FINAL REPORT

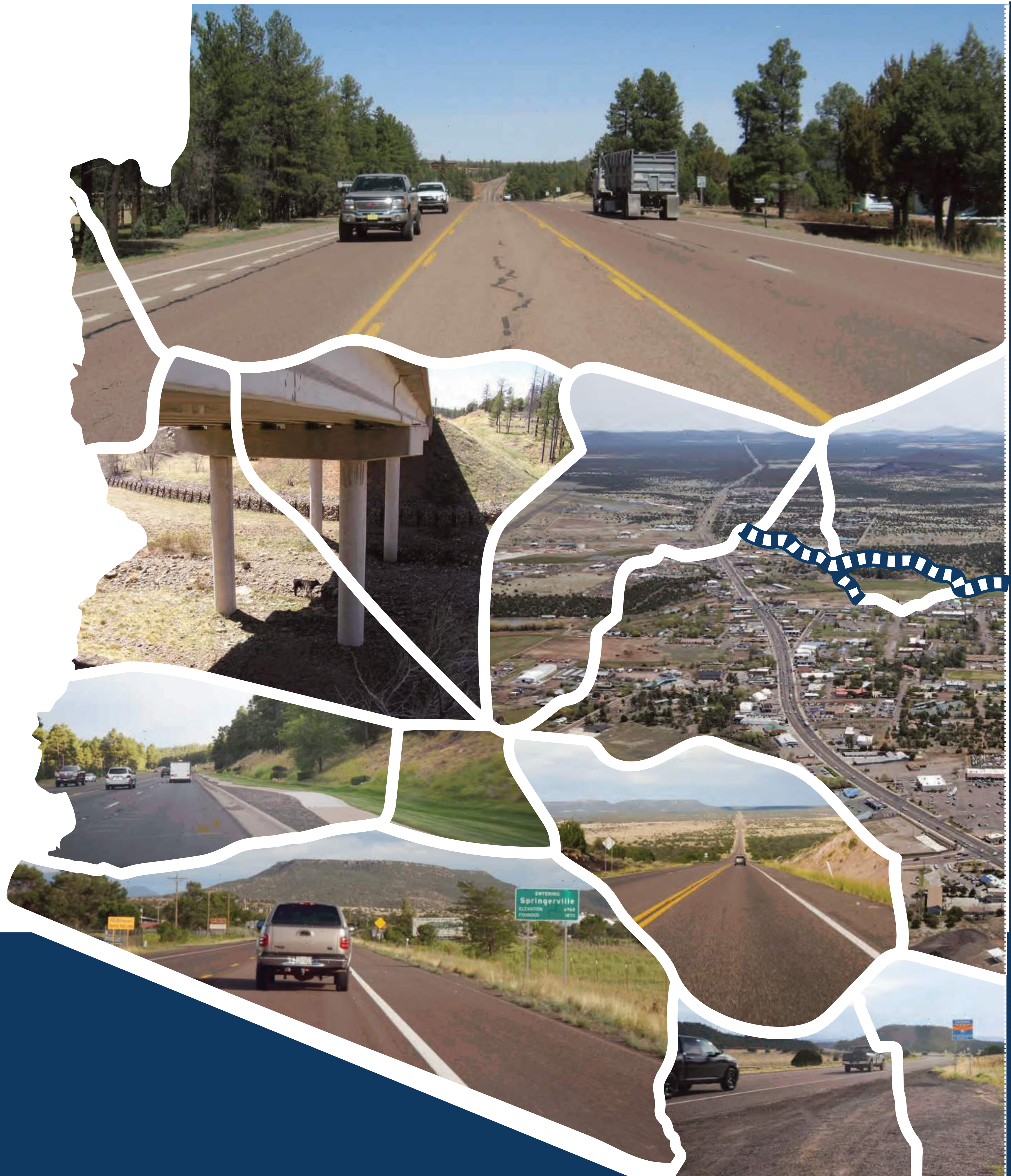
SR 260/US 60 Corridor Profile Study

Heber-Overgaard to New Mexico State Line

PREPARED FOR ADOT JUNE 2022

ADOT WORK TASK NO.
MPD 022-21

ADOT CONTRACT NO.
17-171975



Prepared by
WILSON & COMPANY

SR 260 | US 60 CORRIDOR PROFILE STUDY

HEBER-OVERGAARD TO NEW MEXICO STATE LINE

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PREPARED FOR:

ARIZONA DEPARTMENT OF TRANSPORTATION

ADOT

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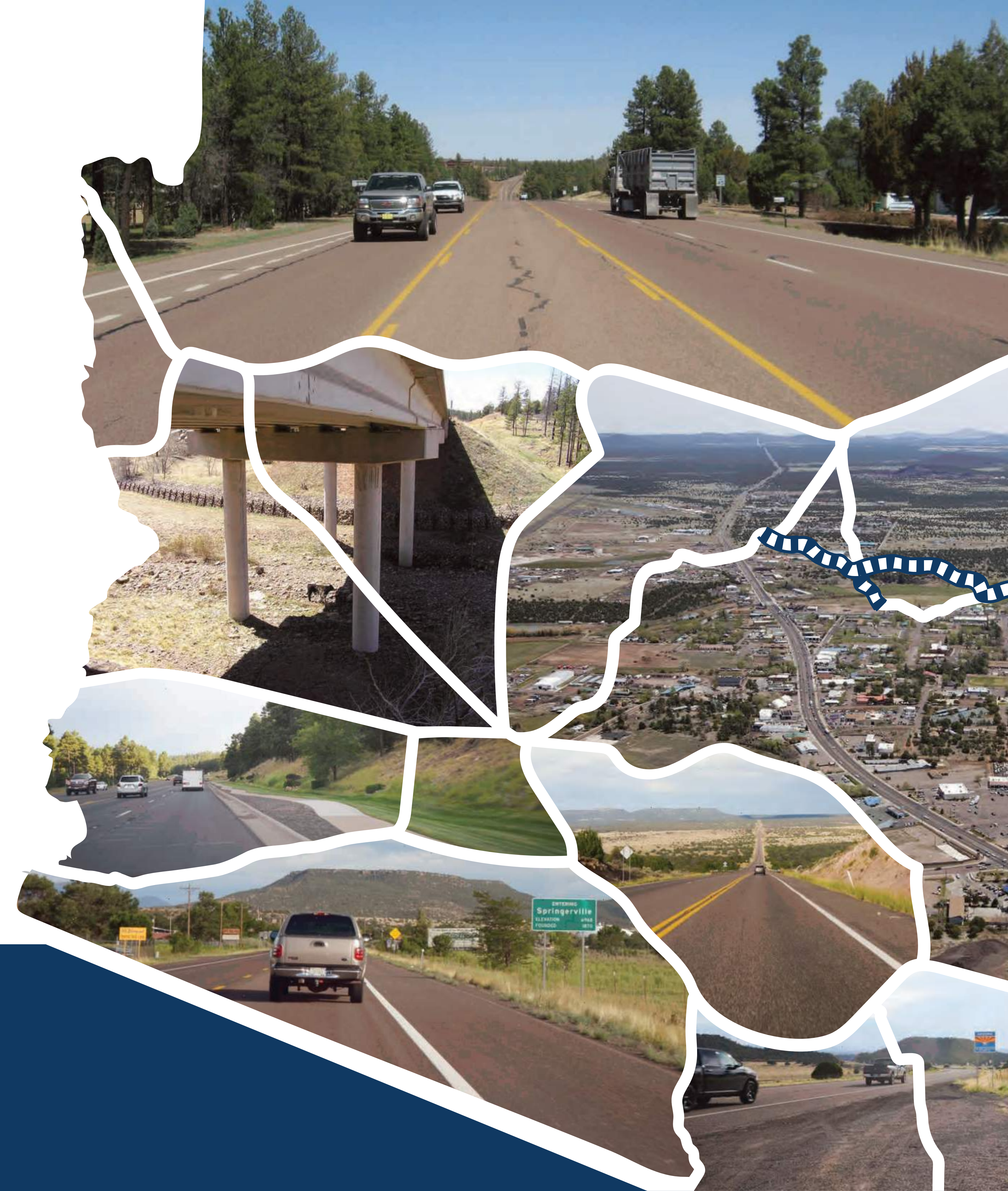
ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ADOT	Arizona Department of Transportation
AGFD	Arizona Game and Fish Department
ASLD	Arizona State Land Department
AZTDM	Arizona Travel Demand Model
BLM	Bureau of Land Management
BNSF	Burlington Northern Santa Fe
BQAZ	Building a Quality Arizona
CCTV	Closed Circuit Television
CR	Cracking Rating
CYMPO	Central Yavapai Metropolitan Planning Organization
DMS	Dynamic Message Sign
DCR	Design Concept Report
FY	Fiscal Year
HCRS	Highway Condition Reporting System
HPMS	Highway Performance Monitoring System
I	Interstate
INRIX	Real-time traffic conditions database
IRI	International Roughness Index
ITS	Intelligent Transportation System
LCCA	Life-Cycle Cost Analysis
LOTTR	Level of Travel Time Reliability
LOS	Level of Service
LRTP	Long Range Transportation Plan
MAG	Maricopa Association of Governments
MAP-21	Moving Ahead for Progress in the 21st Century
MP	Milepost
MPD	Multimodal Planning Division
NACOG	Northern Arizona Council of Governments
NB	Northbound
NPV	Net Present Value
OP	Overpass
PA	Project Assessment
PARA	Planning Assistance for Rural Areas
PeCoS	Performance Controlled System
PES	Performance Effectiveness Score
P2P	Planning to Programming
PDI	Pavement Distress Index
PSR	Pavement Serviceability Rating
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SAT	Small Area Transportation Study
SB	Southbound
SERI	Species of Economic and Recreational Importance
SGCN	Species of Greatest Conservation Need
SHCG	Species and Habitat Conservation Guide
SHSP	Strategic Highway Safety Plan
SR	State Route
SWAP	State Wildlife Action Plan
TAC	Technical Advisory Committee
TI	Traffic Interchange
TIP	Transportation Improvement Plan
TTTR	Truck Travel Time Reliability
UP	Underpass
US	United States Route
USDOT	United States Department of Transportation
V/C	Volume to Capacity Ratio
VMT	Vehicle-Miles Travelled
WIM	Weigh-in-Motion



Executive Summary

EXECUTIVE SUMMARY

INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of State Route 260 (SR 260) | US 60 (US 60) between Heber-Overgaard and the New Mexico State Line. The study examines key performance measures relative to the SR 260 | US 60 corridor, and the results of this performance evaluation are used to identify potential strategic improvements. The intent of the corridor profile program, and of ADOT's Planning-to-Programming (P2P) process, is to conduct performance-based planning to identify areas of need and make the most efficient use of available funding to provide an efficient transportation network.

ADOT has completed 21 original CPS within four separate groupings or rounds. In 2020, ADOT separated the previously studied six groupings to be updated and reassessed. The SR 260 | US 60 corridor, depicted in **Figure ES-1**, along with all CPS corridors, is one of the strategic statewide corridors identified and the subject of this CPS Update.

Corridor Study Purpose, Goals and Objectives

The purpose of the CPS is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process described below:

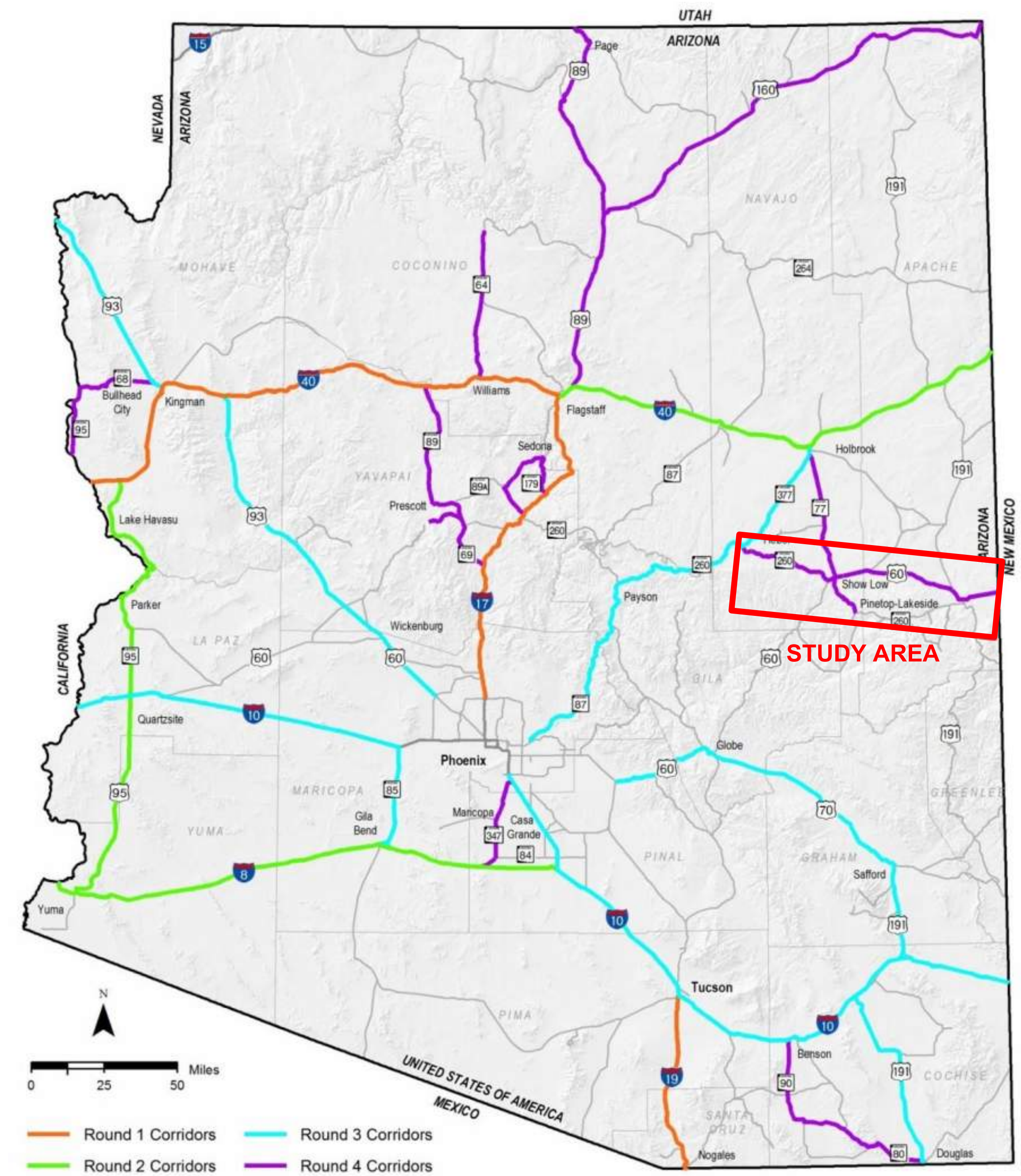
- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the performance measures
- Prioritize solutions for future implementation, accounting for performance effectiveness and risk analysis findings

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The SR 260 | US 60 CPS defines solutions and improvements for the corridor that are evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance.

The following goals are identified as the outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals
- Develop solutions that address identified corridor needs based on measured performance
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure

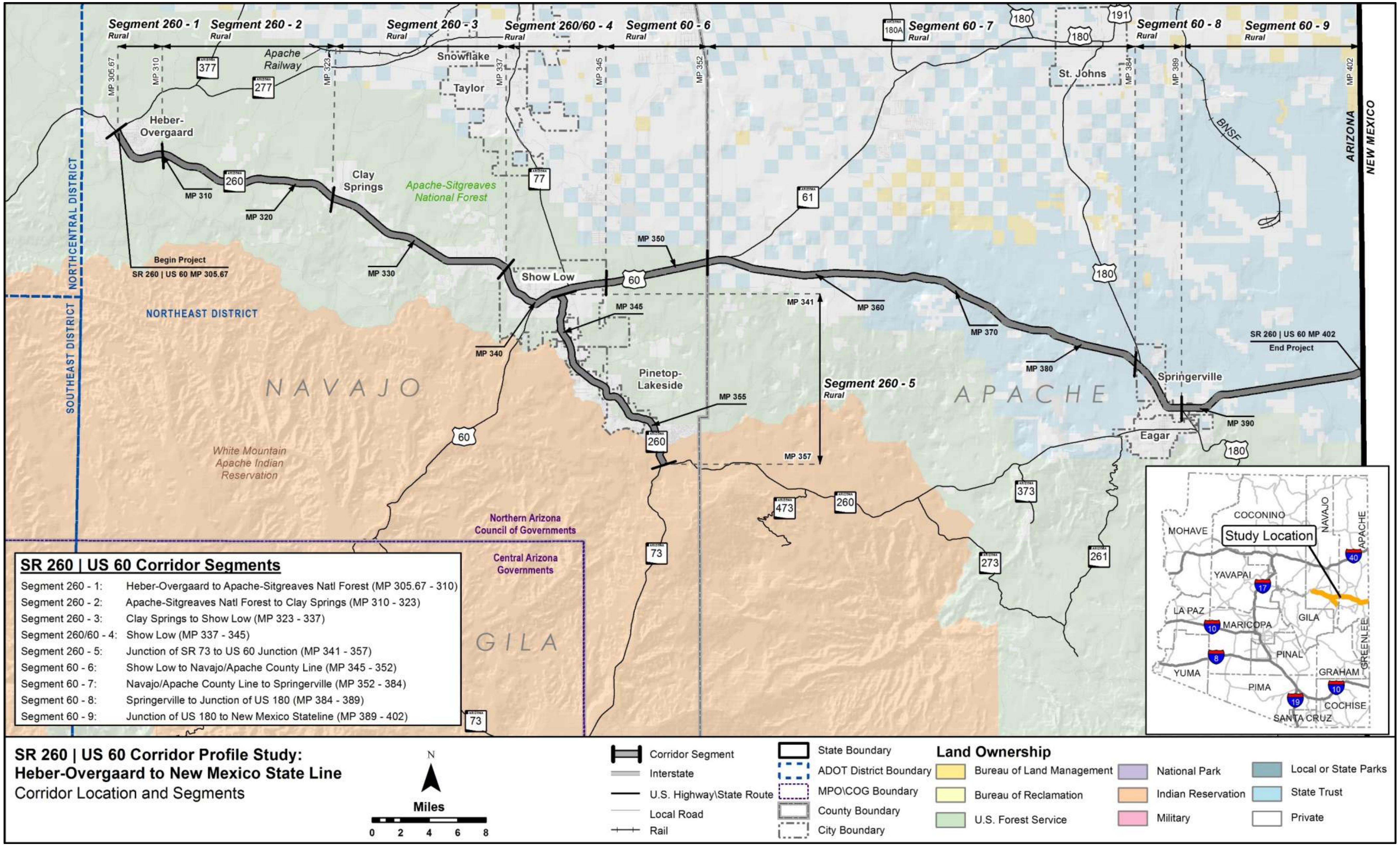
Figure ES-1: Corridor Study Area



Study Location and Corridor Segments

The SR 260 | US 60 corridor is divided into 9 planning segments for analysis and evaluation. The corridor is segmented at logical breaks where the context changes due to differences in characteristics such as terrain, daily traffic volumes, or roadway typical sections. Corridor segments are shown in **Figure ES-2**.

Figure ES-2: Corridor Location and Segments



CORRIDOR PERFORMANCE

A series of performance measures is used to assess the SR 260 | US 60 corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

Corridor Performance Framework

This study uses a performance-based process to define baseline corridor performance, diagnose corridor needs, develop corridor solutions, and prioritize strategic corridor investments. In support of this objective, a framework for the performance-based process was developed through a collaborative process involving ADOT and the CPS consultant teams.

Figure ES-3 illustrates the performance framework, which includes a two-tiered system of performance measures (primary and secondary) to evaluate baseline performance.

Figure ES-3: Corridor Profile Performance Framework

The following five performance areas guide the performance-based corridor analyses:

- Pavement
- Bridge
- Mobility
- Safety
- Freight

The performance measures include five primary measures: Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Additionally, a set of secondary performance measures provides for a more detailed analysis of corridor performance. **Table ES-1** provides the complete list of primary and secondary performance measures for each of the five performance areas.

Table ES-1: Corridor Performance Measures

Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure and structural evaluation rating	• Bridge Sufficiency • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** Based on combination of existing and future daily volume-to-capacity ratios	• Future Congestion • Peak Congestion • Travel Time Reliability • Multimodal Opportunities
Safety	**Safety Index** Based on frequency of fatal and incapacitating injury crashes	• Directional Safety Index • Strategic Traffic Safety Plan Emphasis Areas • Other Crash Unit Types • Safety Hot Spots
Freight	**Freight Index** Based on bi-directional truck travel time reliability	• Travel Time Reliability • Bridge Vertical Clearance • Bridge Vertical Clearance Hot Spots

Each of the primary and secondary performance measures identified in the table above is comprised of one or more quantifiable indicators. A three-level scale was developed to standardize the performance scale across the five performance areas, with numerical thresholds specific to each performance measure:

Good/Above Average Performance – Rating is above the identified desirable/average range

Fair/Average Performance – Rating is within the identified desirable/average range

Poor/Below Average Performance – Rating is below the identified desirable/average range

The terms "good", "fair", and "poor" apply to the Pavement, Bridge, Mobility, and Freight performance measures, which have defined thresholds. The terms "above average", "average", and "below average" apply to the Safety performance measures, which have thresholds referenced to statewide averages.

Corridor Performance Summary

Table ES-2 shows a summary of corridor performance for all primary measures and secondary measure indicators for the SR 260 | US 60 corridor. A weighted corridor average rating (based on the length of the segment) was calculated for each primary and secondary measure as shown in **Table ES-2**.

The corridor is performing in the "fair/average" or "good/above average" range for the primary measure weighted corridor average in all performance areas with the exception of the Freight Index. A total of 52 miles or 46% of the corridor is performing in the "below average" range for the Pavement Index. A total of 50 miles or 44% of the corridor is performing in the "below average" range for the Freight Index Other findings include:

- Overall Performance: The Pavement, Bridge, and Safety performance areas generally show "good" and "fair" performances; The Mobility and Freight performance areas show a mix of "good," "fair," and "poor" performances
- Pavement Performance: The weighted average of the Pavement Index shows "fair" overall performance for the SR 260 | US 60 corridor; Several segments show "poor" or "fair" performances for several Pavement performance measures
- Bridge Performance: The weighted average of the Bridge Index shows "fair" overall performance for the SR 260 | US 60 corridor; The majority of segments show "fair" performances in Lowest Bridge Rating performance area measures, Segments 260-2 and 60-6 show "poor" performance; The majority of segments show "good" performances in Sufficiency Rating; Segments 260-1, 260-5, and 60-9 do not contain any bridges
- Mobility Performance: The weighted average of the Mobility Index shows "good" overall performance for the SR 260 | US 60 corridor; All the segments show a mix of "good" and "fair" performances in the Closure Extent and LOTTR performance area measures for all directions; the majority of segments show "poor" performances in the % Bicycle Accommodation; the majority of segments show "fair" performances in the % Non-Single Occupancy Vehicle (SOV) Trips
- Safety Performance: The weighted average of the Safety Index shows "good" overall performance for the SR 260 | US 60 corridor; Segments 260-2 and 260-7 show "poor" performance in Directional Safety Index, Segments show a mix of "good," "fair," and "poor" performance in the % of Fatal + Incapacitating Injury Crashes Involving Lane Departures
- Freight Performance: The weighted average of the Freight Index shows "poor" overall performance for the SR 260 | US 60 corridor; Segments 260-5, 60-6, and 60-9 show "poor" performances in both directional and bidirectional TTTR performance area measure; Several segments show "poor" performance ratings in both directions of the Closure Duration performance area measure
- Lowest Performing Segments: Segments 60-5 and 60-6 show "poor/below average" performance for many performance area measures
- Highest Performing Segments: Segments 260-3 and 60-8 show "good/above average" performance for many performance area measures

Table ES-2: Corridor Performance Summary by Segment and Performance Measure

Segment #	Segment Length (miles)	Pavement Performance Area: Pavement Index	Directional PSR EB	Directional PSR WB	% Area Failure	Bridge Performance Area: Bridge Index	Sufficiency Rating	Lowest Bridge Rating	Mobility Performance Area: Mobility Index	Future Daily V/C	Existing Peak Hour V/C EB	Existing Peak Hour V/C WB	Closure Extent (instances/ milepost/year/mile) EB	Closure Extent WB	Directional LOTTR (all vehicles) EB	Directional LOTTR WB	% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
260-1[2^a]	4	1.94	2.93	2.76	100.0%	No Bridge			0.10	0.09	0.11	0.11	0.29	0.17	1.11	1.12	93%	16.0%
260-2[2^b]	13	3.20	4.02		76.9%	5.7	88	5	0.39	0.38	0.42	0.42	0.14	0.15	1.08	1.08	0%	12.4%
260-3[2^b]	14	2.21	3.75		42.9%	6.0	93	6	0.20	0.20	0.23	0.23	0.16	0.11	1.08	1.07	5%	15.0%
260/60-4[2*a]	8	3.32	3.43	3.26	56.3%	6.0	85	6	0.39	0.44	0.32	0.32	0.20	0.15	1.17	1.19	54%	16.5%
260-5[2*a]	16	3.16	3.57	3.56	100.0%	No Bridge			0.66	0.74	0.49	0.49	0.24	0.28	1.17	1.20	50%	16.3%
60-6[2^b]	7	3.27	3.63		100.0%	5.0	64	5	0.51	0.59	0.41	0.41	0.31	0.23	1.15	1.18	0%	13.1%
60-7[2^b]	32	2.46	3.31		96.9%	7.0	97	7	0.24	0.27	0.18	0.18	0.46	0.24	1.09	1.07	5%	14.9%
60-8[2*a]	5	3.55	3.73		66.7%	6.0	80	6	0.28	0.32	0.23	0.23	0.04	0.04	1.21	1.21	98%	15.3%
60-9[2^b]	13	3.88	3.93		0.0%	No Bridge			0.06	0.06	0.05	0.05	0.02	0.00	1.16	1.15	100%	0.0%
Weighted Corridor Average		2.92	3.59	3.58	73%	5.9	85	6	0.32	0.34	0.27	0.27	0.25	0.17	1.12	1.12	33%	13%

SCALES

Performance Level	Non-Interstate			All			Rural	All	Uninterrupted	All	
Good/Above Average Performance	> 3.50	> 3.50	< 5%	> 6.5	> 80	> 6	< 0.56	< 0.22	< 1.15	> 90%	> 17%
Fair/Average Performance	2.90 - 3.50	2.90 - 3.50	5% - 20%	5.0 - 6.5	50 - 80	5 - 6	0.56 - 0.76	0.22 - 0.62	1.15 - 1.5	60% - 90%	11% - 17%
Poor/Below Average Performance	< 2.90	< 2.90	> 20%	< 5.0	< 50	< 5	> 0.76	> .62	> 1.5	< 60%	< 11%

Performance Level	Interrupted
Good/Above Average Performance	< 1.15
Fair/Average Performance	> 1.15 & < 1.5
Poor/Below Average Performance	> 1.5

^Uninterrupted Flow Facility
*Interrupted Flow Facility

[a]4 or 5 Lane Undivided Highway
[b]2 or 3 Lane Undivided Highway

[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

Table ES-2: Corridor Performance Summary by Segment and Performance Measure (continued)

Segment #	Segment Length (miles)	Safety Performance Area: Safety Index	Directional Safety Index EB	Directional Safety Index WB	% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles	Freight Performance Area: Freight TTTR	Directional Max TTTR EB	Directional Max TTTR WB	Combined Average Peak TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB) EB	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB) WB	Bridge Vertical Clearance (feet)
260-1[2^a]	4	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.25	1.25	1.24	1.25	73.60	48.24	No UP
260-2[2^b]	13	1.51	1.85	1.16	Insufficient Data	85.7%	Insufficient Data	Insufficient Data	Insufficient Data	1.18	1.19	1.17	1.18	54.58	55.17	No UP
260-3[2^b]	14	0.54	0.19	0.90	Insufficient Data	57.14%	Insufficient Data	Insufficient Data	Insufficient Data	1.21	1.22	1.20	1.21	25.33	15.01	No UP
260/60-4[2*a]	8	0.39	0.61	0.16	Insufficient Data	25.0%	Insufficient Data	Insufficient Data	Insufficient Data	1.77	1.72	1.83	1.77	144.18	138.10	No UP
260-5[2*a]	16	0.01	0.01	0.01	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.05	2.12	1.97	2.05	242.09	248.78	No UP
60-6[2^b]	7	0.04	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.79	1.68	1.91	1.79	263.26	250.69	No UP
60-7[2^b]	32	0.67	1.20	0.15	Insufficient Data	69.2%	Insufficient Data	Insufficient Data	Insufficient Data	1.28	1.30	1.25	1.28	267.81	223.06	No UP
60-8[2*a]	5	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.58	1.65	1.51	1.58	8.12	4.60	No UP
60-9[2^b]	13	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.42	1.47	1.37	1.42	1.65	0.00	No UP
Weighted Corridor Average		0.55	0.74	0.36	Insufficient Data	64.6%	Insufficient Data	Insufficient Data	Insufficient Data	1.46	1.48	1.44	1.46	150.31	134.76	No UP

SCALES

Performance Level	**2 or 3 Lane Undivided Highway**						**Uninterrupted**				**All**		**All**
Good/Above Average Performance	< 0.92	< 11.2%	< 66.9%	< 3.8%	< 4.2%	= 0%	< 1.15				< 44.18		> 16.5
Fair/Average Performance	0.92 - 1.08	11.2% - 15.6%	66.9% - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0% - 3.3%	1.15 - 1.35				44.18-124.86		16.0 - 16.5
Poor/Below Average Performance	> 1.08	> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%	> 1.35				> 124.86		< 16.0
Performance Level	**4 or 5 Lane Undivided Highway**						**Interrupted**						
Good/Above Average Performance	< 0.78	< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%	< 1.45	< 1.45		< 1.45			
Fair/Average Performance	0.78 - 1.22	43.8% - 49.5%	21.1% - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%	1.45-1.85	1.45-1.85		1.45-1.85			
Poor/Below Average Performance	> 1.22	> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%	> 1.85	> 1.85		> 1.85			

^Uninterrupted Flow Facility
*Interrupted Flow Facility

[a]4 or 5 Lane Undivided Highway
[b]2 or 3 Lane Undivided Highway

[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

NEEDS ASSESSMENT

Corridor Description

The SR 260 | US 60 corridor is an important travel corridor in the eastern part of the state. The corridor functions as a route for recreational, tourist, and regional daily traffic and provides critical connections among the communities it serves and the rest of the regional and interstate network.

Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP) 2010-2035 goals and objectives that were updated in 2017. Statewide performance goals that are relevant to SR 260 | US 60 performance areas were identified and corridor goals were then formulated for each of the five performance areas that aligned with the overall statewide goals established by the LRTP. Based on stakeholder input, corridor goals, corridor objectives, and performance results, three "emphasis areas" were identified for the SR 260 | US 60 corridor: Pavement, Safety, and Freight.

Taking into account the corridor goals and identified emphasis areas, performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. For the performance emphasis areas, the corridor-wide weighted average performance objectives are identified with a higher standard than for the other performance areas.

Achieving corridor and segment performance objectives will help ensure that investments are targeted toward improvements that support the safe and efficient movement of travelers on the corridor. Corridor performance is measured against corridor and segment objectives to determine needs – the gap between observed performance and performance objectives.

Needs Assessment Process

The performance-based needs assessment evaluates the difference between the baseline performance and the performance objectives for each of the five performance areas used to characterize the health of the corridor: Pavement, Bridge, Mobility, Safety, and Freight. The performance-based needs assessment process is illustrated in **Figure ES-4**.

The needs assessment compares baseline corridor performance with performance objectives to provide a starting point for the identification of performance needs. This mathematical comparison results in an initial need rating of None, Low, Medium, or High for each primary and secondary performance measure. An illustrative example of this process is shown in **Figure ES-5**.

The initial level of need for each segment is refined to account for hot spots and recently completed or under construction projects, resulting in a final level of need for each segment. The final levels of need for each primary and secondary performance measure are combined to produce a weighted final need rating for each segment. A detailed review of available data helps identify contributing factors to the need and if there is a high level of historical investment.

Figure ES-4: Needs Assessment Process

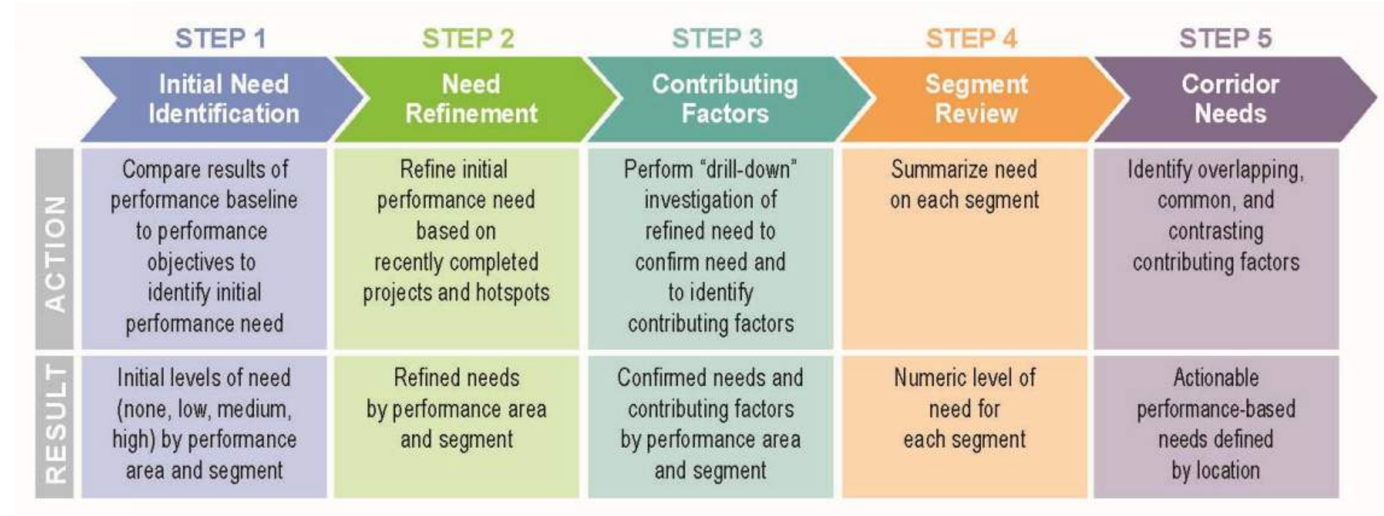


Figure ES-5: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

Performance Thresholds	Performance Level	Initial Level of Need	Description
	Good	None*	All levels of Good and top 1/3 of Fair (>6.0)
	Good		
6.5	Good		
	Fair		
	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
5.0	Fair	Medium	Lower 1/3 of Fair and top 1/3 of Poor (4.5-5.5)
	Poor		
	Poor	High	Lower 2/3 of Poor (<4.5)
	Poor		

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Summary of Needs

Table ES-3 provides a summary of needs for each segment across all performance areas, with the average need score for each segment presented in the last row of the table. A weighting factor of 1.5 is applied to the need scores of the performance areas identified as emphasis areas (Pavement, Safety, and Freight for the SR 260 | US 60 corridor). There are six segments with a Medium average need and three segments with a Low average need. More information on the identified final needs in each performance area is provided below.

Pavement Needs

- Segments 260-1, 260-3 and 60-7 have final needs of High; Segments 260-2, 260-5 and 60-6 have final needs of Medium
- Segments 260|60-4 and 60-8 have final needs of Low

Bridge Needs

- Three segments (260-1, 260-5, and 60-9) do not include any bridges
- Segment 60-6 includes one bridge, the Rocky Arroyo Bridge (No. 384), which could have a repetitive investment issue
- There are no final Bridge needs along the corridor

Mobility Needs

- Low Mobility needs exist on five of the nine segments of the corridor
- One segment (260-5) has Medium final needs due to Medium future Daily V/C needs and a Low level of need for mobility index
- Segment 60-7 contains Low closure extent needs
- Bicycle accommodation needs are High on four of the nine segments of the corridor

Safety Needs

- High Safety needs exist on one of the nine segments
- Safety hot spots exist in Segment 260|60-4 in the westbound direction

Freight Needs

- High Freight needs exist on four of the nine segments
- Many segments along the corridor contain High directional TTTR, bridge clearance, and closure duration needs

Overlapping Needs

This section identifies overlapping performance needs on the SR 260 | US 60 corridor, which provides guidance to develop strategic solutions that address more than one performance area with elevated levels of need. Completing projects that address multiple needs presents the opportunity to more effectively improve overall performance. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- Segment 260-1 contains a High need in the Pavement performance area
- Segment 260-2 contains a Medium need in the Pavement performance area and a High need in the Safety performance area
- Segment 260-3 contains a High need in the Pavement performance area
- Segment 260|60-4 contains a High need in the Freight performance area
- Segment 260-5 contains a Medium need in the Pavement performance area, Medium need in the Mobility performance area, and a High need in the Freight performance area
- Segment 60-6 contains a Medium need in the Pavement performance area and a High need in the Freight performance area
- Segment 60-7 contains a High need in the Pavement performance area and a Medium need in the Freight performance area
- Segment 60-9 contains a High need in the Freight performance area

Table ES-3: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)								
	260-1	260-2	260-3	260|60-4	260-5	60-6	60-7	60-8	60-9
	MP 306-310	MP 310-323	MP 323-337	MP 337-345	MP 341-357	MP 345-352	MP 352-384	MP 384-389	MP 389-402
Pavement*	High	Medium	High	Low	Medium	Medium	High	Low	None*
Bridge	None*	None*	None*	None*	None*	None*	None*	None*	None*
Mobility	None*	Low	Low	Low	Medium	Low	Low	None	None
Safety*	None*	High	None	Low	Low	None	Low	None	None*
Freight*	Low	None	Low	High	High	High	Medium	Low	High
Average Need	**0.92**	**1.31**	**1.08**	**1.31**	**1.69**	**1.31**	**1.54**	**0.46**	**0.69**

Level of Need	Average Need Range
None+	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

* Identified as Emphasis Areas for SR 260 US 60 Corridor
^ 40B-17 Pavement Need estimated based on field review
# N/A indicates insufficient or no data available to determine level of need
+ A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

STRATEGIC SOLUTIONS

The principal objective of the CPS is to identify strategic solutions (investments) that are performance-based to ensure that available funding resources are used to maximize the performance of the State's key transportation corridors. One of the first steps in the development of strategic solutions is to identify areas of elevated levels of need (i.e., Medium or High) as addressing these needs will have the greatest effect on corridor performance and are the focus of the strategic solutions. Segments with Medium or High needs and specific locations of hot spots are considered strategic investment areas for which strategic solutions should be developed. Segments with lower levels of need or without identified hot spots are not considered candidates for strategic investment and are expected to be addressed through other ADOT programming processes. The SR 260 | US 60 strategic investment areas (resulting from the elevated needs) are shown in **Figure ES-6**.

Screening Process

In some cases, needs that are identified do not advance to solutions development and are screened out from further consideration because they have been or will be addressed through other measures including:

- A project is programmed to address this need
- The need is a result of a Pavement or Bridge hot spot that does not show historical investment issues or ratings issues; these hot spots will likely be addressed through other ADOT programming means
- A bridge is not a hot spot but is located within a segment with a Medium or High level of need; this bridge will likely be addressed through current ADOT bridge maintenance and preservation programming processes
- The need is determined to be non-actionable (i.e., cannot be addressed through an ADOT project)
- The conditions/characteristics of the location have changed since the performance data was collected that was used to identify the need

Candidate Solutions

For each elevated need within a strategic investment area that is not screened out, a candidate solution is developed to address the identified need. Each candidate solution is assigned to one of the following three P2P investment categories based on the scope of the solution:

- Preservation
- Modernization
- Expansion

Documented performance needs serve as the foundation for developing candidate solutions for corridor preservation, modernization, and expansion. Candidate solutions are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the SR 260 | US 60 corridor will be considered along with other candidate projects in the ADOT statewide programming process.

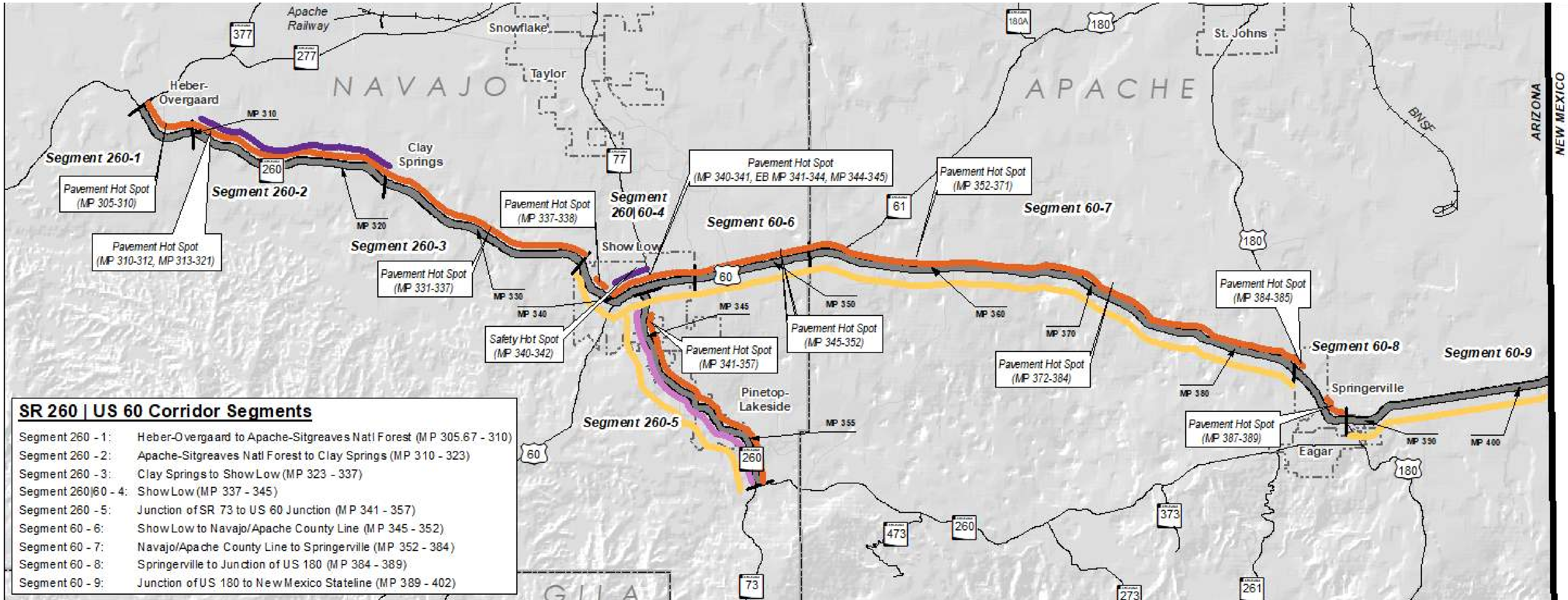
Candidate solutions include some or all of the following characteristics:

- Do not recreate or replace results from normal programming processes
- May include programs or initiatives, areas for further study, and infrastructure projects
- Address elevated levels of need (High or Medium) and hot spots
- Focus on investments in modernization projects (to optimize current infrastructure)
- Address overlapping needs
- Reduce costly repetitive maintenance
- Extend operational life of system and delay expansion
- Leverage programmed projects that can be expanded to address other strategic elements
- Provide measurable benefit

Candidate solutions developed to address an elevated need in the Pavement or Bridge performance areas include two options: rehabilitation or full replacement. These solutions are initially evaluated through a Life-Cycle Cost Analysis (LCCA) to provide insights into the cost-effectiveness of these options so a recommended approach can be identified. Candidate solutions developed to address an elevated need in the Mobility, Safety, or Freight performance areas are advanced directly to the Performance Effectiveness Evaluation. In some cases, there may be multiple solutions identified to address the same area of need.

Candidate solutions that are recommended to expand or modify the scope of an already programmed project are noted and are not advanced to solution evaluation and prioritization. These solutions are directly recommended for programming.

Figure ES-6: Strategic Investment Areas



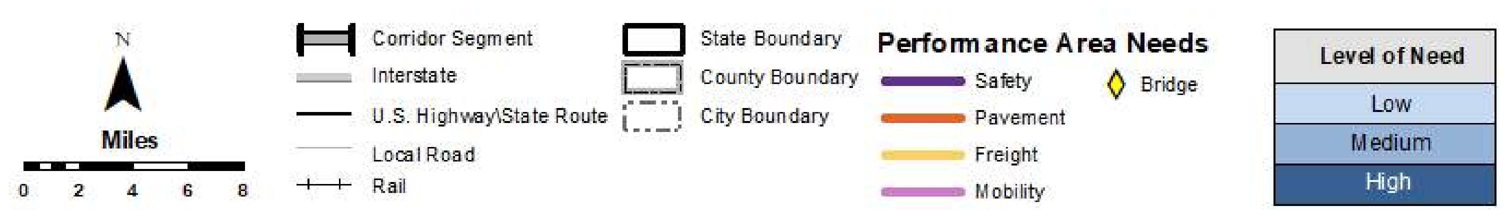
Performance Area	260-1	260-2	260-3	260/60-4	260-5	60-6	60-7	60-8	60-9	Performance Area
	MP 305.67-310	MP 310-323	MP 323-337	MP 337-345	MP 341-357	MP 345-352	MP 352-384	MP 384-389	MP 389-402	
Pavement*	High	Medium	High	Hot Spot	Medium	Medium	High	Hot Spot	-	Pavement*
Bridge	-	-	-	-	-	-	-	-	-	Bridge
Mobility	-	-	-	-	Medium	-	-	-	-	Mobility
Safety*	N/A	High	-	Hot Spot	-	-	-	-	N/A	Safety*
Freight*	-	-	-	High	High	High	Medium	-	High	Freight*

* Identified as emphasis area for SR 260 | US 60 Corridor

Note: Figure shows strategic investment areas, which are segments with Medium and High levels of need and locations of hotspots. A "-" symbol indicates a segment level of need of Low, None, or N/A, which is not considered strategic

SR 260 | US 60 Corridor Profile Study: Heber-Overgaard to New Mexico State Line

Strategic Investment Areas



SOLUTION EVALUATION AND PRIORITIZATION

Candidate solutions are evaluated using the following steps: LCCA (where applicable), Performance Effectiveness Evaluation, Solution Risk Analysis, and Candidate Solution Prioritization. The methodology and approach to this evaluation is shown in **Figure ES-7** and described more fully below.

Life-Cycle Cost Analysis
All Pavement and Bridge candidate solutions have two options: rehabilitation/repair or reconstruction. These options are evaluated through an LCCA to determine the best approach for each location where a Pavement or Bridge solution is recommended. The LCCA can eliminate options from further consideration and identify which options should be carried forward for further evaluation.

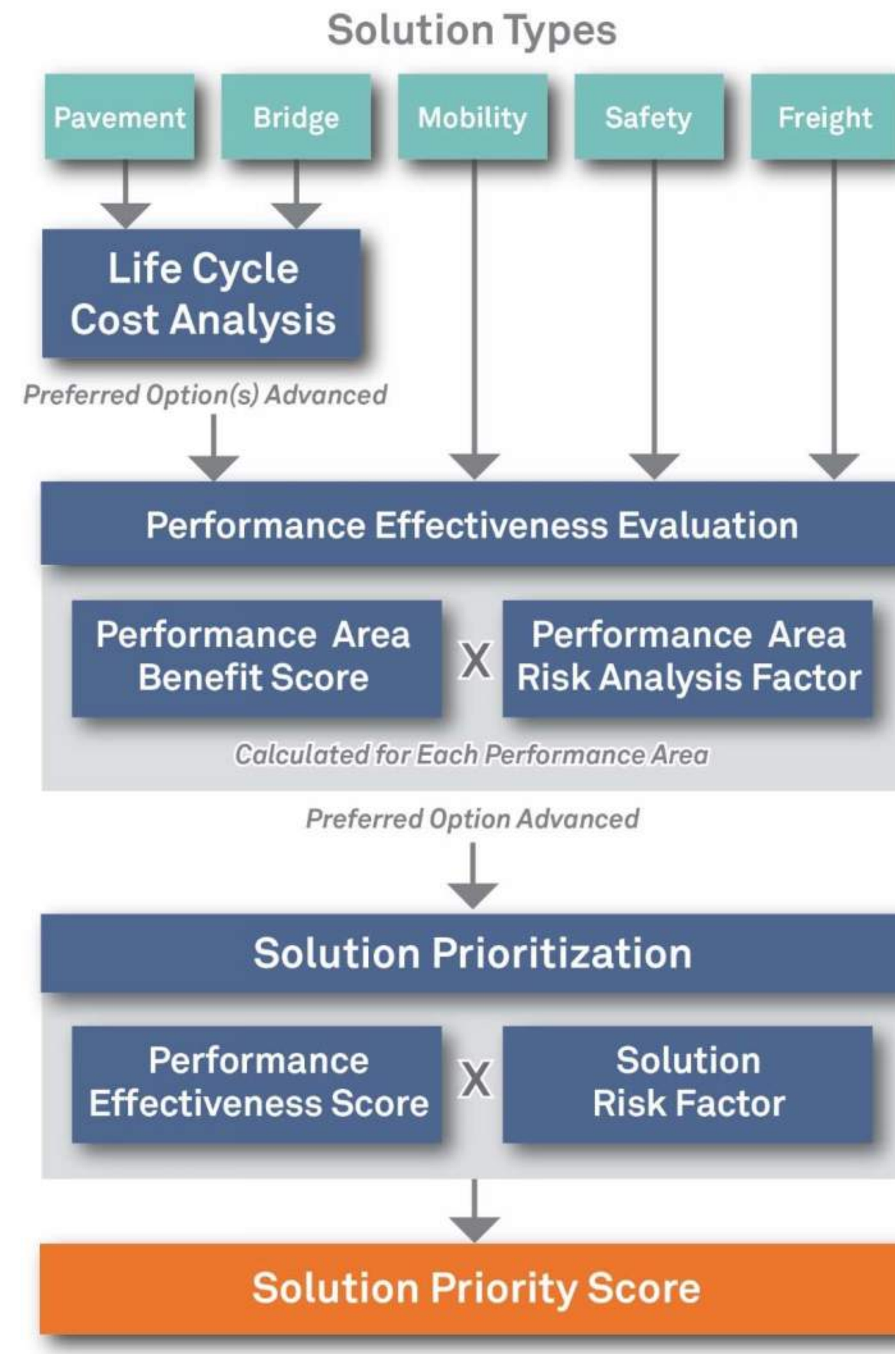
When multiple independent candidate solutions are developed for Mobility, Safety, or Freight strategic investment areas, these candidate solution options advance directly to the Performance Effectiveness Evaluation without an LCCA.

Performance Effectiveness Evaluation
After completing the LCCA process, all remaining candidate solutions are evaluated based on their performance effectiveness. This process includes determining a Performance Effectiveness Score (PES) based on how much each solution impacts the existing performance and needs scores for each segment. This evaluation also includes a Performance Area Risk Analysis to help differentiate between similar solutions based on factors that are not directly addressed in the performance system.

Solution Risk Analysis
All candidate solutions advanced through the Performance Effectiveness Evaluation are also evaluated through a Solution Risk Analysis process. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of the performance failure.

Candidate Solution Prioritization
The PES, weighted risk factor, and segment average need score are combined to create a prioritization score. The candidate solutions are ranked by prioritization score from highest to lowest. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Solutions that address multiple performance areas tend to score higher in this process.

Figure ES-7: Candidate Solution Evaluation Process



SUMMARY OF CORRIDOR RECOMMENDATIONS

Prioritized Candidate Solution Recommendations

Table ES-4 and **Figure ES-8** show the prioritized candidate solutions recommended for the SR 260 | US 60 corridor in ranked order of priority. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Implementation of these solutions is anticipated to improve performance of the SR 260 | US 60 corridor, primarily in the Pavement, Safety, and Freight performance areas. The following observations were noted about the prioritized solutions:

- All of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest priority solutions address needs in the Overgaard Area (MP 310-323) along SR 260)

Other Corridor Recommendations

As part of the investigation of strategic investment areas and candidate solutions, other corridor recommendations can also be identified. These recommendations could include modifications to the existing Statewide Construction Program, areas for further study, or other corridor specific recommendations that are not related to construction or policy. The list below identifies other corridor recommendations for the SR 260 | US 60 corridor:

- Conduct access management studies in the future for the more populated areas of the SR 260 | US 60 corridor:
  - US 60 through the Town Show Low from MP 340-342
  - SR 260 beginning in Show Low to Pinetop-Lakeside from MP 341-355
- Conduct future wildlife mitigation studies to address and reduce the high number of animal crashes on the SR 260 | US 60 corridor. According to data used for this study, animal-vehicle collisions (not resulting in fatal or incapacitating crashes) are concentrated in the following locations:
  - SR 260 – Eastbound: MP 309-322, MP 324-333, MP 335-337, MP 352, MP 356-357
  - SR 260 – Westbound: MP 310-317, MP 318-323, MP 324-333, MP 336, MP 343-345, MP 346-351
  - US 60 – Eastbound: MP 343-345, MP 349-351, MP 358-363
  - US 60 – Westbound: MP 350-352, MP 358-360, MP 362-364, MP 365-367, MP 387-388

Policy and Initiative Recommendations

In addition to location-specific needs, general corridor and system-wide needs have also been identified through the CPS process. While these needs are more overarching and cannot be individually evaluated through this process, it is important to document them. A list of recommended policies and initiatives was developed for consideration when programming future projects not only on SR 260 | US 60, but across the entire state highway system where the conditions are applicable. The following list, which is in no particular order of priority, was derived from the four CPS rounds:

- Install Intelligent Transportation System (ITS) conduit with all new infrastructure projects
- Prepare strategic plans for Closed Circuit Television (CCTV) camera and Road Weather Information System (RWIS) locations statewide
- Leverage power and communication at existing weigh-in-motion (WIM), dynamic message signs (DMS), and call box locations to expand ITS applications across the state
- Consider solar power for lighting and ITS where applicable
- Investigate ice formation prediction technology where applicable
- Conduct highway safety manual evaluation for all future programmed projects
- Develop infrastructure maintenance and preservation plans (including schedule and funding) for all pavement and bridge infrastructure replacement or expansion projects
- Develop standardized bridge maintenance procedures so districts can do routine maintenance work
- Review historical ratings and level of previous investment during scoping of pavement and bridge projects. In pavement locations that warrant further investigation, conduct subsurface investigations during project scoping to determine if full replacement is warranted
- For pavement rehabilitation projects, enhance the amount/level of geotechnical investigations to address issues specific to the varying conditions along the project
- Expand programmed and future pavement projects as necessary to include shoulders
- Expand median cable barrier guidelines to account for safety performance
- Install CCTV cameras with all DMS
- In locations with limited communications, use CCTV cameras to provide still images rather than streaming video
- Develop statewide program for pavement replacement
- Install additional continuous permanent count stations along strategic corridors to enhance traffic count data
- When reconstruction or rehabilitation activities will affect existing bridge vertical clearance, the dimension of the new bridge vertical clearance should be a minimum of 16.25 feet where feasible
- All new or reconstructed roadway/shoulder edges adjacent to an unpaved surface should be constructed with a Safety Edge

- Collision data on tribal lands may be incomplete or inconsistent; additional coordination for data on tribal lands is required to ensure adequate reflection of safety issues
- Expand data collection devices statewide to measure freight delay
- Evaluate and accommodate potential changes in freight and goods movement trends that may result from improvements and expansions to the state roadway network
- At traffic interchanges with existing communication connectivity to the ADOT TOC, consideration should be given to adding thermal detection cameras for vehicle detection with the capability for wrong way vehicle detection
- Improved vehicle detection systems, as recommended by ADOT Systems Technology group, should be deployed at traffic interchanges for improved traffic control

Next Steps

The candidate solutions recommended in this study are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the SR 260 | US 60 corridor will be considered along with other candidate projects in the ADOT statewide programming process.

It is important to note that the candidate solutions are intended to represent strategic solutions to address existing performance needs related to the Pavement, Bridge, Mobility, Safety, and Freight performance areas. Therefore, the strategic solutions are not intended to preclude recommendations related to the ultimate vision for the corridor that may have been defined in the context of prior planning studies and/or design concept reports. Recommendations from such studies are still relevant to addressing the ultimate corridor objectives.

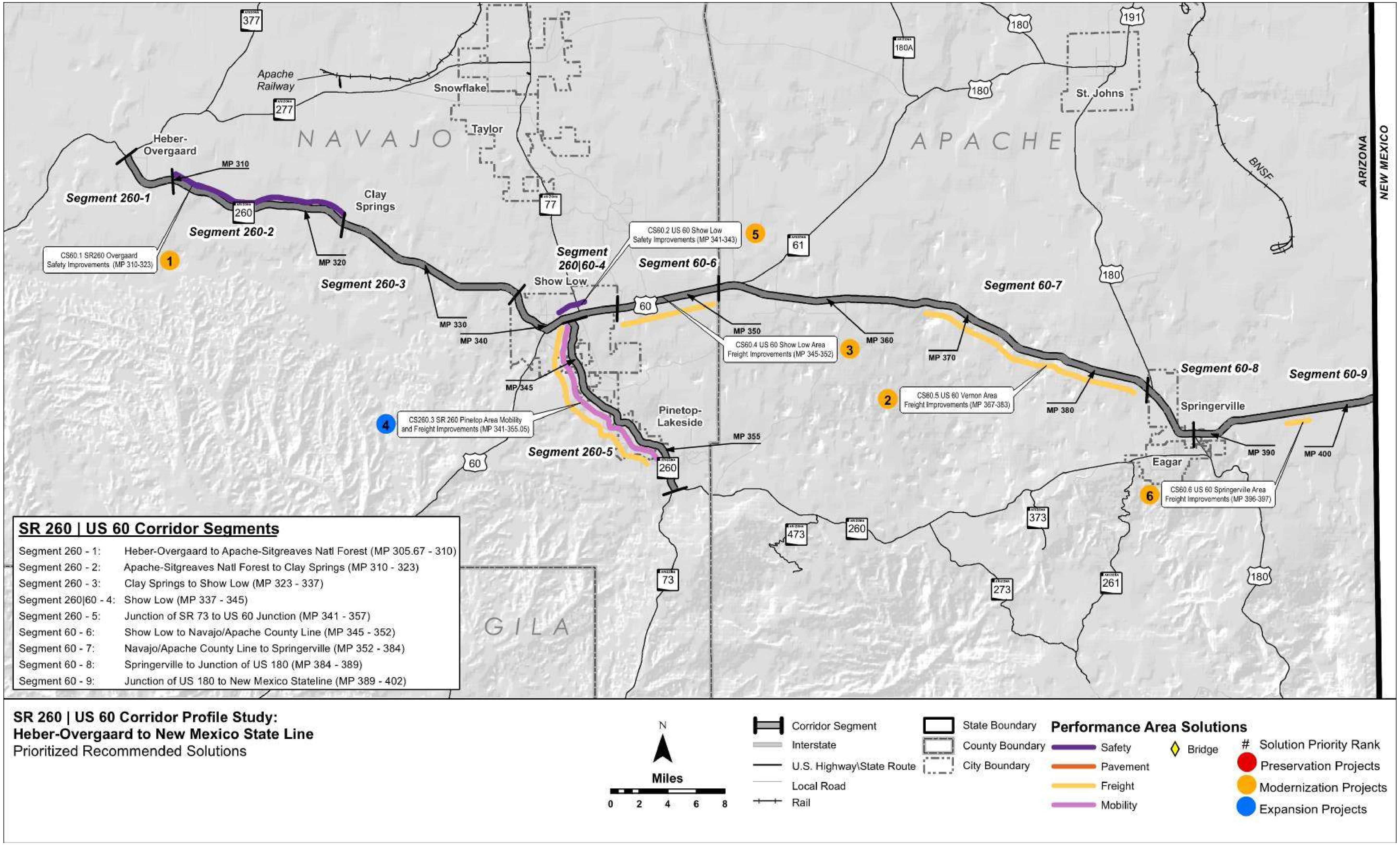
These results will be incorporated into a summary document comparing all corridors that is expected to provide a performance-based review of statewide needs and candidate solutions.

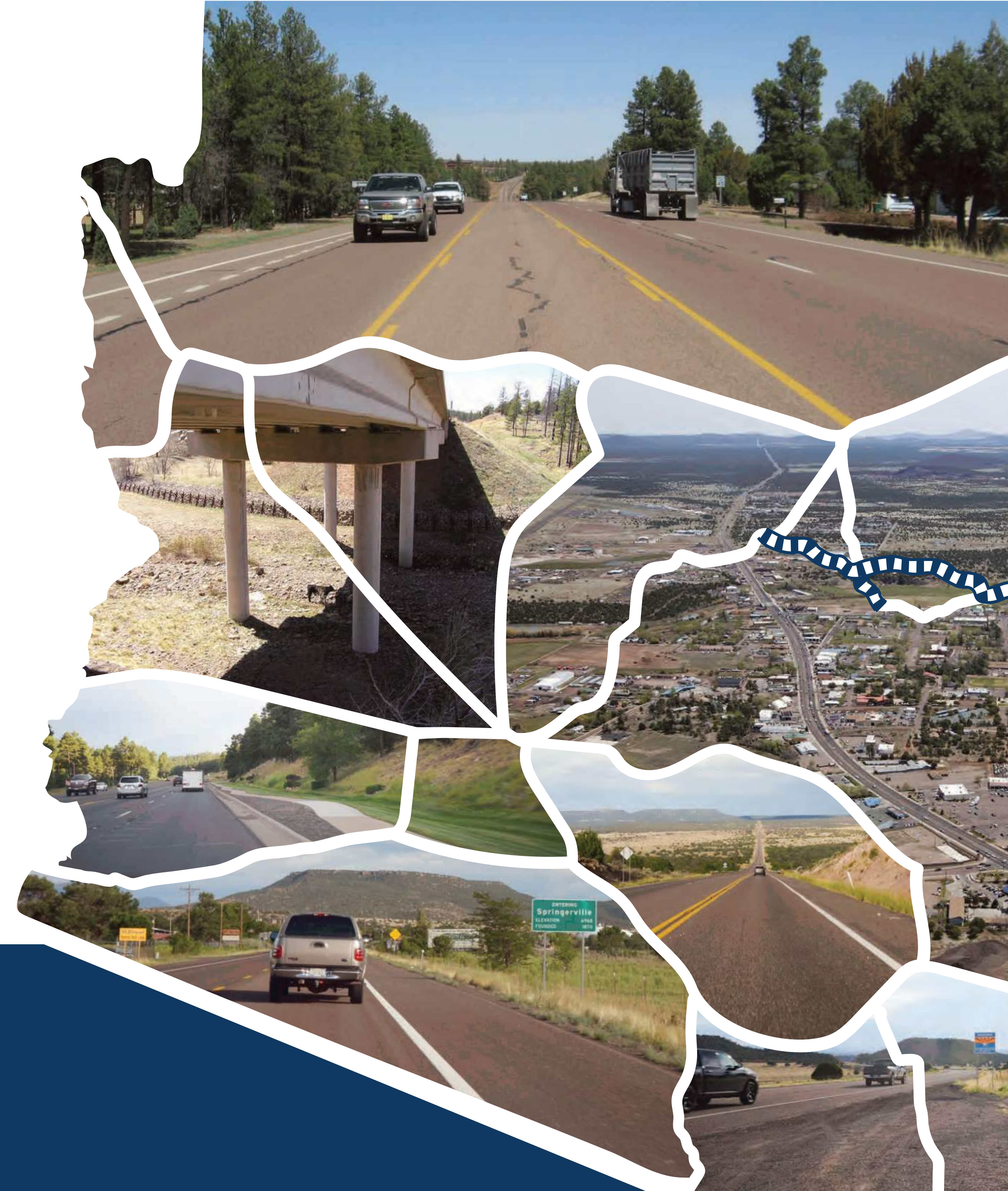
Table ES-4: Prioritized Recommended Solutions

Rank	Candidate Solution #	Option	Candidate Solution Name	Candidate Solution Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS260.1	-	Overgaard Safety Improvements (SR 260 MP 310-323)	• Install centerline rumble strips • Widen shoulders both directions and install rumble strips Improve skid resistance, MP 312-316	$52.2	M	**34**
2	CS60.5	-	Vernon Area Freight Improvements (US 60 MP 367-383)	• Construct EB climbing lane (MP 367-368) • Construct WB climbing lane (MP 380-381) • Construct EB climbing lane (MP 382-383)	$19.4	M	**24**
3	CS60.4	-	Show Low Area Freight Improvements (US 60 MP 345-352)	• Widen shoulders in both directions • Add passing lane in EB direction (MP 349-350) • Add passing lane in WB direction (MP 350-351)	$28.4	M	**21**
4	CS260.3	-	Pinetop Area Mobility and Freight Improvements (SR 260 MP 341-355)	• Add a through lane in both EB and WB directions (MP 341-355.05)	$297.2	E	**6**
5	CS60.2	-	Show Low Safety Improvements (US 60 MP 341-343)	• Limit driveway access to right-in right-out only (MP 341-343) • Install high-visibility striping (MP 341-343) • Install lighting (MP 342-343) • Install right turn lane (MP 342.2)	$8.1	M	**3**
6	CS60.6	-	Springerville Area Freight Improvements (US 60 MP 396-397)	• Construct EB climbing lane (MP 396-397)	$6.4	M	**0**

* '-': Indicates only one solution is being proposed and no options are being considered

Figure ES-8: Prioritized Recommended Solutions





Final Report

Final Report

1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT) is the lead agency for this Corridor Profile Study (CPS) of State Route 260 (SR 260) | US 60 (US 60) between Heber-Overgaard and the New Mexico State Line. The study examines key performance measures relative to the SR 260 | US 60 corridor, and the results of this performance evaluation are used to identify potential strategic improvements. The intent of the corridor profile program, and of ADOT's Planning-to-Programming (P2P) process, is to conduct performance-based planning to identify areas of need and make the most efficient use of available funding to provide an efficient transportation network.

ADOT has completed 21 original CPS within four separate groupings or rounds. In 2020, ADOT separated the previously studied corridors into six groupings to be updated and reassessed: Northeast, Northcentral, Northwest, Southeast, Southcentral, and Southwest. The 12 corridor studies within the three northern groupings began in Spring 2021 and include:

Northeast

- I-40: I-17 to New Mexico State Line
- SR 77: US 60 to SR 377
- SR 87: SR 202L to SR 260; SR 260: SR 87 to SR 277; SR 277: SR 260 to SR 377; SR 377: SR 277 to SR-40B; SR-40B: SR 377 to I-40
- SR 260: SR 277 to SR 73 and US 60: SR 260 to New Mexico State Line

Northcentral

- I 17: SR 69 to I-40
- US 89: Flagstaff to Utah State Line
- US 160: US 89 to New Mexico State Line
- SR 64: I-40 to Grand Canyon National Park
- SR 179: I-17 to SR 89A; SR 89A: SR 179 to I-17; and SR 260: SR 89A to I-17

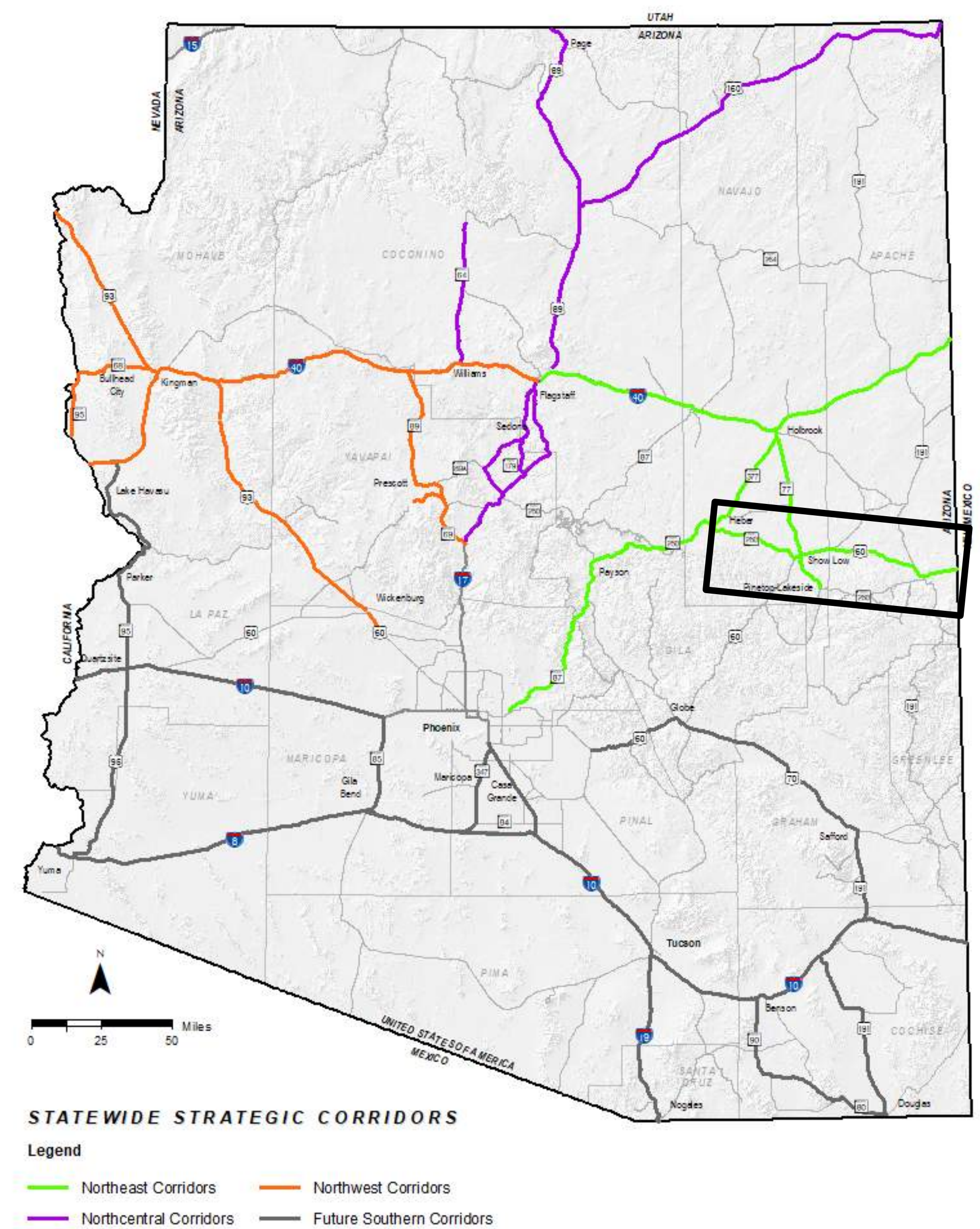
Northwest

- I-40: California State Line to I-17
- US 60: SR 74 to US 93; US 93: US 60 to Nevada State Line
- SR 68: SR 95 North to US 93 and SR 95 North: California State Line to Nevada State Line
- SR 69: I-17 to SR 89; Fain Rd: SR 69 to SR 89A; SR 89A: Fain Rd to SR 89; SR 89: SR 89A to I-40

The 9 corridor studies within the three southern groupings are proposed to begin in Spring 2022.The studies under this program assess the overall health, or performance, of the state's strategic highways. The CPS will identify candidate solutions for consideration in the Multimodal Planning Division's (MPD) P2P project prioritization process, providing information to guide corridor-specific project selection and programming decisions.

The SR 260/US 60 corridor, depicted in **Figure 1** along with all CPS corridors, is one of the strategic statewide corridors identified and the subject of this CPS Update

Figure 1: Corridor Study Area



1.1 Corridor Study Purpose

The purpose of the CPS is to measure corridor performance to inform the development of strategic solutions that are cost-effective and account for potential risks. This purpose can be accomplished by following the process described below:

- Inventory past improvement recommendations
- Define corridor goals and objectives
- Assess existing performance based on quantifiable performance measures
- Propose various solutions to improve corridor performance
- Identify specific solutions that can provide quantifiable benefits relative to the performance measures
- Prioritize solutions for future implementation, accounting for performance effectiveness and risk analysis findings

1.2 Study Goals and Objectives

The objective of this study is to identify a recommended set of prioritized potential solutions for consideration in future construction programs, derived from a transparent, defensible, logical, and replicable process. The SR 260 | US 60 CPS defines solutions and improvements for the corridor that are evaluated and ranked to determine which investments offer the greatest benefit to the corridor in terms of enhancing performance. Corridor benefits can be categorized by the following three investment types:

- Preservation: Activities that protect transportation infrastructure by sustaining asset condition or extending asset service life
- Modernization: Highway improvements that upgrade efficiency, functionality, and safety without adding capacity
- Expansion: Improvements that add transportation capacity through the addition of new facilities and/or services

This study identifies potential actions to improve the performance of the SR 260 | US 60 corridor. Proposed actions are compared based on their likelihood of achieving desired performance levels, life-cycle costs, cost-effectiveness, and risk analysis to produce a prioritized list of solutions that help achieve corridor goals.

The following goals are identified as the desired outcome of this study:

- Link project decision-making and investments on key corridors to strategic goals
- Develop solutions that address identified corridor needs based on measured performance
- Prioritize improvements that cost-effectively preserve, modernize, and expand transportation infrastructure

1.3 Corridor Overview and Location

The combination of SR 260 from Heber-Overgaard to Show Low and US 60 from Show Low to the New Mexico State Line provides movement for freight, tourism, and recreation needs, serving intrastate and interstate commerce in the eastern region of the Arizona and into the State of New Mexico. It is classified as part of the National Highway System. The corridor connects the communities of Heber-Overgaard, Show Low, Pinetop-Lakeside, and Springerville. SR 260 east of Show Low is also a key link within the White Mountain area, providing access for the White Mountain Apache Tribe. The routes also provide access to the National Forests and popular destinations for visitors and residents looking for snow in the winter and seeking relief from high temperatures in the summer. SR 260 | US 60 is a significant connection for visitor traffic in the region and provides an alternative link to the State of New Mexico via the US 180 connection to US 60 in Springerville.

The history of the corridor dates to the 1930's and originally assigned other route numbers. The Payson – Show Low Highway was taken into the State Highway System in 1955 as SR 160. The Heber-Overgaard to Show Low section was re-designated as SR 260 in the 1960s and reconstructed to its current location in the 1970s. The Show Low – Hon Dah section of SR 260 was initially established as SR 173 and later reconstructed and widened as SR 260 in the 1970s and 1980s, respectively. Historical US 60 was reconstructed on a relocated alignment between Show Low and Springerville in the 1930s. Pavement has been upgraded but there have been no changes to alignment. The section of US 60 between Springerville and the New Mexico border was also reconstructed on a new alignment in the 1960s.

The higher forested elevations in Show Low area give way to flatter, open land along US 60 between Show Low and Springerville, while the Show Low – Hon Dah (Jct SR 73) remains in forested area of the White Mountains. Most of the SR 260 | US 60 corridor consists of a two-lane roadway cross-section, except the portions in the communities of Heber-Overgaard, Show Low and Springville. The SR 260 Show Low – Hon Dah segment is entirely a four-lane roadway with continuous left turn or open median. Beyond Hon Dah, SR 260 narrows to two lanes and extends eastward connecting with US 180 in Eager.

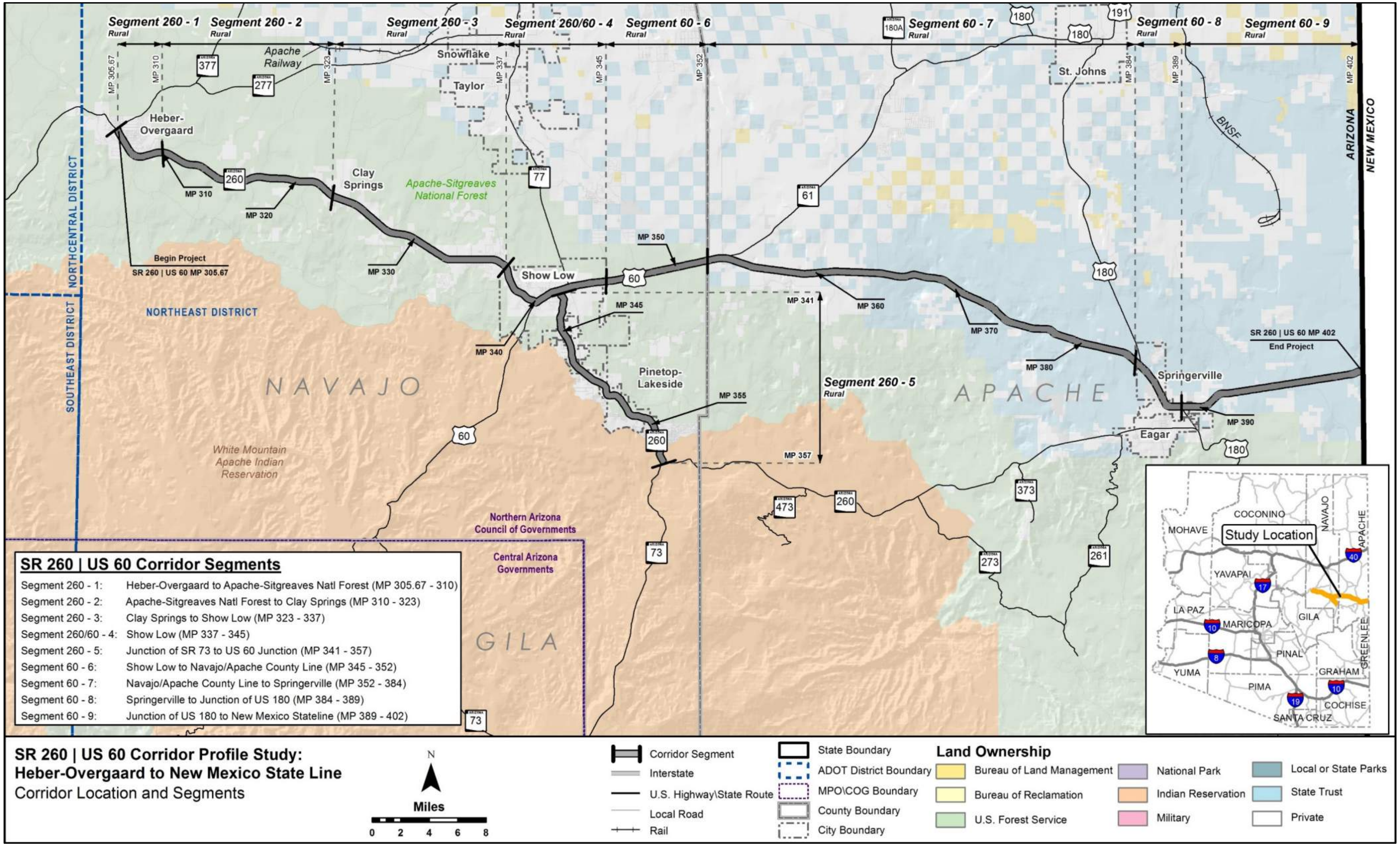
1.4 Corridor Segments

The SR 260 | US 60 corridor is divided into nine planning segments to allow for an appropriate level of detailed needs analysis, performance evaluation, and comparison between different segments of the corridor. The corridor is segmented at logical breaks where the context changes due to differences in characteristics such as terrain, daily traffic volumes, or roadway typical sections. Corridor segments are described in **Table 1** and shown in **Figure 2**.

Table 1: SR 260 | US 60 Corridor Segments

Segment #	Route	Begin	End	Approx. Begin Milepost	Approx. End Milepost	Approx. Length (miles)	Typical Through Lanes (EB, WB)	2018/2040 Average Annual Daily Traffic Volume (vpd)	Character Description
260-1	SR 260	Heber-Overgaard	Apache-Sitgreaves National Forest	306	310	4	2,2	4,900/4,200	Segment 260-1 is comprised of a five-lane undivided roadway section with uninterrupted flow. It is located in the community of Heber-Overgaard.
260-2	SR 260	Apache-Sitgreaves National Forest	Clay Springs	310	323	13	1,1	4,500/4,300	This two-lane undivided segment has uninterrupted flow characteristics and travels through the Apache-Sitgreaves National Forest.
260-3	SR 260	Clay Springs	Show Low	323	337	14	1,1	5,000/5,000	A rural two-lane undivided roadway, Segment 260-3 has consistent traffic volumes and slightly rolling topography with uninterrupted flow.
260|60-4	SR 260 US 60	Show Low	Show Low	337	345	8	2,2	11,300/14,300	This five-lane undivided segment with interrupted flow travels through the town of Show Low until its intersection with US 60. There are three stoplights on the segment in town.
260-5	SR 260	Junction of US 60	Junction of SR 73	341	357	16	2,2	18,800/24,300	Segment 260-5 has interrupted flow, passing through the Pinetop-Lakeside and Show Low urban areas and exhibits several curving sections in passing through the towns. It also has much higher traffic volumes compared to other segments in the corridor.
60-6	US 60	Show Low	Navajo/Apache County Line	345	352	7	1,1	6,100/8,600	The segment is a rural two-lane undivided roadway with uninterrupted flow. The terrain is rolling.
60-7	US 60	Navajo/Apache County Line	Springerville	352	384	32	1,1	1,900/2,400	This rural segment with uninterrupted flow is mostly flat, except for a moderate grade between MP 366 and MP 369.
60-8	US 60	Springerville	Junction of US 180	384	389	5	2,2	4,600/6,100	Segment 60-8 has interrupted flow due to a traffic signal in Springerville. Numerous local streets intersect the segment in town.
60-9	US 60	Junction of US 180	New Mexico State Line	389	402	13	1,1	1,000/1,100	This segment is comprised of a two-lane undivided section that travels through rolling terrain to the New Mexico state border.

Figure 2: Corridor Location and Segments



1.5 Corridor Characteristics

The SR 260 | US 60 corridor is an important travel corridor in the eastern part of the state. The corridor functions as a route for recreational, tourist, and regional daily traffic and provides critical connections among the communities it serves and the rest of the regional and interstate network.

National Context

The SR 260 | US 60 corridor is a strategic transportation link across eastern Arizona for freight and intercity travel. The SR 260 | US 60 corridor also functions as an alternate route to I-40/I-17 when either of those facilities is closed due to adverse weather or incidents.

Regional Connectivity

The SR 260 | US 60 corridor between Heber-Overgaard and the New Mexico State Line provides movement for freight, tourism, and recreation needs within Arizona and across the Arizona-New Mexico State Line. The corridor is in the Northeastern ADOT District; the Northern Arizona Council of Governments (NACOG) planning area; and two counties (Navajo and Apache). Within the corridor study limits, SR 260 | US 60 offers connections to several major roadways, including US 191, US 180, SR 73, SR 61, SR 277, and SR 77. This corridor serves Arizona cities and towns including Heber-Overgaard, Show Low, Springerville, Pinetop-Lakeside, and the White Mountain Apache tribe.

Commercial Truck Traffic

Communities along the SR 260 | US 60 corridor depend on the corridor for freight deliveries and for travel to other locations. Freight traffic (trucks) represents between 4.5% and 17.7% of the total traffic on the corridor, with the highest truck percentages near the New Mexico State Line on US 60 and Heber-Overgaard on SR 260.

Commuter Traffic

Much of the commuter traffic along the SR 260 | US 60 corridor occurs within the urbanized areas of Show Low, Pinetop-Lakeside, Heber-Overgaard, and Springerville. These areas are economic centers along what is considered mostly a combination of rural state routes, U.S. routes, and local roadways. According to the most recent traffic volume data maintained by ADOT, traffic volumes range from approximately 950 vehicles per day on US 60 near the New Mexico State Line to approximately 19,000 vehicles per day within the urban area of Show Low.

According to the 2015 American Community Survey data from the US Census Bureau, 87% of the workforce in areas along the corridor relies on a private vehicle to get to work.

Recreation and Tourism

SR 260 | US 60 provides access to many Arizona attractions such as state parks, national forests, and other recreational activities.

SR 260 | US 60 provides access to the Apache-Sitgreaves National Forest, Mount Baldy Wilderness, and Escudilla Wilderness. Other recreational destinations accessible from the SR 260 | US 60 corridor include Cottonwood Wash Trailhead (near MP 321), Deer Springs Interpretive Site (minor-via SR 188), Lewis Canyon Group Campground (via Pinedale Road-currently closed), and Ghost of the Coyote Trailhead (via Burton Road), to name a few.

Multimodal Uses

Freight Rail

The BNSF Railway has a small branch that terminates just west of Chambers and travels southward passing through St. Johns and ending before Springerville.

Passenger Rail

There are no passenger train stations along the SR 260 | US 60 corridor. The nearest passenger stations are in Winslow, Arizona and Gallup, New Mexico on Amtrak's Southwest Chief Chicago to Los Angeles route.

Bicycles/Pedestrians

Opportunities for bicycle and pedestrian travel are limited on SR 260 | US 60. Bicycle traffic on the US 60 portion of the corridor is permitted on the mainline outside shoulder. However, the effective shoulder widths are less than the preferred 4-foot minimum width with rumble strips present in some areas. As it is on US 60, bicycle traffic on the SR 260 portion of the corridor is permitted on the mainline outside shoulder, but it also has shoulder widths that are less than the preferred 4-foot minimum in some areas.

Bus/Transit

The White Mountain Connection and Four Seasons Connection offer bus service from Holbrook to smaller communities south such as Snowflake, Taylor, Show Low, and Pinetop-Lakeside, along with stops at the Navajo County Government offices and Northland Pioneer College campuses. Shuttle service between Show Low and Phoenix via Payson, with stops in Clay Springs and Heber-Overgaard, is provided by Mountain Valley Shuttle.

Aviation

There is one general aviation facility and one commercial service facility near the SR 260 | US 60 corridor. They are the Show Low Regional Airport for commercial use, owned and operated by the City of Show Low, and the Springerville Municipal Airport, owned and operated by the Town of Springerville. The western, central, and eastern portions of the corridor serve as connections to numerous other airports located in the region (via SR 260, US 60, and US 180).

Land Ownership, Land Uses and Jurisdictions

As shown previously in **Figure 2**, the SR 260 | US 60 corridor traverses multiple jurisdictions and land owned or managed by various entities in Navajo and Apache Counties and NACOG. The western section of the corridor traverses the Apache-Sitgreaves National Forest. The eastern section of the corridor crosses a mix of State Trust land and private land. Land ownership in and surrounding the Heber-Overgaard, Show Low, Pinetop-Lakeside, and Springerville urban areas is mainly private. The southern portion of Pinetop-Lakesides' urban area is adjacent to tribal land (White Mountain Apache Reservation).

Population Centers
Population centers of various sizes exist along the SR 260 | US 60 corridor. **Table 2** provides a summary of the populations for communities along the corridor. Moderate population growth is projected between 2010 and 2040 in the major population centers along the corridor according to the Arizona State Demographer's Office.

Table 2: Current and Future Population

Community	2010 Population	2020 Population	2040 Population	% Change 2010-2040	Total Growth
Navajo County	107,677	114,265	118,511	10.06%	10,834
Holbrook	5,053	5,298	5,498	8.81%	445
Snowflake	5,590	6,213	7,225	29.25%	1,635
Taylor	4,112	4,551	5,421	31.83%	1,309
Show Low	10,660	12,132	14,973	40.46%	4,313
Heber-Overgaard CDP	2,822	2,930	3,395	20.30%	573
Pinetop-Lakeside	4,282	4,663	5,199	21.42%	917
Apache County	71,518	73,551	69,113	-3.36%	-2,405
Springerville	1,961	2,079	2,395	22.13%	434

Source: U.S. Census, Arizona Department of Administration – Employment and Population Statistics

Major Traffic Generators
The City of Show Low, Town of Springerville, Pinetop-Lakeside, Town of Heber-Overgaard, Town of Snowflake, Town of Taylor, and City of Holbrook are major traffic generators for the SR 260 | US 60 corridor. Motorists from New Mexico using US 60 are also part of the traffic mix.

Tribes
The southern portion of the corridor is adjacent to the White Mountain Apache Reservation between Heber-Overgaard and MP 374.

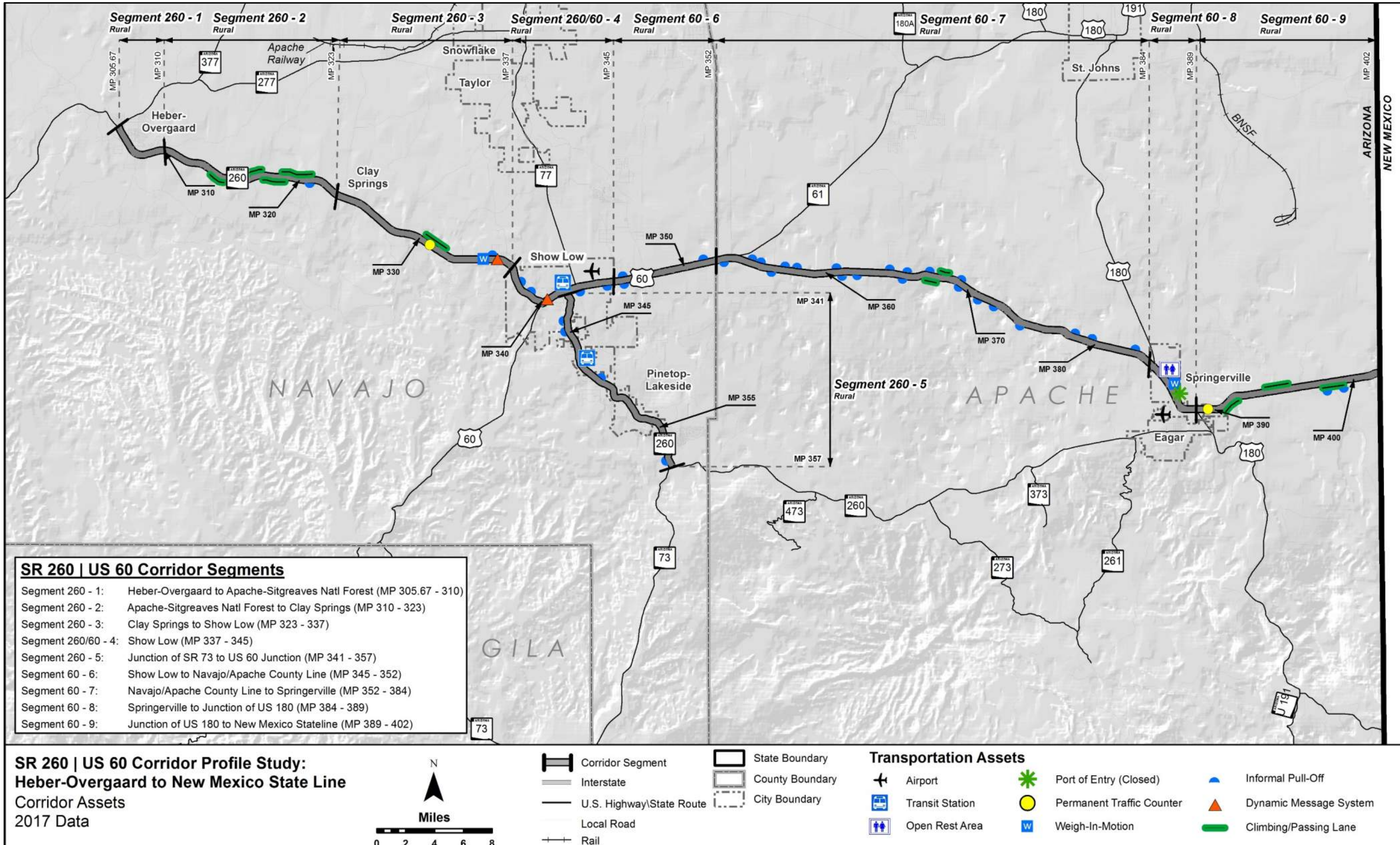
Wildlife Linkages
The Arizona State Wildlife Action Plan (SWAP) provides a 10-year vision for the entire state, identifying wildlife and habitats in need of conservation, insight regarding the stressors to those resources, and actions that can be taken to alleviate those stressors. Using the Habimap Tool that creates an interactive database of information included in the SWAP, the following were identified in relation to the SR 260 | US 60 corridor:

- Arizona Game and Fish Department (AGFD) Wildlife Waters are scattered near the corridor, specifically between Heber-Overgaard and Show Low. There is also one Wildlife Water location near Pinetop-Lakeside, and one between Show Low and Springerville. There are no Wildlife Waters that intersect the corridor.
- Arizona Important Bird Areas: The eastern portion of the corridor, specifically between Springerville and US 180, intersects the Upper Little Colorado River Watershed Important Bird Area
- The corridor travels through allotments controlled by the Arizona State Land Department (ASLD) and the United States Forest Service
- Riparian areas include numerous crossings along SR 260 and US 60
- Arizona Wildlife Linkages: No missing linkages are noted, but potential Arizona Wildlife Linkage Zones were identified along SR 260 from MP 312 to MP 323 and along US 60 from MP 352 to the New Mexico State Line. Most of the SR 260 portion of the corridor has Arizona Habitat Blocks except within the urban limits of Heber-Overgaard, Pinedale, Show Low, and Pinetop-Lakeside
- According to the Species and Habitat Conservation Guide (SHCG), sensitive habitats that have moderate to high conservation potential exist along the entire corridor; these areas are located along the SR 260 portion of the corridor and the portion of US 60 between Show Low and MP 367
- Areas where Species of Greatest Conservation Need (SGCN) are high or moderately vulnerable are similar to the areas identified in the SHCG (see above), in addition to concentrations near Springerville
- Identified areas of moderate or high levels of Species of Economic and Recreational Importance (SERI) are near SR 260 | US 60, specifically with high levels along the US 60 portion of the corridor between Show Low and to Springerville

Corridor Assets
Corridor transportation assets are summarized in **Figure 3**. There are four passing lanes on the SR 260 portion of the corridor between MP 315 and MP 340 and five passing lanes on the US 60 portion of the corridor between MP 366 and MP 400.

