FINAL REPORT

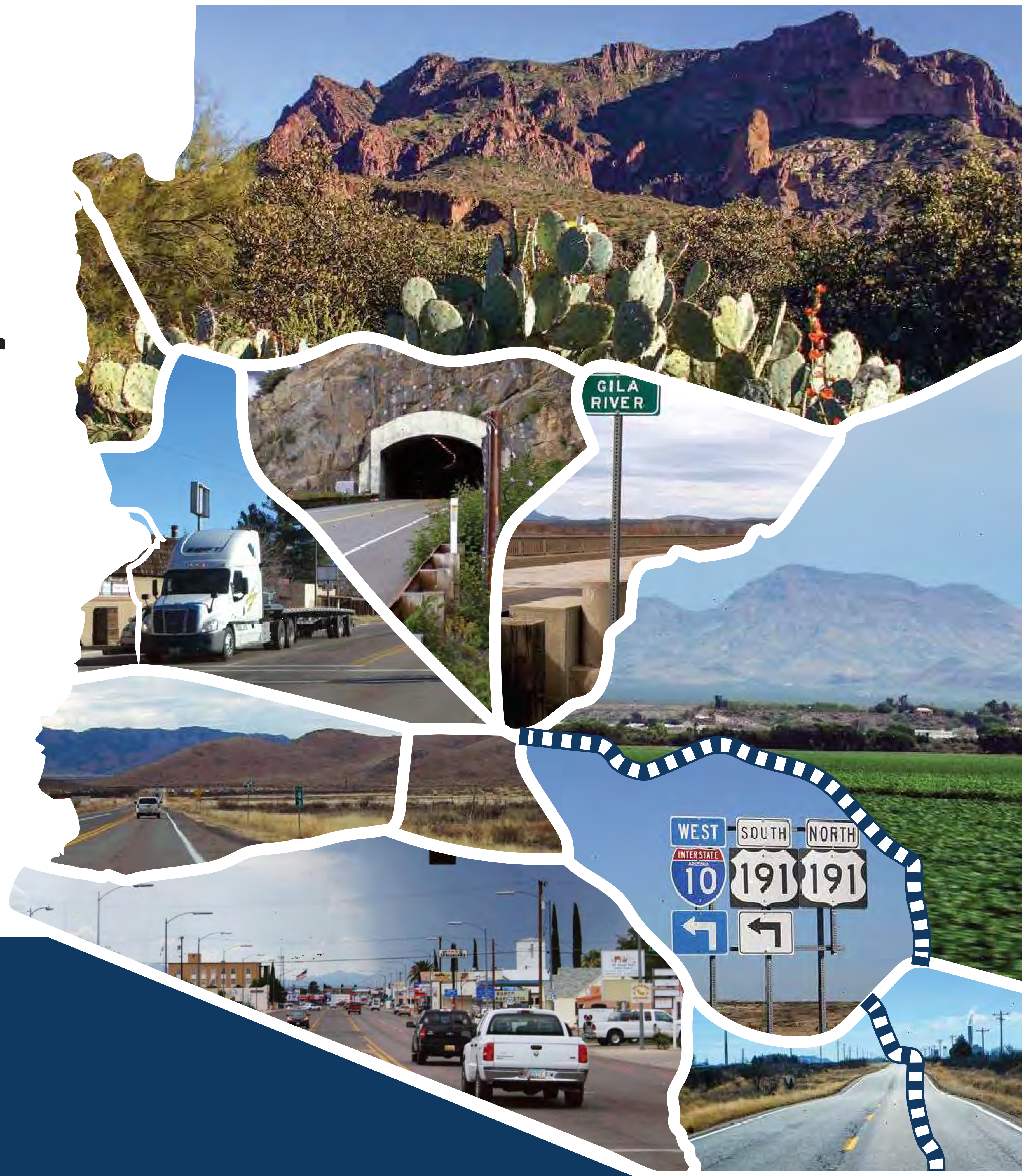
US 60 | US 70 | US 191 Corridor Profile Study

Apache Junction to Douglas

PREPARED FOR ADOT APRIL 2023

ADOT WORK TASK NO.
MPD 022-21

ADOT CONTRACT NO.
17-171975



Prepared by

WILSON & COMPANY

US 60 | US 70 | US 191 CORRIDOR PROFILE STUDY

APACHE JUNCTION TO DOUGLAS

ADOT WORK TASK NO. MPD-029-16
ADOT CONTRACT NO. DT11-013154

FINAL REPORT

APRIL 2023

PREPARED FOR:

ARIZONA DEPARTMENT OF TRANSPORTATION

PREPARED BY:

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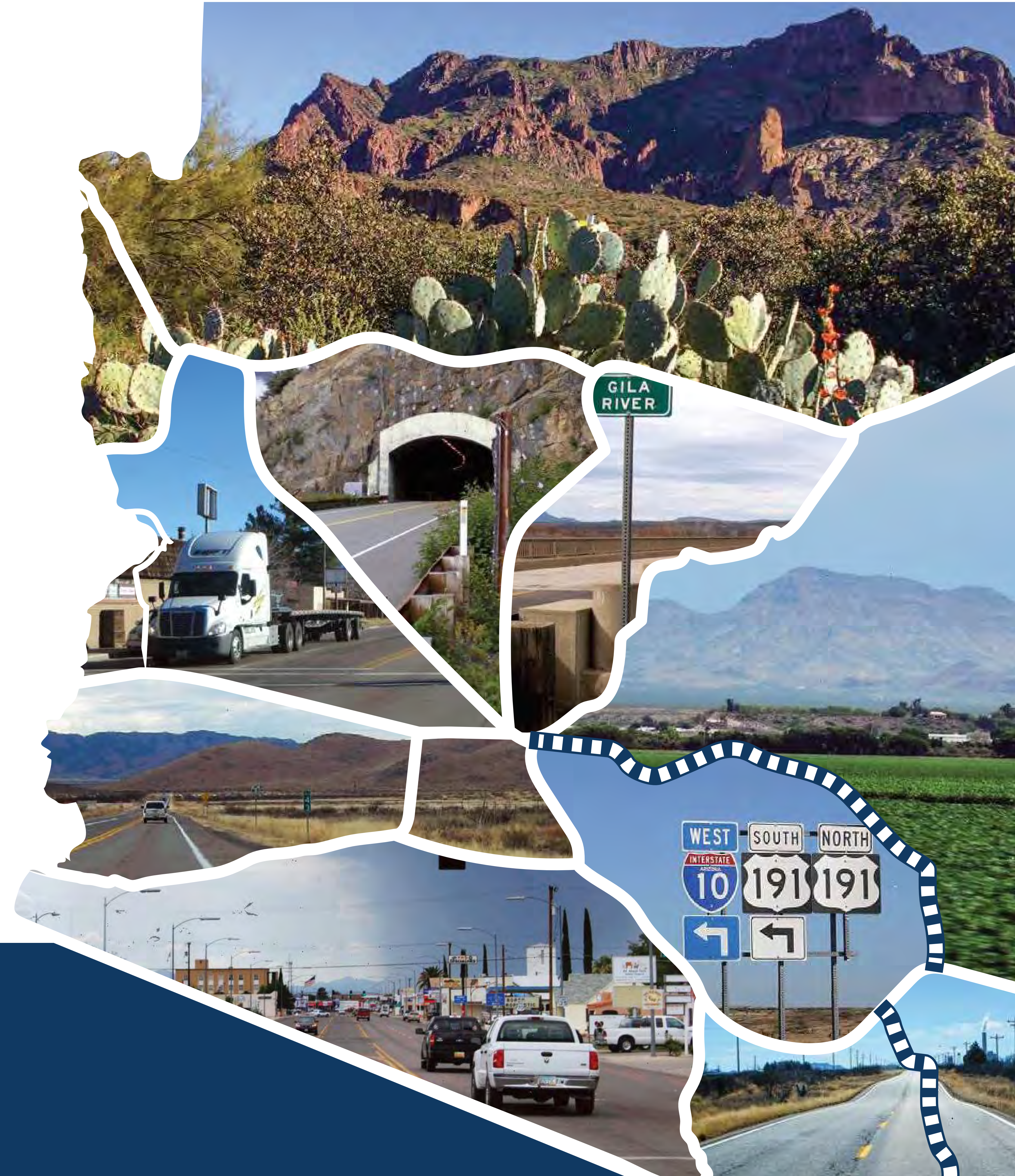
ACRONYMS & ABBREVIATIONS

AADT	Average Annual Daily Traffic
ABISS	Arizona Bridge Information and Storage System
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
BQAZ	Building a Quality Arizona
CAG	Central Arizona Governments
CCTV	Closed Circuit Television
CPS	Corridor Profile Study
CR	Cracking Rating
CYMPO	Central Yavapai Metropolitan Planning Organization
DCR	Design Concept Report
DMS	Dynamic Message Sign
EB	Eastbound
FHWA	Federal Highway Administration
FY	Fiscal Year
HCRS	Highway Condition Reporting System
HERE	Real time traffic conditions database produced by American Digital Cartography Inc.
HPMS	Highway Performance Monitoring System
I	Interstate
IRI	International Roughness Index
ITS	Intelligent Transportation System
LCCA	Life-Cycle Cost Analysis
LOS	Level of Service
LOTTR	Level of Travel Time Reliability
LPOE	Land Point of Entry
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
P2P	Planning to Programming
PA	Project Assessment
PARA	Planning Assistance for Rural Areas
PDI	Pavement Distress Index
PES	Performance Effectiveness Score
PSR	Pavement Serviceability Rating
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SATS	Small Area Transportation Study
SB	Southbound
SEAGO	South Eastern Arizona Governments Organization
SHSP	Strategic Highway Safety Plan
SOV	Single Occupancy Vehicle
SR	State Route
SVMPO	Sierra Vista Metropolitan Planning Organization
SWAP	State Wildlife Action Plan
TAC	Technical Advisory Committee
TI	Traffic Interchange
TIP	Transportation Improvement Plan
TTTR	Truck Travel Time Reliability
UP	Underpass
UPRR	Union Pacific Railroad
USDOT	United States Department of Transportation
V/C	Volume to Capacity Ratio
VMT	Vehicle-Miles Travelled
VPD	Vehicles Per Day
WB	Westbound
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 US Route 60|US 70 from Apache Junction to the US 191 Junction and of US 191 from US 70 to the SR 80 Junction (US 60|US 70|US 191). This study examines key performance measures relative to the US 60|US 70|US 191 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. The 60|US 70|US 191 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 the US 60|US 70|US 191 CPS 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 US 60|US 70|US 191 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

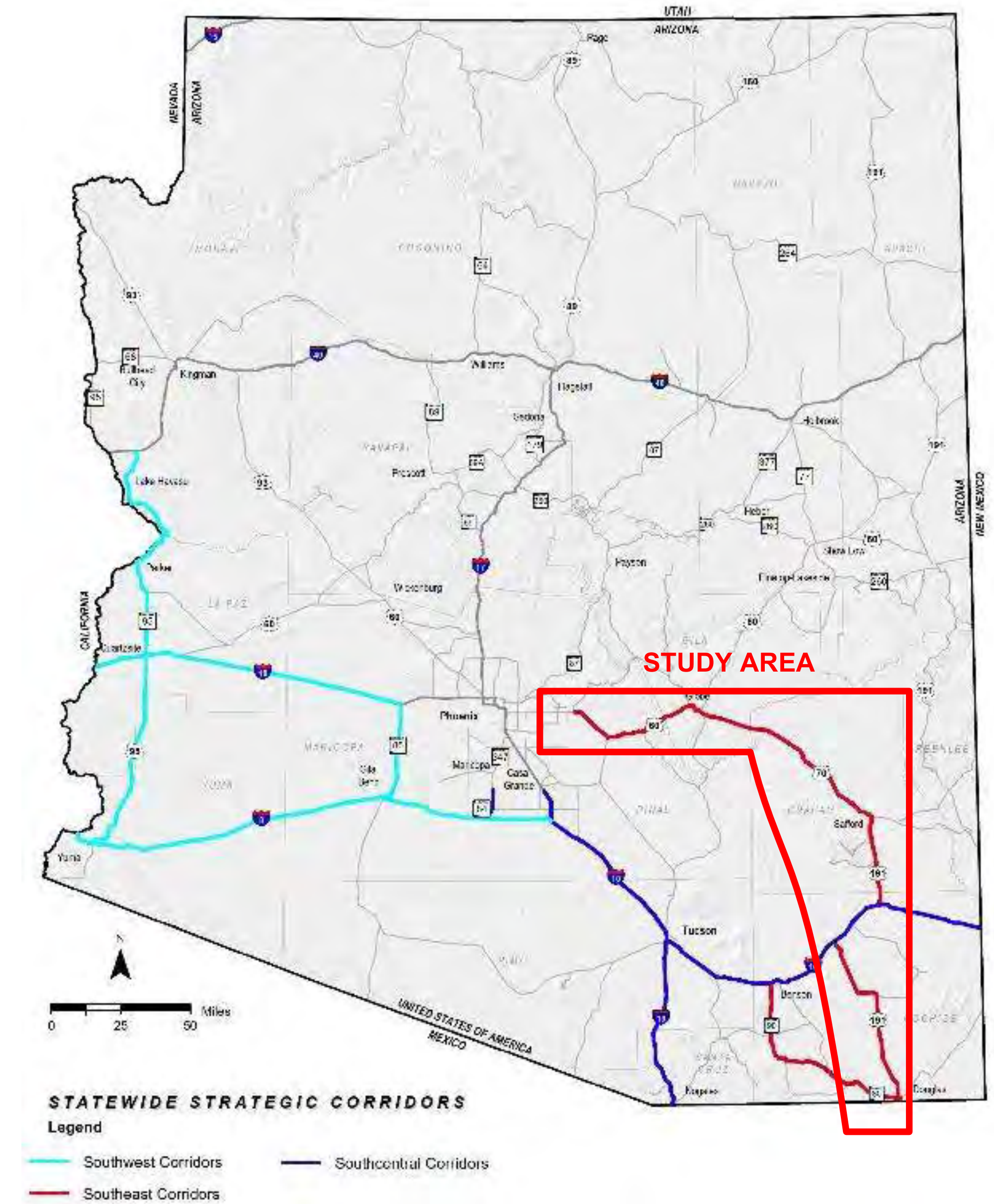
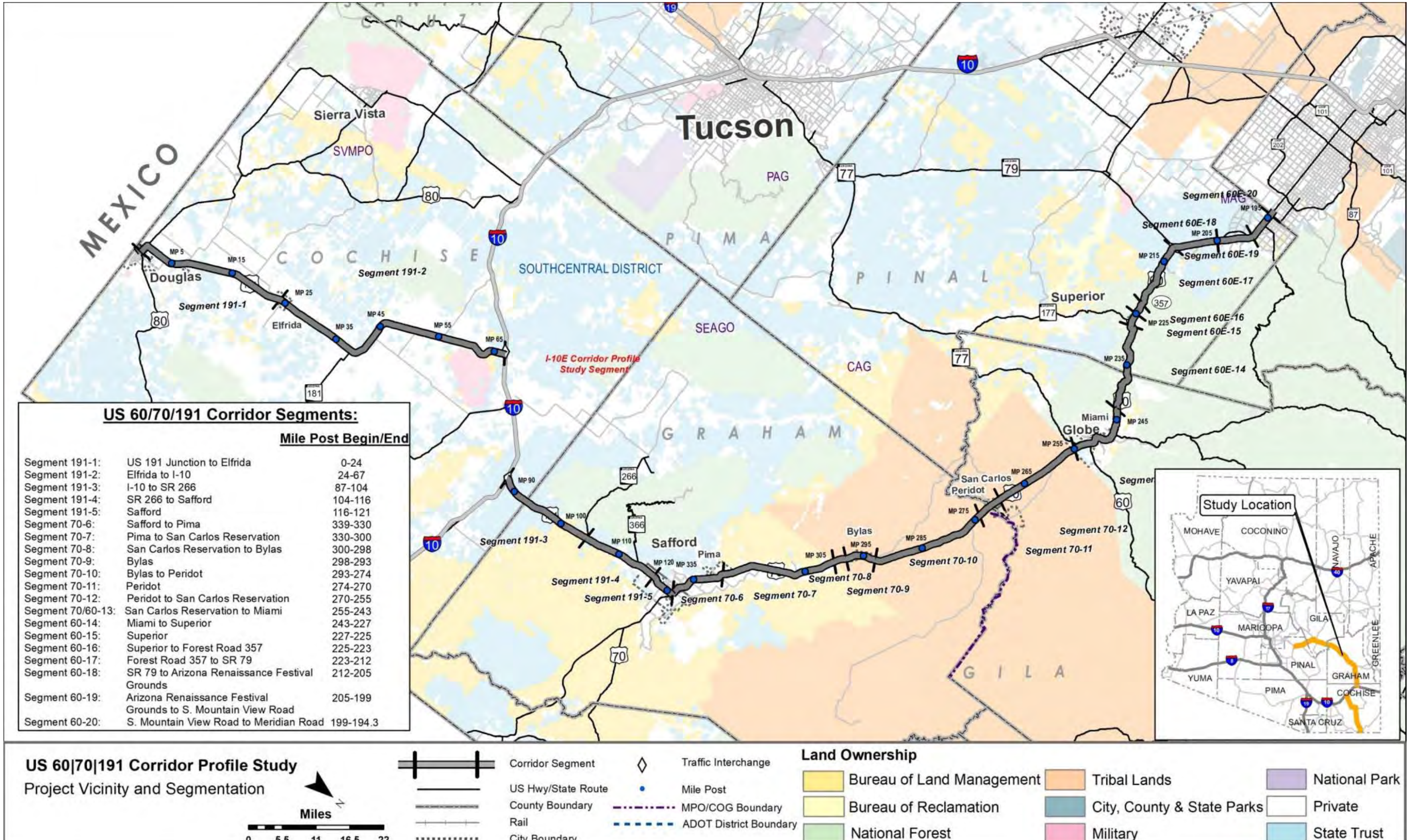


Figure ES-1: Corridor Study Area

Study Location and Corridor Segments

The US 60|US 70|US 191 CPS divides the corridor into twenty planning segments to facilitate 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 are used to assess the US 60|US 70|US 191 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 planning time index	• 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 US 60|US 70|US 191 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 five areas evaluated are split between “good” (40%), “fair” (35%), and “poor” (25%) ratings. The poorest performing segment is 60-14 which rates as “poor” in mobility, safety and freight, and “fair” in pavement & mobility. The highest performing segment, 60-18, has only one performance metric that has “poor” performance which is Percent Area Failure

- **Pavement Performance:** The weighted average of the Pavement Index shows “fair” overall performance for the US 60|US 70|US 191 corridor; Segments 191-1,191-2,191-3,191-4,191-6,70-6, 70-7,70-8,70-9,70-11,70-12,70-13 and 60-18 shows “poor” or “fair performance for several Pavement performance areas. Due to the significant areas of roughness and pavement cracking, 17 of the 20 segments rate poorly for percentage of area in failure.

- **Bridge Performance:** The weighted average of the Bridge Index shows “fair” overall performance for the US 60|US 70|US 191 corridor; Segments 70|60-13 and 60E-14 show “fair” or “poor” performance for all Bridge performance area measures; the Lowest Bridge Rating measures shows “poor” performance; the weighted average for the Sufficiency Rating measure shows “good” performance; Segments 191-5, and 70-9 contain no bridges.

- **Mobility Performance:** The weighted average of the Mobility Index shows “good” overall performance for the US 60|US 70|US 191 corridor; the Future Daily V/C and Existing Peak Hour V/C measures show generally “good” performance for all segments along the corridor with exceptions of segments 60E-14,60E-19 and 60E-20, which show “poor” performance; the Directional Closure Extent measure show generally “good” or “fair” performance with exceptions of segments 60E-14 and 60E-20 which show “poor” performance ; the Directional LOTTR measure shows generally “good’ or “fair” performance for all segments along the corridor; the weighted average for the Directional LOTTR measure shows “fair” in both the NB/WB and SB/EB direction; Segments 191-3, 191-5, 191-6, 70-8 through 60E-14, and 60E-19 show “poor” performance for the % Bicycle Accommodation measure and the weighted average for the corridor shows “fair” performance
- **Safety Performance:** The weighted average of the Safety Index and Directional Safety Indices show “fair” performance for the US 60|US 70|US 191 corridor; The crash unit type performance measures for crashes involving intersections, Pedestrians, Trucks and Bicycles had insufficient data to generate reliable performance ratings; The weighted average of the crash unit type performance measure involving Lane departures shows “above average” performance; The Safety Index value for Segments 70-10 through 60E-14, 60E-17 and 60E-20 are “below average”, meaning these segments have more crashes than the typical statewide for a similar operating environment; The Directional Safety Index value for NB/WB travel for Segments 70-11 through 60E-14, 60E-17, 60E-19 and 60E-20 are “below average” and for SB/EB travel, 70-10 and 70-12 through 60E-14 are “below average”
- **Freight Performance:** The weighted average of the Freight Index shows “poor” overall performance for US 60|US 70|US 191 corridor; All segments show “fair” or “poor” performance for the Freight Index and Directional Max TTTR (for NB/WB travel) measures except for Segment 60E-16; Directional Max TTTR in the SB/EB direction shows “fair” or “poor” for all segments except for segments 60E-17 and 60E-19 which show “good” performance. Segment 60E-14 in the SB/EB direction shows “poor” performance in the Closure Duration performance measure; Most of the segments show “fair” or “good” performance for the Closure Duration performance measure; two bridge vertical clearance hot spots exist in Segments 70/60-13 and 60E-14.

Table ES-2: 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 Max LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			NB/EB	SB/WB							NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB		
191-1[2*]	24	3.17	3.10	3.24	70.8%	6.0	87.80	6	0.16	0.18	0.13	0.13	0.04	0.02	1.40	1.39	66%	15.0%
191-2[2*]	43	2.89	3.44	3.38	55.8%	5.4	69.23	5	0.13	0.17	0.08	0.11	0.03	0.01	Insufficient Data		100%	16.6%
191-3[2^]	17	3.42	3.63	3.69	72.0%	5.5	93.81	5	0.05	0.05	0.03	0.03	0.02	0.00	Insufficient Data		49%	8.8%
191-4[2^]	12	3.44	3.29	3.32	41.7%	6.0	69.50	6	0.17	0.19	0.11	0.11	0.08	0.07	Insufficient Data		97%	8.3%
191-5[1*]	5	3.10	3.16	3.07	80.0%	No Bridges			0.27	0.30	0.15	0.16	0.20	0.20	0.20		0.20	21.2%
70-6[1*]	9	3.23	3.15	3.25	60.0%	6.0	68.10	6	0.41	0.45	0.31	0.29	0.02	0.04	Insufficient Data		46%	17.8%
70-7[2^]	30	2.83	2.87	3.08	86.8%	5.7	70.25	5	0.18	0.20	0.11	0.10	0.04	0.01	Insufficient Data		73%	15.8%
70-8[2^]	2	2.59	3.35	3.67	100.0%	6.0	73.00	6	0.11	0.12	0.08	0.05	0.10	0.00	Insufficient Data		0%	12.8%
70-9[2^]	5	2.71	3.44	3.63	100.0%	No Bridges			0.24	0.26	0.16	0.12	0.04	0.04	0.04		0.04	11.2%
70-10[2^]	19	2.69	3.10	3.35	78.9%	7.0	80.00	7	0.15	0.17	0.11	0.08	0.07	0.05	Insufficient Data		4%	7.7%
70-11[2^]	4	2.40	3.27	3.28	87.5%	6.7	82.02	5	0.18	0.20	0.13	0.10	0.00	0.00	Insufficient Data		4%	11.3%
70-12[2^]	15	3.57	3.28	3.53	33.3%	6.0	52.90	6	0.24	0.27	0.16	0.17	0.17	0.00	Insufficient Data		23%	12.5%
70|60-13[1*]	12	3.28	3.13	3.28	53.8%	5.2	78.01	4	0.40	0.45	0.26	0.25	0.22	0.35	1.16	1.15	54%	16.6%
60E-14[2^]	16	3.68	3.66	3.82	43.8%	5.5	68.13	3	1.42	1.71	0.79	1.14	0.67	1.84	1.12	1.17	49%	14.0%
60E-15[2^]	2	4.03	3.70	3.65	0.0%	6.3	84.08	6	2.80	3.90	1.13	1.12	0.00	0.90	1.18	1.14	95%	10.5%
60E-16[2^]	2	4.50	4.22	4.15	0.0%	5.0	86.43	5	0.73	1.01	0.42	0.42	0.60	0.15	1.05	1.12	87%	7.7%
60E-17[2^]	11	3.51	3.93	3.99	76.2%	6.6	95.57	5	0.26	0.37	0.15	0.14	0.04	0.23	1.05	1.09	96%	8.9%
60E-18[2^]	7	3.30	3.62	3.83	92.9%	5.9	90.24	5	0.53	0.66	0.30	0.32	0.00	0.23	1.12	1.05	100%	12.0%
60E-19[1*]	6	3.57	3.57	3.65	33.3%	5.9	91.43	5	1.01	0.86	0.86	0.91	0.10	0.30	1.20	1.14	42%	17.8%
60E-20[1^]	5	4.17	3.87	3.83	0.0%	6.0	93.95	6	1.31	1.45	0.84	0.88	0.68	0.09	1.06	1.06	100%	17.2%
Weighted Corridor Average		3.18	3.33	3.44	63%	5.82	81.95	4.87	0.34	0.40	0.22	0.24	0.12	0.19	0.19	1.20	63%	13.7%
SCALE																		
Performance Level		**Non-Interstate**				**All**			**Urban [1] Rural [2]**				**All**		**Uninterrupted ^ Interrupted ***			**All**
Good / Above Average		> 3.50			< 5%	> 6.5	> 80	> 6	≤ 0.71 (Urban) ≤ 0.56 (Rural)				< 0.22		≤ 1.15 ≤ 1.15		> 90%	> 17%
Fair / Average		2.9 - 3.5			5%-20%	5.0 - 6.5	50 - 80	5 - 6	0.71 - 0.89 (Urban) 0.56 - 0.76 (Rural)				0.22 - 0.62		1.15 - 1.5 1.15 - 1.5		90% - 60%	17% - 11%
Poor / Average		< 2.90			> 20%	< 5.0	< 50	< 5	> 0.89 (Urban) > 0.76 (Rural)				≥ 0.62		≥ 1.5 ≥ 1.5		< 60%	< 11%

[1] Urban or Fringe Urban Operating Environment
[2] Rural Operating Environment
^ Uninterrupted
* Interrupted

Table ES-2: 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)
			NB/EB	SB/WB							NB/EB	SB/WB		NB/EB	SB/WB	
191-1[2*]	24	0.39	0.04	0.73	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.26	2.52	2.00	2.26	3.02	1.00	No UP
191-2[2*]	43	0.49	0.54	0.44	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.67	1.78	22.04
191-3[2^]	17	0.59	0.00	1.18	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.47	0.00	No UP
191-4[2^]	12	0.58	1.06	0.11	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	12.23	5.00	No UP
191-5[1*]	5	0.06	0.12	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	26.08	16.96	None
70-6[1*]	9	0.38	0.67	0.08	Insufficient Data	25%	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	1.33	4.67	No UP
70-7[2^]	30	1.08	1.41	0.75	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	4.55	5.40	17.03
70-8[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	14.30	0.00	No UP
70-9[2^]	5	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.40	3.00	None
70-10[2^]	19	1.63	0.76	2.50	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	8.63	2.51	No UP
70-11[2^]	4	3.37	6.74	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	0.00	0.00	No UP
70-12[2^]	15	2.63	2.97	2.28	Insufficient Data	22%	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	17.39	0.00	No UP
70|60-13[1*]	12	2.97	3.36	2.57	Insufficient Data	21%	Insufficient Data	Insufficient Data	Insufficient Data	1.58	1.67	1.49	1.58	22.75	26.52	15.84
60E-14[2^]	16	1.78	1.50	2.07	Insufficient Data	81%	Insufficient Data	Insufficient Data	Insufficient Data	1.49	1.52	1.46	1.49	63.60	344.95	13.03
60E-15[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.32	1.34	1.29	1.32	0.00	90.50	16.79
60E-16[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.28	1.14	1.42	1.28	52.20	12.25	No UP

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
^ Uninterrupted
* Interrupted

Note: "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: NB/EB	Directional Safety Index: SB/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: NB/EB	Directional Max TTTR: SB/WB	Combined Average Peak TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB): NB/EB	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile (NB/EB): SB/WB	Bridge Vertical Clearance (feet)
60E-17[2^]	11	1.23	1.82	0.65	Insufficient Data	78%	Insufficient Data	Insufficient Data	Insufficient Data	1.18	1.15	1.20	1.18	3.27	61.40	No UP
60E-18[2^]	7	0.50	0.91	0.09	Insufficient Data	17%	Insufficient Data	Insufficient Data	Insufficient Data	1.22	1.32	1.13	1.22	0.00	22.29	No UP
60E-19[1*]	6	0.95	1.62	0.27	Insufficient Data	60%	Insufficient Data	Insufficient Data	Insufficient Data	1.63	1.74	1.52	1.63	14.00	20.30	No UP
60E-20[1^]	5	1.29	1.89	0.69	Insufficient Data	50%	Insufficient Data	Insufficient Data	Insufficient Data	1.20	1.25	1.14	1.20	74.94	7.11	No UP
Weighted Corridor Average		1.11	1.19	1.03	Insufficient Data	45%	Insufficient Data	Insufficient Data	Insufficient Data	1.64	1.75	1.54	1.64	12.16	30.69	18.90

SCALES

Performance Level	**2 or 3 or 4 Lane Divided Highway 2 or 3 Undivided Highway 4 or 5 Undivided Highway Urban 4 Lane Freeway**						**Uninterrupted**	**All**	
Good/Above Average Performance	< 0.81 <0.92 <0.78 < 0.73	< 23.4% < 11.2% < 43.8% < 0.0%	< 56.4% < 66.9% < 21.1% < 60.6%	< 16% <3.8% <8.8% <0.0%	<3.7% <4.2% < 0.8% < 6.9%	< 0% < 0% < 0.5% < 0%	< 1.15	< 44.18	> 16.5
Fair/Average Performance	0.81 – 1.19 0.92 - 1.08 0.78 - 1.22 0.73 - 1.27	23.4% - 29.3% 11.2% - 15.6% 43.8% - 49.5% 0.0% - 0.0%	56.4% - 65.0% 66.9% - 74.5% 21.1% - 32.1% 60.6%-78.1%	16% - 26% 3.8% - 7.2% 8.8% - 13.5% 0.0% - 4.9%	3.7% - 9.9% 4.2% - 8.0% 0.8% - 5.5% 6.9% - 12.4%	0% - 2% 0% - 3.3% 0.5% - 3.8% 0.0% -0.0%	1.15 - 1.35	44.18-124.86	16.0 - 16.5
Poor/Below Average Performance	> 1.19 > 1.08 > 1.22 > 1.27	> 29.3% > 15.6% > 49.5% > 0.0%	> 65.0%	> 26% > 7.2% > 13.5% > 4.9%	9.90% > 8.0% > 5.5% > 12.4%	> 2% > 3.3% > 3.8% > 0.0%	> 1.35	> 124.86	< 16.0

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
^ Uninterrupted
* Interrupted

Note: "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 US 60|US 70|US 191 corridor links the Mexico border at the City of Douglas and the Phoenix metropolitan area to agricultural, mining and recreational activity in southeastern Arizona. In general, all three highways are two-lane facilities designed for relatively modest traffic volumes in a rural setting. At the same time, the corridor offers some unique benefits within the Arizona circulation system that could be leveraged for increased usage as the need arises.

US 191 provides a link between Mexico and Interstate 10 (I-10), the primary east-west interstate corridor along the southern states. As a result, US 191 serves as a major freight corridor for goods moving between Mexico and the United States. Similarly, the combination of US 191 and US 70 between I-10 and Globe offers a critical connection to mining and agricultural interests located in the greater Safford and Globe areas of Graham and Pinal Counties. US 60 between Globe and SR 79 links activities within the corridor to the major population and commerce center of the Phoenix metropolitan area.

Corridor Objectives

Statewide goals and performance measures were established by the ADOT Long-Range Transportation Plan (LRTP), 2010-2035. Statewide performance goals that are relevant to US 60|US 70|US 191 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 US 60|US 70|US 191 corridor: Mobility, 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 the 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

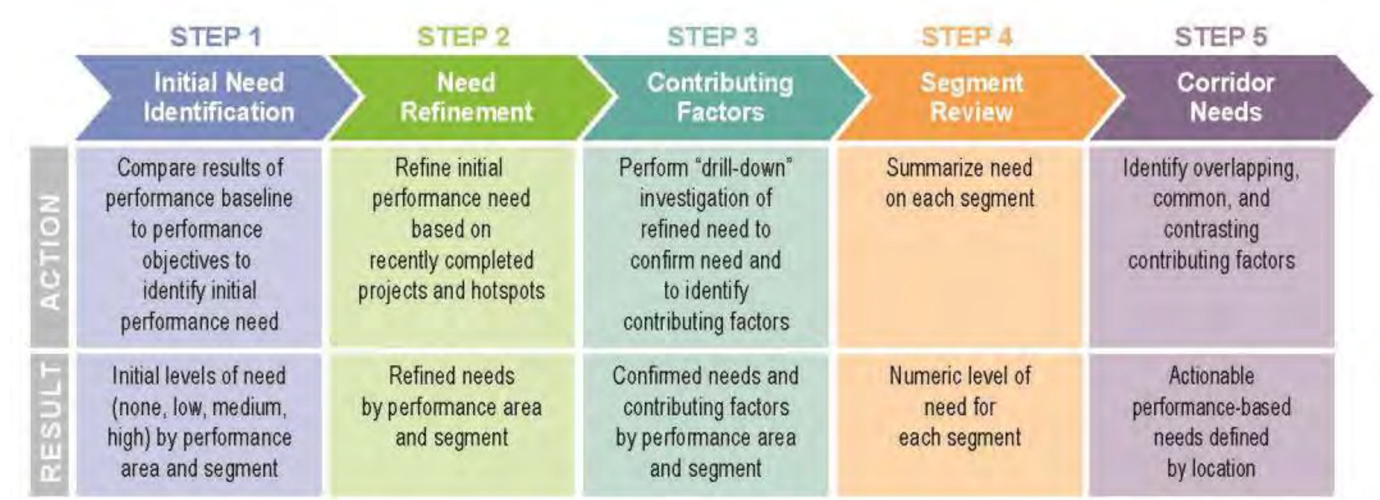


Figure ES-5: Initial Need Ratings in Relation to Baseline Performance (Bridge Example)

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, and the average needs for each segment. A weighting factor of 1.5 is applied to the average need scores of the performance areas identified as emphasis areas (mobility, safety, and freight for the US 60|US 70|US 191 corridor). There are 10 segments with a high average need, seven segments with a medium average need, and 31 segments with a low average need. More information on the identified final needs in each performance area is provided below.

Pavement Needs

- Seventeen segments (191-1 through 70|60-14 and 60-17 through 60-19) contain Pavement hot spots
- Segments 60-15, 60-16 and 60-20 have a final need of None, Segments 191-3, 191-4, 70-12, 60-14, 60-17 and 60-19 have a final need of Low, Segments 191-1, 191-5, 70-6, 70|60-13 and 60-18 have a final need of Medium, and Segments 191-2, and 70-7 through 70-11 show a final level need of High
- A high level of historical investment has occurred on Segments 191-3 and 70-9 and a medium level of historical investment has occurred through Segments 191-2, 191-4,191-5, 70-8, 70-10, and 70-12 through 60-17

Bridge Needs

- Bridge needs were identified on four segments of the corridor, 73 miles (30%) with a “Medium” level of bridge need.
- Seven bridges showed potential repetitive investment issues and may be candidates for life-cycle cost analysis to evaluate alternative solutions.
- Three bridges have bridge ratings of 4: Pinal Creek Bridge (No. 266), Waterfall Canyon Bridge (No. 328), and Queen Creek Bridge (No. 406).
- Eleven bridges were defined as hot spots since they had multiple bridge ratings of 5 or less or one bridge rating of 4.
- Of the eleven hot spot bridges, six also showed repetitive investment issues. These included the Holyoak Wash Bridge (No. 514), Pinal Creek Bridge (No. 549), Pinal Creek Bridge (No. 36), Pinal Creek Bridge (No. 266), Waterfall Canyon Bridge (No. 328) and Queen Creek Bridge (No. 406)

Mobility Needs

- Mobility Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis
- Segments 60-14, 60-19 and 60-20 have a final segment need of High; all other segments on the corridor have a final segment need of Low or None
- There is lack of bicycle accommodation along 60% of the corridor
- Mobility needs are primarily due to mobility, future v/c, and existing v/c issues

Safety Needs

- Safety Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis.
- Segments 70-10 through 60-14, 60-17, 60-19 and 60-20 have a final segment need of Medium or High; all other segments on the corridor have a final segment of Low or None
- Safety hot spots exist in Segments 70-6, 60|70-13, 60-14, and 60-17 through 60-20
- There is insufficient data to generate reliable ratings for the secondary measures including crashes at intersections, involving pedestrians, involving trucks, or involving bicycles

Freight Needs

- Freight Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis.
- Segments 191-1, 60-14 and 60-15 have a final segment need of Medium or High; all other segments on the corridor have a final segment need of Low or None
- Freight needs are primarily due to Freight TTTR, Closure Duration and Bridge Clearance
- There are two freight hot spots along the corridor: Pinal SR UP and Queen Creek Tunnel

Overlapping Needs

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.

- All segments on the corridor have overlapping needs. Traffic counters do not exist in Segments 191-2 through 70-12, approximately 161 miles or 66% of the corridor, resulting in insufficient data to calculate needs in the freight performance area for those locations.
- US 60|70 MP 243 to MP 255 (Segment 70|60-13) and US 60 MP 227 to MP 243 (Segment 60-14) have overlapping needs in all five performance areas. These segments comprised 28 of the 246 corridor miles.
- Segment 70|60-13 has an overall Medium need score on the corridor. Some needs are site specific while others are characteristics of the segment. Medium bridge needs are related to the Bloody Tanks Bridge (No. 173), Pinal Creek Bridge (No. 36), Pinal Creek Bridge (No. 266), Pinal Creek Bridge (No. 549) and McMillen Wash Bridge (No. 1028) which are hot spots due to poor structural ratings and exhibit high repetitive investment. High safety needs are due to the number of fatal or suspected serious injury collisions exceeding the statewide average which are due to failure to yield right-of-way and involve vehicles running off the road (left). Low freight needs are due to the bridge vertical clearance for the Pinal SPRR UP (No. 0562).
- Segment 60-14 has an overall High need and the highest need score in the corridor. This segment has significant grades and subsequently suffers from freight, safety and mobility needs related to delay and incidents/accidents associated with the grade along with speeding too fast for conditions. The segment includes 2 hot spot bridges, both which do not have repetitive investment histories. The Queen Creek Tunnel, also located in the segment, affects bridge and freight needs with low vertical clearance.

- Segments 60-19 registers an overall Medium need score on the corridor with overlapping mobility and safety needs. Medium safety needs are due to the number of fatal or suspected serious injury collisions exceeding the statewide average which are due to dark-lighted conditions and involve vehicles running of the road (left). High mobility needs are due to poor bicycle accommodation and poor existing peak hour volume-to-capacity ratio.

Table ES-3: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)																			
	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9	70-10	70-11	70-12	70|60-13	60-14	60-15	60-16	60-17	60-18	60-19	60-20
	MP 0-24	MP 24-67	MP 87-104	MP 104-116	MP 116-121	MP 339-330	MP 330-300	MP 300-298	MP 298-293	MP 293-274	MP 274-270	MP 270-255	MP 255-243	MP 243-227	MP 227-225	MP 225-223	MP 223-212	MP 212-205	MP 205-199	MP 199-194.3
Pavement	Medium	High	Low	Low	Medium	Medium	High	High	High	High	High	Low	Medium	Low	None*	None*	Low	Medium	Low	None*
Bridge	None*	Medium	Low	Low	N/A	Low	Low	None*	N/A	None*	Low	Low	Medium	Medium	None*	Medium	Low	Low	Low	None*
Mobility+	Low	None*	Low	None*	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	Low	Low	None*	Low	High	High
Safety+	None*	None*	Low	Low	None*	Low	None*	N/A#	N/A#	High	High	High	High	High	N/A#	N/A#	High	Low	Medium	Medium
Freight+	High	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	Low	High	Medium	Low	None*	Low	Low	Low
Average Need	**1.23**	**0.77**	**0.77**	**0.54**	**0.54**	**0.92**	**0.85**	**0.69**	**0.69**	**1.38**	**1.54**	**1.23**	**1.77**	**2.54**	**0.69**	**0.77**	**1.00**	**1.15**	**1.69**	**1.38**

**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.*

+ Identified as an emphasis area for the US 60|US 70|US 191 corridor

 # N/A indicates insufficient or no data available to determine level of need

Average Need Scale	
None*	< 0
Low	0.1-1.0
Medium	1.0-2.0
High	> 2.0

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 as addressing these needs will have the greatest effect on corridor performance. 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. US 60|US 70|US 191 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 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

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 US 60|US 70|US 191 corridor will be considered along with other candidate projects in the ADOT statewide programming process.

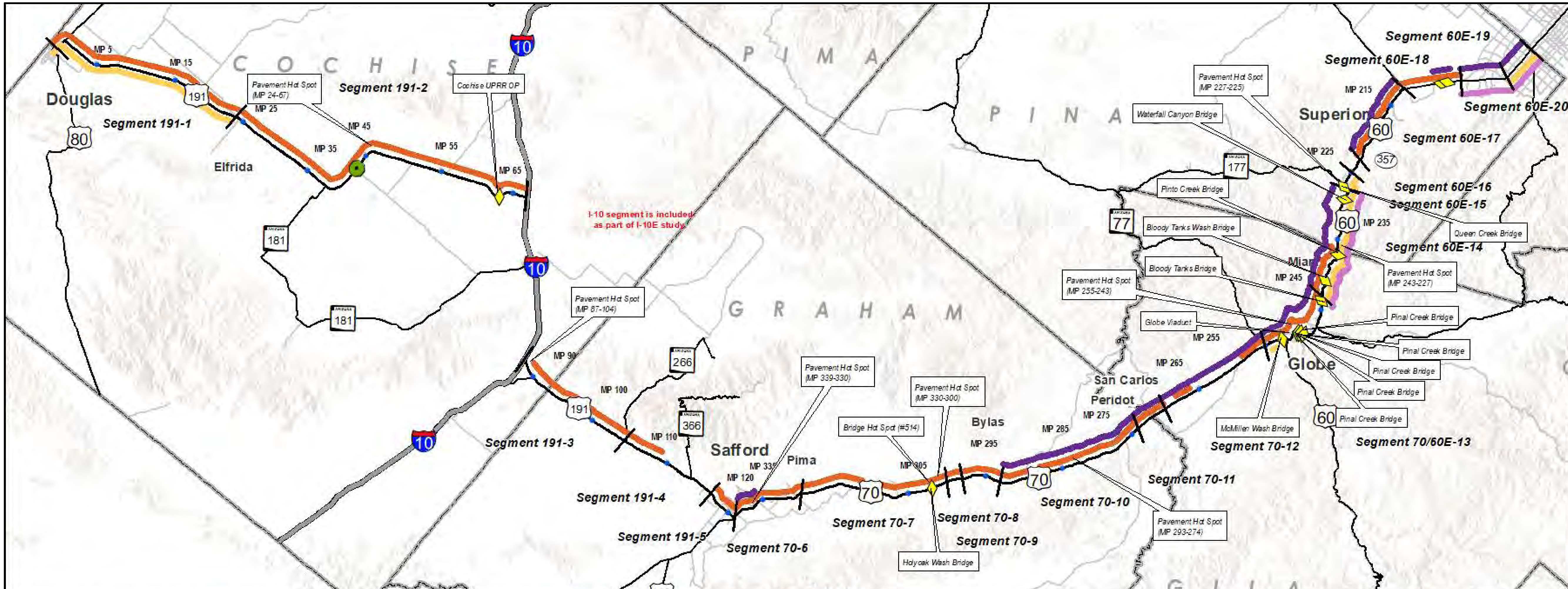
Candidate solutions include some or all of the following characteristics:

- 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	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9	70-10	70-11	70-12	70/60E-13	60E-14	60E-15	60E-16	60E-17	60E-18	60E-19	60E-20
	MP0-24	MP24-67	MP87-104	MP104-116	MP116-121	MP339-330	MP330-300	MP300-298	MP298-293	MP293-274	MP274-270	MP270-255	MP255-243	MP243-227	MP227-225	MP225-223	MP223-212	MP223-213	MP223-214	MP223-215
Pavement	Medium	High	Hot Spots	Hot Spot	Medium	Medium	High	High	High	High	High	Hot Spots	Medium	Hot Spot	-	-	Hot Spots	Medium	-	-
Bridge	-	Medium	-	-	-	-	Hot Spot	-	-	-	-	-	Medium	Medium	-	Medium	-	Hot Spots	-	-
Mobility*	-	-	-	-	-	-	-	-	-	-	-	-	-	High	-	-	-	-	High	High
Safety*	-	-	-	-	-	Hot Spot	-	-	-	High	High	High	High	High	-	-	High	Hot Spot	Medium	Medium
Freight*	High	-	-	-	-	-	-	-	-	-	-	-	Hot Spot	High	Medium	-	-	-	-	High

+ Identified as Emphasis Area for US 60 | US 70 | US 191 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 or None, which is not considered strategic.

US 60|70|191 Corridor Profile Study: Mexico to SR 79 Junction

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 are 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 eliminates options from further consideration and identify which options should be carried forward for further evaluation.

All Mobility, Safety, and Freight strategic investment areas that result in multiple independent candidate solutions are advanced directly to the Performance Effectiveness Evaluation.

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.

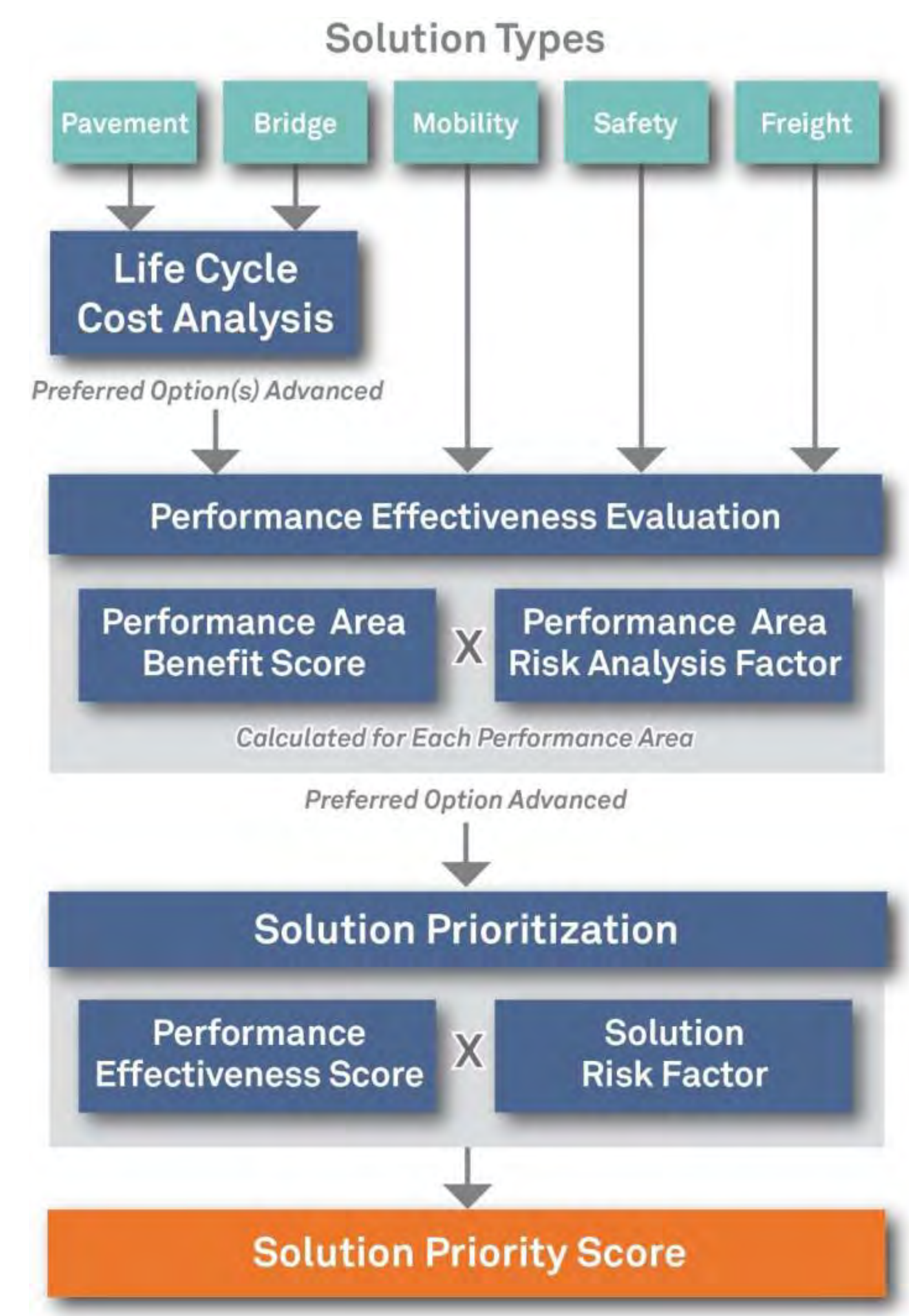
Solution Risk Analysis

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 sorted 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

Table ES-4 and **Figure ES-8** show the prioritized candidate solutions recommended for the US 60|US70|US 191 corridor. These solutions will increase the performance of the US 60|US70|US 191 corridor primarily in the Freight Performance Area. Solutions that address multiple performance areas tend to score higher in this process. Other findings include:

- Most of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest ranking solutions tended to have overlapping benefits in the Mobility, Safety, and Freight performance areas
- The highest priority solutions address needs in the US 60 Superior to Miami area

Other Corridor Recommendations

As part of the investigation of strategic investment areas and candidate solutions, other corridor solutions were also identified that are compatible with the long range vision to increase safety and support truck and freight movements:

- Road Safety Assessments are recommended in Peridot, Cutter and Globe to identify safety improvements, specifically pedestrian circulation and access needs in Peridot.
- Access Control Studies in Peridot (MP 270 – 274) and Globe-Miami (MP 243 – 255) are recommended to reduce friction and improve safety
- Recommend Superior to Globe Design Concept Study
- Recommend San Carlos Area (MP 268 – 292) Superelevation Study

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 the CPS 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 90/SR 80 corridor, but across the entire state highway system where 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 messaging 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 recommended 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 Traffic Operations Center, 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 US 60|US 70|US 191 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.

CPS Program Refinements

This CPS assessment is an update to the originally produced CPS assessments conducted between 2017 and 2019. Due to changes in state and federal reporting standards as well as data availability, the original methodology has been adapted to produce comparable and relatable performance, need, and evaluation results. The methodology changes include~~:~~

- Pavement performance now includes the addition of rutting as a component of the Pavement Distress measure
- Bridge performance no longer includes the % Functionally Obsolete secondary measure
- Safety performance includes updated secondary measure-categories~~,~~ and is evaluated against updated statewide averages.
- Mobility and Freight performance are evaluated using updated reliability measures based on Level of Travel Time Reliability and Truck Travel Time Reliability, which are new federal standard measure adapted from the previous Travel Time Index and Planning Time Index measures

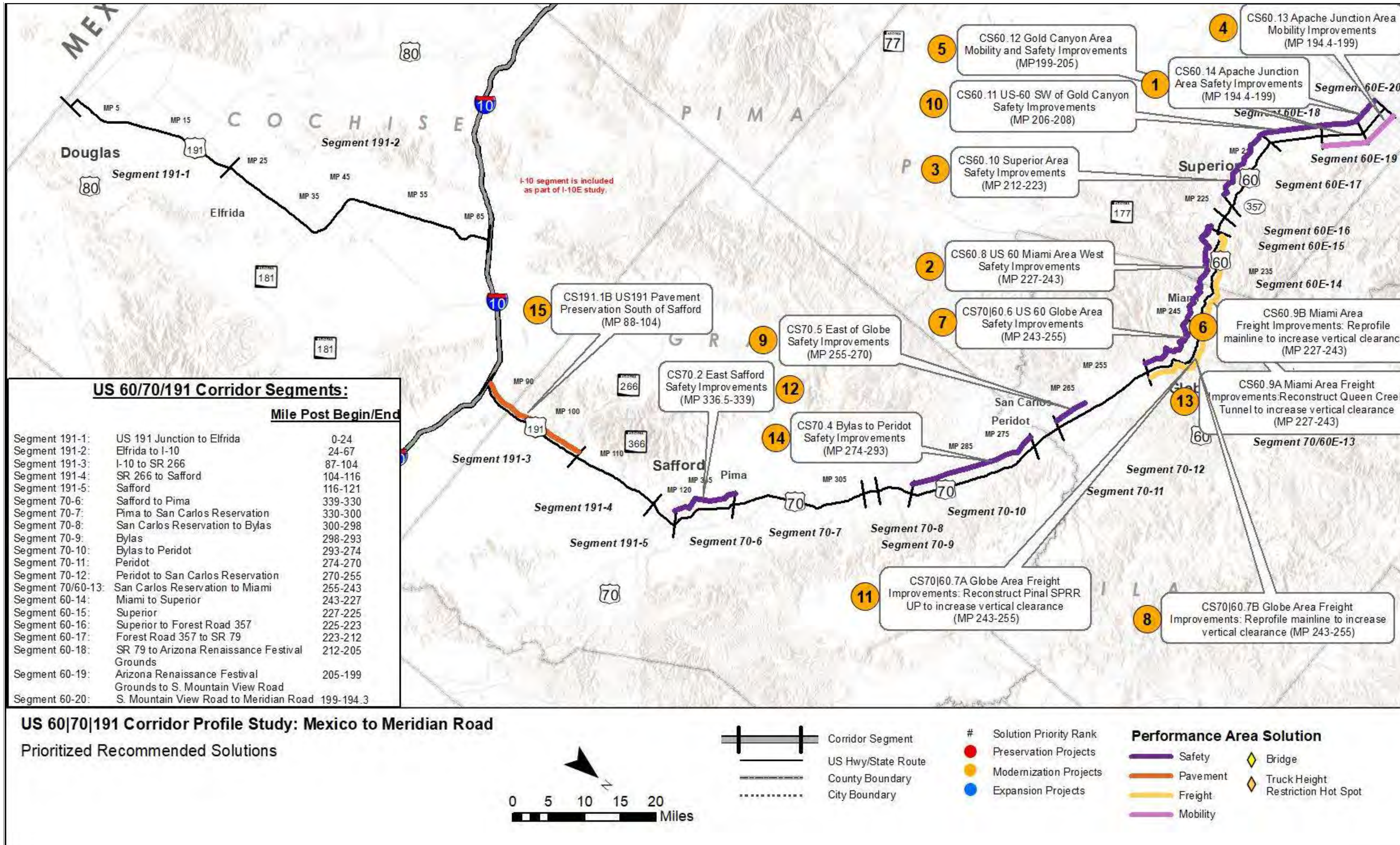
Table ES-4: Prioritized Recommended Solutions

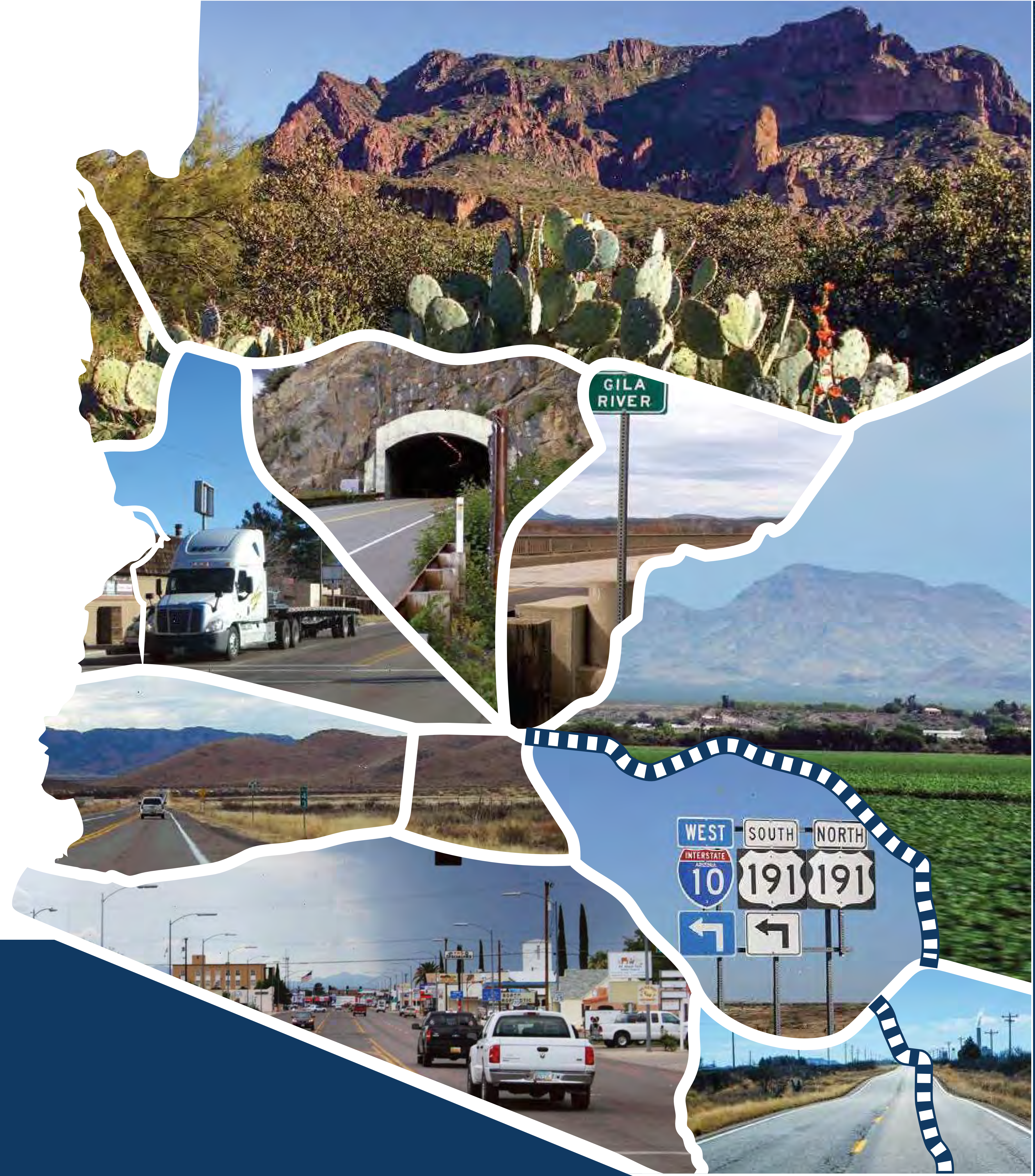
Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	60.14	-	Apache Junction Area Safety Improvements	Install inside and edge line rumble strips through entire segment Consider installing speed feedback sign MP 195	$0.3	M	362
2	60.8	-	Superior Area East Safety Improvements	Consider installing speed feedback signs at MP 229.9, MP 236, MP 241 Install centerline rumble strips at MP 229-231 Install high visibility striping and delineators MP 228-228.3 and MP 241-242 Install edge line rumble strips EB MP 228.17-228.3, MP 229.2-229.26, and MP 247-247.26	$17.0	M	227
3	60.10	-	Superior Area Safety Improvements	Install lighting at N Queen Valley Road and US 60 intersection Consider installing speed feedback sign MP 212.5 Install chevrons or curve warning sign at MP 219.33	$0.4	M	191
4	60.13	-	Apache Junction Area Mobility Improvements	Add through lane in NB/WB direction	$24.7	M	102
5	60.12	-	Gold Canyon Area Mobility and Safety Improvements	Add SB/EB through lane MP 199.12 to 206 Consider installing speed feedback sign at MP 201 Widen shoulders MP 199.12 to 205 Install lighting MP 201-202	$44.0	E	101
6	60.9	B	Superior Area East Freight Improvements	Reprofile mainline to increase vertical clearance	$1.9	E	100
7	70|60.6	-	Globe Area Safety Improvements	Consider installing speed feedback signs (2 EB and 2 WB between MP 246 - 250) High visibility striping Install signal ahead warning signs with beacons in advance of SR 188 intersection Construct passing lane in each direction from MP 243-243.25 and MP 253.6-255	$22.6	M	44
8	70|60.7	B	Globe Area Freight Improvements	Reprofile mainline to increase vertical clearance	$2.1	E	39
9	70.5	-	East of Globe Safety Improvements	Widen shoulders MP 255-270 Install centerline rumble strips MP 255-270 Install improved lighting from milepost 269-270 Construct passing lane in each direction (MP 255-256) Improve existing pedestrian and speed warning signs to include flashing beacons and speed feedback signs (MP 269.25)	$31.1	M	23
10	60.11	-	US-60 SW of Gold Canyon Safety Improvements	Install lighting MP 205-207 Widen inside shoulder 208.3-212 Consider installing speed feedback sign	$3.9	M	13

Table ES-4: Prioritized Recommended Solutions (continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
11	70|60.7	A	Globe Area Freight Improvements	Reconstruct Pinal SPRR UP to increase vertical clearance	$8.2	E	4
12	70.2	-	East Safford Safety Improvements	Provide flashing traffic signal warning signs at Milepost 337.82 and Milepost 338.03. Consider installing feedback signs in both directions at 20th Avenue	$0.1	M	3
13	60.9	A	Superior Area East Freight Improvements	Reconstruct Queen Creek Tunnel to increase vertical clearance	$33.3	E	3
14	70.4	-	Bylas to Peridot Safety Improvements	Widen shoulders Milepost 274-278 Install centerline rumble strips MP 275.5-276.5,MP 279.5-287.5 Install shoulder rumble strips MP 275.5-276.5,MP 279.5-287.5 Install high visibility striping and delineators from milepost 274-278 Improve existing pedestrian / speed warning signs to also include flashing beacons and speed feedback signs (MP 292,MP 280, MP 278.5) Construct passing lanes (WB MP 288.2-289.6) Formalize pullouts (signage, ROW for pullouts) (WB MP 274.5, EB MP 279, EB MP 289, WB 292)	$15.1	M	2
15	191.1	B	US191 Pavement Preservation South of Safford	Replace pavement	$200.3	M	0

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 US Route (US) 60|US 70: State Route (SR) 79 to US 191 and US 191: US 70 to SR 80 (US 60|US 70|US 191). The study examines key performance measures relative to the US 60|US 70|US 191 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 8 corridor studies within the three southern groupings began in Spring 2022 and include:

<u>Southeast</u>

- US 60: Meridian Road to US 70; US 70: US 60 to 191 (1ST Avenue); US 191: US 70 to I-10 and SR 80 to I-10
- SR 90: SR 80 to I-10; SR 80: US 191 to SR 90

<u>Southcentral</u>

- SR 347: SR 84 to Peters and Nall Road; SR 84: I-8 to SR 347
- I-10E: MP 187 to NM border
- I-19: Mexico border to I-10

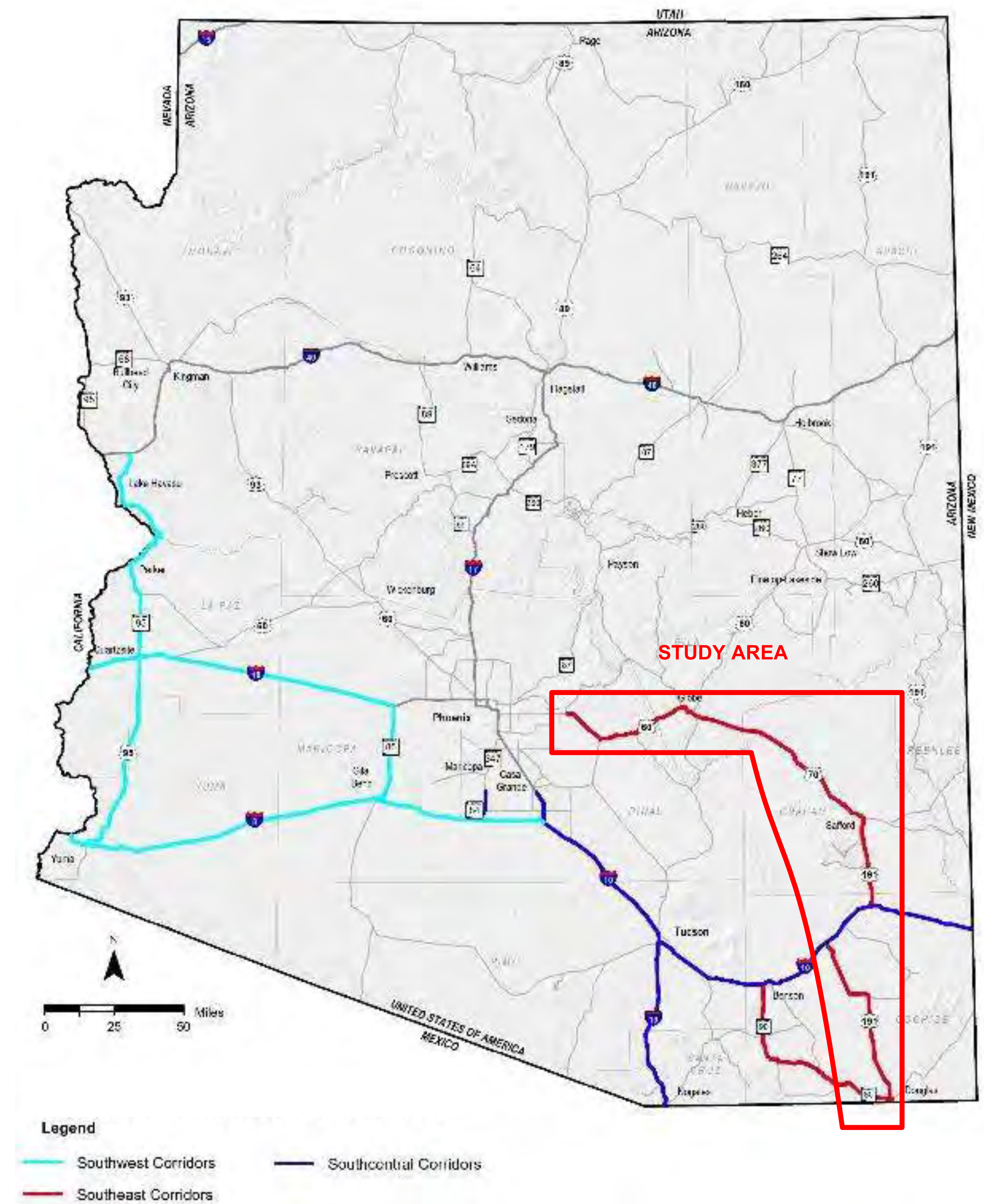
<u>Southwest</u>

- I-8: California border to I-10
- I-10W: California border to SR 85; SR 85: I-10 to I-8
- SR 95: I-10 to I-40; US 95: I-8 to I-10

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 US 60|US 70|US 191 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 US 60|US 70|US 191 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 US 60|US 70|US 191 corridor. Proposed actions are compared based on their likelihood of achieving desired performance levels, life-cycle costs, and cost effectiveness 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 US 60|US 70|US 191 corridor links the Mexico border at the City of Douglas and the Phoenix metropolitan area to agricultural, mining and recreational activity in southeastern Arizona. The US 60|US 70|US 191 Corridor Profile Study limits extend along US 191 from Douglas to I-10, continuing along US 191 from I-10 to Safford to the junction with US 70, then following US 70 from Safford, passing through the San Carlos Apache Reservation to Globe, and transitioning to the US 60 from Globe, through Superior to Apache Junction at the US 60|Meridian Road intersection. In general, all three highways are mostly two-lane facilities designed for relatively modest traffic volumes in a rural setting. At the same time, the corridor offers some unique benefits within the Arizona circulation system that could be leveraged for increased usage as the need arises.

US 191 provides a link between Mexico and Interstate 10 (I-10), the primary east-west interstate corridor along the southern states. As a result, US 191 serves as a major freight corridor for goods moving between Mexico and the United States. Similarly, the combination of US 191 and US 70 between I-10 and Globe offers a critical connection to mining and agricultural interests located in the greater Safford and Globe areas of Graham and Pinal Counties. US 60 between Globe and Apache Junction links activities within the corridor to the major population and commerce center of the Phoenix metropolitan area.

The combination of all three highways (US 60|US 70|US 191) creates a potentially significant alternative to I-10 and I-19 for travel in the eastern reaches of Arizona. A seamless connection among the three routes as a reliever could have major implications for improving international, interstate and intrastate trade along with opening access to financial and commercial distribution centers in the Phoenix area. It would also provide enhanced accessibility to tourist and recreational opportunities in southeastern Arizona.

1.4 Corridor Segments

The US 60|US 70|US 191 Corridor is divided into twenty planning segments for analysis and evaluation. These planning segments allow the corridor to be analyzed at a detailed level so that location-specific needs can be readily identified and compared to other segments on this or other corridors. Segmentation by similar characteristics (e.g., urban/rural surroundings, road width, traffic volumes) allowed the analysis to highlight anomalies or instances of poor performance within the context of each segment. The corridor is segmented at logical breaks where context changes such as terrain, daily traffic volumes, or roadway typical sections. Additional segment breaks may occur at major intersections or junctions, where the corridor transitions from rural to urban environments, other similar operating environments, maintenance sections, and at jurisdictional changes. Corridor segments are described in **Table 1** and are shown in **Figure 2**.

Table 1: US 60|US 70|US 191 Corridor Segments

Segment #	Route	Begin	End	Approximate Begin Milepost	Approximate End Milepost	Approximate Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2020 (2040) Average Annual Daily Traffic Volume (vpd)	Character Description
191-1	US 191	US 191B Junction	Elfrida	0	24	24	1,1	2,093 (2,885)	Starting from MP 0 along US 191, this segment is primarily rural in nature, but is the only route to the Bisbee-Douglas International Airport.
191-2	US 191	Elfrida	I-10	24	67	43	1,1	1,534 (2,759)	Beginning in Elfrida, a census-designated place, this segment connects smaller agricultural communities to each other and I-10.
191-3	US 191	I-10	SR 266	87	104	17	2,2	2,617 (3,316)	No known developments exist along this segment however, it does connect the Arizona State Prison at Fort Grant to I-10 via SR 266.
191-4	US 191	SR 266	Safford City Limit	104	116	12	1,1	4,343 (5,566)	Land along this segment is primarily owned by the Bureau of Reclamation and is therefore undeveloped. The segment begins at SR 266 and ends at approximately the southern limits of Safford. Traffic numbers in this segment increase due to the development south of Safford.
191-5	US 191	Safford City Limit	US 70 Junction	116	121	5	2,2	7,903 (9,942)	This segment starts at approximately the southern limits of Safford and ends at the junction with US 70. The segment is differentiated by jurisdiction and change in route along the corridor rather than any changes in terrain or traffic.
70-6	US 70	US 191 Junction	Pima	339	330	9	2,2	11,553 (14,390)	Beginning at the junction with US 191 in Safford and ending at the northern limit of Pima, this segment has very high traffic volumes which can be attributed to the higher density of surrounding communities and agricultural/mining operations. A large majority of the land abutting the route is privately owned.
70-7	US 70*	Pima	San Carlos Apache Reservation	330	300	19	1,1	3,116 (3,909)	This segment connects the western limit of Pima to the eastern edge of the San Carlos Apache Reservation. A majority of the land abutting US 70 is privately owned and used for agricultural purposes. Milepost equation MP 314.21 Back = MP 325.31 Ahead occurs within this segment.
70-8	US 70	San Carlos Apache Reservation	Bylas	300	298	2	1,1	2,749 (3,473)	Beginning at the eastern limits of the San Carlos Apache Reservation, this short segment terminates at the eastern limits of Bylas.
70-9	US 70	Bylas	Bylas	298	293	5	1,1	2,749 (3,434)	Bylas is a census-designated place within the San Carlos Apache Reservation. The boundary of this segment was determined by the extent of development and not necessarily the jurisdictional limits.
70-10	US 70	Bylas	Peridot	293	274	19	1,1	2,749 (3,468)	This segment begins at the western extent of development in Bylas and extends to the eastern limits of development in Peridot. The segment is within the San Carlos Reservation and has low traffic volume.

