



Wyoming Highways 22 and 390 Planning and Environmental Linkages Study



WYOMING HIGHWAYS 22 AND 390 PLANNING AND ENVIRONMENTAL LINKAGES STUDY

January 2014



Prepared by

JACOBS

ACRONYMS AND ABBREVIATIONS

BLM	Bureau of Land Management
BMP	Best Management Practice
CWA	Clean Water Act
DEQ	Department of Environmental Quality
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographic Information System
LOS	Level-of-service
MAP-21	Moving Ahead for Progress in the 21st Century
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSS	Native Species Status
PEL	Planning and Environmental Linkages
PEMC	Palustrine Emergent Seasonally Flooded
PUD	Planned Urban Development
PWG	Project Working Group
ROW	right-of-way
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SGCN	Species of Greatest Conservation Needs
SHPO	State Historic Preservation Office
SI	Safety Index
START	Southern Teton Area Rapid Transit
STIP	Statewide Transportation Improvement Program
SWMP	Stormwater Management Plan
TAC	Transportation Advisory Committee
TCM	Transportation Control Measure
TWLT	Two-way left turn
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
vpd	vehicles per day

WGFD	Wyoming Game and Fish Department
WISDOM	Wyoming Interagency Spatial Database and Online Management System
WYDOT	Wyoming Department of Transportation
WYO 22	Wyoming State Highway 22
WYO 390	Wyoming State Highway 390

TABLE OF CONTENTS

1	Introduction.....	1
1.1	Study Location and Description	1
1.2	Logical Termini.....	1
1.3	Existing WYO 22 and WYO 390 Corridors	2
1.4	Corridor Vision.....	7
1.5	Purpose and Need.....	7
1.5.1	Purpose.....	7
1.5.2	Need #1 Mobility	7
1.5.3	Need #2 Bicycle and Pedestrian Connectivity	9
1.5.4	Need #3 Transit.....	9
1.5.5	Need #4 Safety and Wildlife-Vehicle Collisions	10
1.6	Study Goals	11
1.7	Planning Context.....	11
2	Alternatives	13
2.1	Decision-making Process	13
2.2	Screening Criteria	16
2.3	Range of Alternatives.....	17
2.3.1	No Action Alternative.....	20
2.3.2	Alternatives Not Considered.....	20
2.3.3	Alternatives Considered	20
2.4	Level 1 Screening.....	23
2.4.1	Cross-Section Alternatives.....	23
2.4.2	Intersection Alternatives	24
2.4.3	Wildlife-Vehicle Safety Alternatives	25
2.4.4	Multimodal Alternatives.....	26
2.5	Level 2 Screening.....	27
2.5.1	Cross-Sections	27
2.5.2	Major Intersections.....	30
2.5.3	Minor Intersections	33
2.5.4	Wildlife Safety Alternatives	37
2.5.5	Multimodal Improvements.....	39
2.6	Corridor Recommendations	40
3	Existing Conditions and Environmental Consequences	45
3.1	Resources Not Evaluated.....	45
3.2	Land Use.....	47
3.2.1	Segment 1.....	51
3.2.2	Segment 2.....	51
3.2.3	Segment 3.....	52
3.2.4	Segment 4.....	53
3.2.5	Segment 5.....	53
3.2.6	Segment 6.....	54
3.2.7	Mitigation	55
3.2.8	Future NEPA Considerations.....	55
3.3	Right-of-Way.....	55
3.3.1	Segment 1.....	55

3.3.2	Segment 2.....	56
3.3.3	Segment 3.....	57
3.3.4	Segment 4.....	58
3.3.5	Segment 5.....	58
3.3.6	Segment 6.....	58
3.3.7	Mitigation	58
3.3.8	Future NEPA Considerations.....	59
3.4	Parks and Recreation	59
3.4.1	Segment 1.....	60
3.4.2	Segments 2 through 4.....	61
3.4.3	Segments 5 and 6	61
3.4.4	Mitigation	61
3.4.5	Future NEPA Considerations.....	62
3.5	Transportation and Traffic	62
3.5.1	Existing and Future Traffic	62
3.5.2	Level of Service.....	62
3.5.3	Segment 1.....	64
3.5.4	Segment 2.....	65
3.5.5	Segment 3.....	66
3.5.6	Segment 4.....	67
3.5.7	Segment 5.....	68
3.5.8	Segment 6.....	70
3.5.9	Major Intersections.....	71
3.5.10	Mitigation	74
3.5.11	Future NEPA Considerations.....	74
3.6	Visual and Aesthetics	74
3.6.1	Segment 1.....	75
3.6.2	Segments 2 and 3	76
3.6.3	Segment 4.....	77
3.6.4	Segments 5 and 6	77
3.6.5	Mitigation	78
3.6.6	Future NEPA Considerations.....	78
3.7	Historic and Archeological Resources	79
3.7.1	Segments 1 and 2	80
3.7.2	Segments 3 and 4	81
3.7.3	Segments 5 and 6	82
3.7.4	Mitigation	82
3.7.5	Future NEPA Considerations.....	82
3.8	Water Resources and Floodplains	83
3.8.1	Segment 1.....	85
3.8.2	Segments 2 and 3	85
3.8.3	Segment 5 and 6.....	86
3.8.4	Mitigation	86
3.8.5	Future NEPA Considerations.....	87
3.9	Wetlands and Other waters of the U.S.	87
3.9.1	Segment 1.....	88
3.9.2	Segments 2 through 4.....	88

3.9.3	Segments 5 and 6	90
3.9.4	Mitigation	90
3.9.5	Future NEPA Considerations.....	90
3.10	Wildlife.....	90
3.10.1	Segment 1.....	95
3.10.2	Segment 2.....	97
3.10.3	Segment 3.....	98
3.10.4	Segment 4.....	98
3.10.5	Segment 5.....	99
3.10.6	Segment 6.....	100
3.10.7	Mitigation	100
3.10.8	Future NEPA Considerations.....	101
3.11	Special Status Species.....	102
3.11.1	Segment 1.....	104
3.11.2	Segment 2.....	105
3.11.3	Segment 3.....	106
3.11.4	Segment 4.....	106
3.11.5	Segment 5.....	106
3.11.6	Segment 6.....	107
3.11.7	Mitigation	107
3.11.8	Future NEPA Considerations.....	108
3.12	Cumulative Impacts	108
4	Agency Coordination and Public Involvement.....	111
4.1	Public Involvement.....	111
4.1.1	Mailing List Development	111
4.1.2	Public Open House Meetings	111
4.1.3	Website	112
4.1.4	Study Contacts.....	113
4.1.5	Public Information and Press Releases.....	113
4.1.6	Letters and Comments	113
4.1.7	Public Input Obtained.....	113
4.2	Stakeholders	114
4.2.1	Visioning Workshop.....	114
4.2.2	Pathways Field Trip.....	114
4.2.3	Wildlife Field Trip.....	114
4.3	Agency Outreach.....	115
4.3.1	Coordination with State and Federal Agencies	115
4.3.2	Coordination with Local Agencies	117
5	Next Steps.....	119
6	References.....	125
7	Appendices	131
	Appendix A: Public Involvement	
	Appendix B: Agency and Local Government Coordination	
	Appendix C: FHWA Acceptance Letter and Questionnaire	
	Appendix D: Alternatives Screening	

(Note: Appendices A, B, D are included on the computer disc attached to the back cover of this document.)

TABLE OF FIGURES

Figure 1: Regional Vicinity Map	4
Figure 2: Study Area	5
Figure 3: Existing Conditions	6
Figure 4: Alternatives Development and Screening Process.....	15
Figure 5: Segments and Travel Demand	19
Figure 6: Recommended Cross-Section Alternatives	29
Figure 7: Level of Service Screening at WYO 22 and Broadway.....	31
Figure 8: Level of Service Screening at WYO 22 and WYO 390.....	32
Figure 9: Level of Service Screening at WYO 22 and Spring Gulch.....	33
Figure 10: Minor Intersections by Segment.....	35
Figure 11: Potential Wildlife Crossings.....	38
Figure 12: Bicycle and Pedestrian Alternatives.....	39
Figure 13: Summary of Corridor Recommendations	43
Figure 14: Conservation Easements.....	49
Figure 15: General Zoning	50
Figure 16: Parks and Recreation Facilities.....	60
Figure 17: Roadway Segment Level of Service Definitions.....	63
Figure 18: Intersection Level of Service Definitions.....	63
Figure 19: Segment 1 Historic and Future Traffic	64
Figure 20: Segment 2 Historic and Future Traffic	65
Figure 21: Segment 3 Historic and Future Traffic	66
Figure 22: Segment 4 Historic and Future Traffic	67
Figure 23: Segment 5 Historic and Future Traffic	69
Figure 24: Segment 6 Historic and Future Traffic	70
Figure 25: Water Resources and Floodplains	84
Figure 26: Wetlands within the Study Area.....	89
Figure 27: Crucial and Enhancement Priority Areas	92
Figure 28: Wildlife Migration Corridor and Crucial Range Map	93
Figure 29: Wildlife Vehicle Collision Mitigation Location Map	94

TABLE OF TABLES

Table 1: Traffic Volumes and Conditions.....	8
Table 2: Areas of Bicycle and Pedestrian Needs	9
Table 3: Corridor Safety Ratings.....	10
Table 4: Major Roles and Responsibilities	13
Table 5: Segments	18
Table 6. Alternatives and Design Options Considered.....	20
Table 7: Level 1 Major Intersection Screening.....	25
Table 8: Distinguishing Criteria for Through Lanes.....	27
Table 9: Distinguishing Criteria for Median Types.....	28
Table 10: Characteristics of Minor Intersection Control Alternatives.....	34
Table 11: Characteristics of Access Control Strategies	37
Table 12: Summary of Recommended Alternatives	41
Table 13: WYO 22 and Broadway Level of Service Impacts	72
Table 14: WYO 22 and WYO 390 Level of Service Impacts	73



Table 15: WYO 22 and Spring Gulch Level of Service Impacts74
Table 16: Identified Cultural Resources79
Table 17: Special Status Species Potentially in Study Area 103
Table 18: Raptor Species in Study Area..... 103
Table 19: Project Prioritization..... 120
Table 20: Prioritization Summary..... 124

(This Page Intentionally Left Blank)



1 Introduction

1.1 STUDY LOCATION AND DESCRIPTION

The Wyoming State Highway 22 (WYO 22) and Wyoming State Highway 390 (WYO 390) roadway corridors connect the Town of Jackson with the Jackson Hole Ski Resort at Teton Village and with the community of Wilson in

southern Teton County, Wyoming. The regional vicinity of the corridors is shown in Figure 1 and the study area is displayed in Figure 2.

Recognizing the vital role the two corridors play in the community, the Wyoming Department of Transportation (WYDOT) initiated a Planning and Environmental Linkages (PEL) study in summer 2012. WYDOT undertook the study along with the Federal Highway Administration (FHWA) in cooperation with Teton County and the Town of Jackson.

As noted by the FHWA, a PEL study represents an approach to transportation decision-making that considers environmental, community, and economic goals early in the planning process and uses the resulting information, analysis, and products to inform the environmental review process (FHWA 2013). This PEL study would precede, and serve as the basis for, any future environmental documents prepared in compliance with the National Environmental Policy Act (NEPA), assuming certain conditions are met. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005, emphasized the need to include environmental considerations in the planning process and to better link planning with NEPA.

The primary purpose of the WYO 22 and WYO 390 PEL study was to develop a vision for the corridors. The vision for the corridors, along with transportation needs identified as part of the study, helped guide the identification and implementation of future improvement projects. The study also sought to identify priority improvements that are compatible with the long-term vision for the corridors.

1.2 LOGICAL TERMINI

Logical termini represent rational starting and stopping points for evaluating transportation improvements. In determining limits of the study, the study team also

considered end points that would provide sufficient length to address corridor issues on a broad scope.

The study limits for the WYO 22 corridor extend from its junction with West Broadway (US 26/89/189/191) in the Town of Jackson at milepost 0.0 to the Teton National Forest boundary at milepost 7.0 beyond the Old Pass Road intersection (west of Wilson). For technical analysis of traffic conditions of the intersection, the study limits extend on West Broadway between Scott Lane and South Park Loop Road. This eastern terminus is located at a major highway junction in the Town of Jackson with different traffic characteristics than the rural WYO-22 corridor. The jurisdictional forest boundary serves as the western terminus because traffic conditions change at this location. Traffic decreases and is composed primarily of interstate traffic over Teton Pass to Idaho.

The study limits for the WYO 390 corridor extend from its junction with WYO 22 at milepost 0.0 to the Grand Teton National Park boundary at milepost 7.7. The jurisdictional national park boundary (north of the entrance to the Jackson Hole Ski Resort at Teton Village) serves as the northern terminus because traffic decreases in volume and is composed entirely of recreational park traffic. Furthermore, the National Park Service and the FHWA have responsibility for the road within the park instead of WYDOT.

1.3 EXISTING WYO 22 AND WYO 390 CORRIDORS

The WYO 22 and 390 corridors traverse an area of natural beauty with open vistas across the Snake River Valley of the Grand Teton Mountain Range. The area is home to an array of wildlife, including abundant free-roaming moose, elk, deer, and bear. Despite the development that has occurred, the study area has a rural character with many conservation easements to preserve the habitat and scenery.

The WYO 22 and 390 highways are two-lane roads with generally substandard shoulders. Left, right, or center turn lanes are present at some locations. The roads require plowing during the heavy snowfall of the winter months. Traffic signals are provided at the WYO 22 intersections with WYO 390, Spring Gulch, and Broadway. WYO 22 crosses the Snake River on a narrow two-lane, 884-foot bridge that functions, but requires more monitoring and maintenance than a modern design. A multi-use path parallels WYO 390, but is largely discontinuous along WYO 22. Figure 3 displays details of the existing conditions of the WYO 22 and 390 corridors, including traffic levels, safety conditions, wildlife crossing areas, and shoulder and bridge conditions.

The corridors serve a variety of travel markets via automobile, bus, truck, and bicycle, including:

- Recreational travelers and commuters between Jackson and the Jackson Hole Ski Resort at Teton Village;
- Interstate and commuter traffic from Idaho across Teton Pass;

- Commuter and personal trips by area residents;
- Commercial trips to and from area businesses; and
- Tourists and recreational visitors to Grand Teton National Park.

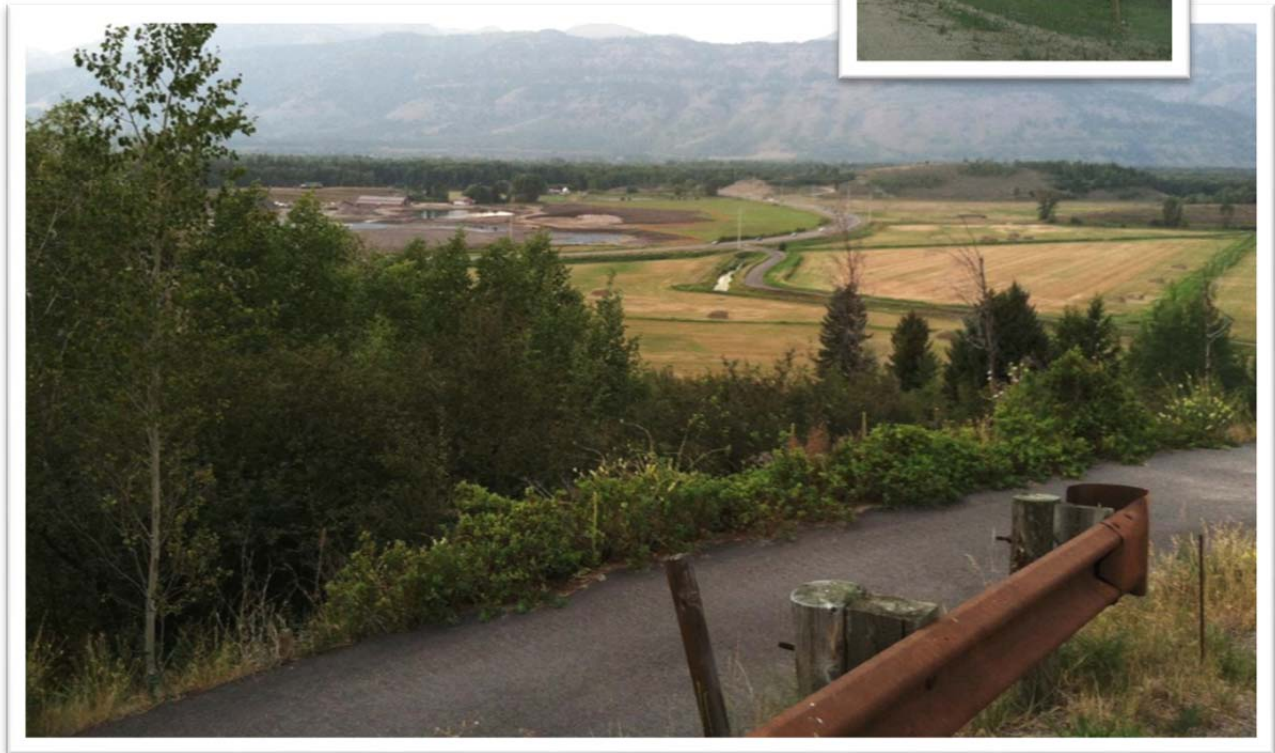


Figure 1: Regional Vicinity Map

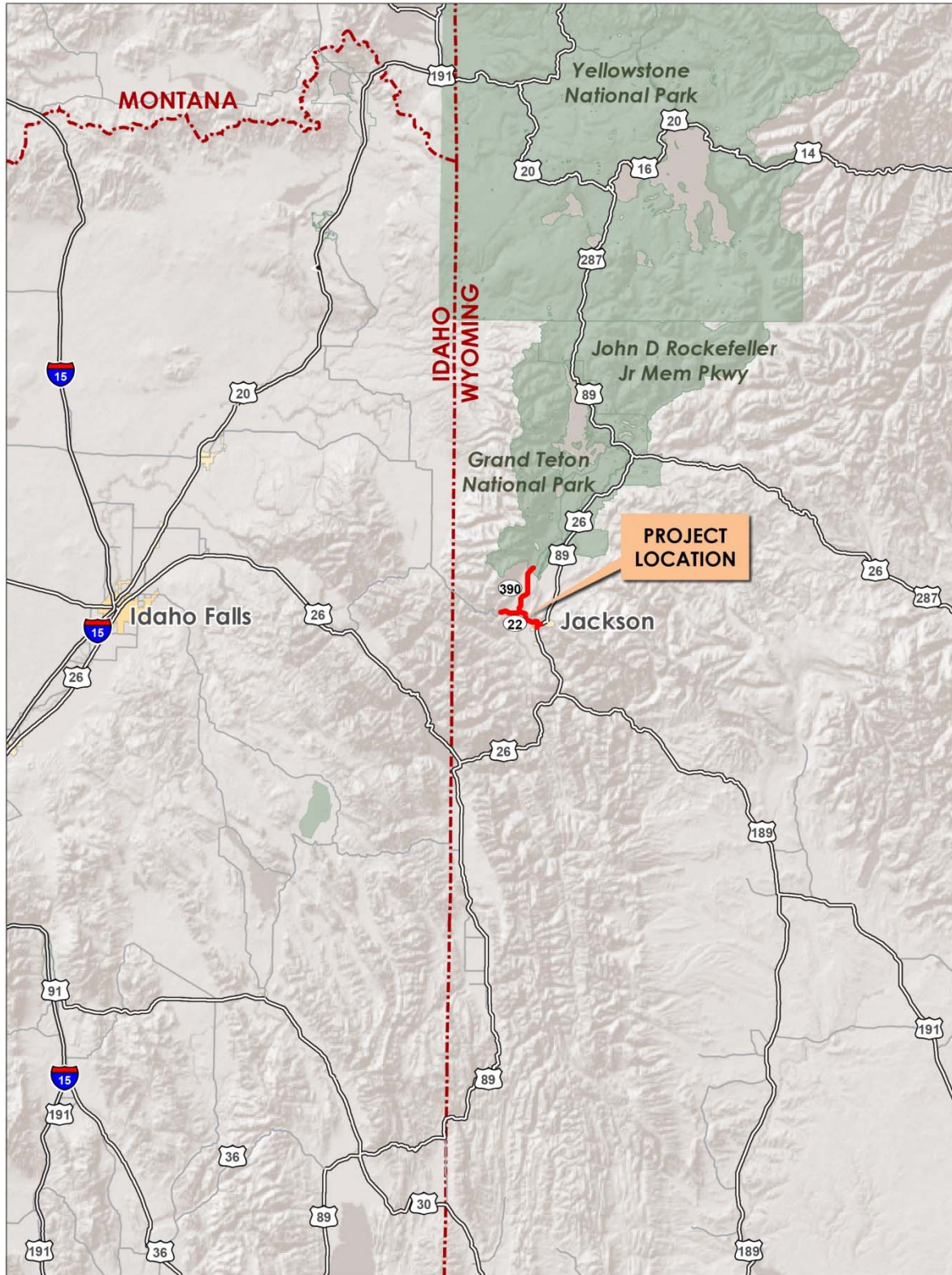


Figure 2: Study Area

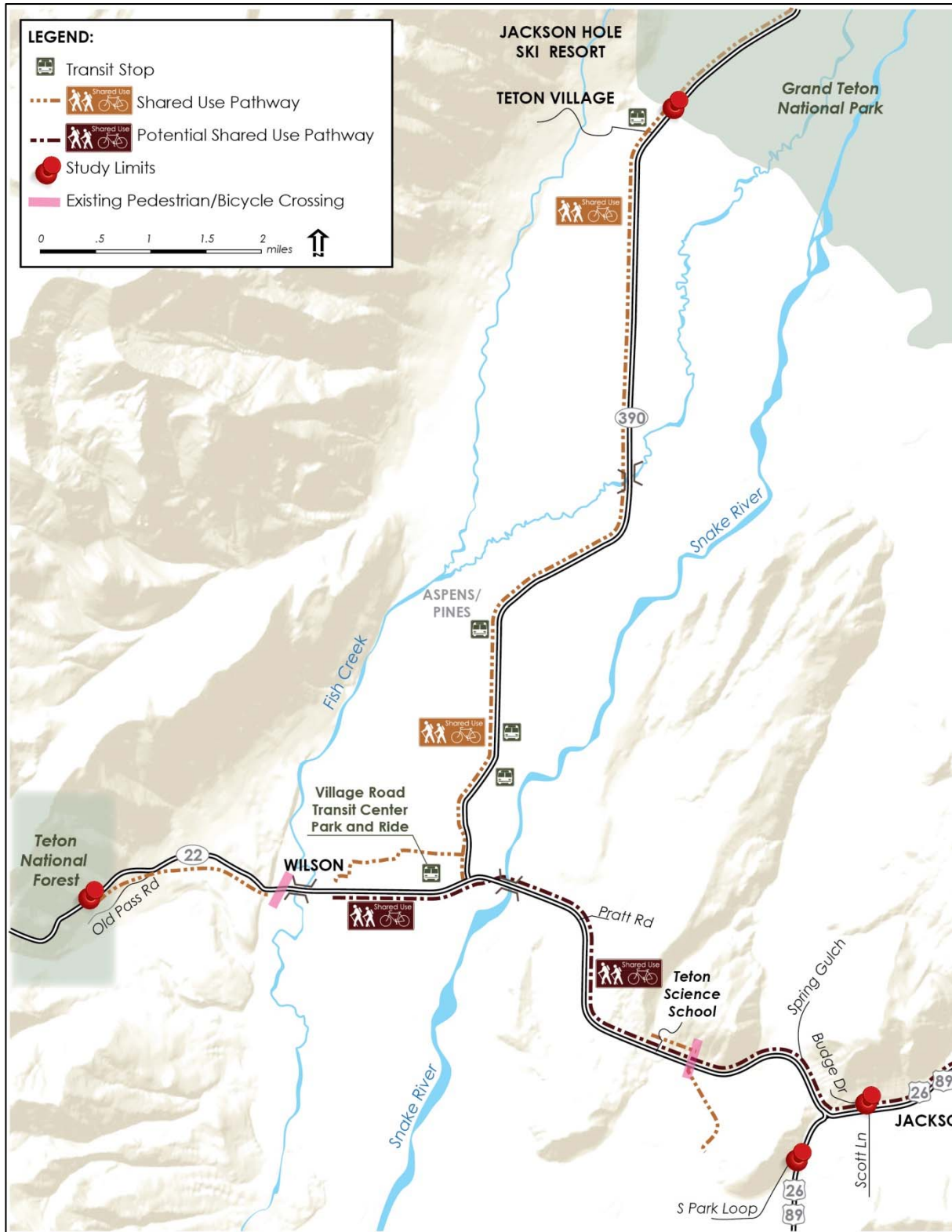
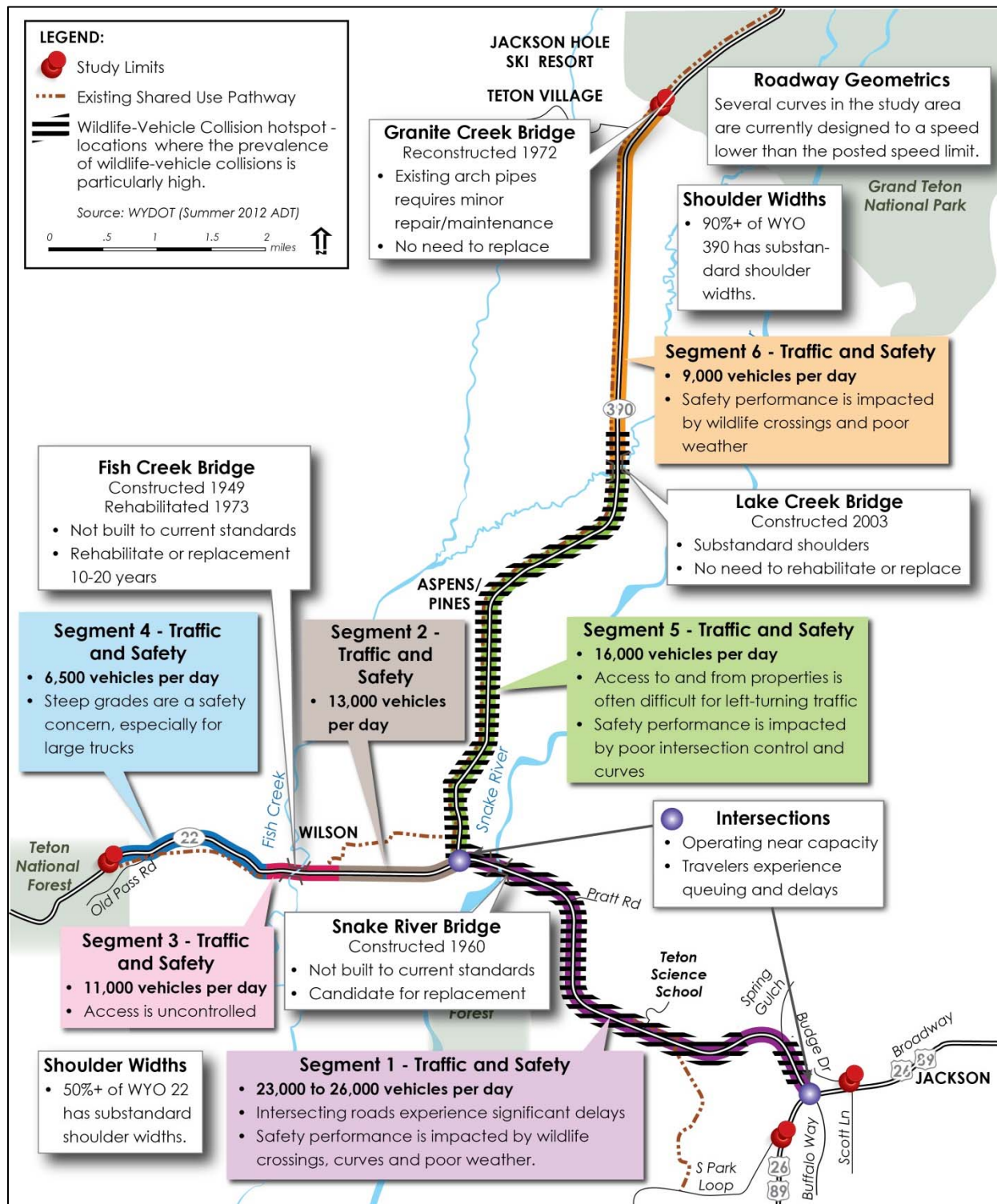


Figure 3: Existing Conditions



1.4 CORRIDOR VISION

The vision statement for the corridors was developed in concert with local stakeholders and the public. The process for engaging the stakeholders and the public is described in Chapter 4 Agency Coordination and Public Involvement. The vision statement helps direct alternative development by providing guidelines for decision making based on the desired outcome.

Vision

WYO 22 and WYO 390 travel through iconic valleys of scenic beauty, connecting the town of Jackson, Wilson (and on to Idaho), and Teton Village (and on to Grand Teton National Park). The corridors serve both the local and regional economies, providing access for residents, recreationalists, and tourists alike. The corridors' stakeholders envision future transportation improvements that provide a balance of economic needs with efficient multi-modal travel, traveler/wildlife safety, and the experience of viewing scenery and wildlife.

1.5 PURPOSE AND NEED

The Purpose and Need statement describes the transportation needs that exist and the problems to be addressed. It serves as the basis for the identification of reasonable alternatives.

1.5.1 Purpose

As mentioned above, the purpose of the study is to establish a long-term transportation vision along the WYO 22 and 390 corridors between the Town of Jackson, Wilson, and Teton Village, and to identify and prioritize potential transportation improvements that address the identified needs, described below.



1.5.2 Need #1 Mobility

The WYO 22 and 390 corridors serve as vital links between the Town of Jackson and Wilson, and between recreational and employment centers in Teton Village and Grand Teton National Park. Congestion along these corridors, particularly during peak periods in the summer and winter seasons, impairs mobility and access for all users, and is projected to worsen as traffic increases. Several intersections in the study area are congested and have safety issues.

Table 1 tabulates the current day traffic volumes and level-of-service (LOS) conditions¹ at key segments along the corridors (segments are further described under Section 2.3).

Table 1: Traffic Volumes and Conditions

Segment Number	Highway	Representative Segment	2012 Daily Traffic Volume (Summer/Average Annual)	Current Traffic Level-of-Service ¹ Conditions (Summer/Average Annual)
1	WYO 22	Broadway to WYO 390	23,000/19,000	F/E
2	WYO 22	WYO 390 to Wilson	13,000/9,500	E/D
3	WYO 22	Within Wilson	11,000/6,500	E/D
4	WYO 22	Wilson to Teton National Forest	6,500/5,000	D/D
5	WYO 390	WYO 22 to Lake Creek	16,000/10,500	E/D
6	WYO 390	Lake Creek to Grand Teton National Park	9,000/7,000	D/C

The traffic conditions shown above result in long platoons of vehicles in steady traffic streams on the two-lane highways. This condition makes access to and from the highways difficult and results in queuing and delay. In particular, it is difficult for left-turning vehicles on and off the highway to make a safe movement. Also, motorists encounter delays at the major intersections of Broadway and WYO 22, WYO 22 and Spring Gulch, and WYO 22 and 390. Each of these major intersections has a 2012 LOS rating of “D.”

Traffic growth has averaged approximately 2% per year for the last 20 years. Projections of socio-economic activity indicate that growth trends will continue and exacerbate traffic congestion in the corridors (see Chapter 3 for further discussion of traffic growth projections). Mobility conditions will worsen in the future compared to current conditions.

Mobility is also impaired during times of traffic disruptions. Traffic disruptions occur due to accidents and incidents, as well as during roadway maintenance and repair. The current two-lane highways prohibit ease of traffic flow when one lane is closed. Over 50% of WYO 22 in the study area has substandard shoulders, and over 90% of WYO 390 has substandard shoulders. The substandard shoulders do not allow temporary use of a shoulder for traffic when a lane is closed. There is a mobility need for system redundancy in the corridors in times of traffic disruption.

¹ Level of Service is a measure of traffic congestion ranging from A through F for given roadway characteristics as defined by the Highway Capacity Manual, Transportation Research Board. More details are contained in Chapter 3.

1.5.3 Need #2 Bicycle and Pedestrian Connectivity



The community values bicycle and pedestrian mobility from both recreational and transportation standpoints. Bicycle and pedestrian facilities within the study area are discontinuous and safe crossing opportunities of the roadways limited. The

WYO 22 and Broadway and WYO 22 and 390 intersections also present barriers to pedestrian and bicycle movement. Figure 2 shows the existing and potential bicycle and pedestrian facilities. Table 2 specifies areas of bicycle and pedestrian needs. In general, these needs are consistent with those identified by the 2007 *Pathways Master Plan* (Town of Jackson and Teton County 2007).

Table 2: Areas of Bicycle and Pedestrian Needs

Location	Bicycle and Pedestrian Need
WYO 22 between Broadway and Coyote Canyon Road	Separate multi-use path
WYO 22 between Coyote Canyon Road and WYO 390	Separate multi-use path
WYO 22 Snake River Bridge	Shoulders and sidewalks
WYO 22 within Wilson	Pedestrian median refuges
WYO 22 at Skyline Ranch	Safe pedestrian and bicycle crossing
WYO 390 between WYO 22 and Aspens/Pines	Pedestrian crosswalks and/or median refuges
WYO 22 and 390 Intersection	Safe pedestrian and bicycle crossing
WYO 22 and Broadway	Safe pedestrian and bicycle crossing

1.5.4 Need #3 Transit

START, the Southern Teton Area Rapid Transit system, runs 90 daily bus trips between Jackson and Teton Village in the winter season. During the summer the number of daily runs is 17, and 9 bus trips occur per day during the off season. The community has identified that meeting transportation and preservation goals (which sometimes conflict) will require increased use of transit. This objective is



documented in the *Jackson/Teton County Comprehensive Plan* (2012) and was reinforced during this study's stakeholder outreach.

However, buses can experience slow travel times due to congestion. Buses operate in mixed

traffic on the WYO 22 and 390 corridors between Jackson and Teton Village. Travel delay is often experienced at the intersections of WYO 22 and Broadway, Spring Gulch, and the intersection of WYO 22 and 390. Buses also have difficulty making left turns to and from the highway to serve bus stops on the route between Jackson and Teton Village. To attract riders, buses need to maintain a competitive travel time with automobiles.

1.5.5 Need #4 Safety and Wildlife-Vehicle Collisions



Within the Study Area, WYO 22 and WYO 390 have the poorest rating for critical crashes when compared to similar roads statewide. The critical crash rate takes into account the severity of the crash. Furthermore, both corridors have a high number of wildlife vehicle collisions due to

the presence of wildlife habitat and migration routes. Many of these wildlife–vehicle collisions are with large mammals. Table 3 provides safety ratings for the respective corridors, and Figure 3 depicts safety issues on the Existing Conditions map.

Table 3: Corridor Safety Ratings

Safety Measure	WYO 22	WYO 390
Corridor Safety Index (SI) Rating	4 (poorest rating)	4 (poorest rating)
Safety Hotspots (SI > 2.0)	<ul style="list-style-type: none"> • Milepost 1.0 to 1.5 • Milepost 3.5 to 4.0 • Milepost 5.7 to 7.3 	<ul style="list-style-type: none"> • Milepost 0.7 to 1.2 • Milepost 2.3 to 2.8
Animal Crash / Carcass Locations Higher than Normal	Entire Corridor	Entire Corridor
Curve Crash Concentrations (SI > 10)	<ul style="list-style-type: none"> • Milepost 3.9 • Milepost 5.6 	<ul style="list-style-type: none"> • Milepost 0.5 • Milepost 1.1 • Milepost 2.6 • Milepost 6.3

In addition, motorists have a need to safely view scenery and wildlife. Tourists are prone to slowing and stopping to look at the picturesque vistas and observe wildlife during random encounters along the road. Figure 29 in Chapter 3 displays wildlife–vehicle collision hotspots and safety concerns by segment.

1.6 STUDY GOALS

Project goals supplement the defined Purpose and Need. These goals help differentiate between the transportation improvements identified to meet the transportation needs, and therefore, help guide the alternatives development and screening process. While the needs must be addressed by the study, the goals provide a framework by which the potential improvements can exceed those requirements.

These goals were developed with input from community and agency stakeholders. The process for engaging the stakeholders and the public is described in the Public Involvement chapter. The goals identified for this study are to:

- Preserve the area's natural setting and character;
- Promote a travel experience that allows for travelers to appreciate the scenery and wildlife;
- Meet transportation safety needs of all modes – automobile, bus, pedestrian, bicycle, and truck;
- Encourage use of alternative modes;
- Provide effective access for commercial and residential properties, while addressing mobility and safety needs;
- Avoid and minimize environmental impacts;
- Protect wildlife;
- Minimize right-of-way impacts and relocation of commercial and residential properties;
- Do not preclude future consideration of new road connections that would provide redundancy;
- Provide system redundancy in the corridors in times of traffic disruption;
- Identify practical and financially realistic transportation improvements for future inclusion in the Statewide Transportation Improvement Program (STIP), given funding constraints; and
- Develop projects that are consistent with vision for the corridors.

1.7 PLANNING CONTEXT

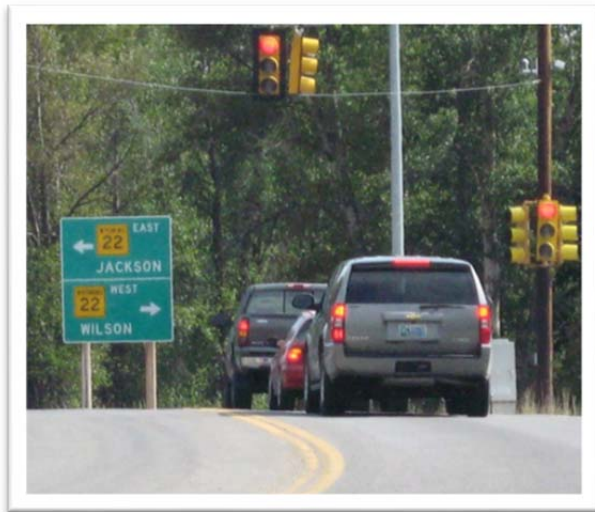
The context for studying the transportation needs and developing a vision for the WYO 22 and 390 corridors occurs within the framework of other transportation plans, studies, and projects within the study area. These include:

- The planned expansion of the bicycle and pedestrian path system within the county, as described in the 2007 *Pathways Master Plan*. This includes the implementation of a new bridge over the Snake River for bicycles and

pedestrians (under construction), the implementation of a cycle track along WYO 22 from Broadway to Spring Gulch (under construction), and the planned extension of a multi-use path along WYO 22 between Broadway and WYO 390.

- The ongoing study of wildlife and wildlife crossing needs. Studies continue to develop the understanding of wildlife movements and migration patterns throughout the study area, including a recent study by the Western Transportation Institute and a mule deer study prepared by the Conservation Research Center of Teton Science Schools.
- The services and plans of transit serving the corridors in the study area. START provides bus service from Jackson to Teton Village and serves a park-and-ride at Stilson, near the junction of WYO 22 and WYO 390.
- The county-wide vision to be documented by the upcoming Integrated Transportation Plan. A planning process has recently been initiated by the Town of Jackson and Teton County to develop an integrated transportation plan to achieve goals identified in their comprehensive plan to enhance transit opportunities, complete streets, and pathways. The plan has a community-wide and system-level focus with an emphasis on alternative modes. It is planned for completion by spring of 2015.
- The planning and visioning for the community of Wilson, as accomplished by the *Wilson Land Use and Transportation Corridor Study Charrette Report* of 2001.

These studies and plans inform the PEL study and set the stage for setting a vision for the WYO 22 and 390 corridors. A complete list of these studies and other source material is provided in Chapter 6 References.



2 Alternatives

This chapter describes the process used to identify, evaluate, and screen alternatives for the study.

2.1 DECISION-MAKING PROCESS

The alternatives development and screening process used a coordination structure that included four groups and the public. The major functions of the four groups as they relate to the alternatives screening are summarized in Table 4.

Table 4: Major Roles and Responsibilities

Public	Inform scoping; provide input and identify issues
Stakeholder Group (community representatives)	Inform scoping; provide input and identify issues
Resource Group (state and federal agencies)	Provide necessary input based on regulatory responsibilities
Transportation Advisory Committee (TAC) (town and county representatives)	Provide input and make recommendations
Project Working Group (PWG) (WYDOT staff, FHWA staff, and consultant staff)	Execute process, perform technical tasks, evaluate, and develop recommendations

The alternatives presented in this report were developed based on input from the scoping process and in coordination with the TAC and PWG. The TAC is a standing committee comprised of representatives from the Town of Jackson, Teton County, START, Jackson Hole Community Pathways, and WYDOT. TAC responsibilities for this study included providing input and raising issues to be considered in the evaluation process.