Other assets include the U.S. Forest Service owned rest area (Springerville Rest Area US 60 WB MP 386), dynamic message signs (DMS) located SR 260 EB, MP 335.17; US 60 EB/WB MP 339.90. There is a Port of Entry (Springerville Port of Entry, now closed), two transit/bus stations, and 19 informal pull-offs.

Figure 3: Corridor Assets



1.6 Corridor Stakeholders and Input Process

A Technical Advisory Committee (TAC) was created that was comprised of representatives from the stakeholders. TAC meetings were held at key milestones to present results and obtain feedback. In addition, several meetings were conducted with key stakeholders to present the results and obtain feedback.

Key stakeholders identified for this study included:

- ADOT Northcentral District
- ADOT Northwest District
- Central Yavapai Metropolitan Planning Organization (CYMPO)
- Maricopa Association of Governments (MAG)
- MetroPlan, formerly known as Flagstaff Metropolitan Planning Organization (FMPO)
- Northern Arizona Council of Governments (NACOG)
- Federal Highway Administration (FHWA)

Several Working Papers were developed during the course of the CPS. The Working Papers were provided to the TAC for review and comment.

1.7 Prior Studies and Recommendations

This study identified recommendations from previous studies, plans, and preliminary design documents. Studies, plans, and programs pertinent to the SR 260 | US 60 corridor were reviewed to understand the full context of future planning and design efforts within and around the study area. These studies are organized below into four categories: Framework and Statewide Studies, Regional Planning Studies, Planning Assistance for Rural Areas (PARAs) and Small Area Transportation Studies (SATS), and Design Concept Reports (DCRs) and Project Assessments (PAs).

Framework and Statewide Studies

- ADOT Bicycle and Pedestrian Plan Update (2013) ADOT Pedestrian Safety Action Plan (2017)
- ADOT Five-Year Transportation Facilities Construction Program (2021-2025)
- ADOT Climbing and Passing Lane Prioritization Study (2015)
- ADOT Arizona Key Commerce Corridors (2014)
- ADOT Arizona Multimodal Freight Analysis Study (2009)
- ADOT Arizona Ports of Entry Study (2021)
- ADOT Arizona State Airport Systems Plan (2008)
- ADOT Arizona State Freight Plan (2017)
- ADOT Arizona State Rail Plan (2011)
- AGFD Arizona State Wildlife Action Plan (2012)
- AGFD Arizona Wildlife Linkages Assessment (2006)
- ADOT Arizona Statewide Dynamic Message Sign Master Plan (2011)
- ADOT Arizona Statewide Intelligent Transportation System (ITS) Architecture (2018)
- ADOT Arizona Statewide Rail Framework Study (2010)
- ADOT Arizona Statewide Rest Area Study (2011)
- ADOT Arizona Statewide Shoulders Study (2015)
- ADOT Arizona Strategic Traffic Safety Plan (2019)
- ADOT Arizona Roadway Departure Safety Implementation Plan (RDSIP) (2014)
- ADOT AASHTO U.S. Bicycle Route System (2015)
- ADOT Low Volume State Routes Study (2017)
- ADOT Statewide Stormwater & Erosion Control Study (2020)
- ADOT Statewide Transportation Planning Framework – Building a Quality Arizona (BQAZ) (2009)
- ADOT Transportation Asset Management Plan (2019)
- ADOT What Moves You Arizona? Long-Range Transportation Plan (2016-2040)

Regional Planning Studies

- Apache County Comprehensive Plan (2004)
- NACOG, Regional Transportation Improvement Program (2017)
- Round Valley Multimodal Transportation Study (2012)
- Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
- Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road, Show Low, Arizona (2014)

Planning Assistance for Rural Areas and Small Area Transportation Studies

- Navajo County Central Region Transportation Study (2010)
- Snowflake/Taylor Multijurisdictional Transportation Plan (2011)
- Show Low Trails and Transit Connectivity Study (2014)
- Second Knolls Development Multimodal Transportation Study (2014)

Design Concept Reports and Project Assessments

- SR 260: Passing Lanes, PA (1999)
- SR 260: MP 342 - (2000)
- SR 260: Payson – DCR (2005)
- SR 260: Payson – Alternative Selection Report (2008)
- SR 260: Old Linden Road Show Low, Scoping Letter (2009)
- SR 260: Overgaard to US 60, DCR (2014)
- US 60: Show Low – MP 342, PA (2002)
- US 60: US Highway 60 East of Springerville, PA (2002)

- US 60: Show Low West, PA (2003)
- US 60: Extending Concrete Box Culvert and Widen Roadway, Scoping Letter (2003)

Summary of Prior Recommendations

Various studies and plans, including several DCRs and PAs, have recommended improvements to the SR 260 | US 60 corridor as shown in **Table 3** and **Figure 4**. They include, but are not limited to:

- Widening of numerous sections of SR 260 | US 60, some of which may require right-of-way acquisition, and many other proposed improvements associated with the recommended widening. Widening sections include:
    - Upgrading SR 260 to a four-lane divided highway from MP 309 to MP 340
    - Adding one general purpose lane to SR 260 in each direction between MP 340 and MP 357
    - Adding one general purpose lane in each direction on US 60 from SR 77 to US 191
    - Adding one lane to US 60 from SR 260 to SR 77
    - Shoulder widening in each direction on US 60 from MP 346 to MP 353 and MP 358 to MP 369 (Tier 1 recommendation)
- Climbing and passing lanes have been recommended on US 60 in both directions from MP 345 to MP 348 and in the eastbound direction from MP 357 to MP 360 by the Climbing and Passing Lane Prioritization Study
- Many intersections along SR 260 and US 60 in the Show Low area have recommendations for improvements or modernization efforts such as signal installation

Table 3: Corridor Recommendations from Previous Studies

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
SR 260											
1	306	340	34	Widen Roadway to Four-Lanes (Overgaard to Show Low) Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside)			√	-	N/A	N	Eastern Arizona Framework Study (2009) bqAZ (2010)
2	309	340	31	Widen Roadway to Four-Lane Divided Highway			√	-	N/A	Y	SR 260 Overgaard to US 60 DCR (2014)
3	328	329	1.00	Construct Scour Retrofit: Mortensen Wash Bridge #1641	√			FY19	H8548	N	ADOT Five-Year Transportation Facilities Construction Program 2018 – 2022
4	335	335	0.00	EB DMS		√		-	N/A	N	Arizona Statewide Dynamic Message Master Plan (2011)
5	335	335	0.00	Intersection Signal: SR 260 and future relocation of Lone Pine Dam Road		√		2030	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
6	343	348	5.00	Pavement Rehabilitation: Church Street – Knottingham Lane	√			FY21	Fxxxx	N	ADOT Five-Year Transportation Facilities Construction Program 2018 – 2022
7	-	-	-	Install Lighting and Sidewalks at interchange on SR 73 at SR 73 and SR 260		√		2024		N	ADOT 2021-2025 Five-Year Transportation Facilities and Construction Program
US 60											
8	292	340	48	Tree Removal	√			2022	F035301D, 01C	N	ADOT 2021-2025 Five-Year Transportation Facilities and Construction Program
9	336	353	17.00	Pavement Rehabilitation: Apache Sitgreaves to SR 61	√			FY19	Fxxxx	N	ADOT Five-Year Transportation Facilities Construction Program 2018 – 2022

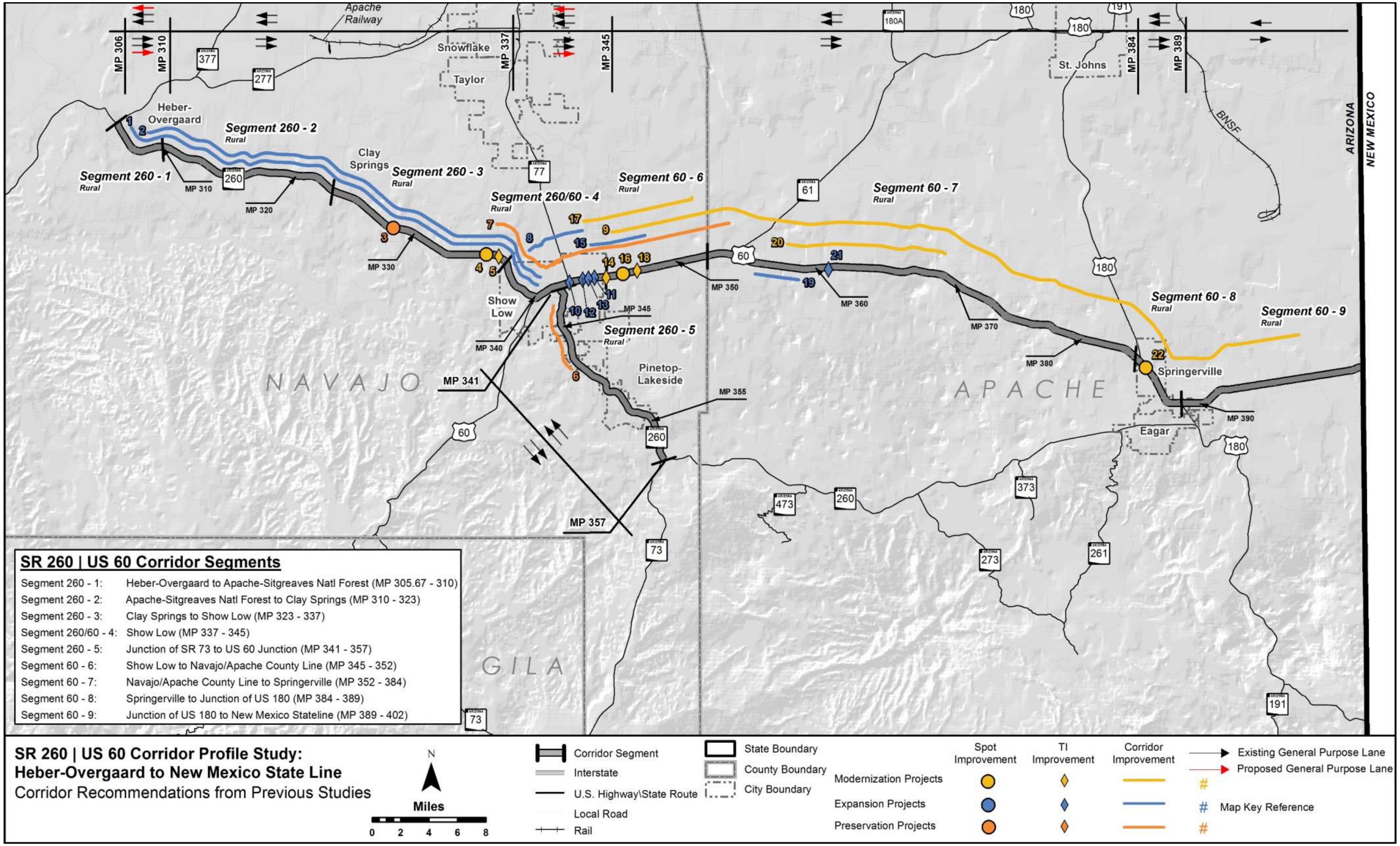
Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
US 60											
10	340	398	58	Widen Roadway: • Six-lanes SR 260 to SR 77 • Four-lanes SR 77 to Springerville			√	-	N/A	N	Eastern Arizona Framework Study (2009) bqAZ (2010)
11	341	343	2	Widen Roadway Show Low to 40th Street			√	FY 2018	H5107	Y	ADOT Five-Year Transportation Facilities Construction Program 2016 – 2020
12	342.2	342.2	0.00	Grade Separated TI: US 60 and SR 77			√	2030	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
13	342.5	342.5	0.0	Exclusive WB turn lane toward 27th place			√	-	N/A	N	Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona (2014)
14	343.3	343.3	0.0	Exclusive EB right turn lane at 40th Street intersection			√	-	N/A	N	Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona (2014)
15	343.3	343.3	0.00	Intersection Signal: US 60 and Future Woolford Extension			√	2030	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
16	345	345	0.00	Intersection Signal: US 60 and Ski Hi Road Future Extension		√		2030	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
17	345	348	3.00	EB/WB Passing Lanes-Tier 1			√	-	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
18	345	345	0.00	WB DMS		√		-	N/A	N	Arizona Statewide Dynamic Message Master Plan (2011)
19	346	353	7.00	EB/WB Shoulder Improvement-Tier 1		√		-	N/A	N	Statewide Shoulders Study (2015)

Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization [M], Expansion [E])			Status of Recommendation			Name of Study
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)?	
US 60											
20	347	347	0.00	Intersection Signal: US 60 and Bourdon Ranch Road		√		-	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
21	352.5	353.15	0.65	Turn and Merge Lanes			√	2022	F035801D, 01C	N	ADOT 2021-2025 Five-Year Transportation Facilities and Construction Program
22	357	360	3.00	EB Passing Lane-Tier 1			√	-	N/A	N	ADOT Climbing and Passing Lane Prioritization Study (2015)
23	358	369	11.00	EB/WB Shoulder Improvement Tier 1		√		-	N/A	N	Statewide Shoulders Study (2015)
24	360.6	360.6	0.00	Intersection Stop: US 60 and Future Vernon-McNary Road			√	-	N/A	N	Southern Navajo/Apache County Sub Regional Transportation Plan (2007)
25	385	385	0.00	WB DMS		√		-	N/A	N	Arizona Statewide Dynamic Message Master Plan (2011)
26	-	-		Stop Signs with Flashers and Loop Detectors intersection on US 60 at US 60 and CR 3148		√		2022	F033801D, F033801C	N	ADOT 2021-2025 Five-Year Transportation Facilities and Construction Program

Figure 4: Corridor Recommendations from Previous Studies



2.0 CORRIDOR PERFORMANCE

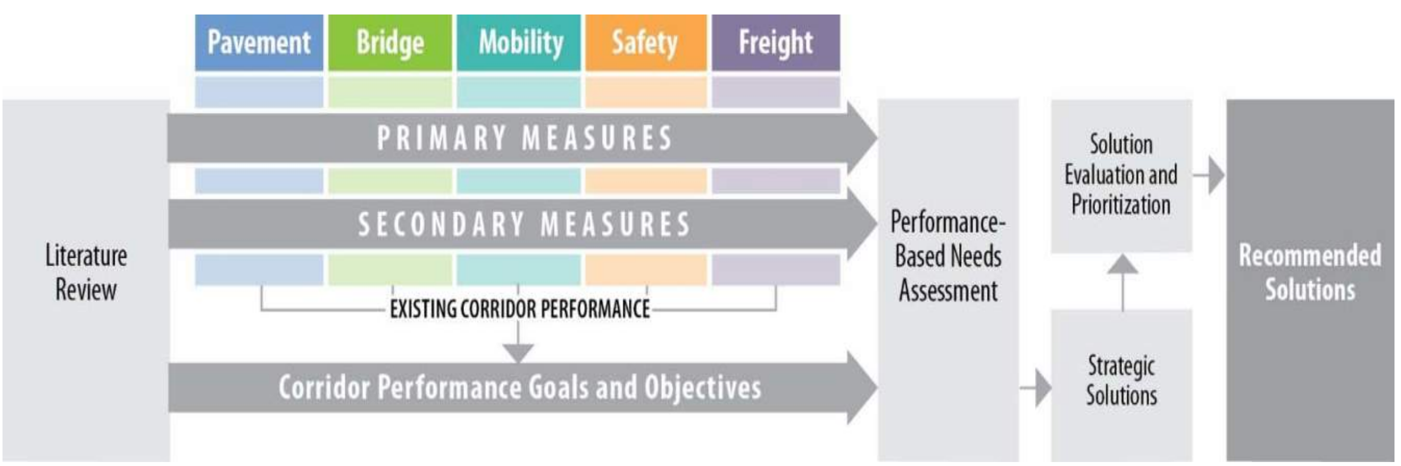
This chapter describes the evaluation of the existing performance of the SR 260 | US 60 corridor. A series of performance measures is used to assess the corridor. The results of the performance evaluation are used to define corridor needs relative to the long-term goals and objectives for the corridor.

2.1 Corridor Performance Framework

This study uses a performance-based process to define baseline corridor performance, diagnose corridor needs, develop corridor solutions, and prioritize strategic corridor investments. In support of this objective, a framework for the performance-based process was developed through a collaborative process involving ADOT and the CPS consultant teams.

Figure 5 illustrates the performance framework, which includes a two-tiered system of performance measures (primary and secondary) to evaluate baseline performance. The primary measures in each of five performance areas are used to define the overall health of the corridor, while the secondary measures identify locations that warrant further diagnostic investigation to delineate needs. Needs are defined as the difference between baseline corridor performance and established performance objectives.

Figure 5: Corridor Profile Performance Framework



The following five performance areas guide the performance-based corridor analyses:

- Pavement
- Bridge
- Mobility
- Safety
- Freight

These performance areas reflect national performance goals stated in *Moving Ahead for Progress in the 21st Century* (MAP-21):

- Safety: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads
- Infrastructure Condition: To maintain the highway infrastructure asset system in a state of good repair
- Congestion Reduction: To achieve a significant reduction in congestion on the National Highway System
- System Reliability: To improve the efficiency of the surface transportation system
- Freight Movement and Economic Vitality: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development
- Environmental Sustainability: To enhance the performance of the transportation system while protecting and enhancing the natural environment
- Reduced Project Delivery Delays: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion

In 2015, the *Fixing America's Surface Transportation Act* (FAST Act) was passed. The FAST Act continued to emphasize the performance management approach identified in MAP-21 but included additional provisions for meeting established performance targets.

The MAP-21 and FAST Act performance areas were considered in the development of ADOT's P2P process, which integrates transportation planning with capital improvement programming and project delivery. Because the P2P program requires the preparation of annual transportation system performance reports using the five performance areas, consistency is achieved among various ADOT processes by using these same performance areas.

While these performance areas were established prior to the earlier rounds of the CPS program, several related federal and ADOT reporting measures and targets were not yet in place at that time. These measures and targets have since been established (subsequent to completion of the prior CPS rounds). As such, it became necessary to revisit and revise the CPS performance measures to be more consistent with the latest federal and ADOT reporting measures and targets.

The performance measures include five primary measures: Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Additionally, a set of secondary performance measures provides for a more detailed analysis of corridor performance.

Each of the primary and secondary performance measures is comprised of one or more quantifiable indicators. A three-level scale was developed to standardize the performance scale across the five performance areas, with numerical thresholds specific to each performance measure:

Good/Above Average Performance	– Rating is above the identified desirable/average range
Fair/Average Performance	– Rating is within the identified desirable/average range
Poor/Below Average Performance	– Rating is below the identified desirable/average range

Table 4 provides the complete list of primary and secondary performance measures for each of the five performance areas.

Table 4: Corridor Performance Measures

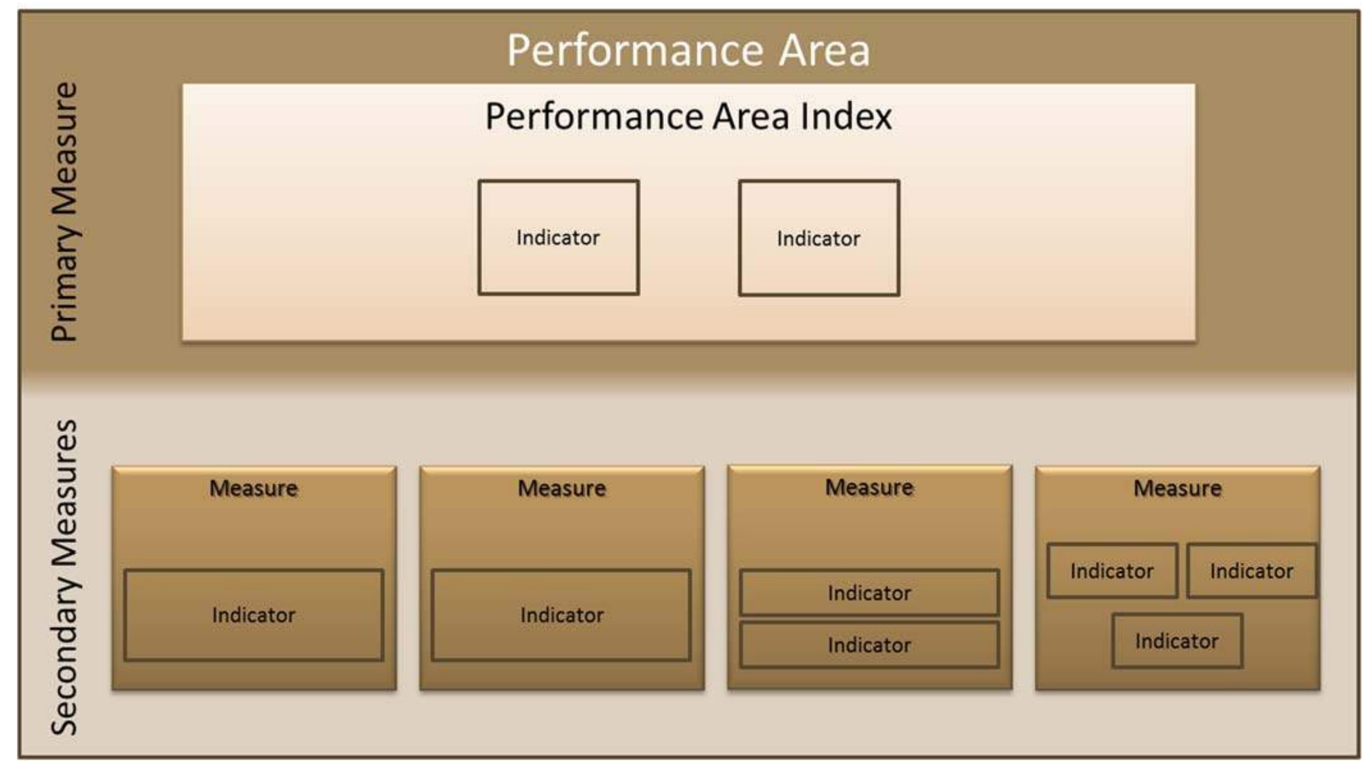
Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure and structural evaluation rating	• Bridge Sufficiency • Bridge Rating • Bridge Hot Spots
Mobility	**Mobility Index** Based on combination of existing and future daily volume-to-capacity ratios	• Future Congestion • Peak Congestion • Travel Time Reliability • Multimodal Opportunities
Safety	**Safety Index** Based on frequency of fatal and suspected serious injury crashes	• Directional Safety Index • Strategic Traffic Safety Plan Emphasis Areas • Other Crash Unit Types • Safety Hot Spots
Freight	**Freight Index** Based on bi-directional truck travel time reliability	• Travel Time Reliability • Bridge Vertical Clearance • Bridge Vertical Clearance Hot Spots

The general template for each performance area is illustrated in **Figure 6**.

The guidelines for performance measure development are:

- Indicators and performance measures for each performance area should be developed for relatively homogeneous corridor segments
- Performance measures for each performance area should be tiered, consisting of primary measure(s) and secondary measure(s)
- Primary and secondary measures should assist in identifying those corridor segments that warrant in-depth diagnostic analyses to identify performance-based needs and a range of corrective actions known as solution sets
- One or more primary performance measures should be used to develop a Performance Index to communicate the overall health of a corridor and its segments for each performance area; the Performance Index should be a single numerical index that is quantifiable, repeatable, scalable, and capable of being mapped; primary performance measures should be transformed into a Performance Index using mathematical or statistical methods to combine one or more data fields from an available ADOT database
- One or more secondary performance measure indicators should be used to provide additional details to define corridor locations that warrant further diagnostic analysis; secondary performance measures may include the individual indicators used to calculate the Performance Index and/or "hot spot" features

Figure 6: Performance Area Template

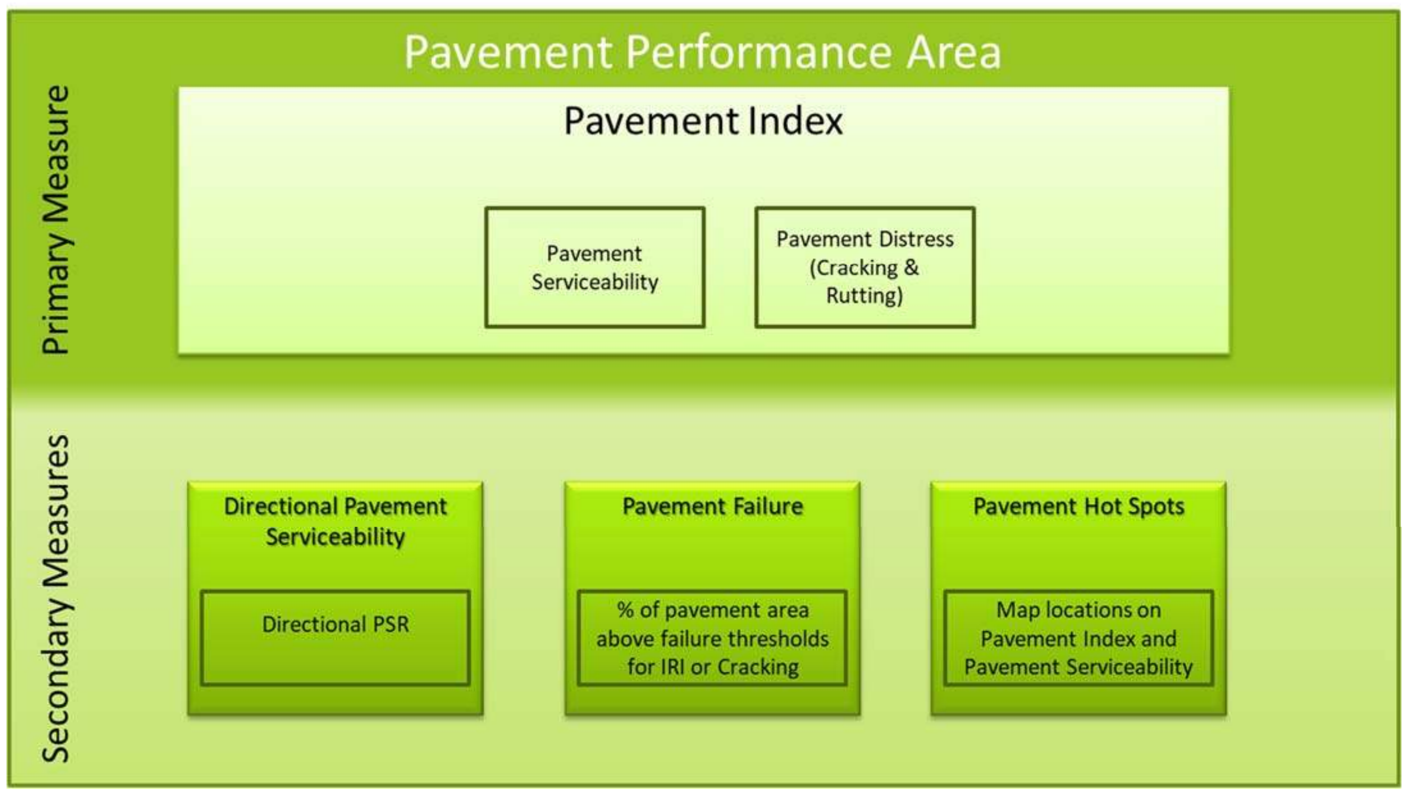


2.2 Pavement Performance Area

The Pavement performance area consists of a primary measure (Pavement Index) and three secondary measures, as shown in **Figure 7**. These measures assess the condition of the existing pavement along the SR 260 | US 60 corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

This CPS is an update to a previously completed report. The performance measures and performance thresholds have been revised from the previous version. For the Pavement performance area, the new methodology includes the use of Rutting data and the performance thresholds have been slightly modified.

Figure 7: Pavement Performance Measures



Primary Pavement Index

The Pavement Index is calculated using two pavement condition ratings: the Pavement Serviceability Rating (PSR) and the Pavement Distress Index (PDI).

The PSR is extracted from the International Roughness Index (IRI), a measurement of pavement roughness based on field-measured longitudinal roadway profiles. The PDI is extracted from the Cracking Rating (CR) and Rutting Rating, field-measured samples from each mile of highway.

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than the condition of a section with fewer travel lanes.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Pavement performance area, the relevant operating environments are designated as interstate and non-interstate segments. For the SR 260 | US 60 corridor, the following operating environment was identified:

- Non-interstate: all segments

Secondary Pavement Measures

Three secondary measures provide an in-depth evaluation of the different characteristics of pavement performance.

Directional Pavement Serviceability

- Weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel

Pavement Failure

- Percentage of pavement area rated above failure thresholds for IRI, Cracking, or Rutting

Pavement Hot Spots

- A Pavement "hot spot" exists where a given one-mile section of roadway rates as being in "poor" condition
- Highlights problem areas that may be under-represented in a segment average. This measure is recorded and mapped, but not included in the Pavement performance area rating calculations

Pavement Performance Results

The Pavement Index provides a high-level assessment of the pavement condition for the corridor and for each segment. The three secondary measures provide more detailed information to assess pavement performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Pavement Index shows "fair" overall performance for the SR 260 | US 60 corridor
- According to the Pavement Index, pavement is in "good" or "fair" condition with the exception of Segments 260-1 and 60-7 which show "poor" performance
- All segments indicate "poor" % Pavement Area Failure ratings with the exception of Segment 60-9

- Pavement hot spots along the corridor include:
  - Segment 260-1 MP 306-310
  - Segment 260-2 MP 313-315, 319-321
  - Segment 260-3 MP 332-336, 337-338,
  - Segment 260|60-4 MP 340
  - Segment 260-5 MP 340-342, 343-345, 343-347, 348-350, 355-356
  - Segment 260-6 MP 321-345, 324-348, 326-351
  - Segment 60-7 MP 331-354, 333-371, 338-383
  - Segment 60-8 MP 384-385, 387-388

Table 5 summarizes the Pavement performance results for the SR 260 | US 60 corridor. **Figure 8** illustrates the primary Pavement Index performance and locations of Pavement hot spots along the SR 260 | US 60 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 5: Pavement Performance

Segment #	Segment Length (miles)	Pavement Performance Area			
		Pavement Index	Directional PSR		% Area Failure
			EB	WB	
260-1	4	1.94	2.93	2.76	100.0%
260-2	13	3.20	4.02		76.9%
260-3	14	2.21	3.75		42.9%
260/60-4	8	3.32	3.43	3.26	56.3%
260-5	16	3.16	3.57	3.56	100.0%
60-6	7	3.27	3.63		100.0%
60-7	32	2.46	3.31		96.9%
60-8	5	3.55	3.73		66.7%
60-9	13	3.88	3.93		0.0%
Weighted Corridor Average		2.92	3.59	3.58	73%
SCALES					
Performance Level		**Non-Interstate**			
Good/Above Average Performance		> 3.50	> 3.50		< 5%
Fair/Average Performance		2.90 - 3.50	2.90 - 3.50		5% - 20%
Poor/Below Average Performance		< 2.90	< 2.90		> 20%

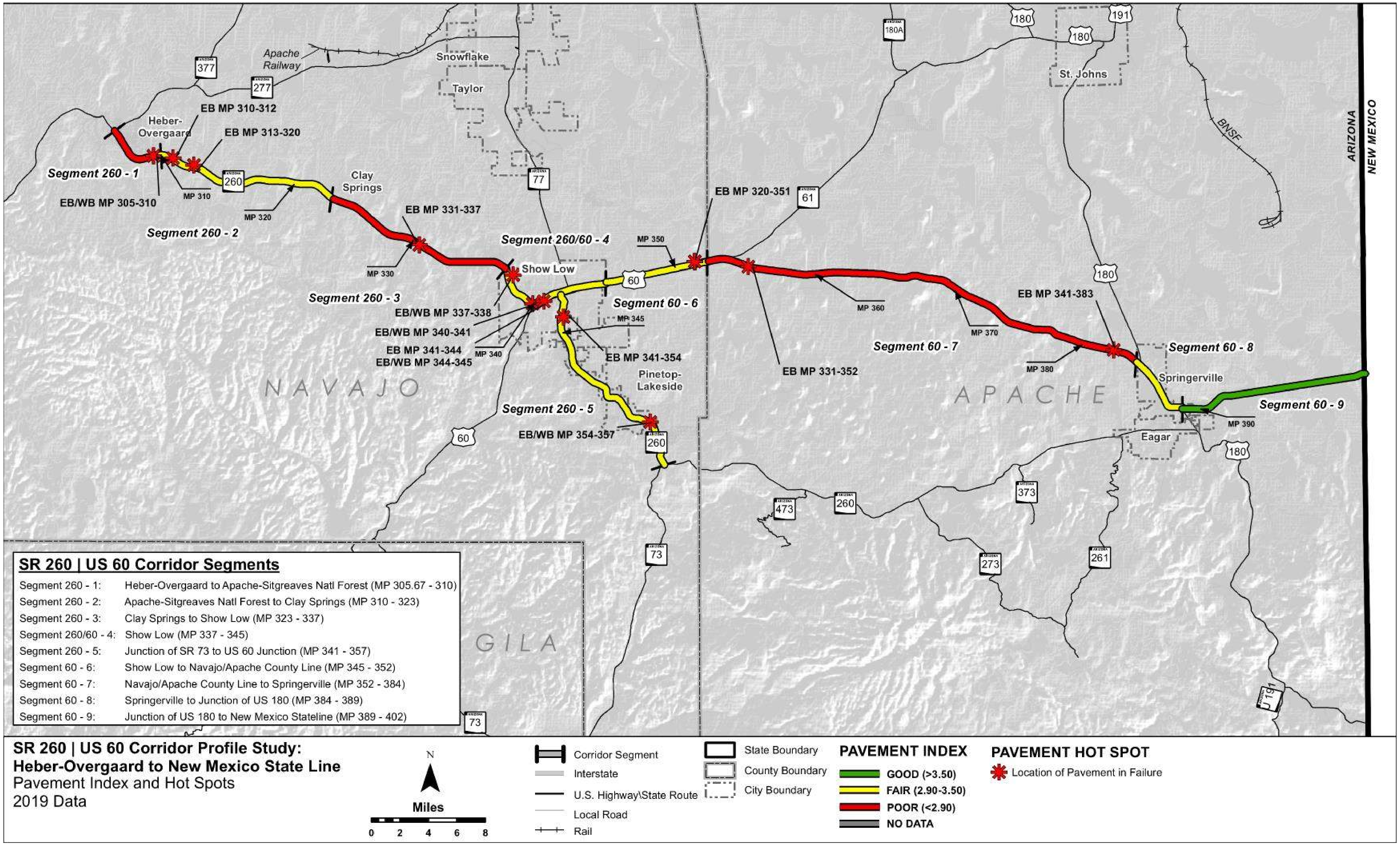
Statewide Transportation Asset Management Plan

Moving Ahead for Progress in the 21st Century Act of 2012 (MAP-21), identified national transportation system goals. The transportation asset management regulations associated with the infrastructure condition goals required the development of a Transportation Asset Management Plan (TAMP) covering National Highway System (NHS) bridges and pavements. As part of the statewide TAMP, ADOT developed pavement performance metrics and thresholds in compliance with federal tracking and reporting requirements, as shown in **Table 6**. The thresholds shown in Table 6 are the basis for the TAMP and ADOT's federal reporting and are different than those used in this CPS, which are based on ADOT's Pavement Management System, as shown in Table 5. The TAMP reports asset condition information in the aggregate at the statewide level and applying the thresholds shown in Table 6 would result in different segment-level performance than shown in Table 5.

Table 6: Statewide TAMP Metrics

Metric	Good	Fair	Poor
IRI (in./mile)	< 95	95-170	> 170
Cracking (%)	< 5	5-20 (asphalt) 5-15 (jointed concrete) 5-10 (cont. reinforced concrete)	> 20 > 15 > 10
Rutting (in.)	< 0.20	0.20–0.40	> 0.40
Faulting (in.)	<0.10	0.10-0.15	> 0.15

Figure 8: Pavement Performance

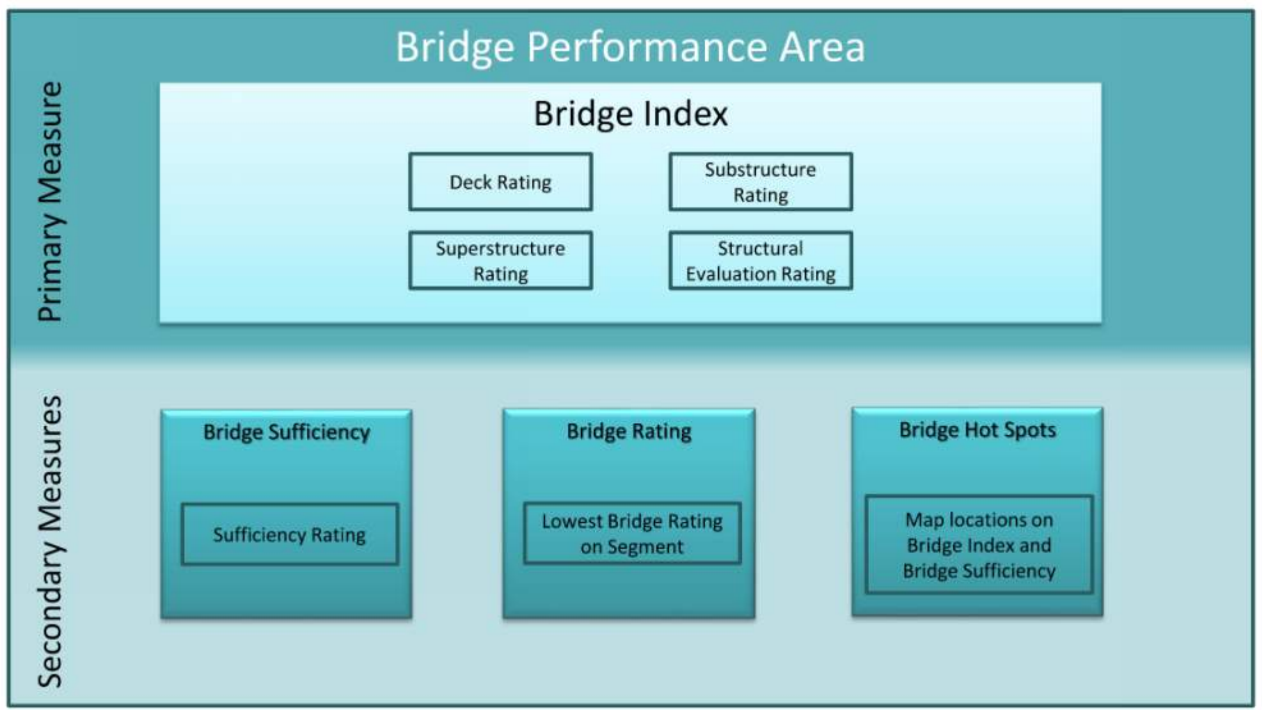


2.3 Bridge Performance Area

The Bridge Performance Area consists of a primary measure (Bridge Index) and three secondary measures, as shown in **Figure 9**. These measures assess the condition of the existing bridges along the SR 260 | US 60 corridor. Only bridges that carry mainline traffic or bridges that cross the mainline are included in the calculation. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

This CPS is an update to a previously completed report. The performance measures and performance thresholds have been revised from the previous version. For the Bridge performance area, the new methodology does not include the performance metric related to Functionally Obsolete bridges, which was used in the previous methodology.

Figure 9: Bridge Performance Measures



Primary Bridge Index

The Bridge Index is calculated based on the use of four different bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. These ratings are based on inspection reports and establish the structural adequacy of each bridge. The performance of each individual bridge is established by using the lowest of these four ratings. The use of these ratings, and the use of the lowest rating, is consistent with the approach used by the ADOT Bridge Group to assess the need for bridge rehabilitation. The Bridge Index is calculated as a weighted average for each segment based on deck area.

Secondary Bridge Measures

Three secondary measures provide an in-depth evaluation of the characteristics of each bridge:

Bridge Sufficiency

- Multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour
- Rates the structural and functional sufficiency of each bridge on a 100-point scale

Bridge Rating

- The lowest rating of the four bridge condition ratings (substructure, superstructure, deck, and structural evaluation) on each segment
- Identifies lowest performing evaluation factor on each bridge

Bridge Hot Spots

- A Bridge “hot spot” is identified where a given bridge has a bridge rating of 4 or lower or multiple ratings of 5 between the deck, superstructure, and substructure ratings
- Identifies particularly low-performing bridges or those that may decline to low performance in the immediate future

Bridge Performance Results

The Bridge Index provides a high-level assessment of the structural condition of bridges for the corridor and for each segment. The four secondary measures provide more detailed information to assess bridge performance.

Based on the results of this analysis, the following observations were made:

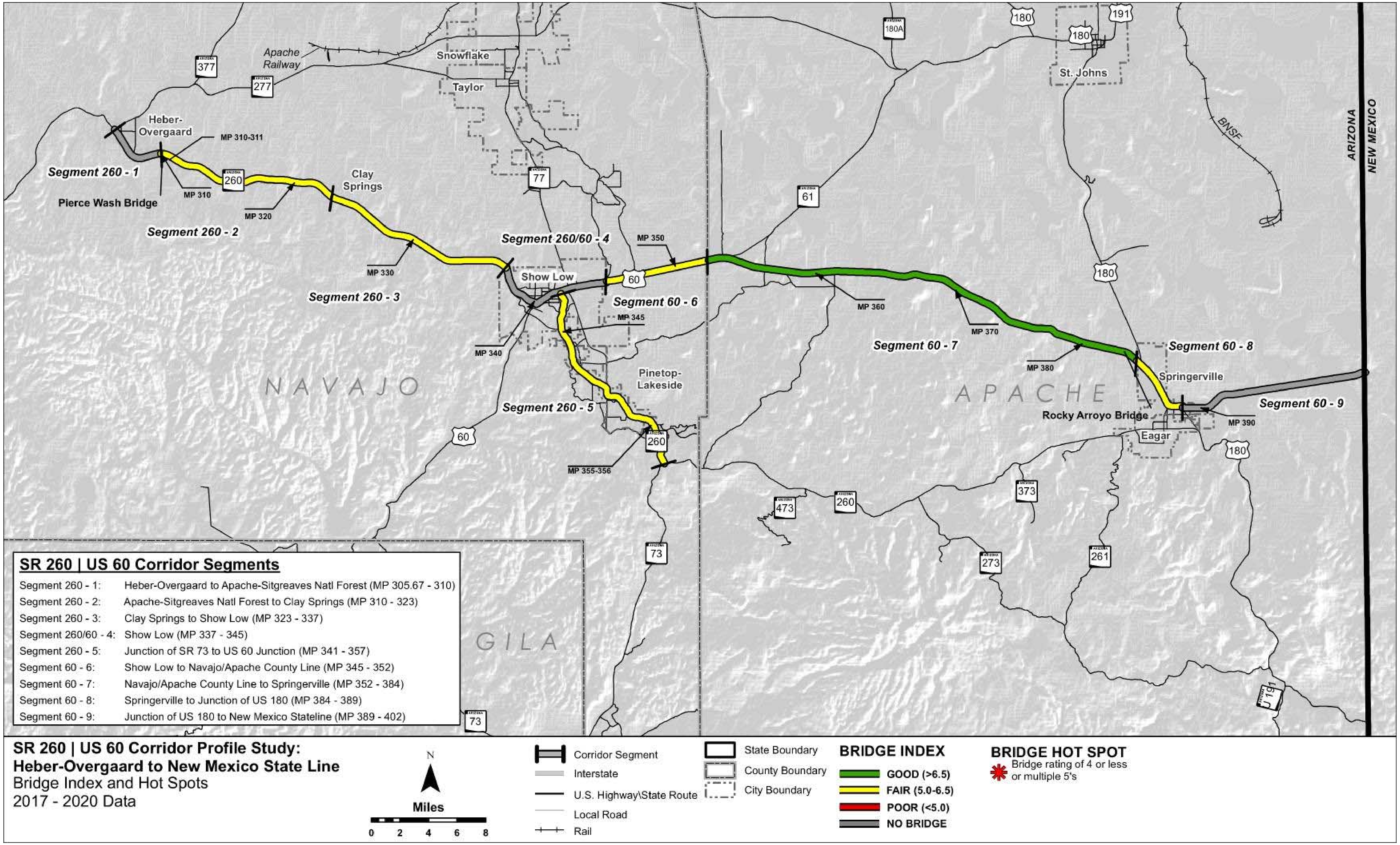
- The weighted average of the Bridge Index shows “fair” overall performance for the SR 260 | US 60 corridor
- Three segments do not contain bridges
- All segments that contain bridges have a “fair” or “good” Bridge Index rating
- All segments that contain bridges have a “good” or “fair” Sufficiency Rating
- Segments 260-2 and 60-6 have a “poor” Lowest Bridge Rating
- There are no bridge hot spots along the corridor

Table 7 summarizes the Bridge performance results for the SR 260 | US 60 corridor. **Figure 10** illustrates the primary Bridge Index performance and locations of Bridge hot spots along the SR 260 | US 60 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 7: Bridge Performance

Segment #	Segment Length (miles)	Bridge Performance Area		
		Bridge Index	Sufficiency Rating	Lowest Bridge Rating
260-1	4	No Bridge		
260-2	13	5.7	88	5
260-3	14	6.0	93	6
260/60-4	8	6.0	85	6
260-5	16	No Bridge		
60-6	7	5.0	64	5
60-7	32	7.0	97	7
60-8	5	6.0	80	6
60-9	13	No Bridge		
Weighted Corridor Average		5.9	85	6
SCALES				
Performance Level		**All**		
Good/Above Average Performance		> 6.5	> 80	> 6
Fair/Average Performance		5.0 - 6.5	50 - 80	5 - 6
Poor/Below Average Performance		< 5.0	< 50	< 5

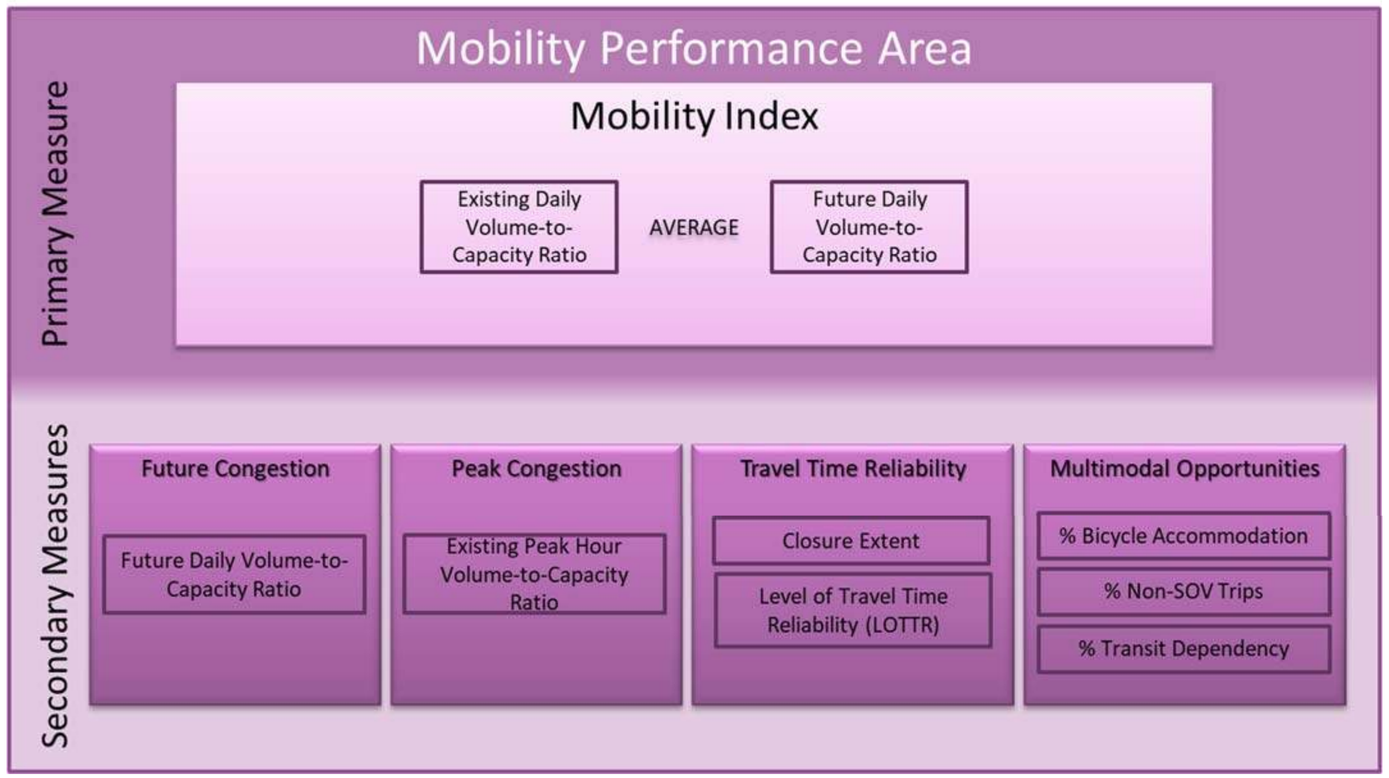
Figure 10: Bridge Performance



2.4 Mobility Performance Area

The Mobility performance area consists of a primary measure (Mobility Index) and four secondary measures, as shown in **Figure 11**. These measures assess the condition of existing mobility along the SR 260 | US 60 corridor. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 11: Mobility Performance Measures



<u>*Primary Mobility Index*</u>

The Mobility Index is an average of the existing (2019) daily volume-to-capacity (V/C) ratio and the future (2040 AZTDM) daily V/C ratio for each segment of the corridor. The V/C ratio is an indicator of the level of congestion. This measure compares the average annual daily traffic (AADT) volume to the capacity of the corridor segment as defined by the service volume for level of service (LOS) E. By using the average of the existing and future year daily volumes, this index measures the level of daily congestion projected to occur in approximately ten years (2030) if no capacity improvements are made to the corridor.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Mobility performance area, the relevant operating environments are urban vs. rural setting. For the SR 260 | US 60 corridor, the following operating environments were identified:

- Rural Uninterrupted Flow: Segments 260-1, 260-2, 260-3, 60-6, 60-7, and 60-9
- Rural Interrupted Flow: Segments 260-4, 260-5, and 60-8

<u>*Secondary Mobility Measures*</u>

Four secondary measures provide an in-depth evaluation of operational characteristics of the corridor:

Future Congestion – Future Daily V/C

- The future (2040 AZTDM) daily V/C ratio; this measure is the same value used in the calculation of the Mobility Index
- Provides a measure of future congestion if no capacity improvements are made to the corridor

Peak Congestion – Existing Peak Hour V/C

- The peak hour V/C ratio for each direction of travel
- Provides a measure of existing peak hour congestion during typical weekdays

Travel Time Reliability – Two separate travel time reliability indicators together provide a comprehensive picture of how much time may be required to travel within the corridor:

- Closure Extent:
  - The average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average was applied to each closure that takes into account the distance over which the closure occurs
  - Closures related to crashes, weather, or other incidents are a significant contributor to non-recurring delays; construction-related closures were excluded from the analysis
- Level of Travel Time Reliability (LOTTR):
  - The ratio of the 80th percentile travel time to average (50th percentile) travel time for a given corridor segment in a specific direction; as corridor segments were often comprised of multiple roadway sections for which LOTTR was reported, a weighted average was applied to each section based on the section length in order to arrive at the segment LOTTR
  - The LOTTR reflects how consistent or dependable the travel might be from day to day or during different times of day

Multimodal Opportunities – Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to the single occupancy vehicle (SOV) for trips along the corridor:

- % Bicycle Accommodation:
  - Percentage of the segment that accommodates bicycle travel; bicycle accommodation on the roadway or on shoulders varies depending on traffic volumes, speed limits, and surface type

- Encouraging bicycle travel has the potential to reduce automobile travel, especially on non-interstate highways
- % Non-SOV Trips:
  - The percentage of trips (less than 50 miles in length) by non-SOVs
  - The percentage of non-SOV trips in a corridor gives an indication of travel patterns along a section of roadway that could benefit from additional multimodal options
- % Transit Dependency:
  - The percentage of households that have zero or one automobile and households where the total income level is below the federally defined poverty level
  - Used to track the level of need among those who are considered transit dependent and more likely to utilize transit if it is available

Mobility Performance Results

The Mobility Index provides a high-level assessment of mobility conditions for the corridor and for each segment. The four secondary measures provide more detailed information to assess mobility performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Mobility Index shows "good" overall performance for the SR 260 | US 60 corridor, except Segment 260-5 which is "fair"
- During the existing peak hour, traffic operations are "good" for all segments
- Segments 260-5 and 60-6 are anticipated to have "fair" performance in the future, according to the Future Daily V/C performance indicator, with the remaining segments with "good" performance
- All segments have "good" or "fair" performance in the Closure Extent performance indicator for each direction of travel
- The LOTTR performance indicator shows that all segments on the SR 260 | US 60 corridor perform at "fair" or "good" performance levels
- Most of the segments show "fair" performance for non-SOV trips
- A majority of the corridor shows "poor" performance in % Bicycle Accommodation, indicating most of the corridor has narrow shoulders, with the exception of Segments 260-1, 60-8, and 60-9, which have "good" performance

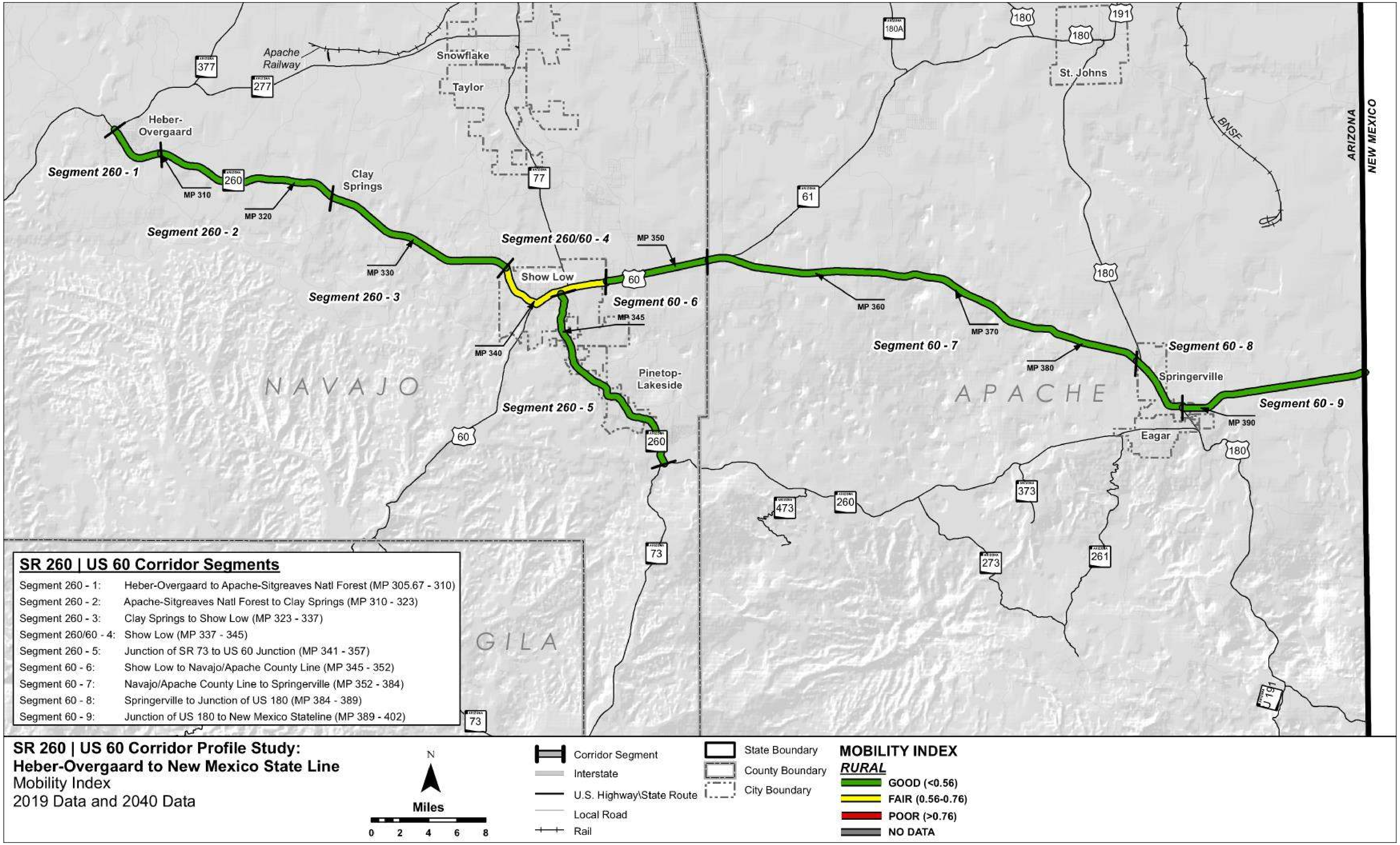
Table 8 summarizes the Mobility performance results for the SR 260 | US 60 corridor. **Figure 12** illustrates the primary Mobility Index performance along the SR 260 | US 60 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 8: Mobility Performance

Segment #	Segment Length (miles)	Mobility Performance Area									
		Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
				EB	WB	EB	WB	EB	WB		
260-1[2]	4	0.10	0.09	0.11	0.11	0.29	0.17	1.11	1.12	93%	16.0%
260-2[2]	13	0.39	0.38	0.42	0.42	0.14	0.15	1.08	1.08	0%	12.4%
260-3[2]	14	0.20	0.20	0.23	0.23	0.16	0.11	1.08	1.07	5%	15.0%
260/60-4[2]	8	0.39	0.44	0.32	0.32	0.20	0.15	1.17	1.19	54%	16.5%
260-5[2]	16	0.66	0.74	0.49	0.49	0.24	0.28	1.17	1.20	50%	16.3%
60-6[2]	7	0.51	0.59	0.41	0.41	0.31	0.23	1.15	1.18	0%	13.1%
60-7[2]	32	0.24	0.27	0.18	0.18	0.46	0.24	1.09	1.07	5%	14.9%
60-8[2]	5	0.28	0.32	0.23	0.23	0.04	0.04	1.21	1.21	98%	15.3%
60-9[2]	13	0.06	0.06	0.05	0.05	0.02	0.00	1.16	1.15	100%	0.0%
Weighted Corridor Average		0.32	0.34	0.27	0.27	0.25	0.17	1.12	1.12	33%	13%
SCALES											
Performance Level		**Urban**				**All**		**Uninterrupted**		**All**	
Good		< 0.71				< 0.22		< 1.15		> 90%	> 17%
Fair		0.71 - 0.89				0.22 - 0.62		1.15 - 1.5		60% - 90%	11% - 17%
Poor		> 0.89				> .62		> 1.5		< 60%	< 11%
Performance Level		**Rural**									
Good		< 0.56									
Fair		0.56 - 0.76									
Poor		> 0.76									

[1]Urban Operating Environment
[2]Rural Operating Environment

Figure 12: Mobility Performance



2.5 Safety Performance Area

The Safety performance area consists of a primary measure (Safety Index) and four secondary measures, as illustrated in **Figure 13**. All measures relate to crashes that result in fatal and suspected serious injuries, as these types of crashes are the emphasis of the ADOT Strategic Traffic Safety Plan (STSP), FHWA, and MAP-21. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C.**

Figure 13: Safety Performance Measures

Primary Safety Index

The Safety Index is based on the bi-directional frequency and rate of fatal and suspected serious injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2018 Highway Safety Improvement Program Application, fatal crashes have an estimated cost that is 17.3 times the estimated cost of incapacitating injury crashes ($9.5 million compared to $555,000).

Each corridor segment is rated on a scale by comparing the segment score with the average statewide score for similar operating environments. Because crash frequencies and rates vary depending on the operating environment of a particular roadway, statewide values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. For the SR 260 | US 60 corridor, the following operating environments were identified:

- 4 or 5 Lane Undivided Highway: Segments 260-1, 260|60-4, 60-5, and 60-8
- 2 or 3 lane Undivided Highway: Segments 260-2, 260-3, 60-6, 60-9
- 2 or 3 or 4 Lane Divided Highway: Segment 60-7

Secondary Safety Measures

Four secondary measures provide an in-depth evaluation of the different characteristics of safety performance:

Directional Safety Index

- This measure is based on the directional frequency and rate of fatal and suspected serious injury crashes

STSP Emphasis Areas

ADOT's 2019 STSP identified several emphasis areas for reducing fatal and suspected serious injury crashes. This measure compared rates of crashes in three STSP emphasis areas to other corridors with a similar operating environment. The three STSP emphasis areas related to crashes involving:

- Intersections
- Lane departures
- Pedestrians

Other Crash Unit Types

- The percentage of total fatal and suspected serious injury crashes that involves crash unit types of trucks and bicycles is compared to the statewide average on roads with similar operating environments

Safety Hot Spots

- The hot spot analysis identifies abnormally high concentrations of fatal and suspected serious injury crashes along the study corridor by direction of travel

For the Safety Index and the secondary safety measures, any segment that has too small of a sample size to generate statistically reliable performance ratings for a particular performance measure is considered to have "insufficient data" and is excluded from the safety performance evaluation for that particular performance measure.

Safety Performance Results

The Safety Index provides a high-level assessment of safety performance for the corridor and for each segment. The four secondary measures provide more detailed information to assess safety performance.

Based on the results of this analysis, the following observations were made:

- The % of Fatal + Suspected Serious Injury Crashes at intersections had insufficient data to generate reliable performance ratings for the SR 87/SR 260/SR 377 corridor

- The % of Fatal + Suspected Serious Injury Crashes Involving Pedestrians had insufficient data to generate reliable performance ratings for the SR 87/SR 260/SR 377 corridor
- The % of Fatal + Suspected Serious Injury Crashes Involving Trucks had insufficient data to generate reliable performance ratings for the SR 87/SR 260/SR 377 corridor
- The % of Fatal + Suspected Serious Injury Crashes Involving Bicycles had insufficient data to generate reliable performance ratings for the SR 87/SR 260/SR 377 corridor
- The % of Fatal + Suspected Serious Injury Crashes Involving Lane Departures shows a weighted corridor average of "average" performance.
- A total of 42 fatal and suspected serious injury crashes occurred along the SR 87/SR 260/SR 377 corridor in 2015 - 2019; of these crashes, 7 were fatal and 35 involved suspected serious injuries
- The weighted average of the Safety Index shows "Average" performance for the SR 87/SR 260/SR 377 corridor compared to other segments statewide that have similar operating environments, meaning the corridor generally performs well as it relates to safety
- The Safety Index value for the majority of segments is "Above average", meaning the majority of the corridor has fewer crashes than is typical statewide, with the exception of Segment 260-2
- The Directional Safety Index value for many segments, usually in both of the directions for the corridor, is "Above average"
- Segments 260-1 and 60-9 had insufficient data to generate reliable performance ratings
- Safety hot spots include Segment 260-4 MP 340-342

Table 9 summarizes the Safety performance results for the SR 260 | US 60 corridor. **Figure 14** illustrates the primary Safety Index performance and locations of Safety hot spots along the SR 260 | US 60 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 9: Safety Performance

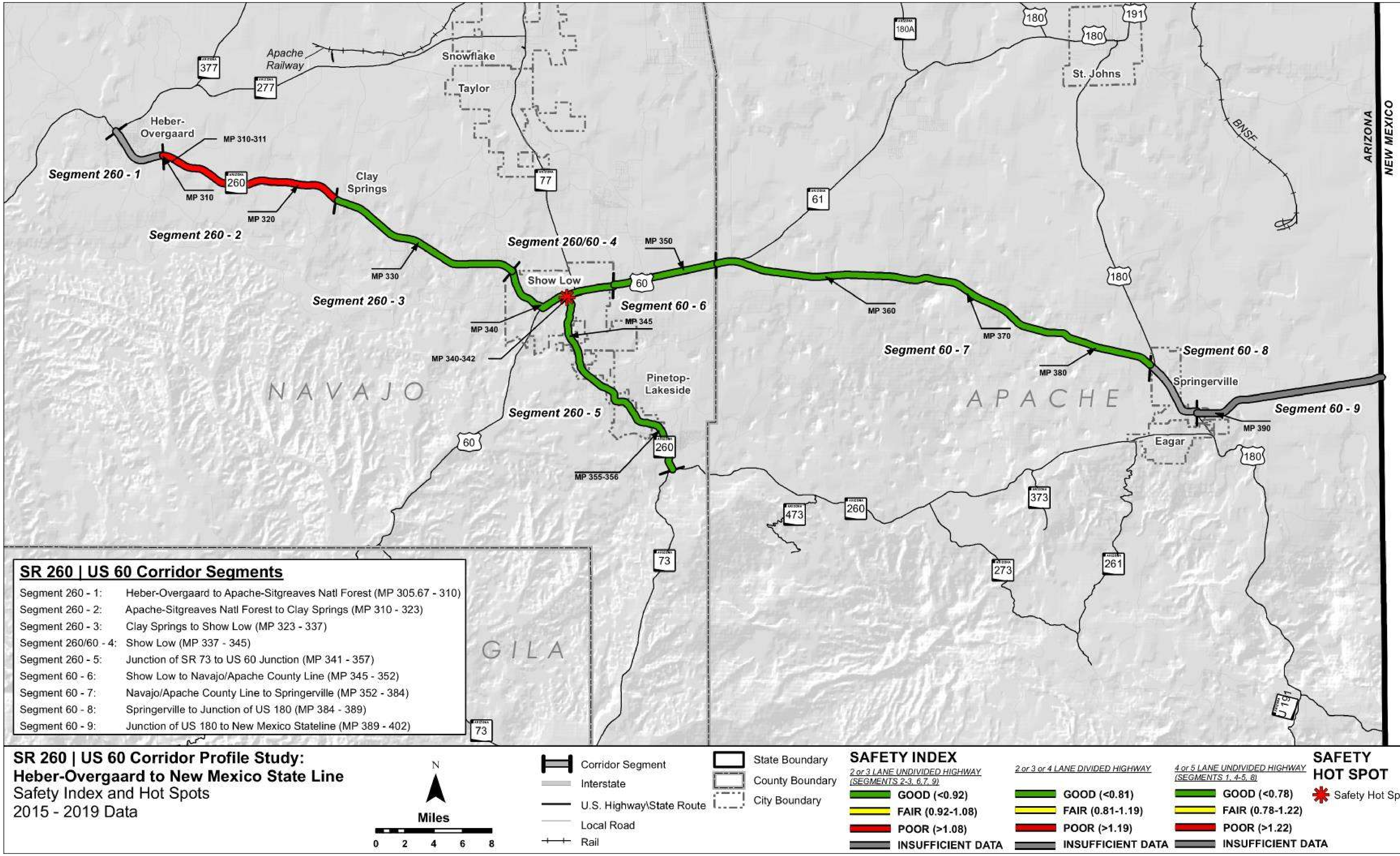
Segment #	Segment Length (miles)	Safety Performance Area							
		Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles
			EB	WB					
260-1[a]	4	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
260-2[b]	13	1.51	1.85	1.16	Insufficient Data	85.7%	Insufficient Data	Insufficient Data	Insufficient Data
260-3[b]	14	0.54	0.19	0.90	Insufficient Data	57.14%	Insufficient Data	Insufficient Data	Insufficient Data
260/60-4[a]	8	0.39	0.61	0.16	Insufficient Data	25.0%	Insufficient Data	Insufficient Data	Insufficient Data
260-5[a]	16	0.01	0.01	0.01	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
60-6[b]	7	0.04	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
60-7[b]	32	0.67	1.20	0.15	Insufficient Data	69.2%	Insufficient Data	Insufficient Data	Insufficient Data
60-8[a]	5	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
60-9[b]	13	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
Weighted Corridor Average		0.55	0.74	0.36	Insufficient Data	64.6%	Insufficient Data	Insufficient Data	Insufficient Data
SCALES									
Performance Level		**2 or 3 Lane Undivided Highway**							
Above Average		< 0.92			< 11.2%	< 66.9%	< 3.8%	< 4.2%	= 0%
Average		0.92 - 1.08			11.2% - 15.6%	66.9% - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0% - 3.3%
Below Average		> 1.08			> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%
Performance Level		**4 or 5 Lane Undivided Highway**							
Above Average		< 0.78			< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%
Average		0.78 - 1.22			43.8% - 49.5%	21.1% - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%
Below Average		> 1.22			> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%

[a]4 or 5 Lane Undivided Highway

[b]2 or 3 Lane Undivided Highway

Note: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings.

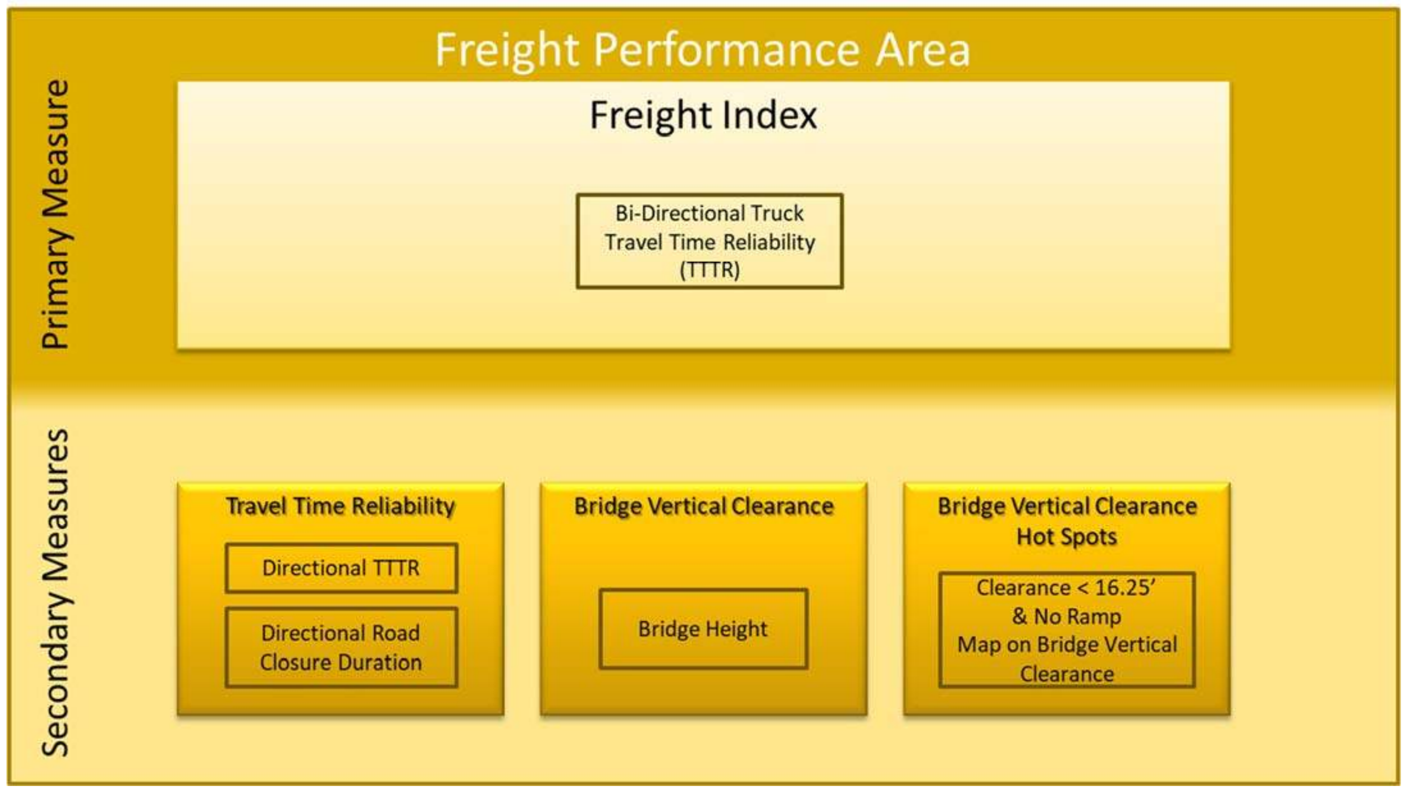
Figure 14: Safety Performance



2.6 Freight Performance Area

The Freight performance area consists of a single primary measure (Freight Index) and three secondary measures, as illustrated in **Figure 15**. All measures related to the reliability of truck travel are measured by observed truck travel time speed and delays to truck travel from road closures or physical restrictions to truck travel. The detailed calculations and equations developed for each measure are available in **Appendix B** and the performance data for this corridor is contained in **Appendix C**.

Figure 15: Freight Performance Measures



Primary Freight Index
The Freight Index is a reliability performance measure based on the travel time reliability for truck travel. The Truck Travel Time Reliability (TTTR) is the ratio of the 95th percentile truck travel time to average (50th percentile) truck travel time. The TTTR reflects the extra buffer time needed for on-time delivery while accounting for delay resulting from circumstances such as recurring congestion, crashes, inclement weather, and construction activities.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the Freight performance area, the relevant operating environments are interrupted flow (e.g., signalized at-grade intersections are present) and uninterrupted flow (e.g., controlled access grade-separated conditions such as a freeway or interstate highway).

For the SR 260 | US 60 corridor, the following operating environments were identified:

- Interrupted Flow: Segments 260-4, 260-5, and 60-8
- Uninterrupted Flow: Segments 260-1, 260-2, 260-3, 60-6, 60-7, and 60-9

Secondary Freight Measures
The Freight performance area includes three secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

Travel Time Reliability – Two separate travel time reliability indicators together provide a comprehensive picture of how much time may be required to travel within the corridor:

- Directional Truck Travel Time Reliability (TTTR):
  - o The ratio of the 95th percentile truck travel time to average (50th percentile) truck travel time for a given corridor segment in a specific direction; as corridor segments were often comprised of multiple roadway sections for which TTTR was reported, a weighted average was applied to each section based on the section length in order to arrive at the segment TTTR
- Directional Closure Duration
  - o The average time (in minutes) a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel; a weighted average is applied to each closure that takes into account the distance over which the closure occurs

Bridge Vertical Clearance

- The minimum vertical clearance (in feet) over the travel lanes for underpass structures on each segment

Bridge Vertical Clearance Hot Spots

- A Bridge vertical clearance "hot spot" exists where the underpass vertical clearance over the mainline travel lanes is less than 16.25 feet and no exit/entrance ramps exist to allow vehicles to bypass the low clearance location
- If a location with a vertical clearance less than 16.25 feet can be avoided by using immediately adjacent exit/entrance ramps rather than the mainline, it is not considered a hot spot

Freight Performance Results

The Freight Index provides a high-level assessment of freight mobility for the corridor and for each segment. The three secondary measures provide more detailed information to assess freight performance.

Based on the results of this analysis, the following observations were made:

- The weighted average of the Freight Index shows “poor” overall performance for the SR 260 | US 60 corridor
- Most segments show either “poor” or “fair” performance for directional TTTR measures, meaning the corridor has “poor” or “fair” travel time reliability in the EB and WB direction due to non-recurring congestion
- Most segments show either “poor” performance in the closure duration performance measure
- No bridge vertical clearance hot spots exist along the SR 260 | US 60 corridor

Table 10 summarizes the Freight performance results for the SR 260 | US 60 corridor. **Figure 16** illustrates the primary Freight Index performance and locations of freight hot spots along the SR 260 | US 60 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 10: Freight Performance

Segment #	Segment Length (miles)	Freight Performance Area						
		Freight TTTR	Directional Max TTTR		Combined Average Peak TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB)		Bridge Vertical Clearance (feet)
			EB	WB		EB	WB	
260-1^	4	1.25	1.25	1.24	1.25	73.60	48.24	No UP
260-2^	13	1.18	1.19	1.17	1.18	54.58	55.17	No UP
260-3^	14	1.21	1.22	1.20	1.21	25.33	15.01	No UP
260/60-4*	8	1.77	1.72	1.83	1.77	144.18	138.10	No UP
260-5*	16	2.05	2.12	1.97	2.05	242.09	248.78	No UP
60-6^	7	1.79	1.68	1.91	1.79	263.26	250.69	No UP
60-7^	32	1.28	1.30	1.25	1.28	267.81	223.06	No UP
60-8*	5	1.58	1.65	1.51	1.58	8.12	4.60	No UP
60-9^	13	1.42	1.47	1.37	1.42	1.65	0.00	No UP
Weighted Corridor Average		1.46	1.48	1.44	1.46	150.31	134.76	No UP

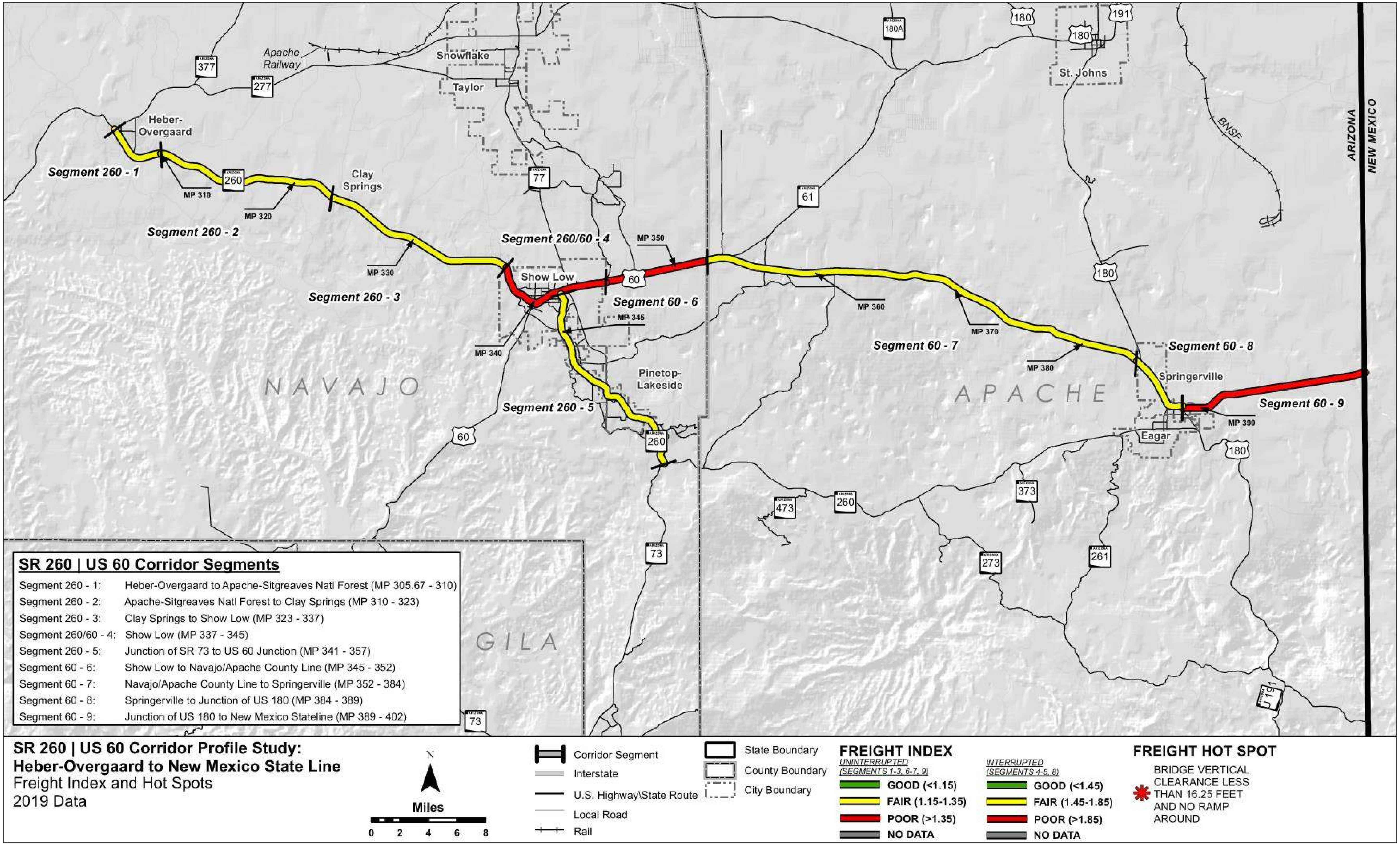
SCALES

Performance Level	**Uninterrupted**	**All**	**All**
Good	< 1.15	< 44.18	> 16.5
Fair	1.15 - 1.35	44.18-124.86	16.0 - 16.5
Poor	> 1.35	> 124.86	< 16.0

Performance Level	**Interrupted**
Good	< 1.45
Fair	1.45-1.85
Poor	> 1.85

^Uninterrupted Flow Facility
*Interrupted Flow Facility

Figure 16: Freight Performance



2.7 Corridor Performance Summary

Based on the results presented in the preceding sections, the following general observations were made related to the performance of the SR 260 | US 60 corridor:

- Overall Performance: The Pavement, Bridge, and Safety performance areas generally show "good" and "fair" performances; The Mobility and Freight performance areas show a mix of "good," "fair," and "poor" performances
- Pavement Performance: The weighted average of the Pavement Index shows "fair" overall performance for the SR 260 | US 60 corridor; Several segments show "poor" or "fair" performances for several Pavement performance measures
- Bridge Performance: The weighted average of the Bridge Index shows "fair" overall performance for the SR 260 | US 60 corridor; The majority of segments show "fair" performances in Lowest Bridge Rating performance area measures, Segments 260-2 and 60-6 show "poor" performance; The majority of segments show "good" performances in Sufficiency Rating; Segments 260-1, 260-5, and 60-9 do not contain any bridges
- Mobility Performance: The weighted average of the Mobility Index shows "good" overall performance for the SR 260 | US 60 corridor; All the segments show a mix of "good" and "fair" performances in the Closure Extent and LOTTR performance area measures for all directions; the majority of segments show "poor" performances in the % Bicycle Accommodation; the majority of segments show "fair" performances in the % Non-Single Occupancy Vehicle (SOV) Trips
- Safety Performance: The weighted average of the Safety Index shows "good" overall performance for the SR 260 | US 60 corridor; Segments 260-2 and 260-7 show "poor" performance in Directional Safety Index, Segments show a mix of "good," "fair," and "poor" performance in the % of Fatal + Incapacitating Injury Crashes Involving Lane Departures
- Freight Performance: The weighted average of the Freight Index shows "poor" overall performance for the SR 260 | US 60 corridor; Segments 260-5, 60-6, and 60-9 show "poor" performances in both directional and bidirectional TTTR performance area measure; Several segments show "poor" performance ratings in both directions of the Closure Duration performance area measure
- Lowest Performing Segments: Segments 60-5 and 60-6 show "poor/below average" performance for many performance area measures
- Highest Performing Segments: Segments 260-3 and 60-8 show "good/above average" performance for many performance area measures

Figure 17 shows the percentage of the SR 260 | US 60 corridor that rates either "good/above average" performance, "fair/average" performance, or "poor/below average" performance for each primary measure. On the SR 260 | US 60 corridor, Freight is the lowest performing area with 44% of the corridor in "poor" condition as it relates to the primary measure. Mobility and Safety are the highest performing areas along the SR 260 | US 60 corridor with 86% of the corridor in "good" condition as it relates to the primary measure.

Table 11 shows a summary of corridor performance for all primary measures and secondary measure indicators for the SR 260 | US 60 corridor. A weighted corridor average rating (based on the length of the segment) was calculated for each primary and secondary measure. The weighted average ratings are summarized in **Figure 18** which also provides a brief description of each performance measure. **Figure 18** represents the average for the entire corridor and any given segment or location could have a higher or lower rating than the corridor average.

Figure 17: Performance Summary by Primary Measure

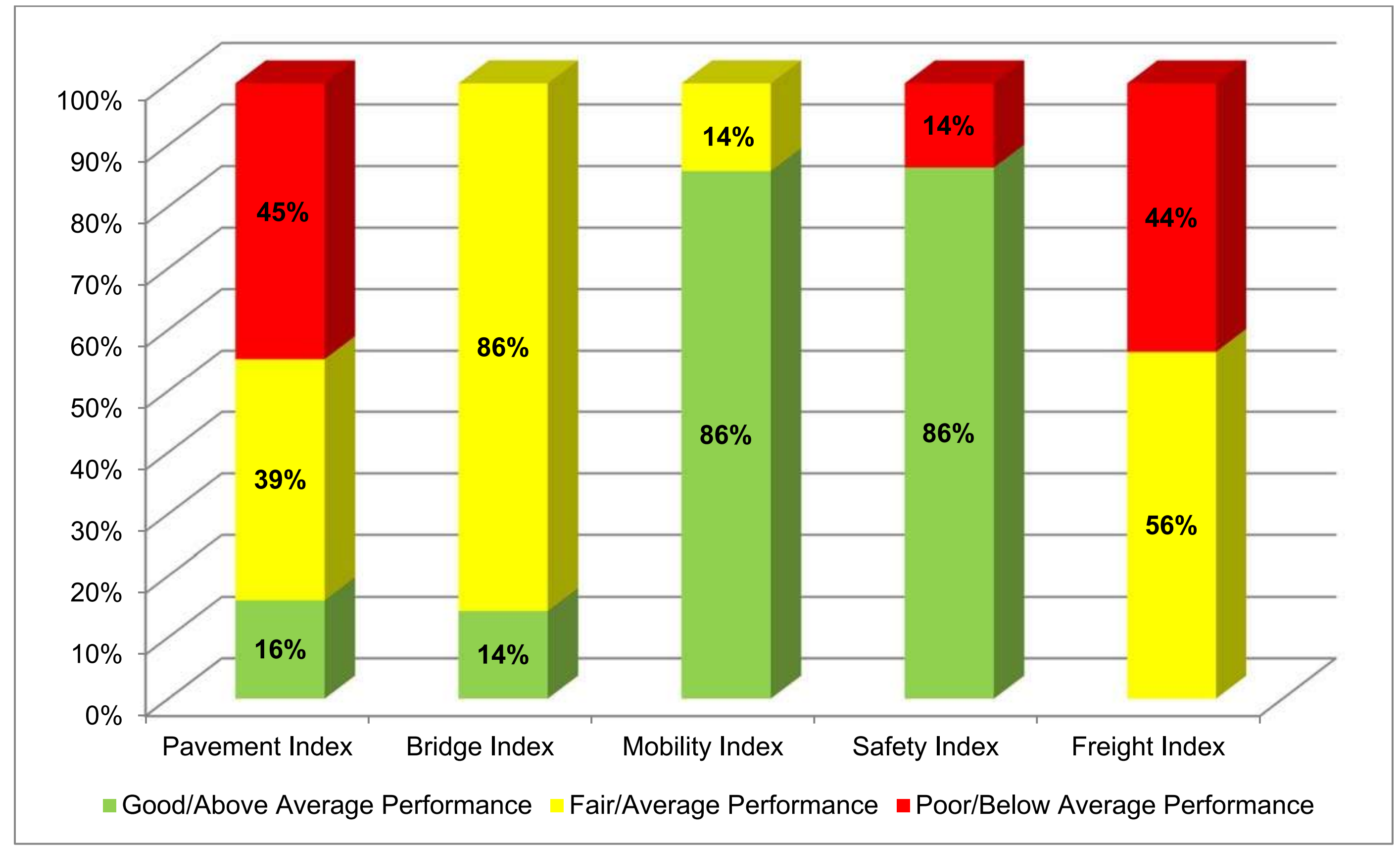


Figure 18: Corridor Performance Summary by Performance Measure

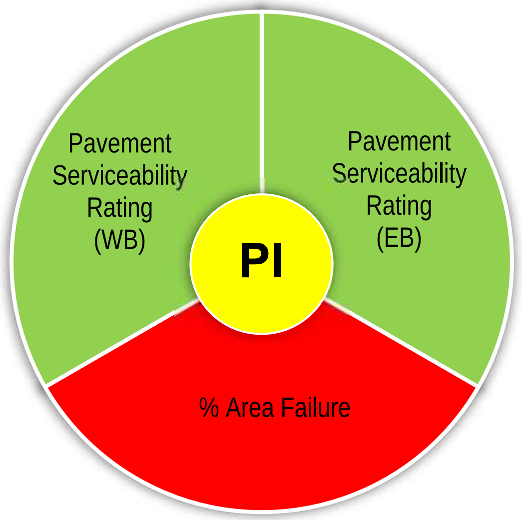
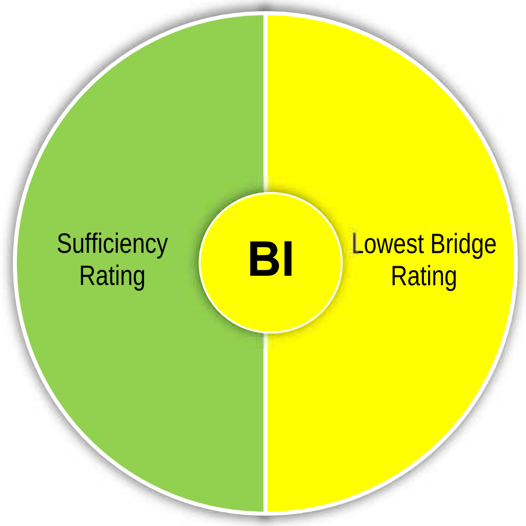
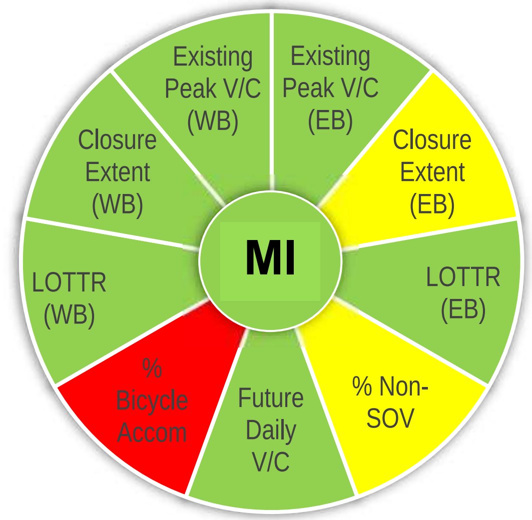
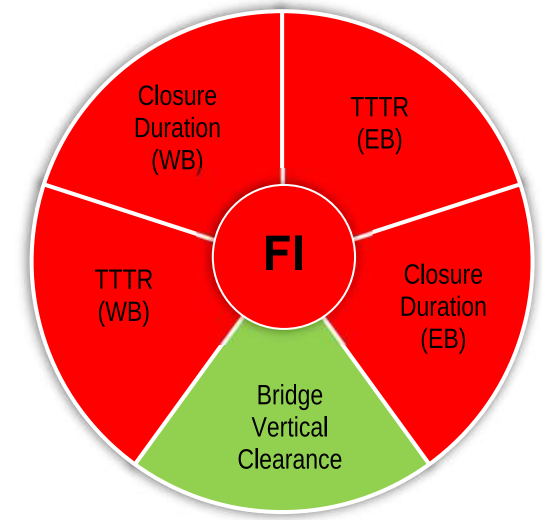
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on three pavement condition ratings from the ADOT Pavement Database; the three ratings are the International Roughness Index (IRI), the Cracking Rating, and the Rutting Rating	**Bridge Index (BI):** based on four bridge condition ratings from the ADOT Bridge Database; the four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating	**Mobility Index (MI):** an average of the existing daily volume-to-capacity (V/C) ratio and the projected long-term future daily V/C ratio	**Safety Index (SI):** combines the bi-directional frequency and rate of fatal and suspected serious injury crashes, compared to crash occurrences on roads with similar operating environments in Arizona	**Freight Index (FI):** a reliability performance measure based on the bi-directional Truck Travel Time Reliability (TTTR) for truck travel
➢ Directional Pavement Serviceability Rating (PSR) – the weighted average (based on number of lanes) of the PSR for the pavement in each direction of travel ➢ % Area Failure – the percentage of pavement area rated above failure thresholds for IRI or Cracking	➢ Sufficiency Rating– multipart rating includes structural adequacy and safety factors as well as functional aspects such as traffic volume and length of detour ➢ Lowest Bridge Rating –the lowest rating of the four bridge condition ratings on each segment	➢ Future Daily V/C – the future daily V/C ratio provides a measure of future congestion if no capacity improvements are made to the corridor ➢ Existing Peak Hour V/C – the existing peak hour V/C ratio for each direction of travel provides a measure of existing peak hour congestion during typical weekdays ➢ Closure Extent – the average number of instances a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ Directional Level of Travel Time Reliability (LOTTR) – the ratio of the 80th percentile peak period travel time to the 50th percentile peak period travel time for all vehicles ➢ % Bicycle Accommodation – the percentage of a segment that accommodates bicycle travel ➢ % Non-Single Occupancy Vehicle (Non-SOV) Trips –the percentage of trips that are taken by vehicles carrying more than one occupant	➢ Directional Safety Index – the combination of the directional frequency and rate of fatal and suspected serious injury crashes, compared to crash occurrences on roads with similar operating environments in Arizona ➢ % of Fatal + Suspected Serious Injury Crashes Involving Lane Departures – the percentage of total fatal and suspected serious injury crashes involving lane departures compared to the statewide average percentage on roads with similar operating environments	➢ Directional TTTR – the ratio of the 95th percentile peak period travel time to the 50th percentile peak period travel time for trucks ➢ Closure Duration – the average time a particular milepost is closed per year per mile on a given segment of the corridor in a specific direction of travel ➢ Bridge Vertical Clearance – the minimum vertical clearance over the travel lanes for underpass structures on each segment.