AADT = Average Annual Daily Traffic
vpd = vehicles per day

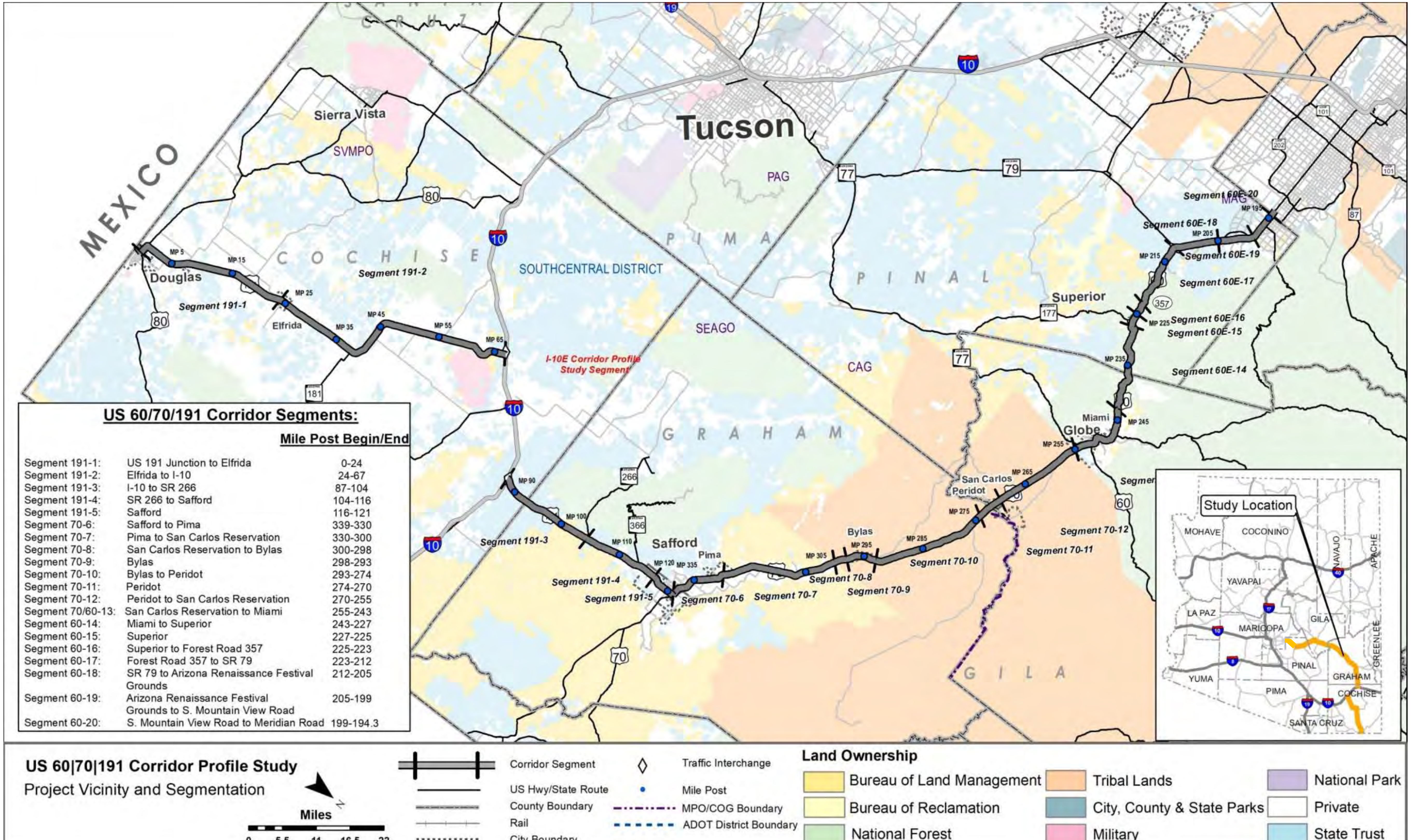
*Milepost equation MP 314.21Back = MP 325.31

Table 1: US 60|US 70|US 191 Corridor Segments (continued)

Segment #	Route	Begin	End	Approximate Begin Milepost	Approximate End Milepost	Approximate Length (miles)	Typical Through Lanes (NB/EB, SB/WB)	2020 (2040) Average Annual Daily Traffic Volume (vpd)	Character Description
70-11	US 70	Peridot	Peridot	274	270	4	1,1	2,900 (3,500)	The segment starts at the new medical center at the eastern limits of Peridot and extends west to the high school. It is differentiated by Graham/Gila County jurisdiction rather than changes in terrain or traffic.
70-12	US 70	Peridot	San Carlos Apache Reservation	270	255	15	1,1	5,800 (7,200)	Beginning at the Peridot High School and continuing to the western limit of the San Carlos Apache Reservation, this segment is differentiated by jurisdiction rather than any changes in terrain or traffic.
70|60-13	US 70/US 60	San Carlos Apache Reservation	Miami	255	243	12	2,2	11,100 (14,400)	Beginning at the western limits of the San Carlos Apache Reservation, this segment goes through the City of Globe, Claypool and Miami. Although this segment includes US 70 and US 60, there is no change in cross section therefore, the segment is differentiated by jurisdiction rather than any other changes. Higher traffic counts are due to the junction of US 60 and US 70 along with higher traffic counts and the proximity of large mines.
60-14	US 60	Miami	Superior	243	227	16	1,1	10,100 (15,400)	Beginning at the western limits of Miami and extending to the eastern limits of Superior, this segment bisects the Tonto National Forest. The high traffic volume can be attributed to a significant number of regular commuters in both directions (Valley to Globe) and tourist traffic.
60-15	US 60	Superior	Superior	227	225	2	1,1	7,500 (17,200)	This segment starts and ends at approximately the eastern and western limits of Superior. This segment is differentiated by jurisdiction rather than any changes in terrain or traffic.
60-16	US 60	Superior	Forest Road 357	225	223	2	2,2	10,700 (24,600)	This segment is bounded by the Tonto National Forest and is differentiated by the number of thru east and west lanes rather than changes in terrain or jurisdiction.
60-17	US 60	Forest Road 357	SR 79	223	212	11	2,2	11,000 (25,500)	Although this segment is generally flat in nature, it is differentiated by the number of thru lanes, compared to 60-16. Beginning at State Forest Road 357, this segment terminates at the interchange with SR 79.
60-18	US 60	SR 79	Arizona Renaissance Festival Grounds	212	205	7	2,2	14,000 (22,900)	The segment starts at the Florence Junction and terminates near the Arizona Renaissance Festival Grounds, just south of Gold Canyon.
60-19	US 60	Arizona Renaissance Festival Grounds	South Mountain View Road	205	199	6	2,2	18,700 (13,900)	This segment begins near Arizona Renaissance Festival Grounds, passes through Gold Canyon, and terminates at the eastern limits of Apache Junction.
60-20	US 60	South Mountain View Road	Meridian Road	199	194.3	5	2,2	48,500 (59,500)	Beginning at the eastern limits of Apache Junction and ending at the western limits of Apache Junction, this segment is widely used by people traveling to and from the Phoenix Metropolitan area.

AADT = Average Annual Daily Traffic
vpd = vehicles per day *Milepost equation MP 314.21Back = MP 325.31

Figure 2: Corridor Location and Segments



1.5 Corridor Characteristics

The US 60|US 70|US 191 corridor provides primary access to agriculture, mining and recreation areas in the southeastern part of Arizona. The corridor intersects I-10, which provides east and west access to and from the corridor. Beginning in Douglas, just north of the international border, the corridor extends northwest through Safford to Apache Junction, at the edge of the Phoenix metropolitan region, providing a key economic and recreational link in the region and state.

National Context

The southern and northern portions of the corridor both provide connectivity to the national transportation network. The southern portion of the corridor, US 191 south of I-10, provides a link between Mexico and I-10, the main east-west corridor along the southern states. As a result, US 191 serves as a major freight corridor for goods moving between Mexico and the US. The portion of the corridor north of I-10 provides connectivity between major mining and agricultural areas, linking to I-10 for national distribution.

Regional Connectivity

The combination of US 191 and US 70 between I-10 and Globe offers a critical connection to mining and agricultural interests located in the greater Safford and Globe areas of Graham and Pinal Counties. US 60 between Globe and Apache Junction ties all the activities within the corridor, along with additional mining and recreational opportunities along US 60, to the major population and commerce center of the Phoenix metropolitan area.

Commercial Truck Traffic

The US 60|US 70|US 191 corridor serves as an important route for agricultural products grown in the Gila River Valley, and for large mining operations near Safford, Miami and Superior. According to ADOT's 2020 Highway Performance Monitoring System (HPMS) data, the average daily commercial truck volumes along the corridor range from 9% to 27% of the total traffic flow on the corridor. Segments with higher truck percentages include Segments 191-2,191-3 and Segment 70-7 through Segment 70-11. The high volume of trucks on these segments can be attributed to the large active mines in the Safford and Globe areas, as well as agricultural shipments. Due to the nature of truck traffic, oversize loads are common on this corridor.

The Douglas Port of Entry (POE) is located at the southern end of the corridor. In 2020, this crossing was the second busiest port in Arizona in terms of total number of loaded truck containers, accounting for approximately 9% of all truck crossings within the State. One inspection station is located adjacent to northbound US 191 at MP 1 and includes a weigh-in-motion scale. One permanent border checkpoint is located just north of Elfrida, on northbound US 191 in Segment 191-2. This location requires all vehicles to stop for inspection, which can create some delay with commercial truck traffic.

Commuter Traffic

Commuter traffic on US 60|US 70|US 191 occurs mostly within the urbanized areas of Safford, Globe and Superior, which are the primary economic centers along the corridor. According to the most recent traffic volume data maintained by ADOT, traffic volumes range from approximately 1,500 vehicles per day in the El Frida/Sunsites/Cochise area to approximately 48,500 vehicles per day in the Apache Junction area.

According to the 2020 5-Year American Community Survey data from the US Census Bureau, 82% of the workforce in the City of Safford, 82% of the workforce in the City of Globe and 78% of the workforce in the Town of Superior drove alone for their daily commutes. Carpooling accounted for 9%-15% of daily commuters. As there are limited transit options in this area, less than 1% of daily commuters used public transportation as a means to get to work. The average commute travel time for these areas is 16-31 minutes. In the less populated areas of Bylas, Elfrida and Miami, there is a lower percentage of the population commuting to work alone, averaging 70%. In Bylas, 0.8% of commuters used public transportation. Twenty two percent of daily commuters in Elfrida and 20% of commuters in Miami carpooled. The average commute travel time for these less populated areas is similar to the larger urban areas, 16-31 minutes.

Recreation and Tourism

US 60|US 70|US 191 provides access to many recreational opportunities within the southeastern area of the state, including National Forest, wildlife areas, tribal recreation areas, and parks. The corridor provides access to both the Coronado and Tonto National Forests. The Coronado National Forest is broken up by the National Forest Service into different Ecosystem Management Areas, defined by each mountain range. The Dragoon, Pinaleno and Santa Teresa Ecosystem Management Areas are primarily accessed via US 191 or US 70. Segments 70|60-13 through 60-17 bisect the Tonto National Forest and can be used to access the Salt River and Superstition Mountains via SR 188.

There are numerous other natural areas and parks along the corridor. The Leslie Canyon National Wildlife Refuge is located east of US 191 between Douglas and Elfrida and encompasses over 2,700 acres. The Refuge was established in 1988 to protect two native fish species of the Rio Yaqui watershed. Located west of US 191 between Douglas and Elfrida is the Whitewater Draw Wildlife Area, which is comprised of 1,500 acres and home to over 20,000 Sandhill Cranes during the winter. The park is open from October 15 through March 15.

Mount Graham is located southwest of Safford and is accessible via US 191. Recreational activities include hiking, rock climbing and cross country skiing. In addition to these opportunities, the Mount Graham is home to the University of Arizona Steward Observatory. The observatory was established in 1916 however construction was delayed due to World War I. By 1963, the original 36" diameter telescope was replaced with a smaller one due to the increased light pollution from the expanding Tucson area.

Coolidge Dam and San Carlos Lake are located west of US 70 just south of Peridot. Built between 1924 and 1928, the Coolidge Dam was part of the San Carlos Irrigation Project and is responsible for irrigating 100,000 acres of agricultural land. Recreational uses within the area include fishing and boating on San Carlos Lake and hiking/biking on a 13 mile route along the dam's access road.

The Apache Gold Casino and Resort in Globe is located along Highway. Owned by the San Carlos Apache Tribe the casino includes 600 slot machines, and 200-seat bingo hall, a golf course, 145-room resort with a conference center and an RV park.

The Boyce Thompson Arboretum and State Park is located off of US 60 in Superior. Founded in the 1920's, the park is Arizona's oldest and largest botanical garden encompassing 323-acres and includes over three miles of paths and trails.

In addition to the recreational amenities already mentioned, there are numerous trailheads along the corridor which are accessible through informal pull off areas.

<u>Multimodal Uses</u>

Besides commuter and freight traffic, as previously discussed, the US 60 US 70 US 191 corridor also accommodates alternative modes of transportation. The following section will discuss the existing multimodal options connecting communities along the corridor to each other and the surrounding region.

Freight Rail

The Arizona Eastern Railroad (AZER) extends from Miami to Lordsburg, New Mexico and Clifton to Lordsburg. The line from Miami to Lordsburg follows the Gila River until Bylas, then parallels US 70 into the Safford area, extending from Segment 191-5 through US 70|60-13. There are three at grade crossings along the corridor. The crossings are located at US 191 near MP 121 in Safford, and MP 246 and MP 247 near Miami. Commodities transported include copper, chemicals, and agricultural and forest products.

There is one additional at grade rail road crossing along the corridor. The Magma Arizona Railroad crosses US 60 near MP 215.

Passenger Rail

The "Copper Spike Extension", which traveled from Globe to the Apache Gold Casino Resort on the San Carlos Indian Reservation, was previously used for passenger train service. In 2011, ownership of the line transferred and the line was abandoned

Bicycles/Pedestrians

Cyclists may use state highways unless specifically prohibited, although a majority of the corridor has an effective shoulder width of less than 10 feet on either side. Only Segments 191-3 and 60-17 have shoulder widths greater than 10 feet. Sidewalks are located along portions of the corridor within the urbanized areas. A pedestrian bridge at Fort Thomas provides a grade separated crossing of US 70. Additionally, within the areas of Bylas and Peridot, pedestrian facilities are not continuous on both sides of the roadway and drainage features create discontinuity in the informal, unpaved pedestrian network in these areas. Also, fencing along the roadway in Bylas and Peridot limits pedestrian crossing opportunities, although there are breaks in the fencing. Unpaved trails can also be found along the corridor and are served by informal pullouts.

Bus/Transit

Within the study area there are limited public transit opportunities. There are two local public transportation service providers along the US 60|US 70|US 191 corridor. The San Carlos Apache Nnee Bich'o Nii Public Transit Service provides buses between Safford and Globe with stops in Thatcher, Pima, Fort Thomas, Bylas, Peridot and Globe. There are three routes with an additional Casino Employee Shuttle. Fares range from $2.00-$10.00 round trip. The second service provider is the Cobre Valley Community Transit which serves Miami, Globe and unincorporated portions of Gila County. There are two routes between Miami and Globe, operating Monday through Friday 6:30am to 6:00pm. One way fares are $1.00. The transit provider also offers a Dial-a-Ride service with fares ranging from $1.00-$4.00, depending on distance.

While existing public transportation service providers may currently be limited, several recent planning documents and studies have identified the need to increase intercity and intracity public transit options along the corridor.

No Greyhound or Amtrak stations are located along the corridor. Private shuttle service provides transportation from Safford to Willcox, Benson, Tucson International Airport and Phoenix Sky Harbor Airport.

Aviation

Municipal airports along the corridor are located in Douglas, Safford, San Carlos, and Superior. The Bisbee Douglas International Airport located along US 191 in Douglas is owned by Cochise County and averages 54 aircraft operations per day. Thirty percent of daily operations are military-related and the remainder is general aviation. The Safford Regional Airport is located northeast of the corridor within Safford city limits. The airfield averages 38 aircraft operations per day. The San Carlos Apache Airport is located along US 70 in Globe. It is owned by the San Carlos Apache tribe and averages 36 aircraft operations per week. The Superior Municipal Airfield is located along US 60 near the western boundaries of the town. The airfield averages 200 aircraft operations per year.

<u>Land Ownership, Land Uses and Jurisdictions</u>

As shown **Table 2**, the corridor crosses multiple jurisdictions and land holdings throughout Cochise, Graham, Gila and Pinal Counties. A majority of the land directly abutting the corridor is privately owned. In the vicinity of the corridor, but not immediately adjacent to it, there are significant Bureau of Reclamation, State Trust and National Forest lands.

Population Centers

The major population centers within the US 60|US 70|US 191 corridor are centered around the urbanized areas of Douglas, Safford, Globe, and Superior. Table 2 provides a summary of the U.S. Census population for the communities along the corridor. The local municipalities saw little change in population between 2010 and 2020, where several of these municipalities actually decreased in population during the same timeframe. At the county level, the population shift was more noticeable, especially for Cochise and Pinal County. The populations in the communities along the corridor fluctuate significantly with market demands related to mining and agriculture activities. Looking at the projected 2040 population, Douglas, Safford and Bylas will experience the greatest growth. During the same time period, Cochise and Pinal County will also see a large population shift. However, the growth is not focused in the areas along the study corridor.

Major Traffic Generators

Along the corridor, major traffic generators are related to mining and agriculture activities, as well as recreation and local commuter traffic in the urbanized areas of Douglas, Safford, Globe and Superior. Outside of the study area, major traffic generators include the Douglas Port of Entry, which generates significant freight traffic that utilizes US 191 to access I-10. Traffic generated from agricultural activities fluctuates seasonally. Mining related traffic experiences significant fluctuations as mining activity varies based on the global price of copper.

There are currently operational mines in Superior, Globe-Miami, and north of Safford, with plans for increases in mining activity in the vicinity of Superior. These mining activities generate traffic related to employment, and induced activity related to the increase in population in the local communities. In some cases, shift workers may live temporarily in housing near the mine while their families live in another community, where the mine workers commute home on off days. Due to the shift work related to the mines, there are not typical peak-hour and weekday commute patterns. The mines also generate significant truck traffic, including oversized loads related to mining equipment.

Tribes

Segments 70-8 through 70-12 bisect the San Carlos Apache Reservation.

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 suggested actions that can be taken to alleviate those stressors. Using the HabiMap Tool developed by Arizona Game and Fish Department (AGFD), which is an interactive database of the information included in the SWAP, the following wildlife considerations were identified in relation to the US 60|US 70|US 191 corridor:

- Wildlife waters are located to the north of US 60 near Superior and on both sides of US 191 between Safford and I-10

Table 2: Current and Future Population

Community	2010 Population	2020 Population	2040 Population	% Change 2010-2040	Total Growth
Cochise County	**131,346**	**131,277**	**130,456**	**-1%**	**-890**
Douglas	17,378	16,416	15,448	-11%	-1,930
Elfrida	459	293	-	-	-
Graham County	**37,220**	**38,614**	**45,331**	**22%**	**8,111**
Safford	9,566	9,974	10,950	14%	1,384
Pima	2,387	2,520	2,870	20%	483
Bylas	1,962	2,005	2,459	25%	497
Peridot	973	994	1,220	25%	247
Gila County	**53,565**	**55,100**	**54,617**	**2%**	**1,052**
San Carlos	4,038	5,434	5,387	33%	1,349
Globe	7,533	7,460	7,457	-1%	-76
Miami	1,837	1,817	1,821	-1%	-16
Pinal County	**376,369**	**466,175**	**820,877**	**118%**	**444,508**
Superior	2,835	3,161	3,184	12%	349

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

- Willcox Playa/Cochise Important Bird Area is located along the eastern side of US 191 from approximately MP 60 continuing north to I-10
- A majority of the US 60|US 70|US 191 corridor bisects allotments/pastures, except along US 70 on the San Carlos Reservation and along US 191 south of US 181
- State Land holdings exist within the corridor, primarily along US 191 between Safford and I-10
- US Forest Service Land is located along US 60 and US 70 between SR 79 and SR 77
- Potential Wildlife Linkages exist along US 60 between SR 79 and SR 77 and along US 191 between SR 366 and I-10
- The Species and Habitat Conservation Guide indicates sensitive habitats exist along the corridor except a portion of US 70 which bisects the San Carlos Reservation
- “Species of Greatest Conservation Need” are identified along the corridor except a portion of US 70 which bisects the San Carlos Reservation
- A moderate level of “Species of Economic and Recreational Importance” are identified along the corridor except a portion of US 70 that bisects the San Carlos Reservation

Corridor Assets

The US 60|US 70|US 191 corridor links regionally important communities in the southwestern part of the state to Mexico, I-10 and the Phoenix metropolitan area. The southern portion of US 191 connects the Douglas Port of Entry to I-10 and is an important route for freight. The corridor is also a vital route between the large mining and agricultural activities within the Gila River Valley and the rest of the state. The Transportation Assets Map (Figure 3) shows key features that are available to the travelling public today.

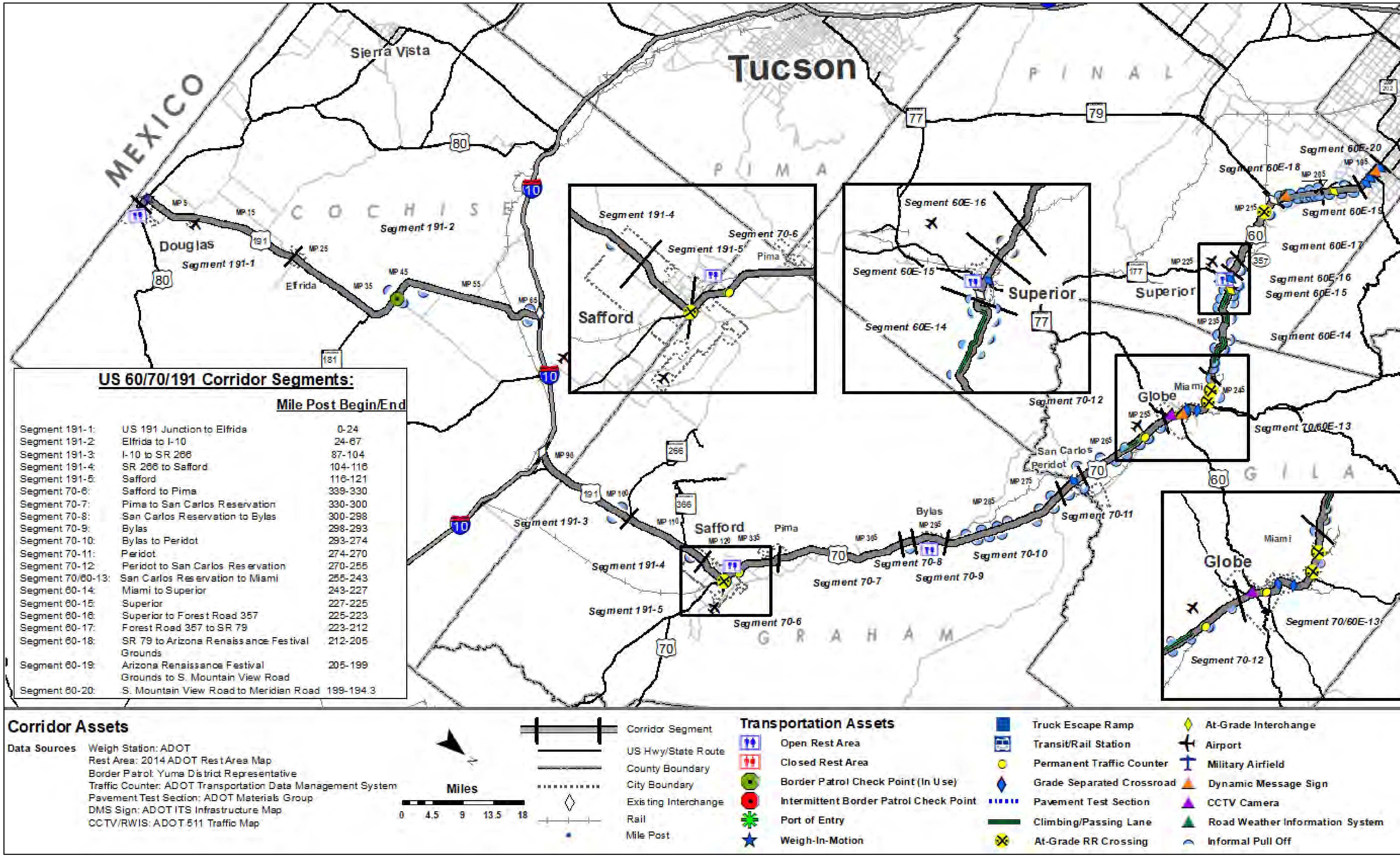
Limited public transportation services are offered within the region. These services either don't span the entire corridor or are only operated on a limited basis. While population changes have not been significant over the last few years, numerous transportation studies have identified a need for intercity and intracity transit services along the corridor.

The majority of assets are located along the most densely populated portions of the corridor near the Safford and Globe areas. In addition to the one Border Patrol check point, one weigh-in-motion scale and four public rest stops already discussed, there are three permanent traffic counters along the corridor, located at MP 337 and MP 254 on US 70 and MP 252 on US 60. There is one short climbing/passing lane for eastbound traffic on US 70 in Segment 70-12, while Segment 60-14 has numerous climbing and passing lanes for both directions. There are several grade-separated crossroads and at-grade railroad crossings along the corridor but they are primarily located near the urbanized areas.

Along the US 60|US 70|US 191 corridor ADOT operates four rest areas. The Douglas Rest Area is located at the southwest corner of US 191 and SR 80 at MP 0. The Safford Park Rest Area is located along the east side of US 70 at MP 338. The third rest area is the Bylas Rest Area along the west side US 70 at MP 296. The fourth rest area is the Superior Rest Area located along the east side of US 60 at MP 226 and serves the eastbound traffic. There are also a number of informal pullouts along the corridor.

There is one closed circuit television (CCTV) camera located along US 70 east of Globe to monitor traffic, as well as one dynamic message sign in the same vicinity currently in design.

Figure 3: Corridor Assets



1.6 Corridor Stakeholders and Input Process

A Technical Advisory Committee (TAC) was created, which was comprised of representatives from key stakeholders. TAC meetings were held at key milestones to present results and obtain feedback. In addition, several meetings were also conducted with key stakeholders between April 2022 and March 2023.

Key stakeholders for this study include:

- South Eastern Arizona Governments Organization (SEAGO)
- Central Arizona Governments (CAG)
- ADOT Southeast District
- ADOT South Central District
- ADOT Technical Groups
- Arizona Game and Fish Department (AGFD)
- Arizona State Land Department (ASLD)
- 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 section provides a summary of previous studies and plans and their recommendations that are relevant to the IUS 60|US 70|US 191 CPS.

Framework and Statewide Studies

- ADOT Bicycle and Pedestrian Plan Update
- ADOT Five-Year Transportation Facilities Construction Program 2016 - 2020
- ADOT Climbing and Passing Lane Prioritization Study
- Arizona Key Commerce Corridors
- Arizona Multimodal Freight Analysis Study
- Arizona Ports of Entry Study
- Arizona State Airports System Plan
- Arizona State Rail Plan
- Arizona Statewide Dynamic Message Sign Master Plan
- Arizona Statewide Rail Framework Study
- Arizona Statewide Shoulders Study
- Arizona Roadway Departure Safety Implementation Plan (RDSIP)
- Arizona Wildlife Action Plan / Arizona Wildlife Linkages Assessment
- Building a Quality Arizona (BQAZ)
- Eastern Arizona Framework Study
- FHWA Freight Analysis Framework
- MAG 2035 RTP
- What Moves You Arizona? Long-Range Transportation Plan 2010-2035

Regional Planning Studies

- Arizona – Sonora Border Master Plan
- Bi-National Border Transportation Infrastructure Needs Study
- Gila County Rail Passenger Study
- Graham County Transit Feasibility Study
- Pinal County Comprehensive Plan Update
- Pinal County Open Space and Trails Master Plan
- Pinal County Regionally Significant Routes for Safety and Mobility Study
- Pinal County Transit Feasibility Study
- Pinal Creek Trail Conceptual Plan
- Safford General Plan
- SEAGO Transportation Coordination plan Update
- SR 80 & US 191 Oversized Load Study

Planning Assistance for Rural Areas (PARA) and Small Area Transportation Studies (SATS)

- Cobre Valley Comprehensive Transportation Study
- City of Douglas Small Area Transportation Study
- Gila County Small Area Transportation Study
- Gila County Transportation Study
- Graham County Alternate Route Study
- Graham County/ Safford/ Thatcher/ Pima Small Area Transportation Study
- San Carlos Apache Tribe Transit Feasibility Study

Design Concept Reports (DCR) and Project Assessments (PA)

- US 60 Florence Junction – Superior DCR
- US 60 Superior – Globe Feasibility Study
- US 60 Superior – Globe Scoping (MP 222 – MP 258)
- US 70 Bylas Road Safety Assessment
- US 70 Segment 1 Pima – Thatcher Final DCR
- US 70 Segment 2 Thatcher – Safford Final DCR
- US 191 Douglas to I-10 Final DCR
- US 191 I-10 to SR 266 Final DCR
- US 191 Jct SR 266 to US 70 Final Corridor Selection Report
- US 191 Whitewater Draw to Thompson Rd Final DCR
- US 60 Passing Lanes (Miami-Superior) Final PA

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)	
1	2	2	0	DMS sign north and southbound		√				N	Arizona Statewide DMS Plan
2	7	N/A	N/A	Bisbee Douglas International Airport improvements	√			2017-2019		N	ADOT Five Year Program
3	67.5	67.5	0	Reconstruct interchange with I-10		√				N	Arizona Key Commerce Corridors
4	87	121	34	Reconstruct to 4 lane divided highway I-10 to US 70			√			N	BQAZ Eastern Arizona Framework Study
5	90	90	0	DMS sign southbound		√				N	Arizona Statewide DMS Plan
6	104	121	17	Alternate Route			√			N	Graham County SATS/US 191 Alternative Route Study/US 191 Jct. SR 266 to US 70 Corridor Selection
7	104.6	121	16.4	Local public transit service		√				N	Graham County SATS
8	110.9	116	5.1	Restripe to 5 lanes between Atresia Road and Lebanon Road			√	2018-2023		N	Graham County SATS
9	110.9	118	4.4	Widen to 4 lanes between Artesia Road and Armory Road			√	2008-2013		N	Graham County SATS
10	114	114	0	SR 366 and Swift Trail Road Intersection Improvement		√		2008-2013		N	Graham County SATS
11	114	118	4	Pavement preservation	√			2016		Y	ADOT Five Year Program
12	116	116	0	DMS sign northbound		√				N	Arizona Statewide DMS Plan
13	118	118	0	Armory Road Intersection Improvement		√		2008-2013		N	Graham County SATS
14	119	119	0	Discovery Park Boulevard Intersection Improvement		√		2008-2013		N	Graham County SATS
15	120	121	1	Restripe to 5 lanes between 11th Street and US 70			√	2008-2013		N	Graham County SATS
16	121	N/A	N/A	Extend Highway North US 70 to 8th Street			√	2018-2023		N	Graham County SATS
17	121	N/A	N/A	Safford Regional Airport improvements	√	√	√	2016 - 2020		N	ADOT Five Year Program

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			Document
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)	
18	339	339	0	Intersection Improvement		√		2008-2013		N	Graham County SATS
19	339	338	1	Safety /Intersection Improvements		√		2018		N	ADOT Five Year Program
20	339	328	11	Provide enhanced local transit in Safford/Pima/Thatcher			√			N	Eastern Arizona Framework Study Graham County Transit Feasibility Study
21	339	328	11	Provide Complete Streets in Safford/Pima/Thatcher		√				N	Eastern Arizona Framework Study
22	339	253	86	Widen roadway to 4 lanes between US 191 and Globe			√			N	Eastern Arizona Framework Study/BQAZ
23	337	337	0	Intersection Improvement		√		2008-2013		N	Graham County SATS
24	335.8	335.8	0	Intersection Improvement		√		2008-2013		N	Graham County SATS
25	335.7	335.7	0	Intersection Improvement		√		2008-2013		N	Graham County SATS
26	335.6	335.6	0	Intersection Improvement		√		2008-2013		N	Graham County SATS
27	335.5	335.5	0	Traffic signal or roundabout		√		2008-2013		N	Graham County SATS
28	330	329	1	Construct Pedestrian Bridge Extension		√		2017	H8397 01C	Y	ADOT Five Year Program
29	312.25	312.25	0	Add Center Turn Lane Bryce-Eden Road			√			N	Graham County SATS
30	300	299	1	Bridge Replacement and Rehabilitation	√			2016	H8547 01C	Y	ADOT Five Year Program
31	300	291	9	Pathway, entry monument and intersection improvements		√		2016	H8031 01C H7637 01C	Y	ADOT Five Year Program
32	298	294	4	Construct continuous two-way left turn lane			√			N	Road Safety Assessment US 70
33	298	294	4	Install street name signs for all intersections		√				N	Road Safety Assessment US 70
34	298	294	4	Evaluate 50 MPH speed limit		√				N	Road Safety Assessment US 70

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			Document
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)	
35	298	294	4	Pedestrian Safety improvements – Pedestrian crossings, warning signs/flashing lights, ADA compliant pedestrian gates		√				N	Road Safety Assessment US 70
36	297.7	296.5	1.1	Eliminate passing zone through Bylas		√				N	Road Safety Assessment US 70
37	297	294	3	Repair 4 street lights west of rest area, 3 lights between MP 294 and 295 and 1 between MP 267 and 297		√				N	Road Safety Assessment US 70
38	296.5	296.5	0	Curb installation on north side of US 70		√				N	Road Safety Assessment US 70
39	296.5	296.5	0	Realign intersection		√				N	Road Safety Assessment US 70
40	295.5	294.6	0.9	Eliminate passing zone through Bylas		√				N	Road Safety Assessment US 70
41	288	282	6	Tier 2 priority westbound climbing lane		√				N	ADOT Climbing and Passing Lane Prioritization Study
42	288	281	7	Tier 2 priority westbound passing lane		√				N	ADOT Climbing and Passing Lane Prioritization Study
43	271	269	2	Construct passing lanes		√		2018		N	ADOT Five Year Program
44	271	251	20	Passenger rail service along Arizona Eastern Railway from Globe to San Carlos			√			N	Gila County Rail Passenger Study
45	270	267	3	Tier 2 priority east and westbound passing lane		√				N	ADOT Climbing and Passing Lane Prioritization Study
46	264	262	2	Tier 2 priority eastbound climbing lane		√				N	ADOT Climbing and Passing Lane Prioritization Study
47	259	259	0	San Carlos Apache Airport improvements	√	√	√	2016 - 2020		N	ADOT Five Year Program
48	254	254	0	Intersection Study at SR 70 and SR 77		√		2015		N	Cobre Valley Comprehensive Transportation Study
49	254	235.5	0.5	Widen to four-lane roadway		√	√	2020		N	Cobre Valley Comprehensive Transportation Study
50	253.75	253.75	0	Rehabilitate Southern Pacific bridge		√		2020		N	Cobre Valley Comprehensive Transportation Study

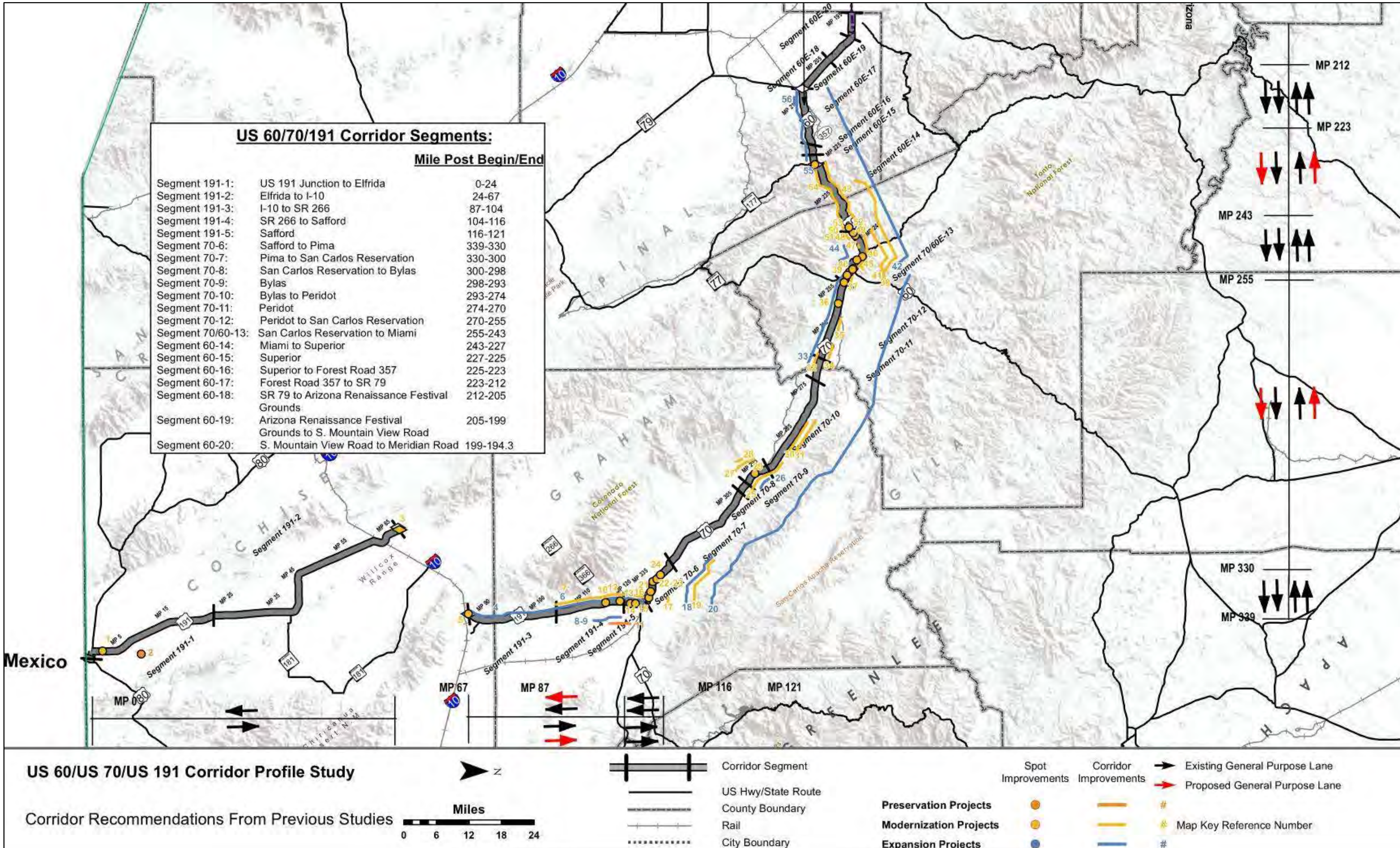
Table 3: Corridor Recommendations from Previous Studies (continued)

Map Key Ref. #	Begin MP	End MP	Length (miles)	Project Description	Investment Category (Preservation [P], Modernization[M], Expansion [E])			Status of Recommendation			Document
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)	
51	253	253	0	DMS sign eastbound		√				N	Arizona Statewide DMS Plan
52	252	243	9	Speed Limit Study		√		2015		N	Cobre Valley Comprehensive Transportation Study
53	252	243	9	Construct new sidewalks on north side		√		2020		N	Cobre Valley Comprehensive Transportation Study
54	252	212	40	Construct alternative alignment/Widen to 4 lanes			√	2030		N	Cobre Valley Comprehensive Transportation Study /BQAZ
55	252	227	25	Priority Paved Shoulder Opportunity		√				N	ADOT Statewide Bicycle and Pedestrian Plan Update
56	251	246	5	Passenger rail service along Arizona Eastern Railway from Miami to Globe			√			N	Gila County Rail Passenger Study
57	250.75	250.75	0	Replace Maple Street Bridge		√		2020		N	Cobre Valley Comprehensive Transportation Study
58	249.9	249.9	0	Rehabilitate Pinal Creek bridge		√		2020		N	Cobre Valley Comprehensive Transportation Study
59	247	246.5	0.5	Access Management Study		√		2015		N	Cobre Valley Comprehensive Transportation Study
60	247	247	0	DMS Sign Eastbound		√				N	Arizona Statewide DMS Plan
61	245.5	243	2.5	Implement access management through Miami		√		2030		N	Cobre Valley Comprehensive Transportation Study
62	244.6	244.6	0	Intersection improvements at Latham Boulevard		√		2020		N	Cobre Valley Comprehensive Transportation Study
63	244.5	244.5	0	Add exclusive turn lanes on US 60		√		2020		N	Cobre Valley Comprehensive Transportation Study
64	244.25	244	0.25	Restripe to a five-lane section		√		2020		N	Cobre Valley Comprehensive Transportation Study
65	243.75	243.75	0	Rehabilitate Bloody Tanks Wash bridge		√		2020		N	Cobre Valley Comprehensive Transportation Study
66	242	242	0	Re-align intersection		√		2030		N	Cobre Valley Comprehensive Transportation Study
67	242	227	15	East and Westbound Shoulder Improvement		√				N	Statewide Shoulders Study

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			Document
					P	M	E	Program Year	Project No.	Environmental Documentation (Y/N)	
68	226	213	13	Regional part-time bus service between Florence Junction and Superior; park-and-ride in the vicinity of Florence Junction			√			N	Pinal County Transit Feasibility Study
69	222.3	219.9	2.4	Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek			√			Y	US 60 Florence Jct – Superior DCR and EA
70	219.9	216.3	3.6	Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit			√			Y	US 60 Florence Jct – Superior DCR and EA
71	215	214	1	Queen Valley TI- Construct full access controlled, grade-separated interchange over Queen Valley Rd and the Arizona Magma RR			√			Y	US 60 Florence Jct – Superior DCR and EA
-	N/A	N/A	0	Bridge Infrastructure Improvements East of SR 177	√					N	Arizona Key Commerce Corridor
-	N/A	N/A	0	Bridge Infrastructure Improvements between SR 177 and SR 77	√					N	Arizona Key Commerce Corridor
-	N/A	N/A	0	Bridge Infrastructure Improvements at Globe	√					N	Arizona Key Commerce Corridor

Figure 4: Corridor Recommendations from Previous Studies



2.0 CORRIDOR PERFORMANCE

This chapter describes the evaluation of the existing performance of the US 60|US 70|US 191 corridor. A series of performance measures are 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

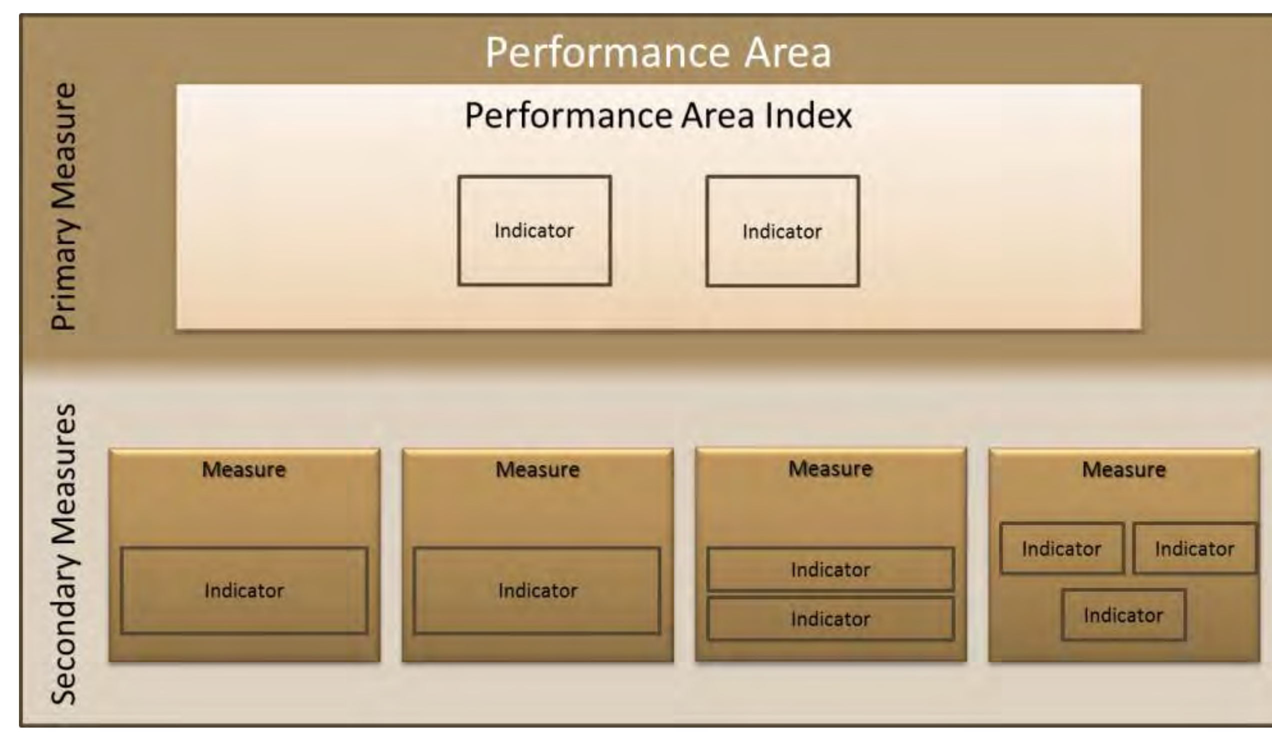
Performance Area	Primary Measure	Secondary Measures
Pavement	**Pavement Index** Based on a combination of International Roughness Index, cracking, and rutting	• Directional Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	**Bridge Index** Based on lowest of deck, substructure, superstructure 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

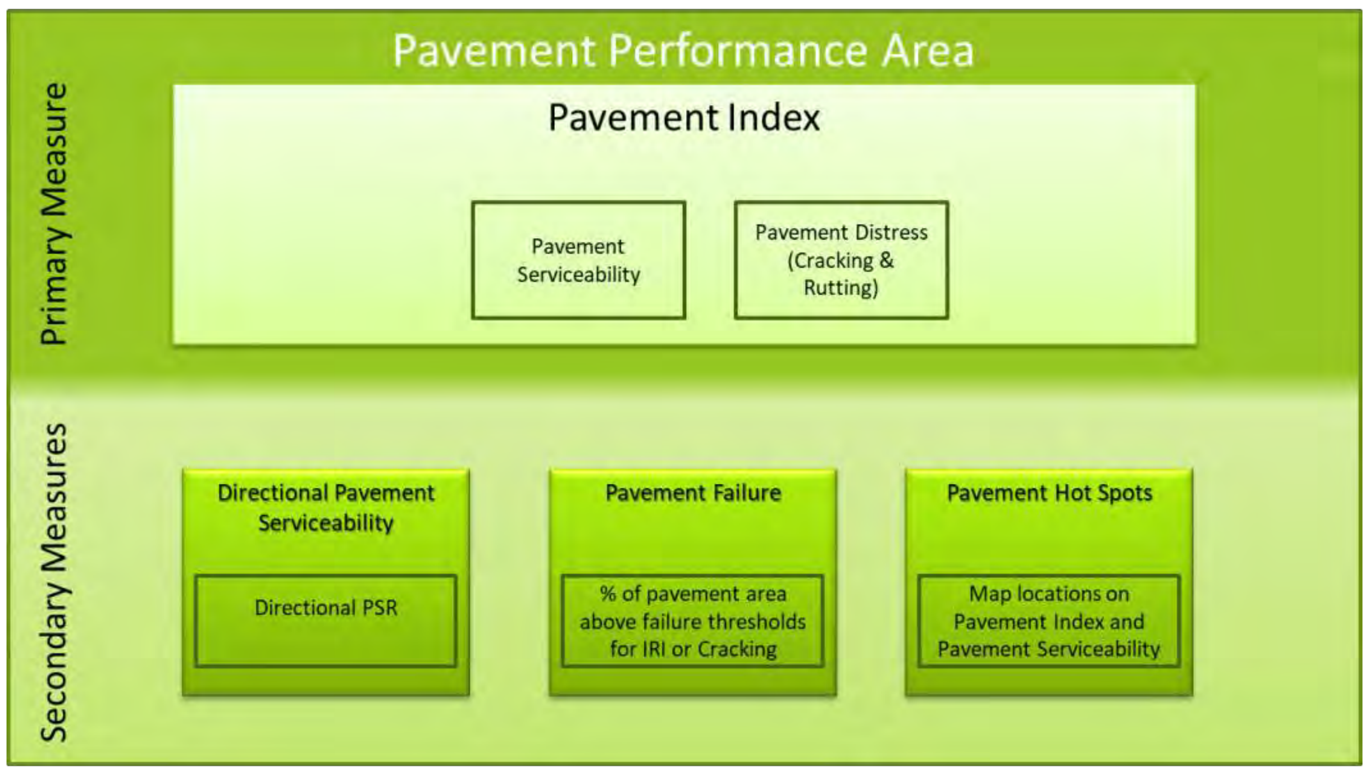


2.2 Pavement Performance Area

The Pavement performance area consisted 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 US 60|US 70|US 191 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 US 60|US 70|US 191, all segments are considered the non-interstate operating environment.

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 Performance 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 the analysis, the following pavement conditions were observed on US 60|US 70|US 191:

- Based on the weighted average of the Pavement Index, the pavement is in “poor” condition on 6 of the 20 segments studied, “fair” condition for 7 of the segments and “good” condition for the other 7 segments.
- Hot spots are present in all segments except for Segments 60E-15, 60E-16, and 60E-20.
- Pavement Failure evaluation assesses the percentage of lane miles considered in failure throughout the corridor. All segments show “poor” performance in area failure except for Segments 60E-15, 60E-16, and 60E-20.
- The Directional Pavement Serviceability shows “fair” or “good” performance except for Segment 70-7 which shows “poor” performance for the NB/WB travel
- Segment 191-2 yielded the lowest Pavement Index

Table 5 summarizes the Pavement performance results for the US 60|US 70|US 191 corridor. **Figure 8** illustrates the primary Pavement Index performance and locations of pavement hot spots along the US 60|US 70|US 191 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 5: Pavement Performance

Segment	Segment Length (miles)	Pavement Index	Pavement Serviceability		% Area Failure
			Dir 1 (NB/WB)	Dir 2 (SB/EB)	
191-1	24	3.17	3.10	3.24	71%
191-2	43	2.89	3.44	3.38	56%
191-3	17	3.42	3.63	3.69	72%
191-4	12	3.44	3.29	3.32	42%
191-5	5	3.10	3.16	3.07	80%
70-6	9	3.23	3.15	3.25	60%
70-7	19	2.83	2.87	3.08	87%
70-8	2	2.59	3.35	3.67	100%
70-9	5	2.71	3.44	3.63	100%
70-10	19	2.69	3.10	3.35	79%
70-11	4	2.40	3.27	3.28	88%
70-12	15	3.57	3.28	3.53	33%
70|60-13	12	3.28	3.13	3.28	54%
60E -14	16	3.68	3.66	3.82	44%
60E -15	2	4.03	3.70	3.65	0%
60E -16	2	4.50	4.22	4.15	0%
60E -17	11	3.51	3.93	3.99	76%
60E -18	7	3.30	3.62	3.83	93%
60E -19	6	3.57	3.57	3.65	33%
60E -20	5	4.17	3.87	3.83	0%
Weighted Corridor Average		3.17	3.34	3.45	62%
SCALES					
Performance Level		**Non-Interstate**			
Good		> 3.50	> 3.50		< 5%
Fair		2.90 - 3.50	2.90 - 3.50		5% - 20%
Poor		< 2.90	< 2.90		> 20%
Performance Level		**Interstate**			
Good		> 3.75	> 3.75		< 5%
Fair		3.20 - 3.75	3.40 - 3.75		5% - 20%
Poor		< 3.20	< 3.4		> 20%

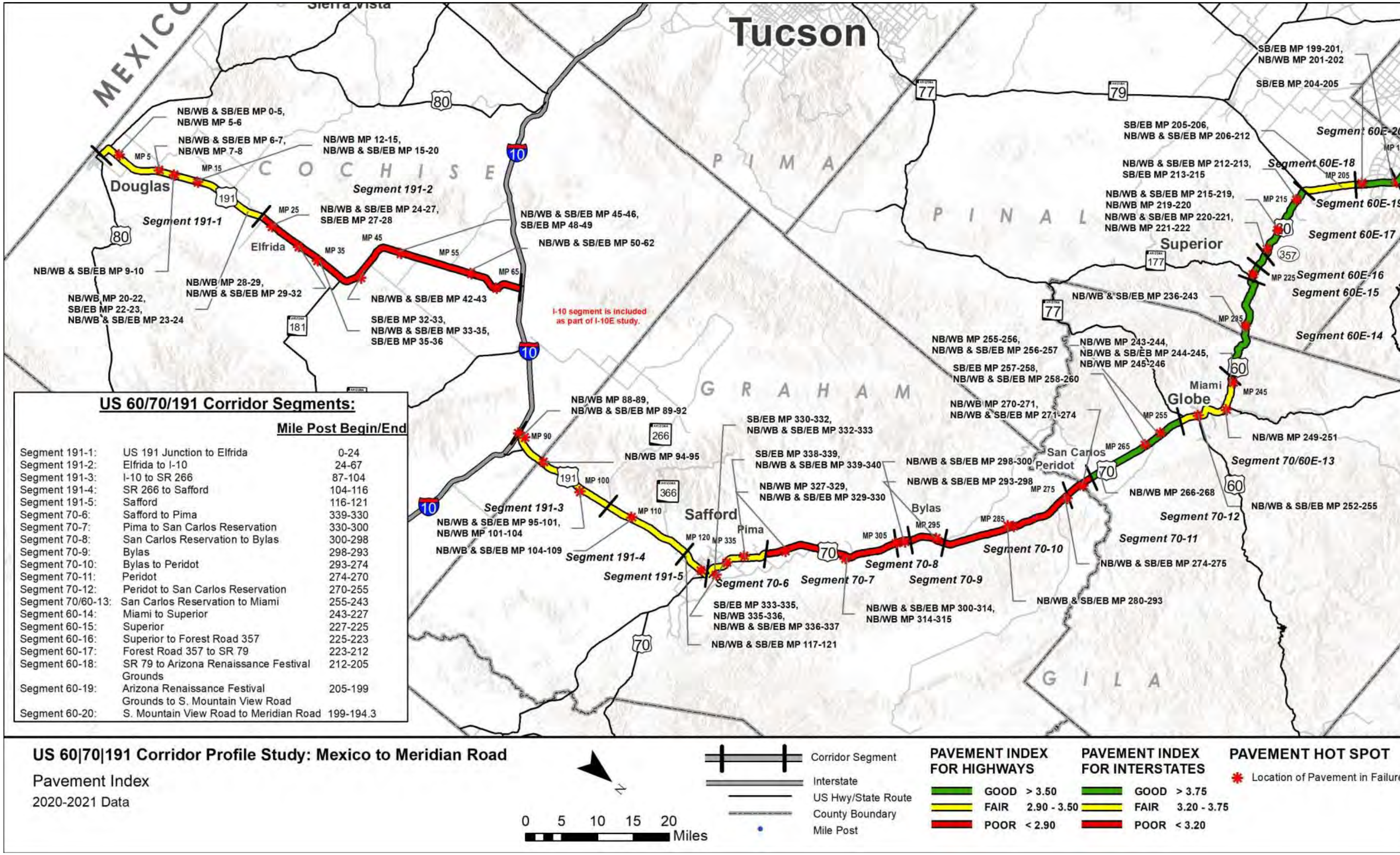
Statewide Transportation Asset Management Plan

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

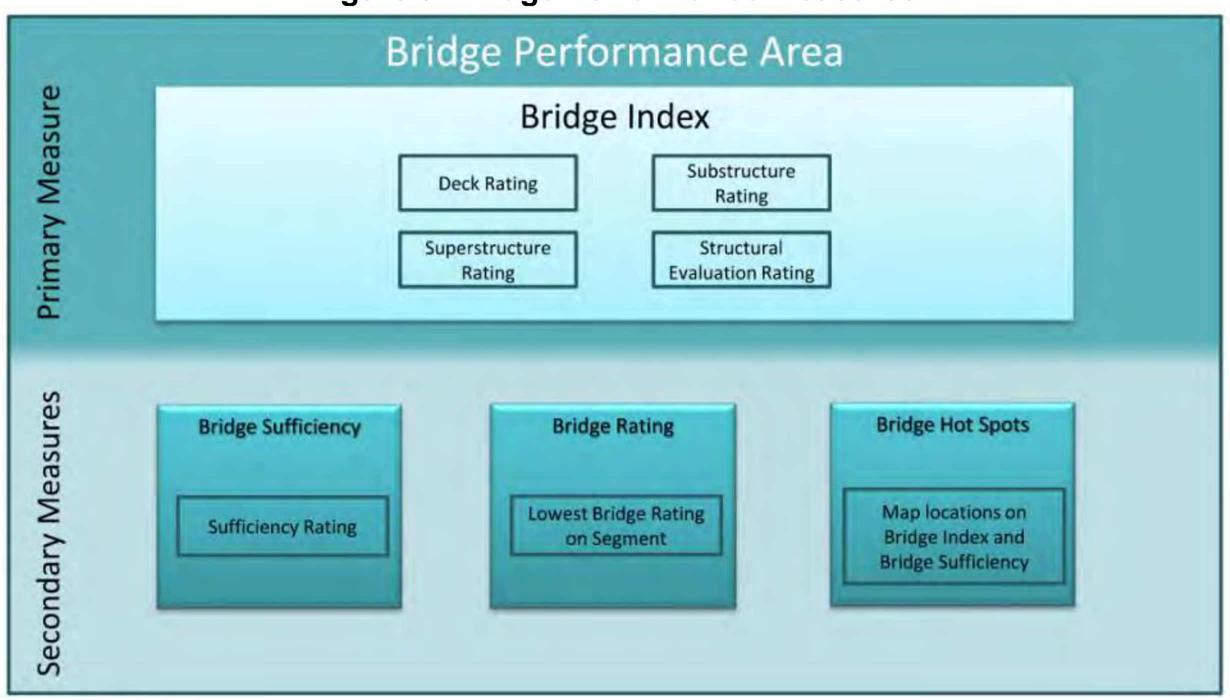


2.3 Bridge Performance Area

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 US 60|US 70|US 191 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 top-level assessment of the structural condition of bridges on the US 60|US 70|US 191 corridor, and for each corridor segment. The three secondary measures provide more detailed information to assess the bridge condition for each segment. A total of 48 major structures classified as bridges were included in the analysis. Major structures that are classified as Reinforced Concrete Box Culverts (RCBC) were not considered. Overall, based on the Bridge Index, all segments show “fair” performance.

- All the segments show “good” or “fair” performance ratings for the Bridge Index, which consists of the deck, substructure, superstructure and structural ratings. The ratings ranged from 5.0 to 7.0.
- Segments 191-5 and 70-9 do not have any bridges.
- Bridge Sufficiency ratings per segment are either “good” or “fair”. The weighted averaged values range from 52.90 to 95.57 out of 100.
- Eleven bridges have been rated as structurally deficient with five of the bridges being in Segment 70 | 60 – 13.
- Queen Creek Tunnel (MP 228.47, No. 407) located on US 60 approximately 1.6 miles east of the SR 177 junction is a major feature on the corridor that was not evaluated within the performance framework for structural integrity (it is considered in freight performance for the vertical clearance secondary measure). This unique feature (located within Segment

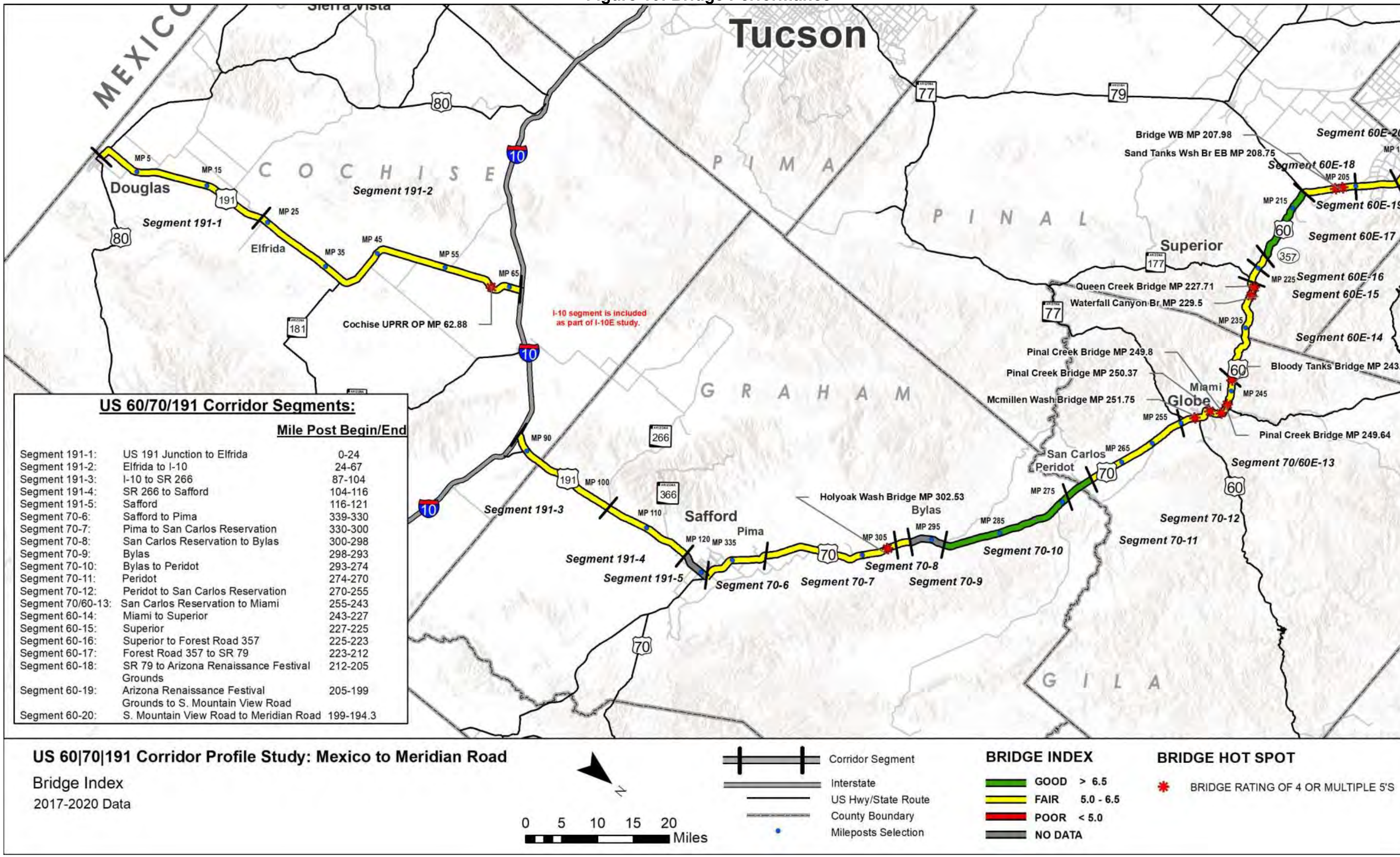
60-14) will require isolated consideration throughout the Corridor Profile Study process to include its contribution to corridor condition and needs.

Table 7 summarizes the bridge performance results for the US 60|US 70|US 191 corridor. **Figure 10** illustrates the primary bridge index performance and locations of bridge hot spots along US 60|US 70|US 191. Maps for each secondary measure can be found in **Appendix A.**

Table 7: Bridge Performance

Segment #	Segment Length (miles)	# of Bridges	Bridge Index	Sufficiency Rating	Lowest Bridge Rating
191 - 1	24	1	6.0	87.80	6
191 - 2	43	2	5.4	69.23	5
191 - 3	17	2	5.5	93.81	5
191 - 4	12	1	6.0	69.50	6
191 - 5	5	0	No Bridges		
70 - 6	9	1	6.0	68.10	6
70 - 7	30	8	5.7	70.25	5
70 - 8	2	1	6.0	73.00	6
70 - 9	5	0	No Bridges		
70 - 10	19	1	7.0	80.00	7
70 - 11	4	2	6.7	82.02	5
70 - 12	15	1	6.0	52.90	6
70|60 - 13	12	11	5.2	78.01	4
60 E - 14	16	6	5.5	68.13	3
60 E - 15	2	3	6.3	84.08	6
60 E - 16	2	2	5.0	86.43	5
60 E - 17	11	7	6.6	95.57	5
60 E - 18	7	8	5.9	90.24	5
60 E - 19	6	6	5.9	91.43	5
60 E - 20	5	4	6.0	93.95	6
Weighted Corridor Average			5.82	81.95	4.87
Scales					
Performance Level			**All**		
Good			> 6.5	> 80	> 6
Fair			5.0-6.5	50-80	5-6
Poor			< 5.0	< 50	<5

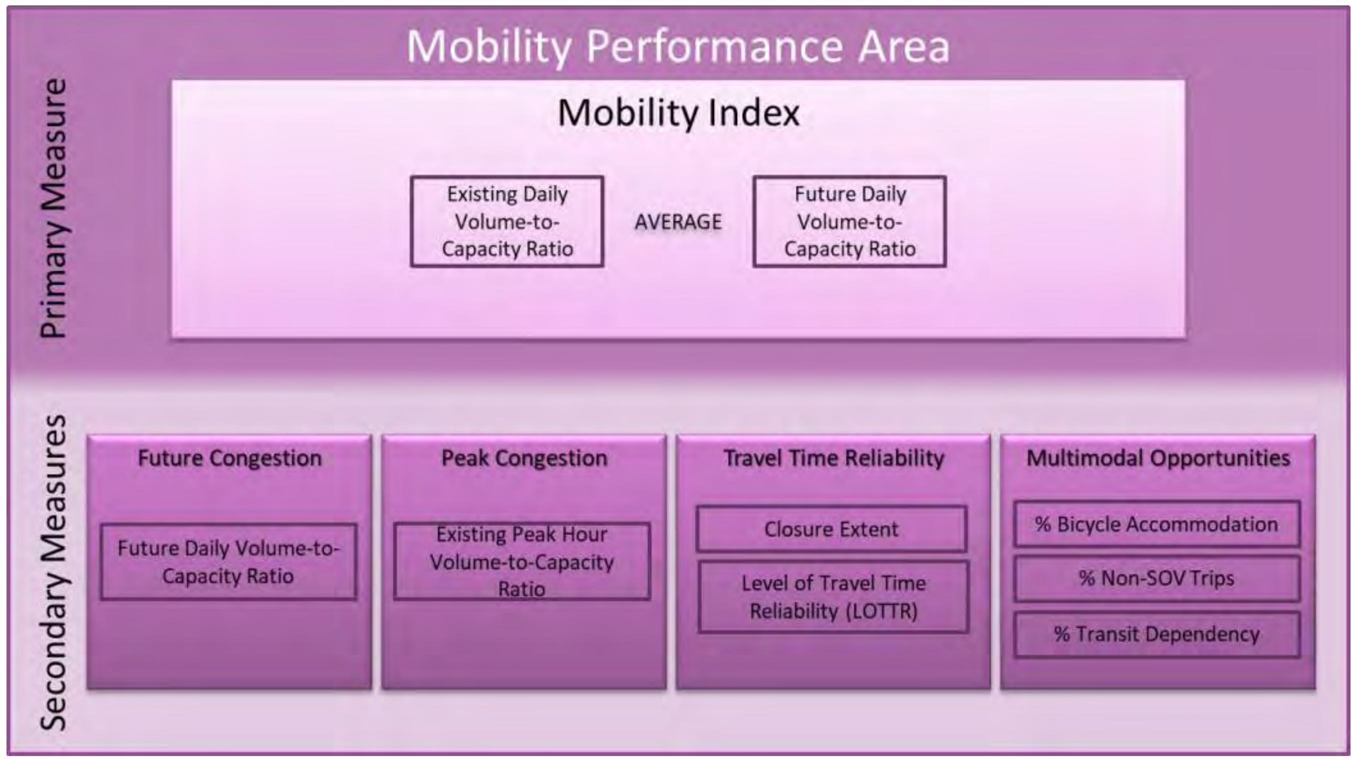
Figure 10: Bridge Performance



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 US 60|US 70|US 191 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



Primary Mobility Index

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 and interrupted flow (e.g., signalized at-grade intersections are present) vs. uninterrupted flow (e.g., controlled access grade-separated conditions such as a freeway or interstate highway). For US 60|US 70|US 191, the following operating environments were identified:

- Urban Interrupted (Segments 5-6; 13, 19)
- Urban Uninterrupted (Segment 20)
- Rural Uninterrupted (Segments 3-4; 7-12; 14-18)
- Rural Interrupted (Segments 1-2)

Secondary Mobility Measures

Four secondary measures provide and 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 80^{th} percentile travel time to average (50^{th} 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

<u>*Mobility Performance Results*</u>

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.

Each corridor segment is rated on a scale with other segments in similar operating environments. Within the mobility performance area, the relevant operating environments included urban or rural locations, as well as interrupted flow (where signalized at-grade intersections are present) and uninterrupted flow (grade-separated).

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

- Overall, based on the weighted average of the Mobility Index, the traffic operations are in “good” condition. Segment 60-14, 60-19 and 60-20 are rated “poor” due to high V/C ratios.
- Existing peak hour traffic operations are “good” throughout the corridor, except for Segment 60-14, 60-19 and 60-20 which are rated as “poor” or “fair”.
- Future traffic operations are anticipated to be “good” throughout the corridor, with the exception being “poor” or “fair” in Segment 60-14 and 60-18 through 60-20.
- Most of the corridor performed “good” in measuring closures for travel time reliability. Segment 60-16 showed “fair” performance in the westbound direction, and Segments 70|60-13 and Segments 60-17 through 60-19 showed “fair” performance in the eastbound direction. Segment 60-15 showed “poor” performance in the eastbound direction, and Segment 60-14 showed “poor” performance in both the eastbound and westbound directions; Segment 60-20 showed “poor” performance in the westbound direction; Segments 60-14 and 60-15 showed “poor” performance in the eastbound direction
- The Directional Max LOTTR shows both directions perform at “good” or “fair”. Segment 191-2 through Segment 70-12 have insufficient data.
- A majority of the corridor shows “poor” or “fair” performance for non-SOV trips meaning that many vehicles carry only a single occupant.
- Eleven segments show “poor” performance for accommodation of bicycles due to lack of sufficient shoulder width. Bicycle accommodation is “good” on Segments 191-2, 191-4, 60-15, 60-17, 60-18, 60-20 and “fair” for Segments 191-1, 70-7 and 60-16.