The stakeholder group met once and included representatives from a broad range of local interest groups, including businesses, property owners, local boards, environmental organizations, and local, state, and federal agencies (see Chapter 4 Agency Coordination and Public Involvement).

The PWG included WYDOT, FHWA, and the consultant team. Responsibilities included executing the PEL study process and providing technical analyses.

Consensus

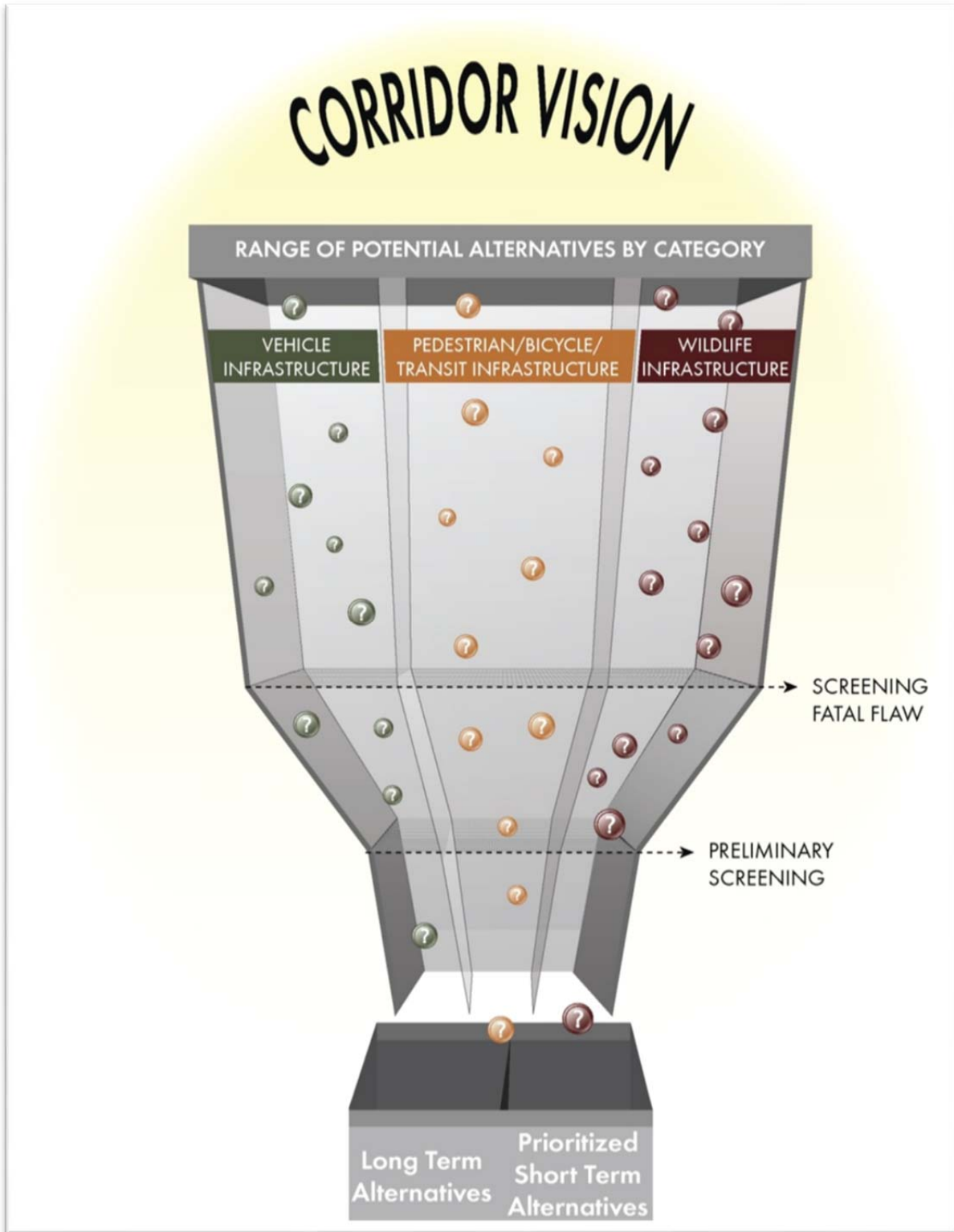
In general, the study team attempted to reach consensus with the TAC and other stakeholders when possible. If not possible, alternatives were not screened out, and were included in the recommendations for consideration in subsequent NEPA processes.

A collaborative and iterative process was used to receive input from the four groups for decision-making. The stakeholders identified goals and values important to their respective communities or agencies. This information then was vetted with the public at open house meetings. Technical information, for example traffic operations data, was provided to the groups as the discussions proceeded. In this way alternatives were jointly developed and screened. Refer to Chapter 4 Public Involvement and Agency Coordination for further information regarding the engagement of agencies and the public.

The following sections describe the process used to develop the range of reasonable alternatives and then screen them (see Figure 4). In summary, this process involved the following steps:

- Develop an overview study vision statement.
- Develop a purpose and need statement.
- Identify a set of project goals.
- Develop project evaluation criteria based on the purpose and need, community values, and project goals.
- Identify potentially feasible alternatives based on an assessment of the existing conditions in the study area, project Purpose and Need, and public and agency input.
- Conduct fatal flaw screening to eliminate those alternatives that could not meet the purpose and need or have fatal flaws (Level 1).
- Conduct a qualitative comparison screening (Level 2) of the remaining alternatives to identify those alternatives that are most practical or feasible from a technical, economic, and environmental standpoint.
- Prioritize the remaining alternatives to aid future decisions about phasing and implementation (see Chapter 2)
- Develop projects that are consistent with the vision for the corridors.

Figure 4: Alternatives Development and Screening Process



2.2 SCREENING CRITERIA

The vision statement, purpose and need, and goals (described in Chapter 1) shape the screening criteria by which potential alternatives are compared. The study team developed criteria based on the purpose and need and project goals in cooperation with resource agencies and the TAC. The screening criteria are presented below, grouped according to the four transportation needs and environmental considerations:

Mobility

Relative ability of the alternative to

- Reduce peak period congestion;
- Meet future traffic demand;
- Provide safe, efficient and well-coordinated access;
- Improve intersection operations; and
- Provide adequate mobility in times of traffic disruption.

Bicycle and Pedestrian

Relative ability of the alternative to

- Improve the continuity of bicycle and pedestrian facilities;
- Provide safe crossing opportunities;
- Safely and comfortably accommodate all levels and abilities of pedestrians and cyclists; and
- Improve non-motorized level-of-service.

Transit

Relative ability of the alternative to

- Provide a competitive and reliable travel time for buses; and
- Provide enhanced access to transit stops (improved non-motorized access to stops and provision of park-and-ride facilities).

Safety and Wildlife

Relative ability of the alternative to

- Improve high accident locations
- Replace or rehabilitate aging infrastructure
- Reduce potential vehicle conflicts
- Accommodate safe travel by pedestrians and bicyclists
- Reduce the potential for wildlife-vehicle collisions

- Accommodate safe viewing of scenery and wildlife

Community, Land Use, and Environment

- Relative impact of the alternative on environmental resources
- Relative ability of the alternative to enhance the corridors' natural setting and character
- Relative ability of the alternative to allow travelers to appreciate the scenery and wildlife
- Extent that the alternative is consistent with planned land uses
- Amount of additional right-of-way required by the alternative
- Relative impact of the alternative on residential and commercial properties
- Extent that the alternative precludes future new road connections that provide redundancy
- Extent that the alternative is practical and financially realistic
- Potential for the alternative to induce the need for other transportation improvements beyond the scope of the corridors

These criteria were applied as appropriate throughout the screening process, using the best information available at each level of screening. Not all criteria were used at each level of screening, and the study team concentrated on distinguishing criteria based on the level of detail needed to make decisions at each level. These distinguishing criteria are described in each level of screening in subsequent sections of this chapter.

2.3 RANGE OF ALTERNATIVES

The study team developed a broad range of alternatives to address the purpose and need presented in Chapter 1. Current transportation problems of the WYO 22 and WYO 390 corridors within the study area drove the development of these needs.

Stakeholder Input on Range of Alternatives

The study team provided information and gathered input on the range of alternatives at the January 25, 2013 TAC Meeting.

In identifying alternatives, the study team recognized portions of the study corridors had different characteristics and experience different levels of travel demand. Therefore, the corridors were divided into six segments, and alternatives were identified by segment and major intersections, described in Table 5 and depicted in Figure 5.

Table 5: Segments

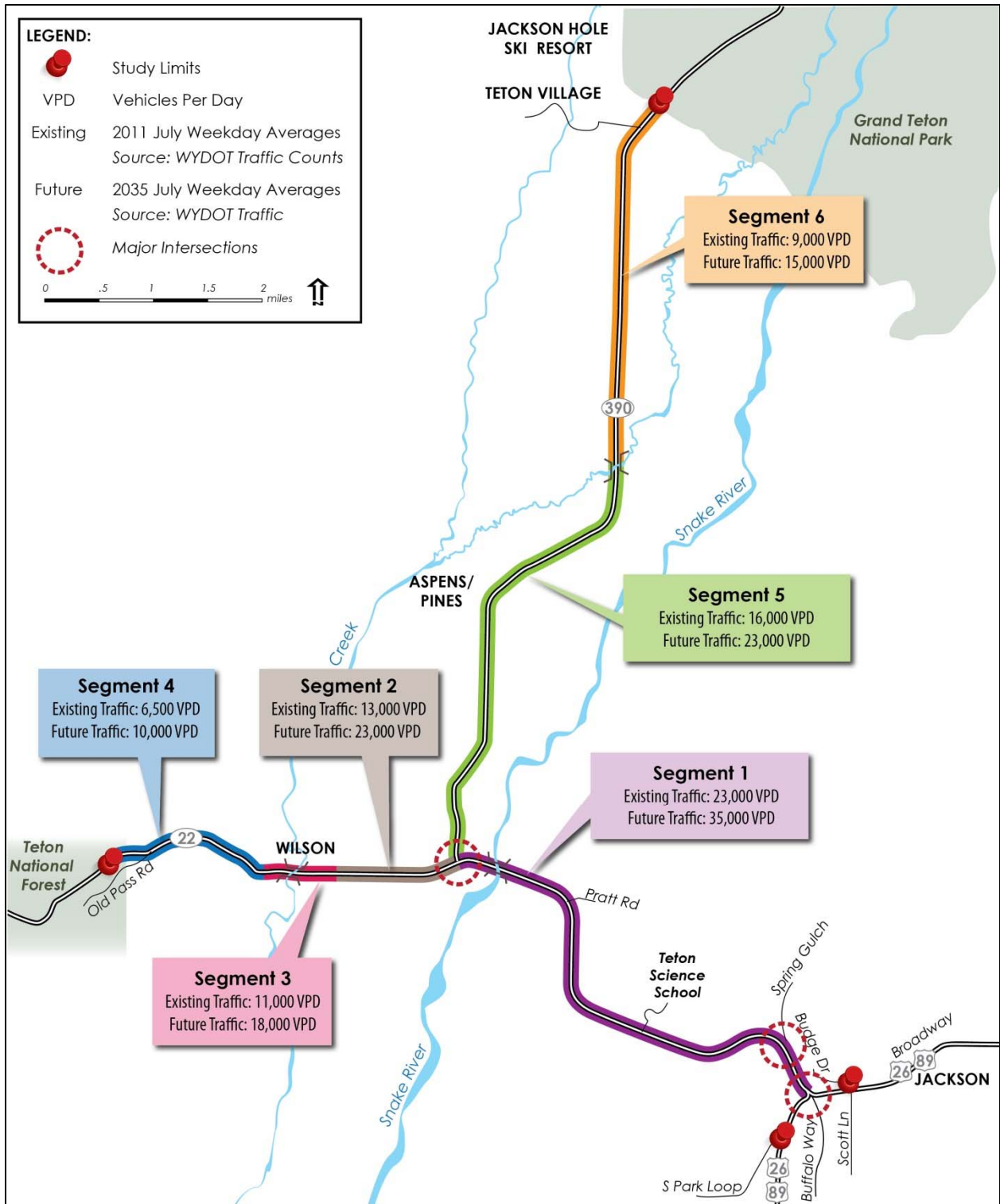
Segments			
No.	Roadway	Mileposts	Description
1	WYO 22	0.0 to 4.0	Between Broadway and WYO 390
2	WYO 22	4.0 to 5.1	Between the WYO 390 junction and Wilson
3	WYO 22	5.1 to 5.6	Within Wilson
4	WYO 22	5.6 to 7.0	Between Wilson and the Teton National Forest boundary
5	WYO 390	0.0 to 3.8	Between the WYO 22 junction and Lake Creek
6	WYO 390	3.8 to 7.7	Between Lake Creek and Grand Teton National Park
Major Intersections			
WYO 22 and WYO 390			
WYO 22 and WYO Broadway (US 26/89/189/191)			
WYO 22 and Spring Gulch Road			

The alternatives were categorized into cross-sections, intersection improvements, wildlife safety improvements, and multimodal components, as follows:

- Cross sections include two or four-lane highway configurations. Each cross-section has advantages and disadvantages for certain segments of the corridors based on physical constraints and travel demand needs.
- Intersection improvements include additional turn lanes, the type of traffic control, and intersection configuration.
- Wildlife safety improvements include crossing treatments and other wildlife conflict mitigation strategies.
- The multimodal alternatives include transit improvements and bike and pedestrian improvements.

No single alternative is expected to fully address the identified purpose and need. Meeting these needs would require a combination or package of alternatives for the different segments, consistent with the vision for the corridors.

Figure 5: Segments and Travel Demand



2.3.1 No Action Alternative

The No Action Alternative includes reasonably foreseeable and programmed projects near the study area. There are no such projects currently programmed in the study area.

2.3.2 Alternatives Not Considered

Potential transportation improvements that are beyond the purview of this study could be considered by future studies to address a different set of transportation problems. Specifically, these future improvements could include

- Off-alignment highway improvements, including a potential “north crossing” connecting north WYO 390 with US 89 north of Jackson;
- A potential Tribal Trails Road connection;
- Potential improvements to Spring Gulch Road, including paving;
- Alternative modes and/or future technologies outside the current highway alignment between Jackson and Teton Village.

The alternatives developed and evaluated during this PEL study would not preclude such future transportation possibilities.

2.3.3 Alternatives Considered

The process identified a wide range of alternatives and design options, described in Table 7. In general:

- Alternatives provide different functionality, such as the function provided by a grade separated wildlife crossing.
- Design options provide functional variations, for example the design options of either an overpass, underpass, or culvert wildlife crossing. Selection of design options is typically based on site specific characteristics.

Design options will be considered in future studies and projects after the PEL study.

Table 6. Alternatives and Design Options Considered

Through Lanes	
One	One through lane per direction can generally accommodate up to 20,000 vehicles per day.
Two	Two through lanes per direction can generally accommodate up to 40,000 vehicles per day.
Shoulders	
WYDOT Standard Shoulders	Improve shoulders throughout the corridors to meet WYDOT standards.
Extra-wide Shoulders	Maintain full shoulder width at intersections to provide better emergency access, and opportunities for stopping.

Medians		
Painted Medians	Painted medians are paved and do not provide a physical barrier to traffic crossing the roadway; they are often used in areas with frequent access points.	
Raised Medians	Raised medians provide a physical barrier to traffic crossing the roadway and are often landscaped.	
Depressed Medians	Depressed medians are usually wider than raised or painted medians and are often landscaped.	
Major Intersections		
Expanded Signalized Intersection	Increase the number of lanes to provide adequate capacity.	
Roundabout	Roundabouts are appropriate for many intersections with balanced movements.	
Florida-T Intersection	Use a raised median on the main street to separate a through movement from the rest of the intersection.	
Reconfigured T-Intersection	Convert a heavy turn movement to the major through movement while shifting a former through movement to the minor approach.	
Continuous Flow Intersection	A continuous flow intersection moves the left-turning movement upstream allowing the left turn phase at the main signal to occur concurrently with the through phase.	
Grade-Separated	Several grade-separated intersection geometries are viable at these locations.	
Minor Intersections		
Signal	Traffic signals are appropriate for higher volume intersections and major accesses.	
Roundabout	Roundabouts are appropriate for intersections where volumes are reasonably balanced on all approaches.	
Grade-Separation	Grade-separations are appropriate for very high volume intersections.	
Frontage Roads / Access Consolidation	Access consolidation can improve safety and mobility by increasing access spacing, and can provide better connectivity between adjacent land uses.	
Traffic Metering	Signals can meter traffic along a main street or highway where cross-street traffic experiences delay to turn onto or off of the main road because gaps in traffic are infrequent.	
Auxiliary and Turn Lanes	Auxiliary lanes provide additional capacity at intersections.	
<i>Design Options</i>	<i>Two-way left turn (TWLT) center lane</i>	Striped TWLT lanes serve roadways with many closely spaced accesses and slower speeds.
	<i>Left and Right Turn Lanes</i>	Exclusive left and right turn lanes are appropriate at intersections with high turning movements.
	<i>Deceleration Lanes</i>	Acceleration/Deceleration lanes provide separation of turning traffic from through lanes.
	<i>Acceleration Lanes</i>	
	<i>Limited movement intersections</i>	Three-quarter turn and right-in, right-out intersections prevent certain movements at intersections to improve through traffic and address safety concerns.
Wildlife		
Grade-Separated Crossings	Allows for unimpeded wildlife passage over or below the roadway. Requires additional right-of-way on each side of the roadway, ideally incorporating a conservation easement to ensure continued use and function as a wildlife corridor.	
<i>Design Options</i>	<i>Overpass</i>	Appropriate for large mammals where topography allows.
	<i>Underpass</i>	Appropriate for small to large size mammals where topography allows.
	<i>Culverts</i>	Appropriate for small mammals where topography allows.
Fencing	Typically a 2-meter fence designed to "funnel" wildlife to designated crossing structures or areas.	
Signage	Increase static and variable-message signage during migration periods.	
Pullouts	Allows motorists to remove themselves from active travel lanes and shoulders to appreciate the scenic views or wildlife. While not a direct enhancement of wildlife safety, pullouts could provide interpretive signage with safety tips for driving in areas with wildlife.	

Wildlife Detection Systems		Detections systems can alert motorists when wildlife are near the roadway.
Bicycle and Pedestrian		
Parallel Facilities		Provision of bicycle and pedestrian facilities adjacent and parallel to the roadway.
Design Options	<i>Multi-use Path</i>	A multi-use path provides a separate alignment for bicycles and pedestrians to share.
	<i>Sidewalk</i>	Sidewalks are adjacent to the roadway, separated by a curb and/or landscaping.
	<i>On-street Bike Lane</i>	On-street bike lanes are usually between 4 and 6 feet wide, adjacent to a travel lane.
	<i>Cycle Track</i>	Cycle tracks are usually between 4 and 6 feet wide, with a painted or curbed buffer between the bike lane and adjacent travel lane.
Crossings		Provision of safe bicycle and pedestrian crossings.
Design Options	<i>Underpass</i>	Allows for unimpeded movements beneath the roadway.
	<i>Speed Table</i>	Slows traffic in areas where multi-use paths are present.
	<i>Bulb-outs</i>	A traffic calming measure, primarily used to extend the sidewalk, reducing the crossing distance and allowing pedestrians about to cross and approaching vehicle drivers to see each other when vehicles parked in a parking lane would otherwise block visibility.
	<i>Medians</i>	Medians can provide a pedestrian refuge, allowing pedestrians to cross one direction of traffic at a time, and shortening the distance pedestrians are exposed.
	<i>Crosswalks</i>	A marked or raised part of a road where pedestrians have the right-of-way to cross. Crosswalks may or may not be signalized.
	<i>Hybrid Activation Signal</i>	A high-intensity activated crosswalk, in which pedestrians activate a traffic signal allowing them to cross, but for traffic to otherwise flow unstopped.
Transit Infrastructure		
Queue Jumps		Additional travel lane on an approach to a signalized intersection, restricted to buses only. Often signal prioritization is provided at the intersection.
Dedicated Bus Lanes		Additional lane exclusively for buses (can be combined with high-occupancy vehicle traffic or right-turns, or available to all traffic during off-peak hours).
Park and Ride		Parking lot for bus riders.
Scenic Enhancements		
Design Options	<i>Pullouts</i>	Allows motorists to remove themselves from active travel lanes and shoulders to appreciate the scenic views or wildlife.
	<i>Remove Overhead Transmission Lines</i>	Relocate overhead transmission lines to underground cables.
Roadway Design		
Design Options	<i>Curve Flattening</i>	Increase the radius at vertical and horizontal curves to enhance automobile safety
	<i>Lowered Speeds</i>	Reduce speed to enhance safety.
	<i>Reduced Night-time Speeds</i>	Posted speed limits can be lowered at dusk as a safety and wildlife-vehicle collision reduction measure
	<i>Variable Speed Limits</i>	Speed limits can be managed to match roadway conditions; e.g., in response to a critical incident, inclement weather, or a temporal presence of wildlife.
	<i>Variable Message Signs</i>	Used to alert motorists to dangerous roadway conditions, including critical incidents, inclement weather, or a temporal presence of wildlife.
	<i>Decreased Lane Width</i>	Decreasing lane width can be used as a traffic calming measure. Shoulder widths can be increased in concert to retain adequate width for emergency maneuvers.
	<i>Chicanes</i>	Chicanes are artificially introduced curves in a roadway that are used as a traffic calming measure.
	<i>Narrow Shoulders</i>	Narrow shoulders can be used as a traffic calming measure.
	<i>Rumble Strips</i>	A feature that alerts drivers to potential danger or roadway changes by causing a vibration and audible rumbling.

2.4 LEVEL 1 SCREENING

During Level 1 screening, the study team evaluated alternatives at a low level of detail. Level 1 criteria included addressing purpose and need elements and avoiding fatal flaws while working within the framework of the vision statement. The fatal flaw criteria are listed below:

- Irreconcilable environmental impacts
- Irreconcilable community impacts
- Inability to be implemented

The project goals and more detailed screening criteria outlined in previous sections were used in subsequent levels of screening. Alternatives were either eliminated from further consideration or carried forward into Level 2 screening for more detailed evaluation.

2.4.1 Cross-Section Alternatives

The basic elements of the roadway cross-sections include the travel lanes, median, and shoulders. Along the corridors, different combinations of these elements were evaluated. The number of travel lanes along the corridors could differ by segment depending on travel demand, as could the presence of a raised, depressed, or painted median. The different cross-section alternatives are listed below:

- One or Two Through Lanes Per Direction
- WYDOT Standard or Extra-wide Shoulders
- Painted, Raised, or Depressed Medians

Alternatives for cross-sections in some segments were eliminated in Level 1 screening for the following reasons:

- Travel demand projections did not indicate a need to expand to two lanes per direction in Wilson, west of Wilson, or north of Aspens/Pines (Segments 3, 4 and 6).
- Medians were not appropriate on rural two-lane highways (Segments 4 and 6).
- Depressed medians would not be appropriate within Wilson, where right-of-way and community impacts would be high.

Level 1 Stakeholder Input

The study team provided information and gathered input at the following meetings:

- January 25, 2013 TAC Meeting
- March 25, 2013 TAC Meeting



Current cross-section on WYO 22

2.4.2 Intersection Alternatives

To address the purpose and need, several intersections would need improvements. Improvements at intersections can range from grade separations to signals or roundabouts to the addition of turn lanes. Most intersections along the corridors can accommodate projected traffic conditions with minor improvements to lane geometry or traffic control, and have been categorized as minor intersections. Three major intersections have been identified at locations that may require substantial improvements to accommodate projected travel demand – WYO 22 and Broadway (US 26/89/189/191), WYO 22 and 390, and WYO 22 and Spring Gulch Road.

The alternatives identified for minor intersections include:

- Traffic Signal
- Roundabout
- Grade-Separated
- Frontage Roads/Access Consolidation
- Traffic Metering
- Auxiliary and Turn Lanes

Some alternatives for minor intersections were eliminated in Level 1 screening for the following reasons:

- Grade separations are not justified for minor intersections.
- Access spacing in segments 2, 3, 4, and 6 does not require consolidation or traffic metering.

WYDOT regularly monitors traffic, optimizes signal timings, and explores options to address congestion and improve operations within the existing highway network.

However, at the three major intersections, existing and projected traffic conditions may necessitate additional improvements beyond traditional signalized or roundabout traffic control. The alternatives considered and Level 1 screening for each of these intersections are presented in Table 7.



Intersection of WYO 22 and Spring Gulch Road

Table 7: Level 1 Major Intersection Screening

Alternative	Screening
WYO 22 and Broadway (US 26/89/189/191)	
Expanded Signalized Intersection	Retained for Level 2 Screening
Roundabout	Retained for Level 2 Screening
Florida-T Intersection	Retained for Level 2 Screening
Continuous Flow Intersection	Retained for Level 2 Screening
Grade-Separated	Retained for Level 2 Screening
WYO 22 and Spring Gulch Road	
Expanded Signalized Intersection	Retained for Level 2 Screening
Roundabout	Retained for Level 2 Screening
Florida-T Intersection	Retained for Level 2 Screening
Continuous Flow Intersection	Eliminated from consideration because traffic benefit would not outweigh the community and right-of-way impacts.
Grade-Separated	Eliminated from consideration because traffic benefit would not outweigh the community and right-of-way impacts and projected traffic volumes do not justify the expense and community impacts of a grade separation at this location.
WYO 22 and WYO 390	
Expanded Signalized Intersection	Retained for Level 2 Screening
Roundabout	Retained for Level 2 Screening
Florida-T Intersection	Retained for Level 2 Screening
Reconfigured T-Intersection	Retained for Level 2 Screening
Continuous Flow Intersection	Retained for Level 2 Screening
Grade-Separated	Eliminated from consideration because traffic benefit would not outweigh the environmental, community, and right-of-way impacts.

Each of the major intersection alternatives retained through Level 1 were developed in greater detail and comparatively evaluated during Level 2 screening.

2.4.3 Wildlife-Vehicle Safety Alternatives

Wildlife-vehicle conflicts are prevalent throughout much of the study area. Selection of appropriate safety enhancements depends on many factors, and is not limited to the type of animals in the area, topography, and driver behavior. The types of improvements identified for evaluation are consistent with *Highway Mitigation Opportunities for Wildlife in Jackson Hole, Wyoming* by the Western Transportation Institute (December 2011). Alternatives considered for wildlife enhancements include:

- Grade-Separated Crossings
- Fencing
- Signage
- Pullouts
- Wildlife Detection Systems

Among these alternatives for wildlife treatments, some were eliminated in Level 1 screening for the following reasons:

- Wildlife detection systems are unproven technology.
- Segment 3 within Wilson would not be appropriate for fencing or pullouts due to community impacts.

Other alternatives for wildlife treatments were retained for Level 2 evaluation.



Existing bike path along WYO 22

2.4.4 Multimodal Alternatives

Potential bike and pedestrian improvements include the addition of parallel facilities and safe crossings. Parallel facilities can include sidewalks, on-street lanes, and off-street multi-use paths. Safe crossings can range from crosswalk treatments to grade separations.

In evaluating transit improvements, the study team focused on those improvements WYDOT could implement.

Responsibility for transit service lies with START. Therefore, potential transit improvements in the study area focus on infrastructure improvements that would make bus transit

more competitive with automobile travel, and range from providing bus-only lanes or priorities to enhanced transit facilities.

Alternatives considered during Level 1 screening include:

- Parallel Facilities
- Crossings
- Transit Infrastructure
- Queue Jumps
- Dedicated Bus Lanes
- Park and Rides
- Transit Stop Amenities

Some multimodal alternatives were eliminated in Level 1 screening for the following reasons:

- The projected frequency of buses during peak periods would not warrant dedicated bus lanes, and such lanes would not be consistent with START long range planning.
- Transit demand is not expected to warrant additional park-and-rides in Segments 2, 4, and 6.

2.5 LEVEL 2 SCREENING

Level 2 Stakeholder Input

The study team provided information and gathered input at the following meetings:

- *March 25, 2013 TAC Meeting*
- *April 26, 2013 TAC Meeting*
- *May 10, 2013 TAC Meeting*
- *June 24, 2013 Public Open House*
- *August 21, 2013 Public Open House*

Level 2 screening involved refining the alternatives retained after Level 1 screening and evaluating them in greater detail. Distinguishing criteria, which are criteria that revealed clear differences between alternatives, were applied during Level 2 screening. This resulted in elimination of some alternatives. Alternatives that were retained are included as part of the recommendations and will be considered in future NEPA studies. The study team worked closely with the TAC to establish consensus where possible, and to establish options to be evaluated in future studies where a consensus decision was not immediately forthcoming.

Alternatives were also presented to the public during Level 2 screening to solicit feedback. As in Level 1 screening, alternatives screened in Level 2 were categorized into cross-sections, intersections, wildlife/safety facilities, and multimodal, described below.

2.5.1 Cross-Sections

The main elements of roadway cross-sections are the number of lanes, medians, and shoulders.

Number of Lanes

The distinguishing criteria for two-lane and four-lane cross-sections are presented in Table 8.

Table 8: Distinguishing Criteria for Through Lanes

Distinguishing Criteria	Two Lanes	Four Lanes
Travel Demand	LOS E capacity is 15,000 to 24,000 vehicles per day (vpd)*	LOS E capacity is 35,000 to 45,000 vpd*
Resilience during traffic disruptions	Little additional capacity to utilize during traffic disruptions	More capacity to utilize during traffic disruptions
Bicycle and pedestrian crossing	Easier to cross due to narrower width	More difficult to cross
Wildlife safety	Trade-offs: <ul style="list-style-type: none"> • Narrower width provides shorter crossing distance • Single lanes cause fewer gaps in traffic stream • Does not preclude wildlife crossing mitigation recommendations 	Trade-offs: <ul style="list-style-type: none"> • Wider width provides longer crossing distance • Double lanes allow more gaps in traffic stream • Does not preclude wildlife crossing mitigation recommendations

Potential to impact environmental resources	Lower due to smaller footprint	Higher due to larger footprint
Potential to impact setting and character	Lower due to smaller footprint	Higher due to larger footprint
Potential right-of-way impacts	Lower due to smaller footprint	Higher due to larger footprint

* Roadway capacity is variable, depending on many roadway and travel demand characteristics; each segment has been analyzed individually. Source: WYDOT traffic data.

These criteria were applied to each segment to determine the recommended number of lanes. Travel demand levels do not warrant four lanes in Segments 3, 4, and 6. Segment 1 between Broadway and WYO 390 is recommended as a four-lane cross-section. On segments 2 and 5, where traffic levels appear to be near the capacity threshold between two lanes and four lanes, it was agreed that traffic levels will be monitored and a laneage decision made prior to project implementation. The recommendations for the respective segments are presented in Figure 6.

Median Types

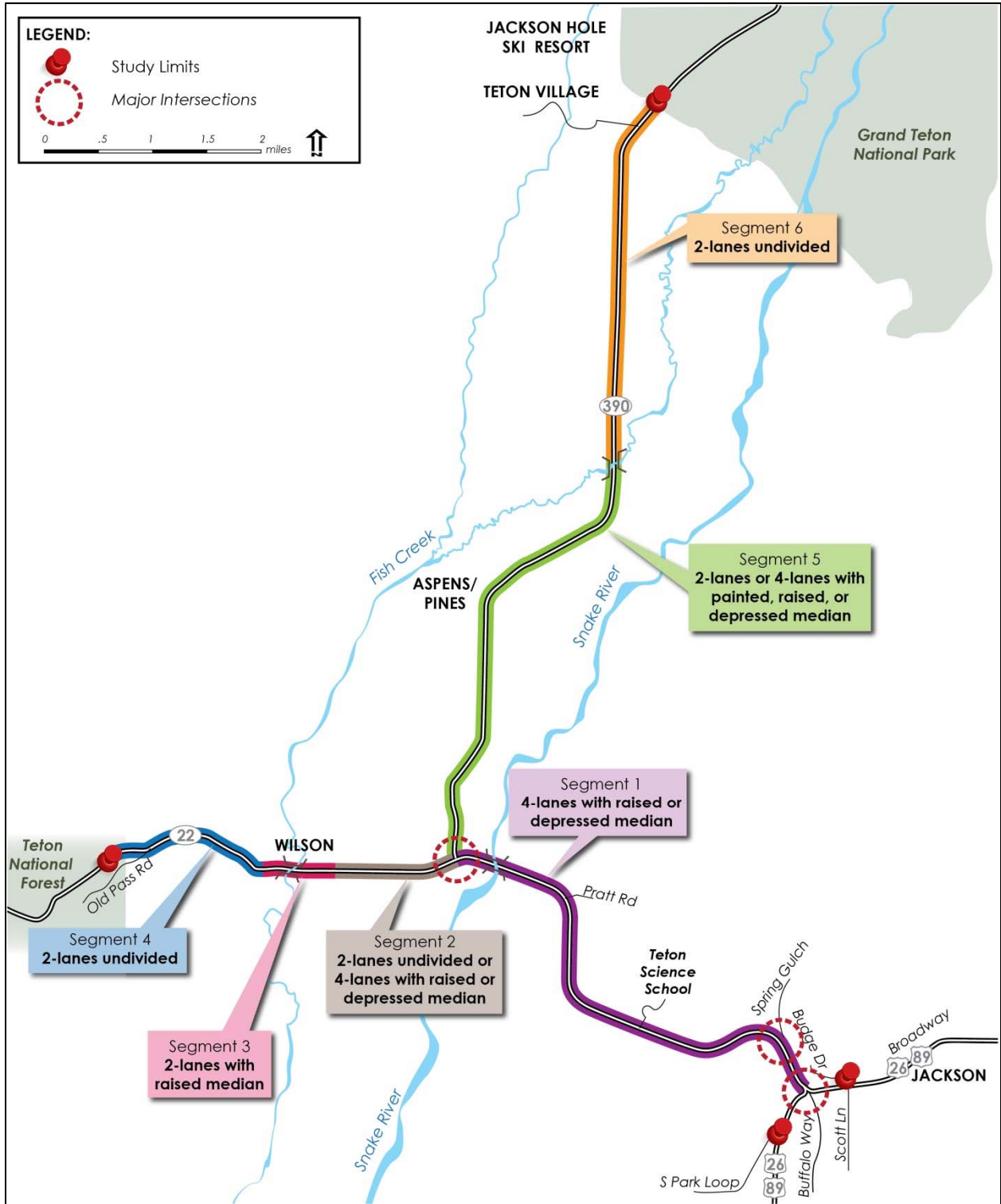
The distinguishing criteria for the different median types are presented in Table 9.

Table 9: Distinguishing Criteria for Median Types

	Undivided	Painted	Raised	Depressed
Travel Demand	Lower capacity than divided	Higher capacity than undivided	Higher capacity than undivided	Higher capacity than undivided
Access	Poor ability to control access	Better than undivided but worse than raised and depressed	Good access control	Good access control
Resiliency during traffic disruptions	Poor ability to respond to traffic disruptions	Good ability to respond to traffic disruption	Fair ability to respond to traffic disruption	Fair ability to respond to traffic disruption
Bicycle and pedestrian crossing	Poor	Fair	Good	Good
Vehicle safety	Worst expected safety performance	Fair expected safety performance	Good expected safety performance	Good expected safety performance
Wildlife safety	Fair	Fair	Fair	Poor
	None preclude wildlife crossing mitigation recommendations from previous studies.* A depressed median, with a wider cross-section, would require larger crossing structures.			
Potential to avoid impacts to environmental resources	Good	Fair	Fair	Poor
Potential to avoid impacts to setting and character	Fair	Poor	Fair	Good
Potential to avoid right-of-way impacts	Good	Fair	Fair	Poor

* Source: WTI 2011, Biota 2003

Figure 6: Recommended Cross-Section Alternatives



For segments with two lanes, an undivided median is assumed. For Segment 1 with a four-lane cross section, painted medians were not recommended at this time because of potential impacts to setting and character. The undivided cross-section was screened out for Segment 1 because it would provide relatively poor safety performance compared to divided cross-sections. The recommendations for the respective segments are presented in Figure 6 and were carried forward as proposed recommendations.

2.5.2 Major Intersections

Level 2 screening for the major intersections followed a two-step process. First, a range of intersection improvements that could potentially address the traffic congestion issues were developed for each of the three major intersections. After technical analysis, if an alternative would not address traffic congestion (i.e., would have a level of service of E or worse) it was screened out. Then, each of the alternatives was subjected to more detailed evaluation according to other distinguishing criteria. The range of alternatives and subsequent screening is presented for the three major intersections below. Appendix D contains more information on the screening details for these alternatives.

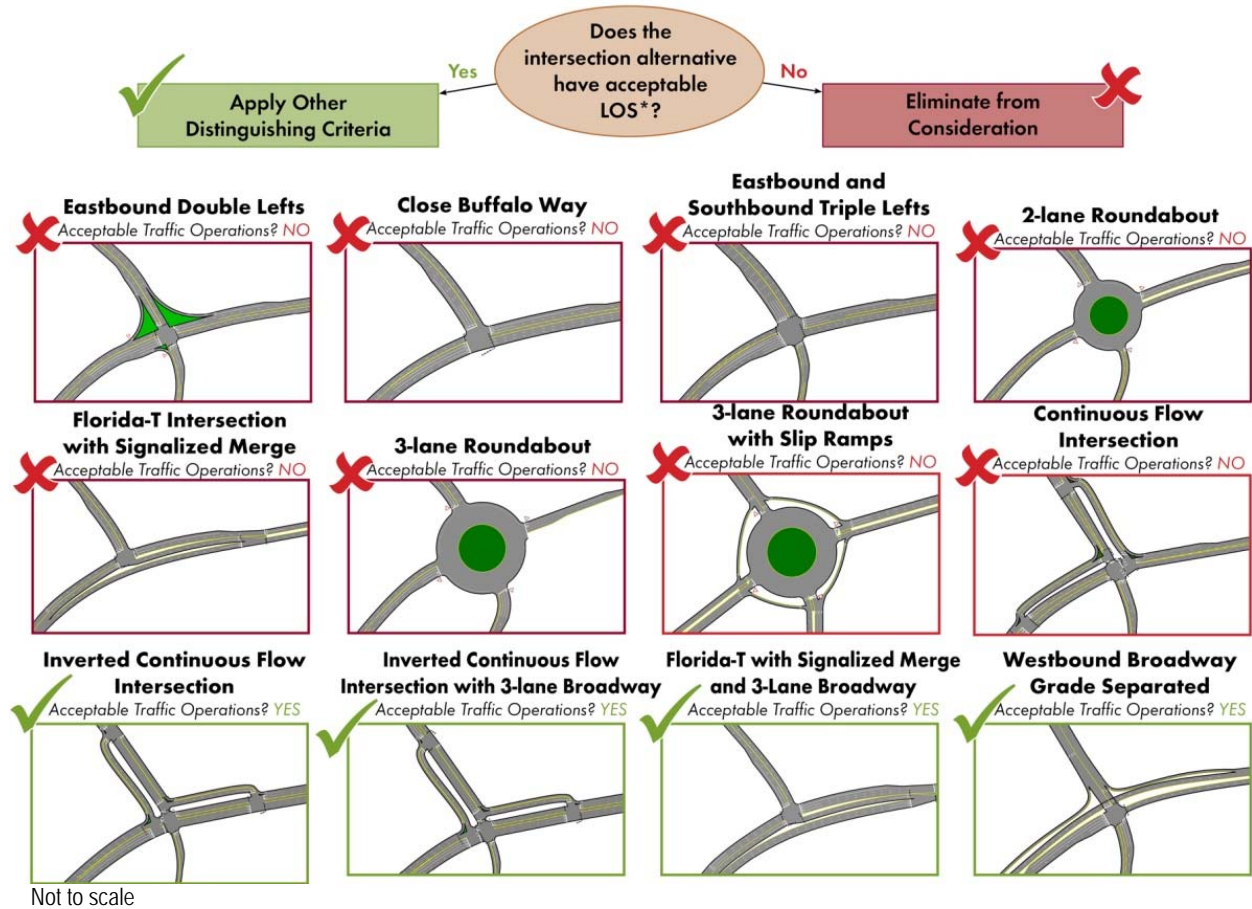
WYO 22 and Broadway

The study team developed alternatives for the WYO 22 and Broadway intersection that ranged from adding turn lanes to creating grade separations. The range of alternatives for Level 2 screening at this intersection is shown on Figure 7, along with the screening based on level of service.

