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Wyoming Connects

Corridor 12 Plan

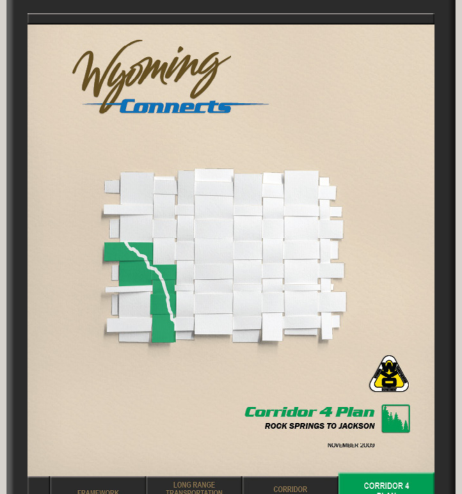
CHEYENNE TO BUFFALO

MAY 2013

The Integrated Planning Framework describes the planning process in detail, including the linkage between strategic goals and project programming - and all the steps in between.

The Long Range Transportation Plan evaluates the state transportation needs from a systems level, describes the issues and problems facing the State including future revenue and programming, and presents options for future investments, all within the context of the Integrated Planning Framework.

Corridor Visions are created for each State Significant Corridor (SSC) as a supplement to the LRTP. These define long term goals and objectives for each corridor based on the strategic goals of the Department, the investment goals of the LRTP, and the specific context of each corridor. The SSC system represents high volume routes in the state that connect major activity centers to each other and to points external to Wyoming. Urban areas are also evaluated as a group.



Corridor Plans build on the Corridor Visions by providing a more detailed look at specific needs and location-based solutions. The plans identify a set of solutions and a recommended program of improvements to be implemented over time that address specific, documented needs.

CORRIDOR PLAN PURPOSE

This Corridor Plan is part of a set of documents created through a comprehensive planning process entitled Wyoming Connects. This set of documents captures consistent, transparent, and repeatable planning steps, analysis, and results designed to provide information to guide project selection and programming decision makers. Each document is designed to build upon prior documents and cascade the Strategic Goals of WYDOT forward from the overarching Strategic Plan to the system wide Long Range Transportation Plan, applied in the development of Corridor Visions, and the definition of Needs and potential Solutions to achieve the vision in Corridor Plans.

PERFORMANCE BASED NEEDS

The Corridor Plan utilizes a performance based approach to needs definition. A system of performance measures is used to evaluate the corridor. The architecture of this tiered system is focused on the three Investment Categories identified in the Long Range Transportation Plan: System Preservation, Safety, and Mobility. Performance measures include both absolute and comparative targets. Absolute measures gauge progress towards long term goals, while comparative measures between corridor and system performance provide information to assist in prioritization.

A need is defined as a deviation between these targets and measured performance. The first tier of the system allows for rapid identification of need in each of the Investment Categories through a Performance Indicator. The second tier provides additional information to qualify potential causes through a set of Performance Qualifiers. GIS based Mapping Analysis tools provide for a spatial analysis of these measurements to further investigate causes and identify overlapping needs.

TIERED APPROACH:

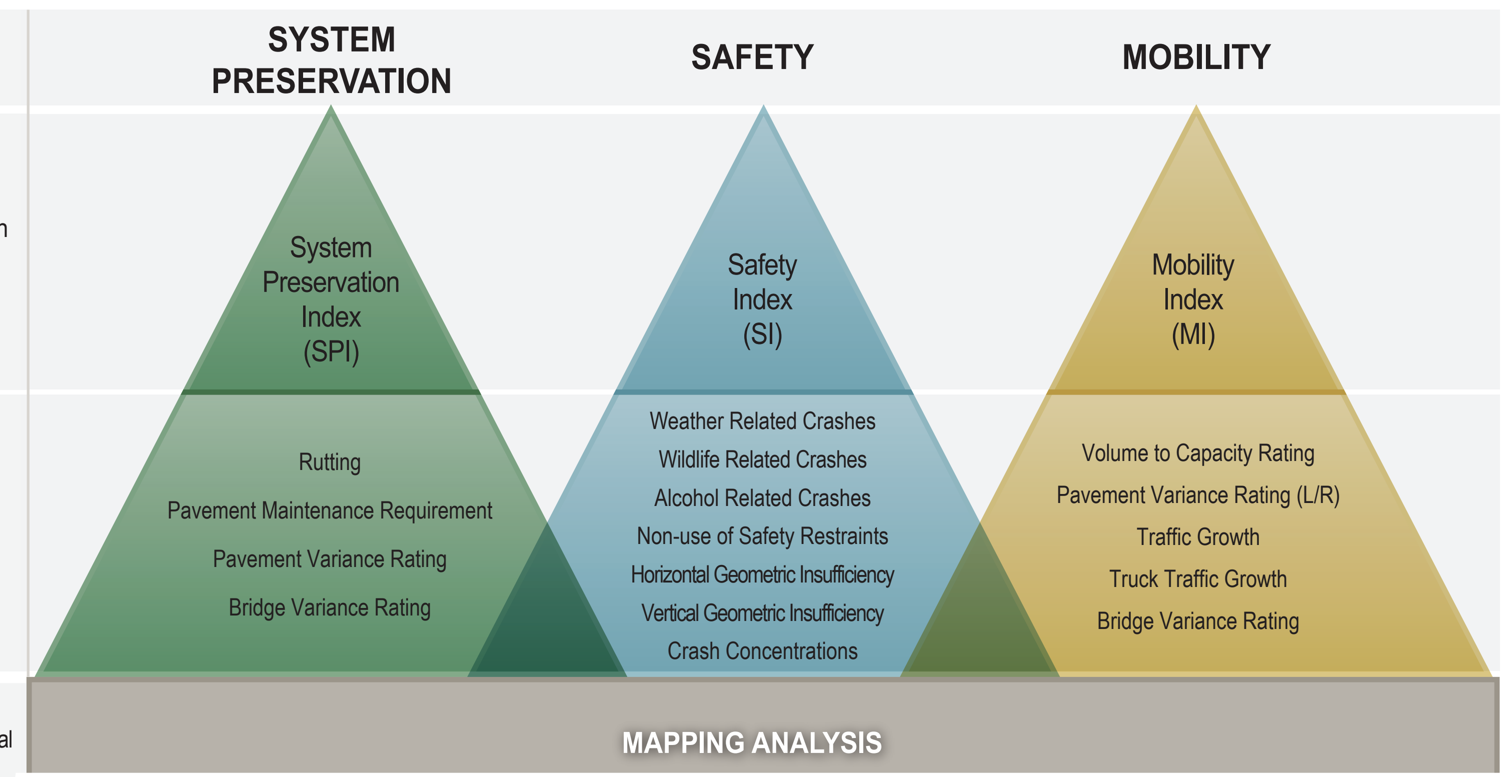
A method to evaluate performance goals at a general level and then advance through the system/hierarchy to filter data and define needs.

INVESTMENT CATEGORY

PERFORMANCE INDICATOR:
These are quantifiable and repeatable measurements that reflect the overall performance of the transportation corridor being analyzed. Targets for these indicators may be absolute and indicate a desired condition or comparative to current performance of the overall system to indicate relative priority.

PERFORMANCE QUALIFIER:
These measures include items that may contribute to the results of the indicator. These variables are measurable and actionable. They are used to qualify the need so that solution sets may be applied.

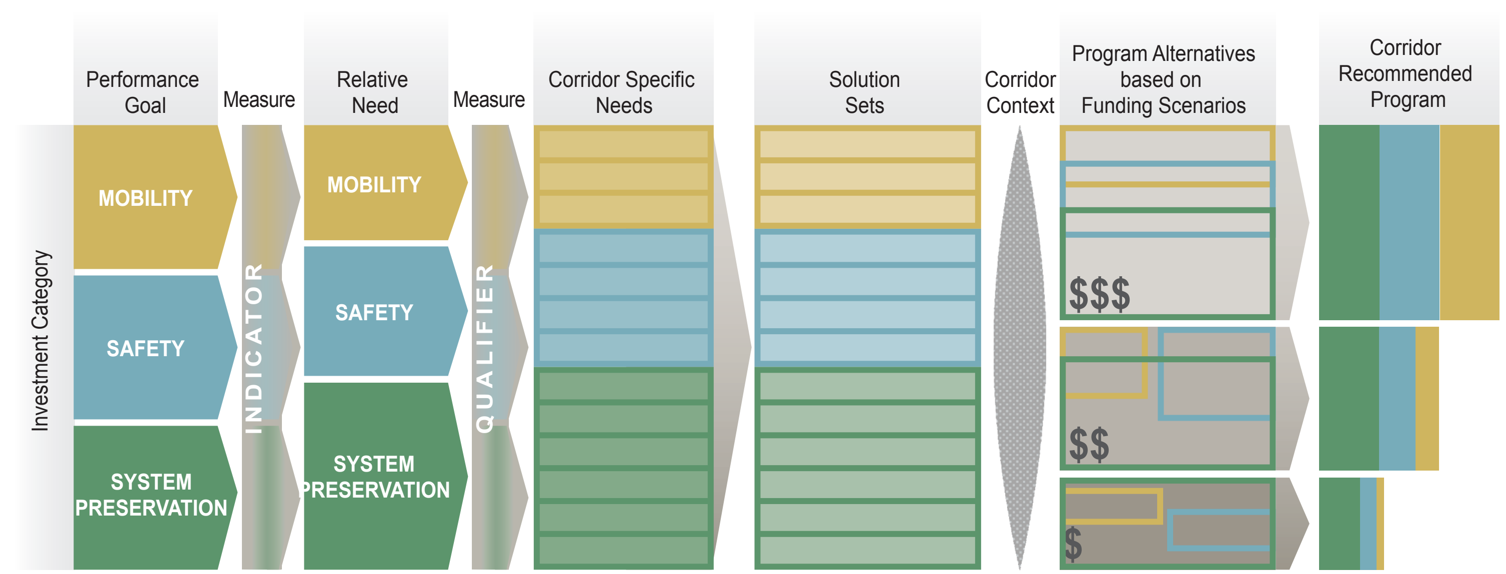
MAPPING ANALYSIS:
Mapping the deviated performance qualifiers against several factors to effectively prioritize, locate, and identify needs.



NEEDS DRIVEN SOLUTIONS:

Performance based needs are captured and documented. These needs remain until the performance is changed. This approach also separates the discussion of need from the discussion of projects, which enhances the transparency of prioritization.

From WYDOT's list of preferred remedies to specific problems, preliminary solutions sets are developed for the identified needs. These sets may be tailored by the specific context of the corridor. For each of the three funding scenarios of the long range plan, the solutions to be considered may vary and the size of the program change. A recommended program can be selected based on anticipated funding levels.



SSC 12 - CHEYENNE TO BUFFALO - I-25
CORRIDOR PLAN

CONTENTS

TABLES

APPENDIX

I. STATE SIGNIFICANT CORRIDOR 12 - DESCRIPTION

CORRIDOR DESCRIPTION

State Significant (SSC) 12 includes Interstate 25 (I-25) from the Wyoming/ Colorado border near Cheyenne in the south to the town of Buffalo 300 miles north where it intersects I-90. It passes through Wyoming's two largest cities, Cheyenne and Casper, and WYDOT Districts 1, 2, and 4. The route passes through several small towns, including Chugwater, Wheatland, Orin, Douglas, Glenrock, Midwest, and Kaycee.

SSC 12 crosses the heart of eastern Wyoming and connects to seven other SSCs (1, 9, 10, 11, 13, 14, and 15) and forms a critical link for access to much of the state as well as interstate travel as a connection between I-80 and I-25. SSC 12 is an important route to Billings, Montana, to the north and Denver, Colorado, and its Front Range communities to the south. It provides commuter, tourism and recreational, truck, and energy-related functions. The Orin to Douglas area affords fishing and boating opportunities along the North Platte River, including Guernsey and Glendo Reservoirs. The connections to other major corridors provide access to all types of recreation opportunities to the east and west.

Cheyenne is Wyoming's state capitol and home to F.E. Warren Air Force Base, both of which generate travel demands on I-25. It has a federally designated Metropolitan Planning Organization. The BNSF Railway parallels I-25 from Cheyenne to Casper. The Cheyenne airport is significant for its passenger service and as the home base for state government's service to remote areas.

Casper is the second largest city in Wyoming, and also has a federally designated Metropolitan Planning Organization. Casper is nicknamed "The Oil City" and has a long history of oil boomtown and cowboy culture, dating back to development of the nearby Teapot Dome. Casper is a regional center of banking and commerce. Development of Wyoming coal and uranium fields in recent decades has helped Casper continue its role as a center in the energy industry. Casper College offers bachelor's degrees from the University of Wyoming.

