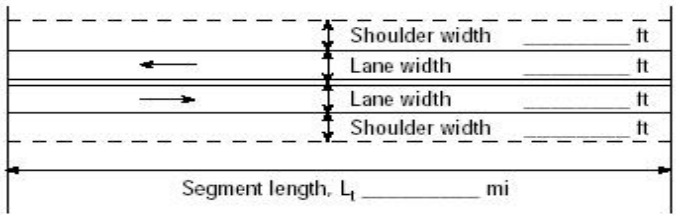
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	*RL*	Highway / Direction of Travel	*SECOND STREET*
Agency or Company	*HDR*	From/To	*LANDER CITY LIMITS/O'BRIAN RD.*
Date Performed	*7/19/2016*	Jurisdiction	*FREMONT COUNTY*
Analysis Time Period	*PEAK, SB*	Analysis Year	*2036*

Project Description: *LANDER AREA STUDY*

Input Data



Show North Arrow

☐ Class I highway ☐ Class II highway ☑ Class III highway

Terrain ☑ Level ☐ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.88*

No-passing zone *21%*

% Trucks and Buses , P_T *2 %*

% Recreational vehicles, P_R *0%*

Access points *mi* *23*/mi

Analysis direction vol., V_d *115*veh/h

Opposing direction vol., V_o *115*veh/h

Shoulder width ft *2.0*

Lane Width ft *12.0*

Segment Length mi *2.1*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*1.8*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.984*	*0.984*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*1.00*	*1.00*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*133*	*133*

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*48.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*2.6 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*5.8 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*0.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*39.7 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*37.2 mi/h*
		Percent free flow speed, PFFS	*93.8 %*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.1*	*1.1*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.998*	*0.998*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*1.00*	*1.00*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*131*	*131*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*14.9*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*33.6*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*31.7*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*A*

Volume to capacity ratio, *v/c*	*0.08*
Capacity, $C_{d,ATS}$ (Equation 15-12) veh/h	*1673*
Capacity, $C_{d,PTSF}$ (Equation 15-13) veh/h	*1697*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*93.8*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*130.7*
Effective width, Wv (Eq. 15-29) ft	*19.95*
Effective speed factor, S_t (Eq. 15-30)	*4.79*
Bicycle level of service score, BLOS (Eq. 15-31)	*2.72*
Bicycle level of service (Exhibit 15-4)	*C*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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APPENDIX

PART 6

WYDOT Crash Reports

CRASH HISTORY FOR US 287/ML15B IN FREMONT COUNTY
FROM RM 1.50 NORTH TO RM 4.00
FOR THE YEARS 2011 THROUGH APPROXIMATELY SEPTEMBER 2016

DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
2011														
01/02/2011	1239	00009	US 287	1.61	0	0				Straight Ahead	Deer	Daylight	Sand of Ic	No Improper Driving
06/10/2011	2025	07916	US 287	2.10	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
10/06/2011	615	13617	US 287	2.10	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
07/28/2011	1651	10256	US 287	2.36	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Southeast	Straight Ahead	Other Non-Collision (MC Loss of Control)	Daylight	Dry	No Improper Driving
08/13/2011	1620	10746	US 287	2.41	0	0	Non-Junction	Sideswipe Same Direction (Passing)	North	Make U-Turn	Motor Vehicle in Transport on Roadway	Daylight	Dry	Improper Turn or No Signal
									Southeast	Straight Ahead				No Improper Driving
12/23/2011	440	18950	US 287	2.50	0	0	Driveway Related	Not a Collision w/2 Vehicles in Transport	Southeast	Negotiating a Curve	Fence (including Post)	Darkness Unlighted	Ice/Frost	Ran Off Road
													Snow	Drove too Fast for Conditions
12/24/2011	1742	18453	US 287	2.80	0	0				Straight Ahead	Cow	Darkness Unlighted	Dry	No Improper Driving
12/04/2011	1745	16883	US 287	2.88	0	0				Straight Ahead	Deer	Darkness Unlighted	Ice/Frost	No Improper Driving
04/26/2011	1555	05871	US 287	3.50	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	North	Straight Ahead	Fence (including Post)	Daylight	Slush	Ran Off Road
													Wet	Drove too Fast for Conditions
10/04/2011	2015	13616	US 287	3.50	0	0				Straight Ahead	Other Domestic (Dog, Llama...)	Darkness Unlighted	Dry	No Improper Driving
12/24/2011	1940	18359	US 287	3.50	2	0	Non-Junction	Angle (Front to Side), Opposing Direction	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Darkness Unlighted	Dry	Wrong Side/Wrong Way
									South	Straight Ahead				Avoiding MV
07/25/2011	1145	10744	US 287	3.83	2	0	Non-Junction	Rear End (Front to Rear)	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	Disregarded Traffic Signs
									North	Stopped in Traffic				Drove too Fast for Conditions
														No Improper Driving
03/29/2011	1710	04970	US 287	4.00	0	0	Non-Junction	Other	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	No Improper Driving
									North	Straight Ahead				Other Improper Action
04/05/2011	353	05032	US 287	4.00	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	North	Straight Ahead	Other Domestic (Dog, Llama...)	Darkness Unlighted	Dry	No Improper Driving
2012														
04/10/2012	2105	04923	US 287	2.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
06/22/2012	1544	07583	US 287	2.18	1	0	Non-Junction	Rear End (Front to Rear)	South	Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	Following too Close
									South	Slowing				No Improper Driving
11/07/2012	650	17191	US 287	2.36	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
11/28/2012	1930	15523	US 287	2.60	0	0				Straight Ahead	Cow	Darkness Unlighted	Dry	No Improper Driving