As shown in Figure 7, the study team determined that four alternatives could accommodate future traffic demands at this location. These alternatives were then evaluated based on other distinguishing criteria and their advantages and disadvantages are summarized below.

- Inverted Continuous Flow Intersection (CFI): Inverted CFIs provide relatively good operations, but require larger footprints and are less intuitive for drivers.
- Inverted Continuous Flow Intersection with Three-lane Broadway: Inverted CFIs provide relatively good operations, but require larger footprints and are less intuitive for drivers. Public comments regarding three lanes in each direction on Broadway were mostly negative.
- Florida-T with Signalized Merge and Three-lane Broadway: A modified Florida-T intersection would provide good operations and safety performance, but may require three lanes on Broadway, which has little public support. Closing Buffalo Way or converting it to right-in, right-out operations also met with opposition from the public and TAC.
- Westbound Broadway Grade-Separated: A westbound grade separation facilitates good and safe traffic operations, but is more visually imposing and has higher costs and speeds. The public generally supported this alternative.

Figure 7: Level of Service Screening at WYO 22 and Broadway

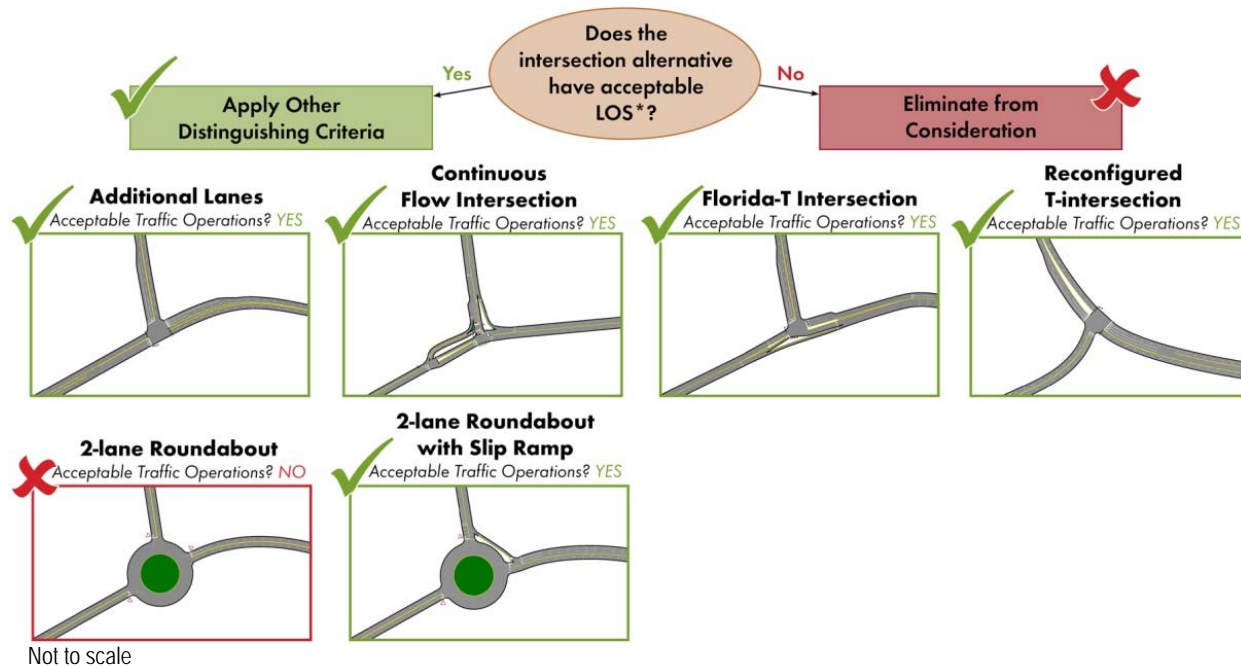


Based on the analyses performed and the relative advantages and disadvantages of each alternative, the study team recommended that each of these alternatives be considered as potential solutions in future studies at this intersection.

WYO 22 and WYO 390

At the WYO 22 and 390 intersection, the study team developed a range of alternatives from simply adding turn lanes to other innovative intersection designs. The range of alternatives for Level 2 screening is shown on Figure 8, along with the screening based on LOS.

Figure 8: Level of Service Screening at WYO 22 and WYO 390



The study team determined that five alternatives could accommodate future traffic demands at this location. These alternatives were then evaluated based on other distinguishing criteria. Their advantages and disadvantages are summarized below.

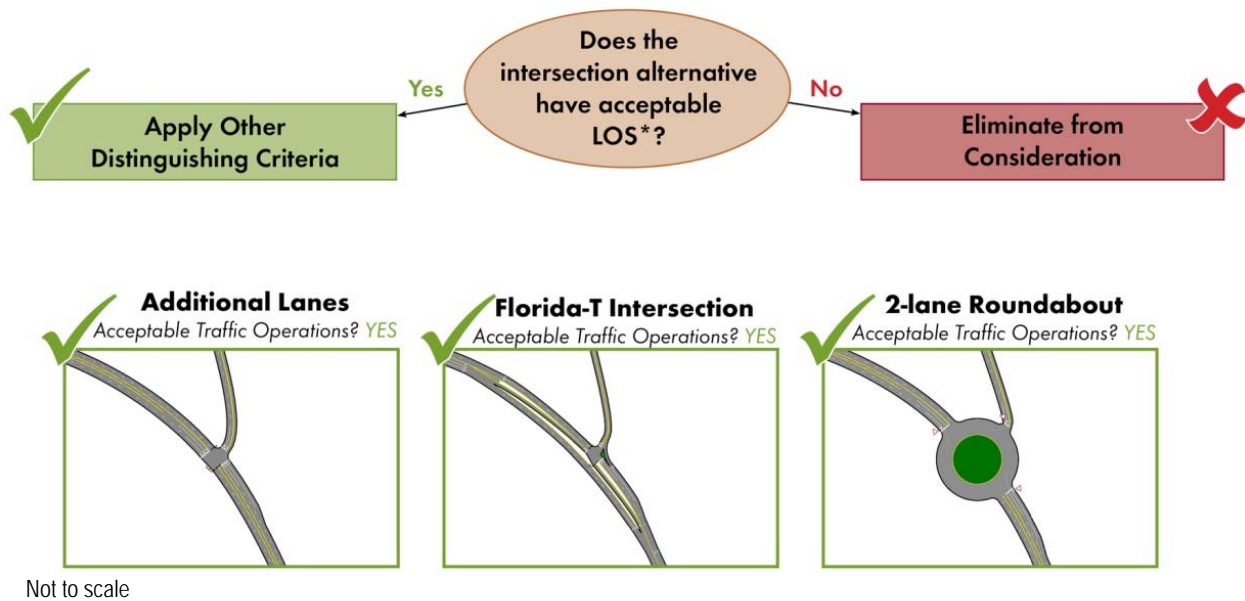
- **Additional Lanes:** An expanded signalized intersection has a relatively smaller footprint but relatively poorer safety performance.
- **Continuous Flow Intersection:** The CFI would have relatively worse pedestrian and bicycle operations and worse aesthetics.
- **Florida-T Intersection:** The Florida-T intersection would have relatively worse pedestrian and bicycle operations and worse aesthetics.
- **Reconfigured-T Intersection:** The Reconfigured-T would result in faster speeds and relatively poorer safety performance.
- **Two-lane Roundabout with Slip Ramp:** The roundabout offers relatively safer operations, better aesthetics, speed calming, but a larger footprint is required and providing safe pedestrian movements may require additional improvements.

Note that the pedestrian underpass currently being constructed under WYO 390 just north of WYO 22 may mitigate some of the pedestrian concerns. Based on the analyses performed and the relative advantages and disadvantages of each alternative, the study team recommended that each of these alternatives be considered as potential solutions in future studies at this intersection.

WYO 22 and Spring Gulch Road

The study team developed a range of alternatives for the WYO 22 and Spring Gulch Road intersection from adding turn lanes to other innovative intersection designs. The range of alternatives for Level 2 screening is shown on Figure 9, along with the screening based on LOS.

Figure 9: Level of Service Screening at WYO 22 and Spring Gulch



The study team determined that three alternatives could accommodate future traffic demands at this location. These alternatives were then evaluated based on other distinguishing criteria. Their advantages and disadvantages are summarized below.

- **Additional Lanes:** An expanded signalized intersection has a relatively smaller footprint but relatively poorer safety performance.
- **Florida-T Intersection:** The Florida-T provides relatively worse pedestrian and bicycle operations and worse aesthetics.
- **Two-lane Roundabout:** The roundabout offers relatively safer operations, better aesthetics, speed calming, but a larger footprint is required and providing safe pedestrian movements may require additional improvements.

Based on the analyses performed and the relative advantages and disadvantages of each alternative, the study team recommended that each of these alternatives be considered as potential solutions in future studies at this intersection.

2.5.3 Minor Intersections

The study team identified several minor intersections along the corridors that could need improvements within the planning horizon (by 2035) and then evaluated three main options for those improvements. This evaluation recognized these intersections may not all need improvements by 2035, and other intersections not identified could

require improvements. The intersections identified are shown in Figure 10 and the three improvement options and their relative advantages and disadvantages are described in Table 10.

Table 10: Characteristics of Minor Intersection Control Alternatives

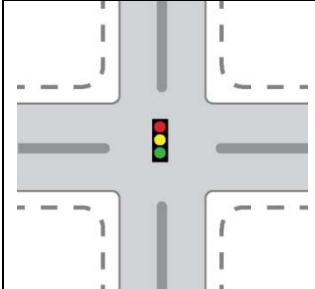
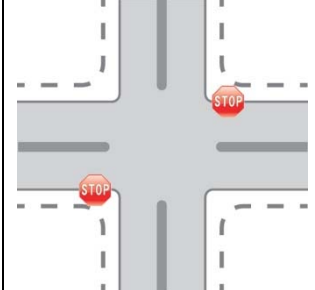
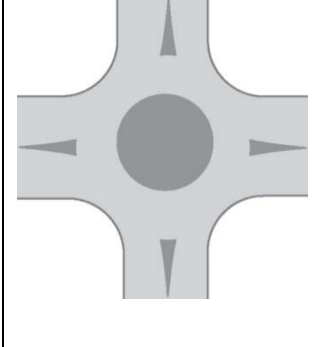
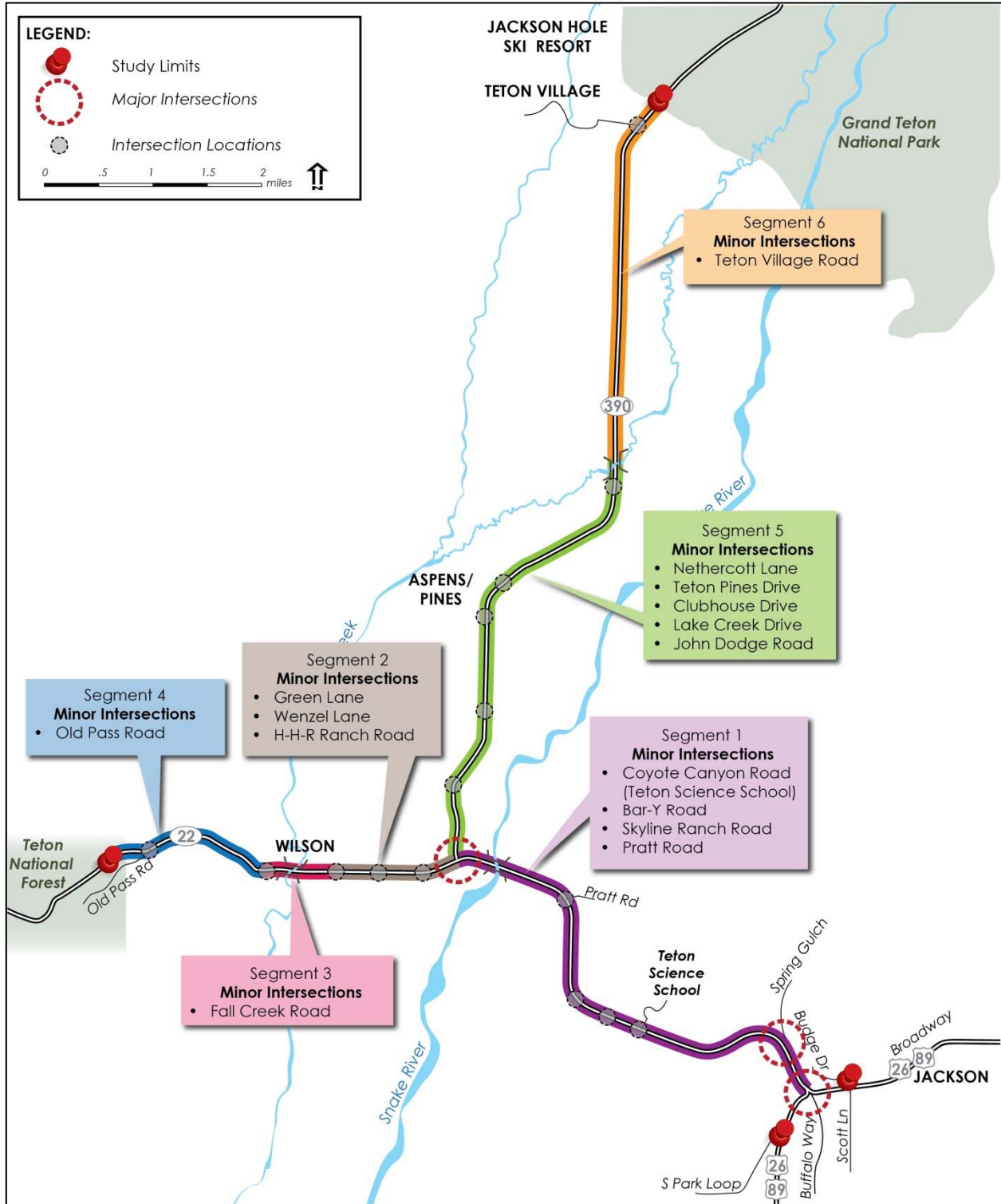
	<p>Signalized Intersection</p> <ul style="list-style-type: none"> +Allows protected pedestrian movements +Accommodates unbalanced approach volumes +Relatively small footprint +Lower construction cost -Can have high amounts of delay -Has higher potential for severe accidents
	<p>Stop Sign Control</p> <ul style="list-style-type: none"> +Appropriate for most low volumes intersections +Low cost -Can have high amounts of delay from minor road -Least safe option
	<p>Roundabout</p> <ul style="list-style-type: none"> +Suitable for relatively balanced approach volumes +Safer for vehicular travel relative to other intersection types +Can result in less delay +Can accommodate aesthetic treatments -Larger footprint than signalized intersection -Less suitable for high volume/multilane approaches -Less intuitive for pedestrians/cyclists than other intersection types

Figure 10: Minor Intersections by Segment



Based on the advantages and disadvantages in Table 10, the study team determined that:

- Roundabouts or stop sign control are appropriate for future consideration.
- Traffic signals will be considered if necessary.
- Access improvements would be provided by left and right turn lanes as appropriate.

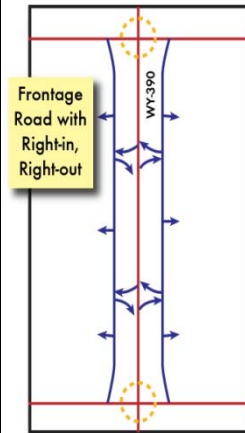
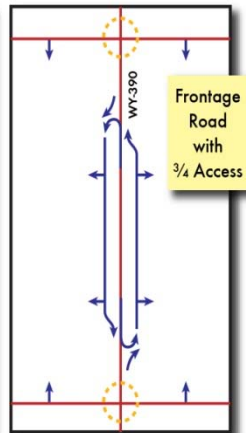
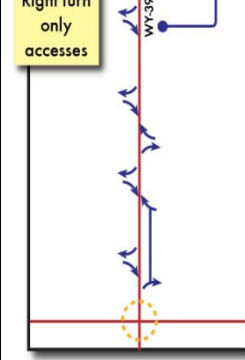
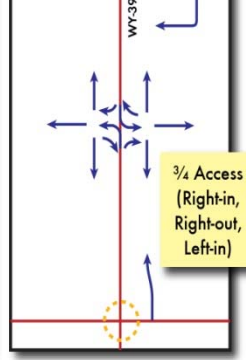
Some driveways and access points may not merit a break in median for left turns, but would be provided right-in, right-out access. Motorists would turn around at the next available location.

As future projects are developed, these options will be further refined and considered, as will any new ideas resulting from additional study and public and stakeholder input.

Segment 5 WYO 390 between WYO 22 and Aspens/Pines

Segment 5 presents challenges between the WYO 22 and 390 intersection and Aspens/Pines for access and minor intersection control beyond those in the other segments of the corridors. Unlike other segments, accesses are spaced very close together in Segment 5 and few turn lanes are provided. During peak hours, there are limited gaps in traffic for vehicles turning left to and from the highway. Therefore, the study team developed and evaluated additional access control treatments at a conceptual level to be considered for this segment. These alternatives and their relative advantages and disadvantages are shown in Table 11.

Table 11: Characteristics of Access Control Strategies

 <p>Frontage Road with Right-in, Right-out</p>	 <p>Frontage Road with 3/4 Access</p>	<p>Frontage Roads</p> <ul style="list-style-type: none"> + Improved safety + Two-lane highway capacity increased - Larger footprint - Increased speeds on highway - Aesthetics - Frontage Road intersections can be confusing for unfamiliar motorists
		<p>Right In Right Out/Three-Quarter Turn</p> <ul style="list-style-type: none"> + Improved safety + Two-lane highway capacity increased + Three-quarter turn movements provide more direct access to properties than frontage roads - Increased speeds on highway - Out-of-direction travel - U-turns can be a safety concern
 <p>Right turn only accesses</p>	 <p>3/4 Access (Right-in, Right-out, Left-in)</p>	<p>Traffic Metering</p> <ul style="list-style-type: none"> + Improved access operations by providing gaps for traffic in and out of driveways - Increased delay for through traffic on the major route - Additional signal can be a safety concern - Additional capital and maintenance costs
		<p>Auxiliary and Turn Lanes</p> <ul style="list-style-type: none"> + Improved safety and operations - Increased impacts and cost

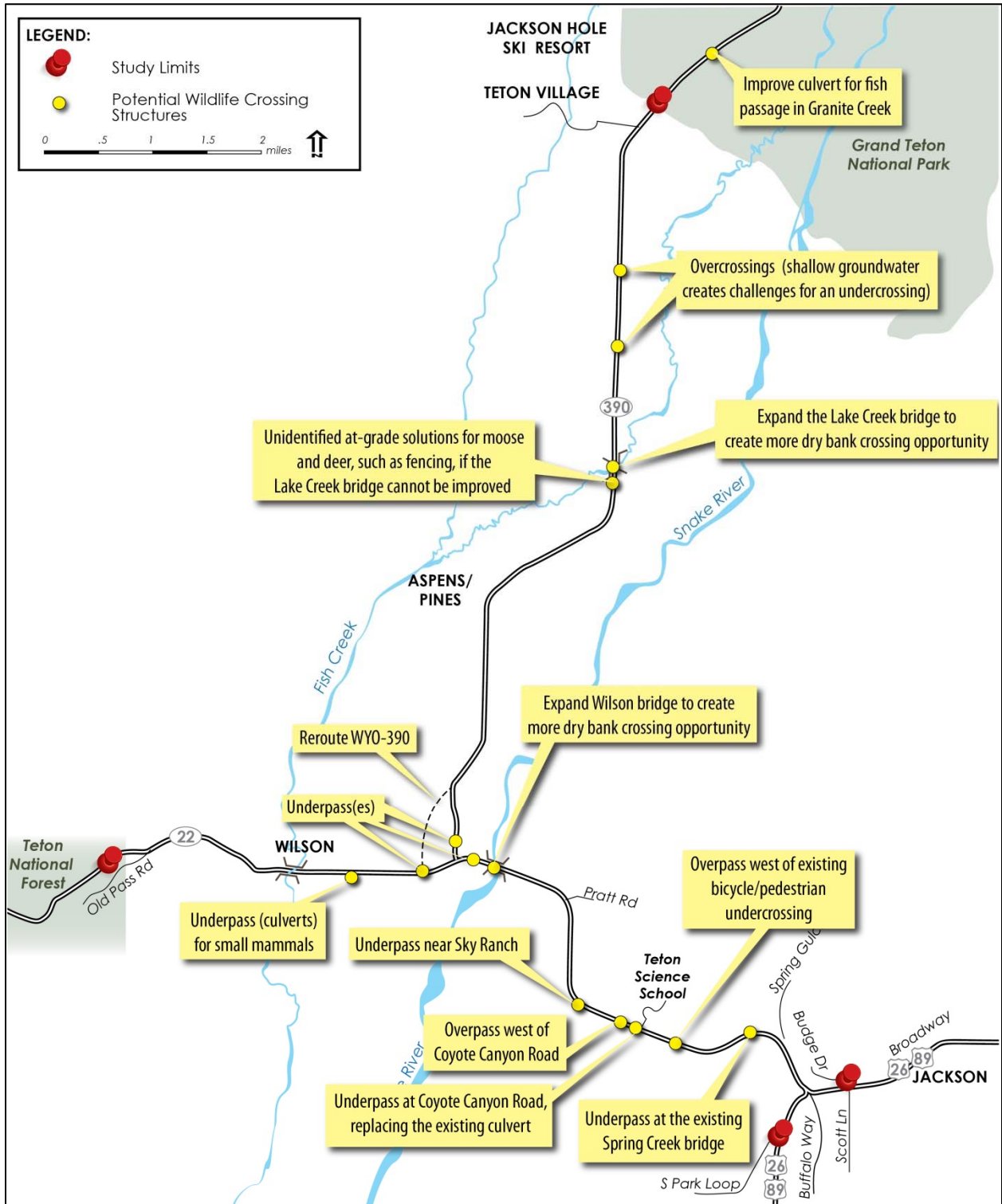
Based on the advantages and disadvantages presented above and on input from the public and TAC, the study team identified the following access and intersection control alternatives for WYO 390 between the WYO 22 junction and Aspens/Pines for future consideration:

- Roundabouts at Minor Intersections
- Additional U-turn Points (as needed)
- Divided Median with Right-in, Right-out Accesses

2.5.4 Wildlife Safety Alternatives

During Level 2 screening, the study team gathered further input from the TAC and the public to determine if any wildlife safety alternatives retained from Level 1 screening should be eliminated from consideration. The process did not result in any alternatives being screened out. This study recommends that any future studies and/or design projects fully evaluate wildlife crossing and other safety considerations. Potential wildlife crossings are presented in Figure 11.

Figure 11: Potential Wildlife Crossings



In addition to wildlife crossings, future studies should consider:

- Fencing
- Signage
- Seasonal speed reductions
- Automated speed detectors
- Vegetation management

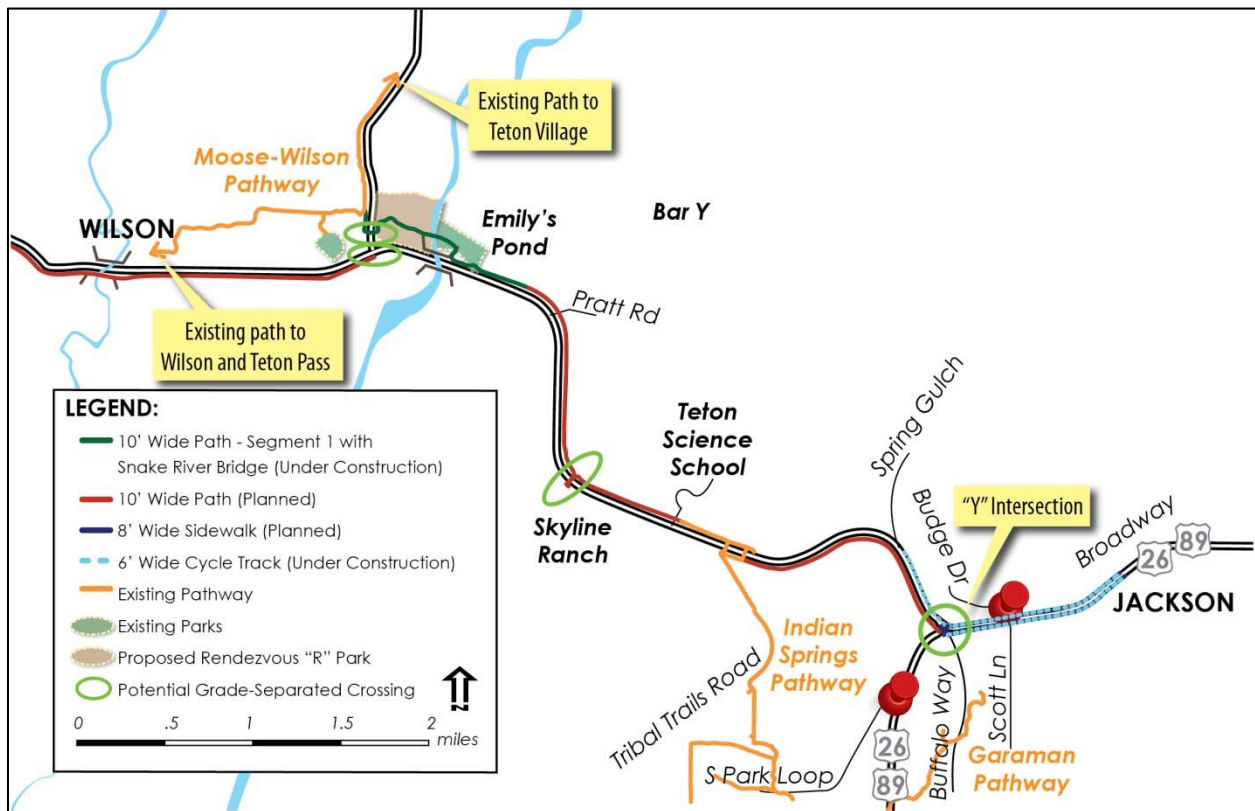
As future projects are developed, these alternatives from minor intersections will be further refined and considered, as will any new ideas resulting from innovations regarding reductions in wildlife and roadway conflicts.

2.5.5 Multimodal Improvements

Bicycle and Pedestrian

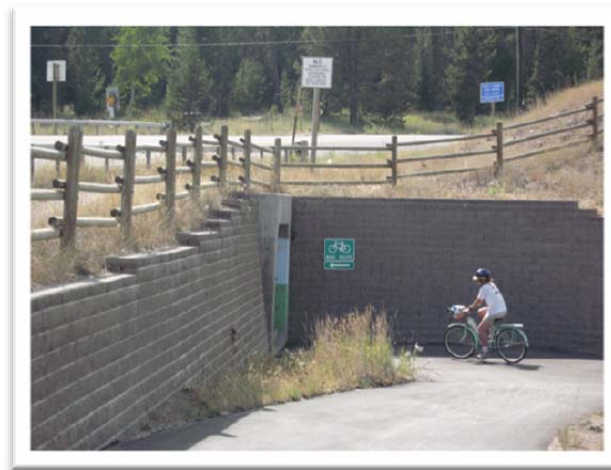
Figure 12 displays the existing and planned bicycle and pedestrian facilities in the study area.

Figure 12: Bicycle and Pedestrian Alternatives



During Level 2 screening, the study team determined that future studies and/or design projects should consider:

- Continue to reference the Path 22 Plan.
- Minimize the need to re-build existing infrastructure and infrastructure currently under construction.
- Continue to accommodate and supplement the Jackson Hole Community Pathway System:
 - Along WYO 390 (existing).
 - Along WYO 22 in Wilson and west of Wilson (existing).
 - Along WYO 22 between town and Spring Gulch Road (cycle track, under construction).
 - Across the Snake River on a new separate bicycle/pedestrian bridge, and also including a WYO 390 underpass (under construction).
- Consider grade-separated or activated signal crossings at the three major intersections in the study area.



Existing multi-use path

As future projects are developed, these options will be further refined and considered, as will any new ideas resulting from further study and public and stakeholder input.

Transit

During Level 2 screening, the study team determined that the recommendations from Level 1 screening should be included in future studies and/or design projects. These include the following:

- Consider queue jumps and transit signal priorities at major intersections.
- Consider new park-and-rides in the study area where appropriate.

Coordination with START should continue to design and fund potential improvements at intersections as projects develop.

2.6 CORRIDOR RECOMMENDATIONS

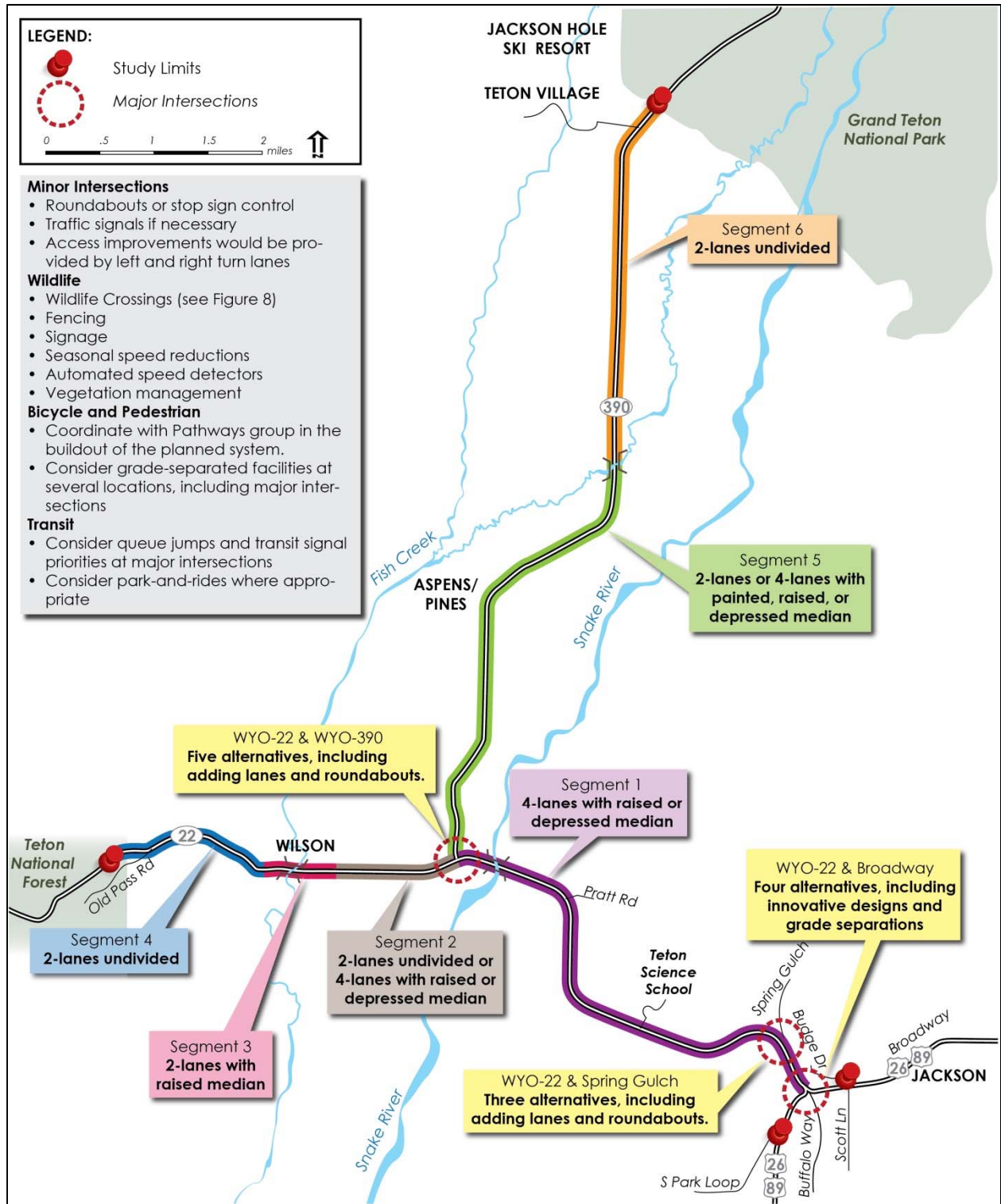
The results of the alternatives development and screening process are summarized in Table 12 and displayed in Figure 13 and are analyzed in Chapter 3.

Table 12: Summary of Recommended Alternatives

Roadway Cross-Section	Recommended Alternatives	
Segment 1	Four Lanes <ul style="list-style-type: none"> • Raised or depressed median • Standard-width shoulders • Turning lanes as needed 	
Segment 2	Two Lanes Undivided <ul style="list-style-type: none"> • Standard-width shoulders • Turning lanes as needed 	Four Lanes with Raised or Depressed Median <ul style="list-style-type: none"> • Standard-width shoulders • Turning lanes as needed
Segment 3	Two Lanes <ul style="list-style-type: none"> • Raised median (per Wilson charrette) • Standard-width shoulders • Turning lanes as needed 	
Segment 4	Two Lanes Undivided <ul style="list-style-type: none"> • Standard-width shoulders • Turning lanes as needed 	
Segment 5	Two Lanes with Painted, Raised, or Depressed Median <ul style="list-style-type: none"> • Painted median could be two-way left turn lane where access spacing requires • Standard-width or extra wide shoulders where appropriate 	Four Lanes with Painted, Raised, or Depressed Median <ul style="list-style-type: none"> • Painted median could be two-way left turn lane where access spacing requires • Standard-width or extra-wide shoulders where appropriate
Segment 6	Two Lanes Undivided <ul style="list-style-type: none"> • Standard-width or extra wide shoulders 	
Major Intersections	Recommended Alternatives	
WYO 22 and Broadway	Four intersection alternatives: <ul style="list-style-type: none"> • Inverted Continuous Flow Intersection • Inverted Continuous Flow Intersection with Three-lane Broadway • Modified Florida-T Intersection • Westbound Broadway Grade-Separated 	
WYO 22 and 390	Five intersection alternatives: <ul style="list-style-type: none"> • Additional Lanes • Continuous Flow Intersection • Florida-T Intersection • Reconfigured-T Intersection • Two-lane Roundabout with Slip Ramp 	
WYO 22 and Spring Gulch	Three intersection alternatives: <ul style="list-style-type: none"> • Additional Lanes • Florida-T Intersection • Two-lane Roundabout 	

Minor Intersections		Recommended Alternatives	
All Segments		<ul style="list-style-type: none"> • Roundabouts or stop sign control appropriate for future consideration • Traffic signals to be considered if necessary • Access improvements would be provided by left and right turn lanes as appropriate 	
Segment 5		<ul style="list-style-type: none"> • Roundabouts at minor intersection locations appropriate for future consideration. • Other U-turn points for consideration as needed. • Divided median with right-in, right-out accesses appropriate for future consideration. 	
Wildlife		Recommended Alternatives	
All Segments		<ul style="list-style-type: none"> • Wildlife crossings as summarized in Figure 11 • Fencing • Signage • Seasonal speed reductions • Automated speed detectors • Vegetation management 	
Bicycle and Pedestrian		Recommended Alternatives	
All Segments		<ul style="list-style-type: none"> • Coordinate with Jackson Hole Community Pathways to assist in the buildout of the planned system. • Consider grade-separated facilities at several locations, including the major intersections 	
Transit		Recommended Alternatives	
All Segments		<ul style="list-style-type: none"> • Consider queue jumps and transit signal priorities at major intersections • Consider new park-and-rides in the study area where appropriate 	

Figure 13: Summary of Corridor Recommendations





3 Existing Conditions and Environmental Consequences

This section describes those resources that could be affected by the proposed alternatives and the potential impacts that could result. Recommendations for further study during NEPA are provided. For purposes of this analysis, the study area is generally defined as 500 feet on either side of the highway corridors.

3.1 RESOURCES NOT EVALUATED

This PEL study only evaluated resources having the potential to influence the screening of alternatives. Resources not evaluated should be revisited during the NEPA process to determine if their analysis is required. These resources include the following:

Noise

Traffic noise levels in the study area would increase as traffic increases, regardless of whether the proposed alternatives are implemented. Also, short-term impacts would occur during construction. FHWA advocates using a “common-sense approach” to controlling noise impacts of construction equipment and activities. In addition, Best Management Practices (BMPs) could be incorporated to minimize the effect of construction noise on local residents and sensitive noise receptors. For these reasons, noise was not a factor in screening the alternatives.

Hazardous Materials

Roadway construction activities have potential for encountering hazardous materials or contaminated sites that may exist in the construction right-of-way (ROW). Four Resource Conservation and Recovery Act hazardous waste sites were identified in the study area. Three automotive facilities are located on West Broadway between WYO 22 and Scott Lane in Segment 1 (EPA 2013b). One of the intersection alternatives could possibly affect one of these facilities. The fourth site is an automotive repair facility near Wilson in Segment 5 that is outside the area of expected impacts and would not be affected by the build alternatives.

Utilities

Utilities are allowed joint use of the right-of-way of Wyoming’s highways (State of Wyoming 2001). Therefore, utilities that provide public services, such as gas and

electric lines, may conflict with roadway construction. A map from the area's public energy supplier (Lower Valley Energy) indicates the existence of gas and electric power lines along WYO 22 and 390 (LVE n.d.).

An overhead electric power line in Segment 1 is outside but roughly parallels the WYO 22 ROW for approximately 2.4 miles north of the Broadway intersection. From that point, the power line is within the WYO 22 ROW to the intersection with WYO 390, where the line then travels north along WYO 390. In Segments 2 through 4, a telephone line is intermittently present along WYO 22 from Green Lane to the western end of the study area on the south side of the highway.

Both telephone and overhead electric lines exist along WYO 390 in Segments 5 and 6. Telephone lines follow the west side of the Jackson Hole Community Pathway System, which parallels the west side of WYO 390 throughout most of Segments 5 and 6. In addition, overhead electric power lines parallel the east side of WYO 390 from WYO 22 north to Teton Village.

These utilities would be affected similarly by any of the proposed alternatives. Therefore, they were not a factor in screening the alternatives.

Social and Economic Conditions

None of the proposed alternatives are expected to induce traffic, and no new roadways would be built. Therefore, no changes to community cohesion would occur. Some changes to property values and local government revenue might occur due to right-of-way acquisition. Beneficial effects are expected to quality of life, mobility, and safety.

The intersection alternatives at WYO 22 and Broadway would affect access to commercial businesses in Segment 1, depending on the type of intersection selected. For any build alternative, short-term construction impacts would result, which could include detours, bypasses, and circulation changes.

Long-term operational impacts could result in changes to traffic patterns, property access, and/or changes to parking availability. Mitigation measures identified during the NEPA process will help reduce these types of impacts. These measures could include timing construction activities to reduce impediments to businesses during peak periods, or designing the intersection to avoid eliminating access to a business activity center.

Air Quality

Air quality is generally assessed by comparing concentrations of air pollutants within a study area to National Ambient Air Quality Standards (NAAQS), which are set by the Environmental Protection Agency (EPA) to protect human health and welfare. The Clean Air Act of 1970 identifies six "criteria" air pollutants that can be harmful to public health and the environment. Areas with concentrations of criteria pollutants that are below the NAAQS are considered in "attainment."

Teton County is in attainment for all criteria pollutants (EPA 2013a). No measurable long-term operational impacts to air quality are expected.

Air quality mitigation identified during the NEPA process may include dust suppression during construction; installation of equipment to reduce emissions from construction vehicles; sand sweeping as part of winter maintenance practices; and transportation control measures (TCMs), such as traffic signal optimization to improve traffic flow.

Vegetation

Vegetation growing within the existing highways' ROW is owned and maintained for safety and aesthetics by WYDOT. Proposed two-lane improvements would remove some vegetation to incorporate improvements, such as adding medians. Where additional ROW would be needed for four-lane improvements, more vegetation would be removed, consisting primarily of shrub/scrub, pasture/ hay, and grasslands. A revegetation plan could be developed to address vegetation disturbance, if needed.

Motor vehicles can spread noxious weeds, and ground disturbed by construction activities can become colonized by noxious weeds. Implementation of weed control best management practices would help control the spread of noxious weeds.

Vegetation would be affected similarly by any of the proposed alternatives. Therefore, it was not a factor in screening the alternatives.

3.2 LAND USE

Construction activities and roadway operations can affect current and future uses of adjacent land. A qualitative review of existing planning documents, land use and zoning maps, readily available geographic information systems (GIS) information, and aerial photography was used to identify current and proposed future land uses and assess how the alternatives could affect them.