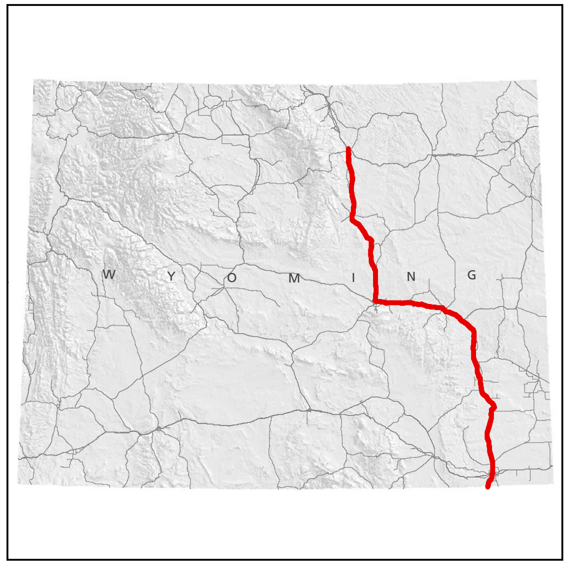
Additional information including environmental context, key issues, and emerging trends is provided in the Corridor Visions and LRTP phases of Wyoming Connects. This Corridor Plan focuses on the identification of the corridor needs through the analysis of corridor performance.


Rich grasslands outside of Sundance

CORRIDOR SEGMENTS

SSC 12 has been divided into 10 planning segments. Planning segments identify generally consistent sections of the corridor for planning level analysis. The planning segments vary in length depending on the context of the corridor. The corridor was segmented at all urban areas and at the intersection of other SSCs. Other context changes may include: roadway typical section (through lanes, shoulders, etc.), average daily traffic, intersecting routes, and terrain. Each segment break or endpoint was assigned as closely as possible to the nearest maintenance section endpoint; segments generally encompass multiple maintenance sections. The planning segments allow for an appropriate analysis and evaluation of corridor needs at a planning level while still providing geographic reference.

Table 1 and the accompanying map on the next page describe general characteristics of each corridor segment.



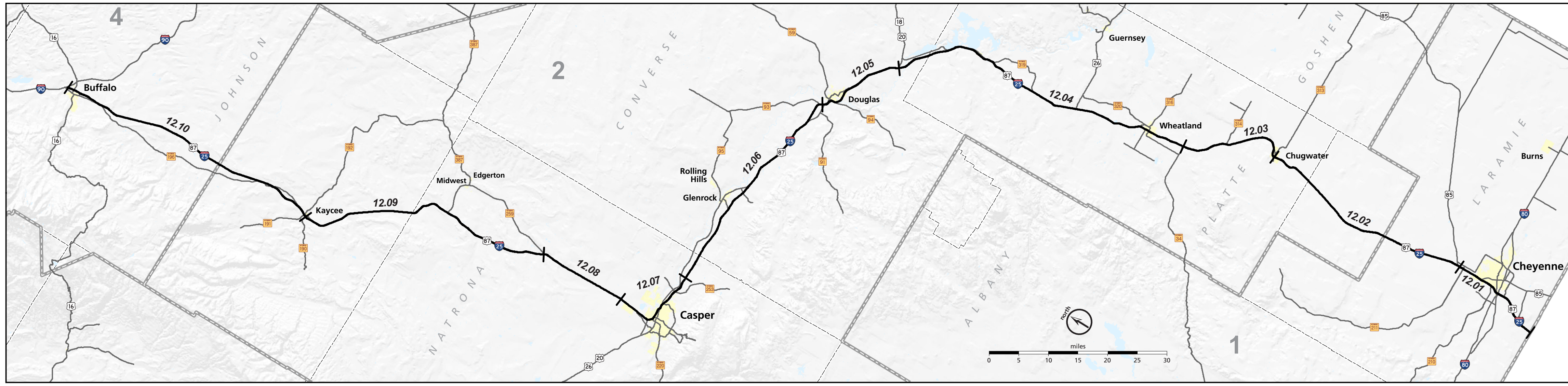


Table 1 - Segments for State Significant Corridor 12

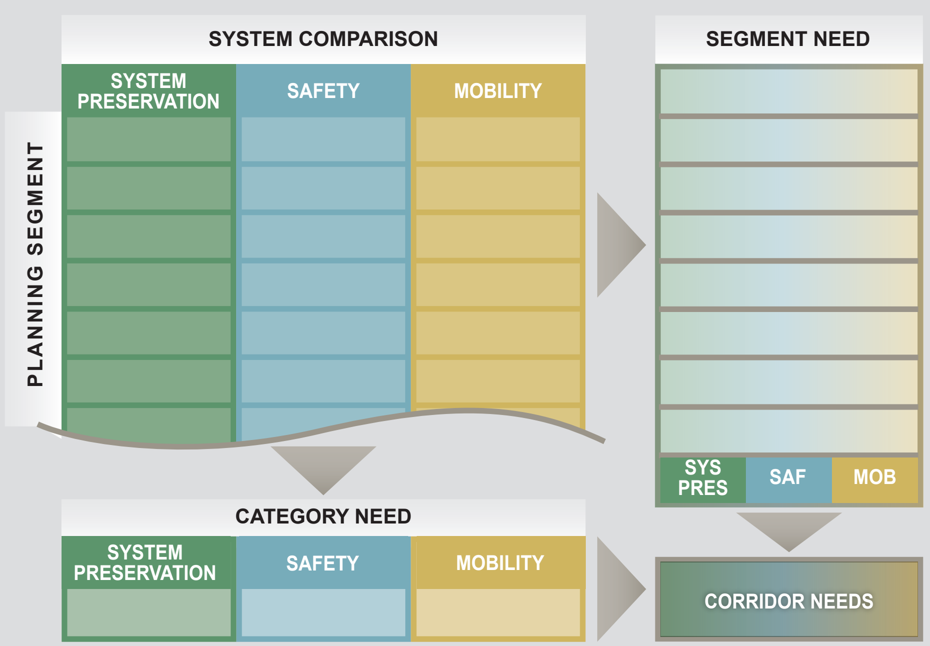
	Segment	ML Route	Begin	End	Length	Description
Corridor 12	12.01	25	0.00	17.01	17.01	**Cheyenne Metropolitan Planning Area (pop. 59,466).** Features: Divided interstate cross-section with 8 interchanges, including SSC 1 (I-80); intersects Regional Route US 85 and Local Routes WYO 223, WYO 212, US 30, WYO 211; Cheyenne Information Center Rest Area; port of entry; changeable message signs; road close gates; multiple creek crossings; 2 UPRR and BNSF Railway grade separations; State Capital; F.E. Warren Air Force Base; intercity bus route and station; local fixed route bus service; Cheyenne Regional-Jerry Olsen Field commercial service airport; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses.
	12.02	25	17.01	54.52	37.51	**Cheyenne to Chugwater.** Features: Divided interstate cross section with 7 interchanges; intersects SSC 16 (US 85) and Regional Route WYO 313; road close gates; changeable message signs; Lodge Pole Creek, Horse Creek, Little Bear Creek, S. Fork Bear Creek, M. Fork Bear Creek, N. Fork Bear Creek, Cantler Draw, Chugwater Creek; BNSF Railway grade separation; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain with rolling terrain near Chugwater.
	12.03	25	54.52	73.00	18.48	**Chugwater to WYO 34.** Features: Divided interstate cross section with 6 interchanges; intersects Regional Routes WYO 313, WYO 34 and Local Routes WYO 211, WYO 321, WYO 314; road close gates; changeable message signs; unnamed draw, Richeau Creek; Chugwater Rest Area; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain.
	12.04	25	73.00	126.70	53.70	**WYO 34 to Orin.** Features: Divided interstate cross section with 7 interchanges; intersects Regional Routes WYO 34 and US 18/20; Local Routes US 87 B in Wheatland (2), US 26 at Dwyer Jct., WYO 319; road close gates; changeable message signs; pedestrian underpass; BNSF Railway grade separation; Dwyer Jct. Rest Area; Rock Creek, 2 Canal, Laramie River (2), Fish Creek, Spring Creek (2), Cottonwood Creek, South Bear Creek, Middle Bear Creek (2), Horseshoe Creek; intercity bus route and station in Wheatland; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; access to Glendo Reservoir and Guernsey State Park; flat terrain.
	12.05	25	126.70	141.42	14.72	**Orin to Douglas.** Features: Divided interstate cross section with 2 interchanges; intersects Local Routes US 20/26/87 & I-25 B in Douglas (2); road close gates; changeable message signs; BNSF Railway grade separation; N. Platte River; intercity bus route and station in Douglas; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain.
	12.06	25	141.42	179.30	37.88	**Douglas to Casper.** Features: Divided interstate cross section with 7 interchanges; intersects Local Routes WYO 96, US 20/26/87, WYO 95; road close gates; changeable message signs; BNSF Railway grade separation; Six Mile Creek, Five Mile Creek, LaPrele Creek, Alkali Creek, Little Boxelder Creek, Boxelder Creek, Deer Creek (2), Dry Muddy Creek; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain.
	12.07	25	179.30	194.89	15.59	**Casper Metropolitan Planning Area (pop. 55,316)**. Features: Multi-lane urban section with curb, gutter, sidewalks, traffic signals, pedestrian crossings; intersects SSC 10 (US 20/26) and SSC 11 (WYO 220), Local Routes WYO 255, WYO 254; changeable message sign; road close gate; BNSF Railway and C&NW grade separations; N. Platte River; Natrona County International Airport; intercity bus route with bus station; local public fixed route bus service; fully developed urban corridor; energy development center; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; urban terrain.
	12.08	25	194.89	210.41	15.52	**Casper to WYO 259.** Features: Divided interstate cross section with 2 interchanges; segment ends at Regional Route WYO 259; road close gate; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain.
	12.09	25	210.41	254.00	43.59	**WYO 259 to Kaycee.** Features: Divided interstate cross section with 7 interchanges; segment begins at Regional Route WYO 259, intersects Local Routes WYO 387, US 87, WYO 196; road close gates; Castle Creek, Dugout Creek, S. Fork Powder River, Powder River, Murphy Creek, Middle Fork Powder River; intercity bus route; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat terrain.
	12.10	25	254.00	300.55	46.55	**Kaycee to Buffalo (pop. 4,832).** Features: Divided interstate cross section with 5 interchanges; intersects Local Routes WYO 190/191, I-25 B, I-90 B, ends at SSC 13 (I-90); road close gates; changeable message signs; Kaycee Rest Area; N. Fork Powder River, Antelope Creek, S. Fork Crazy Woman Creek, M. Fork Crazy Woman Creek, Bull Creek, Clear Creek; intercity bus route and station in Buffalo; major route for commuting, tourism, recreation, agriculture and ranching, gas/oil industry, and other commercial uses; flat and rolling terrain.

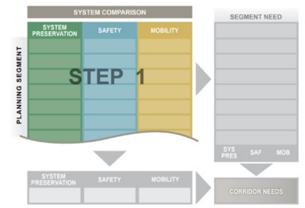
Source: URS Windshield Survey June 2012; Maintenance Section Reference Book 2012; Wyoming Connects: LRTP and Corridor Visions. Note: Descriptions of beginning and endpoints are approximate.

II. EVALUATION OF CORRIDOR PERFORMANCE

This section describes the evaluation of specific corridor needs based on the performance based process defined in the IPF. The Performance Based Needs Process, shown below, illustrates the steps followed for this corridor plan. Indicative Performance measures based on existing or simply defined index measurements for each investment category of System Preservation, Safety, and Mobility were evaluated to preliminarily identify need relative to long term goals. Qualifying performance measures were evaluated to better assess contributing factors to the primary need indicators. The indicators and qualifiers were evaluated and analyzed relative to system averages and, when available, previously specified performance targets. This gap analysis identifies locations where needs exist, qualifies the nature of the need, and provides information on the priority relative to the system of SSCs and available funding.

Many of the measures were established as comparisons to the system average, therefore good performance indicates performance better than the system average. The reverse is also true, poor performance indicates that performance is below the average or rated as poor for a particular indicator or qualifier. As additional corridors are evaluated, specific performance targets may be set to measure absolute performance. The IPF process recommends a mix of absolute measures to evaluate true need relative to long term goals and comparative measures to assist in determining priority.





STEP 1: SUMMARY OF INDICATOR AND QUALIFIER PERFORMANCE MEASURES

This corridor plan evaluates System Preservation, Safety, and Mobility performance using the process described in the Integrated Planning Framework, published separately. The plan analyzes the performance of planning segments described in Table 1 as compared to system averages. It identifies good, fair, poor or less, average, more performance for each segment in an overall index and for each contributing qualifier measurement.

Throughout this report, the color green is used to represent System Preservation, blue represents Safety, and yellow represents Mobility. Lighter shades represent better performance and darker shades represent worse performance compared to the system average.