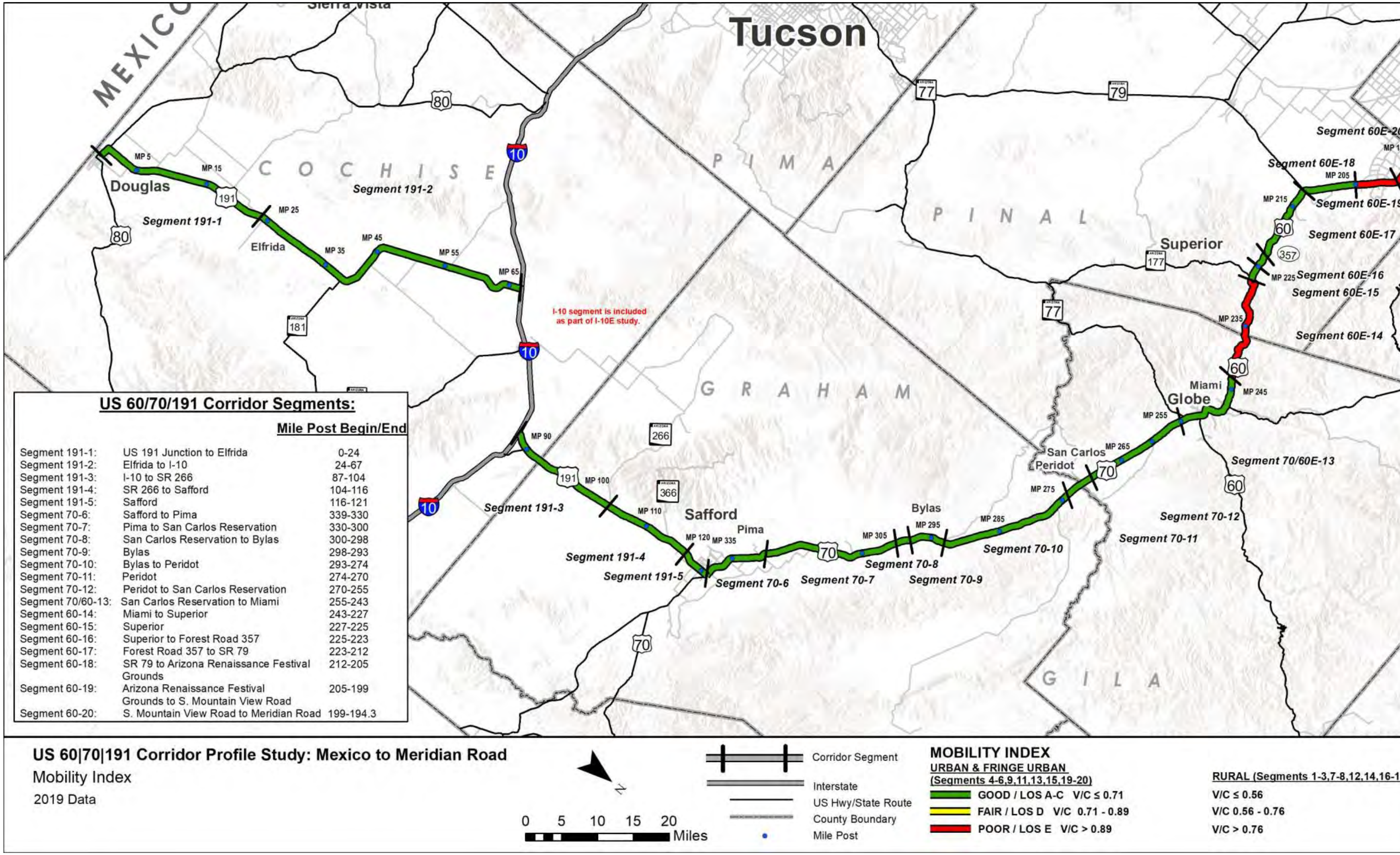
Table 8 summarizes the Mobility performance results for the US 60|US 70|US 191 corridor. **Figure 12** illustrates the primary Mobility Index performance along the US 60|US 70|US 191 corridor. Maps for each secondary measure can be found in Appendix A.

Table 8: Mobility Performance

Segment #	Length (mi)	Mobility Index	Future 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
				NB/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB		
191-1[2*]	24	0.16	0.18	0.13	0.13	0.04	0.02	1.40	1.39	66%	15.0%
191-2[2*]	43	0.13	0.17	0.08	0.11	0.03	0.01	N/A	N/A	100%	16.6%
191-3[2^]	17	0.05	0.05	0.03	0.03	0.02	0.00	N/A	N/A	49%	8.8%
191-4[2^]	12	0.17	0.19	0.11	0.11	0.08	0.07	N/A	N/A	97%	8.3%
191-5[1*]	5	0.27	0.30	0.15	0.16	0.20	0.20	N/A	N/A	27%	21.2%
70-6[1*]	9	0.41	0.45	0.31	0.29	0.02	0.04	N/A	N/A	46%	17.8%
70-7[2^]	30	0.18	0.20	0.11	0.10	0.04	0.01	N/A	N/A	73%	15.8%
70-8[2^]	2	0.11	0.12	0.08	0.05	0.10	0.00	N/A	N/A	0%	12.8%
70-9[2^]	5	0.24	0.26	0.16	0.12	0.04	0.04	N/A	N/A	26%	11.2%
70-10[2^]	19	0.15	0.17	0.11	0.08	0.07	0.05	N/A	N/A	4%	7.7%
70-11[2^]	4	0.18	0.20	0.13	0.10	0.00	0.00	N/A	N/A	4%	11.3%
70-12[2^]	15	0.24	0.27	0.16	0.17	0.17	0.00	N/A	N/A	23%	12.5%
70/60E-13[1*]	12	0.40	0.45	0.26	0.25	0.22	0.35	1.16	1.15	54%	16.6%
60E-14[2^]	16	1.42	1.71	0.79	1.14	0.67	1.84	1.12	1.17	49%	14.0%
60E-15[2^]	2	0.27	0.37	0.11	0.11	0.00	0.90	1.18	1.14	95%	10.5%
60E-16[2^]	2	0.27	0.38	0.16	0.16	0.60	0.15	1.05	1.12	87%	7.7%
60E-17[2^]	11	0.26	0.37	0.15	0.14	0.04	0.23	1.05	1.09	96%	8.9%
60E-18[2^]	7	0.53	0.66	0.30	0.32	0.00	0.23	1.12	1.05	100%	12.0%
60E-19[1*]	6	1.01	0.86	0.86	0.91	0.10	0.30	1.20	1.14	42%	17.8%
60E-20[1^]	5	1.31	1.45	0.84	0.88	0.68	0.09	1.06	1.06	100%	17.2%
Weighted Corridor Average		0.32	0.37	0.20	0.23	0.12	0.19	1.20	1.20	63%	14%
SCALES											
Performance Level		**Urban Rural**				**All**		**Uninterrupted Interrupted**		**All**	
Good		< 0.71 < 0.56				< 0.22		< 1.15 < 1.20		> 17%	90%
Fair		0.71 - 0.89 0.56 - 0.76				0.22 - 0.62		1.15- 1.33 1.30 - 2.00		11% - 17%	90%-60%
Poor		> 0.89 > 0.76				> 0.62		> 1.33 > 2.00		< 11%	60%

[1]Urban Operating Environment   ^Uninterrupted
[2]Rural Operating Environment   *Interrupted

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

<u>*Primary Safety Index*</u>

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. Since 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 US 60|US 70|US 191, the following operating environments were identified:

- 2 or 3 Lane Undivided Highway (Segments 1-2; 4; 7-12; 14-16)
- 4 or 5 Lane Undivided Highway (Segments 5-6; 13)
- 2, 3 or 4 Lane Divided Highway (Segments 3; 17-19)
- 4 Lane Freeway (Segment 20)

<u>*Secondary Measures*</u>

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 incapacitating 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.

The scale for ratings for all of the Safety performance measures depend on the crash history on similar statewide operating environments. Based on the results of this analysis, the following observations were made:

- Overall, based on the weighted average of the Safety Index, the corridor rates in “average performance” condition
- Four segments have insufficient data to determine the Safety Index.
- Eight of the segments perform above average and the remaining are “below average performance” or “average performance” in the Safety Index.
- Nine of the segments perform “below average” or “average” in the NB/WB Directional Safety Index.
- Five of the segments perform “below average” or “average” in the SB/EB Directional Safety Index.
- Most of the segments have insufficient data to assess the percent of fatal and incapacitating injury crashes per crash unit type except for crashes involving Lane Departures which shows the weighted corridor average is “above average.”
- Segments 60-14 and 60-17 show the Percentage of Fatal and Incapacitating Crashes Involving Lane Departures was “above average.”

Table 9 summarizes the Safety performance results for the US 60|US 70|US 191 corridor. **Figure 14** illustrates the primary Safety Index performance and locations of Safety hot spots along the US 60|US 70|US 191 corridor. Maps for each secondary measure can be found in **Appendix A**.

Table 9: Safety Performance

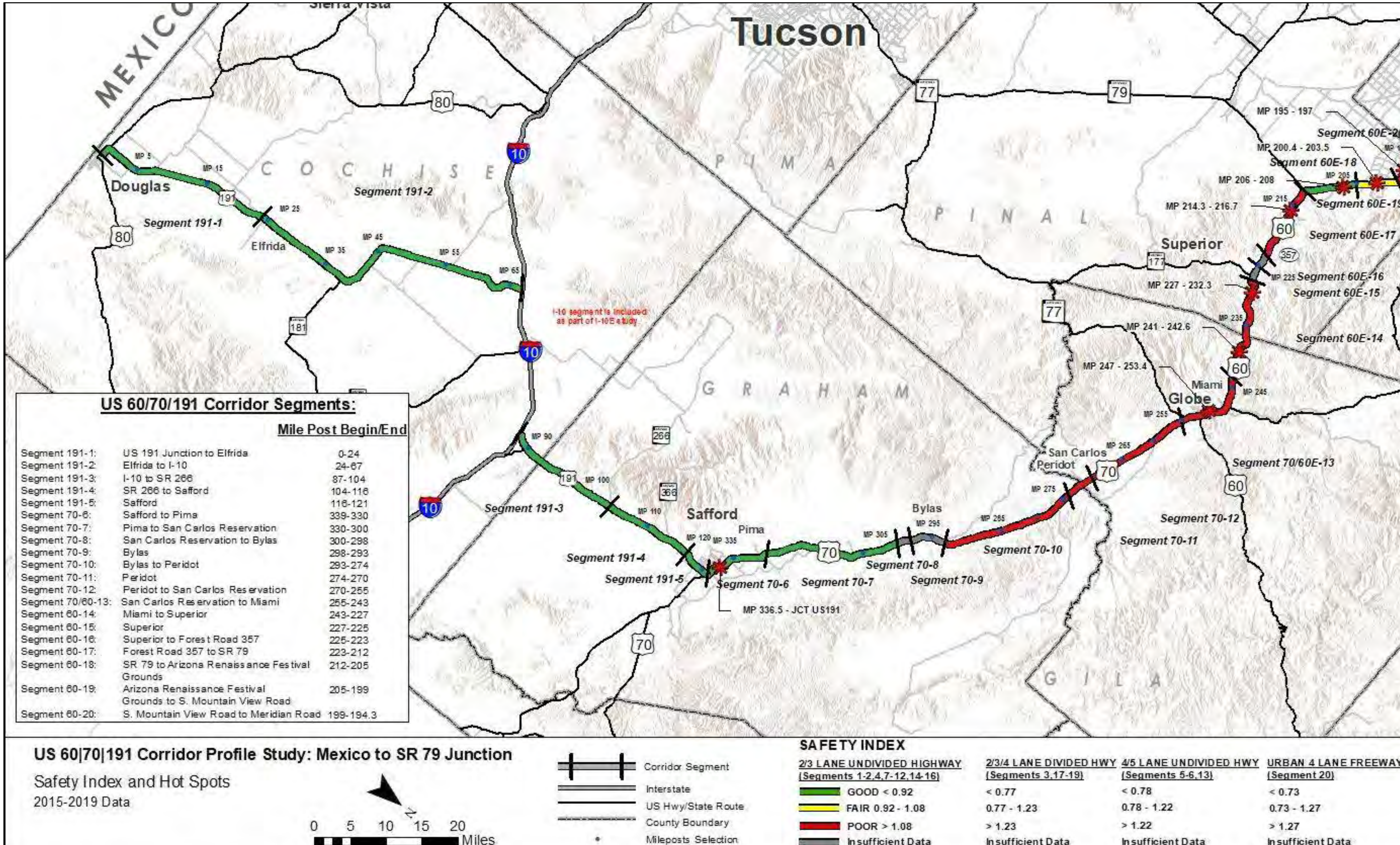
Segment	Segment Length (miles)	Overall Safety Index	NB/WB Directional Safety Index	SB/EB Directional Safety Index	% of Fatal + Suspected Serious Injury Crashes at Intersections	% of Fatal + Suspected Serious Injury Crashes Involving Lane Departures	% of Fatal + Suspected Serious Injury Crashes Involving Pedestrians	% of Segment Fatal + Suspected Serious Injury Crashes Involving Trucks	% of Segment Fatal + Suspected Serious Injury Crashes Involving Bicycles
191-1	24	0.39	0.04	0.73	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
191-2	43	0.49	0.54	0.44	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
191-3	17	0.59	0.00	1.18	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
191-4	12	0.58	1.06	0.11	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
191-5	5	0.06	0.12	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-6	9	0.38	0.67	0.08	Insufficient Data	25%	Insufficient Data	Insufficient Data	Insufficient Data
70-7	30	0.68	0.89	0.48	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-8	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-9	5	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-10	19	1.63	0.76	2.50	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-11	4	3.37	6.74	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
70-12	15	2.63	2.97	2.28	Insufficient Data	22%	Insufficient Data	Insufficient Data	Insufficient Data
60|70-13	12	2.97	3.36	2.57	Insufficient Data	21%	Insufficient Data	Insufficient Data	Insufficient Data
60E-14	16	1.78	1.50	2.07	Insufficient Data	81%	Insufficient Data	Insufficient Data	Insufficient Data
60E-15	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
60E-16	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data
60E-17	11	1.23	1.82	0.65	Insufficient Data	78%	Insufficient Data	Insufficient Data	Insufficient Data
60E-18	7	0.50	0.91	0.09	Insufficient Data	17%	Insufficient Data	Insufficient Data	Insufficient Data
60E-19	6	0.95	1.62	0.27	Insufficient Data	60%	Insufficient Data	Insufficient Data	Insufficient Data
60E-20	5	1.29	1.89	0.69	Insufficient Data	50%	Insufficient Data	Insufficient Data	Insufficient Data
Weighted Corridor Average		1.06	1.13	0.99	Insufficient Data	45%	Insufficient Data	Insufficient Data	Insufficient Data
SCALES									
Performance Level		**2 or 3 or 4 Lane Divided Highway**							
Good/Above Average Performance		< 0.81			< 23.4%	< 56.4%	< 2.4%	<3.7%	< 0%
Fair/Average Performance		0.81 - 1.19			23.4% - 29.3%	56.4% - 65.0%	2.4% - 3.6%	3.7% - 3.9%	0% - 2.2%
Poor/Below Average Performance		> 1.19			> 29.3%	> 65.0%	> 3.6%	3.90%	> 2.2%
Performance Level		**2 or 3 Lane Undivided Highway**							
Good/Above Average Performance		< 0.92			< 11.2%	< 66.9%	< 3.8%	<4.2%	< 0%
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%
Poor/Below Average Performance		> 1.08			> 15.6%	> 74.5%	> 7.2%	> 8.0%	> 3.3%
Performance Level		**4 or 5 Undivided Highway**							
Good/Above Average Performance		< 0.78			< 43.8%	< 21.1%	< 8.8%	< 0.8%	< 0.5%
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%
Poor/Below Average Performance		> 1.22			> 49.5%	> 32.1%	> 13.5%	> 5.5%	> 3.8%
Performance Level		**Urban 4 Lane Freeway**							
Good/Above Average Performance		< 0.73			= 0.0%	< 60.6%	= 0%	<6.9%	= 0.0%
Fair/Average Performance		0.73 - 1.27				60.6% - 78.1%	0.0% - 4.9%	6.9% - 12.4%	
Poor/Below Average Performance		> 1.27			> 0.0%	> 78.1%	> 4.9%	> 12.4%	> 0.0%

[a]2 or 3 or 4 Lane Divided Highway

[b]4 or 5 Lane Undivided Highway, [c]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 as measured by observed truck travel time speed and delays to truck travel from freeway 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 US 60|US 70|US 191, the following operating environments were identified:

- Urban Interrupted (Segments 5-6; 13, 19)
- Urban Uninterrupted (Segment 20)
- Rural Uninterrupted (Segments 3-4; 7-12; 14-18)
- Rural Interrupted (Segments 1-2)

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):
  - 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
  - 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.

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

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

- Overall, based on the weighted average of the Freight Index, the freight mobility is in “poor” condition, although eleven segments did not have a calculated Freight Index due to lack of data. All segments show “fair” performance in Freight TTTR except for Segments 191-1 and 60-14 which show “poor” performance.
- The Directional Max TTTR shows the weighted corridor average for NB/WB travel has “poor” performance while the SB/EB travel has “fair” performance.
- For Closure Duration, most of the corridor performed “good” with just a few Segments showing “fair” performance. Only 60-14 showed “poor” performance, and only in the westbound direction, having the highest average durations of closures.
- Two locations have vertical clearance restrictions that cannot be by-passed, including one bridge in Segment 70|60-13 and the Queen Creek Tunnel in Segment 60-14

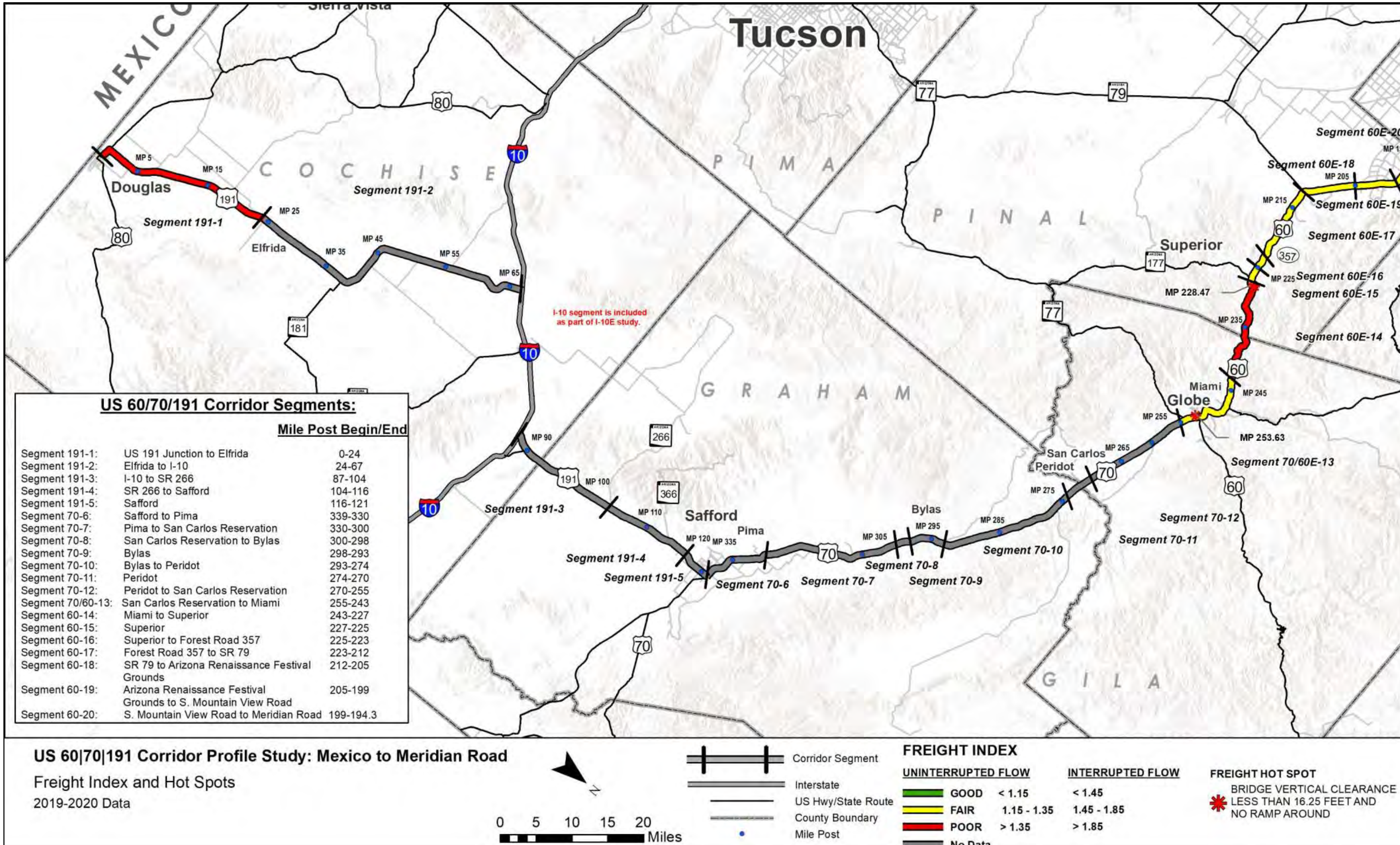
Table 10 summarizes the Freight performance results for the US 60|US 70|US 191 corridor. **Figure 16** illustrates the primary Freight Index performance and locations of freight hot spots along US 60|US 70|US 191. Maps for each secondary measure can be found in **Appendix A.**

Table 10: Freight Performance

Segment #	Freight TTTR	Directional Max TTTR		Combined Average Peak TTTR	Average Minutes Per Year Given Milepost Is Closed Per Segment Mile		Bridge Vertical Clearance (feet)
		NB/WB	SB/EB		NB/WB	SB/EB	
191-1*	2.26	2.52	2.00	2.26	3.02	1.00	No UP
191-2*	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.67	1.78	22.04
191-3^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.47	0.00	No UP
191-4^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	12.23	5.00	No UP
191-5*	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	26.08	16.96	None
70-6*	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.33	4.67	No UP
70-7^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	4.55	5.40	17.03
70-8^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	14.30	0.00	No UP
70-9^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.40	3.00	None
70-10^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	8.63	2.51	No UP
70-11^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.00	0.00	No UP
70-12^	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	17.39	0.00	No UP
70/60E-13*	1.58	1.67	1.49	1.58	22.75	26.52	15.84
60E-14^	1.49	1.52	1.46	1.49	63.60	344.95	13.03
60E-15^	1.32	1.34	1.29	1.32	0.00	90.50	16.79
60E-16^	1.28	1.14	1.42	1.28	52.20	12.25	No UP
60E-17^	1.18	1.15	1.20	1.18	3.27	61.40	No UP
60E-18^	1.22	1.32	1.13	1.22	0.00	22.29	No UP
60E-19*	1.63	1.74	1.52	1.63	14.00	20.30	No UP
60E-20^	1.20	1.25	1.14	1.20	74.94	7.11	No UP
Weighted Corridor Average	1.64	1.75	1.54	1.64	12.16	30.69	18.96
SCALE							
Performance Level	**Uninterrupted:** Segments 3-4; 7-12; 14-18,20 **Interrupted:** Segments 1-2; 5-6; 13,19				**All**		
Good	< 1.15 < 1.45				< 44.18		> 16.5
Fair	1.15-1.35 1.45-1.85				44.18-124.86		16.0-16.5
Poor	> 1.35 > 1.85				> 124.86		< 16.0

^ Uninterrupted
* Interrupted

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 US 60|US 70|US 191 corridor:

- **Overall performance** within all five areas evaluated is split between "good" (40%), "fair" (35%) and "poor" (25%) ratings.
- **Pavement Performance:** The Pavement Index shows a mix of "poor," "fair" and "good" performance. Fifty-seven out of 246 miles of the corridor show Pavement Index performance as "good."
- **Bridge Performance:** A total of 67 bridges were included in the evaluation. Eleven bridges on US 60 are considered structurally deficient in which five fall in Segment 70 | 60 – 13.
- **Mobility Performance:** US 60|US 70|US 191 corridor is considered to have two operating environments for evaluating Mobility. These include Urban/Fringe Highway and Rural Highway. Both the current and future capacity is considered "good" with the exception of Segments 60-14 and 60-18 through 60-20.
- **Safety Performance:** Safety performance utilizes the four operating environments for analysis that compare fatal and incapacitating injury crashes to other similar routes statewide. The US 60|US 70|US 191 corridor is mixed of "good," "fair" and "poor" ratings. The Safety Index for Segments 70-7, 70-10 through 70-14, 60-17 and 60-20 show "poor" performance.
- **Freight Performance:** The performance of freight mobility is overall "poor" within the US 60|US 70|US 191 corridor. This is primarily due to the high TTTR. Traffic counters do not exist in 11 of the 20 segments, which does not allow for the performance to be measured for TTTR for much of the corridor.
- **Poorest Performing Segment:** Segment 60-14 rated lower in performance than the other segments in the corridor. Mobility, Safety and Freight measures all rated as "poor" performance. Pavement and Bridge had mixes of "good," "fair" and poor performance.
- **Highest Performing Segments:** Segment 60-18 has only one performance metric that has "poor" performance which is Percent Area Failure.

Figure 17 shows the percentage of the US 60|US 70|US 191 corridor that rates either "good/above average performance", "fair/average performance", or "poor/below average performance" in each Index.

Table 11 shows a summary of all primary and secondary performance measures for the US 60|US 70|US 191 corridor. A weighted average rating (based on the length of the segment) was calculated for each primary and secondary measure – this is shown in the last row of **Table 11**. 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

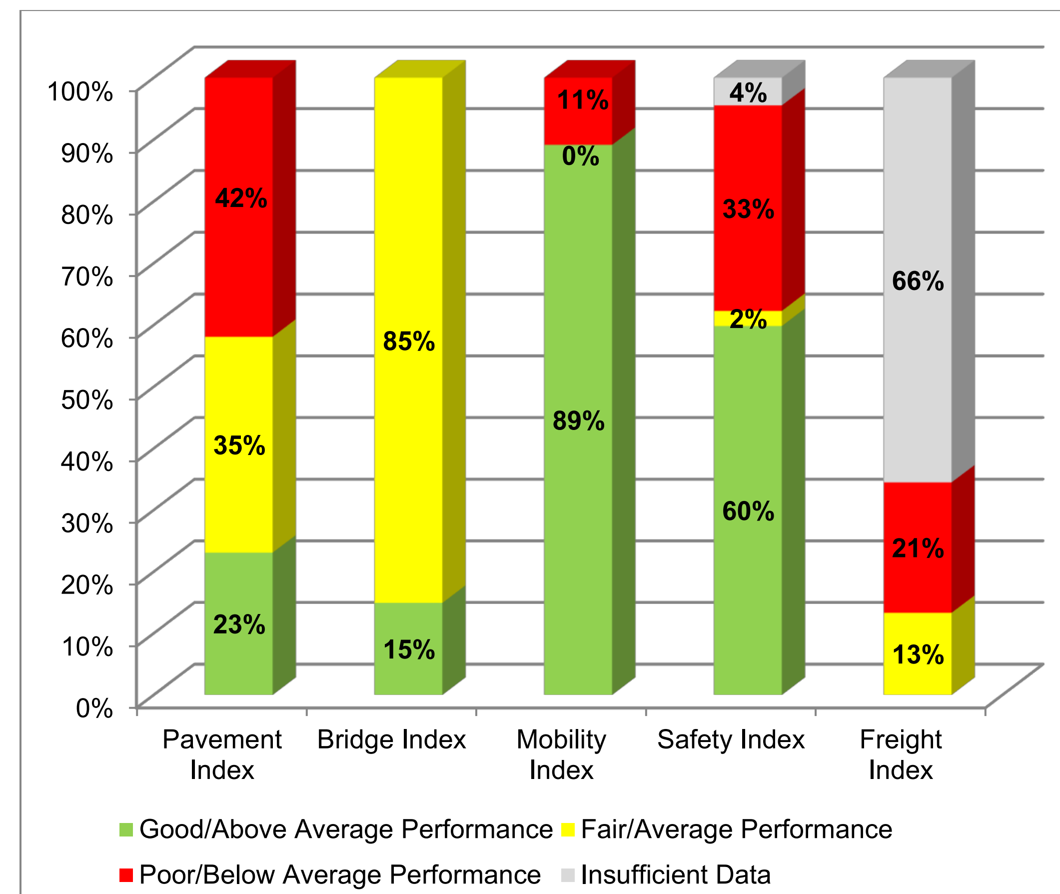


Figure 18: Corridor Performance Summary by Performance Measure

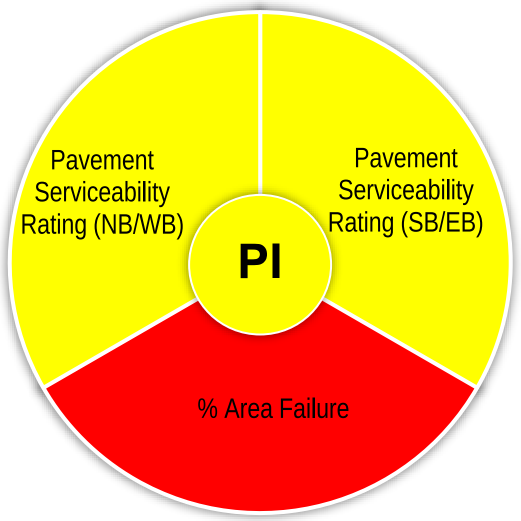
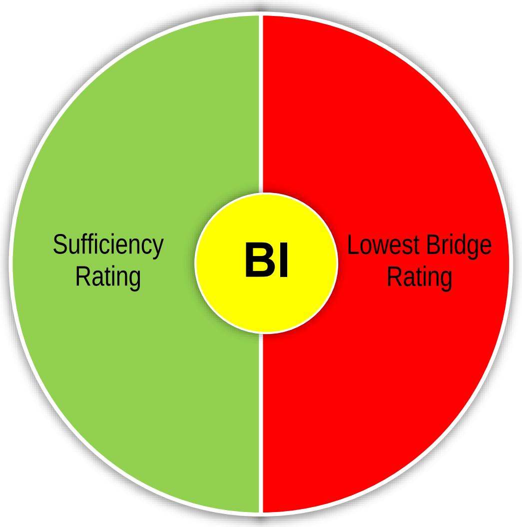
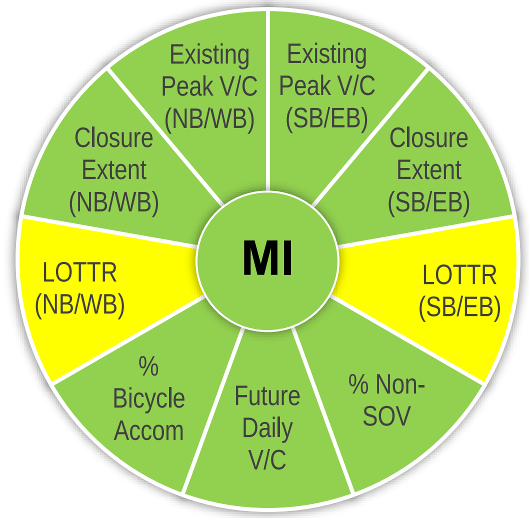
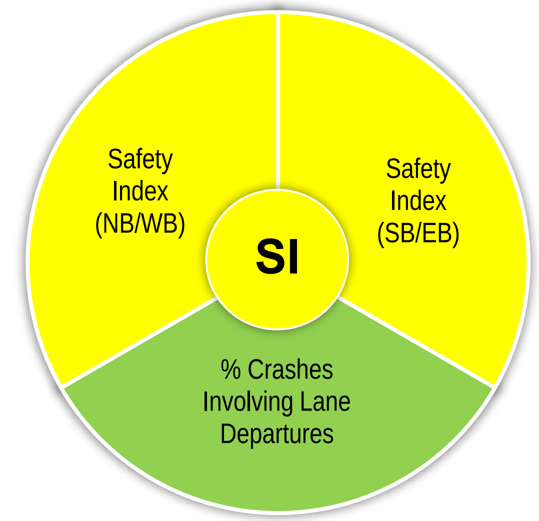
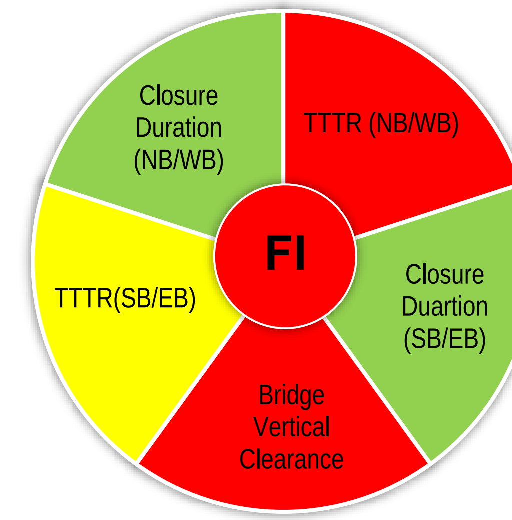
Pavement	Bridge	Mobility	Safety	Freight
				
Pavement Index (PI): based on three pavement condition ratings from the ADOT Pavement Database; the three ratings are the International Roughness Index (IRI), the Cracking Rating, and the Rutting Rating	**Bridge Index (BI):** based on four bridge condition 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 Max LOTTR (all vehicles)		% Bicycle Accommodation	% Non-Single Occupancy Vehicle (SOV) Trips
			NB/EB	SB/WB							NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB		
191-1[2*]	24	3.17	3.10	3.24	70.8%	6.0	87.80	6	0.16	0.18	0.13	0.13	0.04	0.02	1.40	1.39	66%	15.0%
191-2[2*]	43	2.89	3.44	3.38	55.8%	5.4	69.23	5	0.13	0.17	0.08	0.11	0.03	0.01	Insufficient Data		100%	16.6%
191-3[2^]	17	3.42	3.63	3.69	72.0%	5.5	93.81	5	0.05	0.05	0.03	0.03	0.02	0.00	Insufficient Data		49%	8.8%
191-4[2^]	12	3.44	3.29	3.32	41.7%	6.0	69.50	6	0.17	0.19	0.11	0.11	0.08	0.07	Insufficient Data		97%	8.3%
191-5[1*]	5	3.10	3.16	3.07	80.0%	No Bridges			0.27	0.30	0.15	0.16	0.20	0.20	0.20		0.20	21.2%
70-6[1*]	9	3.23	3.15	3.25	60.0%	6.0	68.10	6	0.41	0.45	0.31	0.29	0.02	0.04	Insufficient Data		46%	17.8%
70-7[2^]	30	2.83	2.87	3.08	86.8%	5.7	70.25	5	0.18	0.20	0.11	0.10	0.04	0.01	Insufficient Data		73%	15.8%
70-8[2^]	2	2.59	3.35	3.67	100.0%	6.0	73.00	6	0.11	0.12	0.08	0.05	0.10	0.00	Insufficient Data		0%	12.8%
70-9[2^]	5	2.71	3.44	3.63	100.0%	No Bridges			0.24	0.26	0.16	0.12	0.04	0.04	0.04		0.04	11.2%
70-10[2^]	19	2.69	3.10	3.35	78.9%	7.0	80.00	7	0.15	0.17	0.11	0.08	0.07	0.05	Insufficient Data		4%	7.7%
70-11[2^]	4	2.40	3.27	3.28	87.5%	6.7	82.02	5	0.18	0.20	0.13	0.10	0.00	0.00	Insufficient Data		4%	11.3%
70-12[2^]	15	3.57	3.28	3.53	33.3%	6.0	52.90	6	0.24	0.27	0.16	0.17	0.17	0.00	Insufficient Data		23%	12.5%
70|60-13[1*]	12	3.28	3.13	3.28	53.8%	5.2	78.01	4	0.40	0.45	0.26	0.25	0.22	0.35	1.16	1.15	54%	16.6%
60E-14[2^]	16	3.68	3.66	3.82	43.8%	5.5	68.13	3	1.42	1.71	0.79	1.14	0.67	1.84	1.12	1.17	49%	14.0%
60E-15[2^]	2	4.03	3.70	3.65	0.0%	6.3	84.08	6	2.80	3.90	1.13	1.12	0.00	0.90	1.18	1.14	95%	10.5%
60E-16[2^]	2	4.50	4.22	4.15	0.0%	5.0	86.43	5	0.73	1.01	0.42	0.42	0.60	0.15	1.05	1.12	87%	7.7%
60E-17[2^]	11	3.51	3.93	3.99	76.2%	6.6	95.57	5	0.26	0.37	0.15	0.14	0.04	0.23	1.05	1.09	96%	8.9%
60E-18[2^]	7	3.30	3.62	3.83	92.9%	5.9	90.24	5	0.53	0.66	0.30	0.32	0.00	0.23	1.12	1.05	100%	12.0%
60E-19[1*]	6	3.57	3.57	3.65	33.3%	5.9	91.43	5	1.01	0.86	0.86	0.91	0.10	0.30	1.20	1.14	42%	17.8%
60E-20[1^]	5	4.17	3.87	3.83	0.0%	6.0	93.95	6	1.31	1.45	0.84	0.88	0.68	0.09	1.06	1.06	100%	17.2%
Weighted Corridor Average		3.18	3.33	3.44	63%	5.82	81.95	4.87	0.34	0.40	0.22	0.24	0.12	0.19	0.19	1.20	63%	13.7%

SCALE

Performance Level	Non-Interstate		All			Urban [1] / Rural [2]	All	Uninterrupted ^ / Interrupted *		All
Good / Above Average	> 3.50	< 5%	> 6.5	> 80	> 6	≤ 0.71 (Urban) ≤ 0.56 (Rural)	< 0.22	≤ 1.15 ≤ 1.15	> 90%	> 17%
Fair / Average	2.9 - 3.5	5%-20%	5.0 - 6.5	50 - 80	5 - 6	0.71 - 0.89 (Urban) 0.56 - 0.76 (Rural)	0.22 - 0.62	1.15 - 1.5 1.15 - 1.5	90% - 60%	17% - 11%
Poor / Average	< 2.90	> 20%	< 5.0	< 50	< 5	> 0.89 (Urban) > 0.76 (Rural)	≥ 0.62	≥ 1.5 ≥ 1.5	< 60%	< 11%

[1] Urban or Fringe Urban Operating Environment
[2] Rural Operating Environment
^ Uninterrupted
* Interrupted

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)
			NB/EB	SB/WB							NB/EB	SB/WB		NB/EB	SB/WB	
191-1[2*]	24	0.39	0.04	0.73	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	2.26	2.52	2.00	2.26	3.02	1.00	No UP
191-2[2*]	43	0.49	0.54	0.44	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.67	1.78	22.04
191-3[2^]	17	0.59	0.00	1.18	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.47	0.00	No UP
191-4[2^]	12	0.58	1.06	0.11	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	12.23	5.00	No UP
191-5[1*]	5	0.06	0.12	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	26.08	16.96	None
70-6[1*]	9	0.38	0.67	0.08	Insufficient Data	25%	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	1.33	4.67	No UP
70-7[2^]	30	1.08	1.41	0.75	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	4.55	5.40	17.03
70-8[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	14.30	0.00	No UP
70-9[2^]	5	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	2.40	3.00	None
70-10[2^]	19	1.63	0.76	2.50	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	8.63	2.51	No UP
70-11[2^]	4	3.37	6.74	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	0.00	0.00	No UP
70-12[2^]	15	2.63	2.97	2.28	Insufficient Data	22%	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data		Insufficient Data	17.39	0.00	No UP
70|60-13[1*]	12	2.97	3.36	2.57	Insufficient Data	21%	Insufficient Data	Insufficient Data	Insufficient Data	1.58	1.67	1.49	1.58	22.75	26.52	15.84
60E-14[2^]	16	1.78	1.50	2.07	Insufficient Data	81%	Insufficient Data	Insufficient Data	Insufficient Data	1.49	1.52	1.46	1.49	63.60	344.95	13.03
60E-15[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.32	1.34	1.29	1.32	0.00	90.50	16.79
60E-16[2^]	2	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	1.28	1.14	1.42	1.28	52.20	12.25	No UP

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
^ Uninterrupted
* Interrupted

Note: "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)
			NB/EB	SB/WB							NB/EB	SB/WB		NB/EB	SB/WB	
60E-17[2^]	11	1.23	1.82	0.65	Insufficient Data	78%	Insufficient Data	Insufficient Data	Insufficient Data	1.18	1.15	1.20	1.18	3.27	61.40	No UP
60E-18[2^]	7	0.50	0.91	0.09	Insufficient Data	17%	Insufficient Data	Insufficient Data	Insufficient Data	1.22	1.32	1.13	1.22	0.00	22.29	No UP
60E-19[1*]	6	0.95	1.62	0.27	Insufficient Data	60%	Insufficient Data	Insufficient Data	Insufficient Data	1.63	1.74	1.52	1.63	14.00	20.30	No UP
60E-20[1^]	5	1.29	1.89	0.69	Insufficient Data	50%	Insufficient Data	Insufficient Data	Insufficient Data	1.20	1.25	1.14	1.20	74.94	7.11	No UP
Weighted Corridor Average		1.11	1.19	1.03	Insufficient Data	45%	Insufficient Data	Insufficient Data	Insufficient Data	1.64	1.75	1.54	1.64	12.16	30.69	18.90

SCALES

Performance Level	**2 or 3 or 4 Lane Divided Highway 2 or 3 Undivided Highway 4 or 5 Undivided Highway Urban 4 Lane Freeway**						**Uninterrupted**	**All**	
Good/Above Average Performance	< 0.81 <0.92 <0.78 < 0.73	< 23.4% < 11.2% < 43.8% < 0.0%	< 56.4% < 66.9% < 21.1% < 60.6%	< 16% <3.8% <8.8% <0.0%	<3.7% <4.2% < 0.8% < 6.9%	< 0% < 0% < 0.5% < 0%	< 1.15	< 44.18	> 16.5
Fair/Average Performance	0.81 – 1.19 0.92 - 1.08 0.78 - 1.22 0.73 - 1.27	23.4% - 29.3% 11.2% - 15.6% 43.8% - 49.5% 0.0% - 0.0%	56.4% - 65.0% 66.9% - 74.5% 21.1% - 32.1% 60.6%-78.1%	16% - 26% 3.8% - 7.2% 8.8% - 13.5% 0.0% - 4.9%	3.7% - 9.9% 4.2% - 8.0% 0.8% - 5.5% 6.9% - 12.4%	0% - 2% 0% - 3.3% 0.5% - 3.8% 0.0% -0.0%	1.15 - 1.35	44.18-124.86	16.0 - 16.5
Poor/Below Average Performance	> 1.19 > 1.08 > 1.22 > 1.27	> 29.3% > 15.6% > 49.5% > 0.0%	> 65.0%	> 26% > 7.2% > 13.5% > 4.9%	9.90% > 8.0% > 5.5% > 12.4%	> 2% > 3.3% > 3.8% > 0.0%	> 1.35	> 124.86	< 16.0

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
^ Uninterrupted
* Interrupted

Note: "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. Statewide performance goals that are relevant to US 60|US 70|US 191 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 US 60|US 70|US 191 corridor: Mobility, 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. **Table 12** shows the US 60|US 70|US 191 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	US 60|US 70|US 191 Corridor Goals	US 60|US 70|US 191 Corridor Objectives	Performance Area	Primary Index / Secondary Measure Indicators	Performance Objective: Corridor Average	Performance Objective: Segment
Improve Mobility and Accessibility **Support Economic Growth**	Provide a safe, reliable, and efficient connection for the communities along the corridor Provide a safe and reliable route for recreational and tourist travel Consider future land use when recommending infrastructure improvements since agricultural activities are transitioning to development activities	Reduce current and future congestion in the urbanized areas Reduce delays from non-recurring events and incidents to improve reliability Improve bicycle accommodation	Mobility (Emphasis Area)	**Mobility Index** Future Daily V/C Existing Peak Hour V/C Closure Extent Directional Level of Travel Time Reliability % Bicycle Accommodation % Non-SOV Trips	Good	Fair or Better
	Provide a safe, reliable and efficient freight route between Arizona and Mexico	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** Truck Travel Time Reliability Closure Duration Bridge Vertical Clearance	Good	Fair or Better
Preserve and Maintain the State Transportation System	Preserve and modernize highway infrastructure Provide an all-weather transportation facility	Maintain structural integrity of bridges	Bridge	**Bridge Index** Sufficiency Rating Lowest Bridge Rating	Fair or Better	Fair or Better
		Improve pavement ride quality	Pavement	**Pavement Index** Directional Pavement Serviceability Rating % Area Failure	Fair or Better	Fair or Better
Enhance Safety and Security	Promote safety by implementing appropriate countermeasures, particularly in mountainous and rolling terrain	Reduce fatal and serious injury crashes	Safety (Emphasis Area)	**Safety Index** Directional Safety Index % of Suspected Serious Injury Crashes at Intersections % of Suspected Serious Injury Crashes Involving Lane Departures % of Suspected Serious Injury Crashes Involving Pedestrians % of Suspected Serious Injury Crashes Involving Trucks % of Suspected Serious Injury Crashes Involving Bicycles	Above Average	Average or Better

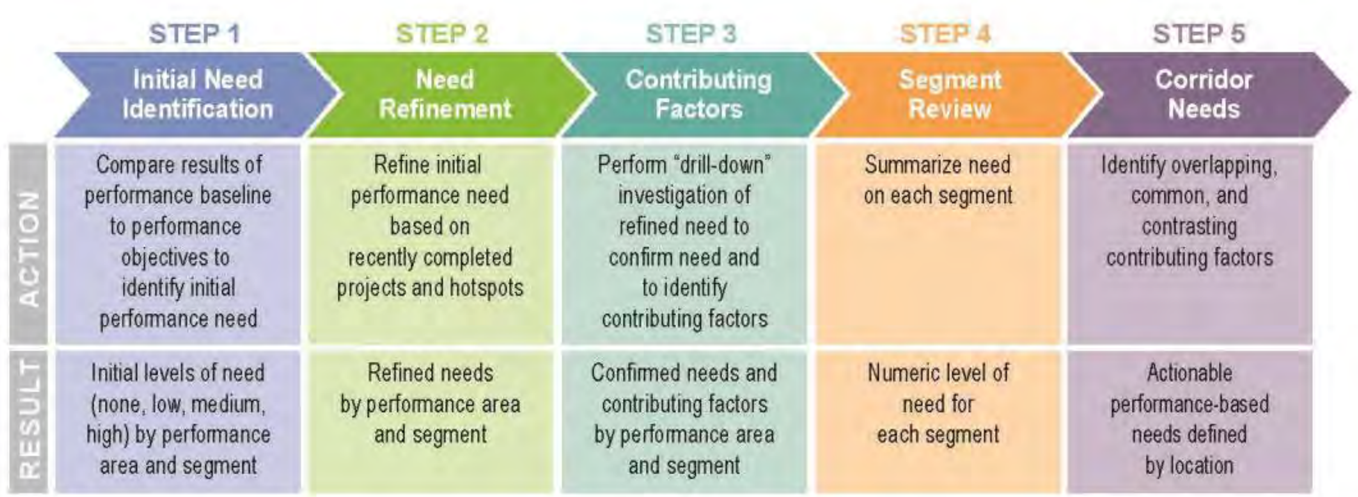
3.2 Needs Assessment Process

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		
5.0	Fair	Low	Middle 1/3 of Fair (5.5-6.0)
	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
- Maintenance history, the level of past investments, or trends in historical data that provide context for pavement and bridge history. (ADOT PeCoS data results from the original ADOT CPS studies were used for pavement; updated PeCoS information is not regularly at the time of completion of the updated assessments)

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

Of the 246 corridor miles, approximately 9 miles (4%) exhibit no level of pavement need, 77 miles (31%) exhibit “Low” level of pavement need, 57 miles (23%) exhibit “Medium” level of pavement need, and 103 miles (42%) exhibit “High” level of pavement need. Pavement hot spot failure needs were identified for 71 miles on US 191, 71 miles on US 70, and 28 miles on US 60.

Key contributing factors are summarized below:

- A high level of historical investment has occurred on Segments 191-3 and 70-9 and a medium level of historical investment has occurred through Segments 191-2, 191-4,191-5, 70-8, 70-10, and 70-12 through 60-17
- See other contributing factors in **Appendix D**.

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				
		NB	SB					
191-1	3.17	3.10	3.24	71%	1.80	MP 0-5 Both; MP 5-6 NB; MP 6-7 Both; MP 7-8 NB, MP 9-10 Both; MP 12-15 NB; MP15-20 Both; MP 20-22 NB; MP 22-23 SB; MP24-23 Both	None	Medium
191-2	2.89	3.44	3.38	56%	2.60	MP 24-27 Both; MP 27-28 SB; MP28-29 NB; MP 2932 Both; MP 32-33 SB; MP 33-35 Both; MP 35-36 SB; MP 42-43 SB MP 45-46 Both; MP 48-49 SB; MP 50-62 Both	None	High
191-3	3.42	3.36	3.69	72%	0.60	MP 88-89 NB; MP 89-092 Both; MP94-95 NB; MP95-101 Both; MP101-104 NB	None	Low
191-4	3.44	3.29	3.32	42%	0.70	MP 104-109 Both	None	Low
191-5	3.10	3.16	3.07	80%	1.90	MP117-121 Both	None	Medium
70-6	3.23	3.15	3.25	60%	1.80	MP 330-332 SB; MP332-333 Both; MP 333-335 SB; MP 335-336 NB; MP 336-337 Both; MP 338-339 SB; MP 339-340 Both	None	Medium
70-7	2.83	2.87	3.08	87%	3.00	MP 300-314 Both; MP314-315 EB; MP 327-329 EB; MP 329-330 Both	None	High
70-8	2.59	3.35	3.67	100%	2.60	MP 298-300 Both	None	High
70-9	2.71	3.44	3.36	100%	2.60	MP 293-298 Both	None	High
70-10	2.69	3.10	3.35	79%	2.70	MP 274-275 Both; MP279-293 Both	None	High

Table 13: Final Pavement Needs (continued)

Segment #	Performance Score and Level of Need				Initial Segment Need	Hot Spots	Recently Completed Projects	Final Segment Need
	Pavement Index	Directional PSR		% Area Failure				
		NB	SB					
70-11	2.40	3.27	3.28	88%	3.80	MP 270-271 EB; MP 271-274 Both	None	High
70-12	3.57	3.28	3.53	33%	0.70	MP 255-256 EB; MP 256-257 Both; MP 257-258 WB; MP 258-260 Both; MP266-268 EB	None	Low
70|60-13	3.28	3.13	3.28	54%	1.80	MP 243-244 EB; MP 244-245 Both; MP 245-246 EB; MP 249-251 EB; MP 252-255 Both	None	Medium
60E-14	3.68	3.66	3.82	44%	0.60	MP236-243 Both	None	Low
60E-15	4.03	3.70	3.65	0%	0.00	None	None	None
60E-16	4.50	4.22	4.15	0%	0.00	None	None	None
60E-17	3.51	3.93	3.99	76%	0.60	MP 212-213 Both; MP 213-215 WB; MP215-219 Both; MP 219-220 EB; MP 220-221 Both; MP 221-222 EB	None	Low
60E-18	3.30	3.62	3.83	93%	1.60	MP 205-206 WB; MP 206-212 Both	None	Medium
60E-19	3.57	3.57	3.65	33%	0.60	MP 199-201 WB; MP 201-202 EB; MP 204-205 WB	None	Low
60E-20	4.17	3.87	3.83	0%	0.00	None	None	None

Need Scales for Interstates				
Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None* (0)	> 3.5	> 3.63	< 10%	0
Low (1)	3.25 - 3.5	3.63 - 3.52	10% - 15%	< 1.5
Medium (2)	2.75 - 3.25	3.52 - 3.38	15% - 25%	1.5 - 2.5
High (3)	< 2.75	< 3.38	> 25%	> 2.5
Need Scales for Highways (Non-Interstates)				
Level of Need (Score)	Performance Score Need Scale			Segment Level Need Scale
None* (0)	> 3.33	> 3.30	< 10%	0
Low (1)	3.07 - 3.33	3.30 - 3.10	10% - 15%	< 1.5
Medium (2)	2.53 - 3.07	3.10 - 2.70	15% - 25%	1.5 - 2.5
High (3)	< 2.53	< 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

Bridge needs were identified on four segments of the corridor, 73 miles (30%) with a "Medium" level of bridge need. These included all bridges that were documented having a bridge rating of 5 or less in deck, substructure, superstructure, or overall structural evaluation. For the remainder of the corridor, 111 miles (45%) have a "Low" level of bridge need, 52 miles (21%) have no level of bridge need, and a final level of bridge need could not be determined for 10 miles (4%) of the corridor due to insufficient data.

Key contributing factors are summarized as follows:

- None of the initial needs required adjustment since no recent bridge work has occurred within the corridor that would change the bridge conditions.
- Eleven bridges were defined as hot spots since they had multiple bridge ratings of 5 or one rating of 4. Three bridges have bridge ratings of 4: Pinal Creek Bridge (No. 266), Queen Creek Bridge (No. 406) and Waterfall Canyon Bridge (No. 328)
- Of the eleven hot spot bridges, seven also showed repetitive investment issues. These included the Cochise UPRR OP (No. 157), Holyoak Wash Bridge (#514), Bloody Tanks Bridge (#173), Pinal Creek Bridge (No. 36), Pinal Creek Bridge (No. 266), Pinal Creek Bridge (No. 549) and McMillen Wash Bridge (#1028)
- See other contributing factors in **Appendix D**.

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				
191-1	6.00	87.80	6.00	0.0	None	None	None
191-2	5.36	69.23	5.00	2.4	Cochise UPRR OP (#157) (MP 62.88)	None	Medium
191-3	5.51	93.81	5.00	1.2	None	None	Low
191-4	6.00	69.50	6.00	0.2	None	None	Low
191-5	No Bridges	No Bridges	No Bridges	None	No Bridges within Segment	None	N/A
70-6	6.00	68.10	6.00	0.2	None	None	Low
70-7	5.74	70.25	5.00	1.2	Holyoak Wash Bridge (#514) (MP 302.53)	None	Low
70-8	6.00	73.00	6.00	0.0	None	None	None
70-9	No Bridges	No Bridges	No Bridges	None	No Bridges within Segment	None	N/A
70-10	7.00	80.00	7.00	0.0	None	None	None
70-11	6.69	82.02	5.00	0.2	None	None	Low
70-12	6.00	52.90	6.00	0.4	None	None	Low

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.*

Table 14: Final Bridge Needs (continued)

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				
70|60-13	5.16	78.01	4.00	2.4	Bloody Tanks Bridge (#173) (MP 243.71) Pinal Creek Bridge (#266) (MP249.64) Pinal Creek Bridge (#36) (MP249.80) Pinal Creek Bridge (#549) (MP 250.37) McMillen Wash Bridge (#1028) (MP251.75)	None	Medium
60E-14	5.52	68.13	3.00	1.8	Queen Creek Bridge (#436) (MP 226.14) Waterfall Canyon Bridge (# 328) (MP229.50)	None	Medium
60E-15	6.32	84.08	6.00	0.0	None	None	None
60E-16	5.00	86.43	5.00	2.2	None	None	Medium
60E-17	6.64	95.57	5.00	0.2	None	None	Low
60E-18	5.89	90.24	5.00	1.2	Sand Tanks Wash Bridge EB (#435) (MP208.75) Bridge WB (# 857) (MP 207.98)	None	Low
60E-19	5.93	91.43	5.00	1.2	None	None	Low
60E-20	6.00	93.95	6.00	0.0	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

Mobility was identified as a focus area for the US 60| US 70| US 191 corridor. No level of need was identified on 66 miles of the corridor (27%), a low level of mobility need was identified on 153 miles (63%) of the corridor and a high level of mobility need was identified on 27 miles (10%) of the corridor.

Key contributing factors are summarized below:

- Multiple closures of the roadway due to incidents/crashes in Segment 60E-14 (MP 227-243)
- Limited bicycle accommodation on much of the corridor, on US 191 from MP 87-104 and MP 116 – 121, and US 60/70 from MP 330-339, MP 298 – 243 and MP 199-205,
- Segment 60E-19 has a high mobility level of need due to existing and future daily volume-to-capacity issues and limited bicycle accommodation
- Segment 60E-20 has a high level of need due to mobility, existing v/c and future v/c issues, closure extents in the NB/WB direction (due to crashes and accidents) and limited bicycle accommodation

See other contributing factors in **Appendix D**.

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/WB	SB/EB	NB/WB	SB/EB	NB/WB	SB/EB				
191-1[2]	0.16	0.18	0.13	0.13	0.04	0.02	1.40	1.39	66%	0.8	None	Low
191-2[2]	0.13	0.17	0.08	0.11	0.03	0.01	No Data	No Data	100%	0.0	None	None
191-3[2]	0.05	0.05	0.03	0.03	0.02	0.00	No Data	No Data	49%	0.6	None	Low
191-4[2]	0.17	0.19	0.11	0.11	0.08	0.07	No Data	No Data	97%	0.0	None	None
191-5[1]	0.27	0.30	0.15	0.16	0.20	0.20	No Data	No Data	27%	0.6	None	Low
70-6[1]	0.41	0.45	0.31	0.29	0.02	0.04	No Data	No Data	46%	0.6	None	Low
70-7[2]	0.18	0.20	0.11	0.10	0.04	0.01	No Data	No Data	73%	0.2	None	Low
70-8[2]	0.11	0.12	0.08	0.05	0.10	0.00	No Data	No Data	0%	0.6	None	Low
70-9[2]	0.24	0.26	0.16	0.12	0.04	0.04	No Data	No Data	26%	0.6	None	Low
70-10[2]	0.15	0.17	0.11	0.08	0.07	0.05	No Data	No Data	4%	0.6	None	Low

Table 15: Final Mobility Needs (continued)

Segment #	Performance Score and Level of Need: Mobility Index	Future Daily V/C	Existing Peak Hour V/C NB/WB	Existing Peak Hour V/C SB/EB	Closure Extent NB/WB	Closure Extent SB/EB	Directional LOTTR NB/WB	Directional LOTTR SB/EB	% Bicycle Accommodation	Initial Segment Need	Recently Completed Projects	Final Segment Need
70-11[2]	0.18	0.20	0.13	0.10	0.00	0.00	No Data	No Data	4%	0.6	None	Low
70-12[2]	0.24	0.27	0.16	0.17	0.17	0.00	No Data	No Data	23%	0.6	None	Low
70/60E-13[1]	0.40	0.45	0.26	0.25	0.22	0.35	1.16	1.15	54%	0.4	FY19 MP 247 New DMS Sign Eastbound (Arizona Statewide DMS Plan) and construct new sidewalks on northside from MP 243-252 (Cobre Valley Comprehensive Transportation Study)	Low
60E-14[2]	1.42	1.71	0.79	1.14	0.67	1.84	1.12	1.17	49%	5.2	None	High
60E-15[2]	0.27	0.37	0.11	0.11	0.00	0.90	1.18	1.14	95%	0.3	None	Low
60E-16[2]	0.27	0.38	0.16	0.16	0.60	0.15	1.05	1.12	87%	0.2	None	Low
60E-17[2]	0.26	0.37	0.15	0.14	0.04	0.23	1.05	1.09	96%	0.0	Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek and Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit	None
60E-18[2]	0.53	0.66	0.30	0.32	0.00	0.23	1.12	1.05	100%	0.2	None	Low
60E-19[1]	1.01	0.86	0.86	0.91	0.10	0.30	1.20	1.14	42%	4.4	None	High
60E-20[1]	1.31	1.45	0.84	0.88	0.68	0.09	1.06	1.06	100%	4.2	None	High

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

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

**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 was identified as a focus area for the US 60|US 70|US 191 corridor. A High level of safety need was identified for 77 miles (31%) of the corridor, a Medium level of safety need was identified for 10.7 miles (4%) of the corridor, a Low level of safety need was identified for 45 miles (18%) of the corridor, and no level of safety need was identified for 102 miles (42%) of the corridor. A safety need was not identified for the remaining 11 miles (4%) of the corridor since there was insufficient data for each measure.

Key contributing factors to the safety needs are summarized below:

- Along US 70 from Bylas to Peridot, segment 70-10, 70 percent of crashes involved single vehicle and about half of the crashes involved collision with a fixed object
- Within Peridot, Segment 70-11, both fatal crashes involved pedestrian collision, occurred in dark-unlighted conditions, and driving under the influence of drugs or alcohol
- On segment 70-12, from Peridot to the San Carlos Apache Reservation, 7 of the 9 crashes were fatal with 33% of crashes involving collision with a pedestrian.
- On Segment 60|70-13, 80% of the crashes involved collision with another motor vehicle with 30% of collisions occurring at an angle
- On segment 60-14, 50% of the crashes involved speeding too fast for conditions with over 50% of crashes involving collision with a fixed object.
- Along Segment 60-17, 4 out of 9 crashes occurred during dark unlit conditions and involved speeding too fast for conditions
- On Segment 60E-19, 60% of the crashes involved exceeding lawful speed limits
- Out of the 6 fatal or incapacitating crashes in Segment 60E-20, half of the crashes were rear-end collisions and half were single-vehicle collisions
- See other Contributing Factors in **Appendix D**.

Table 16: Final Safety Needs

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/WB	SB/EB									
191-1[a]	0.39	0.04	0.73	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
191-2[a]	0.49	0.54	0.44	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
191-3[b]	0.59	0.00	1.18	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.2	None	None	Low
191-4[a]	0.58	1.06	0.11	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.2	None	None	Low
191-5[c]	0.06	0.12	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	Restripe to 5 lanes between 11th Street and US 70 (MP 120-121)	None
70-6[c]	0.38	0.67	0.08	Insufficient Data	25%	Insufficient Data	Insufficient Data	Insufficient Data	0.0	MP 336.5 - JCT US191	Traffic Signal or Roundabout Construction (MP 335.5) Construct Pedestrian Bridge Extension (MP 299-300)	Low
70-7[a]	0.68	0.89	0.48	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	None
70-8[a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	N/A

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
[d] Urban 4 Lane Freeway

**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*

Table 16: Final Safety Needs (continued)

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/WB	SB/EB									
70-9 [a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	Reduced Speed from 50 MPH to 40 MPH (MP 294-298) Eliminate passing zone through Bylas (MP 294.6-295.5) Pedestrian Safety improvements – Pedestrian crossings, warning signs/flashing lights, ADA compliant pedestrian gates (MP 294- 298) Curb installation on north side of US 70 (MP 296.5)	N/A
70-10 [a]	1.63	0.76	2.50	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	3.3	None	None	High
70-11 [a]	3.37	6.74	0.00	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	3.3	None	None	High
70-12 [a]	2.63	2.97	2.28	Insufficient Data	22%	Insufficient Data	Insufficient Data	Insufficient Data	3.6	None	Install Lighting and Center Turn Lane at US 70 & 177 intersection (US 70 Cutter Safety Improvements previous round Prioritized solution)	High
60|70-13 [a]	2.97	3.36	2.57	Insufficient Data	21%	Insufficient Data	Insufficient Data	Insufficient Data	3.6	MP 247 - 253.4	Construct new sidewalks on north side (MP 243-252) DMS Sign Eastbound Installed (MP 247)	High
60-14 [a]	1.78	1.50	2.07	Insufficient Data	81%	Insufficient Data	Insufficient Data	Insufficient Data	4.2	MP 241 - 242.6, MP 227 - 232.3	None	High
60-15 [a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	N/A
60-16 [a]	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data	0.0	None	None	N/A

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
[d] Urban 4 Lane Freeway

**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*

Table 16: Final Safety Needs (continued)

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/WB	SB/EB									
60-17 [b]	1.23	1.82	0.65	Insufficient Data	78%	Insufficient Data	Insufficient Data	Insufficient Data	2.9	MP 214.3 - 216.7	Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek (MP 219.9-222.3) Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit (MP 216.3-219.9)	High
60-18 [b]	0.50	0.91	0.09	Insufficient Data	17%	Insufficient Data	Insufficient Data	Insufficient Data	0.0	MP 206 - 208	None	Low
60-19 [b]	0.95	1.62	0.27	Insufficient Data	60%	Insufficient Data	Insufficient Data	Insufficient Data	1.5	MP 200.4 - 203.5	None	Medium
60-20 [d]	1.29	1.89	0.69	Insufficient Data	50%	Insufficient Data	Insufficient Data	Insufficient Data	2.3	MP 195 - 197	None	Medium

Level of Need* (Score)		Performance Score Needs Scale						Segment Level Need Scale
None (0)	a	≤ 0.97	≤ 13%	≤ 69%	≤ 5%	≤ 5%	≤ 1%	0
	b	≤ 0.94	≤ 25%	≤ 59%	≤ 3%	≤ 6%	≤ 1%	
	c	≤ 0.93	≤ 46%	≤ 25%	≤ 10%	≤ 2%	≤ 2%	
	d	≤ 0.91	0%	≤ 66%	≤ 2%	≤ 9%	0%	
Low (1)	a	0.97 - 1.02	13% - 14%	69% - 72%	5% - 6%	5% - 6%	1% - 2%	≤ 1.5
	b	0.94 - 1.07	25% - 27%	59% - 62%	3% - 3%	6% - 8%	1% - 2%	
	c	0.93 - 1.08	46% - 48%	25% - 29%	10% - 12%	2% - 4%	2% - 3%	
	d	0.91 - 1.09	0%	66% - 72%	2% - 4%	9% - 11%	0%	
Medium (2)	a	1.02 - 1.13	14% -17%	72% - 77%	6% - 8%	6% -9%	2% -4%	1.5 - 2.5
	b	1.07 - 1.32	27% - 31%	62% - 68%	3% - 4%	8% - 12%	2% - 3%	
	c	1.08 - 1.4	48% -52%	29% - 36%	12% - 15%	4% -7%	3% -5%	
	d	1.09 - 1.45	0%	72% - 84%	4% - 7%	11% - 15%	0%	
High (3)	a	≥ 1.13	≥ 17%	≥ 77%	≥ 22%	≥ 9%	≥ 4%	≥ 2.5
	b	≥ 1.32	≥ 31%	≥ 68%	≥ 15%	≥ 12%	≥ 3%	
	c	≥ 1.4	≥ 52%	≥ 36%	≥ 22%	≥ 7%	≥ 5%	
	d	≥ 1.45	0%	≥ 84%	≥ 7%	≥ 15%	0%	

[a] 2 or 3 Lane Undivided
[b] 2,3 or 4 Lane Divided
[c] 4 or 5 Lane Undivided
[d] Urban 4 Lane Freeway

**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

A Low or medium level of freight needs was identified on 16 miles (7%) each of the US 60| US 70| US 191 corridor, and a High level of freight need was identified on 45 miles (18%) of the corridor. The remainder of the corridor had no level of need, or there wasn't data to support a rating. Where there was data, a poor level of Truck Travel Time Reliability (TTTR) contributed to elevated freight needs on segments 191-1, 60-14, and 60-20. 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.

Key contributing factors are summarized below:

- Lengthy winter closures that shut down long segments on US 60 MP in 2016 and 2018 resulted in closure ratios that are above statewide average.
- Clearance restrictions exist at Pinal SPRR UP MP 253.63 (No. 562, height of 15.84 feet) and Queen Creek Tunnel MP 228.47 (height of 13.03 feet)
- See other Contributing Factors in **Appendix D**.

Table 17: Final Freight Needs

Segment #	Performance Score and Level of Need						Initial Segment Need*	Hot Spots	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Segment Need*
	Freight Index	Directional TTTR		Closure Duration		Bridge Clearance				
		NB/WB	SB/EB	NB/WB	SB/EB					
191-1[a]	2.26	1.40	1.39	3.02	1.00	No UP	High	None	None	High
191-2[a]	Insufficient Data	Insufficient Data	Insufficient Data	2.67	1.78	22.04	None	None	None	N/A
191-3[b]	Insufficient Data	Insufficient Data	Insufficient Data	2.47	0.00	No UP	None	None	None	N/A
191-4[b]	Insufficient Data	Insufficient Data	Insufficient Data	12.23	5.00	No UP	None	None	None	N/A
191-5[a]	Insufficient Data	Insufficient Data	Insufficient Data	26.08	16.96	None	None	None	None	N/A
70-6[a]	Insufficient Data	Insufficient Data	Insufficient Data	1.33	4.67	No UP	None	None	None	N/A
70-7[b]	Insufficient Data	Insufficient Data	Insufficient Data	4.55	5.40	17.03	None	None	None	N/A
70-8[b]	Insufficient Data	Insufficient Data	Insufficient Data	14.30	0.00	No UP	None	None	None	N/A
70-9[b]	Insufficient Data	Insufficient Data	Insufficient Data	2.40	3.00	None	None	None	None	N/A
70-10[b]	Insufficient Data	Insufficient Data	Insufficient Data	8.63	2.51	No UP	None	None	None	N/A
70-11[b]	Insufficient Data	Insufficient Data	Insufficient Data	0.00	0.00	No UP	None	None	None	N/A

Table 17: Final Freight Needs (continued)

Segment #	Performance Score and Level of Need						Initial Segment Need*	Hot Spots	Relevant Recently Completed or Under Construction Projects (which supersede performance data)*	Final Segment Need*
	Freight Index	Directional TTTR		Closure Duration		Bridge Clearance				
		NB/EB	SB/WB	NB/EB	SB/WB					
70-12 [b]	Insufficient Data	Insufficient Data	Insufficient Data	17.39	0.00	No UP	None	None	None	N/A
70/60E-13 [a]	1.58	1.16	1.15	22.75	26.52	15.84	Low	1 (Pinal SPRR UP - MP 253.63, #0562)	**FY19 MP 247** New DMS Sign EB (AZ State-wide DMS Plan); and **MP 243-252** Construct new sidewalks on northside (Cobre Valley Comprehensive Transportation Study)	Low
60E-14 [b]	1.49	1.12	1.17	63.60	344.95	13.03	High	1 (Queen Creek Tunnel)	Low	High
60E-15 [b]	1.32	1.18	1.14	0.00	90.50	16.79	Medium	None	Low	Medium
60E-16 [b]	1.28	1.05	1.12	52.20	12.25	No UP	Low	None	Low	Low
60E-17 [b]	1.18	1.05	1.09	3.27	61.40	No UP	None	None	**Picket Post**- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek and Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit	None
60E-18 [b]	1.22	1.12	1.05	0.00	22.29	No UP	Low	None	None	Low
60E-19 [a]	1.63	1.20	1.14	14.00	20.30	No UP	Low	None	None	Low
60E-20 [b]	1.20	1.06	1.06	74.94	7.11	No UP	Low	None	None	Low

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

a: Interrupted Flow
b: Uninterrupted 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 overall average need for each segment presented in the last row. All of the segments showed a Low level of average need.