Over the past several decades, Teton County and the Town of Jackson have experienced growth pressures. The county's population grew substantially from 1990 to 2000, increasing from 11,172 to 18,251. By 2010 the county's population reached 21,294, and the U.S. Census Bureau predicted a 2012 population of 21,675 (US Census Bureau 1990, 2000, 2010). The transportation component of the 2012 *Jackson/Teton County Comprehensive Plan* (comprehensive plan) reflects this trend, stating "traffic generated by present populations of residents and visitors is exceeding the capacity of the existing roadway network. Future traffic volumes . . . will far exceed the available roadway capacity." The 2006 *Grand Teton National Park Final Transportation Plan/Environmental Impact Statement* notes increased visitation and states that WYO 390 is increasingly being used as a through route (NPS 2006).

To address these transportation issues, the comprehensive plan stresses making more efficient use of the current roadway system without adding capacity. However, the plan also notes that "intersection and roadway improvements will still be required in some areas," including the following (Teton County 2012):

- A multilane “complete street” roadway on WYO 22 between Jackson and WYO 390. Complete streets are those that “safely accommodate all users of the public right-of-way, including pedestrians, cyclists, automobile drivers, trucks, and transit riders.
- Redesign of WYO 390 as a complete street from WYO 22 to Teton Village.

Most of the WYO 22 and 390 corridors are precluded from development because of land use and development restrictions. As Figure 14 shows, several large land tracts are held in land trusts and are therefore precluded from development in perpetuity.

Also, Teton County has developed “Zoning District Overlays” to address critical environmental, scenic, and tourism issues that cross multiple zoning districts. Overlay zoning provides additional standards to be met by development (Teton County 1994). Two overlays in the study area are the Scenic Resources Overlay (SRO) and the Natural Resources Overlay (NRO). The purpose of an SRO is to preserve and maintain the county’s most frequently viewed scenic resources that are important to both its character and economy. The purpose of an NRO is to protect the most important and sensitive natural areas throughout the county for numerous wildlife species². SROs are described under Section 3.6 Visual and Aesthetics, below. NROs are described under Section 3.10 Wildlife, below.

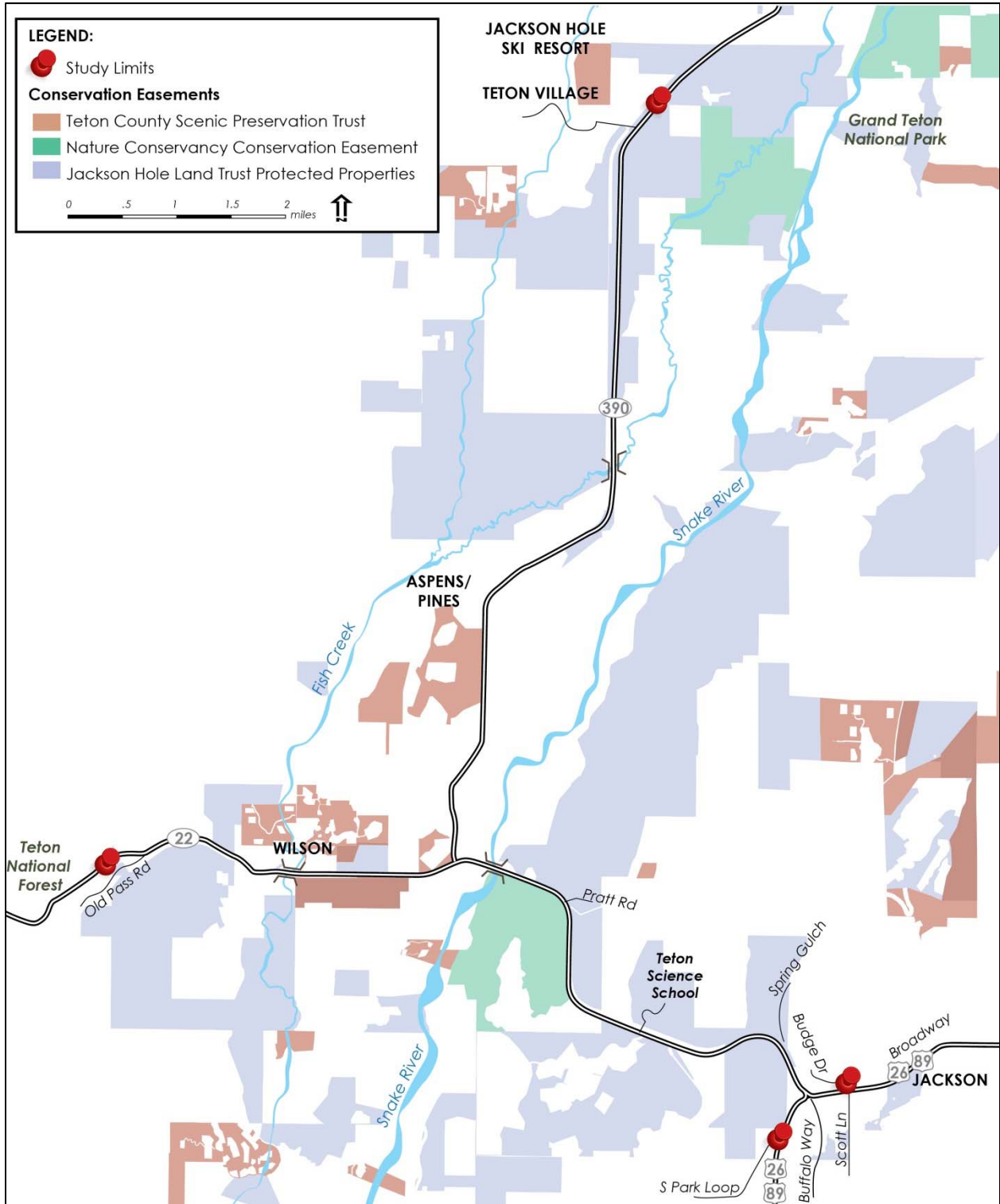


Land trusts adjacent to the highways

The proposed alternatives would support and begin to implement many of the goals Teton County has identified in its comprehensive plan. The proposed alternatives would make more efficient use of the existing roadways. Accommodating the multi-use paths that are currently under construction or planned (described under Parks and Recreation, below) would help contribute to the county’s vision for WYO 22 and 390. Transit infrastructure, safer intersections, and safe bike and pedestrian crossings proposed under this study would contribute to the vision for roadways “that safely accommodate all users.” The multi-use paths and transit infrastructure would address some of Grand Teton National Park’s transportation issues.

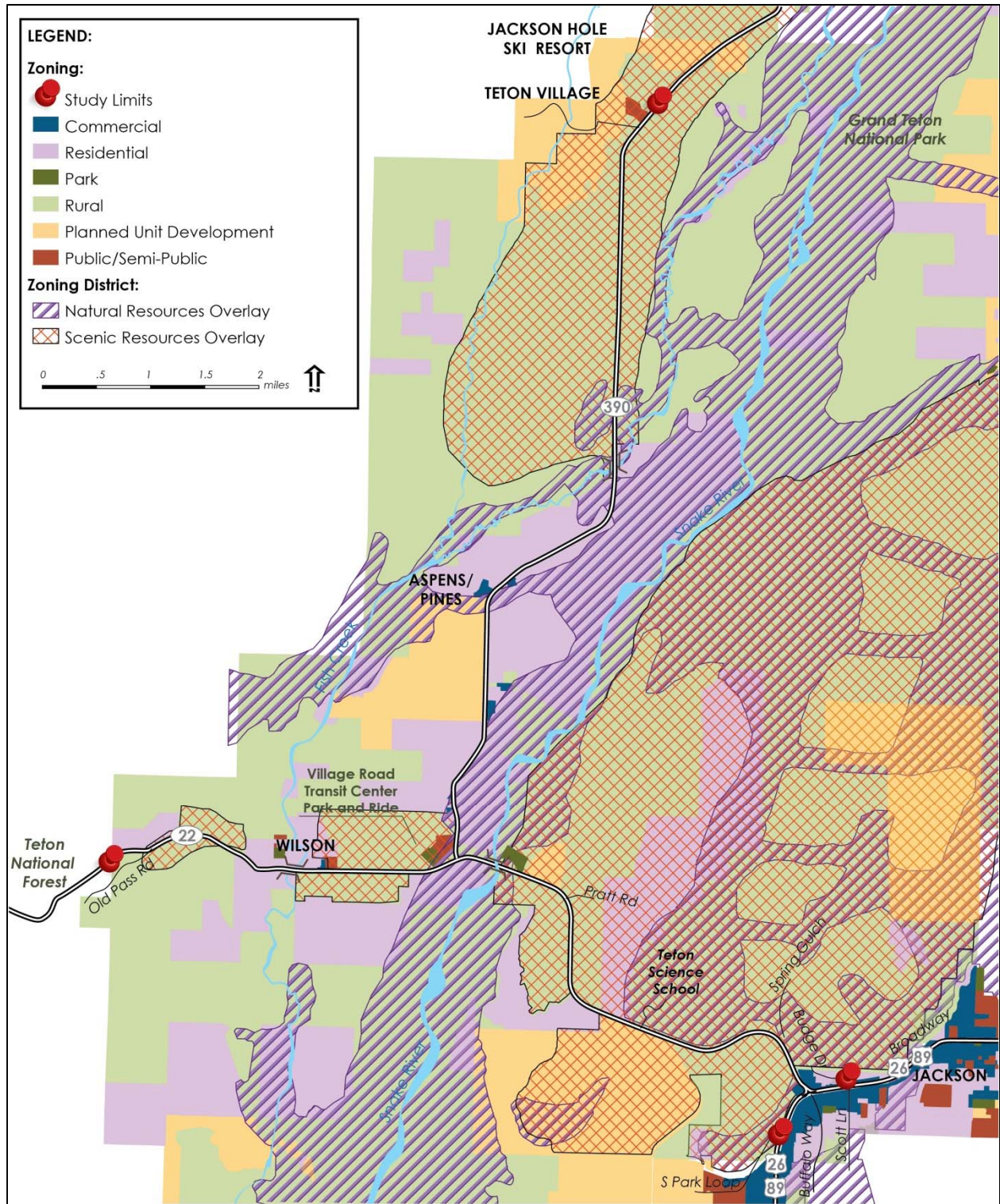
² Teton County requires an environmental analysis for certain types of development in an SRO or NRO. Development “within an approved project already received under Teton County’s Land Development Regulations” is exempt from preparation of such an environmental analysis (Teton County 2002).

Figure 14: Conservation Easements



Source: Teton County n.d.

Figure 15: General Zoning



Source: Teton County n.d.

3.2.1 Segment 1

Existing Conditions

The northwest corner of the intersection of WYO 22 and Broadway is zoned as an Auto-Urban Commercial District. The purpose of this district is to provide for commercial development oriented to the street that is easily accessed by automobiles, with adequate parking and pedestrian connections to adjoining developments (Teton County n.d., 1994). Commercial structures exist throughout this intersection, including a bank and a large grocery store, confirming a business-oriented land use.

Heading west, most of the land bordering WYO 22 within Segment 1 is zoned as Rural and held in land trusts, which preclude development. The highway provides access to some developed areas in this segment that are zoned as Planned Urban Development (PUD) and Single Family (Teton County n.d.).

Potential Impacts

The intersection alternatives for WYO 22 and Broadway would affect how commercial establishments at that location are accessed, discussed under Section 3.5 Transportation and Traffic, below. Despite access and circulation changes, land use at the intersection would generally remain commercial and unchanged from existing conditions. However, the Westbound Broadway Grade-Separated Intersection would need more right-of-way than other alternatives required to build the grade-separated facility. This intersection design may result in conversion of commercial land uses to transportation use. The Florida-T Intersection would have the fewest direct impacts, but would have the most indirect impacts along Buffalo Way.

Similarly, replacing the Spring Gulch Road intersection with any of the proposed intersection alternatives would convert adjacent land use to transportation use. Land on both sides of the proposed intersection is held in land trusts, which would continue to preclude development or other land use changes. Similar impacts are expected for the minor intersections proposed along the rest of this segment.

Widening WYO 22 to four lanes in Segment 1 might require some right-of-way and, if so, would convert adjacent land use (primarily Rural land held in land trusts) to highway use. Most of the land on both sides of the highway is held in land trusts, which would continue to preclude development or other land use changes.

3.2.2 Segment 2

Existing Conditions

Lands zoned as Single Family exist south of WYO 22 near its intersection with WYO 390. WYDOT has considerable ROW on the northeast corner of the WYO 22 and 390 intersection, as well as some on the southeast side.

Most of the lands in Segment 2 are zoned as Rural on both sides of WYO 22, some of which are held in land trusts, which preclude development (Teton County n.d.). Existing land uses in the area reflect this zoning.

Potential Impacts

Because WYDOT owns ROW on the east side of the WYO 22 and 390 intersection, most of the intersection alternatives likely would have minimal land use impacts. The 2-lane Roundabout with Slip Ramp would require conversion of some land on the west side of the intersection to transportation use.

Most improvements under the 2-Lane Alternative, such as medians, are not expected to require additional ROW. Widening the highway to four lanes to accommodate the wider ROW would require conversion of some lands to transportation use. The primary impact would be to lands zoned and used as Single Family residences on the south side of the highway near the eastern end of Segment 2.

3.2.3 Segment 3

Existing Conditions

Land zoned as Rural and held in land trusts border both sides of WYO 22 at the eastern end of Segment 3, and no development exists in these areas. The highway passes through developed areas in Wilson zoned as business, office, semi-public, and residential (Teton County n.d.). Wilson is an unincorporated community with a population of 1,482 (US Census 2010). Wilson's central core includes approximately 156 households, with working ranches nearby. WYO 22 is the primary route through Wilson and serves as its main commercial corridor. The 2012 *Jackson/Teton County Comprehensive Plan* states that "the design of the WYO 22 corridor is key to addressing all users of [Wilson's] commercial core." The plan identifies several actions centered around WYO 22, specifically focusing on pedestrian access. Many of these same concepts were identified in the 2001 *Wilson Community and Transportation Corridor Plan*, which includes a land use component (specifically, a mixed-use village) to help implement transportation-related goals. The plan includes a preferred alternative, which details specific design components, such as the number and width of travel lanes, turn lanes, bike lanes and shoulders, sidewalks and pathways, drainage ditches, medians, and an underpass (Teton County 2001, 2012). However, in its review of the preferred alternative, WYDOT noted specific design concerns related to implementation and maintenance:

- The width of the shoulders did not allow for two travel lanes during a lane closure for resurfacing.
- The median section may result in increased maintenance costs and the source of additional funding was not clear.
- WYDOT needs to ensure that the alternative would serve as a "20-year design" to justify the costs of reconstruction, which requires updated traffic forecasts.
- The section may not fit within the right-of-way after detailed drainage studies are done.

Although the WYDOT representative was unable to advocate a particular design until the planning process is complete, he accepted the preferred alternative as one

that can move forward in the environmental assessment process for Highway 22 (Teton County 2001).

Both the 2012 *Jackson/Teton County Comprehensive Plan* and the 2001 *Wilson Community and Transportation Corridor Plan* stress the need to preserve the area's rural character. However, the comprehensive plan "recognizes the potential for a highway design that will alter the character of Wilson and begin to balance the multiple needs of transportation corridors." Acknowledging the interdependence between land use and transportation, the amendment also describes land use strategies designed to positively impact the transportation system, such as creating mixed use areas (Collins et al. 2003).

Potential Impacts

Design elements proposed under this study are consistent with the preferred alternative discussed above, including pedestrian crossings, bus pullouts, raised medians, and separate pathways. This study also proposes a minor intersection at Fall Creek Road to improve safety, which the Wilson plan does not (Teton County 2001). Generally, Segment 2 alternatives would support the goals of Wilson's plan and incorporate many of its design elements.

Adding a minor intersection at Fall Creek Road would convert adjacent land uses to transportation use. As mentioned under 3.3 Right-of-Way, below, the *Wilson Community and Transportation Corridor Plan* notes that improving WYO 22 would result in a loss of parking for many commercial properties in central Wilson. In 2001, when that plan was completed, most property and business owners understood this need (Teton County 2001).

3.2.4 Segment 4

Existing Conditions

Property held in land trusts and zoned as Rural border the south side of WYO 22 west of Wilson in Segment 4, with smaller parcels north of the highway. An area zoned as Single Family exists on the north side of WYO 22 at the study area's western end (Teton County n.d.).

Potential Impacts

Adding a minor intersection at Old Pass Road would convert some land uses to transportation use. The land trusts that exist along the south side of the highway throughout Segment 4 would continue to preclude development or other land use changes. Other improvements to the highway are expected to remain within the existing two-lane ROW.

3.2.5 Segment 5

Existing Conditions

In Segment 5, WYO 390 passes through lands zoned primarily as Single Family, with some smaller areas zoned for Business. Aspens/Pines is a Master Planned Community west of the highway within Teton County Scenic Preserve Trust lands (Teton County n.d.), which would exclude further development. The Aspens/Pines

development has a residential component located north of Wilson on WYO 390. Development east of the highway consists of undeveloped land mixed with medium density housing to the south, and low density housing with some commercial establishments to the north. The 2012 *Jackson/Teton County Comprehensive Plan* identifies a need for a more cohesive character in this area “highlighted by better connectivity.” This includes connecting both sides of the highway to the commercial core with pedestrian infrastructure and increased START service. The plan also notes that “the highway corridor should be redesigned to be safe for all modes of travel” (Teton County 2012).

Potential Impacts

Alternatives proposed for Segment 5 would help address the issues identified in the comprehensive plan. All of these improvements would affect access to the single family housing that dominates the east side of WYO 390, as well as the PUD and commercial zones in the Aspens/Pines area on the west side. Access improvements in Segment 5 would help address Teton County’s desire for better connectivity between the different subareas and would help connect both sides of the highway to the commercial core.

Adding a minor intersection and additional turn lanes would require some land conversion to transportation use. Frontage roads would require more ROW than other access improvements. Similarly, widening WYO 390 to four lanes would require more property acquisition than the Two-Lane Alternative.

3.2.6 Segment 6

Existing Conditions

WYO 390 is primarily bordered by land trusts and zoned as rural in Segment 6. At the northern end of Segment 6, Teton Village is zoned as a planned resort. Accessed from WYO 390, Teton Village is a resort community dominated by lodging and visitor-oriented, non-residential uses. The village is a major employment center and economic driver for Teton County, particularly in winter. Teton County desires creation of a more “village feel” through the addition of a year-round community. The county expects that a base of full-time residences will reduce peak traffic on WYO 390. In the future, the village is expected to offer “improved circulation for pedestrians and vehicles, and enhanced public transit” (Teton County 2012). The Teton Village Master Plan approval requires that Teton Village implement a Travel Demand Management (TDM) plan to meet the long-term goal of maintaining acceptable traffic volumes and levels of service on WY-390, which could preclude future development should those goals not be met.

Potential Impacts

Adding a minor intersection at Teton Village Road would convert adjacent land use (which is zoned primarily Rural and held in land trusts) to transportation use. Other improvements to the highway likely could be constructed within the existing ROW. Land trusts that exist alongside the highway throughout Segment 6 would continue to preclude development.

3.2.7 Mitigation

The proposed alternatives would support the goals identified in area plans and would not alter the county's future land use planning along the corridors. Opportunities to minimize private property acquisition needed for transportation ROW should be identified as during future NEPA studies.

3.2.8 Future NEPA Considerations

Future NEPA processes should include coordination with Teton County planners. Plans and projects that are currently underway, including implementation of the 1998 *Teton Village Master Plan* and development of multi-use pathways, should be reviewed for updated information.

3.3 RIGHT-OF-WAY

Highway improvements often require acquisition of ROW. A review of existing planning documents, land use and zoning maps, readily available GIS information, and aerial photography was used to identify ROW ownership and issues, and assess how the proposed alternatives could affect ROW. The greatest ROW impacts are expected to occur at the three major intersection improvements and where the highways could be widened to four lanes.

3.3.1 Segment 1

Existing Conditions

A variety of commercial establishments exist at the intersection of WYO 22 and Broadway on private lands, including a bank and a large grocery store. Traveling west from the intersection, WYO 22 is currently a two-lane facility throughout its length, passing through primarily undeveloped land in Segment 1. The ROW width varies along WYO 22 throughout Segment 1, from 100 feet to 220 feet. The two narrowest sections are from the Broadway intersection to approximately one-quarter mile west and from Walton Ranch Road to 0.8 mile south, where the ROW is 100 feet wide.

Potential Impacts

Intersection alternatives at WYO 22 and Broadway would require additional ROW to varying degrees:

- The Continuous Flow Intersection would require additional ROW primarily on the north side of the intersection to incorporate additional lanes, with the biggest effect to commercial businesses on the northwest corner.
- The Florida-T Intersection would require some ROW, particularly south of the intersection, for the "continuous green movement" in one mainline direction. This design is expected to require the least amount of ROW.
- The Westbound Broadway Grade Separated Intersection would require the most ROW, including ROW farther east and west of the current footprint to accommodate the elevated westbound lane. This design would also require more ROW for access lanes, including a new one from Buffalo Way. In addition, the

alignment would be shifted more with this design compared to existing conditions, particularly on the east side of the intersection, requiring substantially more ROW on the north side of Broadway.

At Spring Gulch Road, the Additional Lanes Intersection would require minimal additional ROW for improving the intersection. The Florida-T Intersection would require more ROW for new lanes that would be separated from the main highway corridor. The 2-Lane Roundabout would require the most ROW to include the larger roundabout footprint. The biggest impact would be to lands held in trusts on the west side of the highway.

Widening WYO 22 to four lanes would require additional ROW, and would primarily impact lands held in trusts. Notable areas include:

- The east side of WYO 22 approximately 0.3 mile west of the Broadway intersection, where the existing ROW is 100 feet wide. In this area, earthwork needed for highway widening is expected to require more ROW.
- West of Vogel Road approximately one-half mile on the north side of WYO 22. A hillside adjacent to the road may require grading that would affect a considerable amount of trust lands.
- Additional trust lands on both sides of the highway traveling farther west to approximately milepost 2, where the ROW is current the narrowest, for widening to four lanes, particularly from Walton Ranch Road to 0.8 mile south.
- Small portions of private land on the north side of WYO 22 near the Snake River, where a side slope or retaining wall would be needed.

Acquiring property from land trusts for transportation use would complicate and lengthen the ROW acquisition process. Despite the public benefit of transportation projects, they can be fundamentally at odds with the purposes for which conservation easement are created.

3.3.2 Segment 2

Existing Conditions

Similar to Segment 1, WYO 22 is a two-lane facility passing through primarily undeveloped land. The ROW width in Segment 2 is 80 feet; however, WYDOT owns considerable ROW on the northeast corner of the WYO 22 and 390 intersection, as well as some on the southeast side. Lands on the northwest and southwest side of the intersection are privately held.

Potential Impacts

The Florida-T Intersection and the Additional Lanes Intersection would require the least amount of ROW overall because they would most closely follow the existing alignment. The Additional Lanes Intersection would have a slightly greater impact due to its width. The Reconfigured-T Intersection and Continuous Flow Intersection at the WYO 22 and 390 junction would have minimal impacts because WYDOT currently owns the ROW on the northeast corner. Some ROW impacts would occur

on the south side of the intersection on private land. The Two-lane Roundabout with Slip Ramp Intersection would require the most ROW overall due to the size of the roundabout footprint. This design would have less of an impact to WYDOT ROW but more impact to private land.

Additional ROW would be required for the minor intersections in Segment 2, as well as for widening WYO 22 to four lanes. Impacts would occur to private rural or residential landowners, and to land held in land trusts. Most improvements under the Two-Lane Alternative are not expected to require additional ROW.

3.3.3 Segment 3

Existing Conditions

Conservation lands abut the highway in Segment 3. WYO 22 ROW varies between 80 and 90 feet in Segment 3. In Wilson, the ROW is 80 feet. A variety of businesses and a few residences flank WYO 22 in Wilson.

According to the *Wilson Community and Transportation Corridor Plan* (2001), WYDOT ROW and/or easement ownership for WYO 22 through Wilson is uncertain, and easements may not exist at all in some portions of the corridor (Teton County 2001).

Potential Impacts

During public involvement activities for the 2001 *Wilson Community and Transportation Corridor Plan*, WYDOT indicated the need to acquire ROW to resolve outstanding easement issues and accommodate the WYO 22 cross-section desired by the community. The *Wilson Community and Transportation Corridor Plan* acknowledges this need, noting the importance of coordinating property redevelopment along WYO 22 with acquisition of ROW and/or easements for highway improvements. Improved access management was noted in the plan as necessary for addressing safety for all modes. Informal access management in the past has resulted in unrestricted access to parking lots from the highway. Shared driveway allowing consolidated access for all businesses in Wilson's core was identified for the preferred alternative. The plan also notes that access management (or the addition of defined driveways) and additional ROW would result in a loss of parking for many commercial properties in central Wilson and that most, if not all, property and business owners understood this to be a necessary effect of corridor improvements (Teton County 2001). Although impacts would occur within Wilson to acquire additional ROW, the community has indicated its willingness to do so to improve WYO 22. Some additional ROW would be required from business and residential owners, as well as some land trusts, to contain the improvements identified in the *Wilson Community and Transportation Corridor Plan*, many of which are also included in this study, such as wider medians.

Immediately west of Wilson, additional ROW would be needed for potential retaining walls or guardrails, affecting privately held land on the north side of WYO 22 in two locations.

3.3.4 Segment 4

Existing Conditions

The WYO 22 ROW in Segment 4 varies from 80 to 100 feet. WYO 22 passes through primarily undeveloped land in Segment 4 that is held in land trusts.

Potential Impacts

Additional ROW would be required in Segment 4 for the improved intersection at Old Pass Road. The greatest impact would occur to lands held in conservation trusts on both sides of WYO 22 where the elevation rises at the study area's western boundary. Other improvements to the highway are expected to remain within the existing ROW.

3.3.5 Segment 5

Existing Conditions

WYO 390 is currently a two-lane facility with a 150-foot ROW throughout its length. This ROW encompasses a multi-use path on the west and a transmission line on the east. Residences and businesses occur sporadically along the highway and are typically set back from the corridor.

Potential Impacts

Several additional minor intersections would be added to Segment 5, as well as new frontage roads and turn lanes. These elements would require new ROW for both the Two- and Four-Lane Alternatives, with substantially more needed for four lanes. Most of the impacts would be to private land owners, with some impacts to land trusts at the northern end of Segment 5.

3.3.6 Segment 6

Existing Conditions

Segment 6 is similar to Segment 5, but with few, if any, residences and businesses alongside the highway. The ROW for WYO 390 is 150 feet. Conservation lands flank one or both sides of WYO 390 throughout Segment 6.

Potential Impacts

Additional ROW would be required for the minor intersections in Segment 6. Impacts would primarily occur to private rural or residential landowners, or to land trusts. Other improvements to the highway are expected to occur within the existing ROW.

3.3.7 Mitigation

Mitigation measures should seek to avoid, minimize, and mitigate adverse property effects, particularly from sensitive properties such as land trusts. Any property acquisition required for ROW should conform to the requirements set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 and the Uniform Relocation Act Amendments of 1987.

3.3.8 Future NEPA Considerations

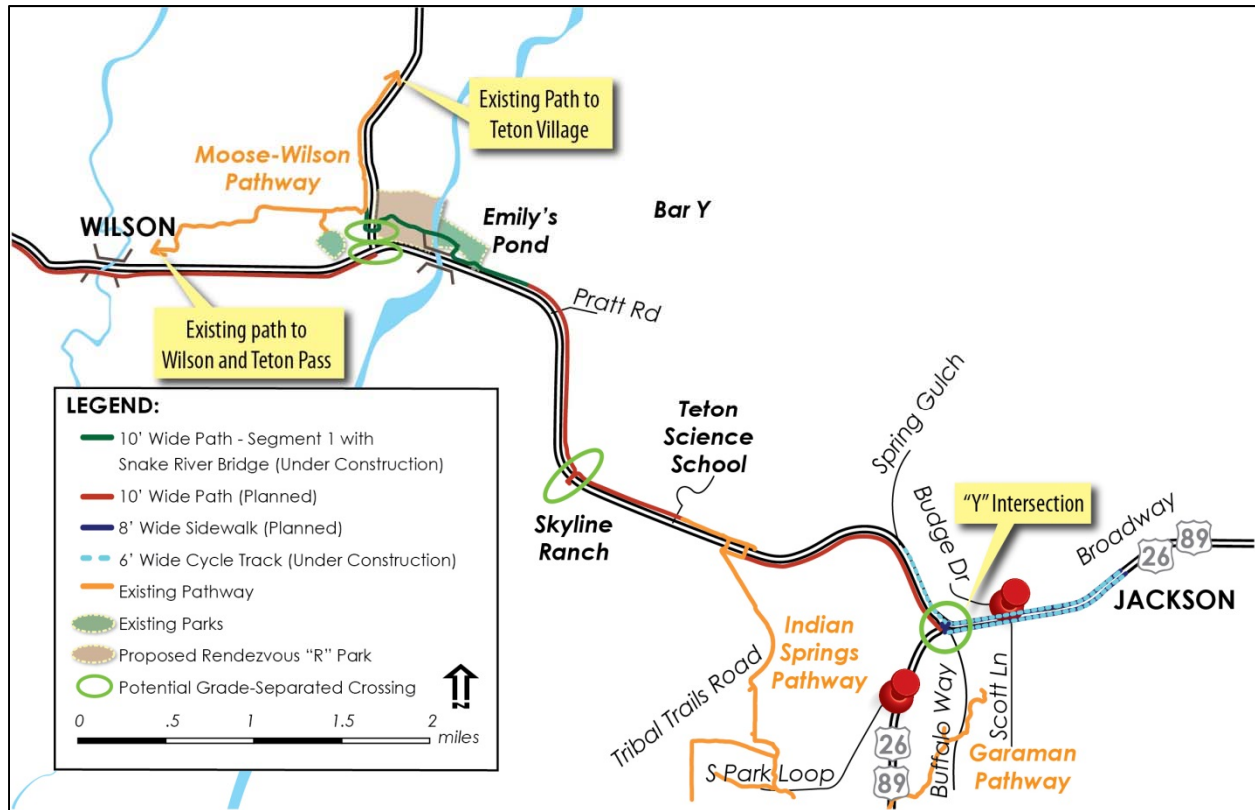
Future NEPA studies should identify future ROW needs through more detailed design and property mapping.

3.4 PARKS AND RECREATION

A qualitative review of existing planning documents, land use and zoning maps, readily available GIS information, and aerial photography was used to identify parks and recreation facilities, and assess how the proposed alternatives could affect these resources.

This review considered whether recreational properties might warrant protection under Section 4(f) of the Department of Transportation Act. Section 4(f) stipulates that FHWA and other Department of Transportation agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historic sites unless there is no feasible and prudent alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from use. Also, park lands developed with assistance from the Land and Water Conservation Fund are afforded protection. The Land and Water Conservation Fund (LWCF) Act of 1965 established a federal funding program to assist states in developing outdoor recreation sites. Section 6(f) of the act prohibits the conversion of property acquired or developed with these funds to a non-recreational purpose without the approval of the National Park Service (NPS 2008). A file search indicates no such funds were used on recreation facilities within the study area (NPS 2013).

Figure 16: Parks and Recreation Facilities



Source: Teton County n.d., 2013; Rendezvous Lands Conservancy n.d.

3.4.1 Segment 1

Existing Conditions

The southeast corner of Emily Steven’s Park abuts the WYO 22 ROW in Segment 1 just east of the Snake River (Teton County n.d.). This park is owned by Teton County Parks & Recreation and is accessed from Emily Stevens Road off WYO 22. The park offers park benches, off-street parking, a pond, and open space for recreational activities, and 3.0 miles of levee trails, which provide views of the Teton mountain range (Teton County Parks & Recreation 2013).

The Jackson Hole Community Pathway System includes a short detached section of a non-motorized multi-use path paralleling the north side of WYO 22 from Coyote Canyon Road east approximately 0.4 mile.

Potential Impacts

Widening the highway to four lanes could require use of Emily Steven’s Park unless the highway is shifted south. Use of this 4(f) site would be avoided and would only occur if there is no feasible and prudent alternative. Alternatives would be designed to encompass existing and future multi-use pathways along WYO 22, resulting in no impact to these facilities.

3.4.2 Segments 2 through 4

Existing Conditions

Stilson Park is an 8.5-acre park located just west of the junction of WYO 390 and WYO 22 in Segment 2, owned by Teton County Parks & Recreation. It is currently open space used for recreational activities, and is the site of future athletic fields (Teton County Parks & Recreation 2013). The park is accessible from both WYO 22 and WYO 390 via Beckley Park Way, which connects the two highways.

In Segments 2 and 3, a multi-use path exists north of but outside the WYO 22 ROW. A detached path parallels WYO 22 from Wilson west through Segment 4.

Potential Impacts

Improvements to WYO 22 in Segment 2 are not expected to require use of Stilson Park. The proposed intersection at Green Lane would improve safe access to and from the park. No impacts to existing and future multi-use pathways along WYO 22 are expected in Segments 2, 3, or 4.

3.4.3 Segments 5 and 6

Existing Conditions

A new park called the Rendezvous “R” Park is planned and being developed by the Rendezvous Lands Conservancy (RLC), a Wyoming nonprofit jointly created by Jackson Hole Land Trust and the LOR Foundation. As such, R Park is privately owned, operated, and maintained by RLC. The 40-acre open space park will be located across the Snake River from Emily’s Pond Recreation Area and adjacent to the Wilson Boat Launch access road at the intersection of WYO 22 and 390. The park is expected to be open to the public in 2014 (Rendezvous Lands Conservancy n.d.). Because the park will be privately owned, 4(f) provisions do not apply. However, WYDOT would work with RLC to minimize impacts to the extent possible.

In Segments 5 and 6, a detached pathway parallels the west side of WYO 390 from Stilson Ranch Road north to the study end point (Friends of Pathways 2009).

Potential Impacts

It is possible that improving and/or widening WYO 390 would require some ROW acquisition from the Rendezvous “R” Park, resulting in an adverse impact. Alternatives would be designed to include existing and future multi-use pathways along WYO 390, resulting in no impact to these facilities.

3.4.4 Mitigation

Future mitigation measures will include all possible planning to minimize harm to parks and recreation sites, including shifting the WYO 22 alignment to avoid Emily Steven’s Park in Segment 1.

3.4.5 Future NEPA Considerations

Ongoing coordination with area agencies should continue into the NEPA process. Plans for more parks, including the Rendezvous “R” Park, and development of multi-use pathways should be reviewed for updated information.

3.5 TRANSPORTATION AND TRAFFIC

3.5.1 Existing and Future Traffic

To evaluate existing and future conditions, the study team collected historic traffic data, existing roadway conditions, and transit service levels.

In general, the level of traffic in the study area has increased by approximately 2 percent per year for the last 20 years. Working under the assumption that traffic will continue to increase at a similar rate for the next 20 years, the WYDOT Traffic Program provided forecasts for each segment. These forecasts were assessed by the study team and TAC to determine their consistency with Town of Jackson and Teton County forecasts produced for their comprehensive plan. After this comparison, the TAC found the WYDOT traffic forecasts to be appropriate for use in this study as part of the alternatives development and screening process and impact evaluation. The study team recognizes that as projects are proposed, more detailed analyses should be conducted using the most recent traffic count data available and a review of new forecasts should be conducted with stakeholders again.

The existing counts and future projections for average summer weekday traffic for each segment are presented in Figure 5.

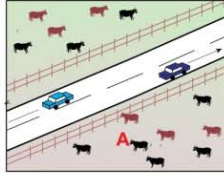
3.5.2 Level of Service

WYDOT’s Traffic Program used methods consistent with the Transportation Research Board’s 2010 *Highway Capacity Manual* to analyze existing conditions and future traffic impacts for the alternatives. For the highway segments, this involved the use of the Highway Capacity Software, and the Synchro software package was applied for intersection analyses. These analyses produce a measure of congestion called level-of-service, which assigns a letter-grade from A to F, with A representing uncongested conditions and F representing a roadway operating above capacity. Figure 17 and Figure 18 graphically display roadway conditions at each LOS grade, for highway segments and intersections, respectively. The following sections provide LOS designations for the study corridors.

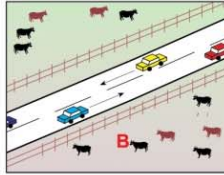
Figure 17: Roadway Segment Level of Service Definitions

**Roadway Segment
LOS Operating Characteristics**

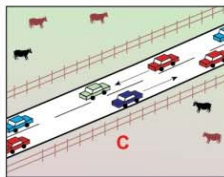
A Free flow, low traffic density, passing demand well below passing capacity, no platoons of three or more vehicles, drivers delayed less than 30% of time by slow moving vehicles.



B Minimum delay, stable traffic flow, passing demand equals passing capacity, drivers delayed up to 45% of time by slow moving vehicles.

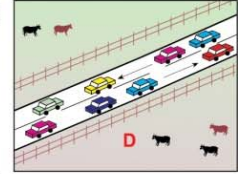


C Stable condition, movements somewhat restricted due to higher volumes, but not objectionable for motorists, noticeable increases in platoon formation, size, and frequency, percent time delays up to 60%.

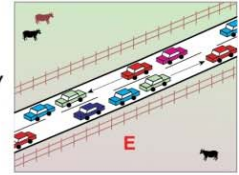


**Roadway Segment
LOS Operating Characteristics**

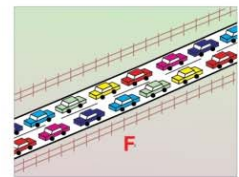
D Movements more restricted, passing demand is very high while passing capacity approaches zero, platoon sizes of 5 to 10 vehicles are common, turning vehicles cause "shock-waves" in traffic stream, percent time delays approach 75%.



E Actual capacity of the roadway, involves delay to over 75% of motorists, passing is virtually impossible, platooning becomes intense.



F Forced flow with demand volumes greater than capacity resulting in severe congestion, no passing opportunities and long platoons.

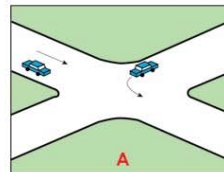


(1) Based on information from Highway Capacity Manual, Transportation Research Board

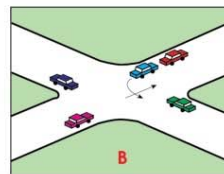
Figure 18: Intersection Level of Service Definitions

**Intersection Segment
LOS Operating Characteristics**

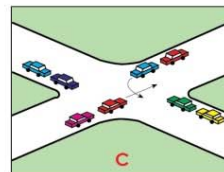
A No vehicle waits longer than one stop or signal indication.



B On a rare occasion, vehicles wait through more than one stop or signal indication.

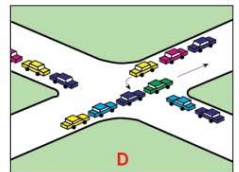


C Intermittently, vehicles wait through more than one stop or signal indication, occasionally backups may develop, traffic flow still stable and acceptable.

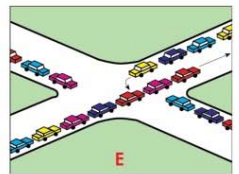


**Intersection Segment
LOS Operating Characteristics**

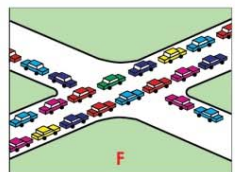
D Delays at intersections may become extensive but enough cycles with lower demand occur to permit periodic clearance, preventing excessive backups.



E Very long queues may create lengthy delays.



F Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a "gridlock" condition.