Table 11: Corridor Performance Summary by Segment and Performance Measure

Segment #	Segment Length (miles)	Pavement Performance Area				Bridge Performance Area			Mobility Performance Area									
		Pavement Index	Directional PSR		% Area Failure	Bridge Index	Sufficiency Rating	Lowest Bridge Rating	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			EB	WB							EB	WB	EB	WB	EB	WB		
260-1[2^a]	4	1.94	2.93	2.76	100.0%	No Bridge			0.10	0.09	0.11	0.11	0.29	0.17	1.11	1.12	93%	16.0%
260-2[2^b]	13	3.20	4.02		76.9%	5.7	88	5	0.39	0.38	0.42	0.42	0.14	0.15	1.08	1.08	0%	12.4%
260-3[2^b]	14	2.21	3.75		42.9%	6.0	93	6	0.20	0.20	0.23	0.23	0.16	0.11	1.08	1.07	5%	15.0%
260/60-4[2*a]	8	3.32	3.43	3.26	56.3%	6.0	85	6	0.39	0.44	0.32	0.32	0.20	0.15	1.17	1.19	54%	16.5%
260-5[2*a]	16	3.16	3.57	3.56	100.0%	No Bridge			0.66	0.74	0.49	0.49	0.24	0.28	1.17	1.20	50%	16.3%
60-6[2^b]	7	3.27	3.63		100.0%	5.0	64	5	0.51	0.59	0.41	0.41	0.31	0.23	1.15	1.18	0%	13.1%
60-7[2^b]	32	2.46	3.31		96.9%	7.0	97	7	0.24	0.27	0.18	0.18	0.46	0.24	1.09	1.07	5%	14.9%
60-8[2*a]	5	3.55	3.73		66.7%	6.0	80	6	0.28	0.32	0.23	0.23	0.04	0.04	1.21	1.21	98%	15.3%
60-9[2^b]	13	3.88	3.93		0.0%	No Bridge			0.06	0.06	0.05	0.05	0.02	0.00	1.16	1.15	100%	0.0%
Weighted Corridor Average		2.92	3.59	3.58	73%	5.9	85	6	0.32	0.34	0.27	0.27	0.25	0.17	1.12	1.12	33%	13%

SCALES

Performance Level	Non-Interstate			All			Rural	All	Uninterrupted	All	
Good/Above Average Performance	> 3.50	> 3.50	< 5%	> 6.5	> 80	> 6	< 0.56	< 0.22	< 1.15	> 90%	> 17%
Fair/Average Performance	2.90 - 3.50	2.90 - 3.50	5% - 20%	5.0 - 6.5	50 - 80	5 - 6	0.56 - 0.76	0.22 - 0.62	1.15 - 1.5	60% - 90%	11% - 17%
Poor/Below Average Performance	< 2.90	< 2.90	> 20%	< 5.0	< 50	< 5	> 0.76	> .62	> 1.5	< 60%	< 11%

Performance Level	Interrupted
Good/Above Average Performance	< 1.15
Fair/Average Performance	> 1.15 & < 1.5
Poor/Below Average Performance	> 1.5

^Uninterrupted Flow Facility
*Interrupted Flow Facility
[a]4 or 5 Lane Undivided Highway
[b]2 or 3 Lane Undivided Highway
[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

Table 11: Corridor Performance Summary by Segment and Performance Measure (continued)

Segment #	Segment Length (miles)	Safety Performance Area								Freight Performance Area						
		Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles	Freight TTTR	Directional Max TTTR		Combined Average Peak TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB)		Bridge Vertical Clearance (feet)
			EB	WB							EB	WB		EB	WB	
260-1[2^a]	4	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.25	1.25	1.24	1.25	73.60	48.24	No UP
260-2[2^b]	13	1.51	1.85	1.16	Insufficient Data	85.7%	Insufficient Data	Insufficient Data	Insufficient Data	1.18	1.19	1.17	1.18	54.58	55.17	No UP
260-3[2^b]	14	0.54	0.19	0.90	Insufficient Data	57.14%	Insufficient Data	Insufficient Data	Insufficient Data	1.21	1.22	1.20	1.21	25.33	15.01	No UP
260/60-4[2*a]	8	0.39	0.61	0.16	Insufficient Data	25.0%	Insufficient Data	Insufficient Data	Insufficient Data	1.77	1.72	1.83	1.77	144.18	138.10	No UP
260-5[2*a]	16	0.01	0.01	0.01	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.05	2.12	1.97	2.05	242.09	248.78	No UP
60-6[2^b]	7	0.04	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.79	1.68	1.91	1.79	263.26	250.69	No UP
60-7[2^b]	32	0.67	1.20	0.15	Insufficient Data	69.2%	Insufficient Data	Insufficient Data	Insufficient Data	1.28	1.30	1.25	1.28	267.81	223.06	No UP
60-8[2*a]	5	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.58	1.65	1.51	1.58	8.12	4.60	No UP
60-9[2^b]	13	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.42	1.47	1.37	1.42	1.65	0.00	No UP
Weighted Corridor Average		0.55	0.74	0.36	Insufficient Data	64.6%	Insufficient Data	Insufficient Data	Insufficient Data	1.46	1.48	1.44	1.46	150.31	134.76	No UP
SCALES																
Performance Level	**2 or 3 Lane Undivided Highway**									**Uninterrupted**				**All**		**All**
Good/Above Average Performance	< 0.92				< 11.2%	< 66.9%	< 3.8%	< 4.2%	= 0%	< 1.15				< 44.18		> 16.5
Fair/Average Performance	0.92 - 1.08				11.2% - 15.6%	66.9% - 74.5%	3.8% - 7.2%	4.2% - 8.0%	0% - 3.3%	1.15 - 1.35				44.18-124.86		16.0 - 16.5
Poor/Below Average Performance	> 1.08				> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%	> 1.35				> 124.86		< 16.0
Performance Level	**4 or 5 Lane Undivided Highway**									**Interrupted**						
Good/Above Average Performance	< 0.78				< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%	< 1.45	< 1.45		< 1.45			
Fair/Average Performance	0.78 - 1.22				43.8% - 49.5%	21.1% - 32.1%	8.8% - 13.5%	0.8% - 5.5%	0.5% - 3.8%	1.45-1.85	1.45-1.85		1.45-1.85			
Poor/Below Average Performance	> 1.22				> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%	> 1.85	> 1.85		> 1.85			

^Uninterrupted Flow Facility
*Interrupted Flow Facility
[a]4 or 5 Lane Undivided Highway
[b]2 or 3 Lane Undivided Highway
[1]Urban Operating Environment
[2]Rural Operating Environment

Notes: "Insufficient Data" indicates there was not enough data available to generate reliable performance ratings
"No UP" indicates no underpasses are present in the segment

3.0 NEEDS ASSESSMENT

3.1 Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP) 2016-2040 goals and objectives that were updated in 2018. Statewide performance goals that are relevant to SR 260 | US 60 performance areas were identified and corridor goals were then formulated for each of the five performance areas that aligned with the overall statewide goals established by the LRTP. Based on stakeholder input, corridor goals, corridor objectives, and performance results, three “emphasis areas” were identified for the SR 260 | US 60 corridor: Pavement, Safety, and Freight.

Considering the corridor goals and identified emphasis areas, performance objectives were developed for each quantifiable performance measure that identify the desired level of performance based on the performance scale levels for the overall corridor and for each segment of the corridor. For the performance emphasis areas, the corridor-wide weighted average performance objectives are identified with a higher standard than for the other performance areas. **Table 12** shows the SR 260 | US 60 corridor goals, corridor objectives, and performance objectives, and how they align with the statewide goals.

It is not reasonable within a financially constrained environment to expect that every performance measure will always be at the highest levels on every corridor segment. Therefore, individual corridor segment objectives have been set as “fair/average” or better and should not fall below that standard.

Achieving corridor and segment performance objectives will help ensure that investments are targeted toward improvements that support the safe and efficient movement of travelers on the corridor. Addressing current and future congestion, thereby improving mobility on congested segments, will also help the corridor fulfill its potential as a significant contributor to the region’s economy.

Corridor performance is measured against corridor and segment objectives to determine needs – the gap between observed performance and performance objectives.

Goal achievement will improve or reduce current and future congestion, increase travel time reliability, and reduce fatalities and incapacitating injuries resulting from vehicle crashes. Where performance is currently rated “good”, the goal is always to maintain that standard, regardless of whether or not the performance is in an emphasis area.

Table 12: Corridor Performance Goals and Objectives

ADOT Statewide LRTP Goals	SR 260 US 60 Corridor Goals	SR 260 US 60 Corridor Objectives	Performance Area	Primary Measure / Secondary Measure Indicators	Performance Objective: Corridor Average	Performance Objective: Segment
Improve Mobility, Reliability, and Accessibility **Make Cost Effective Investment Decisions and Support Economic Vitality**	Provide a safe and reliable route for recreational and tourist travel Provide safe, reliable and efficient connection to all communities along the corridor to permit efficient regional travel	Reduce current and future congestion and delay in the urbanized areas Improve access management and provide guidance for future connections within the corridor Reduce delays from non-recurring events and incidents to improve reliability Improve bicycle and pedestrian accommodations Utilize technology to optimize existing system capacity and performance	Mobility	Mobility Index	Good	Fair or better
				Future Daily V/C		
				Existing Peak Hour V/C		
				Closure Extent		
				Directional Level of Travel Time Reliability		
				% Bicycle Accommodation		
				% Non-SOV Trips		
	Provide a safe, reliable and efficient freight route	Reduce delays and restrictions to freight movement to improve reliability Improve travel time reliability (including impacts to motorists due to freight traffic)	Freight (*Emphasis Area*)	Freight Index	Fair or better	Fair or better
				Truck Travel Time Reliability		
				Closure Duration		
				Bridge Vertical Clearance		
Preserve and Maintain the System	Preserve and modernize highway infrastructure	Maintain structural integrity of bridges	Bridge	Bridge Index	Fair or better	Fair or better
				Sufficiency Rating		
				Lowest Bridge Rating		
		Improve pavement ride quality for all corridor users	Pavement *(Emphasis Area)*	Pavement Index	Good	Fair or better
				Directional Pavement Serviceability Rating		
				% Area Failure		
Enhance Safety	Provide a safe, reliable, and efficient connection for the communities along the corridor Promote safety by implementing appropriate countermeasures	Reduce fatal and incapacitating injury crashes Reduce wildlife-related crashes	Safety *(Emphasis Area)*	Safety Index	Above Average	Average or better
				Directional Safety Index		
				% of Fatal + Suspected Serious Injury Crashes at Intersections		
				% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures		
				% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians		
				% of Fatal + Suspected Serious Injury Crashes Involving Trucks		
				% of Fatal + Suspected Serious Injury Crashes Involving Bicycles		

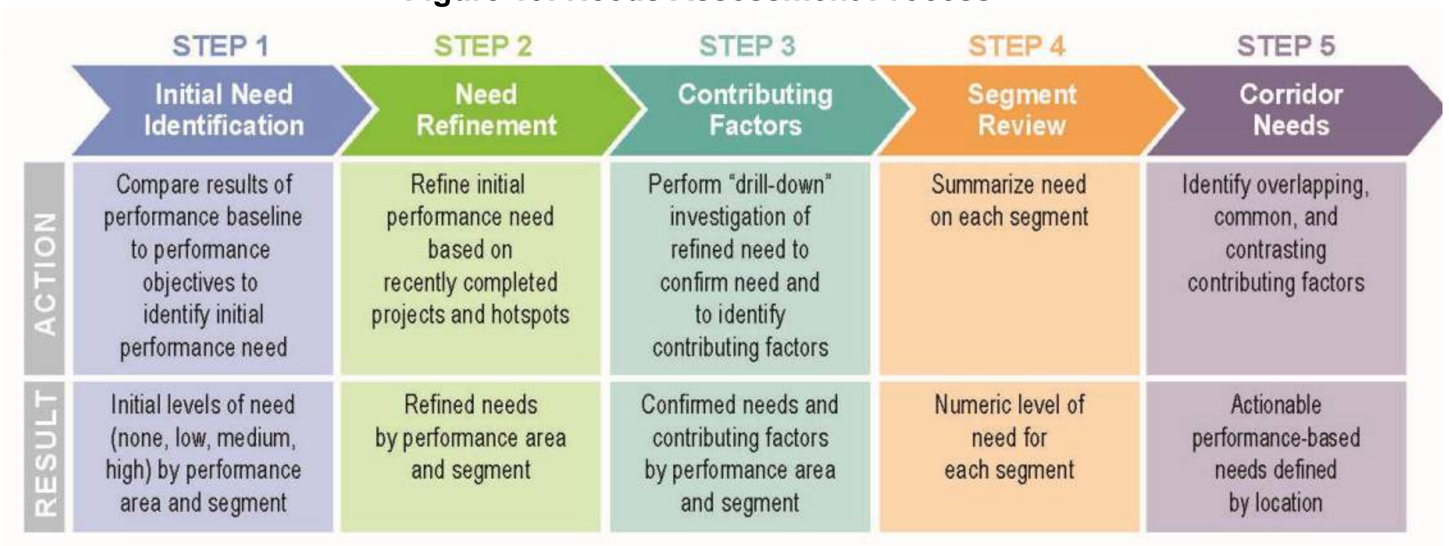
3.2 Needs Assessment Process

The following guiding principles were used as an initial step in developing a framework for the performance-based needs assessment process:

- Corridor needs are defined as the difference between the corridor performance and the performance objectives
- The needs assessment process should be systematic, progressive, and repeatable, but also allow for engineering judgment where needed
- The process should consider all primary and secondary performance measures developed for the study
- The process should develop multiple need levels including programmatic needs for the entire length of the corridor, performance area-specific needs, segment-specific needs, and location-specific needs (defined by MP limits)
- The process should produce actionable needs that can be addressed through strategic investments in corridor preservation, modernization, and expansion

The performance-based needs assessment process is illustrated in **Figure 19** and described in the following sections.

Figure 19: Needs Assessment Process



Step 1: Initial Needs Identification

The first step in the needs assessment process links baseline (existing) corridor performance with performance objectives. In this step, the baseline corridor performance is compared to the performance objectives to provide a starting point for the identification of performance needs. This mathematical comparison results in an initial need rating of None, Low, Medium, or High for each primary and secondary performance measure. An illustrative example of this process is shown below in **Figure 20**.

Figure 20: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

Performance Thresholds	Performance Level	Initial Level of Need	Description
6.5	Good	None*	All levels of Good and top 1/3 of Fair (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
5.0	Fair	Medium	Lower 1/3 of Fair and top 1/3 of Poor (4.5-5.5)
	Poor		
	Poor	High	Lower 2/3 of Poor (<4.5)
	Poor		

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

The initial level of need for each segment is refined to account for hot spots and recently completed or under construction projects, resulting in a final level of need for each segment. The final levels of need for each primary and secondary performance measure are combined to produce a weighted final need rating for each segment. Values of 0, 1, 2, and 3 are assigned to the initial need levels of None, Low, Medium, and High, respectively. A weight of 1.0 is applied to the Performance Index need and equal weights of 0.20 are applied to each need for each secondary performance measure. For directional secondary performance measures, each direction of travel receives a weight of 0.10.

Step 2: Need Refinement

In Step 2, the initial level of need for each segment is refined using the following information and engineering judgment:

- For segments with an initial need of None that contain hot spots, the level of need should be increased from None to Low
- For segments with an initial level of need where recently completed projects or projects under construction are anticipated to partially or fully address the identified need, the level of need should be reduced or eliminated as appropriate
- Programmed projects that are expected to partially or fully address an identified need are not justification to lower the initial need because the programmed projects may not be implemented as planned; in addition, further investigations may suggest that changes in the scope of a programmed project may be warranted

The resulting final needs are carried forward for further evaluation in Step 3.

Step 3: Contributing Factors

In Step 3, a more detailed review of the condition and performance data available from ADOT is conducted to identify contributing factors to the need. Typically, the same databases used to develop the baseline performance serve as the principal sources for the more detailed analysis. However, other supplemental databases may also be useful sources of information. The databases used for diagnostic analysis are listed below:

Pavement Performance Area

- Pavement Rating Database

Bridge Performance Area

- ABISS

Mobility Performance Area

- Highway Performance Monitoring System (HPMS) Database
- AZTDM
- Real-time traffic conditions data produced by INRIX Database
- Highway Conditions Reporting System (HCRS) Database

Safety Performance Area

- Crash Database

Freight Performance Area

- INRIX Database
- HCRS Database

In addition, other sources considered helpful in identifying contributing factors are:

- Maintenance history (from ADOT PeCoS database for pavement), the level of past investments, or trends in historical data that provide context for pavement and bridge history
- Field observations from ADOT district personnel can be used to provide additional information regarding a need that has been identified
- Previous studies can provide additional information regarding a need that has been identified

Step 3 results in the identification of performance-based needs and contributing factors by segment (and MP locations, if appropriate) that can be addressed through investments in preservation, modernization, and expansion projects to improve corridor performance. See **Appendix D** for more information.

Step 4: Segment Review

In this step, the needs identified in Step 2 and refined in Step 3 are quantified for each segment to numerically estimate the level of need for each segment. Values of 0 to 3 are assigned to the final need levels (from Step 3) of None, Low, Medium, and High, respectively. A weighting factor is applied to the performance areas identified as emphasis areas and a weighted average need is calculated for each segment. The resulting average need score can be used to compare levels of need between segments within a corridor and between segments in different corridors.

Step 5: Corridor Needs

In this step, the needs and contributing factors for each performance area are reviewed on a segment-by-segment basis to identify actionable needs and to facilitate the formation of solution sets that address multiple performance areas and contributing factors. The intent of this process is to identify overlapping, common, and contrasting needs to help develop strategic solutions. This step results in the identification of corridor needs by specific location.

3.3 Corridor Needs Assessment

This section documents the results of the needs assessment process described in the prior section. The needs in each performance area were classified as either None, Low, Medium, or High based on how well each segment performed in the existing performance analysis. The needs for each segment were numerically combined to estimate the average level of need for each segment of the corridor

The final needs assessments for each performance measure, along with the scales used in analysis, are shown in **Table 13** through **Table 17**.

Pavement Needs Refinement and Contributing Factors

- There were no recently completed pavement projects along the corridor
- Segments 260-1, 260-3 and 60-7 have final needs of High; Segments 260-2, 260-5 and 60-6 have final needs of Medium
- Segments 260|60-4 and 60-8 have final needs of Low
- See **Appendix D** for detailed information on contributing factors

Table 13: Final Pavement Needs

Segment #	Performance Score and Level of Need				Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Pavement Index	Directional PSR		% Area Failure				
		EB	WB					
260-1	1.94	2.93	2.76	100%	High	MP 305-310	None	High
260-2	3.20	4.02	4.02	77%	Medium	MP 310-312 MP 313-321	None	Medium
260-3	2.21	3.75	3.75	43%	High	MP 331-337	None	High
260|60-4	3.32	3.43	3.26	56%	Low	MP 337-338 MP 340-341 EBMP 341-344 MP 344-345	None	Low
260-5	3.16	3.57	3.56	100%	Medium	MP 341-357	None	Medium
60-6	3.27	3.63	3.63	100%	Medium	MP 345-352	None	Medium
60-7	2.46	3.31	3.31	97%	High	MP 352-371 MP 372-384	None	High
60-8	3.55	3.73	3.73	67%	Low	MP 384-385 MP 387-389	None	Low
60-9	3.88	3.93	3.93	0%	None	None	None	None

Level of Need (Score)	Performance Score Need Scale		Segment Level Need Scale
None* (0)	> 3.30	< 10%	0
Low (1)	3.10 - 3.30	10% - 15%	< 1.5
Medium (2)	2.70 - 3.10	15% - 25%	1.5 - 2.5
High (3)	< 2.70	> 25%	> 2.5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Bridge Needs Refinement and Contributing Factors

- There were no recently completed bridge projects or hot spots along the corridor Three segments (260-1, 260-5, and 60-9) do not include any bridges
- Segment 60-6 includes one bridge, the Rocky Arroyo Bridge (No. 384), which could have a repetitive investment issue
- There are no final Bridge needs along the corridor
- See **Appendix D** for detailed information on contributing factors

Table 14: Final Bridge Needs

Segment #	Performance Score and Level of Need			Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Bridge Index	Sufficiency Rating	Lowest Bridge Rating				
260-1	No Bridges	No Bridges	No Bridges	None	None	None	None
260-2	5.70	88.22	5.00	1.2	None	None	None
260-3	6.00	93.20	6.00	0.0	None	None	None
260|60-4	6.00	85.00	6.00	0.0	None	None	None
260-5	No Bridges	No Bridges	No Bridges	None	None	None	None
60-6	5.00	63.70	5.00	2.4	None	None	None
60-7	7.00	96.90	7.00	0.0	None	None	None
60-8	6.00	79.70	6.00	0.0	None	None	None
60-9	No Bridges	No Bridges	No Bridges	None	None	None	None

Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None (0)	≥ 6.0	≥ 70	> 5	0
Low (1)	5.5 - 6.0	60 - 70	5	< 1.5
Medium (2)	4.5 - 5.5	40 - 60	4	1.5 - 2.5
High (3)	≤ 4.5	≤ 40	< 4	> 2.5

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Mobility Needs Refinement and Contributing Factors

- Recently completed projects did not result in an adjustment to level of need
- Low Mobility needs exist on five of the nine segments of the corridor
- One segment (260-5) has a Medium final need
- Bicycle accommodation needs are High on four of the nine segments of the corridor
- See **Appendix D** for detailed information on contributing factors

Table 15: Final Mobility Needs

Segment #	Performance Score and Level of Need									Initial Segment Need	Recently Completed Projects	Final Segment Need
	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent		Directional LOTTR		% Bicycle Accommodation			
			NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB				
260-1	0.10	0.09	0.11	0.11	0.29	0.17	1.11	1.12	93%	None	Rim Road- Gibson Rd: Shoulder widening [MP 305]	None
260-2	0.39	0.38	0.42	0.42	0.14	0.15	1.08	1.08	0%	Low	None	Low
260-3	0.20	0.20	0.23	0.23	0.16	0.11	1.08	1.07	5%	Low	FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	Low
260|60-4	0.39	0.44	0.32	0.32	0.20	0.15	1.17	1.19	54%	Low	FY17 H5107: Roadway Widening, US 60 Eastbound starting at SR 77 Intersection (MP 342-343.5) FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	Low
260-5	0.66	0.74	0.49	0.49	0.24	0.28	1.17	1.20	50%	Medium	FY16 H8378: Constructing asphaltic concrete pathway, concrete scupper, sidewalk ramps and other miscellaneous work (MP 350.67-351.20).	Medium
60-6	0.51	0.59	0.41	0.41	0.31	0.23	1.15	1.18	0%	Low	None	Low
60-7	0.24	0.27	0.18	0.18	0.46	0.24	1.09	1.07	5%	Low	None	Low
60-8	0.28	0.32	0.23	0.23	0.04	0.04	1.21	1.21	98%	None	None	None
60-9	0.06	0.06	0.05	0.05	0.02	0.00	1.16	1.15	100%	None	None	None

Level of Need (Score)	Performance Score Need Scale				Segment Level Need Scale
None* (0)	≤ 0.77 (Urban) ≥ .63 (Rural)	< 0.35	<1.27[a] <1.27[b]	> 80%	0
Low (1)	0.77 - 0.83 (Urban) 0.63 - 0.69 (Rural)	0.35 - 0.49	1.27 - 1.38[a] 1.27 - 1.38[b]	70% - 80%	< 1.5
Medium (2)	0.83 - .095 (Urban) 0.69 - 0.83 (Rural)	0.49 - 0.75	1.38 - 1.62[a] 1.38 - 1.62[b]	50% - 70%	1.5 - 2.5
High (3)	≥ 0.95 (Urban) ≥ 0.83 (Rural)	>0.75	>1.62[a] >1.62[b]	< 50%	> 2.5

a: Uninterrupted Flow
b: Interrupted Flow

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Safety Needs Refinements and Contributing Factors

- Safety hot spot is present in Segment 260|60-4, which changed the need from None to Low
- High Safety needs exist on one of the nine segments
- See **Appendix D** for detailed information on contributing factors

Table 16: Final Safety Need

Segment #	Performance Score and Level of Need								Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Safety Index	Directional Safety Index		% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Fatal + Suspected Serious Injury Crashes Involving Bicycles				
		NB/EB	SB/WB									
260-1[a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
260-2[b]	1.51	1.85	1.16	Insufficient Data	0.86	Insufficient Data	Insufficient Data	Insufficient Data	4.2	None	None	High
260-3[b]	0.54	0.19	0.90	Insufficient Data	0.57	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	MP 335-338 Constructed Shoulder Widening;	None
260/60-4[a]	0.39	0.61	0.16	Insufficient Data	0.25	Insufficient Data	Insufficient Data	Insufficient Data	0.0	MP 340-342	MP 341-342 Pavement widening, addition of turn lanes, updating of signals and lighting.	Low
260-5[a]	0.01	0.01	0.01	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
60-6[b]	0.04	0.09	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
60-7[b]	0.67	1.20	0.15	Insufficient Data	0.69	Insufficient Data	Insufficient Data	Insufficient Data	0.5	None	None	Low
60-8[a]	0.00	0.00	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
60-9[b]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None

Level of Need (Score)		Performance Score Needs Scale						Segment Level Need Scale
None* (0)	a	≤ 0.93	≤ 46%	≤ 25%	≤ 10%	≤ 2%	≤ 2%	0
	b	≤ 0.97	≤ 13%	≤ 69%	≤ 5%	≤ 5%	≤ 1%	
Low (1)	a	0.93 - 1.07	46% -48%	25% - 29%	10% - 12%	2% - 4%	2% - 3%	≤ 1.5
	b	0.97 - 1.08	13% -14%	69% - 72%	5% - 6%	5% - 6%	1% - 2%	
Medium (2)	a	1.07 – 1.35	48% - 52%	29% - 36%	12% - 15%	4% - 7%	3% - 5%	1.5 - 2.5
	b	1.08 - 1.37	14% - 17%	72% - 77%	6% - 8%	6% - 9%	2% - 4%	
High (3)	a	≥ 1.35	≥ 52%	≥ 36%	≥ 15%	≥ 7%	≥5%	≥ 2.5
	b	≥ 1.37	≥ 17%	≥ 77%	≥ 8%	≥ 9%	≥ 4%	

a: 4 or 5 Lane Undivided Highway
b: 2 or 3 Lane Undivided Highway

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Freight Needs Refinements and Contributing Factors

- There are no bridge vertical clearance hot spots on the corridor
- Recently completed projects did not result in an adjustment to level of need for segments 260/60-4 and 260-5
- Recently completed projects in Segment 260-1 did not result in an adjustment to level of need since there was no need along that segment
- See **Appendix D** for detailed information on contributing factors

Table 17: Final Freight Needs

Segment #	Performance Score and Level of Need						Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Freight Index	Directional TTTR		Closure Duration		Bridge Vertical Clearance				
		NB/EB	SB/WB	NB/EB	SB/WB					
260-1	1.25	1.25	1.24	73.60	48.24	No UP	Low	None	Rim Road- Gibson Rd: Shoulder widening [MP 305]	Low
260-2	1.18	1.19	1.17	54.58	55.17	No UP	None	None	None	None
260-3	1.21	1.22	1.20	25.33	15.01	No UP	Low	None	None	Low
260|60-4	1.77	1.72	1.83	144.18	138.10	No UP	High	None	FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	High
260-5	2.05	2.12	1.97	242.09	248.78	No UP	High	None	FY17 H5107: Roadway Widening, US 60 Eastbound starting at SR 77 Intersection (MP 342-343.5) FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	High
60-6	1.79	1.68	1.91	263.26	250.69	No UP	High	None	None	High
60-7	1.28	1.30	1.25	267.81	223.06	No UP	Medium	None	None	Medium
60-8	1.58	1.65	1.51	8.12	4.60	No UP	Low	None	None	Low
60-9	1.42	1.47	1.37	1.65	0.00	No UP	High	None	None	High

Level of Need (Score)		Performance Score Need Scale				Segment Level Need Scale
None* (0)	a	≤ 1.58	≤ 1.58	< 71.07	< 16.33	0
	b	≥ 1.22	≥ 1.22			
Low (1)	a	1.58 - 1.72	1.58 - 1.72	71.07 - 97.97	16.33 - 16.17	< 1.5
	b	1.22 - 1.28	1.22 - 1.28			
Medium (2)	a	1.72 - 1.98	1.72 - 1.98	97.97 - 151.75	16.17 - 15.83	1.5 - 2.5
	b	1.28 - 1.42	1.28 - 1.42			
High (3)	a	≥ 1.98	≥ 1.98	> 151.75	> 15.83	> 2.5
	b	≥ 1.42	≥ 1.42			

a: Uninterrupted Flow
b: Interrupted Flow

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

Segment Review

The needs for each segment were combined to numerically estimate the average level of need for each segment of the corridor. **Table 18** provides a summary of needs for each segment across all performance areas, with the average need score for each segment presented in the last row of the table. A weighting factor of 1.5 is applied to the need scores of the performance areas identified as emphasis areas (Pavement, Safety, and Freight for the SR 260 | US 60 corridor). Overall, four segments have been assessed with a Medium average need and the remaining five segments with a Low average need.

Table 18: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)								
	260-1	260-2	260-3	260|60-4	260-5	60-6	60-7	60-8	60-9
	MP 306-310	MP 310-323	MP 323-337	MP 337-345	MP 341-357	MP 345-352	MP 352-384	MP 384-389	MP 389-402
Pavement*	High	Medium	High	Low	Medium	Medium	High	Low	None*
Bridge	None*	None*	None*	None*	None*	None*	None*	None*	None*
Mobility	None*	Low	Low	Low	Medium	Low	Low	None	None
Safety*	None*	High	None	Low	Low	None	Low	None	None*
Freight*	Low	None	Low	High	High	High	Medium	Low	High
Average Need	**0.92**	**1.31**	**1.08**	**1.31**	**1.69**	**1.31**	**1.54**	**0.46**	**0.69**

* Identified as Emphasis Areas for SR 260 US 60 Corridor
^ 40B-17 Pavement Need estimated based on field review
[#] N/A indicates insufficient or no data available to determine level of need
[+] A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Level of Need	Average Need Range
None[+]	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

Summary of Corridor

The needs in each performance area are shown in **Figure 21** and summarized below:

Pavement Needs

- Segments 260-1, 260-3 and 60-7 have final needs of High; Segments 260-2, 260-5 and 60-6 have final needs of Medium
- Segments 260|60-4 and 60-8 have final needs of Low

Bridge Needs

- Three segments (260-1, 260-5, and 60-9) do not include any bridges
- Segment 60-6 includes one bridge, the Rocky Arroyo Bridge (No. 384), which could have a repetitive investment issue
- There are no final Bridge needs along the corridor

Mobility Needs

- Low Mobility needs exist on five of the nine segments of the corridor
- One segment (260-5) has Medium final needs due to Medium future Daily V/C needs and a Low level of need for mobility index
- Segment 60-7 contains Low closure extent needs
- Bicycle accommodation needs are High on four of the nine segments of the corridor

Safety Needs

- High Safety needs exist on one of the nine segments
- Safety hot spots exist in Segment 260|60-4 in the westbound direction

Freight Needs

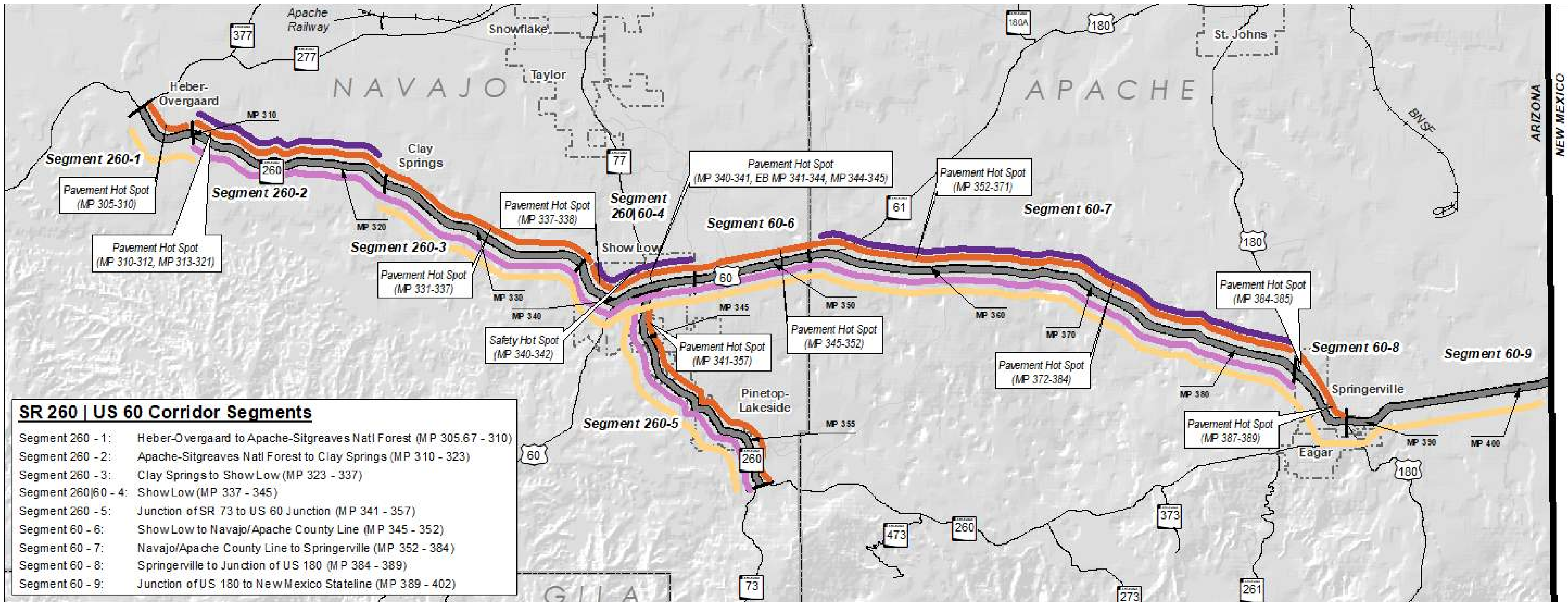
- High Freight needs exist on four of the nine segments
- Many segments along the corridor contain High directional TTTR, bridge clearance, and closure duration needs

Overlapping Needs

This section identifies overlapping performance needs on the SR 260 | US 60 corridor, which provides guidance to develop strategic solutions that address more than one performance area with elevated levels of need. Completing projects that address multiple needs presents the opportunity to more effectively improve overall performance. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- Segment 260-1 contains a High need in the Pavement performance area
- Segment 260-2 contains a Medium need in the Pavement performance area and a High need in the Safety performance area
- Segment 260-3 contains a High need in the Pavement performance area
- Segment 260|60-4 contains a High need in the Freight performance area
- Segment 260-5 contains a Medium need in the Pavement performance area, Medium need in the Mobility performance area, and a High need in the Freight performance area
- Segment 60-6 contains a Medium need in the Pavement performance area and a High need in the Freight performance area
- Segment 60-7 contains a High need in the Pavement performance area and a Medium need in the Freight performance area
- Segment 60-9 contains a High need in the Freight performance area

Figure 21: Corridor Needs Summary



Performance Area	260-1	260-2	260-3	260/60-4	260-5	60-6	60-7	60-8	60-9	Performance Area
	MP 305.67-310	MP 310-323	MP 323-337	MP 337-345	MP 341-357	MP 345-352	MP 352-384	MP 384-389	MP 389-402	
Pavement⁺	High	Medium	High	Low	Medium	Medium	High	Low	None*	Pavement⁺
Bridge	None*	None*	None*	None*	None*	None*	None*	None*	None*	Bridge
Mobility	None	Low	Low	Low	Medium	Low	Low	None	None	Mobility
Safety⁺	None	High	None	Low	None	None	Low	None	None	Safety⁺
Freight⁺	Low	None	Low	High	High	High	Medium	Low	High	Freight⁺
Average Need	0.92	1.31	1.08	1.31	1.69	1.31	1.54	0.46	0.69	Average Need

⁺ *Identified as emphasis area for SR 260 | US 60 Corridor*

**A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study.*

SR 260 | US 60 Corridor Profile Study: Heber-Overgaard to New Mexico State Line

Corridor Needs Summary

N

Miles

0 2 4 6 8

Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary

Performance Area Needs

Safety
Pavement
Freight
Mobility
Bridge

Level of Need	Average Need Range
None*	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

4.0 STRATEGIC SOLUTIONS

The principal objective of the CPS is to identify strategic solutions (investments) that are performance-based to ensure that available funding resources are used to maximize the performance of the State's key transportation corridors. One of the first steps in the development of strategic solutions is to identify areas of elevated levels of need (i.e., Medium or High). Addressing areas of Medium or High need will have the greatest effect on corridor performance and are the focus of the strategic solutions. Segments with Medium or High needs and specific locations of hot spots are considered strategic investment areas for which strategic solutions should be developed. Segments with lower levels of need or without identified hot spots are not considered candidates for strategic investment and are expected to be addressed through other ADOT programming processes. The SR 260 | US 60 strategic investment areas (resulting from the elevated needs) are shown in **Figure 22**.

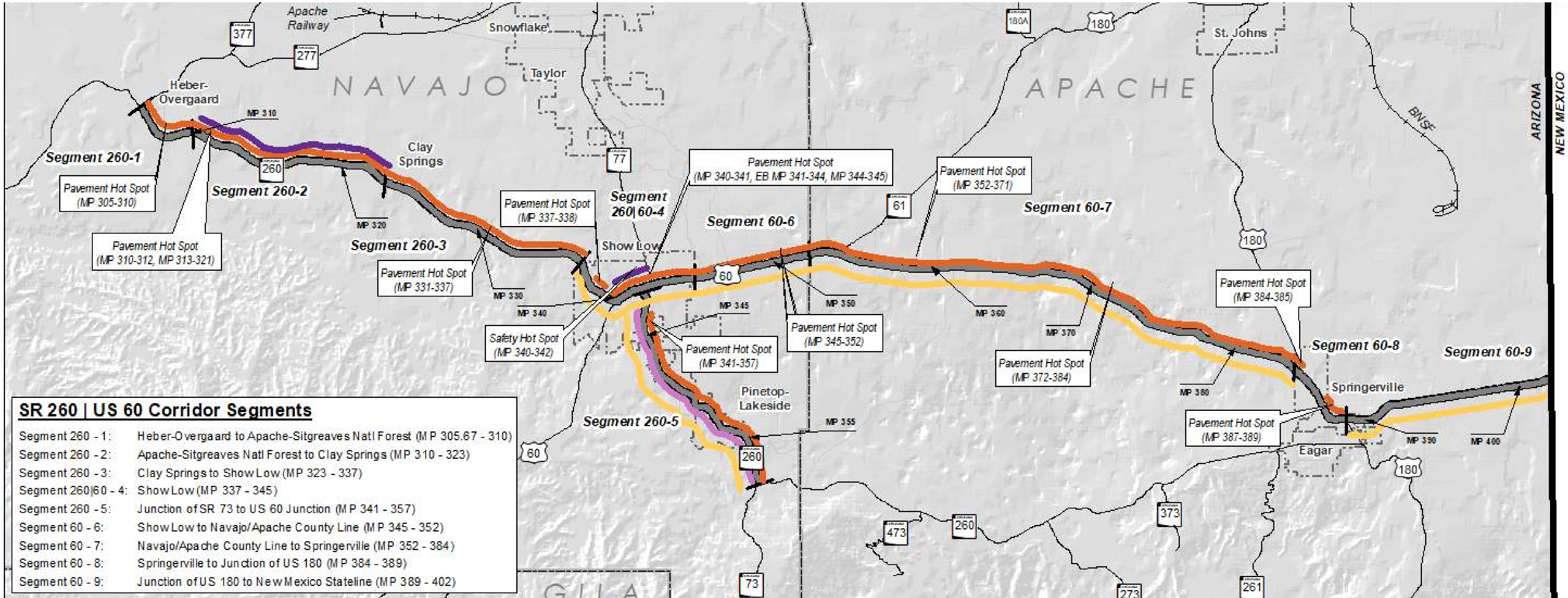
4.1 Screening Process

This section examines qualifying strategic needs and determines if the needs in those locations require action. In some cases, needs that are identified do not advance to solutions development and are screened out from further consideration because they have been or will be addressed through other measures, including:

- A project is programmed to address this need
- The need is a result of a Pavement or Bridge hot spot that does not show historical investment or rating issues; these hot spots will likely be addressed through other ADOT programming means
- A bridge is not a hot spot but is located within a segment with a Medium or High level of need; this bridge will likely be addressed through current ADOT bridge maintenance and preservation programming processes
- The need is determined to be non-actionable (i.e., cannot be addressed through an ADOT project)
- The conditions/characteristics of the location have changed since the performance data was collected that was used to identify the need

Table 19 notes if each potential strategic need advanced to solution development, and if not, the reason for screening the potential strategic need out of the process. Locations advancing to solutions development are marked with Yes (Y); locations not advancing are marked with No (N) and highlighted. This screening table provides specific information about the needs in each segment that will be considered for strategic investment. The table identifies the level of need – either Medium or High segment needs, or segments without Medium or High level of need that have a hot spot. Each area of need is assigned a location number in the screening table to help document and track locations considered for strategic investment.

Figure 22: Strategic Investment Areas



Performance Area	260-1 MP 305.67-310	260-2 MP 310-323	260-3 MP 323-337	260/60-4 MP 337-345	260-5 MP 341-357	60-6 MP 345-352	60-7 MP 352-384	60-8 MP 384-389	60-9 MP 389-402	Performance Area
Pavement*	High	Medium	High	Hot Spot	Medium	Medium	High	Hot Spot	-	Pavement*
Bridge	-	-	-	-	-	-	-	-	-	Bridge
Mobility	-	-	-	-	Medium	-	-	-	-	Mobility
Safety*	N/A	High	-	Hot Spot	-	-	-	-	N/A	Safety*
Freight*	-	-	-	High	High	High	Medium	-	High	Freight*

*Identified as emphasis area for SR 260 | US 60 Corridor
Note: Figure shows strategic investment areas, which are segments with Medium and High levels of need and locations of hotspots. A "-" symbol indicates a segment level of need of Low, None, or N/A, which is not considered strategic

SR 260 | US 60 Corridor Profile Study: Heber-Overgaard to New Mexico State Line
Strategic Investment Areas

Table 19: Strategic Investment Area Screening

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
260-1 (MP 305-310)	High	-	-	-	-	L1	Pavement	MP 305-310 has a High level of need based on the Pavement Index, PSR in both directions, 100% Area Failure and Hot Spots at MP 305-310 due to excessive cracking	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
260-2 (MP 310-323)	Medium	-	-	High	-	L2	Pavement	MP 310-323 has a Medium level of need based on 77% Area Failure and MP 310-312 and 313-321 have Hot Spots due to excessive cracking	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L3	Safety	Crash data analysis indicates percentage of crashes involving overturning (43%) or an animal (14%) were above statewide average. 50% of crashes involved lane departures (17% in opposing lane). 29% occurred in wet conditions, and 29% occurred in dark-unlighted conditions.	Y	No programmed project to address Safety need.
260-3 (MP 323-337)	High	-	-	-	-	L4	Pavement	MP 323-337 has a High level of need based on the Pavement Index with 43% Area Failure and Hot Spots at MP 331-337 due to excessive cracking	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
260|60-4 (MP 337-345)	Hot Spot	-	-	Hot Spot	High	L5	Pavement	Hot Spots at MP 337-338, 340-341, EB MP 341-344 and MP 344-345	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L6	Safety	Hot Spot at WB MP 340-342 Crash data analysis indicates a high rate of crashes involving collision with pedal cyclist or overturning (13% each), 25% involving rear ends, 25% left turns, and 25% involving excessive speed.	Y	No programmed project to address Safety need.
						L7	Freight	MP 337-345 has a High level of need based on the closure duration in both directions. One high closure due to winter storm accounts for high average.	N	No programmed project to address Freight need.

Legend: [shaded] Strategic investment area screened out from further consideration

Table 19: Strategic Investment Area Screening (continued)

Segment # and MP	Level of Strategic Need					Location #	Type	Need Description	Advance (Y/N)	Screening Description
	Pavement	Bridge	Mobility	Safety	Freight					
260-5 (MP 341-357)	Medium	-	Medium	-	High	L8	Pavement	MP 341-354 has a Medium level of need based on 100% Area Failure and MP 241-3571 have Hot Spots due to excessive cracking.	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L9	Mobility	MP 341-357 has a Medium level of need based on bicycle accommodation and Future Volume to Capacity Ratio.	Y	No programmed project to address Mobility need.
						L10	Freight	MP 341-357 has a High level of need based on the overall Freight Index, both directions of TTTR and closure duration in both directions. One high closure duration due to winter storm accounts for high average.	Y	No programmed project to address Freight need.
60-6 (MP 345-352)	Medium	-	-	-	High	L11	Pavement	MP 345-352 has a Medium level of need based on 100% Area Failure and 345-352 have Hot Spots due to excessive cracking	N	Pavement rehabilitation project is programmed in FY 19 and started in May 2021
						L12	Freight	MP 345-352 has a High level of need based on the overall Freight Index, both directions of TTTR and closure duration in both directions. One high closure duration due to winter storm accounts for high average.	Y	No programmed project to address Freight need.
60-7 (MP 352-384)	High	-	-	-	Medium	L13	Pavement	MP 352-384 has a High level of need based on the Pavement Index with 97% Area Failure and Hot spots at MP 352-371, and 372-384 due to excessive cracking	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L14	Freight	MP 352-384 has a Medium level of need based on the EB directional TTTR and closure duration in both directions. A few high closure durations due to winter storms.	Y	No programmed project to address Freight need.
60-8 (MP 384-389)	Hot Spot	-	-	-	-	L15	Pavement	Hot Spots at MP 384-385 and MP 387-389	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
60-9 (MP 389-402)	-	-	-	-	High	L16	Freight	MP 389-402 has a High level of need based on the overall Freight Index and TTTR in both directions.	Y	No programmed project to address Freight need.

Legend: [shaded] Strategic investment area screened out from further consideration

4.2 Candidate Solutions

For each elevated need within a strategic investment area that is not screened out, a candidate solution is developed to address the identified need. Each candidate solution is assigned to one of the following three P2P investment categories based on the scope of the solution:

- Preservation
- Modernization
- Expansion

Documented performance needs serve as the foundation for developing candidate solutions for corridor preservation, modernization, and expansion. Candidate solutions are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the SR 260 | US 60 corridor will be considered along with other candidate projects in the ADOT statewide programming process.

Characteristics of Strategic Solutions

Candidate solutions should include some or all of the following characteristics:

- Do not recreate or replace results from normal programming processes
- May include programs or initiatives, areas for further study, and infrastructure projects
- Address elevated levels of need (High or Medium) and hot spots
- Focus on investments in modernization projects (to optimize current infrastructure)
- Address overlapping needs
- Reduce costly repetitive maintenance
- Extend operational life of system and delay expansion
- Leverage programmed projects that can be expanded to address other strategic elements
- Provide measurable benefit

Candidate Solutions

A set of 6 candidate solutions are proposed to address the identified needs on the SR 260 | US 60 corridor.

Table 20 identifies each strategic location that has been assigned a candidate solution with a number (e.g., CS60.1, CS260.2, CS60.3 etc.). Each candidate solution is comprised of one or more components to address the identified needs. The assigned candidate solution numbers are linked to the location number and provide tracking capability through the rest of the process. The locations of proposed solutions are shown on the map in **Figure 23**.

Candidate solutions developed to address an elevated need in the Pavement or Bridge performance area will include two options: rehabilitation or full replacement. These solutions are initially evaluated through a Life-Cycle Cost Analysis (LCCA) to provide insights into the cost-effectiveness of these options so a recommended approach can be identified. Candidate solutions developed to address an elevated need in the Mobility, Safety, or Freight performance areas are advanced directly to the Performance Effectiveness Evaluation. In some cases, there may be multiple solutions identified to address the same area of need.

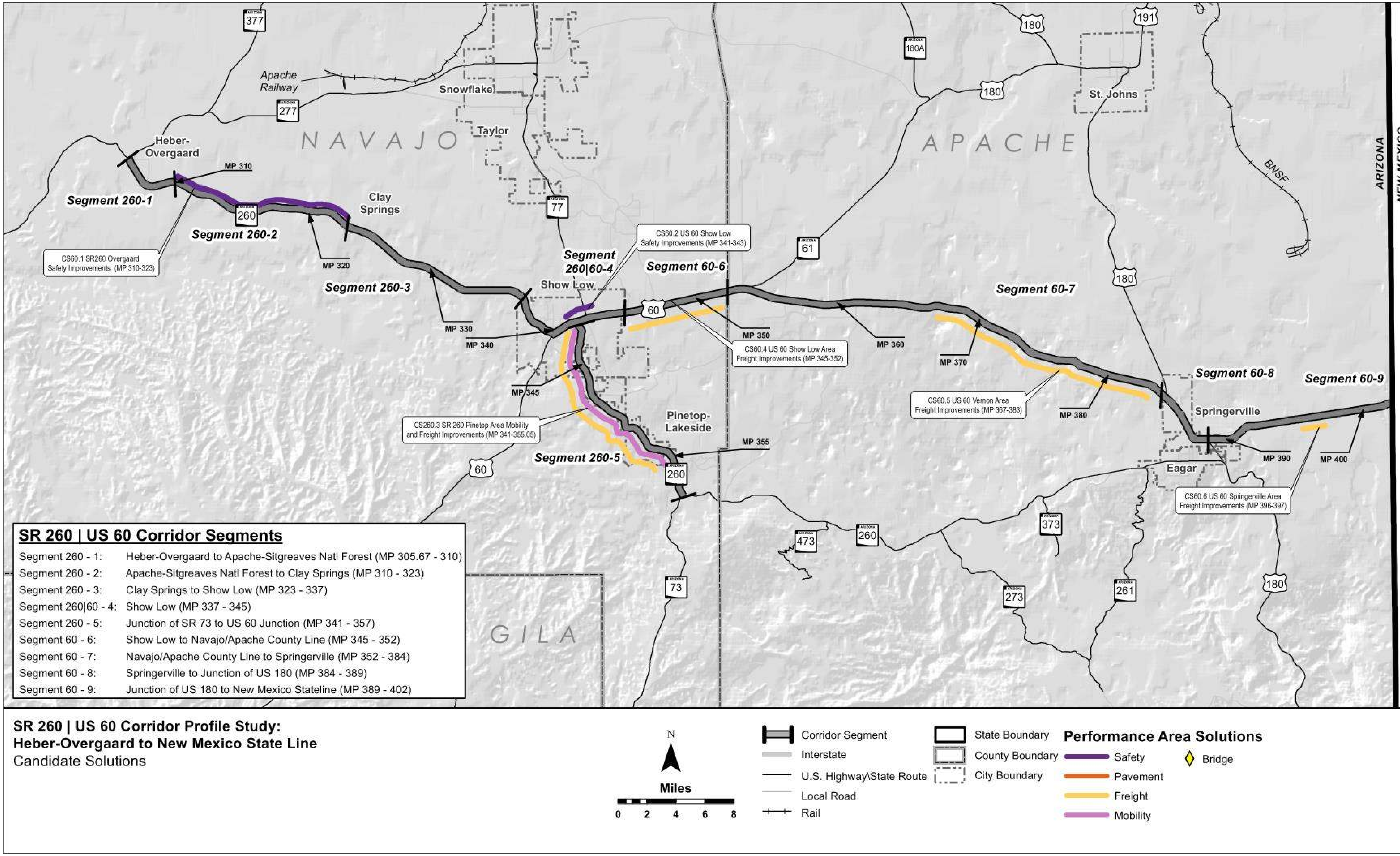
Candidate solutions that are recommended to expand or modify the scope of an already programmed project are noted and are not advanced to solution evaluation and prioritization. These solutions are directly recommended for programming.

Table 20: Candidate Solutions

Candidate Solution #	Segment #	Location #	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option*	Candidate Solution Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS260.1	260-2	L3	310	323	Overgaard Safety Improvements	-	• Install centerline rumblestrips • Widen shoulders both directions and install rumblestrips • Improve skid resistance, MP 312-316	M
CS60.2	260|60-4	L6	341	343	Show Low Safety Improvements	-	• Limit driveway access to right-in right-out only (MP 341-343) • Install high-visibility striping (MP 341-343) • Install lighting (MP 342-343) • Install right turn lane (MP 342.2)	M
CS260.3	260-5	L9/L10	341	355	Pinetop Area Mobility and Freight Improvements	-	• Add a through lane in both EB and WB directions (MP 341-355.05)	E
CS60.4	60-6	L12	345	352	Show Low Area Freight Improvements	-	• Widen shoulders in both directions • Add passing lane in EB direction (MP 349-350) • Add passing lane in WB direction (MP 350-351)	M
CS60.5	60-7	L14	367	383	Vernon Area Freight Improvements	-	• Construct EB climbing lane (MP 367-368) • Construct WB climbing lane (MP 380-381) • Construct EB climbing lane (MP 382-383)	M
CS60.6	60-9	L16	396	397	Springerville Area Freight Improvements	-	• Construct EB climbing lane (MP 396-397)	M

* '-': Indicates only one solution is being proposed and no options are being considered

Figure 23: Candidate Solutions



5.0 SOLUTION EVALUATION AND PRIORITIZATION

Candidate solutions are evaluated using the following steps: LCCA (where applicable), Performance Effectiveness Evaluation, Solution Risk Analysis, and Candidate Solution Prioritization. The methodology and approach to this evaluation are shown in **Figure 24** and described more fully below.

Life-Cycle Cost Analysis

All Pavement and Bridge candidate solutions have two options: rehabilitation/repair or reconstruction. These options are evaluated through an LCCA to determine the best approach for each location where a Pavement or Bridge solution is recommended. The LCCA can eliminate options from further consideration and identify which options should be carried forward for further evaluation.

When multiple independent candidate solutions are developed for Mobility, Safety, or Freight strategic investment areas, these candidate solution options advance directly to the Performance Effectiveness Evaluation without an LCCA.

Performance Effectiveness Evaluation

After completing the LCCA process, all remaining candidate solutions are evaluated based on their performance effectiveness. This process includes determining a Performance Effectiveness Score (PES) based on how much each solution impacts the existing performance and needs scores for each segment. This evaluation also includes a Performance Area Risk Analysis to help differentiate between similar solutions based on factors that are not directly addressed in the performance system.

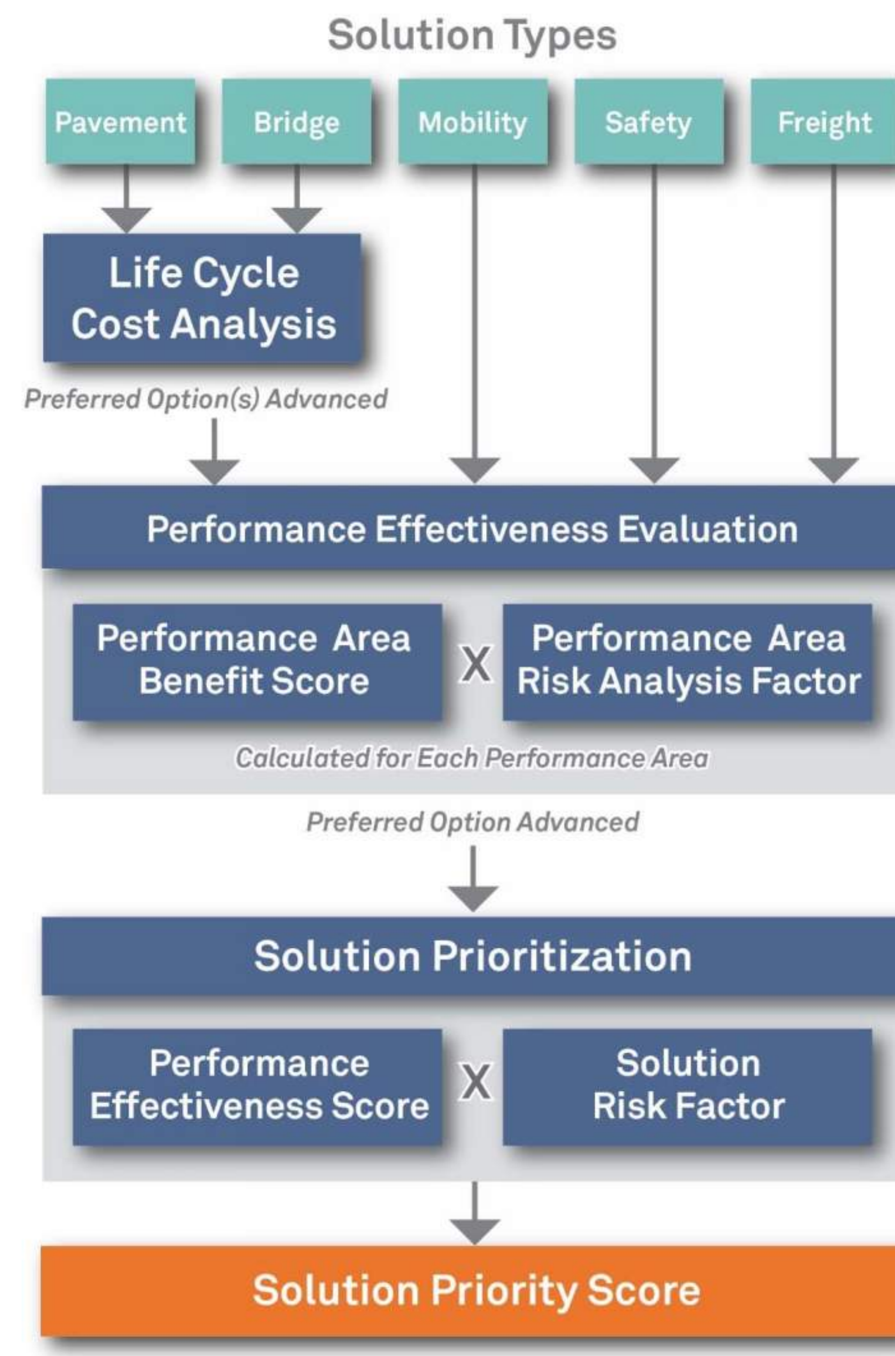
Solution Risk Analysis

All candidate solutions advanced through the Performance Effectiveness Evaluation are also evaluated through a Solution Risk Analysis process. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of performance failure.

Candidate Solution Prioritization

The PES, weighted risk factor, and segment average need score are combined to create a prioritization score. The candidate solutions are ranked by prioritization score from highest to lowest. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Solutions that address multiple performance areas tend to score higher in this process.

Figure 24: Candidate Solution Evaluation Process



5.1 Life-Cycle Cost Analysis

LCCA is conducted for any candidate solution that is developed as a result of a need in the Pavement or Bridge performance area. The intent of the LCCA is to determine which options warrant further investigation and eliminate options that would not be considered strategic.

LCCA is an economic analysis that compares cost streams over time and presents the results in a common measure, the present value of all future costs. The cost stream occurs over an analysis period that is long enough to provide a reasonably fair comparison among alternatives that may differ significantly in scale of improvement actions over shorter time periods. For both bridge and pavement LCCA, the costs are focused on agency (ADOT) costs for corrective actions to meet the objective of keeping the bridge or pavement serviceable over a long period of time.

LCCA is performed to provide a more complete holistic perspective on asset performance and agency costs over the life of an investment stream. This approach helps ADOT look beyond initial and short-term costs, which often dominate the considerations in transportation investment decision making and programming.

Bridge LCCA

For the bridge LCCA, three basic strategies are analyzed that differ in timing and scale of improvement actions to maintain the selected bridges, as described below:

- Bridge replacement (large upfront cost but small ongoing costs afterwards)
- Bridge rehabilitation until replacement (moderate upfront costs then small to moderate ongoing costs until replacement)
- On-going repairs until replacement (low upfront and ongoing costs until replacement)

The bridge LCCA model developed for the CPS reviews the characteristics of the candidate bridges including bridge ratings and deterioration rates to develop the three improvement strategies (full replacement, rehabilitation until replacement, and repair until replacement). Each strategy consists of a set of corrective actions that contribute to keeping the bridge serviceable over the analysis period. Cost and effect of these improvement actions on the bridge condition are essential parts of the model. Other considerations in the model include bridge age, elevation, pier height, length-to-span ratio, skew angle, and substandard characteristics such as shoulders and vehicle clearance. The following assumptions are included in the bridge LCCA model:

- The bridge LCCA only addresses the structural condition of the bridge and does not address other issues or costs
- The bridge will require replacement at the end of its 75-year service life regardless of current condition
- The bridge elevation, pier height, skew angle, and length-to-span ratio can affect the replacement and rehabilitation costs
- The current and historical ratings are used to estimate a rate of deterioration for each candidate bridge
- Following bridge replacement, repairs will be needed every 20 years
- Different bridge repair and rehabilitation strategies have different costs, expected service life, and benefit to the bridge rating
- The net present value of future costs is discounted at 3% and all dollar amounts are in 2022 dollars
- If the LCCA evaluation recommends rehabilitation or repair, the solution is not considered strategic and the rehabilitation or repair will be addressed by normal programming processes
- Because this LCCA is conducted at a planning level, and due to the variabilities in costs and improvement strategies, the LCCA net present value results that are within 15% should be considered equally; in such a case, the solution should be carried forward as a strategic replacement project – more detailed scoping will confirm if replacement or rehabilitation is needed

Based on the candidate solutions presented in **Table 20** LCCA was not conducted for any bridges on the SR 260 | US 60 corridor. This is reflected in **Table 21**. Additional information regarding the bridge LCCA is included in **Appendix E**.

Pavement LCCA

The LCCA approach to pavement is very similar to the process used for bridges. For the pavement LCCA, three basic strategies are analyzed that differ in timing and scale of improvement actions to maintain the selected pavement, as described below:

- Pavement replacement (large upfront cost but small ongoing costs afterwards – could be replacement with asphalt or concrete pavement)
- Pavement major rehabilitation until replacement (moderate upfront costs then small to moderate ongoing costs until replacement)
- Pavement minor rehabilitation until replacement (low upfront and ongoing costs until replacement)

The pavement LCCA model developed for the CPS reviews the characteristics of the candidate paving locations including the historical rehabilitation frequency to develop potential improvement strategies (full replacement, major rehabilitation until replacement, and minor rehabilitation until replacement, for either concrete or asphalt, as applicable). Each strategy consists of a set of corrective actions that contribute to keeping the pavement serviceable over the analysis period. The following assumptions are included in the pavement LCCA model:

- The pavement LCCA only addresses the condition of the pavement and does not address other issues or costs
- The historical pavement rehabilitation frequencies at each location are used to estimate future rehabilitation frequencies
- Different pavement replacement and rehabilitation strategies have different costs and expected service life

- The net present value of future costs is discounted at 3% and all dollar amounts are in 2022 dollars
- If the LCCA evaluation recommends rehabilitation or repair, the solution is not considered strategic and the rehabilitation will be addressed by normal programming processes
- Because this LCCA is conducted at a planning level, and due to the variabilities in costs and improvement strategies, the LCCA net present value results that are within 15% should be considered equally; in such a case, the solution should be carried forward as a strategic replacement project – more detailed scoping will confirm if replacement or rehabilitation is needed

Based on the candidate solutions presented in **Table 20**, LCCA was not conducted for any pavement solutions on the SR 260 | US 60 corridor. This is reflected in **Table 22**. Additional information regarding the pavement LCCA is contained in **Appendix E**.

Table 21: Bridge Life-Cycle Cost Analysis Results

Candidate Solution	Present Value at 3% Discount Rate ($)			Ratio of Present Value Compared to Lowest Present Value			Other Needs	Results
	Replace	Rehab	Repair	Replace	Rehab	Repair		
No LCCA conducted for any bridge candidate solutions on the SR 260 | US 60 Corridor.								

Table 22: Pavement Life-Cycle Cost Analysis Results

Candidate Solution	Present Value at 3% Discount Rate ($)				Ratio of Present Value Compared to Lowest Present Value				Other Needs	Results
	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehabilitation	Asphalt Light Rehabilitation	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehabilitation	Asphalt Light Rehabilitation		
No LCCA conducted for any pavement candidate solutions on the SR 260 | US 60 Corridor.										

5.2 Performance Effectiveness Evaluation

The results of the Performance Effectiveness Evaluation are combined with the results of a Performance Area Risk Analysis to determine a Performance Effectiveness Score (PES). The objectives of the Performance Effectiveness Evaluation include:

- Measure the benefit to the performance system versus the cost of the solution
- Include risk factors to help differentiate between similar solutions
- Apply to each performance area that is affected by the candidate solution
- Account for emphasis areas identified for the corridor

The Performance Effectiveness Evaluation includes the following steps:

- Estimate the post-solution performance for each of the five performance areas (Pavement, Bridge, Mobility, Safety, and Freight)
- Use the post-solution performance scores to calculate a post-solution level of need for each of the five performance areas
- Compare the pre-solution level of need to the post-solution level of need to determine the reduction in level of need (potential solution benefit) for each of the five performance areas
- Calculate performance area risk weighting factors for each of the five performance areas
- Use the reduction in level of need (benefit) and risk weighting factors to calculate the PES

Post-Solution Performance Estimation

For each performance area, a slightly different approach is used to estimate the post-solution performance. This process is based on the following assumptions:

- Pavement:
  - The IRI rating would decrease (to 30 for replacement or 45 for rehabilitation)
  - The Cracking rating would decrease (to 0 for replacement or rehabilitation)
- Bridge:
  - The structural ratings would increase (+1 for repair, +2 for rehabilitation, or increase to 8 for replacement)
  - The Sufficiency Rating would increase (+10 for repair, +20 for rehabilitation, or increase to 98 for replacement)
- Mobility:
  - Additional lanes would increase the capacity and therefore affect the Mobility Index and associated secondary measures
  - Other improvements (e.g., ramp metering, parallel ramps, variable speed limits) would also increase the capacity (to a lesser extent than additional lanes) and therefore would affect the Mobility Index and associated secondary measures
  - Changes in the Mobility Index (due to increased capacity) and Safety Index (due to crash reductions) would have a direct effect on the LOTTR secondary measure
  - Changes in the Safety Index (due to crash reductions) would have a direct effect on the Closure Extent secondary measure
- Safety:
  - Crash modification factors were developed that would be applied to estimate the reduction in crashes (for additional information see **Appendix F**)
- Freight:
  - Changes in the Mobility Index (due to increased capacity) and Safety Index (due to crash reductions) would have a direct effect on the Freight Index and the TTTR secondary measure
  - Changes in the Safety Index (due to crash reductions) would have a direct effect on the Closure Duration secondary measure

Performance Area Risk Analysis

The Performance Area Risk Analysis is intended to develop a numeric risk weighting factor for each of the five performance areas (Pavement, Bridge, Mobility, Safety, and Freight). This risk analysis addresses other considerations for each performance area that are not directly included in the performance system. A risk weighting factor is calculated for each candidate solution based on the specific characteristics at the solution location. For example, the Pavement Risk Factor is based on factors such as the elevation, daily traffic volumes, and amount of truck traffic. Additional information regarding the Performance Area Risk Factors is included in **Appendix G**.

Following the calculation of the reduction in level of need (benefit) and the Performance Area Risk Factors, these values are used to calculate the PES. In addition, the reduction in level of need in each emphasis area is also included in the PES.

Net Present Value Factor

The benefit (reduction in need) is measured as a one-time benefit. However, different types of solutions will have varying service lives during which the benefits will be obtained. For example, a preservation solution would likely have a shorter stream of benefits over time when compared to a modernization or expansion solution. To address the varying lengths of benefit streams, each solution is classified as a 10-year, 20-year, 30-year, or 75-year benefit stream, or the net present value (NPV) factor (F_{NPV}). A 3% discount rate is used to calculate F_{NPV} for each classification of solution. The service lives and respective factors are described below:

- A 10-year service life is generally reflective of preservation solutions such as pavement and bridge preservation; these solutions would likely have a 10-year stream of benefits; for these solutions, a F_{NPV} of 8.8 is used in the PES calculation
- A 20-year service life is generally reflective of modernization solutions that do not include new infrastructure; these solutions would likely have a 20-year stream of benefits; for these solutions, a F_{NPV} of 15.3 is used in the PES calculation

- A 30-year service life is generally reflective of expansion solutions or modernization solutions that include new infrastructure; these solutions would likely have a 30-year stream of benefits; for these solutions, a F_{NPV} of 20.2 is used in the PES calculation
- A 75-year service life is used for bridge replacement solutions; these solutions would likely have a 75-year stream of benefits; for these solutions, a F_{NPV} of 30.6 is used in the PES calculation

Vehicle-Miles Travelled Factor

Another factor in assessing benefits is the number of travelers who would benefit from the implementation of the candidate solution. This factor varies between candidate solutions depending on the length of the solution and the magnitude of daily traffic volumes. Multiplying the solution length by the daily traffic volume results in vehicle-miles travelled (VMT), which provides a measure of the amount of traffic exposure that would receive the benefit of the proposed solution. The VMT is converted to a VMT factor (known as F_{VMT}), which is on a scale between 0 and 5, using the equation below:

$$F_{VMT} = 5 - (5 \times e^{VMT \times -0.0000139})$$

Performance Effectiveness Score

The PES is calculated using the following equation:

PES = ((Sum of all Risk Factored Benefit Scores + Sum of all Risk Factored Emphasis Area Scores) / Cost) x F_{VMT} x F_{NPV}

Where:

Risk Factored Benefit Score = Reduction in Segment-Level Need (benefit) x Performance Area Risk Weighting Factor (calculated for each performance area)

Risk Factored Emphasis Area Score = Reduction in Corridor-Level Need x Performance Area Risk Factors x Emphasis Area Factor (calculated for each emphasis area)

*Cost = estimated cost of candidate solution in millions of dollars (see **Appendix H**)*

F_{VMT} = Factor between 0 and 5 to account for VMT at location of candidate solution based on existing daily volume and length of solution

F_{NPV} = Factor (ranging from 8.8 to 30.6 as previously described) to address anticipated longevity of service life (and duration of benefits) for each candidate solution

The resulting PES values are shown in **Table 23**. Additional information regarding the calculation of the PES is contained in **Appendix I**.

For candidate solutions with multiple options to address Mobility, Safety, or Freight needs, the PES should be compared to help identify the best performing option. If one option clearly performs better than the other options (e.g., more than twice the PES value and a difference in magnitude of at least 20 points), the other options can be eliminated from further consideration. If multiple options have similar PES values, or there are other factors not accounted for in the performance system that could significantly influence the ultimate selection of an option (e.g., potential environmental concerns, potential adverse economic impacts), those options should all be advanced to the prioritization process. On the SR 260 | US 60 Corridor, no candidate solutions have options to address needs.

Table 23: Performance Effectiveness Scores

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost* (in millions)	Risk Factored Benefit Score					Risk Factored Emphasis Area Scores			Total Factored Benefit Score	F_{VMT}	F_{NPV}	Performance Effectiveness Score
						Pavement	Bridge	Mobility	Safety	Freight	Pavement	Safety	Freight				
CS260.1	260-2	-	Overgaard Safety Improvements	310-323	$52.2	0.000	0.000	1.111	15.641	1.330	0.000	0.295	0.338	18.715	2.79	15.3	15.3
CS60.2	260|60-4	-	Show Low Safety Improvements	341-343	$8.1	0.000	0.000	0.007	0.273	0.189	0.000	0.028	0.025	0.523	1.35	15.3	1.3
CS260.3	260-5	-	Pinetop Area Mobility and Freight Improvements	341-355	$297.2	0.000	0.000	4.828	0.057	2.164	0.000	0.012	0.544	7.605	4.87	20.2	2.5
CS60.4	60-6	-	Show Low Area Mobility and Freight Improvements	345-352	$28.4	0.000	0.000	6.301	0.099	1.504	0.000	0.010	0.546	8.460	2.25	15.3	11.9
CS60.5	60-7	-	Vernon Area Freight Improvements	367-383	$19.4	0.000	0.000	5.423	0.000	0.757	0.000	0.000	0.121	6.301	1.75	20.2	11.4
CS60.6	60-9	-	Springerville Area Freight Improvements	396-397	$6.4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.03	20.2	0.0

*: See Table 25 for total construction costs

5.3 Solution Risk Analysis

Following the calculation of the PES, an additional step is taken to develop the prioritized list of solutions. A solution risk probability and consequence analysis is conducted to develop a solution-level risk weighting factor. This risk analysis is a numeric scoring system to help address the risk of not implementing a solution based on the likelihood and severity of performance failure. **Figure 25** shows the risk matrix used to develop the risk weighting factors.

Figure 25: Risk Matrix

		Severity/Consequence				
		Insignificant	Minor	Significant	Major	Catastrophic
Frequency/ Likelihood	Very Rare	Low	Low	Low	Moderate	Major
	Rare	Low	Low	Moderate	Major	Major
	Seldom	Low	Moderate	Moderate	Major	Severe
	Common	Moderate	Moderate	Major	Severe	Severe
	Frequent	Moderate	Major	Severe	Severe	Severe

Using the risk matrix in **Figure 25**, numeric values were assigned to each category of frequency and severity. The higher the risk, the higher the numeric factor that was assigned. The risk weight for each area of the matrix was calculated by multiplying the severity factor times the frequency factor. These numeric factors are shown in **Figure 26**.

Figure 26: Numeric Risk Matrix

			Severity/Consequence				
			Insignificant	Minor	Significant	Major	Catastrophic
		Weight	1.00	1.10	1.20	1.30	1.40
Frequency/ Likelihood	Very Rare	1.00	1.00	1.10	1.20	1.30	1.40
	Rare	1.10	1.10	1.21	1.32	1.43	1.54
	Seldom	1.20	1.20	1.32	1.44	1.56	1.68
	Common	1.30	1.30	1.43	1.56	1.69	1.82
	Frequent	1.40	1.40	1.54	1.68	1.82	1.96

Using the values in **Figure 26**, risk weighting factors were calculated for each of the following four risk categories: low, moderate, major, and severe. These values are simply the average of the values in **Figure 26** that fall within each category. The resulting average risk weighting factors are:

Low	Moderate	Major	Severe
1.14	1.36	1.51	1.78

The risk weighting factors listed above are assigned to the five performance areas as follows:

- Safety = 1.78
  - The Safety performance area quantifies the likelihood of fatal or incapacitating injury crashes; therefore, it is assigned the Severe (1.78) risk weighting factor
- Bridge = 1.51
  - The Bridge performance area focuses on the structural adequacy of bridges; a bridge failure may result in crashes or traffic being detoured for long periods of time resulting in significant travel time increases; therefore, it is assigned the Major (1.51) risk weighting factor
- Mobility and Freight = 1.36
  - The Mobility and Freight performance areas focus on capacity and congestion; failure in either of these performance areas would result in increased travel times but would not have significant effect on safety (crashes) that would not already be addressed in the Safety performance area; therefore, they are assigned the Moderate (1.36) risk weighing factor
- Pavement = 1.14
  - The Pavement performance area focuses on the ride quality of the pavement; failure in this performance area would likely be a spot location that would not dramatically affect drivers beyond what is already captured in the Safety performance area; therefore, it is assigned the Low (1.14) risk weighting factor

The benefit in each performance area is calculated for each candidate solution as part of the Performance Effectiveness Evaluation. Using this information on benefits and the risk factors listed above, a weighted (based on benefit) solution-level numeric risk factor is calculated for each candidate solution. For example, a solution that has 50% of its benefit in Safety and 50% of its benefit in Mobility has a weighted risk factor of 1.57 (0.50 x 1.36 + 0.50 x 1.78 = 1.57).

5.4 Candidate Solution Prioritization

The PES, weighted risk factor, and segment average need score are combined to create a prioritization score as follows:

Prioritization Score = PES x Weighted Risk Factor x Segment Average Need Score

Where:

*PES = Performance Effectiveness Score as shown in **Table 23***

Weighted Risk Factor = Weighted factor to address risk of not implementing a solution based on the likelihood and severity of the performance failure

*Segment Average Need Score = Segment average need score as shown in **Table 17***

Table 24 shows the prioritization scores for the candidate solutions subjected to the solution evaluation and prioritization process. Solutions that address multiple performance areas tend to score higher in this process. A prioritized list of candidate solutions is provided in the subsequent section. See **Appendix J** for additional information on the prioritization process.

Table 24: Prioritization Scores

Candidate Solution #	Segment #	Option	Candidate Solution Name	Milepost Location	Estimated Cost (in millions)	Performance Effectiveness Score	**Weighted Risk Factor**	Segment Average Need Score	Prioritization Score	**Percentage by which Solution Reduces Performance Area Segment Needs**				
										Pavement	Bridge	Mobility	Safety	Freight
CS260.1	260-2	-	Overgaard Safety Improvements	310-323	$52.2	15.3	1.718	1.31	**34**	0.0%	0.0%	16.9%	80.9%	33.3%
CS60.2	260|60-4	-	Show Low Safety Improvements	341-343	$8.1	1.3	1.602	1.31	**3**	0.0%	0.0%	0.8%	18.5%	7.4%
CS260.3	260-5	-	Pinetop Area Mobility and Freight Improvements	341-355	$297.2	2.5	1.364	1.69	**6**	0.0%	0.0%	70.3%	100%	42.9%
CS60.4	60-6	-	Show Low Area Mobility and Freight Improvements	345-352	$28.4	11.9	1.365	1.31	**21**	0.0%	0.0%	53.7%	100%	4.3%
CS60.5	60-7	-	Vernon Area Freight Improvements	367-383	$19.4	11.4	1.360	1.54	**24**	0.0%	0.0%	57.9%	0%	3.4%
CS60.6	60-9	-	Springerville Area Freight Improvements	396-397	$6.4	0.0	0.000	0.69	**0**	0.0%	0.0%	0.0%	0%	0.0%

6.0 SUMMARY OF CORRIDOR RECOMMENDATIONS

6.1 Prioritized Candidate Solution Recommendations

Table 25 and **Figure 27** show the prioritized candidate solutions recommended for the SR 260 | US 60 corridor in ranked order of priority. The highest prioritization score indicates the candidate solution that is recommended as the highest priority. Implementation of these solutions is anticipated to improve performance of the SR 260 | US 60 corridor. The following observations were noted about the prioritized solutions:

- All of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest priority solutions address needs in the Overgaard Area (MP 310-323) along SR 260)

6.2 Other Corridor Recommendations

As part of the investigation of strategic investment areas and candidate solutions, other corridor recommendations can also be identified. These recommendations could include modifications to the existing Statewide Construction Program, areas for further study, or other corridor-specific recommendations that are not related to construction or policy. The list below identifies other corridor recommendations for the SR 260 | US 60 corridor:

- Conduct access management studies in the future for the more populated areas of the SR 260 | US 60 corridor:
  - US 60 through the Town Show Low from MP 340-342
  - SR 260 beginning in Show Low to Pinetop-Lakeside from MP 341-355
- Conduct future wildlife mitigation studies to address and reduce the high number of animal crashes on the SR 260 | US 60 corridor. According to data used for this study, animal-vehicle collisions (not resulting in fatal or incapacitating crashes) are concentrated in the following locations:
  - SR 260 – Eastbound: MP 309-322, MP 324-333, MP 335-337, MP 352, MP 356-357
  - SR 260 – Westbound: MP 310-317, MP 318-323, MP 324-333, MP 336, MP 343-345, MP 346-351
  - US 60 – Eastbound: MP 343-345, MP 349-351, MP 358-363
  - US 60 – Westbound: MP 350-352, MP 358-360, MP 362-364, MP 365-367, MP 387-388

6.3 Policy and Initiative Recommendations

In addition to location-specific needs, general corridor and system-wide needs have also been identified through the CPS process. While these needs are more overarching and cannot be individually evaluated through this process, it is important to document them. A list of recommended policies and initiatives was developed for consideration when programming future projects not only on the SR 260 | US 60 corridor, but across the entire state highway system where the conditions are applicable. The following list, which is in no particular order of priority, was derived from the initial four CPS rounds:

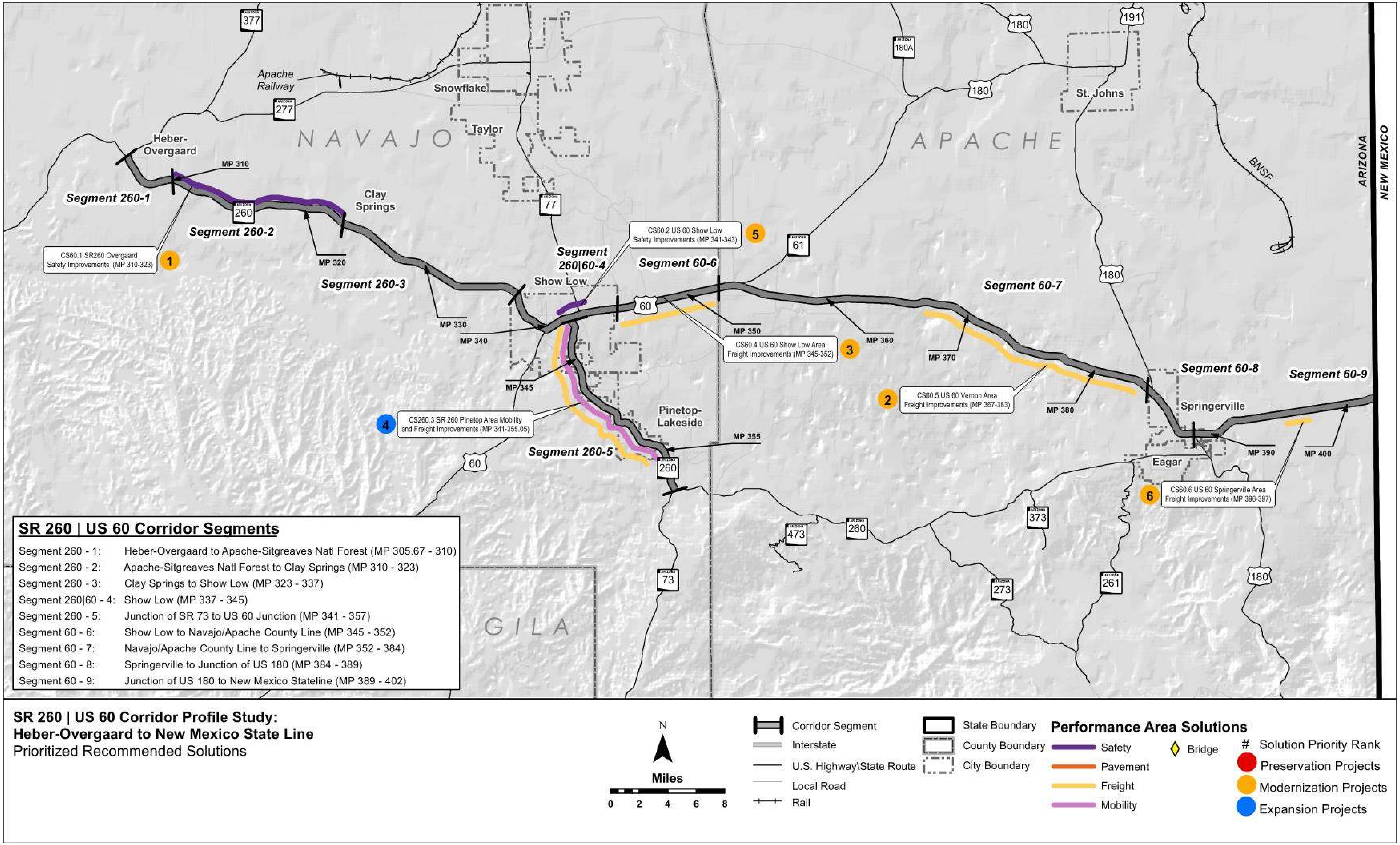
- Install Intelligent Transportation System (ITS) conduit with all new infrastructure projects
- Prepare strategic plans for Closed Circuit Television (CCTV) camera and Road Weather Information System (RWIS) locations statewide
- Leverage power and communication at existing weigh-in-motion (WIM), dynamic message signs (DMS), and call box locations to expand ITS applications across the state
- Consider solar power for lighting and ITS where applicable
- Investigate ice formation prediction technology where applicable
- Conduct highway safety manual evaluation for all future programmed projects
- Develop infrastructure maintenance and preservation plans (including schedule and funding) for all pavement and bridge infrastructure replacement or expansion projects
- Develop standardized bridge maintenance procedures so districts can do routine maintenance work
- Review historical ratings and level of previous investment during scoping of pavement and bridge projects. In pavement locations that warrant further investigation, conduct subsurface investigations during project scoping to determine if full replacement is warranted
- For pavement rehabilitation projects, enhance the amount/level of geotechnical investigations to address issues specific to the varying conditions along the project
- Expand programmed and future pavement projects as necessary to include shoulders
- Expand median cable barrier guidelines to account for safety performance
- Install CCTV cameras with all DMS
- In locations with limited communications, use CCTV cameras to provide still images rather than streaming video
- Develop statewide program for pavement replacement
- Install additional continuous permanent count stations along strategic corridors to enhance traffic count data
- When reconstruction or rehabilitation activities will affect existing bridge vertical clearance, the dimension of the new bridge vertical clearance should be a minimum of 16.25 feet where feasible
- All new or reconstructed roadway/shoulder edges adjacent to an unpaved surface should be constructed with a Safety Edge
- Collision data on tribal lands may be incomplete or inconsistent; additional coordination for data on tribal lands is required to ensure adequate reflection of safety issues
- Expand data collection devices statewide to measure freight delay
- Evaluate and accommodate potential changes in freight and goods movement trends that may result from improvements and expansions to the state roadway network
- At traffic interchanges with existing communication connectivity to the ADOT TOC, consideration should be given to adding thermal detection cameras for vehicle detection with the capability for wrong way vehicle detection
- Improved vehicle detection systems, as recommended by ADOT Systems Technology group, should be deployed at traffic interchanges for improved traffic control

Table 25: Prioritized Recommended Solutions

Rank	Candidate Solution #	Option	Candidate Solution Name	Candidate Solution Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	CS260.1	-	Overgaard Safety Improvements (SR 260 MP 310-323)	• Install centerline rumble strips • Widen shoulders both directions and install rumble strips Improve skid resistance, MP 312-316	$52.2	M	**34**
2	CS60.5	-	Vernon Area Freight Improvements (US 60 MP 367-383)	• Construct EB climbing lane (MP 367-368) • Construct WB climbing lane (MP 380-381) • Construct EB climbing lane (MP 382-383)	$19.4	M	**24**
3	CS60.4	-	Show Low Area Freight Improvements (US 60 MP 345-352)	• Widen shoulders in both directions • Add passing lane in EB direction (MP 349-350) • Add passing lane in WB direction (MP 350-351)	$28.4	M	**21**
4	CS260.3	-	Pinetop Area Mobility and Freight Improvements (SR 260 MP 341-355)	• Add a through lane in both EB and WB directions (MP 341-355.05)	$297.2	E	**6**
5	CS60.2	-	Show Low Safety Improvements (US 60 MP 341-343)	• Limit driveway access to right-in right-out only (MP 341-343) • Install high-visibility striping (MP 341-343) • Install lighting (MP 342-343) • Install right turn lane (MP 342.2)	$8.1	M	**3**
6	CS60.6	-	Springerville Area Freight Improvements (US 60 MP 396-397)	• Construct EB climbing lane (MP 396-397)	$6.4	M	**0**

* '-': Indicates only one solution is being proposed and no options are being considered

Figure 27: Prioritized Recommended Solutions

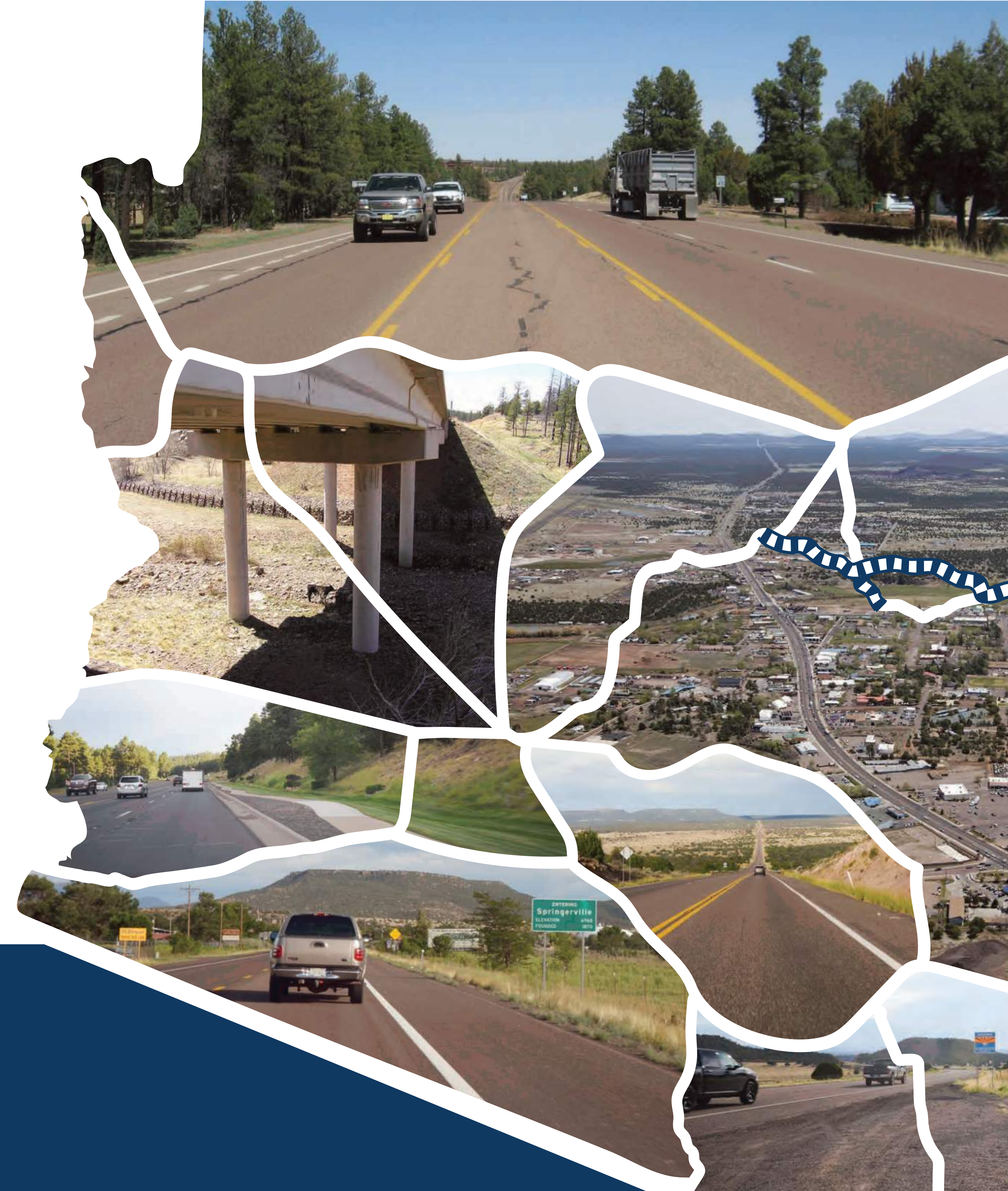


6.4 Next Steps

The candidate solutions recommended in this study are not intended to be a substitute or replacement for traditional ADOT project development processes where various ADOT technical groups and districts develop candidate projects for consideration in the performance-based programming in the P2P process. Rather, these candidate solutions are intended to complement ADOT's traditional project development processes through a performance-based process to address needs in one or more of the five performance areas of Pavement, Bridge, Mobility, Safety, and Freight. Candidate solutions developed for the SR 260 | US 60 corridor will be considered along with other candidate projects in the ADOT statewide programming process.