Table 18: Summary of Needs by Segment

Performance Area	Segment Number and Mileposts (MP)																			
	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9	70-10	70-11	70-12	70|60-13	60-14	60-15	60-16	60-17	60-18	60-19	60-20
	MP 0-24	MP 24-67	MP 87-104	MP 104-116	MP 116-121	MP 339-330	MP 330-300	MP 300-298	MP 298-293	MP 293-274	MP 274-270	MP 270-255	MP 255-243	MP 243-227	MP 227-225	MP 225-223	MP 223-212	MP 212-205	MP 205-199	MP 199-194.3
Pavement	Medium	High	Low	Low	Medium	Medium	High	High	High	High	High	Low	Medium	Low	None*	None*	Low	Medium	Low	None*
Bridge	None*	Medium	Low	Low	N/A	Low	Low	None*	N/A	None*	Low	Low	Medium	Medium	None*	Medium	Low	Low	Low	None*
Mobility+	Low	None*	Low	None*	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	Low	Low	None*	Low	High	High
Safety+	None*	None*	Low	Low	None*	Low	None*	N/A#	N/A#	High	High	High	High	High	N/A#	N/A#	High	Low	Medium	Medium
Freight+	High	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	N/A#	Low	High	Medium	Low	None*	Low	Low	Low
Average Need	**1.23**	**0.77**	**0.77**	**0.54**	**0.54**	**0.92**	**0.85**	**0.69**	**0.69**	**1.38**	**1.54**	**1.23**	**1.77**	**2.54**	**0.69**	**0.77**	**1.00**	**1.15**	**1.69**	**1.38**

**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 strat solutions for that segment will not be developed as part of this study.*

+ Identified as an emphasis area for the US 60|US 70|US 191 corridor

 # N/A indicates insufficient or no data available to determine level of need

Average Need Scale	
None*	< 0
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

- Seventeen segments (191-1 through 70|60-14 and 60-17 through 60-19) contain Pavement hot spots
- Segments 60-15, 60-16 and 60-20 have a final need of None, Segments 191-3, 191-4, 70-12, 60-14, 60-17 and 60-19 have a final need of Low, Segments 191-1, 191-5, 70-6, 70|60-13 and 60-18 have a final need of Medium, and Segments 191-2, and 70-7 through 70-11 show a final level need of High
- A high level of historical investment has occurred on Segments 191-3 and 70-9 and a medium level of historical investment has occurred through Segments 191-2, 191-4,191-5, 70-8, 70-10, and 70-12 through 60-17

Bridge Needs

- Bridge needs were identified on four segments of the corridor, 73 miles (30%) with a "Medium" level of bridge need.
- Seven bridges showed potential repetitive investment issues and may be candidates for life-cycle cost analysis to evaluate alternative solutions.
- Three bridges have bridge ratings of 4: Pinal Creek Bridge (No. 266), Waterfall Canyon Bridge (No. 328), and Queen Creek Bridge (No. 406).
- Eleven bridges were defined as hot spots since they had multiple bridge ratings of 5 or less or one bridge rating of 4.
- Of the eleven hot spot bridges, six also showed repetitive investment issues. These included the Holyoak Wash Bridge (No. 514), Pinal Creek Bridge (No. 549), Pinal Creek Bridge (No. 36), Pinal Creek Bridge (No. 266), Waterfall Canyon Bridge (No. 328) and Queen Creek Bridge (No. 406)

Mobility Needs

- Mobility Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis
- Segments 60-14, 60-19 and 60-20 have a final segment need of High; all other segments on the corridor have a final segment need of Low or None
- There is lack of bicycle accommodation along 60% of the corridor
- Mobility needs are primarily due to mobility, future v/c, and existing v/c issues

Safety Needs

- Safety Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis.
- Segments 70-10 through 60-14, 60-17, 60-19 and 60-20 have a final segment need of Medium or High; all other segments on the corridor have a final segment of Low or None
- Safety hot spots exist in Segments 70-6, 60|70-13, 60-14, and 60-17 through 60-20
- There is insufficient data to generate reliable ratings for the secondary measures including crashes at intersections, involving pedestrians, involving trucks, or involving bicycles

Freight Needs

- Freight Performance is an Emphasis Area for the US 60| US 70| US 191 corridor, giving it a heavier weight in the analysis.
- Segments 191-1, 60-14 and 60-15 have a final segment need of Medium or High; all other segments on the corridor have a final segment need of Low or None
- Freight needs are primarily due to Freight TTTR, Closure Duration and Bridge Clearance
- There are two freight hot spots along the corridor: Pinal SR UP and Queen Creek Tunnel

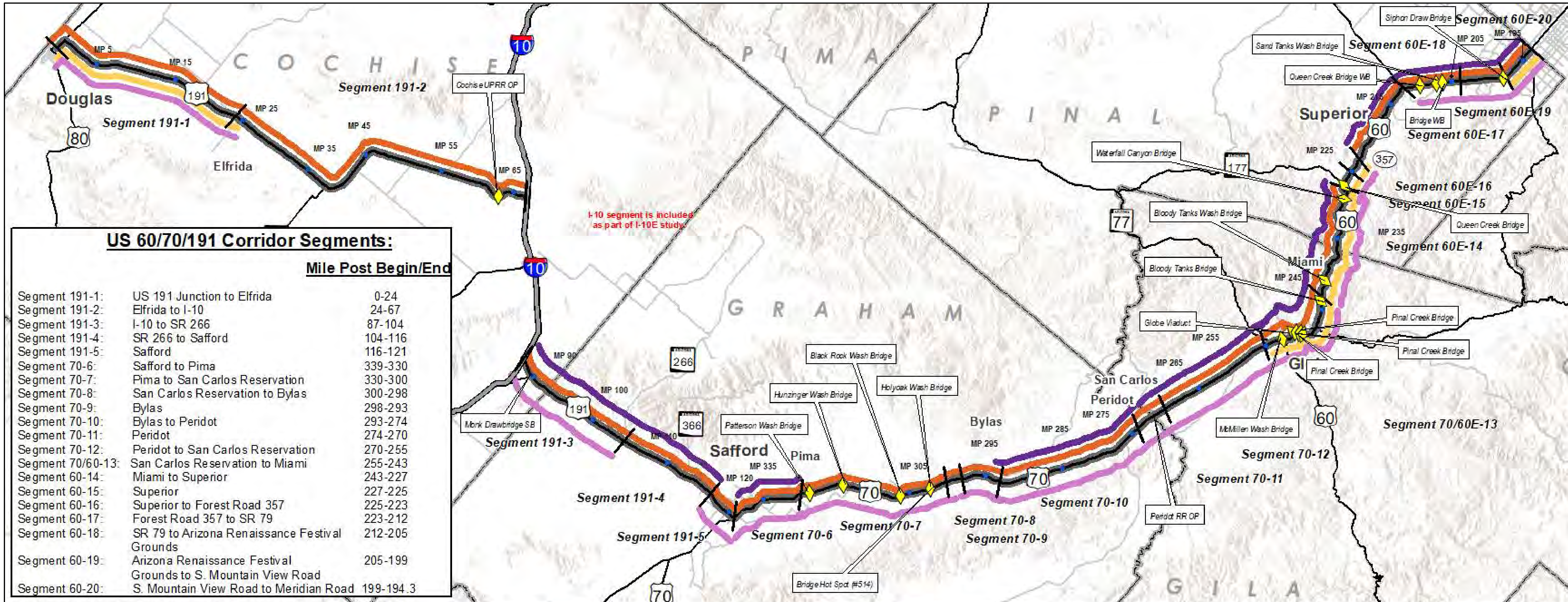
Overlapping Needs

This section identifies overlapping performance needs on the US 60|US 70|US 191 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 improve overall performance more effectively. A summary of the overlapping needs that relate to locations with elevated levels of need is provided below:

- All segments on the corridor have overlapping needs. Traffic counters do not exist in Segments 191-2 through 70-12, approximately 161 miles or 66% of the corridor, resulting in insufficient data to calculate needs in the freight performance area for those locations.
- US 60|70 MP 243 to MP 255 (Segment 70|60-13) and US 60 MP 227 to MP 243 (Segment 60-14) have overlapping needs in all five performance areas. These segments comprised 28 of the 246 corridor miles.
- Segment 70|60-13 has an overall Medium need score on the corridor. Some needs are site specific while others are characteristics of the segment. Medium bridge needs are related to the Bloody Tanks Bridge (No. 173), Pinal Creek Bridge (No. 36), Pinal Creek Bridge (No. 266), Pinal Creek Bridge (No. 549) and McMillen Wash Bridge (No. 1028) which are hot spots due to poor structural ratings and exhibit high repetitive investment. High safety needs are due to the number of fatal or suspected serious injury collisions exceeding the statewide average which are due to failure to yield right-of-way and involve vehicles running off the road (left). Low freight needs are due to the bridge vertical clearance for the Pinal SPRR UP (No. 0562).
- Segment 60-14 has an overall High need and the highest need score in the corridor. This segment has significant grades and subsequently suffers from freight, safety and mobility needs related to delay and incidents/accidents associated with the grade along with speeding too fast for conditions. The segment includes 2 hot spot bridges, both which do not have repetitive investment histories. The Queen Creek Tunnel, also located in the segment, affects bridge and freight needs with low vertical clearance.

- Segments 60-19 registers an overall Medium need score on the corridor with overlapping mobility and safety needs. Medium safety needs are due to the number of fatal or suspected serious injury collisions exceeding the statewide average which are due to dark-lighted conditions and involve vehicles running of the road (left). High mobility needs are due to poor bicycle accommodation and poor existing peak hour volume-to-capacity ratio.

Figure 21: Corridor Needs Summary



Performance Area	Segment Number and Mileposts (MP)																			
	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9	70-10	70-11	70-12	70/60E-13	60E-14	60E-15	60E-16	60E-17	60E-18	60E-19	60E-20
	MP0-24	MP24-67	MP87-104	MP104-116	MP116-121	MP339-330	MP330-300	MP300-298	MP298-293	MP293-274	MP274-270	MP270-255	MP255-243	MP243-227	MP227-225	MP225-223	MP223-212	MP223-213	MP223-214	MP223-215
Pavement	Medium	High	Low	Low	Medium	Medium	High	High	High	High	High	Low	Medium	Low	None	None	Low	Medium	Low	None
Bridge	None	Medium	Low	Low	N/A	Low	Low	None	N/A	None	Low	Low	Medium	Medium	None	Medium	Low	Low	Low	None
Mobility*	Low	None	Low	None	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	Low	Low	None	Low	High	High
Safety*	None	None	Low	Low	None	Low	None	N/A	N/A	High	High	High	High	High	N/A	N/A	High	Low	Medium	Medium
Freight*	High	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Low	High	Medium	Low	None	Low	Low	Low
Average Need	1.23	0.77	0.77	0.54	0.54	0.92	0.85	0.69	0.69	1.38	1.54	1.23	1.77	2.54	0.69	0.77	1.00	1.15	1.69	1.38

+ Identified as emphasis area for US 60 | 70 | 191 Corridor
N/A indicates insufficient 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.*

US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Corridor Needs Summary

0 5 10 15 20 Miles

Corridor Segment
US Hwy/State Route
County Boundary
City Boundary
Border Patrol Check Point

Performance Area Needs
Safety
Pavement
Freight
Mobility
Bridge

Level of Need
None*
Low
Medium
High

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 US 60|US 70|US 191 strategic investment areas (resulting from the elevated needs) are shown in **Figure 22**.

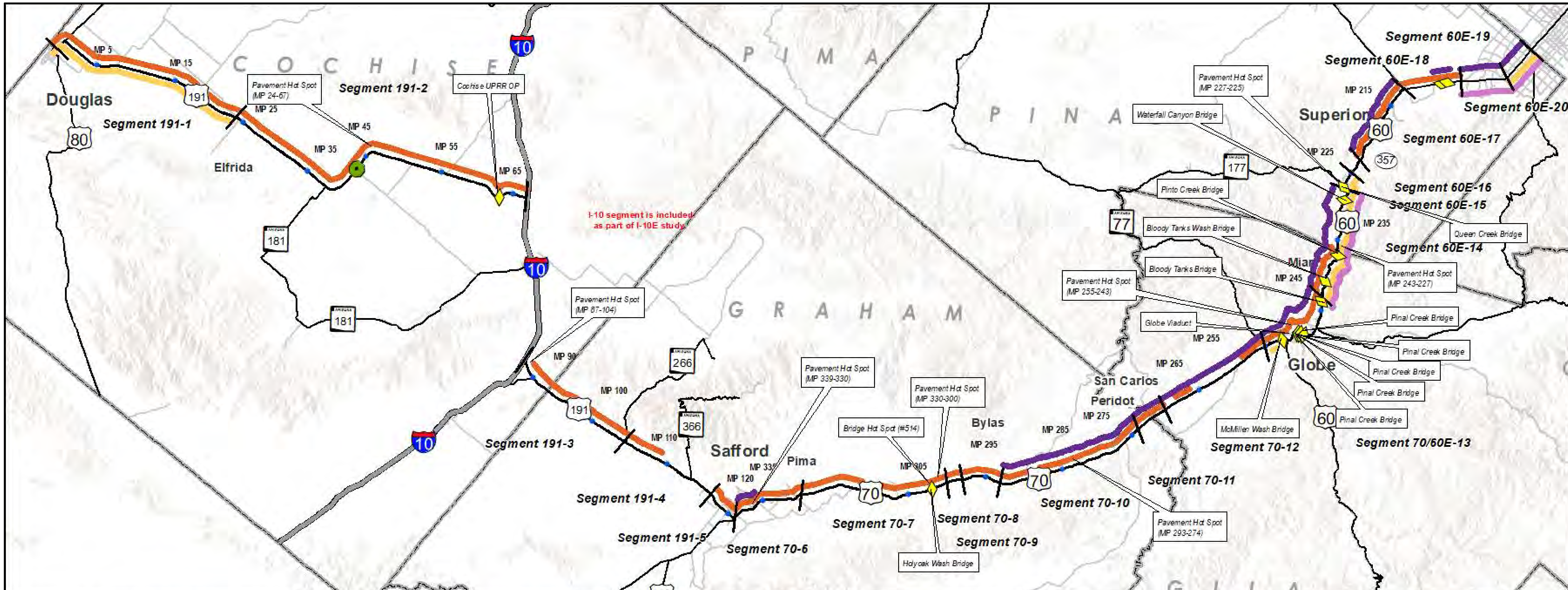
4.1 Screening Process

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	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9	70-10	70-11	70-12	70/60E-13	60E-14	60E-15	60E-16	60E-17	60E-18	60E-19	60E-20
	MP0-24	MP24-67	MP87-104	MP104-116	MP116-121	MP339-330	MP330-300	MP300-298	MP298-293	MP293-274	MP274-270	MP270-255	MP255-243	MP243-227	MP227-225	MP225-223	MP223-212	MP223-213	MP223-214	MP223-215
Pavement	Medium	High	Hot Spots	Hot Spot	Medium	Medium	High	High	High	High	High	Hot Spots	Medium	Hot Spot	-	-	Hot Spots	Medium	-	-
Bridge	-	Medium	-	-	-	-	Hot Spot	-	-	-	-	-	Medium	Medium	-	Medium	-	Hot Spots	-	-
Mobility*	-	-	-	-	-	-	-	-	-	-	-	-	-	High	-	-	-	-	High	High
Safety*	-	-	-	-	-	Hot Spot	-	-	-	High	High	High	High	High	-	-	High	Hot Spot	Medium	Medium
Freight*	High	-	-	-	-	-	-	-	-	-	-	-	Hot Spot	High	Medium	-	-	-	-	High

+ Identified as Emphasis Area for US 60 | US 70 | US 191 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 or None, which is not considered strategic.

US 60|70|191 Corridor Profile Study: Mexico to SR 79 Junction

Strategic Investment Areas

N

0 5 10 15 20 Miles

Corridor Segment
US Hwy/State Route
County Boundary
City Boundary

Border Patrol Check Point

Performance Area Needs
Pavement
Mobility
Safety
Freight
Bridge

Level of Need
Low
Medium
High

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					
191-1 (MP 0 – 24)	Medium	-	-	-	High	L1	Pavement	71% area failure and numerous Hot Spots throughout the segment in both directions (MP 0-5 Both; MP 5-6 NB; MP 6-7 Both; MP 7-8 NB, MP 9-10 Both; MP 12-15 NB; MP15-20 Both; MP 20-22 NB; MP 22-23 SB; MP24-23 Both)	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L2	Freight	Extremely poor Truck Travel Time reliability in the segment in both directions, with indexes approaching double the threshold, influenced by weigh station lines and wait times.	N	No programmed project to address freight need because freight need was due to weigh station
191-2 (MP 24-67)	High	Medium	-	-	-	L3	Pavement	Failure in a high percentage of surface area. Hot Spots throughout the segment in both directions (MP 24-27 Both; MP 27-28 SB; MP28-29 NB; MP 2932 Both; MP 32-33 SB; MP 33-35 Both; MP 35-36 SB; MP 42-43 SB MP 45-46 Both; MP 48-49 SB; MP 50-62 Both)	N	A medium level of historical investment has occurred on Segment 191-2 according to PeCOS data and recent pavement preservation projects. No pavement preservation projects are currently programmed for this portion of the segment. Anticipated to be addressed through current ADOT pavement maintenance and preservation programming processes.
						L4	Bridge	Medium level of need related to deck rating =5. The bridge was not identified as a Hot Spot. Cochise UPRR OP (MP 62.88, #157)	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
191-3 (MP 87-104)	Hot Spots	-	-	-	-	L5	Pavement	All hot spots are either in the northbound direction or in both directions, and span nearly the entire segment (MP 88-89 NB; MP 89-92 Both; MP94-95 NB; MP95-101 Both; MP101-104 NB)	Y	High historical investment; meets criteria for strategic investment
191-4 (MP 104-116)	Hot Spot	-	-	-	-	L6	Pavement	Hot spot (MP 104-109) in both directions	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes

Legend: 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					
191-5 (MP 116-121)	Medium	-	-	-	-	L7	Pavement	80% area failure, with Hot Spot in NB lanes MP 117-121	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
70-6 (MP 339-330)	Medium	-	-	Hot Spot	-	L8	Pavement	60% area failure, with Hot Spots in both directions throughout the segment (MP 330-332 SB; MP332-333 Both; MP 333-335 SB; MP 335-336 NB; MP 336-337 Both; MP 338-339 SB; MP 339-340 Both)	N	A low level of historical investment has occurred on Segment 70-6. No pavement preservation projects are currently programmed for this portion of the segment. Anticipated to be addressed through current ADOT pavement maintenance and preservation programming processes.
						L9	Safety	Cluster of crashes in both directions from MP 336.5 to the junction with US 191. Eleven fatal crashes and one suspected serious injury crash; 25% involve failure to yield right-of-way, 17% involve failure to keep in proper lane, 33% occurred in dark-lighted conditions, 25% involve a first unit event of ran off road right, 17% involve a first unit event of collision with pedestrian, 17% involve illness	Y	No programmed project to address Safety need
70-7 (MP 330-300)	High	Hot Spot	-	-	-	L10	Pavement	Failure in a high percentage of surface area. Hot Spots in both directions throughout the segment (MP 300-314 Both; MP314-315 EB; MP 327-329 EB; MP 329-330 Both)	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L11	Bridge	Hot Spot at Holyoak Wash Bridge (MP 302.53, #514)	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
70-8 (MP 300 - 298)	High	-	-	-	-	L12	Pavement	Poor pavement index and 100% area failure. The entire segment is a hot spot in both directions.	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
70-9 (MP 298 – 293)	High	-	-	-	-	L13	Pavement	Poor pavement index and 100% area failure. The entire segment is a hot spot in both directions.	Y	High historical investment; meets criteria for strategic investment

Legend: 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					
70-10 (MP 293-274	High	-	-	High	-	L14	Pavement	MP 274-293 has a High level of need due to poor performance scores for Pavement Index and fair performance scores for directional PSR; segment also has poor % Area Failure ratings Hot Spots in both directions MP 274-275 and MP 279-293	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L15	Safety	Four fatal crashes in segment; 14% involved pedal cyclist, 14% involved failure to yield right-of-way, 14% were head on crashes, 29% occurred in dark-unlit conditions, 29% involve a first unit event of ran off the road (right), 29% involve overturn, 29% under the influence of drugs or alcohol	Y	No programmed project to address Safety need
70 – 11 (MP 274 – 270)	High	-	-	High	-	L16	Pavement	MP 270-274 has a High level of need due to poor performance scores for Pavement Index and fair performance scores for directional PSR; segment also has poor % Area Failure ratings Hot Spots in both directions MP 270-271 and MP 271-274	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L17	Safety	Two fatal crashes in this segment; Both crashes involve a pedestrian, both crashes involve driver under the influence of drugs or alcohol, both crashes occurred during dark-unlit conditions, both crashes involve driving in opposing lane	N	Need considered non-actionable because fatal crashes involved drugs or alcohol
70-12 (MP270-255)	Hot Spot	-	-	High	-	L18	Pavement	Hot Spots: MP 255-256 EB, MP 256-257 both directions, MP 257-258 WB, MP 258-260 both directions, MP 266-268 EB	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L19	Safety	Seven fatal crashes and two suspected serious injury crashes in segment; 33% involved a pedestrian, 33% involve speed too fast for conditions, 33% occurred in dark-unlit conditions, 22% involved overturning, 11% involved driver falling asleep/fatigued, 22% involve rear end	Y	No programmed project to address Safety need

Legend: 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					
70|60-13 (MP255-243)	Medium	Medium	-	High	Hot Spot	L20	Pavement	MP 243-255 has a Medium level of need due to fair performance scores for Pavement Index and poor % Area Failure ratings Hot Spots: MP 243-244 EB, MP 244-245 both directions, MP 245-246 EB, MP 249-251 EB, MP 252-255 both directions	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L21	Bridge	McMillen Wash Bridge MP 251.75 (#1028) has deck, superstructure and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L22	Bridge	Pinal Creek Bridge MP 250.37 (#549) has deck and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L23	Bridge	Pinal Creek Bridge MP 249.80 (#36) has deck and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L24	Bridge	Pinal Creek Bridge MP 249.64 (#266) has deck and substructure ratings of 4 and a superstructure rating of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L25	Bridge	Bloody Tanks Bridge MP 243.71 (#173) has deck and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L26	Safety	Seven fatal crashes and seventeen suspected serious injury crashes in segment; Hot Spot at MP 247-253.4; 21% collisions involve speed too fast for conditions, 13% occur in dark-lighted conditions, 13% involve ran off the road (left), 17% involve under the influence of drugs or alcohol, 17% failure to yield right-of-way, 21% involve rear end	Y	Note: still screened through even though there is a programmed project which is lighting installation (MP 247.6-247.9) for FY22
						L27	Freight	Vertical clearance hot spot at Pinal SPRR UP (#0562, MP 253.63) has low vertical clearance of 15.84 feet and cannot be ramped around	Y	No programmed project to address Freight need

Legend: 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					
60-14 (MP243-227)	Hot Spot	Medium	High	High	High	L28	Pavement	Hot Spot: MP 236-243 both directions	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L29	Bridge	Queen Creek Bridge MP 227.71 (#406) has deck and superstructure ratings of 4 and substructure rating of 3	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L30	Bridge	Waterfall Canyon Bridge MP 229.50 (#328) has substructure rating of 5 and superstructure rating of 4	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L31	Mobility	Mobility Index, Future Daily V/C, Existing Peak Hour V/C in both directions, Closure Extent in both directions and Bicycle Accommodation performance are below average. There were 99 closures along this segment	N	Construct alternative alignment/widen to 4 lanes (MP 227-243) programmed in FY 2030
						L32	Safety	Five fatal crashes and twenty-one crashes in segment; Hot Spots at MP 241-242.6 and MP 227-232.3; 54% collision with fixed object, 19% head on, 50% speed too fast for conditions, 15% involve drove in opposing lane, 12% involve wet conditions, 27% involve overturning, 19% involve ran off the road, 31% involve under the influence of drugs or alcohol	Y	No programmed project to address Safety need
						L33	Freight	MP 227-243 has a High level of need due to poor performance scores for Freight Index and for SB/WB closure duration	N	Lane alignment/widening project (MP 227-243) programmed in FY 2030 is expected to address freight needs.
						L34	Freight	Vertical clearance hot spot at Queen Creek Tunnel (#538, MP 339.20) has low vertical clearance of 13.03 feet and cannot be ramped around	Y	No programmed project to address Freight need
60-15 (MP227-225)	-	-	-	-	Medium	L35	Freight	MP 225-227 has a Medium level of need due to fair performance scores for Freight Index, NB/EB directional TTTR and for SB/WB closure duration	N	Lane alignment/widening project (MP 225-227) programmed in FY 2030 is expected to address freight needs.

Legend: 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					
60-16 (MP225-223)	-	Medium	-	-	-	L36	Bridge	Silker King Wash Bridge MP 223.70 (#318) has a structural evaluation rating of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L37	Bridge	No Name Wash Bridge MP 225.60 (#319) has a structural evaluation rating of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
60-17 (MP223-212)	Hot Spot	-	-	High	-	L38	Pavement	Hot Spots: MP 212-213 both directions, MP 213-215 WB, MP 215-219 both directions, MP 219-220 EB; MP 220-221 both directions, MP 221-222 EB	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L39	Safety	Four fatal crashes and five suspected serious injury crashes; Hot spot at 214.3-216.7; 44% involve overturning, 11% involve a pedestrian, 11% involve a head on, 44% involve speed too fast for conditions, 44% occur in dark-unlit conditions, 44% involve ran off the road (left), 11% involve crossed centerline, 33% involve under the influence of drugs or alcohol	Y	No programmed project to address Safety need
60-18 (MP 205-212)	Medium	Hot Spot	-	Hot Spot	-	L40	Pavement	MP 205-212 has a Medium level of need due to fair performance scores for Pavement Index and poor % Area Failure ratings Hot Spots: MP 205-206 WB; MP 206-212 both directions	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L41	Bridge	Sand Tanks Wash Bridge MP 208.75 (#435) has deck and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L42	Bridge	Bridge WB MP 207.98 (#857) has deck and substructure ratings of 5	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L43	Safety	One fatal crash and five suspected serious injury crashes in segment; Hot spot at MP 206-208; 17% involve overturning, 50% involve rear end, 83% involve speed too fast for conditions, 33% occurred in dark-unlit conditions, 17% involve a collision with fixed object, 17% involve driver under the influence of drugs or alcohol	Y	No programmed project to address Safety need

Legend: 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					
60-19 (MP 199-205)	Hot Spot	-	High	Medium	-	L44	Pavement	Hot Spots: MP 199-201 WB, MP 201-202 EB, MP 204-205 WB	N	No high historical investment so not considered a strategic investment; will likely be addressed by current ADOT processes
						L45	Mobility	Mobility Index, Existing Peak Hour V/C in the SB/EB direction and Bicycle Accommodation performance are below average.	Y	No programmed project to address mobility need
						L46	Safety	Two fatal crashes and eight suspected serious injury crashes; Hot spot at MP 200.4-203.5; 20% involve collision with a fixed object, 60% involve exceeded lawful speed, 33% occurred in dark-lighted conditions, 40% involve overturn, 20% involve ran off the road (left), 30% under the influence of drugs or alcohol	Y	No programmed project to address safety need
60-20 (MP 194.3-199)	-	-	High	Medium	-	L47	Mobility	Mobility Index, Future Daily V/C, Closure Extent in the NB/WB and Bicycle Accommodation performance are below average. Majority of the closures due to crashes and accidents	Y	No programmed project to address mobility need
						L48	Safety	Four fatal crashes in the segment; Hot spot at MP 195-197; 17% involve collision with a fixed object, 67% involve exceeded lawful speed, 17% involve other unsafe passing, 33% occur in dark-lighted conditions, 33% involve ran off the road (left), 20% fatigued/fell asleep, 30% under the influence of drugs/alcohol	Y	No programmed project to address safety need

Legend: 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 US 60|US 70|US 191 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
UA set of 14 candidate solutions are proposed to address the identified needs on the US 60|US 70|US 191 corridor.

Table 20 identifies each strategic location that has been assigned a candidate solution with a number (e.g., CS8.1, CS8.2, 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 *	Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS191.1	191-3	L5	88	104	US191 Pavement Preservation South of Safford	A	Rehabilitate/repair pavement	P
						B	Replace pavement	M
CS70.2	70-6	L9	339	336.5	East Safford Safety Improvements	-	Provide flashing traffic signal warning signs at Milepost 337.82 and Milepost 338.03. Consider installing feedback signs in both directions at 20th Avenue	M
CS70.3	70-9	L13	298	293	Bylas Area Pavement Preservation	A	Rehabilitate/repair pavement	P
						B	Replace pavement	M
CS70.4	70-10	L15	293	274	Bylas to Peridot Safety Improvements	-	Widen shoulders Milepost 274-278 Install centerline rumble strips MP 275.5-276.5,MP 279.5-287.5 Install shoulder rumble strips MP 275.5-276.5,MP 279.5-287.5 Install high visibility striping and delineators from milepost 274-278 Improve existing pedestrian / speed warning signs to also include flashing beacons and speed feedback signs (MP 292,MP 280, MP 278.5) Construct passing lanes (WB MP 288.2-289.6) Formalize pullouts (signage, ROW for pullouts) (WB MP 274.5, EB MP 279, EB MP 289, WB 292)	M
CS70.5	70-12	L19	270	255	East of Globe Safety Improvements	-	Widen shoulders MP 255-270 Install centerline and shoulder rumble strips MP 255-270 Install improved lighting from milepost 269-270 Construct passing lane in each direction (MP 255-256) Improve existing pedestrian and speed warning signs to include flashing beacons and speed feedback signs (MP 269.25)	M
CS70|60.6	70|60-13	L26	255	243	Globe Area Safety Improvements	-	Consider installing speed feedback signs (2 EB and 2 WB between MP 246 - 250) High visibility striping Install signal ahead warning signs with beacons in advance of SR 188 intersection Construct passing lane in each direction from MP 243-243.25 and MP 253.6-255	M

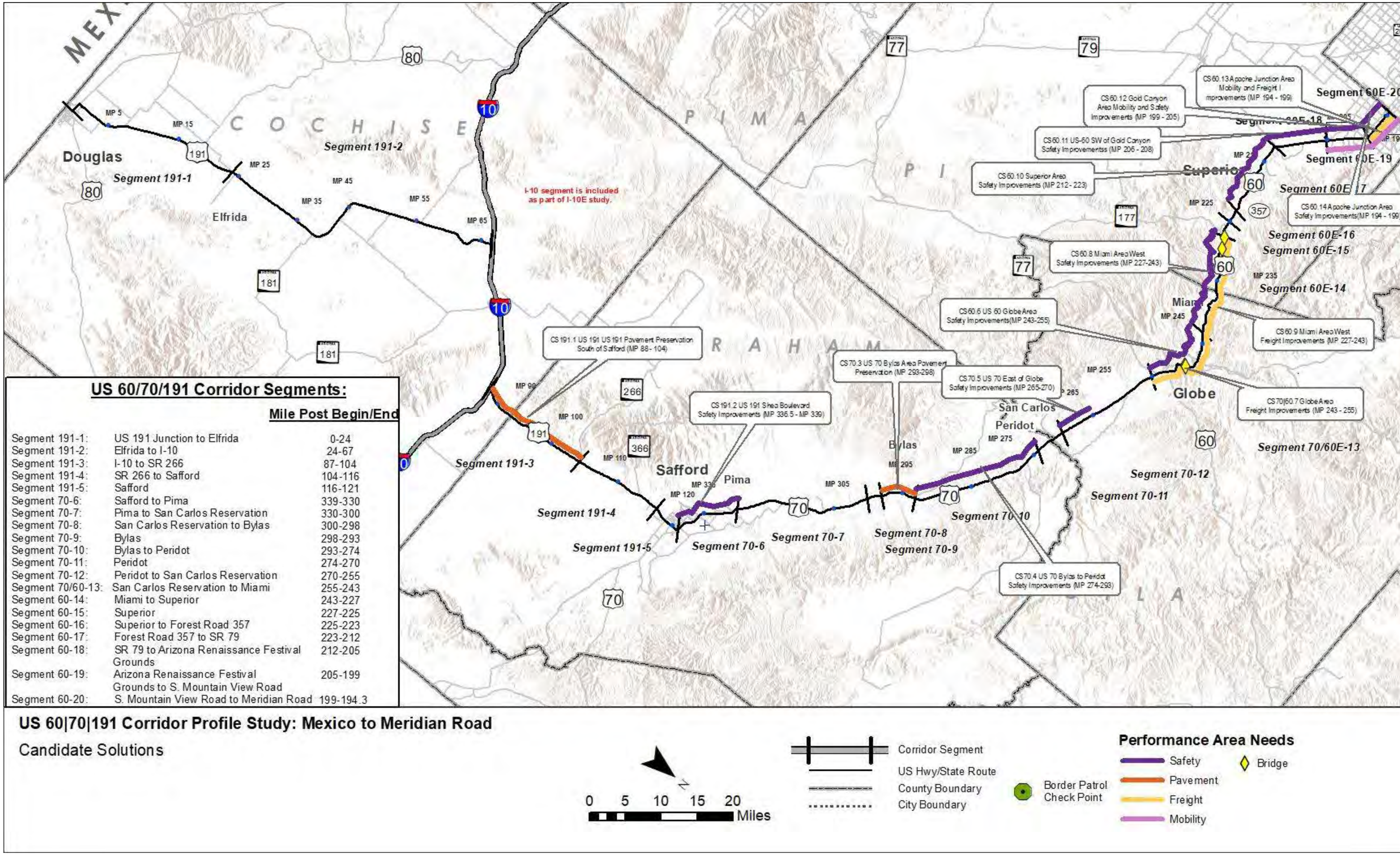
* '-' indicates only one solution is being proposed and no option

Table 20: Candidate Solutions (continued)

Candidate Solution #	Segment #	Location #	Beginning Milepost	Ending Milepost	Candidate Solution Name	Option *	Scope	Investment Category (Preservation [P], Modernization [M], Expansion [E])
CS70|60.7	70|60-13	L27	255	243	Globe Area Freight Improvements	A	Reconstruct Pinal SPRR UP to increase vertical clearance	E
						B	Reprofile mainline to increase vertical clearance	M
CS60.8	60-14	L32	243	227	Superior East Area Safety Improvements	-	Consider installing speed feedback signs at MP 229.9, MP 236, MP 241 Install centerline rumble strips at MP 229-231 Install high visibility striping and delineators MP 228-228.3 and MP 241-242 Install edge line rumble strips EB MP 228.17-228.3, MP 229.2-229.26, and MP 247-247.26	M
CS60.9	60-14	L34	243	227	Superior East Area Freight Improvements	A	Reconstruct Queen Creek Tunnel to increase vertical clearance	E
						B	Reprofile mainline to increase vertical clearance	M
CS60.10	60-17	L39	223	212	Superior Area Safety Improvements	-	Install lighting at N Queen Valley Road and US 60 intersection Consider installing speed feedback sign MP 212.5 Install chevrons or curve warning sign at MP 219.33	M
CS60.11	60-18	L43	208	206	US-60 SW of Gold Canyon Safety Improvements	-	Install lighting MP 205-207 Consider installing speed feedback sign Widen inside shoulder 208.3-212	M
CS60.12	60-19	L45 / L46	205	199	Gold Canyon Area Mobility and Safety Improvements	-	Add SB/EB through lane MP 199.12 to 206 Widen shoulders MP 199.12 to 205 Consider installing speed feedback sign at MP 201 Install lighting MP 201-202	E
CS60.13	60-20	L47 / L49	199	194.3	Apache Junction Area Mobility and Freight Improvements	-	Add through lane in NB/WB direction	M
CS60.14	60-20	L48	199	194.3	Apache Junction Area Safety Improvements	-	Install inside and edge line rumble strips through entire segment Consider installing speed feedback sign MP 195	M

* '-' indicates only one solution is being proposed and no option

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.

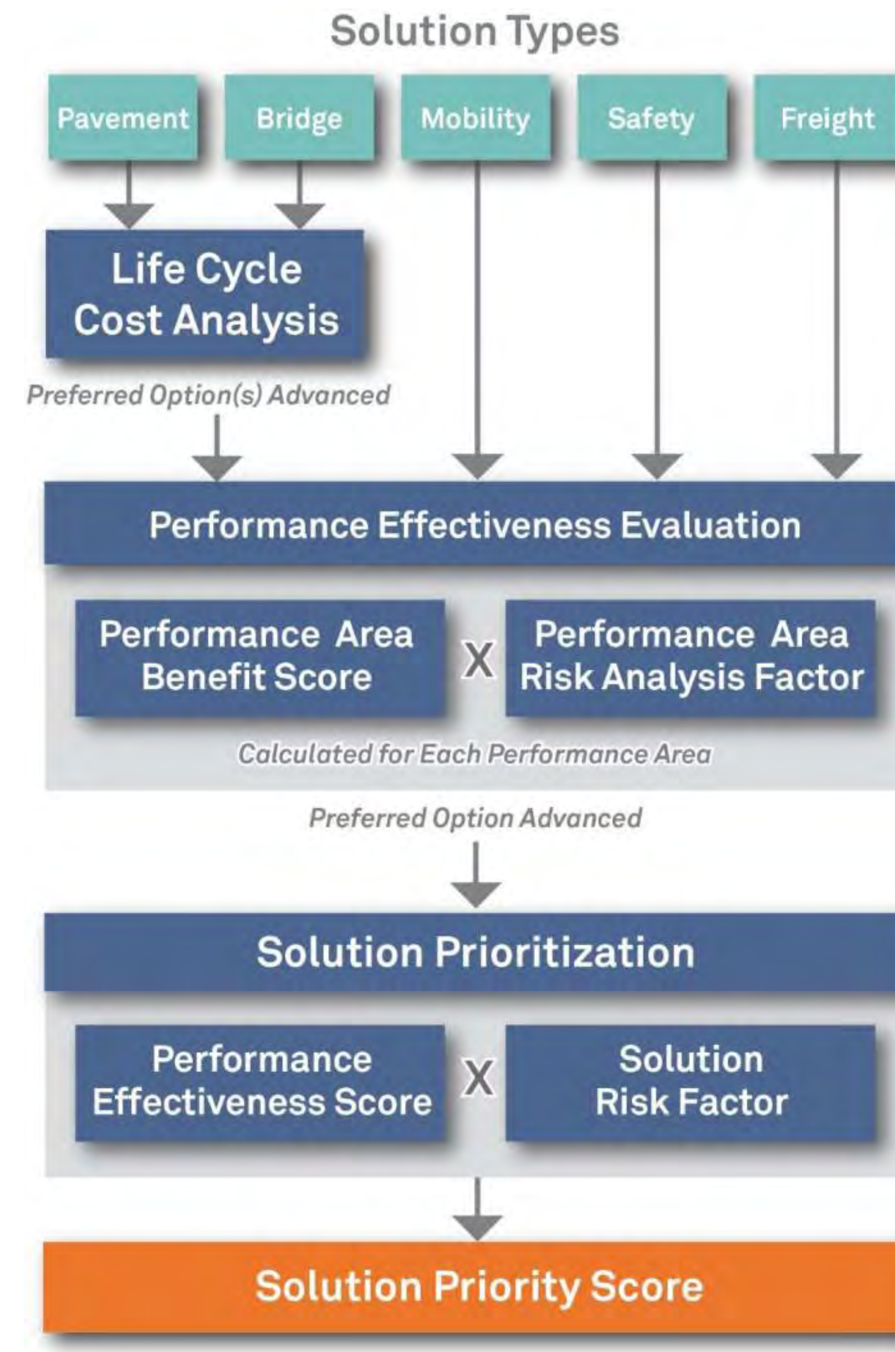
Solution Risk Analysis

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 (NPV) of future costs are discounted at 3% and all dollar amounts are in 2023 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
- Since this LCCA is conducted at a planning level, and due to the variabilities in costs and improvement strategies, the LCCA NPV 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 US 60|US 70|US 191 corridor. A summary of this analysis is shown in **Table 21**. Additional information regarding the 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 NPV of future costs are discounted at 3% and all dollar amounts are in 2023 dollars
- If the LCCA evaluation recommends rehabilitation or repair, the solution will not be 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 NPV 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 conducted for two pavement projects on the US 60|US 70|US 191 corridor. A summary of this analysis is shown in **Table 22**. Additional information regarding the LCCA is contained in **Appendix E**.

As shown in **Table 21** and **Table 22**, the following conclusions were determined based on the LCCA:

- Rehabilitation or repair was determined to be the most effective approach for Candidate Solution 191.1 (US191 Pavement Preservation South of Safford). However, the net present value for the replacement option is within 15% of the lowest cost option, therefore this Candidate Solution was considered strategic and moved forward in the process to Performance Effectiveness Evaluation.
- Rehabilitation or repair was determined to be the most effective approach for the candidate solution 70.3, and this location does not have other Needs. Therefore, it is assumed that these will be addressed by normal programming processes and these candidate solutions will be dropped from further consideration

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 US 60 70 191 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		
US191 Pavement Preservation South of Safford (CS 191.1, MP 88-104)	$262,287,676	$240,087,944	$221,616,023	$209,767,952	1.25	1.14	1.06	1.00	N	Asphalt reconstruction are within 15% of the lowest cost – replacement is recommended
Bylas Area Pavement Preservation (CS 70.3, MP 293-298)	$35,953,272	$32,910,227	$28,425,286	$32,545,584	1.26	1.16	1.00	1.14	N	Reconstruction is not within 15% of lowest cost - Rehabilitation is recommended

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 the 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:
    - o The IRI rating would decrease (to 30 for replacement or 45 for rehabilitation)
    - o The Cracking rating would decrease (to 0 for replacement or rehabilitation)
- Bridge:
    - o The structural ratings would increase (+1 for repair, +2 for rehabilitation, or increase to 8 for replacement)
    - o The Sufficiency Rating would increase (+10 for repair, +20 for rehabilitation, or increase to 98 for replacement)
- Mobility:
    - o Additional lanes would increase the capacity and therefore affect the Mobility Index and associated secondary measures
    - o Other improvements (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
    - o 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
    - o Changes in the Safety Index (due to crash reductions) would have a direct effect on the Closure Extent secondary measure
- Safety:
    - o Crash modification factors were developed that would be applied to estimate the reduction in crashes (for additional information see **Appendix F**)
- Freight:
    - o 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
    - o 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 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 a preservation solution; this would include pavement and bridge preservation solutions which 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 reflective of modernization solutions that generally 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 an expansion solution or a modernization solution that includes 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; 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 = estimate 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 (2023) 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 should 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 US 60|US 70|US 191 corridor, the following candidate solutions have options:

- CS70|60.7 (A, B) – Globe Area Freight Improvements MP 243-255
- CS60.9 (A, B) – Miami Area Freight Improvements MP 227-243

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	Mobility	Safety	Freight				
CS191.1	191-3	B	US191 Pavement Preservation South of Safford - Option B (replace pavement)	88-104	$200.3	1.85	0.00	0.00	0.03	0.00	0.00	0.00	0.00	1.88	2.21	20.2	0.4
CS70.2	70-6	-	East Safford Safety Improvements	336.5-339	$0.1	0.00	0.00	0.00	0.05	0.00	0.00	0.04	0.00	0.08	0.17	15.3	2.1
CS70.4	70-10	-	Bylas to Peridot Safety Improvements	274-293	$15.1	0.00	0.00	0.02	3.74	0.00	0.00	0.75	0.00	4.50	0.13	20.2	0.8
CS70.5	70-12	-	East of Globe Safety Improvements	255-270	$31.1	0.00	0.00	0.31	3.73	0.00	0.03	0.55	0.00	4.61	3.50	20.20	10.5
CS70|60.6	70|60-13	-	Globe Area Safety Improvements	243-255	$22.6	0.00	0.00	0.23	10.03	2.26	0.01	1.19	1.13	14.85	1.13	20.20	15.0
CS70|60.7	70|60-13	A	Globe Area Freight Improvements - Option A (reconstruct Pinal SPRR UP)	243-255	$8.2	0.00	0.00	0.00	0.00	1.90	0.00	0.00	0.01	1.91	0.37	20.20	1.7
		B	Globe Area Freight Improvements - Option B (reprofile mainline)	243-255	$2.1	0.00	0.00	0.05	1.98	1.52	0.00	0.00	0.35	3.90	0.37	20.20	13.9
CS60.8	60-14	-	Superior East Area Safety Improvements	227-243	$17.0	0.00	0.00	0.51	13.77	6.49	0.00	1.82	1.04	23.63	4.47	8.80	54.6
CS60.9A	60-14	A	Superior East Area Freight Improvements - Option A (reconstruct Pinal SPRR UP)	228.47	$33.3	0.00	0.00	0.00	0.00	3.79	0.00	0.00	0.02	3.82	0.34	20.20	0.8
CS60.9B	60-14	B	Superior East Area Freight Improvements - Option A (reprofile mainline)	228.47	$1.9	0.00	0.00	0.28	1.68	4.91	0.00	0.00	0.79	7.66	0.34	20.20	27.1
CS60.10	60-17	-	Superior Area Safety Improvements	212-223	$0.4	0.00	0.00	0.03	0.87	0.74	0.00	0.08	0.16	1.88	3.29	8.80	121.4
CS60.11	60-18	-	US-60 SW of Gold Canyon Safety Improvements	206-208	$3.9	0.00	0.00	0.02	0.06	1.13	0.00	0.03	0.08	1.32	1.61	15.30	8.3
CS60.12	60-19	-	Gold Canyon Area Mobility and Safety Improvements	199-205	$44.0	0.00	0.00	19.52	0.64	2.16	0.08	0.13	0.15	22.67	4.16	20.20	43.3

Table 23: Performance Effectiveness Scores (continued)

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	Mobility	Safety	Freight				
CS60.13	60-20	-	Apache Junction Area Mobility Improvements	194.3-199	$24.7	0.00	0.00	15.22	0.13	1.13	0.04	0.00	0.22	16.74	3.97	20.2	54.5
CS60.14	60-20	-	Apache Junction Area Safety Improvements	194.3-199	$0.3	0.00	0.00	0.03	0.81	0.31	0.00	0.05	0.02	1.21	4.19	8.8	158.2

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

Frequency/ Likelihood		Severity/Consequence				
		Insignificant	Minor	Significant	Major	Catastrophic
	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

Frequency/ Likelihood			Severity/Consequence				
			Insignificant	Minor	Significant	Major	Catastrophic
		Weight	1.00	1.10	1.20	1.30	1.40
	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 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
CS191.1	191-3	B	US191 Pavement Preservation South of Safford - Option B (replace pavement)	88-104	$200.3	0.4	1.15	0.77	**0**	67%	-	0%	30%	0%
CS70.2	70-6	-	East Safford Safety Improvements	336.5-339	$0.1	2.1	1.78	0.92	**3**	-	-	0%	4%	0%
CS70.4	70-10	-	Bylas to Peridot Safety Improvements	274-293	$15.1	0.8	1.78	1.38	**2**	-	-	0%	34%	0%
CS70.5	70-12	-	East of Globe Safety Improvements	255-270	$31.1	10.5	1.75	1.23	**23**	-	-	6%	97%	0%
CS70|60.6	70|60-13	-	Globe Area Safety Improvements	243-255	$22.6	15.0	1.68	1.77	**44**	-	-	4%	30%	46%
CS70|60.7	70|60-13	A	Globe Area Freight Improvements - Option A (reconstruct Pinal SPRR UP)	243-255	$8.2	1.7	1.36	1.77	**4**	-	-	0%	0%	38%
		B	Globe Area Freight Improvements - Option B (reprofile mainline)	243-255	$2.1	13.9	1.57	1.77	**39**	-	-	1%	6%	31%
CS60.8	60-14	-	Superior East Area Safety Improvements	227-243	$17.0	54.6	1.64	2.54	**227**	-	-	0%	56%	18%
CS60.9A	60-14	A	Superior East Area Freight Improvements - Option A (reconstruct Pinal SPRR UP)	227-243	$33.3	0.8	1.36	2.54	**3**	-	-	0%	0%	10%
CS60.9B	60-14	B	Superior East Area Freight Improvements - Option A (reprofile mainline)	227-243	$1.9	27.1	1.45	2.54	**100**	-	-	0%	7%	13%
CS60.10	60-17	-	Superior Area Safety Improvements	212-223	$0.4	121.4	1.57	1.00	**191**	-	-	1%	40%	36%
CS60.11	60-18	-	US-60 SW of Gold Canyon Safety Improvements	206-208	$3.9	8.3	1.39	1.15	**13**	-	-	1%	12%	23%
CS60.12	60-19	-	Gold Canyon Area Mobility and Safety Improvements	199-205	$44.0	43.3	1.37	1.69	**101**	-	-	72%	21%	42%
CS60.13	60-20	-	Apache Junction Area Mobility Improvements	194.3-199	$24.7	54.5	1.36	1.38	**102**	-	-	64%	3%	80%
CS60.14	60-20	-	Apache Junction Area Safety Improvements	194.3-199	$0.3	158.2	1.66	1.38	**362**	-	-	0%	19%	22%

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 US 60|US 70|US 191 corridor. 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 corridor. The following observations were noted about the prioritized solutions:

- Most of the anticipated improvements in performance are in the Mobility, Safety, and Freight performance areas
- The highest ranking solutions tended to have overlapping benefits in the Mobility, Safety, and Freight performance areas
- The highest priority solutions address needs in the US 60 Apache Junction area (MP 194.3-199 to MP 243), Superior Area (MP 212-223) and Miami Area (MP 228-247)

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 US 60|US 70|US 191 corridor:

- Road Safety Assessments are recommended in Peridot, Cutter and Globe to identify safety improvements, specifically pedestrian circulation and access needs in Peridot.
- Access Control Studies in Peridot (MP 270 – 274) and Globe-Miami (MP 243 – 255) are recommended to identify potential for access consolidation, signage, etc to reduce friction and improve safety.
- Recommend Superior to Globe DCR/Feasibility Study
- Recommend San Carlos Area (MP 268 – 292) Superelevation Study

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 US 60|US 70|US 191, 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 Round 1, Round 2, and Round 3 CPS:

- 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

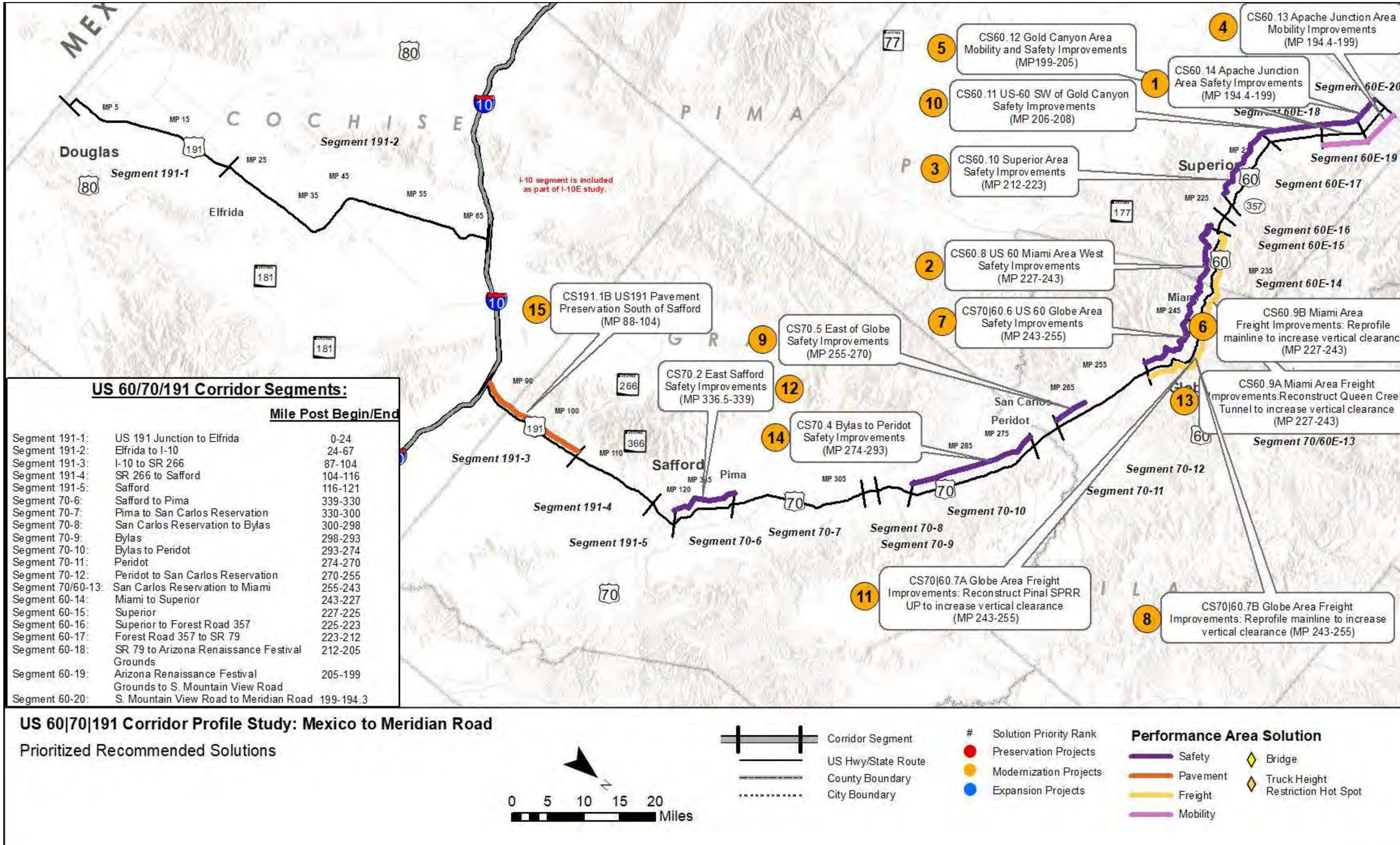
Table 25: Prioritized Recommended Solutions

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
1	60.14	-	Apache Junction Area Safety Improvements	Install inside and edge line rumble strips through entire segment Consider installing speed feedback sign MP 195	$0.3	M	362
2	60.8	-	Superior Area East Safety Improvements	Consider installing speed feedback signs at MP 229.9, MP 236, MP 241 Install centerline rumble strips at MP 229-231 Install high visibility striping and delineators MP 228-228.3 and MP 241-242 Install edge line rumble strips EB MP 228.17-228.3, MP 229.2-229.26, and MP 247-247.26	$17.0	M	227
3	60.10	-	Superior Area Safety Improvements	Install lighting at N Queen Valley Road and US 60 intersection Consider installing speed feedback sign MP 212.5 Install chevrons or curve warning sign at MP 219.33	$0.4	M	191
4	60.13	-	Apache Junction Area Mobility Improvements	Add through lane in NB/WB direction	$24.7	M	102
5	60.12	-	Gold Canyon Area Mobility and Safety Improvements	Add SB/EB through lane MP 199.12 to 206 Consider installing speed feedback sign at MP 201 Widen shoulders MP 199.12 to 205 Install lighting MP 201-202	$44.0	E	101
6	60.9	B	Superior Area East Freight Improvements	Reprofile mainline to increase vertical clearance	$1.9	E	100
7	70|60.6	-	Globe Area Safety Improvements	Consider installing speed feedback signs (2 EB and 2 WB between MP 246 - 250) High visibility striping Install signal ahead warning signs with beacons in advance of SR 188 intersection Construct passing lane in each direction from MP 243-243.25 and MP 253.6-255	$22.6	M	44
8	70|60.7	B	Globe Area Freight Improvements	Reprofile mainline to increase vertical clearance	$2.1	E	39
9	70.5	-	East of Globe Safety Improvements	Widen shoulders MP 255-270 Install centerline rumble strips MP 255-270 Install improved lighting from milepost 269-270 Construct passing lane in each direction (MP 255-256) Improve existing pedestrian and speed warning signs to include flashing beacons and speed feedback signs (MP 269.25)	$31.1	M	23
10	60.11	-	US-60 SW of Gold Canyon Safety Improvements	Install lighting MP 205-207 Widen inside shoulder 208.3-212 Consider installing speed feedback sign	$3.9	M	13

Table 25: Prioritized Recommended Solutions (Continued)

Rank	Candidate Solution #	Option	Solution Name and Location	Description / Scope	Estimated Cost (in millions)	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Prioritization Score
11	70|60.7	A	Globe Area Freight Improvements	Reconstruct Pinal SPRR UP to increase vertical clearance	$8.2	E	4
12	70.2	-	East Safford Safety Improvements	Provide flashing traffic signal warning signs at Milepost 337.82 and Milepost 338.03. Consider installing feedback signs in both directions at 20th Avenue	$0.1	M	3
13	60.9	A	Superior Area East Freight Improvements	Reconstruct Queen Creek Tunnel to increase vertical clearance	$33.3	E	3
14	70.4	-	Bylas to Peridot Safety Improvements	Widen shoulders Milepost 274-278 Install centerline rumble strips MP 275.5-276.5,MP 279.5-287.5 Install shoulder rumble strips MP 275.5-276.5,MP 279.5-287.5 Install high visibility striping and delineators from milepost 274-278 Improve existing pedestrian / speed warning signs to also include flashing beacons and speed feedback signs (MP 292,MP 280, MP 278.5) Construct passing lanes (WB MP 288.2-289.6) Formalize pullouts (signage, ROW for pullouts) (WB MP 274.5, EB MP 279, EB MP 289, WB 292)	$15.1	M	2
15	191.1	B	US191 Pavement Preservation South of Safford	Replace pavement	$200.3	M	0

Figure 27: Prioritized Recommended Solutions

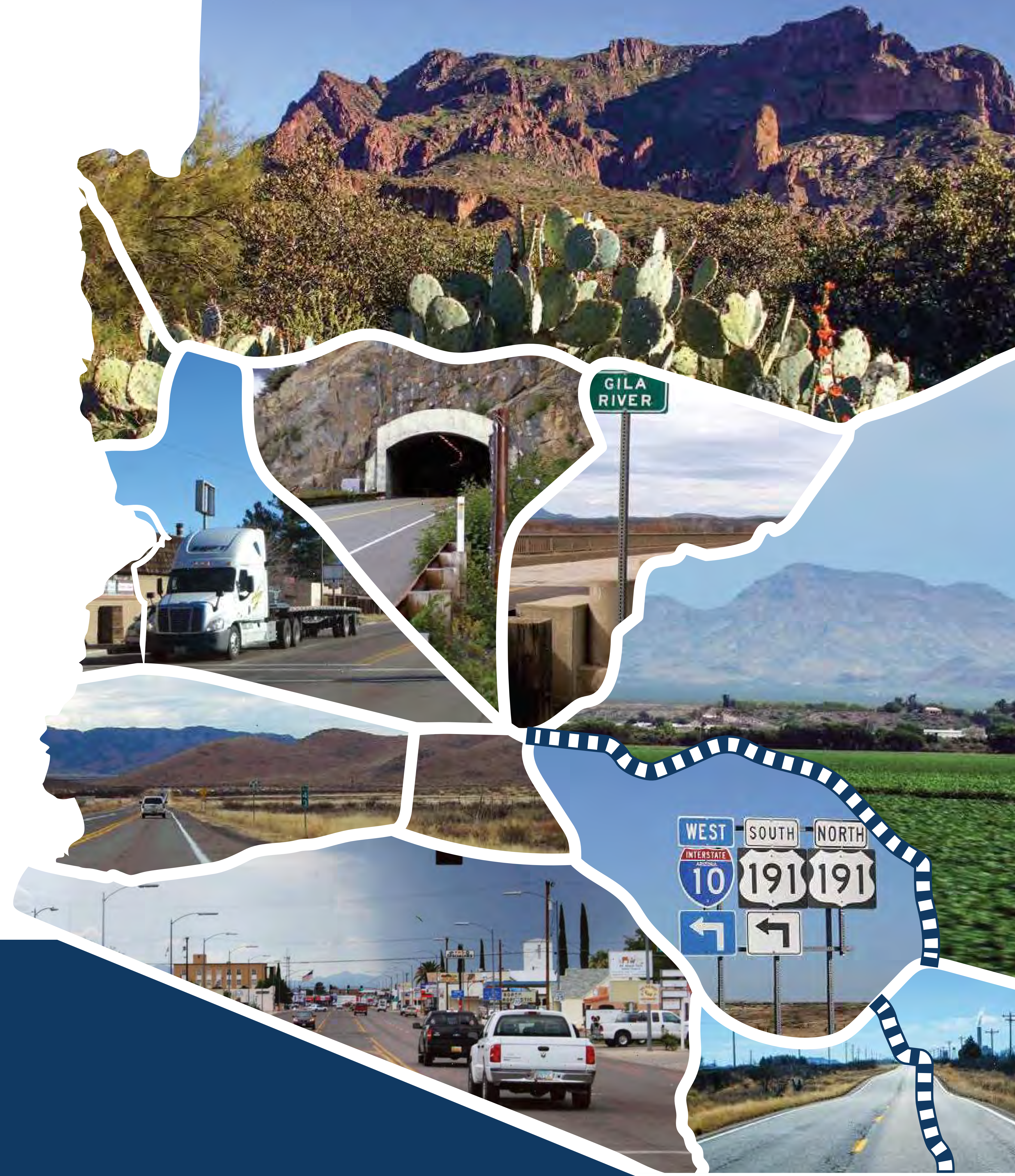


6.4 Next Steps

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 US 60|US 70|US 191 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:

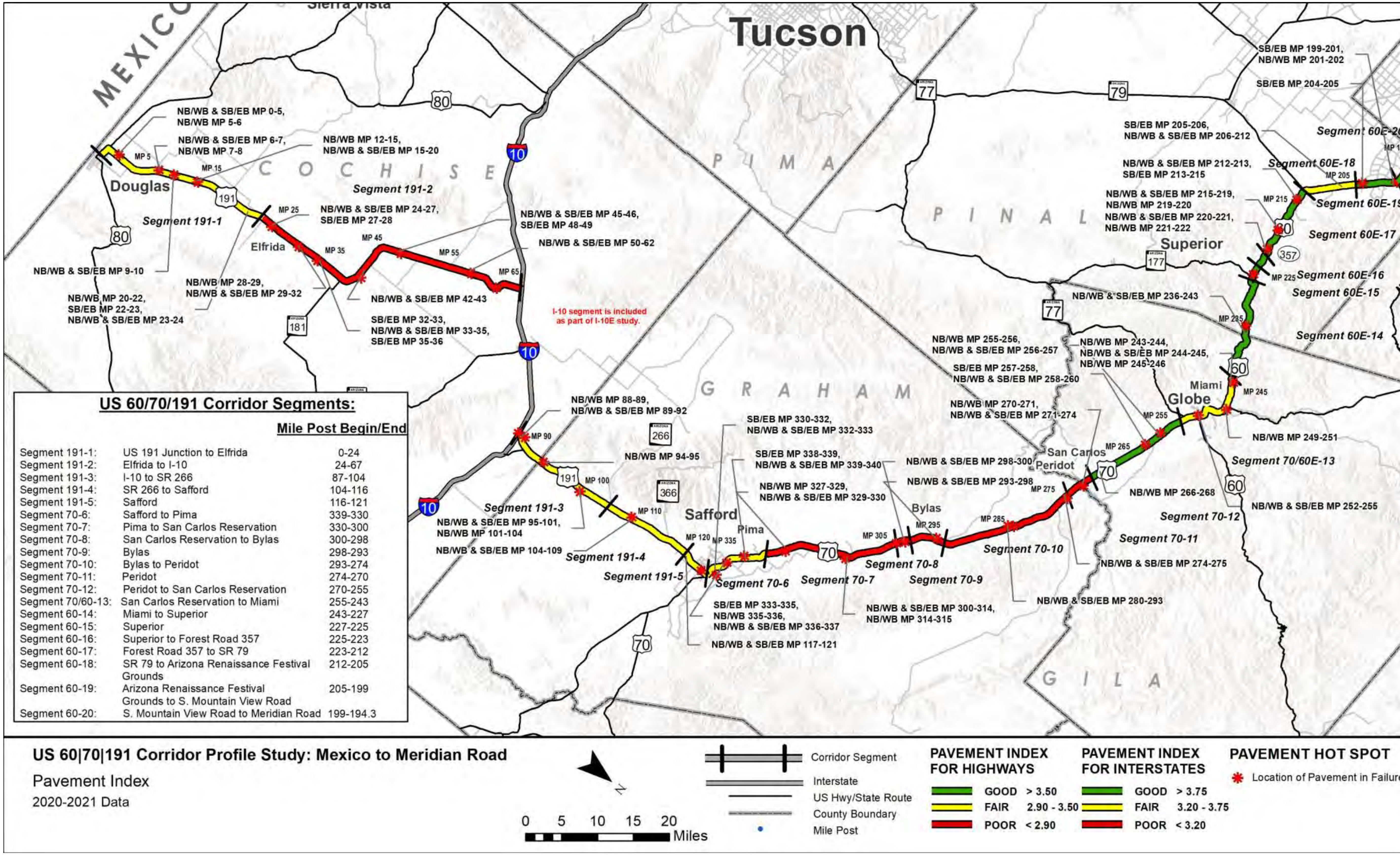
- Mobility Index
- Future Daily V/C Ratio
- Existing Peak Hour V/C Ratio (directional)
- Closure Frequency (directional)
- Level of Travel Time Reliability (directional)
- Multimodal Opportunities
- Percentage of Bicycle Accommodation

Safety Performance Area:

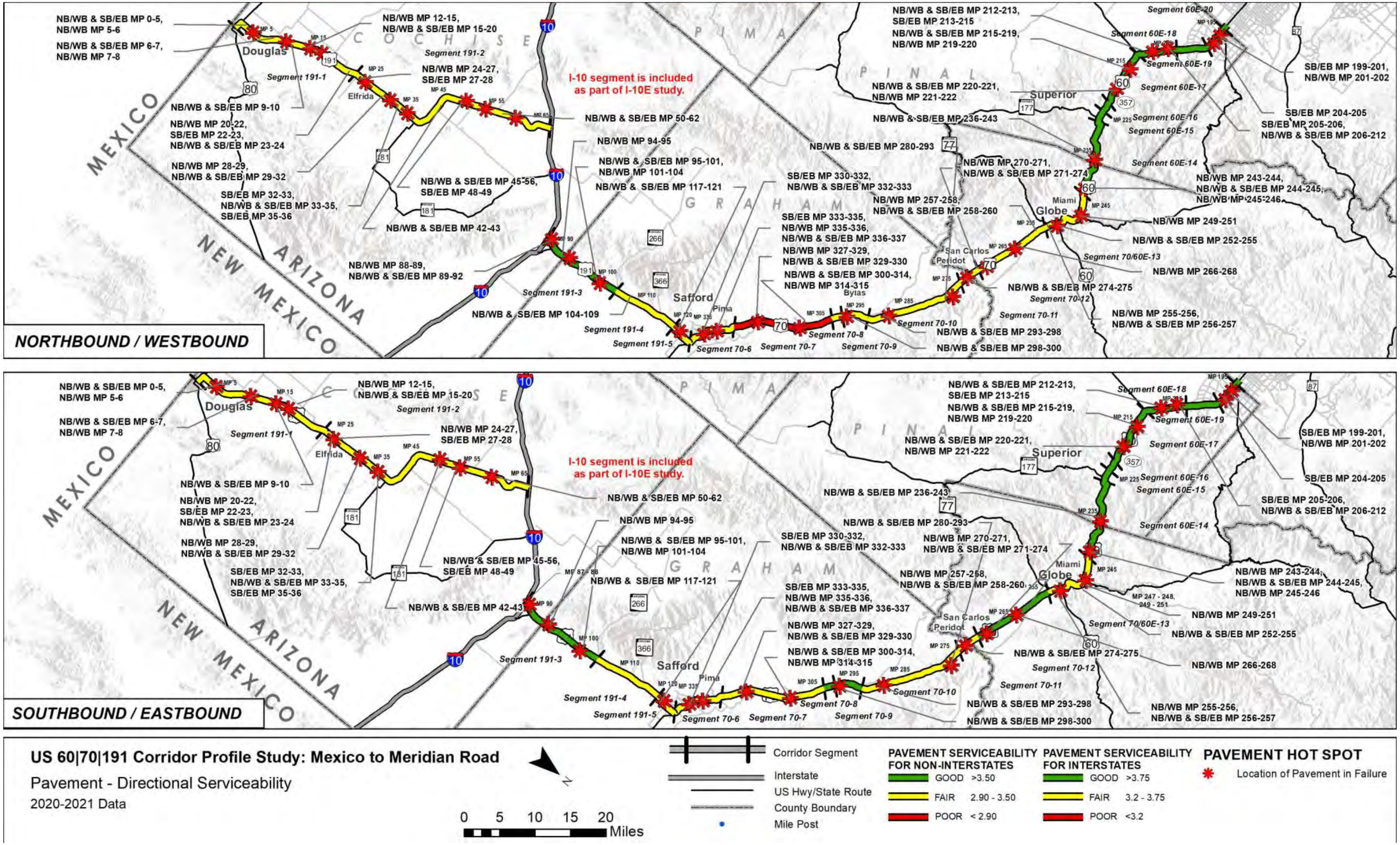
- Safety Index and Hot Spots
- Safety Index and Hot Spots (directional)
- Relative Frequency of Fatal + Suspected Serious Injury Crashes Involving Intersection Crashes Compared to the Statewide Average for Similar Segments (insufficient data – not included)
- Relative Frequency of Fatal + Suspected Serious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

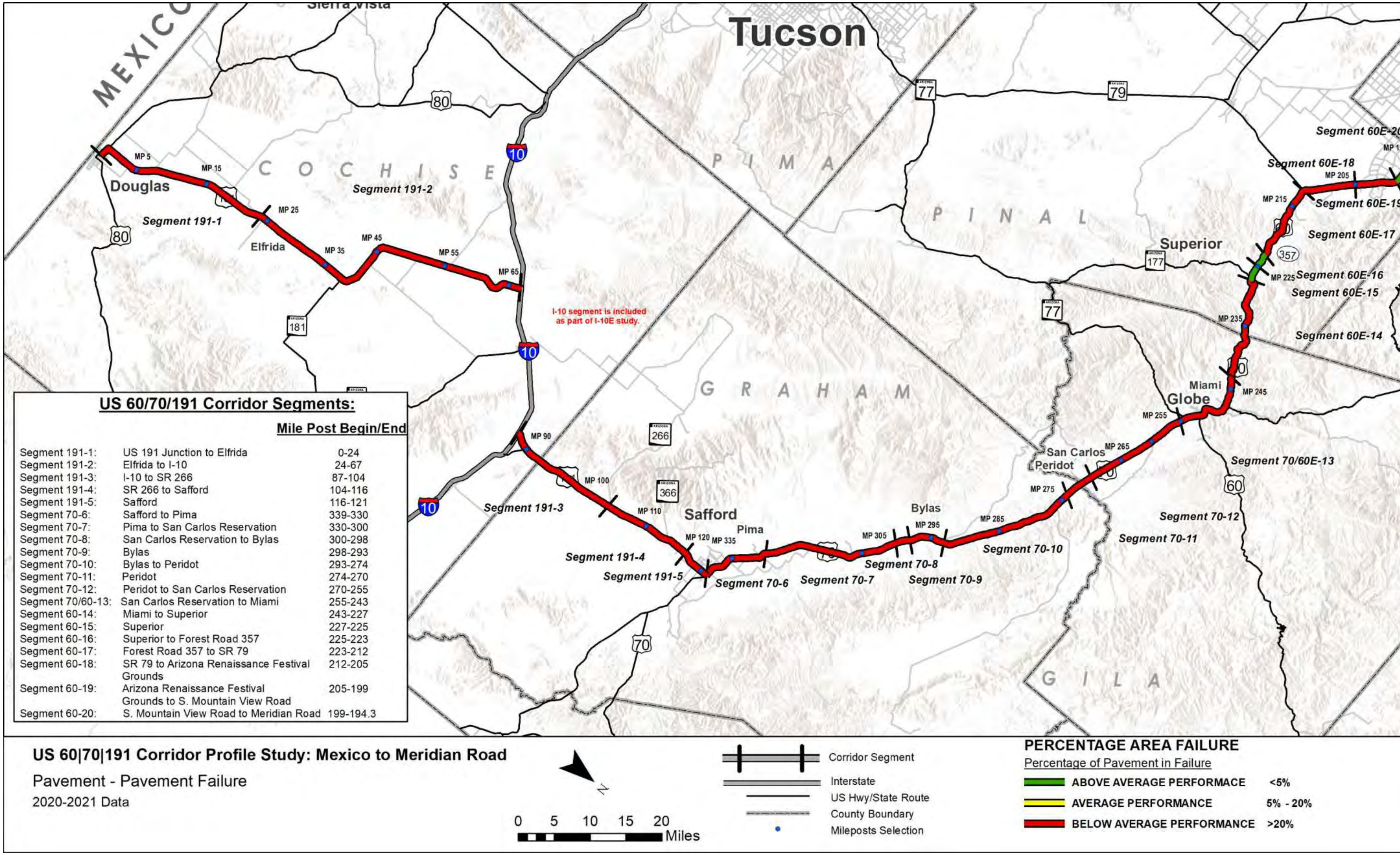
Freight Performance Area:

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



Segment	Description	Mile Post Begin/End
Segment 191-1:	US 191 Junction to Elfrida	0-24
Segment 191-2:	Elfrida to I-10	24-67
Segment 191-3:	I-10 to SR 266	87-104
Segment 191-4:	SR 266 to Safford	104-116
Segment 191-5:	Safford	116-121
Segment 70-6:	Safford to Pima	339-330
Segment 70-7:	Pima to San Carlos Reservation	330-300
Segment 70-8:	San Carlos Reservation to Bylas	300-298
Segment 70-9:	Bylas	298-293
Segment 70-10:	Bylas to Peridot	293-274
Segment 70-11:	Peridot	274-270
Segment 70-12:	Peridot to San Carlos Reservation	270-255
Segment 70/60-13:	San Carlos Reservation to Miami	255-243
Segment 60-14:	Miami to Superior	243-227
Segment 60-15:	Superior	227-225
Segment 60-16:	Superior to Forest Road 357	225-223
Segment 60-17:	Forest Road 357 to SR 79	223-212
Segment 60-18:	SR 79 to Arizona Renaissance Festival Grounds	212-205
Segment 60-19:	Arizona Renaissance Festival Grounds to S. Mountain View Road	205-199
Segment 60-20:	S. Mountain View Road to Meridian Road	199-194.3


NORTHBOUND / WESTBOUND
SOUTHBOUND / EASTBOUND
I-10 segment is included as part of I-10E study.
MEXICO
NEW MEXICO
ARIZONA
COCHISE
PIMA
PINAL
GRAHAM
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
NB/WB & SB/EB MP 0-5, NB/WB MP 5-6
NB/WB & SB/EB MP 6-7, NB/WB MP 7-8
NB/WB & SB/EB MP 9-10
NB/WB MP 20-22, SB/EB MP 22-23, NB/WB & SB/EB MP 23-24
NB/WB MP 28-29, NB/WB & SB/EB MP 29-32
SB/EB MP 32-33, NB/WB & SB/EB MP 33-35, SB/EB MP 35-36
NB/WB & SB/EB MP 42-43
NB/WB MP 12-15, NB/WB & SB/EB MP 15-20
NB/WB MP 24-27, SB/EB MP 27-28
NB/WB & SB/EB MP 45-56, SB/EB MP 48-49
NB/WB & SB/EB MP 50-62
NB/WB MP 88-89, NB/WB & SB/EB MP 89-92
NB/WB MP 94-95
NB/WB & SB/EB MP 95-101, NB/WB MP 101-104
NB/WB & SB/EB MP 117-121
NB/WB & SB/EB MP 104-109
SB/EB MP 330-332, NB/WB & SB/EB MP 332-333
SB/EB MP 333-335, NB/WB MP 335-336, NB/WB & SB/EB MP 336-337
NB/WB MP 327-329, NB/WB & SB/EB MP 329-330
NB/WB & SB/EB MP 300-314, NB/WB MP 314-315
NB/WB MP 257-258, NB/WB & SB/EB MP 258-260
NB/WB MP 270-271, NB/WB & SB/EB MP 271-274
NB/WB & SB/EB MP 280-293
NB/WB & SB/EB MP 236-243
NB/WB & SB/EB MP 220-221, NB/WB MP 221-222
NB/WB & SB/EB MP 212-213, SB/EB MP 213-215, NB/WB & SB/EB MP 215-219, NB/WB MP 219-220
SB/EB MP 199-201, NB/WB MP 201-202
SB/EB MP 204-205, SB/EB MP 205-206, NB/WB & SB/EB MP 206-212
NB/WB MP 243-244, NB/WB & SB/EB MP 244-245, NB/WB MP 245-246
NB/WB MP 249-251
NB/WB & SB/EB MP 252-255
NB/WB MP 266-268
NB/WB & SB/EB MP 274-275
NB/WB MP 255-256, NB/WB & SB/EB MP 256-257
NB/WB & SB/EB MP 293-298
NB/WB & SB/EB MP 298-300
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Pavement - Directional Serviceability
2020-2021 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
PAVEMENT SERVICEABILITY FOR NON-INTERSTATES
GOOD >3.50
FAIR 2.90 - 3.50
POOR < 2.90
PAVEMENT SERVICEABILITY FOR INTERSTATES
GOOD >3.75
FAIR 3.2 - 3.75
POOR <3.2
PAVEMENT HOT SPOT
Location of Pavement in Failure


US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
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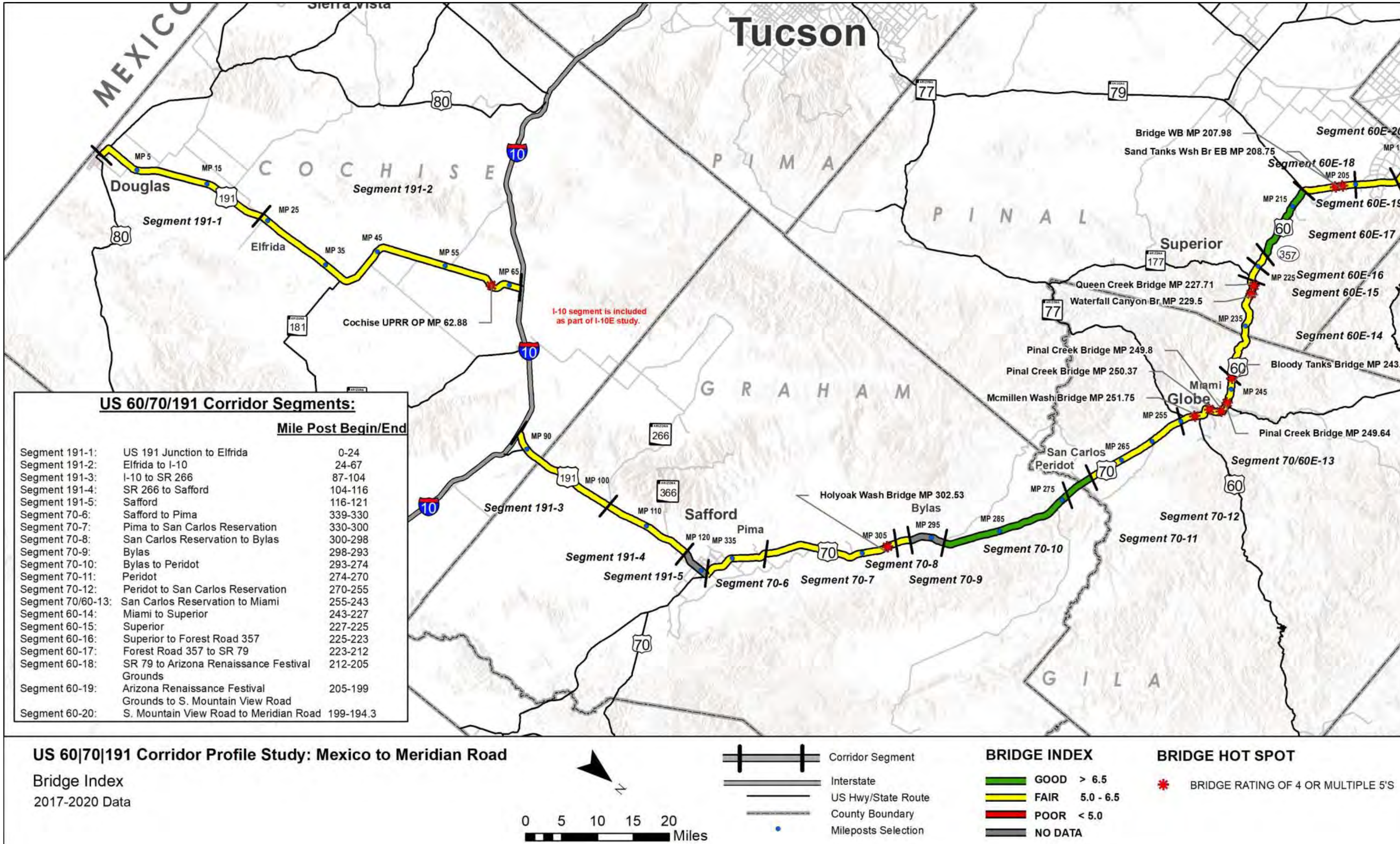
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
I-10 segment is included as part of I-10E study.
Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Pavement - Pavement Failure
2020-2021 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
PERCENTAGE AREA FAILURE
Percentage of Pavement in Failure
ABOVE AVERAGE PERFORMACE <5%
AVERAGE PERFORMANCE 5% - 20%
BELOW AVERAGE PERFORMANCE >20%



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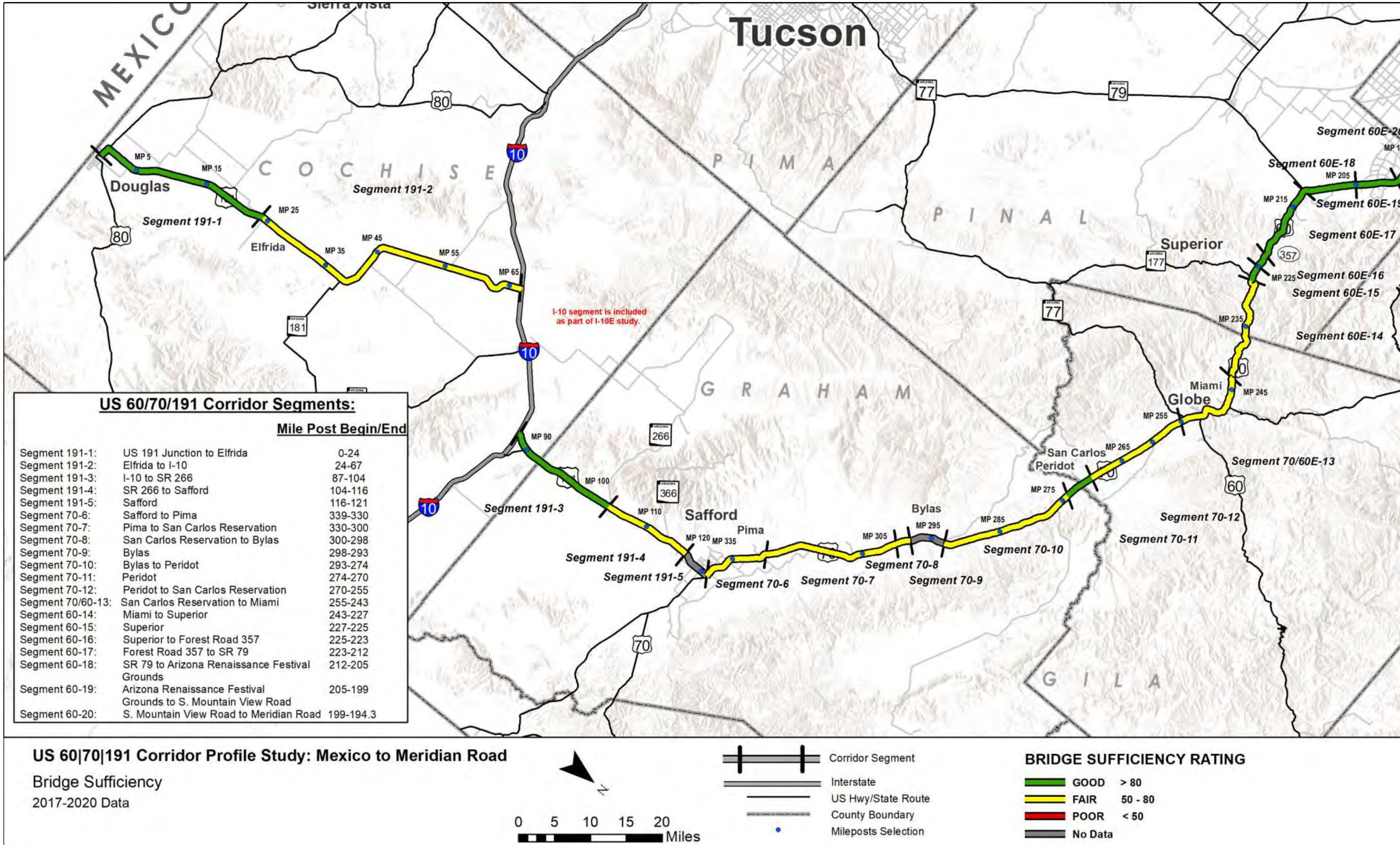
Segment 60-20:	S. Mountain View Road to Meridian Road	199-194.3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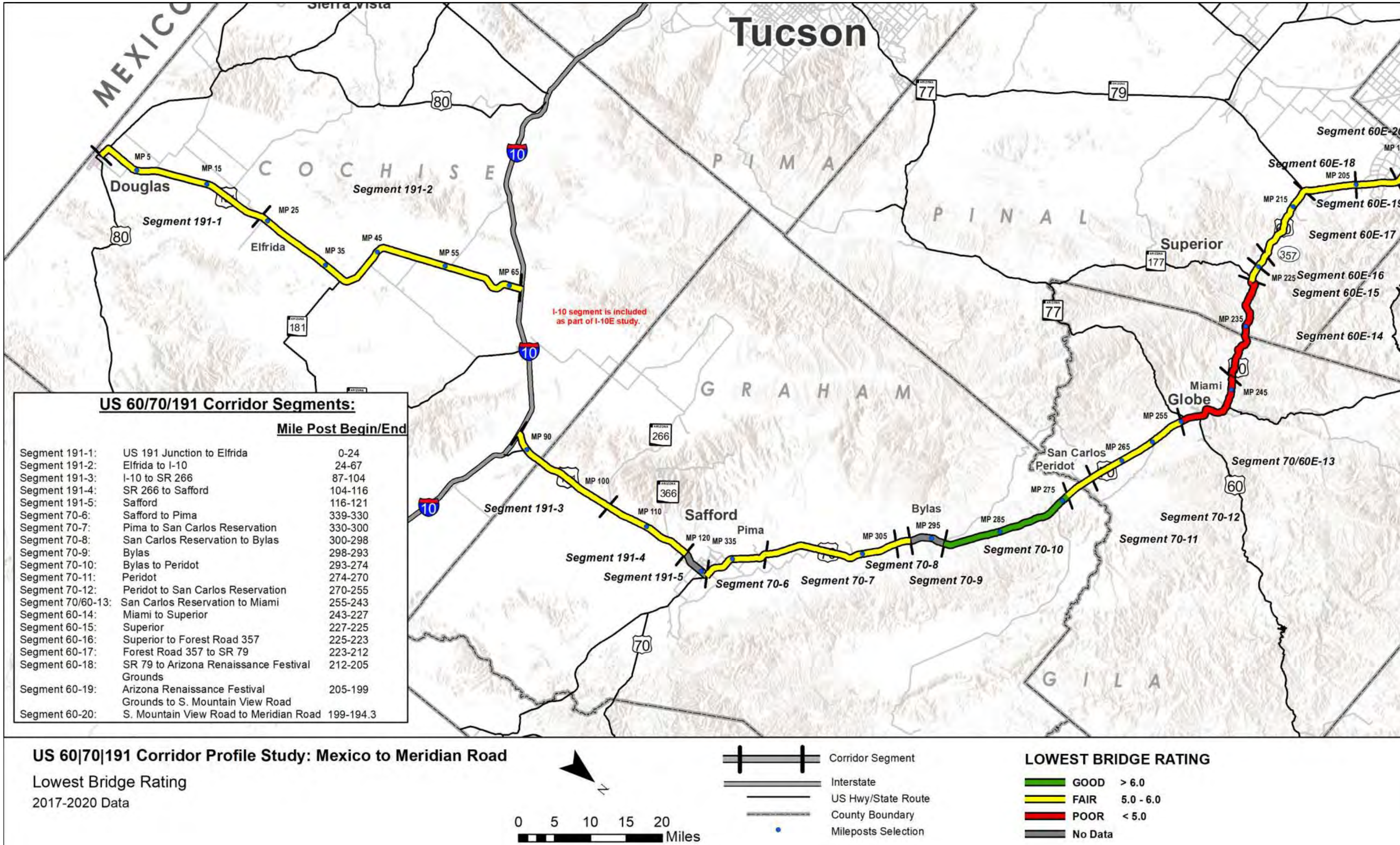
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Bridge Sufficiency
2017-2020 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
BRIDGE SUFFICIENCY RATING
GOOD > 80
FAIR 50 - 80
POOR < 50
No Data



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Mile Post Begin/End
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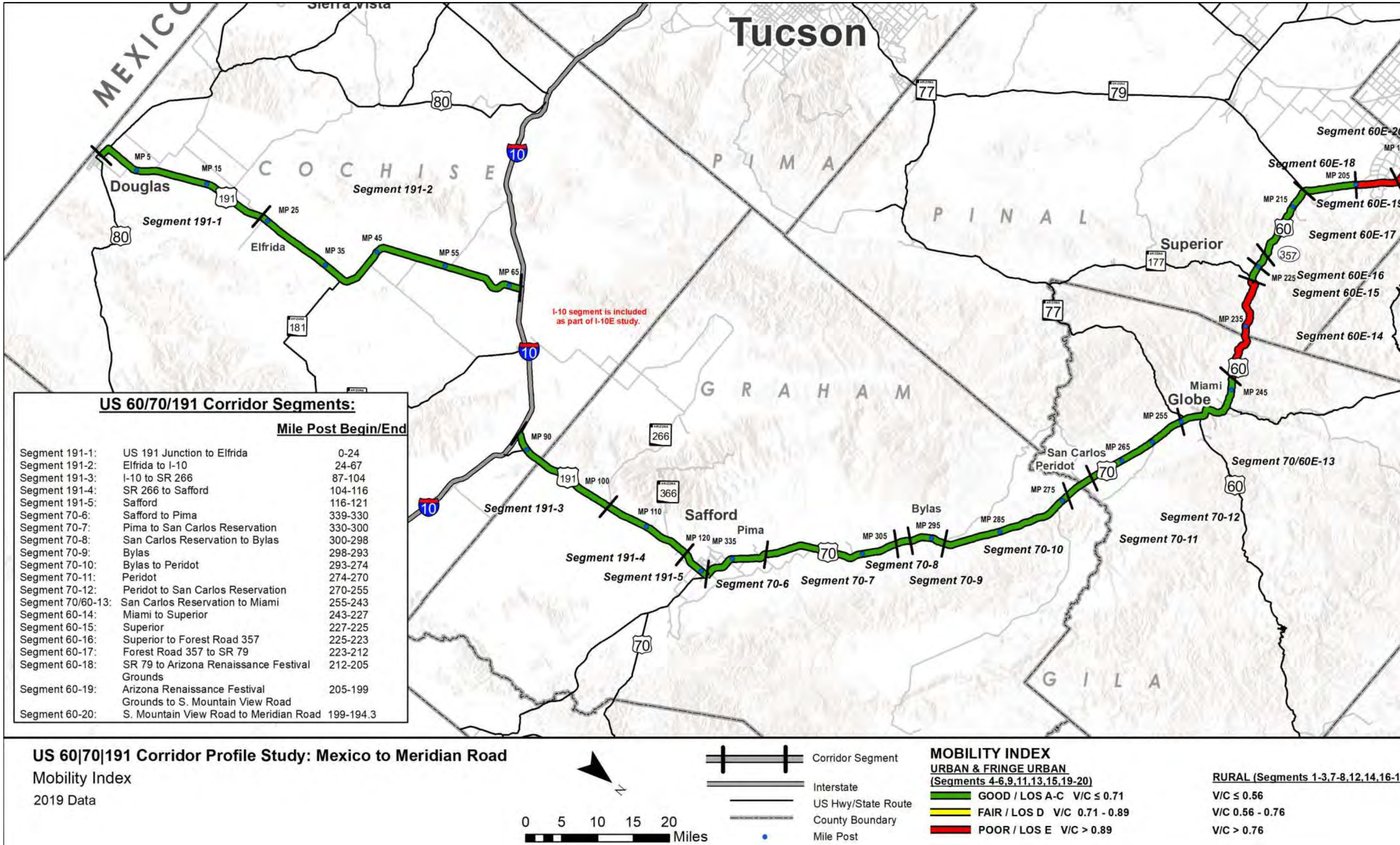
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
I-10 segment is included as part of I-10E study.
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 5
MP 15
MP 25
MP 35
MP 45
MP 55
MP 65
MP 90
MP 100
MP 110
MP 120
MP 335
MP 305
MP 295
MP 285
MP 275
MP 265
MP 255
MP 245
MP 235
MP 225
MP 215
MP 205
MP 195
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Lowest Bridge Rating
2017-2020 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
LOWEST BRIDGE RATING
GOOD > 6.0
FAIR 5.0 - 6.0
POOR < 5.0
No Data


Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Miami
Globe
Superior
Sierra Vista
I-10 segment is included as part of I-10E study.
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
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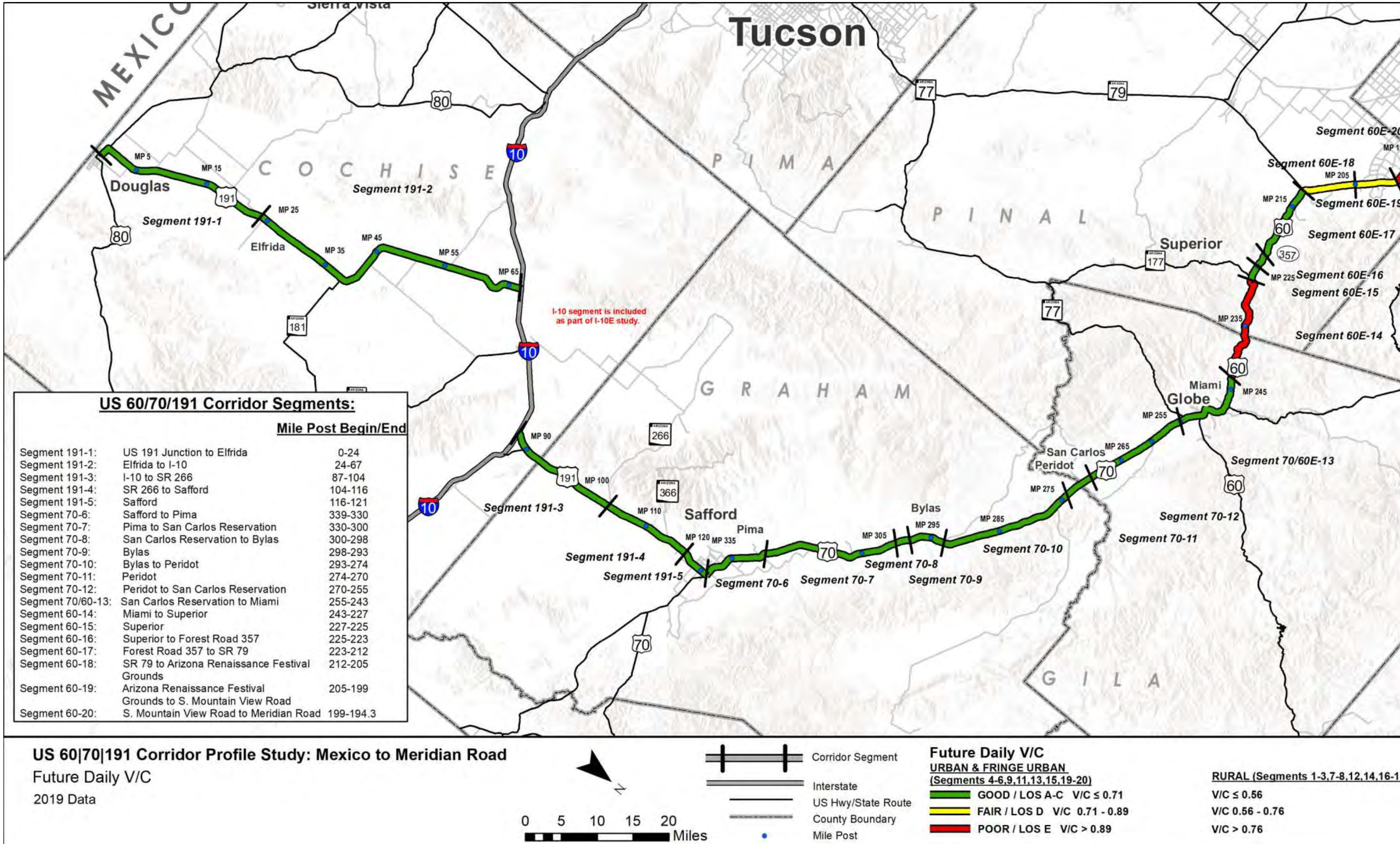
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Mobility Index
2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
MOBILITY INDEX
URBAN & FRINGE URBAN (Segments 4-6,9,11,13,15,19-20)
GOOD / LOS A-C V/C ≤ 0.71
FAIR / LOS D V/C 0.71 - 0.89
POOR / LOS E V/C > 0.89
RURAL (Segments 1-3,7-8,12,14,16-18)
V/C ≤ 0.56
V/C 0.56 - 0.76
V/C > 0.76


Tucson
MEXICO
Sierra Vista
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Miami
Globe
Superior
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
I-10 segment is included as part of I-10E study.
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
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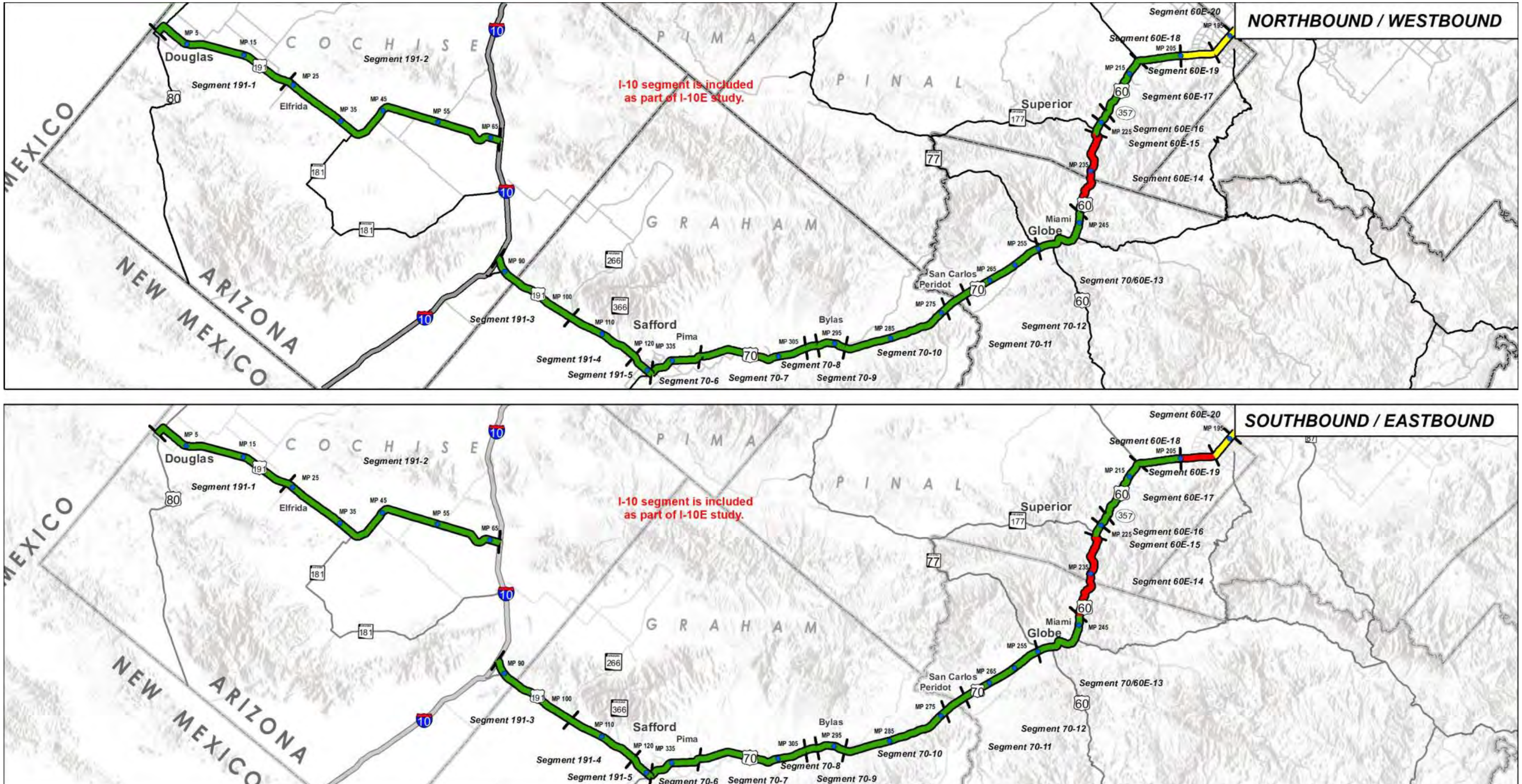
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Future Daily V/C
2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
Future Daily V/C
URBAN & FRINGE URBAN (Segments 4-6,9,11,13,15,19-20)
GOOD / LOS A-C V/C ≤ 0.71
FAIR / LOS D V/C 0.71 - 0.89
POOR / LOS E V/C > 0.89
RURAL (Segments 1-3,7-8,12,14,16-18)
V/C ≤ 0.56
V/C 0.56 - 0.76
V/C > 0.76



US 60|70|191 Corridor Profile Study: Mexico to Meridian Road

Existing Peak V/C (Directional)

2019 Data

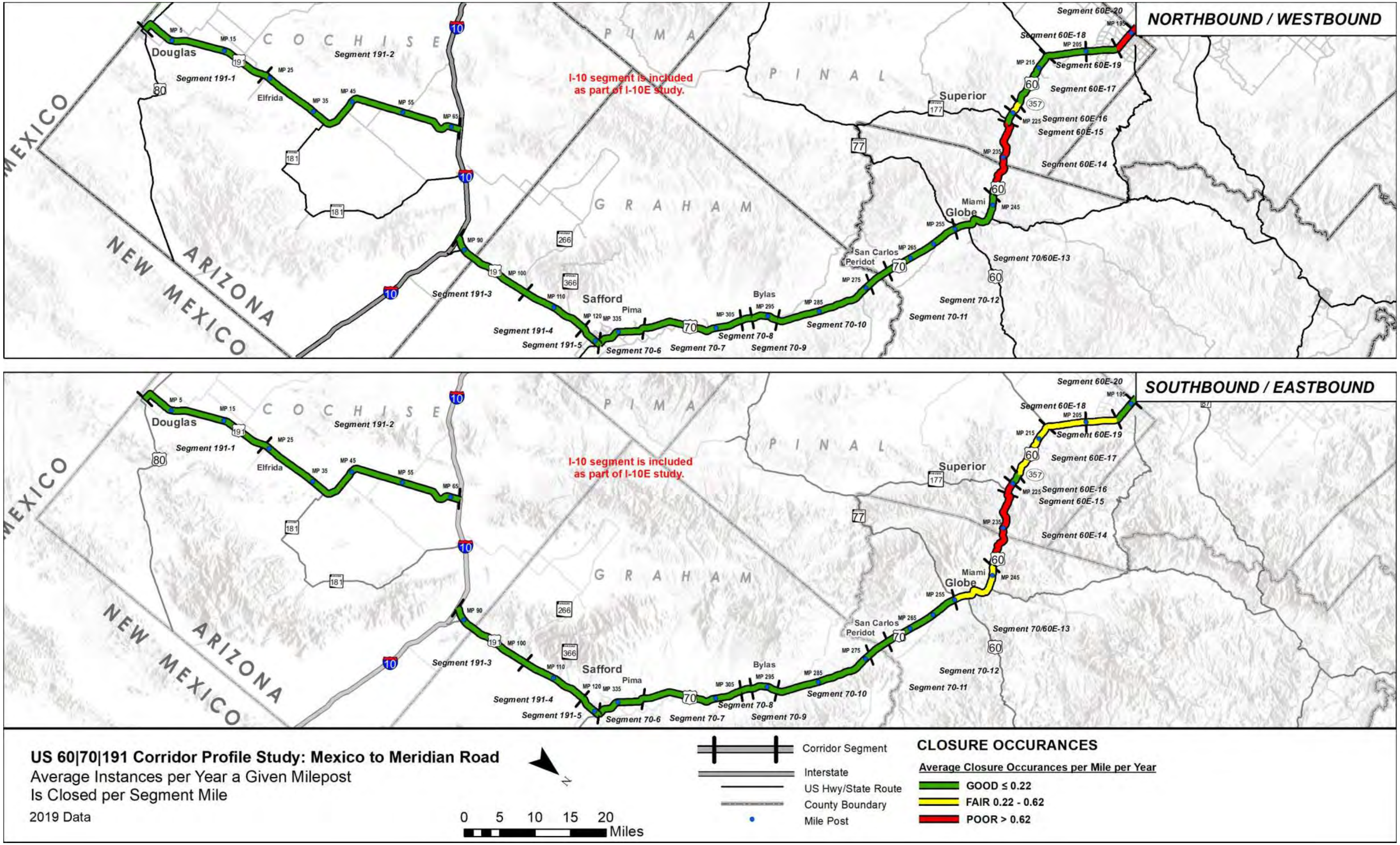
0 5 10 15 20 Miles

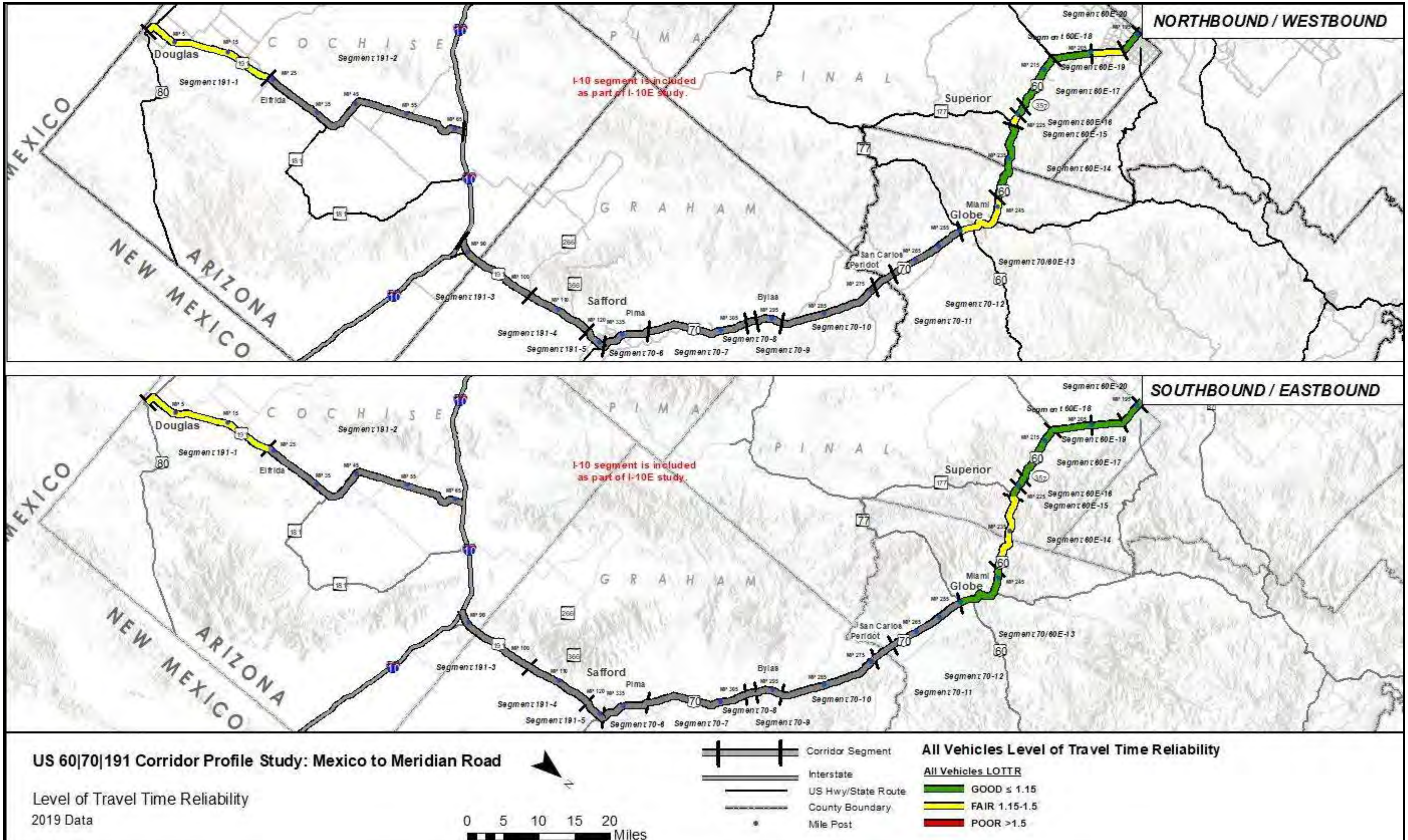
- Corridor Segment
- Interstate
- US Hwy/State Route
- County Boundary
- Mile Post

CURRENT PEAK HOUR V/C

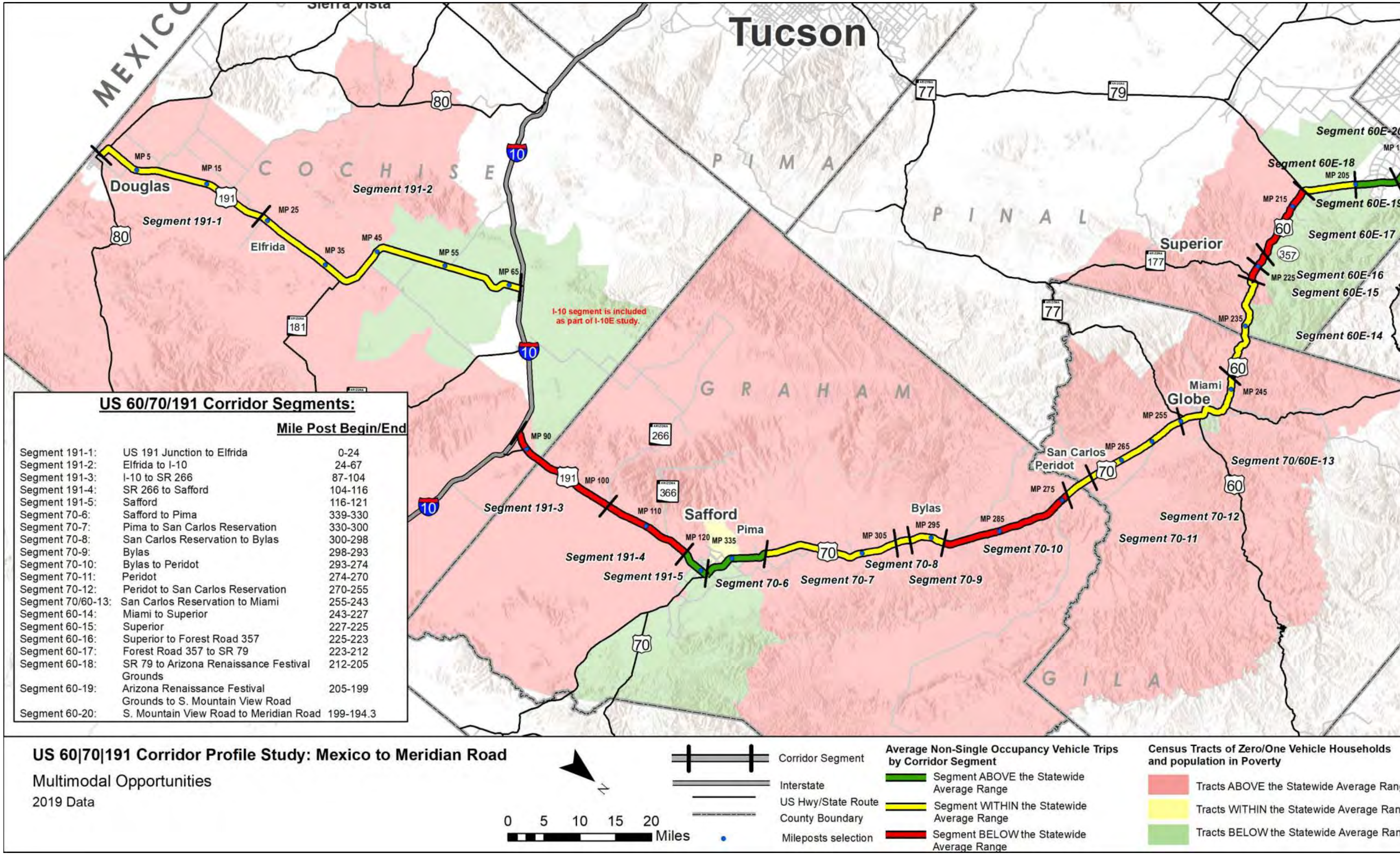
	URBAN & FRINGE URBAN (Segments 4-6,9,11,13,15)	RURAL (Segments 1-3,7-8,12,14,16-17)
GOOD / LOS A-C	V/C ≤ 0.71	V/C ≤ 0.56
FAIR / LOS D	V/C 0.71 - 0.89	V/C 0.56 - 0.76
POOR / LOS E	V/C > 0.89	V/C > 0.76

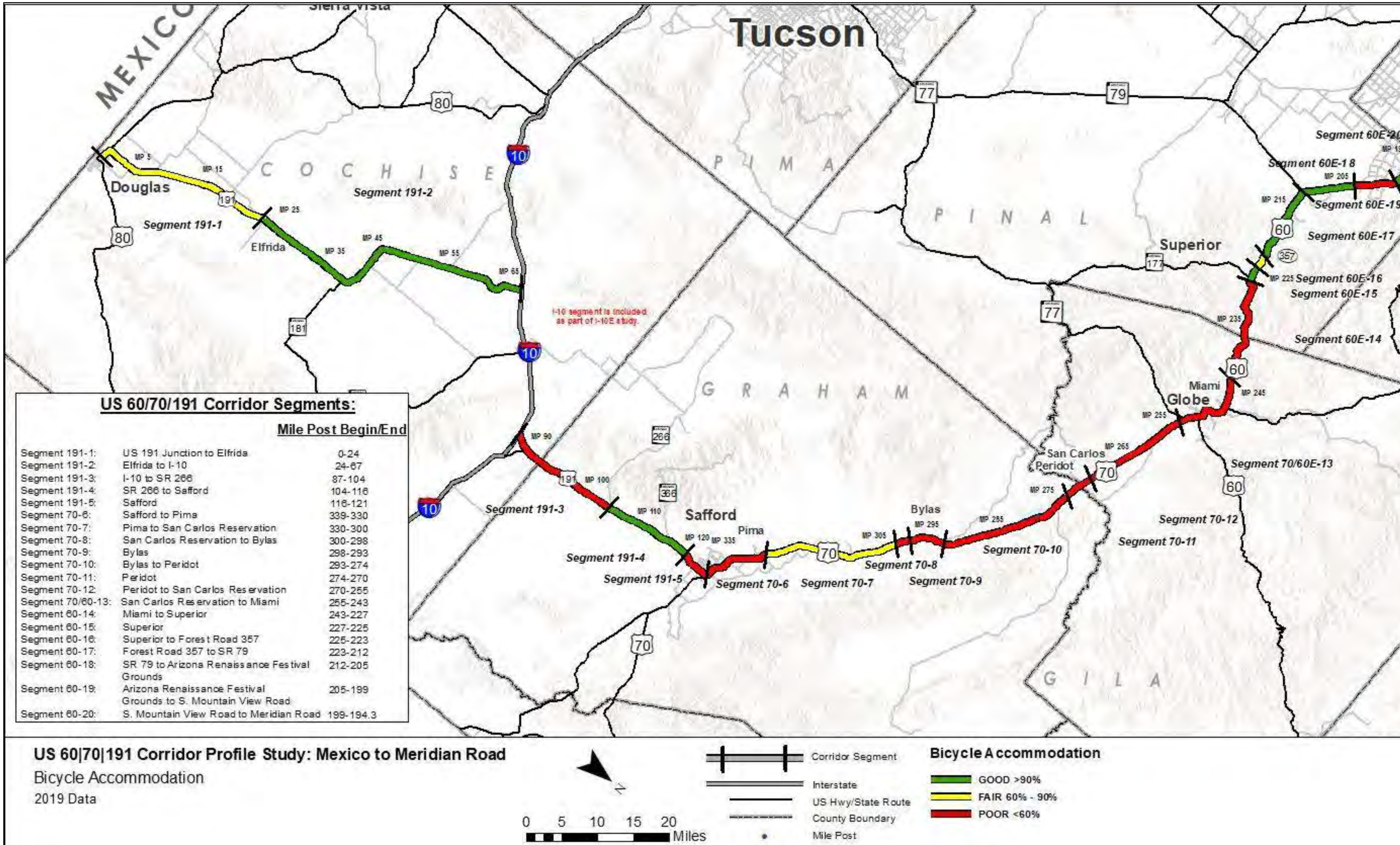
*


NORTHBOUND / WESTBOUND
SOUTHBOUND / EASTBOUND
I-10 segment is included as part of I-10E study.
MEXICO
NEW MEXICO
ARIZONA
COCHISE
PIMA
PINAL
GRAHAM
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Superior
Miami
Globe
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Average Instances per Year a Given Milepost
Is Closed per Segment Mile
2019 Data
0 5 10 15 20
Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
CLOSURE OCCURANCES
Average Closure Occurances per Mile per Year
GOOD ≤ 0.22
FAIR 0.22 - 0.62
POOR > 0.62



NORTHBOUND / WESTBOUND
SOUTHBOUND / EASTBOUND
I-10 segment is included as part of I-10E study.
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Level of Travel Time Reliability
2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
All Vehicles Level of Travel Time Reliability
All Vehicles LOTTR
GOOD ≤ 1.15
FAIR 1.15-1.5
POOR >1.5


US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
I-10 segment is included as part of I-10E study.
Tucson
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Multimodal Opportunities
2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts selection
Average Non-Single Occupancy Vehicle Trips by Corridor Segment
Segment ABOVE the Statewide Average Range
Segment WITHIN the Statewide Average Range
Segment BELOW the Statewide Average Range
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



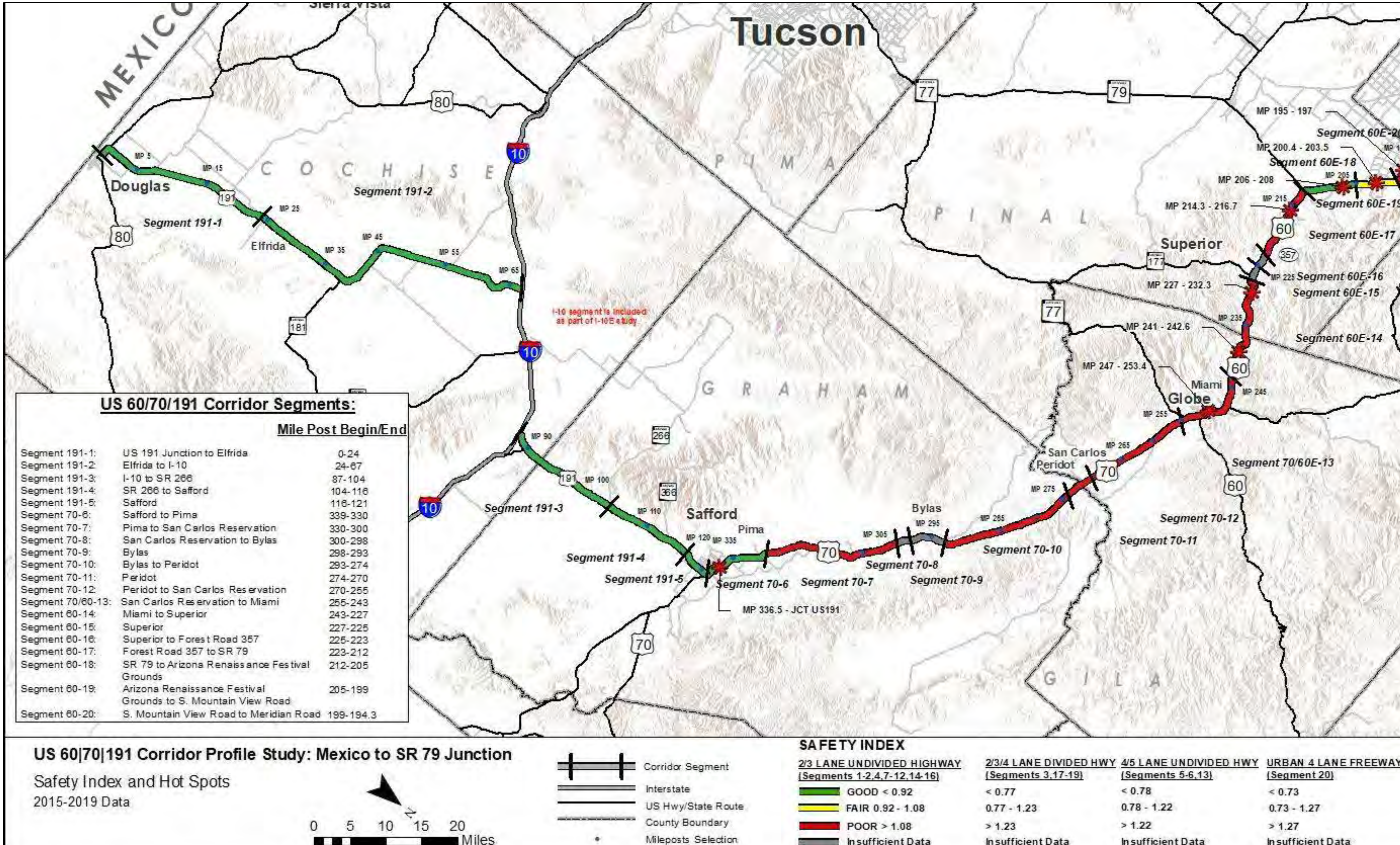
US 60/70/191 Corridor Segments:

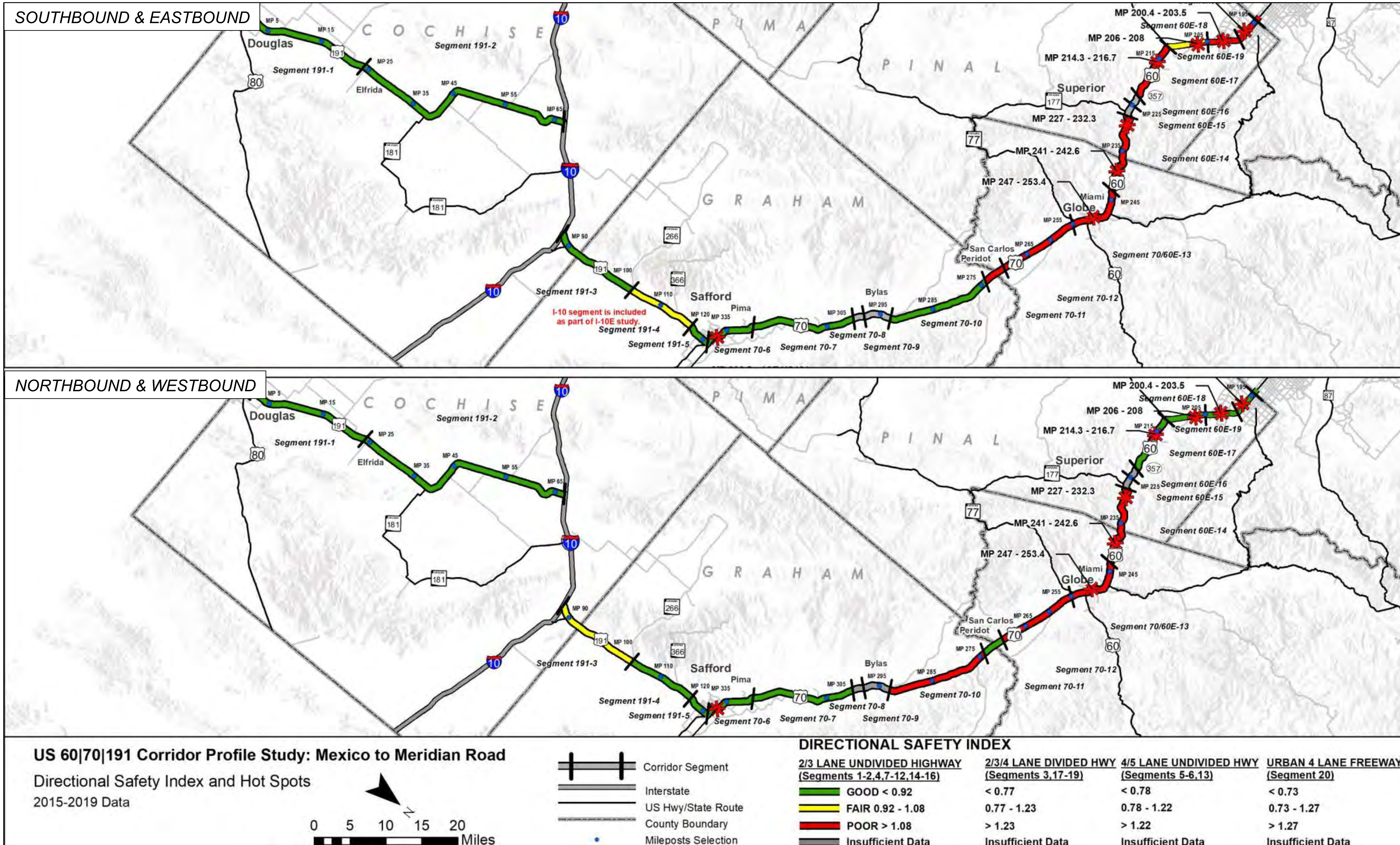
Segment		Mile Post Begin/End
Segment 191-1:	US 191 Junction to Elfrida	0-24
Segment 191-2:	Elfrida to I-10	24-67
Segment 191-3:	I-10 to SR 266	87-104
Segment 191-4:	SR 266 to Safford	104-116
Segment 191-5:	Safford	116-121
Segment 70-6:	Safford to Pima	339-330
Segment 70-7:	Pima to San Carlos Reservation	330-300
Segment 70-8:	San Carlos Reservation to Bylas	300-298
Segment 70-9:	Bylas	298-293
Segment 70-10:	Bylas to Peridot	293-274
Segment 70-11:	Peridot	274-270
Segment 70-12:	Peridot to San Carlos Reservation	270-255
Segment 70/60-13:	San Carlos Reservation to Miami	255-243
Segment 60-14:	Miami to Superior	243-227
Segment 60-15:	Superior	227-225
Segment 60-16:	Superior to Forest Road 357	225-223
Segment 60-17:	Forest Road 357 to SR 79	223-212
Segment 60-18:	SR 79 to Arizona Renaissance Festival Grounds	212-205
Segment 60-19:	Arizona Renaissance Festival Grounds to S. Mountain View Road	205-199
Segment 60-20:	S. Mountain View Road to Meridian Road	199-194.3

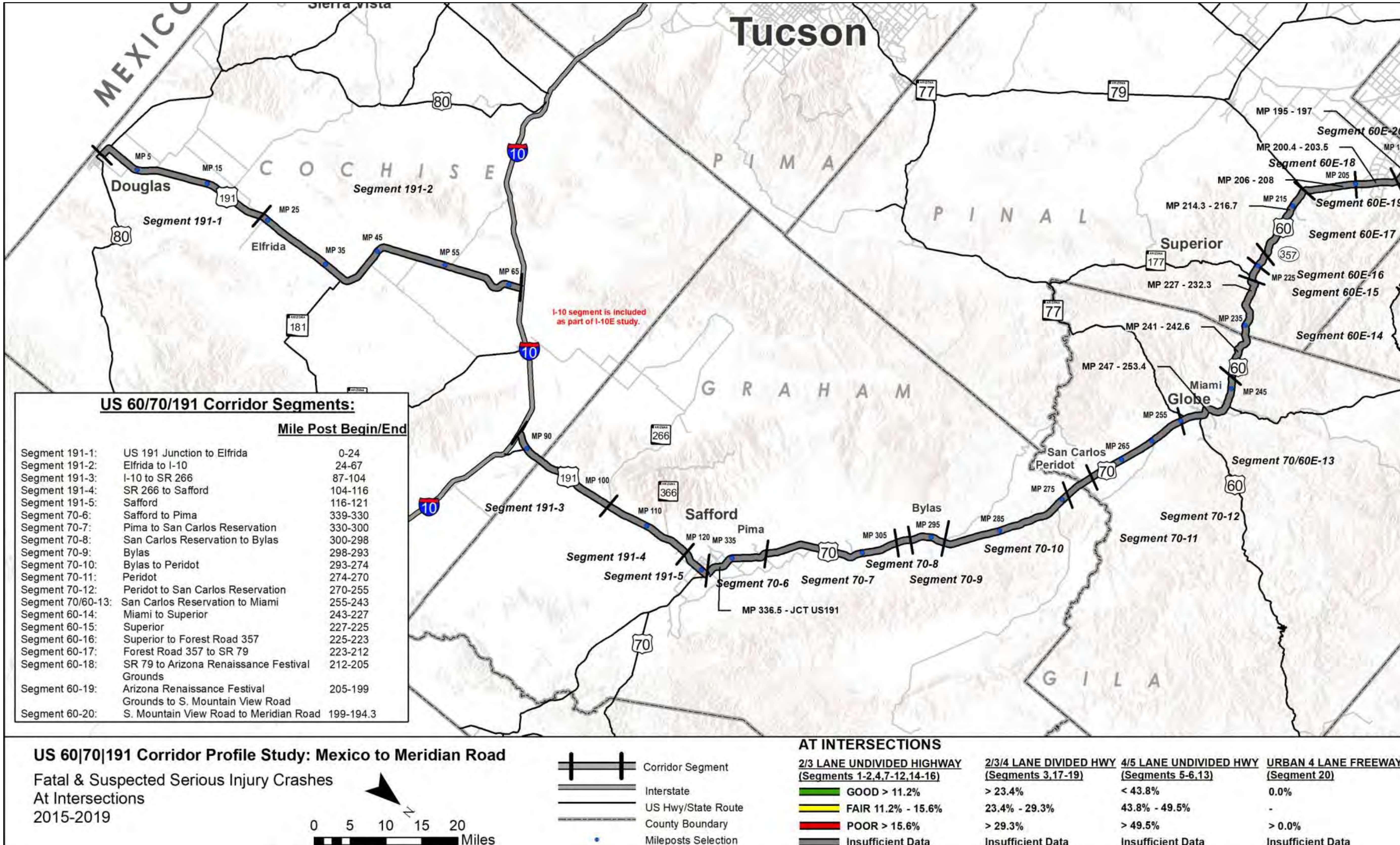
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road

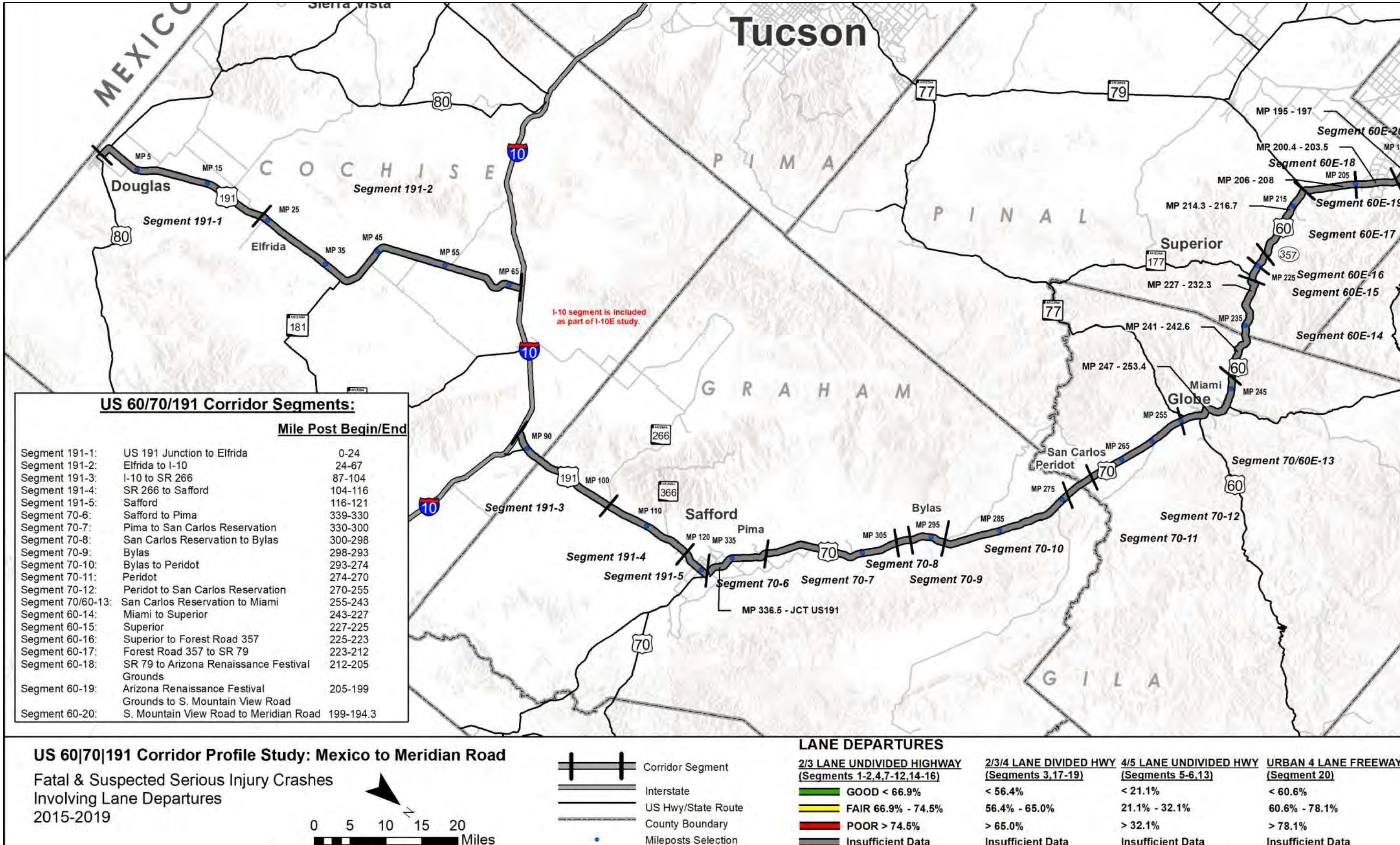
Bicycle Accommodation

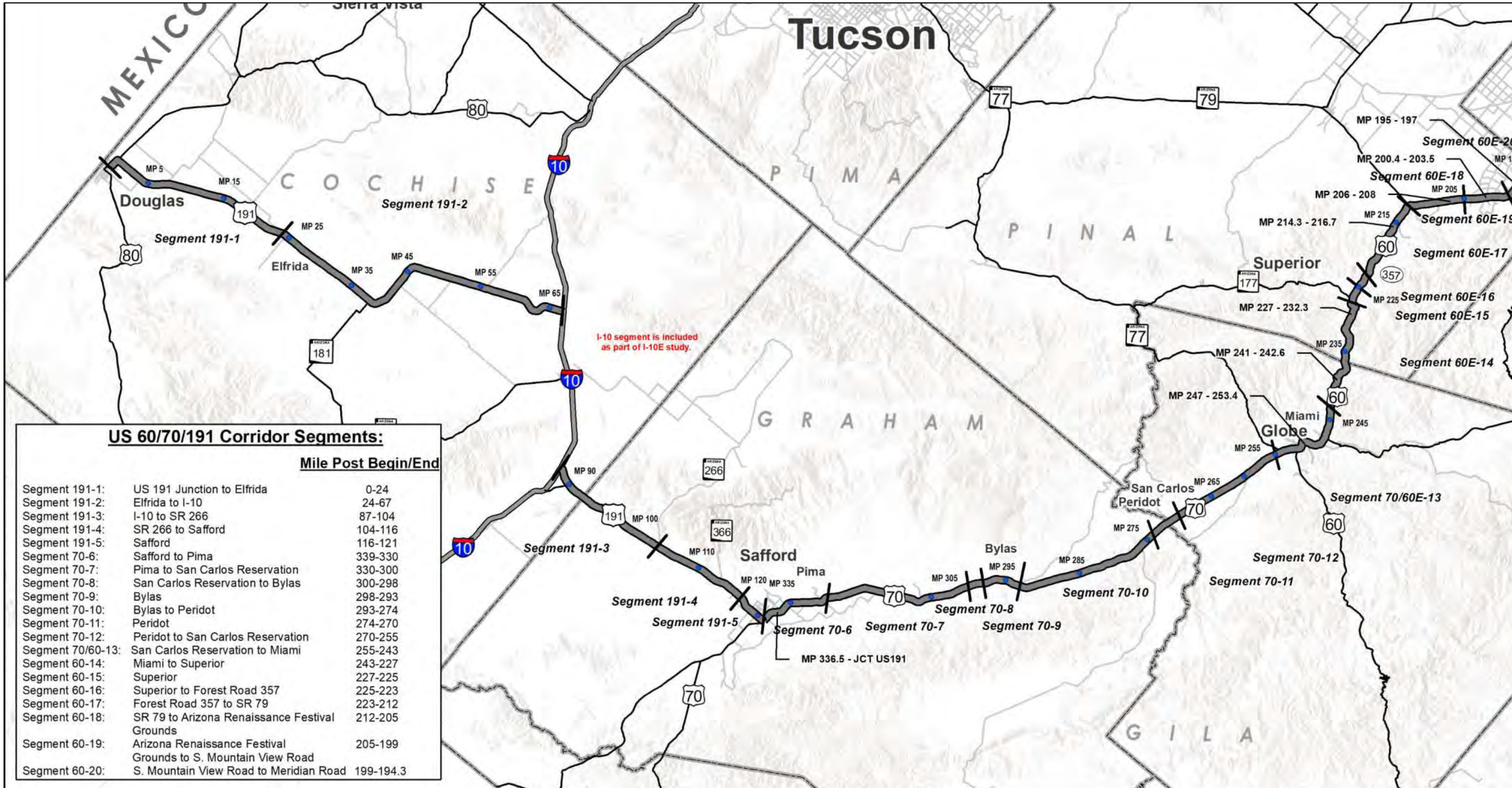
2019 Data


US 60|70|191 Corridor Profile Study: Mexico to SR 79 Junction
Safety Index and Hot Spots
2015-2019 Data
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
Tucson
MEXICO
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
C O C H I S E
P I M A
P I N A L
G R A H A M
G I L A
I-10 segment is included as part of I-10E study
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 336.5 - JCT US191
MP 195 - 197
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
0 5 10 15 20 Miles
SAFETY INDEX
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD < 0.92
FAIR 0.92 - 1.08
POOR > 1.08
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
< 0.77
0.77 - 1.23
> 1.23
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 0.78
0.78 - 1.22
> 1.22
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
< 0.73
0.73 - 1.27
> 1.27
Insufficient Data


SOUTHBOUND & EASTBOUND
NORTHBOUND & WESTBOUND
COCHISE
PIMA
PINAL
GRAHAM
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
I-10 segment is included as part of I-10E study.
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Directional Safety Index and Hot Spots
2015-2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
DIRECTIONAL SAFETY INDEX
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD < 0.92
FAIR 0.92 - 1.08
POOR > 1.08
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
< 0.77
0.77 - 1.23
> 1.23
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 0.78
0.78 - 1.22
> 1.22
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
< 0.73
0.73 - 1.27
> 1.27
Insufficient Data


Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Sierra Vista
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
I-10 segment is included as part of I-10E study.
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 5
MP 15
MP 25
MP 35
MP 45
MP 55
MP 65
MP 90
MP 100
MP 110
MP 120
MP 335
MP 336.5 - JCT US191
MP 285
MP 295
MP 305
MP 275
MP 265
MP 255
MP 245
MP 235
MP 225
MP 215
MP 205
MP 195
MP 195 - 197
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Fatal & Suspected Serious Injury Crashes
At Intersections
2015-2019
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
AT INTERSECTIONS
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD > 11.2%
FAIR 11.2% - 15.6%
POOR > 15.6%
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
> 23.4%
23.4% - 29.3%
> 29.3%
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 43.8%
43.8% - 49.5%
> 49.5%
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
0.0%
-
> 0.0%
Insufficient Data


US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Fatal & Suspected Serious Injury Crashes
Involving Lane Departures
2015-2019
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
I-10 segment is included as part of I-10E study.
Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
Sierra Vista
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 195 - 197
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
MP 336.5 - JCT US191
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
0 5 10 15 20 Miles
LANE DEPARTURES
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD < 66.9%
FAIR 66.9% - 74.5%
POOR > 74.5%
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
< 56.4%
56.4% - 65.0%
> 65.0%
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 21.1%
21.1% - 32.1%
> 32.1%
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
< 60.6%
60.6% - 78.1%
> 78.1%
Insufficient Data



US 60/70/191 Corridor Segments:

		Mile Post Begin/End
Segment 191-1:	US 191 Junction to Elfrida	0-24
Segment 191-2:	Elfrida to I-10	24-67
Segment 191-3:	I-10 to SR 266	87-104
Segment 191-4:	SR 266 to Safford	104-116
Segment 191-5:	Safford	116-121
Segment 70-6:	Safford to Pima	339-330
Segment 70-7:	Pima to San Carlos Reservation	330-300
Segment 70-8:	San Carlos Reservation to Bylas	300-298
Segment 70-9:	Bylas	298-293
Segment 70-10:	Bylas to Peridot	293-274
Segment 70-11:	Peridot	274-270
Segment 70-12:	Peridot to San Carlos Reservation	270-255
Segment 70/60-13:	San Carlos Reservation to Miami	255-243
Segment 60-14:	Miami to Superior	243-227
Segment 60-15:	Superior	227-225
Segment 60-16:	Superior to Forest Road 357	225-223
Segment 60-17:	Forest Road 357 to SR 79	223-212
Segment 60-18:	SR 79 to Arizona Renaissance Festival Grounds	212-205
Segment 60-19:	Arizona Renaissance Festival Grounds to S. Mountain View Road	205-199
Segment 60-20:	S. Mountain View Road to Meridian Road	199-194.3

US 60|70|191 Corridor Profile Study: Mexico to Meridian Road

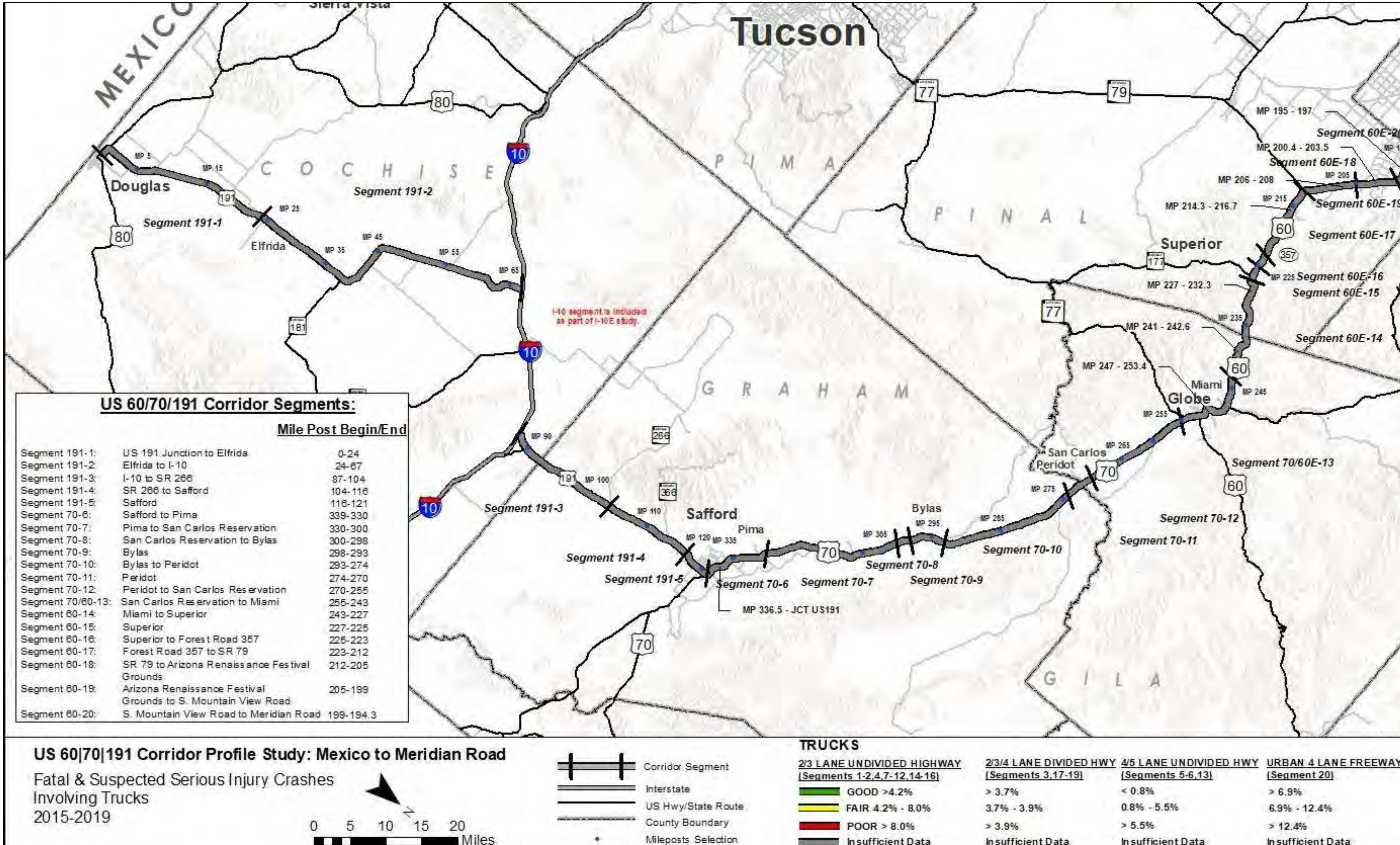
Fatal & Suspected Serious Injury Crashes Involving Pedestrians 2015-2019