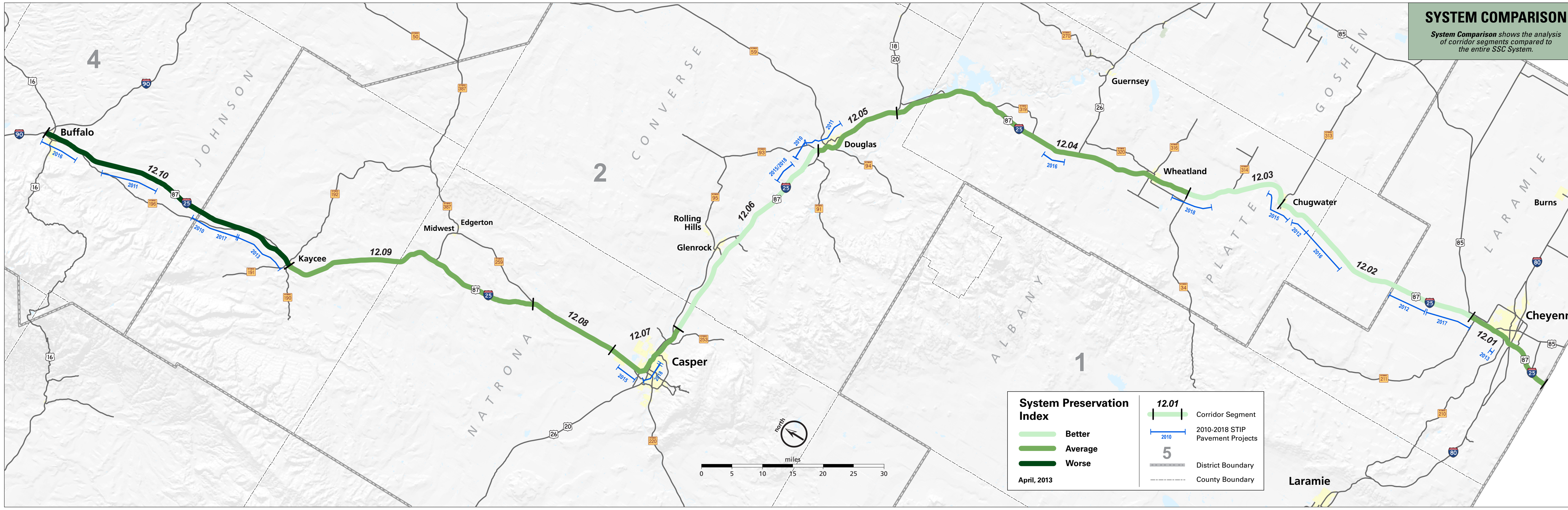
Table 2 summarizes the results for each performance index and qualifier for each planning segment on the corridor.

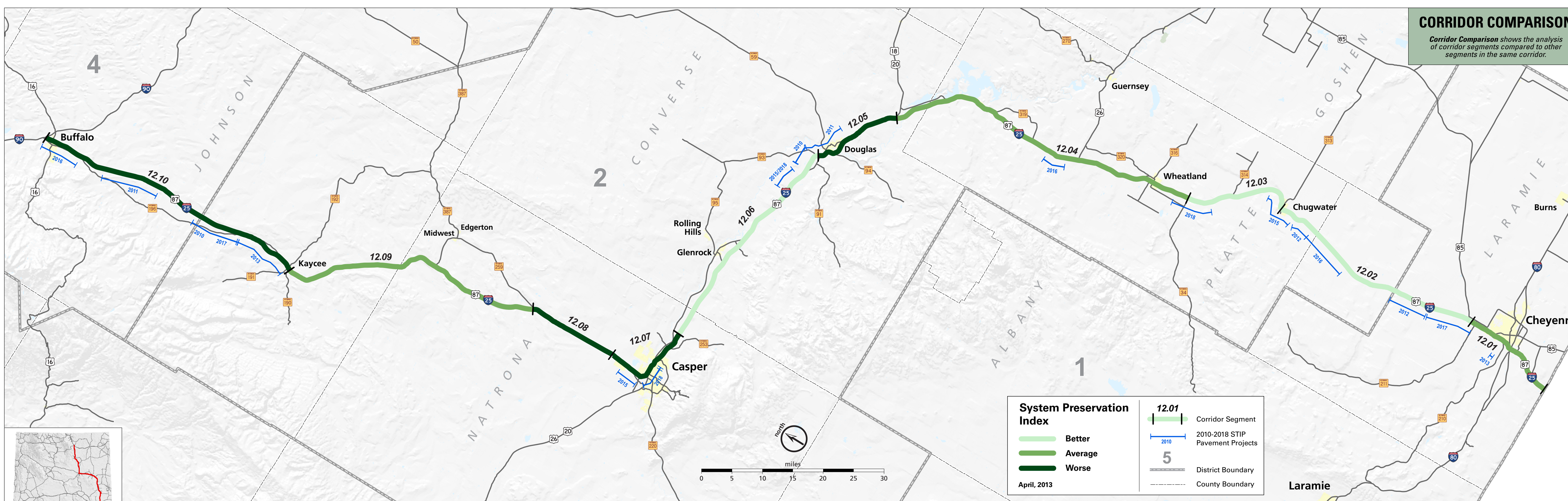
Table 2 - Indicator and Qualifier Performance of SSC 12

	SYSTEM PRESERVATION					SAFETY								MOBILITY					
Segment	System Preservation Index	Rutting	Pavement Maint. Requirement	Pavement Variance Rating	Bridge Variance Rating	Safety Index	Weather Related Crashes	Wildlife Related Crashes	Alcohol Related Crashes	Non-use of Safety Restraints	Horizontal Geometric Insufficiency	Vertical Geometric Insufficiency	Crash Concen-trations	Mobility Index	Volume to Capacity Rating	Pavement Variance Rating (L/R)	Traffic Growth	Truck Traffic Growth	Bridge Variance (L/R)
12.01	Average	Good	Average	Good	Less	Fair	More	Less	Average	More	Less	More	Good	Average	Good	Fair	More	Average	Average
12.02	Better	Good	Average	Good	Less	Fair	More	Average	Average	More	Less	Average	Poor	Better	Good	Fair	Average	Average	Less
12.03	Better	Good	Average	Good	Less	Fair	Average	Average	Less	More	Less	Average	Fair	Better	Good	Fair	More	Average	Less
12.04	Average	Good	More	Good	Less	Fair	More	Average	Average	Average	Less	Average	Poor	Average	Good	Poor	Average	Average	Less
12.05	Average	Fair	More	Fair	Average	Good	More	Average	Average	More	Less	Less	Good	Worse	Good	Poor	Average	Average	Average
12.06	Better	Good	Average	Good	Less	Fair	More	Average	Average	Average	Less	Average	Fair	Average	Good	Poor	Average	Average	Average
12.07	Average	Fair	Average	Fair	Average	Poor	More	Less	More	More	Less	Average	Poor	Average	Good	Poor	Average	Average	Average
12.08	Average	Poor	More	Fair	Less	Fair	More	Average	More	Average	Less	Less	Poor	Better	Good	Good	Average	Average	Less
12.09	Average	Fair	More	Good	Less	Good	Average	Average	Average	Average	Less	Average	Good	Average	Good	Poor	More	Average	Less
12.10	Worse	Fair	Average	Fair	Average	Good	Less	More	Less	Less	Less	Less	Poor	Average	Good	Poor	More	Average	Less

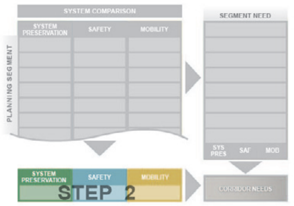
CORRIDOR 12

SYSTEM PRESERVATION – INDEX





STEP 2: ANALYSIS OF INVESTMENT CATEGORY NEEDS - SYSTEM PRESERVATION



Performance Index

The System Preservation Index is average or better, with the exception of segment 12.10, which is worse than average.

Performance qualifiers with a negative effect on the System Preservation Index:
- The Pavement Rutting score on segment 12.08 is poor.
- The Pavement Maintenance Requirement on segments 12.04, 12.05, 12.08, and 12.09 is more than average.

Refer to the sections below for more information.

Performance Qualifiers

Rutting

There are three locations where rutting falls within the poor category along ML 25: 7 miles between route marker (RM) 160 and 167 in segment 12.06, 4 miles between RM 196 and 206, and 6 miles between RM 200 and 206 both in segment 12.08.

	SYSTEM PRESERVATION				
Segment	System Preservation Index	Rutting	Pavement Maint. Requirement	Pavement Variance Rating	Bridge Variance Rating
12.01	Average	Good	Average	Good	Less
12.02	Better	Good	Average	Good	Less
12.03	Better	Good	Average	Good	Less
12.04	Average	Good	More	Good	Less
12.05	Average	Fair	More	Fair	Average
12.06	Better	Good	Average	Good	Less
12.07	Average	Fair	Average	Fair	Average
12.08	Average	Poor	More	Fair	Less
12.09	Average	Fair	More	Good	Less
12.10	Worse	Fair	Average	Fair	Average

Pavement Maintenance Requirements

The pavement maintenance sections that were recommended by the Pavement Management System (Agile Assets) and not yet selected to receive funding within the STIP will continue to decline. If not treated fairly soon, the treatments will become more costly as conditions deteriorate.

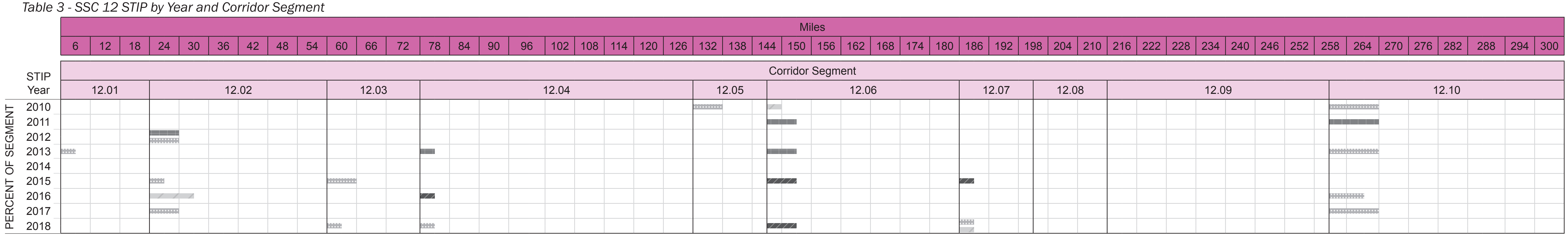
There are no segments that have been identified as having a 1S need within Corridor 12 according to the Pavement Management System. However, based upon current available funding, two projects, representing 12 miles of pavement, have been selected to be completed within the next several years.

Approximately 27% of Corridor 12 has been identified as having a 2S need. This represents 82 miles of pavement. Segments 12.02, 12.03, 12.04, 12.05, 12.09, and 12.10 have 2S treatment recommended by the Pavement Management System. Based upon current available funding, only eight projects, representing 49 miles of pavement, have been selected to be completed within the next several years.

Approximately 73% has been identified as having a 3S need. This represents 218 miles of pavement. Segments 12.01, 12.02, 12.03, 12.04, 12.05, 12.06, 12.07, 12.08, 12.09, and 12.10 have 3S treatment recommended by the Pavement Management System. Based upon current available funding, only two projects, representing two miles of pavement, have been selected to be completed within the next several years.

Based upon current available funding within the STIP, Corridor 12 has identified four 4S projects, representing 15.5 miles of pavement.

Table 3 - SSC 12 STIP by Year and Corridor Segment



SUMMARY PROJECT I.D.