(1) Based on information from Highway Capacity Manual, Transportation Research Board

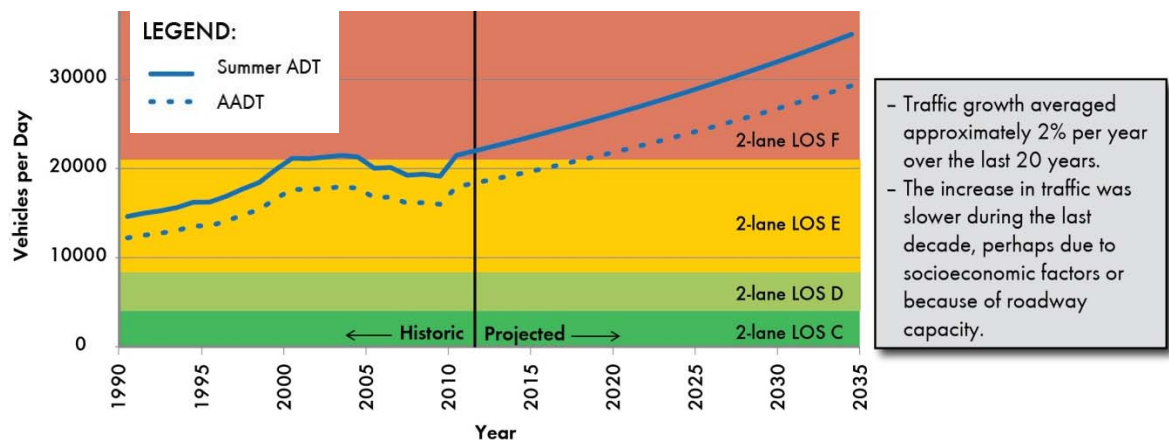
3.5.3 Segment 1

Existing Conditions

WYO 22 between Broadway and WYO 390 is primarily a two-lane undivided highway, with a short four-lane segment on its east end. It traverses flat terrain amidst rolling hills. The posted speed outside of Jackson is 55 miles per hour (45 mph during winter), and 45 mph approaching the junction with WYO 390. There is a signalized intersection at Spring Gulch Road. Some minor intersections and private driveways occur along this section, with short turn lanes provided at a limited number of locations. Shoulders are typically 8 feet wide in Segment 1. The highway in Segment 1 crosses the Snake River; the 884-foot bridge has narrow 4-foot shoulders and sidewalks and is not built to current standards. Bus service with limited stops serves Segment 1. The bus operating plan has seasonal variations.

Segment 1 experiences the highest level of travel demand in the study area, with the exception of Broadway. Figure 19 shows historic traffic data and projected conditions, as well as the LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Segment 1 traffic has been at or near capacity (LOS E/F threshold) for several years.

Figure 19: Segment 1 Historic and Future Traffic



Potential Impacts

As shown in Figure 19, travel demand along Segment 1 is expected to increase over the next 22 years. Because Segment 1 is already at or near its practical vehicular capacity, any additional travel demand is projected to cause additional delay and would result in poor LOS and considerable queuing.

The recommended cross-section for Segment 1 is four lanes with a divided median (either depressed or raised), and standard-width shoulders. Increasing the capacity of the roadway would improve operations for Segment 1 from LOS F to D throughout the year. Incorporating auxiliary turn lanes and minor intersection improvements, where warranted, would enhance the safety performance of the segment and would reduce delay for cross-street traffic. Other safety improvements along Segment 1

would focus on wildlife-vehicle conflicts, sharp curves, and intersection improvements where necessary.

Bicycle and pedestrian recommendations include the buildout of the 2007 *Pathways Master Plan*, including a detached pathway on the south side, and potential crossings at key locations. A detached pathway and additional grade-separated crossings would improve connectivity, safety, and mobility for bicyclists and pedestrians.

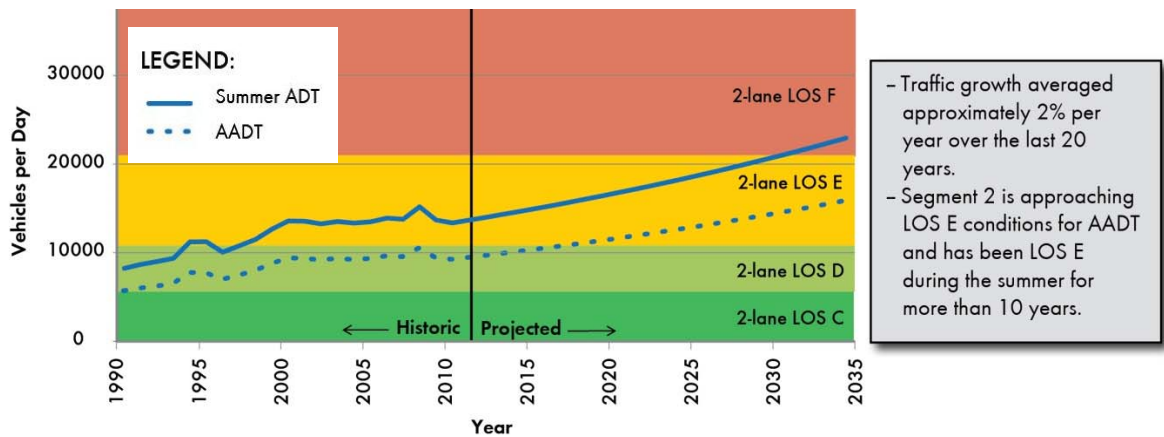
3.5.4 Segment 2

Existing Conditions

WYO 22 between WYO 390 and Wilson is primarily a two-lane undivided highway traversing flat terrain. The posted speed is 45 miles per hour (mph). Segment 2 includes three minor intersections, with short turn lanes provided at a limited number of locations. Typical shoulder widths are slightly sub-standard (approximately 7 feet wide) in Segment 2.

Segment 2 experiences slightly less travel demand than Segment 1. Figure 20 shows historic traffic data and projected conditions, as well as LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Segment 2 traffic has been operating at LOS E in the summer for more than 10 years.

Figure 20: Segment 2 Historic and Future Traffic



Potential Impacts

As shown in Figure 20, travel demand along Segment 2 is expected to increase over the next 22 years. Already operating at LOS E in the summer, the additional traffic is projected to cause additional delay and would result in poor LOS and considerable queuing.

The recommended cross-section for Segment 2 is either two lanes undivided or four lanes with a divided median (either depressed or raised), and standard-width shoulders. Increasing the capacity of the roadway to four lanes would improve operations for Segment 1 from LOS F to C throughout the year. Incorporating auxiliary turn lanes and minor intersection improvements, where warranted, would enhance the safety performance of the segment and would reduce delay for cross-

street traffic. Other safety improvements along Segment 2 would focus on wildlife-vehicle conflicts and intersection improvements where necessary. Such improvements would generally improve the safety performance for the segment.

Bicycle and pedestrian recommendations include the buildout of the 2007 *Pathways Master Plan*, including a detached pathway on the south side, and a potential crossing near the WYO 22 and 390 intersection. A detached pathway and additional grade-separated crossings would improve connectivity, safety, and mobility for bicyclists and pedestrians.

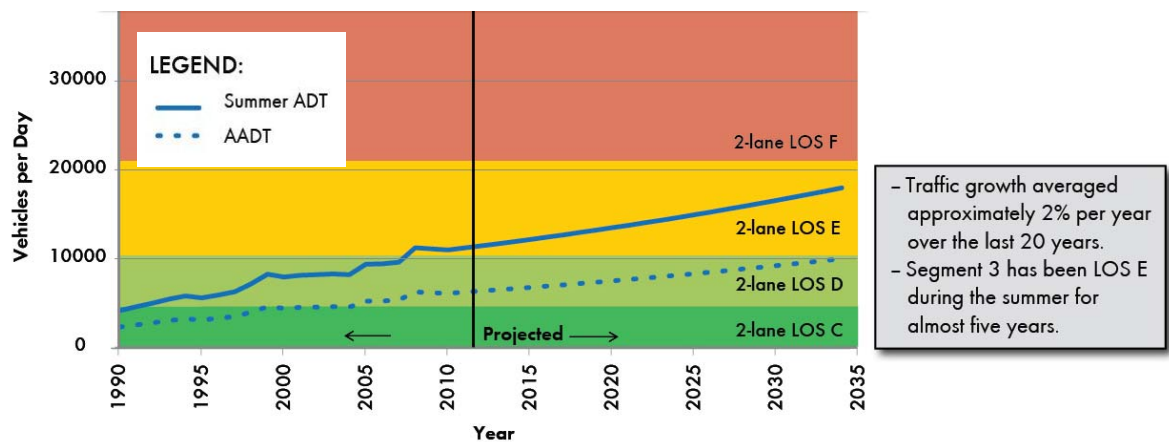
3.5.5 Segment 3

Existing Conditions

WYO 22 through the community of Wilson is primarily a two-lane undivided highway. The posted speed is 40 mph and 25 mph within the center of town. There are minor intersections, private driveways, and open access to parking lots of commercial businesses. A high amount of pedestrian activity occurs along and across the highway. A center turn lane is provided at Fall Creek Road. Shoulders are typically 5 feet wide, with short sections of 4 feet or less.

Segment 3 experiences slightly less travel demand than Segment 2. Figure 21 shows historic traffic data and projected conditions, as well as the LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Traffic in Segment 3 has been operating at LOS E in the summer for almost five years.

Figure 21: Segment 3 Historic and Future Traffic



Potential Impacts

An increase in travel demand along Segment 3 is projected to cause additional delay and would result in poor LOS.

The recommended cross-section for Segment 3 is two lanes with a raised median and standard-width shoulder. Provision of turn lanes at minor intersections and major accesses would improve operations for Segment 3 and reduce turn conflicts with through traffic. A two-way-left-turn lane would also be appropriate where access

spacing is tight. These improvements are consistent with findings in the 2001 *Wilson Land Use and Transportation Corridor Study Charrette Report*.

These recommendations would enhance the safety performance of the segment and would reduce delay for cross-street traffic. Other safety improvements along Segment 3 would focus on wildlife-vehicle conflicts, minor intersection improvements, and/or access consolidation and management to generally improve the safety performance for the segment.

Bicycle and pedestrian recommendations include the buildout of the 2007 *Pathways Master Plan* and potential crossing treatments at key locations, which would improve connectivity, safety, and mobility for bicyclists and pedestrians.

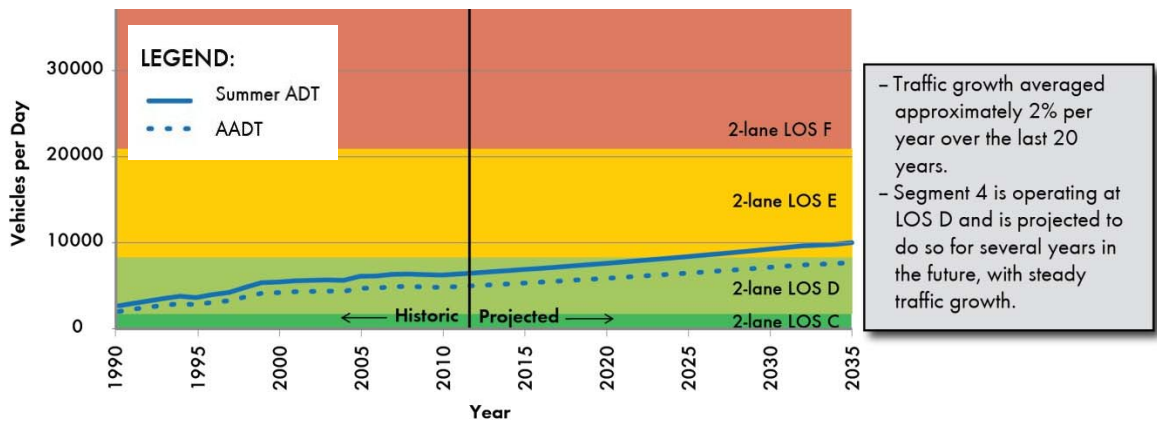
3.5.6 Segment 4

Existing Conditions

WYO 22 between Wilson and Teton National Forest is primarily a two-lane undivided highway, traversing mountainous terrain. The posted speed is 55 mph. Segment 4 includes some minor intersections and private driveways. Shoulders are typically 5 feet wide in Segment 4, with short segments of 4 feet or less. A separate multi-use path parallels the south side of the highway for the majority of its length in Segment 4.

Segment 4 experiences the lowest travel demand in the study area. Figure 22 shows historic traffic data and projected conditions, as well as the LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Segment 4 traffic has been operating at LOS D for several years.

Figure 22: Segment 4 Historic and Future Traffic



Safety concerns include steep grades and narrow shoulders, especially for heavy vehicles traveling downhill into Wilson. Heavy vehicle limits are in place but are often ignored for travel from Idaho over the pass. Runaway trucks have been an issue along this segment. Another safety issue on this segment is the interaction between pedestrian recreationists and motorists. Informal car shuttles to the top of

the pass occur along this segment during winter months, and passenger pickups can create hazards on the narrow shoulders.

Potential Impacts

As shown in Figure 22, travel demand along Segment 4 is expected to increase over the next 22 years. The segment is expected to operate at LOS D for several years.

The recommended cross-section for Segment 4 is two lanes, undivided with standard-width shoulders. Increasing the shoulder width of the roadway would improve safety conditions for Segment 4 and would allow for some redundancy during maintenance and other disruptions.

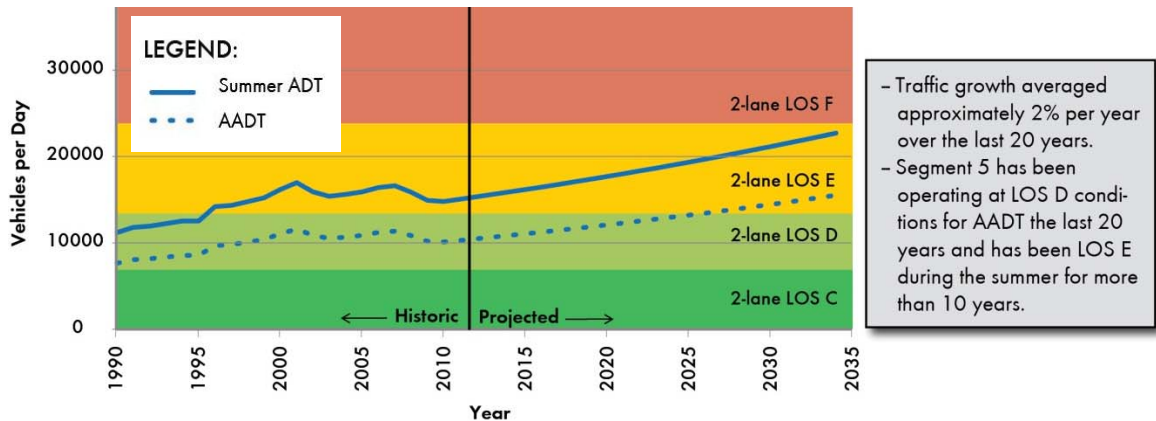
Other safety improvements along Segment 4 would focus on heavy vehicle infrastructure, such as runaway truck ramps, and addressing wildlife-vehicle conflicts and the recreationist car shuttle issues. Such improvements would generally improve the safety performance for the segment.

3.5.7 Segment 5

Existing Conditions

WYO 390 between WYO 22 and Lake Creek is primarily a two-lane undivided highway. It traverses flat terrain amidst forest. The posted speed is 45 mph (35 mph at night) and 55 mph north of Aspens/Pines. Segment 5 includes numerous minor intersections and numerous private driveways, with short turn lanes provided at a limited number of locations. Shoulders are typically substandard, varying from 4 to 8 feet wide. The highway in Segment 5 crosses Lake Creek on a new bridge constructed in 2003. Bus service with limited stops serves Segment 5; the bus operating plan has seasonal variations. A separate multi-use path parallels the highway to the west.

Segment 5 experiences high levels of travel demand. Figure 23 shows historic traffic data and projected conditions, as well as the LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Traffic in Segment 5 has been operating at LOS D throughout the year for the last 20 years, and at LOS E in the summer for more than 10 years.

Figure 23: Segment 5 Historic and Future Traffic


Potential Impacts

As shown in Figure 23, travel demand along Segment 5 is expected to increase over the next 22 years. Because Segment 5 is already operating at LOS E during the summer, any additional travel demand is projected to cause additional delay and would result in poor LOS and considerable queuing. Traffic will be monitored as the decision-making process proceeds for Segment 5 to determine the appropriate cross-section. The County's plan to implement TDM strategies may slow traffic growth in this segment to allow the deferral of widening of this segment for the foreseeable future. Teton Village monitors traffic on WYO 390 as part of its TDM program, which was established as part of the Teton Village Master Plan approval and is designed to help evaluate the effectiveness of Teton Village's TDM plan to determine if the resort is meeting the long-term goal of maintaining acceptable traffic volumes and levels of service on WYO 390.

With that in mind, the recommended cross-section for Segment 5 is either two lanes or four lanes with a divided median and standard-width shoulders. Increasing the capacity of the roadway to four lanes would improve operations for Segment 5 from LOS F to C throughout the year.

Incorporating auxiliary turn lanes and minor intersection improvements, where warranted, would enhance the safety performance of the segment and would reduce delay for cross-street traffic. Because access spacing is very frequent and directly affects operations along Segment 5, additional measures to control access were identified in order to improve operations, as an alternative to, or in addition to, widening. Such strategies would require further evaluation as part of a subsequent study, but would likely have impacts to local businesses and residents, such as out-of-direction travel and right-of-way, and potential confusion for unfamiliar motorists. The benefits of such strategies would be:

- Better through traffic operations;
- Safer conditions by limiting driveway conflict points;
- Potential to install traffic calming treatments, such as roundabouts.

Other safety improvements along Segment 5 would focus on wildlife-vehicle conflicts and sharp curves, as well as intersection improvements where necessary, to generally improve the safety performance for the segment.

Bicycle and pedestrian recommendations for Segment 5 include the provision of crossing treatments at key locations to improve connectivity, safety, and mobility for bicyclists and pedestrians.

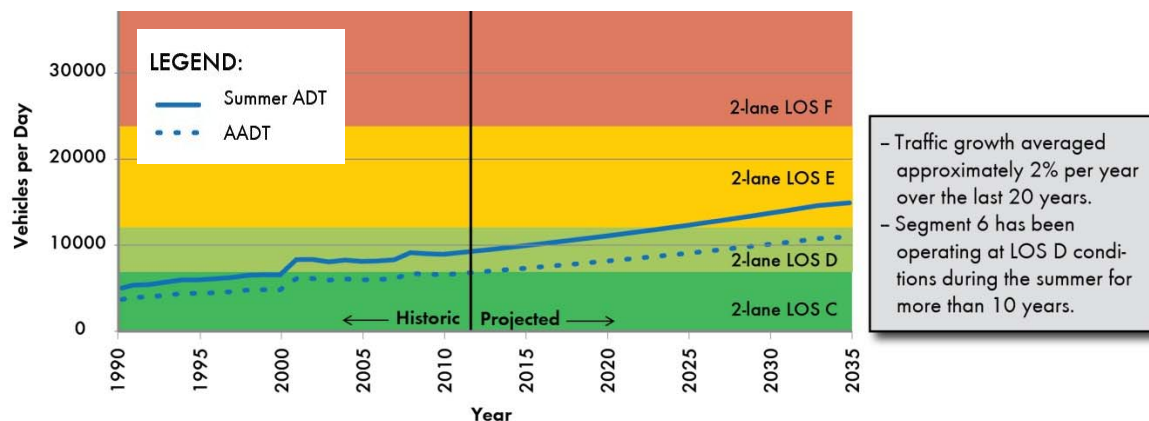
3.5.8 Segment 6

Existing Conditions

WYO 390 between Lake Creek and Grand Teton National Park is primarily a two-lane undivided highway, traversing flat terrain. The posted speed is 55 mph. Segment 6 includes a limited number of minor intersections and private driveways. Shoulders are typically 4 feet wide in Segment 6, with short sections of 3 feet or less. The highway in Segment 6 crosses Granite Creek; the arch pipe structure is not in need of replacement. Bus service travels along Segment 6 to serve Teton Village; the bus operating plan has seasonal variations. A separate multi-use path parallels the highway to the west.

Segment 6 experiences relatively low levels of travel demand in the study area. Figure 24 shows historic traffic data and projected conditions, as well as the LOS for the segment based on traffic demand and on its specific existing roadway characteristics. Segment 6 traffic has been operating at LOS D in the summer for more than 10 years). The Teton Village Master Plan approval requires that Teton Village implement a Travel Demand Management (TDM) plan to meet the long-term goal of maintaining acceptable traffic volumes and levels of service on WY-390, which could preclude future development should those goals not be met.

Figure 24: Segment 6 Historic and Future Traffic



Potential Impacts

As shown in Figure 24, travel demand along Segment 6 is expected to increase over the next 22 years. The segment is expected to operate at LOS D for several years.

The recommended cross-section for Segment 6 is two lanes, undivided with standard-width shoulders. Increasing the shoulder width of the roadway would improve safety conditions for Segment 4 and would allow for some redundancy during maintenance and other disruptions.

Incorporating auxiliary turn lanes and minor intersection improvements, where warranted, would enhance the safety performance of the segment and would reduce delay for cross-street traffic. Other safety improvements along Segment 6 would focus on wildlife-vehicle conflicts and intersection improvements where necessary to generally improve the safety performance for the segment.

3.5.9 Major Intersections

Three major intersections were identified for detailed evaluation. These intersections are all currently signalized and operate at LOS D. They are discussed in detail below.

WYO 22 and Broadway

Existing Conditions

The intersection of WYO 22 and Broadway, informally known as the “Y,” is a major gateway junction on the southeast side of Jackson. It is a four-way signalized intersection with the following approach laneage characteristics:

- Two through lanes and single left turn lanes in each direction, and separated eastbound and westbound right turn lanes on Broadway
- Single left and left/through lane and a separated right turn lane on WYO 22
- Single left, through, and right turn lanes on Buffalo Way

This intersection is congested during peak hours and currently operates at LOS D, with some movements at LOS F. Navigation of the intersection by pedestrians and bicyclists can be difficult due to the traffic volumes and geometric conditions.

Potential Impacts

Travel demand for this intersection is projected to increase at approximately the same rate as the surrounding roadways — nearly 2 percent per year. This would result in severe congestion at this location, with long queues and substantial delay.

The recommended alternatives include innovative intersection designs, such as continuous flow intersections, closure or conversion to right-in, right-out of the Buffalo Way section, and grade separations. These improvements would all accommodate the projected travel demand and would operate at LOS D or better. Table 13 shows the intersection LOS and worst movement volume-to-capacity ratios³ for each of the recommendations.

³ The worst movement volume-to-capacity ratio of an intersection is among the intersection’s approach movements, the approach with the worst volume-to-capacity ratio.

Table 13: WYO 22 and Broadway Level of Service Impacts

Alternative	LOS	Worst Movement Volume-to-Capacity Ratio
Inverted Continuous Flow	C	0.98
Inverted Continuous Flow with 3-lane Broadway	B	0.91
Modified Florida-T with Restricted Buffalo Way	C	0.91
Westbound Broadway Grade-Separated	D	1.03

In general, the Westbound Broadway Grade-Separated Intersection would provide better vehicular safety performance than the other alternatives by removing a major movement from the intersection and reducing the number of conflict points.

The alternatives proposed at the intersection of WYO 22 and Broadway would affect access conditions to commercial establishments at that location, as follows:

- Both Inverted Continuous Flow Intersection options would introduce a new two-way traffic lane at the northwest and northeast corners, separate from the main WYO 22 corridor. These lanes would affect access to commercial businesses on the north side of the intersection from all travel directions.
- The Florida-T Intersection would eliminate access from Buffalo Way. Access would still be provided to businesses on the south side of Broadway, but those that are accessed from Buffalo Way would be affected. This option would have the fewest direct impacts at the intersection, but would have the most indirect impacts to land use along Buffalo Way.
- The Westbound Broadway Grade Separated Intersection would impede access to the adjacent businesses for both east- and west-bound traffic, particularly for westbound traffic that would be elevated above Broadway. This option would also create a barrier for pedestrians accessing commercial businesses and would likely result in the most impacts due to the extent of the footprint required to build the grade separated facility.

Subsequent studies of these intersection alternatives should include evaluation of pedestrian and bicycle facilities, including potential grade-separated crossings. Each of these intersection alternatives would present barriers to pedestrian and bicycle movements, but construction of any alternative would present an opportunity to address these impacts directly and concurrently, and could result in improved environments for all users. Additionally, re-construction of this intersection would present an opportunity to provide transit infrastructure in the form of queue jumps and/or signal priorities, working in coordination with START.

WYO 22 and WYO 390

Existing Conditions

The intersection of WYO 22 and WYO 390 is a three-legged signalized intersection with the following approach laneage characteristics:

- Single through lanes, a single eastbound left turn lane, and a separated westbound right turn lane on WYO 22

- A single left and single right turn lane on WYO 390

This intersection is congested during peak hours and currently operates at LOS D, with the eastbound left movement at LOS F. Navigation of the intersection by pedestrians and bicyclists can be difficult due to the traffic volumes and geometric conditions, and a lack of sidewalks, crosswalks, and paths.

Potential Impacts

Similar to the WYO 22 and Broadway intersection, travel demand for this intersection is projected to increase at approximately two percent per year. This would result in increased congestion, with long queues and substantial delay.

The recommended alternatives include additional lanes, reconfiguring the intersection, or conversion to a roundabout. These improvements would all accommodate the projected travel demand and would operate at LOS D or better. Table 14 shows the intersection LOS and worst movement volume-to-capacity ratios⁴ for each of the recommendations.

Table 14: WYO 22 and WYO 390 Level of Service Impacts

Alternative	LOS	Worst Movement Volume-to-Capacity Ratio
Additional Lanes	C	0.95
Continuous Flow	C	0.92
Florida-T	C	0.97
Reconfigured-T	C	0.97
2-lane Roundabout with Slip Ramp	C	0.81

In general, the roundabout would provide the best vehicular safety performance of the three alternatives, followed by the Florida-T intersection. This is due to a reduction in the number and severity of conflict points.

Subsequent studies of these intersection alternatives should occur as described for the WYO 22 and Broadway Intersection. Barriers and opportunities related to pedestrian and bicycle movements and transit infrastructure would also exist as described for the WYO 22 and Broadway Intersection.

WYO 22 and Spring Gulch

Existing Conditions

The intersection of WYO 22 and Spring Gulch Road is a three-legged signalized intersection with the following approach laneage characteristics:

- Single through lanes, a single eastbound left turn lane, and a separated westbound right turn lane on WYO 22
- A single left and single right turn lane on Spring Gulch Road

⁴ The worst movement volume-to-capacity ratio of an intersection is among the intersection’s approach movements, the approach with the worst volume-to-capacity ratio.

This intersection currently operates at LOS D. Some motorists experience substantial delay for turning movements.

Potential Impacts

Like the other two major intersections, travel demand for this intersection is projected to increase at approximately two percent per year. This would result in increased congestion, with longer queues and substantial delay.

The recommended alternatives include additional lanes, innovative designs, or conversion to a roundabout. These improvements would all accommodate the projected travel demand and would operate at LOS D or better. Table 15 shows the intersection LOS and worst movement volume-to-capacity ratios⁵ for each of the recommendations.

Table 15: WYO 22 and Spring Gulch Level of Service Impacts

Alternative	LOS	Worst Movement Volume-to-Capacity Ratio
Additional Lanes	A	0.75
Florida-T Intersection	B	0.87
2-lane Roundabout	C	0.85

In general, the roundabout would provide the best vehicular safety performance of the three alternatives, followed by the Florida-T intersection. This is due to a reduction in the number and severity of conflict points.

Subsequent studies of these intersection alternatives should occur as described for the WYO 22 and Broadway Intersection. Barriers and opportunities related to pedestrian and bicycle movements and transit infrastructure would also exist as described for the WYO 22 and Broadway Intersection.

3.5.10 Mitigation

Subsequent studies of the alternatives should include evaluation of wildlife and pedestrian/bicycle facilities, including potential grade-separated crossings

3.5.11 Future NEPA Considerations

Future NEPA processes will need to collect current traffic counts and prepare updated traffic forecasts. This will ensure the traffic forecasts take into account the effectiveness of current and future travel demand management strategies implemented by the Town of Jackson and Teton County.

3.6 VISUAL AND AESTHETICS

Highway and interchange improvements could result in visual impacts by introducing new and/or larger transportation elements onto the landscape. A

⁵ The worst movement volume-to-capacity ratio of an intersection is among the intersection’s approach movements, the approach with the worst volume-to-capacity ratio.

qualitative review of existing planning documents, land use and zoning maps, readily available GIS information, and aerial and study photography was used to identify visual resources, and assess how the proposed alternatives could affect them.

According to Teton County, the scenic resources that are instrumental to the county's unique character are the vistas to the Teton, Gros Ventre, Wyoming and Snake River mountain ranges that are frequently seen from the major public roads that enter the Town of Jackson, Wilson, Grand Teton National Park, Teton Village, and Teton Pass (Teton County 2002). The 2012 *Jackson/Teton County Comprehensive Plan* notes that "Scenic resources, natural landforms and dark skies are vital to the community's natural character. . . . Interruption of these natural forms by the built environment detracts from Teton County's scenic character and should be avoided." The plan lists the following policies related to scenic resources (Teton County 2012):

- Maintain natural skylines.
- Maintain expansive hillside and foreground vistas.
- Maintain natural landforms.
- Maintain dark night skies.

As mentioned under Section 3.2 Land Use, above, all segments traverse a Scenic Resources Overlay, with the exception of Segment 5 (Teton County n.d.). The Moose-Wilson Road Scenic Area (i.e., WYO 390) and the WYO 22 Scenic Area (which consists of four distinct sections) are specifically identified for protection by Teton County regulations (Teton County 2002).

3.6.1 Segment 1

Existing Conditions

Segment 1 includes the WYO 22 Scenic Area, comprised of the following sections (Teton County 2002):

- The West Gros Ventre Butte/Antelope Butte section extends along both sides of WYO 22 and includes the West Gros Ventre Butte on the north and Boyles Hill, the Indian Springs, Brown and Poodle Ranches, and Antelope Butte on the south. "The views encompass imposing steep sided buttes which rise abruptly from the foreground and long views across open meadows to the Snake River range on the south."
- The Walton Ranch/Skyline Ranch section extends along both sides of WYO 22 from the Snake River Bridge to the West Gros Ventre Butte. "It is an important county-wide scenic resource because it provides one of the most frequently experienced vistas of meadows and pasture backed by the Teton mountain range. The Skyline Ranch portion is an important county-wide scenic resource because it provides an open space setting for views to the Snake River range."



Intersection of WYO 22 and Broadway

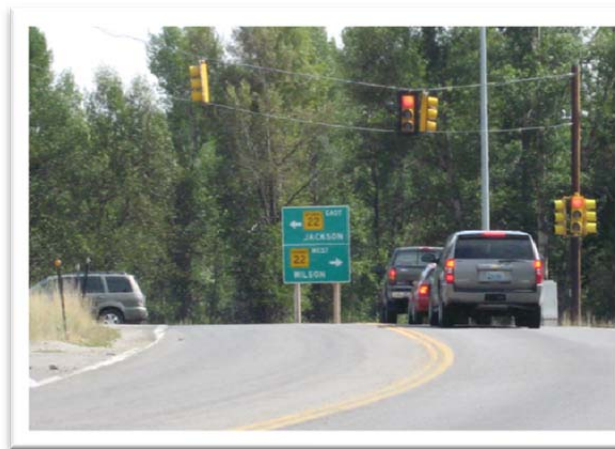
Potential Impacts

FHWA guidance for assessing visual impacts includes an evaluation of impacts as seen both *of* the road and *from* the road (FHWA 1979). Improving the intersection of WYO 22 and Broadway would alleviate congestion and improve flow, resulting in a slight visual benefit for viewers both of and from the road. The larger ROW required for each intersection option would add new manmade intrusions into the area, but the intersection is already adversely affected by the existing intersection and lacks visual intactness and unity. The Westbound Broadway Grade Separated design would have the most visual impacts due to the raised overhead structure and the greatest ROW needed for additional lanes. The Florida-T

Intersection would have the fewest impacts due to removal of Buffalo Way from the junction.

The Roundabout Intersection for Spring Gulch Road father west on WYO 22 would result in the most visual impacts for viewers both of and from the road due to the large amount of ROW required to encompass the facility. However, roundabouts can incorporate aesthetic treatments to minimize impacts. The Additional Lanes intersection would have the fewest visual impacts because no separate structures would be built, which would be the case with the additional separate lanes for the Florida-T Intersection.

Widening WYO 22 to four lanes in Segment 1 and adding four new minor intersections would adversely affect viewers of the road, who would see a wider swath of pavement and intersection facilities across the landscape. Viewers from the road would continue to enjoy views of the buttes and across open meadows to the Teton and Snake River range with few interruptions.



Intersection of WYO 22 and 390

3.6.2 Segments 2 and 3

Existing Conditions

Segments 2 and 3 include the WYO 22 Scenic Area’s Wilson Approach section, which extends along both sides of WYO 22 from the Snake River to the eastern edge of Wilson. “It is an important county-wide scenic resource because of its broad open meadows and the unobstructed views provided to surrounding mountains, which create a dramatic sense of arrival to Wilson” (Teton County 2002).

Potential Impacts

The larger ROW required for the intersection options at WYO 22 and 390 would add new

manmade intrusions into the area. However, with the exception of the Roundabout Intersection, the new visual elements would not measurably deviate from existing visual conditions. The Roundabout would have the most visual impacts for viewers of and from the road. However, roundabouts can incorporate aesthetic treatments to minimize impacts.

Views from Wilson are already affected by existing commercial areas and residential roads, which have slightly reduced visual intactness and unity. Improving minor intersections in Segment 2 and 3 would not measurably affect visual quality. Widening WYO 22 to encompass additional turn lanes and medians would have a similar effect. Increasing the width of Segment 2 to four lanes would have a more noticeable impact, particularly for viewers of the road.

3.6.3 Segment 4

Existing Conditions

Segment 4 includes the WYO 22 Scenic Area's Trail Creek Ranch section, which extends along both sides of WYO 22 from Teton Pass to the western edge of Wilson. "It is an important county-wide scenic resource because of the panoramic views of Jackson Hole that it provides as well as setting the western entry to Wilson, defining Wilson as a unique and special place" (Teton County 2002).

Potential Impacts

Improving WYO 22 and improving one minor intersection in Segment 4 would introduce few visual elements onto the landscape. These changes would not noticeably affect the important panoramic views of Jackson Hole or the setting of the western entry to Wilson for viewers of and from the road.

3.6.4 Segments 5 and 6

Existing Conditions

WYO 390 "is an important county-wide scenic resource because of the vistas it offers of the Teton, Gros Ventre, and Snake River mountain ranges and of the West Gros Ventre Butte, which frame the area's broad and open meadows" (Teton County 2002).



Teton Village

WYO 390 provides access to Grand Teton National Park, which borders the study's northern end. The 2006 *Grand Teton National Park Final Transportation Plan/Environmental Impact Statement* acknowledges the "high scenic value" of WYO 390 as a popular destination for park visitors. The plan cites WYO 390 as a travel route that provides "exceptional opportunities to view the park's unique and distinctive scenic resources" and notes that 96 percent of visitors reported that scenic views were "very or extremely important" to their experience (NPS 2006).

Potential Impacts

Alternatives for Segment 5 include several improved minor intersections, frontage roads, and new turn lanes that would introduce visual intrusions onto the landscape. These elements would be seen by viewers both of and from the road. Widening the road to four lanes would increase this impact. Some of the views from Segment 5 are currently affected by existing commercial areas and residential roads, which have slightly reduced visual intactness and unity. Therefore, introduction of new transportation elements would not noticeably affect important views of mountain ranges and features in this area.

Minimal visual impacts would occur in Segment 6, including improving one minor intersection. The highway would remain two lanes wide. Additional improvements such as medians would not detract from mountain views. WYO 390 would continue to provide exceptional views of the “unique and distinctive” scenic resources travelers see as they approach Grand Teton National Park.

3.6.5 Mitigation

As alternatives are selected and design details refined, WYDOT should consider and evaluate mitigation measures to reduce visual impacts, including:

- Modifying design elements to blend in with the surrounding landscape through use of shape, texture, and color.
- Incorporating turnouts and interpretive signs to promote enjoyment of visual resources viewed from the highways.
- Designing necessary cuts, fills, or bridge abutments to soften their impact.
- Minimizing the amount of vegetation removed and incorporating vegetation to screen negative views.

Other relevant mitigation measures may include design options for lighting (to preserve dark skies), guard rails, walls, and landscaping.

3.6.6 Future NEPA Considerations

Future NEPA processes should evaluate the need to conduct visual impact assessment in accordance with FHWA’s 1979 *Visual Impact Assessment for Highway Projects*. The need for and nature of these assessments will vary depending on the alternatives considered. Assessment could include a description of the existing visual quality, important visual resource issues, viewer characteristics, and the visual environment. Based on these elements, key observation points should be determined that represent important views. If necessary, photo simulations may be developed to assist in determining impacts to visual quality and identifying appropriate mitigation measures.

3.7 HISTORIC AND ARCHEOLOGICAL RESOURCES

Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). Transportation actions can result in an “adverse effect” to historic properties. “Adverse effect” is defined by the National Historic Preservation Act (NHPA) as an alteration to the characteristics of a historic property that qualify it for inclusion in the NRHP.

Also, as mentioned under Section 3.4 Parks and Recreation, Section 4(f) of the Department of Transportation Act stipulates that FHWA and other Department of Transportation agencies cannot approve the use of land from public and private historic sites unless there is no feasible and prudent alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from use.

WYDOT recently completed two cultural resource surveys in the study area. One study, completed in July 2011, includes WYO 22 from the Town of Jackson to the National Forest boundary west of Wilson (Segments 1 through 4), and WYO 390 extending from the WYO 22 and WYO 390 intersection to Teton Village (Segments 5 and 6) (Waitkus 2011). The second study, completed September 2010, includes only a single parcel in the northeast quadrant of the WYO 22 and WYO 390 intersection (Segment 2) (Sanders 2010). These two studies identified 19 cultural resources, shown in Table 16. With the exception of the Stagecoach Inn (Site Number 48TE1713), the Wyoming State Historic Preservation Office (SHPO) concurred with WYDOT’s determination of eligibility for listing on the NRHP for these sites. The SHPO recommended leaving the Stage Coach Inn “unevaluated.” Those properties identified as “unevaluated” require additional analysis during the NEPA process to determine eligibility for listing on the NRHP (SHPO 2011).

Table 16: Identified Cultural Resources

Site Number	Description	Eligibility	Segment
48TE970	Monument	Not eligible	1
48TE1005	Town of Wilson	Not eligible	3
48TE1337	Van Winkle Ditch	Not eligible	5
48TE1205	Moose-Wilson Road	Eligible, non-contributing	5, 6
48TE1476	Sleeping Indian Motel	Eligible	3
48TE1706	Mosely Hereford Ranch	Eligible	3
48TE1713	Stagecoach Inn	Unevaluated	3
48TE1769	Brown Ranch	Unevaluated	1
48TE1770	Artifact scatter	Not eligible	1
48TE1772	Lithic scatter	Not eligible	4
48TE1773	Hungry Jack’s General Store	Not eligible	3
48TE1774	Wilson View residence	Unevaluated	3
48TE1775	Derosa and Anthony residence	Unevaluated	3
48TE1776	Waldron residence	Unevaluated	N/A*
48TE1777	Nora’s Fish Creek Inn	Unevaluated	3
48TE1858	Fabi residence	Unevaluated	3
48TE1432	Waldron cabin–removed	Not eligible	N/A*

Site Number	Description	Eligibility	Segment
48TE1433	Lundy cabin-removed	Not eligible	N/A*
48TE1771	Historic scatter	Not eligible	1
48TE1887	Historic bridge (Snake River Bridge)	Eligible	1
48TE1888	Historic bridge (Fish Creek Bridge)	Eligible	3

Source: Waitkus 2011.

* These properties are outside the area of potential effect and were therefore not analyzed in this report.

3.7.1 Segments 1 and 2

Existing Conditions

A monument erected by the Daughters of Utah Pioneers in 1948, consisting of a plaque set into the upper of two large boulders, is located on the north side of the junction of WYO 22 and WYO 89/191 (Site 48TE970). The monument is not listed on the NRHP and is not currently eligible for listing. The monument’s location is not an important aspect of significance; it does not commemorate a specific place and is not tied to its specific location (Waitkus 2011).

In March 2013 WYDOT completed an inventory of post-1945 concrete and steel bridges in compliance with the *Advisory Council on Historic Preservation Program Comment for Streamlining Section 106 Review for Action Affecting Post 1945 Concrete and Steel Bridges*. The Snake River Bridge (also known as the Wilson Bridge) in Segment 1 was identified as an “exceptional” bridge. This bridge is considered of “exceptional” historic significance and any federal action affecting these bridges would be subject to historic review per Section 106 of the NHPA (Francis 2013). In addition, this bridge was determined to be eligible for listing on the NRHP by the Wyoming SHPO in December 2013 (pers. comm. King 2013).

Potential Impacts

The monument would likely need to be moved to accommodate the proposed changes. The possibility of moving the monument to Wilson has been discussed since the 1980s between the Daughters of Utah Pioneers and the Wyoming Department of State Parks and Cultural Resources (Waitkus 2011). Because the monument is not tied to its specific location, a determination of no adverse effect is expected.