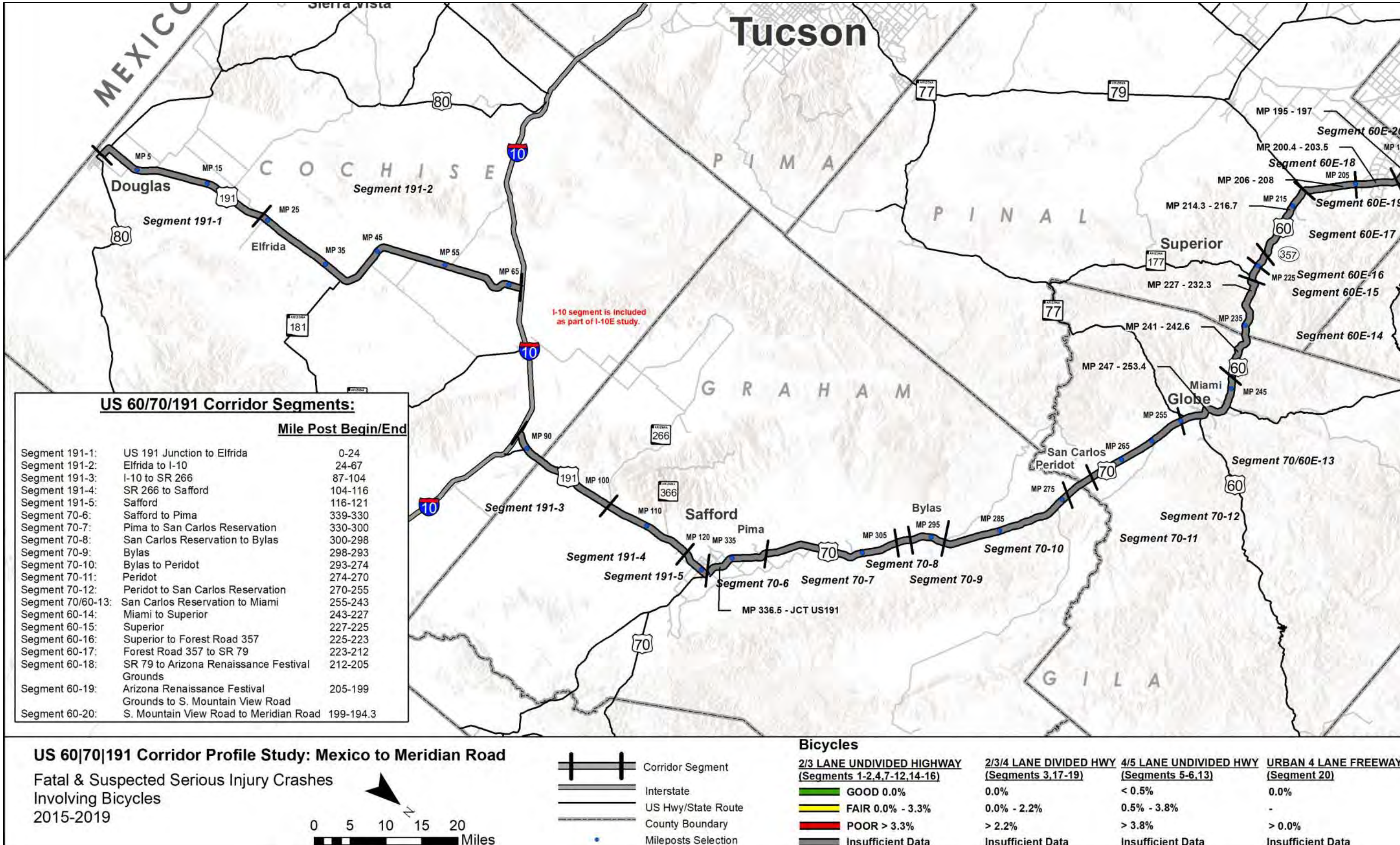
0 5 10 15 20 Miles

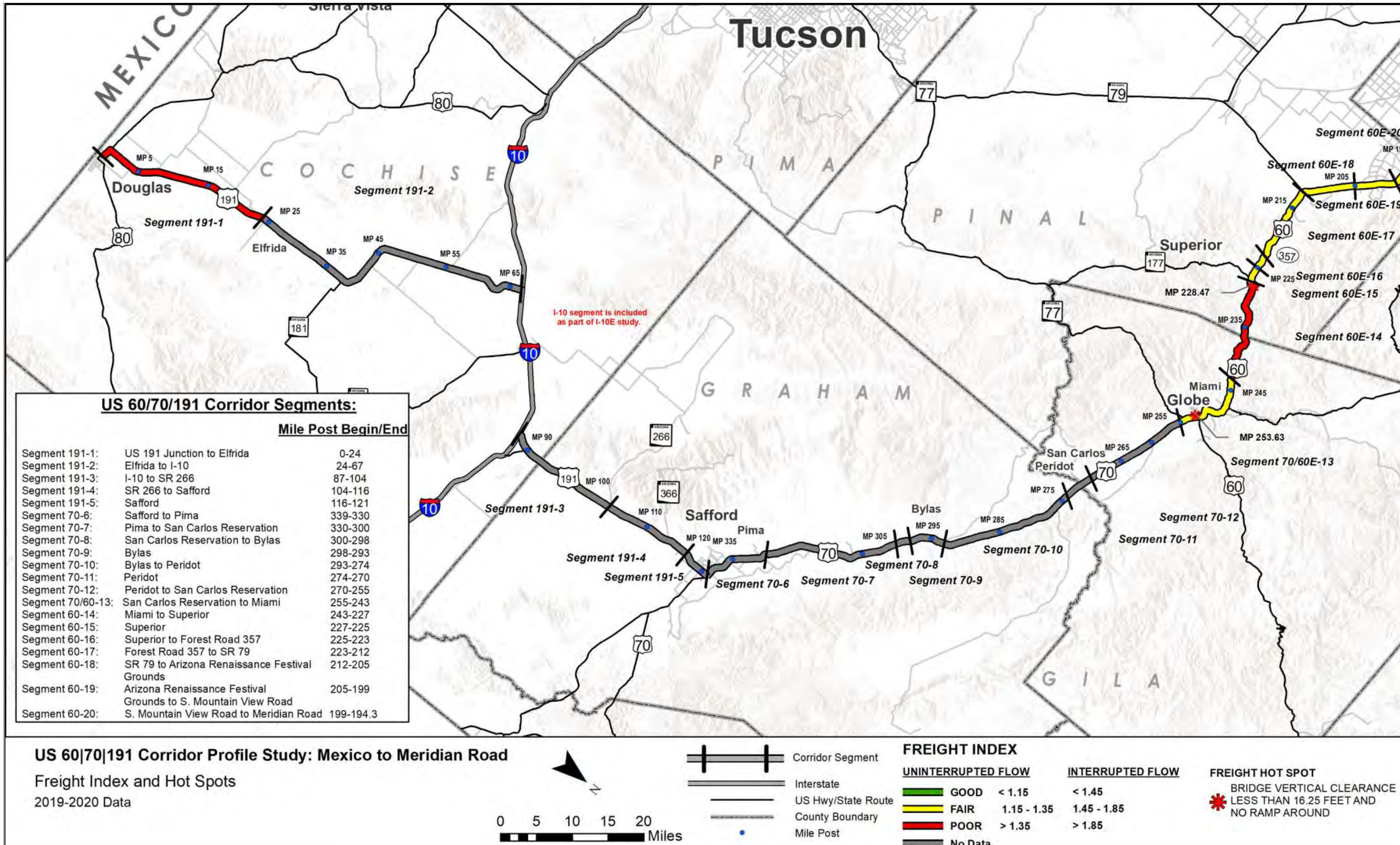
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection

PEDESTRIANS

2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)	2/3/4 LANE DIVIDED HWY (Segments 3,17-19)	4/5 LANE UNDIVIDED HWY (Segments 5-6,13)	URBAN 4 LANE FREEWAY (Segment 20)
GOOD > 3.8%	> 2.4%	< 8.8%	0.0%
FAIR 3.8% - 7.2%	2.4% - 3.6%	8.8% - 13.5%	0.0% - 4.9%
POOR > 7.2%	> 3.6%	> 13.5%	> 4.9%
Insufficient Data	Insufficient Data	Insufficient Data	Insufficient Data


US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Fatal & Suspected Serious Injury Crashes Involving Trucks
2015-2019
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
I-10 segment is included as part of I-10E study.
Tucson
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
COCHISE
PIMA
PINAL
GRAHAM
GILA
MEXICO
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 336.5 - JCT US191
MP 195 - 197
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
TRUCKS
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD >4.2%
FAIR 4.2% - 8.0%
POOR > 8.0%
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
> 3.7%
3.7% - 3.9%
> 3.9%
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 0.8%
0.8% - 5.5%
> 5.5%
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
> 6.9%
6.9% - 12.4%
> 12.4%
Insufficient Data


US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
Segment 191-5: Safford 116-121
Segment 70-6: Safford to Pima 339-330
Segment 70-7: Pima to San Carlos Reservation 330-300
Segment 70-8: San Carlos Reservation to Bylas 300-298
Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
Segment 70-11: Peridot 274-270
Segment 70-12: Peridot to San Carlos Reservation 270-255
Segment 70/60-13: San Carlos Reservation to Miami 255-243
Segment 60-14: Miami to Superior 243-227
Segment 60-15: Superior 227-225
Segment 60-16: Superior to Forest Road 357 225-223
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
I-10 segment is included as part of I-10E study.
Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
Sierra Vista
MP 336.5 - JCT US191
MP 195 - 197
MP 200.4 - 203.5
MP 206 - 208
MP 214.3 - 216.7
MP 227 - 232.3
MP 241 - 242.6
MP 247 - 253.4
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Fatal & Suspected Serious Injury Crashes Involving Bicycles 2015-2019
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
Bicycles
2/3 LANE UNDIVIDED HIGHWAY (Segments 1-2,4,7-12,14-16)
GOOD 0.0%
FAIR 0.0% - 3.3%
POOR > 3.3%
Insufficient Data
2/3/4 LANE DIVIDED HWY (Segments 3,17-19)
0.0%
0.0% - 2.2%
> 2.2%
Insufficient Data
4/5 LANE UNDIVIDED HWY (Segments 5-6,13)
< 0.5%
0.5% - 3.8%
> 3.8%
Insufficient Data
URBAN 4 LANE FREEWAY (Segment 20)
0.0%
-
> 0.0%
Insufficient Data


Tucson
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Douglas
Elfrida
Superior
Miami
Globe
San Carlos
Peridot
Bylas
Safford
Pima
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
MP 228.47
MP 253.63
I-10 segment is included as part of I-10E study.
US 60/70/191 Corridor Segments:
Mile Post Begin/End
Segment 191-1: US 191 Junction to Elfrida 0-24
Segment 191-2: Elfrida to I-10 24-67
Segment 191-3: I-10 to SR 266 87-104
Segment 191-4: SR 266 to Safford 104-116
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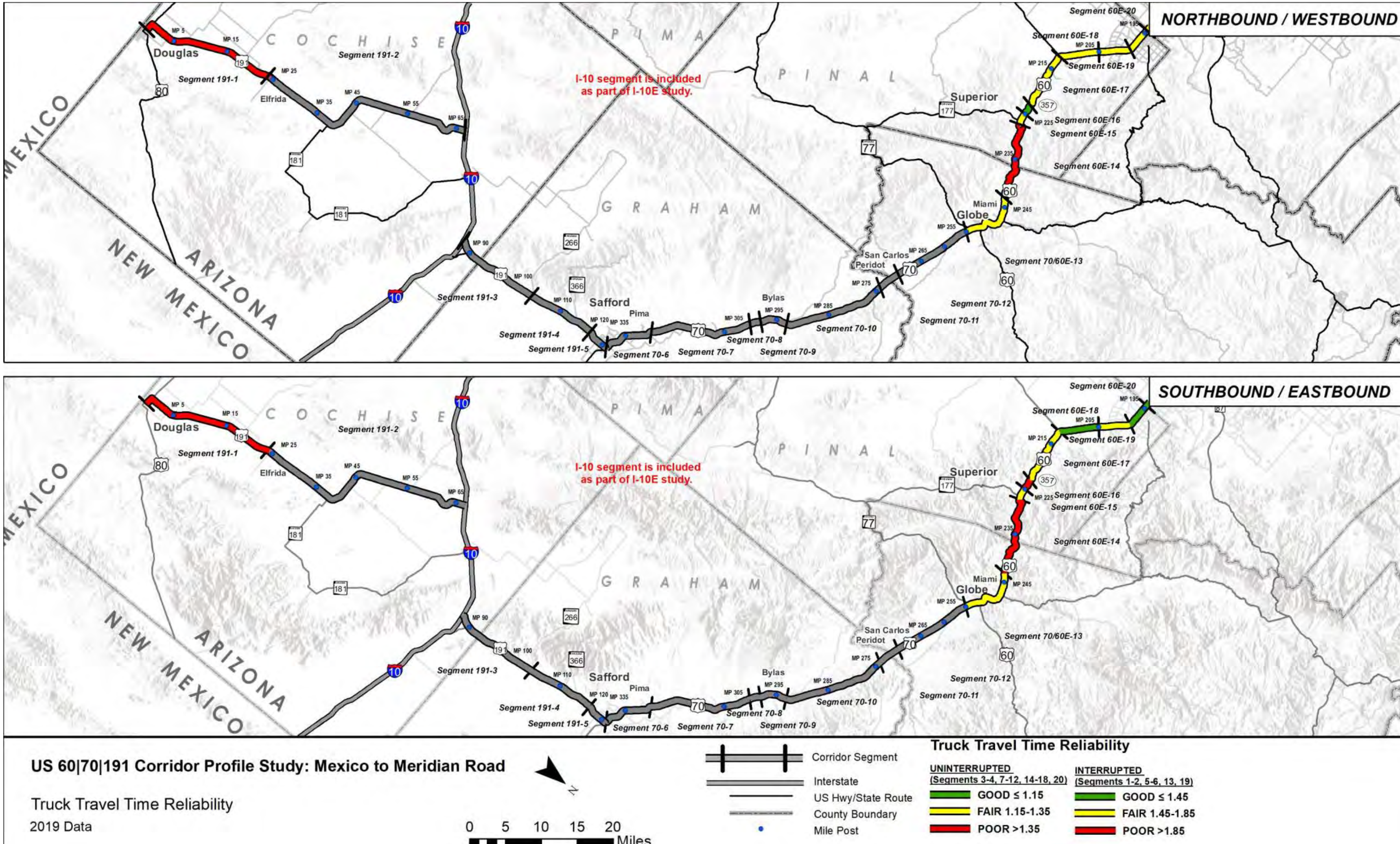
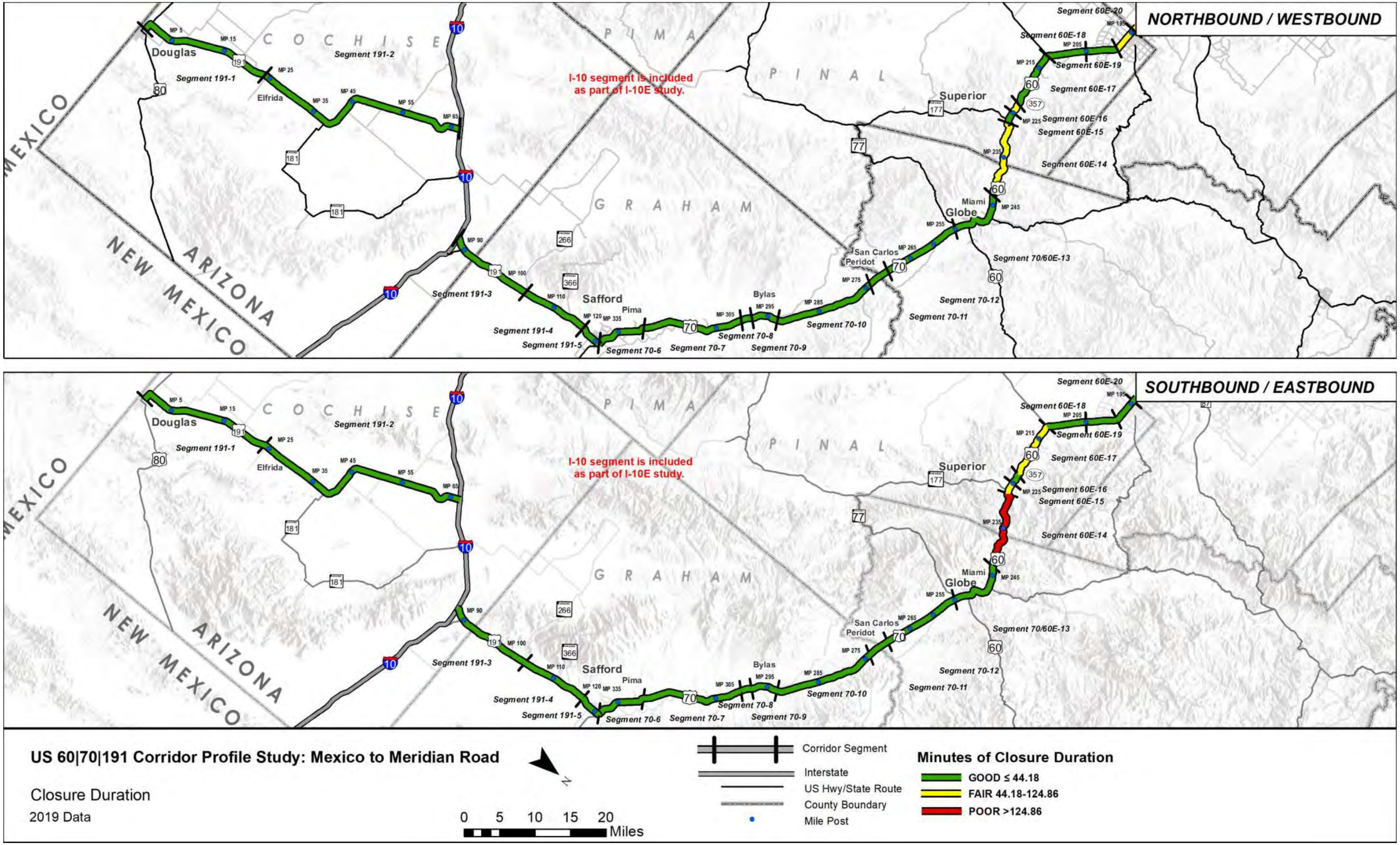
Segment 60-17: Forest Road 357 to SR 79 223-212
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Freight Index and Hot Spots
2019-2020 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
FREIGHT INDEX
UNINTERRUPTED FLOW
INTERRUPTED FLOW
GOOD < 1.15 < 1.45
FAIR 1.15 - 1.35 1.45 - 1.85
POOR > 1.35 > 1.85
No Data
FREIGHT HOT SPOT
BRIDGE VERTICAL CLEARANCE LESS THAN 16.25 FEET AND NO RAMP AROUND

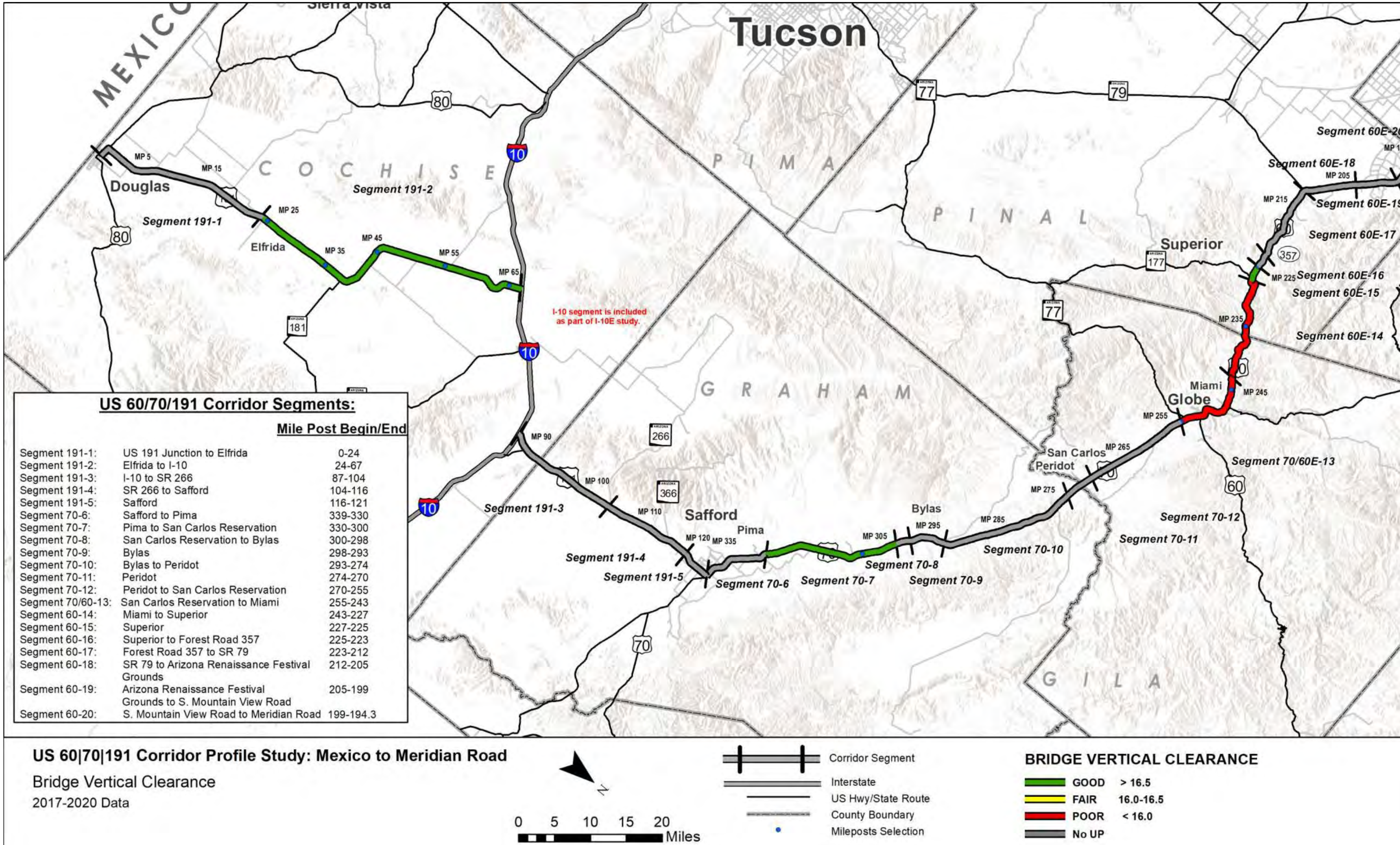

NORTHBOUND / WESTBOUND
SOUTHBOUND / EASTBOUND
I-10 segment is included as part of I-10E study.
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
Douglas
Elfrida
Safford
Pima
Bylas
San Carlos
Peridot
Globe
Miami
Superior
COCHISE
PIMA
PINAL
GRAHAM
MEXICO
NEW MEXICO
ARIZONA
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Truck Travel Time Reliability
2019 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mile Post
Truck Travel Time Reliability
UNINTERRUPTED (Segments 3-4, 7-12, 14-18, 20)
GOOD ≤ 1.15
FAIR 1.15-1.35
POOR >1.35
INTERRUPTED (Segments 1-2, 5-6, 13, 19)
GOOD ≤ 1.45
FAIR 1.45-1.85
POOR >1.85



US 60|70|191 Corridor Profile Study: Mexico to Meridian Road

Closure Duration

2019 Data


Tucson
Douglas
Elfrida
Superior
Miami
Globe
San Carlos
Peridot
Bylas
Safford
Pima
MEXICO
COCHISE
PIMA
PINAL
GRAHAM
GILA
Segment 191-1
Segment 191-2
Segment 191-3
Segment 191-4
Segment 191-5
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Segment 70-11
Segment 70-12
Segment 70/60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
I-10 segment is included as part of I-10E study.
US 60/70/191 Corridor Segments:
Mile Post Begin/End
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Segment 191-2: Elfrida to I-10 24-67
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Segment 70-9: Bylas 298-293
Segment 70-10: Bylas to Peridot 293-274
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Segment 70/60-13: San Carlos Reservation to Miami 255-243
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Segment 60-16: Superior to Forest Road 357 225-223
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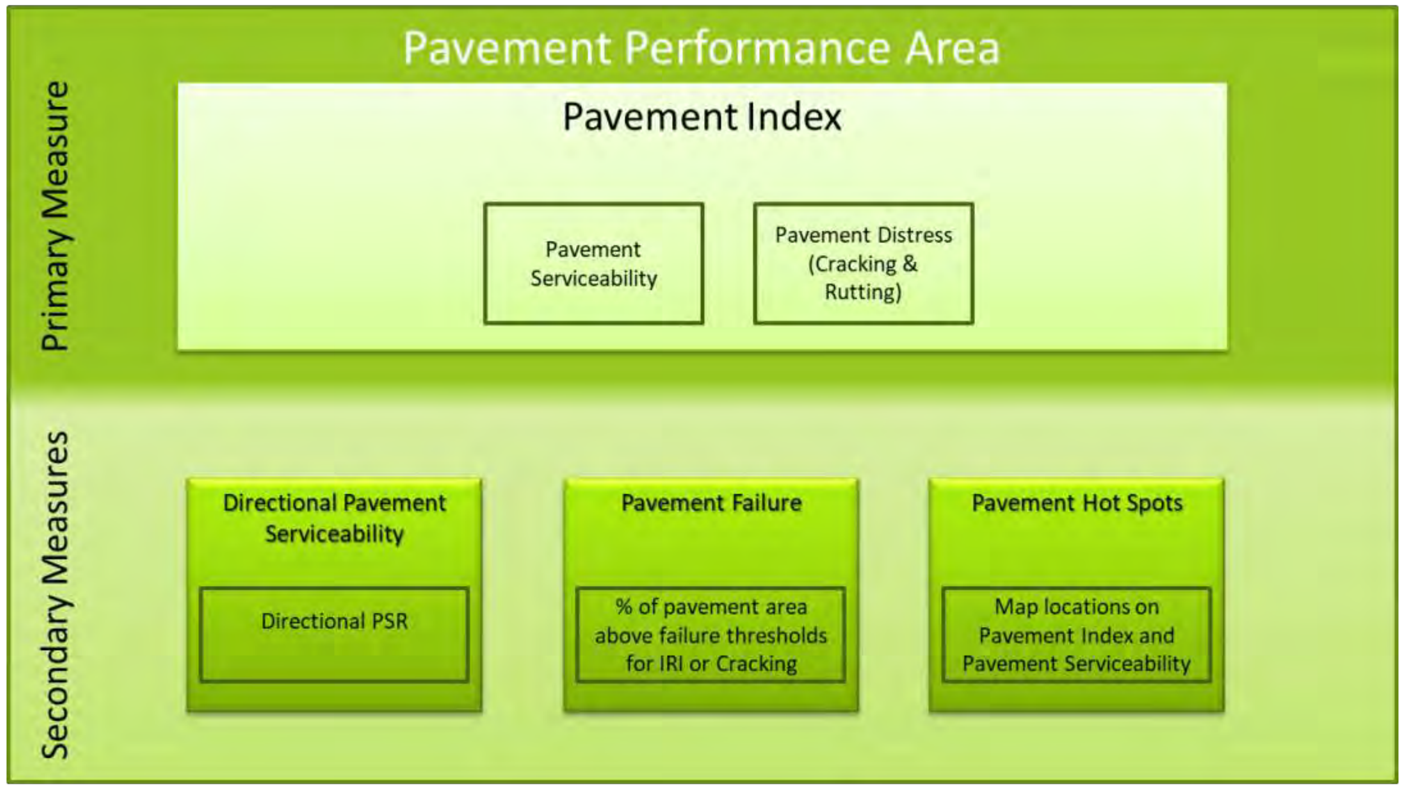
Segment 60-18: SR 79 to Arizona Renaissance Festival Grounds 212-205
Segment 60-19: Arizona Renaissance Festival Grounds to S. Mountain View Road 205-199
Segment 60-20: S. Mountain View Road to Meridian Road 199-194.3
US 60|70|191 Corridor Profile Study: Mexico to Meridian Road
Bridge Vertical Clearance
2017-2020 Data
0 5 10 15 20 Miles
Corridor Segment
Interstate
US Hwy/State Route
County Boundary
Mileposts Selection
BRIDGE VERTICAL CLEARANCE
GOOD > 16.5
FAIR 16.0-16.5
POOR < 16.0
No UP

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.

Primary Pavement Index

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 two 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:

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

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.

Secondary Pavement Measures

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.

Scoring

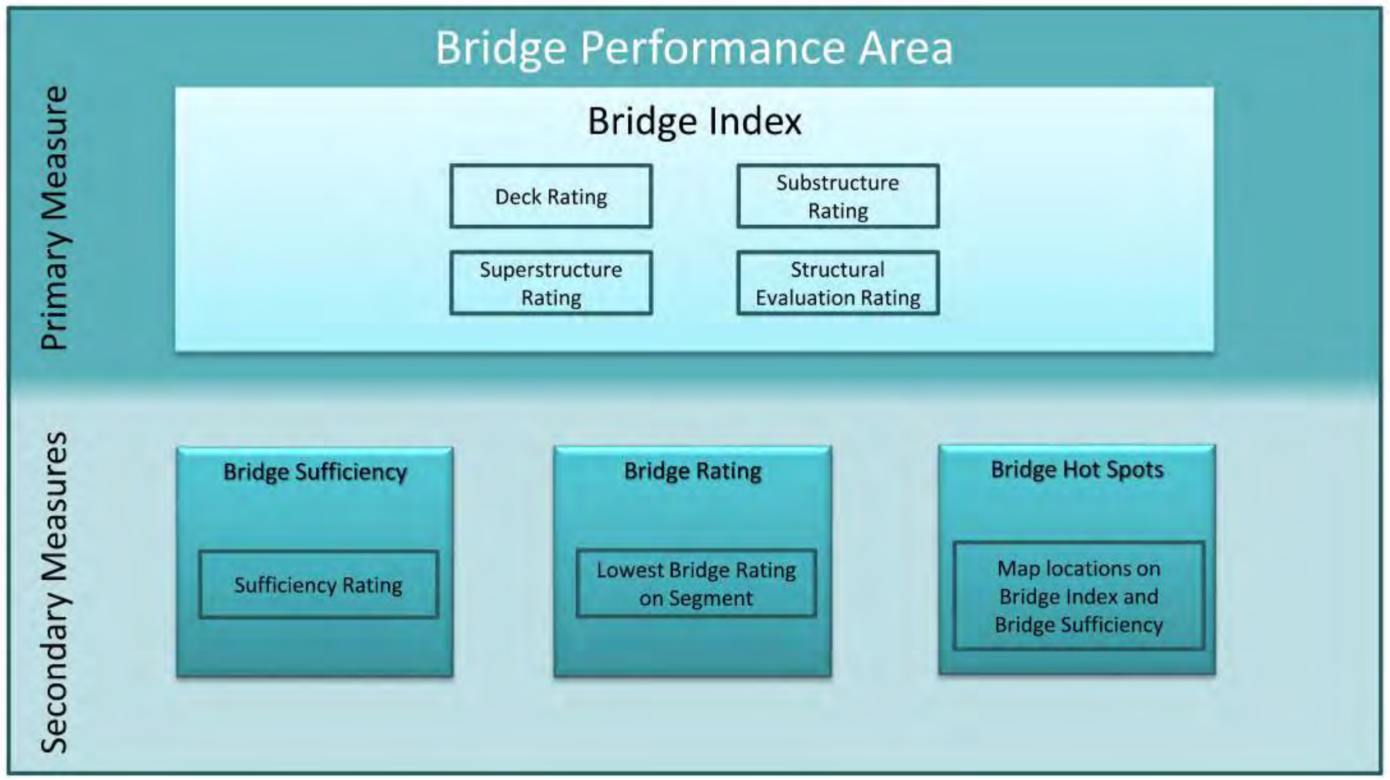
Performance Level	Pavement Index	
	Interstates	Non-Interstates
Good	>3.75	>3.6
Fair	3.0 - 3.75	2.8 - 3.6
Poor	<3.0	<2.8

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.

<u>Primary Bridge Index</u>

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.

<u>Secondary Bridge Measures</u>

Three 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:

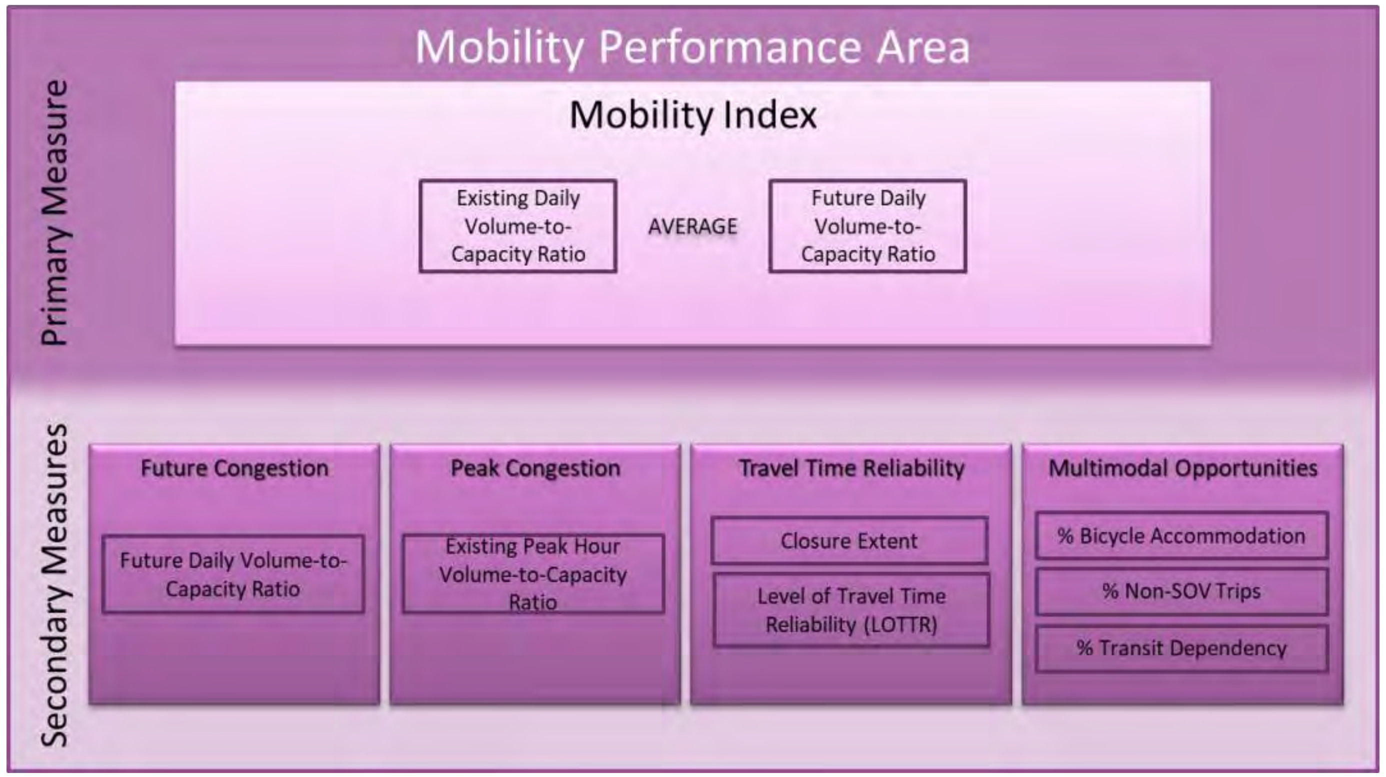
Performance Level	Bridge Index
Good	>6.5
Fair	5.0-6.5
Poor	<5.0

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:



<u>Primary Mobility Index</u>

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.

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

<u>Secondary Mobility Measures</u>

Four secondary measures are evaluated:

- Future Congestion
- Peak Congestion
- Travel Time Reliability

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

  - Closure Extent
  - Directional Level of Travel Time Reliability
- Multimodal Opportunities
  - % Bicycle Accommodation
  - % Non-Single Occupancy Vehicle (SOV) Trips

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) metric.

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 the 80th percentile travel time to average (50th 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 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

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

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 Application, fatal crashes have an estimated cost that is 17.3 times the estimated cost of suspected serious injury crashes ($9.5 million compared to $555,000).

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 (STSP) 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

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 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*

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*

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:

Primary Freight Index

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.

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
    - 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.

Truck Travel Time Reliability: 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.

Closure Duration: 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 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 1		***Interstate?***		**No**																
Milepost	0	to	1	1	183.15	19.35	0.17	1	172.48	19.15	0.19	2.49	2.73	2.60	2.73	2.49	2.60		1	1
Milepost	1	to	2	1	172.79	20.00	0.20	1	149.16	16.45	0.16	2.59	2.66	2.84	2.98	2.59	2.84		1	1
Milepost	2	to	3	1	159.63	20.70	0.21	1	163.91	18.60	0.21	2.73	2.59	2.68	2.76	2.73	2.68		1	1
Milepost	3	to	4	1	152.47	18.50	0.20	1	160.55	19.30	0.18	2.80	2.78	2.72	2.73	2.80	2.72		1	1
Milepost	4	to	5	1	134.40	17.36	0.14	1	115.90	11.36	0.14	3.00	2.91	3.22	3.43	2.94	3.28		1	1
Milepost	5	to	6	1	142.06	13.40	0.12	1	110.61	3.50	0.12	2.91	3.26	3.28	4.31	3.02	3.59		1	0
Milepost	6	to	7	1	141.68	13.30	0.14	1	121.61	11.10	0.12	2.92	3.26	3.15	3.47	3.02	3.25		1	1
Milepost	7	to	8	1	138.31	17.00	0.20	1	122.70	6.78	0.14	2.96	2.90	3.14	3.90	2.94	3.37		1	0
Milepost	8	to	9	1	118.49	10.00	0.16	1	118.99	9.90	0.21	3.19	3.55	3.18	3.52	3.30	3.28		0	0
Milepost	9	to	10	1	102.46	15.00	0.15	1	106.58	16.55	0.22	3.39	3.10	3.33	2.92	3.19	3.04		1	1
Milepost	10	to	11	1	121.38	3.40	0.17	1	115.99	9.60	0.19	3.15	4.28	3.22	3.57	3.49	3.32		0	0
Milepost	11	to	12	1	137.35	3.70	0.16	1	129.71	4.90	0.20	2.97	4.25	3.05	4.07	3.35	3.36		0	0
Milepost	12	to	13	1	115.69	10.40	0.16	1	101.97	10.00	0.12	3.22	3.51	3.39	3.58	3.31	3.45		1	0
Milepost	13	to	14	1	110.69	11.10	0.16	1	98.18	8.20	0.11	3.28	3.45	3.44	3.76	3.33	3.54		1	0
Milepost	14	to	15	1	95.89	14.20	0.16	1	92.42	9.40	0.14	3.47	3.17	3.52	3.63	3.26	3.59		1	0
Milepost	15	to	16	1	124.37	17.10	0.17	1	101.82	14.40	0.13	3.12	2.91	3.40	3.16	2.97	3.23		1	1
Milepost	16	to	17	1	132.95	17.00	0.20	1	100.07	16.10	0.17	3.02	2.90	3.42	3.00	2.93	3.12		1	1
Milepost	17	to	18	1	110.38	15.40	0.22	1	104.55	12.80	0.16	3.29	3.01	3.36	3.29	3.10	3.31		1	1
Milepost	18	to	19	1	123.58	13.30	0.19	1	100.92	13.70	0.16	3.13	3.22	3.41	3.21	3.15	3.27		1	1
Milepost	19	to	20	1	90.18	15.50	0.21	1	93.96	11.50	0.12	3.55	3.01	3.50	3.43	3.17	3.45		1	1
Milepost	20	to	21	1	96.74	12.20	0.22	1	77.27	9.90	0.15	3.46	3.30	3.73	3.57	3.35	3.62		1	0
Milepost	21	to	22	1	103.17	10.70	0.23	1	85.57	8.90	0.16	3.38	3.42	3.61	3.66	3.41	3.65		1	0
Milepost	22	to	23	1	82.07	2.30	0.24	1	88.53	11.50	0.17	3.66	4.36	3.57	3.40	3.87	3.45		0	1
Milepost	23	to	24	1	150.51	16.56	0.27	1	140.82	19.78	0.24	2.82	2.85	2.93	2.64	2.82	2.64		1	1
			Total	24				24												34
			Weighted Average									3.10	3.22	3.24	3.36	3.11	3.24			
			Factor									1.00		1.00						
			Indicator Score									3.10		3.24						70.8%
			Pavement Index															3.17		

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 2		***Interstate?***		**No**																
Milepost	24	to	25	1	206.10	22.80	0.31	1	222.29	28.70	0.35	2.28	2.32	2.15	1.85	2.28	2.15		1	1
Milepost	25	to	26	1	191.55	15.82	0.39	1	174.09	17.73	0.28	2.41	2.74	2.58	2.75	2.41	2.58		1	1
Milepost	26	to	27	1	193.91	10.10	0.35	1	172.02	13.80	0.36	2.39	3.30	2.60	2.97	2.39	2.60		1	1
Milepost	27	to	28	1	113.90	8.60	0.09	1	118.86	11.80	0.15	3.24	3.73	3.18	3.39	3.39	3.24		0	1
Milepost	28	to	29	1	95.02	10.30	0.08	1	110.01	9.90	0.15	3.48	3.55	3.29	3.57	3.53	3.37		1	0
Milepost	29	to	30	1	144.57	8.22	0.16	1	144.27	13.44	0.21	2.89	3.73	2.89	3.19	2.89	2.89		1	1
Milepost	30	to	31	1	112.12	10.18	0.18	1	129.04	14.18	0.20	3.27	3.52	3.06	3.13	3.34	3.08		1	1
Milepost	31	to	32	1	92.74	10.10	0.16	1	108.27	16.40	0.20	3.51	3.54	3.31	2.95	3.53	3.06		1	1
Milepost	32	to	33	1	98.39	7.50	0.13	1	108.38	16.60	0.22	3.44	3.83	3.31	2.91	3.56	3.03		0	1
Milepost	33	to	34	1	95.12	11.50	0.15	1	127.14	16.50	0.22	3.48	3.41	3.08	2.92	3.43	2.97		1	1
Milepost	34	to	35	1	123.43	15.18	0.15	1	130.12	18.27	0.17	3.13	3.09	3.05	2.82	3.10	2.89		1	1
Milepost	35	to	36	1	94.10	4.11	0.17	1	121.37	11.56	0.18	3.50	4.19	3.15	3.39	3.71	3.22		0	1
Milepost	36	to	37	1	105.60	6.50	0.10	1	92.14	6.10	0.15	3.35	3.95	3.52	3.97	3.53	3.66		0	0
Milepost	37	to	38	1	103.39	8.00	0.16	1	85.21	2.60	0.15	3.38	3.76	3.62	4.42	3.49	3.86		0	0
Milepost	38	to	39	1	75.49	6.60	0.08	1	55.61	2.70	0.09	3.75	3.94	4.05	4.44	3.89	4.32		0	0
Milepost	39	to	40	1	56.61	0.80	0.08	1	52.21	4.60	0.07	4.03	4.77	4.10	4.18	4.25	4.16		0	0
Milepost	40	to	41	1	56.21	2.90	0.08	1	58.20	7.60	0.08	4.04	4.41	4.01	3.83	4.30	3.89		0	0
Milepost	41	to	42	1	55.65	9.90	0.07	1	61.34	5.10	0.07	4.05	3.59	3.96	4.12	3.73	4.07		0	0
Milepost	42	to	43	1	61.69	8.10	0.07	1	55.97	10.30	0.09	3.96	3.78	4.04	3.55	3.83	3.70		0	1
Milepost	43	to	44	1	68.81	8.20	0.05	1	60.32	9.80	0.07	3.85	3.76	3.98	3.60	3.79	3.71		0	0
Milepost	44	to	45	1	66.60	5.60	0.07	1	59.41	5.40	0.06	3.88	4.06	3.99	4.08	4.01	4.06		0	0
Milepost	45	to	46	1	74.83	20.50	0.10	1	79.70	17.20	0.09	3.76	2.66	3.69	2.93	2.66	3.16		1	1
Milepost	46	to	47	1	80.83	9.40	0.09	1	81.59	8.60	0.09	3.68	3.64	3.67	3.73	3.65	3.71		0	0
Milepost	47	to	48	1	91.71	0.00	0.05	1	94.27	0.00	0.09	3.53	4.95	3.49	4.89	3.96	3.91		0	0
Milepost	48	to	49	1	114.60	7.00	0.13	1	115.27	12.50	0.13	3.23	3.88	3.23	3.33	3.43	3.26		0	1
Milepost	49	to	50	1	95.89	0.00	0.05	1	101.41	0.00	0.07	3.47	4.96	3.40	4.92	3.92	3.86		0	0
Milepost	50	to	51	1	94.98	26.50	0.07	1	102.53	27.40	0.09	3.49	2.20	3.39	2.14	2.20	2.14		1	1
Milepost	51	to	52	1	92.15	54.40	0.12	1	118.36	55.10	0.10	3.52	0.44	3.19	0.39	0.44	0.39		1	1
Milepost	52	to	53	1	83.08	51.70	0.11	1	106.83	57.30	0.12	3.65	0.59	3.33	0.27	0.59	0.27		1	1
Milepost	53	to	54	1	131.28	48.70	0.14	1	134.33	50.00	0.16	3.04	0.77	3.00	0.69	0.77	0.69		1	1
Milepost	54	to	55	1	166.51	49.40	0.15	1	175.37	52.00	0.20	2.66	0.73	2.57	0.55	0.73	0.55		1	1
Milepost	55	to	56	1	94.47	35.90	0.17	1	112.43	47.90	0.16	3.49	1.55	3.26	0.81	1.55	0.81		1	1
Milepost	56	to	57	1	116.07	35.70	0.13	1	130.49	49.60	0.12	3.22	1.58	3.05	0.72	1.58	0.72		1	1
Milepost	57	to	58	1	118.52	21.40	0.13	1	114.01	51.20	0.13	3.19	2.59	3.24	0.62	2.59	0.62		1	1
Milepost	58	to	59	1	115.01	19.50	0.11	1	132.91	52.10	0.14	3.23	2.74	3.02	0.57	2.74	0.57		1	1
Milepost	59	to	60	1	108.25	41.40	0.10	1	111.11	48.80	0.14	3.31	1.21	3.28	0.76	1.21	0.76		1	1

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Milepost	60	to	61	1	94.06	42.60	0.09	1	100.00	48.10	0.13	3.50	1.14	3.42	0.81	1.14	0.81		1	1
Milepost	61	to	62	1	97.32	18.00	0.10	1	87.61	21.10	0.12	3.45	2.87	3.58	2.61	3.04	2.61		1	1
Milepost	62	to	63	1	97.27	1.30	0.15	1	115.50	2.60	0.12	3.46	4.62	3.22	4.44	3.80	3.59		0	0
Milepost	63	to	64	1	71.43	0.10	0.10	1	76.99	0.80	0.14	3.81	4.92	3.73	4.73	4.14	4.03		0	0
Milepost	64	to	65	1	55.82	0.00	0.09	1	49.25	0.00	0.14	4.04	4.89	4.15	4.82	4.30	4.62		0	0
Milepost	65	to	66	1	59.34	0.00	0.08	1	57.27	0.00	0.10	3.99	4.91	4.02	4.88	4.27	4.28		0	0
Milepost	66	to	67	1	75.47	1.17	0.08	1	85.58	4.10	0.10	3.75	4.70	3.61	4.24	4.04	3.80		0	0
			Total	43				43												48
			Weighted Average									3.44	3.24	3.38	2.93	3.00	2.78			
			Factor									1.00		1.00						
			Indicator Score									3.44		3.38						**55.8%**
			Pavement Index															2.89		
Segment 3		***Interstate?***		**No**																
Milepost	87	to	88	2	79.96	0.00	0.13	2	89.10	0.00	0.12	3.69	4.83	3.56	4.85	4.03	3.95		0	0
Milepost	88	to	89	2	81.49	10.88	0.15	1	90.91	9.24	0.12	3.67	3.47	3.54	3.65	3.53	3.62		2	0
Milepost	89	to	90	2	86.38	10.25	0.14	1	90.99	10.20	0.11	3.60	3.54	3.54	3.56	3.56	3.55		2	1
Milepost	90	to	91	1	77.84	19.33	0.13	2	89.30	14.42	0.16	3.72	2.75	3.56	3.15	3.04	3.27		1	2
Milepost	91	to	92	1	63.79	11.90	0.19	2	83.45	14.50	0.14	3.92	3.35	3.64	3.15	3.52	3.30		1	2
Milepost	92	to	93	1	48.79	3.20	0.23	1	52.20	0.20	0.11	4.15	4.24	4.10	4.89	4.21	4.34		0	0
Milepost	93	to	94	1	84.94	0.91	0.18	1	55.38	0.64	0.13	3.62	4.66	4.05	4.77	3.93	4.27		0	0
Milepost	94	to	95	2	82.05	13.78	0.16	2	65.46	7.00	0.13	3.66	3.20	3.90	3.88	3.34	3.89		2	0
Milepost	95	to	96	2	94.90	16.50	0.19	2	72.50	13.30	0.15	3.49	2.94	3.80	3.25	3.11	3.41		2	2
Milepost	96	to	97	2	83.30	17.30	0.25	2	76.39	11.60	0.16	3.64	2.83	3.74	3.40	3.07	3.50		2	2
Milepost	97	to	98	2	102.00	22.00	0.30	2	75.42	14.70	0.17	3.39	2.40	3.75	3.11	2.40	3.30		2	2
Milepost	98	to	99	1	101.38	23.30	0.24	2	104.52	17.40	0.12	3.40	2.37	3.36	2.91	2.37	3.05		1	2
Milepost	99	to	100	1	91.89	24.09	0.23	2	93.79	17.91	0.12	3.53	2.32	3.50	2.87	2.32	3.06		1	2
Milepost	100	to	101	1	95.90	16.60	0.22	1	90.60	12.67	0.10	3.47	2.92	3.54	3.33	3.08	3.39		1	1
Milepost	101	to	102	1	80.68	16.90	0.18	1	61.99	1.09	0.06	3.68	2.92	3.95	4.72	3.15	4.18		1	0
Milepost	102	to	103	1	79.57	14.44	0.14	1	63.04	1.78	0.06	3.70	3.16	3.93	4.59	3.32	4.13		1	0
Milepost	103	to	104	1	75.80	13.60	0.12	1	79.25	7.40	0.08	3.75	3.24	3.70	3.85	3.39	3.81		1	0
			Total	24				26												36
			Weighted Average									3.63	3.26	3.69	3.64	3.27	3.57			
			Factor									1.00		1.00						
			Indicator Score									3.63		3.69						**72.0%**
			Pavement Index															3.42		

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 4		***Interstate?***		**No**																
Milepost	104	to	105	1	127.27	16.80	0.23	1	137.20	16.70	0.25	3.08	2.88	2.97	2.87	2.94	2.94		1	1
Milepost	105	to	106	1	151.42	11.50	0.30	1	140.78	12.50	0.26	2.81	3.26	2.93	3.21	2.81	3.01		1	1
Milepost	106	to	107	1	205.07	26.00	0.29	1	189.26	18.00	0.29	2.29	2.12	2.44	2.72	2.29	2.44		1	1
Milepost	107	to	108	1	185.82	31.10	0.30	1	185.39	34.80	0.28	2.47	1.75	2.47	1.53	1.75	1.53		1	1
Milepost	108	to	109	1	148.58	11.10	0.29	1	142.17	11.10	0.21	2.84	3.31	2.91	3.41	2.84	3.06		1	1
Milepost	109	to	110	1	104.16	0.00	0.23	1	89.84	0.00	0.13	3.37	4.63	3.55	4.84	3.75	3.94		0	0
Milepost	110	to	111	1	101.87	0.40	0.29	1	95.80	0.00	0.20	3.40	4.60	3.47	4.70	3.76	3.84		0	0
Milepost	111	to	112	1	100.94	0.50	0.30	1	110.29	0.80	0.21	3.41	4.55	3.29	4.64	3.75	3.69		0	0
Milepost	112	to	113	1	96.17	0.00	0.25	1	96.61	0.00	0.20	3.47	4.60	3.46	4.69	3.81	3.83		0	0
Milepost	113	to	114	1	61.42	0.00	0.17	1	60.29	0.00	0.16	3.96	4.76	3.98	4.79	4.20	4.22		0	0
Milepost	114	to	115	1	43.43	0.00	0.10	1	46.74	0.00	0.11	4.24	4.88	4.19	4.86	4.69	4.66		0	0
Milepost	115	to	116	1	49.77	2.50	0.12	1	48.84	2.18	0.12	4.14	4.45	4.15	4.50	4.36	4.40		0	0
			Total	12				12												10
			Weighted Average									3.29	3.82	3.32	3.90	3.41	3.46			
			Factor									1.00		1.00						
			Indicator Score									3.29		3.32						**41.7%**
			Pavement Index															3.44		
Segment 5		***Interstate?***		**No**																
Milepost	116	to	117	2	51.72	2.50	0.14	2	45.74	2.10	0.13	4.11	4.44	4.20	4.50	4.34	4.41		0	0
Milepost	117	to	118	2	132.16	16.80	0.23	2	156.01	16.78	0.27	3.03	2.88	2.76	2.84	2.92	2.76		2	2
Milepost	118	to	119	2	128.03	16.10	0.18	2	156.35	15.30	0.26	3.07	2.99	2.76	2.98	3.01	2.76		2	2
Milepost	119	to	120	2	137.99	21.60	0.24	2	146.84	15.40	0.23	2.96	2.49	2.86	3.00	2.49	2.86		2	2
Milepost	120	to	121	2	167.42	16.10	0.21	2	154.16	9.70	0.18	2.65	2.96	2.78	3.57	2.65	2.78		2	2
			Total	10				10												16
			Weighted Average									3.16	3.15	3.07	3.38	3.08	3.12			
			Factor									1.00		1.00						
			Indicator Score									3.16		3.07						**80.0%**
			Pavement Index															3.10		

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 6		***Interstate?***		**No**																
Milepost	330	to	331	2	127.11	9.50	0.14	2	154.98	14.30	0.19	3.08	3.61	2.77	3.13	3.24	2.77		0	2
Milepost	331	to	332	2	113.47	8.67	0.25	2	126.49	11.78	0.28	3.25	3.59	3.09	3.25	3.35	3.14		0	2
Milepost	332	to	333	2	96.14	10.09	0.21	2	79.35	13.64	0.25	3.47	3.50	3.70	3.13	3.49	3.30		2	2
Milepost	333	to	334	2	97.53	5.60	0.27	2	93.96	14.20	0.29	3.45	3.89	3.50	3.04	3.58	3.18		0	2
Milepost	334	to	335	2	110.73	9.60	0.29	2	82.52	12.20	0.27	3.28	3.45	3.65	3.23	3.33	3.36		0	2
Milepost	335	to	336	2	167.89	10.30	0.22	2	123.39	9.70	0.21	2.64	3.47	3.13	3.53	2.64	3.25		2	0
Milepost	336	to	337	2	150.87	4.70	0.21	2	147.59	3.50	0.18	2.82	4.07	2.85	4.26	2.82	2.85		2	2
Milepost	337	to	338	2	104.34	2.90	0.19	2	106.70	1.80	0.25	3.36	4.33	3.33	4.42	3.65	3.66		0	0
Milepost	338	to	339	2	134.32	8.80	0.18	2	107.76	12.13	0.16	3.00	3.65	3.32	3.35	3.20	3.34		0	2
Milepost	339	to	340	2	125.13	12.30	0.14	2	124.26	13.50	0.11	3.11	3.35	3.12	3.25	3.18	3.16		2	2
			Total	20				20												24
			Weighted Average									3.15	3.69	3.25	3.46	3.25	3.20			
			Factor									1.00		1.00						
			Indicator Score									3.15		3.25						60.0%
			Pavement Index															3.23		
Segment 7		***Interstate?***		**No**																
Milepost	300	to	301	1	138.79	22.60	0.27	1	126.64	14.80	0.11	2.95	2.39	3.09	3.13	2.39	3.10		1	1
Milepost	301	to	302	1	141.09	26.30	0.29	1	138.65	22.00	0.21	2.93	2.09	2.95	2.49	2.09	2.49		1	1
Milepost	302	to	303	1	147.46	21.50	0.25	1	123.68	13.80	0.20	2.86	2.49	3.13	3.17	2.49	3.14		1	1
Milepost	303	to	304	1	176.01	18.80	0.22	1	130.39	28.40	0.20	2.56	2.73	3.05	2.04	2.56	2.04		1	1
Milepost	304	to	305	1	185.95	21.50	0.25	1	145.12	23.50	0.17	2.47	2.49	2.88	2.41	2.47	2.41		1	1
Milepost	305	to	306	1	153.63	12.80	0.19	1	131.47	14.10	0.15	2.79	3.27	3.03	3.18	2.79	3.08		1	1
Milepost	306	to	307	1	200.36	19.60	0.25	1	174.03	17.90	0.19	2.34	2.64	2.58	2.83	2.34	2.58		1	1
Milepost	307	to	308	1	180.01	23.50	0.25	1	182.51	16.80	0.24	2.52	2.35	2.50	2.88	2.52	2.50		1	1
Milepost	308	to	309	1	208.74	20.30	0.20	1	189.61	19.00	0.23	2.26	2.63	2.43	2.71	2.26	2.43		1	1
Milepost	309	to	310	1	124.53	18.60	0.29	1	115.33	17.40	0.19	3.11	2.67	3.23	2.87	2.67	2.98		1	1
Milepost	310	to	311	1	134.57	19.80	0.27	1	113.57	17.90	0.18	3.00	2.60	3.25	2.84	2.60	2.96		1	1
Milepost	311	to	312	1	155.05	20.10	0.21	1	136.63	17.30	0.17	2.77	2.64	2.98	2.89	2.77	2.95		1	1
Milepost	312	to	313	1	144.03	19.50	0.17	1	142.72	18.90	0.17	2.89	2.72	2.91	2.77	2.72	2.86		1	1
Milepost	313	to	314	1	208.71	22.40	0.21	1	133.19	14.90	0.19	2.26	2.46	3.01	3.08	2.26	3.03		1	1
Milepost	314	to	315	1	133.22	20.67	0.16	1	109.13	6.89	0.14	3.01	2.63	3.30	3.89	2.63	3.48		1	0
Milepost	326	to	327	1	95.77	6.44	0.13	1	78.45	8.67	0.13	3.47	3.95	3.71	3.71	3.62	3.71		0	0
Milepost	327	to	328	1	106.55	12.09	0.14	1	84.79	9.09	0.11	3.34	3.37	3.62	3.67	3.36	3.66		1	0
Milepost	328	to	329	1	92.36	11.00	0.14	1	75.99	8.10	0.12	3.52	3.47	3.75	3.77	3.48	3.76		1	0
Milepost	329	to	330	1	97.59	14.30	0.21	1	116.32	13.50	0.18	3.45	3.12	3.21	3.21	3.22	3.21		1	1
			Total	19				19												33

				Direction 1 (Northbound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Weighted Average												2.87	2.77	3.08	3.03	2.70	2.97			
Factor												1.00		1.00						
Indicator Score												2.87		3.08						86.8%
Pavement Index																		2.83		
Segment 8		***Interstate?***		**No**																
Milepost	298	to	299	1	98.99	24.30	0.23	1	77.89	16.00	0.15	3.43	2.31	3.72	3.01	2.31	3.23		1	1
Milepost	299	to	300	1	112.58	36.00	0.22	1	85.29	14.20	0.15	3.26	1.51	3.62	3.17	1.51	3.30		1	1
Total				2				2												4
Weighted Average												3.35	1.91	3.67	3.09	1.91	3.27			
Factor												1.00		1.00						
Indicator Score												3.35		3.67						100.0%
Pavement Index																		2.59		
Segment 9		***Interstate?***		**No**																
Milepost	293	to	294	1	117.04	19.30	0.20	1	98.27	14.90	0.17	3.20	2.71	3.44	3.10	2.71	3.20		1	1
Milepost	294	to	295	1	103.87	32.50	0.24	1	85.51	36.10	0.25	3.37	1.72	3.61	1.48	1.72	1.48		1	1
Milepost	295	to	296	1	93.57	17.22	0.14	1	83.60	17.33	0.17	3.50	2.92	3.64	2.90	3.10	3.12		1	1
Milepost	296	to	297	1	83.26	16.91	0.19	1	84.37	13.00	0.12	3.64	2.91	3.63	3.29	3.13	3.39		1	1
Milepost	297	to	298	1	96.50	27.30	0.26	1	70.50	17.40	0.16	3.47	2.05	3.82	2.90	2.05	3.17		1	1
Total				5				5												10
Weighted Average												3.44	2.46	3.63	2.73	2.54	2.87			
Factor												1.00		1.00						
Indicator Score												3.44		3.63						100.0%
Pavement Index																		2.71		
Segment 10		***Interstate?***		**No**																
Milepost	274	to	275	1	84.31	23.00	0.18	1	75.45	22.40	0.18	3.63	2.44	3.75	2.48	2.44	2.48		1	1
Milepost	275	to	276	1	91.84	5.40	0.10	1	80.80	8.90	0.08	3.53	4.08	3.68	3.69	3.69	3.69		0	0
Milepost	276	to	277	1	95.87	8.80	0.10	1	76.13	5.90	0.10	3.47	3.70	3.74	4.02	3.63	3.94		0	0
Milepost	277	to	278	1	83.28	4.20	0.06	1	72.72	1.90	0.11	3.64	4.23	3.79	4.56	3.82	4.02		0	0
Milepost	278	to	279	1	87.33	4.10	0.09	1	91.73	3.90	0.14	3.59	4.25	3.53	4.24	3.79	3.74		0	0
Milepost	279	to	280	1	159.52	24.90	0.28	1	124.23	14.30	0.21	2.73	2.20	3.12	3.11	2.20	3.12		1	1
Milepost	280	to	281	1	166.08	30.60	0.42	1	134.12	12.70	0.23	2.66	1.61	3.00	3.24	1.61	3.07		1	1
Milepost	281	to	282	1	146.67	16.00	0.28	1	121.75	14.10	0.27	2.86	2.90	3.15	3.07	2.86	3.09		1	1
Milepost	282	to	283	1	156.53	6.80	0.18	1	134.41	10.90	0.16	2.76	3.87	3.00	3.47	2.76	3.14		1	1
Milepost	283	to	284	1	184.58	24.50	0.27	1	137.50	27.70	0.25	2.48	2.25	2.97	2.04	2.48	2.04		1	1
Milepost	284	to	285	1	167.14	31.30	0.34	1	132.74	46.50	0.26	2.65	1.68	3.02	0.82	1.68	0.82		1	1
Milepost	285	to	286	1	189.27	36.90	0.35	1	113.31	46.60	0.23	2.44	1.30	3.25	0.84	1.30	0.84		1	1
Milepost	286	to	287	1	145.08	39.60	0.31	1	134.67	51.90	0.38	2.88	1.18	3.00	0.36	1.18	0.36		1	1

				Direction 1 (Northbound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Milepost	287	to	288	1	126.80	16.20	0.19	1	111.29	18.20	0.28	3.09	2.97	3.28	2.72	3.01	2.72		1	1
Milepost	288	to	289	1	105.30	17.50	0.19	1	79.66	18.70	0.31	3.35	2.87	3.69	2.63	3.01	2.63		1	1
Milepost	289	to	290	1	98.84	18.30	0.18	1	96.43	17.60	0.28	3.43	2.81	3.47	2.76	3.00	2.97		1	1
Milepost	290	to	291	1	87.12	17.50	0.12	1	93.03	18.10	0.26	3.59	2.90	3.51	2.74	3.11	2.74		1	1
Milepost	291	to	292	1	111.84	19.70	0.12	1	104.90	19.50	0.23	3.27	2.73	3.36	2.67	2.73	2.67		1	1
Milepost	292	to	293	1	145.43	10.43	0.21	1	104.98	18.57	0.19	2.88	3.47	3.36	2.78	2.88	2.95		1	1
			Total	19				19												30
			Weighted Average									3.10	2.81	3.35	2.75	2.69	2.69			
			Factor									1.00		1.00						
			Indicator Score									3.10		3.35						78.9%
			Pavement Index															2.69		
Segment 11		***Interstate?***		**No**																
Milepost	270	to	271	1	133.24	17.50	0.14	1	103.12	6.60	0.10	3.01	2.90	3.38	3.94	2.93	3.55		1	0
Milepost	271	to	272	1	97.07	25.75	0.15	1	113.70	19.63	0.16	3.46	2.26	3.25	2.71	2.26	2.71		1	1
Milepost	272	to	273	1	120.95	29.80	0.20	1	130.61	29.20	0.22	3.16	1.94	3.04	1.97	1.94	1.97		1	1
Milepost	273	to	274	1	97.20	28.50	0.19	1	96.26	31.50	0.21	3.46	2.04	3.47	1.82	2.04	1.82		1	1
			Total	4				4												7
			Weighted Average									3.27	2.28	3.28	2.61	2.29	2.51			
			Factor									1.00		1.00						
			Indicator Score									3.27		3.28						87.5%
			Pavement Index															2.40		
Segment 12		***Interstate?***		**No**																
Milepost	255	to	256	1	91.72	10.22	0.22	1	109.77	5.89	0.20	3.53	3.48	3.29	3.94	3.49	3.49		1	0
Milepost	256	to	257	1	97.25	10.60	0.20	1	98.29	12.90	0.17	3.46	3.46	3.44	3.28	3.46	3.33		1	1
Milepost	257	to	258	1	120.21	10.00	0.22	1	107.64	13.60	0.21	3.17	3.49	3.32	3.18	3.26	3.22		0	1
Milepost	258	to	259	1	137.73	11.20	0.11	1	142.32	12.00	0.10	2.96	3.46	2.91	3.39	3.11	3.05		1	1
Milepost	259	to	260	1	107.51	11.30	0.14	1	86.23	10.50	0.14	3.32	3.44	3.60	3.52	3.41	3.54		1	1
Milepost	260	to	261	1	84.39	0.90	0.10	1	88.33	1.80	0.12	3.63	4.74	3.57	4.57	3.96	3.87		0	0
Milepost	261	to	262	1	97.36	4.10	0.11	1	77.29	2.30	0.14	3.45	4.24	3.73	4.47	3.69	3.95		0	0
Milepost	262	to	263	1	129.04	5.70	0.14	1	90.10	2.20	0.16	3.06	4.02	3.55	4.47	3.35	3.83		0	0
Milepost	263	to	264	1	110.42	5.30	0.16	1	71.29	1.70	0.11	3.29	4.06	3.81	4.58	3.52	4.04		0	0
Milepost	264	to	265	1	93.34	4.70	0.14	1	70.83	6.60	0.13	3.51	4.14	3.82	3.93	3.70	3.90		0	0
Milepost	265	to	266	1	108.75	1.80	0.12	1	70.36	0.50	0.11	3.31	4.56	3.83	4.82	3.68	4.12		0	0
Milepost	266	to	267	1	141.17	21.00	0.14	1	96.58	3.60	0.11	2.92	2.62	3.46	4.31	2.62	3.72		1	0
Milepost	267	to	268	1	167.42	17.60	0.14	1	117.95	4.20	0.10	2.65	2.89	3.19	4.23	2.65	3.50		1	0
Milepost	268	to	269	1	63.19	0.00	0.14	1	64.04	0.00	0.16	3.93	4.82	3.92	4.78	4.20	4.18		0	0
Milepost	269	to	270	1	134.85	3.30	0.14	1	97.85	2.20	0.11	3.00	4.32	3.45	4.51	3.39	3.77		0	0

				Direction 1 (Northbound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Total				15				15												10
Weighted Average												3.28	3.85	3.53	4.13	3.43	3.70			
Factor												1.00		1.00						
Indicator Score												3.28		3.53						33.3%
Pavement Index																		3.57		
Segment 13		*Interstate?*		**No**																
Milepost	243	to	244	2	106.70	14.86	0.12	2	114.06	8.17	0.11	3.33	3.13	3.24	3.77	3.19	3.40		2	0
Milepost	244	to	245	2	111.38	13.70	0.13	2	107.36	13.30	0.14	3.27	3.23	3.32	3.26	3.24	3.28		2	2
Milepost	245	to	246	2	138.99	14.20	0.15	2	116.93	6.50	0.17	2.95	3.17	3.21	3.91	3.02	3.42		2	0
Milepost	246	to	247	2	134.90	5.00	0.16	2	117.49	5.91	0.17	2.99	4.09	3.20	3.98	3.32	3.43		0	0
Milepost	247	to	248	2	115.96	4.82	0.16	2	86.41	2.00	0.16	3.22	4.11	3.60	4.50	3.49	3.87		0	0
Milepost	248	to	249	2	132.44	2.00	0.11	2	95.41	1.75	0.17	3.02	4.54	3.48	4.53	3.48	3.79		0	0
Milepost	249	to	250	2	169.99	4.22	0.09	2	112.69	4.00	0.22	2.62	4.23	3.26	4.16	2.62	3.53		2	0
Milepost	250	to	251	2	158.74	5.11	0.11	2	137.10	8.50	0.22	2.74	4.11	2.97	3.65	2.74	3.17		2	0
Milepost	251	to	252	2	126.42	7.83	0.13	2	124.51	6.83	0.20	3.09	3.79	3.12	3.85	3.30	3.33		0	0
Milepost	252	to	253	2	108.70	13.90	0.18	2	118.97	12.10	0.18	3.31	3.18	3.18	3.34	3.22	3.23		2	2
Milepost	253	to	254	2	99.41	13.90	0.15	2	99.40	14.65	0.18	3.43	3.20	3.43	3.11	3.27	3.21		2	2
Milepost	252	to	253	2	108.70	13.90	0.18	2	118.97	12.10	0.18	3.31	3.18	3.18	3.34	3.22	3.23		2	2
Milepost	253	to	254	1	99.41	13.90	0.15	1	99.40	14.65	0.18	3.43	3.20	3.43	3.11	3.27	3.21		1	1
Milepost	254	to	255	1	95.50	16.38	0.17	1	99.89	16.33	0.22	3.48	2.97	3.42	2.94	3.13	3.08		1	1
Total				26				26												28
Weighted Average												3.13	3.62	3.28	3.72	3.18	3.39			
Factor												1.00		1.00						
Indicator Score												3.13		3.28						53.8%
Pavement Index																		3.28		
Segment 14		*Interstate?*		**No**																
Milepost	227	to	228	1	101.34	7.30	0.12	1	85.05	2.50	0.11	3.40	3.85	3.62	4.46	3.54	3.87		0	0
Milepost	228	to	229	1	68.45	0.00	0.09	1	70.06	0.00	0.07	3.85	4.90	3.83	4.92	4.17	4.16		0	0
Milepost	229	to	230	1	56.22	0.00	0.07	1	44.32	0.10	0.07	4.04	4.92	4.23	4.95	4.30	4.74		0	0
Milepost	230	to	231	1	60.77	0.00	0.07	1	37.79	0.00	0.06	3.97	4.93	4.33	4.94	4.26	4.75		0	0
Milepost	231	to	232	1	44.74	0.00	0.06	1	48.51	0.00	0.07	4.22	4.94	4.16	4.93	4.72	4.39		0	0
Milepost	232	to	233	1	63.16	0.00	0.08	1	63.68	0.00	0.07	3.93	4.92	3.93	4.92	4.23	4.22		0	0
Milepost	233	to	234	1	48.72	0.00	0.08	1	44.21	0.00	0.08	4.15	4.92	4.23	4.91	4.38	4.71		0	0
Milepost	234	to	235	1	48.94	5.90	0.07	1	58.34	0.55	0.15	4.15	4.02	4.01	4.77	4.06	4.23		0	0
Milepost	235	to	236	1	35.94	0.56	0.05	1	37.34	0.33	0.07	4.36	4.83	4.34	4.89	4.69	4.72		0	0
Milepost	236	to	237	1	114.13	19.18	0.22	1	107.15	19.64	0.18	3.24	2.71	3.33	2.70	2.71	2.70		1	1
Milepost	237	to	238	1	114.82	20.38	0.21	1	129.95	20.43	0.19	3.23	2.61	3.05	2.63	2.61	2.63		1	1