12.01	12.02	12.03	12.04	12.05	12.06	12.07	12.08	12.09	12.10
Year 2013, 2S P251031 Plant Mix Overlay/ADA	Year 2012, 3S I251156 Resurfacing	Year 2015, 2S I252163 Mill/Level/ 2" Overlay	Year 2013, 3S O252140 Widen & Overlay w/ ISO-Reconstruct	2010, 2S I253112 Overlay	Year 2010, 1S I253111 Fault & Pavement	2015, 4S O254147 CSA/Struct/ Grdrl/Widen & Overlay	None	None	Year 2010, 2S I255107 Mill/Level & Overlay
	Year 2012, 2S I252162 Mill/Level/Overlay	Year 2018, 2S I252164 Mill/Level/ Overlay	Year 2016, 4S O252153 Widen & Overlay w/ ISO-Reconstruct		Year 2011, 3S O253085 Widen & Overlay/ISO-Reconstruct	2018, 2S O254139 CSA/Struct/ DWL BAR/ Gurd Rl/Surf			Year 2011, 3S O255098 Widen & Resurface
	Year 2015, 2S I252163 Mill/Level/2" Overlay		Year 2018, 2S I252164 Mill/Level/Overlay		Year 2013, 3S I253109 Widen & Overlay/ISO-Reconstruct	2018, 1S I254142 Enhance-ment			Year 2013, 2S I255106 Widen/Mill/Level/Overlay
	Year 2016, 1S I251166 Microsurface				Year 2015, 4S I253113 Widen & Overlay/ISO-Reconstruct				Year 2016, 2S O255104 Rehabilitation
	Year 2017, 2S O251155 Surfacing				Year 2018, 4S I253114 Widen & Overlay/ISO-Reconstruct				Year 2017 I255113 Mill/Level & Overlay

Legend
1S
2S
3S
4S

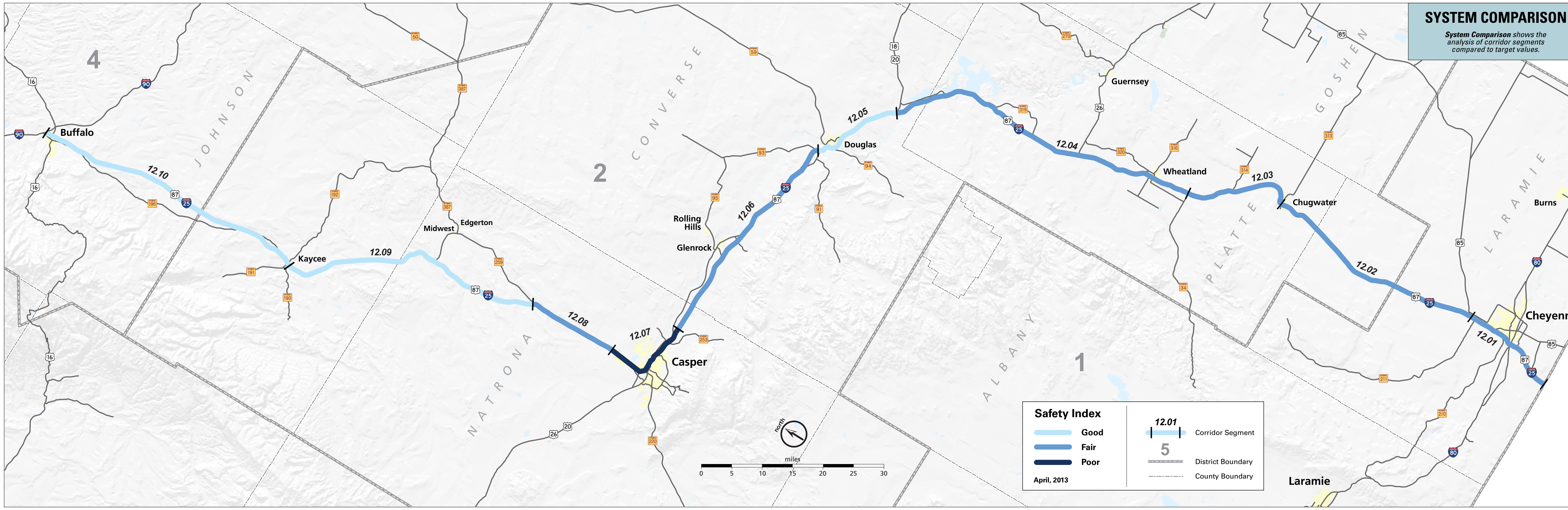
Pavement Variance Rating

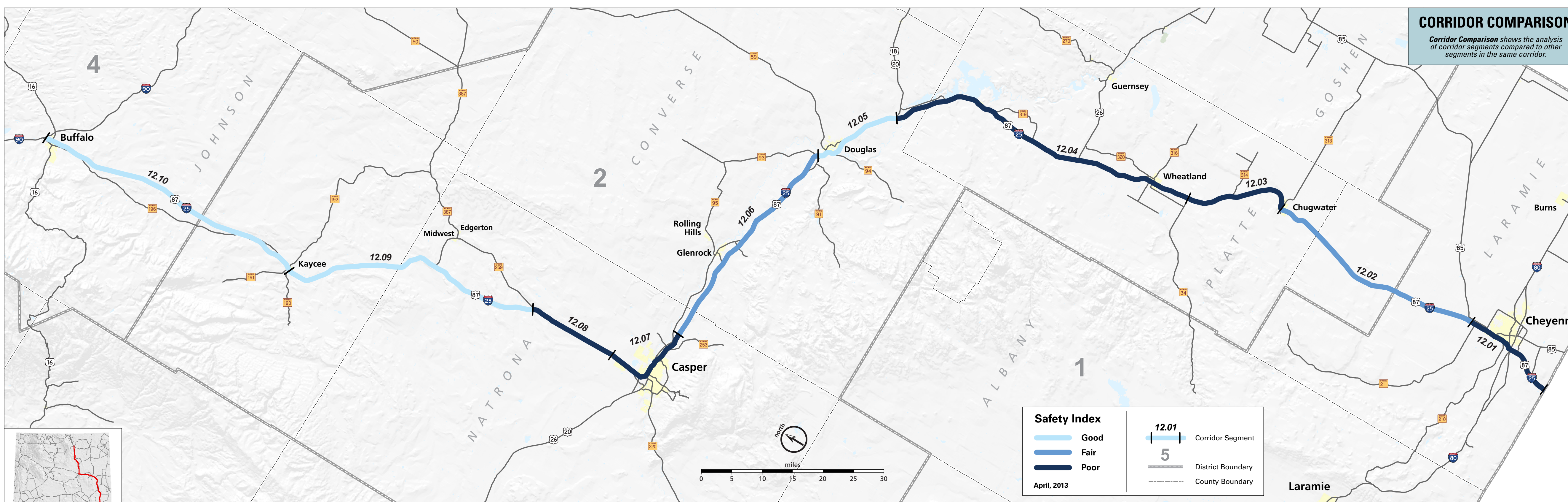
The Pavement Variance Rating is fair or better for the entire corridor. Pavement hotspots, identified by length and severity, occur at two spots near Buffalo (most or moderately severe), and one other location (moderately severe).

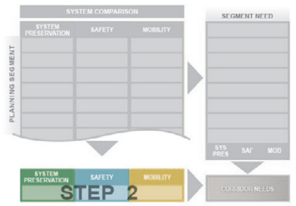
Bridge Variance Rating

The Bridge Variance Rating for all of the corridor is average or better than the system average. All segments have at least one bridge. There are 21 structurally deficient bridges along SSC 12, 18 with bridge decks under 15,000 ft2, two under 30,000 ft2, and one 55,500 ft2. The structurally deficient bridges are in segments 12.01 (2), 12.02 (2), 12.04 (5), 12.05 (1), 12.07 (1), 12.09 (2), and 12.10 (8), resulting in Bridge Variance Ratings of average when compared to the system average.

NOTE: See Appendix for maps documenting each performance qualifier.


SYSTEM COMPARISON
System Comparison shows the analysis of corridor segments compared to target values.
Buffalo
Kaycee
Midwest
Edgerton
Rolling Hills
Glenrock
Casper
Douglas
Guernsey
Wheatland
Chugwater
Burns
Cheyenne
Laramie
12.10
12.09
12.08
12.07
12.06
12.05
12.04
12.03
12.02
12.01
JOHNSON
CONVERSE
NATRONA
GOSHEN
PLATTE
LARAMIE
ALBANY
Safety Index
Good
Fair
Poor
April, 2013
Corridor Segment
District Boundary
County Boundary
miles


CORRIDOR COMPARISON
Corridor Comparison shows the analysis of corridor segments compared to other segments in the same corridor.
Buffalo
Kaycee
Midwest
Edgerton
Rolling Hills
Glenrock
Casper
Douglas
Guernsey
Wheatland
Chugwater
Burns
Cheyenne
Laramie
12.10
12.09
12.08
12.07
12.06
12.05
12.04
12.03
12.02
12.01
JOHNSON
CONVERSE
NATRONA
GOSHEN
PLATTE
LARAMIE
ALBANY
Safety Index
Good
Fair
Poor
April, 2013
Corridor Segment
District Boundary
County Boundary
miles



Performance Index

The Safety Performance Index ranges from good to poor across the corridor. Segments rated poor include 12.07.

Performance qualifiers with poor performance include:

- Weather Related Crashes are more than the average on segments 12.01, 12.02, 12.04, 12.05, 12.06, 12.07, and 12.08.
- Wildlife Related Crashes are more than the average on segment 12.10.
- Alcohol Related Crashes are more than the average on segments 12.07 and 12.08.
- Non-Use of Safety Restraints is more than the average on segments 12.01, 12.02, 12.03, 12.05, and 12.07.
- Crashes on Horizontal Geometric Insufficient Curves are more than the average on segments 12.01.
- Crash Concentrations are rated poor on segments 12.02, 12.04, 12.07, 12.08, and 12.10.

Refer to the sections below for more information.

	SAFETY							
Segment	Safety Index	Weather Related Crashes	Wildlife Related Crashes	Alcohol Related Crashes	Non-use of Safety Restraints	Horizontal Geometric Insufficiency	Vertical Geometric Insufficiency	Crash Concen-trations
12.01	Fair	More	Less	Average	More	Less	More	Good
12.02	Fair	More	Average	Average	More	Less	Average	Poor
12.03	Fair	Average	Average	Less	More	Less	Average	Fair
12.04	Fair	More	Average	Average	Average	Less	Average	Poor
12.05	Good	More	Average	Average	More	Less	Less	Good
12.06	Fair	More	Average	Average	Average	Less	Average	Fair
12.07	Poor	More	Less	More	More	Less	Average	Poor
12.08	Fair	More	Average	More	Average	Less	Less	Poor
12.09	Good	Average	Average	Average	Average	Less	Average	Good
12.10	Good	Less	More	Less	Less	Less	Less	Poor

Performance Qualifiers

Weather Related Crashes

Weather related crashes are a significant concern for this corridor. The ratio of weather related crashes to total crashes was above the system average in all but two segments. The highest percentage of weather related crashes, approximately 48%, occurred in Segments 12.01, 12.02, and 12.05, and was twice the system average. The adverse conditions frequently identified included snow, blowing snow, blizzard, rain, sleet/hail/freezing rain, fog, and severe wind. Segments 12.03, 12.04, 12.06, 12.07, and 12.08 also had a percentage rating higher than the system average. Hazardous weather conditions are a significant problem for this stretch of Interstate.

Wildlife Related Crashes

Corridor 12 is varied in its wildlife related collisions. Segments 12.09 and 12.10 have the highest rate of accidents involving wildlife within the Corridor, each received 42% and 60% respectively. The urban segment on 12.01 near Cheyenne had the lowest rating of accidents involving wildlife, with only 4% of accidents that involve wildlife.

Segment 12.10 is a rural highway between Kaycee and Buffalo. Wildlife crashes occur along the entire segment; however, the section from mileposts 295 though 299 had significantly higher number of crashes than the rest of the 46-mile segment. A majority of the wildlife crashes involve deer and occur during darkness. The crashes do not correlate with migration routes documented by the Wyoming Game and Fish Department.

Alcohol Related Crashes

The percentage of alcohol related crashes is below at the system average except for the two segments in the Casper area. The crash locations in segment 12.07, approximately 16 miles in length, were concentrated between RM 186 and 190. Segment 12.08, north of Casper to WYO 259, also had an alcohol related crash rate higher than the system average and crash locations occurred along the entire segment.

Non-use of Safety Restraint

Within SSC 12, the ratio of crashes in which a restraint device was not worn to total crashes is above the system average. All segments were high, but segment 12.01 had the highest percentage (90.58%) of crashes in which seat belts were not worn.

Horizontal Geometry Insufficiency

Corridor 12 has one horizontal alignment found to be insufficient based on the associated posted speed and an assumed emax of 8%. The horizontal alignment insufficiency was calculated along ML 25 at RM 100.8. No crashes were recorded at this location. Because of the low number of crashes, it is suggested funding be spent in other locations where there are more crashes that can be attributed to poor roadway geometry.

Table 4 - Horizontal Geometry Insufficiency

Segment	ML Route	Route Marker	# of Crashes
N/A			

Vertical Geometry Insufficiency

Several vertical alignments were found to be insufficient based on the associated posted speed and the length of the curve for stopping sight distance. Segment 12.01 has the most insufficient vertical alignments within the corridor. Further study will need to take place to determine specific needs of each alignment and the constraints to which it was designed and built.

Table 5 summarizes locations where a vertical profile corresponded to a crash. The data is not clear if the crash was directly related to the geometry. However, locations with several crashes should be further studied. The table summarizes locations of insufficient profiles with more than one crash in the near vicinity within the 5 year crash analysis.