Sleeping Indian Motel, northwest corner of WYO 22 and 3rd Street

The Snake River Bridge, identified as “exceptional” by WYDOT and SHPO and as eligible for listing on the NRHP, would need to be replaced to accommodate widening WYO 22 to four lanes. This would result in an adverse impact to this structure under Section 106. No other properties have been identified in Segment 1 as eligible for listing on the NRHP, although properties identified as “unevaluated” in Table 16 will require further investigation during the NEPA process, discussed below.

Under Section 4(f), replacement of the Snake River Bridge would require a full alternatives analysis to determine if there are any feasible and prudent alternatives.

3.7.2 Segments 3 and 4

Existing Conditions

Insufficient historic integrity remains along WYO 22 for downtown Wilson (48TE1005) to be considered a district. Therefore, it is not eligible for listing on the NRHP. Although no historic district is adjacent to the highway in this segment, individually eligible buildings exist adjacent to the highway. The properties listed in Table 16 as unevaluated could be potentially eligible for listing.

Currently, three properties are eligible for listing on the NRHP, as shown in Table 16. Two are located in Segment 3 in Wilson: The Sleeping Indian Motel and the Moseley Hereford Ranch. The Sleeping Indian Motel is located at the northeast corner of WYO 22 and 3rd Street in Wilson. The Moseley Hereford Ranch is located approximately 330 feet south of WYO 22 between 2nd Street and Fish Creek. None of the Moseley Hereford Ranch structures exist adjacent to the highway.

Site 48TE1772 is a lithic scatter immediately west of Wilson that contains a sparse scatter of obsidian flakes or fragments and several fragments of fire cracked rocks. This site is not eligible to the NRHP (Waitkus 2011).

The Fish Creek Bridge was identified as an “exceptional” bridge during the inventory of post-1945 bridges described above and has since been determined as eligible for listing on the NRHP. The bridge conveys WYO 22 over Fish Creek in Wilson.

Potential Impacts

Proposed highway improvements through Wilson may widen the highway to incorporate new functionality, but the highway would remain two lanes wide and traffic would not be increased. However, some small amounts of right-of-way may need to be acquired from lots adjacent to the highway, which could affect historic properties. In addition, indirect adverse effects for the eligible and potentially eligible buildings immediately adjacent to the highway could occur, such as potential for changes to setting and changes from increased auditory elements.

The Fish Creek Bridge in Wilson in Segment 3 may need to be replaced to accommodate new functionality. The result would be an adverse impact to this structure under Section 106 of the NRPA. Also, the lithic scatter, mentioned above, likely would be impacted. No other properties have been identified in Segments 3 and 4 as eligible for listing on the NRHP, although properties identified as “unevaluated” in Table 16 will require further investigation during the NEPA process to determine their potential eligibility, discussed below.

Similar to the Snake River Bridge, under Section 4(f), replacement of the Fish Creek Bridge would require a full alternatives analysis. Impacts to the remaining properties would require evaluation under Section 4(f).

3.7.3 Segments 5 and 6

Existing Conditions

A section of the Moose-Wilson Road (WYO 390) within Grand Teton National Park is eligible for listing on the NRHP. This eligible section is outside the study area boundary. A section of the road between the park boundary and the park entry gate is a non-contributing portion of the eligible section within the park boundary. This section is also outside the study area. The present alignment that is south of the park boundary and within the study area has been “dramatically altered.” This section of the road is a non-contributing portion of an eligible section (Waitkus 2011).

Potential Impacts

Construction is expected to have no adverse effect to the section of the roadway that is eligible for listing and the section that is a non-contributing portion to it. No other properties have been identified in Segments 5 and 6 as eligible for listing on the NRHP, although properties identified as “unevaluated” in Table 16 will require further investigation during the NEPA process, discussed below.

Impacts to properties in Segments 5 and 6 would require evaluation under Section 4(f).

3.7.4 Mitigation

WYDOT would look at measures to avoid and minimize impacts to historic properties. If adverse effects still would occur, mitigation measures will be evaluated. WYDOT would negotiate a Memorandum of Agreement with SHPO and interested parties for mitigation of adverse effects

WYDOT should consult with the SHPO on effects to the “exceptional” bridges that would be impacted on WYO 22 and potential mitigation measures that could be applied. Under Section 4(f), replacement of the bridges would require a full alternatives analysis to determine if there are any feasible and prudent alternatives to replacement. Because no adverse effects are expected to other listed or eligible historic properties, mitigation many not be needed for them.

3.7.5 Future NEPA Considerations

The properties listed in Table 16 as “unevaluated” require additional analysis to determine their eligibility for listing on the NRHP. Consultation with the SHPO should occur for concurrence with NRHP eligibility determinations for those properties. A determination of no adverse effect or adverse effect should be identified during the NEPA process, followed by consultation with the SHPO and identification of any necessary mitigation for these properties. Consultation should also be performed to identify potential mitigation measures for the “exceptional” bridges on WYO 22.

3.8 WATER RESOURCES AND FLOODPLAINS

A qualitative review of existing planning documents, readily available GIS information, and floodplain maps was used to identify water resources and floodplains, and assess how the proposed alternatives could affect them.

Transportation actions can introduce potential contaminants that may impact water resources during both construction and operation. A widened roadway adds new impervious surface to an area, which prevents rain from soaking into the ground, thus increasing flows during storms and reducing stream flows during dry periods. This can increase runoff that brings sediment, nutrients, and contaminants into bodies of water (EPA 2012).

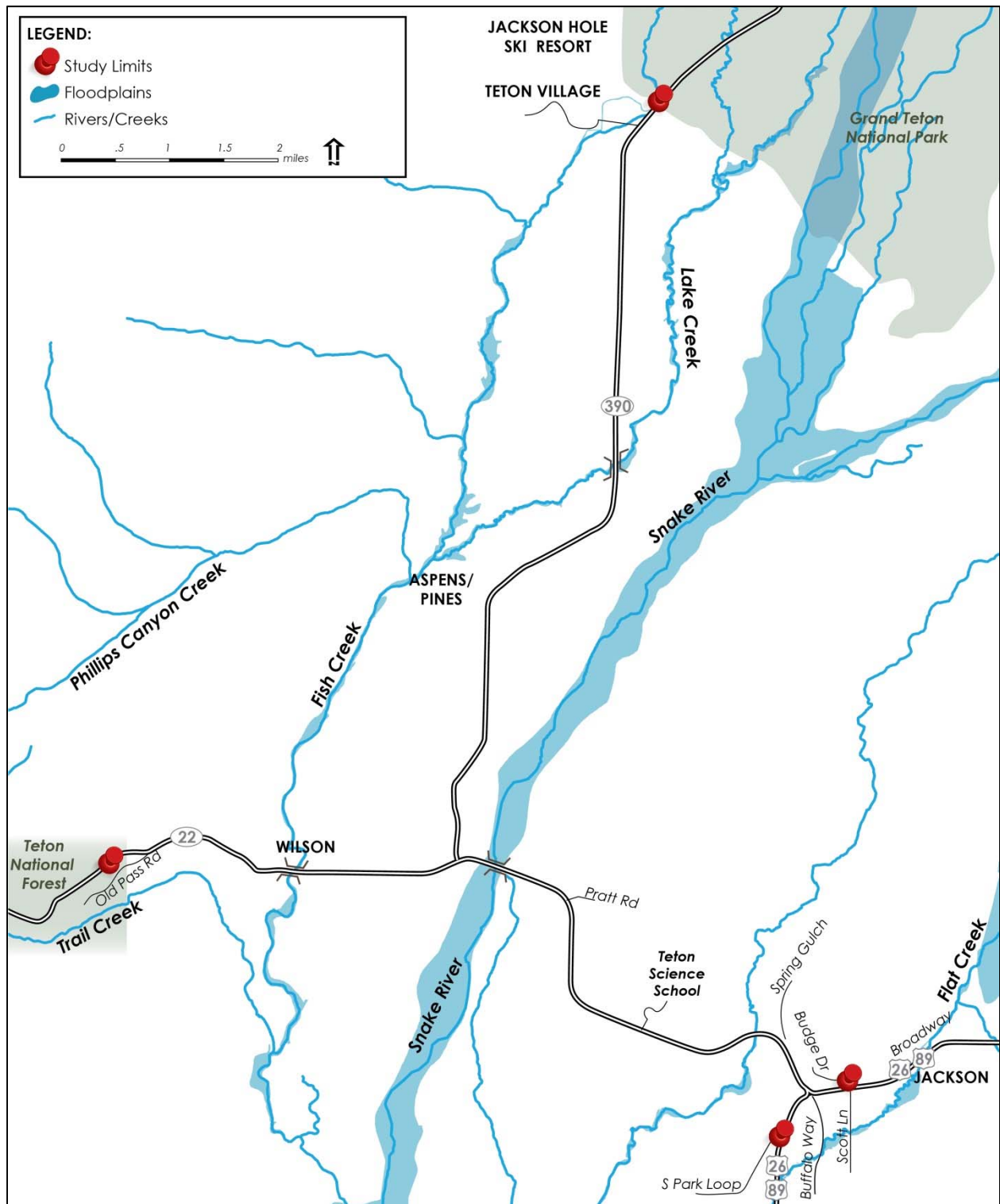
Several creeks cross WYO 22 and 390 in the study area, the largest being the Snake River just east of the intersection of both roadways. Some small waterbodies exist adjacent to the highways, particularly at the northeast corner of the intersection of WYO 22 and 390 where the future Rendezvous “R” Park is planned. None of these streams or waterbodies are identified by the EPA or the Wyoming Department of Environmental Quality (WDEQ) as impaired in the study area. Impaired waters are those that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or tribes (EPA 2013b). The main stem of the Snake River through its entire length above the U.S. Highway 22 Bridge (Wilson Bridge) and all waters within the Fish Creek (near Wilson, Wyoming) drainage are designated a Class 1 Water by the WDEQ. Class 1 waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through implementation of appropriate best management practices (WDEQ 2013).

A transportation project may also encroach upon or alter floodplains, which possess natural values and serve several important functions. Executive Order 11988, Floodplain Management, requires that federal-aid projects avoid incompatible floodplain development, minimize the impact of highway actions that adversely affect a floodplain, and restore and preserve natural and beneficial floodplain services.

Floodplains are designated by the size and frequency of floods large enough to cover them. The Federal Emergency Management Agency (FEMA) has designated 100-year floodplains, defined as an area that has a one percent chance of flooded in any given year. FEMA-regulated floodways are defined as “the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the one percent annual chance flood can be carried without substantial increases in flood heights” (FEMA n.d.)

The Snake River has a wide 100-year floodplain, measuring approximately 1,000 feet wide at the WYO 22 bridge. Elsewhere, WYO 22 and 390 cross relatively small 100-year flood hazard areas at existing structures.

Figure 25: Water Resources and Floodplains



Source: Teton County n.d.



Snake River flowing under WYO 22

3.8.1 Segment 1

Existing Conditions

Currently a culvert conveys WYO 22 over Spring Creek and its floodway, which is approximately 125 feet wide at the crossing. The culvert is sized to accommodate a 100-year flood discharge (FEMA 2006b).

The western end of Segment 1 crosses the Snake River and its associated floodplain and floodway. The floodway is a Special Flood Hazard Area inundated by the 100-year flood and is approximately 1,000 feet wide where it is crossed by WYO 22.

Data from monitoring sites on the Snake River in Grand Teton National Park from 1998-2002 indicate that its water quality is generally good (USGS 2004). The Snake River is not designated as a national wild, scenic, or recreational river within the study area (NPS 2010).

Potential Impacts

During construction, stormwater can pick up pollutants like sediment, debris, and chemicals and transport them to a nearby storm sewer system or directly to a waterbody. Temporary impacts to water resources could occur during construction from working within the Snake River to install bridge structures and working adjacent to Spring Creek, which could result in runoff reaching the creek.

Increasing the width of the highway by adding medians and other design features would have minimal impacts to Spring Creek and its floodway given the size of the affected area. Replacing and widening the Snake River Bridge to four lanes would result in minimal encroachment onto the floodplain, which could be resolved with mitigation efforts. Replacing this bridge, which was built in 1960 and is not to current standards, would also provide an opportunity to locate and design it for minimal floodplain effects and to withstand potential flooding impacts. Impacts on human life, transportation facilities, and the natural and beneficial floodplain services would not be significant and could be resolved with mitigation efforts.

3.8.2 Segments 2 and 3

Existing Conditions

A 500-year flood zone begins near Emily Stevens Road just east of the Snake River and extends along WYO 22 west into Segments 2 and 3 to the western edge of the community of Wilson (approximately West Street). Fish Creek, which flows through Wilson, is crossed by WYO 22. Fish Creek is also a Special Flood Hazard Area inundated by the 100-year flood. Fish Creek's floodway is approximately 200 feet wide where it is crossed by the highway (FEMA 2006a).

Potential Impacts

Increasing the width of the highway by adding the proposed improvements would have minimal impacts to Fish Creek and its floodway due to its size. Replacing and/or widening the Fish Creek Bridge would result in minimal encroachment onto the floodplain, which could be resolved with mitigation efforts.

3.8.3 Segment 5 and 6

A 500-year flood zone encompasses WYO 390 north through Segment 5 and into Segment 6, ending approximately at Snake River Ranch Road. The Aspens/Pines area is protected from the 100-year flood from the Snake River by levee, dike, or other structure subject to possible failure or overtopping.

Lake Creek crosses WYO 390 just north of W. John Dodge Road in this segment. The creek's flood zone widens to approximately 400 feet where it meets the highway. This flood zone is a Special Flood Hazard Area inundated by the 100-year flood (FEMA 1989).

FEMA flood maps show Fish Creek roughly paralleling the west side of WYO 390 in Segment 6 for approximately 800 feet. The creek is within a narrow Special Flood Hazard Area inundated by the 100-year flood (FEMA 1989). However, Teton County GIS data and aerial photographs show the creek more channelized and paralleling a longer stretch of the highway on the west side of the multi-use path for approximately 1,600 feet (Teton County n.d.).

Potential Impacts

Temporary impacts to water resources could occur during construction from working adjacent to Lake Creek in Segment 5 and Fish Creek in Segment 6, with runoff potentially reaching these creeks.

Increasing the width of the highway by adding improvements may impact Fish Creek and its floodway due to its proximity to WYO 390 at the northern end of Segment 6.

3.8.4 Mitigation

Under section 402 of the Clean Water Act National Pollutant Discharge Elimination System (NPDES), construction projects that disturb one acre or greater or are part of a larger common plan of development require a Construction Stormwater Permit and a Stormwater Management Plan (SWMP) (EPA 2012). The SWMP would address erosion and sedimentation on construction sites, thereby minimizing adverse construction-related impacts. In addition, construction and permanent BMPs should be identified to eliminate or reduce the potential impacts to water resources from construction, as well as operations and maintenance.

Special attention should be given to site access for regular maintenance needs. Specific design elements should be considered to address floodplains, such as raising the deck above the level of the flood and reducing the roadway depth to allow high water to flow beneath it.

Recommendations provided by the Wyoming Game and Fish Department (WGFD) regarding preventing the spread of invasive aquatic species will be followed, including:

- Inspecting equipment that has been used in an area known or suspected to contain aquatic invasive species by an inspector certified by the State of Wyoming prior to its use in any Wyoming water.
- If aquatic invasive species are found, decontaminating the equipment by:
 - Draining all water from equipment and compartments; cleaning all mud, plants, debris, or animals; and drying the equipment; or
 - Using a high pressure hot water pressure washer to wash equipment and flush all compartments that may hold water.

3.8.5 Future NEPA Considerations

During the NEPA process, the location of drinking water supplies and groundwater resources that could be potentially affected by runoff from both construction activities and operation should be identified and analyzed for possible impact.

As alternatives are finalized, attention should be given to the location of the flood prevention structures in Segment 5 that protect the Aspens/Pines community from a 500-year flood. Alternatives should also consider the location and function of the channelized portion of Fish Creek paralleling Segment 6. A search should be performed for a more recent update to the FEMA map in that area.

WYDOT designers should work with local agencies and FEMA to ensure the alternatives are developed consistent with local floodway plans and floodplain management programs, which should be recorded in the NEPA document. The number and type of permits should be identified, including an NPDES permit.

3.9 WETLANDS AND OTHER WATERS OF THE U.S.

Executive Order 11990, Protection of Wetlands, calls for avoiding adverse impacts associated with the destruction or modification of wetlands, and avoiding new construction in wetlands. Waters of the U.S., including wetlands, are protected and regulated under the Clean Water Act (CWA). The Environmental Protection Agency (EPA) generically describes waters of the U.S. as rivers, streams, ponds, and special aquatic sites (e.g., wetlands) (EPA 2013c). The U.S. Army Corps of Engineers (USACE) and the EPA define wetlands as areas that are “inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstance do support, a prevalence of vegetation typically adapted for life in saturated soils conditions.” Examples include swamps, marshes, and bogs (USACE 1995).

Transportation improvements can affect these resources directly (e.g., building bridge footings in a wetland) or indirectly (e.g., releasing silt or chemicals into wetlands or waters of the U.S. during construction and operation).

In 2007, WYDOT conducted a delineation of wetlands and waters of the U.S. within the study area. This information was used to identify the full extent of wetlands and waters of the U.S. in the study area and assess how the proposed alternatives could affect them. Figure 26 shows general wetlands areas based on USFWS data (i.e., not those mapped along the corridors by WYDOT).

3.9.1 Segment 1

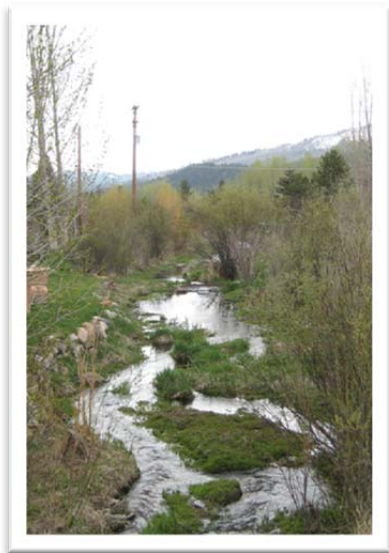
Existing Conditions

As shown in Figure 26, WYO 22 currently crosses several wetlands in Segment 1. Wetlands immediately adjacent to the highway occur at Spring Gulch, west of the highway where the corridor is aligned directly north, and on both sides of the Snake River. The majority of these wetlands are Palustrine Emergent Seasonally Flooded (PEMC). The wetlands associated with the Snake River are riverine wetlands and include shallow marshes, wet meadows, and shrub swamps (Western Ecosystems Technology 2007c, EPA 2013c).

Waters of the U.S. include Spring Gulch, the Snake River, ponds adjacent to the Snake River, and several unnamed drainages. A large pond also exists within the wetlands on the west side of WYO 22 where the corridor is aligned directly north (Western Ecosystems Technology 2007c, EPA 2013c).

Potential Impacts

Widening the highway to four lanes in Segment 1 would likely require filling of wetlands, particularly those immediately adjacent to the highway. Impacts would also occur to the waters of the U.S. listed above. Where wetlands abut one side of the highway, it could be widened on the opposite side to avoid wetland impacts, where possible.



Wetland

3.9.2 Segments 2 through 4

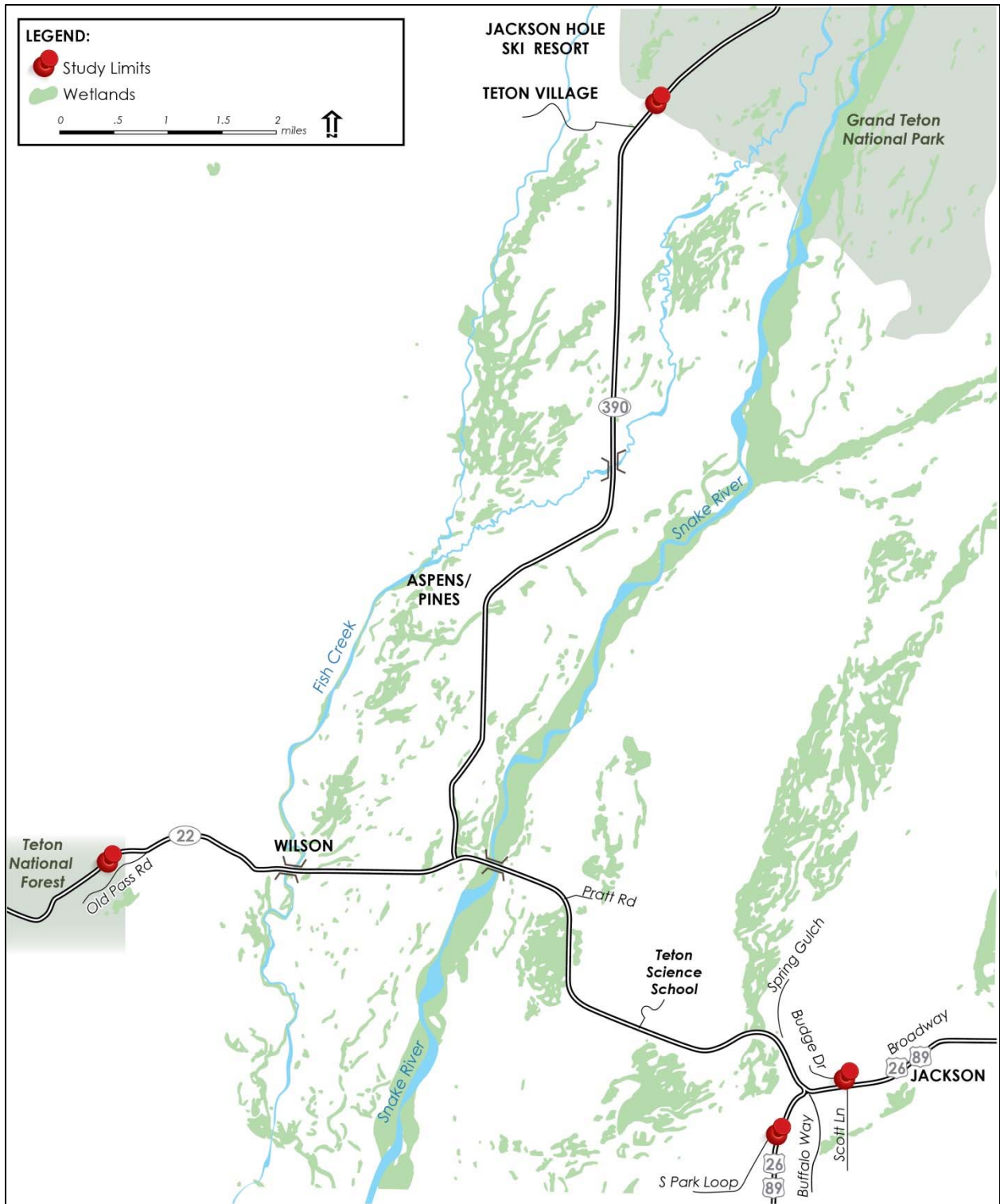
Existing Conditions

Among these segments, wetlands occur primarily in Segment 3 and are associated with Fish Creek and tributaries to Fish Creek. These wetlands include wet meadows or shrub swamps. Fish Creek is a water of the U.S. in Segment 3. Some small wetlands occur in Segment 2. No wetlands or waters of the U.S. occur in Segment 4 (Western Ecosystems Technology 2007c, EPA 2013c).

Potential Impacts

Widening the highway to four lanes would likely require filling of wetlands in Segment 2 during construction to accommodate four lanes. In Segment 2, impacts would likely occur under the Two-Lane Alternative, but would be fewer than the Four-Lane Alternative. Impacts in Segment 3 could also be minimized because the highway would remain two lanes wide. No impacts to wetlands or waters of the U.S. are expected in Segment 4.

Figure 26: Wetlands within the Study Area



Source: EPA 2013b

3.9.3 Segments 5 and 6

Existing Conditions

Twenty-nine wetlands were delineated in Segment 5, and 26 were delineated in Segment 6 in 2007. In Segment 5, the majority of wetlands are associated with the Snake River, irrigation ditches, and Lake Creek. Three waters of the U.S. exist in Segment 5, including Lake Creek, which crosses the highway at the boundary of Segment 6. Many wetlands in Segment 6 are associated with drainage ditches and canals, as well as Granite Creek, which is one of two waters of the U.S. in Segment 6 (Western Ecosystems Technology 2007a, b; EPA 2013c).

Potential Impacts

Widening the highway to four lanes likely would require filling of wetlands waters of the U.S. in Segment 3, particularly near the Snake River at the intersection of WYO 22. Impacts would likely occur under the Two-Lane Alternative as well, but could be mitigated to minimize work done in waters of the U.S. and wetlands. Special attention would be required near the Snake River, where impacts may be unavoidable. No or minimal impacts to wetlands or waters of the U.S. are expected in Segment 6.

3.9.4 Mitigation

WYDOT will consider measures to avoid and minimize impacts to waters of the U.S. and wetlands during the NEPA process and design phases. Such measures could include lengthening bridges to span wetland areas, minimizing the number of piers in the rivers, or shifting in highway alignments, particularly in Segment 1. Compensatory wetland mitigation may include creation or restoration of affected wetlands.

3.9.5 Future NEPA Considerations

During the NEPA process, WYDOT will review its wetland delineations to determine if updates are needed. Impacted areas will be calculated, including those affected temporarily. The amount of linear feet of waters of the U.S. will also be calculated. After design, a permit from the USACE will be required for impacts to wetland and waters of the U.S.

3.10 WILDLIFE

Fish and wildlife contribute to ecosystem diversity, provide a source of enjoyment for recreationists, and provide a source of food for people and other animals. Transportation projects can affect fish and wildlife through changes such as habitat fragmentation, human encroachment, and disruption of migration routes. A qualitative review of the WGFD data, Teton County data, wildlife studies conducted in the area, and aerial photographs of the study area was used to identify fish and wildlife that could be affected by the proposed alternatives.

The study area is dominated by a broad mountain valley bisected by the Snake River. This diverse topographic and geologic setting lends itself to diverse habitats,

including riparian, montane, and grasslands; therefore, a wide variety of wildlife is located in the study area (WGFD 2010). The WGFD has identified Crucial Priority Areas and Enhancement Priority Areas for the state’s wildlife habitats. Crucial areas are those that are crucial to conserving and maintain populations of terrestrial and aquatic wildlife for the present and future. Enhancement areas are important wildlife areas that should be actively enhanced or improved; these areas are experiencing “habitat issues,” such as habitat fragmentation (WGFD 2010). The study area includes both Crucial and Enhancement Priority Areas, described by segment and shown in Figure 27, below.

Nearly the entire study area lies within a Bear Conflict Priority Area 1 (Teton County n.d.). Conflict Priority Area 1 designations are those that overlap with, lay adjacent to, or are in close proximity to known bear-occupied habitat and/or regular travel corridors and/or seasonal bear-use areas (Teton County 1994). The Wyoming Game and Fish Department also notes that grizzly bears (*Ursus arctos*) have been observed in the area (WGFD 2012).

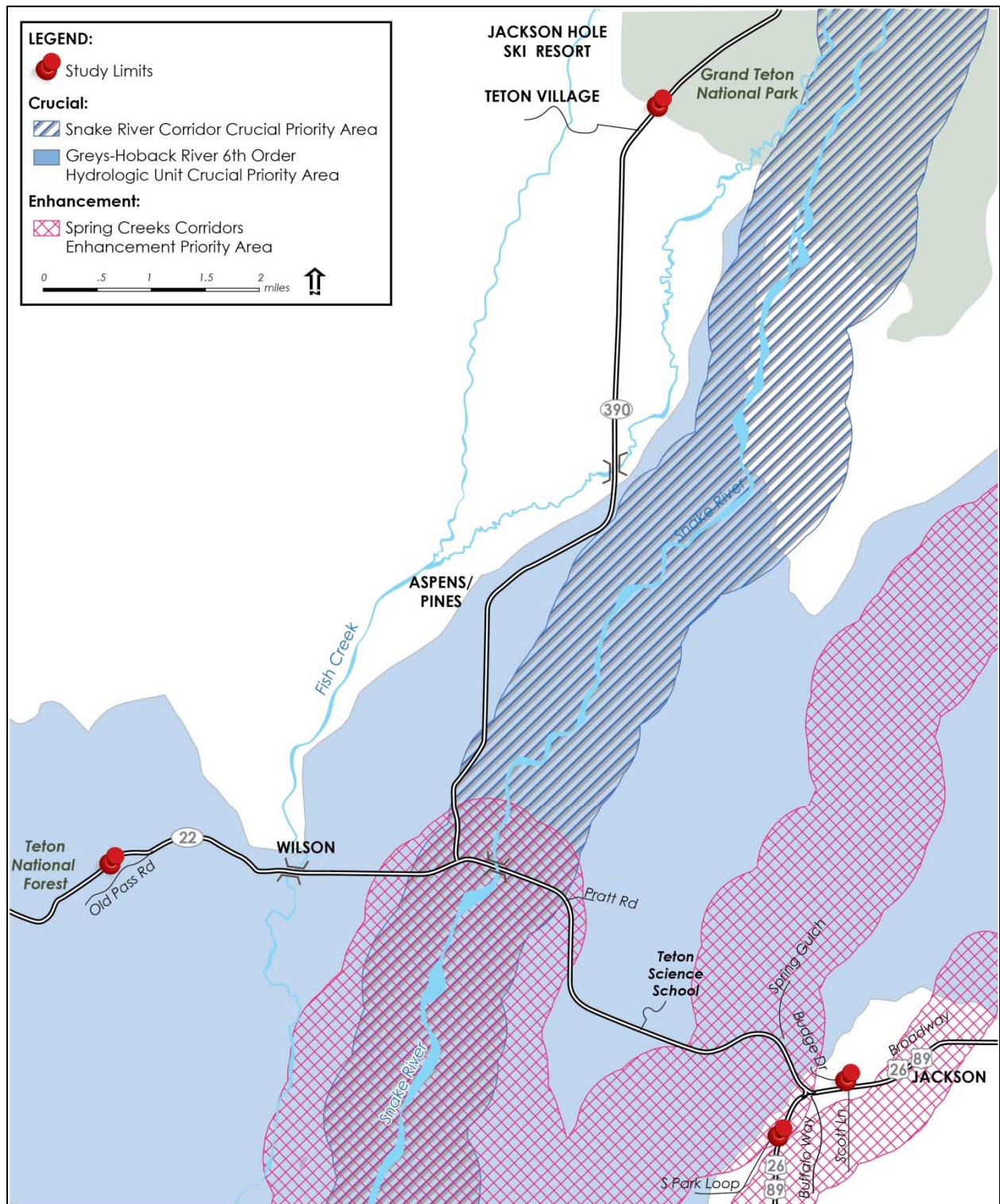
Numerous wildlife studies have been completed for portions and/or the entirety of the study area. Several of these studies have focused on wildlife-vehicle collisions which, poses an important safety issue in the study area. Figure 28 shows the migration corridors for moose (*Alces alces*), mule deer (*Odocoileus hemionus*), and elk (*Cervus elaphus*), as well as locations where wildlife-vehicle collisions are high. Those studies proposed a variety of potential mitigation measures to reduce these wildlife conflicts, including overpasses, underpasses, seasonal speed limits reductions, and increased warning signage (Biota 2002, 2003; WTI 2011). Figure 29 shows the location of many of these mitigation measures.



Moose adjacent to highway

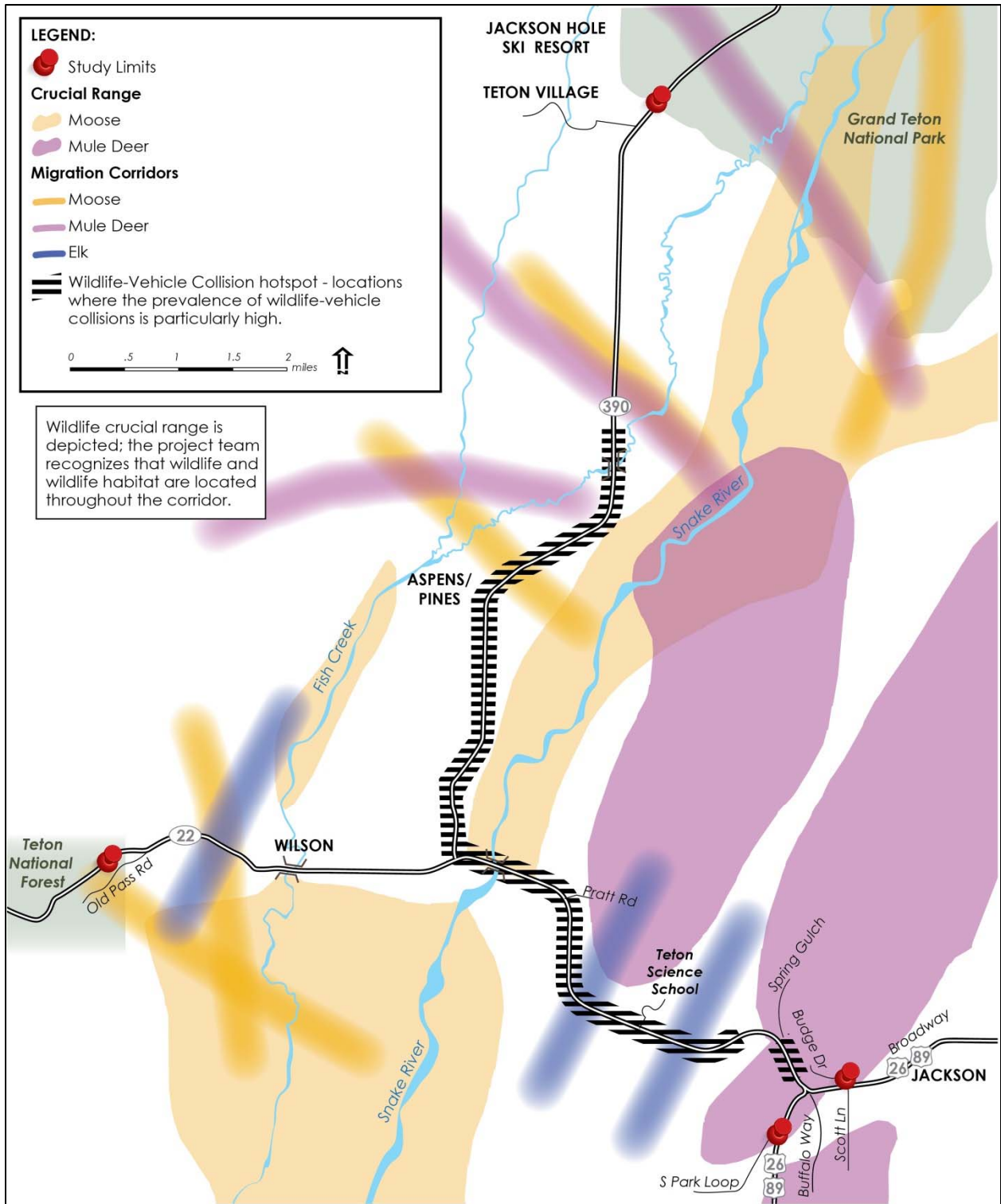
In November 2012 the study team led a field trip to the study area with Jackson Hole Wildlife Alliance and Safe Wildlife Crossings. This field trip included stops at identified wildlife crossing locations and wildlife-vehicle collision hotspots. The purpose of this field trip was to look at previously identified mitigation locations and determine potential conflicts regarding future roadway improvements. The improvements identified in the alternatives would not preclude any of these mitigation measures from being implemented.

Figure 27: Crucial and Enhancement Priority Areas



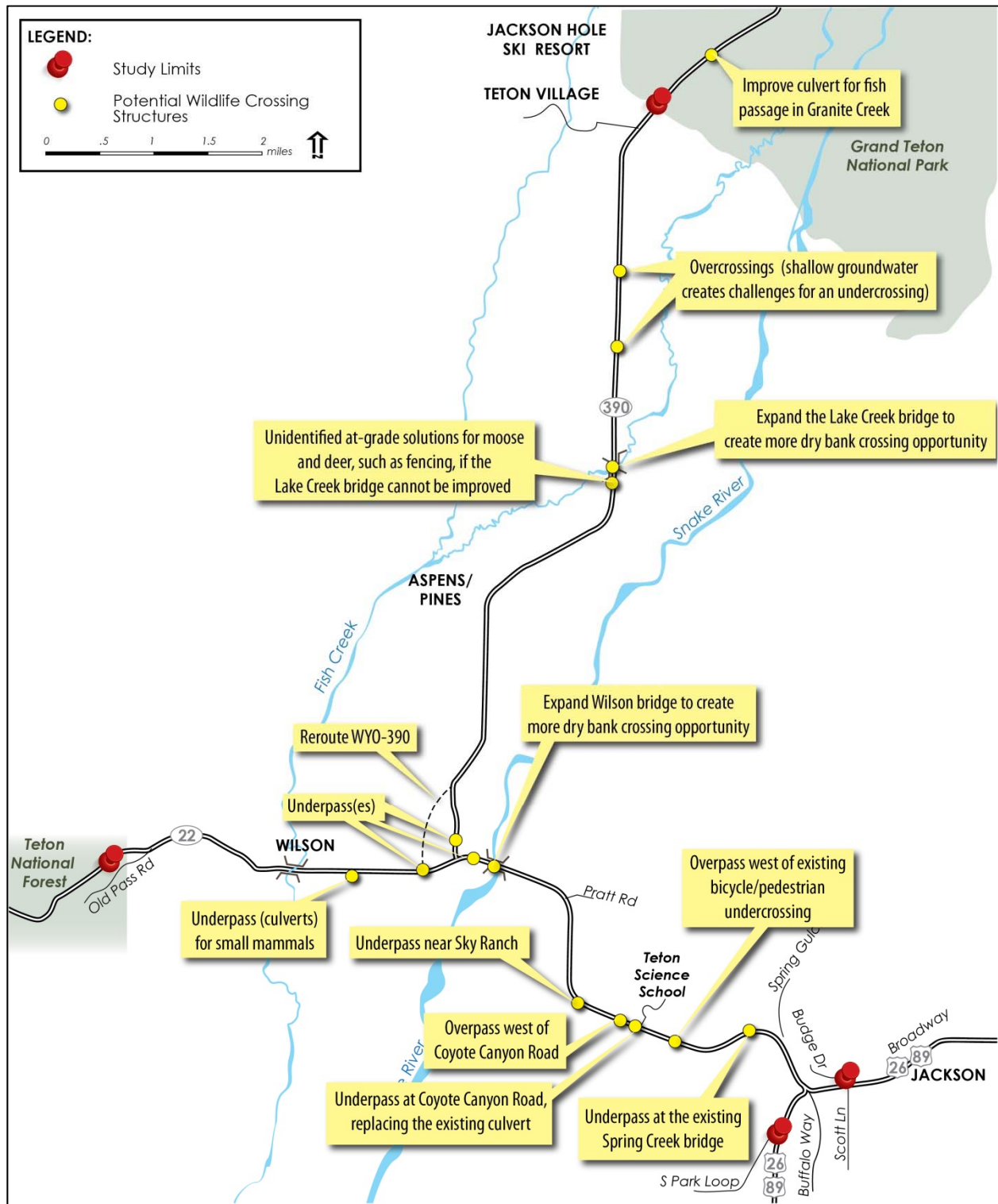
Source: Teton County n.d.

Figure 28: Wildlife Migration Corridor and Crucial Range Map



Source: WGFD 2013a.

Figure 29: Wildlife Vehicle Collision Mitigation Location Map



3.10.1 Segment 1

Existing Conditions

Segment 1 includes Crucial Priority Areas for terrestrial wildlife, including moose, mule deer, and elk. Although not shown in Figure 27, this Crucial Priority Areas also protects other large mammals, including black bear (*Ursus americanus*), bighorn sheep (*Ovis canadensis*), and mountain lion (*Felis concolor*), and a variety of small mammals, such as beaver (*Castor canadensis*) and squirrels, birds, and aquatic species (WGFD 2009). Segment 1 crosses two elk migration corridors and crucial mule deer range, and has been identified as an area with a prevalence of wildlife-vehicle collisions (WGFD 2013a).

Although not shown in Figure 27, Segment 1 includes Crucial Priority Areas for aquatic wildlife within the Snake River Corridor as well. In addition to aquatic species classified by the state as Native Species Status (discussed under 3.11 Special Status Species, below), this Crucial Priority Area is also important for elk, mule deer, waterfowl, and moose. Moose are also classified by the state as Native Species Status (WGFD 2009).