It is important to note that the candidate solutions are intended to represent strategic solutions to address existing performance needs related to the Pavement, Bridge, Mobility, Safety, and Freight performance areas. Therefore, the strategic solutions are not intended to preclude recommendations related to the ultimate vision for the corridor that may have been defined in the context of prior planning studies and/or design concept reports. Recommendations from such studies are still relevant to addressing the ultimate corridor objectives.

These results will be incorporated into a summary document comparing all corridors that is expected to provide a performance-based review of statewide needs and candidate solutions.



Appendices

Appendix A: Corridor Performance Maps

This appendix contains maps of each primary and secondary measure associated with the five performance areas for the SR 260/US 60 corridor. The following are the areas and maps included:
Pavement Performance Area:

- Pavement Index and Hot Spots
- Pavement Serviceability (directional)
- Percentage of Pavement Area Failure

Bridge Performance Area:

- Bridge Index and Hot Spots
- Bridge Sufficiency
- Lowest Bridge Rating

Mobility Performance Area:

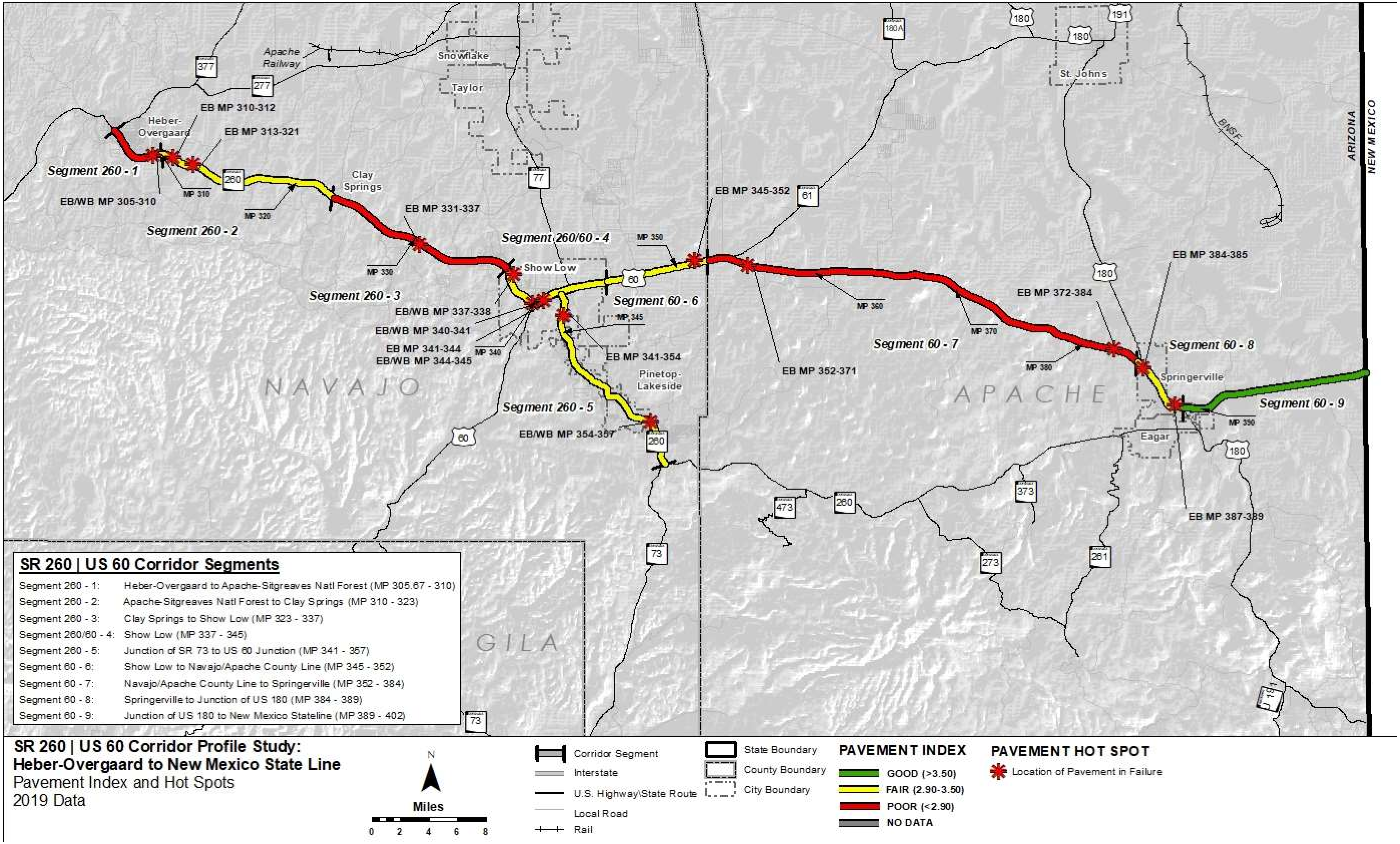
- Mobility Index
- Future Daily V/C Ratio
- Existing Peak Hour V/C Ratio (directional)
- Closure Frequency (directional)
- Level of Travel Time Reliability (directional)
- Multimodal Opportunities
- Percentage of Bicycle Accommodation

Safety Performance Area:

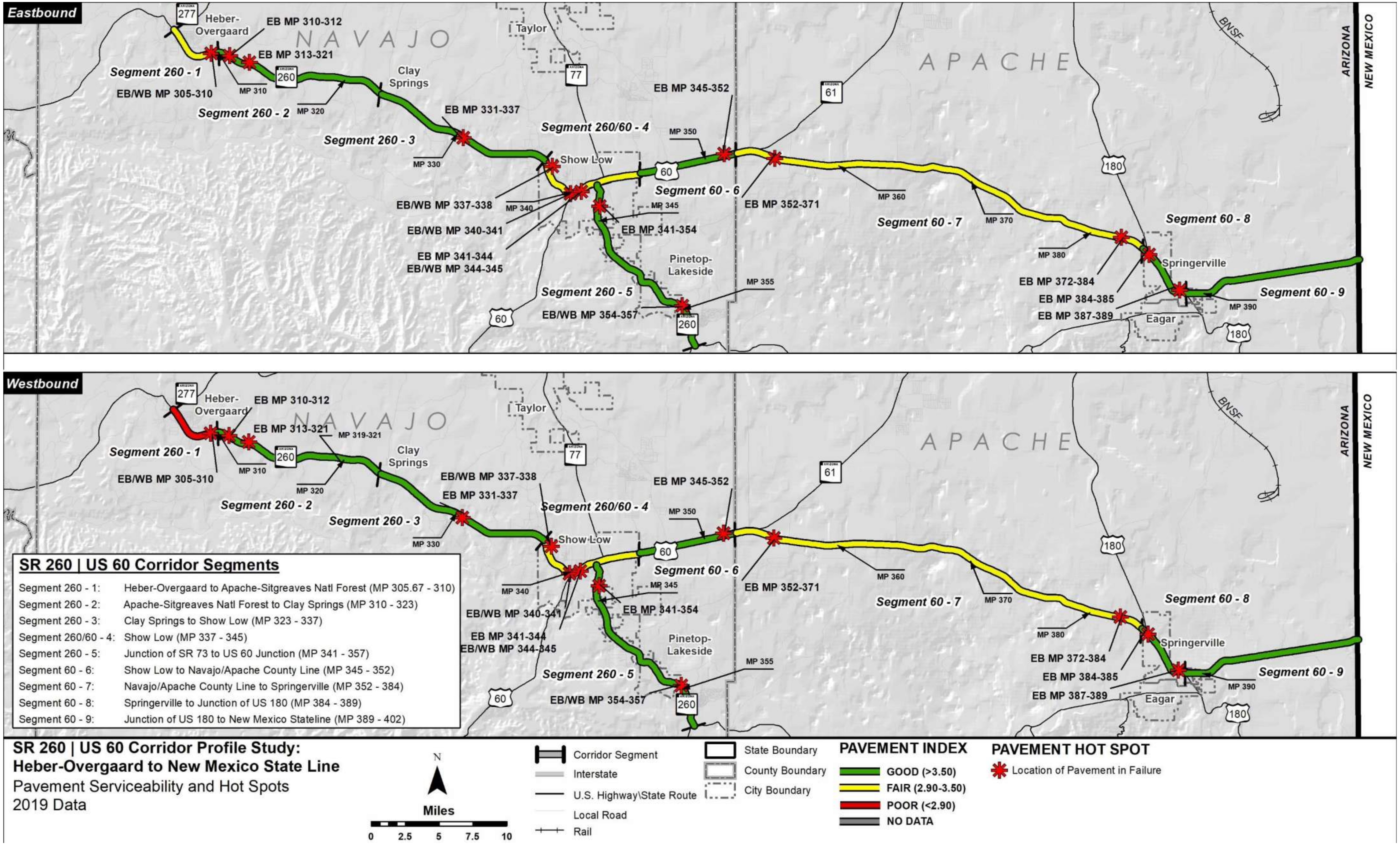
- Safety Index and Hot Spots
- Safety Index and Hot Spots (directional)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Intersection Crashes Compared to the Statewide Average for Similar Segments (insufficient data – not included)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Lane Departures Compared to the Statewide Average for Similar Segments
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Pedestrians Compared to the Statewide Average for Similar Segments (insufficient data – not included)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Trucks Compared to the Statewide Average for Similar Segments (insufficient data – not included)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Bicycles Compared to the Statewide Average for Similar Segments (insufficient data – not included)

Freight Performance Area:

- Freight Index and Hot Spots
- Truck Travel Time Reliability (directional)
- Closure Duration (directional)
- Bridge Vertical Clearance



Apache Railway
Snowflake
Taylor
Heber-Overgaard
EB MP 310-312
EB MP 313-321
Segment 260 - 1
EB/WB MP 305-310
MP 310
MP 320
Segment 260 - 2
Clay Springs
EB MP 331-337
Segment 260/60 - 4
MP 350
EB MP 345-352
Show Low
MP 330
Segment 260 - 3
EB/WB MP 337-338
EB/WB MP 340-341
EB MP 341-344
EB/WB MP 344-345
MP 340
Segment 60 - 6
MP 345
EB MP 341-354
Pinetop-Lakeside
NAVAJO
Segment 260 - 5
EB/WB MP 354-357
MP 360
EB MP 352-371
Segment 60 - 7
MP 370
EB MP 372-384
MP 380
St. Johns
BNSF
ARIZONA
NEW MEXICO
EB MP 384-385
Segment 60 - 8
Springerville
APACHE
Segment 60 - 9
MP 390
Eagar
EB MP 387-389
GILA
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Pavement Index and Hot Spots
2019 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
PAVEMENT INDEX
GOOD (>3.50)
FAIR (2.90-3.50)
POOR (<2.90)
NO DATA
PAVEMENT HOT SPOT
Location of Pavement in Failure


Eastbound
Heber-Overgaard
EB MP 310-312
EB MP 313-321
NAVAJO
Taylor
APACHE
BNSF
ARIZONA
NEW MEXICO
Segment 260 - 1
EB/WB MP 305-310
MP 310
Clay Springs
Segment 260 - 2
MP 320
EB MP 331-337
EB MP 345-352
Segment 260/60 - 4
MP 350
Segment 260 - 3
MP 330
Show Low
Segment 60 - 6
EB/WB MP 337-338
MP 340
MP 345
EB MP 352-371
MP 360
EB/WB MP 340-341
EB MP 341-354
Segment 60 - 7
MP 370
Segment 60 - 8
EB MP 341-344
EB/WB MP 344-345
Pinetop-Lakeside
MP 380
Springerville
MP 355
EB MP 372-384
Segment 260 - 5
EB MP 384-385
Segment 60 - 9
MP 390
EB/WB MP 354-357
EB MP 387-389
Eagar
Westbound
Heber-Overgaard
EB MP 310-312
EB MP 313-321
MP 319-321
Clay Springs
Segment 260 - 1
EB/WB MP 305-310
MP 310
EB/WB MP 337-338
EB MP 331-337
EB MP 345-352
MP 320
Segment 260 - 2
Segment 260/60 - 4
MP 350
Segment 260 - 3
MP 330
Show Low
SR 260 | US 60 Corridor Segments
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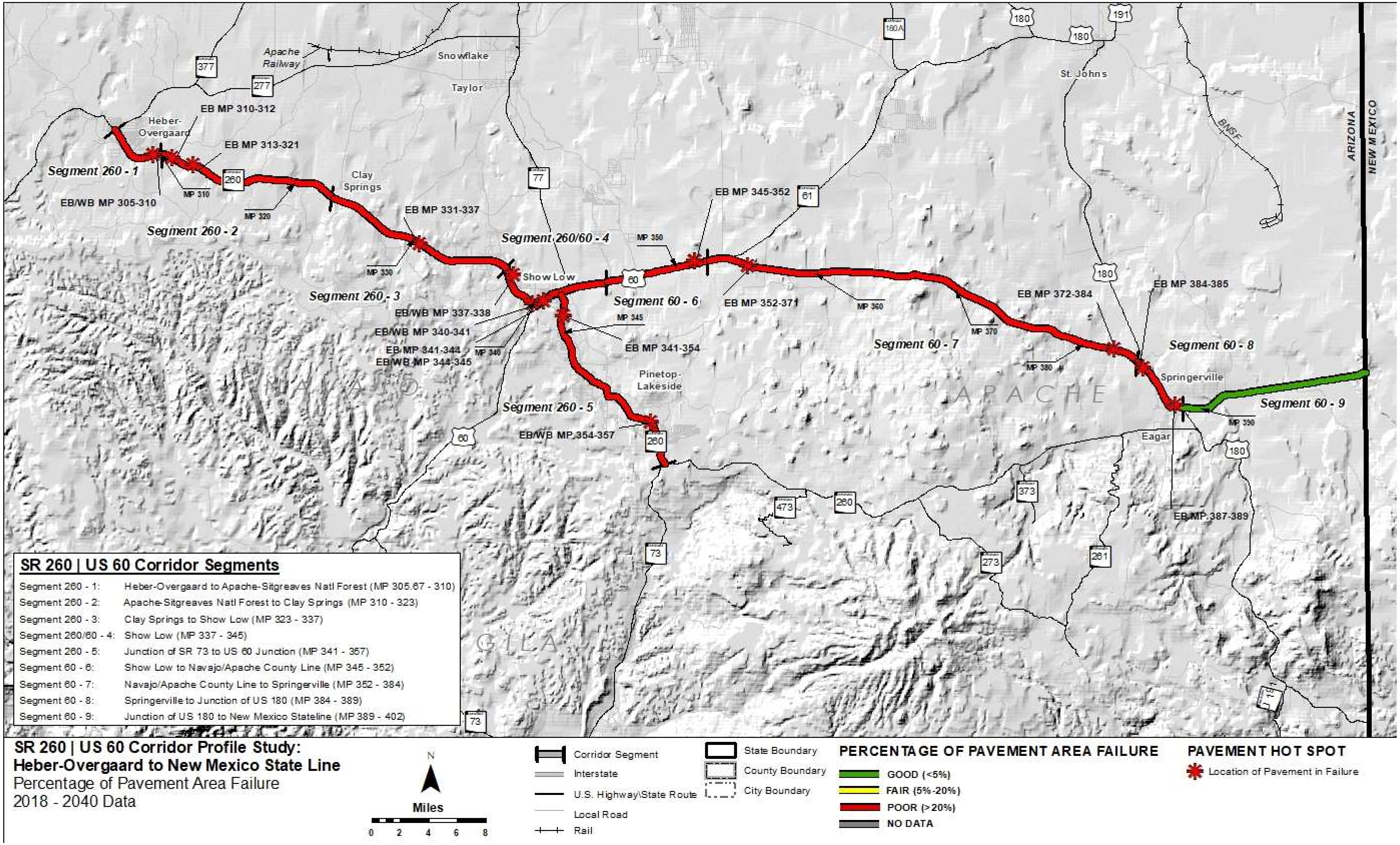
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
Segment 60 - 6
MP 340
MP 345
EB MP 352-371
MP 360
EB/WB MP 340-341
EB MP 341-354
Segment 60 - 7
MP 370
Segment 60 - 8
EB MP 341-344
EB/WB MP 344-345
Pinetop-Lakeside
MP 380
Springerville
EB MP 372-384
MP 355
Segment 260 - 5
EB MP 384-385
Segment 60 - 9
MP 390
EB/WB MP 354-357
EB MP 387-389
Eagar
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Pavement Serviceability and Hot Spots
2019 Data
N
Miles
0 2.5 5 7.5 10
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
PAVEMENT INDEX
GOOD (>3.50)
FAIR (2.90-3.50)
POOR (<2.90)
NO DATA
PAVEMENT HOT SPOT
Location of Pavement in Failure


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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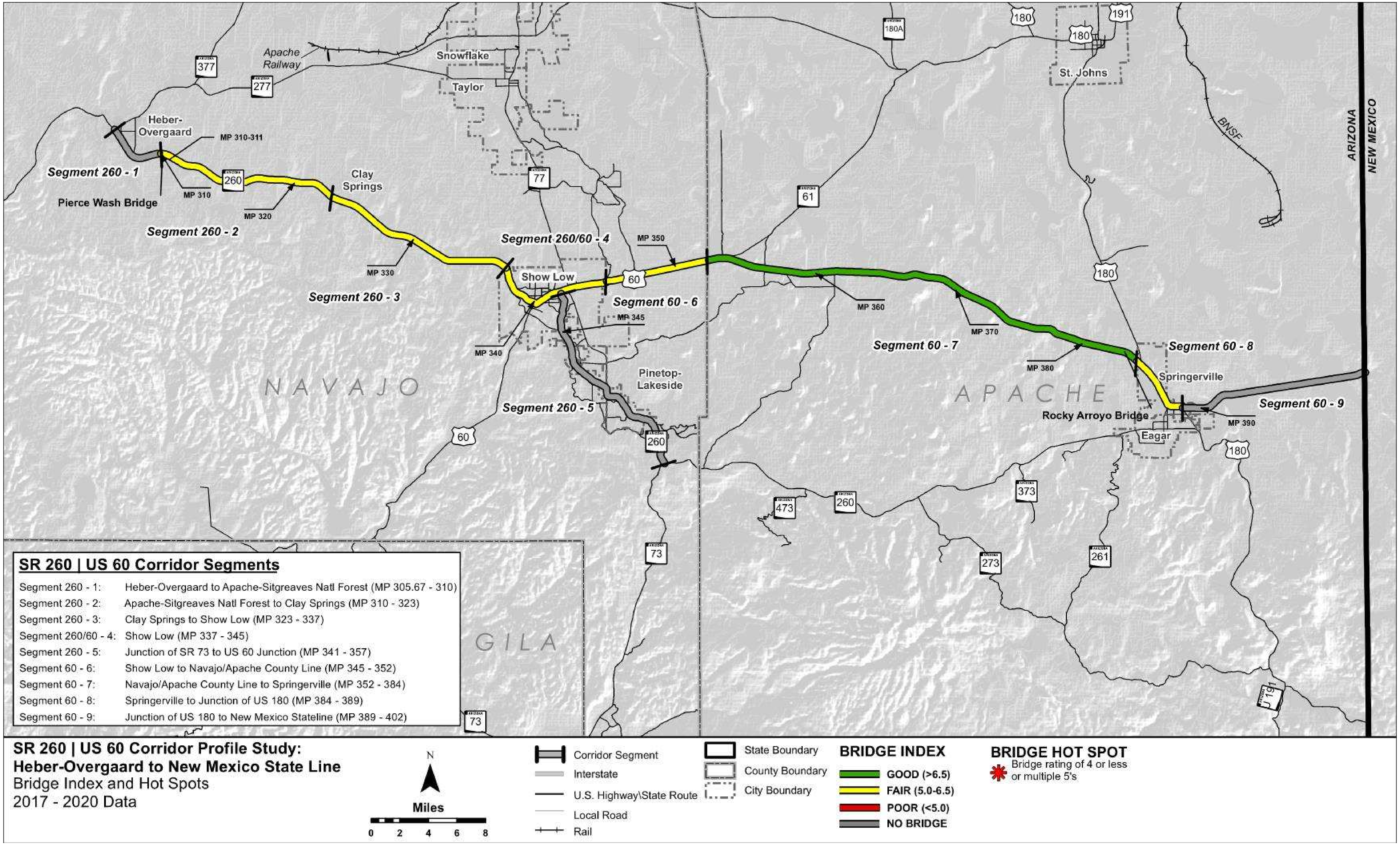
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Percentage of Pavement Area Failure
2018 - 2040 Data
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
PERCENTAGE OF PAVEMENT AREA FAILURE
GOOD (<5%)
FAIR (5%-20%)
POOR (>20%)
NO DATA
PAVEMENT HOT SPOT
Location of Pavement in Failure
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
EB/WB MP 305-310
EB MP 310-312
EB MP 313-321
EB MP 331-337
EB/WB MP 337-338
EB/WB MP 340-341
EB MP 341-344
EB/WB MP 344-345
EB MP 341-354
EB/WB MP 354-357
EB MP 345-352
EB MP 352-371
EB MP 372-384
EB MP 384-385
EB MP 387-389
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
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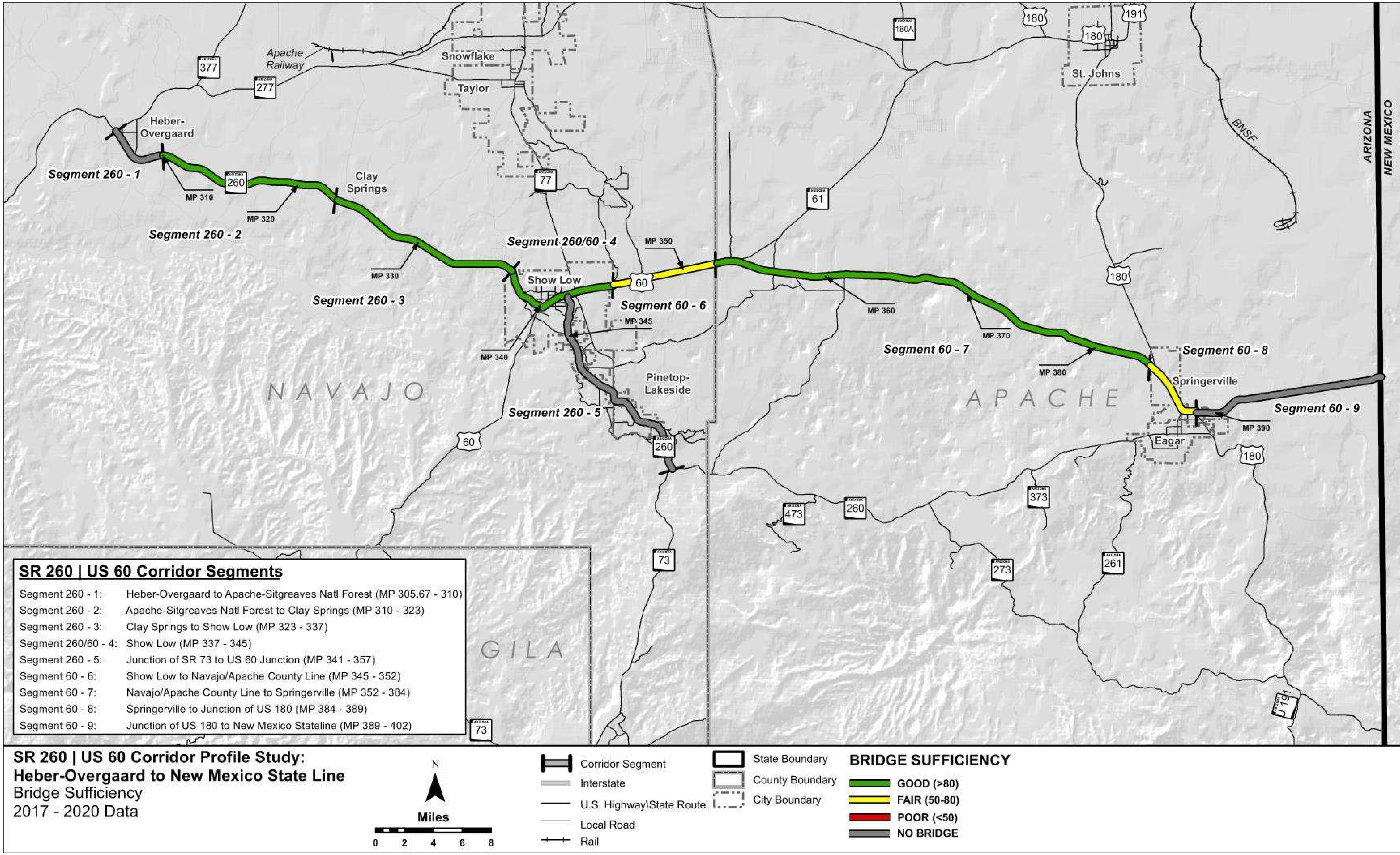
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Bridge Index and Hot Spots
2017 - 2020 Data
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
BRIDGE INDEX
GOOD (>6.5)
FAIR (5.0-6.5)
POOR (<5.0)
NO BRIDGE
BRIDGE HOT SPOT
Bridge rating of 4 or less or multiple 5's
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
Pierce Wash Bridge
Rocky Arroyo Bridge
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Clay Springs
Apache Railway
Snowflake
Taylor
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
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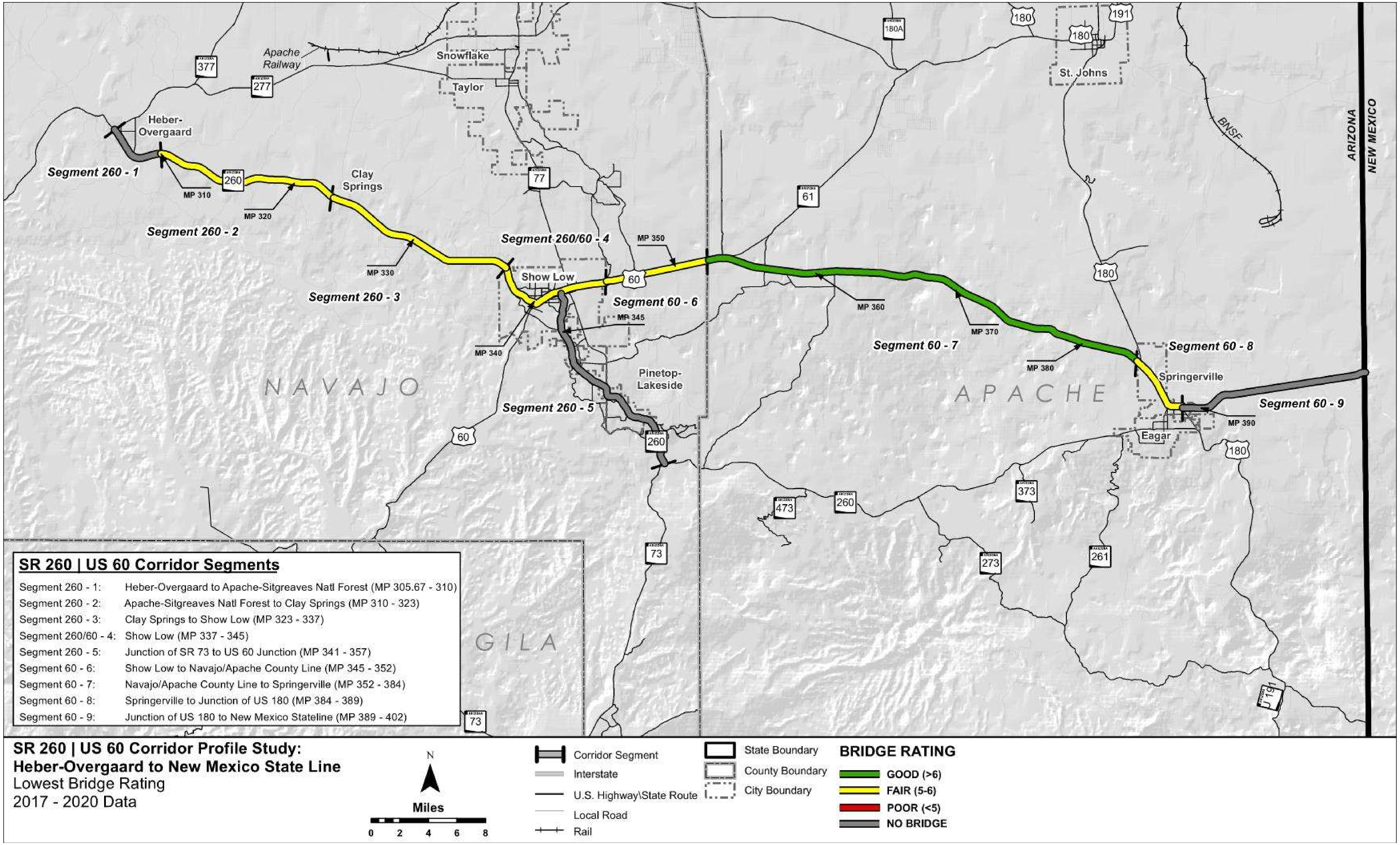
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Bridge Sufficiency
2017 - 2020 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
BRIDGE SUFFICIENCY
GOOD (>80)
FAIR (50-80)
POOR (<50)
NO BRIDGE
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
BNSF
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
377
277
260
77
61
60
180A
180
191
73
473
373
273
261


Heber-Overgaard
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
Clay Springs
Show Low
Pinetop-Lakeside
Snowflake
Taylor
St. Johns
Springerville
Eagar
Apache Railway
BNSF
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 360
MP 370
MP 380
MP 390
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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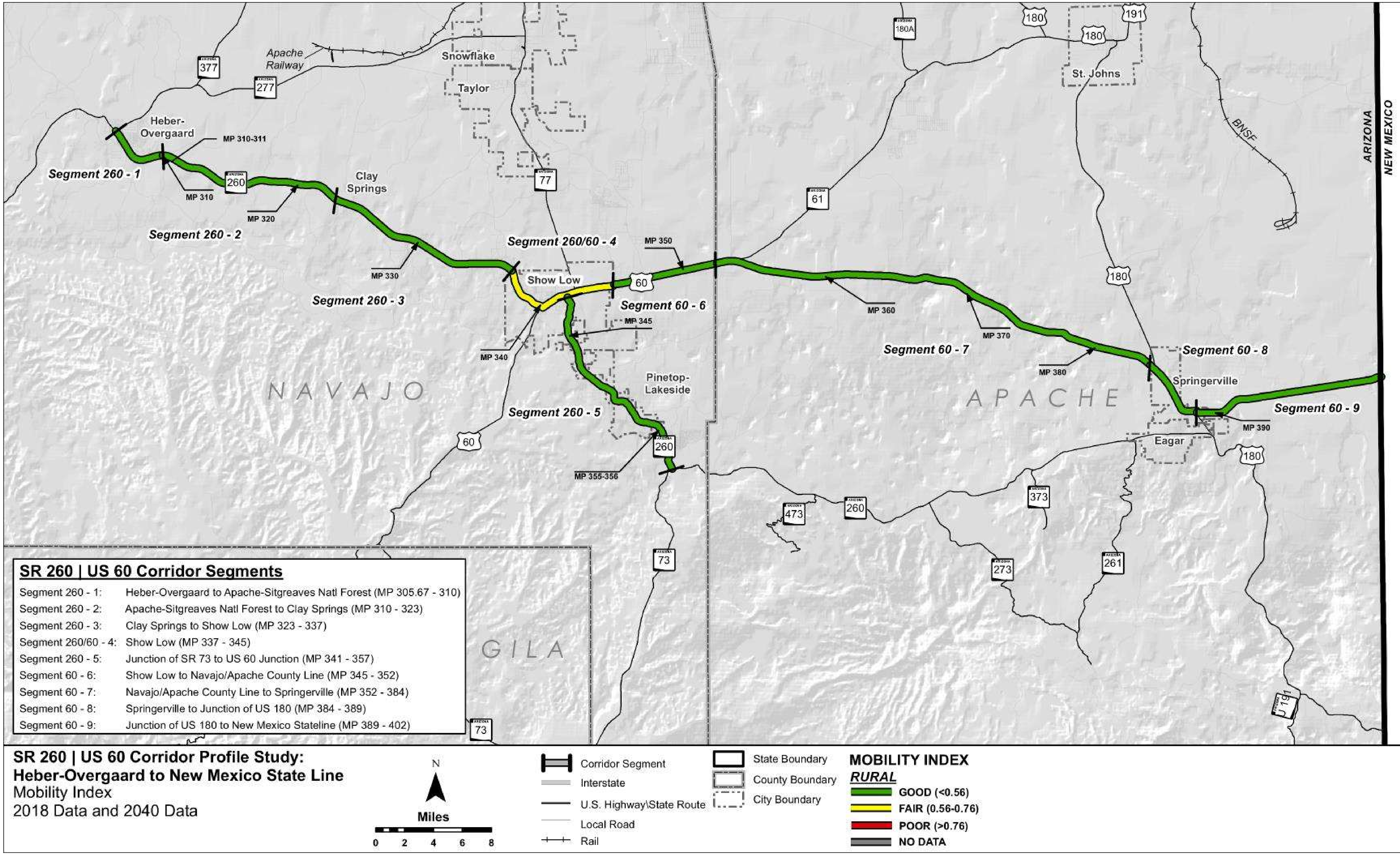
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Lowest Bridge Rating
2017 - 2020 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
BRIDGE RATING
GOOD (>6)
FAIR (5-6)
POOR (<5)
NO BRIDGE



Heber-Overgaard
Segment 260 - 1
MP 310-311
MP 310
Apache Railway
Snowflake
Taylor
Clay Springs
MP 320
Segment 260 - 2
MP 330
Segment 260 - 3
Segment 260/60 - 4
MP 350
Show Low
Segment 60 - 6
MP 345
MP 340
Pinetop-Lakeside
Segment 260 - 5
MP 355-356
NAVAJO
GILA
APACHE
St. Johns
BNSF
MP 360
MP 370
Segment 60 - 7
MP 380
Segment 60 - 8
Springerville
Eagar
Segment 60 - 9
MP 390
ARIZONA
NEW MEXICO
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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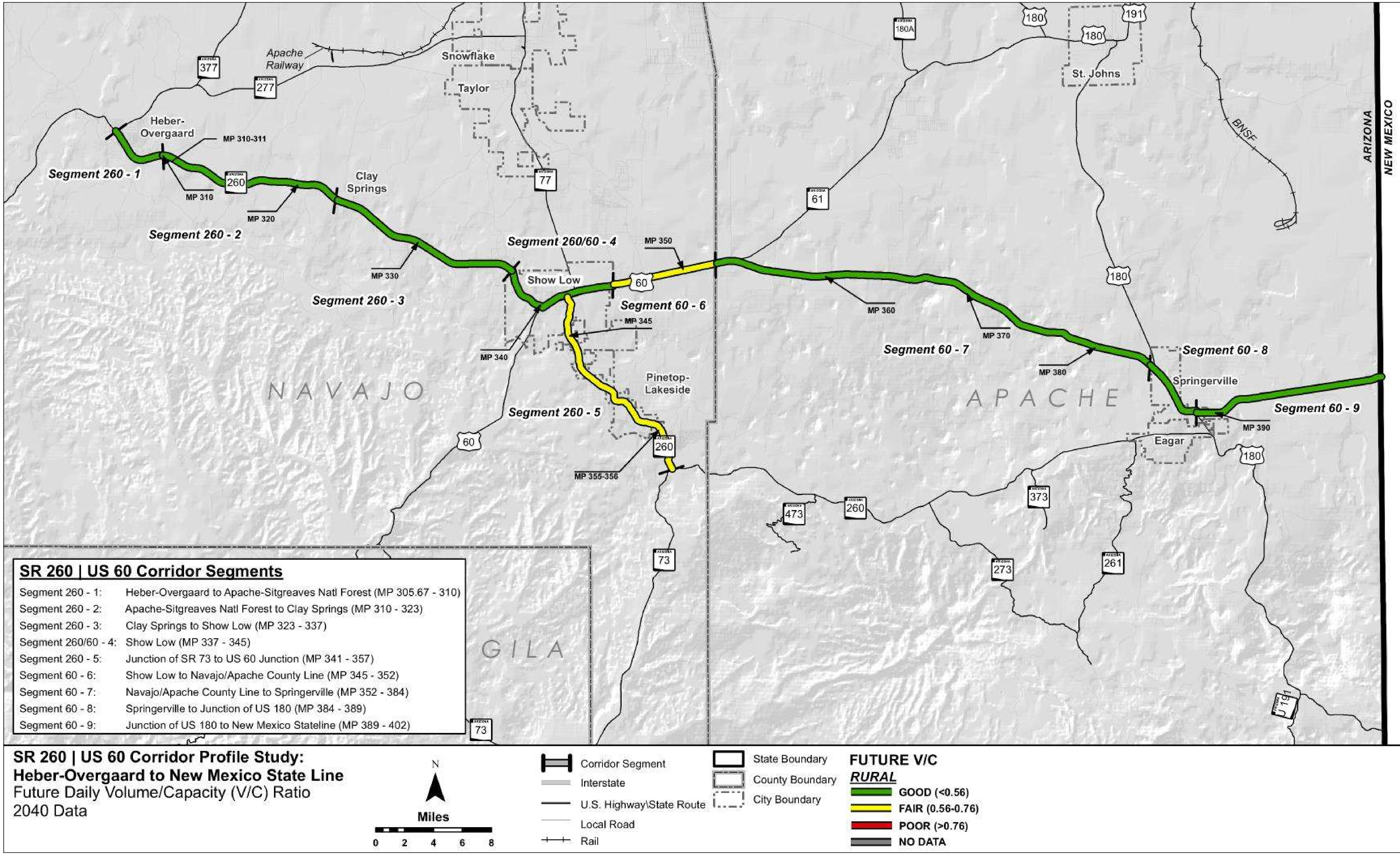
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Mobility Index
2018 Data and 2040 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
MOBILITY INDEX
RURAL
GOOD (<0.56)
FAIR (0.56-0.76)
POOR (>0.76)
NO DATA


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
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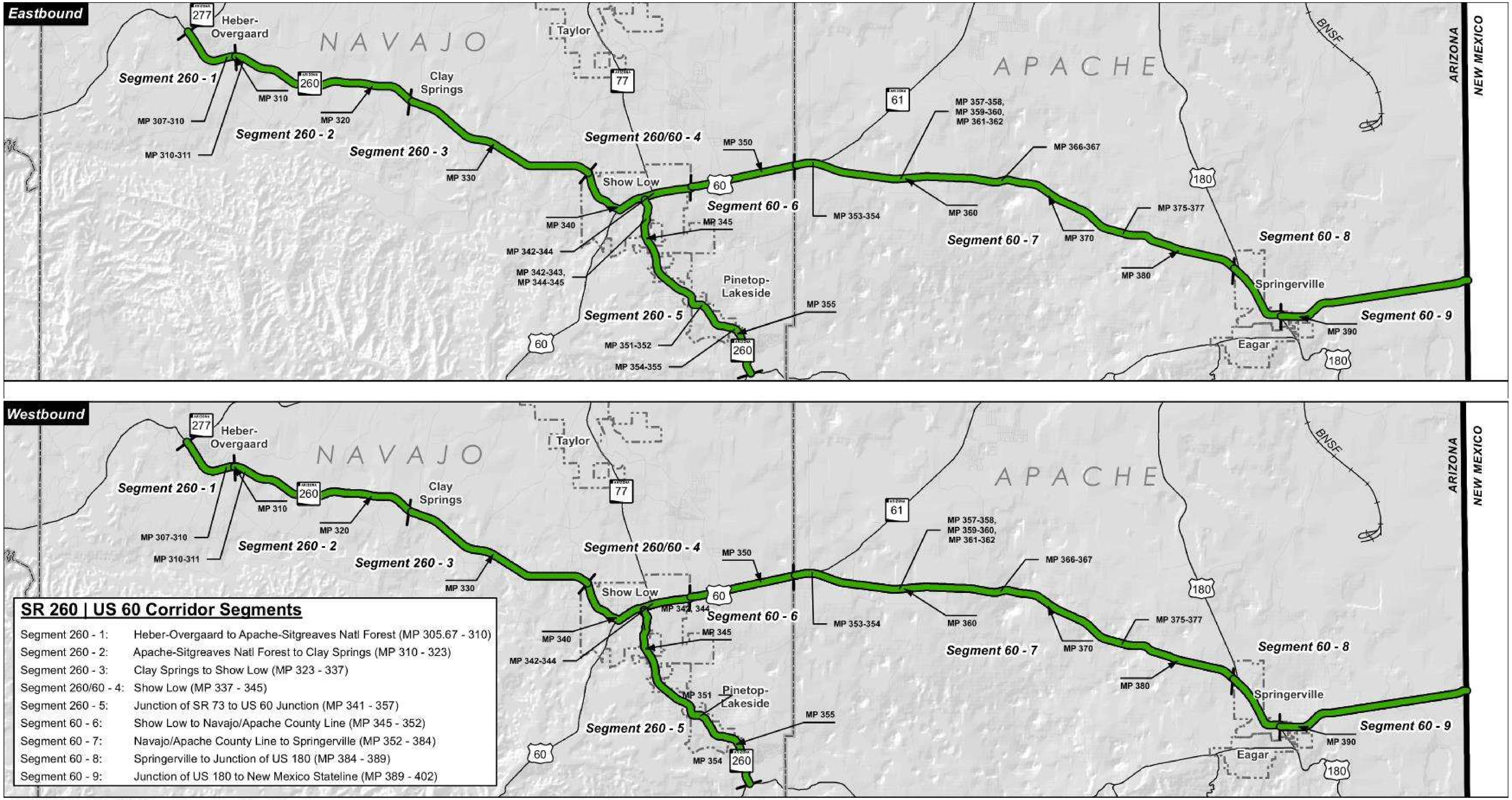
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Future Daily Volume/Capacity (V/C) Ratio
2040 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FUTURE V/C
RURAL
GOOD (<0.56)
FAIR (0.56-0.76)
POOR (>0.76)
NO DATA
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
BNSF
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
377
277
260
77
61
60
73
180A
180
191
473
373
273
261

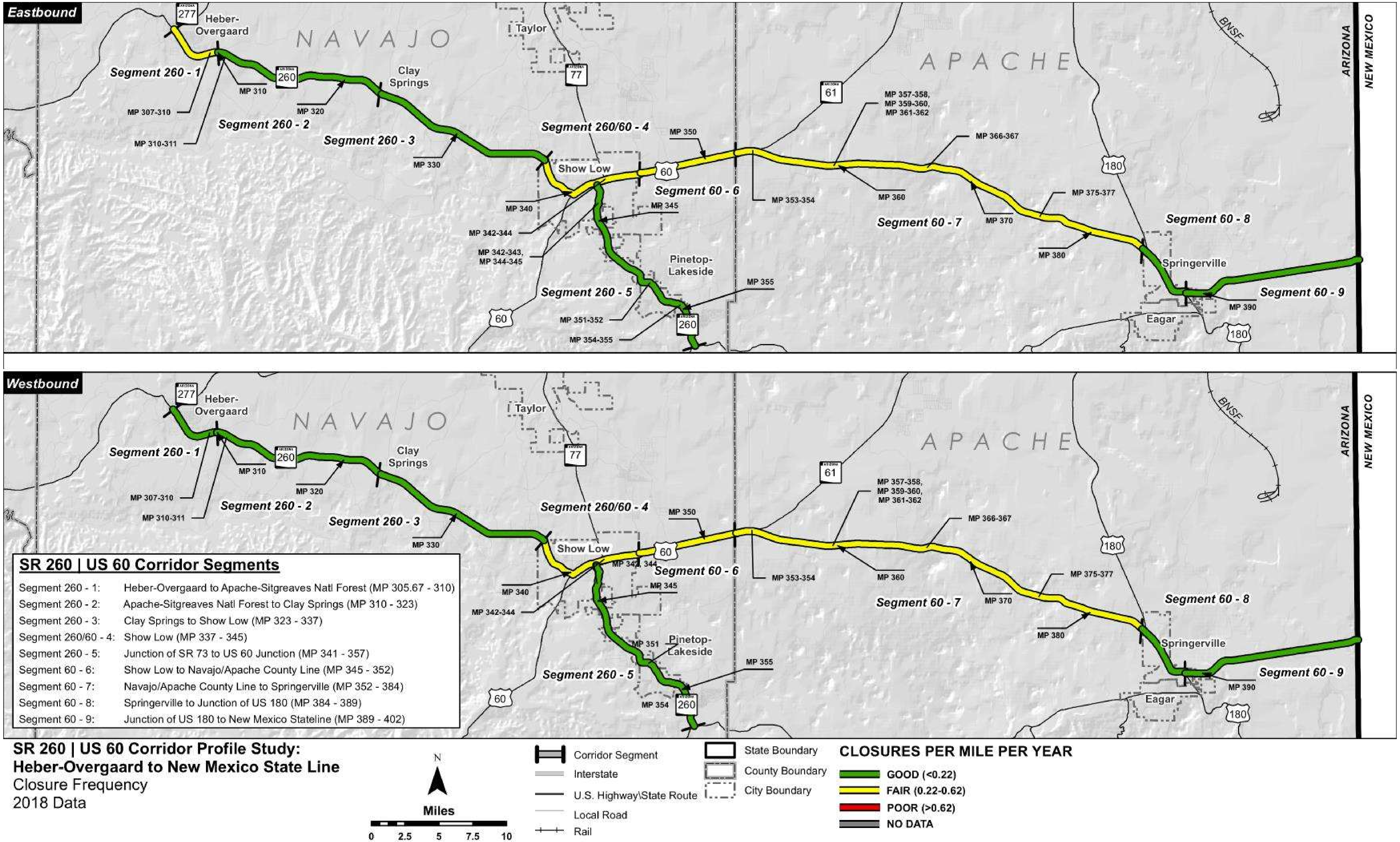


SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Existing Peak Hour V/C
2018 Data

Miles: 0, 2.5, 5, 7.5, 10

Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary

PEAK V/C
RURAL
- GOOD (<0.56)
- FAIR (0.56-0.76)
- POOR (>0.76)
- NO DATA


Eastbound
Westbound
Heber-Overgaard
NAVAJO
APACHE
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
Springerville
Eagar
BNSF
ARIZONA
NEW MEXICO
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 307-310
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 342-344
MP 342-343, MP 344-345
MP 345
MP 350
MP 351-352
MP 354-355
MP 353-354
MP 355
MP 357-358, MP 359-360, MP 361-362
MP 360
MP 366-367
MP 370
MP 375-377
MP 380
MP 390
MP 342, 344
MP 351
MP 354
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
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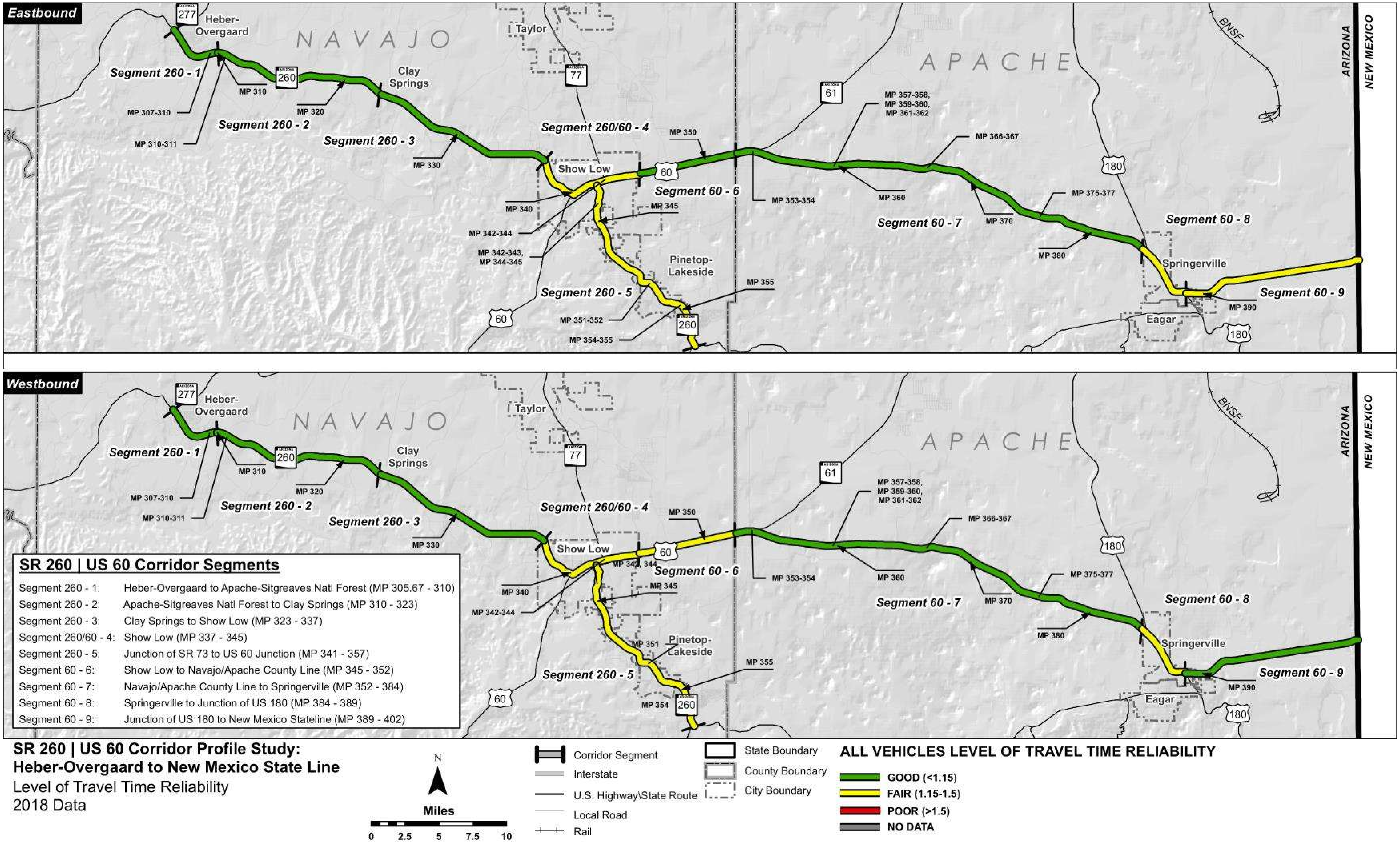
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Closure Frequency
2018 Data
N
Miles
0 2.5 5 7.5 10
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
CLOSURES PER MILE PER YEAR
GOOD (<0.22)
FAIR (0.22-0.62)
POOR (>0.62)
NO DATA


Eastbound
Westbound
NAVAJO
APACHE
ARIZONA
NEW MEXICO
Heber-Overgaard
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
Springerville
Eagar
BNSF
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 307-310
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 342-344
MP 342-343, MP 344-345
MP 345
MP 350
MP 351-352
MP 354-355
MP 353-354
MP 355
MP 357-358, MP 359-360, MP 361-362
MP 360
MP 366-367
MP 370
MP 375-377
MP 380
MP 390
SR 260 | US 60 Corridor Segments
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Segment 260/60 - 4: Show Low (MP 337 - 345)
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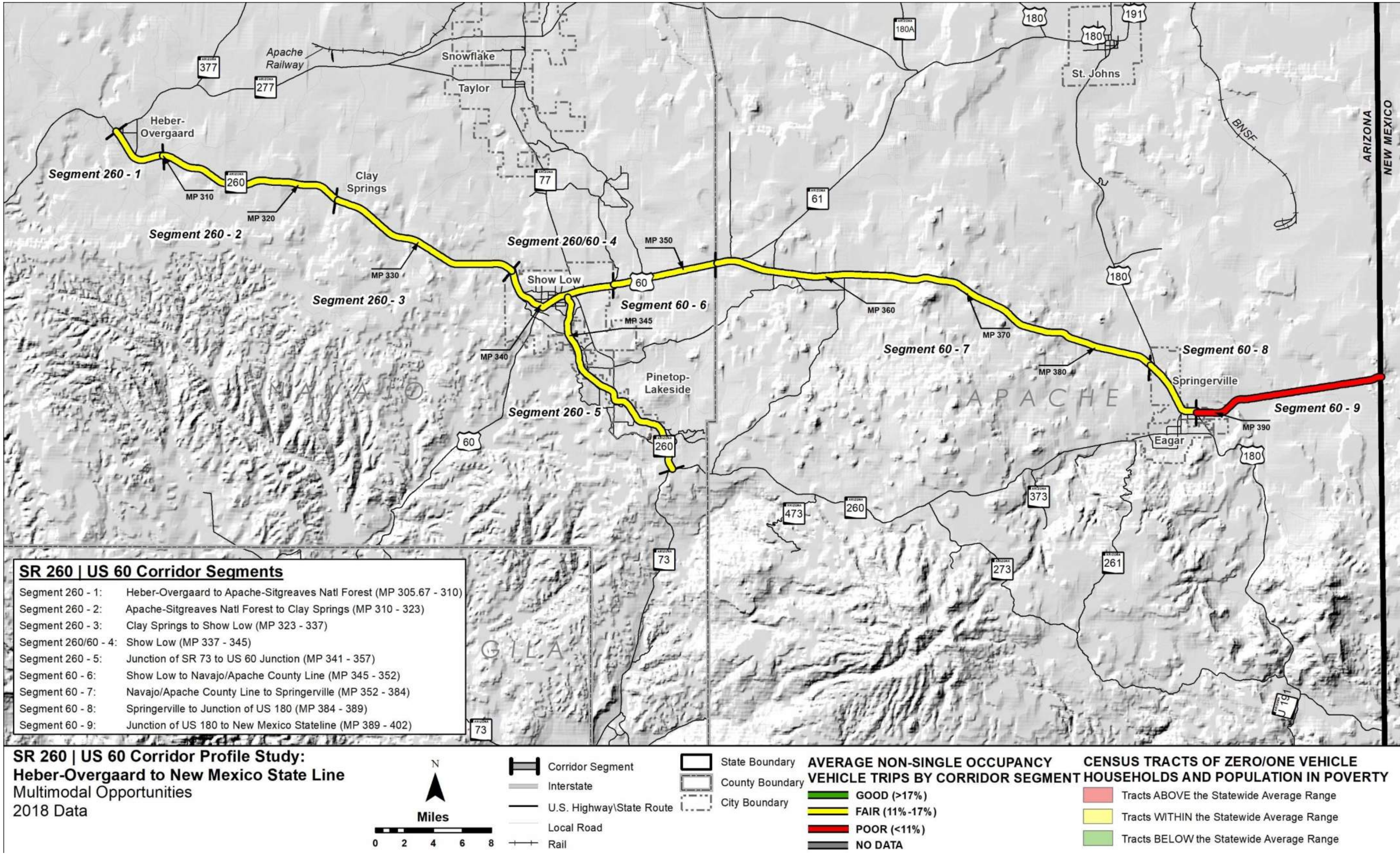
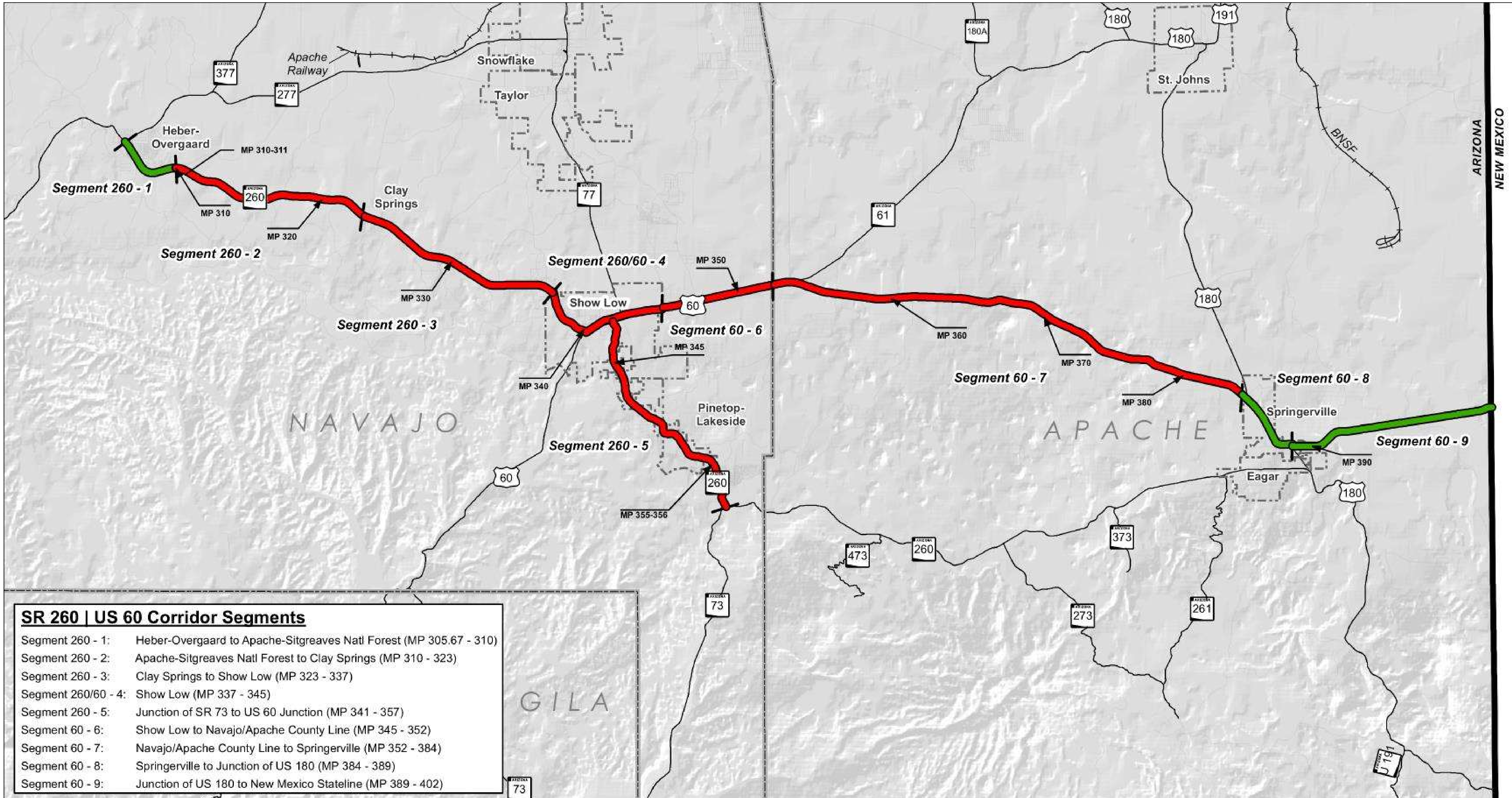
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Level of Travel Time Reliability
2018 Data
Miles
0 2.5 5 7.5 10
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
ALL VEHICLES LEVEL OF TRAVEL TIME RELIABILITY
GOOD (<1.15)
FAIR (1.15-1.5)
POOR (>1.5)
NO DATA

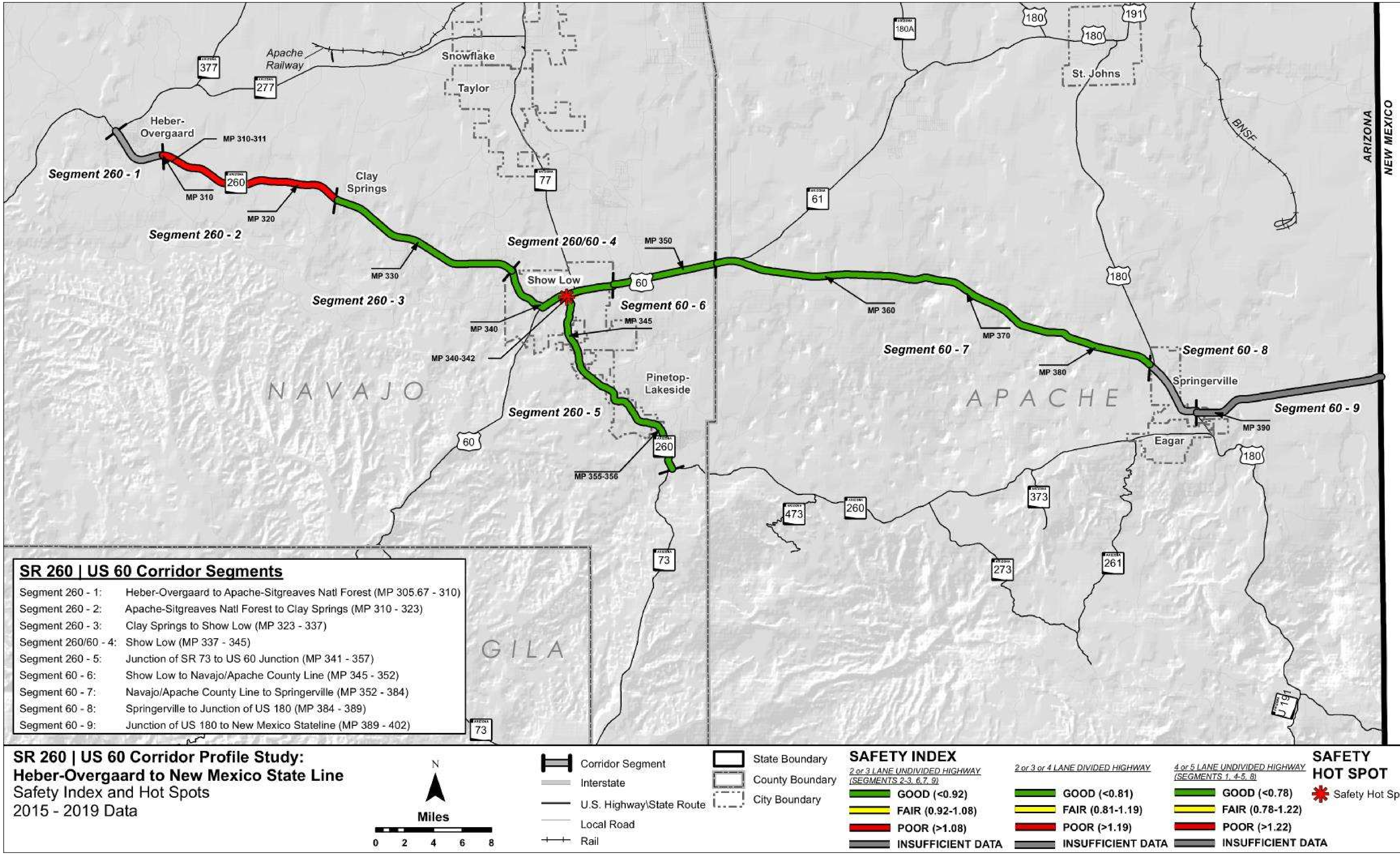

SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
Springerville
Eagar
St. Johns
BNSF
ARIZONA
NEW MEXICO
NAVAJO
APACHE
GILA
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 360
MP 370
MP 380
MP 390
377
277
260
77
61
60
180
180A
191
73
473
373
273
261
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Multimodal Opportunities
2018 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
AVERAGE NON-SINGLE OCCUPANCY VEHICLE TRIPS BY CORRIDOR SEGMENT
GOOD (>17%)
FAIR (11%-17%)
POOR (<11%)
NO DATA
CENSUS TRACTS OF ZERO/ONE VEHICLE HOUSEHOLDS AND POPULATION IN POVERTY
Tracts ABOVE the Statewide Average Range
Tracts WITHIN the Statewide Average Range
Tracts BELOW the Statewide Average Range



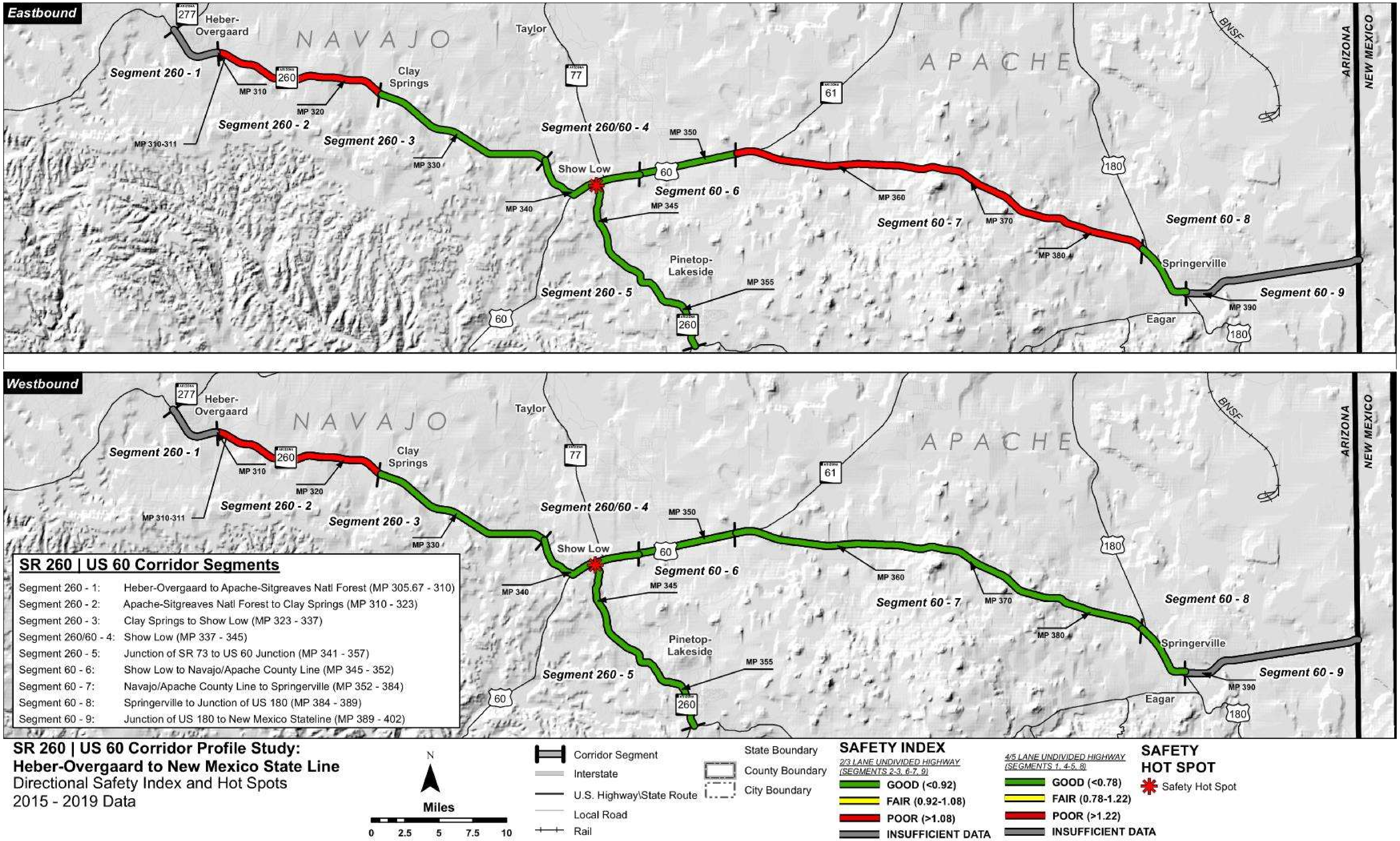
SR 260 | US 60 Corridor Segments

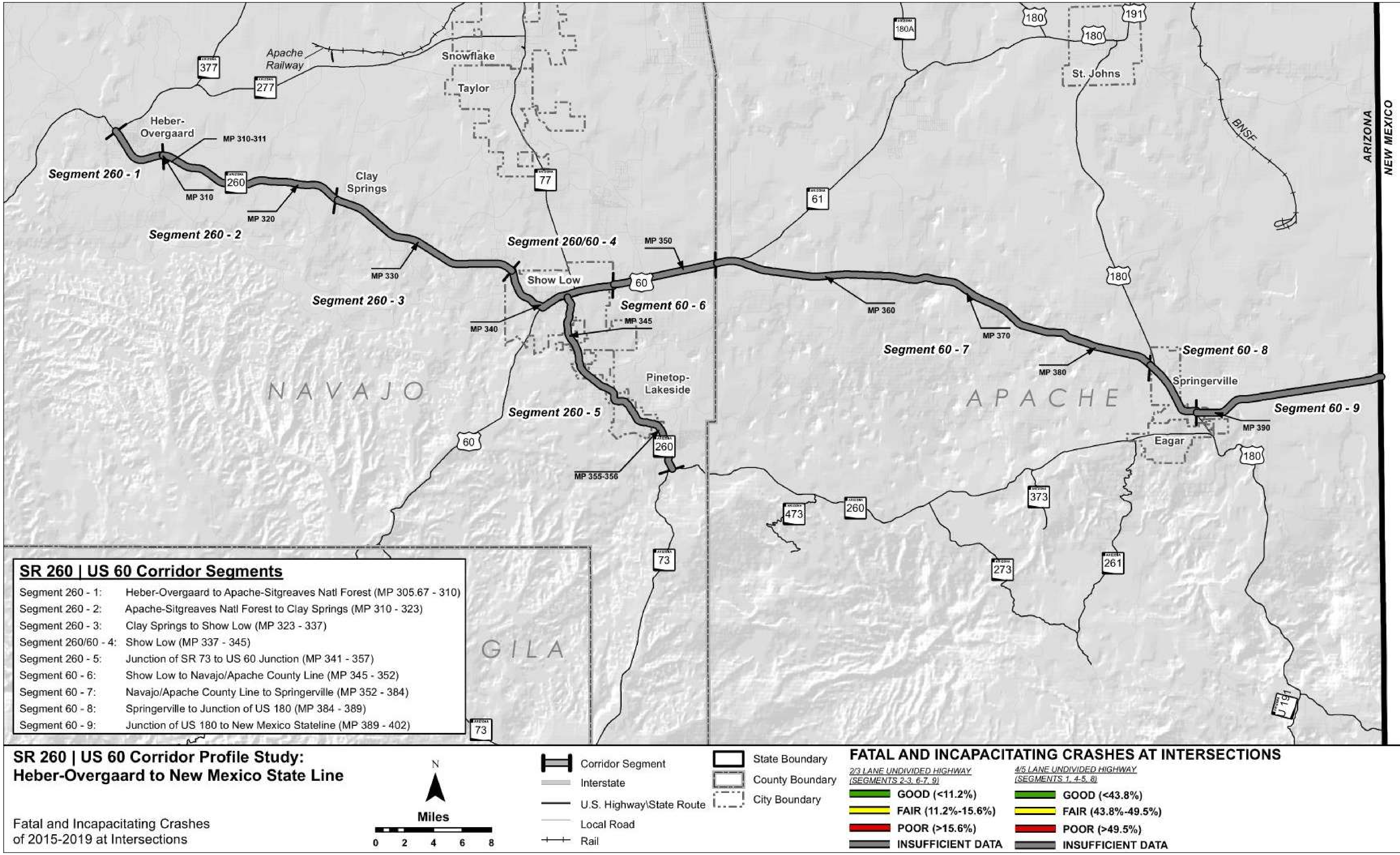
Segment 260 - 1:	Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2:	Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3:	Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4:	Show Low (MP 337 - 345)
Segment 260 - 5:	Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6:	Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7:	Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8:	Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9:	Junction of US 180 to New Mexico Stateline (MP 389 - 402)

SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Percentage of Bicycle Accommodation
2018 Data



SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Safety Index and Hot Spots
2015 - 2019 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
SAFETY INDEX
2 or 3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6,7, 9)
GOOD (<0.92)
FAIR (0.92-1.08)
POOR (>1.08)
INSUFFICIENT DATA
2 or 3 or 4 LANE DIVIDED HIGHWAY
GOOD (<0.81)
FAIR (0.81-1.19)
POOR (>1.19)
INSUFFICIENT DATA
4 or 5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<0.78)
FAIR (0.78-1.22)
POOR (>1.22)
INSUFFICIENT DATA
SAFETY HOT SPOT
Safety Hot Spot
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 340-342
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF


Eastbound
Heber-Overgaard
NAVAJO
Taylor
APACHE
BNSF
ARIZONA
NEW MEXICO
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
Clay Springs
Show Low
Pinetop-Lakeside
Springerville
Eagar
MP 310
MP 310-311
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355
MP 360
MP 370
MP 380
MP 390
Westbound
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Directional Safety Index and Hot Spots
2015 - 2019 Data
N
Miles
0 2.5 5 7.5 10
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
SAFETY INDEX
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<0.92)
FAIR (0.92-1.08)
POOR (>1.08)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<0.78)
FAIR (0.78-1.22)
POOR (>1.22)
INSUFFICIENT DATA
SAFETY HOT SPOT
Safety Hot Spot


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
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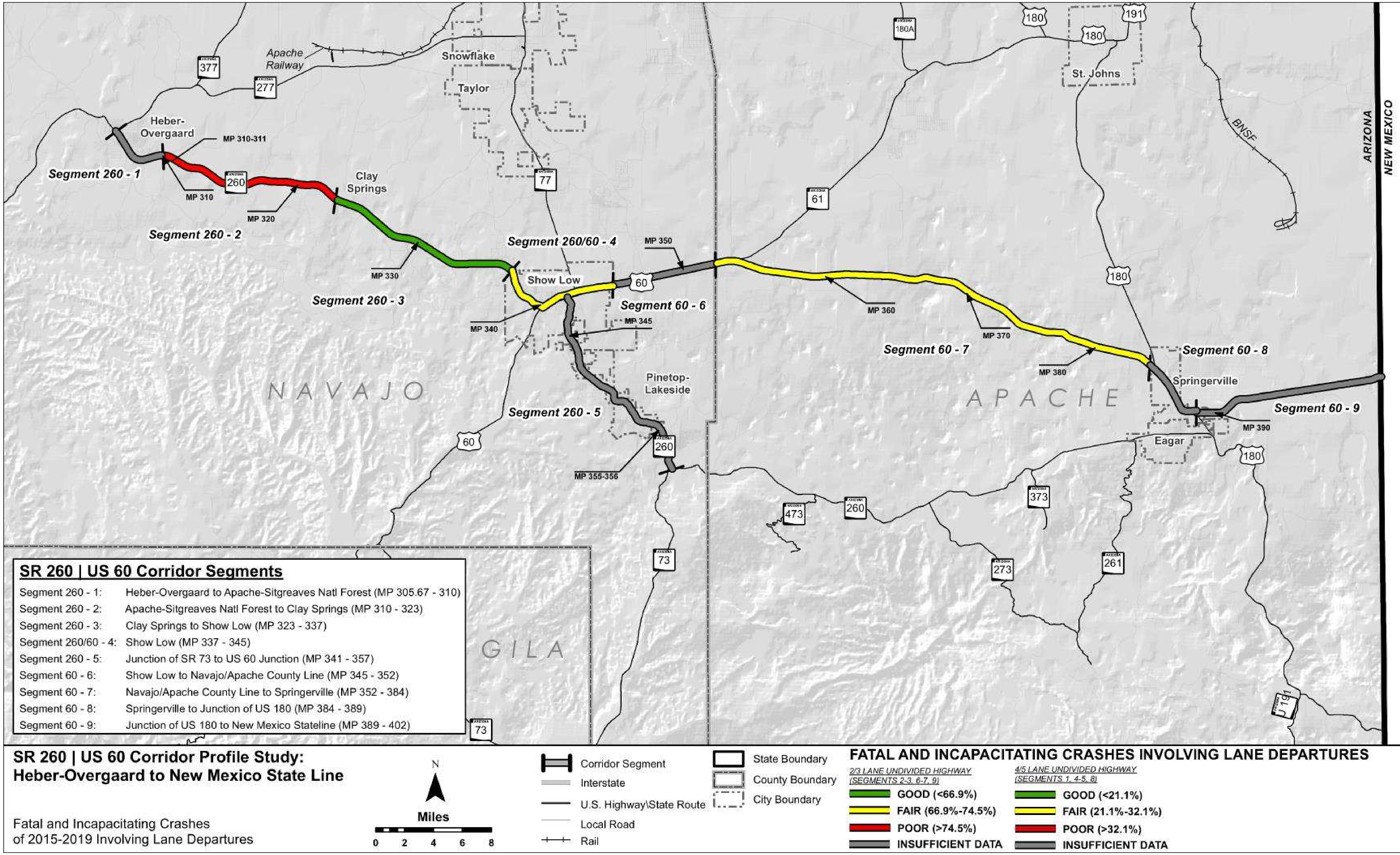
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Fatal and Incapacitating Crashes
of 2015-2019 at Intersections
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FATAL AND INCAPACITATING CRASHES AT INTERSECTIONS
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<11.2%)
FAIR (11.2%-15.6%)
POOR (>15.6%)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<43.8%)
FAIR (43.8%-49.5%)
POOR (>49.5%)
INSUFFICIENT DATA
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
Segment 260 - 2: Apache-Sitgreaves Natl Forest to Clay Springs (MP 310 - 323)
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
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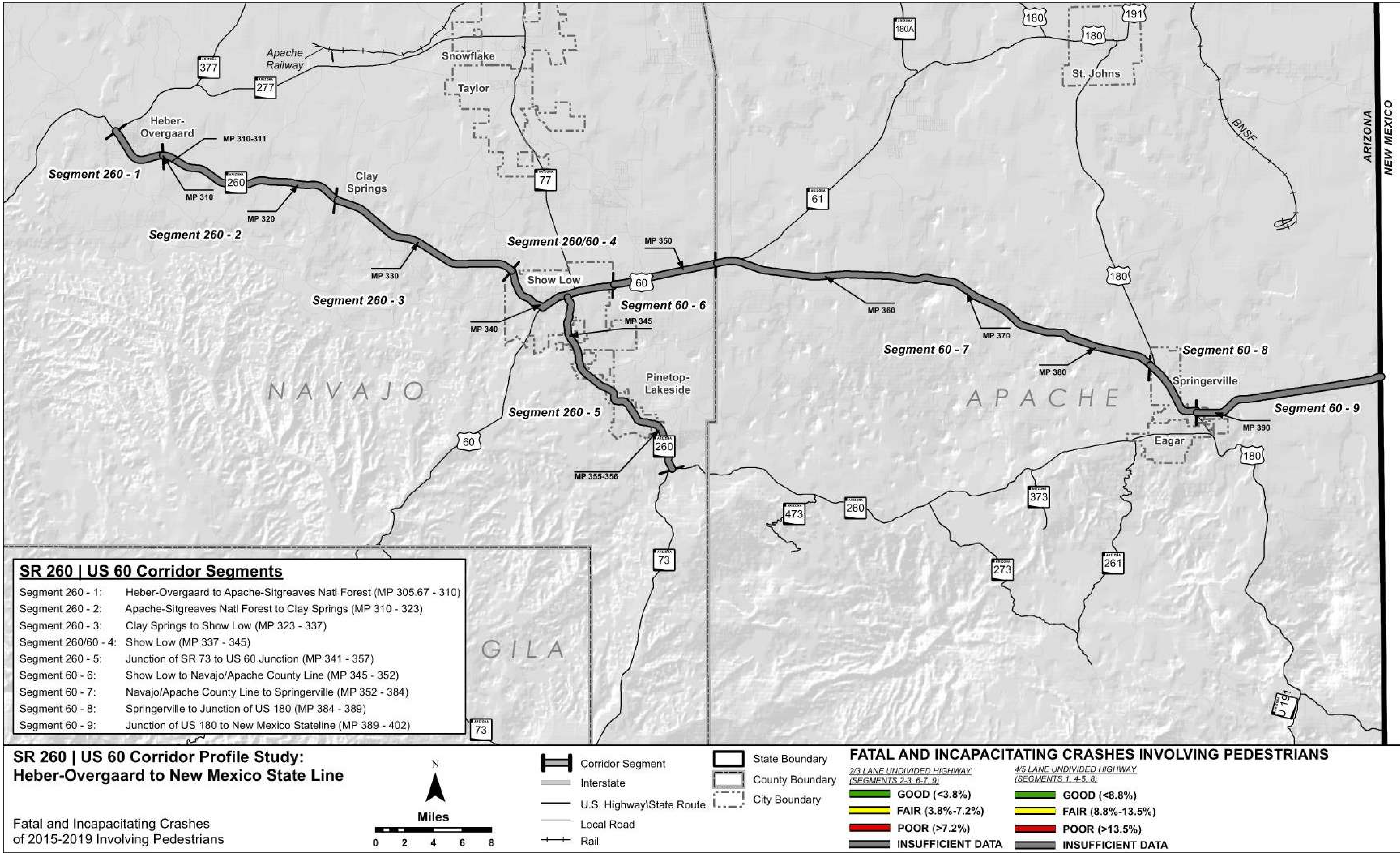
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Fatal and Incapacitating Crashes
of 2015-2019 Involving Lane Departures
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FATAL AND INCAPACITATING CRASHES INVOLVING LANE DEPARTURES
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<66.9%)
FAIR (66.9%-74.5%)
POOR (>74.5%)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<21.1%)
FAIR (21.1%-32.1%)
POOR (>32.1%)
INSUFFICIENT DATA



Apache Railway
Snowflake
Taylor
St. Johns
Heber-Overgaard
MP 310-311
Segment 260 - 1
MP 310
MP 320
Clay Springs
Segment 260 - 2
Segment 260/60 - 4
MP 350
MP 330
Show Low
Segment 260 - 3
Segment 60 - 6
MP 345
MP 340
MP 360
MP 370
Segment 60 - 7
Segment 60 - 8
MP 380
Springerville
Pinetop-Lakeside
NAVAJO
APACHE
Segment 60 - 9
Segment 260 - 5
MP 390
Eagar
MP 355-356
BNSF
ARIZONA
NEW MEXICO
GILA
SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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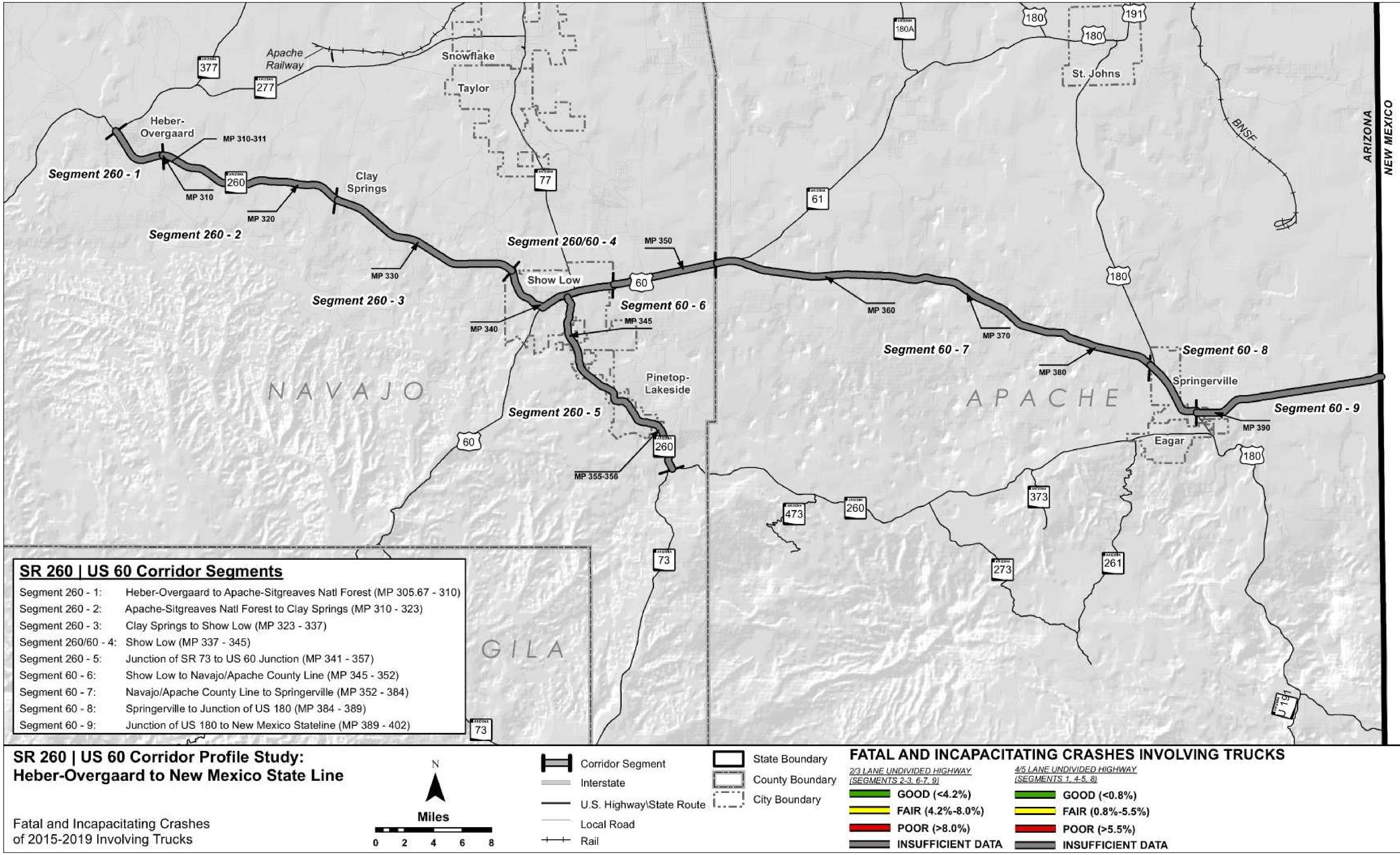
Segment 260 - 3: Clay Springs to Show Low (MP 323 - 337)
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Fatal and Incapacitating Crashes of 2015-2019 Involving Pedestrians
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FATAL AND INCAPACITATING CRASHES INVOLVING PEDESTRIANS
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<3.8%)
FAIR (3.8%-7.2%)
POOR (>7.2%)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<8.8%)
FAIR (8.8%-13.5%)
POOR (>13.5%)
INSUFFICIENT DATA


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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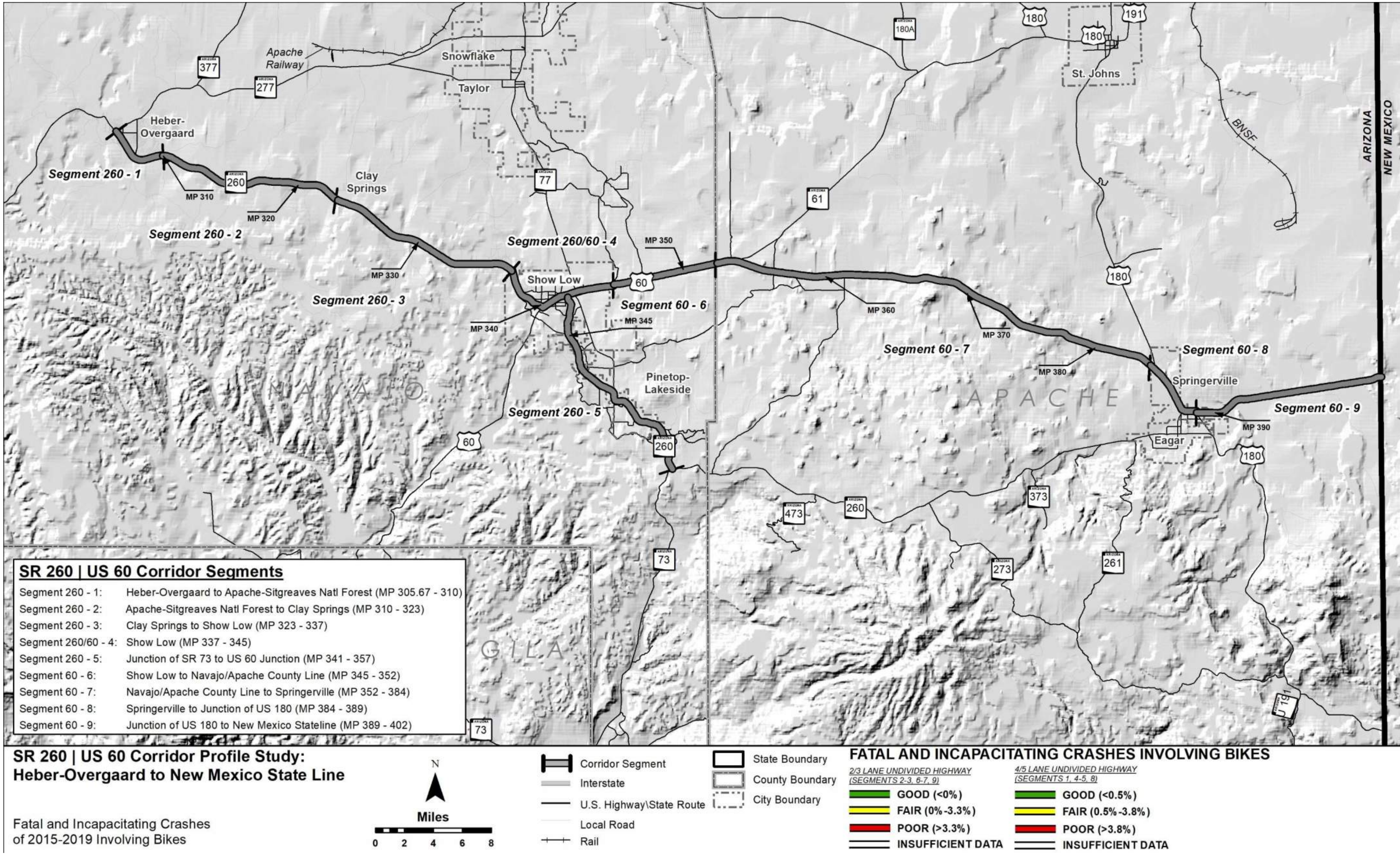
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Fatal and Incapacitating Crashes
of 2015-2019 Involving Trucks
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FATAL AND INCAPACITATING CRASHES INVOLVING TRUCKS
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<4.2%)
FAIR (4.2%-8.0%)
POOR (>8.0%)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<0.8%)
FAIR (0.8%-5.5%)
POOR (>5.5%)
INSUFFICIENT DATA
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
BNSF
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO


SR 260 | US 60 Corridor Segments
Segment 260 - 1: Heber-Overgaard to Apache-Sitgreaves Natl Forest (MP 305.67 - 310)
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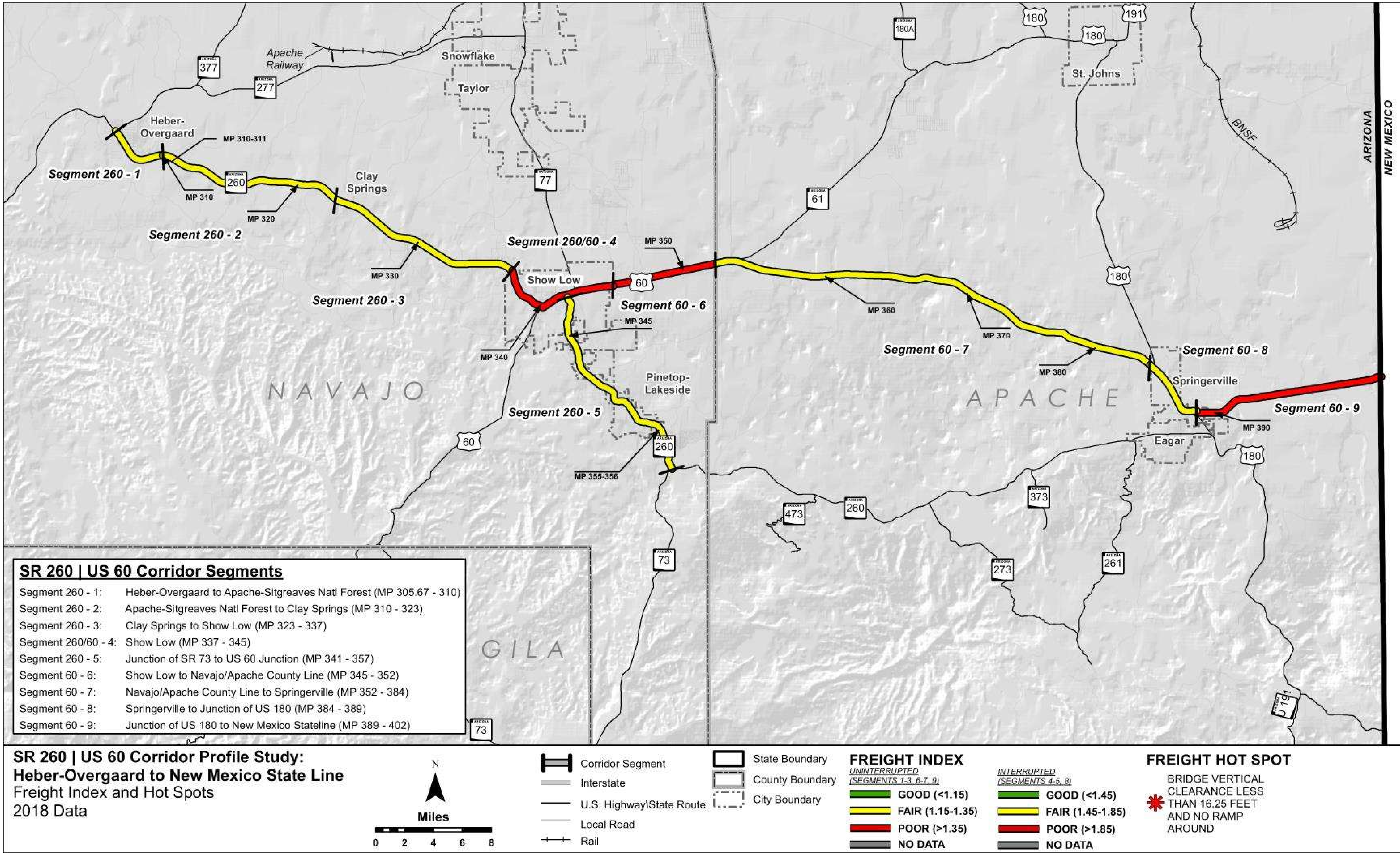
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
Heber-Overgaard
Apache Railway
Snowflake
Taylor
St. Johns
Clay Springs
Show Low
Pinetop-Lakeside
Springerville
Eagar
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 360
MP 370
MP 380
MP 390
NAVAJO
APACHE
GILA
BNSF
ARIZONA
NEW MEXICO
377
277
260
77
61
60
180A
180
191
73
473
373
273
261
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Fatal and Incapacitating Crashes of 2015-2019 Involving Bikes
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FATAL AND INCAPACITATING CRASHES INVOLVING BIKES
2/3 LANE UNDIVIDED HIGHWAY (SEGMENTS 2-3, 6-7, 9)
GOOD (<0%)
FAIR (0%-3.3%)
POOR (>3.3%)
INSUFFICIENT DATA
4/5 LANE UNDIVIDED HIGHWAY (SEGMENTS 1, 4-5, 8)
GOOD (<0.5%)
FAIR (0.5%-3.8%)
POOR (>3.8%)
INSUFFICIENT DATA


SR 260 | US 60 Corridor Segments
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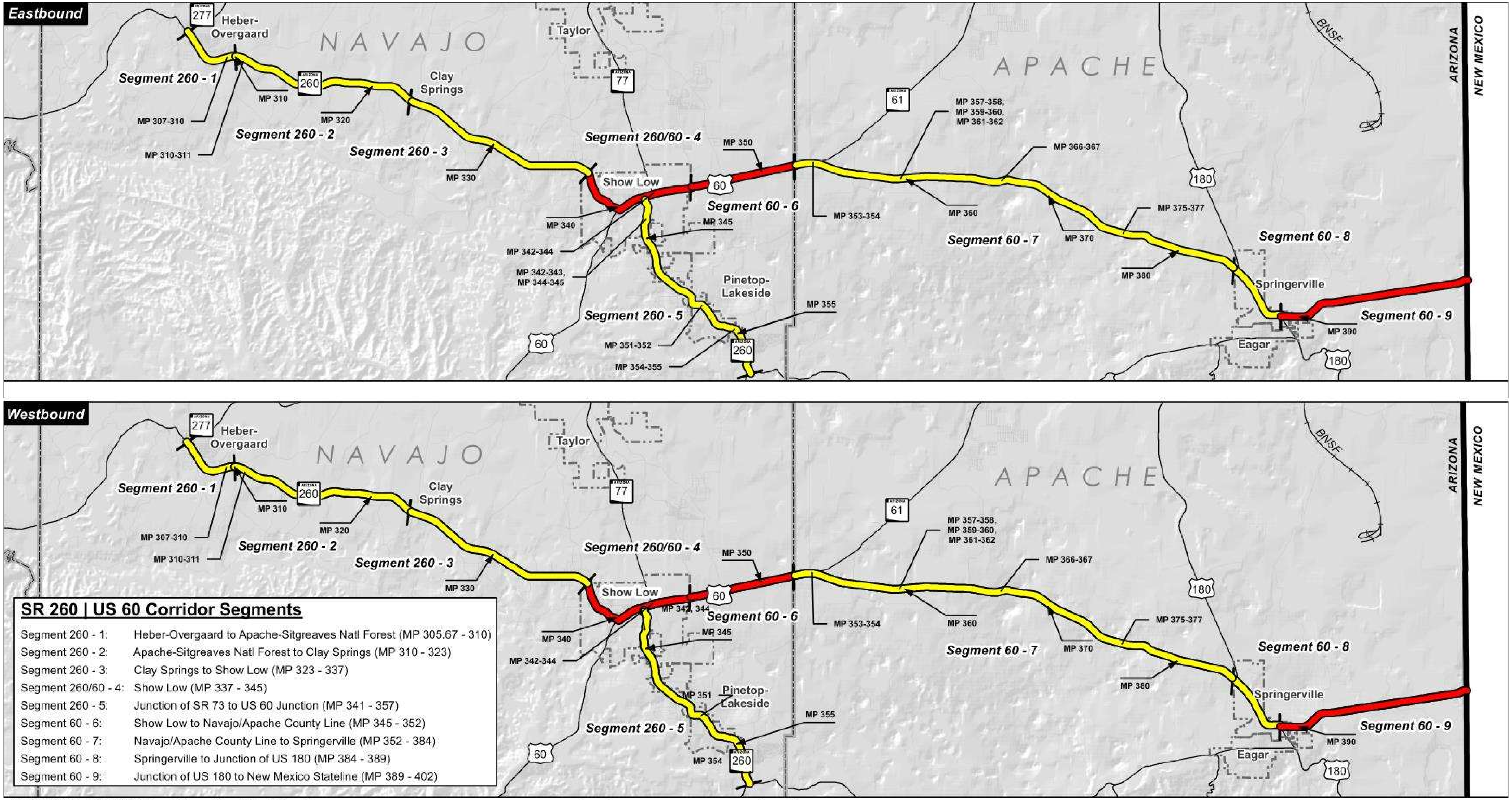
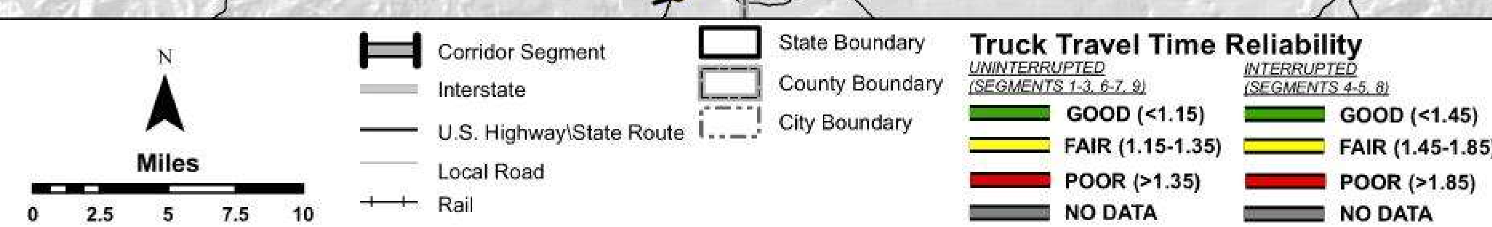
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Freight Index and Hot Spots
2018 Data
N
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
FREIGHT INDEX
UNINTERRUPTED (SEGMENTS 1-3, 6-7, 9)
GOOD (<1.15)
FAIR (1.15-1.35)
POOR (>1.35)
NO DATA
INTERRUPTED (SEGMENTS 4-5, 8)
GOOD (<1.45)
FAIR (1.45-1.85)
POOR (>1.85)
NO DATA
FREIGHT HOT SPOT
BRIDGE VERTICAL CLEARANCE LESS THAN 16.25 FEET AND NO RAMP AROUND
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
Heber-Overgaard
Clay Springs
Show Low
Pinetop-Lakeside
Snowflake
Taylor
St. Johns
Springerville
Eagar
Apache Railway
BNSF
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
MP 310
MP 310-311
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390

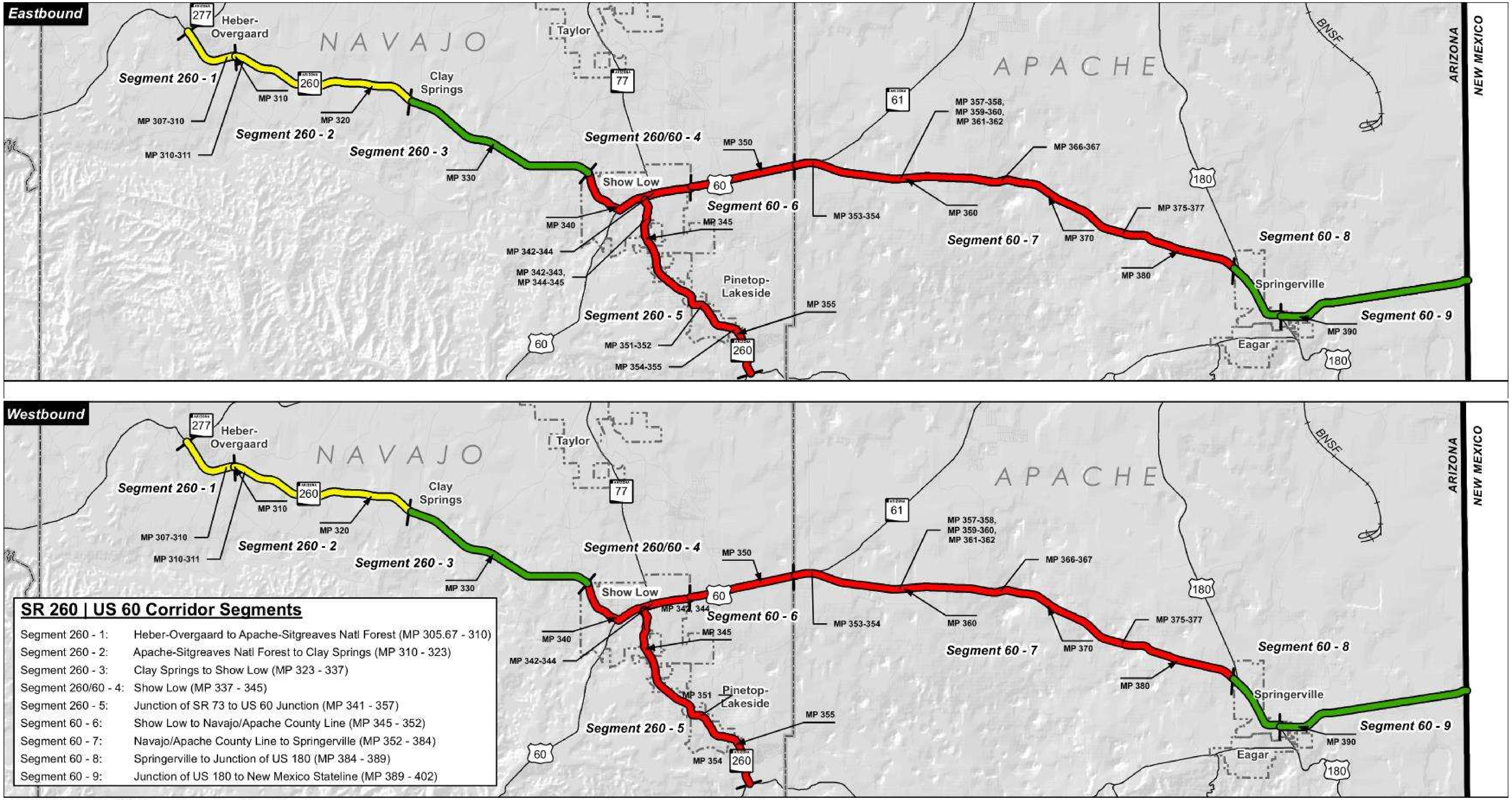


SR 260 | US 60 Corridor Profile Study: Heber-Overgaard to New Mexico State Line

Truck Travel Time Reliability

2018 Data



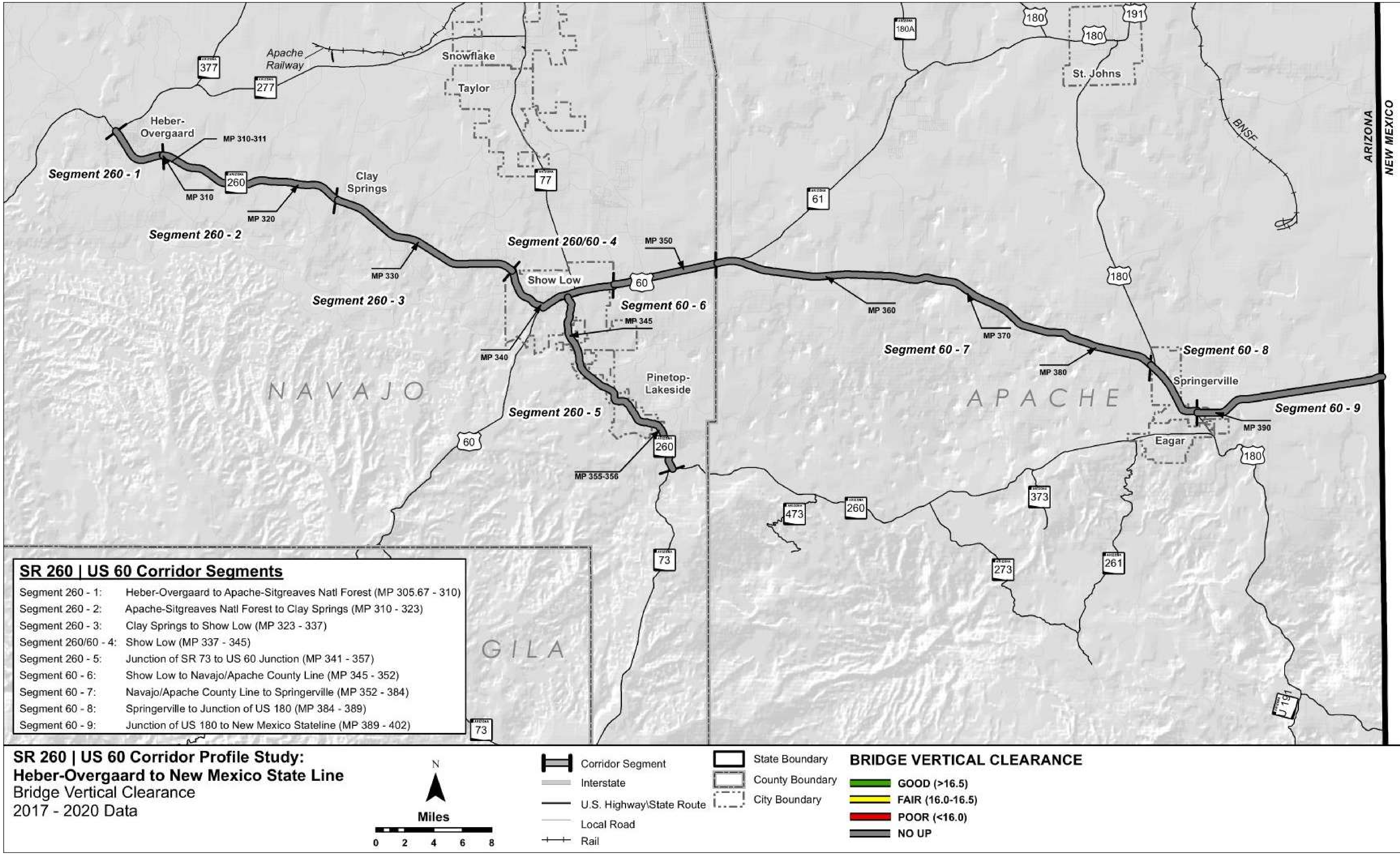


SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Closure Duration
2017 - 2020 Data

N
Miles
0 2.5 5 7.5 10

Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary

MINUTES OF CLOSURE DURATION
- GOOD (<44.18)
- FAIR (44.18-124.86)
- POOR (>124.86)
- NO DATA



SR 260 | US 60 Corridor Segments
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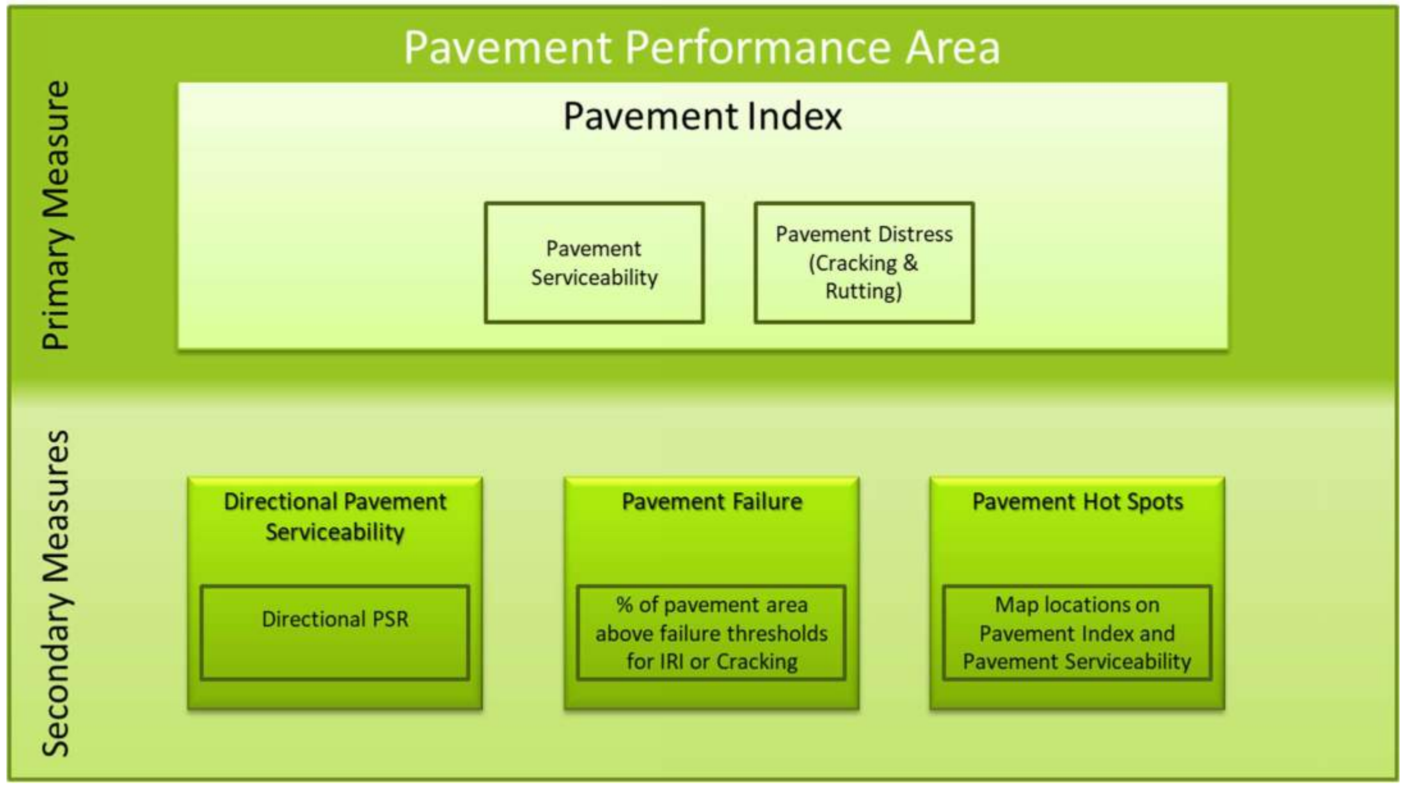
Segment 260/60 - 4: Show Low (MP 337 - 345)
Segment 260 - 5: Junction of SR 73 to US 60 Junction (MP 341 - 357)
Segment 60 - 6: Show Low to Navajo/Apache County Line (MP 345 - 352)
Segment 60 - 7: Navajo/Apache County Line to Springerville (MP 352 - 384)
Segment 60 - 8: Springerville to Junction of US 180 (MP 384 - 389)
Segment 60 - 9: Junction of US 180 to New Mexico Stateline (MP 389 - 402)
SR 260 | US 60 Corridor Profile Study:
Heber-Overgaard to New Mexico State Line
Bridge Vertical Clearance
2017 - 2020 Data
Miles
0 2 4 6 8
Corridor Segment
Interstate
U.S. Highway\State Route
Local Road
Rail
State Boundary
County Boundary
City Boundary
BRIDGE VERTICAL CLEARANCE
GOOD (>16.5)
FAIR (16.0-16.5)
POOR (<16.0)
NO UP
Segment 260 - 1
Segment 260 - 2
Segment 260 - 3
Segment 260/60 - 4
Segment 260 - 5
Segment 60 - 6
Segment 60 - 7
Segment 60 - 8
Segment 60 - 9
MP 310-311
MP 310
MP 320
MP 330
MP 340
MP 345
MP 350
MP 355-356
MP 360
MP 370
MP 380
MP 390
Heber-Overgaard
Apache Railway
Snowflake
Taylor
Clay Springs
Show Low
Pinetop-Lakeside
St. Johns
Springerville
Eagar
NAVAJO
APACHE
GILA
ARIZONA
NEW MEXICO
BNSF

Appendix B: Performance Area Detailed Calculation Methodologies

Pavement Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Pavement performance area as shown in the following graphic:



This performance area is used to evaluate mainline pavement condition. Pavement condition data for ramps, frontage roads, crossroads, etc. was not included in the evaluation.

<u>Primary Pavement Index</u>

The Pavement Index is calculated based on the use of three pavement condition ratings from the ADOT Pavement Database. The three ratings are the International Roughness Index (IRI), the Cracking rating, and the Rutting rating. The calculation of the Pavement Index uses a combination of these three ratings.

The IRI is a measurement of the pavement roughness based on field-measured longitudinal roadway profiles. To facilitate the calculation of the index, the IRI rating was converted to a Pavement Serviceability Rating (PSR) using the following equation:

$$PSR = 5 * e^{-0.0038*IRI}$$

The Cracking rating is a measurement of the amount of surface cracking based on a field-measured area of 1,000 square feet that serves as a sample for each mile. The Rutting rating is a measurement of the depth of pavement rutting based on field measurements. To facilitate the calculation of the index, the Cracking Rating and Rutting Rating were combined and converted to a Pavement Distress Index (PDI) using the following equation:

$$PDI = 5 - [\,(0.345 * C^{0.66}) + \left(0.01428 * \left(\frac{R}{2} * 100\right)^{1.32}\right) - \left(0.0823 * C^{0.18} * \left(\frac{R}{2} * 100\right)^{0.50}\right)\,]$$

Both the PSR and PDI use a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance. The performance thresholds for interstates and non-interstates shown in the tables below were used for the PSR and PDI.

Performance Level for Interstates	IRI (PSR)	Cracking & Rutting (PDI)
Good	<75 (>3.75)	Cracking <5.75 Rutting < 0.35
Fair	75 - 102 (3.40 - 3.75)	Cracking 5.75 - 12 Rutting 0.35 – 0.55
Poor	>102(<3.40)	Cracking >12 Rutting > 0.55

Performance Level for Non-Interstates	IRI (PSR)	Cracking & Rutting (PDI)
Good	<94 (>3.5)	Cracking < 5.75 Rutting < 0.35
Fair	94 - 142 (2.90 - 3.5)	Cracking 5.75 - 12 Rutting 0.35 – 0.55
Poor	>142 (<2.90)	Cracking >12 Rutting > 0.55

The PSR and PDI are calculated for each 1-mile section of roadway. If PSR or PDI falls into a poor rating (<3.4 for PSR for interstates, for example) for a 1-mile section, then the score for that 1-mile section is entirely (100%) based on the lower score (either PSR or PDI). If neither PSR or PDI fall into a poor rating for a 1-mile section, then the score for that 1-mile section is based on a combination of the lower rating (70% weight) and the higher rating (30% weight). The result is a score between 0 and 5 for each direction of travel of each mile of roadway based on a combination of both the PSR and the PDI.

The project corridor has been divided into segments. The Pavement Index for each segment is a weighted average of the directional ratings based on the number of travel lanes. Therefore, the condition of a section with more travel lanes will have a greater influence on the resulting segment Pavement Index than a section with fewer travel lanes.

<u>Secondary Pavement Measures</u>

Three secondary measures are evaluated:

- Directional Pavement Serviceability
- Pavement Failure
- Pavement Hot Spots

Directional Pavement Serviceability: Similar to the Pavement Index, the Directional Pavement Serviceability is calculated as a weighted average (based on number of lanes) for each segment. However, this rating only utilizes the PSR and is calculated separately for each direction of travel. The PSR uses a 0 to 5 scale with 0 representing the lowest performance and 5 representing the highest performance.

Pavement Failure: The percentage of pavement area rated above the failure thresholds for IRI, Cracking, or Rutting is calculated for each segment. In addition, the Standard score (z-score) is calculated for each segment

The Standard score (z-score) is the number of standard deviations above or below the mean. Therefore, a Standard score between -0.5 and +0.5 is “average”, less than -0.5 is lower (better) than average, and higher than +0.5 is above (worse) than average.

Pavement Hot Spots: The Pavement Index map identifies locations that have an IRI rating, Cracking rating, or Rutting rating that fall above the failure threshold as identified by ADOT Pavement Group. For interstates, an IRI rating above 105, a Cracking rating above 10, or a Rutting rating above 0.4 will be used as the thresholds which are slightly different than the ratings shown previously. For non-interstates, an IRI rating above 142, a Cracking rating above 10, or a Rutting rating above 0.4 will be used as the thresholds.

<u>Scoring</u>

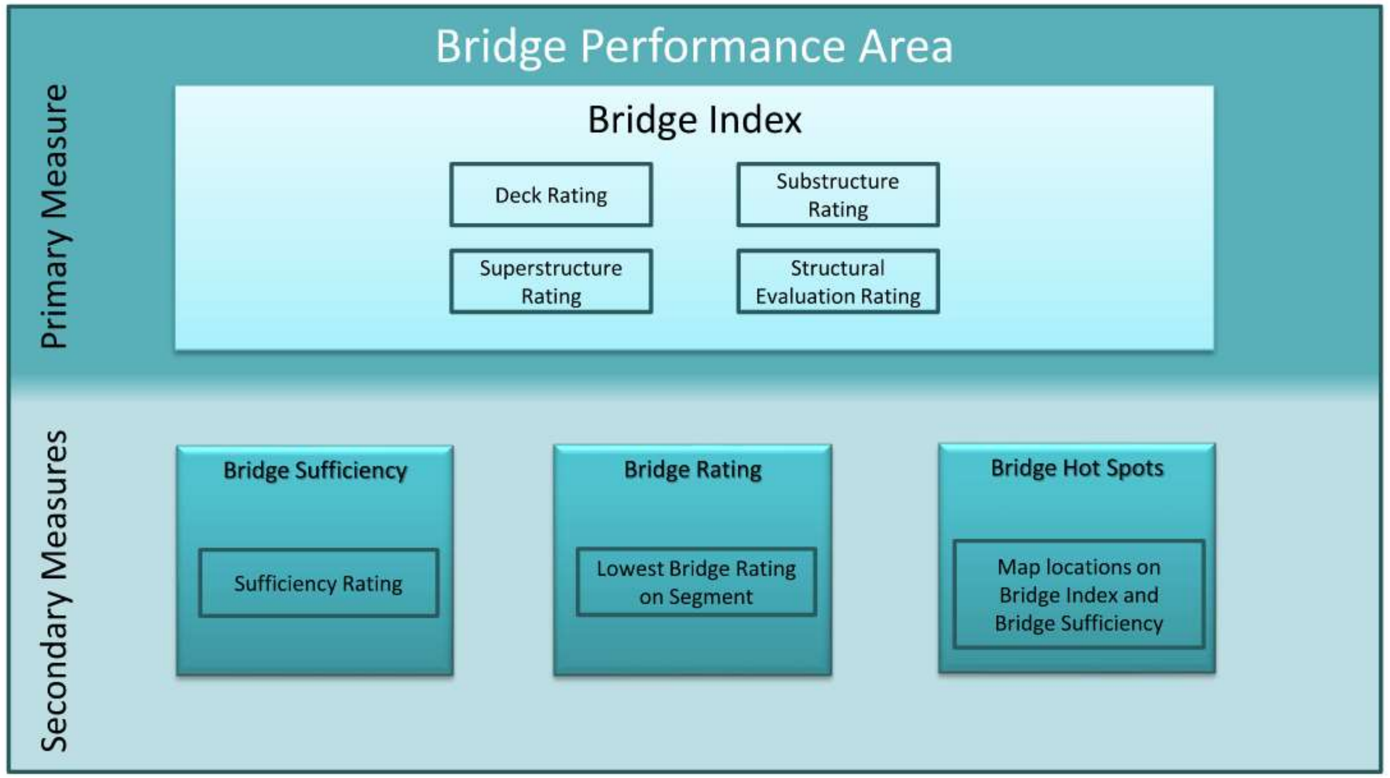
Performance Level	Pavement Index	
	Interstates	Non-Interstates
Good	>3.75	>3.6
Fair	3.0 - 3.75	2.8 - 3.6
Poor	<3.0	<2.8

Performance Level	Directional Pavement Serviceability	
	Interstates	Non-Interstates
Good	>3.75	>3.5
Fair	3.4 - 3.75	2.9 - 3.5
Poor	<3.4	<2.9

Performance Level	% Pavement Failure
Good	< 5%
Fair	5% – 20%
Poor	>20%

Bridge Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Bridge performance area as shown in the following graphic:



This performance area is used to evaluate mainline bridges. Bridges on ramps (that do not cross the mainline), frontage roads, etc. should not be included in the evaluation. Basically, any bridge that carries mainline traffic or carries traffic over the mainline should be included and bridges that do not carry mainline traffic, run parallel to the mainline (frontage roads), or do not cross the mainline should not be included.

Primary Bridge Index

The Bridge Index is calculated based on the use of four bridge condition ratings from the ADOT Bridge Database, also known as the Arizona Bridge Information and Storage System (ABISS). The four ratings are the Deck Rating, Substructure Rating, Superstructure Rating, and Structural Evaluation Rating. The calculation of the Bridge Index uses the lowest of these four ratings.

Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

The project corridor has been divided into segments and the bridges are grouped together according to the segment definitions. In order to report the Bridge Index for each corridor segment, the Bridge Index for each segment is a weighted average based on the deck area for each bridge. Therefore, the condition of a larger bridge will have a greater influence on the resulting segment Bridge Index than a smaller bridge.

Secondary Bridge Measures

Four secondary measures will be evaluated:

- Bridge Sufficiency
- Bridge Rating
- Bridge Hot Spots

Bridge Sufficiency: Similar to the Bridge Index, the Bridge Sufficiency rating is calculated as a weighted average (based on deck area) for each segment. The Bridge Sufficiency rating is a scale of 0 to 100 with 0 representing the lowest performance and 100 representing the highest performance. A rating of 80 or above represents “good” performance, a rating between 50 and 80 represents “fair” performance, and a rating below 50 represents “poor” performance.

Bridge Rating: The Bridge Rating simply identifies the lowest bridge rating on each segment. This performance measure is not an average and therefore is not weighted based on the deck area. The Bridge Index identifies the lowest rating for each bridge, as described above. Each of the four condition ratings use a 0 to 9 scale with 0 representing the lowest performance and 9 representing the highest performance.

Bridge Hot Spots: The Bridge Index map identifies individual bridge locations that are identified as hot spots. Hot spots are bridges that have a single rating of 4 in any of the four ratings, or multiple ratings of 5 in the deck, substructure or superstructure ratings.

Scoring:

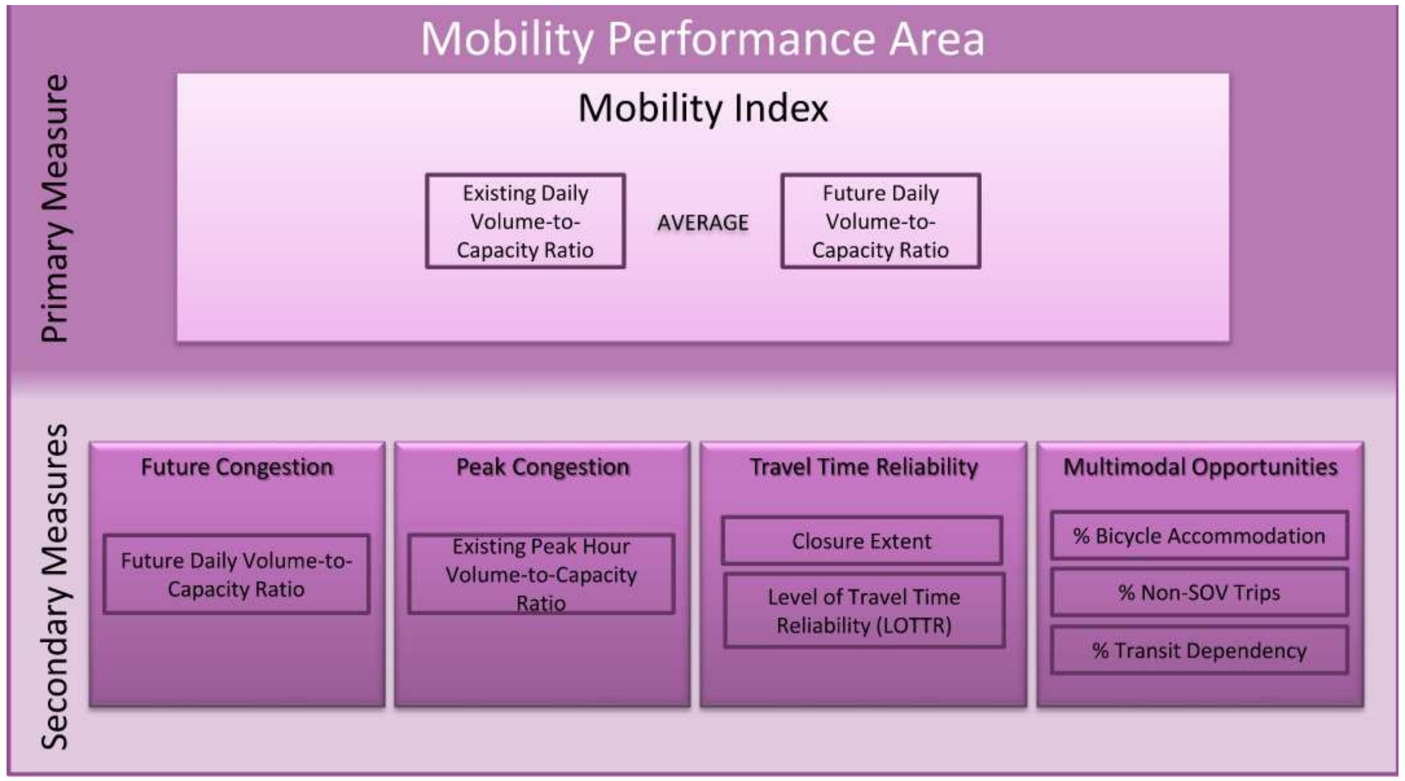
Performance Level	Bridge Index
Good	>6.5
Fair	5.0-6.5
Poor	<5.0

Performance Level	Sufficiency Rating
Good	>80
Fair	50-80
Poor	<50

Performance Level	Bridge Rating
Good	>6
Fair	5-6
Poor	<5

Mobility Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Mobility performance area as shown in the following graphic:



Primary Mobility Index

The primary Mobility Index is an average of the existing daily volume-to-capacity (V/C) ratio and the future daily V/C ratio for each segment of the corridor.

Existing Daily V/C: The existing daily V/C ratio for each segment is calculated by dividing the existing Annual Average Daily Traffic (AADT) volume for each segment by the total Level of Service (LOS) E capacity volume for that segment.

The capacity is calculated using the HERS Procedures for Estimating Highway Capacity[1]. The HERS procedure incorporates HCM 2010 methodologies. The methodology includes capacity estimation procedures for multiple facility types including freeways, rural two-lane highways, multilane highways, and signalized and non-signalized urban sections.

The segment capacity is defined as a function of the number of mainline lanes, shoulder width, interrupted or uninterrupted flow facilities, terrain type, percent of truck traffic, and the designated urban or rural environment.

[1] HERS Support – 2011, Task 6: Procedures for Estimating Highway Capacity, draft Technical Memorandum. Cambridge Systematics. Prepared for the Federal Highway Administration. March 2013.

The AADT for each segment is calculated by applying a weighted average across the length of the segment based on the individual 24-hour volumes and distances associated with each HPMS count station within each segment.

The following example equation is used to determine the weighted average of a segment with two HPMS count locations within the corridor

((HPMS 1 Distance x HPMS 1 Volume) + (HPMS 2 Distance x HPMS 2 Volume))/Total Segment Length

For specific details regarding the HERS methodology used, refer to the *Procedures for Estimating Highway Capacity, draft Technical Memorandum.*

Future Daily V/C: The future daily V/C ratio for each segment is calculated by dividing the future AADT volume for each segment by the existing LOS E capacity. The capacity volume used in this calculation is the same as is utilized in the existing daily V/C equation.

The future AADT daily volumes are generated by applying an average annual compound growth rate (ACGR) to each existing AADT segment volume. The following equation is used to apply the average annual compound growth rate:

Future AADT = Existing AADT x ((1+ACGR)^(Future Year-Existing Year))

The ACGR for each segment is defined by comparing the total volumes in the existing Arizona Travel Demand Model (AZTDM2) to the future AZTDM2 traffic volumes at each existing HPMS count station location throughout the corridor. Each existing and future segment volume is defined using the same weighted average equation described in the *Existing Daily V/C* section above and then summing the directional volumes for each location. The following equation is used to determine the ACGR for each segment:

ACGR = ((Future Volume/Existing Volume)^(1/(Future Year-Existing Year))))-1

Secondary Mobility Measures

Four secondary measures are evaluated:

- Future Congestion
- Peak Congestion
- Travel Time Reliability
    - Closure Extent
    - Directional Level of Travel Time Reliability

- Multimodal Opportunities
  - % Bicycle Accommodation
  - % Non-Single Occupancy Vehicle (SOV) Trips
  - % Transit Dependency

Future Congestion: The future daily V/C ratios for each segment in the corridor that are calculated and used in the Mobility Index as part of the overall average between Existing Daily V/C and Future Daily V/C are applied independently as a secondary measure. The methods to calculate the Future Daily V/C can be referenced in the Mobility Index section.

Peak Congestion: Peak Congestion has been defined as the peak hour V/C ratio in both directions of the corridor. The peak hour V/C ratio is calculated using the HERS method as described previously. The peak hour volume utilizes the directional AADT for each segment, which is calculated by applying a weighted average across the length of the segment based on the individual directional 24-hour volumes and distances associated with each HPMS count station within each segment. The segment capacity is defined based on the characteristics of each segment including number of lanes, terrain type, and environment, similar to the 24-hour volumes using the HERS method.

Travel Time Reliability: Travel time reliability is a secondary measure that includes two indicators. The two indicators are the number of times a piece of a corridor is closed for any specific reason and the directional Level of Travel Time Reliability (LOTTR).

Closure Extent: The number of times a roadway is closed is documented through the HCRS dataset. Closure Extent is defined as the average number of times a particular milepost of the corridor is closed per year per mile in a specific direction of travel. The weighted average of each occurrence takes into account the distance over which a specific occurrence spans.

Thresholds that determine levels of good, fair, and poor are based on the average number of closures per mile per year within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Directional Level of Travel Time Reliability: In terms of overall mobility, the LOTTR is the relationship of 80^{th} percentile travel time to average (50^{th} percentile) travel time for a given corridor segment in a specific direction.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak). The highest value of the four time periods calculation is defined as the LOTTR for that data point. The weighted average LOTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average LOTTR across each entry is used as the LOTTR for each respective segment within the corridor.

Multimodal Opportunities: Three multimodal opportunity indicators reflect the characteristics of the corridor that promote alternate modes to a single occupancy vehicle (SOV) for trips along the corridor. The three indicators include the percent bicycle accommodation, non-SOV trips, and transit dependency along the corridor.

Percent Bicycle Accommodation: For this secondary performance evaluation, outside shoulder widths are evaluated considering the roadway's context and conditions. This requires use of the roadway data that includes right shoulder widths, shoulder surface types, and speed limits, all of which are available in the following ADOT geographic information system (GIS) data sets:

- Right Shoulder Widths
- Left Shoulder Widths (for undivided roadways)
- Shoulder Surface Type (Both Left/Right)
- Speed Limit

Additionally, each segment's average AADT, estimated earlier in the Mobility performance area methodology, is used for the criteria to determine if the existing shoulder width meets the effective width.

The criteria for screening if a shoulder segment meets the recommended width criteria are as followed:

(1) If AADT <= 1500 OR Speed Limit <= 25 miles per hour (mph):
The segment's general purpose lane can be shared with bicyclists (no effective shoulder width required)

(2) If AADT > 1500 AND Speed Limit between (25 - 50 mph) AND Pavement Surface is Paved:
Effective shoulder width required is 4 feet or greater

(3) If AADT > 1500 AND Speed Limit >= 50 mph and Pavement Surface is Paved:
Effective shoulder width required is 6 feet or greater

The summation of the length of the shoulder sections that meet the defined effective width criteria, based on criteria above, is divided by the segment's total length to estimate the percent of the segment that accommodates bicycles as illustrated at the end of this section. If shoulder data is not available or appears erroneous, field measurements can substitute for the shoulder data.

Percent Non-SOV Trips: The percentage of non-SOV trips over distances less than 50 miles gives an indication of travel patterns along a section of the corridor that could benefit from additional multimodal options in the future.

Thresholds that determine levels of good, fair, and poor are based on the percent non-SOV trips within each of the identified statewide significant corridors by ADOT. The thresholds shown at the end of this section represent statewide averages across those corridors.

Percent Transit Dependency: : U.S. Census American Community Survey tract and state level geographic data and attributes from the tables B08201 (Number of Vehicles Available by Household Size) and B17001 (Population in Poverty within the Last 12 Months) were downloaded with margins of error included from the Census data retrieval application Data Ferret. Population ranges for each tract were determined by adding and subtracting the margin of error to each estimate in excel. The tract level attribute data was then joined to geographic tract data in GIS. Only tracts within a one mile buffer of each corridor are considered for this evaluation.

Tracts that have a statistically significantly larger number of either people in poverty or households with only one or no vehicles available than the state average are considered potentially transit dependent.

Example: The state average for zero or one vehicles households (HHs) is between 44.1% and 45.0%. Tracts which have the lower bound of their range above the upper bound of the state range have a greater percentage of zero/one vehicle HHs than the state average. Tracts that have their upper bound beneath the lower bound of the state range have a lesser percentage of zero/one vehicles HHs than the state average. All other tracts that have one of their bounds overlapping with the state average cannot be considered statistically significantly different because there is a chance the value is actually the same.

In addition to transit dependency, the following attributes are added to the Multimodal Opportunities map based on available data.

- Shoulder width throughout the corridor based on 'Shoulder Width' GIS dataset provided by ADOT
- Intercity bus routes
- Multiuse paths within the corridor right-of-way, if applicable

Scoring:

Volume-to-Capacity Ratios		
Urban and Fringe Urban		
Good - LOS A-C	V/C ≤ 0.71	*Note - ADOT Roadway Design Standards indicate Urban and Fringe Urban roadways should be designed to level of service C or better
Fair - LOS D	V/C > 0.71 & ≤ 0.89	
Poor - LOS E or less	V/C > 0.89	
Rural		
Good - LOS A-B	V/C ≤ 0.56	*Note - ADOT Roadway Design Standards indicate Rural roadways should be designed to level of service B or better
Fair - LOS C	V/C > 0.56 & ≤ 0.76	
Poor - LOS D or less	V/C > 0.76	

Performance Level	Closure Extent
Good	≤ 0.22
Fair	> 0.22 & ≤ 0.62
Poor	V/C > 0.62

Performance Level	LOTTR on Uninterrupted Flow Facilities
Good	< 1.15
Fair	≥ 1.15 & < 1.50
Poor	≥ 1.50

Performance Level	LOTTR on Interrupted Flow Facilities
Good	< 1.15
Fair	≥ 1.15 & < 1.50
Poor	≥ 1.50

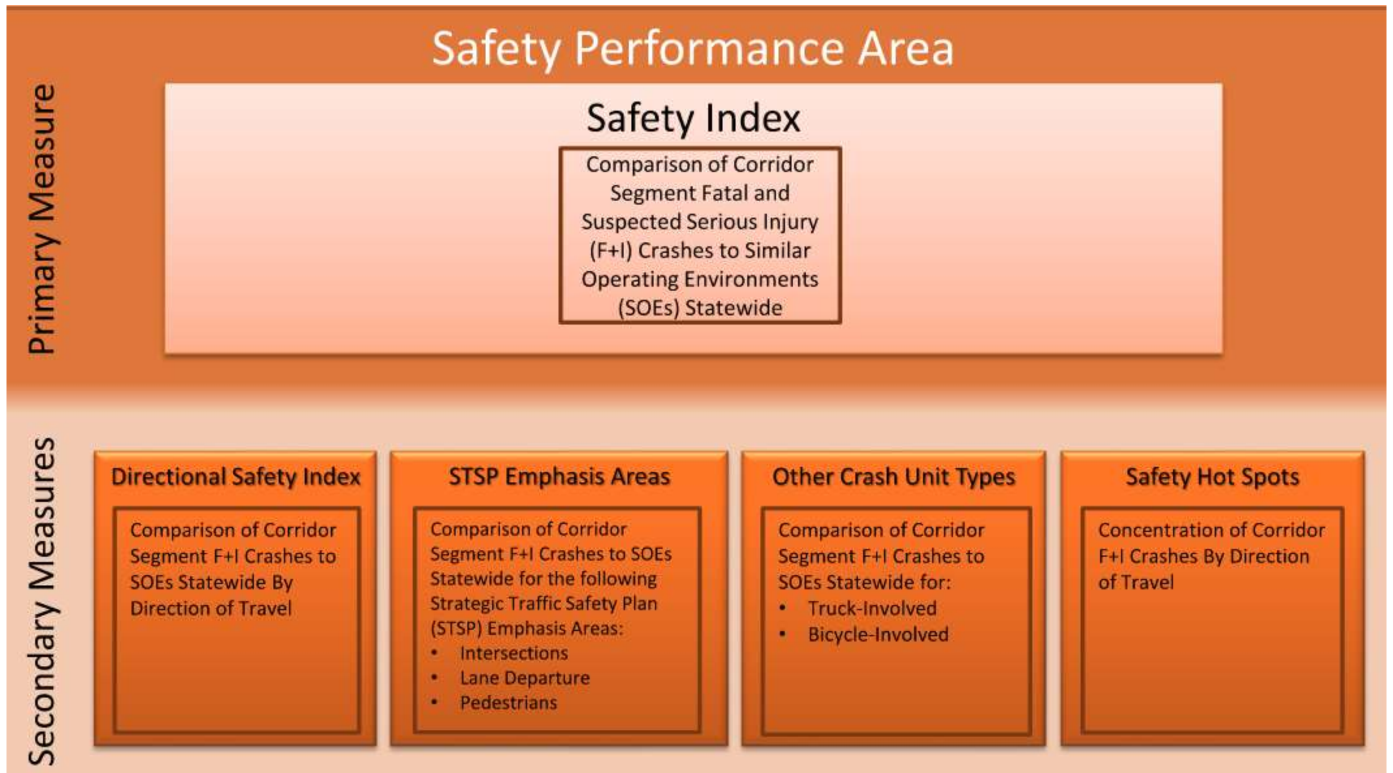
Performance Level	Percent Bicycle Accommodation
Good	≥ 90%
Fair	> 60% & ≤ 90%
Poor	< 60%

Performance Level	Percent Non-SOV Trips
Good	≥ 17%
Fair	> 11% & ≤ 17%
Poor	< 11%

Performance Level	Percent Transit Dependency
Good	Tracts with both zero and one vehicle household population in poverty percentages below the statewide average
Fair	Tracts with either zero and one vehicle household or population in poverty percentages below the statewide average
Poor	Tracts with both zero and one vehicle household and population in poverty percentages above the statewide average

Safety Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Safety performance area as shown in the following graphic:



<u>Primary Safety Index</u>

The Safety Index is a safety performance measure based on the bi-directional (i.e., both directions combined) frequency and rate of fatal and suspected serious injury crashes, the relative cost of those types of crashes, and crash occurrences on similar roadways in Arizona. According to ADOT's 2018 Highway Safety Improvement Program Manual, fatal crashes have an estimated cost that is 17.3 times the estimated cost of suspected serious injury crashes ($9.5 million compared to $550,000).

The Combined Safety Score (CSS) is an interim measure that combines fatal and suspected serious injury crashes into a single value. The CSS is calculated using the following generalized formula:

*CSS = 17.3 * (Normalized Fatal Crash Rate + Frequency) + (Normalized Suspected Serious Injury Crash Rate + Frequency)*

Because crashes vary depending on the operating environment of a particular roadway, statewide CSS values were developed for similar operating environments defined by functional classification, urban vs. rural setting, number of travel lanes, and traffic volumes. To determine the Safety Index of a particular segment, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment.

The Safety Index is calculated using the following formula:

Safety Index = Segment CSS / Statewide Similar Operating Environment CSS

The average annual Safety Index for a segment is compared to the statewide similar operating environment annual average, with one standard deviation from the statewide average forming the scale break points.

The more a particular segment's Safety Index value is below the statewide similar operating environment average, the better the safety performance is for that particular segment as a lower value represents fewer crashes.

<u>Scoring:</u>

The scale for rating the Safety Index depends on the operating environments selected, as shown in the table below.

Similar Operating Environment	Safety Index (Overall & Directional)	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	0.92	1.08
2 or 3 or 4 Lane Divided Highway	0.81	1.19
4 or 5 Lane Undivided Highway	0.78	1.22
6 Lane Highway	0.76	1.24
Rural 4 Lane Freeway with Daily Volume < 25,000	0.84	1.16
Rural 4 Lane Freeway with Daily Volume > 25,000	0.78	1.22
Urban 4 Lane Freeway	0.73	1.27
Urban or Rural 6 Lane Freeway	0.65	1.35
Urban > 6 Lane Freeway	0.89	1.11

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Some corridor segments may have a very low number of total fatal and suspected serious injury crashes. Low crash frequencies (i.e., a small sample size) can translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following two criteria were developed to identify segments with "insufficient data" for assessing performance for the Safety Index. Both of these criteria must be met for a segment to have "insufficient data" to reliably rate the Safety Index performance:

- If the crash sample size (total fatal plus suspected serious injury crashes) for a given segment is less than five crashes over the five-year analysis period; AND
- If a change in one crash results in a change in segment performance by two levels (i.e., a change from below average to above average performance or a change from above average

to below average frequency), the segment has "insufficient data" and Safety Index performance ratings are unreliable.

Secondary Safety Measures

The Safety performance area has four secondary measures related to fatal and suspected serious injury crashes:

- Directional Safety Index
- Strategic Traffic Safety Plan (SHSP) Emphasis Areas
- Other Crash Unit Types
- Safety Hot Spots

Directional Safety Index: The Directional Safety Index shares the same calculation procedure and thresholds as the Safety Index. However, the measure is based on the directional frequency and rate of fatal and suspected serious injury crashes.

Similar to the Safety Index, the segment CSS is compared to the average statewide CSS for the similar statewide operating environment. The Directional Safety Index follows the lead of the Safety Index in terms of "insufficient data" status. If the Safety Index meets both criteria for "insufficient data", the Directional Safety Index should also be changed to "insufficient data". If the Safety Index does not meet both criteria for "insufficient data", the Directional Safety Index would also not change to say "insufficient data"

STSP Emphasis Areas: ADOT's 2019 STSP identifies several emphasis areas for reducing fatal and suspected serious injury crashes. The three relevant STSP emphasis areas relate to crashes involving:

- Intersections
- Lane departures
- Pedestrians

To develop a performance measure that reflects these emphasis areas, the percentage of total fatal and suspected serious injury crashes that involves a given emphasis area on a particular segment is compared to the statewide average percentage of crashes involving that same emphasis area on roads with similar operating environments in a process similar to how the Safety Index is developed.

The STSP emphasis areas performance is calculated using the following formula:

% Crashes Involving STSP Emphasis Area = Segment Crashes Involving STSP Emphasis Area / Total Segment Crashes

The percentage of total crashes involving STSP emphasis areas for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the STSP emphasis areas, the more the frequency of crashes involving STSP emphasis areas is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index.

Scoring:

The scale for rating the STSP emphasis areas performance depends on the crash history on similar statewide operating environments, as shown in the tables below:

Similar Operating Environment	Crashes at Intersections	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	11.2%	15.6%
2 or 3 or 4 Lane Divided Highway	23.4%	29.3%
4 or 5 Lane Undivided Highway	43.8%	49.5%
6 Lane Highway	57.8%	73.2%
Rural 4 Lane Freeway with Daily Volume < 25,000	0.00%	0.00%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.00%	0.00%
Urban 4 Lane Freeway	0.00%	0.00%
Urban or Rural 6 Lane Freeway	0.00%	0.00%
Urban > 6 Lane Freeway	0.00%	0.00%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Lane Departures	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	66.9%	74.5%
2 or 3 or 4 Lane Divided Highway	56.4%	65.0%
4 or 5 Lane Undivided Highway	21.1%	32.1%
6 Lane Highway	11.7%	38.1%
Rural 4 Lane Freeway with Daily Volume < 25,000	72.8%	76.4%
Rural 4 Lane Freeway with Daily Volume > 25,000	69.0%	77.5%
Urban 4 Lane Freeway	60.6%	78.1%
Urban or Rural 6 Lane Freeway	55.7%	62.9%
Urban > 6 Lane Freeway	40.4%	43.2%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Pedestrians	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	3.8%	7.2%
2 or 3 or 4 Lane Divided Highway	2.4%	3.6%
4 or 5 Lane Undivided Highway	8.8%	13.5%
6 Lane Highway	0.4%	11.9%
Rural 4 Lane Freeway with Daily Volume < 25,000	1.0%	3.3%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.7%	4.7%
Urban 4 Lane Freeway	0.0%	4.9%
Urban or Rural 6 Lane Freeway	4.0%	7.9%
Urban > 6 Lane Freeway	1.6%	4.7%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The STSP emphasis area secondary safety performance measures for the Safety performance area include proportions of specific types of crashes within the total fatal and suspected serious injury crash frequencies. This more detailed categorization of fatal and suspected serious injury crashes can result in low crash frequencies (i.e., a small sample size) that translate into performance ratings that can be unstable. In some cases, a change in crash frequency of one crash (one additional crash or one less crash) could result in a change in segment performance of two levels. To avoid reliance on performance ratings where small changes in crash frequency result in large changes in performance, the following criteria were developed to identify segments with “insufficient data” for assessing performance for the STSP emphasis area secondary safety performance measures. If any of these criteria are met for a segment, that segment has “insufficient data” to reliably rate that STSP emphasis area performance:

- If the crash sample size (total fatal plus suspected serious injury crashes) for a given segment is less than five crashes over the five-year analysis period, the segment has “insufficient data” and performance ratings are unreliable. OR
- If a change in one crash results in a change in segment performance by two levels (i.e., a change from below average to above average performance or a change from above average to below average frequency), the segment has “insufficient data” and performance ratings are unreliable. OR
- If the corridor average segment crash frequency for any of the STSP emphasis area performance measures is less than two crashes over the five-year analysis period, that entire STSP emphasis area performance measure has “insufficient data” and performance ratings are unreliable.

Other Crash Unit Types: Other crash unit types of interest are:

- Truck-involved crashes
- Bicycle-involved crashes

To develop a performance measure that reflects the aforementioned crash unit types, the percentage of total fatal and suspected serious injury crashes that involves a given crash unit type on a particular segment is compared to the statewide average percentage of crashes involving that same crash unit type on roads with similar operating environments in a process similar to how the Safety Index is developed.

The crash unit type performance is calculated using the following formula:

% Crashes Involving Crash Unit Type = Segment Crashes Involving Crash Unit Type / Total Segment Crashes

The percentage of total crashes involving each crash unit type for a segment is compared to the statewide percentages on roads with similar operating environments. One standard deviation from the statewide average percentage forms the scale break points.

When assessing the performance of the crash unit types, the more the frequency of crashes involving crash unit types is below the statewide average implies better levels of segment performance. Thus, lower values are better, similar to the Safety Index.

Scoring:

The scale for rating the unit-involved crash performance depends on the crash history on similar statewide operating environments, as shown in the following tables.

Similar Operating Environment	Crashes Involving Trucks	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	4.2%	8.0%
2 or 3 or 4 Lane Divided Highway	3.7%	9.9%
4 or 5 Lane Undivided Highway	0.8%	5.5%
6 Lane Highway	4.3%	7.5%
Rural 4 Lane Freeway with Daily Volume < 25,000	19.0%	22.5%
Rural 4 Lane Freeway with Daily Volume > 25,000	8.5%	18.0%
Urban 4 Lane Freeway	6.9%	12.4%
Urban or Rural 6 Lane Freeway	5.0%	12.9%
Urban > 6 Lane Freeway	1.9%	5.1%

** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

Similar Operating Environment	Crashes Involving Bicycles	
	Lower Limit of Average*	Upper Limit of Average*
2 or 3 Lane Undivided Highway	0.0%	3.3%
2 or 3 or 4 Lane Divided Highway	0.0%	2.2%
4 or 5 Lane Undivided Highway	0.5%	3.8%
6 Lane Highway	0.0%	7.2%
Rural 4 Lane Freeway with Daily Volume < 25,000	0.0%	0.9%
Rural 4 Lane Freeway with Daily Volume > 25,000	0.0%	0.0%
Urban 4 Lane Freeway	0.0%	0.0%
Urban or Rural 6 Lane Freeway	0.0%	1.3%
Urban > 6 Lane Freeway	0.0%	0.0%

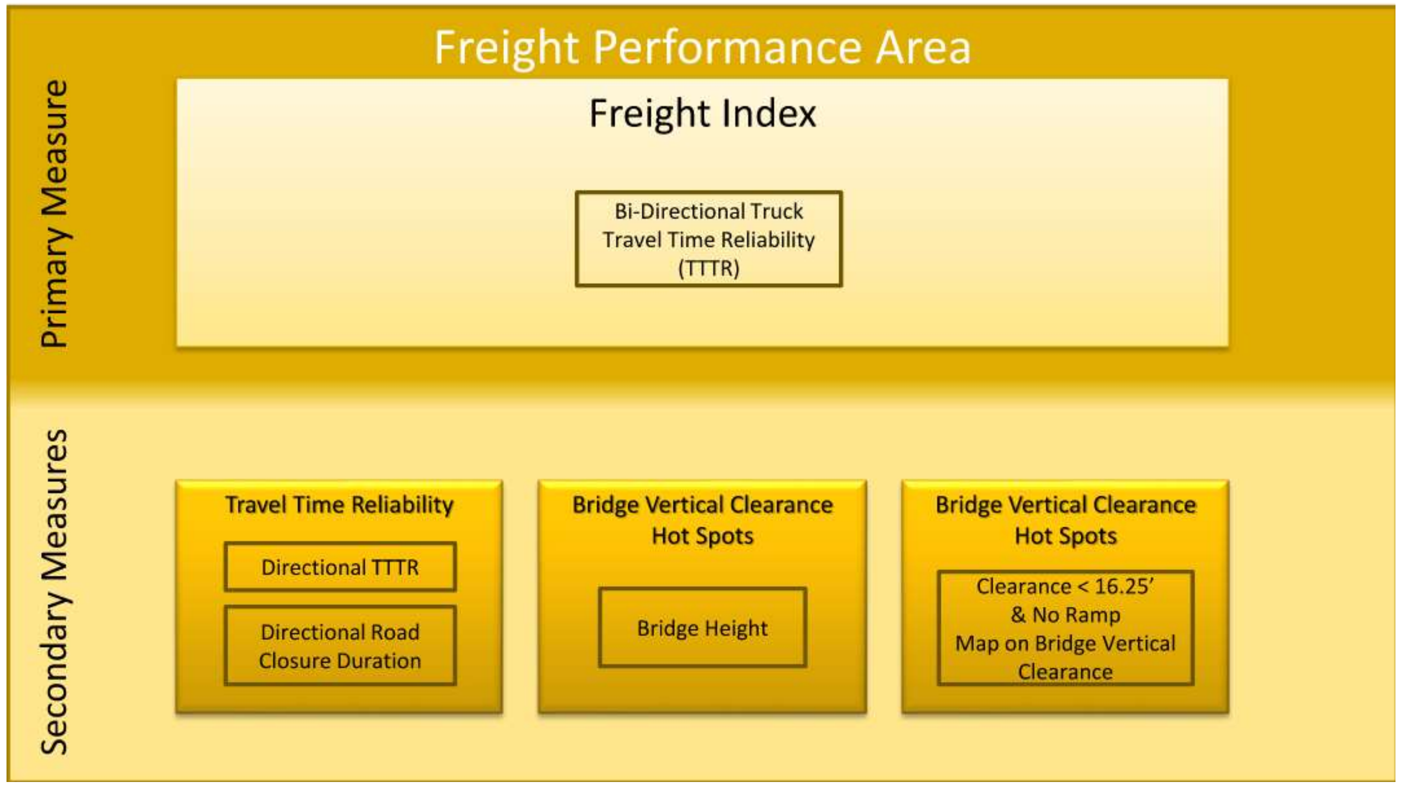
** Lower/upper limit of Average calculated as one standard deviation below/above the Mean*

The crash unit types have the same “insufficient data” criteria as the STSP emphasis areas.

Safety Hot Spots: A hot spot analysis was conducted that identified abnormally high concentrations of fatal and suspected serious injury crashes along the study corridor by direction of travel. The identification of crash concentrations involves a GIS-based function known as “kernel density analysis”. This measure is mapped for graphical display purposes with the Directional Safety Index but is not included in the Safety performance area rating calculations.

Freight Performance Area Calculation Methodologies

This section summarizes the approach for developing the primary and secondary performance measures in the Freight performance area as shown in the following graphic:



<u>Primary Freight Index</u>

The Freight Index is a reliability performance measure based on the bi-directional truck travel time reliability (TTTR) for truck travel. The industry standard definition for the Truck Travel Time Reliability (TTTR) is the ratio of the 95th percentile travel time to average (50th percentile) travel time for trucks.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak).

The highest calculated value of the four time periods is defined as the TTTR for that data point. The weighted average TTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average TTTR across each entry is used as the TTTR for each respective segment within the corridor.

For each corridor segment, the TTTR is calculated for each direction of travel and then averaged to create a bi-directional TTTR. The Freight Index is equal to the average bi-directional TTTR for the segment.

The scale for rating the Freight Index differs between uninterrupted and interrupted flow facilities.

<u>Secondary Freight Measures</u>

The Freight performance area includes three secondary measures that provide an in-depth evaluation of the different characteristics of freight performance:

- Travel Time Reliability
  - Directional Truck Travel Time Reliability
  - Closure Duration
- Bridge Vertical Clearance
- Bridge Vertical Clearance Hot Spots

Travel Time Reliability: Travel time reliability is a secondary measure that includes two indicators. The two indicators are the directional Truck Travel Time Reliability (TTTR) and the duration a piece of a corridor is closed for any specific reason.

<u>Truck Travel Time Reliability</u>: The performance measure for truck travel time reliability is directional TTTR. The industry standard definition for TTTR is the ratio of 95th percentile travel time to average (50th percentile) travel time for trucks for a given corridor segment in a specific direction.

Using INRIX data provided by ADOT, four time periods for each data point were collected throughout the day (AM peak, mid-day, PM peak, and off-peak). The highest value of the four time periods calculation is defined as the TTTR for that data point. The weighted average TTTR is calculated within each segment based on the number of data points collected and the length associated with the TMC location. The value of the weighted average TTTR across each entry is used as the TTTR for each respective segment within the corridor.

<u>Closure Duration</u>: This performance measure related to road closures is average roadway closure (i.e., full lane closure) duration time in minutes. There are three main components to full closures that affect reliability – frequency, duration, and extent. In the freight industry, closure duration is the most important component because trucks want to minimize travel time and delay.

Data on the frequency, duration, and extent of full roadway closures on the ADOT State Highway System is available in the HCRS database that is managed and updated by ADOT.

The average closure duration in a segment – in terms of the average time a milepost is closed per mile per year on a given segment – is calculated using the following formula:

*Closure Duration = Sum of Segment (Closure Clearance Time * Closure Extent) / Segment Length*

The segment closure duration time in minutes can then be compared to statewide averages for closure duration in minutes, with one-half standard deviation from the average forming the scale break points. The scale for rating closure duration in minutes is found at the end of this section.

Bridge Vertical Clearance: This performance measure uses the vertical clearance information from the ADOT Bridge Database to identify locations with low vertical clearance. The minimum vertical clearance for all underpass structures (i.e., structures under which mainline traffic passes) is determined for each segment.

Bridge Vertical Clearance Hot Spots: This performance measure related to truck restrictions is the locations, or hot spots, where bridge vertical clearance issues restrict truck travel. Sixteen feet three inches (16.25') is the minimum standard vertical clearance value for state highway bridges over travel lanes.

Locations with lower vertical clearance values than the minimum standard are categorized by the ADOT Intermodal Transportation Department Engineering Permits Section as either locations where ramps exist that allow the restriction to be avoided or locations where ramps do not exist and the restriction cannot be avoided. The locations with vertical clearances below the minimum standard that cannot be ramped around are considered hot spots. This measure is mapped for graphical display purposes with the bridge vertical clearance map but is not included in the Freight performance area rating calculations.

Scoring:

Performance Level	Freight Index	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.15	< 1.45
Fair	1.15 – 1.35	1.45 – 1.85
Poor	> 1.35	> 1.85

Performance Level	TTTR	
	Uninterrupted Flow Facilities	Interrupted Flow Facilities
Good	< 1.15	< 1.45
Fair	1.15 – 1.35	1.45 – 1.85
Poor	> 1.35	> 1.85

Performance Level	Closure Duration (minutes)
Good	< 44.18
Fair	44.18 – 124.86
Poor	> 124.86

Performance Level	Bridge Vertical Clearance
Good	> 16.5'
Fair	16.0' – 16.5'
Poor	< 16.0'

Appendix C: Performance Area Data

Pavement Performance Area Data

				Direction 1 (Eastbound)				Direction 2 (Westbound)				Direction 1		Direction 2		Composite		Pavement	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (EB)	Dir 2 (WB)	Index	Dir 1 (EB)	Dir 2 (WB)
Segment 260-1		***Interstate?***		**No**																
Milepost	305	to	306	2	-	6.60	0.10	2	-	10.40	0.10	-	3.94	-	3.54	-	-		2	2
Milepost	306	to	307	2	91.51	15.80	0.20	2	104.10	24.80	0.17	3.53	3.00	3.37	2.32	3.16	2.32		2	2
Milepost	307	to	308	2	82.85	21.30	0.21	2	98.18	25.70	0.19	3.65	2.55	3.44	2.24	2.55	2.24		2	2
Milepost	308	to	309	2	73.10	27.20	0.20	2	96.60	23.80	0.19	3.79	2.12	3.46	2.38	2.12	2.38		2	2
Milepost	309	to	310	2	78.78	23.00	0.17	2	91.95	26.90	0.15	3.71	2.45	3.53	2.17	2.45	2.17		2	2
			Total	10				10												20
			Weighted Average									2.93	2.81	2.76	2.53	2.06	1.82			
			Factor									1.00		1.00						
			Indicator Score									2.93		2.76						100.0%
			Pavement Index															1.94		
Segment 260-2		***Interstate?***		**No**																
Milepost	310	to	311	2	64.20	10.40	0.13		-	-	-	3.92	3.53	-	-	3.65	-		2	0
Milepost	311	to	312	2	56.21	15.00	0.13		-	-	-	4.04	3.11	-	-	3.39	-		2	0
Milepost	312	to	313	2	56.65	9.20	0.14		-	-	-	4.03	3.65	-	-	3.76	-		0	0
Milepost	313	to	314	2	53.68	19.40	0.13		-	-	-	4.08	2.75	-	-	2.75	-		2	0
Milepost	314	to	315	2	56.96	17.40	0.21		-	-	-	4.03	2.85	-	-	3.21	-		2	0
Milepost	315	to	316	2	48.10	13.50	0.16		-	-	-	4.16	3.23	-	-	3.51	-		2	0
Milepost	316	to	317	2	69.27	13.80	0.20		-	-	-	3.84	3.16	-	-	3.37	-		2	0
Milepost	317	to	318	2	52.74	10.80	0.15		-	-	-	4.09	3.48	-	-	3.67	-		2	0
Milepost	318	to	319	2	55.78	13.00	0.14		-	-	-	4.04	3.29	-	-	3.51	-		2	0
Milepost	319	to	320	2	60.06	15.30	0.15		-	-	-	3.98	3.07	-	-	3.35	-		2	0
Milepost	320	to	321	2	58.35	17.30	0.16		-	-	-	4.01	2.90	-	-	3.23	-		2	0
Milepost	321	to	322	2	56.89	3.15	0.11		-	-	-	4.03	4.37	-	-	4.27	-		0	0
Milepost	322	to	323	2	58.85	0.10	0.08		-	-	-	4.00	-	-	-	-	-		0	0
			Total	26				0												20
			Weighted Average									4.02	3.03	#DIV/0!	#DIV/0!	3.20	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									4.02		#DIV/0!						76.9%
			Pavement Index															3.20		
Segment 260-3		***Interstate?***		**No**																
Milepost	323	to	324	2	58.32	0.10	0.08		-	-	-	4.01	-	-	-	-	-		0	0
Milepost	324	to	325	2	62.34	0.05	0.09		-	-	-	3.95	4.95	-	-	4.25	-		0	0
Milepost	325	to	326	2	60.75	0.05	0.09		-	-	-	3.97	4.95	-	-	4.26	-		0	0
Milepost	326	to	327	2	66.87	0.10	0.07		-	-	-	3.88	-	-	-	-	-		0	0
Milepost	327	to	328	2	61.57	0.10	0.08		-	-	-	3.96	-	-	-	-	-		0	0
Milepost	328	to	329	2	67.86	0.10	0.08		-	-	-	3.86	-	-	-	-	-		0	0
Milepost	329	to	330	2	51.98	0.10	0.08		-	-	-	4.10	-	-	-	-	-		0	0
Milepost	330	to	331	2	65.63	7.10	0.12		-	-	-	3.90	3.87	-	-	3.88	-		0	0
Milepost	331	to	332	2	74.85	12.85	0.15		-	-	-	3.76	3.29	-	-	3.44	-		2	0
Milepost	332	to	333	2	97.82	16.65	0.16		-	-	-	3.45	2.95	-	-	3.10	-		2	0
Milepost	333	to	334	2	92.52	16.40	0.21		-	-	-	3.52	2.94	-	-	3.11	-		2	0
Milepost	334	to	335	2	90.22	15.30	0.19		-	-	-	3.55	3.05	-	-	3.20	-		2	0
Milepost	335	to	336	2	113.04	19.95	0.24		-	-	-	3.25	2.62	-	-	2.62	-		2	0
Milepost	336	to	337	2	109.90	14.80	0.22		-	-	-	3.29	3.07	-	-	3.13	-		2	0
			Total	28				0												12
			Weighted Average									3.75	2.27	#DIV/0!	#DIV/0!	2.21	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									3.75		#DIV/0!						42.9%
			Pavement Index															2.21		

Segment 260/60-4		***Interstate?***		**No**																
Milepost	337	to	338	2	117.88	14.00	0.23	2	103.78	15.40	0.21	3.19	3.12	3.37	3.02	3.14	3.12		2	2
Milepost	338	to	339	2	96.87	2.40	0.07	2	99.17	6.00	0.09	3.46	4.49	3.43	4.01	3.77	3.60		0	0
Milepost	339	to	340	2	88.50	1.89	0.07	2	115.86	5.70	0.10	3.57	4.57	3.22	4.04	3.87	3.47		0	0
Milepost	340	to	341	2	140.95	11.00	0.34	2	232.16	12.00	0.13	2.93	3.24	2.07	3.38	3.02	2.07		2	2
Milepost	341	to	342	2	132.77	18.14	0.15	2	113.78	4.40	0.14	3.02	2.84	3.24	4.18	2.89	3.52		2	0
Milepost	342	to	343	2	71.71	14.85	0.11	2	83.29	1.10	0.15	3.81	3.13	3.64	4.66	3.33	3.95		2	0
Milepost	343	to	344	2	77.51	17.28	0.14	2	76.63	6.40	0.19	3.72	2.91	3.74	3.90	3.16	3.85		2	0
Milepost	344	to	345	2	78.43	18.05	0.15	2	103.23	14.10	0.21	3.71	2.85	3.38	3.13	3.11	3.20		2	2
			Total	16				16												18
			Weighted Average									3.43	3.39	3.26	3.79	3.29	3.35			
			Factor									1.00		1.00						
			Indicator Score									3.43		3.26						56.3%
			Pavement Index															3.32		
Segment 260-5		***Interstate?***		**No**																
Milepost	341	to	342	4	132.77	18.14	0.15		113.78	4.40	0.14	3.02	2.84	3.24	4.18	2.89	3.52		4	0
Milepost	342	to	343	4	71.71	14.85	0.11		83.29	1.10	0.15	3.81	3.13	3.64	4.66	3.33	3.95		4	0
Milepost	343	to	344	4	77.51	17.28	0.14		76.63	6.40	0.19	3.72	2.91	3.74	3.90	3.16	3.85		4	0
Milepost	344	to	345	4	78.43	18.05	0.15		103.23	14.10	0.21	3.71	2.85	3.38	3.13	3.11	3.20		4	0
Milepost	345	to	346	4	75.38	15.89	0.13		-	-	-	3.75	3.04	-	-	3.25	-		4	0
Milepost	346	to	347	4	85.78	15.90	0.12		-	-	-	3.61	3.04	-	-	3.21	-		4	0
Milepost	347	to	348	4	69.44	11.70	0.17		-	-	-	3.84	3.39	-	-	3.52	-		4	0
Milepost	348	to	349	4	94.11	15.15	0.12		-	-	-	3.50	3.10	-	-	3.22	-		4	0
Milepost	349	to	350	4	99.08	15.36	0.14		-	-	-	3.43	3.08	-	-	3.18	-		4	0
Milepost	350	to	351	4	96.25	14.65	0.14		-	-	-	3.47	3.14	-	-	3.24	-		4	0
Milepost	351	to	352	4	70.08	15.60	0.12		-	-	-	3.83	3.06	-	-	3.29	-		4	0
Milepost	352	to	353	4	71.04	16.15	0.12		-	-	-	3.82	3.02	-	-	3.26	-		4	0
Milepost	353	to	354	4	110.09	17.44	0.15		-	-	-	3.29	2.90	-	-	3.02	-		4	0
Milepost	354	to	355	2	120.78	18.55	0.25	2	97.61	19.55	0.18	3.16	2.73	3.45	2.71	2.73	2.71		2	2
Milepost	355	to	356	2	103.09	12.40	0.27	2	78.54	16.60	0.26	3.38	3.22	3.71	2.87	3.27	3.12		2	2
Milepost	356	to	357	2	99.92	16.70	0.29	2	92.03	16.70	0.25	3.42	2.82	3.52	2.87	3.00	3.06		2	2
			Total	58				6												64
			Weighted Average									3.57	3.03	3.56	2.81	3.18	2.96			
			Factor									1.00		1.00						
			Indicator Score									3.57		3.56						100.0%
			Pavement Index															3.16		
Segment 60-6		***Interstate?***		**No**																
Milepost	345	to	320	2	75.38	15.89	0.13		-	-	-	3.75	3.04	-	-	3.25	-		2	0
Milepost	346	to	321	2	85.78	15.90	0.12		-	-	-	3.61	3.04	-	-	3.21	-		2	0
Milepost	347	to	322	2	69.44	11.70	0.17		-	-	-	3.84	3.39	-	-	3.52	-		2	0
Milepost	348	to	323	2	94.11	15.15	0.12		-	-	-	3.50	3.10	-	-	3.22	-		2	0
Milepost	349	to	324	2	99.08	15.36	0.14		-	-	-	3.43	3.08	-	-	3.18	-		2	0
Milepost	350	to	325	2	96.25	14.65	0.14		-	-	-	3.47	3.14	-	-	3.24	-		2	0
Milepost	351	to	326	2	70.08	15.60	0.12		-	-	-	3.83	3.06	-	-	3.29	-		2	0
			Total	14				0												14
			Weighted Average									3.63	3.12	#DIV/0!	#DIV/0!	3.27	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									3.63		#DIV/0!						100.0%
			Pavement Index															3.27		

Segment 60-7		*Interstate?*		No																
Milepost	352	to	331	2	71.04	16.15	0.12		-	-	-	3.82	3.02	-	-	3.26	-		2	0
Milepost	353	to	332	2	110.09	17.44	0.15		-	-	-	3.29	2.90	-	-	3.02	-		2	0
Milepost	354	to	333	2	120.78	18.55	0.25		97.61	19.55	0.18	3.16	2.73	3.45	2.71	2.73	2.71		2	0
Milepost	355	to	334	2	103.09	12.40	0.27		78.54	16.60	0.26	3.38	3.22	3.71	2.87	3.27	3.12		2	0
Milepost	356	to	335	2	99.92	16.70	0.29		92.03	16.70	0.25	3.42	2.82	3.52	2.87	3.00	3.06		2	0
Milepost	357	to	336	2	152.79	34.15	0.18		-	-	-	2.80	1.66	-	-	1.66	-		2	0
Milepost	358	to	337	2	164.42	40.05	0.20		-	-	-	2.68	1.26	-	-	1.26	-		2	0
Milepost	359	to	338	2	163.65	42.90	0.21		-	-	-	2.68	1.08	-	-	1.08	-		2	0
Milepost	360	to	339	2	141.32	37.26	0.21		-	-	-	2.92	1.44	-	-	1.44	-		2	0
Milepost	361	to	340	2	136.55	33.14	0.21		-	-	-	2.98	1.71	-	-	1.71	-		2	0
Milepost	362	to	341	2	126.13	33.35	0.20		-	-	-	3.10	1.70	-	-	1.70	-		2	0
Milepost	363	to	332	2	121.03	32.30	0.16		-	-	-	3.16	1.79	-	-	1.79	-		2	0
Milepost	364	to	333	2	121.99	23.18	0.18		-	-	-	3.15	2.43	-	-	2.43	-		2	0
Milepost	365	to	334	2	128.68	29.11	0.19		-	-	-	3.07	2.00	-	-	2.00	-		2	0
Milepost	366	to	335	2	138.07	29.60	0.19		-	-	-	2.96	1.96	-	-	1.96	-		2	0
Milepost	367	to	336	2	105.70	29.80	0.22		-	-	-	3.35	1.92	-	-	1.92	-		2	0
Milepost	368	to	337	2	89.05	21.70	0.20		-	-	-	3.56	2.52	-	-	2.52	-		2	0
Milepost	369	to	338	2	108.37	16.80	0.14		-	-	-	3.31	2.95	-	-	3.06	-		2	0
Milepost	370	to	339	2	114.40	16.10	0.13		-	-	-	3.24	3.02	-	-	3.08	-		2	0
Milepost	371	to	340	2	99.41	6.85	0.17		-	-	-	3.43	3.87	-	-	3.56	-		0	0
Milepost	372	to	341	2	110.58	21.30	0.14		-	-	-	3.28	2.59	-	-	2.59	-		2	0
Milepost	373	to	342	2	94.49	19.70	0.14		-	-	-	3.49	2.72	-	-	2.72	-		2	0
Milepost	374	to	343	2	94.76	19.95	0.17		-	-	-	3.49	2.68	-	-	2.68	-		2	0
Milepost	375	to	344	2	108.86	25.85	0.20		-	-	-	3.31	2.22	-	-	2.22	-		2	0
Milepost	376	to	345	2	89.76	20.25	0.16		-	-	-	3.55	2.66	-	-	2.66	-		2	0
Milepost	377	to	346	2	78.54	17.15	0.16		-	-	-	3.71	2.91	-	-	3.15	-		2	0
Milepost	378	to	347	2	97.74	22.40	0.16		-	-	-	3.45	2.50	-	-	2.50	-		2	0
Milepost	379	to	348	2	104.30	12.65	0.18		-	-	-	3.36	3.29	-	-	3.31	-		2	0
Milepost	380	to	349	2	90.79	14.60	0.18		-	-	-	3.54	3.11	-	-	3.24	-		2	0
Milepost	381	to	350	2	75.49	21.35	0.17		-	-	-	3.75	2.57	-	-	2.57	-		2	0
Milepost	382	to	351	2	81.00	21.70	0.19		-	-	-	3.68	2.54	-	-	2.54	-		2	0
Milepost	383	to	340	2	59.29	26.00	0.13		-	-	-	3.99	2.25	-	-	2.25	-		2	0
			Total	64				0												62
			Weighted Average									3.31	2.44	#DIV/0!	#DIV/0!	2.46	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									3.31		#DIV/0!						96.9%
			Pavement Index															2.46		

Segment 60-8		***Interstate?***		**No**																
Milepost	384	to	385	2	61.73	19.20	0.13		-	-	-	3.95	2.76	-	-	3.12	-		2	0
Milepost	385	to	386	2	50.69	1.05	0.20		-	-	-	4.12	4.60	-	-	4.46	-		0	0
Milepost	386	to	387	2	61.64	4.95	0.18		-	-	-	3.96	4.08	-	-	4.04	-		0	0
Milepost	387	to	388	2	81.05	15.43	0.15		-	-	-	3.67	3.07	-	-	3.25	-		2	0
Milepost	388	to	389	4	105.67	14.45	0.15		-	-	-	3.35	3.15	-	-	3.21	-		4	0
			Total	12				0												8
			Weighted Average									3.73	3.47	#DIV/0!	#DIV/0!	3.55	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									3.73		#DIV/0!						66.7%
			Pavement Index															3.55		
Segment 60-9		***Interstate?***		**No**																
Milepost	389	to	390	2	56.19	1.55	0.12		-	-	-	4.04	4.61	-	-	4.44	-		0	0
Milepost	390	to	391	2	53.44	0.63	0.11		-	-	-	4.08	4.78	-	-	4.29	-		0	0
Milepost	391	to	392	2	82.22	0.52	0.12		-	-	-	3.66	4.80	-	-	4.00	-		0	0
Milepost	392	to	393	2	50.83	0.25	0.13		-	-	-	4.12	4.86	-	-	4.34	-		0	0
Milepost	393	to	394	2	48.82	0.10	0.11		-	-	-	4.15	-	-	-	-	-		0	0
Milepost	394	to	395	2	55.60	0.25	0.11		-	-	-	4.05	4.87	-	-	4.30	-		0	0
Milepost	395	to	396	2	60.54	0.25	0.12		-	-	-	3.97	4.87	-	-	4.24	-		0	0
Milepost	396	to	397	2	72.35	0.76	0.13		-	-	-	3.80	4.74	-	-	4.08	-		0	0
Milepost	397	to	398	2	70.12	0.22	0.12		-	-	-	3.83	4.88	-	-	4.14	-		0	0
Milepost	398	to	399	2	60.64	0.15	0.14		-	-	-	3.97	4.87	-	-	4.24	-		0	0
Milepost	399	to	400	2	58.58	0.05	0.14		-	-	-	4.00	4.90	-	-	4.27	-		0	0
Milepost	400	to	401	2	76.54	0.15	0.13		-	-	-	3.74	4.88	-	-	4.08	-		0	0
Milepost	401	to	402	2	77.47	0.33	0.14		-	-	-	3.72	4.82	-	-	4.05	-		0	0
			Total	26				0												0
			Weighted Average									3.93	4.45	#DIV/0!	#DIV/0!	3.88	#DIV/0!			
			Factor									1.00		1.00						
			Indicator Score									3.93		#DIV/0!						**0.0%**
			Pavement Index															3.88		

Bridge Performance Area Data

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges	Bridge Rating	Hot Spots on Bridge Index map
				Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete		
Segment 1												
#N/A		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Total			#N/A									
Weighted Average				#N/A					#N/A	#N/A		
Factor				1.00					1.00	1.00		
Indicator Score				**#N/A**						**#N/A**	**#N/A**	
Bridge Index									**#N/A**			
Segment 2												
Pierce Wash Bridge	1373	310.05	2957	78.00	5.00	5.00	7.00	5.00	5.0	0		
Cottonwood Wash Br	1643	321.25	7064	92.50	6.00	7.00	7.00	7.00	6.0	0		
Total			10,021									
Weighted Average				88.22					5.70	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**88.22**						**0.00%**	**5**	
Bridge Index									**5.70**			
Segment 3												
Mortensen Wash Br	1641	328.29	8891	93.20	6.00	7.00	7.00	7.00	6.0	0		
Total			8,891									
Weighted Average				93.20					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**93.20**						**0.00%**	**6**	
Bridge Index									**6.00**			
Segment 4												
Show Low Creek Bridge	2823	341.68	12673	85.00	6.00	7.00	7.00	7.00	6.0	0		
Total			12,673									
Weighted Average				85.00					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**85.00**						**0.00%**	**6**	
Bridge Index									**6.00**			
Segment 5												
#N/A		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Total			#N/A									
Weighted Average				#N/A					#N/A	#N/A		
Factor				1.00					1.00	1.00		
Indicator Score				**#N/A**						**#N/A**	**#N/A**	
Bridge Index									**#N/A**			

Segment 6													
Rocky Arroyo Bridge		384	347.01	4136	63.70	5.00	5.00	6.00	5.00	5.0	0		
	Total			4,136									
	Weighted Average				63.70					5.00	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				**63.70**						**0.00%**	**5**	
	Bridge Index									**5.00**			
Segment 7													
Mallory Draw Bridge		2605	371.74	7802	96.90	7.00	7.00	7.00	7.00	7.0	0		
	Total			7,802									
	Weighted Average				96.90					7.00	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				**96.90**						**0.00%**	**7**	
	Bridge Index									**7.00**			
Segment 8													
Little Colo River Br		414	386.78	3645	79.70	6.00	7.00	7.00	6.00	6.0	0		
	Total			3,645									
	Weighted Average				79.70					6.00	0.00%		
	Factor				1.00					1.00	1.00		
	Indicator Score				**79.70**						**0.00%**	**6**	
	Bridge Index									**6.00**			
Segment 9													
#N/A			#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
	Total			#N/A									
	Weighted Average				#N/A					#N/A	#N/A		
	Factor				1.00					1.00	1.00		
	Indicator Score				**#N/A**						**#N/A**	**#N/A**	
	Bridge Index									**#N/A**			

Mobility Performance Area Data

Segment	Begin MP	End MP	Length (mi)	Facility Type	Flow Type	Terrain	No. of Lanes	Capacity Environment Type	Lane Width (feet)	Posted Speed Limit (mph)	Divided or Undivided	Access Points (per mile)	% No-Passing Zone	Street Parking
260 - 1	305.7	310	4.33	Rural	Uninterrupted	Rolling	4	Multilane Highway	12.00	45	Undivided	17.1	0%	N/A
260 - 2	310	323	13	Rural	Uninterrupted	Mountainous	2	Rural Two-Lane, Non-Signalized	12.00	65	Undivided	3.2	44%	N/A
260 - 3	323	337	14	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	58	Undivided	7.1	40%	N/A
260|60 - 4	337	345	8	Rural	Interrupted	Rolling	4	Urban/Rural Single or Multilane Signalized	12.00	38	Undivided	N/A	0%	N/A
260 - 5	341	357	16	Rural	Interrupted	Rolling	4	Urban/Rural Single or Multilane Signalized	12.00	41	Undivided	N/A	0%	N/A
60 - 6	345	352	7	Rural	Uninterrupted	Rolling	2	Rural Two-Lane, Non-Signalized	12.00	65	Undivided	52.4	87%	N/A
60 - 7	352	384	32	Rural	Uninterrupted	Mountainous	2	Rural Two-Lane, Non-Signalized	12.00	64	Undivided	0.1	71%	N/A
60 - 8	384	389	5	Rural	Interrupted	Rolling	2.336	Urban/Rural Single or Multilane Signalized	12.00	39	Undivided	N/A	30%	N/A
60 - 9	389	402	13	Rural	Uninterrupted	Rolling	2	Rural Two-Lane, Non-Signalized	12.00	65	Undivided	10.2	37%	N/A