Table 5 - Vertical Geometry Insufficiency

Segment	ML Route	Route Marker	Curve Type	# of Crashes
12.01	ML25D	9.48	SAG	5
12.01	ML25D	10.41	SAG	6
12.01	ML25D	11.23	CREST	12
12.01	ML25D	15.86	CREST	9
12.01	ML25I	10.79	CREST	3
12.01	ML25I	11.23	CREST	5
12.01	ML25I	15.86	CREST	7
12.03	ML25D	66.98	CREST	3
12.03	ML25I	64.57	CREST	3
12.04	ML25D	92.36	SAG	4
12.04	ML25D	100.52	CREST	2
12.04	ML25D	108.96	CREST	6
12.04	ML25I	98.94	CREST	2
12.04	ML25I	108.88	CREST	5
12.04	ML25I	109.04	SAG	5
12.06	ML25D	164.42	SAG	2
12.06	ML25D	174.66	SAG	2
12.06	ML25I	148.19	CREST	3
12.06	ML25I	171.44	SAG	2
12.06	ML25I	171.97	CREST	3
12.06	ML25I	178.92	SAG	6
12.07	ML25D	187.53	CREST	6
12.07	ML25D	188.46	SAG	7
12.07	ML25D	188.60	CREST	2
12.07	ML25I	180.56	SAG	2
12.07	ML25I	187.53	CREST	8
12.07	ML25I	188.46	SAG	2
12.07	ML25I	188.60	CREST	6

Crash Concentrations

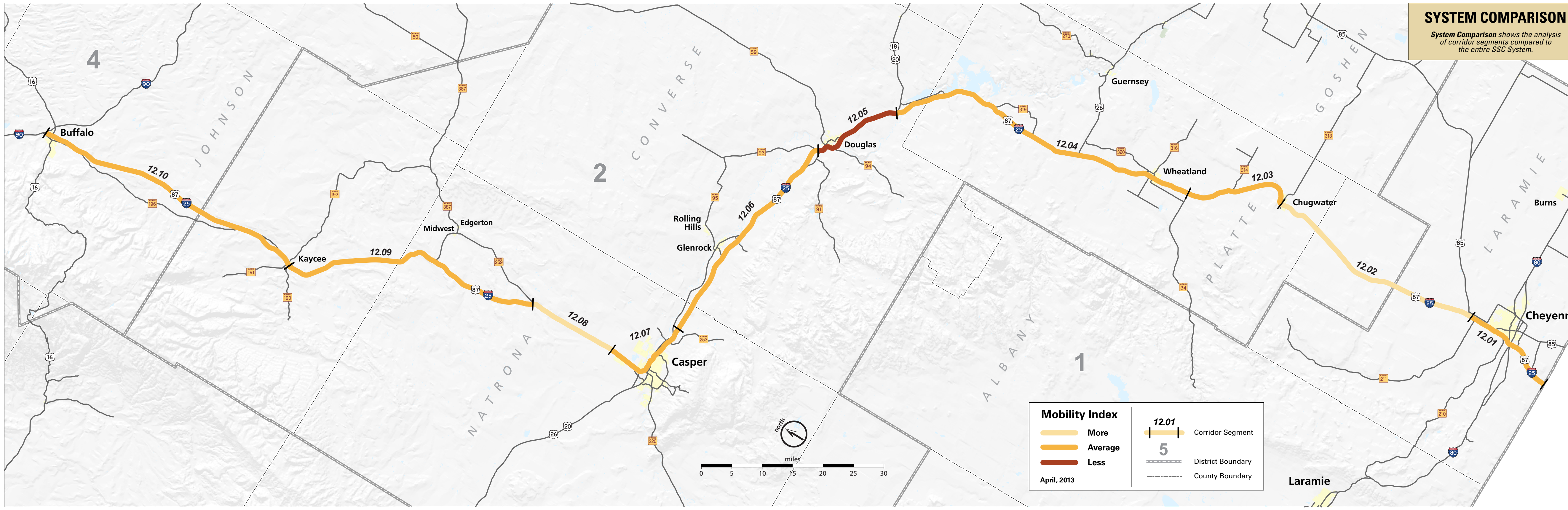
Crash concentrations are identified by locating spatially significant clusters of individual crash events that are of a similar severity level. The concentrations fall into one of two severity types: Critical, which consists of only "Critical" level crashes, and Other, which consists of "Severe" and "Damage" level crashes.

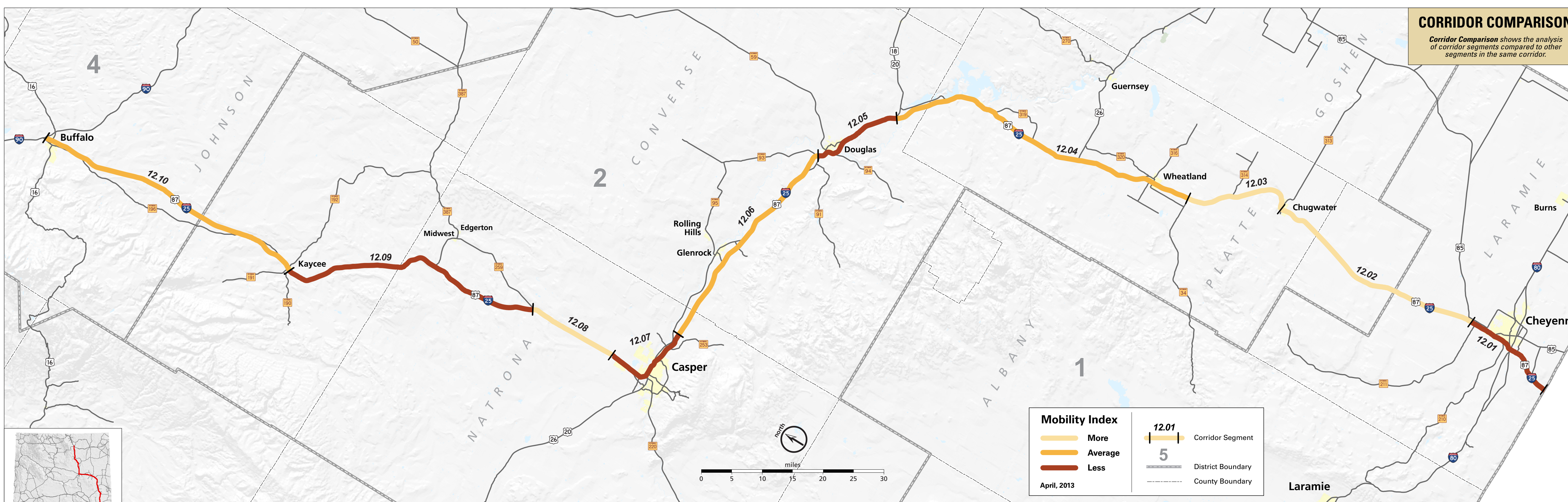
There are sixteen Critical concentrations on Corridor 12, which are listed in Table 6. Additionally, there is one Other type concentration. Segment 12.04 exhibits the most crash concentrations with 4 Critical concentrations, see table below to see occurrences. Segments 12.01, 12.04, 12.06, 12.09, and 12.10 have Other type concentrations, resulting primarily from Damage level crashes.

Table 6 - Critical Crash Concentrations

Segment	ML Route	Route Marker	
		From	To
12.02	ML25	39.7	40
12.02	ML25	44.4	44.7
12.02	ML25	51	51.8
12.03	ML25	71.8	72.4
12.04	ML25	88.8	90.6
12.04	ML25	91.6	92.8
12.04	ML25	99.8	100.2
12.04	ML25	102.8	103
12.06	ML25	172.8	173
12.07	ML25	183	184
12.07	ML25	188.6	189
12.07	ML25	193	193.3
12.08	ML25	198.5	198.8
12.08	ML25	205.6	206.2
12.10	ML25	267.9	268.3
12.10	ML25	272	272.4

NOTE: See Appendix for maps documenting each performance qualifier.


SYSTEM COMPARISON
System Comparison shows the analysis of corridor segments compared to the entire SSC System.
Buffalo
Kaycee
Midwest
Edgerton
Rolling Hills
Glenrock
Casper
Douglas
Guernsey
Wheatland
Chugwater
Burns
Cheyenne
Laramie
12.10
12.09
12.08
12.07
12.06
12.05
12.04
12.03
12.02
12.01
JOHNSON
CONVERSE
NATRONA
ALBANY
PLATTE
GOSHEN
LARAMIE
4
2
1
Mobility Index
More
Average
Less
April, 2013
12.01
Corridor Segment
5
District Boundary
County Boundary
miles
0 5 10 15 20 25 30
north


CORRIDOR COMPARISON
Corridor Comparison shows the analysis of corridor segments compared to other segments in the same corridor.
Buffalo
Kaycee
Midwest
Edgerton
Rolling Hills
Glenrock
Casper
Douglas
Guernsey
Wheatland
Chugwater
Burns
Cheyenne
Laramie
12.10
12.09
12.08
12.07
12.06
12.05
12.04
12.03
12.02
12.01
JOHNSON
CONVERSE
NATRONA
ALBANY
PLATTE
GOSHEN
LARAMIE
4
2
1
Mobility Index
More
Average
Less
April, 2013
12.01
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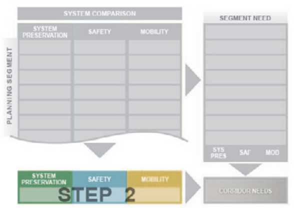
5
District Boundary
County Boundary
miles
0 5 10 15 20 25 30
north



Performance Index

The Mobility Performance Index for SSC 12 ranges from average to better than average.

Segment	MOBILITY: Mobility Index	Volume to Capacity Rating	Pvmnt. Var. Rating (L/R)	Traffic Growth	Truck Traffic Growth	Bridge Variance (L/R)
12.01	Average	Good	Fair	More	Average	Average
12.02	Better	Good	Fair	Average	Average	Less
12.03	Better	Good	Fair	More	Average	Less
12.04	Average	Good	Poor	Average	Average	Less
12.05	Worse	Good	Poor	Average	Average	Average
12.06	Average	Good	Poor	Average	Average	Average
12.07	Average	Good	Poor	Average	Average	Average
12.08	Better	Good	Good	Average	Average	Less
12.09	Average	Good	Poor	More	Average	Less
12.10	Average	Good	Poor	More	Average	Less

Five regional routes connect to SSC 12. The condition of each local and regional route is associated with a planning segment and directly influences the mobility of that segment. The condition of some local and regional routes is poor. There are currently five structurally deficient bridges on the local and regional routes.

SSC 12 is subject to heavy loads associated with of all the energy development in the area, as well as agricultural products equipment, and stock movement. Most of this corridor has moderate to high traffic volumes. This route fulfills an important function of connecting the smaller communities along the border with each other as well as the urban centers of Torrington and Cheyenne. Shoulder widths are typically 10' with some rumble strips.

Table 7 - Major Traffic Generators

Major Traffic Generators
State Capitol - Cheyenne
Employment centers - Cheyenne, Casper, Buffalo
Energy industry truck traffic - gas/oil/wind
Energy industry center - Casper
Interstate commercial trucks
F.E. Warren Air Force Base - Cheyenne
Local/regional recreation - Glendo State Park & Reservoir, Edness Kimball-Wilkins State Park

Performance Qualifiers

Volume to Capacity Rating

Volume to Capacity Ratio (V/C) is a measure that reflects mobility and quality of travel of a corridor or section of a corridor. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity). The volume to capacity rating for the entire SSC 12 is good.

Traffic Growth

The average traffic growth within the SSC System is 1.42%. All segments within Corridor 12 are above this average. The highest growth rates were found in segments 12.01 and 12.09. Segment 12.01 connects Cheyenne to ML85 on ML 25 and segment 12.09 connects ML259 to Kaycee on ML 25.

Table 8 - Traffic Growth

Segment	AADT 2010	Average 20 Year Growth
12.01	17,018	1.99%
12.02	6,478	1.85%
12.03	6,231	1.89%
12.04	6,365	1.73%
12.05	7,419	1.69%
12.06	7,911	1.49%
12.07	10,168	1.56%
12.08	4,303	1.44%
12.09	3,179	1.99%
12.10	2,828	1.95%

Truck Traffic Growth

The average truck traffic growth within the SSC System is 1.34%. The majority of SSC 12 segments are above this average with the exception of segment 12.08. The majority of the corridor is an inter-rural roadway classification. Segment 12.01 has the highest average annual truck growth rate. This segment is from the Colorado State Line north through Cheyenne via I-25.