Segment 1 is within an Enhancement Priority Area, established primarily to protect trout, and is discussed under 3.11 Special Status Species, below.

Although the majority of Segment 1 lies within a Bear Conflict Priority Area 1 designation, the section from Broadway west to Spring Gulch Road is within a Bear Conflict Priority Area 2. Such areas are within close proximity to, or lie adjacent to, Conflict Priority Area 1 locations and contain habitat that is not suitable for regular, seasonal, or occasional bear occupancy and/or use. Conflicts have rarely been documented or verified in these areas and are considered highly unlikely (Teton County 1994).

The Jackson Hole Wildlife Foundation has recorded roadkill statistics in the study area. According to this data, 2 coyotes (*Canis latrans*), 15 deer, 8 elk, 10 moose, and 2 red fox (*Vulpes vulpes*) were killed on WYO 22 over a 5-year period (2004-2009; data for 2008 not available). No black bears have been reported killed on the highway in Segment 1 (JHWF 2012).

Hunting for moose, elk, deer, and black bear is permitted along WYO 22 in Segment 1. Hunting seasons are generally during fall for these species, and also include spring for black bear (WGFD 2013b).

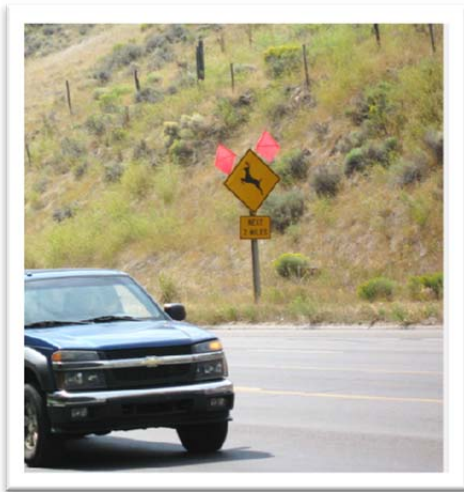
Potential Impacts

Short-term habitat losses include those areas disturbed during construction but later reclaimed to native vegetation. Long-term habitat losses include those areas converted from native vegetation to pavement or other permanent features or infrastructure, such as bridges and pathways. These impacts would adversely affect the two Crucial Priority Areas in this segment and the species they protect. However, due to the relatively developed nature of the existing highway corridor compared to

the surrounding area, much of which is protected by land trusts, habitat losses would not be substantial.

Increased levels of human disturbance would cause some wildlife species or individuals to avoid the study area during construction. Some species may be more susceptible to displacement than others, but many species are capable of avoiding activities causing disturbance. Because wildlife has likely already habituated to traffic disturbance on WYO 22, they may also habituate to disturbance from increased traffic levels resulting from widening the highway.

The alternatives would create short- and long-term barriers to wildlife movement due to construction, increased highway width, and additional permanent features, such as bridges or guardrails. Wildlife crossings during construction would be minimal as a result of human disturbance, described above. Following construction, the alternatives would have a greater effect on wildlife movement due to the wider highway throughout Segment 1 compared to existing conditions. Wider roadways are generally more difficult for wildlife to cross, particularly for small terrestrial animals. For smaller species, multi-lane roads may be impassable without crossing structures. Segment 1 includes features to facilitate wildlife movement across WYO 22 at six locations, which would help alleviate impacts. The widened highway would not be a movement barrier to highly mobile aerial species such as birds or bats. Reduced overall highway permeability is expected in the long term, except where adequate crossing structures would be provided.



Wildlife crossing sign

Short-term risks of wildlife-vehicle collisions would be minimal because traffic speeds would be reduced during construction, and construction disturbance would displace wildlife away from the highway. Segment 1 currently experiences a high prevalence of wildlife-vehicle collisions, increasing the potential adverse impact from widening the highway to four lanes. In the long term, the greatest impacts would be to small species not physically capable of crossing the surface, such as rodents or amphibians. However, if the four-lane highway has a depressed median, a refuge would be available for wildlife. Adverse impacts to elk would be lessened by the four over- or underpasses identified in the vicinity of the two elk migration corridors through WYO 22. Mule deer, which experience high levels of traffic-related mortality, would be adversely impacted closer to Broadway where their range crosses WYO 22 and no crossing structures are proposed. Moose would be susceptible at the

western end of Segment 1 near the Snake River. An underpass is proposed at this location, and the bridge would be expanded to create more crossing opportunity, which would help alleviate impacts. In the long term, the wider highway width and increased traffic volumes would increase the potential for wildlife-vehicle collisions where highway crossings are not available. Additional disturbance during hunting

seasons could cause more wildlife movement, thus increasing the likelihood of wildlife-vehicle collisions in this segment, primarily during the fall.

Work near or within Spring Creek and the Snake River could impact fish through increased turbidity levels and/or temporary habitat loss. These impacts are expected to be short-term and localized, resulting in a minor impact. Direct mortality to fish during construction is not likely due to the high mobility of fish. Expanding the bridge to create more dry bank crossing opportunities may limit the amount of work done in the river if support structures can be placed on dry land adjacent to the river banks. During operations, increased highway runoff resulting from a widened roadway would have negligible impacts on fish compared to existing conditions. Long-term operations are not expected to measurably affect fish populations.

3.10.2 Segment 2

Existing Conditions

Segment 2 includes the same Crucial Priority Area for terrestrial wildlife described for Segment 1. Segment 2 also includes a small section of the Crucial Priority Areas for aquatic wildlife within the Snake River Corridor described for Segment 1. Segment 2 is not within an Enhancement Priority Area (WGFD 2009). No migration corridors cross Segment 2 (WGFD 2013a). All of Segment 2 is within Bear Conflict Priority Area 1 (Teton County n.d.).

The prevalence of wildlife-vehicle collisions is not particularly high in Segment 2 (WGFD 2013a). Although uncommon, a black bear was killed on WYO 22 in 2007 just east of Wilson. The only other documented roadkill on WYO 22 in Segment 2 from 2004-2009 was one deer (JHWF 2012).

Hunting for moose, elk, deer, and black bear is permitted along WYO 22 in Segment 2 (WGFD 2013b).

Potential Impacts

Impacts to habitat loss, human disturbance, and barriers to movement from the Four-Lane Alternative would be similar to those described for Segment 1. Under the Two-Lane Alternative, no change from existing conditions is expected to habitat loss, human disturbance, and barriers to movement because the alternative would not substantially change the corridor in those respects. Impacts to wildlife movement under the Two-Lane Alternative could be improved over existing with installation of the two underpasses, proposed in the previously cited studies, in Segment 2.

Short-term risks of wildlife-vehicle collisions during construction would be similar to those described for Segment 1. In the long term, impacts from wildlife-vehicle collisions would be similar to existing conditions. Crucial range does not exist adjacent to the highway, and no wildlife migration corridors exist in this segment. Roadkill in Segment 2 has also been historically low, and the area does not currently experience a high prevalence of wildlife-vehicle collisions. The two proposed underpasses would help minimize wildlife-vehicle collisions. Overall, wildlife-vehicle collisions in Segment 2 are expected to be minimal.

3.10.3 Segment 3

Existing Conditions

The same Crucial Priority Area for terrestrial wildlife described for Segment 1 borders the south side of WYO 22 in Segment 3. Segment 3 is not within an Enhancement Priority Area (WGFD 2009). No migration corridors cross Segment 3, although crucial range for moose exists on the south side of WYO 22 at Fish Creek (WGFD 2013a). All of Segment 3 is within Bear Conflict Priority Area 1 (Teton County n.d.).

Development along the highway through Wilson likely discourages wildlife from using this area. The prevalence of wildlife-vehicle collisions is not particularly high in Segment 3 (WGFD 2013a). No roadkill was identified by the Jackson Hole Wildlife Foundation data in this segment for 2004-2009 (JHWF 2012).

Hunting for moose, elk, deer, and black bear is permitted along WYO 22 in Segment 3 (WGFD 2013b).

Potential Impacts

Impacts to habitat loss, human disturbance, and barriers to movement would be similar to existing conditions because the alternative would remain two lanes wide and would not substantially change the corridor in those respects.

Wildlife-vehicle collisions would be minimal because crucial range does not span the highway and no wildlife migration corridors exist in this segment. Roadkill in Segment 3 has also been historically low and the area does not currently experience a high prevalence of wildlife-vehicle collisions. Hunting pressure is not expected to affect wildlife movement onto the highway given the presence of the community of Wilson. Overall, wildlife-vehicle collisions in Segment 3 are expected to be minimal.

Impacts to fish in Fish Creek would be similar to those described for Segment 1.

3.10.4 Segment 4

Existing Conditions

Segment 4 includes the same Crucial Priority Area for terrestrial wildlife described for Segment 1 (WGFD 2009). Segment 1 crosses a moose migration corridor and an elk migration corridor, both of which intersect WYO 22 approximately 0.5 mile west of Wilson. Another moose migration corridor crosses the highway just beyond the study area boundary (WGFD 2013a).

All of Segment 4 is within Bear Conflict Priority Area 1 (Teton County n.d.).

The prevalence of wildlife-vehicle collisions is not particularly high in Segment 4 (WGFD 2013a). Roadkill data from 2004-2009 identifies one deer killed on WYO 22 in Segment 4 from 2004-2009 (JHWF 2012).

Hunting for moose, elk, deer, and black bear is permitted along WYO 22 in Segment 4 (WGFD 2013b).

Potential Impacts

Overall, impacts are expected to be similar to existing conditions because the highway corridor would remain two lanes wide and would not substantially change in ways that would adversely affect wildlife. Although no wildlife crossing facilities are proposed for Segment 4 to address the existing migration corridors, roadkill in Segment 4 has also been historically low, and the area does not currently experience a high prevalence of wildlife-vehicle collisions.

3.10.5 Segment 5

Existing Conditions

Segment 5 includes the same Crucial Priority Area for terrestrial wildlife described for Segment 1. Segment 5 also includes a small section of the Crucial Priority Areas for aquatic wildlife within the Snake River Corridor described for Segment 1. Segment 5 is not within an Enhancement Priority Area (WGFD 2009). A moose migration corridor crosses Segment 5 just north of the Aspens/Pines area and connects to a moose migration corridor that follows the Snake River east of WYO 390. A mule deer migration corridor is adjacent to the west side of the highway near Lake Creek (WGFD 2013a). All of Segment 5 is within Bear Conflict Priority Area 1 (Teton County n.d.).

Ongoing research indicates that moose rarely cross the Snake River, and demonstrate high fidelity to the same summer and winter ranges in this area. Elk use of the area is highest during fall and spring migration seasons, and elk cross WYO 390 in a “back and forth movement.” During summer months, elk concentrate east of WYO 390 and north of the John Dodge subdivision (Biota 2002).

The prevalence of wildlife-vehicle collisions is particularly high in Segment 5 (WGFD 2013a). Roadkill data from 2004-2009 identifies four deer, three moose, and one raccoon (*Procyon lotor*) killed on WYO 390 in Segment 5 from 2004-2009 (JHWF 2012).

Potential Impacts

Impacts to habitat loss, human disturbance, and barriers to movement from the Four-Lane Alternative would be similar to those described for Segment 1. The underpass proposed at the southern end of Segment 5 would help wildlife in the vicinity of the Snake River in both Crucial Priority Areas. No wildlife crossing facilities are proposed at the moose migration corridor crossing farther north. However, improvements to the Lake Creek Bridge or an at-grade solution at this location would facilitate mule deer crossing and may also benefit moose. Impacts to wildlife movement under the Two-Lane Alternative would be improved over existing conditions as a result of the two proposed crossing facilities.

Short-term risks of wildlife-vehicle collisions during construction would be similar to Segment 1. Segment 5 currently experiences a high prevalence of wildlife-vehicle collisions, increasing the potential adverse impact from widening the highway under the Four-Lane Alternative. In the long term, the greatest impacts would be to small species not physically capable of crossing the wider surface, unless a depressed

median was included to provide refuge. The greatest impacts to large mammals would be to moose and mule deer. The two proposed wildlife crossing facilities would help minimize these impacts. Impacts to wildlife-vehicle collisions under the Two-Lane Alternative would be improved over existing conditions as a result of the two proposed underpasses in Segment 5.

Impacts to fish in Lake Creek would be similar to those described for Segment 1.

3.10.6 Segment 6

Existing Conditions

No Crucial Priority Areas or Enhancement Priority Areas exist in Segment 6 (WGFD 2009). A moose and a mule deer migration corridor cross Segment 6 at approximately the same location near the southern end of this segment (WGFD 2013a). All of Segment 6 is within Bear Conflict Priority Area 1 (Teton County n.d.).

The majority of Segment 6 has does not experience a prevalence of wildlife-vehicle collisions (WGFD 2013a). Roadkill data from 2004-2009 identifies two elk and one mule deer killed on WYO 390 in Segment 6 (JHWF 2012).

Potential Impacts

No change to habitat loss, human disturbance, and barriers to movement is expected from existing conditions because the corridor would remain two lanes wide and would not substantially change in these respects. Short-term risks of wildlife-vehicle collisions would be similar to Segment 1. Long-term impacts to wildlife movement and wildlife-vehicle collisions would be improved over existing conditions as a result of the two proposed overcrossings in Segment 6.

3.10.7 Mitigation

The following mitigation measures may apply for terrestrial wildlife:

- Design bridges to accommodate wildlife movement.
- Minimize use of guardrails, and use guardrail heights commensurate with industry standards.
- Use wildlife fencing or retaining walls to channel wildlife underneath the road.
- Coordinate with the WGFD and other appropriate parties on wildlife crossing design.
- Increase visibility of wildlife to drivers. Post advisory signs, and/or use dynamic signs to warn drivers during high wildlife use periods, such as migration season.
- Minimize the removal of snags, mature trees, and old growth trees, especially near riparian areas.
- If new bridges or culverts are planned, enhance bat roost sites.
- Conduct amphibian surveys in all affected wetlands to identify breeding sites that might be impacted

- Place fences in accordance with Teton County's fencing standards.
- Design overhead powerlines to reduce impacts to avian wildlife.
- Invasive/noxious weeds are a concern; limit removal and/or alteration of vegetation to limit the spread of weeds.

In addition, WYDOT should perform an amphibian survey prior to construction at all wetlands adjacent to the roadway.

The following mitigation measures may apply for fisheries:

- Place new bridge foundations parallel with the direction of stream flow. Place intermediate supports on the stream banks outside of the ordinary high water.
- Allow fish passage during construction.
- Conduct in-stream construction at bridges and culvert when spawning and fish passage will not be restricted.
- Install instream habitat, such as placement of boulders and overpour structures, to enhance fish habitat within the disturbed in consultation with the WGFD.
- Return all disturbed stream banks to their original or better degree of stability and contour.
- Follow construction standards and approved BMPs to minimize the potential for an accidental spill or discharge that may be hazardous to fish and wildlife.
- Ensure that construction equipment fueling and servicing areas have appropriate pollution prevention measures and will be located a minimum of 300 feet away from surface water, riparian zones and/or slopes that lead directly to water, riparian, or aquatic habitat.
- Apply sediment-reduction practices within all construction areas to minimize excessive sedimentation and reduction of aquatic and fisheries habitat quality.
- Implement WYDOT construction specifications for control of soil erosion and water pollution.
- Reintroduce any riparian canopy or bank stabilizing vegetation removed during construction.
- Maintain buffer zones of undisturbed vegetation along water bodies to inhibit transportation of contaminated runoff to surface waters.

3.10.8 Future NEPA Considerations

During the NEPA process, updated wildlife movement, critical ranges, and roadkill data should be obtained. Coordination with the WGFD should occur to identify any issues of which the department is aware. Mitigation measures should be refined when designs are more solidified.

3.1.1 SPECIAL STATUS SPECIES

Special status species include plants and animals that are listed under the Endangered Species Act (ESA) as threatened or endangered, those being considered for listing under the ESA (candidate species), and those that receive protections under state or other laws. Transportation projects can affect plant species through removal or habitat disruption, and can affect animal species through habitat fragmentation, human encroachment, and other means. A qualitative review of species listed under the ESA, including federal candidate and state-protected species, readily available GIS information, and aerial photography was used to identify special status species and assess how the proposed alternatives could affect them.

A search of the U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation System database was conducted to identify natural resources of concern within Teton County. The database produces a list based on the type of action being proposed. A list was generated to identify species that would be affected by a transportation undertaking. As a result, the list did not include *all* special status species that may exist in county, just those susceptible to transportation activities (USFWS 2013). This list was cross-referenced against a list generated by the Wyoming Interagency Spatial Database and Online Management System (WISDOM) by WYDOT on October 15, 2013. If a species was listed by WISDOM but not by the USFWS, it was not included in this study because the focus is on those species that would be affected by transportation actions. The result is shown in Table 17.

WGFD identified wildlife species with low and declining populations and that are indicative of the diversity and health of the state's wildlife. These species are termed "Species of Greatest Conservation Needs" (SGCN). SGCN designation is intended to identify species whose conservation status warrants increased management attention and funding, as well as consideration in conservation, land use, and development plans. WGFD uses a Native Species Status (NSS) classification system to identify wildlife that should receive SGCN designation. Species classified as NSS1, NSS2, NSS3, NSS4, and NNSU (unknown) are considered to be SGCN, as follows:

- NSS1: Imperiled (extirpation possible) with extreme limiting factors
- NSS2: Imperiled with severe limiting factors or vulnerable with extreme limiting factors
- NSS3: Vulnerable with severe limiting factors
- NSS4: Vulnerable with moderate limiting factors or stable with severe limiting factors

SGCN species with potential to be in the study area are identified in Table 17.

Table 17: Special Status Species Potentially in Study Area

Species	Status	Habitat	Occurrence in Study Area	Potential Section
Canada lynx (<i>Lynx canadensis</i>)	Federally threatened, state NSS1	Moist forest types with high hare densities and a matrix of other habitats (hardwoods, dry forest, non-forest) with low hare densities	No documented occurrences; no critical habitat	4
Greater sage grouse (<i>Centrocercus urophasianus</i>)	Federal candidate, state NSS2	Elevations from 4,000 to over 9,000 feet; highly dependent on sagebrush for cover and food	Unconfirmed. No leks within 2.0 miles of study area; no core areas or connectivity areas	All
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Federal candidate, state NSSU	Large blocks of riparian habitats, particularly woodlands with cottonwoods and willows	Unconfirmed 1998	1,5
North American wolverine (<i>Culo gulo luscus</i>)	Federal candidate, state NSS3	Deep, persistent, reliable spring snow cover; no specific vegetation or geological habitat	No documented occurrences	All
Ute ladies' tresses (<i>Spiranthes diluvialis</i>)	Federal threatened	Moist, seasonally flooded soils in valley bottoms, gravel bars, or floodplains bordering springs, lakes, rivers, or perennial streams between 1,800 and 6,800 feet.	Unknown; no known populations in Teton County	All

Source: USFWS 2013; WISDOM 2013, Fertig 2000; WYDOT 2010

Moose are also a state SGCN species with a designation of NSS4. Moose are discussed with other ungulates (large hooved mammals) under Section 3.10 Wildlife, above.

The Migratory Bird Treaty Act (MBTA) is a federal law that specifies that no one may take, possess, import, export, transport, sell, purchase, or barter, any migratory bird, or parts including nests and eggs unless authorized by permit. Most U.S. native bird species are protected by the MBTA (USFWS 2011). The following raptor species (Table 18) have been identified in the study area and are protected by the MBTA.

Table 18: Raptor Species in Study Area

Species	Most Recent Observation	Total Observations
Osprey (<i>Pandion haliaetus</i>)	Confirmed 2008	19
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Unconfirmed 2003	3
Northern Goshawk (<i>Accipiter gentilis</i>)	Confirmed 1985	2
Golden Eagle (<i>Aquila chrysaetos</i>)	Confirmed 1986	2
Merlin (<i>Falco columbarius</i>)	Confirmed 1979	1
Western Screech Owl (<i>Otus kennicottii</i>)	Confirmed 1989	1
Burrowing Owl (<i>Athene cunicularia</i>)	Unconfirmed 2003	1

Source: WISDOM 2013

Although the bald eagle was removed from the federal list of threatened and endangered species in 2007, it continues to be protected under the Bald and Golden Eagle Protection Act and the MBTA. Although the recovering bald eagle population in Wyoming has expanded, limiting factors are severe and continue to increase in severity (WGFD 2010). The entire Snake River corridor is considered critical wintering habitat for resident and migratory bald eagles (Biota 2002). Bald eagles nest along major river drainages and lakes throughout Wyoming near large lakes and rivers in forested habitat where adequate prey (fish, waterfowl and ungulate carcasses) and old, large-diameter cottonwood or conifer trees for nesting are available. Wyoming's largest bald eagle concentrations are in Teton, Sublette, and Carbon counties. Bald eagles that nest in northwestern Wyoming are part of the significant nesting population in the Rocky Mountain west (WGFD 2010). Six bald eagle nests have been identified within one mile of the study area (WISDOM 2013).

3.11.1 Segment 1

Existing Conditions

The WGFD Aquatic and Combined Enhancement Areas and the Aquatic and Combined Crucial Areas protect several NSS species in Segment 1, specifically along Spring Creek and the Snake River. The Snake River corridor is identified as a “fishery of national importance.” Declining habitat for the Snake River cutthroat trout (*Oncorhynchus clarkia*) (NSS4) is the reason for the enhancement area designation. Other NSS species in these priority areas include bluehead sucker (*Catostomus discobolus*) (NSS1), mountain sucker (*Catostomus platyrhynchus*) (NSS3), bald eagle (*Haliaeetus leucocephalus*) (NSS2), trumpeter swan (*Cygnus buccinator*) (NSS2), moose (*Alces alces*) (NSS3), boreal toad (*Anaxyrus boreas boreas*) (NSS1), and rubber boa (*Charina bottae*) (NSS2).

Habitat issues identified for the enhancement priority area include existing road culverts and bridges that restrict aquatic species migration, and trout spawning and rearing habitat that is limited by sediment. Destabilization of the stream bank and resulting high erosion has also led to high sediment loads, degraded water quality, and limited quality aquatic habitat (WYGF 2009). Several other NSS fish species are identified in the Snake River, which may exist outside of the designated priority areas but could occur in the study area (WISDOM 2013).

The highest concentration/density of bald eagle nest sites in Wyoming occurs along the Snake River drainage where diverse river habitat is found in close proximity to elk feeding grounds. Recovery of the bald eagle is centered along the Snake River drainage in Jackson Hole and the Greater Yellowstone area (WGFD 2010).

A categorical exclusion prepared by WYDOT in 2010 for the northeast quadrant of the intersection of WYO 22 and WYO 390 indicates that “suitable raptor nesting habitat is plentiful” in this area. Numerous raptor nests, including bald eagle nests, exist upstream and downstream of the area. Several active osprey nests were also observed in this area, including an osprey nest immediately adjacent to WYO 390. This nest is the only one identified as being of concern (WYDOT 2010a).

Potential Impacts

Negligible impacts are expected in Segment 1 to the greater sage grouse and North American wolverine due to their undocumented and/or unconfirmed presence in the study area, as shown in Table 17. Impacts to moose are described under Section 3.10 Wildlife. Impacts to boreal toad and rubber boa would be similar to those described for small, less mobile terrestrial species under Section 3.10 Wildlife.

In general, the alternatives are not expected to affect migratory birds. Typically, habitat loss impacts associated with highway widening are not considered substantial enough to cause population declines to migratory birds. Bald eagles and other raptors are highly mobile and could move away from areas of disturbance. Impacts to all migratory birds would be greatest along the Snake River corridor, where riparian vegetation and large trees suitable for nesting and foraging exist. The Snake River also includes suitable habitat for yellow-billed cuckoo (federal candidate species). The categorical exclusion prepared for the WYO 22 and WYO 390 intersection notes that the high amount of activity along the river corridor may preclude yellow-billed cuckoos from using the habitat in the area. Greater impacts could occur to ospreys, which have the highest number of nests in the study area. The USFWS recommends a 0.25-mile disturbance-free buffer zone around active osprey nests from April 1 through August 31. WYDOT notes that adult ospreys using the nest near the intersection are accustomed to a high level of disturbance. If construction activities result in increased disturbance levels, a timing restriction could be implemented to reduce impacts (WYDOT 2010a).

Work near or within Spring Creek and the Snake River could impact SCGN fish through increased turbidity levels and/or temporary habitat loss, as described under Section 3.10 Wildlife, above. Working in the Snake River could further destabilize the existing streambank and increase sediment loads that are already high. Any future replacement of culverts in Segment 1 could help address problems, if any, currently caused by existing road culverts that restrict aquatic species migration.

Impacts to Ute ladies'-tresses, if present, could occur during construction activities in riverine areas, such as Spring Creek and the Snake River. Noxious weeds could enter the study area on construction equipment could threaten this plant species, as aggressive weeds can ultimately displace native species (Fertig 2000).

3.11.2 Segment 2

Existing Conditions

Segment 2 includes a small section of WFGD's Crucial Priority Areas for aquatic wildlife within the Snake River Corridor described for Segment 1. Segment 2 is not within an Enhancement Priority Area (WFGD 2009). Greater sage grouse and North American wolverine may occur in Segment 2, although their presence in the study area is unconfirmed or undocumented, as shown in Table 17.

Potential Impacts

Negligible impacts are expected to wildlife special status species due to the lack of suitable habitat or unlikely presence of the species. Impacts would be similar to those

described under Section 3.10 Wildlife, above. Minimal impacts to Ute ladies'-tresses would occur given the small section of riverine environment within Segment 2. Impacts would be greater under the Four-Lane Alternative.

3.11.3 Segment 3

Existing Conditions

Segment 3 is not within state designated priority areas that protect NSS species (WGFD 2009). Development along the highway through Wilson likely discourages wildlife from using this area. Greater sage grouse and North American wolverine may occur in Segment 3, although their presence in the study area is unconfirmed or undocumented, as shown in Table 17.

Potential Impacts

Negligible impacts are expected to wildlife special status species due to the presence of Wilson, lack of suitable habitat, and unlikely presence of the species. Impacts would be similar to those described under Section 3.10 Wildlife, above. Negligible impacts would occur to Ute ladies'-tresses given the limited amount of riverine habitat and the developed nature of Fish Creek as it passes through the community of Wilson.

3.11.4 Segment 4

Existing Conditions

Segment 4 is not within state designated priority areas that protect NSS species (WGFD 2009). Greater sage grouse, North American wolverine, and Canada lynx may occur in Segment 3, although their presence in the study area is unconfirmed or undocumented, as shown in Table 17.

Potential Impacts

The western end of the study area approaches habitat that could be suitable for the Canada lynx. However, no critical habitat for the lynx exists in this area and no occurrences have been documented. Impacts to lynx are unlikely. Impacts to wildlife special status species would be similar to those described under Section 3.10 Wildlife, above. No to negligible impacts would occur to Ute ladies'-tresses given lack of riverine habitat in Segment 4.

3.11.5 Segment 5

Existing Conditions

Segment 5 includes portions of the WGFD Aquatic and Combined Crucial Priority Areas and Aquatic and Combined Enhancement Priority Areas associated with the Snake River, as described for Segment 1. Greater sage grouse and North American wolverine may occur in Segment 5, although their presence in the study area is unconfirmed or undocumented, as shown in Table 17.

Potential Impacts

Widening the highway to four lanes in Segment 5 would have similar impacts to wildlife special status species along the Snake River corridor as described for

Segment 1. These impacts would occur to a lesser degree for the Two-Lane Alternative. Impacts to wildlife special status species outside the Snake River corridor would be similar to those described under Section 3.10 Wildlife, above. Some impacts to Ute ladies'-tresses would occur along the section of riverine environment associated with the Snake River as described for Segment 1 for the Four-Lane Alternative. Impacts would be less under the Two-Lane Alternative as fewer plants would be removed.

3.11.6 Segment 6

Existing Conditions

No Crucial Priority Areas or Enhancement Priority Areas exist in Segment 6 (WGFD 2009). Greater sage grouse and North American wolverine may occur in Segment 6, although their presence in the study area is unconfirmed or undocumented, as shown in Table 17.

Creeks, ponds, and perch trees in the vicinity of the John Dodge subdivision represent important habitat for nesting bald eagles and their young. Several raptor nests have been identified in this area, including a bald eagle nest. A total of 32 raptor nests were located during a 2002 study and many more were expected to be present (Biota 2002).

Potential Impacts

Negligible impacts are expected to special status species due to the lack of suitable habitat or unlikely presence of the species. Impacts to wildlife special status species would be similar to those described under Section 3.10 Wildlife, above. Negligible impacts would occur to Ute ladies'-tresses given the limited amount of riverine habitat in Segment 6.

3.11.7 Mitigation

The mitigation measures described under Section 3.10 Wildlife would apply to special status species as well. In addition, the following mitigation measures should be considered.

- Conduct construction activities farther than 660 feet from bald eagle nests to minimize impacts to nesting bald eagles, as defined by the 2007 *USFWS National Bald Eagle Management Guidelines*.
- Because the Snake River is a “fishery of national importance,” identify and monitor mitigation measures to protect special status fish in this river. Solutions identified by WGFD for the Aquatic and Combined Enhancement Areas include coordinating with WYDOT, USFWS, and Teton County to improve culvert and bridge structures (WGFD 2009).
- Comply with the 2007 *USFWS National Bald Eagle Management Guidelines* and the 2010 *USFWS Wyoming Guidelines for Bald Eagles*. Alternatively, work with the USFWS to develop project-specific conservation measures for bald eagles.
- Preserve large trees near the highways as much as possible.

- Conduct a survey for active migratory bird nests prior to construction. If active nests are found, coordinate with USFWS to determine an appropriate course of action.
- Implement timing restrictions, if necessary, to minimize impacts to nesting ospreys at the intersection of WYO 22 and WYO 390.
- Conduct a survey for Ute ladies'-tresses and develop an integrated noxious weed control program to implement in the vicinity of the species.
- Conduct surveys to determine if bats listed in the State Wildlife Action Plan are present and if structures that would be replaced are used as roosts.

3.11.8 Future NEPA Considerations

During the NEPA process, an updated list of special status species should be obtained and reviewed for additions or deletions. Field surveys may need to be conducted to determine the presence of special status species. Consultation with the USFWS should occur in compliance with Section 7 of the ESA. A biological assessment may need to be prepared and submitted to the USFWS for review and approval.

3.12 CUMULATIVE IMPACTS

The plans listed below and other area plans should be reviewed for past, present, and reasonably foreseeable future actions that, when combined with the impacts expected from this study, result in cumulative effects. In addition, other actions that have occurred within the study area should be identified that could have cumulative results.

The 1998 *Teton Village Master Plan* calls for substantial development of additional accommodations, commercial space, and attractions. The plan includes measures to help mitigate traffic on WYO 390, including seasonal bus passes for Teton Village employees and free parking and shuttles from Stilson Parking Lot near the intersection of WYO 22 and 390 (Jackson Hole Mountain Resort n.d.). A “revised submittal document,” the 2005 *Teton Village Expansion Resort Master Plan, PUD* notes that, since adoption of the plan in 1994, “Teton Village has been planned for additional growth.” This plan caps the amount of additional growth, stops sprawl by creating a permanent buffer of open lands, and enhances the scenic approach to the Village and Grand Teton National Park by preserving 1,116 acres of land as permanently protected open space. The plan also includes a Traffic Plan that consists of a map of the resort’s roads (Snake River Associates 2005).

The 2006 NPS *Grand Teton National Park Final Transportation Plan/Environmental Impact Statement* states that “plans for expansion of Teton Village, as well as the growth in background traffic on Wyoming WYO 390, could increase traffic on the Moose-Wilson Road [WYO 390]” (NPS 2006). A 2006 report that analyzed transportation impacts associated with the *Teton Village Master Plan* states that “all improvements outlined in the Approved Plan are sufficient to accommodate traffic from the Master

Plan Expansion” (Snake River Associates 2006). Additional research should be conducted during the NEPA process to confirm whether these expansions have occurred and if not, when they can be expected.

As of September 2013, work is continuing on the Pathway 22 project between Stilson Ranch Road and the Town of Jackson. Improvements along WYO 22 in Segment 1 include a multi-use path and protected bike lane located within the WYDOT right-of-way. The west end of Segment 1 also includes a new Snake River Pathway Bridge. In Segment 5, a new pedestrian underpass below WYO 390 near WYO 22 will connect the existing pathways at Stilson Ranch Road to the pathway planned through the new Rendezvous “R” Park (described above), across the Snake River, and east along WYO 22 to the pathway system in the Town of Jackson (Teton County 2013).

Grand Teton National Park also has plans to provide multi-use path connectivity from the park to the greater system of paths in the county, noting that “multi-use pathways have been constructed to encourage bicycling and walking elsewhere in Teton County, but these pathways do not extend into the park.” The 2006 *Grand Teton National Park Final Transportation Plan/Environmental Impact Statement* examines opportunities for the park to partner with neighboring communities to develop multi-use pathways that respond to community interest (NPS 2006).



4 Agency Coordination and Public Involvement

WYDOT conducted an extensive public and agency involvement program to provide opportunities for interested parties to participate in and contribute to the PEL

study. The intent was to solicit information, ideas, and opinions from the public and agencies. This chapter summarizes the results of those efforts.

4.1 PUBLIC INVOLVEMENT

4.1.1 Mailing List Development

The study team compiled mailing lists of approximately 190 adjacent property owners, 25 homeowners associations, 40 stakeholders, and 75 interested citizens. People were continually added to the mailing list as comments were received throughout the process. The mailing list was used for the notification of open houses.

4.1.2 Public Open House Meetings

Public meetings were held in an open house format that allowed participants to have personal interaction with planners, engineers, and representatives from FHWA and WYDOT. The open houses were designed to provide information to the general public and to obtain their input. The meetings provided individuals interested in the WYO 22 and WYO 390 corridors time to express their concerns and have questions answered. Appendix A contains more detailed information on the following public open house meetings:

- **Public Scoping meeting October 9, 2013**, 4:30 pm to 7:00 pm, at the Jackson Hole Center for the Arts in Jackson.
 - Approximately 79 people attended.
 - The purpose of this meeting was to obtain input on issues, transportation needs, and visions, provide a description of the PEL process, and obtain public input.
- **June 24, 2013**, 4:30 pm to 7:00 pm, at the Teton County Library in Jackson.

- Approximately 6 people attended.
 - The purpose of this meeting was to provide a description of the process, explain the recommended set of alternatives, solicit input on project prioritization, and gather other public input and address concerns.
 - Due to the low attendance, a third open house public meeting was planned after a review and revamping of the outreach efforts.
- **August 21, 2013**, 4:30 pm to 7:00 pm, at Teton County Library in Jackson.
 - Approximately 92 people attended.
 - The purpose of this meeting was to provide a description of the process, explain the recommended set of alternatives, solicit input on project prioritization, and gather other public input and address concerns.

4.1.3 Website

A project website was maintained throughout the study at <http://www.22-390corridorstudy.com/>. The website’s purpose was to disseminate study information and to receive comments from the general public. Featured contents included:

- Project overview
- Study area, including flyover videos
- Public involvement
- Public input map,
- Alternatives development
- What is a PEL?
- Study documents
- Contacts/links

The study input map included a feature where the public could insert comments in specific areas of the corridors with “push-pins.” A total of five comments were received via the website. Content from the public meetings and meeting summaries also were available.



Study Overview

Study Purpose

The primary purpose of the Wyoming State Highway 22 and Wyoming State Highway 390 Planning and Environmental Linkages Study (PEL) is to develop a vision for the corridor. This corridor vision will help guide the identification and implementation of future improvement projects. The study will define the transportation needs of the existing highways, and develop a set of potential alternatives or solutions to address these needs. An outcome of the study also will be the identification of near-term improvements for specific needs that are compatible with the long-term vision for the corridor.

Further information is available on the [Study Documents](#) page.

The Youtube video below provides additional detail regarding the intent of the study and the transportation challenges along WYO 22 and WYO 390.

[Click Here to view the
Public Open House #2
Graphics from August 21, 2013](#)



4.1.4 Study Contacts

Study team members were available to answer questions from the public. Team members responded to the public via phone, e-mail, website, and in person. The main study contact was:

Bob Hammond, PE
Wyoming Department of Transportation
1040 Evans Rd
Jackson, WY 83001
307-733-3665 (phone)
E-mail: bob.hammond@wyo.gov

4.1.5 Public Information and Press Releases

Press releases were distributed for the public open houses. An advertisement was sent to the *Jackson Hole News and Guide* announcing the public meetings on October 9, 2012 and August 21, 2013.

4.1.6 Letters and Comments

Written communication in the form of emails, letters, and comment sheets were received throughout the study process. As of October 1, 2013, approximately 58 comments were received via letter, website, or e-mail. This does not include comments received at the public open houses.

4.1.7 Public Input Obtained

Comments received varied greatly in terms of content, preferences, and opinions. The study team reviewed and considered all comments as part of the alternatives development and screening. Although difficult to categorize, several dominant themes emerged from the public comments:

- Maintain the western rural character.
- The entire study area is rife with wildlife.
 - Safe crossing of wildlife is an issue for all of WYO 390 and WYO 22.
 - Slower speed limits would be safer for wildlife; increase enforcement of speed limits.
- Safety is paramount.
 - Need safe pedestrian and bicycle crossings, such as tunnels.
 - Future roads should always include bike paths or bike lanes.
 - Slower speed limits would be safer for pedestrians; increase enforcement of speed limits.
- Consider roadway widening issues.

- Some comments support four-lane roadways where congestion is very bad.
- Some comments oppose four-lane roadways where other solutions may exist.
- Consider intersection issues.
 - Consider roundabouts at intersections.
 - Create turn lanes and/or acceleration/deceleration lanes at key intersections.
- Prioritize transit.

4.2 STAKEHOLDERS



Stakeholders at workshop

4.2.1 Visioning Workshop

The study team held a visioning workshop on the day of the first public open house meeting at the beginning of the study. The workshop included major stakeholders in the study area and provided an opportunity to describe the intention of the study and to initiate a discussion of potential visions for the WYO 22 and 390 corridors.

The stakeholders included 35 people with a wide range of expertise, including community and transportation planning, resource conservation, land management, and business professionals. Members

of the TAC (see Section 4.3.2, below) also attended. Part of the workshop was devoted to small group break-out sessions to ascertain community values, visions, and transportation needs. The stakeholders provided key input at the onset of the study for scoping purposes and to guide the development of a vision for the corridors, purpose and need, and study goals. Appendix A contains more detailed information on this workshop.

4.2.2 Pathways Field Trip

A field trip with study team members and Jackson Hole Community Pathways staff was conducted on November 13, 2012. The field trip consisted of a tour and discussion of planned pathways projects in the study area. This allowed the study team to gain an understanding of design standards, maintenance issues, and any other topics that Pathways staff thought pertinent to the project team.

4.2.3 Wildlife Field Trip

In the fall of 2012, the study team held a field meeting with representatives of Teton Science Schools, Safe Wildlife Crossings, and the Jackson Hole Wildlife Foundation to examine wildlife-related issues in the field and confirm locations of proposed

wildlife crossings. The meeting reaffirmed “hot spot” locations identified in previous studies where wildlife conflicts occur and the locations of potential crossings.

4.3 AGENCY OUTREACH

4.3.1 Coordination with State and Federal Agencies

At the onset of the study, WYDOT sent scoping letters to the following state and federal agencies: EPA, USACE, Bureau of Land Management (BLM), U.S. Forest Service (USFS), NPS (Grand Teton National Park), Natural Resources Conservation Service (NRCS), WGFD, U.S. Fish and Wildlife Service, Teton County Conservation District, Wyoming Office of State Lands, Wyoming State Historic Preservation Office, and Wyoming Department of Environmental Quality (DEQ). The purpose of these letters was to conduct scoping, collect data, and obtain technical direction and input.



Recreationists near the WYO 22 Snake River bridge.

Replies were received in September and October of 2012 through written letters and phone correspondence. All agencies expressed an interest to participate and to stay engaged. The EPA, BLM, and the Wyoming DEQ had no specific comments, and the NRCS replied that they do not believe the work will adversely impact prime farmland. Additional agency replies include the following:

- USACE
 - Development and construction will likely impact waters of the U.S., including the Snake River, Fish Creek, and adjacent wetlands, requiring a USACE permit.
 - Avoid and minimize impacts to waters of the U.S. as required under the Clean Water Act.
 - Identify and delineate all aquatic resources as early as possible.
- USFS
 - Moose road kill is a problem on WYO 390; possible mitigation includes vegetation management, fencing, wildlife crossings, and speed reduction.