LOTTR and TTTR – Direction 1

Segment	TMC	Time Period	Week Type	Road Number	Road Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
260-1	115-06321	1 AM Peak	Weekday	AZ-260	SB	58	60	63	88	45	1.09	1.46	1.12	1.46	0.11	1.11	1.25
	115-06321	2 Mid Day	Weekday	AZ-260	SB	58	60	65	80	45	1.12	1.32					
	115-06321	3 PM Peak	Weekday	AZ-260	SB	58	59	62	80	45	1.07	1.35					
	115-06321	4 Weekend	Weekend	AZ-260	SB	56	59	60	69	45	1.07	1.18					
	115-06319	1 AM Peak	Weekday	AZ-260	SB	102	107	110	128	45	1.08	1.20	1.08	1.25	0.20		
	115-06319	2 Mid Day	Weekday	AZ-260	SB	105	106	112	132	45	1.07	1.25					
	115-06319	3 PM Peak	Weekday	AZ-260	SB	105	107	109	125	45	1.04	1.18					
	115-06319	4 Weekend	Weekend	AZ-260	SB	101	105	109	117	45	1.08	1.12					
	115-06318	1 AM Peak	Weekday	AZ-260	EB	315	321	346	392	47	1.10	1.22	1.12	1.22	0.70		
	115-06318	2 Mid Day	Weekday	AZ-260	EB	312	318	345	384	47	1.11	1.21					
	115-06318	3 PM Peak	Weekday	AZ-260	EB	313	321	339	392	47	1.08	1.22					
	115-06318	4 Weekend	Weekend	AZ-260	EB	310	321	346	392	47	1.12	1.22					
260-2	115-06316	1 AM Peak	Weekday	AZ-260	EB	128	132	136	154	60	1.07	1.17	1.07	1.17	0.14	1.08	1.19
	115-06316	2 Mid Day	Weekday	AZ-260	EB	129	132	136	153	60	1.06	1.16					
	115-06316	3 PM Peak	Weekday	AZ-260	EB	130	134	136	151	60	1.05	1.13					
	115-06316	4 Weekend	Weekend	AZ-260	EB	128	134	135	156	60	1.06	1.17					
	115-06317	1 AM Peak	Weekday	AZ-260	EB	516	530	542	624	65	1.05	1.18	1.06	1.18	0.56		
	115-06317	2 Mid Day	Weekday	AZ-260	EB	514	525	542	613	65	1.05	1.17					
	115-06317	3 PM Peak	Weekday	AZ-260	EB	516	533	539	601	65	1.04	1.13					
	115-06317	4 Weekend	Weekend	AZ-260	EB	509	533	539	601	65	1.06	1.13					
	115-06318	1 AM Peak	Weekday	AZ-260	EB	315	321	346	392	65	1.10	1.22	1.12	1.22	0.30		
	115-06318	2 Mid Day	Weekday	AZ-260	EB	312	318	345	384	65	1.11	1.21					
	115-06318	3 PM Peak	Weekday	AZ-260	EB	313	321	339	392	65	1.08	1.22					
	115-06318	4 Weekend	Weekend	AZ-260	EB	310	321	346	392	65	1.12	1.22					
260-3	115-06316	1 AM Peak	Weekday	AZ-260	EB	128	132	136	154	65	1.07	1.17	1.07	1.17	0.14	1.08	1.22
	115-06316	2 Mid Day	Weekday	AZ-260	EB	129	132	136	153	65	1.06	1.16					
	115-06316	3 PM Peak	Weekday	AZ-260	EB	130	134	136	151	65	1.05	1.13					
	115-06316	4 Weekend	Weekend	AZ-260	EB	128	134	135	156	65	1.06	1.17					
	115-06315	1 AM Peak	Weekday	AZ-260	EB	158	163	167	186	65	1.06	1.14	1.07	1.17	0.17		
	115-06315	2 Mid Day	Weekday	AZ-260	EB	158	162	169	189	65	1.07	1.17					
	115-06315	3 PM Peak	Weekday	AZ-260	EB	158	163	166	186	65	1.05	1.14					
	115-06315	4 Weekend	Weekend	AZ-260	EB	158	163	166	187	65	1.05	1.15					
	115-06314	1 AM Peak	Weekday	AZ-260	EB	334	344	355	392	63	1.06	1.14	1.06	1.14	0.36		
	115-06314	2 Mid Day	Weekday	AZ-260	EB	336	341	355	388	63	1.06	1.14					
	115-06314	3 PM Peak	Weekday	AZ-260	EB	336	346	353	396	63	1.05	1.14					
	115-06314	4 Weekend	Weekend	AZ-260	EB	333	344	354	391	63	1.06	1.14					
	115-06313	1 AM Peak	Weekday	AZ-260	EB	353	356	389	444	55	1.10	1.25	1.12	1.36	0.32		

Segment	TMC	Time Period	Week Type	Road Number	Road Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-06313	2 Mid Day	Weekday	AZ-260	EB	359	362	396	491	55	1.10	1.36					
	115-06313	3 PM Peak	Weekday	AZ-260	EB	356	360	389	450	55	1.09	1.25					
	115-06313	4 Weekend	Weekend	AZ-260	EB	354	355	397	465	55	1.12	1.31					
260|60-4	115-06313	1 AM Peak	Weekday	US-60	EB	353	356	389	444	45	1.10	1.25	1.12	1.36	0.28	1.17	1.72
	115-06313	2 Mid Day	Weekday	US-60	EB	359	362	396	491	45	1.10	1.36					
	115-06313	3 PM Peak	Weekday	US-60	EB	356	360	389	450	45	1.09	1.25					
	115-06313	4 Weekend	Weekend	US-60	EB	354	355	397	465	45	1.12	1.31					
	115-06000	1 AM Peak	Weekday	US-60	EB	154	160	177	224	45	1.15	1.40	1.19	1.51	0.11		
	115-06000	2 Mid Day	Weekday	US-60	EB	158	162	184	239	45	1.16	1.48					
	115-06000	3 PM Peak	Weekday	US-60	EB	162	162	184	245	45	1.14	1.51					
	115-06000	4 Weekend	Weekend	US-60	EB	158	162	188	224	45	1.19	1.39					
	115-05944	1 AM Peak	Weekday	US-60	WB	82	77	110	136	35	1.33	1.76	1.33	2.14	0.04		
	115-05944	2 Mid Day	Weekday	US-60	WB	82	80	107	144	35	1.30	1.81					
	115-05944	3 PM Peak	Weekday	US-60	WB	77	77	97	144	35	1.27	1.87					
	115-05944	4 Weekend	Weekend	US-60	WB	74	77	96	165	35	1.29	2.14					
	115-05945	1 AM Peak	Weekday	US-60	WB	394	335	507	721	35	1.29	2.16	1.32	2.64	0.26		
	115-05945	2 Mid Day	Weekday	US-60	WB	329	353	433	753	35	1.32	2.13					
	115-05945	3 PM Peak	Weekday	US-60	WB	312	346	412	911	35	1.32	2.64					
	115-05945	4 Weekend	Weekend	US-60	WB	305	309	404	597	35	1.32	1.93					
	115-06258	1 AM Peak	Weekday	US-60	WB	326	331	345	428	55	1.06	1.29	1.06	1.29	0.31		
	115-06258	2 Mid Day	Weekday	US-60	WB	326	329	345	423	55	1.06	1.29					
	115-06258	3 PM Peak	Weekday	US-60	WB	326	329	342	373	55	1.05	1.14					
	115-06258	4 Weekend	Weekend	US-60	WB	323	326	342	384	55	1.06	1.18					
260-5	115-06311	1 AM Peak	Weekday	AZ-260	SB	353	363	395	524	44	1.12	1.44	1.17	2.06	0.25	1.17	2.12
	115-06311	2 Mid Day	Weekday	AZ-260	SB	383	405	449	833	44	1.17	2.06					
	115-06311	3 PM Peak	Weekday	AZ-260	SB	363	383	416	590	44	1.15	1.54					
	115-06311	4 Weekend	Weekend	AZ-260	SB	349	363	405	510	44	1.16	1.40					
	115-06310	1 AM Peak	Weekday	AZ-260	SB	171	180	197	379	45	1.15	2.11	1.23	2.46	0.13		
	115-06310	2 Mid Day	Weekday	AZ-260	SB	185	225	228	554	45	1.23	2.46					
	115-06310	3 PM Peak	Weekday	AZ-260	SB	176	180	206	400	45	1.17	2.22					
	115-06310	4 Weekend	Weekend	AZ-260	SB	167	171	196	360	45	1.17	2.10					
	115-06309	1 AM Peak	Weekday	AZ-260	EB	195	199	218	299	44	1.12	1.50	1.14	1.86	0.15		
	115-06309	2 Mid Day	Weekday	AZ-260	EB	197	204	225	380	44	1.14	1.86					
	115-06309	3 PM Peak	Weekday	AZ-260	EB	197	199	223	299	44	1.13	1.50					
	115-06309	4 Weekend	Weekend	AZ-260	EB	192	197	214	246	44	1.12	1.25					
	115-06308	1 AM Peak	Weekday	AZ-260	SB	68	72	84	115	35	1.23	1.60	1.26	2.50	0.04		
	115-06308	2 Mid Day	Weekday	AZ-260	SB	74	77	92	192	35	1.26	2.50					
	115-06308	3 PM Peak	Weekday	AZ-260	SB	72	72	86	110	35	1.19	1.52					

Segment	TMC	Time Period	Week Type	Road Number	Road Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-06308	4 Weekend	Weekend	AZ-260	SB	66	70	78	105	35	1.18	1.50					
	115-06307	1 AM Peak	Weekday	AZ-260	EB	237	245	271	371	35	1.14	1.52	1.14	1.63	0.15		
	115-06307	2 Mid Day	Weekday	AZ-260	EB	244	251	277	409	35	1.14	1.63					
	115-06307	3 PM Peak	Weekday	AZ-260	EB	244	256	272	356	35	1.11	1.39					
	115-06307	4 Weekend	Weekend	AZ-260	EB	235	251	267	371	35	1.13	1.48					
	115-06306	1 AM Peak	Weekday	AZ-260	EB	181	186	208	272	41	1.15	1.46	1.18	3.16	0.12		
	115-06306	2 Mid Day	Weekday	AZ-260	EB	181	195	208	336	41	1.15	1.73					
	115-06306	3 PM Peak	Weekday	AZ-260	EB	181	186	202	589	41	1.11	3.16					
	115-06306	4 Weekend	Weekend	AZ-260	EB	177	186	208	338	41	1.18	1.82					
	115-06305	1 AM Peak	Weekday	AZ-260	SB	62	64	76	135	50	1.24	2.10	1.24	2.26	0.05		
	115-06305	2 Mid Day	Weekday	AZ-260	SB	60	66	71	149	50	1.18	2.26					
	115-06305	3 PM Peak	Weekday	AZ-260	SB	60	62	67	88	50	1.12	1.44					
	115-06305	4 Weekend	Weekend	AZ-260	SB	59	63	67	105	50	1.14	1.67					
	115-06002	1 AM Peak	Weekday	AZ-260	SB	122	122	139	189	54	1.13	1.55	1.13	1.55	0.11		
	115-06002	2 Mid Day	Weekday	AZ-260	SB	122	125	139	149	54	1.13	1.19					
	115-06002	3 PM Peak	Weekday	AZ-260	SB	120	125	133	160	54	1.11	1.28					
	115-06002	4 Weekend	Weekend	AZ-260	SB	122	127	136	164	54	1.11	1.29					
60-6	115+06258	1 AM Peak	Weekday	US-60	EB	321	333	396	753	65	1.23	2.26	1.24	2.26	0.44	1.15	1.68
	115+06258	2 Mid Day	Weekday	US-60	EB	333	330	412	641	65	1.24	1.94					
	115+06258	3 PM Peak	Weekday	US-60	EB	346	332	422	559	65	1.22	1.68					
	115+06258	4 Weekend	Weekend	US-60	EB	309	321	385	525	65	1.24	1.64					
	115P05946	1 AM Peak	Weekday	US-60	EB	20	20	21	24	65	1.08	1.22	1.10	1.28	0.03		
	115P05946	2 Mid Day	Weekday	US-60	EB	20	20	21	26	65	1.08	1.28					
	115P05946	3 PM Peak	Weekday	US-60	EB	20	20	22	24	65	1.10	1.22					
	115P05946	4 Weekend	Weekend	US-60	EB	19	20	21	23	65	1.10	1.19					
	115+05946	1 AM Peak	Weekday	US-60	EB	329	331	350	403	65	1.07	1.22	1.07	1.22	0.53		
	115+05946	2 Mid Day	Weekday	US-60	EB	326	329	348	391	65	1.07	1.19					
	115+05946	3 PM Peak	Weekday	US-60	EB	331	334	351	388	65	1.06	1.16					
	115+05946	4 Weekend	Weekend	US-60	EB	326	331	344	380	65	1.06	1.15					
60-7	115P05946	1 AM Peak	Weekday	US-60	EB	20	20	21	24	56	1.08	1.22	1.10	1.28	0.01	1.09	1.30
	115P05946	2 Mid Day	Weekday	US-60	EB	20	20	21	26	56	1.08	1.28					
	115P05946	3 PM Peak	Weekday	US-60	EB	20	20	22	24	56	1.10	1.22					
	115P05946	4 Weekend	Weekend	US-60	EB	19	20	21	23	56	1.10	1.19					
	115+05946	1 AM Peak	Weekday	US-60	EB	329	331	350	403	64	1.07	1.22	1.07	1.22	0.15		
	115+05946	2 Mid Day	Weekday	US-60	EB	326	329	348	391	64	1.07	1.19					
	115+05946	3 PM Peak	Weekday	US-60	EB	331	334	351	388	64	1.06	1.16					
	115+05946	4 Weekend	Weekend	US-60	EB	326	331	344	380	64	1.06	1.15					
	115+06259	1 AM Peak	Weekday	US-60	EB	475	480	520	618	65	1.09	1.29	1.09	1.30	0.22		

Segment	TMC	Time Period	Week Type	Road Number	Road Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115+06259	2 Mid Day	Weekday	US-60	EB	476	484	516	631	65	1.08	1.30					
	115+06259	3 PM Peak	Weekday	US-60	EB	476	488	518	631	65	1.09	1.29					
	115+06259	4 Weekend	Weekend	US-60	EB	469	484	504	581	65	1.07	1.20					
	115+06642	1 AM Peak	Weekday	US-60	EB	64	64	68	76	65	1.07	1.19	1.08	1.19	0.03		
	115+06642	2 Mid Day	Weekday	US-60	EB	64	64	67	73	65	1.05	1.15					
	115+06642	3 PM Peak	Weekday	US-60	EB	64	64	67	73	65	1.05	1.15					
	115+06642	4 Weekend	Weekend	US-60	EB	63	64	68	72	65	1.08	1.13					
	115+06260	1 AM Peak	Weekday	US-60	EB	575	613	640	833	65	1.11	1.36	1.15	1.52	0.26		
	115+06260	2 Mid Day	Weekday	US-60	EB	571	609	657	924	65	1.15	1.52					
	115+06260	3 PM Peak	Weekday	US-60	EB	617	645	699	864	65	1.13	1.34					
	115+06260	4 Weekend	Weekend	US-60	EB	586	606	653	782	65	1.11	1.29					
	115+06261	1 AM Peak	Weekday	US-60	EB	599	613	627	682	65	1.05	1.11	1.06	1.17	0.29		
	115+06261	2 Mid Day	Weekday	US-60	EB	594	603	623	696	65	1.05	1.15					
	115+06261	3 PM Peak	Weekday	US-60	EB	608	622	632	727	65	1.04	1.17					
	115+06261	4 Weekend	Weekend	US-60	EB	594	618	627	681	65	1.06	1.10					
	115P05947	1 AM Peak	Weekday	US-60	EB	9	9	10	14	65	1.13	1.56	1.15	1.80	0.00		
	115P05947	2 Mid Day	Weekday	US-60	EB	9	9	10	13	65	1.15	1.45					
	115P05947	3 PM Peak	Weekday	US-60	EB	9	9	11	13	65	1.13	1.39					
	115P05947	4 Weekend	Weekend	US-60	EB	9	9	10	17	65	1.15	1.80					
	115+05947	1 AM Peak	Weekday	US-60	EB	79	82	84	99	65	1.07	1.20	1.07	1.27	0.04		
	115+05947	2 Mid Day	Weekday	US-60	EB	79	81	84	103	65	1.07	1.27					
	115+05947	3 PM Peak	Weekday	US-60	EB	81	84	87	103	65	1.07	1.23					
	115+05947	4 Weekend	Weekend	US-60	EB	79	82	83	93	65	1.06	1.13					
	115P05947	1 AM Peak	Weekday	US-60	EB	9	9	10	14	65	1.13	1.56	1.15	1.80	0.01		
	115P05947	2 Mid Day	Weekday	US-60	EB	9	9	10	13	65	1.15	1.45					
	115P05947	3 PM Peak	Weekday	US-60	EB	9	9	11	13	65	1.13	1.39					
	115P05947	4 Weekend	Weekend	US-60	EB	9	9	10	17	65	1.15	1.80					
	115+05947	1 AM Peak	Weekday	US-60	EB	79	82	84	99	65	1.07	1.20	1.07	1.27	0.11		
	115+05947	2 Mid Day	Weekday	US-60	EB	79	81	84	103	65	1.07	1.27					
	115+05947	3 PM Peak	Weekday	US-60	EB	81	84	87	103	65	1.07	1.23					
60-8	115+05947	4 Weekend	Weekend	US-60	EB	79	82	83	93	65	1.06	1.13				1.21	1.65
	115+06262	1 AM Peak	Weekday	US-60	SB	232	228	283	409	56	1.22	1.79	1.24	2.23	0.27		
	115+06262	2 Mid Day	Weekday	US-60	SB	242	247	298	434	56	1.23	1.76					
	115+06262	3 PM Peak	Weekday	US-60	SB	237	237	291	415	56	1.23	1.75					
	115+06262	4 Weekend	Weekend	US-60	SB	234	237	291	528	56	1.24	2.23					
	115+06263	1 AM Peak	Weekday	US-60	EB	464	465	556	684	45	1.20	1.47	1.22	1.47	0.61		
	115+06263	2 Mid Day	Weekday	US-60	EB	467	467	567	635	45	1.22	1.36					
	115+06263	3 PM Peak	Weekday	US-60	EB	468	470	564	635	45	1.21	1.35					

Segment	TMC	Time Period	Week Type	Road Number	Road Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115+06263	4 Weekend	Weekend	US-60	EB	444	453	516	574	45	1.16	1.27					
60-9	115+06263	1 AM Peak	Weekday	US-60	EB	464	465	556	684	63	1.20	1.47	1.22	1.47	0.56	1.16	1.47
	115+06263	2 Mid Day	Weekday	US-60	EB	467	467	567	635	63	1.22	1.36					
	115+06263	3 PM Peak	Weekday	US-60	EB	468	470	564	635	63	1.21	1.35					
	115+06263	4 Weekend	Weekend	US-60	EB	444	453	516	574	63	1.16	1.27					
	115+06651	1 AM Peak	Weekday	US-60	EB	321	329	348	401	65	1.08	1.22	1.08	1.46	0.44		
	115+06651	2 Mid Day	Weekday	US-60	EB	326	333	350	485	65	1.07	1.46					
	115+06651	3 PM Peak	Weekday	US-60	EB	335	339	360	417	65	1.08	1.23					
	115+06651	4 Weekend	Weekend	US-60	EB	319	326	340	390	65	1.07	1.20					

LOTTR and TTTR – Direction 2

Segment	TMC	Time Period	Week Type	Rd No.	Rd Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
260-1	115+06319	1 AM Peak	Weekday	AZ-260	WB	308	313	340	384	47	1.10	1.23	1.14	1.25	0.70	1.12	1.24
	115+06319	2 Mid Day	Weekday	AZ-260	WB	307	314	339	392	47	1.11	1.25					
	115+06319	3 PM Peak	Weekday	AZ-260	WB	311	315	353	384	47	1.14	1.22					
	115+06319	4 Weekend	Weekend	AZ-260	WB	304	319	343	384	47	1.13	1.20					
	115+06320	1 AM Peak	Weekday	AZ-260	NB	105	105	109	114	45	1.04	1.09	1.09	1.12	0.20		
	115+06320	2 Mid Day	Weekday	AZ-260	NB	102	105	109	117	45	1.07	1.12					
	115+06320	3 PM Peak	Weekday	AZ-260	NB	105	106	110	117	45	1.06	1.10					
	115+06320	4 Weekend	Weekend	AZ-260	NB	100	107	109	117	45	1.09	1.09					
	115+06322	1 AM Peak	Weekday	AZ-260	NB	57	58	62	71	45	1.09	1.24	1.09	1.38	0.11		
	115+06322	2 Mid Day	Weekday	AZ-260	NB	56	58	60	75	45	1.07	1.31					
	115+06322	3 PM Peak	Weekday	AZ-260	NB	58	58	60	80	45	1.04	1.38					
	115+06322	4 Weekend	Weekend	AZ-260	NB	54	58	59	65	45	1.09	1.12					
260-2	115+06317	1 AM Peak	Weekday	AZ-260	WB	126	128	132	141	65	1.05	1.10	1.06	1.14	0.14	1.08	1.17
	115+06317	2 Mid Day	Weekday	AZ-260	WB	126	129	132	143	65	1.05	1.11					
	115+06317	3 PM Peak	Weekday	AZ-260	WB	126	128	130	146	65	1.03	1.14					
	115+06317	4 Weekend	Weekend	AZ-260	WB	124	130	131	143	65	1.06	1.11					
	115+06318	1 AM Peak	Weekday	AZ-260	WB	512	525	534	590	65	1.04	1.12	1.06	1.13	0.56		
	115+06318	2 Mid Day	Weekday	AZ-260	WB	513	525	539	595	65	1.05	1.13					
	115+06318	3 PM Peak	Weekday	AZ-260	WB	512	525	533	592	65	1.04	1.13					
	115+06318	4 Weekend	Weekend	AZ-260	WB	505	529	533	591	65	1.06	1.12					
	115+06319	1 AM Peak	Weekday	AZ-260	WB	308	313	340	384	60	1.10	1.23	1.14	1.25	0.30		
	115+06319	2 Mid Day	Weekday	AZ-260	WB	307	314	339	392	60	1.11	1.25					
	115+06319	3 PM Peak	Weekday	AZ-260	WB	311	315	353	384	60	1.14	1.22					
	115+06319	4 Weekend	Weekend	AZ-260	WB	304	319	343	384	60	1.13	1.20					
260-3	115+06314	1 AM Peak	Weekday	AZ-260	WB	352	352	381	434	55	1.08	1.23	1.08	1.25	0.32	1.07	1.20
	115+06314	2 Mid Day	Weekday	AZ-260	WB	352	353	374	424	55	1.06	1.20					
	115+06314	3 PM Peak	Weekday	AZ-260	WB	350	352	373	439	55	1.07	1.25					
	115+06314	4 Weekend	Weekend	AZ-260	WB	346	353	373	434	55	1.08	1.23					
	115+06315	1 AM Peak	Weekday	AZ-260	WB	338	341	361	396	63	1.07	1.16	1.07	1.20	0.36		
	115+06315	2 Mid Day	Weekday	AZ-260	WB	338	344	361	411	63	1.07	1.20					
	115+06315	3 PM Peak	Weekday	AZ-260	WB	338	344	356	403	63	1.05	1.17					
	115+06315	4 Weekend	Weekend	AZ-260	WB	333	347	355	393	63	1.07	1.13					
	115+06316	1 AM Peak	Weekday	AZ-260	WB	156	159	163	176	65	1.05	1.11	1.07	1.16	0.17		
	115+06316	2 Mid Day	Weekday	AZ-260	WB	156	161	166	184	65	1.07	1.15					
	115+06316	3 PM Peak	Weekday	AZ-260	WB	156	158	163	184	65	1.05	1.16					
	115+06316	4 Weekend	Weekend	AZ-260	WB	156	161	163	184	65	1.05	1.15					
	115+06317	1 AM Peak	Weekday	AZ-260	WB	126	128	132	141	65	1.05	1.10	1.06	1.14	0.14		
	115+06317	2 Mid Day	Weekday	AZ-260	WB	126	129	132	143	65	1.05	1.11					

Segment	TMC	Time Period	Week Type	Rd No.	Rd Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115+06317	3 PM Peak	Weekday	AZ-260	WB	126	128	130	146	65	1.03	1.14					
	115+06317	4 Weekend	Weekend	AZ-260	WB	124	130	131	143	65	1.06	1.11					
260|60-4	115-05945	1 AM Peak	Weekday	US-60	WB	394	335	507	721	51	1.29	2.16	1.32	2.64	0.38	1.19	1.83
	115-05945	2 Mid Day	Weekday	US-60	WB	329	353	433	753	51	1.32	2.13					
	115-05945	3 PM Peak	Weekday	US-60	WB	312	346	412	911	51	1.32	2.64					
	115-05945	4 Weekend	Weekend	US-60	WB	305	309	404	597	51	1.32	1.93					
	115-05944	1 AM Peak	Weekday	US-60	WB	82	77	110	136	35	1.33	1.76	1.33	2.14	0.05		
	115-05944	2 Mid Day	Weekday	US-60	WB	82	80	107	144	35	1.30	1.81					
	115-05944	3 PM Peak	Weekday	US-60	WB	77	77	97	144	35	1.27	1.87					
	115-05944	4 Weekend	Weekend	US-60	WB	74	77	96	165	35	1.29	2.14					
	115-06257	1 AM Peak	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115-06257	2 Mid Day	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115-06257	3 PM Peak	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115-06257	4 Weekend	Weekend	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115+06000	1 AM Peak	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115+06000	2 Mid Day	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115+06000	3 PM Peak	Weekday	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115+06000	4 Weekend	Weekend	US-60	WB	0	0	0	0	35	NO DATA	NO DATA	NO DATA	NO DATA	NO DATA		
	115+06313	1 AM Peak	Weekday	US-60	WB	151	154	165	189	46	1.10	1.22	1.10	1.29	0.15		
	115+06313	2 Mid Day	Weekday	US-60	WB	150	153	162	188	46	1.08	1.23					
	115+06313	3 PM Peak	Weekday	US-60	WB	151	151	162	193	46	1.07	1.28					
	115+06313	4 Weekend	Weekend	US-60	WB	148	154	162	198	46	1.09	1.29					
	115+06314	1 AM Peak	Weekday	US-60	WB	352	352	381	434	57	1.08	1.23	1.08	1.25	0.41		
	115+06314	2 Mid Day	Weekday	US-60	WB	352	353	374	424	57	1.06	1.20					
	115+06314	3 PM Peak	Weekday	US-60	WB	350	352	373	439	57	1.07	1.25					
	115+06314	4 Weekend	Weekend	US-60	WB	346	353	373	434	57	1.08	1.23					
260-5	115+06305	1 AM Peak	Weekday	AZ-260	NB	120	127	133	188	54	1.11	1.47	1.11	1.56	0.11	1.20	1.97
	115+06305	2 Mid Day	Weekday	AZ-260	NB	120	127	133	162	54	1.11	1.27					
	115+06305	3 PM Peak	Weekday	AZ-260	NB	119	129	130	201	54	1.09	1.56					
	115+06305	4 Weekend	Weekend	AZ-260	NB	118	136	130	173	54	1.10	1.28					
	115+06306	1 AM Peak	Weekday	AZ-260	NB	59	59	67	79	50	1.14	1.33	1.16	2.19	0.05		
	115+06306	2 Mid Day	Weekday	AZ-260	NB	59	60	67	79	50	1.14	1.31					
	115+06306	3 PM Peak	Weekday	AZ-260	NB	57	62	66	135	50	1.16	2.19					

Segment	TMC	Time Period	Week Type	Rd No.	Rd Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115+06306	4 Weekend	Weekend	AZ-260	NB	57	63	66	81	50	1.16	1.29					
	115+06307	1 AM Peak	Weekday	AZ-260	WB	181	184	203	222	42	1.12	1.21	1.15	1.84	0.12		
	115+06307	2 Mid Day	Weekday	AZ-260	WB	182	187	208	284	42	1.15	1.52					
	115+06307	3 PM Peak	Weekday	AZ-260	WB	177	203	203	373	42	1.14	1.84					
	115+06307	4 Weekend	Weekend	AZ-260	WB	177	192	203	244	42	1.14	1.28					
	115+06308	1 AM Peak	Weekday	AZ-260	WB	231	244	265	356	35	1.15	1.46	1.16	1.46	0.15		
	115+06308	2 Mid Day	Weekday	AZ-260	WB	238	244	275	305	35	1.16	1.25					
	115+06308	3 PM Peak	Weekday	AZ-260	WB	229	237	252	316	35	1.10	1.33					
	115+06308	4 Weekend	Weekend	AZ-260	WB	225	248	251	316	35	1.12	1.28					
	115+06309	1 AM Peak	Weekday	AZ-260	NB	68	70	82	100	35	1.21	1.43	1.21	1.74	0.04		
	115+06309	2 Mid Day	Weekday	AZ-260	NB	71	72	86	122	35	1.21	1.68					
	115+06309	3 PM Peak	Weekday	AZ-260	NB	66	70	77	122	35	1.17	1.74					
	115+06309	4 Weekend	Weekend	AZ-260	NB	62	68	75	100	35	1.19	1.48					
	115+06310	1 AM Peak	Weekday	AZ-260	WB	194	204	216	288	44	1.11	1.41	1.14	1.55	0.15		
	115+06310	2 Mid Day	Weekday	AZ-260	WB	195	199	220	309	44	1.13	1.55					
	115+06310	3 PM Peak	Weekday	AZ-260	WB	193	207	219	303	44	1.14	1.47					
	115+06310	4 Weekend	Weekend	AZ-260	WB	190	199	214	261	44	1.13	1.31					
	115+06311	1 AM Peak	Weekday	AZ-260	NB	180	198	232	554	45	1.29	2.80	1.48	3.86	0.13		
	115+06311	2 Mid Day	Weekday	AZ-260	NB	200	267	295	1028	45	1.48	3.86					
	115+06311	3 PM Peak	Weekday	AZ-260	NB	171	189	212	514	45	1.24	2.71					
	115+06311	4 Weekend	Weekend	AZ-260	NB	167	174	200	288	45	1.19	1.66					
	115+06001	1 AM Peak	Weekday	AZ-260	NB	345	364	394	566	42	1.14	1.56	1.18	1.80	0.25		
	115+06001	2 Mid Day	Weekday	AZ-260	NB	378	393	444	708	42	1.18	1.80					
	115+06001	3 PM Peak	Weekday	AZ-260	NB	354	364	407	545	42	1.15	1.50					
	115+06001	4 Weekend	Weekend	AZ-260	NB	345	360	402	590	42	1.16	1.64					
60-6	115-06258	1 AM Peak	Weekday	US-60	WB	326	331	345	428	65	1.06	1.29	1.06	1.29	0.54	1.18	1.91
	115-06258	2 Mid Day	Weekday	US-60	WB	326	329	345	423	65	1.06	1.29					
	115-06258	3 PM Peak	Weekday	US-60	WB	326	329	342	373	65	1.05	1.14					
	115-06258	4 Weekend	Weekend	US-60	WB	323	326	342	384	65	1.06	1.18					
	115-05945	1 AM Peak	Weekday	US-60	WB	394	335	507	721	65	1.29	2.16	1.32	2.64	0.46		
	115-05945	2 Mid Day	Weekday	US-60	WB	329	353	433	753	65	1.32	2.13					
	115-05945	3 PM Peak	Weekday	US-60	WB	312	346	412	911	65	1.32	2.64					
	115-05945	4 Weekend	Weekend	US-60	WB	305	309	404	597	65	1.32	1.93					
60-7	115-06261	1 AM Peak	Weekday	US-60	WB	77	79	81	95	65	1.05	1.21	1.07	1.21	0.04	1.07	1.25
	115-06261	2 Mid Day	Weekday	US-60	WB	76	77	81	92	65	1.07	1.19					
	115-06261	3 PM Peak	Weekday	US-60	WB	76	79	80	93	65	1.05	1.19					
	115-06261	4 Weekend	Weekend	US-60	WB	76	79	80	90	65	1.05	1.15					
	115-06260	1 AM Peak	Weekday	US-60	WB	620	627	649	761	65	1.05	1.21	1.07	1.21	0.29		
	115-06260	2 Mid Day	Weekday	US-60	WB	603	613	643	720	65	1.07	1.18					

Segment	TMC	Time Period	Week Type	Rd No.	Rd Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-06260	3 PM Peak	Weekday	US-60	WB	608	627	643	711	65	1.06	1.13					
	115-06260	4 Weekend	Weekend	US-60	WB	603	626	644	736	65	1.07	1.18					
	115-06642	1 AM Peak	Weekday	US-60	WB	556	563	586	703	65	1.06	1.25	1.07	1.30	0.26		
	115-06642	2 Mid Day	Weekday	US-60	WB	541	550	578	716	65	1.07	1.30					
	115-06642	3 PM Peak	Weekday	US-60	WB	545	558	581	664	65	1.07	1.19					
	115-06642	4 Weekend	Weekend	US-60	WB	541	558	577	690	65	1.07	1.24					
	115-06259	1 AM Peak	Weekday	US-60	WB	65	66	69	79	65	1.07	1.20	1.09	1.24	0.03		
	115-06259	2 Mid Day	Weekday	US-60	WB	65	65	69	81	65	1.07	1.24					
	115-06259	3 PM Peak	Weekday	US-60	WB	65	65	69	77	65	1.07	1.19					
	115-06259	4 Weekend	Weekend	US-60	WB	64	66	69	77	65	1.09	1.17					
	115N05946	1 AM Peak	Weekday	US-60	WB	18	18	19	21	64	1.07	1.19	1.09	1.20	0.01		
	115N05946	2 Mid Day	Weekday	US-60	WB	18	18	19	20	64	1.05	1.13					
	115N05946	3 PM Peak	Weekday	US-60	WB	18	18	19	20	64	1.05	1.13					
	115N05946	4 Weekend	Weekend	US-60	WB	18	18	19	22	64	1.09	1.20					
	115-05946	1 AM Peak	Weekday	US-60	WB	461	461	489	570	64	1.06	1.24	1.08	1.24	0.22		
	115-05946	2 Mid Day	Weekday	US-60	WB	461	461	497	543	64	1.08	1.18					
	115-05946	3 PM Peak	Weekday	US-60	WB	454	461	484	538	64	1.07	1.17					
	115-05946	4 Weekend	Weekend	US-60	WB	454	461	484	538	64	1.07	1.17					
	115-06258	1 AM Peak	Weekday	US-60	WB	326	331	345	428	56	1.06	1.29	1.06	1.29	0.15		
	115-06258	2 Mid Day	Weekday	US-60	WB	326	329	345	423	56	1.06	1.29					
	115-06258	3 PM Peak	Weekday	US-60	WB	326	329	342	373	56	1.05	1.14					
	115-06258	4 Weekend	Weekend	US-60	WB	323	326	342	384	56	1.06	1.18					
60-8	115-05948	1 AM Peak	Weekday	US-60	WB	478	478	572	702	45	1.20	1.47	1.20	1.47	0.57	1.21	1.51
	115-05948	2 Mid Day	Weekday	US-60	WB	475	470	567	667	45	1.19	1.42					
	115-05948	3 PM Peak	Weekday	US-60	WB	481	476	564	659	45	1.17	1.38					
	115-05948	4 Weekend	Weekend	US-60	WB	464	471	523	620	45	1.13	1.32					
	115-06262	1 AM Peak	Weekday	US-60	WB	116	114	171	191	33	1.47	1.67	1.47	1.71	0.07		
	115-06262	2 Mid Day	Weekday	US-60	WB	115	112	147	191	33	1.29	1.71					
	115-06262	3 PM Peak	Weekday	US-60	WB	112	112	147	162	33	1.32	1.45					
	115-06262	4 Weekend	Weekend	US-60	WB	108	108	130	148	33	1.20	1.37					
	115N05947	1 AM Peak	Weekday	US-60	WB	9	9	9	10	56	1.05	1.17	1.08	1.21	0.01		
	115N05947	2 Mid Day	Weekday	US-60	WB	9	9	9	11	56	1.08	1.19					
	115N05947	3 PM Peak	Weekday	US-60	WB	9	9	9	11	56	1.07	1.21					
	115N05947	4 Weekend	Weekend	US-60	WB	9	9	9	10	56	1.05	1.14					
	115-05947	1 AM Peak	Weekday	US-60	NB	228	227	273	325	65	1.20	1.43	1.22	1.70	0.25		
	115-05947	2 Mid Day	Weekday	US-60	NB	226	232	270	387	65	1.20	1.67					
	115-05947	3 PM Peak	Weekday	US-60	NB	227	229	273	390	65	1.20	1.70					
	115-05947	4 Weekend	Weekend	US-60	NB	222	227	270	363	65	1.22	1.60					
	115-06261	1 AM Peak	Weekday	US-60	WB	77	79	81	95	65	1.05	1.21	1.07	1.21	0.11		

Segment	TMC	Time Period	Week Type	Rd No.	Rd Dir	Cars 50th % Travel Time (seconds)	Trucks 50th % Travel Time (seconds)	Cars 80th % Travel Time (seconds)	Trucks 95th % Travel Time (seconds)	Posted Speed Limit	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-06261	2 Mid Day	Weekday	US-60	WB	76	77	81	92	65	1.07	1.19					
	115-06261	3 PM Peak	Weekday	US-60	WB	76	79	80	93	65	1.05	1.19					
	115-06261	4 Weekend	Weekend	US-60	WB	76	79	80	90	65	1.05	1.15					
60-9	115-06263	1 AM Peak	Weekday	US-60	WB	326	329	354	407	65	1.08	1.24	1.08	1.24	0.44	1.15	1.37
	115-06263	2 Mid Day	Weekday	US-60	WB	321	324	340	373	65	1.06	1.15					
	115-06263	3 PM Peak	Weekday	US-60	WB	321	326	343	387	65	1.07	1.19					
	115-06263	4 Weekend	Weekend	US-60	WB	319	326	346	404	65	1.08	1.24					
	115-05948	1 AM Peak	Weekday	US-60	WB	478	478	572	702	63	1.20	1.47	1.20	1.47	0.56		
	115-05948	2 Mid Day	Weekday	US-60	WB	475	470	567	667	63	1.19	1.42					
	115-05948	3 PM Peak	Weekday	US-60	WB	481	476	564	659	63	1.17	1.38					
	115-05948	4 Weekend	Weekend	US-60	WB	464	471	523	620	63	1.13	1.32					

Closure Data

Segment	Length (miles)	# of closures	Total miles of closures		Average Occurrences/Mile/Year	
			EB	WB	EB	WB
260-1	5	6	7.3	4.3	0.29	0.17
260-2	13	12	9.0	10.0	0.14	0.15
260-13	14	16	11.0	8.0	0.16	0.11
260 | 60-4	8	6	8.0	6.0	0.20	0.15
260-5	16	10	19.0	22.0	0.24	0.28
60-6	7	5	11.0	8.0	0.31	0.23
60-7	32	15	74.1	39.0	0.46	0.24
60-8	5	2	1.0	1.0	0.04	0.04
60-9	13	1	1.0	0.0	0.02	0.00

Segment	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
260-1	1	1	0	0	5	2	0	0	0	0	0	0
260-2	0	0	1	1	4	7	2	0	0	0	0	0
260-13	1	0	2	1	8	7	0	0	0	0	0	0
260 | 60-4	1	1	0	0	2	1	1	0	0	0	1	1
260-5	2	2	0	1	2	4	0	0	0	0	1	1
60-6	0	0	0	0	4	1	0	0	0	0	1	1
60-7	0	0	0	0	9	4	1	1	0	0	3	3
60-8	0	0	0	0	1	1	0	0	0	0	0	0
60-9	0	0	0	0	0	0	1	0	0	0	0	0

HPMS Data

SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE EB AADT	WEIGHTED AVERAGE WB AADT	WEIGHTED AVERAGE AADT	EB AADT	WB AADT	2015 AADT	K Factor	D-Factor	T-Factor
260-1	305.7	310	2431	2346	4777	2457	2457	4913	11	50	14
260-2	310	323	1962	1882	3845	2259	2259	4517	11	50	15
260-13	323	337	2290	2322	4612	2498	2498	4996	12	50	13
260 | 60-4	337	345	5578	5489	11067	5655	5655	11311	10	50	10
260-5	341	357	9562	9656	19219	9381	9381	18763	9	50	9
60-6	345	352	3019	2818	5837	3073	3073	6146	10	50	12
60-7	352	384	1039	1033	2071	966	966	1932	9	50	14
60-8	384	389	2098	2188	4286	2310	2310	4619	10	50	11
60-9	389	402	393	387	779	475	475	950	10	50	11

SEGMENT	Loc ID	BMP	EMP	Length	Pos Dir AADT	Neg Dir AADT	Corrected Pos Dir AADT	Corrected Neg Dir AADT	2015 AADT	K Factor	D-Factor	D-Factor Adjusted	T-Factor
260-1	101514	305.75	307.98	2.23	0	0	3583	3583	7166	12	58	50	12
	101516	307.98	309.49	1.51	0	0	2363	2363	4726	11	63	50	15
	101518	309.49	322.09	12.60	0	0	2269	2269	4537	11	64	50	15
260-2	101518	309.49	322.09	12.60	0	0	2269	2269	4537	11	64	50	15
	102312	322.09	327.11	5.02	0	0	2234	2234	4468	11	63	50	15
260-3	101519	327.11	332.94	5.83	0	0	2359	2359	4717	14	66	50	13
	102312	322.09	327.11	5.02	0	0	2234	2234	4468	11	63	50	15
	101519	327.11	332.94	5.83	0	0	2359	2359	4717	14	66	50	13
	101520	332.94	337.17	4.23	0	0	3195	3195	6390	9	60	50	10
260 | 60-4	101520	332.94	337.17	4.23	0	0	3195	3195	6390	9	60	50	10
	101521	337.17	340.07	2.90	0	0	6665	6665	13329	11	56	50	10
	101930	339.72	340.87	1.15	0	0	8696	8696	17392	9	70	50	10
	101932	340.87	341.69	0.82	0	0	10575	10575	21149	7	59	50	10
	101934	341.69	342.26	0.57	0	0	10637	10637	21274	8	50	50	10
	101936	342.26	343.35	1.09	0	0	5175	5175	10350	8	61	50	10
	101937	343.35	345.00	1.65	0	0	4222	4222	8443	13	60	50	13
260-5	101522	341.68	342.60	0.92	0	0	9052	9052	18104	9	57	50	10
	101524	342.60	345.73	3.13	0	0	14511	14511	29022	9	52	50	10
	101526	345.73	350.67	4.94	0	0	9968	9968	19936	9	50	50	10
	101528	350.67	353.54	2.87	0	0	9962	9962	19923	9	51	50	10
	101530	353.54	357.62	4.08	0	0	4402	4402	8804	9	52	50	8
60-6	101938	345.00	347.15	2.15	0	0	4216	4216	8431	13	61	50	13
	101939	347.15	353.16	6.01	0	0	2665	2665	5329	9	67	50	11
60-7	101940	353.16	356.37	3.21	0	0	1833	1833	3666	10	53	50	12
	101941	356.37	361.31	4.94	0	0	1183	1183	2365	9	55	50	11
	101942	361.31	363.30	1.99	0	0	1030	1030	2059	9	64	50	11
	101943	363.30	384.45	21.15	0	0	778	778	1556	9	56	50	15
60-8	101944	384.45	387.83	3.38	0	0	2351	2351	4701	10	62	50	11
	101945	387.83	388.70	0.87	0	0	3022	3022	6044	9	58	50	10
	101947	388.70	389.20	0.50	0	0	794	794	1587	12	52	50	14
60-9	101948	389.20	401.97	12.77	0	0	475	475	950	10	53	50	11

Bicycle Accommodation Data

Segment	BMP	EMP	Divided or Non	EB Right Shoulder Width	WB Right Shoulder Width	EB Left Shoulder Width	WB Left Shoulder Width	EB Effective Length of Shoulder	WB Effective Length of Shoulder	% Bicycle Accommodation
260-1	305.67	310	Undivided	7.7	7.8	N/A	N/A	4.0	4.0	93%
260-2	310	323	Undivided	5.0	5.0	N/A	N/A	0.0	0.0	0%
260-3	323	337	Undivided	5.0	4.8	N/A	N/A	0.8	0.6	5%
260 | 60-4	337	345	Undivided	2.5	3.0	N/A	N/A	3.5	5.2	54%
260-5	341	357	Undivided	3.0	2.6	N/A	N/A	8.4	7.7	50%
60-6	345	352	Undivided	5.0	5.0	N/A	N/A	0.0	0.0	0%
60-7	352	384	Undivided	2.4	2.4	N/A	N/A	1.5	1.5	5%
60-8	384	389	Undivided	7.9	8.0	N/A	N/A	4.8	4.9	98%
60-9	389	402	Undivided	7.2	7.5	N/A	N/A	13.0	13.0	100%

AZTDM Data

SEGMENT	Growth Rate	% Non-SOV
260-1	-0.73%	16.0%
260-2	-0.25%	12.4%
260-3	0.00%	15.0%
260 | 60-4	1.07%	16.5%
260-5	1.19%	16.3%
60-6	1.54%	13.1%
60-7	1.05%	14.9%
60-8	1.25%	15.3%
60-9	0.53%	0.0%

HERS Capacity Calculation Data

Segment	Capacity Environment Type	Facility Type	Terrain	Lane Width	EB Rt. Shoulder	WB Rt. Shoulder	F_{lw} or f_w or f_{LS}	EB F_{lc}	WB F_{lc}	Total Ramp Density	PHF	E_T	f_{HV}	f_M	f_A	g/C	f_G	f_{NP}	Nm	f_p	EB FFS	WB FFS	EB Peak-Hour Capacity	WB Peak-Hour Capacity	Major Direction Peak-Hour Capacity	Daily Capacity
260-1	2	Rural	Rolling	12.00	7.74	7.78	0.0	0	0	N/A	0.88	2.5	0.822	1.6	4.27	N/A	N/A	N/A	N/A	N/A	39.13	39.13	2579	2579	N/A	49,132
260-2	4	Rural	Mountainous	12.00	5.00	5.00	0.0	N/A	N/A	N/A	0.88	7.2	0.521	N/A	0.81	N/A	0.62	2.20	N/A	N/A	74.19	74.19	N/A	N/A	585.42	11,151
260-3	4	Rural	Level	12.00	4.97	4.85	0.0	N/A	N/A	N/A	0.88	1.4	0.951	N/A	1.79	N/A	1	1.90	N/A	N/A	66.21	66.21	N/A	N/A	1310.95	24,971
260 | 60-4	3	Rural	Mountainous	12.00	2.48	3.02	1.0	N/A	N/A	N/A	0.9	2	0.907	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1705.16	32,479
260-5	3	Rural	Rolling	12.00	2.99	2.59	1.0	N/A	N/A	N/A	0.9	2	0.915	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1720.77	32,777
60-6	4	Rural	Rolling	12.00	5.00	5.00	0.0	N/A	N/A	N/A	0.88	2.1	0.887	N/A	13.11	N/A	0.83	3.70	N/A	N/A	61.89	61.89	N/A	N/A	759.30	14,463
60-7	4	Rural	Mountainous	12.00	2.41	2.42	2.6	N/A	N/A	N/A	0.88	7.2	0.538	N/A	0.03	N/A	0.55	2.90	N/A	N/A	71.37	71.37	N/A	N/A	478.00	9,105
60-8	3	Rural	Rolling	12.00	7.91	8.03	1.0	N/A	N/A	N/A	0.9	2	0.899	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	987.71	18,814
60-9	4	Rural	Rolling	12.00	7.18	7.50	0.0	N/A	N/A	N/A	0.88	2.7	0.841	N/A	2.56	N/A	0.67	2.20	N/A	N/A	72.44	72.44	N/A	N/A	966.51	18,410

Safety Performance Area Data

Segment	Operating Environment	Segment Length (miles)	EB Fatal Crashes 2015-2019	WB Fatal Crashes 2015-2019	EB Incapacitating Injury Crashes	WB Incapacitating Injury Crashes	Fatal + Incapacitating Injury Crashes at Intersections
260-1	4 or 5 Lane Undivided Highway	4.33	0	0	2	2	2
260-2	2 or 3 Lane Undivided Highway	13	2	1	0	4	0
260-3	2 or 3 Lane Undivided Highway	14	0	1	4	2	1
260 | 60-4	4 or 5 Lane Undivided Highway	8	1	0	2	5	2
260-5	4 or 5 Lane Undivided Highway	16	0	0	1	1	1
60-6	2 or 3 Lane Undivided Highway	7	0	0	1	0	0
60-7	2 or 3 or 4 Lane Divided Highway	32	2	0	6	5	3
60-8	4 or 5 Lane Undivided Highway	5	0	0	0	0	0
60-9	2 or 3 Lane Undivided Highway	13	0	0	0	0	0

Segment	Operating Environment	Fatal + Incapacitating Injury Crashes Involving Lane Departures	Fatal + Incapacitating Injury Crashes Involving Pedestrians	Fatal + Incapacitating Injury Crashes Involving Trucks	Fatal + Incapacitating Injury Crashes Involving Bicycles	Weighted 5-Year (2011-2015) Average EB AADT	Weighted 5-Year (2011-2015) Average WB AADT	Weighted 5-Year (2011-2015) Average Total AADT
260-1	4 or 5 Lane Undivided Highway	1	0	0	0	2431	2346	4777
260-2	2 or 3 Lane Undivided Highway	6	0	0	0	1962	1882	3845
260-3	2 or 3 Lane Undivided Highway	4	1	1	0	2290	2322	4612
260 | 60-4	4 or 5 Lane Undivided Highway	2	0	0	1	5578	5489	11067
260-5	4 or 5 Lane Undivided Highway	0	0	0	0	9562	9656	19218
60-6	2 or 3 Lane Undivided Highway	1	0	0	0	3019	2818	5837
60-7	2 or 3 or 4 Lane Divided Highway	9	0	1	0	1039	1033	2071
60-8	4 or 5 Lane Undivided Highway	0	0	0	0	2098	2188	4286
60-9	2 or 3 Lane Undivided Highway	0	0	0	0	393	387	780

HPMS Data

2015-2019 Weighted Average						2019			2018			2017			2016			2015		
SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE EB AADT	WEIGHTED AVERAGE WB AADT	WEIGHTED AVERAGE AADT	EB AADT	WB AADT	2019 AADT	EB AADT	WB AADT	2019 AADT	EB AADT	WB AADT	2019 AADT	EB AADT	WB AADT	2019 AADT	EB AADT	WB AADT	2019 AADT
260-1	306	310	2431	2346	4777	2457	2457	4913	2705	2199	4904	2006	2012	4018	3069	3134	6204	1916	1930	3847
260-2	310	323	1962	1882	3845	2259	2259	4517	2515	1993	4508	1613	1735	3348	1785	1785	3569	1641	1641	3281
260-3	323	337	2290	2322	4612	2498	2498	4996	2633	2420	5053	2141	2245	4386	2161	2281	4442	2015	2168	4184
260 | 60-4	337	345	5578	5489	11067	5655	5655	11311	5693	5698	11391	5531	5329	10860	5603	5477	11079	5409	5287	10695
260-5	357	341	9562	9656	19219	9381	9381	18763	9533	9358	18891	10124	10540	20664	8797	9124	17921	9975	9878	19853
60-6	345	352	3019	2818	5837	3073	3073	6146	3349	2784	6134	3303	3303	6607	2748	2524	5272	2619	2406	5026
60-7	352	384	1039	1033	2071	966	966	1932	990	939	1928	1020	949	1970	1141	1188	2330	1076	1120	2197
60-8	384	389	2098	2188	4286	2310	2310	4619	2246	2377	4622	1796	1856	3653	2115	2245	4360	2026	2151	4177
60-9	389	402	393	387	779	475	475	950	494	454	948	344	346	688	335	337	671	319	321	640

Freight Performance Area Data

Segment	Length (miles)	# of closures	Total minutes of closures		Avg Mins/Mile/Year	
			EB	WB	EB	WB
260-1	5	6	1840.0	1206.0	73.60	48.24
260-2	13	12	3548.0	3586.0	54.58	55.17
260-3	14	16	1773.0	1051.0	25.33	15.01
260 | 60-4	8	6	5767.0	5524.0	144.18	138.10
260-5	16	10	19367.0	19902.0	242.09	248.78
60-6	7	5	9214.0	8774.0	263.26	250.69
60-7	32	15	42850.3	35689.0	267.81	223.06
60-8	5	2	203.0	115.0	8.12	4.60
60-9	13	1	107.0	0.0	1.65	0.00

Segment	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
260-1	1	1	0	0	5	2	0	0	0	0	0	0
260-2	0	0	1	1	4	7	2	0	0	0	0	0
260-3	1	0	2	1	8	7	0	0	0	0	0	0
260 | 60-4	1	1	0	0	2	1	1	0	0	0	1	1
260-5	2	2	0	1	2	4	0	0	0	0	1	1
60-6	0	0	0	0	4	1	0	0	0	0	1	1
60-7	0	0	0	0	9	4	1	1	0	0	3	3
60-8	0	0	0	0	1	1	0	0	0	0	0	0
60-9	0	0	0	0	0	0	1	0	0	0	0	0

See the **Mobility Performance Area Data** section for other Freight Performance Area related data.

Appendix D: Needs Analysis Contributing Factors and Scores

Pavement Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Pavement Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Pavement. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scales" within the Step 1 template.

To develop an aggregate Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 2.5).

The steps include:

Step 1.1

Enter the appropriate segment information into the columns titled "Segment", "Segment Length", "Segment Mileposts" and "Facility Type".

Step 1.2

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis into the appropriate "Performance Score" columns. Copy the performance score for each segment to the appropriate "Performance Score" column. Paste only the "values" and do not overwrite the formatting.

Step 1.3

Indicate if Pavement is an Emphasis Area by selecting "Yes" or "No" in the row immediately below the segment information.

Step 1.4

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the segment information and the initial needs from the Step 1 template to the "Initial Need" column of the Step 2 template.

Step 2.2

Note in the "Hot Spots" column any pavement failure hot spots identified as part of the baseline corridor performance. For each entry, include the milepost limits of the hot spot. Hot spots are identified in the Pavement Index spreadsheet by the red cells in the columns titled "% Pavement Failure". These locations are based on the following criteria:

Interstates: IRI > 105 or Cracking > 10 or Rutting > 0.4

Non-Interstates: IRI > 142 or Cracking > 10 or Rutting > 0.4

Every segment that has a % Pavement Failure greater than 0% will have at least one hot spot. Hot spot locations should be described as extending over consecutive miles. For example, if there is a pavement failure location that extends 5 consecutive miles, it should be identified as one hot spot, not 5 separate hot spots.

Step 2.3

Identify recently completed or under construction paving projects in the "Previous Projects" column. Include only projects that were completed after the pavement condition data period (check dates in pavement condition data provided by ADOT) that would supersede the results of the performance system.

Step 2.5

Update the "Final Need" column using the following criteria:

- If "None" but have a hot spot (or hot spots), the Final Need = Low, and note the reason for the change in the "Comments" column (column H).
- If a recent project has superseded the performance rating data, change the Final Need to "None" and note the reason for the change in the "Comments" column.

Example Scales for Level of Need

Pavement Index (Interstates) Performance Thresholds		Initial Need	Description (Non-Emphasis Area)
3.75	Good	None	All of Good Performance and upper third of Fair Performance (>3.50)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Fair Perf. (3.25 - 3.5)
3	Fair	Medium	Lower third of Fair and top third of Poor Performance (2.75-3.25)
	Poor		
	Poor	High	Lower two-thirds of Poor Performance (<2.75)
	Poor		

Need Scale for Interstates

Measure	None >=	Low >=	> Medium <		High <=
Pavement Index (corridor non-emphasis area)	3.5	3.25	3.25	2.75	2.75
Pavement Index (corridor emphasis area)	4.0	3.5	3.5	3.00	3.00
Pavement Index (segments)	3.5	3.25	3.25	2.75	2.75
Directional PSR	3.63	3.52	3.52	3.28	3.28
%Pavement Failure	10%	15%	15%	25%	25%

Need Scale for Highways (Non-Interstates)

Measure	None >=	Low >=	> Medium <		High <=
Pavement Index (corridor non-emphasis area)	3.33	3.07	3.07	2.53	2.53
Pavement Index (corridor emphasis area)	3.87	3.33	3.33	2.80	2.80
Pavement Index (segments)	3.33	3.07	3.07	2.53	2.53
Directional PSR	3.30	3.10	3.10	2.70	2.70
%Pavement Failure	10%	15%	15%	25%	25%

Step 2.6

Note any programmed projects that could have the potential to mitigate pavement needs in in the "Comments" column. Programmed projects are provided as information and do not impact the need rating. The program information can be found in ADOT's 5-year construction program. If there are other comments relevant to the needs analysis (such as information from previous reports), they can be entered in the "Comments" column. However, only include information related to needs that have been identified through this process. Do not add or create needs from other sources.

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to complete Step 3 include:

Step 3.1

Input the level of historical investment for each segment. This will be determined from the numeric score from the Pavement History Table based on the following thresholds:

- Low = < 4.60
- Medium = 4.60 – 6.60
- High = > 6.60

If the PeCoS data shows a high level of maintenance investment, increase the historical investment rating by one level.

Step 3.2

Note the milepost ranges of pavement failure hot spots into the column titled "Contributing Factors and Comments."

Step 3.3

Note any other information that may be contributing to the deficiency, or supplemental information, in the "Contributing Factors and Comments" column. This could come from discussions with ADOT District staff, ADOT Materials/Pavement Group, previous reports, or the historical investment data.

Step 3.4

Include any programmed projects from ADOT's 5-year construction program in the "Contributing Factors and Comments" column.

Bridge Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Bridge Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Bridge. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scales" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial level of need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 2.5).

The steps include:

Step 1.1

Enter the appropriate segment information into the columns titled "Segment", "Segment Length", "Segment Mileposts" and "Number of Bridges."

Step 1.2

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis into the appropriate "Performance Score" columns. Copy the performance score for each segment to the appropriate "Performance Score" column. Paste only the "values" and do not overwrite the formatting.

Step 1.3

Indicate if Bridge is an Emphasis Area by selecting "Yes" or "No" in the row immediately below the segment information.

Step 1.4

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial needs from the Step 1 template to the "Initial Need" column of the Step 2 template.

Step 2.2

Note in the column titled "Hot Spots" any bridge hot spots identified as part of the baseline corridor performance. For each entry, note the specific location. Hot spots are identified as having any bridge rating of 4 or less, or multiple ratings of 5 in the deck, substructure, or superstructure ratings.

Step 2.3

Identify recently completed or under construction bridge projects in the "Previous Projects" column. Include only projects that were completed after the bridge condition data period (check dates in bridge condition data provided by ADOT) that would supersede the results of the performance system.

Step 2.4

Update the Final Need on each segment based on the following criteria:

- If the Initial Need is "None" and there is at least one hot spot located on the segment, change the Final Need to "Low".
- If a recent project has superseded the performance rating data, the performance data should be adjusted to increase the specific ratings and the resulting need should be reduced to account for the project.
- Note the reason for any change in the "Comments" column.

Step 2.5

Historical bridge rating data was tabulated and graphed to find any bridges that had fluctuations in the ratings. Note in the "Historical Review" column any bridge that was identified as having a potential historical rating concern based on the following criteria:

- Ratings increase or decrease (bar chart) more than 2 times
- Sufficiency rating drops more than 20 points

This is for information only and does not affect the level of need.

Step 2.6

Note the number of functionally obsolete bridges in each segment in the column titled "# Functionally Obsolete Bridges". This is for information only and does not affect the level of need.

Step 2.7

Identify each bridge "of concern" in the "Comments" column. Note any programmed projects that could have the potential to mitigate bridge needs. Programmed projects are provided as information and do not impact the need rating. The program information can be found in ADOT's 5-year construction program. If there are other comments relevant to the needs analysis (such as information from previous reports), they can be entered in the "Comments" column. However, only include information related to needs that have been identified through this process. Do not add or create needs from other sources.

Example Scales for Level of Need

Bridge Index Performance Thresholds	Level of Need		Description (Non-Emphasis Area)
6.5	Good	None	All of Good Performance and upper third of Fair Performance (>6.0)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Fair Performance (5.5-6.0)
5.0	Fair	Medium	Lower third of Fair and top third of Poor Performance (4.5-5.5)
	Poor		
	Poor	High	Lower two-thirds of Poor Performance (<4.5)
	Poor		

Need Scale

Measure	None >=	Low >=	> Medium <		High <=
Bridge Index (corridor non-emphasis area)	6.0	5.5	5.5	4.5	4.5
Bridge Index (corridor emphasis area)	7.0	6.0	6.0	5.0	5.0
Bridge Index (segments)	6.0	5.5	5.5	4.5	4.5
Bridge Sufficiency	70	60	60	40	40
Bridge Rating	6.0	5.0	4.0	4.0	3.0

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to compete Step 3 include:

Step 3.1

Input the bridge name, structure number, and milepost information for each bridge "of concern" resulting from Step 2.

Step 3.2

For bridges that have a current rating of 5 or less, enter the specific rating, or state "No current ratings less than 6".

Step 3.3

For bridges that were identified for a historical review (step 2.5), state "Could have a repetitive investment issue". If a bridge was not identified for a historical review, state "This structure was not identified in historical review".

Step 3.4

Input any programmed projects from ADOT's 5-year construction program. Note any other information that may be contributing to the deficiency, or supplemental information. This could come from discussions with ADOT District staff, ADOT Bridge Group, or previous reports.

Mobility Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Mobility Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Refined Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

<u>Step 1: Initial Needs</u>

The input required to populate the Step 1 template includes transferring the existing performance score for each segment to the appropriate “Performance Score” columns from Existing Performance Analysis. This includes the primary and secondary measures for Mobility. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of “None” (score = 0), “Low” (score = 1), “Medium” (score = 2), and “High” (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled “Needs Assessment Scales” in the Step 1 tab.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scores, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of “None” (score < 0.01), “Low” (score $\geq$ 0.01 and < 1.5), “Medium” (score $\geq$ 1.5 and < 2.5), and “High” (score $\geq$ 2.5).

The steps include:

Step 1.1

Input the accurate number of segments for your corridor in the column titled ‘Segment’ and the appropriate segment milepost limits and segment lengths in adjacent columns.

Step 1.2

Select the appropriate ‘Environment Type’ and ‘Facility Operation Type’ from the drop-down menus as defined in Existing Performance Analysis.

Step 1.3

Select ‘Yes’ or ‘No’ form the drop-down list to not if the Mobility Performance Area is an Emphasis Area for your corridor.

Step 1.4

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score for each segment to the appropriate “Performance Score” column.

Step 1.5

Confirm that that the Step 1 template is generating the appropriate “Level of Need” for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

<u>Step 2: Final Needs</u>

The Initial Need will be carried over to Step 2 The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial deficiencies from the Step 1 template to the Step 2 template.

Step 2.2

Identify recently completed or under construction projects that would be considered relevant to mobility performance. Include only projects that were constructed after the date for which the HPMS data used for traffic volumes would not include. Any completed or under construction roadway project after the HPMS data date that has the potential to mitigate a mobility issue on a corridor segment should be listed in the template. Such projects should include the construction of new travel lanes or speed limit changes on the main corridor only. Do not include projects involving frontage roads or crossings as they would not impact the corridor level performance.

Step 2.3

Update the Final Need using the following criteria:

- If a recent project has superseded the performance rating data and it is certain the project addressed the deficiency, change the need rating to “None”.
- If a recent project has superseded the performance rating data but it is uncertain that a project addressed the need, maintain the current deficiency rating and note the uncertainty as a comment.

Step 2.4

Note any programmed or planned projects that have the potential to mitigate any mobility needy on the segment. Programmed and Planned projects are provided as information and do not impact the deficiency rating. Future projects will be reviewed in the development of solution sets for identified needs and deficiencies. The source of future projects can be found in ADOT's 5-year construction program or other planning documents. Other comments relevant to the needs analysis can be entered.

Example Scales for Level of Need

Mobility Index (Urban and Fringe Urban) Performance Thresholds	Initial Need		Description (Non-Emphasis Area)
0.71	Good	None	All of Good Performance and upper third of Fair Performance (<0.77)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Fair Performance (0.77 - 0.83)
0.89	Fair	Medium	Lower third of Fair and top third of Poor Performance (0.83-0.95)
	Poor		
	Poor	High	Lower two-thirds of Poor Performance (>0.95)
	Poor		

Needs Scale

Measure		None <=	Low >=	> Medium <		High <=
Mobility Index (Corridor Emphasis Area)		Weighted calculation for the segment totals in corridor (urban vs. rural)				
Mobility Index (Corridor Non-Emphasis Area)		Weighted calculation for the segment totals in corridor (urban vs. rural)				
Mobility Index (Segment)	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Future Daily V/C	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Existing Peak Hour V/C	Urban	0.77	0.83	0.83	0.95	0.95
	Rural	0.63	0.69	0.69	0.83	0.83
Closure Extent		0.35	0.49	0.49	0.75	0.75
Directional LOTTR	Uninterrupted	1.27	1.38	1.38	1.62	1.62
	Interrupted	1.27	1.38	1.38	1.62	1.62
Bicycle Accommodation		80%	70%	70%	50%	50%

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab. The steps to compete Step 3 include:

Step 3.1

Input data from Mobility Index worksheet and corridor observations in appropriate columns for Roadway Variables.

Step 3.2

Input traffic variable data in appropriate columns as indicated, Buffer Index scores will auto populate.

Step 3.3

Input relevant mobility related infrastructure located within each segment as appropriate

Step 3.4

Input the Closure Extents that have occurred along the study corridor. Road closure information can be detailed out by the reason for the closure as documented in Highway Condition Reporting System (HCRS) data analyzed as part of the baseline corridor performance. Closure reasons include incident/accidents, winter storms, obstruction hazards, and undefined closures. Statewide average percentages for the various closure reasons have been calculated for most recent five-year period on ADOT's designated strategic corridors. Compare these statewide average percentages to the corridor percentages for the various closure reasons to identify higher than average percentages of one or more closure reasons on any given segment. Input the closures as follows and use red text to indicate that the segment percentage exceeds statewide averages:

- Total Number of Closures
- % Incidents/Accidents
- % Obstructions/Hazards
- % Weather Related

Step 3.5

List the non-actionable conditions that are present within each segment by milepost if possible. Non-Actionable conditions are conditions that exist within the environment of each segment that cannot be improved through an engineered solution. For example, the border patrol check point in Segment 3 of I-19 is a non-actionable condition.

Step 3.6

Considering all information input, identify and list the contributing factors to the Final Need score.

Safety Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Safety Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the corridor characteristics and existing performance score for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for safety. As each performance score is input into the template, the Level of Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Scale" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted scored, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 2.5).

The steps include:

Step 1.1

Populate the Step 1 template with the corridor characteristics information. This includes segment operating environments and segment length. Also, specify if the safety performance area is an emphasis area as determined in Goals and Objectives. The "Level of Need" is dependent on the input of the operating environment and "Emphasis Area" as the thresholds dynamically update accordingly.

Input the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score (paste values only) for each segment to the appropriate "Performance Score" column and conditional formatting should color each cell green, yellow, or red based on the corresponding performance thresholds.

Step 1.2

The thresholds for the corridor safety index are based on the segments' operating environments. To ensure that the correct corridor safety index threshold is applied, input the unique segment operating environments that exist with the corridor. Once the input is complete, the average of the Good/Fair and Fair/Poor thresholds for each of the operating environments is calculated and the "Level of Need" thresholds will be derived and applied to the main Step 1 Table.

Step 1.3

Confirm that the following criteria for "Insufficient Data" have been applied and that the resulting Level of Need has been shown as "N/A" where applicable.

- Crash frequency for a segment is less than 5 crashes over the 5-year crash analysis period.
- The change in +/- 1 crash results in the change of need level of 2 levels (i.e., changes from Above Average to Below Average or changes from Below Average to Above Average).
- The average segment crash frequency for the overall corridor (total fatal plus suspected serious injury crash frequency divided by the number of corridor segments) is less than 2 per segment over the 5-year crash analysis period.

Step 1.4

Confirm that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial needs from the Step 1 template to the Step 2 template.

Step 2.2

Using the crash concentration (hot spot) map developed as part of the baseline corridor performance, note the direction of travel and approximate milepost limits of each hot spot.

Step 2.3

Identify recently completed or under construction projects that would be considered relevant to safety performance. Include only projects that were not taken into account during the five-year crash data analysis period. Any completed or under construction roadway project after the crash analysis period that has the potential to mitigate a safety issue on a corridor segment should be listed in the template. Sources of recent or current project activity can include ADOT MPD staff, ADOT public notices, and ADOT District staff.

Step 2.4

Update the Final Need based on the following criteria:

- If there is a crash hot spot concentration on a “None” segment, upgrade the need rating to “Low.”

Step 2.5

Note any programmed projects that could have the potential to mitigate any safety need on the segment. Programmed projects are provided as information and do not impact the need rating. Programmed projects will be reviewed in the development of solution sets for identified needs. The source of the programming information can be found in ADOT’s 5-year construction program. Any other relevant issues identified in previous reports should also be reported.

Example Scales for Level of Need

Safety Index (6 Lane Highway) Performance Thresholds	Initial Need		Description (Non-Emphasis Area)
0.76	Good	None	All of Above Average Performance and upper third of Average Performance (<0.92)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Average Performance (0.92 - 1.08)
1.24	Fair	Medium	Lower third of Average and top third of Below Average Performance (1.08-1.40)
	Poor		
	Poor	High	Lower two-thirds of Below Average Performance (>1.40)

Measure		None <=	Low <=	< Medium >		High >=	Good/Fair Threshold	Fair/Poor Threshold
Corridor Safety Index (Emphasis Area)		Weighted average based on operating environment type						
Corridor Safety Index (Non-Emphasis Area)		# Weighted average based on operating environment type					0.92	1.08
Safety Index and Directional Safety Index (Segment)	2 or 3 Lane Undivided Highway	0.97	1.02	1.02	1.13	1.13	0.92	1.08
	2 or 3 or 4 Lane Divided Highway	0.94	1.07	1.07	1.32	1.32	0.81	1.19
	4 or 5 Lane Undivided Highway	0.93	1.08	1.08	1.37	1.37	0.78	1.22
	6 Lane Highway	0.92	1.08	1.08	1.4	1.4	0.76	1.24
	Rural 4 Lane Freeway with Daily Volume < 25,000	0.95	1.06	1.06	1.27	1.27	0.84	1.16
	Rural 4 Lane Freeway with Daily Volume > 25,000	0.93	1.08	1.08	1.37	1.37	0.78	1.22
	Urban 4 Lane Freeway	0.91	1.09	1.09	1.45	1.45	0.73	1.27
	Urban or Rural 6 Lane Freeway	0.88	1.11	1.11	1.58	1.58	0.65	1.35
	Urban > 6 Lane Freeway	0.96	1.03	1.03	1.18	1.18	0.89	1.11
% of Fatal + Susp. Serious Injury Crashes at Intersections	2 or 3 Lane Undivided Highway	13%	14%	14%	17%	17%	11%	16%
	2 or 3 or 4 Lane Divided Highway	25%	27%	27%	31%	31%	23%	29%
	4 or 5 Lane Undivided Highway	46%	48%	48%	52%	52%	44%	50%
	6 Lane Highway	63%	68%	68%	78%	78%	58%	73%
	Rural 4 Lane Freeway with Daily Volume < 25,000	0%	0%	0%	0%	0%	0%	0%
	Rural 4 Lane Freeway with Daily Volume > 25,000	0%	0%	0%	0%	0%	0%	0%
	Urban 4 Lane Freeway	0%	0%	0%	0%	0%	0%	0%
	Urban or Rural 6 Lane Freeway	0%	0%	0%	0%	0%	0%	0%
	Urban > 6 Lane Freeway	0%	0%	0%	0%	0%	0%	0%
% of Fatal + Susp. Serious Injury Crashes Involving Lane Departures	2 or 3 Lane Undivided Highway	69%	72%	72%	77%	77%	67%	75%
	2 or 3 or 4 Lane Divided Highway	59%	62%	62%	68%	68%	56%	65%
	4 or 5 Lane Undivided Highway	25%	29%	29%	36%	36%	21%	32%
	6 Lane Highway	21%	30%	30%	47%	47%	12%	38%
	Rural 4 Lane Freeway with Daily Volume < 25,000	74%	75%	75%	78%	78%	73%	76%
	Rural 4 Lane Freeway with Daily Volume > 25,000	72%	75%	75%	81%	81%	69%	78%
	Urban 4 Lane Freeway	66%	72%	72%	84%	84%	61%	78%
	Urban or Rural 6 Lane Freeway	58%	60%	60%	65%	65%	56%	63%
	Urban > 6 Lane Freeway	41%	42%	42%	44%	44%	40%	43%
% of Fatal + Susp. Serious Injury Crashes Involving Pedestrians	2 or 3 Lane Undivided Highway	5%	6%	6%	8%	8%	4%	7%
	2 or 3 or 4 Lane Divided Highway	3%	3%	3%	4%	4%	2%	4%
	4 or 5 Lane Undivided Highway	10%	12%	12%	15%	15%	9%	14%
	6 Lane Highway	4%	8%	8%	16%	16%	0%	12%
	Rural 4 Lane Freeway with Daily Volume < 25,000	2%	3%	3%	4%	4%	1%	3%
	Rural 4 Lane Freeway with Daily Volume > 25,000	2%	3%	3%	6%	6%	1%	5%
	Urban 4 Lane Freeway	2%	4%	4%	7%	7%	0%	5%
	Urban or Rural 6 Lane Freeway	5%	6%	6%	9%	9%	4%	8%
	Urban > 6 Lane Freeway	3%	4%	4%	6%	6%	2%	5%

Measure		None <=	Low <=	< Medium >		High >=	Good/Fair Threshold	Fair/Poor Threshold
Corridor Safety Index (Emphasis Area)		Weighted average based on operating environment type						
Corridor Safety Index (Non-Emphasis Area)		# Weighted average based on operating environment type					0.92	1.08
% of Fatal + Susp. Serious Injury Crashes Involving Trucks	2 or 3 Lane Undivided Highway	5%	6%	6%	9%	9%	4%	8%
	2 or 3 or 4 Lane Divided Highway	6%	8%	8%	12%	12%	4%	10%
	4 or 5 Lane Undivided Highway	2%	4%	4%	7%	7%	1%	6%
	6 Lane Highway	5%	6%	6%	8%	8%	4%	8%
	Rural 4 Lane Freeway with Daily Volume < 25,000	20%	21%	21%	24%	24%	19%	23%
	Rural 4 Lane Freeway with Daily Volume > 25,000	12%	15%	15%	22%	22%	9%	18%
	Urban 4 Lane Freeway	9%	11%	11%	15%	15%	7%	12%
	Urban or Rural 6 Lane Freeway	8%	11%	11%	16%	16%	5%	13%
	Urban > 6 Lane Freeway	3%	4%	4%	6%	6%	2%	5%
% of Fatal + Susp. Serious Injury Crashes Involving Bicycles	2 or 3 Lane Undivided Highway	1%	2%	2%	4%	4%	0%	3%
	2 or 3 or 4 Lane Divided Highway	1%	2%	2%	3%	3%	0%	2%
	4 or 5 Lane Undivided Highway	2%	3%	3%	5%	5%	1%	4%
	6 Lane Highway	2%	4%	4%	9%	9%	0%	7%
	Rural 4 Lane Freeway with Daily Volume < 25,000	0%	0%	0%	1%	1%	0%	1%
	Rural 4 Lane Freeway with Daily Volume > 25,000	0%	0%	0%	0%	0%	0%	0%
	Urban 4 Lane Freeway	0%	0%	0%	0%	0%	0%	0%
	Urban or Rural 6 Lane Freeway	0%	0%	0%	1%	1%	0%	1%
	Urban > 6 Lane Freeway	0%	0%	0%	0%	0%	0%	0%

Step 3: Contributing Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab.

Table 3 - Step 3 Template

A separate *Crash Summary Sheet* file contains summaries for 8 crash attributes for the entire corridor, for each corridor segment, and for statewide roadways with similar operating environments (the database of crashes on roadways with similar operating environments was developed in Existing Performance Analysis (the baseline corridor performance)). The crash attribute summaries are consistent with the annual ADOT Publication, *Crash Facts*. The 8 crash attribute summaries consist of the following:

- First Harmful Event (FHET)
- Crash Type (CT)
- Violation or Behavior (VB)
- Lighting Condition (LC)
- Roadway Surface Type (RST)
- First Unit Event (FUE)
- Driver Physical Condition (Impairment)
- Safety Device Usage (Safety Device)

Non-colored tabs in this spreadsheet auto-populate with filtered crash attributes. Each tab is described below:

- **Step_3_Summary** – This tab contains the filtered summary of crashes that exceed statewide thresholds for crashes on roadways with similar operating environments. Data in this tab are copied into the Step 3 template.
- **Statewide** – This tab contains a summary of statewide crashes from roadways with similar operating environments filtered by the 8 crash type summaries listed above. The crash type summaries calculate statewide crash thresholds (% total for fatal plus suspected serious crashes). The crash thresholds were developed to provide a statewide expected proportion of crash attributes against which the corridor segments' crash attributes can be compared. The crash thresholds were developed using the *Probability of Specific Crash Types Exceeding a Threshold Proportion* as shown in the Highway Safety Manual, Volume 1 (2010). The thresholds are automatically calculated within the spreadsheet. The threshold proportion was calculated as follows:

$$p*_i = \frac{\sum N_{Observed,i}}{\sum N_{Observed,i(total)}}$$

Where:

$p*_i$ = Threshold proportion

$\sum N_{Observed,i}$ = Sum of observed target crash frequency within the population

$\sum N_{Observed,i(total)}$ = Sum of total observed crash frequency within the population

A minimum crash sample size of 5 crashes over the 5-year crash analysis period is required for a threshold exceedance to be displayed in the Step 3 template. The probability of exceeding the crash threshold was not calculated to simplify the process.

- **Corridor** – A summary of corridor-wide crashes filtered by the 8 crash attribute summaries listed above.
- **Segment FHET** – A segment-by-segment summary of crashes filtered by first harmful event attributes.
- **Segment CT** – A segment-by-segment summary of crashes filtered by crash type attributes.
- **Segment VB** - A segment-by-segment summary of crashes filtered by violation or behavior attributes.
- **Segment LC** – A segment-by-segment summary of crashes filtered by lighting condition attributes.
- **Segment RST** – A segment-by-segment summary of crashes filtered by roadway surface attributes.
- **Segment FUE** – A segment-by-segment summary of crashes filtered by first unit event attributes.
- **Segment Impairment** – A segment-by-segment summary of crashes filtered by driver physical condition attributes related to impairment.
- **Segment Safety Device** – A segment-by-segment summary of crashes filtered by safety device usage attributes.

The steps to compete Step 3 include:

Step 3.1

Using the Crash_Summary_Sheet.xlsx, go to the "Step_3_Summary" tab. Input the operating environments for each segment in the table.

Step 3.2

Filter data from the ADOT database for the "CORRIDOR_DATA" tab by inserting the following data in the appropriate columns that are highlighted in gray for the "INPUT_CORRIDOR_DATA" tab:

- Incident ID
- Incident Crossing Feature (MP)
- Segment Number (Non-native ADOT data – must be manually assigned based on the location of the crash)
- Operating Environment (Non-native ADOT data – should already be assigned but if for some reason it isn't, it will need to be manually assigned)
- Incident Injury Severity
- Incident First Harmful Description
- Incident Collision Manner

- Incident Lighting Condition Description
- Unit Body Style
- Surface Condition
- First Unit Event Sequence
- Person Safety Equipment
- Personal Violation or Behavior
- Impairment

Note that columns highlighted in yellow perform a calculated input to aggregate specific crash descriptions. For example, crashes can contain various attributes for animal-involved crashes. The crash attributes that involve an animal were combined into a common attribute, such as "ANIMAL". This will allow the summaries to be consistent with the ADOT *Crash Facts*.

The data in the Impairment category contains blank descriptions if it was found that there was "No Apparent Influence" or if it was "Unknown". Using the crash data fields "PersonPhysicalDescription" 0 - 99, fill in the blank columns to reflect if the physical description is described as "No Apparent Influence" or "Unknown". Note that the native physical description data from the ADOT database may need to be combined to a single column.

Step 3.3

Confirm that the crash database is being properly filtered by comparing crash frequencies from the summary tables with the frequencies developed in Existing Performance Analysis. For example, the lookup function will fail if the filter is for "NO IMPROPER ACTION" if the database has the attribute of "NO_IMPROPER_ACTION".

Step 3.4

Copy and paste the Step_3_Summary into the Safety Needs Assessment spreadsheet in the Step 3 tab. Paste values only and remove the summaries with "0%s" for a clean display. Where duplicate values exist, go to the "Calcs" tab in the Crash_Summary_Sheet file to determine which categories have the same %. If there are more crash types with the same % than there is space in the table, select the crash type with the highest difference between the segment % and the statewide average %

Step 3.5

The Step 3 table in the Safety Needs Assessment spreadsheet should be similar to the Step 3 template. In the Segment Crash Summaries row, the top three crash attributes are displayed. Change the font color of the crash attributes that exceed the statewide crash threshold to red for emphasis. The attributes with a red font in the "Calcs" tab have exceeded statewide crash thresholds. Note that corridor-wide values are not compared to statewide values as corridor-wide values are typically a blend of multiple similar operating environments while the statewide values apply to one specific similar operating environment.

Step 3.6

Provide a summary of any observable patterns found within the crash Hot Spots, if any exist in the segments.

Step 3.7

Input any historic projects (going no further back than 15 years) that can be related to improving safety. Projects more than five years old may have exceeded their respective design life and could be contributing factors to safety performance needs.

Step 3.8

Input key points from District interviews or any important information from past discussions with District staff that is consistent with needs and crash patterns identified as part of the performance and needs assessment as this may be useful in identifying contributing causes. This information may be obtained from District Maintenance personnel by requesting the mile post locations that may be considered safety issues.

Step 3.9

For segments with one or more of the following characteristics, review crashes of all severity levels (not just fatal and suspected serious injury crashes). Identify likely contributing factors and compare that to the above statewide average comparison findings already calculated for fatal and suspected serious injury crashes. Refine the contributing factors list accordingly.

- Segments with Medium or High need
- Segments with a crash hot spot concentration (but only review crashes at the concentration areas)
- Segments with no apparent predominant contributing factors based on the comparison of fatal and suspected serious injury crashes to statewide averages if the segment has a Medium or High need.

Step 3.10

Considering all information in Steps 1-3, list the contributing factors using engineering judgment and the information on contributing factors available in Section 6.2 of the 2010 Highway Safety Manual. Additional sources for determining contributing factors may include aerial, "streetview", and/or ADOT photologs. Other documents such as Design Concept Reports (DCR) or Road Safety Assessments can provide insight into the study corridor's contributing factors.

Add comments as needed on additional information related to contributing factors that may have been provided by input from ADOT staff.

Freight Needs Assessment Methodology (Steps 1-3)

This section documents the approach for conducting the first three steps of a 5-step needs assessment process for the Freight Performance Area. After completion of Step 3 for all performance areas (Pavement, Bridge, Mobility, Safety, and Freight), Step 4 will review each corridor segment to quantify a total level of need that combines all performance areas. Corridor needs are then identified in Step 5 of the process. The 5-step process is listed below:

- Step 1: Initial Needs
- Step 2: Final Needs
- Step 3: Contributing Factors
- Step 4: Segment Review
- Step 5: Corridor Needs

Step 1: Initial Needs

The input required to populate the Step 1 template includes transferring the existing performance score and color for each segment to the appropriate "Performance Score" columns. This includes the primary and secondary measures for Freight. As each performance score is input into the template, the Initial Need will populate based on the weighted scoring system for each measure.

The Level of Need for each performance measure has levels of "None" (score = 0), "Low" (score = 1), "Medium" (score = 2), and "High" (score = 3). The assignment of these levels to individual performance measures for segments is determined by the table entitled "Needs Assessment Scale" within the Step 1 template.

To develop an aggregated Initial Need for each segment, the primary and secondary measures are combined by summing the weighted score, with the primary measure having a weight of 1.0 while each secondary measure has a weight of 0.2 (0.1 each direction if directional). The Initial Need for each segment (combining the primary and secondary measures) has levels of "None" (score < 0.01), "Low" (score ≥ 0.01 and < 1.5), "Medium" (score ≥ 1.5 and < 2.5), and "High" (score ≥ 2.5).

The steps include:

Step 1.1

Populate the Step 1 template with the existing (baseline) performance scores for all primary and secondary performance measures from Existing Performance Analysis. Copy the performance score for each segment to the appropriate "Performance Score" column. Select the *Facility Operations* for each segment from the drop-down list and input whether or not the performance area is an emphasis area. The corridor needs assessment scales will be updated automatically.

Step 1.2

Confirm that that the Step 1 template is generating the appropriate "Level of Need" for each primary and secondary measure by reviewing the relationship of baseline performance score to level of need.

Step 2: Final Needs

The Initial Need will be carried over to Step 2. The steps required to complete Step 2 are as follows:

Step 2.1

Confirm that the template has properly populated the initial need from the Step 1 template to the Step 2 template.

Step 2.2

Note any truck height restriction hot spots (clearance < 16.25') identified as part of the baseline corridor performance. For each entry, note the milepost of the height restriction and if the height restriction can be detoured by ramping around the obstruction. If it is not possible for a truck to ramp around the height restriction, note the existing height as well.

Step 2.3

Identify recently completed or under construction projects that would be considered relevant to freight performance. Include only projects that were not taken into account during the freight data analysis period. Any completed or under construction roadway project after the date of the data that has the potential to mitigate a freight issue on a corridor segment should be listed in the template. Such projects can include the construction of climbing lanes or Dynamic Message Signs (DMS) installation. Sources of recent or current project activity can be ADOT MPD staff, ADOT public notices, and ADOT District staff.

Step 2.4

Update the Final Need using the following criteria:

- If there is at least one truck height restriction hot spot where a truck cannot ramp around on a 'None' segment, increase (i.e., worsen) the need rating to 'Low'.
- If a recent project has superseded the performance rating data and it is certain the project addressed the need, change the need rating to "None".
- If a recent project has superseded the performance rating data but it is uncertain that a project addressed the need, maintain the current need rating and note the uncertainty as a comment.

Step 2.5

Note any programmed projects that could have the potential to mitigate any freight need on the segment. Programmed projects are provided as information and do not impact the need rating. Programmed projects will be reviewed in the development of solution sets for identified needs. The source of the programming information can be found in ADOT's 5-year construction program. If there are other comments relevant to the needs analysis, they can be entered in the right-most column.

Example Scales for Level of Need

Freight Index (Interrupted) Performance Score Thresholds	Performance Level	Initial Performance Level of Need	Description (Non-emphasis Area)
1.45	Good	None	All levels of Good and the top third of Fair (<1.58)
	Good		
	Good		
	Fair		
	Fair	Low	Middle third of Fair (1.58-1.72)
1.85	Fair	Medium	Lower third of Fair and top third of Poor (1.72-1.98)
	Poor		
	Poor	High	Lower two-thirds of Poor (>1.98)
	Poor		

Needs Scale

Measure	None <=	Low <=	> Medium <		High >=
Corridor Freight Index (Emphasis Area)	Dependent on weighted average of interrupted vs. uninterrupted segments				
Corridor Freight Index (Non-Emphasis Area)	Dependent on weighted average of interrupted vs. uninterrupted segments				
Freight Index (Segment)					
Interrupted	1.58	1.72	1.72	1.98	1.98
Uninterrupted	1.22	1.28	1.28	1.42	1.42
Directional TTTR					
Interrupted	1.58	1.72	1.72	1.98	1.98
Uninterrupted	1.22	1.28	1.28	1.42	1.42
Closure Duration					
All Facility Operations	71.07	97.97	97.97	151.75	151.75
Measure	**None >=**	**Low >=**	**< Medium >**		**High <=**
Bridge Clearance (feet)					
All Bridges	16.33	16.17	16.17	15.83	15.83

Step 3: Contributing

Factors

The Final Need ratings from Step 2 will populate into the Step 3 tab.

The steps to compete Step 3 include:

Step 3.1

Input all roadway variable data that describe each segment into the appropriate columns. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.2

Input all traffic variables for each segment into the appropriate columns. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.3

Input any freight-related infrastructure that currently exists on the corridor for each segment. The relevant infrastructure can include DMS locations, weigh stations, Ports of Entry (POE), rest areas, parking areas, and climbing lanes. Include the mileposts of the listed infrastructure. This data can be extracted from the most recent Highway Log and the 2015 Climbing and Passing Lane Prioritization Study.

Step 3.4

Input the Closure Extents that have occurred along the study corridor. Road closure information can be detailed out by the reason for the closure as documented in Highway Condition Reporting System (HCRS) data analyzed as part of the baseline corridor performance. Closure reasons include incident/accidents, winter storms, obstruction hazards, and undefined closures. Statewide average percentages for the various closure reasons have been calculated for the analysis period on ADOT's designated strategic corridors. Compare these statewide average percentages to the corridor percentages for the various closure reasons to identify higher than average percentages of one or more closure reasons on any given segment. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment. Input the closures as follows and use red text to indicate that the segment percentage exceeds statewide averages:

- Total Number of Closures
- % Closures (No Reason)
- % Incidents/Accidents
- % Obstructions/Hazards
- % Weather Related

Step 3.5

List the non-actionable conditions that are present within each segment by milepost if possible. Non-Actionable conditions are conditions that exist within the environment of each segment that cannot be improved through an engineered solution. Examples of Non-Actionable conditions can include border patrol check points and other closures/restrictions not controlled by ADOT. Note that this data can be copied from the Mobility Needs Assessment spreadsheet for Needs Assessment.

Step 3.6

Input any programmed and planned projects or issues that have been identified from previous documents or studies that are relevant to the Final Need. Sources for this data include the current Highway Log, the 2015 Climbing and Passing Lane Prioritization Study, and ADOT's 5-year construction program.

Step 3.7

Considering all information in Steps 1-3, identify the contributing factors to the Final Need column. Potential contributing factors to freight performance needs include roadway vertical grade, number of lanes, traffic volume-to-capacity ratios, presence/lack of a climbing lanes, and road closures. Also, identify higher than average percentages of one or more closure reasons on any given segment

.