Table 9 - Truck Traffic Growth

Segment	AADTT 2010	% Trucks 2010	Truck Traffic Growth
12.01	2,912	17.22%	2.13%
12.02	1,089	16.85%	1.60%
12.03	1,054	16.92%	1.79%
12.04	1,089	17.12%	1.75%
12.05	1,204	16.30%	1.75%
12.06	1,315	16.62%	1.52%
12.07	1,779	15.66%	1.52%
12.08	987	19.31%	1.29%
12.09	738	23.21%	1.82%
12.10	683	23.84%	1.84%

Local and Regional Roads

Local and Regional Routes that connect to the SSC affect the Mobility Performance Indicator. These routes serve the important function of connecting rural areas to the primary routes. While traffic volumes are typically low on these secondary routes, maintaining them in acceptable condition is important to general mobility for the state. This analysis includes pavement and bridge condition as qualifiers.

Local and Regional Roads Impacting Pavement Variance Rating (L/R)

The Mobility Index may be affected by local and regional routes that have poor pavement condition as reflected by the Pavement Variance Rating (PVR). The PVR is the product of Pavement Sufficiency Rating (PSR) calculated as the deviation from the system average. Poor PSR is reported on local/regional routes associated with segments 12.03, 12.04, 12.05, 12.06, 12.07, 12.09, and 12.10. Table 10 lists the local/regional routes with poor PSR.

Table 10 - Local/Regional Routes with Poor PSR

Segment	Average PVR	ML Route	Route Marker		Average PSR
			Begin	End	
12.03	0.85	ML321	55.18	57.93	2.40
12.04	1.11	ML1600	1.00	8.49	2.14
12.04	0.94	ML312	0.00	7.30	2.31
12.05	1.69	ML91	0.00	23.10	1.56
12.05	1.29	ML94	0.00	16.61	1.96
12.06	1.10	ML504	1.68	18.88	2.15
12.06	2.73	ML507	0.00	3.00	0.52
12.06	1.51	ML96	0.00	3.11	1.74
12.07	1.27	ML253	0.00	10.90	1.98
12.07	1.07	ML254	0.00	4.06	2.18
12.07	1.26	ML256	0.00	2.67	1.99
12.07	0.87	ML47	0.00	2.89	2.38
12.09	0.93	ML1006	249.58	299.42	2.46
12.09	0.79	ML42	93.45	151.26	2.46
12.10	1.33	ML1000	100.00	109.66	1.92
12.10	1.37	ML1002	0.00	35.64	1.92
12.10	1.13	ML59	298.02	299.70	2.12

Bridge Variance Rating (L/R)

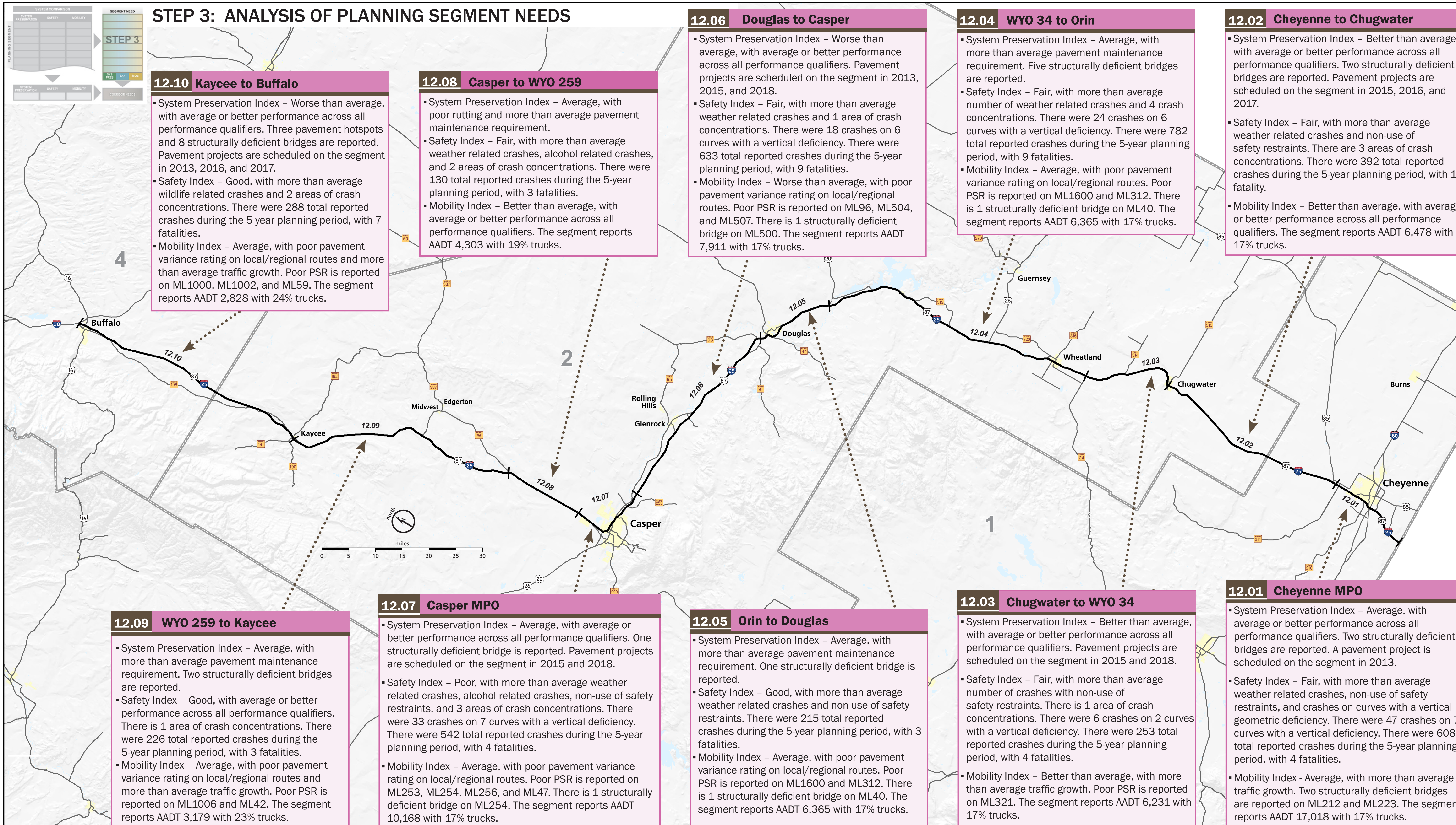
The bridge variance rating for local and regional routes on SSC 12 shows 6 structurally deficient bridges. The locations of the bridges are shown in the table below.

Table 11 - SSC 12 Structurally Deficient Bridges on Local/Regional Routes

Segment	ML Route	Route Marker
12.01	ML212	5.95
12.01	ML223	0.86
12.04	ML40	15.9
12.05	ML40	15.9
12.06	ML500	0
12.07	ML254	1.38

NOTE: See Appendix for maps documenting each performance qualifier.

STEP 3: ANALYSIS OF PLANNING SEGMENT NEEDS



12.10 Kaycee to Buffalo

- System Preservation Index – Worse than average, with average or better performance across all performance qualifiers. Three pavement hotspots and 8 structurally deficient bridges are reported. Pavement projects are scheduled on the segment in 2013, 2016, and 2017.
- Safety Index – Good, with more than average wildlife related crashes and 2 areas of crash concentrations. There were 288 total reported crashes during the 5-year planning period, with 7 fatalities.
- Mobility Index – Average, with poor pavement variance rating on local/regional routes and more than average traffic growth. Poor PSR is reported on ML1000, ML1002, and ML59. The segment reports AADT 2,828 with 24% trucks.

12.08 Casper to WYO 259

- System Preservation Index – Average, with poor rutting and more than average pavement maintenance requirement.
- Safety Index – Fair, with more than average weather related crashes, alcohol related crashes, and 2 areas of crash concentrations. There were 130 total reported crashes during the 5-year planning period, with 3 fatalities.
- Mobility Index – Better than average, with average or better performance across all performance qualifiers. The segment reports AADT 4,303 with 19% trucks.

12.06 Douglas to Casper

- System Preservation Index – Worse than average, with average or better performance across all performance qualifiers. Pavement projects are scheduled on the segment in 2013, 2015, and 2018.
- Safety Index – Fair, with more than average weather related crashes and 1 area of crash concentrations. There were 18 crashes on 6 curves with a vertical deficiency. There were 633 total reported crashes during the 5-year planning period, with 9 fatalities.
- Mobility Index – Worse than average, with poor pavement variance rating on local/regional routes. Poor PSR is reported on ML96, ML504, and ML507. There is 1 structurally deficient bridge on ML500. The segment reports AADT 7,911 with 17% trucks.

12.04 WYO 34 to Orin

- System Preservation Index – Average, with more than average pavement maintenance requirement. Five structurally deficient bridges are reported.
- Safety Index – Fair, with more than average number of weather related crashes and 4 crash concentrations. There were 24 crashes on 6 curves with a vertical deficiency. There were 782 total reported crashes during the 5-year planning period, with 9 fatalities.
- Mobility Index – Average, with poor pavement variance rating on local/regional routes. Poor PSR is reported on ML1600 and ML312. There is 1 structurally deficient bridge on ML40. The segment reports AADT 6,365 with 17% trucks.

12.02 Cheyenne to Chugwater

- System Preservation Index – Better than average, with average or better performance across all performance qualifiers. Two structurally deficient bridges are reported. Pavement projects are scheduled on the segment in 2015, 2016, and 2017.
- Safety Index – Fair, with more than average weather related crashes and non-use of safety restraints. There are 3 areas of crash concentrations. There were 392 total reported crashes during the 5-year planning period, with 1 fatality.
- Mobility Index – Better than average, with average or better performance across all performance qualifiers. The segment reports AADT 6,478 with 17% trucks.

12.09 WYO 259 to Kaycee

- System Preservation Index – Average, with more than average pavement maintenance requirement. Two structurally deficient bridges are reported.
- Safety Index – Good, with average or better performance across all performance qualifiers. There is 1 area of crash concentrations. There were 226 total reported crashes during the 5-year planning period, with 3 fatalities.
- Mobility Index – Average, with poor pavement variance rating on local/regional routes and more than average traffic growth. Poor PSR is reported on ML1006 and ML42. The segment reports AADT 3,179 with 23% trucks.

12.07 Casper MPO

- System Preservation Index – Average, with average or better performance across all performance qualifiers. One structurally deficient bridge is reported. Pavement projects are scheduled on the segment in 2015 and 2018.
- Safety Index – Poor, with more than average weather related crashes, alcohol related crashes, non-use of safety restraints, and 3 areas of crash concentrations. There were 33 crashes on 7 curves with a vertical deficiency. There were 542 total reported crashes during the 5-year planning period, with 4 fatalities.
- Mobility Index – Average, with poor pavement variance rating on local/regional routes. Poor PSR is reported on ML253, ML254, ML256, and ML47. There is 1 structurally deficient bridge on ML254. The segment reports AADT 10,168 with 17% trucks.

12.05 Orin to Douglas

- System Preservation Index – Average, with more than average pavement maintenance requirement. One structurally deficient bridge is reported.
- Safety Index – Good, with more than average weather related crashes and non-use of safety restraints. There were 215 total reported crashes during the 5-year planning period, with 3 fatalities.
- Mobility Index – Average, with poor pavement variance rating on local/regional routes. Poor PSR is reported on ML1600 and ML312. There is 1 structurally deficient bridge on ML40. The segment reports AADT 6,365 with 17% trucks.

12.03 Chugwater to WYO 34

- System Preservation Index – Better than average, with average or better performance across all performance qualifiers. Pavement projects are scheduled on the segment in 2015 and 2018.
- Safety Index – Fair, with more than average number of crashes with non-use of safety restraints. There is 1 area of crash concentrations. There were 6 crashes on 2 curves with a vertical deficiency. There were 253 total reported crashes during the 5-year planning period, with 4 fatalities.
- Mobility Index – Better than average, with more than average traffic growth. Poor PSR is reported on ML321. The segment reports AADT 6,231 with 17% trucks.

12.01 Cheyenne MPO

- System Preservation Index – Average, with average or better performance across all performance qualifiers. Two structurally deficient bridges are reported. A pavement project is scheduled on the segment in 2013.
- Safety Index – Fair, with more than average weather related crashes, non-use of safety restraints, and crashes on curves with a vertical geometric deficiency. There were 47 crashes on 7 curves with a vertical deficiency. There were 608 total reported crashes during the 5-year planning period, with 4 fatalities.
- Mobility Index - Average, with more than average traffic growth. Two structurally deficient bridges are reported on ML212 and ML223. The segment reports AADT 17,018 with 17% trucks.