				Direction 1 (Northound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Milepost	238	to	239	1	132.73	23.60	0.25	1	97.66	19.00	0.23	3.02	2.33	3.45	2.71	2.33	2.71		1	1
Milepost	239	to	240	1	106.31	17.64	0.20	1	91.31	16.80	0.21	3.34	2.84	3.53	2.90	2.99	3.09		1	1
Milepost	240	to	241	1	152.11	24.50	0.22	1	78.76	18.55	0.13	2.81	2.30	3.71	2.82	2.30	3.08		1	1
Milepost	241	to	242	1	114.50	20.73	0.16	1	88.26	17.82	0.17	3.24	2.63	3.58	2.85	2.63	3.07		1	1
Milepost	242	to	243	1	87.02	17.50	0.16	1	75.47	10.20	0.16	3.59	2.89	3.75	3.53	3.10	3.60		1	1
			Total	16				16												14
			Weighted Average									3.66	3.78	3.82	3.99	3.56	3.79			
			Factor									1.00		1.00						
			Indicator Score									3.66		3.82						**43.8%**
			Pavement Index															3.68		
Segment 15		***Interstate?***		**No**																
Milepost	225	to	226	1	78.40	0.10	0.11	1	76.20	0.10	0.14	3.71	4.92	3.74	4.89	4.07	4.09		0	0
Milepost	226	to	227	1	79.87	0.89	0.08	1	89.56	0.00	0.10	3.69	4.75	3.56	4.89	4.01	3.96		0	0
			Total	2				2												0
			Weighted Average									3.70	4.83	3.65	4.89	4.04	4.02			
			Factor									1.00		1.00						
			Indicator Score									3.70		3.65						**0.0%**
			Pavement Index															4.03		
Segment 16		***Interstate?***		**No**																
Milepost	223	to	224	1	42.13	0.00	0.10	1	42.38	0.00	0.16	4.26	4.88	4.26	4.77	4.70	4.62		0	0
Milepost	224	to	225	1	46.95	2.20	0.11	1	56.22	0.00	0.16	4.18	4.51	4.04	4.78	4.41	4.26		0	0
			Total	2				2												0
			Weighted Average									4.22	4.70	4.15	4.78	4.55	4.44			
			Factor									1.00		1.00						
			Indicator Score									4.22		4.15						**0.0%**
			Pavement Index															4.50		

Segment 17		***Interstate?***		**No**																
Milepost	212	to	213	2	84.53	16.70	0.15	2	85.70	20.50	0.21	3.63	2.96	3.61	2.61	3.16	2.61		2	2
Milepost	213	to	214	2	88.75	9.58	0.12	2	74.12	17.33	0.12	3.57	3.62	3.77	2.92	3.60	3.17		0	2
Milepost	214	to	215	2	79.56	3.60	0.10	2	59.86	13.70	0.12	3.70	4.31	3.98	3.23	3.88	3.46		0	2
Milepost	215	to	216	2	58.21	11.70	0.13	2	47.57	17.20	0.11	4.01	3.41	4.17	2.93	3.59	3.30		2	2
Milepost	216	to	217	2	58.68	13.30	0.15	2	49.74	15.90	0.14	4.00	3.25	4.14	3.03	3.48	3.36		2	2
Milepost	217	to	218	2	61.99	12.90	0.13	2	53.85	17.00	0.15	3.95	3.30	4.07	2.94	3.49	3.28		2	2
Milepost	218	to	219	2	55.53	12.90	0.11	2	54.52	11.30	0.12	4.05	3.30	4.06	3.45	3.53	3.63		2	2
Milepost	219	to	220	2	56.84	16.30	0.11	2	62.39	3.30	0.09	4.03	3.01	3.94	4.35	3.31	4.23		2	0
Milepost	220	to	221	2	52.89	12.90	0.09	2	62.78	14.10	0.13	4.09	3.31	3.94	3.19	3.54	3.41		2	2

				Direction 1 (Northbound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Milepost	221	to	222	2	54.06	15.30	0.09	2	53.77	7.70	0.10	4.07	3.09	4.08	3.82	3.39	3.90		2	0
Milepost	222	to	223	1	40.37	4.33	0.13	1	49.89	1.10	0.12	4.29	4.20	4.14	4.68	4.23	4.52		0	0
			Total	21				21												32
			Weighted Average									3.93	3.40	3.99	3.32	3.53	3.49			
			Factor									1.00		1.00						
			Indicator Score									3.93		3.99						76.2%
			Pavement Index															3.51		
Segment 18		***Interstate?***		**No**																
Milepost	205	to	206	2	85.21	6.70	0.12	2	66.56	12.90	0.16	3.62	3.92	3.88	3.28	3.83	3.46		0	2
Milepost	206	to	207	2	93.59	17.70	0.13	2	58.61	10.50	0.15	3.50	2.89	4.00	3.51	3.07	3.66		2	2
Milepost	207	to	208	2	86.46	17.55	0.13	2	78.48	16.70	0.15	3.60	2.90	3.71	2.96	3.11	3.18		2	2
Milepost	208	to	209	2	73.05	16.33	0.13	2	68.26	16.00	0.14	3.79	3.00	3.86	3.02	3.24	3.27		2	2
Milepost	209	to	210	2	90.67	16.40	0.12	2	65.90	15.50	0.13	3.54	3.00	3.89	3.07	3.16	3.32		2	2
Milepost	210	to	211	2	75.04	17.44	0.12	2	58.32	15.44	0.09	3.76	2.91	4.01	3.08	3.16	3.36		2	2
Milepost	211	to	212	2	90.91	16.40	0.18	2	97.41	13.60	0.19	3.54	2.96	3.45	3.20	3.14	3.27		2	2
			Total	14				14												26
			Weighted Average									3.62	3.08	3.83	3.16	3.24	3.36			
			Factor									1.00		1.00						
			Indicator Score									3.62		3.83						92.9%
			Pavement Index															3.30		
Segment 19		***Interstate?***		**No**																
Milepost	199	to	200	2	87.98	9.00	0.15	2	101.64	11.88	0.16	3.58	3.66	3.40	3.38	3.63	3.38		0	2
Milepost	200	to	201	2	82.45	7.67	0.16	2	65.15	15.70	0.13	3.66	3.79	3.90	3.05	3.75	3.31		0	2
Milepost	201	to	202	2	90.92	15.20	0.20	2	77.20	1.90	0.14	3.54	3.05	3.73	4.53	3.20	3.97		2	0
Milepost	202	to	203	2	99.95	8.40	0.15	2	84.48	4.80	0.14	3.42	3.72	3.63	4.13	3.51	3.78		0	0
Milepost	203	to	204	2	84.96	9.80	0.12	2	87.68	0.50	0.06	3.62	3.59	3.58	4.85	3.60	3.96		0	0
Milepost	204	to	205	2	84.70	10.00	0.10	2	83.94	17.00	0.16	3.62	3.58	3.63	2.93	3.59	3.14		0	2
			Total	12				12												8
			Weighted Average									3.57	3.57	3.65	3.81	3.55	3.59			
			Factor									1.00		1.00						
			Indicator Score									3.57		3.65						33.3%
			Pavement Index															3.57		

				Direction 1 (Northbound)				Direction 2 (Southbound)				Direction 1 (Northbound)		Direction 2 (Southbound)		Composite		Pavement Index	% Pavement Failure	
				# of Lanes	IRI	Cracking	Rutting	# of Lanes	IRI	Cracking	Rutting	PSR	PDI	PSR	PDI	Dir 1 (NB)	Dir 2 (SB)		Dir 1 (NB)	Dir 2 (SB)
Segment 20		***Interstate?***		**No**																
Milepost	194	to	195	2	71.23	0.20	0.10	2	69.98	0.00	0.09	3.81	4.90	3.83	4.89	4.14	4.15		0	0
Milepost	195	to	196	2	66.02	0.20	0.10	2	73.54	0.20	0.10	3.89	4.90	3.78	4.90	4.19	4.12		0	0
Milepost	196	to	197	2	70.69	0.00	0.12	2	82.33	0.10	0.09	3.82	4.85	3.66	4.93	4.13	4.04		0	0
Milepost	197	to	198	2	65.25	0.00	0.10	2	62.05	0.10	0.09	3.90	4.88	3.95	4.94	4.19	4.25		0	0
Milepost	198	to	199	2	64.70	0.00	0.10	2	62.29	0.10	0.09	3.91	4.88	3.95	4.93	4.20	4.24		0	0
			Total	10				10												0
			Weighted Average									3.87	4.88	3.83	4.92	4.17	4.16			
			Factor									1.00		1.00						
			Indicator Score									3.87		3.83						**0.0%**
			Pavement Index															4.17		

Bridge Performance Area Data

Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Bridge Sufficiency: Sufficiency Rating	Bridge Index: Deck (N58)	Bridge Index: Sub (N59)	Bridge Index: Super (N60)	Bridge Index: Eval (N67)	Bridge Index: Lowest	Functionally Obsolete Bridges: Deck Area on Func Obsolete	Bridge Rating	Hot Spots on Bridge Index map
Segment 1												
Moffet Wash Bridge	297	6.44	2592	87.80	6.00	7.00	6.00	6.00	6.0	0		
Total			2,592									
Weighted Average				87.80					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**87.80**						**0.00%**	**6**	
Bridge Index									**6.00**			
Segment 2												
Bridge	291	45.46	1892	80.10	6.00	6.00	6.00	6.00	6.0	0		
Cochise UPRR OP	157	62.88	3302	63.00	5.00	6.00	5.00	5.00	5.0	0		
Total			5,194									
Weighted Average				69.23					5.36	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**69.23**						**0.00%**	**5**	
Bridge Index									**5.36**			
Segment 3												
Monk Draw Bridge SB	292	89.28	3584	87.60	6.00	6.00	7.00	5.00	5.0	0		
Monk Draw Br NB	2572	89.29	3718	99.80	6.00	6.00	7.00	6.00	6.0	0		
Total			7,302									
Weighted Average				93.81					5.51	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**93.81**						**0.00%**	**5**	
Bridge Index									**5.51**			
Segment 4												
Stockton Wash Bridge	201	111.11	6514	69.50	6.00	6.00	7.00	6.00	6.0	0		
Total			6,514									
Weighted Average				69.50					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**69.50**						**0.00%**	**6**	
Bridge Index									**6.00**			

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 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												
Cottonwood Wash Br	305	330.14	10647	68.10	6.00	6.00	6.00	6.00	6.0	0		
Total			10,647									
Weighted Average				68.10					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**68.10**						**0.00%**	**6**	
Bridge Index									**6.00**			
Segment 7												
Goodwin Wash Bridge	2736	301.87	8245	80.00	7.00	8.00	8.00	8.00	7.0	0		
Holyoak Wash Bridge	514	302.53	4185	66.70	5.00	5.00	5.00	5.00	5.0	0		
Fine Wash Bridge	515	304.85	5040	78.70	6.00	6.00	6.00	6.00	6.0	0		
Ft Thomas Ped UP	560	306.59	566	-2.00	7.00	6.00	7.00	N	6.0	0		
Black Rock Wash Br	545	306.76	9522	67.00	6.00	6.00	5.00	5.00	5.0	0		
Hunzinger Wash Br	561	313.62	3715	69.00	6.00	6.00	5.00	5.00	5.0	0		
Matthewsville Wash Br	394	326.25	7740	66.80	6.00	6.00	6.00	6.00	6.0	0		
Patterson Wash Br	1421	327.72	1118	66.00	6.00	6.00	5.00	5.00	5.0	0		
Total			40,131									
Weighted Average				70.25					5.74	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**70.25**						**0.00%**	**5**	
Bridge Index									**5.74**			

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 8												
Bridge	513	299.51	4850	73.00	6.00	6.00	7.00	6.00	6.0	0		
Total			4,850									
Weighted Average				73.00					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**73.00**						**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**			
Segment 10												
Gila River Br Bylas	2945	292.55	102258	80.00	7.00	8.00	8.00	8.00	7.0	0		
Total			102,258									
Weighted Average				80.00					7.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**80.00**						**0.00%**	**7**	
Bridge Index									**7.00**			
Segment 11												
Peridot RR OP	477	271.27	9225	93.20	5.00	6.00	6.00	6.00	5.0	0		
San Carlos River Bridge	2910	271.56	51095	80.00	7.00	8.00	8.00	8.00	7.0	0		
Total			60,320									
Weighted Average				82.02					6.69	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**82.02**						**0.00%**	**5**	
Bridge Index									**6.69**			
Segment 12												
Gilson Wash Br	464	259.55	7599	52.90	6.00	6.00	6.00	6.00	6.0	0		
Total			7,599									
Weighted Average				52.90					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**52.90**						**0.00%**	**6**	
Bridge Index									**6.00**			

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 13												
Bloody Tanks Bridge	173	243.71	6294	77.20	5.00	5.00	6.00	5.00	5.0	0		
Pinal Creek Bridge	266	249.64	9963	44.90	4.00	4.00	5.00	4.00	4.0	0		
Pinal Creek Bridge	36	249.80	7558	53.50	5.00	5.00	6.00	5.00	5.0	0		
Central Sch Ped OP	1788	250.34	3380	-2.00	7.00	8.00	7.00	7.00	7.0	0		
Pinal Creek Bridge	549	250.37	14382	78.30	5.00	5.00	6.00	5.00	5.0	0		
Pinal Creek Bridge	1785	250.53	17453	94.60	6.00	6.00	7.00	6.00	6.0	0		
Maple Street OP	1786	250.75	7038	94.60	6.00	7.00	7.00	7.00	6.0	0		
Globe Viaduct	1787	250.90	71113	85.10	5.00	6.00	7.00	6.00	5.0	0		
Globe School Ped OP	488	251.27	774	-2.00	7.00	7.00	7.00	7.00	7.0	0		
McMillen Wash Br	1028	251.75	7605	81.40	5.00	5.00	5.00	5.00	5.0	0		
Pinal SPRR UP	562	253.63	1107	-2.00	N	6.00	7.00	N	6.0	0		
Total			146,667									
Weighted Average				78.01					5.16	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**78.01**						**0.00%**	**4**	
Bridge Index									**5.16**			
Segment 14												
Queen Creek Bridge	406	227.71	19618	19.40	4.00	3.00	4.00	3.00	3.0	0		
Queen Creek Tunnel	407	228.47	4491	-2.00	N	N	N	N				
Waterfall Canyon Br	328	229.50	4176	40.30	6.00	5.00	4.00	4.00	4.0	0		
Devils Canyon Bridge	261	232.49	2035	81.60	6.00	6.00	6.00	6.00	6.0	0		
Pinto Creek Bridge	20077	238.25	32793	100.00	8.00	8.00	8.00	8.00	8.0	0		
Bloody Tanks Wash Br	45	242.72	2812	68.00	6.00	6.00	5.00	5.00	5.0	0		
Total			65,925									
Weighted Average				68.13					5.52	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**68.13**						**0.00%**	**3**	
Bridge Index									**5.52**			

				Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges		
Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete	Bridge Rating	Hot Spots on Bridge Index map
Segment 15												
Queen Creek Bridge	436	226.14	12936	77.00	6.00	6.00	7.00	6.00	6.0	0		
Stone Ave OP	20113	226.62	8400	91.50	7.00	7.00	8.00	7.00	7.0	0		
Route 177 TI UP	438	226.85	5099	89.80	6.00	6.00	7.00	6.00	6.0	0		
Total			26,435									
Weighted Average				84.08					6.32	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**84.08**						**0.00%**	**6**	
Bridge Index									**6.32**			
Segment 16												
Silver King Wash Br	318	223.70	3432	86.30	6.00	7.00	7.00	5.00	5.0	0		
No Name Wash Br WB	319	224.64	1568	86.70	6.00	6.00	6.00	5.00	5.0	0		
Total			5,000									
Weighted Average				86.43					5.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**86.43**						**0.00%**	**5**	
Bridge Index									**5.00**			
Segment 17												
US 60 EB OP Bridge	2663	212.25	9094	97.40	7.00	7.00	7.00	7.00	7.0	0		
US 60 WB OP Bridge	2664	212.25	9094	97.00	6.00	7.00	7.00	7.00	6.0	0		
Reymert Wash Bridge EB	286	219.85	1892	87.20	7.00	7.00	6.00	5.00	5.0	0		
Reymert Wash Bridge WB	2846	220.00	3624	97.20	7.00	8.00	8.00	8.00	7.0	0		
Queen Creek Bridge EB	2847	222.25	12647	98.20	7.00	8.00	7.00	7.00	7.0	0		
Queen Creek Br WB	20029	222.25	9900	97.20	7.00	8.00	8.00	8.00	7.0	0		
Wash Bridge	288	222.87	2322	65.80	6.00	6.00	6.00	5.00	5.0	0		
Total			48,573									
Weighted Average				95.57					6.64	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**95.57**						**0.00%**	**5**	
Bridge Index									**6.64**			

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 18												
Queen Creek Br EB	2056	210.83	13424	98.90	7.00	7.00	7.00	7.00	7.0	0		
Queen Creek Br WB	841	210.83	10630	79.40	5.00	7.00	7.00	7.00	5.0	0		
Sand Tanks Wsh Br EB	435	208.75	3942	79.30	5.00	5.00	6.00	5.00	5.0	0		
N/A - No Bridges	7178											
Bridge EB	578	207.98	3942	97.40	6.00	6.00	6.00	6.00	6.0	0		
Bridge WB	857	207.98	3942	85.30	5.00	5.00	6.00	5.00	5.0	0		
Bridge EB	1533	206.08	781	89.50	6.00	6.00	7.00	6.00	6.0	0		
Bridge over Wash EB	434	205.37	4928	90.10	6.00	6.00	6.00	6.00	6.0	0		
Bridge over Wash WB	856	205.37	4844	97.40	6.00	6.00	7.00	6.00	6.0	0		
Total			46,433									
Weighted Average				90.24					5.89	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**90.24**						**0.00%**	**5**	
Bridge Index									**5.89**			
Segment 19												
Bridge EB	433	203.09	1792	87.60	6.00	6.00	6.00	5.00	5.0	0		
Bridge WB	855	203.09	1798	97.20	6.00	6.00	7.00	6.00	6.0	0		
Bridge EB	432	200.58	2688	91.20	6.00	6.00	6.00	6.00	6.0	0		
Bridge WB	799	200.58	2910	94.10	6.00	6.00	7.00	6.00	6.0	0		
Siphon Draw Br EB	2199	199.12	9085	96.20	7.00	7.00	7.00	7.00	7.0	0		
Siphon Draw Br WB	2200	199.12	9085	85.50	7.00	5.00	7.00	5.00	5.0	0		
Total			27,358									
Weighted Average				91.43					5.93	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**91.43**						**0.00%**	**5**	
Bridge Index									**5.93**			

				Bridge Sufficiency	Bridge Index					Functionally Obsolete Bridges		
Structure Name (A209)	Structure # (N8)	Milepost (A232)	Area (A225)	Sufficiency Rating	Deck (N58)	Sub (N59)	Super (N60)	Eval (N67)	Lowest	Deck Area on Func Obsolete	Bridge Rating	Hot Spots on Bridge Index map
Segment 20												
Goldfield Road TI OP	2068	198.40	19150	93.80	7.00	6.00	7.00	6.00	6.0	0		
Tomahawk Rd TI OP	2067	197.41	19150	94.00	7.00	6.00	7.00	6.00	6.0	0		
Idaho Rd TI OP	2066	196.41	19150	94.00	7.00	6.00	7.00	6.00	6.0	0		
Ironwood Dr TI OP	2065	195.39	19998	94.00	7.00	6.00	6.00	6.00	6.0	0		
#N/A	null											
N/A - No Bridges	7327											
#N/A	null											
Total			77,448									
Weighted Average				93.95					6.00	0.00%		
Factor				1.00					1.00	1.00		
Indicator Score				**93.95**						**0.00%**	**6**	
Bridge Index									**6.00**			

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)	WB/NB Right Shoulder Width	EB/SB Right Shoulder Width	WB/NB Left Shoulder Width	EB/SB Left Shoulder Width	NB/WB AADT	SB/EB AADT	2020 AADT	K Factor	D Factor	T Factor	Weighted Average Posted Speed Limit (mph)	Divided or Undivided	Access Points (per mile)	% No-Passing Zone
191-1	0	24	24	Rural	Interrupted	Level	2	Urban/Rural Single or Multilane Signalized	12.00	6.78	6.81	N/A	N/A	1040	1053	2093	0.10	0.53	0.15	55	Undivided	7	12%
191-2	24	67	43	Rural	Interrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	2.32	2.37	N/A	N/A	628	906	1534	0.11	0.62	0.27	55	Undivided	8	26%
191-3	87	104	17	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	10.29			4.05	1316	1301	2617	0.07	0.50	0.21	55	Divided	2	3%
191-4	104	116	12	Rural	Uninterrupted	Level	4	Rural Two-Lane, Non-Signalized	12.00	7.93	7.81	N/A	N/A	2184	2159	4343	0.08	0.50	0.16	65	Undivided	13	30%
191-5	116	121	5	Urban	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	2.97	2.29	N/A	N/A	3828	4075	7903	0.07	0.56	0.10	40	Undivided	N/A	13%
70-6	330	339	9	Urban	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	2.89	2.82	N/A	N/A	5888	5665	11553	0.09	0.51	0.13	40	Undivided	N/A	0%
70-7	300	330	30	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	6.68	6.67	N/A	N/A	1671	1446	3116	0.07	0.54	0.27	55	Undivided	9	13%
70-8	298	300	2	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	5.00	5.00	N/A	N/A	1599	1150	2749	0.07	0.58	0.25	65	Undivided	7	6%
70-9	293	298	5	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	5.82	5.92	N/A	N/A	1599	1150	2749	0.07	0.58	0.25	50	Undivided	14	53%
70-10	274	293	19	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	5.07	5.08	N/A	N/A	1599	1150	2749	0.07	0.58	0.25	55	Undivided	2	37%

Segment	Begin MP	End MP	Length	Facility Type	Flow Type	Terrain	No. of	Capacity Environment Type	Lane Width	WB/NB Right Shoulder Width	EB/SB Right Shoulder Width	WB/NB Left Shoulder Width	EB/SB Left Shoulder Width	NB/WB AADT	SB/EB AADT	2020 AADT	K Factor	D Factor	T Factor	Weighted Average	Divided or Undivided	Access Points	% No-Passing
70-11	270	274	4	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	4.54	4.70	N/A	N/A	1638	1213	2850	0.07	0.58	0.25	55	Undivided	9	77%
70-12	255	270	15	Rural	Uninterrupted	Level	2	Rural Two-Lane, Non-Signalized	12.00	5.43	5.33	N/A	N/A	2774	3016	5790	0.08	0.52	0.17	60	Undivided	4	10%
70/60 E-13	243	255	12	Urban	Interrupted	Level	4	Urban/Rural Single or Multilane Signalized	12.00	5.04	4.15	N/A	N/A	5623	5520	11143	0.08	0.52	0.11	45	Undivided	N/A	0%
60E-14	227	243	16	Rural	Uninterrupted	Mountainous	2	Rural Two-Lane, Non-Signalized	12.00	4.86	4.78	N/A	N/A	4152	5976	10128	0.09	0.59	0.11	50	Undivided	4	68%
60E-15	225	227	2	Rural	Uninterrupted	Rolling	4	Multilane Highway	12.00	7.88	7.87	7.87	N/A	3763	3726	7489	0.07	0.51	0.18	45	Undivided	23	98%
60E-16	223	225	2	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	7.75	7.25	7.25	N/A	5338	5355	10693	0.10	0.50	0.13	55	Undivided	0.3	55%
60E-17	212	223	11	Rural	Uninterrupted	Level	4	Multilane Highway	12.00	10.12	10.00	10.00	4.78	5537	5511	11048	0.10	0.50	0.13	65	Divided	2	0%
60E-18	205	212	7	Rural	Uninterrupted	Level	2	Multilane Highway	12.00	6.57	9.59	9.59	4.00	6755	7248	14003	0.08	0.52	0.13	65	Divided	2	0%
60E-19	199	205	6	Urban	Interrupted	Level	2	Urban/Rural Single or Multilane Signalized	12.00	6.00	9.05	N/A	N/A	9049	9603	18653	0.08	0.53	0.11	55	Divided	N/A	0%
60E-20	194.3	199	4.7	Urban	Uninterrupted	Level	2	Freeway Segment	12.00	10.00	10.00	N/A	N/A	23754	24754	48507	0.08	0.51	0.09	65	Divided	N/A	0%

LOTTR and TTTR – Northbound/Westbound

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
1	115+06006	1 AM Peak	AZ-80	W	1.5	128	135	176	341	65	65	65	1.37	2.52	1.40	2.52	100%	1.40	2.52
	115+06006	2 Mid Day	AZ-80	W	1.5	140	143	195	310	65	65	65	1.40	2.18					
	115+06006	3 PM Peak	AZ-80	W	1.5	132	135	170	264	65	65	65	1.29	1.95					
	115+06006	4 Weekend	AZ-80	W	1.5	126	128	151	211	65	65	65	1.20	1.65					
13	115-05674	1 AM Peak	US-60	W	4.2	316	318	353	436	45	45	45	1.12	1.37	1.18	1.39	29%	1.16	1.67
	115-05674	2 Mid Day	US-60	W	4.2	311	318	348	443	45	45	45	1.12	1.39					
	115-05674	3 PM Peak	US-60	W	4.2	305	312	339	423	45	45	45	1.11	1.36					
	115-05674	4 Weekend	US-60	W	4.2	311	339	366	462	45	45	45	1.18	1.36					
	115-05675	1 AM Peak	US-60	W	3.3	345	357	387	597	45	45	45	1.12	1.67	1.19	2.65	23%		
	115-05675	2 Mid Day	US-60	W	3.3	346	358	386	629	45	45	45	1.11	1.76					
	115-05675	3 PM Peak	US-60	W	3.3	346	363	397	629	45	45	45	1.15	1.73					
	115-05675	4 Weekend	US-60	W	3.3	340	357	406	946	45	45	45	1.19	2.65					
	115N05940	1 AM Peak	US-60	W	0.05	5	5	7	12	45	45	45	1.35	2.36	1.40	2.66	0%		
	115N05940	2 Mid Day	US-60	W	0.05	5	5	7	14	45	45	45	1.40	2.66					
	115N05940	3 PM Peak	US-60	W	0.05	5	6	7	13	45	45	45	1.39	2.31					
	115N05940	4 Weekend	US-60	W	0.05	5	6	7	12	45	45	45	1.40	2.22					
	115-05940	1 AM Peak	US-60	W	5.0	508	517	555	662	45	45	45	1.09	1.28	1.12	1.35	35%		
	115-05940	2 Mid Day	US-60	W	5.0	528	538	576	688	45	45	45	1.09	1.28					
	115-05940	3 PM Peak	US-60	W	5.0	526	539	581	727	45	45	45	1.10	1.35					
	115-05940	4 Weekend	US-60	W	5.0	506	521	568	699	45	45	45	1.12	1.34					
	115+05840	1 AM Peak		W	1.9	154	154	173	212	45	45	45	1.12	1.37	1.12	1.42	13%		
	115+05840	2 Mid Day		W	1.9	155	156	172	210	45	45	45	1.11	1.35					
	115+05840	3 PM Peak		W	1.9	157	159	174	227	45	45	45	1.10	1.42					
	115+05840	4 Weekend		W	1.9	152	154	170	216	45	45	45	1.11	1.41					
	115P05841	1 AM Peak	US-70	W	0	0	0	0	0	45	45	45	NO CORRESPONDING DATA	NO CORRESPONDING DATA	0.00	0.00	0%		
	115P05841	2 Mid Day	US-70	W	0	0	0	0	0	45	45	45	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
	115P05841	3 PM Peak	US-70	W	0	0	0	0	0	45	45	45	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
	115P05841	4 Weekend	US-70	W	0	0	0	0	0	45	45	45	NO CORRESPONDING DATA	NO CORRESPONDING DATA					
14	115-05668	1 AM Peak	US-60	S	1.43	105	105	117	138	55	55	55	1.12	1.32	1.12	1.36	12%	1.12	1.52

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-05668	2 Mid Day	US-60	S	1.43	103	105	112	143	55	55	55	1.09	1.36					
	115-05668	3 PM Peak	US-60	S	1.43	100	103	109	135	55	55	55	1.09	1.32					
	115-05668	4 Weekend	US-60	S	1.43	101	105	111	135	55	55	55	1.10	1.29					
	115N11100	1 AM Peak	US-60	W	0.23	17	17	19	23	55	55	55	1.15	1.35	1.15	1.35	2%		
	115N11100	2 Mid Day	US-60	W	0.23	16	17	18	23	55	55	55	1.09	1.35					
	115N11100	3 PM Peak	US-60	W	0.23	16	16	17	21	55	55	55	1.09	1.31					
	115N11100	4 Weekend	US-60	W	0.23	16	17	18	22	55	55	55	1.11	1.32					
	115-11100	1 AM Peak	US-60	W	1.92	137	137	161	203	55	55	55	1.17	1.48	1.17	1.62	16%		
	115-11100	2 Mid Day	US-60	W	1.92	134	136	149	210	55	55	55	1.11	1.54					
	115-11100	3 PM Peak	US-60	W	1.92	132	136	144	210	55	55	55	1.09	1.55					
	115-11100	4 Weekend	US-60	W	1.92	133	138	150	224	55	55	55	1.13	1.62					
	115-05669	1 AM Peak	US-60	W	4.23	280	281	308	363	55	55	55	1.10	1.29	1.10	1.30	35%		
	115-05669	2 Mid Day	US-60	W	4.23	277	279	299	363	55	55	55	1.08	1.30					
	115-05669	3 PM Peak	US-60	W	4.23	277	280	299	346	55	55	55	1.08	1.24					
	115-05669	4 Weekend	US-60	W	4.23	277	287	305	354	55	55	55	1.10	1.23					
	115-05671	1 AM Peak	US-60	W	4.32	297	299	331	458	55	55	55	1.11	1.53	1.13	1.76	36%		
	115-05671	2 Mid Day	US-60	W	4.32	294	296	325	521	55	55	55	1.11	1.76					
	115-05671	3 PM Peak	US-60	W	4.32	289	294	317	389	55	55	55	1.10	1.32					
	115-05671	4 Weekend	US-60	W	4.32	294	311	331	387	55	55	55	1.13	1.24					
15	115+11100	1 AM Peak	US-60	N	1.43	130	149	156	206	50	50	50	1.20	1.38	1.38	1.60	34%	1.18	1.34
	115+11100	2 Mid Day	US-60	N	1.43	137	151	171	214	50	50	50	1.24	1.42					
	115+11100	3 PM Peak	US-60	N	1.43	142	156	169	214	50	50	50	1.19	1.37					
	115+11100	4 Weekend	US-60	N	1.43	115	134	159	214	50	50	50	1.38	1.60					
	115-05667	1 AM Peak	US-60	W	2.42	164	164	174	193	50	50	50	1.06	1.18	1.08	1.20	57%		
	115-05667	2 Mid Day	US-60	W	2.42	162	164	174	194	50	50	50	1.07	1.18					
	115-05667	3 PM Peak	US-60	W	2.42	161	164	173	197	50	50	50	1.07	1.20					
	115-05667	4 Weekend	US-60	W	2.42	161	165	174	193	50	50	50	1.08	1.17					
	115N05668	1 AM Peak	US-60	W	0.41	31	31	34	38	50	50	50	1.09	1.21	1.09	1.23	10%		
	115N05668	2 Mid Day	US-60	W	0.41	31	31	33	37	50	50	50	1.07	1.20					
	115N05668	3 PM Peak	US-60	W	0.41	30	31	32	38	50	50	50	1.06	1.23					
	115N05668	4 Weekend	US-60	W	0.41	31	32	33	36	50	50	50	1.08	1.15					
16	115-05666	1 AM Peak	US-60	W	1.82	97	98	102	109	50	50	50	1.04	1.12	1.05	1.14	100%	1.05	1.14
	115-05666	2 Mid Day	US-60	W	1.82	98	99	102	111	50	50	50	1.04	1.12					
	115-05666	3 PM Peak	US-60	W	1.82	97	98	101	111	50	50	50	1.04	1.14					
	115-05666	4 Weekend	US-60	W	1.82	98	101	102	111	50	50	50	1.05	1.10					
17	115-05662	1 AM Peak	US-60	W	1.39	74	75	77	89	65	65	65	1.04	1.20	1.06	1.20	13%	1.05	1.15
	115-05662	2 Mid Day	US-60	W	1.39	74	76	77	86	65	65	65	1.04	1.14					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-05662	3 PM Peak	US-60	W	1.39	74	76	77	89	65	65	65	1.05	1.18					
	115-05662	4 Weekend	US-60	W	1.39	74	77	78	86	65	65	65	1.06	1.12					
	115N05663	1 AM Peak	US-60	W	0.09	5	5	5	6	65	65	65	1.05	1.17	1.05	1.17	1%		
	115N05663	2 Mid Day	US-60	W	0.09	5	5	5	5	65	65	65	1.04	1.14					
	115N05663	3 PM Peak	US-60	W	0.09	5	5	5	5	65	65	65	1.05	1.16					
	115N05663	4 Weekend	US-60	W	0.09	5	5	5	5	65	65	65	1.05	1.12					
	115-05663	1 AM Peak	US-60	W	1.59	84	85	88	95	65	65	65	1.05	1.13	1.05	1.14	15%		
	115-05663	2 Mid Day	US-60	W	1.59	85	85	88	95	65	65	65	1.04	1.12					
	115-05663	3 PM Peak	US-60	W	1.59	84	85	87	97	65	65	65	1.04	1.14					
	115-05663	4 Weekend	US-60	W	1.59	84	87	88	97	65	65	65	1.05	1.11					
	115-05664	1 AM Peak	US-60	W	5.62	302	304	316	349	65	65	65	1.05	1.15	1.05	1.15	52%		
	115-05664	2 Mid Day	US-60	W	5.62	303	307	316	351	65	65	65	1.04	1.14					
	115-05664	3 PM Peak	US-60	W	5.62	298	304	312	349	65	65	65	1.04	1.15					
	115-05664	4 Weekend	US-60	W	5.62	300	312	316	349	65	65	65	1.05	1.12					
	115-05665	1 AM Peak	US-60	W	0.96	51	52	54	59	65	65	65	1.05	1.15	1.06	1.19	9%		
	115-05665	2 Mid Day	US-60	W	0.96	52	52	54	60	65	65	65	1.04	1.16					
	115-05665	3 PM Peak	US-60	W	0.96	51	52	53	61	65	65	65	1.05	1.19					
	115-05665	4 Weekend	US-60	W	0.96	51	53	55	60	65	65	65	1.06	1.14					
	115N05662	1 AM Peak	US-60	W	1.13	60	61	63	68	65	65	65	1.05	1.12	1.05	1.12	11%		
	115N05662	2 Mid Day	US-60	W	1.13	60	62	63	68	65	65	65	1.04	1.10					
	115N05662	3 PM Peak	US-60	W	1.13	60	62	63	69	65	65	65	1.05	1.12					
	115N05662	4 Weekend	US-60	W	1.13	60	63	63	68	65	65	65	1.05	1.08					
18	115-05661	1 AM Peak		W	3.44	186	185	197	203	65	65	65	1.06	1.10	1.06	1.10	45%	1.12	1.32
	115-05661	2 Mid Day		W	3.44	185	188	192	207	65	65	65	1.04	1.10					
	115-05661	3 PM Peak		W	3.44	182	188	188	207	65	65	65	1.04	1.10					
	115-05661	4 Weekend		W	3.44	182	191	194	207	65	65	65	1.06	1.08					
	115-05660	1 AM Peak		W	4.14	235	233	249	293	65	65	65	1.06	1.25	1.17	1.50	55%		
	115-05660	2 Mid Day		W	4.14	236	238	249	317	65	65	65	1.06	1.33					
	115-05660	3 PM Peak		W	4.14	232	237	245	304	65	65	65	1.05	1.29					
	115-05660	4 Weekend		W	4.14	235	242	276	364	65	65	65	1.17	1.50					
19	115N05660	1 AM Peak	US-60	N	0.07	5	5	6	9	55	55	55	1.18	1.86	1.33	2.43	1%	1.20	1.74
	115N05660	2 Mid Day	US-60	N	0.07	5	5	6	11	55	55	55	1.21	2.08					
	115N05660	3 PM Peak	US-60	N	0.07	5	5	6	10	55	55	55	1.19	1.96					
	115N05660	4 Weekend	US-60	N	0.07	5	5	7	12	55	55	55	1.33	2.43					
	115-05659	1 AM Peak		N	1.42	104	102	119	150	55	55	55	1.14	1.47	1.21	1.96	24%		
	115-05659	2 Mid Day		N	1.42	112	111	129	172	55	55	55	1.15	1.55					
	115-05659	3 PM Peak		N	1.42	103	108	119	169	55	55	55	1.16	1.56					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-05659	4 Weekend		N	1.42	100	109	122	213	55	55	55	1.21	1.96					
	115N04264	1 AM Peak	US-60	W	1.09	61	61	64	71	55	55	55	1.06	1.16	1.08	1.21	18%		
	115N04264	2 Mid Day	US-60	W	1.09	62	63	66	74	55	55	55	1.05	1.17					
	115N04264	3 PM Peak	US-60	W	1.09	61	63	65	75	55	55	55	1.07	1.19					
	115N04264	4 Weekend	US-60	W	1.09	59	63	64	76	55	55	55	1.08	1.21					
	115N05658	1 AM Peak	US-60	N	0.15	12	11	14	25	55	55	55	1.24	2.22	1.36	2.42	3%		
	115N05658	2 Mid Day	US-60	N	0.15	13	13	17	32	55	55	55	1.26	2.41					
	115N05658	3 PM Peak	US-60	N	0.15	12	12	15	29	55	55	55	1.28	2.42					
	115N05658	4 Weekend	US-60	N	0.15	12	12	16	27	55	55	55	1.36	2.35					
	115-05657	1 AM Peak	US-60	N	1.36	93	93	100	129	55	55	55	1.08	1.39	1.14	1.53	23%		
	115-05657	2 Mid Day	US-60	N	1.36	99	100	108	144	55	55	55	1.09	1.44					
	115-05657	3 PM Peak	US-60	N	1.36	94	97	104	144	55	55	55	1.10	1.49					
	115-05657	4 Weekend	US-60	N	1.36	92	96	105	148	55	55	55	1.14	1.53					
	115-05658	1 AM Peak		W	1.54	141	146	167	244	55	55	55	1.19	1.67	1.31	1.98	26%		
	115-05658	2 Mid Day		W	1.54	165	174	197	308	55	55	55	1.19	1.77					
	115-05658	3 PM Peak		W	1.54	142	150	172	264	55	55	55	1.21	1.76					
	115-05658	4 Weekend		W	1.54	142	152	187	302	55	55	55	1.31	1.98					
	115-04264	1 AM Peak	US-60	W	0.37	23	23	26	39	55	55	55	1.12	1.68	1.17	1.90	6%		
	115-04264	2 Mid Day	US-60	W	0.37	25	24	28	41	55	55	55	1.13	1.70					
	115-04264	3 PM Peak	US-60	W	0.37	24	24	27	41	55	55	55	1.13	1.73					
	115-04264	4 Weekend	US-60	W	0.37	24	24	28	46	55	55	55	1.17	1.90					
20	115-04263	1 AM Peak	US-60	W	0.20	11	11	11	12	65	65	65	1.04	1.11	1.06	1.12	5%	1.06	1.25
	115-04263	2 Mid Day	US-60	W	0.20	11	11	11	12	65	65	65	1.04	1.10					
	115-04263	3 PM Peak	US-60	W	0.20	11	11	11	12	65	65	65	1.05	1.12					
	115-04263	4 Weekend	US-60	W	0.20	10	11	11	12	65	65	65	1.06	1.12					
	115N04263	1 AM Peak	US-60	W	0.77	41	42	42	46	65	65	65	1.04	1.12	1.06	1.12	18%		
	115N04263	2 Mid Day	US-60	W	0.77	41	42	43	46	65	65	65	1.04	1.10					
	115N04263	3 PM Peak	US-60	W	0.77	41	43	43	47	65	65	65	1.04	1.11					
	115N04263	4 Weekend	US-60	W	0.77	40	43	42	46	65	65	65	1.06	1.08					
	115-04262	1 AM Peak	US-60	W	0.26	13	14	14	15	65	65	65	1.04	1.12	1.06	1.12	6%		
	115-04262	2 Mid Day	US-60	W	0.26	14	14	14	15	65	65	65	1.04	1.10					
	115-04262	3 PM Peak	US-60	W	0.26	13	14	14	15	65	65	65	1.04	1.10					
	115-04262	4 Weekend	US-60	W	0.26	13	14	14	15	65	65	65	1.06	1.08					
	115N04262	1 AM Peak	US-60	W	0.76	40	41	41	46	65	65	65	1.04	1.12	1.06	1.12	18%		
	115N04262	2 Mid Day	US-60	W	0.76	40	41	41	46	65	65	65	1.03	1.10					
	115N04262	3 PM Peak	US-60	W	0.76	40	41	41	46	65	65	65	1.04	1.10					
	115N04262	4 Weekend	US-60	W	0.76	39	42	41	46	65	65	65	1.06	1.10					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-04261	1 AM Peak	US-60	W	0.24	12	13	13	14	65	65	65	1.04	1.12	1.06	1.13	6%		
	115-04261	2 Mid Day	US-60	W	0.24	13	13	13	14	65	65	65	1.03	1.10					
	115-04261	3 PM Peak	US-60	W	0.24	12	13	13	14	65	65	65	1.05	1.10					
	115-04261	4 Weekend	US-60	W	0.24	12	13	13	15	65	65	65	1.06	1.13					
	115N04261	1 AM Peak	US-60	W	0.78	41	43	43	54	65	65	65	1.04	1.27	1.06	1.30	19%		
	115N04261	2 Mid Day	US-60	W	0.78	41	43	43	48	65	65	65	1.03	1.12					
	115N04261	3 PM Peak	US-60	W	0.78	41	43	43	48	65	65	65	1.04	1.11					
	115N04261	4 Weekend	US-60	W	0.78	40	43	43	56	65	65	65	1.06	1.30					
	115-04260	1 AM Peak	US-60	W	1.21	65	67	68	99	65	65	65	1.04	1.48	1.05	1.48	29%		
	115-04260	2 Mid Day	US-60	W	1.21	64	67	66	76	65	65	65	1.03	1.14					
	115-04260	3 PM Peak	US-60	W	1.21	64	67	66	80	65	65	65	1.04	1.20					
	115-04260	4 Weekend	US-60	W	1.21	63	67	66	89	65	65	65	1.05	1.33					

LOTTR and TTTR – Southbound/Eastbound

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
1	115-06005	1 AM Peak	AZ-80	E	1.46	140	142	195	251	65	65	65	1.39	1.76	1.39	2.00	100%	1.39	2.00
	115-06005	2 Mid Day	AZ-80	E	1.46	142	142	193	264	65	65	65	1.35	1.85					
	115-06005	3 PM Peak	AZ-80	E	1.46	134	135	170	220	65	65	65	1.27	1.62					
	115-06005	4 Weekend	AZ-80	E	1.46	126	139	168	278	65	65	65	1.34	2.00					
13	115+05940	1 AM Peak	US-60	E	3.32	354	380	394	608	45	45	45	1.11	1.60	1.19	1.72	31%	1.15	1.49
	115+05940	2 Mid Day	US-60	E	3.32	373	389	421	656	45	45	45	1.13	1.69					
	115+05940	3 PM Peak	US-60	E	3.32	367	390	421	629	45	45	45	1.15	1.62					
	115+05940	4 Weekend	US-60	E	3.32	358	386	427	664	45	45	45	1.19	1.72					
	115+05941	1 AM Peak	US-60	E	5.10	530	556	581	745	45	45	45	1.09	1.34	1.13	1.38	48%		
	115+05941	2 Mid Day	US-60	E	5.10	566	592	619	773	45	45	45	1.09	1.31					
	115+05941	3 PM Peak	US-60	E	5.10	558	588	617	798	45	45	45	1.11	1.36					
	115+05941	4 Weekend	US-60	E	5.10	541	573	612	789	45	45	45	1.13	1.38					
	115P05941	1 AM Peak	US-60	E	0.06	5	7	7	9	45	45	45	1.33	1.30	1.44	1.53	1%		
	115P05941	2 Mid Day	US-60	E	0.06	5	7	7	10	45	45	45	1.32	1.53					
	115P05941	3 PM Peak	US-60	E	0.06	5	7	7	9	45	45	45	1.44	1.33					
	115P05941	4 Weekend	US-60	E	0.06	5	7	7	10	45	45	45	1.39	1.42					
	115N05841	1 AM Peak	US-70	E	0.09	6	6	7	7	45	45	45	1.08	1.20	1.09	1.20	1%		
	115N05841	2 Mid Day	US-70	E	0.09	6	6	7	7	45	45	45	1.08	1.20					
	115N05841	3 PM Peak	US-70	E	0.09	6	6	7	8	45	45	45	1.08	1.18					
	115N05841	4 Weekend	US-70	E	0.09	6	6	7	7	45	45	45	1.09	1.17					
	115N05840	1 AM Peak		E	0.04	4	4	5	7	45	45	45	1.20	1.83	1.31	2.14	0%		
	115N05840	2 Mid Day		E	0.04	4	4	5	9	45	45	45	1.30	2.14					
	115N05840	3 PM Peak		E	0.04	4	4	5	8	45	45	45	1.28	2.02					
	115N05840	4 Weekend		E	0.04	4	4	5	8	45	45	45	1.31	2.11					
	115-05841	1 AM Peak		E	1.92	148	151	164	202	45	45	45	1.11	1.34	1.12	1.41	18%		
	115-05841	2 Mid Day		E	1.92	152	152	169	210	45	45	45	1.11	1.38					
	115-05841	3 PM Peak		E	1.92	154	154	173	217	45	45	45	1.12	1.41					
	115-05841	4 Weekend		E	1.92	148	151	166	209	45	45	45	1.12	1.39					
	115N05841	1 AM Peak	US-70	E	0.09	6	6	7	7	45	45	45	1.08	1.20	1.09	1.20	1%		
	115N05841	2 Mid Day	US-70	E	0.09	6	6	7	7	45	45	45	1.08	1.20					
	115N05841	3 PM Peak	US-70	E	0.09	6	6	7	8	45	45	45	1.08	1.18					
	115N05841	4 Weekend	US-70	E	0.09	6	6	7	7	45	45	45	1.09	1.17					
14	115-05668	1 AM Peak	US-60	S	1.43	105	105	117	138	55	55	55	1.12	1.32	1.12	1.36	9%	1.17	1.46
	115-05668	2 Mid Day	US-60	S	1.43	103	105	112	143	55	55	55	1.09	1.36					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115-05668	3 PM Peak	US-60	S	1.43	100	103	109	135	55	55	55	1.09	1.32					
	115-05668	4 Weekend	US-60	S	1.43	101	105	111	135	55	55	55	1.10	1.29					
	115P11100	1 AM Peak	US-60	E	0.23	21	26	26	35	55	55	55	1.25	1.36	1.47	1.68	1%		
	115P11100	2 Mid Day	US-60	E	0.23	23	26	29	38	55	55	55	1.28	1.45					
	115P11100	3 PM Peak	US-60	E	0.23	24	28	29	38	55	55	55	1.22	1.36					
	115P11100	4 Weekend	US-60	E	0.23	19	22	28	36	55	55	55	1.47	1.68					
	115+05669	1 AM Peak	US-60	E	1.92	169	198	207	268	55	55	55	1.22	1.35	1.42	1.64	12%		
	115+05669	2 Mid Day	US-60	E	1.92	180	202	228	288	55	55	55	1.27	1.43					
	115+05669	3 PM Peak	US-60	E	1.92	190	213	231	293	55	55	55	1.22	1.37					
	115+05669	4 Weekend	US-60	E	1.92	154	173	220	283	55	55	55	1.42	1.64					
	115+05671	1 AM Peak	US-60	E	4.23	307	325	343	431	55	55	55	1.11	1.33	1.19	1.33	26%		
	115+05671	2 Mid Day	US-60	E	4.23	316	329	359	423	55	55	55	1.14	1.29					
	115+05671	3 PM Peak	US-60	E	4.23	319	338	358	423	55	55	55	1.12	1.25					
	115+05671	4 Weekend	US-60	E	4.23	299	317	354	421	55	55	55	1.19	1.33					
	115+05674	1 AM Peak	US-60	E	4.32	297	305	322	451	55	55	55	1.09	1.48	1.10	1.71	26%		
	115+05674	2 Mid Day	US-60	E	4.32	300	305	331	521	55	55	55	1.10	1.71					
	115+05674	3 PM Peak	US-60	E	4.32	298	305	322	380	55	55	55	1.08	1.24					
	115+05674	4 Weekend	US-60	E	4.32	294	305	321	374	55	55	55	1.09	1.23					
	115+05675	1 AM Peak	US-60	E	4.23	302	307	325	399	55	55	55	1.07	1.30	1.10	1.30	26%		
	115+05675	2 Mid Day	US-60	E	4.23	307	311	331	391	55	55	55	1.08	1.26					
	115+05675	3 PM Peak	US-60	E	4.23	305	310	330	391	55	55	55	1.08	1.26					
	115+05675	4 Weekend	US-60	E	4.23	299	305	329	394	55	55	55	1.10	1.29					
15	115P05668	1 AM Peak	US-60	E	0.41	33	34	36	44	50	50	50	1.10	1.28	1.14	1.29	100%	1.14	1.29
	115P05668	2 Mid Day	US-60	E	0.41	34	34	38	44	50	50	50	1.11	1.27					
	115P05668	3 PM Peak	US-60	E	0.41	34	34	37	42	50	50	50	1.11	1.23					
	115P05668	4 Weekend	US-60	E	0.41	32	34	37	44	50	50	50	1.14	1.29					
16	115+05668	1 AM Peak	US-60	E	2.43	174	175	189	236	50	50	50	1.09	1.35	1.12	1.42	100%	1.12	1.42
	115+05668	2 Mid Day	US-60	E	2.43	175	178	192	240	50	50	50	1.10	1.35					
	115+05668	3 PM Peak	US-60	E	2.43	173	176	194	250	50	50	50	1.12	1.42					
	115+05668	4 Weekend	US-60	E	2.43	172	178	190	230	50	50	50	1.10	1.29					
17	115+05663	1 AM Peak	US-60	E	1.43	78	78	80	87	65	65	65	1.04	1.12	1.05	1.13	12%	1.09	1.20
	115+05663	2 Mid Day	US-60	E	1.43	78	79	81	88	65	65	65	1.04	1.11					
	115+05663	3 PM Peak	US-60	E	1.43	77	79	81	89	65	65	65	1.05	1.13					
	115+05663	4 Weekend	US-60	E	1.43	78	81	82	89	65	65	65	1.05	1.10					
	115+05664	1 AM Peak	US-60	E	1.69	92	92	95	103	65	65	65	1.03	1.12	1.06	1.14	15%		
	115+05664	2 Mid Day	US-60	E	1.69	92	93	96	103	65	65	65	1.04	1.11					
	115+05664	3 PM Peak	US-60	E	1.69	91	92	96	105	65	65	65	1.06	1.14					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
	115+05664	4 Weekend	US-60	E	1.69	92	95	96	105	65	65	65	1.05	1.10					
	115+05665	1 AM Peak	US-60	E	5.63	325	337	348	406	65	65	65	1.07	1.20	1.12	1.26	49%		
	115+05665	2 Mid Day	US-60	E	5.63	329	336	359	414	65	65	65	1.09	1.23					
	115+05665	3 PM Peak	US-60	E	5.63	331	344	363	415	65	65	65	1.10	1.21					
	115+05665	4 Weekend	US-60	E	5.63	317	335	356	422	65	65	65	1.12	1.26					
	115+05666	1 AM Peak	US-60	E	0.95	51	52	53	59	65	65	65	1.04	1.14	1.06	1.16	8%		
	115+05666	2 Mid Day	US-60	E	0.95	52	52	54	59	65	65	65	1.05	1.14					
	115+05666	3 PM Peak	US-60	E	0.95	51	52	54	60	65	65	65	1.05	1.16					
	115+05666	4 Weekend	US-60	E	0.95	52	53	55	62	65	65	65	1.06	1.16					
	115+05667	1 AM Peak	US-60	E	1.81	102	103	106	119	65	65	65	1.04	1.15	1.07	1.17	16%		
	115+05667	2 Mid Day	US-60	E	1.81	102	103	108	119	65	65	65	1.06	1.15					
	115+05667	3 PM Peak	US-60	E	1.81	102	103	109	121	65	65	65	1.07	1.17					
	115+05667	4 Weekend	US-60	E	1.81	101	105	109	121	65	65	65	1.07	1.16					
18	115P05662	1 AM Peak	US-60	E	1.10	59	60	61	66	65	65	65	1.03	1.10	1.05	1.10	24%	1.05	1.13
	115P05662	2 Mid Day	US-60	E	1.10	59	60	61	66	65	65	65	1.03	1.10					
	115P05662	3 PM Peak	US-60	E	1.10	59	60	61	66	65	65	65	1.04	1.10					
	115P05662	4 Weekend	US-60	E	1.10	59	61	62	67	65	65	65	1.05	1.10					
	115+05662	1 AM Peak	US-60	E	3.44	188	188	195	208	65	65	65	1.04	1.10	1.05	1.14	76%		
	115+05662	2 Mid Day	US-60	E	3.44	188	188	196	214	65	65	65	1.04	1.14					
	115+05662	3 PM Peak	US-60	E	3.44	187	189	195	210	65	65	65	1.05	1.11					
	115+05662	4 Weekend	US-60	E	3.44	188	191	197	214	65	65	65	1.05	1.12					
19	115+05660	1 AM Peak		S	1.49	94	94	100	116	55	55	55	1.06	1.24	1.13	1.33	17%	1.14	1.52
	115+05660	2 Mid Day		S	1.49	96	97	105	126	55	55	55	1.09	1.30					
	115+05660	3 PM Peak		S	1.49	92	94	100	124	55	55	55	1.09	1.33					
	115+05660	4 Weekend		S	1.49	92	96	105	127	55	55	55	1.13	1.33					
	115+05661	1 AM Peak		E	4.15	230	232	239	262	55	55	55	1.04	1.13	1.12	1.40	48%		
	115+05661	2 Mid Day		E	4.15	231	233	242	276	55	55	55	1.05	1.18					
	115+05661	3 PM Peak		E	4.15	229	232	239	269	55	55	55	1.04	1.16					
	115+05661	4 Weekend		E	4.15	233	237	260	332	55	55	55	1.12	1.40					
	115+05659	1 AM Peak	US-60	E	1.55	117	119	134	180	55	55	55	1.15	1.52	1.26	1.79	18%		
	115+05659	2 Mid Day	US-60	E	1.55	130	133	153	200	55	55	55	1.18	1.51					
	115+05659	3 PM Peak	US-60	E	1.55	117	119	139	186	55	55	55	1.19	1.56					
	115+05659	4 Weekend	US-60	E	1.55	115	118	145	212	55	55	55	1.26	1.79					
	115+05658	1 AM Peak	US-60	S	1.54	98	97	103	118	55	55	55	1.06	1.21	1.09	1.77	18%		
	115+05658	2 Mid Day	US-60	S	1.54	100	99	107	124	55	55	55	1.07	1.25					
	115+05658	3 PM Peak	US-60	S	1.54	98	99	105	123	55	55	55	1.08	1.24					
	115+05658	4 Weekend	US-60	S	1.54	96	97	105	172	55	55	55	1.09	1.77					

Segment	TMC	Time Period	Road No.	Road Dir	Miles	Cars 50th % Travel Time (secs)	Trucks 50th % Travel Time (secs)	Cars 80th % Travel Time (secs)	Trucks 95th % Travel Time (secs)	Posted Speed Limit	Assumed Car Free- Flow Speed	Assumed Truck Free- Flow Speed	LOTTR	TTTR	Peak LOTTR	Peak TTTR	TMC Weighting	Weighted LOTTR	Weighted TTTR
20	115+05657	1 AM Peak	US-60	E	0.57	33	33	34	37	65	65	65	1.03	1.13	1.06	1.19	13%	1.06	1.14
	115+05657	2 Mid Day	US-60	E	0.57	32	33	34	37	65	65	65	1.04	1.11					
	115+05657	3 PM Peak	US-60	E	0.57	32	33	34	37	65	65	65	1.05	1.13					
	115+05657	4 Weekend	US-60	E	0.57	32	33	34	39	65	65	65	1.06	1.19					
	115P04264	1 AM Peak	US-60	E	0.79	43	44	45	48	65	65	65	1.03	1.10	1.06	1.12	18%		
	115P04264	2 Mid Day	US-60	E	0.79	43	44	45	48	65	65	65	1.04	1.10					
	115P04264	3 PM Peak	US-60	E	0.79	42	44	44	48	65	65	65	1.05	1.10					
	115P04264	4 Weekend	US-60	E	0.79	42	45	45	50	65	65	65	1.06	1.12					
	115+04264	1 AM Peak	US-60	E	0.21	11	11	12	13	65	65	65	1.03	1.10	1.06	1.12	5%		
	115+04264	2 Mid Day	US-60	E	0.21	11	11	12	13	65	65	65	1.04	1.10					
	115+04264	3 PM Peak	US-60	E	0.21	11	11	11	13	65	65	65	1.05	1.10					
	115+04264	4 Weekend	US-60	E	0.21	11	12	12	13	65	65	65	1.06	1.12					
	115P04263	1 AM Peak	US-60	E	0.76	41	42	42	46	65	65	65	1.03	1.12	1.06	1.14	17%		
	115P04263	2 Mid Day	US-60	E	0.76	40	42	42	46	65	65	65	1.03	1.10					
	115P04263	3 PM Peak	US-60	E	0.76	39	42	42	46	65	65	65	1.05	1.11					
	115P04263	4 Weekend	US-60	E	0.76	39	42	42	48	65	65	65	1.06	1.14					
	115+04263	1 AM Peak	US-60	E	0.23	12	12	12	14	65	65	65	1.03	1.10	1.06	1.12	5%		
	115+04263	2 Mid Day	US-60	E	0.23	12	12	12	14	65	65	65	1.04	1.10					
	115+04263	3 PM Peak	US-60	E	0.23	12	12	12	14	65	65	65	1.05	1.12					
	115+04263	4 Weekend	US-60	E	0.23	12	13	12	14	65	65	65	1.06	1.12					
	115P04262	1 AM Peak	US-60	E	0.80	42	43	44	48	65	65	65	1.03	1.10	1.05	1.11	18%		
	115P04262	2 Mid Day	US-60	E	0.80	42	43	43	47	65	65	65	1.03	1.09					
	115P04262	3 PM Peak	US-60	E	0.80	42	44	44	49	65	65	65	1.05	1.11					
	115P04262	4 Weekend	US-60	E	0.80	41	44	43	49	65	65	65	1.05	1.10					
	115+04262	1 AM Peak	US-60	E	0.22	12	12	12	14	65	65	65	1.03	1.12	1.05	1.12	5%		
	115+04262	2 Mid Day	US-60	E	0.22	12	12	12	13	65	65	65	1.03	1.10					
	115+04262	3 PM Peak	US-60	E	0.22	12	12	12	14	65	65	65	1.05	1.12					
	115+04262	4 Weekend	US-60	E	0.22	12	12	12	14	65	65	65	1.05	1.12					
	115P04261	1 AM Peak	US-60	E	0.77	41	42	42	47	65	65	65	1.03	1.11	1.06	1.19	18%		
	115P04261	2 Mid Day	US-60	E	0.77	41	42	43	48	65	65	65	1.04	1.14					
	115P04261	3 PM Peak	US-60	E	0.77	42	43	44	52	65	65	65	1.06	1.19					
	115P04261	4 Weekend	US-60	E	0.77	40	43	42	48	65	65	65	1.06	1.12					

Closure Data

Segment	Length (miles)	# of closures	Total miles of closures		Average Occurrences/Mile/Year	
			NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)
191-1	24	7	5.0	2.0	0.04	0.02
191-2	43	9	7.0	2.1	0.03	0.01
191-3	17	2	2.0	0.0	0.02	0.00
191-4	12	9	5.0	4.0	0.08	0.07
191-5	5	10	5.0	5.0	0.20	0.20
70-6	9	3	1.0	2.0	0.02	0.04
70-7	30	8	6.0	2.0	0.04	0.01
70-8	2	1	1.0	0.0	0.10	0.00
70-9	5	2	1.0	1.0	0.04	0.04
70-10	19	12	7.0	5.0	0.07	0.05
70-11	4	0	0.0	0.0	0.00	0.00
70-12	15	3	13.0	0.0	0.17	0.00
70|60-13	12	29	13.0	21.0	0.22	0.35
60E-14	16	99	53.2	147.4	0.67	1.84
60E-15	2	7	0.0	9.0	0.00	0.90
60E-16	2	9	6.0	1.5	0.60	0.15
60E-17	11	12	2.0	12.8	0.04	0.23
60E-18	7	8	0.0	8.0	0.00	0.23
60E-19	6	12	3.0	9.0	0.10	0.30
60E-20	5	18	16.0	2.0	0.68	0.09

Segment	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)
191-1	5	2	0	0	5	2	0	0	0	0	0	0
191-2	7	2	0	0	5	1	1	1	0	0	0	0
191-3	2	0	0	0	2	0	0	0	0	0	0	0
191-4	5	4	1	1	2	2	2	1	0	0	0	0
191-5	5	5	3	1	1	4	0	0	0	0	0	0
70-6	1	2	0	0	1	2	0	0	0	0	0	0
70-7	6	2	1	0	4	2	1	0	0	0	0	0
70-8	1	0	0	0	1	0	0	0	0	0	0	0
70-9	1	1	0	0	1	1	0	0	0	0	0	0
70-10	7	5	1	0	6	5	0	0	0	0	0	0
70-11	0	0	0	0	0	0	0	0	0	0	0	0
70-12	3	0	0	0	3	0	0	0	0	0	0	0
70|60-13	13	16	2	4	8	9	0	1	0	0	1	1
60E-14	52	47	6	6	43	28	2	7	0	0	0	6
60E-15	0	7	0	1	0	1	0	1	0	0	0	4
60E-16	6	3	2	0	4	0	0	0	0	0	0	3
60E-17	2	10	1	2	1	7	0	0	0	0	0	0
60E-18	0	8	0	2	0	4	0	1	0	0	0	0
60E-19	3	9	1	2	1	5	0	0	0	0	0	0
60E-20	16	2	3	1	11	1	0	0	0	0	0	0

HPMS Data

SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/WB AADT	WEIGHTED AVERAGE SB/EB AADT	WEIGHTED AVERAGE AADT	NB/WB AADT	SB/EB AADT	2015 AADT	K Factor	D-Factor	T-Factor
191-1	0	24	988	1003	1991	1040	1053	2093	10	53	15
191-2	24	67	695	811	1506	628	906	1534	11	62	27
191-3	87	104	1303	1285	2587	1316	1301	2617	7	50	21
191-4	104	116	2279	2262	4541	2184	2159	4343	8	50	16
191-5	116	121	4207	4427	8634	3828	4075	7903	7	56	10
70-6	339	330	6215	5968	12182	5888	5665	11553	9	51	13
70-7	330	300	1636	1497	3132	1671	1446	3116	7	54	27
70-8	300	298	1461	1180	2641	1599	1150	2749	7	58	25
70-9	298	293	1461	1180	2641	1599	1150	2749	7	58	25
70-10	293	274	1461	1180	2641	1599	1150	2749	7	58	25
70-11	274	270	1509	1240	2749	1638	1213	2850	7	58	25
70-12	270	255	2419	2508	4926	2774	3016	5790	8	52	17
70/60E-13	255	243	5575	5554	11128	5623	5520	11143	8	52	11
60E-14	243	227	4552	5025	9577	4152	5976	10128	9	59	11
60E-15	227	225	4017	3906	7923	3763	3726	7489	7	51	18
60E-16	225	223	5292	5200	10492	5338	5355	10693	10	50	13
60E-17	223	212	5342	5247	10589	5537	5511	11048	10	50	13
60E-18	205	212	7213	7123	14336	6755	7248	14003	8	52	13
60E-19	199	205	10565	10301	20867	9049	9603	18653	8	53	11
60E-20	194.3	199	24463	25455	49918	23754	24754	48507	8	51	9

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
191-1	102213	0.00	3.90	3.90	1640	1570	1640	1570	3210	10	60	51	12
	102214	3.90	7.40	3.50	1544	1652	1544	1652	3196	10	67	52	9
	102215	7.40	18.33	10.93	873	962	873	962	1835	10	66	52	13
	102216	18.33	24.53	6.20	671	551	671	551	1222	10	64	55	21
191-2	102217	24.53	38.14	13.61	831	785	831	785	1616	9	63	51	33
	102218	38.14	42.95	4.81	843	881	843	881	1724	8	52	51	31
	102219	42.95	48.04	5.09	535	539	535	539	1074	11	50	50	18
	102220	48.04	55.67	7.63	986	997	986	997	1983	11	59	50	17
	102221	55.67	66.26	10.59	56	1183	56	1183	1239	13	59	95	29
191-3	102222	87.43	89.98	2.55	1133	1160	1133	1160	2293	9	57	51	20
	102223	89.98	104.36	14.38	1348	1326	1348	1326	2674	7	57	50	21
191-4	102224	104.36	113.68	9.32	1372	1340	1372	1340	2712	7	55	51	19
	102225	113.68	118.83	5.15	3653	3642	3653	3642	7295	9	54	50	11
191-5	102226	118.83	120.32	1.49	3111	3957	3111	3957	7068	7	63	56	10
	102228	120.32	121.02	0.70	5354	4327	5354	4327	9681	6	54	55	11
70-6	102032	330.32	330.75	0.43	2654	2579	2654	2579	5233	9	50	51	15
	102034	330.75	331.30	0.55	3319	3236	3319	3236	6555	8	51	51	22
	102036	331.30	331.80	0.50	4404	4413	4404	4413	8817	8	54	50	17
	102038	331.80	335.50	3.70	4656	4401	4656	4401	9057	8	56	51	14
	102040	335.50	335.98	0.48	5580	5359	5580	5359	10939	8	54	51	9
	102042	335.98	336.62	0.64	6247	6268	6247	6268	12515	8	56	50	9
	102044	336.62	337.94	1.32	8414	8131	8414	8131	16545	10	55	51	11
	102046	337.94	338.32	0.38	9620	9333	9620	9333	18953	10	52	51	16
	102048	338.32	338.97	0.65	9574	9216	9574	9216	18790	10	51	51	7
	102050	338.97	339.46	0.49	7473	7248	7473	7248	14721	9	50	51	8
	102052	339.46	339.75	0.29	6233	5628	6233	5628	11861	10	56	53	10
70-7	102029	301.52	313.45	11.93	1638	1654	1638	1654	3292	7	53	50	28
	102030	313.45	328.90	15.45	1761	1752	1761	1752	3513	6	52	50	27
	102031	328.90	330.32	1.42	2424	2389	2424	2389	4813	9	53	50	26
	102028	272.55	301.52	28.97	1599	1150	1599	1150	2749	7	63	58	25
70-8	102028	272.55	301.52	28.97	1599	1150	1599	1150	2749	7	63	58	25
70-9	102028	272.55	301.52	28.97	1599	1150	1599	1150	2749	7	63	58	25
70-10	102028	272.55	301.52	28.97	1599	1150	1599	1150	2749	7	63	58	25
70-11	102026	272.01	272.55	0.54	-	-	1911	1911	3822	22	56	50	14
	102027	271.27	272.01	0.74	2947	3154	2947	3154	6101	8	56	52	14
	102028	272.55	301.52	28.97	1599	1150	1599	1150	2749	7	63	58	25

70-12	102025	259.46	271.27	11.81	2774	3016	2774	3016	5790	8	55	52	17
70/60-13	101909	244.34	245.60	1.26	6647	6829	6647	6829	13476	6	54	51	6
	101911	245.60	247.05	1.45	9132	7336	9132	7336	16468	8	56	55	5
	101912	247.05	248.12	1.07	5580	7423	5580	7423	13003	8	59	57	13
	101914	248.12	249.46	1.34	14066	11692	14066	11692	25758	8	54	55	6
	101916	249.46	250.06	0.60	13448	12534	13448	12534	25982	8	54	52	6
	101918	250.06	250.46	0.40	7930	11322	7930	11322	19252	8	58	59	7
	101920	250.46	251.03	0.57	8475	8533	8475	8533	17008	6	53	50	8
	101922	251.03	252.14	1.11	7443	7446	7443	7446	14889	10	56	50	10
	101924	252.14	255.56	3.42	1639	1767	1639	1767	3406	7	52	52	14
	102019	252.14	252.79	0.65	6000	5355	6000	5355	11355	9	55	53	10
	102021	252.79	253.38	0.59	5200	5053	5200	5053	10253	9	55	51	9
	102023	253.38	254.10	0.72	3629	3442	3629	3442	7071	8	53	51	16
	102024	254.10	259.46	5.36	3415	3605	3415	3605	7020	8	51	51	15
60E-14	101908	242.70	244.34	1.64	4152	5976	4152	5976	10128	9	51	59	11
60E-15	101906	225.82	226.89	1.07	3774	2769	3774	2769	6543	6	60	58	42
	101907	226.89	242.70	15.81	3762	3791	3762	3791	7553	7	61	50	16
60E-16	101905	213.50	225.82	12.32	5338	5355	5338	5355	10693	10	63	50	13
60E-17	101904	212.23	213.50	1.27	7470	7027	7470	7027	14497	5	62	52	14
	101905	213.50	225.82	12.32	5338	5355	5338	5355	10693	10	63	50	13
60E-18	101903	208.25	212.23	3.98	7324	7443	7324	7443	14767	10	66	50	14
	101902	204.18	208.25	4.07	6198	7058	6198	7058	13256	6	56	53	13
60E-19	101902	204.18	208.25	4.07	6198	7058	6198	7058	13256	6	56	53	13
	101901	202.70	204.18	1.48	8960	7026	8960	7026	15986	9	72	56	10
	101900	202.05	202.70	0.65	7765	11436	7765	11436	19201	6	60	60	9
	101899	201.17	202.05	0.88	10953	11191	10953	11191	22144	8	52	51	9
	101898	199.05	201.17	2.12	14189	15068	14189	15068	29257	12	60	52	8
60E-20	101897	198.42	199.05	0.63	13600	12001	13600	12001	25601	8	60	53	8
	101896	197.41	198.42	1.01	14833	14514	14833	14514	29347	7	58	51	10
	101895	196.41	197.41	1.00	15432	16379	15432	16379	31811	7	62	51	10
	101894	195.41	196.41	1.00	22704	22509	22704	22509	45213	8	58	50	9
	101893	193.41	195.41	2.00	36143	39251	36143	39251	75394	8	53	52	8