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DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
10/19/2012	1128	13587	US 287	2.80	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Southeast	Slowing	Overturn/Rollover	Daylight	Dry	Other Improper Action
03/07/2012	810	03171	US 287	2.82	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Northwest	Straight Ahead	Fence (including Post)	Daylight	Ice/Frost Snow	Drove too Fast for Conditions Ran Off Road
02/03/2012	923	01455	US 287	2.88	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Northwest	Straight Ahead	Snow Embankment	Daylight	Sand of Ic Wet	Ran Off Road Drove too Fast for Conditions Failed to Keep Proper Lane
11/04/2012	1730	14430	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
02/10/2012	2245	02362	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
10/30/2012	2250	14000	US 287	3.00	2	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Straight Ahead	Deer	Darkness Unlighted	Dry	Avoiding Animal Ran Off Road
12/30/2012	735	17213	US 287	3.00	0	0				Straight Ahead	Deer	Dusk	Dry	No Improper Driving
08/31/2012	2029	11081	US 287	3.20	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
09/29/2012	1948	13102	US 287	3.20	0	0				Straight Ahead	Deer	Dusk	Dry	No Improper Driving
03/19/2012	1930	04182	US 287	3.50	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
03/04/2012	1850	03227	US 287	3.70	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
04/27/2012	1910	06149	US 287	4.00	2	0	Non-Junction	Rear End (Front to Rear)	Southeast Southeast	Straight Ahead Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	No Improper Driving Disregarded Traffic Signs Speeding Erratic/Reckless/Careless/Ag
2013														
04/19/2013	1600	05108	US 287	2.00	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	North	Overtaking/Passing	Fence (including Post)	Daylight	Dry	Speeding Improper Passing Erratic/Reckless/Careless/Ag Ran Off Road
04/07/2013	15	05064	US 287	2.45	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Straight Ahead	End of Drainage Pipe/Structure/Culvert	Darkness Unlighted	Dry	Ran Off Road
03/21/2013	705	03805	US 287	2.60	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
12/29/2013	535	17949	US 287	2.90	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Northwest	Straight Ahead	Overturn/Rollover	Darkness Unlighted	Snow	Drove too Fast for Conditions Ran Off Road
07/19/2013	1510	09456	US 287	3.00	0	0	Non-Junction	Rear End (Front to Rear)	South South	Straight Ahead Stopped in Traffic	Motor Vehicle in Transport on Roadway	Daylight	Dry	Following too Close No Improper Driving
01/11/2013	650	01124	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Snow	No Improper Driving
09/20/2013	410	12253	US 287	3.10	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving

DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
03/15/2013	2035	05660	US 287	3.10	0	0		Not a Collision w/2 Vehicles in Transport		Straight Ahead	Deer	Darkness Unlighted	Dry	
01/13/2013	1810	01130	US 287	3.60	2	0	Non-Junction	Sideswipe Opposite Direction (Meeting)	South	Straight Ahead	Motor Vehicle in Transport on Roadway	Darkness Unlighted	Snow	Wrong Side/Wrong Way
									North	Straight Ahead				No Improper Driving
03/28/2013	2130	04431	US 287	4.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	Unknown
2014														
05/27/2014	2150	06832	US 287	1.50	0	0				Straight Ahead	Deer	Darkness Lighted	Dry	No Improper Driving
11/10/2014	1020	14805	US 287	1.63	0	0	Intersection	Angle Right (Front to Side, includes Broadside	West	Turning Left	Motor Vehicle in Transport on Roadway	Daylight	Snow	Failed to Yield ROW
			TWEED LN						North	Straight Ahead				No Improper Driving
10/08/2014	2100	13343	US 287	2.10	0	0	Non-Junction	Other	North	Negotiating a Curve	Deer	Darkness Unlighted	Dry	No Improper Driving
									South	Negotiating a Curve				No Improper Driving
12/03/2014	1755	16568	US 287	2.50	0	0				Negotiating a Curve	Deer	Darkness Unlighted	Dry	No Improper Driving
03/14/2014	920	03802	US 287	3.00	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Southeast	Turning Right	Traffic Sign Support	Daylight	Snow	Drove too Fast for Conditions
													Ice/Frost	
06/02/2014	1715	07783	US 287	3.00	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Northwest	Straight Ahead	Deer	Daylight	Dry	No Improper Driving
									Southeast	Straight Ahead				No Improper Driving
11/16/2014	1740	15659	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
12/20/2014	2035	17791	US 287	3.00	2	0	Non-Junction	Sideswipe Same Direction (Passing)	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Darkness Unlighted	Dry	Speeding
									North	Straight Ahead				Improper Passing
														Erratic/Reckless/Careless/Ag
														Failed to Keep Proper Lane
														No Improper Driving
09/03/2014	735	11536	US 287	3.20	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
12/29/2014	645	17778	US 287	3.25	1	0	Non-Junction	Rear End (Front to Rear)	South	Straight Ahead	Parked Motor Vehicle	Darkness Unlighted	Ice/Frost	Following too Close
									South	Parked			Snow	Drove too Fast for Conditions
05/12/2014	1520	06726	US 287	3.30	1	0	Driveway Related	Rear End (Front to Rear)	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	Following too Close
									North	Stopped in Traffic				Other Improper Action
														No Improper Driving
11/29/2014	1240	16053	US 287	3.50	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
12/19/2014	115	17772	US 287	3.50	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
12/31/2014	2230	18168	US 287	3.50	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
2015														
08/13/2015	1533	09956	US 287	1.50	0	0	Non-Junction	Rear End (Front to Rear)	North	Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Dry	Following too Close
									North	Straight Ahead				Erratic/Reckless/Careless/Ag
														Other Improper Action

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DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
08/23/2015	2050	10567	US 287	2.35	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
10/14/2015	830	12536	US 287	3.00	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
07/07/2015	2130	08276	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
11/24/2015	1815	14659	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
09/12/2015	2130	11305	US 287	3.50	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
05/21/2015	2130	05915	US 287	4.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Wet	No Improper Driving
01/09/2015	2200	00610	US 287	4.00	0	0				Straight Ahead	Deer	Darkness Lighted	Dry	No Improper Driving
2016														
08/18/2016	2340	09919	US 287	2.35	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
03/05/2016	1450	02812	US 287	2.50	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
04/23/2016	940	04660	US 287	2.50	0	0				Straight Ahead	Deer	Daylight	Dry	No Improper Driving
06/21/2016	500	08399	US 287	3.00	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving

DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION

TOTAL CRASHES IN THIS REPORT 66

PDO CRASHES 53
INJURY CRASHES 13
FATAL CRASHES 0

TOTAL PERSONS INJURED 19
TOTAL PERSONS KILLED 0

	NUMBER PERSONS INJURED	NUMBER PERSONS KILLED	PDO* CRASHES	INJURY CRASHES	FATAL CRASHES	TOTAL CRASHES
2011	6	0	10	4	0	14
2012	5	0	13	3	0	16
2013	4	0	7	3	0	10
2014	4	0	11	3	0	14
2015	0	0	8	0	0	8
2016	0	0	4	0	0	4
TOTAL	**19**	**0**	**53**	**13**	**0**	**66**