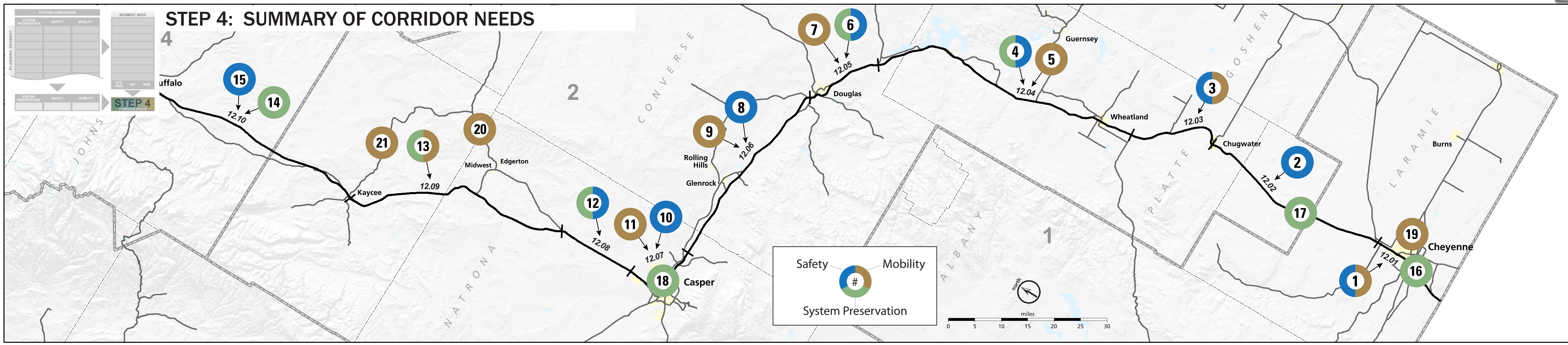
Environmental Overview

The Wyoming Interagency Spatial Database and Online Management System (WISDOM) was queried to identify natural resources that could be impacted by transportation projects. The following summary lists the general type of potentially impacted resources. The project development phase should investigate these resources in more detail to determine if mitigation activities are required. Please see Appendix and http://wisdom.wygisc.org/ for detailed information.

There are ten different terrestrial habitat types located throughout the ten special management areas within SSC 12. Five federally listed species within the corridor fall into one of three categories, candidate, endangered, and threatened. Two big game species and fifteen raptor species are found in SSC 12. There are four different categories that fall under the aquatic habitat. There are twenty-one watersheds, three aquatic crucial priority areas, three aquatic enhancement priority areas, and one combined enhancement priority area. See Table 12 for general locations.

Table 12 - Environmental Considerations

Category	SOUTH (State line - Orin)	CENTRAL (Orin - Casper)	NORTH (Casper - Buffalo)
Big Game Crucial Range	Mule Deer Pronghorn Antelope	Mule Deer Pronghorn Antelope	Pronghorn Antelope
Big Game Migration Route	na	na	na
WGFD Aquatic Crucial Priority Areas SHP	Middle North Platte-Glendo	Middle North Platte-Glendo North Platte Corridor	Foothills to Prairie Stream & Riparian Corridors
WGFD Terrestrial Crucial Priority Areas SHP	Shortgrass Prairie	"Hat Six North Laramie Range"	Powder-Tongue Rivers & Tributaries Cottonwood-Willow Riparian Ecosystem Sagebrush-Mixed Grass Habitats within Major Sage-Grouse Complexes
WGFD Combined Crucial Priority Areas SHP	Goshen Hole & Lower Horse Creek Lower Laramie & North Laramie River Watersheds	Bates Hole-North Laramie Range	na
Occurrence & Distribution (Federally Listed Species)	Black-footed Ferret Colorado butterfly plant Greater Sage Grouse North American Wolverine Ute ladies' tresses Yellow-billed Cuckoo	Gray Wolf Greater Sage Grouse Piping Plover Yellow-billed Cuckoo	Greater Sage Grouse Yellow-billed Cuckoo



Summary of Needs

This section summarizes needs by planning segment for each of the three performance indicators and the supporting performance qualifiers. The summary identifies overlapping needs, which provides guidance in the efficient prioritization of projects to best address deficiencies. The practice of completing projects that simultaneously address multiple needs may present cost savings as well as being most effective in improving performance indexes across the system. The summary also lists other needs in each of the three performance measurement areas. For more information about needs at the corridor level, see the maps in the appendix which compare both system level and corridor level needs.

SSC 12 needs occur in all three Performance Indexes. Within System Preservation, five segments are reported with pavement needs, along with three pavement hotspots and 22 structurally deficient bridges. Within Safety, weather related crashes and the non-use of safety restraints are prevalent. Sixteen areas of critical crash concentrations occur on the corridor. Within Mobility, pavement conditions on local/regional routes is poor, along with 6 structurally deficient bridges. Traffic growth is high through parts of the corridor.

Several big game crucial ranges for Mule Deer and Pronghorn Antelope intersect parts of the corridor and should be investigated for concurrence with wildlife related crashes. The Wyoming Game and Fish Department documents the entire corridor as Terrestrial and Aquatic Crucial Priority Areas. Several federally listed endangered species are found in the corridor and should be considered in all project planning.

Based on the needs identified in this analysis and the recommended strategies and solution sets, this plan does not identify specific needs to preserve or acquire additional rights of way to accommodate improvements. Heavier traffic in the Cheyenne urban area present challenges for traffic management and safety and should be evaluated for future improvements, including new or reconstructed interchanges. WYDOT owns sufficient right of way for the Interstate highway mainline for the foreseeable future. However, due to rapidly increasing traffic and truck volumes, interchange improvements or additions could be required in some locations. This plan does not identify specific future interchange locations. However, if such projects are planned, additional right of way may be required in some cases. Interchange locations in the cities along the route would need to be coordinated with local planning processes.

Overlapping Needs

Overlapping needs are identified on all segments:

1. 12.01 - SAFETY/MOBILITY: Weather Related Crashes, Non-use of Safety Restraints, Vertical Geometric Deficiency, Traffic Growth
2. 12.02 - SAFETY: Weather Related Crashes, Non-use of Safety Restraints, Crash Concentrations
3. 12.03 - SAFETY/MOBILITY: Non-use of Safety Restraints, Crash Concentrations, Traffic Growth
4. 12.04 - SYSTEM PRESERVATION/SAFETY: Pavement Maintenance Requirement, Bridge Variance Rating, Weather Related Crashes, Crash Concentrations
5. 12.04 - MOBILITY: Pavement Variance Rating (L&R), Bridge Variance Rating (L/R)/Structurally Deficient Bridge
6. 12.05 - SYSTEM PRESERVATION/SAFETY: Pavement Maintenance Requirement, Bridge Variance Rating, Weather Related Crashes, Non-Use of Safety Restraints
7. 12.05 - MOBILITY: Pavement Variance Rating (L&R), Bridge Variance Rating (L/R)/Structurally Deficient Bridge
8. 12.06 - SAFETY: Weather Related Crashes, Crash Concentrations
9. 12.06 - MOBILITY: Pavement Variance Rating (L/R), Bridge Variance Rating (L/R)/Structurally Deficient Bridge
10. 12.07 - SAFETY: Weather Related Crashes, Alcohol Related Crashes, Non-Use of Safety Restraints, Crash Concentrations
11. 12.07 - MOBILITY: Pavement Variance Rating (L/R), Bridge Variance Rating (L/R)/Structurally Deficient Bridge
12. 12.08 - SYSTEM PRESERVATION/SAFETY: Rutting, Pavement Maintenance Requirement, Weather Related Crashes, Alcohol Related Crashes, Crash Concentrations
13. 12.09 - SYSTEM PRESERVATION/MOBILITY: Pavement Maintenance Requirement, Bridge Variance Rating, Traffic Growth
14. 12.10 - SYSTEM PRESERVATION: Pavement Hotspot, Bridge Variance Rating, Traffic Growth
15. 12.10 - SAFETY: Wildlife Related Crashes, Crash Concentrations

Other Performance Index Needs

System Preservation

16. 12.01 - Bridge Variance Rating/Structurally Deficient Bridge
17. 12.02 - Bridge Variance Rating/Structurally Deficient Bridge
18. 12.07 - Bridge Variance Rating/Structurally Deficient Bridge

Mobility

19. 12.01 - Bridge Variance Rating/Structurally Deficient Bridge (L/R)
20. 12.09 - Pavement Variance Rating (L/R)
21. 12.10 - Pavement Variance Rating (L/R)

III. SOLUTION SETS

A solutions menu was created to address the needs identified in the previous sections. This menu identifies potential solution strategies grouped by performance measure categories. The strategies are a preliminary list based on industry accepted approaches and the efforts to date of WYDOT programs to document preferred approaches. This list is not intended to be all-inclusive, but represents types of improvements that may be employed to address documented needs.

Section IV recommends how the solution sets may be efficiently grouped depending on funding availability.

Table 13 - Recommended Solution Sets to Improve Performance in Each Index

System Preservation	Safety		Mobility	
Pavement Maintenance Requirement & Pavement Variance Rating *Rutting* Mill Mill and overlay *1S Treatments* Mill and overlay Seal Coat Cleaning and sealing joints Patching pavement Micro surfacing *2S Treatments* Roadway Restoration *3S Treatments* Reconstruct Roadway Roadway widening Upgrade geometric design *Bridge Variance Rating* Bridge Replacement Channel reconstruction Cleaning and sealing bridge members Lower weight limits Restore drainage systems Scour countermeasures	*Weather Related* Signage Automated anti-icing systems Grooved pavement ITS Larger signs Snow berms/grading Snow fencing Warning beacons *Wildlife Related* Animal detection systems Animal jump-out or one-way gates ITS Remove brush from ROW Signage Warning beacons Wildlife bridge/underpass Wildlife fencing *Alcohol Related* Centerline rumble strips ITS Law Enforcement Media campaign Shoulder rumble strips	*Horizontal Geometry* Centerline rumble strips Dynamic curve warning system Guardrail Improve/restore superelevation Lighting Oversize/length restrictions Reconstruction/realignment Reduce posted speed Reflectors Shoulder rumble strips Signage Warning beacons *Vertical Geometry* Larger signs Reconstruction/realignment Reduce posted speed Reflectors Signage Warning beacons *Safety Restraints* ITS Law Enforcement Media campaign	*Volume to Capacity Rating & Traffic Growth / Truck Traffic Growth* Acceleration lane Capacity improvements Deceleration lane Increase lane width Intersection/interchange improvements Multimodal improvements Passing lanes Shoulder widening Through lanes Turn lane *Bridge Variance (L/R)* Bridge Replacement Channel reconstruction Cleaning and sealing bridge members Lower allowable weight limits on bridge Restore drainage systems Scour countermeasures	*Pavement Variance Rating (L/R)* *Rutting* Mill Mill and overlay *1S Treatments* Cleaning and sealing joints Micro surfacing Mill and overlay Patching pavement Seal Coat *2S Treatments* Roadway Restoration *3S Treatments* Reconstruct Roadway Roadway widening Upgrade geometric design