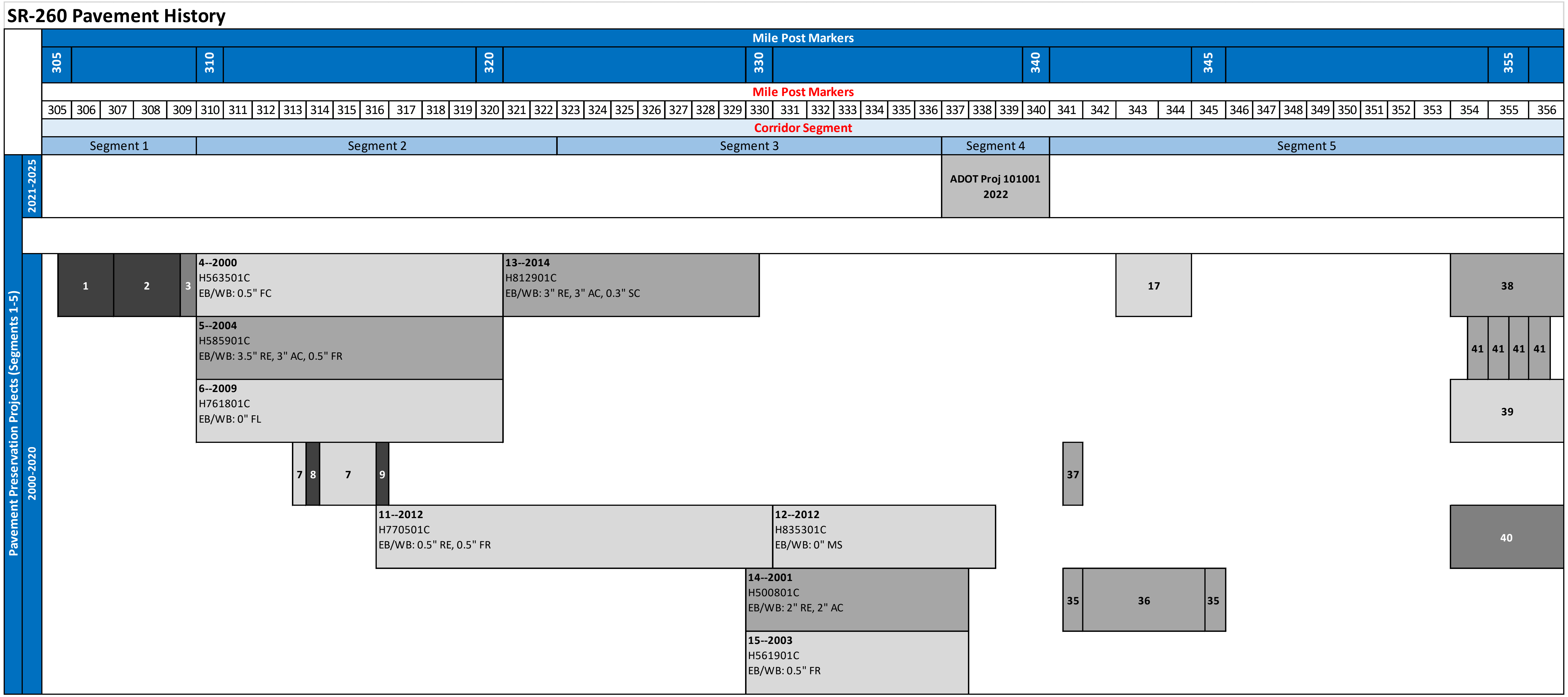
Pavement Performance Area – Need Analysis Step 1

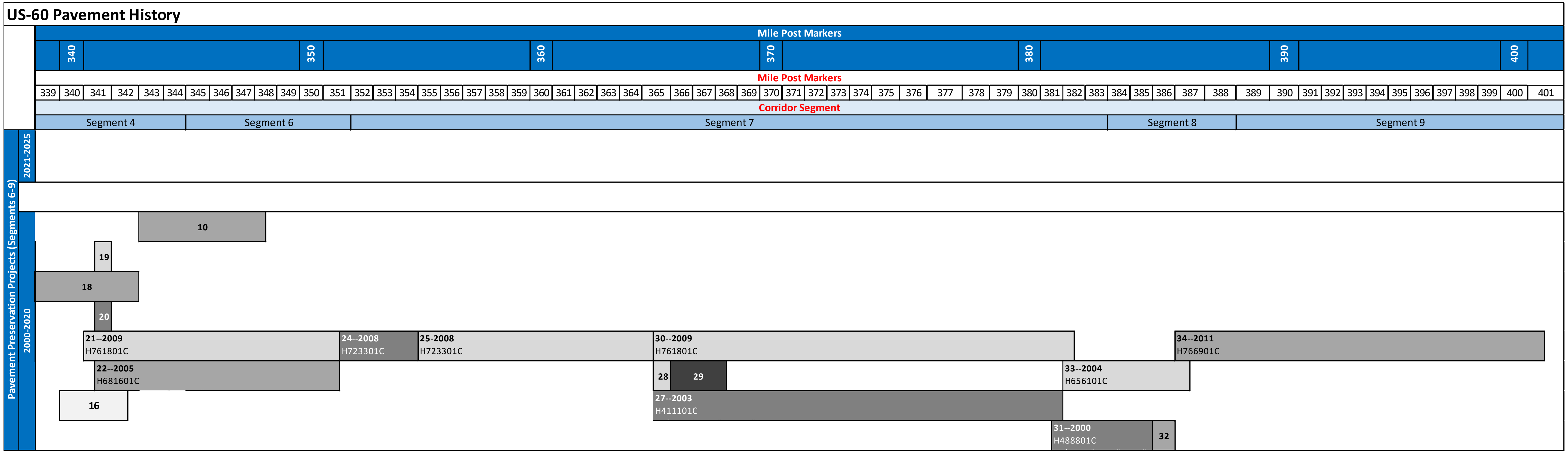
Segment	Segment Length (miles)	Segment Mileposts (MP)	Facility Type	Pavement Index			Directional PSR					% Area Failure			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score EB	Performance Score WB	Performance Objective	Level of Need EB	Level of Need WB	Performance Score	Performance Objective	Level of Need	
260-1	4	306-310	Highway	1.94	Fair or Better	High	2.93	2.76	Fair or Better	Medium	Medium	100.00%	Fair or Better	High	High
260-2	13	310-323	Highway	3.20	Fair or Better	Low	4.02	4.02	Fair or Better	None	None	77.00%	Fair or Better	High	Medium
260-3	14	323-337	Highway	2.21	Fair or Better	High	3.75	3.75	Fair or Better	None	None	43.00%	Fair or Better	High	High
260|60-4	8	337-345	Highway	3.32	Fair or Better	Low	3.43	3.26	Fair or Better	None	Low	56.00%	Fair or Better	High	Medium
260-5	16	341-357	Highway	3.16	Fair or Better	Low	3.57	3.56	Fair or Better	None	None	100.00%	Fair or Better	High	Medium
60-6	7	345-352	Highway	3.27	Fair or Better	Low	3.63	3.63	Fair or Better	None	None	100.00%	Fair or Better	High	Medium
60-7	32	352-384	Highway	2.46	Fair or Better	High	3.31	3.31	Fair or Better	None	None	97.00%	Fair or Better	High	High
60-8	5	384-389	Highway	3.55	Fair or Better	None	3.73	3.73	Fair or Better	None	None	67.00%	Fair or Better	High	Low
60-9	13	389-402	Highway	3.88	Fair or Better	None	3.93	3.93	Fair or Better	None	None	0.00%	Fair or Better	None	None
Emphasis Area?	No	Weighted Average		2.92	Fair or Better	Medium									

Pavement Performance Area – Need Analysis Step 2

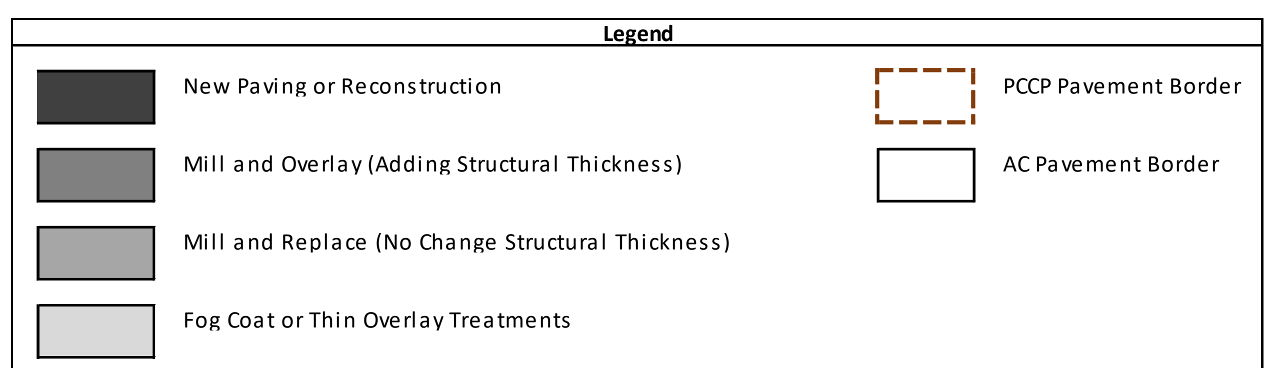
Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Need Adjustments		Final Need	Comments (may include programmed projects or issues from previous reports)
				Hot Spots	Previous Projects (which supersede condition data)		
260-1	4	306-310	High	MP 305-310	None	High	
260-2	13	310-323	Medium	MP 310-312 MP 313-321	None	Medium	
260-3	14	323-337	High	MP 331-337	None	High	
260|60-4	8	337-345	Medium	MP 337-338 MP 340-341 EBMP 341-344 MP 344-345	None	Low	
260-5	16	341-357	Medium	MP 341-357	None	Medium	
60-6	7	345-352	Medium	MP 345-352	None	Medium	
60-7	32	352-384	High	MP 352-371 MP 372-384	None	High	
60-8	5	384-389	Low	MP 384-385 MP 387-389	None	Low	
60-9	13	389-402	None	None	None	None	

Pavement History





Pavement Treatment Reference Numbers	Pavement Treatment Reference Numbers	Pavement Treatment Reference Numbers
1. 2003 (EB/WB) H460401C: 12" AB, 3" AC, 2" AR	**15. 2003 (EB/WB)** H561901C: 0.5" FR	**29. 2004 (EB/WB)** H355201C: 8" AB, 6" AC, 0.5" FR
2. 2003 (EB/WB) H460401C: 14" AB, 4" AC, 2" AR	**16. 2016** (EB/WB) H876201C: 0.3" Slurry Seal	**30. 2009 (EB/WB)** H761801C: 0" FL
3. 2003 (EB/WB) H460401C: 2" AR	**17. 2019 (EB/WB)** M699701C: Crack seal	**31. 2000 (EB/WB)** H488801C: Remove 2", New 2" AC, 2" AR
4. 2000 (EB/WB) H563501C: 0.5" FC	**18. 2008 (EB/WB)** H681601C: Remove 3", New 2.5" AC, 0.5" FR	**32. 2000 (EB/WB)** H488801C: Remove 2.5", New 2.5" AR
5. 2004 (EB/WB) H585901C: Remove 3.5", New 3" AC, 0.5" FR	**19. 2004 (EB/WB)** H531301C: 0.6" DC	**33. 2004 (EB/WB)** H656101C: 0.5" FR
6. 2009 (EB/WB) H761801C: 0" FL	**20. 2009 (EB/WB)** H466301C: 10" AC, 0.5" FC	**34. 2011 (EB/WB)** H766901C: Remove 2.5", New 2.5" AC, 0.3" SC
7. 2007 (EB/WB) H460301C: Remove 0.5", New 0.5" FR	**21. 2009 (EB/WB)** H761801C: 0" FL	**35. 2001 (EB/WB)** H490501C: Remove 4.5", New 4" AC, 0.5" FR
8. 2007 (EB/WB) H460301C: 12" AB, 5" AC, 0.5" FC	**22. 2008 (EB/WB)** H681601C: Remove 3", New 2.5" AC, 0.5" FR	**36. 2001 (EB/WB)** H490501C: Remove 2.5", New 2" AC, 0.5" FR
9. 2012 (EB/WB) H770501C: 13" AB, 4" AC, 0.5" FR	**23. N/A**	**37. 2004 (EB/WB)** H531301C: Remove 3", New 3" AC, 0.6" DC
10. 2005 (EB/WB) H614101C: Remove 3", New 2.5 AC, 0.5" FR	**24. 2008 (EB/WB)** H723301C: 2.5" AC, 0.5" FR	**38. 2013 (EB/WB)** H855101C: Remove 3", New 3" AC, 0" SR
11. 2012 (EB/WB) H770501C: Remove 0.5", New 0.5" FR	**25. 2008 (EB/WB)** H723301C: 0.5" FR	**39. 2009 (EB/WB)** H761801C: 0" FL
12. 2012 (EB/WB) H835301C: 0" MS	**26. N/A**	**40. 2003 (EB/WB)** H435701C: Remove 4", New 5" AC, 0.5" FR
13. 2014 (EB/WB) H812901C: Remove 3", New 3" AC, 0.3" SC	**27. 2003 (EB/WB)** H411101C: Remove 2", New 4" AC, 0.5" FR	**41. 2011 (EB/WB)** H818401C: Remove 3.5", New 3" AC, 0.5" FC
14. 2001 (EB/WB) H500801C: Remove 2", New 2" AC	**28. 2004 (EB/WB)** H355201C: Remove 0.5", New 0.5" FR	**42. N/A**



		Segment Number																	
		1		2		3		4		5		6		7		8		9	
Value	Level	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir	Uni-Dir	Bi-Dir
1	L1				85%		57%				19%		93%		2%		70%		
1					85%		43%		15%		20%				6%				
1					19%		50%		20%						42%				
1					50%				41%						53%				
1									33%										
3	L2				85%		54%		10%		6%		93%				40%		
3					15%		50%		30%		22%						20%		
3									35%		3%								
3											19%								
3											13%								
3																			
4	L3		10%				5%		5%		19%		21%				40%		96%
4									48%		52%		7%		9%				
4															5%				
4															52%				
4																			
6	L4		80%		8%										8%				
6																			
6																			
6																			
6																			
6																			
Sub-Total		0.0	5.2	0.0	5.9	0.0	4.8	0.0	5.5	0.0	5.1	0.0	4.9	0.0	4.1	0.0	4.1	0.0	3.8
Total		**5.2**		**5.9**		**4.8**		**5.5**		**5.1**		**4.9**		**4.1**		**4.1**		**3.8**	

Pavement Historical Investment

Segment	Pavement History Value (bid projects)	Pavement History (bid projects)	PeCos ($/mile/yr)	PeCos	Resulting Historical Investment
260-1	5.20	Medium	$143.27	Low	Medium
260-2	5.86	Medium	$129.97	Low	Medium
260-3	4.81	Medium	$620.67	Low	Medium
260|60-4	5.66	Medium	$840.45	Low	Medium
260-5	4.90	Medium	$1,643.55	Medium	Medium
60-6	4.86	Medium	$16,488.00	High	High
60-7	4.11	Low	$2,696.07	Medium	Low
60-8	4.10	Low	$19,084.33	High	Medium
60-9	3.85	Low	$382.24	Low	Low

Pavement Performance Area – Need Analysis Step 3

Segment	Segment Length (miles)	Segment Mileposts (MP)	Final Need	Bid History Investment	PeCos History Investment	Resulting Historical Investment	Contributing Factors and Comments
260-1	4	306-310	High	Medium	Low	Medium	Hot Spots: MP 305-310
260-2	13	310-323	Medium	Medium	Low	Medium	Hot Spots: MP 310-312 MP 313-321
260-3	14	323-337	High	Medium	Low	Medium	Hot Spots: MP 331-337
260 | 60-4	8	337-345	Low	Medium	Low	Medium	Hot Spots: MP 337-338 MP 340-341 EBMP 341-344 MP 344-345
260-5	16	341-357	Medium	Medium	Medium	Medium	Hot Spots: MP 341-357
60-6	7	345-352	Medium	Low	High	high	Hot Spots: MP 345-352
60-7	32	352-384	High	Low	Medium	Medium	Hot Spots: MP 352-371 MP 372-384
60-8	5	384-389	Low	Low	High	High	Hot Spots: MP 384-385 MP 387-389
60-9	13	389-402	None	Low	Low	Low	Hot Spots: None

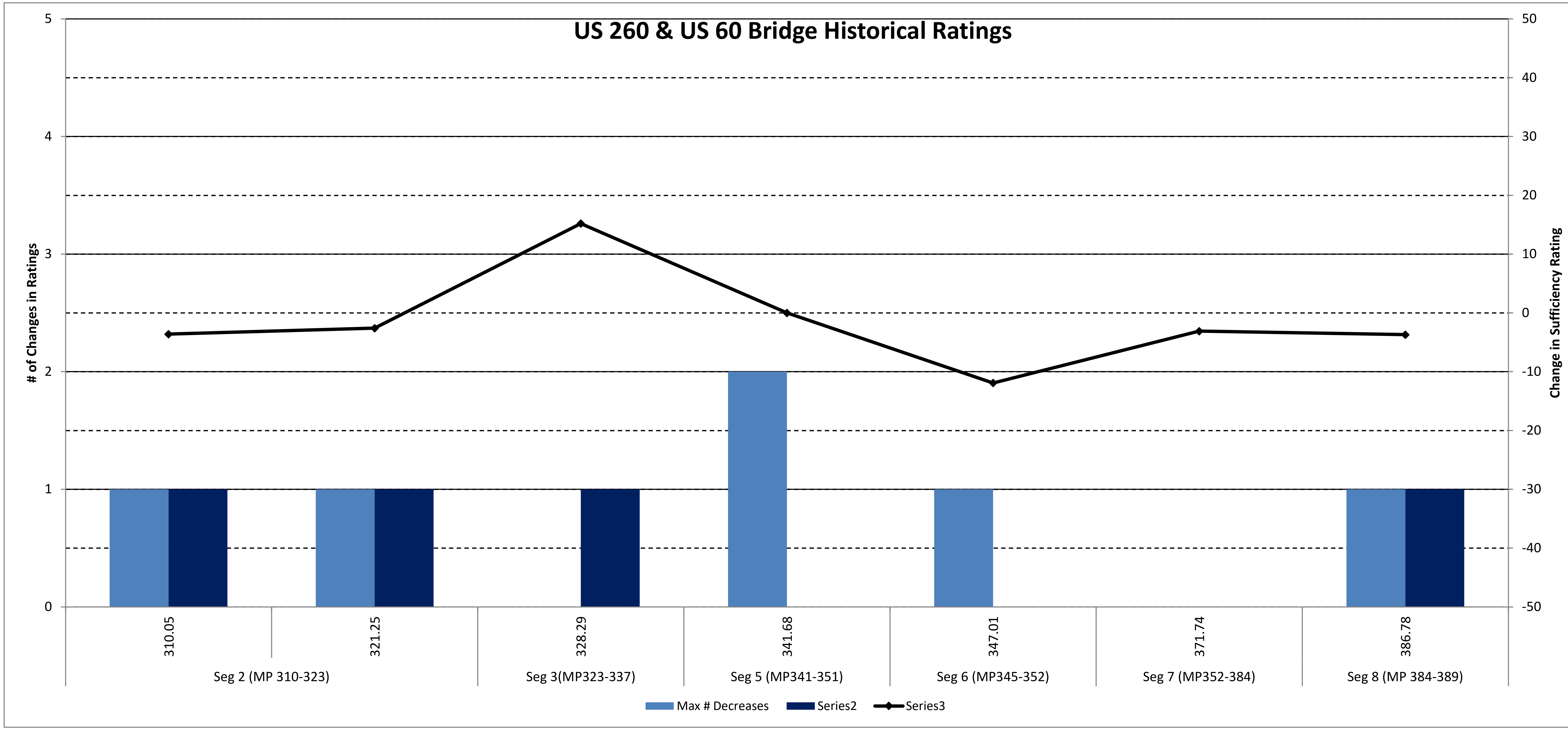
Bridge Performance Area – Need Analysis Step 1

Segment	Segment Length (miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Bridge Index			Lowest Bridge Rating			Sufficiency Rating			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	
260-1	4	306-310	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	N/A
260-2	13	310-323	2	5.70	Fair or Better	Low	5	Fair or Better	Low	88.2	Fair or Better	None	Low
260-3	14	323-337	1	6.00	Fair or Better	None	6	Fair or Better	None	93.2	Fair or Better	None	None
260|60-4	8	337-345	0	6.00	Fair or Better	None	6	Fair or Better	None	85.0	Fair or Better	None	None
260-5	16	341-357	1	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	N/A
60-6	7	345-352	1	5.00	Fair or Better	Medium	5	Fair or Better	Low	63.7	Fair or Better	Low	Medium
60-7	32	352-384	1	7.00	Fair or Better	None	7	Fair or Better	None	96.9	Fair or Better	None	None
60-8	5	384-389	1	6.00	Fair or Better	None	6	Fair or Better	None	79.7	Fair or Better	None	None
60-9	13	389-402	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	N/A
Emphasis Area?	No	Weighted Average		6.29	Fair or Better	None							

Bridge Performance Area – Need Analysis Step 2

Segment	Segment Length (miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Initial Need	Need Adjustments		Final Need	Historical Review	Comments
					Hot Spots (Rating of 4 or multiple 5's)	Previous Projects (which supersede condition data)			
260-1	4	306-310	0	N/A	None	None	None	None	No bridges in segment
260-2	13	310-323	2	Low	None	None	None	None	No bridges with current ratings of 4 or 5 and no historical issues
260-3	14	323-337	1	None	None	None	None	None	No bridges with current ratings of 4 or 5 and no historical issues
260|60-4	8	337-345	0	None	None	None	None	None	No bridges with current ratings of 4 or 5 and no historical issues
260-5	16	341-357	1	N/A	None	None	None	None	No bridges in segment
60-6	7	345-352	1	Medium	None	None	None	Rocky Arroyo Br (#384)	Rocky Arroyo Bridge (#384) has historical issues three changes of Historical ratings
60-7	32	352-384	1	None	None	None	None	None	No bridges with current ratings of 4 or 5 and no historical issues
60-8	5	384-389	1	None	None	None	None	None	No bridges with current ratings of 4 or 5 and no historical issues
60-9	13	389-402	0	N/A	None	None	None	None	No bridges in segment

Bridge Ratings History



○ identifies the bridge indicated is of concern from a historical ratings perspective

Maximum # of Decreases: Maximum number of times that the Deck Rating, Substructure Rating, or Superstructure Rating decreased in the last 20 years of available data. (Higher number could indicate a more dramatic decline in the performance of the bridge)

Maximum # of Increases: Maximum number of times that the Deck Rating, Substructure Rating, or Superstructure Rating increased in the last 20 years of available data. (Higher number could indicate a higher level of investment)

Change in Sufficiency Rating: Cumulative change in Sufficiency Rating in the last 20 years of available data. (Bigger negative number could indicate a more dramatic decline in the performance of the bridge)

Bridge Performance Area – Need Analysis Step 3

Segment	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Final Need	Contributing Factors			Comments
					Bridge	Current Ratings	Historical Review	
260-1	4	306-310	0	None	No bridges in segment			
260-2	13	310-323	2	None	No bridges with current ratings less than 6 and no historical issues			
260-3	14	323-337	1	None	No bridges with current ratings less than 6 and no historical issues			**FY19** Construct Scour Retrofit: Mortenson Wash Bridge (#1641) (MP 328)
260 | 60-4	8	337-345	0	None	No bridges with current ratings less than 6 and no historical issues			
260-5	16	341-357	1	None	No bridges in segment			
60-6	7	345-352	1	None	**Rocky Arroyo Bridge (#384) (MP 347.01)**	None	Could have a repetitive investment issue	
60-7	32	352-384	1	None	No bridges with current ratings less than 6 and no historical issues			
60-8	5	384-389	1	None	No bridges with current ratings less than 6 and no historical issues			
60-9	13	389-402	0	None	No bridges in segment			

Mobility Performance Area – Need Analysis Step 1

Segment	Segment Mileposts	Segment Length (miles)	Environment Type	Facility Operation	Mobility Index			Future Daily V/C			Existing Peak Hour V/C					Closure Extent (occurrences/year/mile)				
					Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need		Performance Score		Performance Objective	Level of Need	
											EB	WB		EB	WB	EB	WB		EB	WB
260-1	306-310	4	Rural	Uninterrupted	0.10	Fair or Better	None	0.09	Fair or Better	None	0.11	0.11	Fair or Better	None	None	0.29	0.17	Fair or Better	None	None
260-2	310-323	13	Rural	Uninterrupted	0.39	Fair or Better	None	0.38	Fair or Better	None	0.42	0.42	Fair or Better	None	None	0.14	0.15	Fair or Better	None	None
260-3	323-337	14	Rural	Uninterrupted	0.20	Fair or Better	None	0.20	Fair or Better	None	0.23	0.23	Fair or Better	None	None	0.16	0.11	Fair or Better	None	None
260|60-4	337-345	8	Rural	Interrupted	0.39	Fair or Better	None	0.44	Fair or Better	None	0.32	0.32	Fair or Better	None	None	0.20	0.15	Fair or Better	None	None
260-5	341-357	16	Rural	Interrupted	0.66	Fair or Better	Low	0.74	Fair or Better	Medium	0.49	0.49	Fair or Better	None	None	0.24	0.28	Fair or Better	None	None
60-6	345-352	7	Rural	Uninterrupted	0.51	Fair or Better	None	0.59	Fair or Better	None	0.41	0.41	Fair or Better	None	None	0.31	0.23	Fair or Better	None	None
60-7	352-384	32	Rural	Uninterrupted	0.24	Fair or Better	None	0.27	Fair or Better	None	0.18	0.18	Fair or Better	None	None	0.46	0.24	Fair or Better	Low	None
60-8	384-389	5	Rural	Interrupted	0.28	Fair or Better	None	0.32	Fair or Better	None	0.23	0.23	Fair or Better	None	None	0.04	0.04	Fair or Better	None	None
60-9	389-402	13	Rural	Uninterrupted	0.06	Fair or Better	None	0.06	Fair or Better	None	0.05	0.05	Fair or Better	None	None	0.02	0.00	Fair or Better	None	None
Mobility Emphasis Area		No	Weighted Average		0.32	Fair or Better	None													

Segment	Segment Mileposts	Segment Length (miles)	Environment Type	Facility Operation	Directional LOTTR (all vehicles)					Bicycle Accommodation			Initial Need
					Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
					EB	WB		EB	WB				
260-1	306-310	4	Rural	Uninterrupted	1.11	1.12	Fair or Better	None	None	93%	Fair or Better	None	None
260-2	310-323	13	Rural	Uninterrupted	1.08	1.08	Fair or Better	None	None	0%	Fair or Better	High	Low
260-3	323-337	14	Rural	Uninterrupted	1.08	1.07	Fair or Better	None	None	5%	Fair or Better	High	Low
260|60-4	337-345	8	Rural	Interrupted	1.17	1.19	Fair or Better	None	None	54%	Fair or Better	Medium	Low
260-5	341-357	16	Rural	Interrupted	1.17	1.20	Fair or Better	None	None	50%	Fair or Better	Medium	Medium
60-6	345-352	7	Rural	Uninterrupted	1.15	1.18	Fair or Better	None	None	0%	Fair or Better	High	Low
60-7	352-384	32	Rural	Uninterrupted	1.09	1.07	Fair or Better	None	None	5%	Fair or Better	High	Low
60-8	384-389	5	Rural	Interrupted	1.21	1.21	Fair or Better	None	None	98%	Fair or Better	None	None
60-9	389-402	13	Rural	Uninterrupted	1.16	1.15	Fair or Better	None	None	100%	Fair or Better	None	None

Mobility Performance Area – Need Analysis Step 2

Segment	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments Recently Completed Projects	Final Need	Planned and Programmed Future Projects
260-1	306-310	4	None	Rim Road- Gibson Rd: Shoulder widening [MP 305]	None	**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-2	310-323	13	Low	None	Low	**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-3	323-337	14	Low	FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	Low	**Programmed**: None **Planned**: Intersection Signal: SR 260 and future relocation of Lone Pine Dam Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 335) Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340] EB DMS
260|60-4	337-345	8	Low	FY17 H5107: Roadway Widening, US 60 Eastbound starting at SR 77 Intersection (MP 342-343.5) FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	Low	**Programmed**: None **Planned**: Roadway Widening to 4-lane Divided Highway from Heber-Overgaard to Show Low (Payson-Show Low Highway, SR 260, Overgaard to US 60 MP 309.4-340.1, DCR, 2014) Grade Separated TI: US 60 and SR 77 Intersection Signals: US 60 and Future Woolford Extension; US 60 and Ski Hi Road Future Extension (Southern Navajo/Apache County Sub Regional Transportation Plan) Exclusive WB turn lane toward 27th Place (MP 342.5) and exclusive EB right turn lane at 40th Street intersection (Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona, MP 343.3) Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-5	341-357	16	Medium	FY16 H8378: Constructing asphaltic concrete pathway, concrete scupper, sidewalk ramps and other miscellaneous work (MP 350.67-351.20).	Medium	**Programmed**: None **Planned**: Widen Roadway: six-lanes SR 260 to SR 77, four-lanes SR 77 to Springerville [MP340-398] Widen Roadway: Showlow to 40th St Grade Separated TI: US 60 and SR 77 [MP 342.2] Exclusive WB turn lane toward 27th place [MP342.5] Exclusive EB turn lane at 40th St Intersection [343.3]

Segment	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments Recently Completed Projects	Final Need	Planned and Programmed Future Projects
						Intersection signal: US 60 and Future Woolford Extension [MP 343.3] Intersection signal: US 60 and Ski Hi Rd Future Extension [MP 345] EB/WB Passing Lanes-Tier 1 [MP 345-348] WB DMS [MP 345] EB/WB Shoulder Improvement-Tier 1 [MP346-353] Intersection signal: US60 and Bourbon Ranch Rd [MP 347] Turn and merge lanes [MP 352.5-353.15]
60-6	345-352	7	Low	None	Low	**Programmed**: None **Planned**: EB/WB Passing Lanes-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 345-348) Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 345) EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 346-352) Intersection Signal: US 60 and Bourdon Ranch Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 347)
60-7	352-384	32	Low	None	Low	**Programmed**: None **Planned**: EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 352-353, MP 358-369) EB Passing Lane-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 357-360) Stop Controlled Intersection: US 60 and Future Vernon-McNary Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 360.6) Turn and merge lanes [MP 352.5-353.15]
60-8	384-389	5	None	None	None	**Programmed**: None Planned: Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 385)
60-9	389-402	13	None	None	None	**Programmed**: None Planned: None

Mobility Performance Area – Need Analysis Step 3

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables			Relevant Mobility Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2040 LOS	% Trucks	
260-1	306-310	4	Low	State Highway	Rural	Rolling	4	45	No	Non-Divided	0%	A/B	A/B	14	
260-2	310-323	13	Low	State Highway	Rural	Level	2	65	No	Non-Divided	30%	A/B	A/B	15	
260-3	323-337	14	Low	State Highway	Rural	Level	2	58	No	Non-Divided	30%	A/B	A/B	13	Existing DMS EB MP 335.17
260 | 60-4	337-345	8	Low	State Highway	Rural	Rolling	4	38	No	Non-Divided	0%	A/B	C	10	Existing DMS EB MP 339.9; DMS WB MP 339.9
260-5	341-357	16	High	State Highway	Rural	Rolling	4	41	No	Non-Divided	0%	D-F	D-F	9	
60-6	345-352	7	Medium	State Highway	Rural	Level	2	65	No	Non-Divided	50%	A/B	D-F	12	
60-7	352-384	32	Low	State Highway	Rural	Level	2	64	No	Non-Divided	30%	A/B	A/B	14	
60-8	384-389	5	Low	State Highway	Rural	Rolling	2	39	No	Non-Divided	30%	A/B	A/B	11	
60-9	389-402	13	Low	State Highway	Rural	Level	2	65	No	Non-Divided	40%	A/B	A/B	11	

Mobility Performance Area – Need Analysis Step 3 (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
260-1	306-310	4	None	6	0	0%	0	0%	0	0%		**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]	High percentage of closures due to incidents/crashes.
260-2	310-323	13	Low	12	2	17%	2	17%	0	0%		**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]	High percentage of closures due to incidents/crashes.
260-3	323-337	14	Low	16	3	19%	0	0%	0	0%		**Programmed**: None **Planned**: Intersection Signal: SR 260 and future relocation of Lone Pine Dam Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 335) Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340] EB DMS	High percentage of closures due to incidents/crashes.
260 | 60-4	337-345	8	Low	6	0	0%	1	17%	2	33%		**Programmed**: None **Planned**: Roadway Widening to 4-lane Divided Highway from Heber-Overgaard to Show Low (Payson-Show Low Highway, SR 260, Overgaard to US 60 MP 309.4-340.1, DCR, 2014) Grade Separated TI: US 60 and SR 77 Intersection Signals: US 60 and Future Woolford Extension; US 60 and Ski Hi Road Future Extension (Southern Navajo/Apache County Sub Regional Transportation Plan) Exclusive WB turn lane toward 27th Place (MP 342.5) and exclusive EB right turn lane at 40th Street intersection (Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona, MP 343.3) Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]	The duration of one closure exceeded 1000 minutes due to weather conditions.

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
260-5	341-357	16	Medium	10	1	10%	0	0%	2	20%		**Programmed**: None **Planned**: Widen Roadway: six-lanes SR 260 to SR 77, four-lanes SR 77 to Springerville [MP340-398] Widen Roadway: Showlow to 40th St Grade Separated TI: US 60 and SR 77 [MP 342.2] Exclusive WB turn lane toward 27th place [MP342.5] Exclusive EB turn lane at 40th St Intersection [343.3] Intersection signal: US 60 and Future Woolford Extension [MP 343.3] Intersection signal: US 60 and Ski Hi Rd Future Extension [MP 345] EB/WB Passing Lanes-Tier 1 [MP 345-348] WB DMS [MP 345] EB/WB Shoulder Improvment-Tier 1 [MP346-353] Intersection signal: US60 and Bourbon Ranch Rd [MP 347] Turn and merge lanes [MP 352.5-353.15]	The duration of one closure exceeded 1000 minutes due to incidents/acccident s. High percentage of closures due to incidents/crashes.
60-6	345-352	7	Low	5	0	0%	0	0%	2	40%		**Programmed**: None **Planned**: EB/WB Passing Lanes-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 345-348) Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 345) EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 346-352) Intersection Signal: US 60 and Bourdon Ranch Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 347)	High percentage of closures due to incidents/crashes. The duration of one closure exceeded 1000 minutes due to incidents/ accidents.
60-7	352-384	32	Low	15	0	0%	2	13%	6	40%		**Programmed**: None **Planned**: EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 352-353, MP 358-369) EB Passing Lane-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 357-360) Stop Controlled Intersection: US 60 and Future Vernon-McNary Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 360.6) Turn and merge lanes [MP 352.5-353.15]	High percentage of closures due to incidents/ crashes, mostly traveling in the EB direction. The duration of three closures exceeded 1000 minutes due to incidents/ crashes and weather conditions.

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
60-8	384-389	5	None	2	0	0%	0	0%	0	0%		**Programmed**: None **Planned**: Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 385)	Both closures due to incidents/ crashes.
260-9	389-402	13	None	1	0	0%	1	100%	0	0%		**Programmed**: None **Planned**: None	Only closure is due to obstruciton hazards in the EB direction.

Safety Performance Area – Need Analysis Step 1

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	Safety Index			Directional Safety Index					% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures		
				Performance Score	Performance Objective	Level of Need	EB Performance Score	WB Performance Score	Performance Objective	EB Level of Need	WB Level of Need	Performance Score	Performance Objective	Level of Need
260-1	4 or 5 Lane Undivided Highway	4	305.67 - 310	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
260-2	2 or 3 Lane Undivided Highway	13	310 - 323	1.51	Average or Better	High	1.85	1.16	1.85	High	High	86%	Average or Better	High
260-3	2 or 3 Lane Undivided Highway	14	323 - 337	0.54	Average or Better	None	0.19	0.90	0.19	None	None	57%	Average or Better	None
260|60-4	4 or 5 Lane Undivided Highway	8	337 - 345	0.39	Average or Better	None	0.61	0.16	0.61	None	None	25%	Average or Better	None
260-5	4 or 5 Lane Undivided Highway	16	341 - 357	0.01	Average or Better	None	0.01	0.01	0.01	None	None	*Insufficient Data*	Average or Better	N/A
60-6	2 or 3 Lane Undivided Highway	7	345 - 352	0.04	Average or Better	None	0.09	0.00	0.09	None	None	*Insufficient Data*	Average or Better	N/A
60-7	2 or 3 Lane Undivided Highway	32	352 - 384	0.67	Average or Better	None	1.20	0.15	1.20	High	None	69%	Average or Better	Low
60-8	4 or 5 Lane Undivided Highway	5	384 - 389	0.00	Average or Better	None	0.00	0.00	0.00	None	None	*Insufficient Data*	Average or Better	N/A
60-9	2 or 3 Lane Undivided Highway	13	389 - 402	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
Safety Emphasis Area?		Yes	Weighted Average	0.47	Average or Better	None								

Safety Performance Area – Need Analysis Step 1 (continued)

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians			% of Fatal + Suspected Serious Injury Crashes Involving Trucks			% of Fatal + Suspected Serious Injury Crashes Involving Bicycles			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	
260-1	4 or 5 Lane Undivided Highway	4	305.67 - 310	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
260-2	2 or 3 Lane Undivided Highway	13	310 - 323	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	High
260-3	2 or 3 Lane Undivided Highway	14	323 - 337	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
260|60-4	4 or 5 Lane Undivided Highway	8	337 - 345	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
260-5	4 or 5 Lane Undivided Highway	16	341 - 357	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
60-6	2 or 3 Lane Undivided Highway	7	345 - 352	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
60-7	2 or 3 Lane Undivided Highway	32	352 - 384	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	Low
60-8	4 or 5 Lane Undivided Highway	5	384 - 389	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None
60-9	2 or 3 Lane Undivided Highway	13	389 - 402	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	N/A	None

Safety Performance Area – Need Analysis Step 2

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Hot Spots	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address need or other relevant issues identified in previous reports)
260-1	4	305.67 - 310	None			None	Crashes primarily due to differences of speeds, or errors in passing or at intersections. **Programmed:** **Planned:**
260-2	13	310 - 323	High			High	Concentration of single-vehicle crashes incuding rollover accidents and some in which vehicle departed lanes or crossed over the center line. **Programmed:** **Planned:**
260-3	14	323 - 337	None		MP 335-338 Constructed Shoulder Widening;	None	Concentration of crashes incuding rollover accidents and some in which vehicle departed lanes or crossed over the center line. Low light conditions at MP 324 and MP 327 contributed to animal and pedestrian accidents **Programmed:** **Planned:**
260|60-4	8	337 - 345	None	MP 340-342	MP 341-342 Pavement widening, addition of turn lanes, updating of signals and lighting.	Low	Concentration of crashes due to congestion and in low light conditions. Likely will decrease with the improvements. **Programmed:** **Planned:**
260-5	16	341 - 357	None			None	Concentration of pedestrian and pedalcycle involved crashes, some due to low-light conditions. **Programmed:** **Planned:**
60-6	7	345 - 352	None			None	Crashes vary greatly in manner and conditions. **Programmed:** **Planned:**
60-7	32	352 - 384	Low			Low	Concentration of single vehicle crashes, so with low light conditions contributing and some under the influence of drugs/alcohol. **Programmed:** **Planned:**

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Hot Spots	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address need or other relevant issues identified in previous reports)
60-8	5	384 - 389	None			None	No evident trends **Programmed:** **Planned:**
60-9	13	389 - 402	None			None	No crashes. **Programmed:** **Planned:**

Safety Performance Area – Need Analysis Step 3

Segment Number	260-1	260-2	260-3	260/60-4	260-5	60-6	60-7	60-8	60-9
Segment Length (miles)	4	13	14	8	16	7	32	5	13
Segment Milepost (MP)	305 - 310	310 - 323	323 - 337	337 - 345	341 - 357	345 - 352	352 - 384	384 - 389	389 - 402
Final Need	None	High	None	Low	None	None	Low	None	None
Segment Crash Overview	0 Crashes were fatal	3 Crashes were fatal	1 Crashes were fatal	1 Crashes were fatal	1 Crashes were fatal	0 Crashes were fatal	2 Crashes were fatal	0 Crashes were fatal	0 Crashes were fatal
	4 Crashes had suspected serious injuries	4 Crashes had suspected serious injuries	6 Crashes had suspected serious injuries	7 Crashes had suspected serious injuries	7 Crashes had suspected serious injuries	1 Crashes had suspected serious injuries	11 Crashes had suspected serious injuries	0 Crashes had suspected serious injuries	0 Crashes had suspected serious injuries
	2 Crashes at intersections	0 Crashes at intersections	1 Crashes at intersections	2 Crashes at intersections	3 Crashes at intersections	0 Crashes at intersections	3 Crashes at intersections	0 Crashes at intersections	0 Crashes at intersections
	1 Crashes involve lane departures	6 Crashes involve lane departures	4 Crashes involve lane departures	2 Crashes involve lane departures	4 Crashes involve lane departures	1 Crashes involve lane departures	9 Crashes involve lane departures	0 Crashes involve lane departures	0 Crashes involve lane departures
	0 Crashes involve pedestrians	0 Crashes involve pedestrians	1 Crashes involve pedestrians	0 Crashes involve pedestrians	0 Crashes involve pedestrians	0 Crashes involve pedestrians	0 Crashes involve pedestrians	0 Crashes involve pedestrians	0 Crashes involve pedestrians
	0 Crashes involve trucks	0 Crashes involve trucks	1 Crashes involve trucks	0 Crashes involve trucks	1 Crashes involve trucks	0 Crashes involve trucks	1 Crashes involve trucks	0 Crashes involve trucks	0 Crashes involve trucks
	0 Crashes involve bicycles	0 Crashes involve bicycles	0 Crashes involve bicycles	1 Crashes involve bicycles	0 Crashes involve bicycles	0 Crashes involve bicycles	0 Crashes involve bicycles	0 Crashes involve bicycles	0 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes)									
First Harmful Event Type	100% Involve Collision with Motor Vehicle	43% Involve Overturning 29% Involve Collision with Motor Vehicle 14% Involve Collision With Animal	43% Involve Collision with Motor Vehicle 29% Involve Overturning 14% Involve Collision With Animal	63% Involve Collision with Motor Vehicle 13% Involve Collision with Pedalcyclist 13% Involve Overturning	100% Involve Collision with Motor Vehicle	100% Involve Collision with Fixed Object	46% Involve Overturning 31% Involve Collision with Motor Vehicle 15% Involve Collision with Fixed Object	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Collision Type	25% Involve Head On 25% Involve Other 25% Involve Angle	71% Involve Single Vehicle 29% Involve Head On	33% Involve Other 33% Involve Head On 17% Involve Single Vehicle	25% Involve Rear End 25% Involve Left Turn 25% Involve Single Vehicle	50% Involve Rear End 50% Involve Left Turn	100% Involve Single Vehicle	69% Involve Single Vehicle 15% Involve Rear End 8% Involve Sideswipe (same)	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Violation or Behavior	25% Involve Passed in No Passing Zone 25% Involve Made Improper Turn 25% Involve Speed too Fast for Conditions	33% Involve Failure to Keep in Proper Lane 33% Involve Unknown 17% Involve Drove in Opposing Lane	33% Involve Speed too Fast for Conditions 17% Involve No Improper Action 17% Involve No Improper Action	25% Involve No Improper Action 25% Involve Speed too Fast for Conditions 13% Involve Unsafe Lane Change	50% Involve Made Improper Turn 50% Involve Speed too Fast for Conditions	100% Involve Speed too Fast for Conditions	46% Involve Speed too Fast for Conditions 31% Involve Failure to Keep in Proper Lane 8% Involve Followed Too Closely	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Lighting Conditions	100% Occur in Daylight Conditions	57% Occur in Daylight Conditions 29% Occur in Dark-Unlighted Conditions 14% Occur in Dusk Conditions	57% Occur in Daylight Conditions 29% Occur in Dark-Unlighted Conditions 14% Occur in Dusk Conditions	75% Occur in Daylight Conditions 13% Occur in Dark-Lighted Conditions 13% Occur in Dark-Unlighted Conditions	100% Occur in Daylight Conditions	100% Occur in Daylight Conditions	92% Occur in Daylight Conditions 8% Occur in Dusk Conditions	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Surface Conditions	67% Involve Dry Conditions 33% Involve Wet Conditions	71% Involve Dry Conditions 29% Involve Wet Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	83% Involve Dry Conditions 8% Involve Slush Conditions 8% Involve Ice/Frost Conditions	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
First Unit Event	100% Involve a first unit event of Motor Vehicle in Transport	43% Involve a first unit event of Ran Off the Road (Right) 29% Involve a first unit event of Motor Vehicle in Transport 14% Involve a first unit event of Overturn	71% Involve a first unit event of Motor Vehicle in Transport 14% Involve a first unit event of Ran Off the Road (Right) 14% Involve a first unit event of Collision with Animal	63% Involve a first unit event of Motor Vehicle in Transport 13% Involve a first unit event of Ran Off the Road (Right) 13% Involve a first unit event of Overturn	100% Involve a first unit event of Motor Vehicle in Transport	100% Involve a first unit event of Ran Off the Road (Right)	31% Involve a first unit event of Motor Vehicle in Transport 23% Involve a first unit event of Overturn 15% Involve a first unit event of Ran Off the Road (Left)	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Driver Physical Condition	100% No Apparent Influence	43% Unknown 29% Under the Influence of Drug 14% Fatigued/Fell Asleep	57% No Apparent Influence 29% Unknown 14% Fatigued/Fell Asleep	75% No Apparent Influence 13% Illness 13% Under the Influence of Drugs or Alcohol	50% Under the Influence of Dr 50% No Apparent Influence	100% No Apparent Influence	77% No Apparent Influence 15% Fatigued/Fell Asleep 8% Unknown	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!
Safety Device Usage	75% Shoulder And Lap Belt Used 25% Unknown	43% None Used 29% Shoulder And Lap Belt Used 14% Not Applicable	86% Shoulder And Lap Belt Used 14% Not Applicable	88% Shoulder And Lap Belt Used 13% Helmet Used	100% Shoulder And Lap Belt Used	100% Unknown	69% Shoulder And Lap Belt Used 15% None Used 8% Unknown	#### #DIV/0! #### #DIV/0! #### #DIV/0!	#### #DIV/0! #### #DIV/0! #### #DIV/0!

Freight Performance Area – Need Analysis Step 1

Segment	Facility Operations	Segment Mileposts (MP)	Segment Length (miles)	Freight Index			Directional TTTR (trucks only)				
				Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need	
							EB	WB		EB	WB
260-1	Uninterrupted	306-310	4	1.25	Fair or Better	Low	1.25	1.24	Fair or Better	Low	Low
260-2	Uninterrupted	310-323	13	1.18	Fair or Better	None	1.19	1.17	Fair or Better	None	None
260-3	Uninterrupted	323-337	14	1.21	Fair or Better	None	1.22	1.20	Fair or Better	Low	None
260|60-4	Interrupted	337-345	8	1.77	Fair or Better	Medium	1.72	1.83	Fair or Better	Medium	Medium
260-5	Interrupted	341-357	16	2.05	Fair or Better	High	2.12	1.97	Fair or Better	High	Medium
60-6	Uninterrupted	345-352	7	1.79	Fair or Better	High	1.68	1.91	Fair or Better	High	High
60-7	Uninterrupted	352-384	32	1.28	Fair or Better	Low	1.30	1.25	Fair or Better	Medium	Low
60-8	Interrupted	384-389	5	1.58	Fair or Better	None	1.65	1.51	Fair or Better	Low	None
60-9	Uninterrupted	389-402	13	1.42	Fair or Better	High	1.47	1.37	Fair or Better	High	Medium
Emphasis Area?	Yes	**Weighted Average**		1.46	Good	Medium					

Segment	Facility Operations	Segment Mileposts (MP)	Segment Length (miles)	Closure Duration (minutes/mile/year)					Bridge Clearance (feet)			Initial Need
				Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
				EB	WB		EB	WB				
260-1	Uninterrupted	306-310	4	73.60	48.24	Fair or Better	Low	None	No UP	Fair or Better	None	Low
260-2	Uninterrupted	310-323	13	54.58	55.17	Fair or Better	None	None	No UP	Fair or Better	None	None
260-3	Uninterrupted	323-337	14	25.33	15.01	Fair or Better	None	None	No UP	Fair or Better	None	Low
260|60-4	Interrupted	337-345	8	144.18	138.10	Fair or Better	Medium	Medium	No UP	Fair or Better	None	High
260-5	Interrupted	341-357	16	242.09	248.78	Fair or Better	High	High	No UP	Fair or Better	None	High
60-6	Uninterrupted	345-352	7	263.26	250.69	Fair or Better	High	High	No UP	Fair or Better	None	High
60-7	Uninterrupted	352-384	32	267.81	223.06	Fair or Better	High	High	No UP	Fair or Better	None	Medium
60-8	Interrupted	384-389	5	8.12	4.60	Fair or Better	None	None	No UP	Fair or Better	None	Low
60-9	Uninterrupted	389-402	13	1.65	0.00	Fair or Better	None	None	No UP	Fair or Better	None	High

Freight Performance Area – Need Analysis Step 2

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Vertical Clearance Hot Spots (Vertical Clearance < 16.25' and No Ramps)	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address needs or other relevant issues identified in previous reports)
260-1	4	306-310	Low	None	Rim Road- Gibson Rd: Shoulder widening [MP 305]	Low	**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-2	13	310-323	None	None	None	None	**Programmed**: None **Planned**: Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-3	14	323-337	Low	None	None	Low	**Programmed**: None **Planned**: Intersection Signal: SR 260 and future relocation of Lone Pine Dam Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 335) Widen Roadway to Four-Lanes (Overgaard to Show Low) [MP 306-340] Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340] EB DMS
260|60-4	8	337-345	High	None	FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and gaurdrail replacement (MP 334.46-337.48).	High	**Programmed**: None **Planned**: Roadway Widening to 4-lane Divided Highway from Heber-Overgaard to Show Low (Payson-Show Low Highway, SR 260, Overgaard to US 60 MP 309.4-340.1, DCR, 2014) Grade Separated TI: US 60 and SR 77 Intersection Signals: US 60 and Future Woolford Extension; US 60 and Ski Hi Road Future Extension (Southern Navajo/Apache County Sub Regional Transportation Plan) Exclusive WB turn lane toward 27th Place (MP 342.5) and exclusive EB right turn lane at 40th Street intersection (Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona, MP 343.3) Widen Roadway to Six-Lanes (Show Low to Pinetop-Lakeside) [MP 306-340]
260-5	16	341-357	High	None	FY17 H5107: Roadway Widening, US 60 Eastbound starting at SR 77 Intersection (MP 342-343.5) FY16 H8256: Cheney Ranch Loop - Bison Ridge Trail Shoulder Widening and guardrail replacement (MP 334.46-337.48).	High	**Programmed**: None **Planned**: Widen Roadway: six-lanes SR 260 to SR 77, four-lanes SR 77 to Springerville [MP340-398] Widen Roadway: Showlow to 40th St Grade Separated TI: US 60 and SR 77 [MP 342.2] Exclusive WB turn lane toward 27th place [MP342.5] Exclusive EB turn lane at 40th St Intersection [343.3] Intersection signal: US 60 and Future Woolford Extension [MP 343.3] Intersection signal: US 60 and Ski Hi Rd Future Extension [MP 345] EB/WB Passing Lanes-Tier 1 [MP 345-348] WB DMS [MP 345] EB/WB Shoulder Improvement-Tier 1 [MP346-353] Intersection signal: US60 and Bourbon Ranch Rd [MP 347] Turn and merge lanes [MP 352.5-353.15]

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Vertical Clearance Hot Spots (Vertical Clearance < 16.25' and No Ramps)	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Need	Comments (may include tentatively programmed projects with potential to address needs or other relevant issues identified in previous reports)
60-6	7	345-352	High	None	None	High	**Programmed**: None **Planned**: EB/WB Passing Lanes-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 345-348) Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 345) EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 346-352) Intersection Signal: US 60 and Bourdon Ranch Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 347)
60-7	32	352-384	Medium	None	None	Medium	**Programmed**: None **Planned**: EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 352-353, MP 358-369) EB Passing Lane-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 357-360) Stop Controlled Intersection: US 60/Future Vernon-McNary Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 360.6) Turn and merge lanes [MP 352.5-353.15]
60-8	5	384-389	Low	None	None	Low	**Programmed**: None **Planned**: Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 385)
60-9	13	389-402	High	None	None	High	Programmed: None Planned: None

Freight Performance Area – Need Analysis Step 3

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Roadway Variables								Traffic Variables			Relevant Freight Related Existing Infrastructure
				Functional Classification	Environmental Type (Urban/Rural)	Terrain	# of Lanes/ Direction	Weighted Average Speed Limit	Aux Lanes	Divided/ Non-Divided	% No Passing	Existing LOS	Future 2040 LOS	% Trucks	
260-1	306-310	4	Low	State Highway	Rural	Rolling	4	45	No	Divided	0%	A/B	A/B	14	
260-2	310-323	13	None	State Highway	Rural	Level	2	65	No	Non-Divided	30%	A/B	A/B	15	
260-3	323-337	14	Low	State Highway	Rural	Level	2	58	No	Non-Divided	30%	A/B	A/B	13	Existing DMS EB MP 335.17; Weigh-In-Motion 334.33
260 | 60-4	337-345	8	High	State Highway	Rural	Rolling	4	38	No	Non-Divided	0%	A/B	C	10	Existing DMS EB MP 339.9; DMS WB MP 339.9
260-5	341-357	16	High	State Highway	Rural	Rolling	4	41	No	Non-Divided	0%	C	C	9	
60-6	345-352	7	High	State Highway	Rural	Level	2	65	No	Non-Divided	50%	A/B	A/B	12	
60-7	352-384	32	Medium	State Highway	Rural	Level	2	64	No	Non-Divided	30%	A/B	A/B	14	
60-8	384-389	5	Low	State Highway	Rural	Rolling	2	39	No	Non-Divided	30%	A/B	A/B	11	
60-9	389-402	13	High	State Highway	Rural	Level	2	65	No	Non-Divided	40%	A/B	A/B	11	

Freight Performance Area – Need Analysis Step 3 (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
260-1	306-310	4	Low	6	0	0%	0	0%	0	0%		**Programmed**: None **Planned**: None	High percentage of closures due to incidents/crashes.
260-2	310-323	13	None	12	2	17%	2	17%	0	0%		**Programmed**: None **Planned**: None	High percentage of closures due to incidents/crashes.
260-3	323-337	14	Low	16	3	19%	0	0%	0	0%		**Programmed**: None **Planned**: Intersection Signal: SR 260 and future relocation of Lone Pine Dam Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 335)	High percentage of closures due to incidents/crashes.
260 | 60-4	337-345	8	High	6	0	0%	1	17%	2	33%		**Programmed**: None **Planned**: Roadway Widening to 4-lane Divided Highway from Heber-Overgaard to Show Low (Payson-Show Low Highway, SR 260, Overgaard to US 60 MP 309.4-340.1, DCR, 2014) Grade Separated TI: US 60 and SR 77 Intersection Signals: US 60 and Future Woolford Extension; US 60 and Ski Hi Road Future Extension (Southern Navajo/Apache County Sub Regional Transportation Plan) Exclusive WB turn lane toward 27th Place (MP 342.5) and exclusive EB right turn lane at 40th Street intersection (Roadway Capacity and Turn Lane Analysis: US 60 between SR 77 and Little Mormon Lake Road Show Low, Arizona, MP 343.3)	The duration of one closure exceeded 1000 minutes due to weather conditions.
260-5	341-357	16	High	10	1	10%	0	0%	2	20%		**Programmed**: None **Planned**: None	The duration of one closure exceeded 1000 minutes due to incidents/acccidents. High percentage of closures due to incidents/crashes.
60-6	345-352	7	High	5	0	0%	0	0%	2	40%		**Programmed**: None **Planned**: EB/WB Passing Lanes-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 345-348) Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 345) EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 346-352)	High percentage of closures due to incidents/crashes. The duration of one closure exceeded 1000 minutes due to incidents/acccidents.

Segment	Segment Mileposts (MP)	Segment Length (miles)	Final Need	Closure Extent							Non-Actionable Conditions	Programmed and Planned Projects or Issues from Previous Documents Relevant to Final Need	Contributing Factors
				Total Number of Closures	# Incidents/ Accidents	% Incidents/ Accidents	# Obstructions/ Hazards	% Obstructions/ Hazards	# Weather Related	% Weather Related			
												Intersection Signal: US 60 and Bourdon Ranch Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 347)	
60-7	352-384	32	Medium	15	0	0%	2	13%	6	40%		**Programmed**: None **Planned**: EB/WB Shoulder Improvement (Statewide Shoulders Study, MP 352-353, MP 358-369) EB Passing Lane-Tier 1 (ADOT Climbing and Passing Lane Prioritization Study, MP 357-260) Stop Controlled Intersection: US 60 and Future Vernon-McNary Road (Southern Navajo/Apache County Sub Regional Transportation Plan, MP 360.6)	High percentage of closures due to incidents/crashes, mostly traveling in the EB direction. The duration of three closures exceeded 1000 minutes due to incidents/crashes and weather conditions.
60-8	384-389	5	Low	2	0	0%	0	0%	0	0%		**Programmed**: None **Planned**: Proposed WB DMS (Arizona Statewide Dynamic Message Master Plan, MP 385)	Both closures due to incidents/crashes.
60-9	389-402	13	High	1	0	0%	1	100%	0	0%		**Programmed**: None **Planned**: None	Only closure is due to obstruciton hazards in the EB direction.

Needs Summary Table

Performance Area	260-1 MP 306-310	260-2 MP 310-323	260-3 MP 323-337	260|60-4 MP 337-345	260-5 MP 341-357	60-6 MP 345-352	60-7 MP 352-384	60-8 MP 384-389	60-9 MP 389-402
Pavement⁺	High	Medium	High	Low	Medium	Medium	High	Low	None*
Bridge	None*	None*	None*	None*	None*	None*	None*	None*	None*
Mobility	None*	Low	Low	Low	Medium	Low	Low	None	None
Safety⁺	None*	High	None	Low	Low	None	Low	None	None*
Freight⁺	Low	None	Low	High	High	High	Medium	Low	High
Average Need	**0.92**	**1.31**	**1.08**	**1.31**	**1.69**	**1.31**	**1.54**	**0.46**	**0.69**

** Identified as Emphasis Areas for SR 260 US 60 Corridor*

^ 40B-17 Pavement Need estimated based on field review

 # N/A indicates insufficient or no data available to determine level of need

⁺ A segment need rating of 'None' does not indicate a lack of needed improvements; rather, it indicates that the segment performance score exceeds the established performance thresholds and strategic solutions for that segment will not be developed as part of this study

Level of Need	Average Need Range
None*	< 0.1
Low	0.1 - 1.0
Medium	1.0 - 2.0
High	> 2.0

Appendix E: Life-Cycle Cost Analysis

No LCCA conducted for any Pavement or Bridge candidate solutions on the SR 260 | US 60 corridor

Appendix F: Crash Modification Factors and Factored Unit Construction Costs

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
REHABILITATION											
Rehabilitate Pavement (AC)	$276,500	1.74	$481,110	Mile	2.20	$610,000	$1,060,000	Mill and replace 1"-3" AC pavement; accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, striping, delineators, RPMs, rumble strips	0.70	0.68	Updated to include 2 additional values (in addition to 3 previous values) from CMF Clearinghouse and revised combination of rehabilitate pavement (0.88), striping, delineators, RPMs (0.77 for combination), and rumble strips (0.89) = 0.68
Rehabilitate Bridge	$65	1.74	$113	SF	2.20	$140	$250	Based on deck area; bridge only - no other costs included	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
GEOMETRIC IMPROVEMENT											
Re-profile Roadway	$974,500	1.74	$1,695,630	Mile	2.20	$2,140,000	$3,730,000	Includes excavation of approximately 3", pavement replacement (AC), striping, delineators, RPMs, rumble strips, for one direction of travel on two-lane roadway (38' width)	0.70	0.70	Assumed - this is similar to rehab pavement. This solution is intended to address vertical clearance at bridge, not profile issue; factor the cost as a ratio of needed depth to 3".
Realign Roadway	$2,960,000	1.74	$5,150,400	Mile	2.20	$6,510,000	$11,330,000	All costs per direction except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.50	0.50	Based on Caltrans and NCDOT
Improve Skid Resistance	$675,000	1.74	$1,174,500	Mile	2.20	$1,490,000	$2,580,000	Average cost of pavement replacement and variable depth paving to increase super-elevation; for one direction of travel on two-lane roadway; includes pavement, striping, delineators, RPMs, rumble strips	0.66	0.65	Updated to include 6 additional values (in addition to 6 previous values) from CMF Clearinghouse (0.71) and calculated composite CMF value using that 0.71 value, the HSM value (0.87) for skid resistance; striping, delineators, RPMs (0.77 for combination), and rumble strips (0.89) = 0.65
INFRASTRUCTURE IMPROVEMENT											
Reconstruct to Urban Section	$1,000,000	1.74	$1,740,000	Mile	2.20	$2,200,000	$3,828,000	Includes widening by 16' total (AC = 12'+2'+2') to provide median, curb & gutter along both side of roadway, single curb for median, striping (doesn't include widening for additional travel lane).	0.88	0.88	From HSM

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Construct Auxiliary Lanes (AC)	$914,000	1.74	$1,590,360	Mile	2.20	$2,011,000	$3,499,000	For addition of aux lane (AC) in one direction of travel; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.78	0.78	Average of 4 values from clearinghouse
Construct Climbing Lane (High)	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In one direction; all costs except bridges; applicable to areas with large fills and cuts, retaining walls, rock blasting, steep slopes on both sides of road	0.75	0.75	From HSM
Construct Climbing Lane (Medium)	$2,250,000	1.74	$3,915,000	Mile	2.20	$4,950,000	$8,613,000	In one direction; all costs except bridges; applicable to areas with medium or large fills and cuts, retaining walls, rock blasting, steep slopes on one side of road	0.75	0.75	From HSM
Construct Climbing Lane (Low)	$1,500,000	1.74	$2,610,000	Mile	2.20	$3,300,000	$5,742,000	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.75	0.75	From HSM
Construct Reversible Lane (Low)	$2,400,000	1.74	$4,176,000	Lane-Mile	2.20	$5,280,000	$9,190,000	All costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.73 for uphill and 0.88 for downhill	0.73 for uphill and 0.88 for downhill	Based on proposed conditions on I-17 with 2 reversible lanes and a concrete barrier
Construct Reversible Lane (High)	$4,800,000	1.74	$8,352,000	Lane-Mile	2.20	$10,560,000	$18,370,000	All costs except bridges; applicable to areas with large fills and cuts, retaining walls, rock blasting, mountainous terrain	0.73 for uphill and 0.88 for downhill	0.73 for uphill and 0.88 for downhill	Based on proposed conditions on I-17 with 2 reversible lanes and a concrete barrier
Construct Passing Lane	$1,500,000	1.74	$2,610,000	Mile	2.20	$3,300,000	$5,742,000	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls	0.63	0.63	Average of 3 values from clearinghouse
Construct Entry/Exit Ramp	$730,000	1.74	$1,270,200	Each	2.20	$1,610,000	$2,790,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, typical earthwork & drainage; does not include any major structures or improvements on crossroad	1.09	1.09	Average of 16 values on clearinghouse; for adding a ramp not reconstructing. CMF applied to crashes 0.25 miles upstream/downstream from the gore.
Relocate Entry/Exit Ramp	$765,000	1.74	$1,331,100	Each	2.20	$1,680,000	$2,930,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, typical earthwork, drainage and demolition of existing ramp; does not include any major structures or improvements on crossroad	1.00	1.00	Assumed to not add any crashes since the ramp is simply moving and not being added. CMF applied to crashes 0.25 miles upstream/downstream from the gore.

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Construct Turn Lanes	$42,500	1.74	$73,950	Each	2.20	$93,500	$163,000	Includes 14' roadway widening (AC) for one additional turn lane (250' long) on one leg of an intersection; includes AC pavement, curb & gutter, sidewalk, ramps, striping, and minor signal modifications	0.81	0.81	Average of 7 values from HSM; CMF applied to intersection-related crashes; this solution also applies when installing a deceleration lane
Modify Entry/Exit Ramp	$445,000	1.74	$774,300	Each	2.20	$979,000	$1,703,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, minor earthwork, & drainage; For converting existing ramp to parallel-type configuration	0.21	0.21	Average of 4 values from clearinghouse (for exit ramps) and equation from HSM (for entrance ramp). CMF applied to crashes within 1/8 mile upstream/downstream from the gore.
Widen & Modify Entry/Exit Ramp	$619,000	1.74	$1,077,060	Each	2.20	$1,361,800	$2,370,000	Cost per ramp; includes pavement, striping, signing, RPMs, lighting, minor earthwork, & drainage; For converting 1-lane ramp to 2-lane ramp and converting to parallel-type ramp	0.21	0.21	Will be same as "Modify Ramp"
Replace Pavement (AC) (with overexcavation)	$1,446,500	1.74	$2,516,910	Mile	2.20	$3,180,000	$5,540,000	Accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, overexcavation, striping, delineators, RPMs, rumble strips	0.70	0.70	Same as rehab
Replace Pavement (PCCP) (with overexcavation)	$1,736,500	1.74	$3,021,510	Mile	2.20	$3,820,000	$6,650,000	Accounts for 38' width; for one direction of travel on two-lane roadway; includes pavement, overexcavation, striping, delineators, RPMs, rumble strips	0.70	0.70	Same as rehab
Replace Bridge (Short)	$125	1.74	$218	SF	2.20	$280	$480	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing small washes	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Replace Bridge (Medium)	$160	1.74	$278	SF	2.20	$350	$610	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing over the mainline freeway, crossroads, or large washes	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Replace Bridge (Long)	$180	1.74	$313	SF	2.20	$400	$690	Based on deck area; bridge only - no other costs included; cost developed generally applies to bridges crossing large rivers or canyons	0.95	0.95	Assumed - should have a minor effect on crashes at the bridge
Widen Bridge	$175	1.74	$305	SF	2.20	$390	$670	Based on deck area; bridge only - no other costs included	0.90	0.90	Assumed - should have a minor effect on crashes at the bridge

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Install Pedestrian Bridge	$135	1.74	$235	SF	2.20	$300	$520	Includes cost to construct bridge based on linear feet of the bridge. This cost includes and assumes ramps and sidewalks leading to the structure.	0.1 (pedestrian only)	0.1 (pedestrian only)	Assumed direct access on both sides of structure
Implement Automated Bridge De-icing	$115	1.74	$200	SF	2.20	$250	$440	Includes cost to replace bridge deck and install system	0.72 (snow/ice)	0.72 (snow/ice)	Average of 3 values on clearinghouse for snow/ice
Install Wildlife Crossing Under Roadway	$650,000	1.74	$1,131,000	Each	2.20	$1,430,000	$2,488,000	Includes cost of structure for wildlife crossing under roadway and 1 mile of fencing in each direction that is centered on the wildlife crossing	0.25 (wildlife)	0.25 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Install Wildlife Crossing Over Roadway	$1,140,000	1.74	$1,983,600	Each	2.20	$2,508,000	$4,364,000	Includes cost of structure for wildlife crossing over roadway and 1 mile of fencing in each direction that is centered on the wildlife crossing	0.25 (wildlife)	0.25 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Construct Drainage Structure - Minor	$280,000	1.74	$487,200	Each	2.20	$616,000	$1,072,000	Includes 3-36" pipes and roadway reconstruction (approx. 1,000 ft) to install pipes	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Construct Drainage Structure - Intermediate	$540,000	1.74	$939,600	Each	2.20	$1,188,000	$2,067,000	Includes 5 barrel 8'x6' RCBC and roadway reconstruction (approx. 1,000 ft) to install RCBC	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Construct Drainage Structure - Major	$8,000	1.74	$13,920	LF	2.20	$17,600	$30,600	Includes bridge that is 40' wide and reconstruction of approx. 500' on each approach	0.70	0.70	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure
Install Acceleration Lane	$127,500	1.74	$221,850	Each	2.20	$280,500	$488,000	For addition of an acceleration lane (AC) on one leg of an intersection that is 1,000' long plus a taper; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.85	0.85	Average of 6 values from the FHWA Desktop Reference for Crash Reduction Factors
Install Curb and Gutter	$211,200	1.74	$367,488	Mile	2.20	$465,000	$808,000	In both directions; curb and gutter	0.89	0.89	From CMF Clearinghouse
Install Sidewalks, Curb, and Gutter	$475,200	1.74	$826,848	Mile	2.20	$1,045,000	$1,819,000	In both directions; 5' sidewalks, curb, and gutter	0.89 installing sidewalk 0.24 (pedestrian crashes only)	0.89 installing sidewalk 0.24 (pedestrian crashes only)	From CMF Clearinghouse Avg of 6 values from FHWA Desktop Reference

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Install Sidewalks	$264,000	1.74	$459,360	Mile	2.20	$581,000	$1,011,000	In both directions; 5' sidewalks	0.24 (pedestrian crashes only)	0.24 (pedestrian crashes only)	Avg of 6 values from FHWA Desktop Reference
OPERATIONAL IMPROVEMENT											
Implement Variable Speed Limits (Wireless, Overhead)	$718,900	1.25	$898,625	Mile	2.20	$1,580,000	$1,980,000	In one direction; includes 1 sign assembly per mile (foundation and structure), wireless communication, detectors	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Ground-mount)	$169,700	1.25	$212,125	Mile	2.20	$373,300	$467,000	In one direction; includes 2 signs per mile (foundations and posts), wireless communication, detectors	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Solar, Overhead)	$502,300	1.25	$627,875	Mile	2.20	$1,110,000	$1,380,000	In one direction; includes 1 sign assembly per mile (foundation and structure), wireless communication, detectors, solar power	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Variable Speed Limits (Wireless, Solar, Ground-mount)	$88,400	1.25	$110,500	Mile	2.20	$194,500	$243,000	In one direction; includes 2 signs per mile (foundations and posts), wireless communication, detectors, solar power	0.92	0.91 (all crashes) 0.69 (weather-related)	Originally only 1 value from CMF Clearinghouse. Updated to include 1 value for all crashes and 2 additional values for weather-related crashes
Implement Ramp Metering (Low)	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	For each entry ramp location; urban area with existing ITS backbone infrastructure; includes signals, poles, timer, pull boxes, etc.	0.64	0.64	From 1 value from clearinghouse; CMF applied to crashes 0.25 miles after gore
Implement Ramp Metering (High)	$150,000	1.25	$187,500	Mile	2.20	$330,000	$413,000	Area without existing ITS backbone infrastructure; in addition to ramp meters, also includes conduit, fiber optic lines, and power	0.64	0.64	From 1 value from clearinghouse
Implement Signal Coordination	$140,000	1.25	$175,000	Mile	2.20	$308,000	$385,000	Includes conduit, conductors, and controllers for 4 intersections that span a total of approximately 2 miles	0.90	0.90	Assumed

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Implement Left-Turn Phasing	$7,500	1.25	$9,375	Each	2.20	$16,500	$20,600	Includes four new signal heads (two in each direction) and associated conductors for one intersection	0.88 (protected) 0.98 (permitted /protected or protected/ permitted)	0.88 (protected) 0.98 (permitted/ protected or protected/ permitted)	From HSM; CMF = 0.94 for each protected approach and 0.99 for each permitted/protected or protected/permitted approach. CMFs of different approaches should be multiplied together. CMF applied to crashes within intersection
Install Adaptive Signal Control and Signal Coordination	$363,500	1.25	$454,375	mile	2.20	$800,000	$1,000,000	Controller upgrades, advanced detection, software configuration, cameras; includes conduit, conductors, and controllers for 4 intersections that span a total of approximately 2 miles for coordination	0.81 (adaptive control)0.90 (signal coordination)	0.78 (adaptive control)0.90 (signal coordination)	Updated to include 15 additional values (in addition to 2 previous values) for adaptive control from CMF Clearinghouse
ROADSIDE DESIGN											
Install Guardrail	$130,000	1.74	$226,200	Mile	2.20	$286,000	$498,000	One side of road	0.62 (ROR)	0.62 (ROR)	0.62 is average of 2 values from clearinghouse
Install Cable Barrier	$80,000	1.74	$139,200	Mile	2.20	$176,000	$306,000	In median	0.81	0.65	Updated to include 5 additional values (in addition to 5 previous values) from CMF Clearinghouse
Widen Shoulder (AC)	$256,000	1.74	$445,440	Mile	2.20	$563,000	$980,000	Assumes 10' of existing shoulder (combined left and right), includes widening shoulder by a total of 4'; new pavement for 4' width and mill and replace existing 10' width; includes pavement, minor earthwork, striping edge lines, RPMs, high-visibility delineators, safety edge, and rumble strips	0.68 (1-4') 0.64 (>= 4')	0.68 (1-4') 0.64 (>= 4')	0.86 is average of 5 values from clearing house for widening shoulder 1-4'. 0.76 is calculated from HSM for widening shoulder >= 4'. (Cost needs to be updated if dimension of existing and widened shoulder differ from Description.)
Rehabilitate Shoulder (AC)	$113,000	1.74	$196,620	Mile	2.20	$249,000	$433,000	One direction of travel (14' total shoulder width-4' left and 10' right); includes paving (mill and replace), striping, high-visibility delineators, RPMs, safety edge, and rumble strips for both shoulders	0.72	0.72	0.98 is average of 34 values on clearinghouse for shoulder rehab/replace; include striping, delineators, RPMs (0.77 combined CMF), and rumble strips (0.89). (Cost needs to be updated if dimension of existing shoulder differs from Description.)

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Replace Shoulder (AC)	$364,000	1.74	$633,360	Mile	2.20	$801,000	$1,393,000	One direction of travel (14' total shoulder width-4' left and 10' right); includes paving (full reconstruction), striping, high-visibility delineators, RPMs, safety edge, and rumble strips for both shoulders	0.72	0.72	0.98 is average of 34 values on clearinghouse for shoulder rehab/replace; include striping, delineators, RPMs (0.77 combined CMF), and rumble strips (0.89). (Cost needs to be updated if dimension of existing shoulder differs from Description.)
Install Rumble Strip	$5,500	1.74	$9,570	Mile	2.20	$12,000	$21,000	Both edges - one direction of travel; includes only rumble strip; no shoulder rehab or paving or striping	0.89	0.89	Average of 75 values on clearinghouse and consistent with HSM
Install Centerline Rumble Strip	$2,800	1.74	$4,872	Mile	2.20	$6,000	$11,000	Includes rumble strip only; no pavement rehab or striping	0.85	0.85	From HSM
Install Wildlife Fencing	$340,000	1.74	$591,600	Mile	2.20	$748,000	$1,302,000	Fencing only plus jump outs for 1 mile (both directions)	0.50 (wildlife)	0.50 (wildlife)	Assumed
Remove Tree/Vegetation	$200,000	1.74	$348,000	Mile	2.20	$440,000	$766,000	Intended for removing trees that shade the roadway to allow sunlight to help melt snow and ice (see Increase Clear Zone CMF for general tree/vegetation removal in clear zone)	0.72 (snow/ice)	0.72 (snow/ice)	Average of 3 values on clearinghouse for snow/ice
Increase Clear Zone	$59,000	1.74	$102,660	Mile	2.20	$130,000	$226,000	In one direction; includes widening the clear zone by 10' to a depth of 3'	0.71	0.71	Median of 14 values from FHWA Desktop Reference for Crash Reduction Values
Install Access Barrier Fence	$15	1.74	$26	LF	2.20	$33	$60	8' fencing along residential section of roadway	0.10 (pedestria n only)	0.10 (pedestrian only)	Equal to pedestrian overpass
Install Rock-Fall Mitigation - Wire Mesh	$1,320,000	1.74	$2,296,800	Mile	2.20	$2,904,000	$5,053,000	Includes wire mesh and rock stabilization (one direction)	0.75 (debris)	0.75 (debris)	Assumed
Install Rock-Fall Mitigation - Containment Fence & Barrier	$2,112,000	1.74	$3,674,880	Mile	2.20	$4,646,000	$8,085,000	Includes containment fencing, concrete barrier, and rock stabilization (one direction)	0.75 (debris)	0.75 (debris)	Assumed
Install Raised Concrete Barrier in Median	$650,000	1.74	$1,131,000	Mile	2.20	$1,430,000	$2,488,000	Includes concrete barrier with associated striping and reflective markings; excludes lighting in barrier (one direction)	0.90 (Cross-median and head on crashes eliminated completely)	0.90 (Cross-median and head on crashes eliminated completely)	All cross median and head-on fatal or incapacitating injury crashes are eliminated completely; all remaining crashes have 0.90 applied
Formalize Pullout (Small)	$7,500	1.74	$13,050	Each	2.20	$17,000	$29,000	Includes paving and signage (signs, posts, and foundations) - approximately 4,200 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign

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Formalize Pullout (Medium)	$27,500	1.74	$47,850	Each	2.20	$61,000	$105,000	Includes paving and signage (signs, posts, and foundations) - approximately 22,500 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
Formalize Pullout (Large)	$80,500	1.74	$140,070	Each	2.20	$177,100	$308,000	Includes paving and signage (signs, posts, and foundations) - approximately 70,000 sf	0.97	0.97	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
INTERSECTION IMPROVEMENTS											
Construct Traffic Signal	$150,000	1.74	$261,000	Each	2.20	$330,000	$574,000	4-legged intersection; includes poles, foundations, conduit, controller, heads, luminaires, mast arms, etc.	0.95	0.95	From HSM; CMF applied to crashes within intersection only
Improve Signal Visibility	$35,000	1.74	$60,900	Each	2.20	$77,000	$134,000	4-legged intersection; signal head size upgrade, installation of new back-plates, and installation of additional signal heads on new poles.	0.85	0.85	Average of 7 values from clearinghouse; CMF applied to crashes within intersection only
Install Raised Median	$360,000	1.74	$626,400	Mile	2.20	$792,000	$1,378,000	Includes removal of 14' wide pavement and construction of curb & gutter; does not include cost to widen roadway to accommodate the median; if the roadway needs to be widened, include cost from New General Purpose Lane	0.83	0.83	Average from HSM
Install Transverse Rumble Strip/Pavement Markings	$3,000	1.74	$5,220	Each	2.20	$7,000	$11,000	Includes pedestrian markings and rumble strips only across a 30' wide travelway; no pavement rehab or other striping	0.95	0.95	Average of 17 values from clearinghouse; CMF applied to crashes within 0.5 miles after the rumble strips and markings
Construct Single-Lane Roundabout	$1,500,000	1.74	$2,610,000	Each	2.20	$3,300,000	$5,742,000	Removal of signal at 4-legged intersection; realignment of each leg for approx. 800 feet including paving, curbs, sidewalk, striping, lighting, signing	0.22	0.22	From HSM; CMF applied to crashes within intersection only
Construct Double-Lane Roundabout	$1,800,000	1.74	$3,132,000	Each	2.20	$3,960,000	$6,890,000	Removal of signal at 4-legged intersection; realignment of each leg for approx. 800 feet including paving, curbs, sidewalk, striping, lighting, signing	0.40	0.40	From HSM; CMF applied to crashes within intersection only
Install Indirect Left Turn Intersection	$1,140,000	1.74	$1,983,600	each	2.20	$2,500,000	$4,364,000	Raised concrete median improvements; intersection improvements; turn lanes	0.80	0.76	Updated to include 2 additional values (in addition to 1 previous value) from CMF Clearinghouse

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Convert Standard Diamond Interchange to Diverging Diamond Interchange	$2,272,700	1.74	$3,954,498	each	2.20	$5,000,000	$8,700,000	Convert traditional diamond interchange into diverging diamond interchange; assumes re-use of existing bridges	0.67	0.56	Updated to include 2 additional values (in addition to 1 previous value) from CMF Clearinghouse
Left-in Only Center Raised Median Improvements	$84,100	1.74	$146,334	each	2.20	$185,000	$322,000	Left-in only center raised median improvements	0.87	0.87	CMF Clearinghouse
ROADWAY DELINEATION											
Install High-Visibility Edge Line Striping	$10,800	1.25	$13,500	Mile	2.20	$23,800	$29,700	2 edge lines and lane line - one direction of travel	0.77	0.77	Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install High-Visibility Delineators	$6,500	1.25	$8,125	Mile	2.20	$14,300	$17,900	Both edges - one direction of travel			Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install Raised Pavement Markers	$2,000	1.25	$2,500	Mile	2.20	$4,400	$5,500	Both edges - one direction of travel			Average of 3 values from clearinghouse. Assumes package of striping, delineators, and RPMs. (If implemented separately, CMF will be higher.)
Install In-Lane Route Markings	$6,000	1.25	$7,500	Each	2.20	$13,200	$16,500	Installation of a series of three in-lane route markings in one lane	0.95	0.95	Assumed; CMF applied to crashes within 1.0 mile before the gore
IMPROVED VISIBILITY											
Cut Side Slopes	$80	1.74	$139	LF	2.20	$200	$300	For small grading to correct sight distance issues; not major grading	0.85	0.85	Intent of this solution is to improve sight distance. Most CMF's are associated with vehicles traveling on slope. Recommended CMF is based on FDOT and NCDOT but is more conservative.
Install Lighting (connect to existing power)	$270,000	1.74	$469,800	Mile	2.20	$594,000	$1,034,000	One side of road only; offset lighting, not high-mast; does not include power supply; includes poles, luminaire, pull boxes, conduit, conductor	0.75 (night)	0.75 (night)	Average of 3 values on clearinghouse & consistent with HSM

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Install Lighting (solar powered LED)	$10,000	1.74	$17,400	Pole	2.20	$22,000	$38,300	Offset lighting, not high-mast; solar power LED; includes poles, luminaire, solar panel	0.75 (night)	0.75 (night)	Average of 3 values on clearinghouse & consistent with HSM
DRIVER INFORMATION/WARNING											
Install Dynamic Message Sign (DMS)	$250,000	1.25	$312,500	Each	2.20	$550,000	$688,000	Includes sign, overhead structure, and foundations; wireless communication; does not include power supply	1.00	1.00	Not expected to reduce crashes
Install Dynamic Weather Warning Beacons	$40,000	1.25	$50,000	Each	2.20	$88,000	$110,000	Assumes solar operation and wireless communication or connection to existing power and communication; ground mounted; includes posts, foundations, solar panel, and dynamic sign	0.80 (weather-related)	0.80 (weather-related)	Average of 3 values from FHWA Desktop Reference for Crash Reduction Factors; CMF applies to crashes within 0.25 miles after a sign
Install Dynamic Speed Feedback Signs	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	Assumes solar operation and no communication; ground mounted; includes regulatory sign, posts, foundations, solar panel, and dynamic sign	0.94	0.94	Average of 2 clearinghouse values; CMF applies to crashes within 0.50 miles after a sign
Install Chevrons	$18,400	1.25	$23,000	Mile	2.20	$40,500	$50,600	On one side of road - includes signs, posts, and foundations	0.79	0.79	Average of 11 clearinghouse values
Install Curve Warning Signs	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.83	0.83	Average of 4 clearinghouse values; CMF applies to crashes within 0.25 miles after a sign
Install Traffic Control Device Warning Signs (e.g., stop sign ahead, signal ahead, etc.)	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.85	0.85	FHWA Desktop Reference for Crash Reduction Factors; CMF applies to crashes within 0.25 miles after a sign
Install Other General Warning Signs (e.g., intersection ahead, wildlife in area, slow vehicles, etc.)	$2,500	1.25	$3,125	Each	2.20	$5,500	$6,900	Includes 2 signs, posts, and foundations	0.97	0.97	Assumed; CMF applies to crashes within 0.25 miles after a sign

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Install Wildlife Warning System	$162,000	1.25	$202,500	Each	2.20	$356,400	$446,000	Includes wildlife detection system at a designated wildlife crossing, flashing warning signs (assumes solar power), advance signing, CCTV (solar and wireless), game fencing for approximately 0.25 miles in each direction - centered on the wildlife crossing, and regular fencing for 1.0 mile in each direction - centered on the wildlife crossing.	0.50 (wildlife)	0.50 (wildlife)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions
Install Warning Sign with Beacons	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	In both directions; includes warning sign, post, and foundation, and flashing beacons (assumes solar power) at one location	0.75	0.75	FHWA Desktop Reference for Crash Reduction Factors for Installing Flashing Beacons as Advance Warning; CMF applies to crashes within 0.25 miles after a sign
Install Rectangular Rapid Flashing Beacons (RRFB)	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	In both directions; includes warning sign, post, and foundation, and flashing beacons (assumes solar power) at one location	n/a	0.53 (pedestrian)	CMF Clearinghouse Countermeasures Tech Sheet
Install Larger Stop Sign with Beacons	$10,000	1.25	$12,500	Each	2.20	$22,000	$27,500	In one direction; includes large stop sign, post, and foundation, and flashing beacons (assumes solar power) at one location	0.85/0.81	0.85/0.81	Use 0.85 for adding beacons to an existing sign; 0.81 for installing a larger sign with flashing beacons; CMF applies to intersection-related crashes
Install Advanced Warning Signal System	$108,000	1.25	$135,000	each	2.20	$238,000	$297,000	Overhead static sign with flashing beacons, detectors, and radar system. Signs for each mainline approach of the intersection (2)	0.61	0.61	FHWA Desktop Reference for CRF
DATA COLLECTION											
Install Roadside Weather Information System (RWIS)	$60,000	1.25	$75,000	Each	2.20	$132,000	$165,000	Assumes wireless communication and solar power, or connection to existing power and communications	1.00	1.00	Not expected to reduce crashes
Install Closed Circuit Television (CCTV) Camera	$25,000	1.25	$31,250	Each	2.20	$55,000	$68,800	Assumes connection to existing ITS backbone or wireless communication; does not include fiber-optic backbone infrastructure; includes pole, camera, etc.	1.00	1.00	Not expected to reduce crashes
Install Vehicle Detection Stations	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	Assumes wireless communication and solar power, or connection to existing power and communications	1.00	1.00	Not expected to reduce crashes

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Install Flood Sensors (Activation)	$15,000	1.25	$18,750	Each	2.20	$33,000	$41,300	Sensors with activation cabinet to alert through texting (agency)	1.00	1.00	Not expected to reduce crashes
Install Flood Sensors (Gates)	$100,000	1.25	$125,000	Each	2.20	$220,000	$275,000	Sensors with activation cabinet to alert through texting (agency) and beacons (public) plus gates	1.00	1.00	Not expected to reduce crashes
WIDEN CORRIDOR											
Construct New General Purpose Lane (PCCP)	$1,740,000	1.74	$3,027,600	Mile	2.20	$3,830,000	$6,660,000	For addition of 1 GP lane (PCCP) in one direction; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.90	0.90	North Carolina DOT uses 0.90 and Florida DOT uses 0.87
Construct New General Purpose Lane (AC)	$1,200,000	1.74	$2,088,000	Mile	2.20	$2,640,000	$4,590,000	For addition of 1 GP lane (AC) in one direction; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.90	0.90	North Carolina DOT uses 0.90 and Florida DOT uses 0.88
Convert a 2-Lane undivided highway to a 5-Lane highway	$1,576,000	1.74	$2,742,240	Mile	2.20	$3,467,200	$6,030,000	For expanding a 2-lane undivided highway to a 5-lane highway (4 through lanes with TWLTL), includes standard shoulder widths but no curb, gutter, or sidewalks	0.60	0.60	Assumed to be slightly lower than converting from a 4-lane to a 5-lane highway
Install Center Turn Lane	$1,053,000	1.74	$1,832,220	Mile	2.20	$2,316,600	$4,030,000	For adding a center turn lane (i.e., TWLTL); assumes symmetrical widening on both sides of the road; includes standard shoulder widths but no curb, gutter, or sidewalk	0.75	0.75	From FHWA Desktop Reference for Crash Reduction Factors, CMF Clearinghouse, and SR 87 CPS comparison
Construct 4-Lane Divided Highway (Using Existing 2-Lane Road for one direction)	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In both directions; one direction uses existing 2-lane road; other direction assumes addition of 2 new lanes (AC) with standard shoulders; includes all costs except bridges	0.67	0.67	Assumed
Construct 4-Lane Divided Highway (No Use of Existing Roads)	$6,000,000	1.74	$10,440,000	Mile	2.20	$13,200,000	$22,968,000	In both directions; assumes addition of 2 new lanes (AC) with standard shoulders in each direction; includes all costs except bridges	0.67	0.67	Assumed

SOLUTION	2016 CONST UNIT COST	INFLATION FACTOR 2016-2022	2022 CONST UNIT COST	UNIT	FACTOR^	2016 FACTORED CONST UNIT COST	2022 FACTORED CONST UNIT COST	DESCRIPTION	2016 CMF FOR CORRIDOR PROFILE STUDIES	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
Construct Bridge over At-Grade Railroad Crossing	$10,000,000	1.74	$17,400,000	Each	2.20	$22,000,000	$38,280,000	Assumes bridge width of 4 lanes (AC) with standard shoulders; includes abutments and bridge approaches; assumes vertical clearance of 23'4" + 6'8" superstructure	0.72 (All train-related crashes eliminated)	0.72 (All train-related crashes eliminated)	Removes all train-related crashes at at-grade crossing; all other crashes CMF = 0.72
Construct Underpass at At-Grade Railroad Crossing	$15,000,000	1.74	$26,100,000	Each	2.20	$33,000,000	$57,420,000	Assumes underpass width of 4 lanes (AC) with standard shoulders; includes railroad bridge with abutments and underpass approaches; assumes vertical clearance of 16'6" + 6'6" superstructure	0.72 (All train-related crashes eliminated)	0.72 (All train-related crashes eliminated)	Removes all train-related crashes at at-grade crossing; all other crashes CMF = 0.72
Construct High-Occupancy Vehicle (HOV) Lane	$900,000	1.74	$1,566,000	Mile	2.20	$1,980,000	$3,445,000	For addition of 1 HOV lane (AC) in one direction with associated signage and markings; includes all costs except bridges; for generally at-grade facility with minimal walls and no major drainage improvements	0.95	0.95	Similar to general purpose lane
ALTERNATE ROUTE											
Construct Frontage Roads	$2,400,000	1.74	$4,176,000	Mile	2.20	$5,280,000	$9,190,000	For 2-lane AC frontage road; includes all costs except bridges; for generally at-grade facility with minimal walls	0.90	0.90	Assumed - similar to new general purpose lane
Construct 2-Lane Undivided Highway	$3,000,000	1.74	$5,220,000	Mile	2.20	$6,600,000	$11,484,000	In both directions; assumes addition of 2 new lanes (AC) with standard shoulders in each direction; includes all costs except bridges	0.90	0.90	Assuming new alignment for a bypass

^ Factor accounts for traffic control, erosion control, construction surveying and quality control, mobilization, construction engineering, contingencies, indirect cost allocation, and miscellaneous work

Appendix G: Performance Area Risk Factors

Pavement Performance Area

- Elevation
- Mainline Daily Traffic Volume
- Mainline Daily Truck Volume

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000’
0-5	4000’- 9000’
5	> 9000’

Mainline Daily Traffic Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.000039)})$

Score	Condition
0	< 6,000
0-5	6,000 – 160,000
5	>160,000

Mainline Daily Truck Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.00025)})$

Score	Condition
0	<900
0-5	900-25,000
5	>25,000

Bridge Performance Area

- Mainline Daily Traffic Volume
- Elevation
- Carries Mainline Traffic
- Detour Length
- Scour Critical Rating
- Vertical Clearance

Mainline Daily Traffic Volume

Exponential equation; score = $5-(5*e^{(ADT*-0.000039)})$

Score	Condition
0	<6,000
0-5	6,000-160,000
5	>160,000

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000’
0-5	4000’- 9000’
5	> 9000’

Carries Mainline Traffic

Score	Condition
0	Does not carry mainline traffic
5	Carries mainline traffic

Detour Length

Divides detour length by 10 and multiplies by 2.5

Score	Condition
0	0 miles
0-5	0-20 miles
5	> 20 miles

Scour Critical Rating

Variance below 8

Score	Condition
0	Rating > 8
0-5	Rating 8 - 3
5	Rating < 3

Vertical Clearance

Variance below 16’ x 2.5; (16 –Clearance) x 2.5

Score	Condition
0	>16’
0-5	16’-14’
5	<14’

Mobility Performance Area

- Mainline VMT
- Detour Length
- Outside Shoulder Width

Mainline VMT

Exponential equation; score = 5-(5*e(ADT*-0.0000139))

Score	Condition
0	<16,000
0-5	16,000-400,000
5	>400,000

Detour Length

Score	Condition
0	Detour < 10 miles
5	Detour > 10 miles

Outside Shoulder Width

Variance below 10’, if only 1 lane in each direction

Score	Condition
0	10’ or above or >1 lane in each direction
0-5	10’-5’ and 1 lane in each direction
5	5’ or less and 1 lane in each direction

Safety Performance Area

- Mainline Daily Traffic Volume
- Interrupted Flow
- Elevation
- Outside Shoulder Width
- Vertical Grade

Mainline Daily Traffic Volume

Exponential equation; score = 5-(5*e$^{(ADT*-0.000039)}$)

Score	Condition
0	<6,000
0-5	6,000-160,000
5	>160,000

Interrupted Flow

Score	Condition
0	Not interrupted flow
5	Interrupted Flow

Elevation

Variance above 4000' divided by 1000; (Elev-4000)/1000

Score	Condition
0	< 4000’
0-5	4000’- 9000’
5	> 9000’

Outside Shoulder Width

Variance below 10'

Score	Condition
0	10’ or above
0-5	10’ - 5’
5	5’ or less

Grade

Variance above 3% x 1.5

Score	Condition
0	< 3%
0-5	3% - 6.33%
5	>6.33%

Freight Performance Area

- Mainline Daily Truck Volume
- Detour Length
- Truck Travel Time Reliability (TTTR)
- Outside Shoulder Width

Mainline Daily Truck Volume

Exponential equation; score = 5-(5*e$^{(ADT*-0.00025)}$)

Score	Condition
0	<900
0-5	900-25,000
5	>25,000

Detour Length

Score	Condition
0	Detour < 10 miles
5	Detour > 10 miles

Outside Shoulder Width

Variance below 10’, if only 1 lane in each direction

Score	Condition
0	10’ or above or >1 lane in each direction
0-5	10’-5’ and 1 lane in each direction
5	5’ or less and 1 lane in each direction

Solution Number	Mainline Traffic Vol (vpd) (2-way)	Solution Length (miles)	Bridge Detour Length (miles) (N19)	Elevation (ft)	Scour Critical Rating (0-9)	Carries Mainline Traffic (Y/N)	Bridge Vert. Clear (ft)	Mainline Truck Vol (vpd) (2-way)	Detour Length > 10 miles (Y/N)	Grade (%)	Interrupted Flow (Y/N)	Outside/ Right Shoulder Width (ft)	1-lane each direction
260.1	4,517	13		6,580				678	Y	3.66	N	5.0	N
60.2	11,311	2		6,400				1,131	N	3.45	N	2.7	N
260.3	18,763	14		7,200				1,689	N	4.41	N	2.8	N
60.4	6,146	7		6,650				738	Y	3.56	Y	5.0	Y
60.5	1,932	16		7,550				271	Y	1.3	Y	2.4	Y
60.6	950	1		7,100				105	Y	0.68	Y	7.3	Y

Solution Number	Bridge	Pavement	Mobility	Safety	Freight	Risk Score (0 to 10)				
						Bridge	Pavement	Mobility	Safety	Freight
260.1	N	N	Y	Y	Y	0.00	0.00	5.19	3.75	3.86
60.2	N	N	Y	Y	Y	0.00	0.00	0.90	5.94	0.82
260.3	N	Y	Y	Y	Y	0.00	5.00	3.25	7.16	1.15
60.4	N	N	Y	Y	Y	0.00	0.00	8.17	3.82	7.23
60.5	N	N	Y	Y	Y	0.00	0.00	7.83	3.56	6.89
60.6	N	N	Y	Y	Y	0.00	0.00	5.15	2.38	5.19