***PDO = Property Damage Only Crashes; No Injuries, No Fatalities**

CREATED BY: Ann Smith; WYDOT Highway Safety; (307) 777-4258; Ann.Smith@wyo.gov

CRASH HISTORY FOR CR 43/N 2ND ST/ML5709B IN FREMONT COUNTY
FROM RM 2.69 NORTH TO RM 4.94
FOR THE YEARS 2011 THROUGH APPROXIMATELY SEPTEMBER 2016

DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
2011														
03/13/2011	19	04225	CR 43	3.26	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Northeast	Negotiating a Curve	Concrete Traffic Barrier/Jersey Barrier	Darkness Unlighted	Dry	Drove too Fast for Conditions Other Improper Action
10/04/2011	628	13390	CR 43	4.00	0	0				Straight Ahead	Cow	Darkness Unlighted	Dry	No Improper Driving
2012														
11/24/2012	1217	16875	CR 43	3.50	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Straight Ahead	Ditch	Daylight	Dry	Ran Off Road
2013														
01/09/2013	2100	01123	N SECOND ST	2.70	0	0				Straight Ahead	Deer	Darkness Unlighted	Dry	No Improper Driving
02/02/2013	1139	03486	CR 43	3.50	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	Southeast	Straight Ahead	Concrete Traffic Barrier/Jersey Barrier	Daylight	Dry	Erratic/Reckless/Careless/Ag Evading Law Enforcement
03/15/2013	2245	04295	CR 43	3.50	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Backing	Fence (including Post)	Darkness Unlighted	Dry	No Improper Driving
2014														
02/25/2014	2143	03803	CR 43	3.06	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Negotiating a Curve	Ditch	Darkness Unlighted	Ice/Frost	No Improper Driving
11/27/2014	140	17355	CR 43	3.10	0	0	Driveway Related	Not a Collision w/2 Vehicles in Transport	North	Negotiating a Curve	Fence (including Post)	Darkness Unlighted	Dry	Avoiding Animal
06/22/2014	2007	08707	CR 43	4.00	2	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	South	Straight Ahead	Pedacycle	Dusk	Dry	No Improper Driving
2015														
06/26/2015	1502	07525	N SECOND ST	2.70	1	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	West	Negotiating a Curve	Delineator Post	Daylight	Dry	Drove too Fast for Conditions Erratic/Reckless/Careless/Ag Ran Off Road
09/13/2015	100	17299	CR 43	4.10	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	North	Negotiating a Curve	Overturn/Rollover	Darkness Unlighted	Dry	Speeding Erratic/Reckless/Careless/Ag Over Corrected/Over Steered
2016														
05/07/2016	1348	05420	CR 43	3.06	0	0	Non-Junction	Sideswipe Opposite Direction (Meeting)	North South	Straight Ahead Straight Ahead	Motor Vehicle in Transport on Roadway	Daylight	Wet	Drove too Fast for Conditions No Improper Driving
09/13/2016	555	10909	CR 43	3.20	0	0				Straight Ahead	Deer	Darkness Unlighted	Wet	No Improper Driving

CREATED BY: Ann Smith; WYDOT Highway Safety; (307) 777-4258; Ann.Smith@wyo.gov

DATE	TIME	REPORT NUMBER	CRASH LOCATION	MILEPOST	NUM INJ	NUM KIL	JUNCTION RELATION	MANNER_OF COLLISION	DIRECTION	ACTIVITY PRIOR	FIRST HARMFUL EVENT	LIGHT COND	ROAD COND	DRIVER ACTION
07/30/2016	250	09032	CR 43	3.50	0	0	Non-Junction	Not a Collision w/2 Vehicles in Transport	North	Make U-Turn	Ditch	Darkness Unlighted	Dry	Unknown

TOTAL CRASHES IN THIS REPORT 14

PDO CRASHES 8
INJURY CRASHES 6
FATAL CRASHES 0

TOTAL PERSONS INJURED 7
TOTAL PERSONS KILLED 0

	NUMBER PERSONS INJURED	NUMBER PERSONS KILLED	PDO* CRASHES	INJURY CRASHES	FATAL CRASHES	TOTAL CRASHES
2011	1	0	1	1	0	2
2012	1	0	0	1	0	1
2013	1	0	2	1	0	3
2014	3	0	1	2	0	3
2015	1	0	1	1	0	2
2016	0	0	3	0	0	3
TOTAL	**7**	**0**	**8**	**6**	**0**	**14**

***PDO = Property Damage Only Crashes; No Injuries, No Fatalities**

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