- Consider a wildlife crossing on WYO 22 near the Teton Science School. A center lane at the Teton Science School would help with turning movement and traffic flow.
- Traffic at the WYO 22 and 390 intersection includes use by recreationists to destinations farther north; consider a roundabout at this location.
- Traffic speed through Wilson is a safety issue.
- NPS
 - Traffic volumes on WYO 390 may have reached the point where further increases are unsustainable.
 - Widening or other improvements to WYO 390 to accommodate higher traffic volumes or greater speeds would diminish the qualities for which Grand Teton National Park is valued.
 - WYO 390 is becoming increasingly used by bicyclists.
 - Explore options to ensure WYO 390 continues to serve park purposes while accommodating a sustainable level of motor vehicle use.
 - The purpose of WYO 390 within Grand Teton National Park is primarily to provide visitors with access to destinations along the road, and only secondarily, if at all, as a through transportation corridor.
- WGFD
 - Vehicle/wildlife collisions are common due to high traffic volumes.
 - Important wetlands are adjacent to the roads and need to be identified.
 - Conduct amphibian surveys in all affected wetlands to identify breeding sites that might be impacted
 - Grizzly bears have been observed in the study area in the past few years and should be analyzed for impacts.
 - Evaluate the study area for SGCN species and their habitat and species listed and candidates for listing under the ESA.
 - Conduct surveys to determine if bats listed in the *State Wildlife Action Plan* are present and if structures that would be replaced are used as roosts.
 - If new bridges or culverts are planned, enhance bat roost sites.
 - Place fences in accordance with Teton County's fencing standards.
 - Design overhead powerlines to reduce impacts to avian wildlife.
 - Invasive/noxious weeds are a concern; limit removal and/or alteration of vegetation to limit the spread of weeds.
- On March 8, 2013, an update was provided to the agencies regarding major developments that had occurred since release of the scoping letters (see Appendix B). The update provided information about the following:

- Purpose and need
- Project vision statement
- Goals
- Alternative screening
- Project schedule

4.3.2 Coordination with Local Agencies

Cooperating Agencies

Early in the study, FHWA and WYDOT invited the Town of Jackson and Teton County to participate as cooperating agencies on this study in accordance with FHWA regulations 23 CFR 771.111(d). Both accepted, which led to preparation and signing of a Memorandum of Understanding that outlined roles and responsibilities of the various parties (see Appendix B).

Transportation Advisory Committee

The southern Teton County area has a standing Transportation Advisory Committee for coordination on transportation issues. The TAC is composed of staff representatives from Teton County, the Town of Jackson, START, Jackson Hole Community Pathways, and WYDOT. Generally, the TAC serves as a technical body providing recommendations to the elected representatives.

The study team met with the TAC throughout the course of the PEL study. Study presentations were made at six TAC meetings and one TAC/stakeholder meeting. The discussions included the vision for the corridors, purpose and need, goals, evaluation criteria, alternatives, recommendations, and plans for public involvement. The TAC also reviewed and provided comments on the draft PEL study report, which were incorporated into the final report. Appendix B contains more detailed information on the presentations to the TAC.

Joint Information Meeting

On October 1, 2012, a presentation of the PEL study was given at a Joint Information Meeting of the Council members of the Town of Jackson and the Commissioners of Teton County. The presentation provided an overview of the PEL process, the study area, the intention to develop a vision for the corridors, identification of transportation needs, plans for public involvement, and prioritizations.



5 Next Steps

The PEL study assessed the transportation needs within the WYO 22 and 390 corridors. The study team engaged the community stakeholders and the public to develop a vision for the corridors. The study process considered effects on the human and natural environment from various alternatives, and also included consultation with applicable resource agencies.

This planning process sets the stage for moving ahead in the future with individual improvement projects. Future studies, initiated under NEPA, will be able to incorporate planning products from this PEL study assuming certain conditions outlined in 23 USC 168 are met.

While the corridors have numerous needs, limited resources prevent WYDOT from implementing corridor-wide alternatives. Therefore, a project prioritization plan has been developed. The plan provides an implementation framework based on the transportation needs, and also considers environmental impacts, right-of-way needs, and public support.

Table 19 below displays the prioritization plan, and Table 20 provides a summary of the prioritization.

Table 19: Project Prioritization

Location	How do elements of the Purpose and Need (in bold) and <i>project goals</i> (in italics) inform priorities?	Recommendations
WYO 22 and Broadway Intersection	<ul style="list-style-type: none"> • Mobility – most congested location in the study area. • Bicycle and Pedestrian Connectivity – the intersection presents an obstacle to bicycle and pedestrian connections. • Transit – intersection presents a good opportunity to provide transit infrastructure including queue jumps or signal priorities. • Safety and Wildlife – low wildlife concerns, but substantial safety issues • <i>Environmental</i> – relatively low potential for natural resource impacts; relatively high potential for business impacts • <i>Right-of-way (ROW)</i> – relatively high potential for ROW impacts • <i>Public Support</i> - high 	Priority = HIGH <i>Near term need:</i> eastbound dual left turn
WYO 22 and 390 Intersection	<ul style="list-style-type: none"> • Mobility – second-most congested location in the study area. • Bicycle and Pedestrian Connectivity – the intersection presents an obstacle to bicycle and pedestrian connections, but the construction of the Snake River Pedestrian Bridge and accompanying paths will alleviate some need. • Transit – intersection presents a good opportunity to provide transit infrastructure including queue jumps or signal priorities. • Safety and Wildlife – very active wildlife area, some safety issues. • <i>Environmental</i> – relatively high potential for environmental resource impacts (e.g. wetlands) • <i>Right-of-way (ROW)</i> – moderate potential for ROW impacts • <i>Public Support</i> - high 	Priority = HIGH
WYO 22 and Spring Gulch Road Intersection	<ul style="list-style-type: none"> • Mobility – least congested major intersection in the study area. • Bicycle and Pedestrian Connectivity –pedestrian and bicycle facilities lack connectivity. • Transit – intersection presents a good opportunity to provide transit infrastructure including queue jumps or signal priorities. • Safety and Wildlife – moderate wildlife concerns • <i>Environmental</i> – relatively low potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – relatively low potential for ROW impacts – may affect Jackson Hole Land Trust Protected Properties • <i>Public Support</i> - moderate 	Priority = HIGH <i>Near term need:</i> southbound right turn lane (underway by County)

Location	How do elements of the Purpose and Need (in bold) and <i>project goals</i> (in italics) inform priorities?	Recommendations
WYO 22 Snake River Bridge	<ul style="list-style-type: none"> • Mobility – highly congested location with narrow shoulders, may restrict ability to improve WYO 22 / WYO 390 intersection • Bicycle and Pedestrian Connectivity – significant barrier for bicycle and pedestrian connectivity that is being only partly addressed by bike/ped bridge under construction • Transit – little opportunity to improve transit-oriented infrastructure • Safety and Wildlife – relatively high wildlife concerns, presents opportunity to lengthen bridge and provide a crossing next to river. Safety issues are mainly a result of the narrow shoulders and lack of pedestrian and bicycle facility • <i>Environmental</i> – high potential for environmental resource impacts (e.g. wetlands, water quality, historic) • <i>Right-of-way (ROW)</i> – relatively low potential for ROW impacts, adjacent to conservation easements/protected properties • <i>Redundancy</i> – improvements/replacement would partly address redundancy concerns in times of traffic disruption • <i>Public Support</i> - high 	Priority = HIGH
Segment 1: WYO 22 between Broadway and WYO 390	<ul style="list-style-type: none"> • Mobility – most congested segment in the study area. • Bicycle and Pedestrian Connectivity – represents a missing link in the bicycle and pedestrian path system • Transit – little opportunity to improve transit-oriented infrastructure • Safety and Wildlife – relatively high wildlife concerns, safety issues include some sharp curves • <i>Environmental</i> – moderate potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – high potential for ROW impacts, including conservation easements/protected properties • <i>Public Support</i> - high 	Priority = MEDIUM <i>Near term need:</i> intersection improvements at Skyline, Teton Science School, Bar Y
Segment 2 Cross-Section: WYO 22 between WYO 390 and Wilson	<ul style="list-style-type: none"> • Mobility – moderately congested. • Bicycle and Pedestrian Connectivity – good existing parallel path system; lacks safe crossings • Transit – little opportunity to provide transit-oriented improvements • Safety and Wildlife – moderate wildlife concerns • <i>Environmental</i> – relatively low potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – moderate potential for ROW impacts, including conservation easements • <i>Public Support</i> - moderate 	Priority = MEDIUM <i>Near term need:</i> intersection improvements at Wenzel

Location	How do elements of the Purpose and Need (in bold) and <i>project goals</i> (in italics) inform priorities?	Recommendations
Segment 3 Cross-Section: WYO 22 within Wilson	<ul style="list-style-type: none"> • Mobility – low congestion. Access consolidation needs to be considered. • Bicycle and Pedestrian Connectivity – fair existing parallel path system; lacks safe crossings in an active pedestrian area • Transit – little opportunity to provide transit-oriented improvements • Safety and Wildlife – moderate wildlife concerns • <i>Environmental</i> – relatively low potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – moderate potential for ROW impacts, including conservation easements/preservation trust lands • <i>Public Support</i> - low 	Priority = MEDIUM
Segment 4 Cross-Section: WYO 22 west of Wilson	<ul style="list-style-type: none"> • Mobility – least congested segment in the study area. • Bicycle and Pedestrian Connectivity – good existing parallel path system; lacks safe crossings, especially near intersection of Old Pass Road, where recreationalist use is high • Transit – little opportunity to provide transit-oriented improvements, no existing service • Safety and Wildlife – moderate wildlife concerns; safety issues near the community of Wilson include runaway trucks and some sharp curves. • <i>Environmental</i> – relatively low potential for environmental resource impacts; improvements would likely require substantial cut-and-fill or walls • <i>Right-of-way (ROW)</i> – moderate potential for ROW impacts, including conservation easements/protected properties • <i>Public Support</i> - low 	Priority = LOW
Segment 5 Cross-Section: WYO 390 between WYO 22 and Lake Creek	<ul style="list-style-type: none"> • Mobility – moderately congested; access to/from side streets and properties is often difficult • Bicycle and Pedestrian Connectivity – good existing parallel path system; lacks safe crossings • Transit – good opportunity to provide transit-oriented improvements, including bus lanes/pullouts, queue jumps or others. • Safety and Wildlife – very active wildlife area; other safety concerns include intersection related issues and curves near Aspens/Pines. • <i>Environmental</i> – relatively low potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – relatively low potential for ROW impacts, including preservation trust lands • <i>Public Support</i> - moderate 	Priority = MEDIUM <i>Near term need:</i> intersection improvements at Nethercott, Teton Pines, Clubhouse, Lake Creek, John Dodge

Location	How do elements of the Purpose and Need (in bold) and <i>project goals</i> (in italics) inform priorities?	Recommendations
Segment 6 Cross-Section: WYO 390 between Lake Creek and Grand Teton National Park	<ul style="list-style-type: none"> • Mobility – low congestion. • Bicycle and Pedestrian Connectivity – good existing parallel path system; lacks safe crossings • Transit – little opportunity to provide transit-oriented improvements • Safety and Wildlife –active wildlife area • <i>Environmental</i> – relatively low potential for environmental resource impacts • <i>Right-of-way (ROW)</i> – relatively high potential for ROW impacts, including protected properties • <i>Public Support</i> - low 	Priority = LOW

Table 20: Prioritization Summary

High Priorities	<ol style="list-style-type: none"> 1) WYO 22 and Broadway Intersection 2) Snake River Bridge 3) WYO 22 and WYO 390 Intersection 4) WYO 22 and Spring Gulch Road Intersection
Medium Priorities	<ol style="list-style-type: none"> 1) Segment 1 cross-section – WYO 22 between Broadway and WYO 390 2) Segment 5 cross-section – WYO 390 between WYO 22 and Lake Creek 3) Segment 2 cross-section – WYO 22 between WYO 390 and Wilson 4) Segment 3 cross-section – WYO 22 within Wilson
Low Priorities	<ol style="list-style-type: none"> 1) Segment 6 cross-section – WYO 390 between Lake Creek and Grand Teton National Park 2) Segment 4 cross-section – WYO 22 west of Wilson
Note: Wildlife crossings and improvements will be considered with each proposed project.	
Near Term Needs	<ol style="list-style-type: none"> 1) WYO 22 and Spring Gulch Road Intersection – southbound right turn lane 2) Segment 1 minor intersection improvements at: <ol style="list-style-type: none"> a) Skyline b) Teton Science School c) Bar Y 3) Segment 5 minor intersection improvements at: <ol style="list-style-type: none"> a. Nethercott b. Teton Pines c. Clubhouse d. Lake Creek e. John Dodge 4) Segment 2 minor intersection improvements at: <ol style="list-style-type: none"> a. Wenzel

6 References

Biota Research and Consulting, Inc. 2002. *West Bank Wildlife Study Habitat Inventory and Linkage Assessment, Teton County, Wyoming*. Prepared by Cynthia J. Riegel for Jackson Hole Land Trust. March 15.

_____. 2003. *Jackson Hole Roadway and Wildlife Crossing Study*. Prepared for the Jackson Hole Wildlife Foundation.

Collins, Bill, Nancy Arkin, Randy Bosch, and Paula Stevens. 2003. *Amendment to the Text of the Comprehensive Plan to Incorporate a Mixed Use Village Concept with Specific Inclusion of Wilson Community & Transportation Corridor Plan Concepts*. AMD 03-0007. August 29.

Environmental Protection Agency (EPA). 2012. Impervious Surfaces. <http://www.epa.gov/ged/coralreef/models/ImperviousSurfaces.html>. Accessed September 17, 2013.

_____. 2013a. Currently Designated Nonattainment Areas for All Criteria Pollutants. <http://www.epa.gov/airquality/greenbk/ancl.html#WYOMING>. Accessed September 18, 2013.

_____. 2013b. NEPAssist maps. <http://nepassisttool.epa.gov/>. Accessed September 18, 2013.

_____. 2013c. Regulatory Definition of waters of the U.S. <http://water.epa.gov/lawsregs/guidance/wetlands/CWAwaters.cfm>. Accessed October 1, 2013.

Federal Emergency Management Agency (FEMA). n.d. Definitions of FEMA Flood Zone Designations. <https://msc.fema.gov/webapp/wcs/stores/servlet/info?storeId=10001&catalogId=10001&langId=-1&content=floodZones&title=FEMA%2520Flood%2520Zone%2520Designations>.

_____. 1989. FIRM Flood Insurance Rate Map Teton County, Wyoming and Incorporated Areas Map Number 56039C0530 B. May 4. <http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=32039469&IFIT=1>. Accessed September 24, 2013.

_____. 2006a. FIRM Flood Insurance Rate Map Teton County, Wyoming and Incorporated Areas Map Number 56039C0540 C. September 29. <http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=31177201&IFIT=1>. Accessed September 24, 2013.

_____. 2006b. FIRM Flood Insurance Rate Map Teton County, Wyoming and Incorporated Areas Map Number 56039C2906C.

<http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=31276447&IFIT=1>.

Accessed September 24, 2013.

Federal Highway Administration (FHWA). 1979. Visual Impact Assessment for Highway Projects. <http://contextsensitivesolutions.org/content/reading/visual-impact-2/?>. Accessed September 3, 2013.

_____. 2013. Planning and Environmental Linkages.

<http://www.environment.fhwa.dot.gov/integ/>

Fertig, Walter. 2000. *Status Review of the Ute ladies tresses (Spiranthes diluvialis) in Wyoming*. Wyoming Natural Diversity Database, University of Wyoming, Laramie. January 4.

<http://www.uwyo.edu/wyndd/files/docs/reports/wynddreports/u00fer01wyus.pdf>. Accessed October 17, 2013.

Francis, Julie. 2013. Exceptional bridges. Personal communication from Julie Francis, Archaeologist, Wyoming Department of Transportation, to Randy Strang, Federal Highway Administration. Letter dated March 25.

Friends of Pathways. 2009. Jackson Hole Community Pathways Map.

http://www.townofjackson.com/resources/files//Town%20Services/F.%20Pathways/Pathways_County_Map_12091.pdf. Accessed September 23, 2013.

Jackson Hole Mountain Resort. n.d. Parking in Jackson Hole.

<http://www.jacksonhole.com/summer-parking.html>. Accessed September 19, 2013.

Jackson Hole Wildlife Foundation (JHWF). 2012. Roadkill data. Personal communication from Leigh Work, JHWF Executive Director, to Sandy Beazley, Jacobs Engineering. Email dated October 2.

King, Elizabeth C. 2013. Personal communication from Elizabeth C. King, Wyoming State Parks & Cultural Resources Historic Preservation Specialist, to Julie Francis, WYDOT Archaeologist. Letter dated December 10, 2013.

Lower Valley Energy (LVE). n.d. Service territory map. Available at:

http://www.lvenergy.com/wp-content/uploads/LVE_Service_Territory2-2.pdf.

Accessed September 18, 2013.

National Park Service. 2006. *Grand Teton National Park Final Transportation Plan/Environmental Impact Statement*.

<http://parkplanning.nps.gov/document.cfm?parkID=68&projectID=10940&documentID=16829>. Accessed September 23, 2013.

_____. 2010. Snake River Headwaters Newsletter.

<http://parkplanning.nps.gov/showFile.cfm?projectID=31397&MIMEType=application%252Fpdf&filename=SNAKE%5FSCOPING%5F12pgs%2Epdf&sfid=0>.

- _____. 2013. Wyoming Land & Water Conservation Fund Grants.
<http://www.nps.gov/state/wy/index.htm?program=parks>. Accessed September 23, 2013.
- Rendezvous Lands Conservancy. n.d. <http://rendezvouslandsconservancy.org/>. Accessed September 23, 2013.
- Sanders, Paul H. 2010. *A Class III Cultural Resource Inventory of a Small Block Area for the Teton Village Road, WYDOT Project STP-2000101/2001013 and STP2000036, Teton County, Wyoming*. Prepared for Wyoming Department of Transportation. Project Number WY-36-2007. September.
- Snake River Associates. 2005. Teton Village Expansion Resort Master Plan, PUD.
<http://www.tetonwyo.org/plan/docs/StaffReports/2002/SRA3/Chapters1-9.pdf>. Accessed September 26, 2013.
- _____. 2006. *Teton Village Expansion Resort Master Plan, PUD Transportation Element Final Report*. FHU Reference No. 01-20.1 Prepared by Felsburg Holt & Ullevig. May 12. <http://www.tetonwyo.org/plan/docs/ResortMasterPlans/SRA/AppendixY.pdf>. Accessed September 19, 2013.
- State Historic Preservation Office (SHPO). 2011. SHPO consultation. Personal communication from Laura Nowlin, Historic Preservation Specialist, to Julie Francis, Archaeologist, Wyoming Department of Transportation. Letter dated December 28.
- State of Wyoming. 2001. SF0076 – Highway right of way permitted use. Case.
<http://legisweb.state.wy.us/2001/engross/sf0076.htm>. Accessed September 19, 2013.
- Teton County. 1994. *Article II Zoning District Regulations – Teton County*.
<http://www.tetonwyo.org/plan/docs/ComprehensivePlan/LDR-ArticleII-2013May28.pdf>. Accessed September 23, 2013.
- _____. 2001. *Wilson Land Use and Transportation Corridor Study Charrette Report*. Prepared by Charlier Associates, Inc. May.
<http://www.tetonwyo.org/plan/docs/SpecialReports/WilsonCharretteReport.pdf>. Accessed September 19, 2013.
- _____. 2002. *Article III Natural, Scenic, Agricultural, and Tourism Resources Protection - Teton County*.
http://landuse.law.pace.edu/landuse/documents/laws/reg8/Reg8_WY_TetonCo_SkylineDev.pdf. Accessed September 23, 2013.
- _____. 2012. *Jackson/Teton County Comprehensive Plan*.
<http://www.tetonwyo.org/compp/topics/jackson-teton-county-comprehensive-plan/251817/>. Accessed September 18, 2013.

- _____. 2013. Jackson Hole Community Pathways.
<http://www.tetonwyo.org/pathwy/news/work-on-the-pathway-22-project-continuing-this-fall/11749>. Accessed September 23, 2013.
- _____. n.d. Teton County Mapserver.
<http://maps.greenwoodmap.com/tetonwy/mapserver/>. Accessed September 18, 2013.
- Teton County Parks & Recreation. 2013. Parks Directory and Map.
<http://www.tetonparksandrec.org/parks-pathways/park-directory>. Accessed September 23, 2013.
- Town of Jackson and Teton County. 2007. *Pathways Master Plan*. June.
- U.S. Army Corps of Engineers. 1995. Wetlands Delineation Manual Part II: Technical Guidelines. <http://www.wetlands.com/coe/87manp2a.htm>. Accessed October 2, 2013.
- U.S. Census Bureau. 1990, 2000, 2010. Demographic data for Teton County.
<http://www.census.gov/>. Accessed September 19, 2013.
- U.S. Fish & Wildlife Service. 2011. What is a Migratory Bird?
<http://www.fws.gov/pacific/migratorybirds/definition.html>.
- _____. 2013. IPaC - Information, Planning, and Conservation System.
<http://ecos.fws.gov/ipac/>. Accessed October 17, 2013.
- U.S. Geological Survey. 2004. *Water-Quality Characteristics of the Snake River and Five Tributaries in the upper Snake River Basin, Grand Teton National Park, Wyoming, 1998-2002*. By Melanie Clark, Wilfrid J. Sadler, and Susan E. O’Ney.
<http://pubs.usgs.gov/sir/2004/5017/pdf/sir2004-5017.pdf>. Accessed September 23, 2013.
- Waitkus, Brian R. 2011. *A Class III Cultural Resource Survey of the Environmental Study Corridor along State Highway 22 Between Jackson and the Forest Service Lands West of Wilson, and State Highway 390 between State Highway 22 and Grand Teton National Park WYDOT Projects STPS-2000-00(36) and STPS-00(012). (013) Teton County, Wyoming*. Prepared for Wyoming Department of Transportation. Project Number WY-36-2007. July.
- Western EcoSystems Technology, Inc. 2007a. *Preliminary Wetlands and Other Surface Waters Report. Project No. 2000-00(036), Teton Village Road, Jct. S-2000 North, Teton County, Wyoming*. Prepared by Kurt Flaig. November 26.
- _____. 2007b. *Preliminary Wetlands and Other Surface Waters Report. Project No. 2000-00(036), Teton Village Road, Teton Village South, Teton County, Wyoming*. Prepared by Kurt Flaig. November 26.
- _____. 2007c. *Preliminary Wetlands and Other Surface Waters Report. Project No. 2000-00(036), Jackson-Wilson, Wilson Section, Teton County, Wyoming*. Prepared by Kurt Flaig. November 26.

Western Transportation Institute (WTI). 2011. *Highway Mitigation Opportunities for Wildlife in Jackson Hole*. Prepared for the Jackson Hole Conservation Alliance.

Wyoming Department of Environmental Quality. 2013. *Water Quality Rules and Regulations. Chapter 1*. http://deq.state.wy.us/wqd/wqdrules/Chapter_01.pdf. Accessed November 20, 2013.

Wyoming Department of Transportation (WYDOT). 2010a. *Categorical Exclusion 10-48 Project No.'s 2000036 & 2001012 WY 22 and 390 Intersection Parcel Title 23 Transfer Advanced Land Acquisition Teton County*. R.M.0.00-7.00. October 22.

_____. 2010b. *Wyoming Connects; Long Range Transportation Plan*. August.

Wyoming Game & Fish Department (WGFD). 2009. *Strategic Habitat Plan*. Habitat priority maps. <http://wgfd.wyo.gov/web2011/wildlife-1000426.aspx>. Accessed October 7, 2013.

_____. 2010. *State Wildlife Action Plan*. <http://www.wildlifeactionplan.org/sites/default/files/Complete%20SWAP%20021412.pdf>. Accessed October 7, 2013.

_____. 2012. Agency scoping. Personal communication from John Emmerich, Deputy Director, Wyoming Game & Fish Department, to Timothy L. Stark, Environmental Engineer, Wyoming Department of Transportation. Letter dated October 1.

_____. 2013a. Big Game GIS Data. <http://wgfd.wyo.gov/web2011/wildlife-1000819.aspx>.

_____. 2013b. Hunting Information. <http://wgfd.wyo.gov/web2011/hunting-1000045.aspx> Accessed October 8, 2013.

Wyoming Interagency Spatial Database and Online Management System (WISDOM). 2013. WYO 22 & 390 PELS WISDOM Biological Resources Summary Report. Produced by Kevin Powell, WYDOT. October 15.

(This Page Intentionally Left Blank)

7 Appendices

Appendix A: Public Involvement

Appendix B: Agency and Local Government Coordination

Appendix C: FHWA Acceptance Letter and Questionnaire

Appendix D: Alternatives Screening

(This Page Intentionally Left Blank)

Appendix A: Public Involvement

(Note: Appendices A, B, D are included on the computer disc attached to the back cover of this document due to their large file size.)

Appendix B: Agency and Local Government Coordination

(Note: Appendices A, B, D are included on the computer disc attached to the back cover of this document due to their large file size.)

Appendix C: FHWA Acceptance Letter and Questionnaire



U.S. Department
of Transportation
**Federal Highway
Administration**

Wyoming Division

January 22, 2014

2617 E. Lincolnway, Suite D
Cheyenne, WY 82001-5671

Mr. John F. Cox
Director
Wyoming Department of Transportation
5300 Bishop Boulevard
Cheyenne, Wyoming 82009-3340

SUBJECT: Planning Environmental Linkage Study for WYO-22 and WYO-390

Dear Mr. Cox:

This letter is to acknowledge the completion of the WYO-22 and WYO-390 Planning and Environmental Linkages (PEL) study by the Wyoming Department of Transportation (WYDOT). This corridor planning study was undertaken in a manner consistent with the Federal Highway Administration (FHWA) PEL guidance in Appendix A to Part 450, Linking the Transportation Planning and National Environmental Policy Act (NEPA) Processes. The planning process incorporated the intent of NEPA through the consideration of natural, physical, and social effects, involved environmental resource agencies, documented the transportation planning process, and vetted the results through public involvement.

The PEL Questionnaire submitted to FHWA in January 2014, provides a good summary of the work completed in the PEL study and the information that will be needed once projects enter into the NEPA process. The PEL study establishes a corridor-wide framework that can be referenced in subsequent NEPA documents for individual projects, as provided for under 23 U.S.C. 168.

As individual projects are initiated, it will be necessary for FHWA and WYDOT to coordinate on a project-by-project basis to determine the scope of the NEPA study, including level of study required, purpose and need, logical termini, and the extent to which the corridor study can be used to supplement or replace certain milestones in the NEPA process.

If you have any questions, please contact me at 307-771-2942 or email Jeffrey.Purdy@dot.gov.

Sincerely yours,

Jeffrey R. Purdy, AICP, PTP
Planning and Right-of-Way Program Manager

cc:

Kevin Powell, Environmental Services, WYDOT
John Eddins, P.E., District 3 Engineer, WYDOT
Jim Clarke, AICP, Jacobs Engineering

Background

What is the name of the PEL document and other identifying project information (e.g. sub-account or STIP numbers)?

Wyoming Highways 22 and 390 Planning and Environmental Linkages Study
Teton County
WyDOT Project Number B129086

Provide a brief chronology of the planning activities (PEL study) including the year(s) the studies were conducted.

Study Period: June 2012 through Winter 2014
Summer 2012: Project Kick-off
October 2012: Visioning Stakeholder Workshop and Public Open House
Fall 2012: Development of Purpose and Need
Winter 2012 – 2013: Development of Alternatives
Spring 2013: Evaluation of Alternatives
Summer 2013: Public Open Houses
Fall 2013: Recommended Alternatives and Project Prioritization
Winter 2013 – 2014 : Final Report

Provide a description of the existing transportation corridor, including project limits, modes, number of lanes, shoulder, access control and surrounding environment (urban vs. rural, residential vs. commercial, etc.)

The Wyoming State Highway 22 (WYO 22) and Wyoming State Highway 390 (WYO 390) roadway corridors connect the Town of Jackson with the Jackson Hole Ski Resort at Teton Village and with the community of Wilson in southern Teton County, Wyoming.

See Section 1.3 for a description of the corridor characteristics.

Who was the sponsor of the PEL study? (DOT, Local Agency, Other)

FHWA and WYDOT

Who was included on the study team (Name and title of agency representatives, consultants, etc.)?

FHWA:
Jeff Purdy, Planning and Right-of-Way Program Manager
Randy Strang, Environmental Program Engineer

WYDOT:
Jeff Brown, Assistant State Traffic Engineer
John Eddins, District Engineer
Bob Hammond, Resident Engineer
Stephanie Harsha, District 3 Public Relations Specialist
Kevin Powell, Environmental Manager
Ted Wells, District Construction Engineers
Mark Wingate, Systems Planning Engineer

Jacobs:
Jim Clarke, Project Manager
Chris Primus, Deputy Project Manager
Keith Borsheim, Transportation Planner
Patti Steinholtz, Environmental Planner

Are there recent, current or near future planning studies or projects in the vicinity? What is the relationship of this project to those studies/projects?

The context for studying the transportation needs and developing a vision for the WYO 22 and 390 corridors occurs within the framework of other transportation plans, studies, and projects within the study area. See Section 1.7 for a summary list of these activities, and Chapter 6 for a list of references.

Methodology

Did you use NEPA-like language? Why or why not?

Yes; NEPA-like language was appropriate since the study team followed a NEPA-like process for activities such as Scoping, Purpose and Need and Alternatives development, and impact assessment. Use of NEPA terms also will facilitate use of the PEL in future NEPA project(s) on the corridor.

What were the actual terms used and how did you define them? (Provide examples or list)

Example NEPA terms included:

Logical Termini. The termini identified for the study represent rational starting and stopping points for evaluating transportation improvements. In determining limits of the study, the study team also considered end points that would provide sufficient length to address corridor issues on a broad scope.

Purpose and Need. The Purpose and Need statement describes the transportation needs that exist and the problems to be addressed. It serves as the basis for the identification of reasonable alternatives.

No Action Alternative. The No Action Alternative includes reasonably foreseeable and programmed projects near the study area.

Public Involvement. The public and agency involvement program provided opportunities for interested parties to participate in and contribute to the PEL study. The intent was to solicit information, ideas, and opinions from the public and agencies.

Environmental Resources. Similar to many NEPA documents, this chapter describes 'Existing Conditions' for various resources to establish baseline conditions, and then discusses 'Environmental Consequences' from study alternatives. .

Mitigation. Mitigation measures should seek to avoid, minimize, and mitigate adverse environmental effects.

How do you see these terms being used in NEPA documents?

It is expected that these terms will be used in future NEPA projects in the corridor. Minor modifications to the terms may be needed based on NEPA class of action or other consideration.

What were the key steps and coordination points in the PEL decision-making process? Who were the decision-makers and who else participated in those key steps? For example, for the corridor vision, the decision was made by CDOT and the local agency, with buy-in from FHWA, the Corps, and USFWS.

The study team conducted an extensive public and agency involvement program to provide opportunities for interested parties to participate in and contribute to the PEL study. The intent was to solicit information, ideas, and opinions from the public and agencies. See Chapter 4 for a summary and results of those efforts.

The Transportation Advisory Committee for southern Teton County served as a significant stakeholder body for coordination on issues. The TAC is composed of staff representatives from Teton County, the Town of Jackson, START, Jackson Hole Community Pathways, and WYDOT.

How should the PEL information below be presented in NEPA?

This PEL completes the early planning stages for future NEPA projects.

Agency Coordination

Provide a synopsis of coordination with federal, tribal, state and local environmental, regulatory and resource agencies. Describe their level of participation and how you coordinated with them.

At the onset of the study, WYDOT sent scoping letters to the following state and federal agencies: Environmental Protection Agency, US Army Corps of Engineers, US Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service, National Park Service (Grand Teton National Park), Natural Resources Conservation Service, Wyoming Game and Fish Department, Teton County Conservation District, Wyoming Office of State Lands, Wyoming State Historic Preservation Office and Wyoming Department of Environmental Quality. The purpose of these letters was to conduct scoping, collect data, and obtain technical direction and input.

On March 8, 2013, an update was provided to the agencies regarding major developments that had occurred since release of the scoping letters.

See Section 4.3.1 for details.

What transportation agencies (e.g. for adjacent jurisdictions) did you coordinate with or were involved in the PEL study?

Transportation agencies were comprised of the Town of Jackson, Teton County, START, Jackson Hole Community Pathways, and WYDOT. See Section 4.3 for a list of all state and federal agencies that were involved.

What steps will need to be taken with each agency during NEPA scoping?

The agencies will be contacted at the initiation of a NEPA project on the corridor, with a reference to their previous involvement on this PEL study. Steps to be taken with the agencies will vary and depend on the potential resources and impacts from the particular NEPA project. However, future steps during NEPA scoping likely will include activities such as informal consultation with US Fish and Wildlife Service on federally protected species, coordination with the Wyoming State Historic Preservation Office on Areas of Potential Effect, and coordination with the National Park on transportation and wildlife issues.

Public Coordination

<p>Provide a synopsis of your coordination efforts with the public and stakeholders.</p>	<p>WYDOT conducted an extensive public involvement program to provide opportunities for interested parties to participate in and contribute to the PEL study. The intent was to solicit information, ideas, and opinions from the public and stakeholders. See Chapter 4 for a description of this engagement process.</p>
--	--

Corridor Vision/Purpose and Need

<p>What was the scope of the PEL study and the reason for doing it?</p>	<p>The project scope was to engage the stakeholders in a collaborative manner to identify a long term vision for the WYO 22 and 390 corridors, and identifying projects for initial phasing that are consistent with the long-term corridor goal.</p>
<p>Provide the corridor vision, objectives, or purpose and need statement.</p>	<p>See Section 1.4 for the corridor vision statement, and Section 1.5 for the Purpose and Need statement. Study goals are provided in Section 1.6.</p>
<p>What steps will need to be taken during the NEPA process to make this a project-level purpose and need statement?</p>	<p>This Purpose and Need statement will provide the basis for future project-specific Purpose and Need statements on the corridor, but these statements may need to be tailored for the specific study area. Also, some data may need to be updated.</p>

Range of Alternatives Considered, Screening Criteria and Screening Process

<p>What types of alternatives were looked at? (Provide a one or two sentence summary and reference document.)</p>	<p>The study team developed a broad range of alternatives to address the purpose and need. Current transportation problems of the WYO 22 and WYO 390 corridors within the study area drove the development of these alternatives. The types of alternatives included cross-sections, intersections, and multimodal alternatives. See Chapter 2 for the description of alternatives.</p>
<p>How did you select the screening criteria and screening process?</p>	<p>Through input gathered from the website, public comments, coordination with local officials and stakeholders, previous studies, and local and regional plans, all with input and approval from FHWA, WYDOT, and the TAC.</p>
<p>For alternative(s) that were screened out, briefly summarize the reasons for eliminating the alternative(s). (During the initial screenings, this generally will focus on fatal flaws)</p>	<p>Some alternatives were eliminated because of their lack of ability to meet the identified Purpose and Need. Details regarding the elimination of alternatives are provided in Chapter 2.</p>
<p>Which alternatives should be brought forward into NEPA and why?</p>	<p>The study recommended several alternatives for further detailed evaluation in future NEPA project(s). See Section 2.6 for a summary of the recommended alternatives.</p>
<p>Did the public, stakeholders, and agencies have an opportunity to comment during this process?</p>	<p>WYDOT conducted an extensive public involvement program to provide opportunities for interested parties to participate in and contribute to the PEL study, including the development and evaluation of alternatives. The intent was to solicit information, ideas, and opinions from the public and stakeholders. See Chapter 4 for a description of this engagement process.</p>
<p>Were there unresolved issues with the public, stakeholders and/or agencies?</p>	<p>There are no major unresolved issues with the public, stakeholders, or agencies. However, opposition from some stakeholders to several build alternatives (e.g. highway widening to four lanes on Segment 1) likely will reemerge during future</p>

NEPA studies.

Planning Assumptions and Analytical Methods

What is the forecast year used in the PEL study?	2035
What method was used for forecasting traffic volumes?	See Section 3.5.1 for a description of the traffic forecasting process and method.
Are the planning assumptions and the corridor vision/purpose and need statement consistent with the long-range transportation plan?	WYO 22 is identified as a Regional Corridor and WYO 390 is identified as a Local Corridor in the Statewide Long Range Transportation Plan. The corridor vision and Purpose and Need statement are consistent with the planning factors identified in the Long Range Transportation Plan.
What were the future year policy and/or data assumptions used in the transportation planning process related to land use, economic development, transportation costs and network expansion?	See Section 2.3.1 and 2.3.2 for a description of future transportation network assumptions. Section 3.5.1 discusses future data assumptions regarding traffic forecasting. See Section 3.2 for a discussion of future land use.

Resources

In the PEL study, at what level of detail was the resource reviewed and what was the method of review?	Levels of detail for the study of environmental resources varied. Generally, resources having the most potential to influence alternative development and evaluation were evaluated in greater detail. These resources include wetlands, historic resources, and Section 4(f) properties. The study did not evaluate some resources that likely would not influence the screening of alternatives (see below). Chapter 3 provides details on evaluation methods for each resource studied.
Is this resource present in the area and what is the existing environmental condition for this resource?	Chapter 3 describes resources present in the study area and existing environmental conditions for each.
What are the issues that need to be considered during NEPA, including potential resource impacts and potential mitigation requirements (if known)?	Issues to be considered during NEPA will depend on the future NEPA project being initiated. For example, bridge replacement over the Snake River will present issues related to wetlands and aquatic species that will not be a concern for future intersection improvements at WYO 22 and Broadway. In general, issues of concern along the corridor include: <ul style="list-style-type: none"> • wildlife and vehicle conflicts • wetlands • historic properties • Section 4(f) properties • access changes • business relocations at WYO 22 and Broadway intersection Mitigation requirements will vary depending on impacts. However, compensatory wetland mitigation may be needed for some future projects. Wildlife crossing mitigation measures identified in the study will be needed and warrant further study. Effects to historic properties may require mitigation.

<p>How will the data provided need to be supplemented during NEPA?</p>	<p>Each environmental resource evaluated includes a subsection entitled 'Future NEPA Considerations' that described future data needs and considerations. Notable resource information that will or may updating or supplementing includes:</p> <ul style="list-style-type: none"> • updating traffic data • updating wildlife impact data • verifying wetland boundaries for changed conditions • updating protected species lists • updating land use information, including information on land trusts, new or pending developments, and land use planning updates.
<p>List resources that were not reviewed in the PEL study and why? Indicate whether or not they will need to be reviewed in NEPA and explain why.</p>	<p>The study did not evaluate some resources that likely would not influence the screening of alternatives. These resources include: Noise, Hazardous Materials, Utilities, Social and Economic Conditions, Air Quality, and Vegetation.</p> <p>Resources not evaluated should be revisited during the NEPA process to determine if their analysis is required.</p>
<p>Were cumulative impacts considered in the PEL study? If yes, provide the information or reference where it can be found.</p>	<p>Yes, see Section 3.1.2 for details.</p>
<p>Describe any mitigation strategies discussed at the planning level that should be analyzed during NEPA.</p>	<p>Each environmental resource evaluated includes a subsection entitled 'Mitigation' that described future mitigation needs and considerations. See Chapter 3.</p>
<p>What needs to be done during NEPA to make information from the PEL study available to the agencies and the public? Are there PEL study products which can be used or provided to agencies or the public during the NEPA scoping process?</p>	<p>FHWA and WYDOT will make this PEL study available to the agencies and public during future NEPA scoping processes along the corridor before adopting planning products from the PEL into future NEPA studies. This PEL does have planning products that can be used in future NEPA studies.</p>
<p>Are there any other issues a future project team should be aware of? Examples: Utility problems, access or ROW issues, encroachments into ROW, problematic land owners and/or groups, contact information for stakeholders, special or unique resources in the area, etc.</p>	<p>Through coordination with the TAC, it was recognized in this PEL that as specific projects are proposed, more detailed traffic analyses should be conducted by a future project team using the most recent traffic count data available and a review of new forecasts should be conducted with stakeholders at that point in time. This will in particular further inform the future need for either two or four lanes on Segments 2 and 5. Utilities also are a concern, as discussed in Section 3.1.</p>

Appendix D: Alternatives Screening

(Note: Appendices A, B, D are included on the computer disc attached to the back cover of this document due to their large file size.)