Appendix H: Candidate Solution Cost Estimates

Candidate Solution #	Location #	Candidate Solution Name	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost	Construction Cost	Total Cost	Notes
260.1	L3	Overgaard Safety Improvements	Install Centerline Rumble Strips	310	323	Mile	13	$11,000	$4,300	$14,300	$0	$143,000	$161,600	
			Widen shoulders both directions	310	323	Mile	13	$1,960,000	$764,400	$2,548,000	$0	$25,480,000	$28,792,400	Cost was Doubled to account for both directions of travel
			Improve skid resistance	312	316	Mile	8	$2,580,000	$619,200	$2,064,000	$0	$20,640,000	$23,323,200	
			Solution Total						**$1,387,900**	**$4,626,300**	**$0**	**$46,263,000**	**$52,277,200**	
60.2	L6	Show Low Safety Improvements	Limit driveway access to right-in and right-out only	341	343	Mile	2	$1,378,000	$82,700	$275,600	$0	$2,756,000	$3,114,300	Used install raised median
			Install High-Visibility Striping	341	343	Mile	2	$59,400	$3,600	$11,900	$0	$118,800	$134,300	Cost was Doubled to account for both directions of travel
			Install Lighting	342	343	Mile	2	$2,068,000	$124,100	$413,600	$0	$4,136,000	$4,673,700	Quantity was Doubled to account for both directions of travel
			Construct Right Turn Lane	342.15	342.2	Each	1	$163,000	$4,900	$16,300	$0	$163,000	$184,200	
			Solution Total						**$215,300**	**$717,400**	**$0**	**$7,173,800**	**$8,106,500**	
CS260.3	L9/L10	Pinetop Area Mobility and Freight Improvements	Construct New Lane in Each Direction Through Urbanized Area (AC)	341	355.05	Mile	28.1	$9,180,000	$7,738,700	$25,795,800	$5,702,400	$257,958,000	$297,194,900	
			Solution Total						**$7,738,700**	**$25,795,800**	**$5,702,400**	**$257,958,000**	**$297,194,900**	
CS60.4	L12	Show Low Area Freight Improvements	Widen Shoulder (AC) EB and WB	345	352	Mile	7	$1,960,000	$411,600	$1,372,000	$0	$13,720,000	$15,503,600	
			Construct Climbing Lane EB	349	350	Mile	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
			Construct Climbing Lane WB	350	351	Mile	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
			Solution Total						**$756,200**	**$2,520,400**	**$0**	**$25,204,000**	**$28,480,600**	

Candidate Solution #	Location #	Candidate Solution Name	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost	Construction Cost	Total Cost	Notes
CS60.5	L14	Vernon Area Freight Improvements	Construct Climbing Lane EB	367	368	mi	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
			Construct Climbing Lane WB	380	381	mi	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
			Construct Climbing Lane EB	382	383	mi	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
								Solution Total	**$516,900**	**$1,722,600**	**$0**	**$17,226,000**	**$19,465,500**	
CS60.6	L16	Springerville Area Freight Improvements	Construct Climbing Lane EB	396	397	mi	1	$5,742,000	$172,300	$574,200	$0	$5,742,000	$6,488,500	
								Solution Total	**$172,300**	**$574,200**	**$0**	**$5,742,000**	**$6,488,500**	

Appendix I: Performance Effectiveness Scores

Need Reduction

			Solution #	**260.1**	**60.2**	**260.3**	**60.4**	**60.5**	**60.6**
			Description	Overgaard Safety Improvements	Show Low Safety Improvements	Pinetop Area Mobility and Freight Improvements	Show Low Freight Improvements	Vernon Area Freight Improvements	Springerville Area Freight Improvements
	LEGEND:		Project Beg MP	310	341	341	345	367	396
		- user entered value	Project End MP	323	343	355	352	383	397
		- calculated value for reference only	Project Length (miles)	13	2	14	2	3	1
		- calculated value for entry/use in other spreadsheet	Segment Beg MP	310	337	341	345	352	389
		- for input into Performance Effectiveness Score spreadsheet	Segment End MP	323	345	357	352	384	402
		- assumed values (do not modify)	Segment Length (miles)	13	8	16	7	32	13
			Segment #	**2**	**4**	**5**	**6**	**7**	**9**
			Current # of Lanes (both directions)	2	4	4	2	2	2
			Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	one-way	one-way
			Additional Lanes (one-way)	0	0	1	0.29	0.034	1.00
			Pro-Rated # of Lanes	2.00	4.00	5.75	2.08	2.01	2.08
		Notes and Directions	**Description**						
SAFETY	DIRECTIONAL SAFETY	Input current value from performance system (direction 1)	Orig Segment Directional Safety Index (EB)	1.852	0.612	0.012	0.085	1.197	Insufficient Data
		Input current value from performance system (direction 1)	Orig Segment Directional Fatal Crashes (EB)	2	1	0	0	2	0
		Input current value from performance system (direction 1)	Orig Segment Directional Suspected Serious Crashes (EB)	0	2	1	1	6	0
		Input current value from performance system (direction 1)	Original Fatal Crashes in project limits (EB)	2	1	4	0	1	0
		Input current value from performance system (direction 1)	Original Suspected Serious Crashes in project limits (EB)	0	2	12	1	1	0
		Input CMF value (direction 1) - If no CMF enter 1.0	CMF 1 (EB)(lowest CMF)			0.9			0.75
		Input CMF value (direction 1) - If no CMF enter 1.0	CMF 2 (EB)	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	1	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	1
		Input CMF value (direction 1) - If no CMF enter 1.0	CMF 3 (EB)			1			1
		Input CMF value (direction 1) - If no CMF enter 1.0	CMF 4 (EB)			1			1
		Input CMF value (direction 1) - If no CMF enter 1.0	CMF 5 (EB)			1			1
		Calculated Value (direction 1)	Total CMF (EB)	1.000	1.000	0.900	1.000	1.000	0.750
		Calculated Value (direction 1)	Fatal Crash reduction (EB)	1.092	0.230	0.400	1.280	0.000	0.000
		Calculated Value (direction 1)	Suspected Serious Crash reduction (EB)	0.721	0.460	1.200	3.570	0.000	0.000
		Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Fatal Crashes (EB)	0.908	0.770	-0.400	-1.280	2.000	0.000
		Enter in Safety Index spreadsheet to calculate new Safety Index (direction 1)	Post-Project Segment Directional Suspected Serious Crashes (EB)	-0.721	1.540	-0.200	-2.570	6.000	0.000
		Input value from updated Safety Index spreadsheet (direction 1)	Post-Project Segment Directional Safety Index (EB)	0.840	0.470	0.000	0.000	1.197	Insufficient Data
		Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 1)	Post-Project Segment Directional Safety Index (EB)	0.840	0.470	0.000	0.000	1.197	Insufficient Data
		Input current value from performance system (direction 2)	Orig Segment Directional Safety Index (WB)	1.160	0.162	0.012	0.000	0.148	Insufficient Data
		Input current value from performance system (direction 2)	Orig Segment Directional Fatal Crashes (WB)	1	0	0	0	0	0
		Input current value from performance system (direction 2)	Orig Segment Directional Suspected Serious Crashes (WB)	4	5	1	0	5	0
		Input current value from performance system (direction 2)	Original Fatal Crashes in project limits (WB)	1	0	1	0	0	0
		Input current value from performance system (direction 2)	Original Suspected Serious Crashes in project limits (WB)	4	1	7	2	2	0
		Input CMF value (direction 2) - If no CMF enter 1.0	CMF 1 (WB)(lowest CMF)			0.9			
		Input CMF value (direction 2) - If no CMF enter 1.0	CMF 2 (WB)	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	1	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	
		Input CMF value (direction 2) - If no CMF enter 1.1	CMF 3 (WB)			1			
		Input CMF value (direction 2) - If no CMF enter 1.2	CMF 4 (WB)			1			
		Input CMF value (direction 2) - If no CMF enter 1.0	CMF 5 (WB)			1			
		Calculated Value (direction 2)	Total CMF (WB)	1.000	1.000	0.900	1.000	1.000	0.500
		Calculated Value (direction 2)	Fatal Crash reduction (WB)	0.350	0.250	0.100	0.000	0.000	0.000
		Calculated Value (direction 2)	Suspected Serious Crash reduction (WB)	1.834	0.000	0.700	1.060	0.000	0.000
		Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Fatal Crashes (WB)	0.650	-0.250	-0.100	0.000	0.000	0.000
		Enter in Safety Index spreadsheet to calculate new Safety Index (direction 2)	Post-Project Segment Directional Suspected Serious Crashes (WB)	2.166	5.000	0.300	-1.060	5.000	0.000
		Input value from updated Safety Index spreadsheet (direction 2)	Post-Project Segment Directional Safety Index (WB)	0.730	0.160	0.000	0.000	0.148	Insufficient Data
		Enter in Safety Needs spreadsheet to calculate new segment level Safety Need (direction 2)	Post-Project Segment Directional Safety Index (WB)	0.730	0.160	0.000	0.000	0.148	Insufficient Data
	SAFETY INDEX	Calculated Value - verify that it matches current performance system	Current Safety Index	1.506	0.387	0.012	0.043	0.673	#DIV/0!
		Enter in Safety Needs spreadsheet to calculate new segment level Safety Need	Post-Project Safety Index	0.785	0.315	0.000	0.000	0.673	#DIV/0!
	Needs	User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Safety Need	**5.157**	**0.249**	**0.008**	**0.026**	**0.729**	**0.000**
		User entered value from Safety Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Safety Need	**0.986**	**0.203**	**0.000**	**0.000**	**0.729**	**0.000**

LEGEND:

- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Scores spreadsheet
- assumed values (do not modify)

		Notes and Directions	Description						
			Solution #	260.1	60.2	260.3	60.4	60.5	60.6
			Description	Overgaard Safety Improvements	Show Low Safety Improvements	Pinetop Area Mobility and Freight Improvements	Show Low Freight Improvements	Vernon Area Freight Improvements	Springerville Area Freight Improvements
			Project Beg MP	310	341	341	345	367	396
			Project End MP	323	343	355	352	383	397
			Project Length (miles)	13	2	14	2	3	1
			Segment Beg MP	310	337	341	345	352	389
			Segment End MP	323	345	357	352	384	402
			Segment Length (miles)	13	8	16	7	32	13
			Segment #	2	4	5	6	7	9
			Current # of Lanes (both directions)	2	4	4	2	2	2
			Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	one-way	one-way
			Additional Lanes (one-way)	0	0	1	0.29	0.094	1
			Pro-Rated # of Lanes	2.00	4.00	5.75	2.08	2.01	2.08
MOBILITY	MOBILITY INDEX	Input current value from performance system	Original Segment Mobility Index	0.390	0.390	0.660	0.510	0.240	0.060
		Enter in Mobility Index Spreadsheet to determine new segment level Mobility Index	Part-Project # of Lanes (both directions)	2.00	4.00	5.75	2.08	2.01	2.08
		Input value from updated Mobility Index spreadsheet	Part-Project Segment Mobility Index	0.39	0.39	0.46	0.45	0.23	0.06
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Part-Project Segment Mobility Index	0.390	0.390	0.460	0.450	0.230	0.060
	FUT V/C	Input current value from performance system	Original Segment Future V/C	0.380	0.440	0.740	0.590	0.270	0.060
		Input value from updated Mobility Index spreadsheet	Part-Project Segment Future V/C	0.380	0.440	0.520	0.520	0.250	0.060
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Part-Project Segment Future V/C	0.380	0.440	0.520	0.520	0.250	0.060
	PEAK HOUR V/C	Input current value from performance system (direction 1)	Original Segment Peak Hour V/C (NB)	0.420	0.320	0.490	0.410	0.180	0.050
		Input current value from performance system (direction 2)	Original Segment Peak Hour V/C (SB)	0.420	0.320	0.490	0.410	0.180	0.050
		***If One-Way project**, enter in Mobility Index Spreadsheet to determine new segment level Peak Hour V/C. **If Two-Way project**, disregard	Adjusted total # of Lanes for use in directional peak hr	N/A	N/A	N/A	2.17	2.02	2.15
		Input value from updated Mobility Index spreadsheet (direction 1)	Part-Project Segment Peak Hr V/C (NB)	0.42	0.32	0.34	0.41	0.18	0.05
		Input value from updated Mobility Index spreadsheet (direction 2)	Part-Project Segment Peak Hr V/C (SB)	0.42	0.32	0.34	0.41	0.18	0.05
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Part-Project Segment Peak Hr V/C (NB)	0.420	0.320	0.340	0.410	0.180	0.050
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need	Part-Project Segment Peak Hr V/C (SB)	0.420	0.320	0.340	0.410	0.180	0.050
	LOTTR	Calculated Value (both directions)	Safety Reduction Factor	0.521	0.814	0.000	0.000	1.000	1.000
		Calculated Value (both directions)	Safety Reduction	0.479	0.186	1.000	1.000	0.000	0.000
		Calculated Value (both directions)	Mobility Reduction Factor	1.000	1.000	0.697	0.882	0.958	1.000
		Calculated Value (both directions)	Mobility Reduction	0.000	0.000	0.303	0.118	0.042	0.000
		Assumed effect on LOTTR (% of mobility reduction)	Mobility effect on LOTTR	0.20	0.20	0.20	0.20	0.20	0.20
		Assumed effect on LOTTR (% of safety reduction)	Safety effect on LOTTR	0.30	0.30	0.30	0.30	0.30	0.30
		Input current value from performance system (direction 1)	Original Directional Segment LOTTR (NB)	1.080	1.170	1.170	1.150	1.090	1.160
		Input current value from performance system (direction 2)	Original Directional Segment LOTTR (SB)	1.120	1.190	1.200	1.180	1.070	1.150
		Calculated Value (both directions)	Reduction Factor for Segment LOTTR	0.144	0.056	0.361	0.324	0.008	0.000
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Part-Project Directional Segment LOTTR (NB)	1.040	1.105	1.085	1.075	1.081	1.160
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Part-Project Directional Segment LOTTR (SB)	1.060	1.123	1.100	1.180	1.070	1.150
	CLOSURE EXTENT	Input current value from performance system (direction 1)	Orig Segment Directional Closure Extent (NB)	0.140	0.200	0.240	0.310	0.460	0.020
		Input current value from performance system (direction 2)	Orig Segment Directional Closure Extent (SB)	0.150	0.150	0.280	0.230	0.240	0.000
		Input value from HCRS	Segment Closures with fatalities/injuries	7	2	5	1	5	0
		Input value from HCRS	Total Segment Closures	12	6	10	5	15	1
		Calculated Value (both directions)	% Closures with Fatality/Injury	0.58	0.33	0.50	0.20	0.33	0.00
		Calculated Value (both directions)	Closure Reduction	0.279	0.062	0.500	0.200	0.000	0.000
		Calculated Value (both directions)	Closure Reduction Factor	0.721	0.938	0.500	0.800	1.000	1.000
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 1)	Part-Project Segment Directional Closure Extent (NB)	0.101	0.188	0.120	0.248	0.460	0.020
		Enter in Mobility Needs spreadsheet to update segment level Mobility Need (direction 2)	Part-Project Segment Directional Closure Extent (SB)	0.108	0.141	0.140	0.230	0.240	0.000
	BICYCLE ACCOM	Input current value from performance system	Orig Segment Bicycle Accomodation %	0.0%	54.0%	50.0%	0.0%	5.0%	100.0%
		Input current value from performance system	Orig Segment Outside Shoulder width	5.0	2.8	2.8	5.0	2.4	7.3
		Input value from updated Mobility Index spreadsheet	Part-Project Segment Outside Shoulder width	10	2.8	10	10	2.4	7.3
		Input value from updated Mobility Index spreadsheet	Part-Project Segment Bicycle Accomodation (%)	50.0%	54.0%	100.0%	100.0%	100.0%	100.0%
		Enter in Mobility Needs spreadsheet to calculate new segment level Mobility Need	Part-Project Segment Bicycle Accomodation (%)	50.0%	54.0%	100.0%	100.0%	100.0%	100.0%
	Needs	User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Mobility Need	**1.265**	**1.032**	**2.113**	**1.435**	**1.196**	**0.159**
		User entered value from Mobility Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Part-Project Segment Mobility Need	**1.051**	**1.024**	**0.627**	**0.664**	**0.504**	**0.159**

LEGEND:
- user entered value
- calculated value for reference only
- calculated value for entry/use in other spreadsheet
- for input into Performance Effectiveness Score spreadsheet
- assumed values (do not modify)

		Notes and Directions	Description	260.1	60.2	260.3	60.4	60.5	60.6
			Solution #	260.1	60.2	260.3	60.4	60.5	60.6
			Description	Overgaard Safety Improvements	Show Low Safety Improvements	Pinetop Area Mobility and Freight Improvements	Show Low Freight Improvements	Vernon Area Freight Improvements	Springerville Area Freight Improvements
			Project Beg MP	310	341	341	345	367	396
			Project End MP	323	343	355	352	383	397
			Project Length (miles)	13	2	14	2	3	1
			Segment Beg MP	310	337	341	345	352	389
			Segment End MP	323	345	357	352	384	402
			Segment Length (miles)	13	8	16	7	32	13
			Segment #	2	4	5	6	7	9
			Current # of Lanes (both directions)	2	4	4	2	2	2
			Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	one-way	one-way
			Additional Lanes (one-way)	0	0	1	0.29	0.094	1
			Pro-Rated # of Lanes	2.00	4.00	5.75	2.08	2.01	2.08
Freight	TTTR	Assumed effect on TTTR (% of mobility reduction)	Mobility effect on TTTR	0.10	0.10	0.10	0.10	0.10	0.10
Freight	TTTR	Assumed effect on TTTR (% of safety reduction)	Safety effect on TTTR	0.15	0.15	0.15	0.15	0.15	0.15
Freight	TTTR	Input current value from performance system (direction 1)	Original Directional Segment TTTR (NB)	1.190	1.720	2.120	1.680	1.300	1.470
Freight	TTTR	Input current value from performance system (direction 2)	Original Directional Segment TTTR (SB)	1.170	1.830	1.970	1.910	1.250	1.370
Freight	TTTR	Calculated Value (both directions)	Reduction Factor for Segment TTTR (both directions)	0.072	0.028	0.180	0.162	0.004	0.000
Freight	TTTR	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Directional Segment TTTR (NB)	1.105	1.672	1.738	1.408	1.295	1.470
Freight	TTTR	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Directional Segment TTTR (SB)	1.086	1.779	1.615	1.910	1.250	1.370
Freight	FREIGHT INDEX	Value from above	Original Segment MAX TTTR (NB)	1.190	1.720	2.120	1.680	1.300	1.470
Freight	FREIGHT INDEX	Value from above	Original Segment MAX TTTR (SB)	1.170	1.830	1.970	1.910	1.250	1.370
Freight	FREIGHT INDEX	Calculated Value	Original Segment Freight Index	1.1800	1.7750	2.0450	1.7950	1.2750	1.4200
Freight	FREIGHT INDEX	Calculated Value	Post-Project Segment MAX TTTR (NB)	1.105	1.672	1.738	1.408	1.295	1.470
Freight	FREIGHT INDEX	Calculated Value	Post-Project Segment MAX TTTR (SB)	1.086	1.779	1.615	1.910	1.250	1.370
Freight	FREIGHT INDEX	Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Freight Index	1.095	1.725	1.676	1.659	1.272	1.420
Freight	CLOSURE DURATION	Input current value from performance system (direction 1)	Orig Segment Directional Closure Duration (dir 1)	54.580	144.180	242.090	263.260	267.810	1.650
Freight	CLOSURE DURATION	Input current value from performance system (direction 2)	Orig Segment Directional Closure Duration (dir 2)	55.170	138.100	248.780	250.690	223.060	0.000
Freight	CLOSURE DURATION	Calculated Value	Segment Closures with fatalities	7	2	5	1	5	0
Freight	CLOSURE DURATION	Calculated Value	Total Segment Closures	12	6	10	5	15	1
Freight	CLOSURE DURATION	Calculated Value	% Closures with Fatality	0.58	0.33	0.50	0.20	0.33	0.00
Freight	CLOSURE DURATION	Calculated Value	Closure Reduction	0.279	0.062	0.500	0.200	0.000	0.000
Freight	CLOSURE DURATION	Calculated Value	Closure Reduction Factor	0.721	0.938	0.500	0.800	1.000	1.000
Freight	CLOSURE DURATION	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 1)	Post-Project Segment Directional Closure Duration (NB)	39.337	135.239	121.045	210.608	267.810	1.650
Freight	CLOSURE DURATION	Enter in Freight Needs spreadsheet to update segment level Freight Need (direction 2)	Post-Project Segment Directional Closure Duration (SB)	39.763	129.536	124.390	250.690	223.060	0.000
Freight	VERT CLR	Input current value from performance system	Original Segment Vertical Clearance	No UP	No UP	No UP	No UP	No UP	No UP
Freight	VERT CLR	Input current value from performance system	Original vertical clearance for specific bridge	No UP	No UP	No UP	No UP	No UP	No UP
Freight	VERT CLR	Input post-project value (depends on solution)	Post-Project vertical clearance for specific bridge	No UP	No UP	No UP	No UP	No UP	No UP
Freight	VERT CLR	Input post-project value (depends on solution)(force segment clearance to equal this specific bridge)	Post-Project Segment Vertical Clearance	No UP	No UP	No UP	No UP	No UP	No UP
Freight	VERT CLR	Enter in Freight Needs spreadsheet to update segment level Freight Need	Post-Project Segment Vertical Clearance	No UP	No UP	No UP	No UP	No UP	No UP
Freight	**Needs**	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Freight Need	**1.034**	**3.136**	**4.385**	**4.891**	**3.253**	**3.601**
Freight	**Needs**	User entered value from Freight Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Freight Need	**0.689**	**2.905**	**2.504**	**4.683**	**3.143**	**3.601**

			Solution #	260.1	60.2	260.3	60.4	60.5	60.6
			Description	Overgaard Safety Improvements	Show Low Safety Improvements	Pinetop Area Mobility and Freight Improvements	Show Low Freight Improvements	Vernon Area Freight Improvements	Springerville Area Freight Improvements
	LEGEND:		Project Beg MP	310	341	341	345	367	396
		- user entered value	Project End MP	323	343	355	352	383	397
		- calculated value for reference only	Project Length (miles)	13	2	14	7	16	1
		- calculated value for entry/use in other spreadsheet	Segment Beg MP	310	337	341	345	352	389
		- for input into Performance Effectiveness Score spreadsheet	Segment End MP	323	345	357	352	384	402
		- assumed values (do not modify)	Segment Length (miles)	13	8	16	7	32	13
			Segment #	2	4	5	6	7	9
			Current # of Lanes (both directions)	2	4	4	2	2	2
			Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	one-way	one-way
			Additional Lanes (one-way)	0	0	1	0.29	0.094	1
			Pro-Rated # of Lanes	2.00	4.00	5.75	2.29	2.05	2.08
		Notes and Directions	**Description**						
BRIDGE	BRIDGE INDEX	Input current value from performance system	Original Segment Bridge Index						
		Input current value from performance system	Original lowest rating for specific bridge						
		Input post-project value (For repair +1, rehab +2, replace=8)	Post-Project lowest rating for specific bridge						
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project lowest rating for specific bridge	0	0	0	0	0	0
		Input updated segment value from updated Bridge Index spread	Post-Project Segment Bridge Index						
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Index	0.00	0.00	0.00	0.00	0.00	0.00
	SUFF RATING	Input current value from performance system	Original Segment Sufficiency Rating						
		Input current value from performance system	Original Sufficiency Rating for specific bridge						
		Input post-project value (For repair +10, rehab +20, replace=98)	Post-Project Sufficiency Rating for specific bridge						
		Enter in Bridge Index spreadsheet to calculate new Bridge Index	Post-Project Sufficiency Rating for specific bridge	0.00	0.00	0.00	0.00	0.00	0.00
		Input updated segment value from updated Bridge Index spread	Post-Project Segment Sufficiency Rating						
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Sufficiency Rating	0.00	0.00	0.00	0.00	0.00	0.00
	BR RTNG	Input current value from performance system	Original Segment Bridge Rating						
		Input updated segment value from updated Bridge Index spread	Post-Project Segment Bridge Rating						
		Enter in Bridge Needs spreadsheet to update segment level Bridge Need	Post-Project Segment Bridge Rating	0	0	0	0	0	0
	Needs	User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Bridge Need	1.2	0	0	2.4	0	0
		User entered value from Bridge Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Bridge Need						

			Solution #	260.1	60.2	260.3	60.4	60.5	60.6
			Description	Overgaard Safety Improvements	Show Low Safety Improvements	Pinetop Area Mobility and Freight Improvements	Show Low Freight Improvements	Vernon Area Freight Improvements	Springerville Area Freight Improvements
	LEGEND:		Project Beg MP	310	341	341	345	367	396
		- user entered value	Project End MP	323	343	355	352	383	397
		- calculated value for reference only	Project Length (miles)	13	2	14	7	16	1
		- calculated value for entry/use in other spreadsheet	Segment Beg MP	310	337	341	345	352	389
		- for input into Performance Effectiveness Score spreadsheet	Segment End MP	323	345	357	352	384	402
		- assumed values (do not modify)	Segment Length (miles)	13	8	16	7	32	13
			Segment #	2	4	5	6	7	9
			Current # of Lanes (both directions)	2	4	4	2	2	2
			Project Type (one-way or two-way)	two-way	two-way	two-way	one-way	one-way	one-way
			Additional Lanes (one-way)	0	0	1	0.29	0.094	1
			Pro-Rated # of Lanes	2.00	4.00	5.75	2.29	2.05	2.08
		Notes and Directions	**Description**						
PAVEMENT	PAVEMENT INDEX	Input current value from performance system	Original Segment Pavement Index						
		Input current value from performance system	Original Segment IRI in project limits						
		Input current value from performance system	Original Segment Cracking in project limits						
		Input current value from performance system	Original Segment Rutting in project limits						
		Input post-project value (For rehab, increase to 45; for replace increase to 30)	Post-Project IRI in project limits						
		Enter in Pavement Index spreadsheet to calculate new Pavement In	Post-Project IRI in project limits	0	0	0	0	0	0
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Cracking in project limits						
		Enter in Pavement Index spreadsheet to calculate new Pavement In	Post-Project Cracking in project limits	0	0	0	0	0	0
		Input post-project value (Lower to 0 for rehab or replace)	Post-Project Rutting in project limits						
		Enter in Pavement Index spreadsheet to calculate new Pavement In	Post-Project Rutting in project limits	0	0	0	0	0	0
		Input updated segment value from updated Pavement Index spreadsheet	Post-Project Segment Pavement Index						
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Pavement Index	0	0	0	0	0	0
	DIRECTION PSR	Input current value from performance system (direction 1)	Original Segment Directional PSR (NB)						
		Input current value from performance system (direction 2)	Original Segment Directional PSR (SB)						
		Value from above	Original Segment IRI in project limits	0	0	0	0	0	0
		Value from above	Post-Project directional IRI in project limits	0	0	0	0	0	0
		Input updated segment value from updated Pavement Index spreadsheet (direction 1)	Post-Project Segment Directional PSR (NB)						
		Input updated segment value from updated Pavement Index spreadsheet (direction 2)	Post-Project Segment Directional PSR (SB)						
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (NB)	0	0	0	0	0	0
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment Directional PSR (SB)	0	0	0	0	0	0
	% FAIL	Input current value from performance system	Original Segment % Failure						
		Input value from updated Pavement Index spreadsheet	Post-Project Segment % Failure						
		Enter in Pavement Needs spreadsheet to update segment level Pavement Need	Post-Project Segment % Failure	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Needs	User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Original Segment Pavement Need	2.54	1.746	3.154	2.731	4.563	0
		User entered value from Pavement Needs spreadsheet and for use in Performance Effectiveness spreadsheet	Post-Project Segment Pavement Need	2.54	1.746	3.154	2.731	4.563	0

CMF Application

SR 260|US 60 Corridor Profile Study
CMF Application

=user input

CS260.1 (MP 310-323)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	otal Crash Reductio Fatal	otal Crash Reductio Incap
310	323.00	0.68	0.85	1	1	NB/EB	0.629			2	1	1.258	0.629	0.742	0.371
310	323.00	0.68	0.85	1	1	SB/WB	0.629			0	4	0.000	2.516	0.000	1.484
312	316.00	0.65	1.00	1	1	NB/EB	0.650			1	1	0.650	0.650	0.350	0.350
312	316.00	0.65	1.00	1	1	SB/WB	0.650			1	1	0.650	0.650	0.350	0.350
						NB/EB		2	0	3	2	**0.908**	**-0.721**	1.092	0.721
						SB/WB		1	4	1	5	**0.650**	**2.166**	0.350	1.834

CS60.2 (MP 341-343)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	otal Crash Reductio Fatal	otal Crash Reductio Incap
341	343	0.77	1.00	1	1	NB/EB	0.770			1	2	0.770	1.540	0.230	0.460
341	343	0.77	1.00	1	1	SB/WB	0.770			0	0	0.000	0.000	0.000	0.000
342	343	0.75	1	1	1	NB/EB	0.750			0	0	0.000	0.000	0.000	0.000
342	343	0.75	1	1	1	SB/WB	0.750			1	0	0.750	0.000	0.250	0.000
342.2	342.2	0.81	1	1	1	NB/EB	0.810			0	0	0.000	0.000	0.000	0.000
342.2	342.2	0.81	1	1	1	SB/WB	0.810			0	0	0.000	0.000	0.000	0.000
						NB/EB		1	2	1	2	**0.770**	**1.540**	0.230	0.460
						SB/WB		0	5	1	0	**-0.250**	**5.000**	0.250	0.000

CS60.4 (MP 345-352)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	Total Crash Reduction Fatal	Total Crash Reduction Incap
345	352	0.68	1.00	1.00	1	NB/EB	0.68			4	10	2.720	6.800	1.280	3.200
345	352	0.68	1.00	1.00	1	SB/WB	0.68			0	1	0.000	0.680	0.000	0.320
349	350	0.63	1.00	1.00	1	NB/EB	0.63			0	1	0.000	0.630	0.000	0.370
350	351	0.63	1.00	1.00	1	SB/WB	0.63			0	2	0.000	1.260	0.000	0.740
		passing lane				NB/EB		0	1	4	11	**-1.280**	**-2.570**	1.280	3.570
						SB/WB		0	0	0	3	**0.000**	**-1.060**	0.000	1.060

CS60.5 (MP 367-383)

BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	Effective CMF	Crashes in Segment Limits Fatal	Crashes in Segment Limits Incap	Crashes in Solution Limits Fatal	Crashes in Solution Limits Incap	Post-Solution Crashes Fatal	Post-Solution Crashes Incap	otal Crash Reductio Fatal	otal Crash Reductio Incap
367	368	0.75	1.00	1	1	NB/EB	0.750			0	0	0.000	0.000	0.000	0.000
380	381	0.75	1.00	1	1	SB/WB	0.750			0	0	0.000	0.000	0.000	0.000
382	383	0.75	1.00	1	1	NB/EB	0.750			0	0	0.000	0.000	0.000	0.000
		climbing lane				NB/EB		3	8	0	0	**3.000**	**8.000**	0.000	0.000
						SB/WB		1	2	0	0	**1.000**	**2.000**	0.000	0.000

Performance Area Scoring

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement					Bridge					Safety					Mobility					Freight					Total Risk Factored Performance Area Benefit
				Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	Existing Segment Need	Post-Solution Segment Need	Raw Score	Risk Factor	Factored Score	
CS260.1	Overgaard Safety Improvements	310-323	52.3	2.540	2.540	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	5.157	0.986	4.171	3.75	15.641	1.265	1.051	0.214	5.19	1.111	1.034	0.689438	0.345	3.86	1.330	18.082
CS60.2	Show Low Area Safety Improvements	341-343	8.1	1.746	1.746	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.249	0.203	0.046	5.94	0.273	1.032	1.024	0.008	0.90	0.007	3.136	2.904962	0.231	0.82	0.189	0.470
CS260.3	Pinetop Area Mobility and Freight Improvements	341-355	297.2	3.154	3.154	0.000	5.00	0.000	0.000	0.000	0.000	0.00	0.000	0.008	0.000	0.008	7.16	0.057	2.113	0.627	1.486	3.25	4.828	4.385	2.503672	1.882	1.15	2.164	7.049
CS60.4	Show Low Area Freight Improvements	345-352	24.5	2.731	2.731	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.026	0.000	0.026	3.82	0.099	1.435	0.664	0.771	8.17	6.301	4.891	4.683098	0.208	7.23	1.504	7.904
CS60.5	Vernon Area Freight Improvements	367-383	19.5	4.560	4.560	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0.729	0.729	0.000	3.56	0.000	1.196	0.504	0.693	7.83	5.423	3.253	3.142953	0.110	6.89	0.757	6.180
CS60.6	Springerville Area Freight Improvements	396-397	6.5	0.000	0.000	0.000	0.00	0.000	0.000	0.000	0.000	0.00	0.000	0	0.000	0.000	2.38	0.000	0.159	0.159	0.000	5.15	0.000	3.601409	3.601409	0.000	5.19	0.000	0.000

Performance Effectiveness Scoring

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement Emphasis Area						Safety Emphasis Area						Freight Emphasis Area						Total Factored Benefit	VMT Factor	NPV Factor	Performance Effectiveness Score
				Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score	Existing Corridor Need	Post-Solution Corridor Need	Raw Score	Risk Factor	Emphasis Factor	Factored Score				
CS260.1	Overgaard Safety Improvements	310-323	52.3	2.657	2.657	0.000	0.00	1.50	0.000	0.293	0.240	0.052	3.75	1.50	0.295	2.909	2.851	0.058	3.86	1.50	0.338	18.715	2.79	15.3	15.3
CS60.2	Show Low Area Safety Improvements	341-343	8.1	2.657	2.657	0.000	0.00	1.50	0.000	0.293	0.289	0.003	5.94	1.50	0.028	2.909	2.889	0.021	0.82	1.50	0.025	0.523	1.35	15.3	1.3
CS260.3	Pinetop Area Mobility and Freight Improvements	341-355	297.2	2.657	2.657	0.000	5.00	1.50	0.000	0.293	0.291	0.001	7.16	1.50	0.012	2.909	2.594	0.316	1.15	1.50	0.544	7.605	4.87	20.2	2.5
CS60.4	Show Low Area Freight Improvements	345-352	24.5	2.657	2.657	0.000	0.00	1.50	0.000	0.293	0.291	0.002	3.82	1.50	0.010	2.909	2.859	0.050	7.23	1.50	0.546	8.460	2.25	15.3	11.9
CS60.5	Vernon Area Freight Improvements	367-383	19.5	2.657	2.657	0.000	0.00	1.50	0.000	0.293	0.293	0.000	3.56	1.50	0.000	2.909	2.898	0.012	6.89	1.50	0.121	6.301	1.75	20.2	11.4
CS60.6	Springerville Area Freight Improvements	396-397	6.5	2.657	2.657	0.000	0.00	1.50	0.000	0.293	0.293	0.000	2.38	1.50	0.000	2.909	2.909	0.000	5.19	1.50	0.000	0.000	0.03	20.2	0.00

miles	2018 ADT	1-way or 2-way	VMT
13.00	4517	2	58725.4
2.00	11311	2	22621.3
14.00	18763	2	262678
7.00	6146	2	43024.2
16.00	1932	2	30914.8
1.00	950	1	475

Appendix J: Solution Prioritization Scores

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Pavement		Bridge		Safety		Mobility		Freight		Total Factored Score	Risk Factors					Weighted Risk Factor	Segment Need	Prioritization Score
				Score	%	Score	%	Score	%	Score	%	Score	%		Pavement	Bridge	Safety	Mobility	Freight			
CS260.1	Overgaard Safety Improvements	310-323	52.3	0.000	0.0%	0.000	0.0%	15.936	85.2%	1.111	5.9%	1.668	8.9%	18.715	1.14	1.51	1.78	1.36	1.36	1.718	1.31	34
CS60.2	Show Low Area Safety Improvements	341-343	8.1	0.000	0.0%	0.000	0.0%	0.301	57.6%	0.007	1.4%	0.214	41.0%	0.523	1.14	1.51	1.78	1.36	1.36	1.602	1.31	3
CS260.3	Pinetop Area Mobility and Freight Improvements	341-355	297.2	0.000	0.0%	0.000	0.0%	0.069	0.9%	4.828	63.5%	2.708	35.6%	7.605	1.14	1.51	1.78	1.36	1.36	1.364	1.69	6
CS60.4	Show Low Area Freight Improvements	345-352	24.5	0.000	0.0%	0.000	0.0%	0.109	1.3%	6.301	74.5%	2.050	24.2%	8.460	1.14	1.51	1.78	1.36	1.36	1.365	1.31	21
CS60.5	Vernon Area Freight Improvements	367-383	19.5	0.000	0.0%	0.000	0.0%	0.000	0.0%	5.423	86.1%	0.879	13.9%	6.301	1.14	1.51	1.78	1.36	1.36	1.360	1.54	24
CS60.6	Springerville Area Freight Improvements	396-397	6.5	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	1.14	1.51	1.78	1.36	1.36	0.000	0.69	0

Appendix K: Preliminary Scoping Reports for Prioritized Solutions

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Show Low Safety Improvements	
City/Town: Show Low	**County: Navajo**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: US 60	
Beginning Limit: 341	
End Limit: 343	
Project Length: 2	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*		
LPA/Tribal Name:		
LPA/Tribal Contact:		
Email Address:	**Phone Number:**	
Administration: ☐ ADOT Administered	☐ Self-Administered	☐ Certification Acceptance

PROJECT NEED

Safety need: On US 60 in Show Low from MP 340-345, there are many incidents/crashes above the statewide average. There are many incidents/crashes involving motor vehicles in transport. These types of crashes occurred at a rate of 83% above the statewide average. Other crash types of note involved failure to yield the right-of-way (50%), involved vehicles making left turns (33%), and occurred in daylight conditions (83%).

PROJECT PURPOSE

What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐

Address Safety Need by installing raised median and high-visibility striping from MP 341-343. Also, install lighting from MP 342-343. Finally, install a right turn lane at MP 342.2, the intersection of US 60 and SR 77.

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

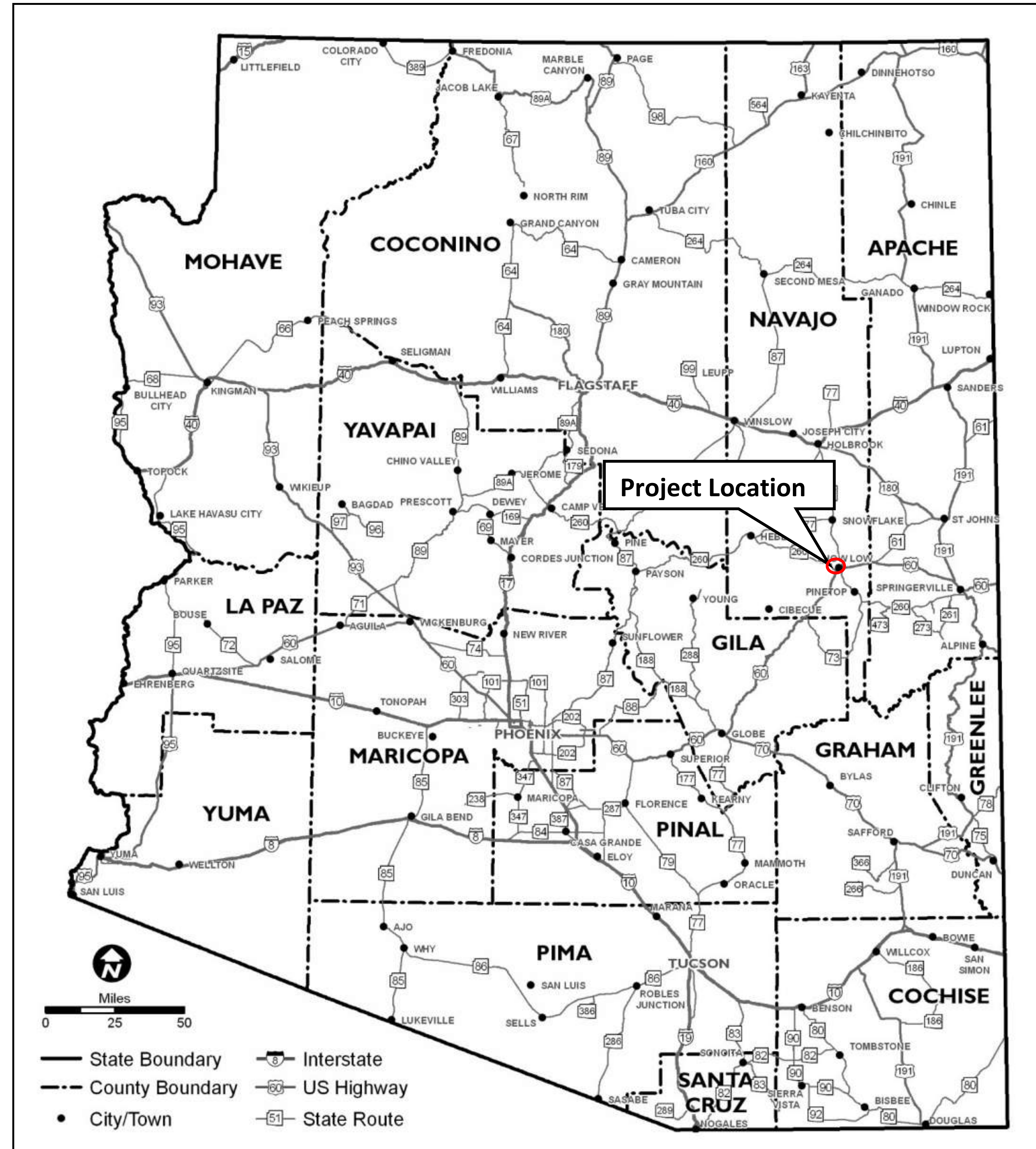
COST ESTIMATE				
Preliminary Engineering $127,300	Design $424,400	Right-of-Way $0	Construction $4,243,900	Total $4,795,600

RECOMMENDED PROJECT DELIVERY		
Delivery: ☐ Design-Bid-Build	☐ Design-Build	☐ Other:
Design Program Year: FY		
Construction Program Year: FY		

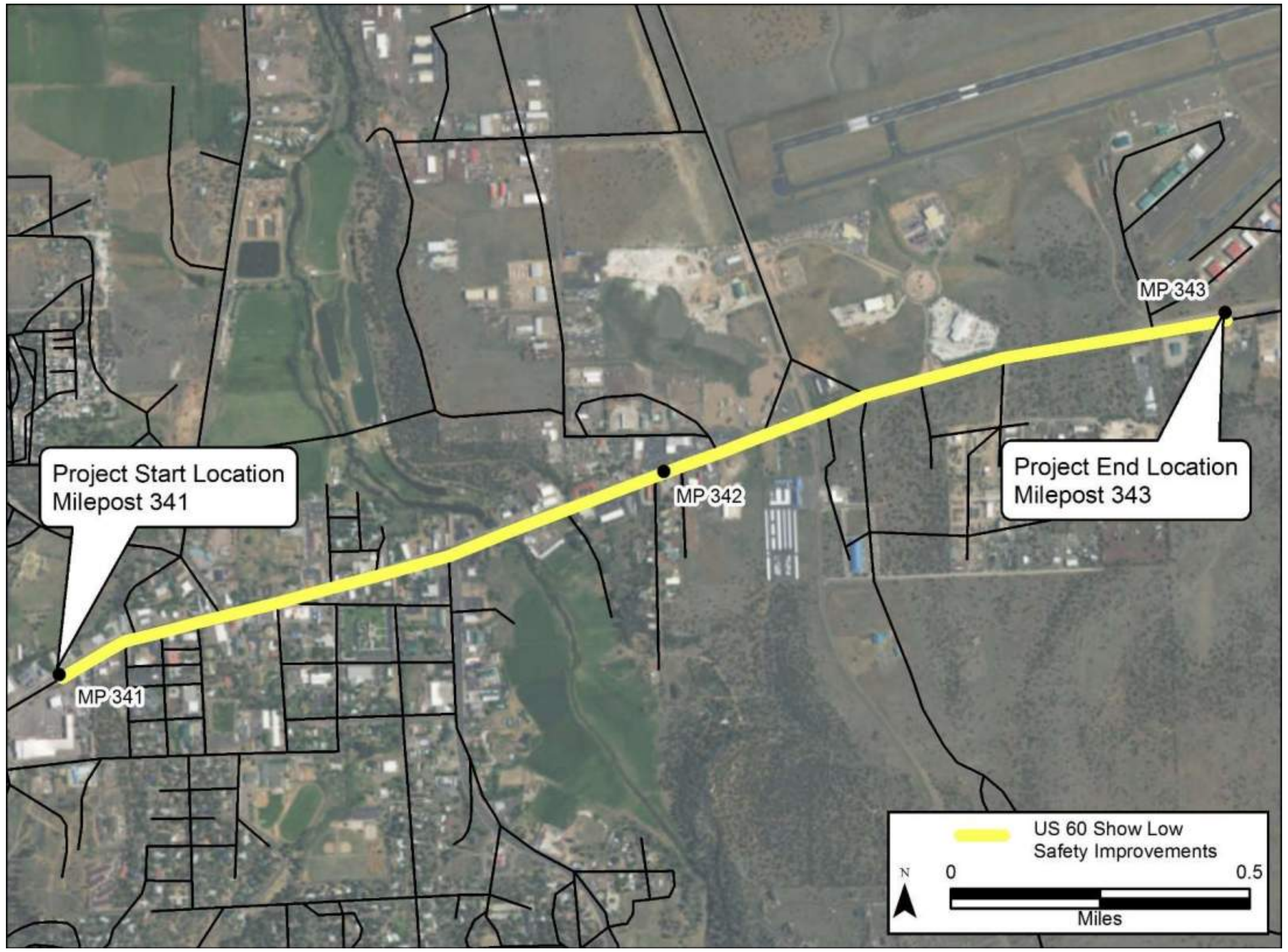
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP


Project Start Location
Milepost 341
MP 341
MP 342
MP 343
Project End Location
Milepost 343
US 60 Show Low
Safety Improvements
N
0
0.5
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Install raised median and high-visibility striping • Install lighting • Install a right turn lane at the intersection of US 60 and SR 77

1.0 SCOPE ITEMS CONSIDERED, BUT <u>NOT</u> INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

The below 23 USC 409 disclaimer is to be included in the Final Pre-Scoping Report and Field Review Report:

Pursuant to 23 USC 409: Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or rail-way-highway crossings, pursuant to sections 130, 144, and 148 [152] of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or dat

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Pinetop Area Mobility and Freight Improvements	
City/Town: Pinetop-Lakeside	**County: Navajo**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: SR 260	
Beginning Limit: 341	
End Limit: 355	
Project Length: 14	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Mobility need: In the Pinetop-Lakeside area from MP 341-357 on SR 260, there is a high level of need based on the overall Mobility Index due to poor performances in future V/C, closure rates, and bicycle accommodation. *Freight need: In the Pinetop-Lakeside area from MP 341-357 on SR 260, there is a High level of need based on the overall Freight Index due to the TPTI and closure duration performance measures.*

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☐	Expansion ☒
Address Mobility and Freight Needs by adding a through lane in both the eastbound (EB) and westbound (WB) directions from MP 341-355.05.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

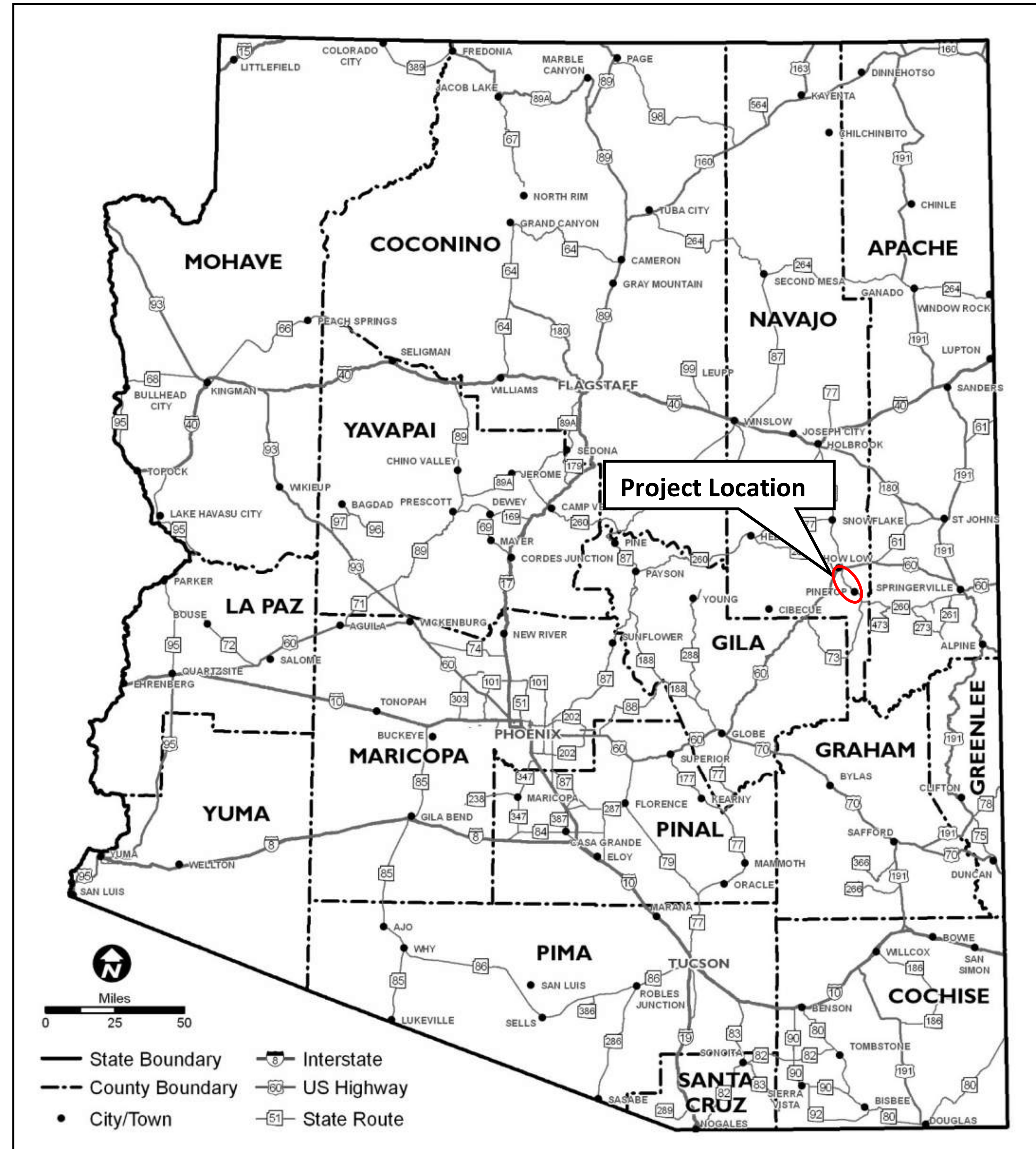
COST ESTIMATE				
Preliminary Engineering $3,106,500	Design $10,354,900	Right-of-Way $5,702,400	Construction $103,548,500	Total $122,712,300

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

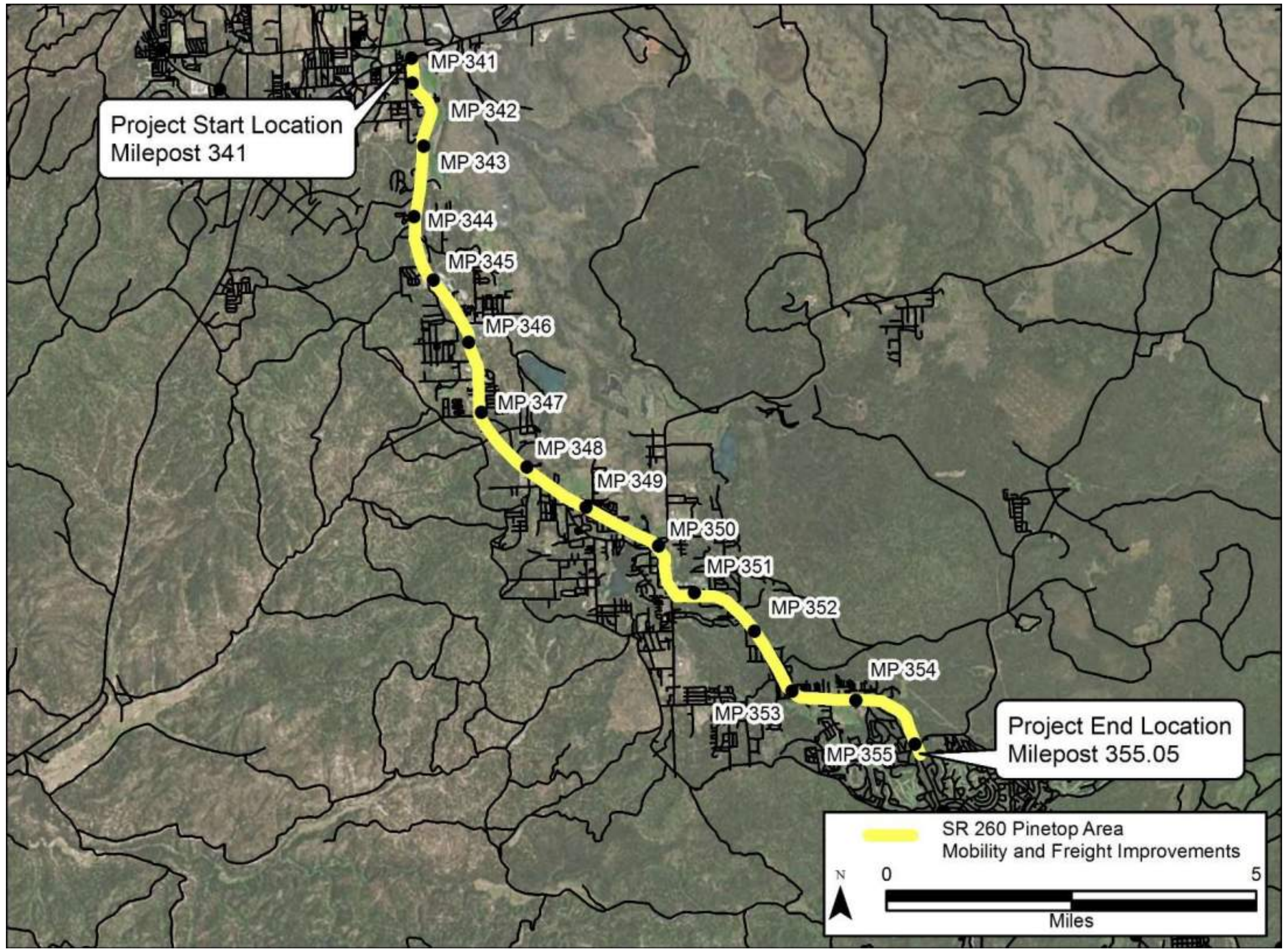
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP


Project Start Location
Milepost 341
MP 341
MP 342
MP 343
MP 344
MP 345
MP 346
MP 347
MP 348
MP 349
MP 350
MP 351
MP 352
MP 353
MP 354
MP 355
Project End Location
Milepost 355.05
SR 260 Pinetop Area
Mobility and Freight Improvements
N
0
5
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Add a through lane in both the eastbound (EB) and westbound (WB) directions from MP 341-355.05

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

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PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Show Low Area Mobility and Freight Improvements	
City/Town: Show Low	**County: Navajo**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: US 60	
Beginning Limit: 345	
End Limit: 352	
Project Length: 7	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☐ Private; ☒ Federal; ☐ Tribal; ☐ Other: *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED

Mobility need: In the Pinetop-Lakeside area from MP 345-352 on US 60, there is a medium level of need based on the overall Mobility Index due to poor performances in closure rates, PTI, and bicycle accommodation. Freight need: In the Pinetop-Lakeside area from MP 341-357 on SR 260, there is a High level of need based on the overall Freight Index due to the TPTI and closure duration performance measures.

PROJECT PURPOSE

What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐

Address Mobility and Freight Needs by widening the shoulders in both the eastbound (EB) and westbound (WB) directions from MP 345-352. Also, add an EB passing lane from MP 349-350 and a WB passing lane from MP 350-351.

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering $336, 600	Design $1,122,000	Right-of-Way $0	Construction $11,220,000	Total $12,678,600

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS

1) **State Location Map**
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4) **Project Schedule**
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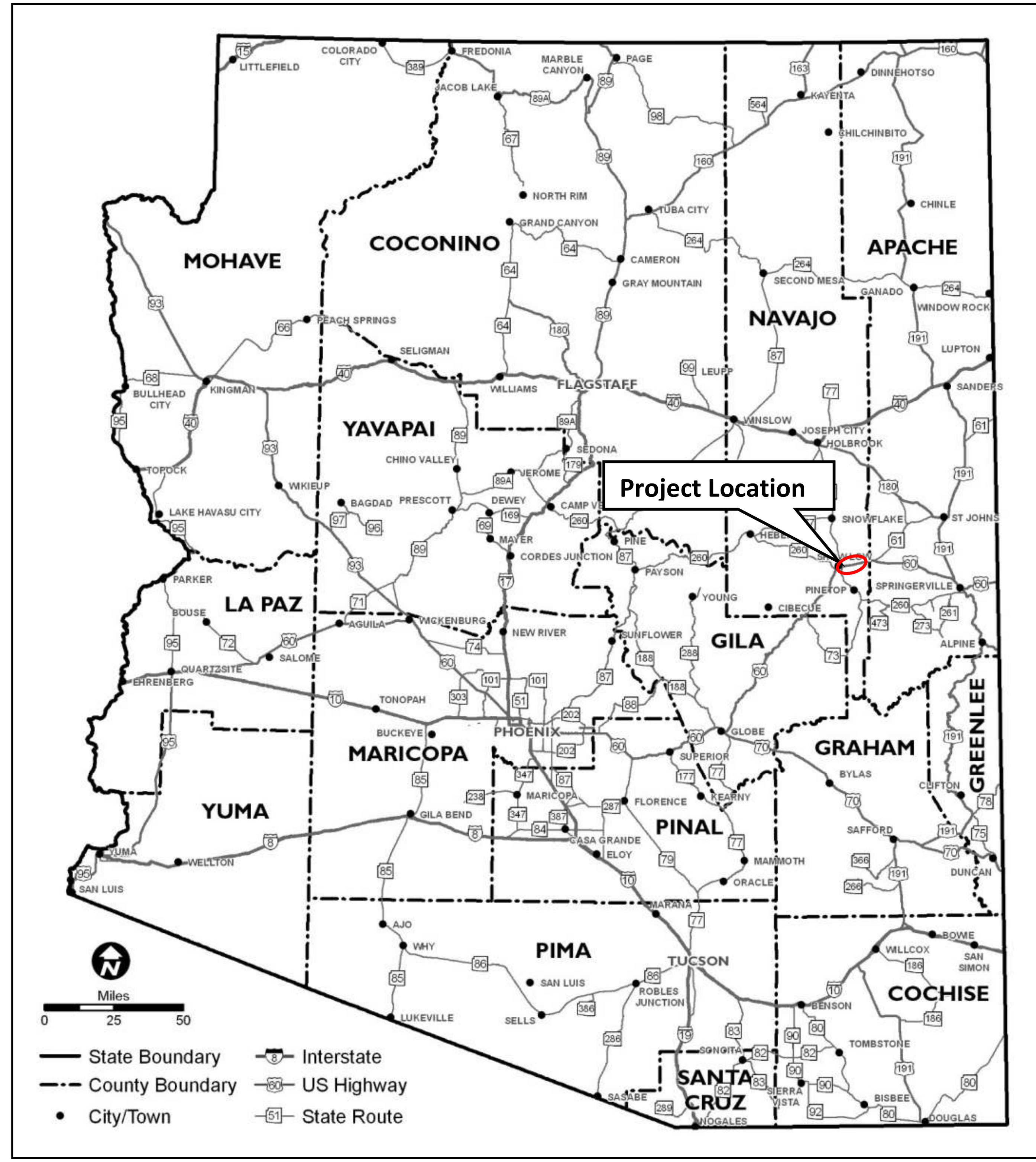
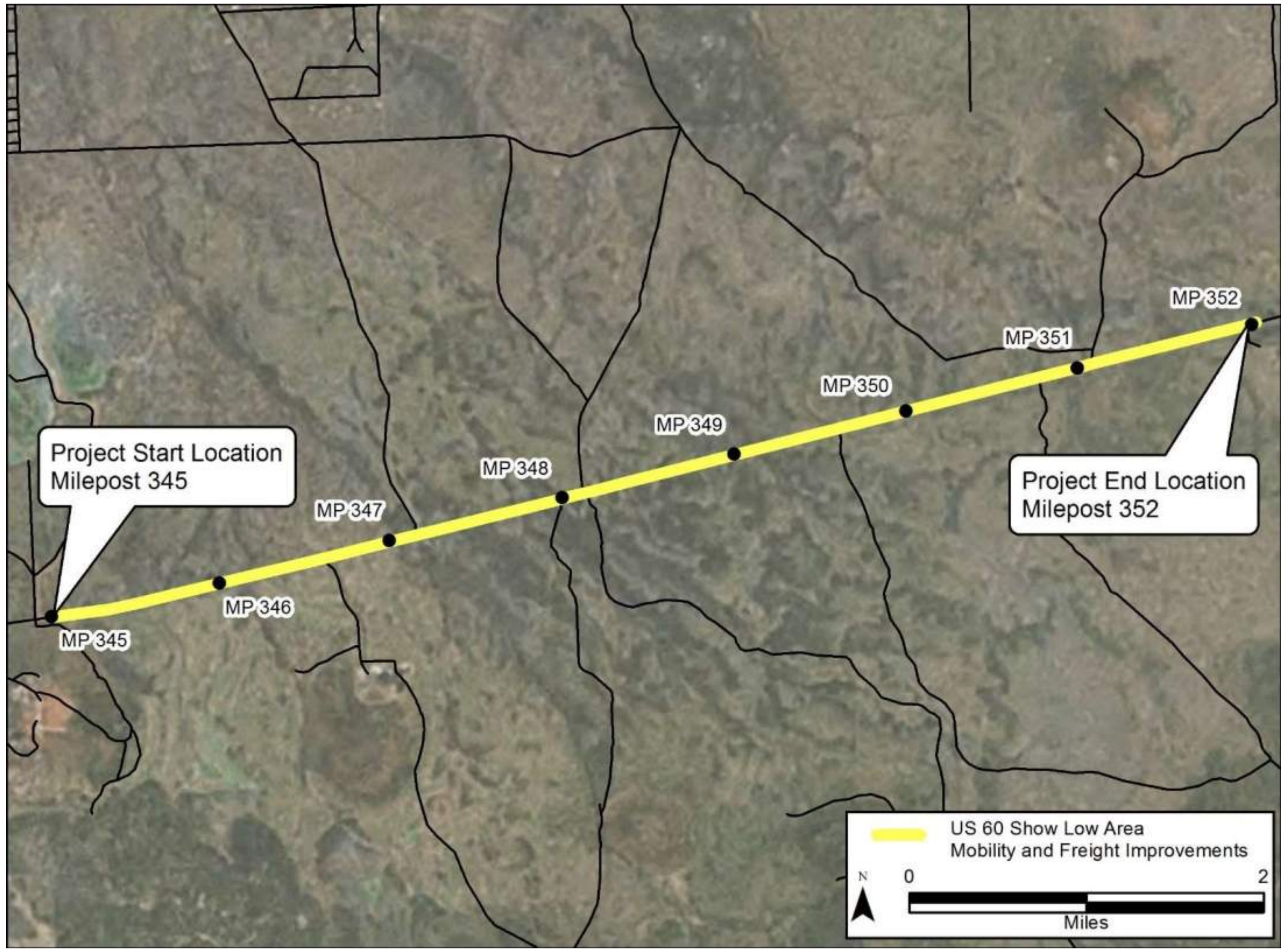
ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP


Project Start Location
Milepost 345
Project End Location
Milepost 352
MP 345
MP 346
MP 347
MP 348
MP 349
MP 350
MP 351
MP 352
US 60 Show Low Area
Mobility and Freight Improvements
N
0
2
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Widen the shoulders in both the eastbound (EB) and westbound (WB) directions • Add an EB passing lane from MP 349-350 and a WB passing lane from MP 350-351

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

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ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Vernon Area Safety Improvements	
City/Town: Show Low/Springerville	**County: Apache**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: US 60	
Beginning Limit: 352	
End Limit: 384	
Project Length: 32	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Trust *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Safety need: On US 60 in between Show Low and Springerville from MP 352-384, there is a Safety Index significantly above the statewide average, particularly in the eastbound(EB) direction. Incidents/crashes related to overturning occurred at a rate 0f 43% above the statewide average. Other crash types of note involved single vehicles (79%), involved running off the road to the right (64%), and occurred in daylight conditions (64%). Overall, there are 4 fatal crashes, 10 incapacitating crashes, and 2 crashes involving trucks.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐

Address the Safety Need by widening the shoulders in both the EB and the WB directions, and install centerline rumble strips from MP 352-384. Construct right and left turn lanes at the intersection of US 60 and County Road 3330/3331 (MP 354.25). Install EB curve warning signage at MP 366 and WB curve signage at MP 368. Install EB chevrons from MP 366.25-366.50 and WB chevrons from MP 366.75-367. Install dynamic weather warning beacons in the EB direction at MP 366 and in the WB direction at MP 368.

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

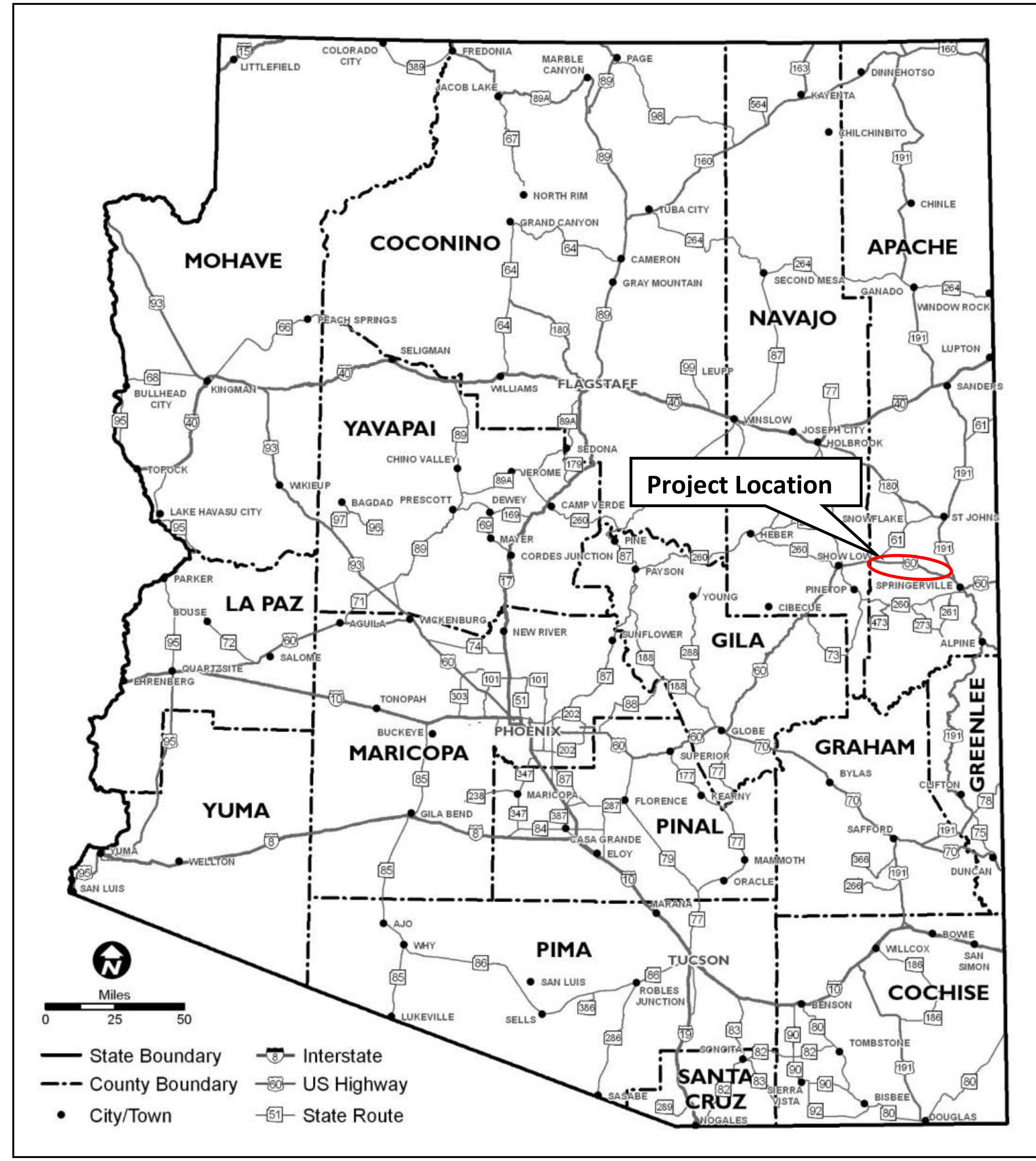
COST ESTIMATE				
Preliminary Engineering $779,200	Design $2,597,100	Right-of-Way $0	Construction $25,970,950	Total $29,347,250

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

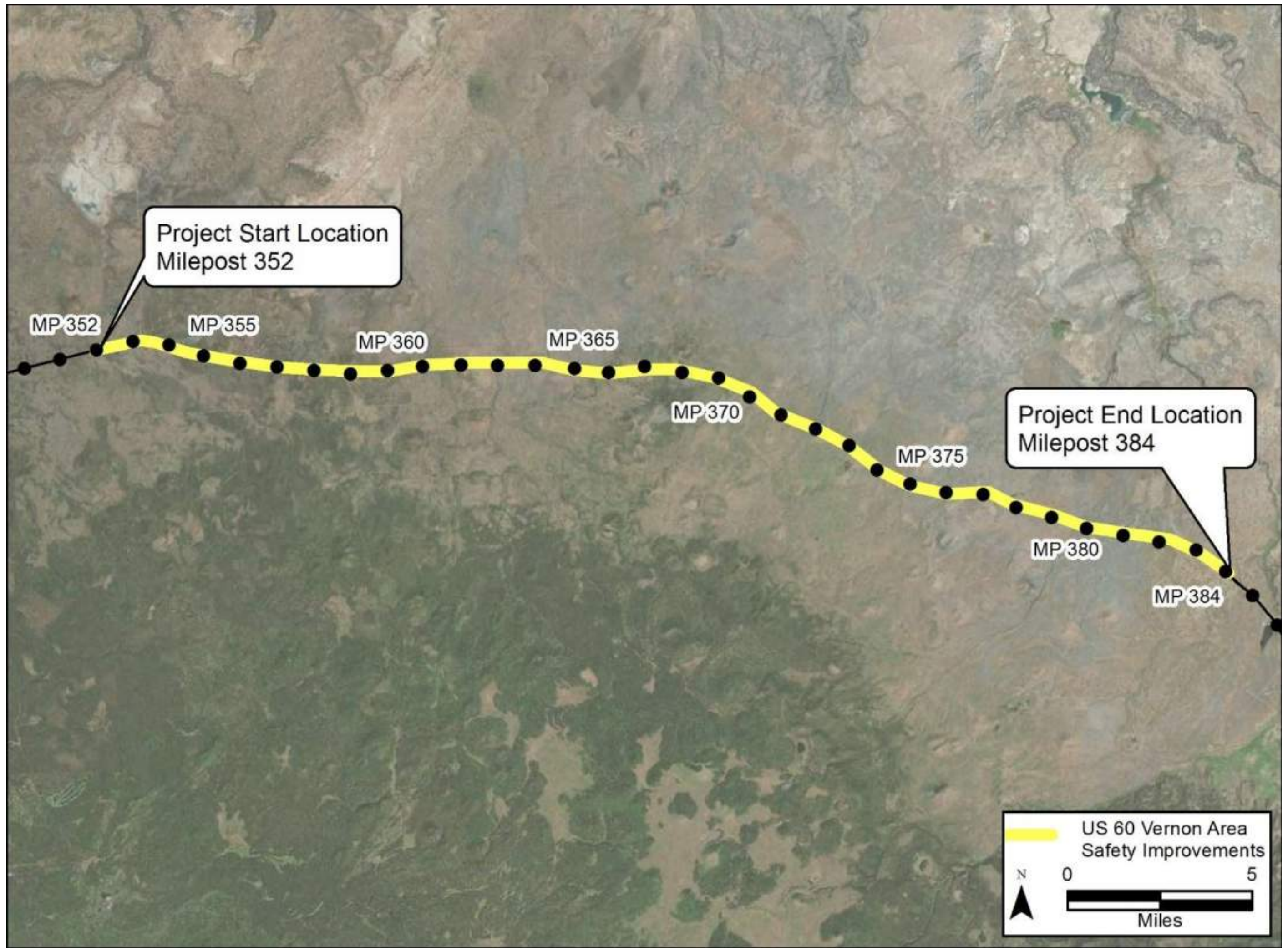
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP


Project Start Location
Milepost 352
MP 352
MP 355
MP 360
MP 365
MP 370
MP 375
MP 380
MP 384
Project End Location
Milepost 384
US 60 Vernon Area
Safety Improvements
N
0
5
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Widen the shoulders in both the eastbound (EB) and the westbound (WB) directions • Install centerline rumble strips from MP 352-384 • Construct right and left turn lanes at the intersection of US 60 and County Road 3330/3331 • Install EB Curve warning signage at MP 366 and WB curve warning signage at MP 368 along with installing EB chevrons from MP 366.25-366.50 and WB chevrons from 366.75-367 • Install dynamic weather warning beacons in the EB direction at MP 366 and in the WB direction at MP 368

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

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ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Vernon Area Freight Improvements	
City/Town: Springerville	**County: Apache**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: US 60	
Beginning Limit: 367	
End Limit: 383	
Project Length: 16	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☒ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Trust *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight need: From MP 352-384 on US 60, there is a High level of need based on the overall Freight Index due to poor performances in TTTI, TPTI, and closure duration.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by constructing two eastbound climbing lanes: The first from MP 367-368 and the second from MP 382-383. Also, address the Need by constructing a westbound climbing lane from MP 380-381.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

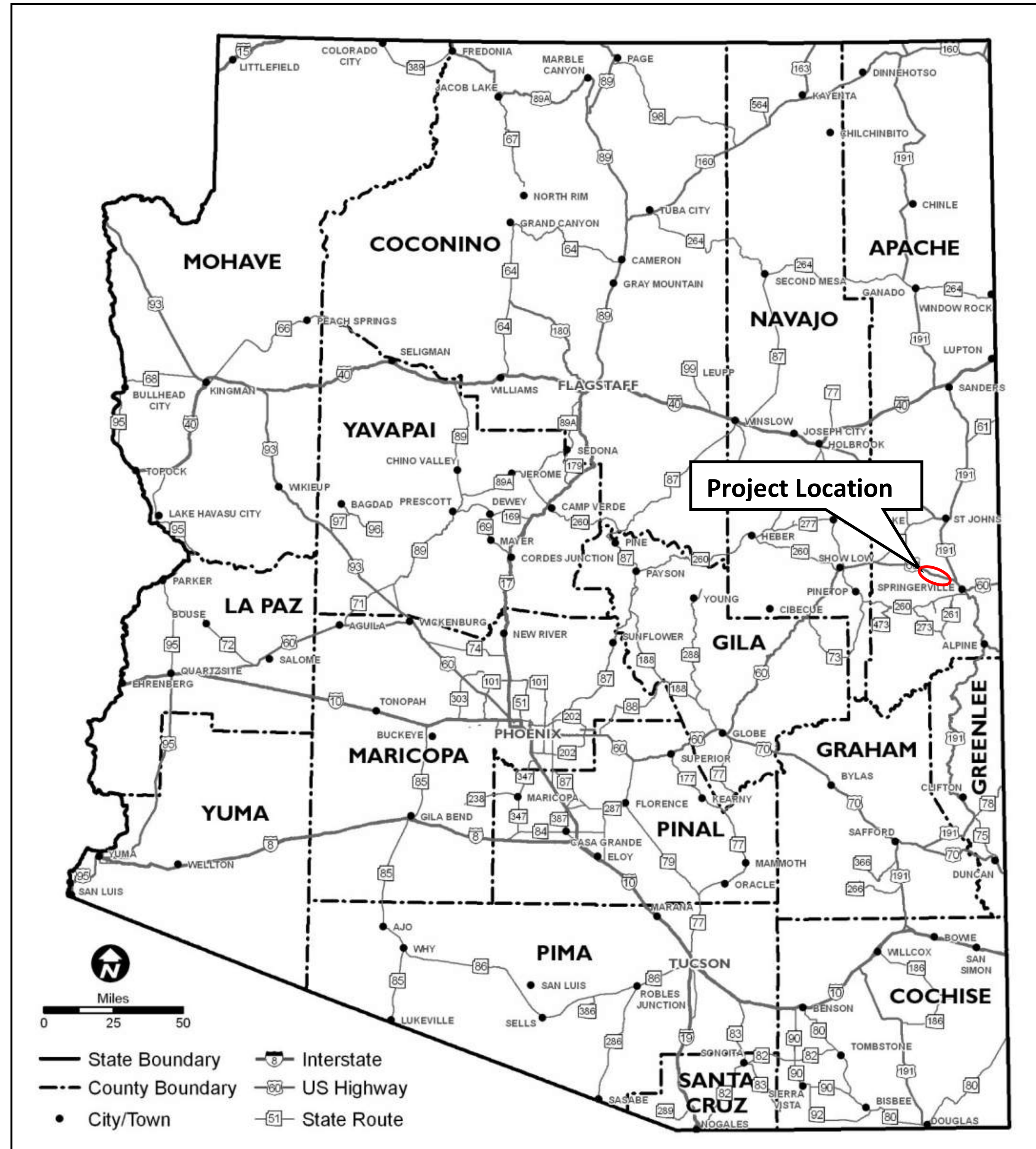
COST ESTIMATE				
Preliminary Engineering $297,000	Design $990,000	Right-of-Way $0	Construction $9,900,000	Total $11,187,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

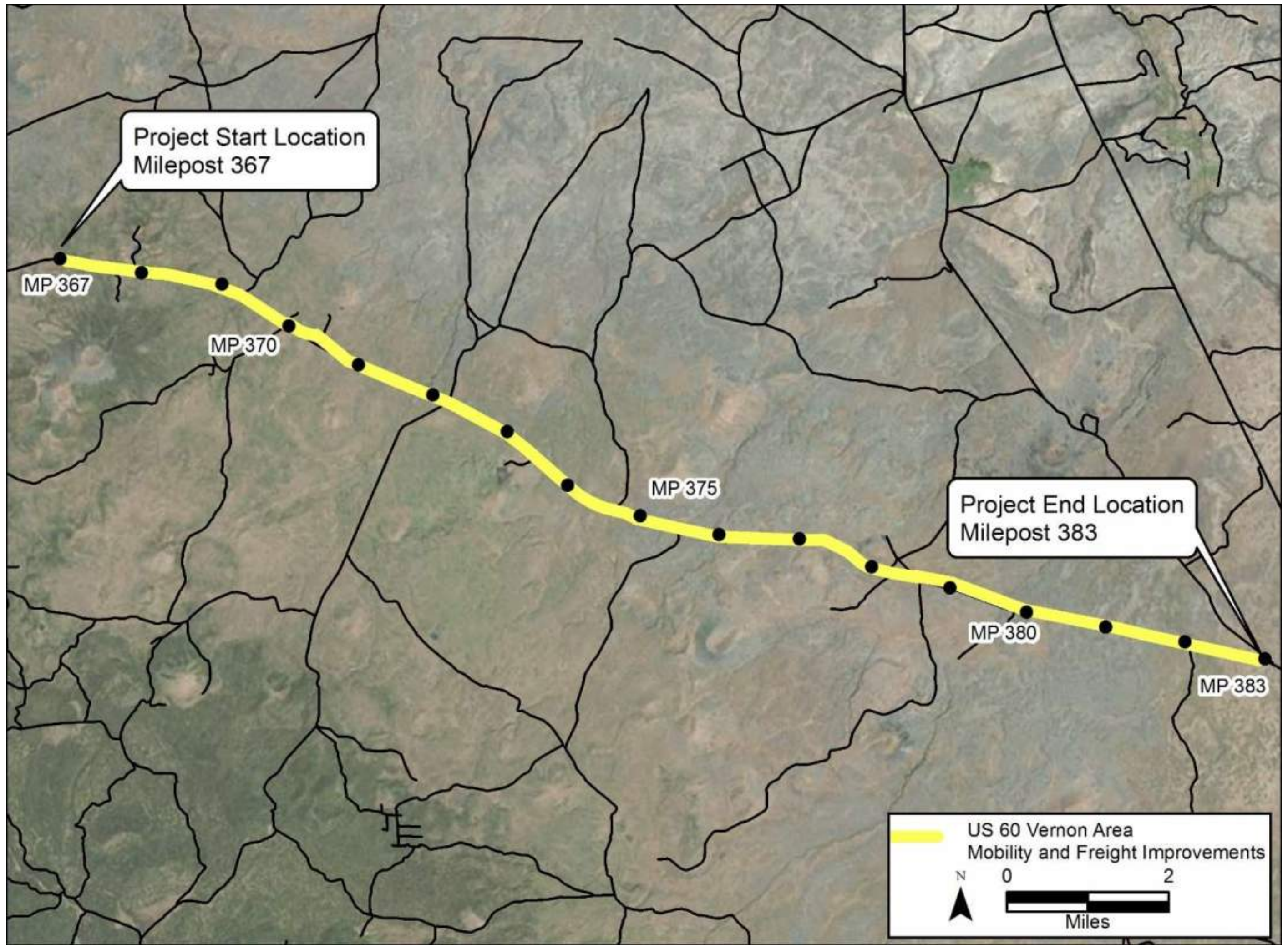
ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**
4) **Project Schedule**
5) **Itemized Cost Estimate**
6) **Conceptual Design Plans (not to exceed 15% design)**
7) **Final Field Review Report**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP


Project Start Location
Milepost 367
MP 367
MP 370
MP 375
Project End Location
Milepost 383
MP 380
MP 383
US 60 Vernon Area
Mobility and Freight Improvements
N
0
2
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Construct an eastbound climbing lane from MP 367-368 • Construct an eastbound climbing lane from MP 382-383 • Construct a westbound climbing lane from MP 380-381

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

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ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: December 18, 2017	**ADOT Project Manager:**
Project Name: Springerville Area Freight Improvements	
City/Town: Springerville	**County: Apache**
COG/MPO: NACOG	**ADOT District: Northeast**
Primary Route/Street: US 60	
Beginning Limit: 396	
End Limit: 397	
Project Length: 1	
Right-of-Way Ownership(s) (where proposed project construction would occur): *(Check all that apply)* ☐ City/Town; ☐ County; ☒ ADOT ; ☐ Private ; ☐ Federal; ☐ Tribal; ☐ Other:	
Adjacent Land Ownership(s): *(Check all that apply)* ☐ City/Town; ☐ County; ☐ ADOT; ☐ Private; ☐ Federal; ☐ Tribal; ☒ Other: State Trust *http://gis.azland.gov/webapps/parcel/*	

LOCAL PUBLIC AGENCY (LPA) or TRIBAL GOVERNMENT INFORMATION *(If applicable)*	
LPA/Tribal Name:	
LPA/Tribal Contact:	
Email Address:	**Phone Number:**
Administration: ☐ ADOT Administered ☐ Self-Administered ☐ Certification Acceptance	

PROJECT NEED
Freight need: From MP 389-402 on US 60, there is a High level of need based on the overall Freight Index due to poor performances in TPTI and closure duration.

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by constructing an eastbound climbing lane from MP 396-397.			

ADOT

PRELIMINARY SCOPING REPORT

PROJECT RISKS	
Check any risks identified that may impact the project's scope, schedule, or budget:	
☐ Access / Traffic Control / Detour Issues	☐ Right-of-Way
☐ Constructability / Construction Window Issues	☐ Environmental
☐ Stakeholder Issues	☐ Utilities
☐ Structures & Geotech	☐ Other:
Risk Description: *(If a box is checked above, briefly explain the risk)*	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering $99,000	Design $330,000	Right-of-Way $0	Construction $3,300,000	Total $3,729,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS

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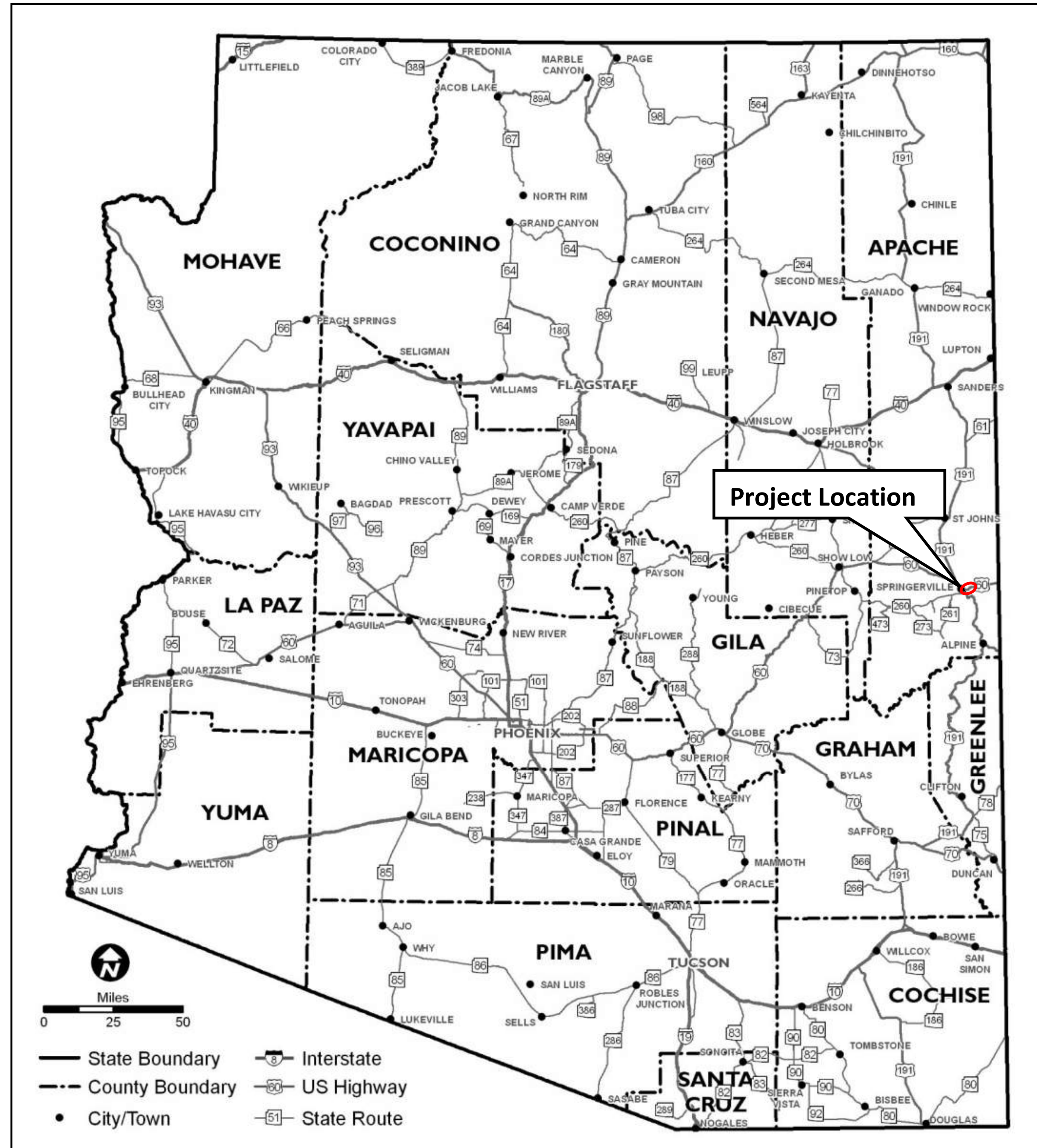
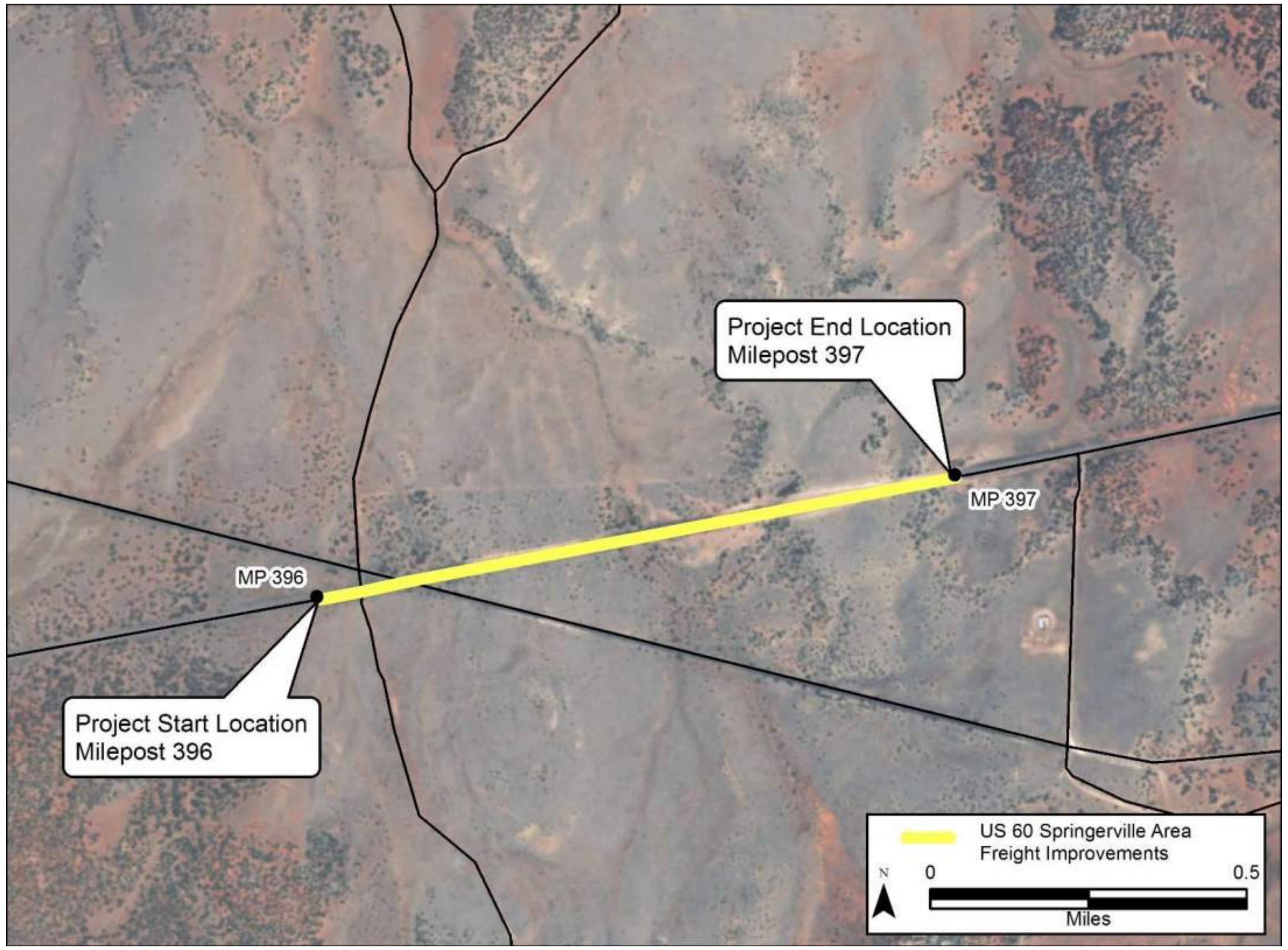


ATTACHMENT 2 – PROJECT VICINITY MAP


Project End Location
Milepost 397
MP 397
MP 396
Project Start Location
Milepost 396
US 60 Springerville Area
Freight Improvements
N
0
0.5
Miles

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
(Provide a detailed breakdown of the project's scope of work using bullet format) • Construct an eastbound climbing lane from MP 396-397

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED
(Describe scope items considered, but not accepted by the Pre-Scoping Team and why)

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