IV. RECOMMENDATIONS

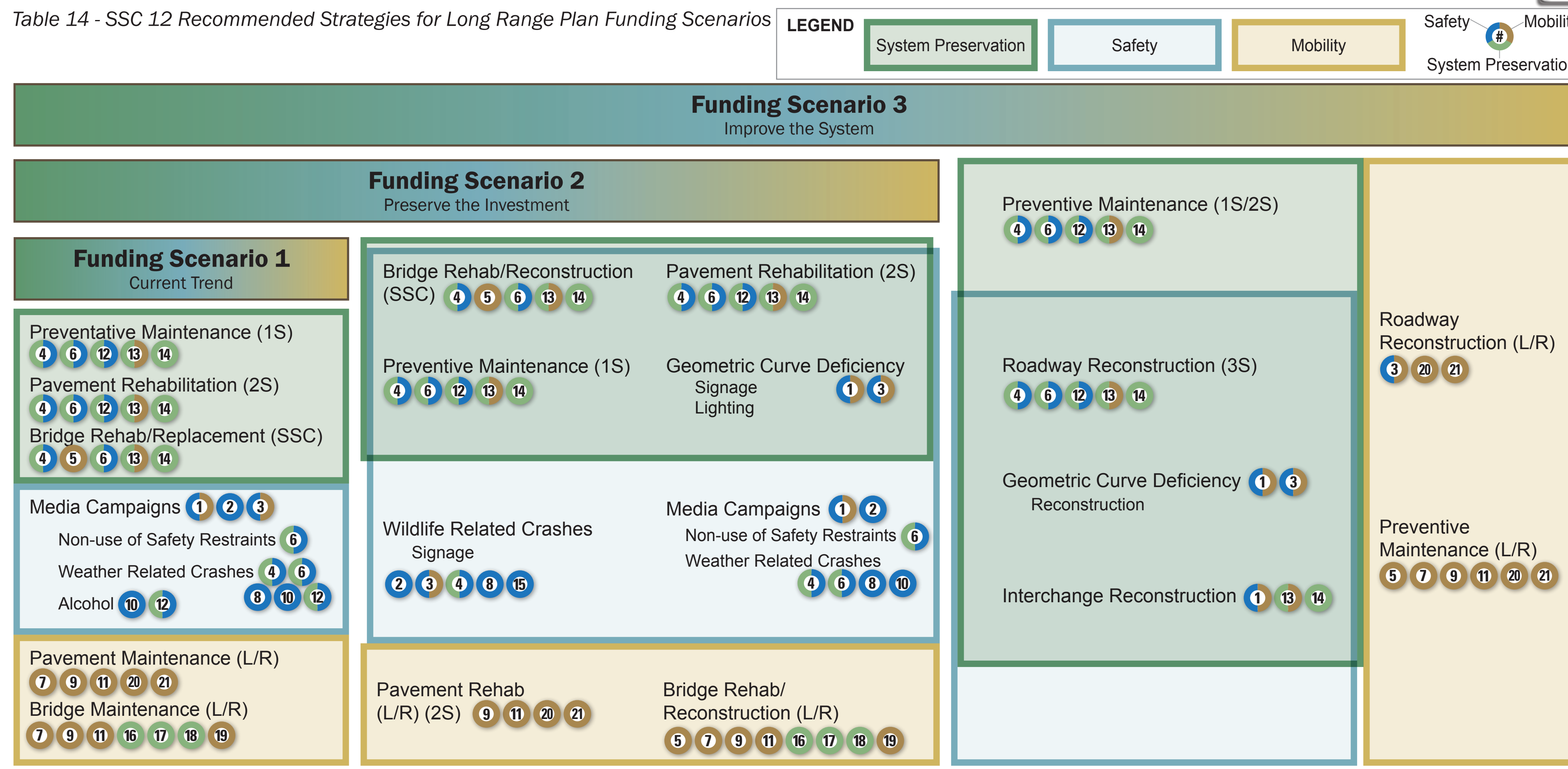
This section describes recommendations for strategies and priorities to address corridor needs. The selected strategies address the needs described in previous sections and are organized by the three strategic performance areas: System Preservation, Safety, and Mobility. These recommendations provide information and guidance consistent with the Strategic and Long Range Plans to help WYDOT select projects in coordination with the STIP process.

The recommended strategies have been packaged into solution sets that recognize the inherent overlap that investments may have across performance areas. For example, an intersection improvement may simultaneously improve traffic flow (Mobility) and reduce crashes (Safety).

The solution sets are tiered to the three Funding Scenarios identified in the Long Range Transportation Plan. The funding scenarios describe a progressively increasing budget, with generally defined allocations to System Preservation, Safety, and Mobility. With each succeeding level of investment, additional funding is allocated to address shortfalls in performance-based goals.

- Funding Scenario 1 – The continuation of program funding at current levels. Most funding is directed to System Preservation needs. System characteristics are expected to decline with inflation and increasing construction costs over time. Few major projects to address Safety, other than with specially restricted and allocated funds, or Mobility would be implemented.
- Funding Scenario 2 – Funding over and above the base level would allow additional investments in pavement and bridge projects to meet WYDOT goals.
- Funding Scenario 3 – Additional funding over and above Scenario 2 would allow WYDOT to maintain and improve existing conditions, achieve pavement and bridge condition goals, plus invest in major projects to improve Mobility.

Table 14 - SSC 12 Recommended Strategies for Long Range Plan Funding Scenarios



Funding Scenario 1

Funding Scenario 1, defined as the continuation of current program funding, is focused primarily on addressing System Preservation needs through preventive maintenance efforts. For this corridor, the plan recommends that these funds remain allocated to preventive maintenance, along with reserving a portion to address identified safety needs. The growing traffic and truck traffic volumes, while not generally requiring capacity improvements, do require systematic pavement treatments in order to stay ahead of the pavement lifecycle curve. Less expensive treatments on a regular schedule, delay the need indefinitely for more expensive reconstruction. The corridor also has needs in the bridge area. Bridge maintenance or rehabilitation should be timed to coincide with pavement treatments, to the extent possible.

Safety needs are most apparent – corridor wide - in the category of weather related crashes. The non-use of safety restraints is also a frequent factor. Sixteen specific areas of crash concentrations are also observed. WYDOT should consider a targeted effort such as a media campaign and expanded ITS-related information systems to address these issues.

These needs may be only partially met under current funding. Additional needs that cannot be met under Scenario 1 may be delayed pending additional funds under Scenarios 2 or 3.

- Surface treatments on the SSC mainline, including mill and overlay.
- Bridge rehabilitation and replacement of structurally deficient bridges on the SSC mainline.
- Safety campaign to reduce number of weather-related crashes and increase the use of safety restraints.

Funding Scenario 2

If sufficient funds to preserve the system in at least its current operational form are made available, WYDOT will direct funding to strengthen pavement and bridge conditions across the system, including on local and regional routes. The corridor has significant bridge rehabilitation needs on local and regional routes. This scenario would allow investments to fully achieve WYDOT goals in the System Preservation investment category. Expansion of safety programs to reduce the number and severity of crashes related to weather and the non-use of safety restraints should be considered, especially in areas of crash concentrations as identified in this corridor plan.

- Preventive maintenance could be deferred and/or advanced, depending on life cycle, as recommended by the Pavement Management System.
- Reconstruction (2S) to address geometric insufficiencies on the SSC mainline.
- Improvement of pavement condition of Local and Regional Routes, to include preventive maintenance or mill and overlay.
- Bridge rehabilitation on local and regional routes.
- Safety program expansion to address weather related crashes and non-use of safety restraints.
- Projects to reduce the number of crashes at curves with a geometric deficiency, not involving major construction.

Funding Scenario 3

If additional funds are made available to WYDOT under Funding Scenario 3, opportunities would be created to address all three investment categories, thus preserving the investment and improving the overall "health" of the system. Additional funds allow project selection to address overlapping needs, therefore investing funds most effectively. The additional funds would expand to include other items to improve performance in the Mobility Index.

- Roadway reconstruction (3S) to meet long term goals, including correction of geometric deficiencies.
- Interchange improvements to improve safety and traffic flow in high volume areas.
- Improvement of pavement condition of Local and Regional Routes, to include reconstruction (3S).

Performance Measurement over Time

As these performance measures are continually monitored over time it will become evident how the recommended solution strategies and the selected projects address the needs of the corridor and the overall system. Addressing deficiencies documented in the corridor plan will effectively improve the System Preservation, Safety, and Mobility indexes at both the corridor and system level.

Ongoing performance measure documentation is critical to identify trends, capture the existing health of the system, and allowing an accurate forecast of the future health of Wyoming's Transportation system. The need for additional funding and/or more aggressive solutions will become evident if performance measures fail to meet WYDOT goals.

REALIZING THE CORRIDOR VISION

As part of the statewide Wyoming Connects and Long Range Transportation Plan, the Corridor Vision for SSC 12 - and all SSCs - focuses on the identification of overall system performance aggregated from the evaluations of each individual corridor's "health" relative to WYDOT's long-term Strategic Goals. The identified types of investment needs (system preservation, safety, and mobility) expressed in the Corridor Vision are reflected in the three primary need indicators of this Corridor Plan. The analysis of each investment type generated goals representing corridor health issues as communicated by the planning and public process used in development of the Vision. See ***Wyoming Connects:*** *Corridor Visions* for more information.

Corridor Vision Goals

The Cheyenne to Buffalo Corridor Vision captured Key Issues and Emerging Trends of critical importance and how SSC 12 could best serve the communities it connects over the long term. While issues were identified relative to each investment type, the Primary Investment Type is Mobility:

Dashboard from Corridor Visions

SSC 12 (I-25) occupies a critical position on the system due to its strategic position connecting two other major east/west interstates, I-80 and I-90. It also connects to seven other SSC routes, connecting many destinations both internal and external to Wyoming. Maintaining, upgrading, and in some cases replacing interchanges, ensuring system preservation, and adding ITS or other methods of improving function is necessary to keep the commuters, tourists, trucks, and energy vehicles moving. Plans should also include the rehabilitation and replacement of deficient bridges and efforts to reduce vehicle crashes.

Additional goals which reflect the full context, character, and issues of SSC 12 were set as high priority goals as indicated in Table 15. A review of these Vision Goals compared to the findings of this Corridor Plan provides for a conformance check and identifies additional issues to be considered when evaluating potential projects and implementation plans.

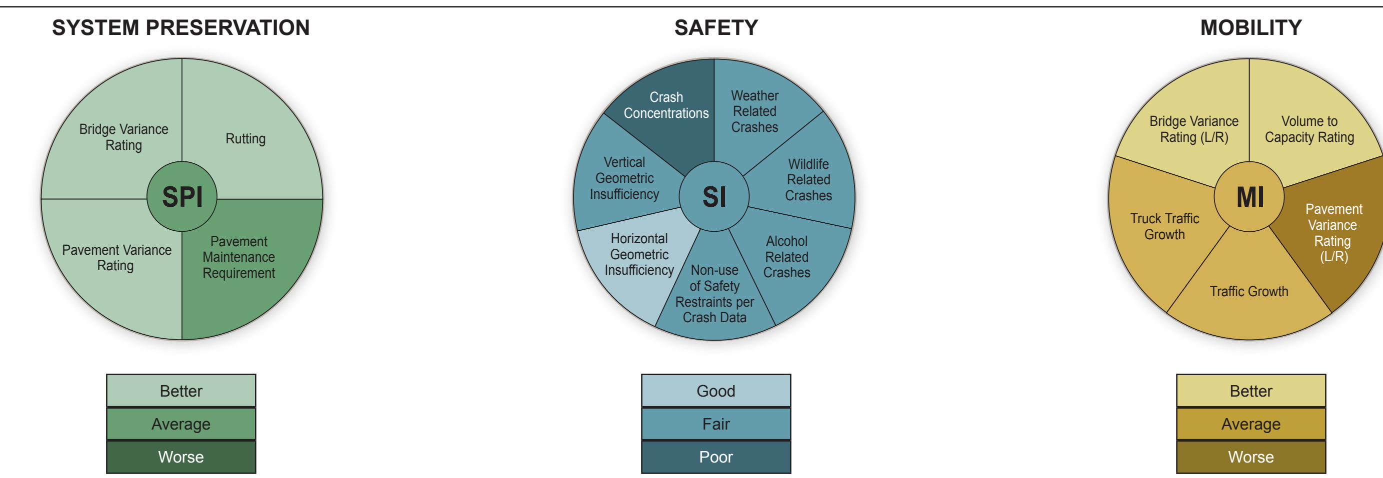
Table 15 - Review of Corridor Vision Goals and Other Considerations

Corridor Visions		High Priority	Other Considerations
Investment Category	**Goal**		
System Preservation	Preserve the existing transportation system	✓	On-going pavement treatments required to maintain conditions resulting from growing traffic and truck traffic volumes. Several structurally deficient bridges identified for rehabilitation.
Safety	Safety		Weather related crashes are prevalent throughout the corridor. The high number of critical (severe and fatal) crashes may be reduced by improved use of safety restraints.
Mobility	Maintain statewide transportation connections	✓	I-25 is a key interstate connection between Colorado, I-80, and I-90. Operating conditions on interstate highways are expected to be superior.
	Accommodate growth in truck freight transport		I-25 is a key link in the state's commercial transportation. Volumes do not indicate the need for expansion at this time, except for interchange improvements at the highest volume interchanges.
	Promote intergovernmental coordination		Major improvements on I-25 to be coordinated with local governments/MPOs
	Ensure airport facility meets existing and projected demands		The Cheyenne and Casper airports board most of the state's commercial passengers. Connections to the airports should remain solid.
	Improve public transportation opportunities		Local transit improvements in Cheyenne, Casper, Buffalo, and Sheridan would help improve mobility for local residents. I-25 is a key intercity bus route.

CORRIDOR PERFORMANCE

Table 16 shows SSC 12 corridor performance compared to the system. The center of each chart indicates the value of the performance index, with each section indicating the performance qualifier for each measure.

Table 16 - Corridor Performance



System Preservation – The System Preservation Index is average compared to all other corridors. Performance qualifiers had average to better than average performance across all qualifiers.

Safety – The Safety Index is fair compared to all other corridors. The performance qualifiers show worse than average or poor performance in Crash Concentrations.

Mobility - The Mobility Index is average compared to all other corridors. The performance qualifiers show worse than average or poor performance in Pavement Variance Rating (Local and Regional Routes).

Coordination with System Priorities

The corridor comparison can be used to help assign a priority level to entire corridors, if conditions warrant. The Corridor Plans – Executive Summary is published under separate cover and provides an overview of corridor comparisons. The summary identifies areas of greatest need within all performance indexes and for performance qualifiers across the state system. By addressing these areas of greatest need, whether by program, corridor, or corridor segment WYDOT will ensure positive changes in reported conditions throughout Wyoming.