Bicycle Accommodation Data

Segment	BMP	EMP	Divided or Non	NB/EB Right Shoulder Width	SB/WB Right Shoulder Width	NB/EB Left Shoulder Width	SB/WB Left Shoulder Width	NB/EB Effective Length of Shoulder	SB/WB Effective Length of Shoulder	% Bicycle Accommodation
1	191-1	0	24	Undivided	6.8	6.8	N/A	N/A	15.7	15.8
2	191-2	24	67	Undivided	2.3	2.4	N/A	N/A	43.0	43.0
3	191-3	87	104	Divided	10.3		4.0		16.5	0.0
4	191-4	104	116	Undivided	7.9	7.8	N/A	N/A	11.8	11.3
5	191-5	116	121	Undivided	3.0	2.3	N/A	N/A	1.6	1.1
6	70-6	330	339	Undivided	2.9	2.8	N/A	N/A	4.2	4.1
7	70-7	300	330	Undivided	6.7	6.7	N/A	N/A	43.5	0.0
8	70-8	298	300	Undivided	5.0	5.0	N/A	N/A	0.0	0.0
9	70-9	293	298	Undivided	5.8	5.9	N/A	N/A	1.2	1.4
10	70-10	274	293	Undivided	5.1	5.1	N/A	N/A	0.8	0.9
11	70-11	270	274	Undivided	4.5	4.7	N/A	N/A	0.0	0.3
12	70-12	255	270	Undivided	5.4	5.3	N/A	N/A	4.1	2.8
13	70/60E-13	243	255	Undivided	5.04	4.1	N/A	N/A	7.8	5.2
14	60E-14	227	243	Undivided	4.86	4.8	N/A	N/A	7.7	7.8
15	60E-15	225	227	Undivided	7.88	7.9	N/A	N/A	1.9	1.9
16	60E-16	223	225	Undivided	7.75	7.2	N/A	N/A	1.8	1.7
17	60E-17	212	223	Divided	10.12	10.0	4.8	6.0	11.0	10.2
18	60E-18	205	212	Divided	6.57	9.6	4.0	6.0	7.0	7.0
19	60E-19	199	205	Divided	6.00	9.0	4.0	8.7	0.7	4.3
20	60E-20	194.3	199	Divided	10.00	10.0	8.0	8.0	4.7	4.7

AZTDM Data

SEGMENT	Growth Rate	% Non-SOV
191-1	1.5%	15.0%
191-2	2.7%	16.6%
191-3	1.1%	8.8%
191-4	1.1%	8.3%
191-5	1.0%	21.2%
70-6	1.0%	17.8%
70-7	1.0%	15.8%
70-8	1.1%	12.8%
70-9	1.0%	11.2%
70-10	1.1%	7.7%
70-11	1.0%	11.3%
70-12	1.0%	12.5%
70/60E-13	1.2%	16.6%
60E-14	1.9%	14.0%
60E-15	3.9%	10.5%
60E-16	3.9%	7.7%
60E-17	3.9%	8.9%
60E-18	2.3%	12.0%
60E-19	-1.3%	17.8%
60E-20	0.9%	17.2%

<u>*HERS Capacity Calculation Data*</u>

Segment	Capacity Environment Type	Facility Type	Terrain	Lane Width	NB/EB Rt. Shoulder	SB/WB Rt. Shoulder	F_{lw} or f_w or f_{LS}	NB/EB F_{lc}	SB/WB F_{lc}	Total Ramp Density	PHF	E_T	f_{HV}	f_M	f_A	g/C	f_G	f_{NP}	Nm	f_p	NB/EB FFS	SB/WB FFS	NB/EB Peak-Hour Capacity	SB/WB Peak-Hour Capacity	Major Direction Peak-Hour Capacity	Daily Capacity
191-1	3	Rural	Level	12.00	6.78	6.81	1.0	N/A	N/A	N/A	0.9	2	0.873	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	821.14	15,641
191-2	4	Rural	Level	12.00	2.32	2.37	2.6	N/A	N/A	N/A	0.88	1.9	0.805	N/A	2	N/A	1	1.20	N/A	N/A	N/A	N/A	N/A	N/A	876.54	16,696
191-3	2	Rural	Level	12.00	10.29		0.0	0	0.4	N/A	0.88	1.5	0.905	0	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3330	3318	N/A	63,438
191-4	4	Rural	Level	12.00	7.93	7.81	0.0	N/A	N/A	N/A	0.88	1.5	0.925	N/A	3.25	N/A	1	2.75	N/A	N/A	N/A	N/A	N/A	N/A	1521.48	28,981
191-5	3	Urban	Level	12.00	2.97	2.29	1.0	N/A	N/A	N/A	0.9	2	0.910	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1711.67	32,603
70-6	3	Urban	Level	12.00	2.89	2.82	1.0	N/A	N/A	N/A	0.9	2	0.886	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1666.32	31,739
70-7	4	Rural	Level	12.00	6.68	6.67	0.0	N/A	N/A	N/A	0.88	1.9	0.807	N/A	2.25	N/A	1	0.70	N/A	N/A	N/A	N/A	N/A	N/A	1008.78	19,215
70-8	4	Rural	Level	12.00	5.00	5.00	0.0	N/A	N/A	N/A	0.88	1.9	0.814	N/A	1.75	N/A	1	1.10	N/A	N/A	N/A	N/A	N/A	N/A	1483.06	28,249
70-9	4	Rural	Level	12.00	5.82	5.92	0.0	N/A	N/A	N/A	0.88	1.9	0.814	N/A	3.5	N/A	1	1.70	N/A	N/A	N/A	N/A	N/A	N/A	682.71	13,004
70-10	4	Rural	Level	12.00	5.07	5.08	0.0	N/A	N/A	N/A	0.88	1.9	0.814	N/A	0.5	N/A	1	1.70	N/A	N/A	N/A	N/A	N/A	N/A	1051.75	20,033
70-11	4	Rural	Level	12.00	4.54	4.70	0.0	N/A	N/A	N/A	0.88	1.9	0.817	N/A	2.25	N/A	1	2.80	N/A	N/A	N/A	N/A	N/A	N/A	923.61	17,593
70-12	4	Rural	Level	12.00	5.43	5.33	0.0	N/A	N/A	N/A	0.88	1.5	0.921	N/A	1	N/A	1	2.20	N/A	N/A	N/A	N/A	N/A	N/A	1400.02	26,667
70/60E-13	3	Urban	Level	12.00	5.04	4.15	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	1691.51	32,219
60E-14	4	Rural	Mountainous	12.00	4.86	4.78	0.0	N/A	N/A	N/A	0.88	7.2	0.584	N/A	1	N/A	0.87	2.55	N/A	N/A	N/A	N/A	N/A	N/A	473.84	9,025
60E-15	2	Rural	Rolling	12.00	7.88	7.87	0.0	0	0	N/A	0.88	2.5	0.787	1.6	5.75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2427	2427	N/A	46,222
60E-16	2	Rural	Level	12.00	7.75	7.25	0.0	0	0	N/A	0.88	1.5	0.937	1.6	0.07	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3410	3410	N/A	64,943
60E-17	2	Rural	Level	12.00	10.12	10.00	0.0	0	0.4	N/A	0.88	1.5	0.937	0	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3629	3629	N/A	69,129
60E-18	2	Rural	Level	12.00	6.57	9.59	0.0	0	0.4	N/A	0.88	1.5	0.938	0	0.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1816	1816	N/A	34,584
60E-19	3	Urban	Level	12.00	6.00	9.05	1.0	N/A	N/A	N/A	0.9	2	0.904	N/A	N/A	0.55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	850.28	16,196
60E-20	1	Urban	Level	12.00	10.00	10.00	0.0	0	0	1.76	0.94	1.5	0.958	N/A	N/A	N/A	N/A	N/A	N/A	N/A	70.22	70.22	2161	2161	N/A	41,163

Safety Performance Area Data

Segment	Operating Environment	Segment Length (miles)	NB/WB Fatal Crashes 2015-2019	SB/EB Fatal Crashes 2015-2019	NB/WB Suspected Serious Injury Crashes	SB/EB Suspected Serious Injury Crashes	Fatal + Suspected Serious Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors
191-1	2 or 3 Lane Undivided Highway	24	0	1	1	1	3
191-2	2 or 3 Lane Undivided Highway	43	1	1	2	0	4
191-3	2 or 3 or 4 Lane Divided Highway	17	0	1	0	3	4
191-4	2 or 3 Lane Undivided Highway	12	1	0	2	2	5
191-5	4 or 5 Lane Undivided Highway	5	0	0	2	0	2
70-6	4 or 5 Lane Undivided Highway	9	1	0	8	3	12
70-7	2 or 3 Lane Undivided Highway	30	2	1	1	1	5
70-8	2 or 3 Lane Undivided Highway	2	1	0	0	0	1
70-9	2 or 3 Lane Undivided Highway	5	0	1	0	0	1
70-10	2 or 3 Lane Undivided Highway	19	1	3	1	2	7
70-11	2 or 3 Lane Undivided Highway	4	2	0	0	0	2
70-12	2 or 3 Lane Undivided Highway	15	4	3	0	2	9
60|70-13	2 or 3 Lane Undivided Highway	12	4	3	9	8	24
60-14	2 or 3 Lane Undivided Highway	16	2	3	10	11	26
60-15	2 or 3 Lane Undivided Highway	2	0	0	0	0	0
60-16	2 or 3 Lane Undivided Highway	2	0	0	1	1	2
60-17	2 or 3 or 4 Lane Divided Highway	11	3	1	3	2	9
60-18	2 or 3 or 4 Lane Divided Highway	7	1	0	3	2	6
60-19	2 or 3 or 4 Lane Divided Highway	6	2	0	2	6	10
60-20	Urban 4 Lane Freeway	5	3	1	0	2	6

Segment	Operating Environment	Fatal + Suspected Serious Injury Crashes at Intersections	Fatal + Suspected Serious Injury Crashes Involving Lane Departures	Fatal + Suspected Serious Injury Crashes Involving Pedestrians	Fatal + Suspected Serious Injury Crashes Involving Trucks	Fatal + Suspected Serious Injury Crashes Involving Bicycles	Weighted 5-Year (2015-2019) Average SB/WB AADT	Weighted 5-Year (2015-2019) Average Total AADT
191-1	2 or 3 Lane Undivided Highway	1	1	0	0	0	988	1003
191-2	2 or 3 Lane Undivided Highway	1	1	1	0	0	695	811
191-3	2 or 3 or 4 Lane Divided Highway	0	4	0	0	0	1303	1285
191-4	2 or 3 Lane Undivided Highway	2	3	0	0	0	2279	2262
191-5	4 or 5 Lane Undivided Highway	0	2	0	0	0	4207	4427
70-6	4 or 5 Lane Undivided Highway	5	3	1	0	1	6215	5968
70-7	2 or 3 Lane Undivided Highway	0	3	1	0	0	1636	1497
70-8	2 or 3 Lane Undivided Highway	0	0	0	0	0	1461	1180
70-9	2 or 3 Lane Undivided Highway	0	0	1	0	0	1461	1180
70-10	2 or 3 Lane Undivided Highway	0	5	0	0	1	1461	1180
70-11	2 or 3 Lane Undivided Highway	0	0	2	0	0	1509	1240
70-12	2 or 3 Lane Undivided Highway	0	2	3	0	0	2419	2508
60|70-13	2 or 3 Lane Undivided Highway	8	5	1	0	0	5575	5554
60-14	2 or 3 Lane Undivided Highway	1	21	0	1	1	4552	5025
60-15	2 or 3 Lane Undivided Highway	0	0	0	0	0	4017	3906
60-16	2 or 3 Lane Undivided Highway	1	0	0	1	0	5292	5200
60-17	2 or 3 or 4 Lane Divided Highway	1	7	1	1	0	5342	5247
60-18	2 or 3 or 4 Lane Divided Highway	1	1	0	0	0	7213	7123
60-19	2 or 3 or 4 Lane Divided Highway	4	6	0	0	0	10565	10301
60-20	Urban 4 Lane Freeway	0	3	0	0	0	24463	25455

HPMS Data

2011-2015 Weighted Average						2016			2017			2018			2019			2020		
SEGMENT	MP_FROM	MP_TO	WEIGHTED AVERAGE NB/WB AADT	WEIGHTED AVERAGE SB/EB AADT	WEIGHTED AVERAGE AADT	NB/WB AADT	SB/EB AADT	2016 AADT	NB/WB AADT	SB/EB AADT	2017 AADT	NB/WB AADT	SB/EB AADT	2018 AADT	NB/WB AADT	SB/EB AADT	2019 AADT	NB/WB AADT	SB/EB AADT	2020 AADT
191-1	0	24	988	1003	1991	1012	1012	2025	974	974	1947	949	994	1943	967	982	1949	1040	1053	2093
191-2	24	67	695	811	1506	692	693	1384	748	750	1498	785	769	1555	623	938	1561	628	906	1534
191-3	87	104	1303	1285	2587	1382	1382	2765	1159	1113	2271	1326	1312	2638	1330	1316	2646	1316	1301	2617
191-4	104	116	2279	2262	4541	2375	2375	4750	2362	2362	4723	2220	2187	4407	2254	2227	4481	2184	2159	4343
191-5	116	121	4207	4427	8634	4370	4422	8791	4704	4618	9323	3974	4598	8572	4157	4424	8581	3828	4075	7903
70-6	339	330	6215	5968	12182	6230	6095	12324	6025	5843	11868	6443	6108	12551	6487	6129	12616	5888	5665	11553
70-7	330	300	1636	1497	3132	1685	1664	3349	1369	1374	2743	1725	1498	3223	1729	1501	3230	1671	1446	3116
70-8	300	298	1461	1180	2641	1536	1485	3021	943	943	1885	1612	1160	2772	1617	1163	2780	1599	1150	2749
70-9	298	293	1461	1180	2641	1536	1485	3021	943	943	1885	1612	1160	2772	1617	1163	2780	1599	1150	2749
70-10	293	274	1461	1180	2641	1536	1485	3021	943	943	1885	1612	1160	2772	1617	1163	2780	1599	1150	2749
70-11	274	270	1509	1240	2749	1583	1527	3111	1019	1011	2030	1651	1223	2874	1656	1226	2882	1638	1213	2850
70-12	270	255	2419	2508	4926	2208	2208	4416	2338	2338	4676	2434	2434	4867	2339	2543	4882	2774	3016	5790
70/60E-13	255	243	5575	5554	11128	5827	5675	11502	5604	5445	11049	5397	5597	10994	5422	5532	10954	5623	5520	11143
60E-14	243	227	4552	5025	9577	4886	5692	10578	4470	4470	8940	4669	4486	9155	4581	4501	9082	4152	5976	10128
60E-15	227	225	4017	3906	7923	3652	3652	7304	4208	3913	8121	4170	4166	8337	4290	4072	8362	3763	3726	7489
60E-16	225	223	5292	5200	10492	4971	4771	9742	5160	4952	10112	5441	5377	10818	5551	5545	11096	5338	5355	10693
60E-17	223	212	5342	5247	10589	5032	4829	9861	5217	5010	10228	5411	5365	10776	5512	5519	11031	5537	5511	11048
60E-18	205	212	7213	7123	14336	6673	6683	13356	7088	7088	14176	7710	7236	14947	7837	7362	15199	6755	7248	14003
60E-19	199	205	10565	10301	20867	10477	10301	20778	10459	10277	20736	11334	10653	21987	11509	10673	22182	9049	9603	18653
60E-20	194.3	199	24463	25455	49918	23653	24561	48215	24199	25324	49524	25030	26120	51150	25679	26517	52195	23754	24754	48507

Freight Performance Area Data

			Total minutes of closures		Avg Mins/Mile/Year	
Segment	Length (miles)	# of closures	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)
191-1*	24.00	7	362.0	120.0	3.02	1.00
191-2*	43.00	9	574.0	383.0	2.67	1.78
191-3^	17.00	2	210.0	0.0	2.47	0.00
191-4^	12.00	9	734.0	300.0	12.23	5.00
191-5*	5.00	10	652.0	424.0	26.08	16.96
70-6*	9.00	3	60.0	210.0	1.33	4.67
70-7^	30.00	8	683.0	810.0	4.55	5.40
70-8^	2.00	1	143.0	0.0	14.30	0.00
70-9^	5.00	2	60.0	75.0	2.40	3.00
70-10^	19.00	12	820.0	238.0	8.63	2.51
70-11^	4.00	0	0.0	0.0	0.00	0.00
70-12^	15.00	3	1304.0	0.0	17.39	0.00
70/60E-13*	12.00	29	1365.0	1591.0	22.75	26.52
60E-14^	16.00	99	5088.0	27596.0	63.60	344.95
60E-15^	2.00	7	0.0	905.0	0.00	90.50
60E-16^	2.00	9	522.0	122.5	52.20	12.25
60E-17^	11.00	12	180.0	3377.2	3.27	61.40
60E-18^	7.00	8	0.0	780.0	0.00	22.29
60E-19*	6.00	12	420.0	609.0	14.00	20.30
60E-20^	4.70	18	1761.0	167.0	74.94	7.11

Segment	ITIS Category Description											
	Closures		Incidents/Accidents		Incidents/Crashes		Obstruction Hazards		Winds		Winter Storm Codes	
	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)	SB (or EB)	NB (or WB)
191-1*	5	2	0	0	5	2	0	0	0	0	0	0
191-2*	7	2	0	0	5	1	1	1	0	0	0	0
191-3^	2	0	0	0	2	0	0	0	0	0	0	0
191-4^	5	4	1	1	2	2	2	1	0	0	0	0
191-5*	5	5	3	1	1	4	0	0	0	0	0	0
70-6*	1	2	0	0	1	2	0	0	0	0	0	0
70-7^	6	2	1	0	4	2	1	0	0	0	0	0
70-8^	1	0	0	0	1	0	0	0	0	0	0	0
70-9^	1	1	0	0	1	1	0	0	0	0	0	0
70-10^	7	5	1	0	6	5	0	0	0	0	0	0
70-11^	0	0	0	0	0	0	0	0	0	0	0	0
70-12^	3	0	0	0	3	0	0	0	0	0	0	0
70/60E-13*	13	16	2	4	8	9	0	1	0	0	1	1
60E-14^	52	47	6	6	43	28	2	7	0	0	0	6
60E-15^	0	7	0	1	0	1	0	1	0	0	0	4
60E-16^	6	3	2	0	4	0	0	0	0	0	0	3
60E-17^	2	10	1	2	1	7	0	0	0	0	0	0
60E-18^	0	8	0	2	0	4	0	1	0	0	0	0
60E-19*	3	9	1	2	1	5	0	0	0	0	0	0
60E-20^	16	2	3	1	11	1	0	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

<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. 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.

<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 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)
3.0	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

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 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' from 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.

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 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 $\geq$ 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

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 incapacitating 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 2000) 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 incapacitating injury crashes). Identify likely contributing factors and compare that to the above statewide average comparison findings already calculated for fatal and incapacitating 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 incapacitating 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, “street view”, 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 $\geq$ 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

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)						
Measure	**None >=**	**> Low <**		**> Medium <**		**High <=**
Interrupted	1.58	1.72	1.72	1.98	1.98	1.58
Uninterrupted	1.22	1.28	1.28	1.42	1.42	1.22
Measure	**None <=**	**< Low >**		**< Medium >**		**High >=**
Directional TTTR						
Interrupted	1.58	1.72	1.72	1.98	1.98	1.58
Uninterrupted	1.22	1.28	1.28	1.42	1.42	1.22
Closure Duration						
All Facility Operations	71.07	97.97	97.97	151.75	151.75	71.07
Measure	**None >=**	**> Low <**		**> Medium <**		**High <=**
Bridge Clearance (feet)						
All Bridges	16.33	16.17	16.17	15.83	15.83	16.33

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

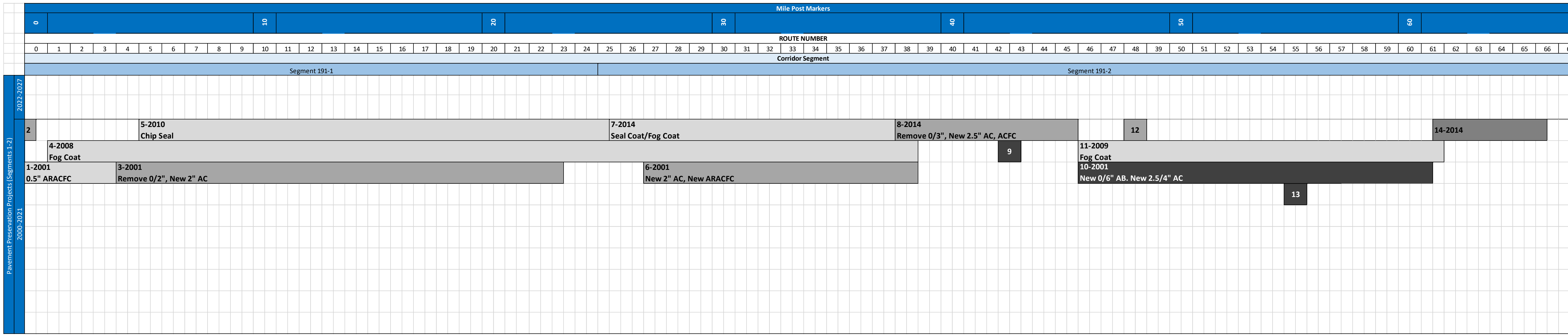
Pavement Performance Area - Need Analysis Step 1

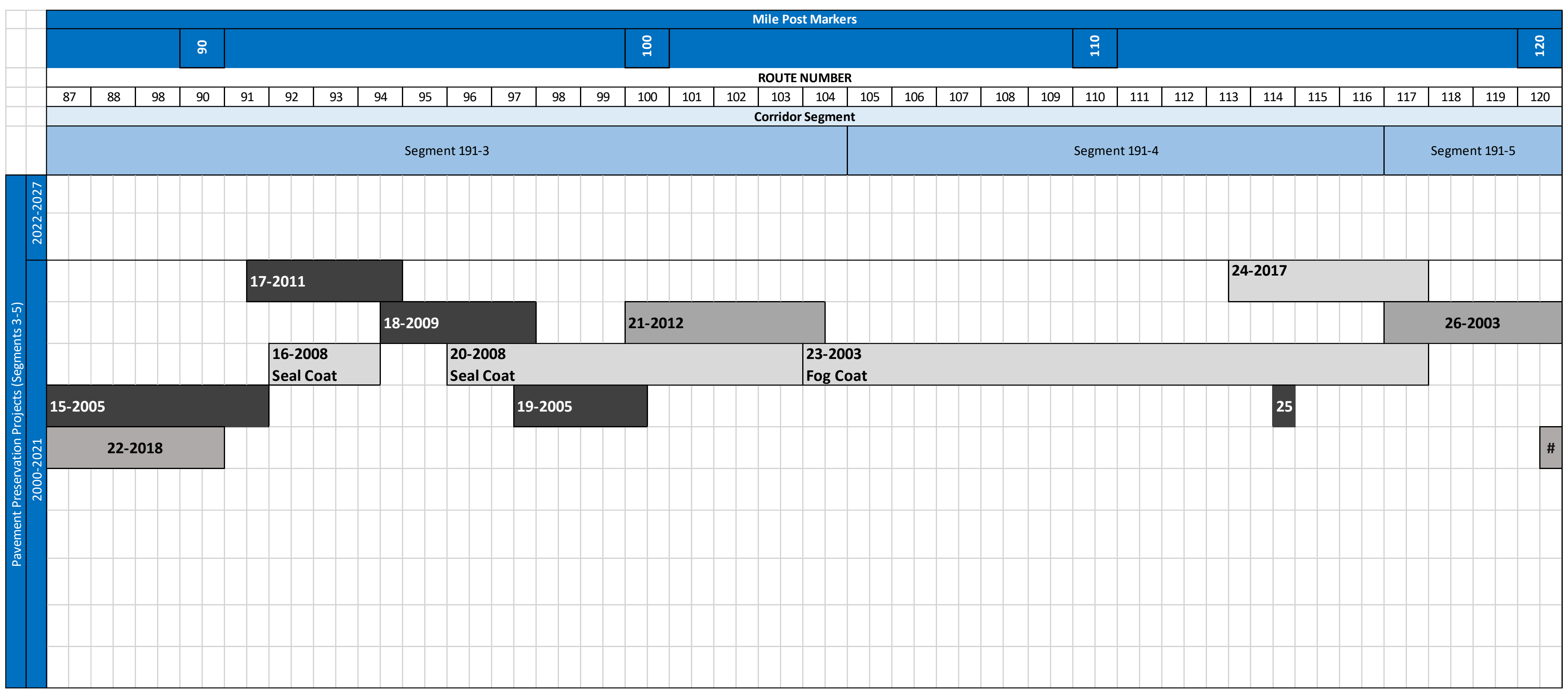
Segment #	Segment Length (miles)	Segment Mileposts (MP)	Facility Type	Pavement Index			Directional PSR					% Area Failure			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score		Performance Objective	Level of Need		Performance Score	Performance Objective	Level of Need	
							NB	SB		NB	SB				
191-1	24	MP0-MP24	Highway	3.17	Fair or Better	Low	3.10	3.24	Fair or Better	Low	Low	71.00%	Fair or Better	High	Medium
191-2	43	MP24-MP67	Highway	2.89	Fair or Better	Medium	3.44	3.38	Fair or Better	None	None	56.00%	Fair or Better	High	High
191-3	17	MP87-MP104	Highway	3.42	Fair or Better	None	3.36	3.69	Fair or Better	None	None	72.00%	Fair or Better	High	Low
191-4	12	MP104-MP116	Highway	3.44	Fair or Better	None	3.29	3.32	Fair or Better	Low	None	42.00%	Fair or Better	High	Low
191-5	5	MP116-MP121	Highway	3.10	Fair or Better	Low	3.16	3.07	Fair or Better	Low	Medium	80.00%	Fair or Better	High	Medium
70-6	9	MP339-MP330	Highway	3.23	Fair or Better	Low	3.15	3.25	Fair or Better	Low	Low	60.00%	Fair or Better	High	Medium
70-7	30	MP330-MP300	Highway	2.83	Fair or Better	Medium	2.87	3.08	Fair or Better	Medium	Medium	87.00%	Fair or Better	High	High
70-8	2	MP300-MP298	Highway	2.59	Fair or Better	Medium	3.35	3.67	Fair or Better	None	None	100.00%	Fair or Better	High	High
70-9	5	MP298-MP293	Highway	2.71	Fair or Better	Medium	3.44	3.36	Fair or Better	None	None	100.00%	Fair or Better	High	High
70-10	19	MP293-MP274	Highway	2.69	Fair or Better	Medium	3.10	3.35	Fair or Better	Low	None	79.00%	Fair or Better	High	High
70-11	4	MP274-MP270	Highway	2.40	Fair or Better	High	3.27	3.28	Fair or Better	Low	Low	88.00%	Fair or Better	High	High
70-12	15	MP270-MP255	Highway	3.57	Fair or Better	None	3.28	3.53	Fair or Better	Low	None	33.00%	Fair or Better	High	Low
70|60-13	12	MP255-MP243	Highway	3.28	Fair or Better	Low	3.13	3.28	Fair or Better	Low	Low	54.00%	Fair or Better	High	Medium
60E-14	16	MP243-MP227	Highway	3.68	Fair or Better	None	3.66	3.82	Fair or Better	None	None	44.00%	Fair or Better	High	Low
60E-15	2	MP227-MP225	Highway	4.03	Fair or Better	None	3.70	3.65	Fair or Better	None	None	0.00%	Fair or Better	None	None
60E-16	2	MP225-MP223	Highway	4.50	Fair or Better	None	4.22	4.15	Fair or Better	None	None	0.00%	Fair or Better	None	None
60E-17	11	MP223-MP212	Highway	3.51	Fair or Better	None	3.93	3.99	Fair or Better	None	None	76.00%	Fair or Better	High	Low
60E-18	7	MP212-MP205	Highway	3.30	Fair or Better	Low	3.62	3.83	Fair or Better	None	None	93.00%	Fair or Better	High	Medium
60E-19	6	MP205-MP199	Highway	3.57	Fair or Better	None	3.57	3.65	Fair or Better	None	None	33.00%	Fair or Better	High	Low
60E-20	5	MP199-MP194	Interstate	4.17	Fair or Better	None	3.87	3.83	Fair or Better	None	None	0.00%	Fair or Better	None	None
Emphasis Area?	No	Weighted Average		3.18	Fair or Better	Low									

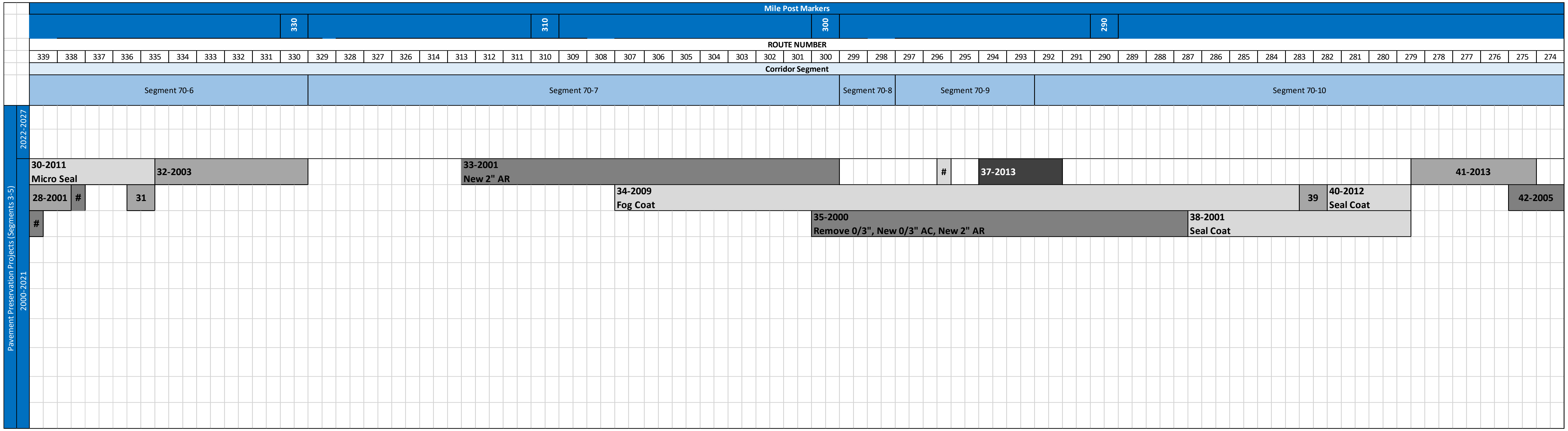
Pavement Performance Area - Need Analysis Step 2

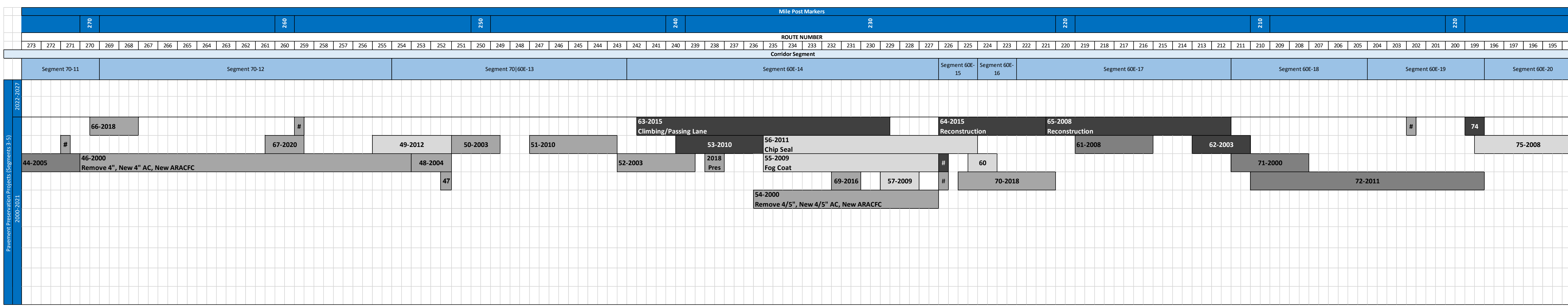
Segment #	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Need Adjustments		Final Need	Comments (may include programmed projects or issues from previous reports)
				Hot Spots	Previous Projects (which supersede condition data)		
191-1	24	MP0-MP24	Medium	MP 0-5 Both; MP 5-6 NB; MP 6-7 Both; MP 7-8 NB, MP 9-10 Both; MP 12-15 NB; MP15-20 Both; MP 20-22 NB; MP 22-23 SB; MP24-23 Both	None	Medium	
191-2	43	MP24-MP67	High	MP 24-27 Both; MP 27-28 SB; MP28-29 NB; MP 2932 Both; MP 32-33 SB; MP 33-35 Both; MP 35-36 SB; MP 42-43 SB MP 45-46 Both; MP 48-49 SB; MP 50-62 Both	None	High	
191-3	17	MP87-MP104	Low	MP 88-89 NB; Mp89-092 Both; MP94-95 NB; MP95-101 Both; MP101-104 NB	None	Low	
191-4	12	MP104-MP116	Low	MP 104-109 Both	None	Low	
191-5	5	MP116-MP121	Medium	MP117-121 Both	None	Medium	
70-6	9	MP339-MP330	Medium	MP 330-332 SB; MP332-333 Both; MP 333-335 SB; MP 335-336 NB; MP 336-337 Both; MP 338-339 SB; MP 339-340 Both	None	Medium	Pavement rehabilitation MP 335.8-342.1 FY 2021 F027901D
70-7	30	MP330-MP300	High	MP 300-314 Both; MP314-315 EB; MP 327-329 EB; MP 329-330 Both	None	High	
70-8	2	MP300-MP298	High	MP 298-300 Both	None	High	
70-9	5	MP298-MP293	High	MP 293-298 Both	None	High	
70-10	19	MP293-MP274	High	MP 274-275 Both; MP279-293 Both	None	High	
70-11	4	MP274-MP270	High	MP 270-271 EB; MP 271-274 Both	None	High	
70-12	15	MP270-MP255	Low	MP 255-256 EB; MP 256-257 Both; MP 257-258 WB; MP 258-260 Both; MP266-268 EB	None	Low	
70|60-13	12	MP255-MP243	Medium	MP 243-244 EB; MP 244-245 Both; MP 245-246 EB; MP 249-251 EB; MP 252-255 Both	None	Medium	
60E-14	16	MP243-MP227	Low	MP236-243 Both	None	Low	
60E-15	2	MP227-MP225	None	None	None	None	
60E-16	2	MP225-MP223	None	None	None	None	
60E-17	11	MP223-MP212	Low	MP 212-213 Both; MP 213-215 WB; MP215-219 Both; MP 219-220 EB; MP 220-221 Both; MP 221-222 EB	None	Low	
60E-18	7	MP212-MP205	Medium	MP 205-206 WB; MP 206-212 Both	None	Medium	
60E-19	6	MP205-MP199	Low	MP 199-201 WB; MP 201-202 EB; MP 204-205 WB	None	Low	
60E-20	5	MP199-MP194	None	None	None	None	

Pavement History






Mile Post Markers
330
310
300
290
ROUTE NUMBER
339 338 337 336 335 334 333 332 331 330 329 328 327 326 314 313 312 311 310 309 308 307 306 305 304 303 302 301 300 299 298 297 296 295 294 293 292 291 290 289 288 287 286 285 284 283 282 281 280 279 278 277 276 275 274
Corridor Segment
Segment 70-6
Segment 70-7
Segment 70-8
Segment 70-9
Segment 70-10
Pavement Preservation Projects (Segments 3-5)
2022-2027
2000-2021
30-2011
Micro Seal
32-2003
33-2001
New 2" AR
#
37-2013
41-2013
28-2001
#
31
34-2009
Fog Coat
39
40-2012
Seal Coat
42-2005
#
35-2000
Remove 0/3", New 0/3" AC, New 2" AR
38-2001
Seal Coat


Mile Post Markers
270
260
250
240
230
220
210
200
ROUTE NUMBER
273 272 271 270 269 268 267 266 265 264 263 262 261 260 259 258 257 256 255 254 253 252 251 250 249 248 247 246 245 244 243 242 241 240 239 238 237 236 235 234 233 232 231 230 229 228 227 226 225 224 223 222 221 220 219 218 217 216 215 214 213 212 211 210 209 208 207 206 205 204 203 202 201 200 199 196 197 196 195 194
Corridor Segment
Segment 70-11
Segment 70-12
Segment 70|60E-13
Segment 60E-14
Segment 60E-15
Segment 60E-16
Segment 60E-17
Segment 60E-18
Segment 60E-19
Segment 60E-20
Pavement Preservation Projects (Segments 3-5)
2022-2027
2000-2021
66-2018
#
63-2015
Climbing/Passing Lane
64-2015
Reconstruction
65-2008
Reconstruction
#
74
#
67-2020
49-2012
50-2003
51-2010
53-2010
56-2011
Chip Seal
61-2008
62-2003
75-2008
44-2005
46-2000
Remove 4", New 4" AC, New ARACFC
48-2004
52-2003
2018
Pres
55-2009
Fog Coat
#
60
71-2000
47
69-2016
57-2009
#
70-2018
72-2011
54-2000
Remove 4/5", New 4/5" AC, New ARACFC

Pavement Treatment Reference Numbers				
1. 2001 (NB/SB): 0.5" AR-ACFC	**19. 2005 (NB/SB):** 8" AB, 5" AC, 0.5" AR-ACFC	**37. 2013 (EB/WB)**: New 5" AB, New 5" AC, New ACFC	**55. 2009 (EB/WB):** Fog Coat	**73. 2018 (EB):** Remove 0.5", 0.5" FR
2. 2007 (NB/SB): Remove 0.5", 0.5" AR-ACFC	**20. 2008 (NB/SB):** Seal Coat	**38. 2001 (EB/WB)**: Seal Coat	**56. 2011 (EB/WB):** Chip Seal	**74. 2003 (EB/WB):** 5" AB, 5"AC, 0.5" FR
3. 2001 (NB/SB): Remove 2", 2" AC	**21. 2012 (NB/SB):** 2.5" AC, 0.5" AR-ACFC	**39. 2007 (EB/WB)**: Remove 2.5/31.5, New 0/5" AB, New 2.5/5" AC, New 0/18" BO, New ACFC	**57. 2009 (EB/WB):** Grind	**75. 2008 (EB/WB):** 1" FR
4. 2008 (NB/SB): Fog Coat	**22. 2018 (NB/SB):** Remove 2.5", 2.50" AC, 0.6" DC	**40. 2012 (EB/WB)**: Seal Coat	**58. 2000 (EB/WB):** Remove 2", New 2" AC, New ACFC	
5. 2010 (NB/SB): Chip Seal	**23. 2003 (NB/SB):** Fog Coat	**41. 2013 (EB/WB)**: Removed 3", New 3" AC, New ARACFC	**59. 2003 (EB/WB):** New 0/6" AB, New 0/6.5" AC, New 0/10" PC, New ARACFC	
6. 2001 (NB/SB): 2" AC, 0.5" AR-ACFC	**24. 2017 (NB/SB):** Remove 4", 3.50" AC, 0.5" FR	**42. 2005 (EB/WB)**: Remove 0/1.5", New 0/2.5" AR, New ARACFC	**60. 2001 (EB/WB):** Seal Coat	
7. 2014 (NB/SB): Seal Coat/Fog Coat	**25. 2020 (NB/SB):** Remove 18.50", 12.0" AB, 6.0" AC, 0.5" FR	**43. 2019 (EB/WB)**: Remove 3.5", New 3" AC, 0.5" FT	**61. 2008 (EB/WB):** Remove 0/2", New 5/9" AC, New ARACFC	
8. 2014 (NB/SB): Remove 3", 2.5" AC, 0.5" ACFC	**26. 2003 (NB/SB):** Remove 2", 2" AR, 0.5" AR-ACFC	**44. 2005 (EB/WB):** Remove 0/1.5", New 0/2.5" AR, New ARACFC	**62. 2003 (EB/WB):** New 6" AB, New 7" AC, New ARACFC	
9. 2006 (NB/SB): 8" AB, 4" AC, 0.3" SC	**27. 2017 (NB/SB)**: Remove 3', 3" AC, 0.5" FC	**45. 2013 (EB/WB):** Removed 0.5", New 0.5" ACFC	**63. 2014 (EB/WB):** Climbing/Passing Lane	
10. 2001 (NB/SB): 6" AB 4" AC	**28. 2001 (EB/WB)**: Remove 0.7", New 0.7" AC, New ARACFC	**46. 2000 (EB/WB):** Remove 0/4", New 2/4" AC, New ARACFC	**64. 2014 (EB/WB):** Reconstruction	
11. 2012 (NB/SB): Fog Coat	**29. 2009 (EB/WB)**: New 0/1" AC, New ARACFC	**47. 2004 (EB/WB):** Remove 3", New 3" AC, New ARACFC	**65. 2008 (EB/WB):** Reconstruction	
12. 2009 (NB/SB): Remove 0.5", 0.5" ACFC	**30. 2011 (EB/WB)**: Micro Seal	**48. 2004 (EB/WB):** Remove 3", New 3" AC, New ARACFC	**66. 2018 (EB/WB):** 0.5" FT	
13. 2005 (NB/SB): 8" AB, 4.5" AC, 0.3" SC	**31. 2009 (EB)**: Remove 2/3", New 2/3" AC	**49. 2012 (EB/WB):** Micro Seal	**67. 23020 (EB/WB):** Remove 2", New 4" AC, 0.5" FR	
14. 2014 (NB/SB): Remove 4", 7.5" AC, 0.5 DC", 0.5" ACFC	**32. 2003 (EB/WB)**: Remove 0/3", New 3" AC, New ARACFC	**50. 2003 (EB/WB):** Remove 2/3", New 2/3" AR	**68. 2017 (EB/WB):** Remove 0.5", 0.5" FT	
15. 2005 (NB/SB): New 8' AB, New 2.5/5" AC, New ACFC	**33. 2001 (EB/WB)**: New 2" AR	**51. 2010 (EB/WB):** Remove 3/6", New 3/6" AC	**69. 2016 (EB/WB):** Remove .75", 0.5" FR	
16. 2008 (NB/SB): Seal Coat	**34. 2009 (EB/WB)**: Fog Coat	**52. 2003 (EB/WB):** Remove 4", New 4" AC, New ARACFC	**70. 2018 (EB/WB):** 3" AC, 0.5" FR	
17. 2011 (NB/SB): 8" AB, Remove 0.5", AR-ACFC	**35. 2000 (EB/WB)**: Remove 0/3", New 0/3" AC, New 2" AR	**53. 2010 (EB/WB):** Remove 0/3.5", New 0/6" AB, New 3/6" AC, New ARACFC	**71. 2000 (EB/WB):** Remove 2", 4" AC, 0.5" FR	
18. 2009 (NB/SB): 4" AB, 5" AC, 0.5" AR-ACFC	**36. 2004 (EB/WB)**: Fogcoat	**54. 2000 (EB/WB):** Remove 4/5", New 4/5" AC, New ARACFC	**72. 2011 (EB/WB):** Remove 3.5", 3" AC, 0.5" FC	

Legend

New Paving or Reconstruction	PCCP Pavement Border
Mill and Overlay (Adding Structural Thickness)	AC Pavement Border
Mill and Replace (No Change Structural Thickness)	
Fog Coat or Thin Overlay Treatments	

Value	Level	1		2		3		4		5		6		7		8		9		10	
		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	Uni-Dir	Bi-Dir
1	L1		88%		2%		14%		100%		25%		45%		42%		100%		100%		50%
1			96%		33%		44%		29%		25%								10%		42%
1			13%		29%		5%														16%
1					34%																
3	L2		2%		19%		22%				100%		55%								5%
3			83%		2%		25%				12%		15%								24%
3					28%							10%									
3																					
3																					
3																					
4	L3				12%								5%		71%		100%		100%		29%
4													5%		5%						10%
4																					
4																					
6	L4				2%		21%		4%										40%		5%
6					2%		21%														
6					36%		28%														
6							16%														
6																					
6																					
Sub-Total		0.0	4.5	0.0	5.3	0.0	7.2	0.0	1.5	0.0	3.9	0.3	3.0	0.0	3.5	0.0	5.0	0.0	7.5	0.0	3.8
Total		**4.5**		**5.3**		**7.2**		**1.5**		**3.9**		**3.1**		**3.5**		**5.0**		**7.5**		**3.8**	

Value	Level	11		12		13		14		15		16		17		18		19		20	
		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	Uni-Dir	Bi-Dir
1	L1				7%		25%		56%		100%								8%		100%
1									56%		25%		50%								
1									13%												
1																					
3	L2		13%		100%		8%		60%		25%		25%						8%		
3			13%		13%		16%		9%												
3			25%		13%		4%		6%												
3					3%		21%		22%												
3							38%														
3							4%														
4	L3		75%												36%		85%		100%		
4															18%		57%				
4																					
4																					
6	L4								81%		100%		100%		100%		14%		16%		
6									28%		25%				18%						
6																					
6																					
6																					
6																					
Sub-Total		0.0	4.5	0.0	3.9	0.0	3.0	0.0	10.7	0.0	9.5	0.0	7.3	0.0	9.2	0.0	6.5	0.0	5.3	0.0	1.0
Total		**4.5**		**3.9**		**3.0**		**10.7**		**9.5**		**7.3**		**9.2**		**6.5**		**5.3**		**1.0**	

Pavement Historical Investment

Route	Segment	Pavement History Value (bid projects)	Pavement History (bid projects)	Resulting Historical Investment
191	1	4.5	Low	Low
191	2	5.3	Medium	Medium
191	3	7.2	High	High
191	4	1.5	Low	Low
191	5	3.9	Low	Low
70	6	3.1	Low	Low
70	7	3.5	Low	Low
70	8	5.0	Medium	Medium
70	9	7.5	High	High
70	10	3.8	Low	Low
70	11	4.5	Low	Low
70	12	3.9	Low	Low
70|60	13	3.0	Low	Low
60E	14	10.7	High	Low
60E	15	9.5	High	Low
60E	16	7.3	High	Low
60E	17	9.2	High	Low
60E	18	0	Low	Low
60E	19	0.5	Low	Low
60E	20	1	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
191-1	24	MP0-MP24	Medium	Low	Low	Low	
191-2	43	MP24-MP67	High	Medium	Medium	Medium	
191-3	17	MP87-MP104	Low	High	Low	High	
191-4	12	MP104-MP116	Low	Low	High	Medium	
191-5	5	MP116-MP121	Medium	Low	High	Medium	
70-6	9	MP339-MP330	Medium	Low	Low	Low	Pavement rehabilitation MP 335.8-342.1 FY 2021 F027901D
70-7	30	MP330-MP300	High	Low	Low	Low	
70-8	2	MP300-MP298	High	Medium	Low	Medium	
70-9	5	MP298-MP293	High	High	Low	High	
70-10	19	MP293-MP274	High	Low	High	Medium	
70-11	4	MP274-MP270	High	Low	Low	Low	
70-12	15	MP270-MP255	Low	Low	High	Medium	
70|60-13	12	MP255-MP243	Medium	Low	High	Medium	
60E-14	16	MP243-MP227	Low	Medium	Low	Medium	
60E-15	2	MP227-MP225	None	Medium	Low	Medium	
60E-16	2	MP225-MP223	None	Medium	Low	Medium	
60E-17	11	MP223-MP212	Low	Medium	Medium	Medium	
60E-18	7	MP212-MP205	Medium	Low		Low	
60E-19	6	MP205-MP199	Low	Low		Low	
60E-20	5	MP199-MP194	None	Low		Low	

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		
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Level of Need
191-1	24	MP0-MP24	1	6.00	Fair or Better	None	6.00	Fair or Better	None	87.80	Fair or Better	None
191-2	43	MP24-MP67	2	5.36	Fair or Better	Medium	5.00	Fair or Better	Low	69.23	Fair or Better	Low
191-3	17	MP87-MP104	2	5.51	Fair or Better	Low	5.00	Fair or Better	Low	93.81	Fair or Better	None
191-4	12	MP104-MP116	1	6.00	Fair or Better	None	6.00	Fair or Better	None	69.50	Fair or Better	Low
191-5	5	MP116-MP121	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A
70-6	9	MP339-MP330	1	6.00	Fair or Better	None	6.00	Fair or Better	None	68.10	Fair or Better	Low
70-7	30	MP330-MP300	8	5.74	Fair or Better	Low	5.00	Fair or Better	Low	70.25	Fair or Better	None
70-8	2	MP300-MP298	1	6.00	Fair or Better	None	6.00	Fair or Better	None	73.00	Fair or Better	None
70-9	5	MP298-MP293	0	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A	No Bridges	Fair or Better	N/A
70-10	19	MP293-MP274	1	7.00	Fair or Better	None	7.00	Fair or Better	None	80.00	Fair or Better	None
70-11	4	MP274-MP270	2	6.69	Fair or Better	None	5.00	Fair or Better	Low	82.02	Fair or Better	None
70-12	15	MP270-MP255	1	6.00	Fair or Better	None	6.00	Fair or Better	None	52.90	Fair or Better	Medium
70|60-13	12	MP255-MP243	11	5.16	Fair or Better	Medium	4.00	Fair or Better	Medium	78.01	Fair or Better	None
60E-14	16	MP243-MP227	6	5.52	Fair or Better	Low	3.00	Fair or Better	High	68.13	Fair or Better	Low
60E-15	2	MP227-MP225	3	6.32	Fair or Better	None	6.00	Fair or Better	None	84.08	Fair or Better	None
60E-16	2	MP225-MP223	2	5.00	Fair or Better	Medium	5.00	Fair or Better	Low	86.43	Fair or Better	None
60E-17	11	MP223-MP212	7	6.64	Fair or Better	None	5.00	Fair or Better	Low	95.57	Fair or Better	None
60E-18	7	MP212-MP205	8	5.89	Fair or Better	Low	5.00	Fair or Better	Low	90.24	Fair or Better	None
60E-19	6	MP205-MP199	6	5.93	Fair or Better	Low	5.00	Fair or Better	Low	91.43	Fair or Better	None
60E-20	5	MP199-MP194	4	6.00	Fair or Better	None	6.00	Fair or Better	None	93.95	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: Hot Spots (Rating of 4 or multiple 5's)	Need Adjustments: Previous Projects (which supersede condition data)	Final Need	Historical Review	Comments
191-1	24	MP0-MP24	1	None	None	None	None	None	
191-2	43	MP24-MP67	2	Medium	Cochise UPRR OP (#157) (MP 62.88)	None	Medium	None	
191-3	17	MP87-MP104	2	Low	None	None	Low	None	
191-4	12	MP104-MP116	1	Low	None	None	Low	None	
191-5	5	MP116-MP121	0	N/A	No Bridges within Segment	None	N/A	None	
70-6	9	MP339-MP330	1	Low	None	None	Low	None	
70-7	30	MP330-MP300	8	Low	Holyoak Wash Bridge (#514) (MP 302.53)	None	Low	None	
70-8	2	MP300-MP298	1	None	None	None	None	None	
70-9	5	MP298-MP293	0	N/A	No Bridges within Segment	None	N/A	None	
70-10	19	MP293-MP274	1	None	None	None	None	None	
70-11	4	MP274-MP270	2	Low	None	None	Low	None	
70-12	15	MP270-MP255	1	Low	None	None	Low	None	
70|60-13	12	MP255-MP243	11	Medium	Bloody Tanks Bridge (#173) (MP 243.71) Pinal Creek Bridge (#266) (MP249.64) Pinal Creek Bridge (#36) (MP249.80) Pinal Creek Bridge (#549) (MP 250.37) McMillen Wash Bridge (#1028) (MP251.75)	None	Medium	None	
60E-14	16	MP243-MP227	6	Medium	Queen Creek Bridge (#436) (MP 226.14) Waterfall Canyon Bridge (# 328) (MP229.50)	None	Medium	None	
60E-15	2	MP227-MP225	3	None	None	None	None	None	
60E-16	2	MP225-MP223	2	Medium	None	None	Medium	None	
60E-17	11	MP223-MP212	7	Low	None	None	Low	None	
60E-18	7	MP212-MP205	8	Low	Sand Tanks Wash Bridge EB (#435) (MP208.75) Bridge WB (# 857) (MP 207.98)	None	Low	None	
60E-19	6	MP205-MP199	6	Low	None	None	Low	None	
60E-20	5	MP199-MP194	4	None	None	None	None	None	

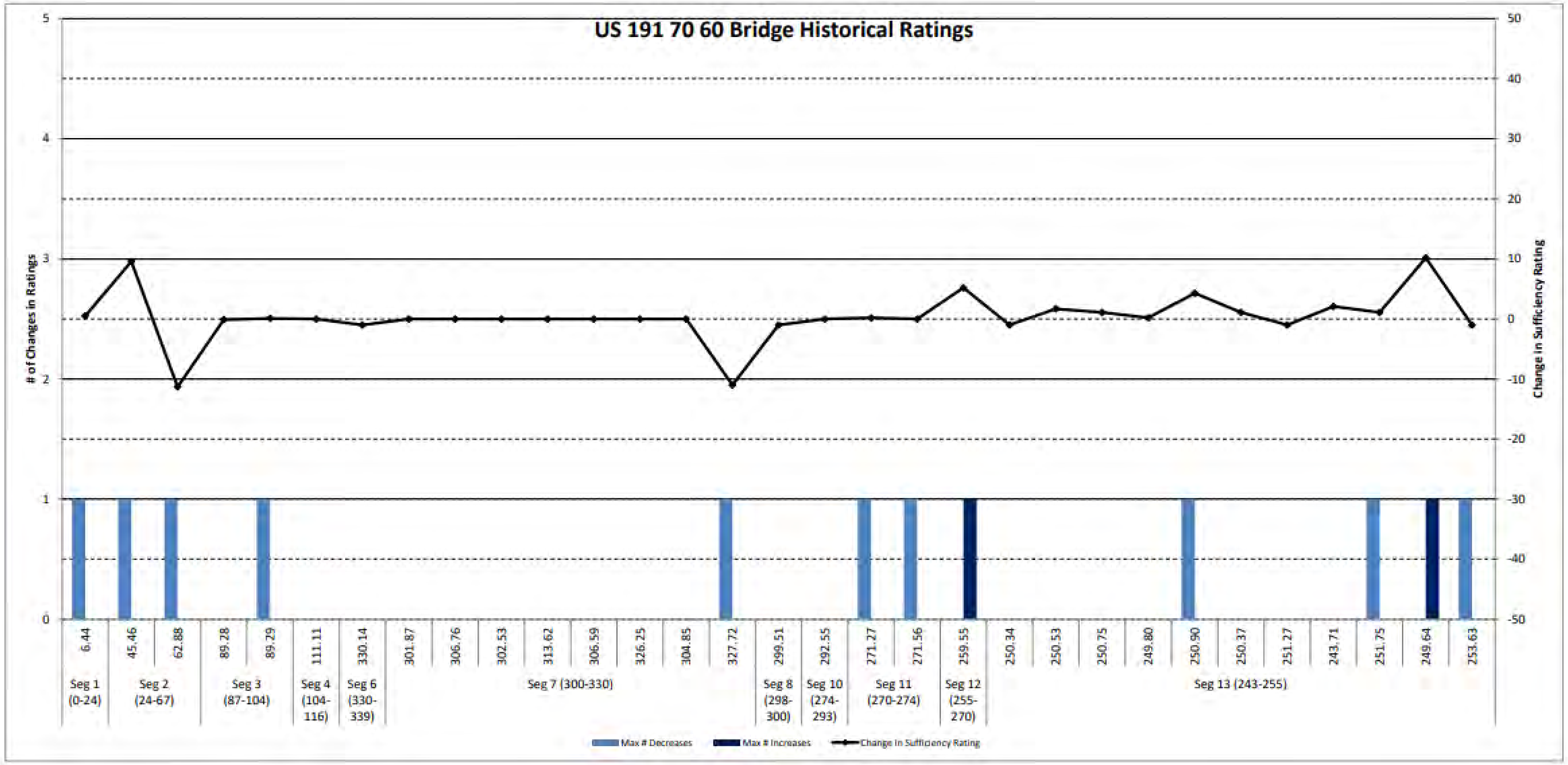
Bridge Performance Area – Need Analysis Step 3

Segment #	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Final Need	Contributing Factors		
					Bridge	Current Ratings	Historical Review
191-1	24	MP0-MP24	1	None	None	None	
191-2	43	MP24-MP67	2	Medium	Cochise UPRR OP (#157) (MP 62.88)	Deck and Superstructure of 5	Cochise UPRR OP (No. 157 MP 62.88) Deck=5
191-3	17	MP87-MP104	2	Low	None	None	Monk Draw Bridge SB (No. 292 MP 89.28) Eval=5
191-4	12	MP104-MP116	1	Low	None	None	
191-5	5	MP116-MP121	0	N/A	No Bridges within Segment	No Bridges within Segment	
70-6	9	MP339-MP330	1	Low	None	None	
70-7	30	MP330-MP300	8	Low	Holyoak Wash Bridge (#514) (MP 302.53) Boack Rock Wask Br (#545) (MP306.76) Hunzinger Wash Br (#561) (MP313.62) Patterson Wash Br (#1421) (MP 327.72)	Deck, Sub- and Superstructure of 5 Superstructure of 5 Superstructure of 5 Superstructure of 5	Hunzinger Wash Bridge (No. 561 MP 313.62) Super=5; Eval=5 Black Rock Wash Bridge (No. 515 MP 306.76)Super=5; Eval=5 Holyoak Wash Bridge (No. 514 MP 302.53) Deck, Sub, Super, Eval=5
70-8	2	MP300-MP298	1	None	None	None	
70-9	5	MP298-MP293	0	N/A	No Bridges within Segment	No Bridges within Segment	
70-10	19	MP293-MP274	1	None	None	None	

Bridge Performance Area – Need Analysis Step 3 (continued)

Segment #	Segment Length (Miles)	Segment Mileposts (MP)	Number of Bridges in Segment	Final Need	Contributing Factors		
					Bridge	Current Ratings	Historical Review
70-11	4	MP274-MP270	2	Low	None	None	Peridot RR OP (No. 477 MP 271.27) Deck=5
70-12	15	MP270-MP255	1	Low	None	None	
70|60-13	12	MP255-MP243	11	Medium	Bloody Tanks Bridge (#173) (MP 243.71) Pinal Creek Bridge (#266) (MP249.64) Pinal Creek Bridge (#36) (MP249.80) Pinal Creek Bridge (#549) (MP 250.37) McMillen Wash Bridge (#1028) (MP251.75)	Deck and Substructure of 5 Superstructure of 5 Deck and Substructure of 5 Deck and Substructure of 5 Deck, Sub- and Superstructure of 5	Bloody Tanks Bridge (No. 173 MP 243.71) Super, Eval =5 Globe Viaduct (No. 1787 MP 250.9) Deck=5 Pinal Creek Bridge (No. 266 MP249.64) Deck, Sub and Eval=5 Pinal Creek Bridge (No. 36 MP249.80) Deck, Sub and Eval =5 Pinal Creek Bridge (No. 549 MP 250.37) Deck, Sub, Super and Eval=5 McMillen Wash Bridge (No. 1028 MP251.75) Super and Eval =5
60E-14	16	MP243-MP227	6	Medium	Queen Creek Bridge (#436) (MP 226.14) Waterfall Canyon Bridge (# 328) (MP229.50)	Deck and Superstructure of 4, Substructure of 3 Substructure of 5	
60E-15	2	MP227-MP225	3	None	None	None	
60E-16	2	MP225-MP223	2	Medium	None	None	Wash Bridge (No.319 MP224.64) Eval=5 Silver King Wash Br (No. 318 MP223.7) Eval=5
60E-17	11	MP223-MP212	7	Low	None	None	Wash Bridge (No.288 MP224.87) Eval=5 Queen Creek Bridge WB(No. 296 MP222.45) Super and Eval=5
60E-18	7	MP212-MP205	8	Low	Sand Tanks Wash Bridge EB (#435) (MP208.75) Bridge WB (# 857) (MP 207.98)	Deck and Substructure of 5 Deck and Substructrure of 5	
60E-19	6	MP205-MP199	6	Low	None	None	
60E-20	5	MP199-MP194	4	None	None	None	

Bridge Ratings History



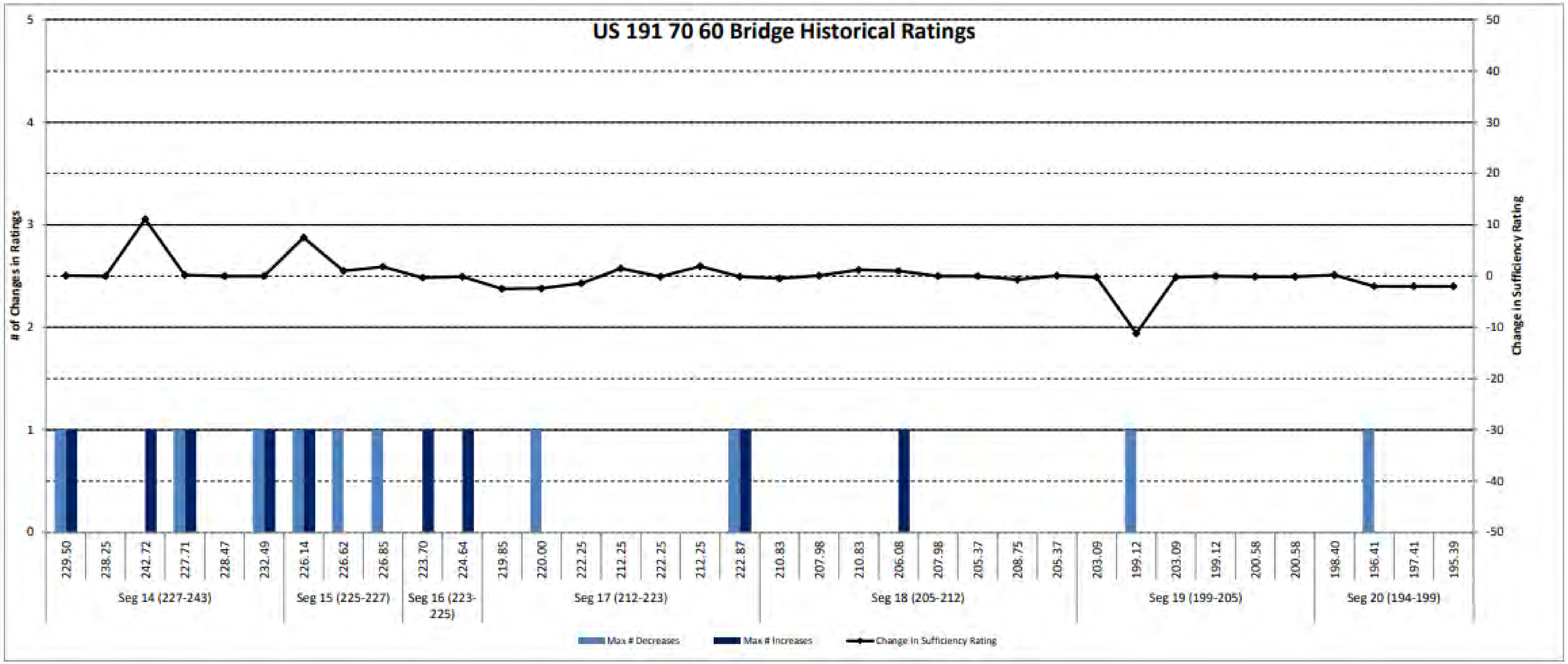
identifies the bridge indicated is of concern from a historical ratings perspective

Maximum # of Decreases: Maximum number of times that the Deck Rating, Substructure Rating, or Superstructure Rating decreased from 1997 to 2014. (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 from 1997 to 2014. (Higher number could indicate a higher level of investment)

Change in Sufficiency Rating: Cumulative change in Sufficiency Rating from 1997 to 2014. (Bigger negative number could indicate a more dramatic decline in the performance of the bridge)

Bridge Ratings History (continued)



◯ 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 from 1997 to 2014. (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 from 1997 to 2014. (Higher number could indicate a higher level of investment)

Change in Sufficiency Rating: Cumulative change in Sufficiency Rating from 1997 to 2014. (Bigger negative number could indicate a more dramatic decline in the performance of the bridge)

Mobility Performance Area - Needs 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	
											NB	SB		NB	SB	NB	SB		NB	SB
191-1	0 - 24	24	Rural	Interrupted	0.16	Fair or Better	None	0.18	Fair or Better	None	0.13	0.13	Fair or Better	None	None	0.04	0.02	Fair or Better	None	None
191-2	24 - 67	43	Rural	Interrupted	0.13	Fair or Better	None	0.17	Fair or Better	None	0.08	0.11	Fair or Better	None	None	0.03	0.01	Fair or Better	None	None
191-3	87 - 104	17	Rural	Uninterrupted	0.05	Fair or Better	None	0.05	Fair or Better	None	0.03	0.03	Fair or Better	None	None	0.02	0.00	Fair or Better	None	None
191-4	104 - 116	12	Rural	Uninterrupted	0.17	Fair or Better	None	0.19	Fair or Better	None	0.11	0.11	Fair or Better	None	None	0.08	0.07	Fair or Better	None	None
191-5	116 - 121	5	Urban	Interrupted	0.27	Fair or Better	None	0.30	Fair or Better	None	0.15	0.16	Fair or Better	None	None	0.20	0.20	Fair or Better	None	None
70-6	330 - 339	9	Urban	Interrupted	0.41	Fair or Better	None	0.45	Fair or Better	None	0.31	0.29	Fair or Better	None	None	0.02	0.04	Fair or Better	None	None
70-7	300 - 330	30	Rural	Uninterrupted	0.18	Fair or Better	None	0.20	Fair or Better	None	0.11	0.10	Fair or Better	None	None	0.04	0.01	Fair or Better	None	None
70-8	298 - 300	2	Rural	Uninterrupted	0.11	Fair or Better	None	0.12	Fair or Better	None	0.08	0.05	Fair or Better	None	None	0.10	0.00	Fair or Better	None	None
70-9	293 - 298	5	Rural	Uninterrupted	0.24	Fair or Better	None	0.26	Fair or Better	None	0.16	0.12	Fair or Better	None	None	0.04	0.04	Fair or Better	None	None
70-10	274 - 293	19	Rural	Uninterrupted	0.15	Fair or Better	None	0.17	Fair or Better	None	0.11	0.08	Fair or Better	None	None	0.07	0.05	Fair or Better	None	None
70-11	270 - 274	4	Rural	Uninterrupted	0.18	Fair or Better	None	0.20	Fair or Better	None	0.13	0.10	Fair or Better	None	None	0.00	0.00	Fair or Better	None	None
70-12	255 - 270	15	Rural	Uninterrupted	0.24	Fair or Better	None	0.27	Fair or Better	None	0.16	0.17	Fair or Better	None	None	0.17	0.00	Fair or Better	None	None
70/60E-13	243 - 255	12	Urban	Interrupted	0.40	Fair or Better	None	0.45	Fair or Better	None	0.26	0.25	Fair or Better	None	None	0.22	0.35	Fair or Better	None	None
60E-14	227 - 243	16	Rural	Uninterrupted	1.42	Fair or Better	High	1.71	Fair or Better	High	0.79	1.14	Fair or Better	Medium	High	0.67	1.84	Fair or Better	Medium	High
60E-15	225 - 227	2	Rural	Uninterrupted	0.27	Fair or Better	None	0.37	Fair or Better	None	0.11	0.11	Fair or Better	None	None	0.00	0.90	Fair or Better	None	High
60E-16	223 - 225	2	Rural	Uninterrupted	0.27	Fair or Better	None	0.38	Fair or Better	None	0.16	0.16	Fair or Better	None	None	0.60	0.15	Fair or Better	Medium	None
60E-17	212 - 223	11	Rural	Uninterrupted	0.26	Fair or Better	None	0.37	Fair or Better	None	0.15	0.14	Fair or Better	None	None	0.04	0.23	Fair or Better	None	None
60E-18	205 - 212	7	Rural	Uninterrupted	0.53	Fair or Better	None	0.66	Fair or Better	Low	0.30	0.32	Fair or Better	None	None	0.00	0.23	Fair or Better	None	None
60E-19	199 - 205	6	Urban	Interrupted	1.01	Fair or Better	High	0.86	Fair or Better	Medium	0.86	0.91	Fair or Better	Medium	Medium	0.10	0.30	Fair or Better	None	None
60E-20	194.3 - 199	4.7	Urban	Uninterrupted	1.31	Fair or Better	High	1.45	Fair or Better	High	0.84	0.88	Fair or Better	Medium	Medium	0.68	0.09	Fair or Better	Medium	None

Mobility Performance Area - Needs Analysis Step 1 (continued)

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	
					NB	SB		NB	SB				
191-1	0 - 24	24	Rural	Interrupted	1.40	1.39	Fair or Better	Medium	Medium	66%	Fair or Better	Medium	Low
191-2	24 - 67	43	Rural	Interrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	100%	Fair or Better	None	None
191-3	87 - 104	17	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	49%	Fair or Better	High	Low
191-4	104 - 116	12	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	97%	Fair or Better	None	None
191-5	116 - 121	5	Urban	Interrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	27%	Fair or Better	High	Low
70-6	330 - 339	9	Urban	Interrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	46%	Fair or Better	High	Low
70-7	300 - 330	30	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	73%	Fair or Better	Low	Low
70-8	298 - 300	2	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	0%	Fair or Better	High	Low
70-9	293 - 298	5	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	26%	Fair or Better	High	Low
70-10	274 - 293	19	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	4%	Fair or Better	High	Low
70-11	270 - 274	4	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	4%	Fair or Better	High	Low
70-12	255 - 270	15	Rural	Uninterrupted	*No Data*	*No Data*	Fair or Better	N/A	N/A	23%	Fair or Better	High	Low
70/60E-13	243 - 255	12	Urban	Interrupted	1.16	1.15	Fair or Better	None	None	54%	Fair or Better	Medium	Low
60E-14	227 - 243	16	Rural	Uninterrupted	1.12	1.17	Fair or Better	None	None	49%	Fair or Better	High	High
60E-15	225 - 227	2	Rural	Uninterrupted	1.18	1.14	Fair or Better	None	None	95%	Fair or Better	None	Low
60E-16	223 - 225	2	Rural	Uninterrupted	1.05	1.12	Fair or Better	None	None	87%	Fair or Better	None	Low
60E-17	212 - 223	11	Rural	Uninterrupted	1.05	1.09	Fair or Better	None	None	96%	Fair or Better	None	None
60E-18	205 - 212	7	Rural	Uninterrupted	1.12	1.05	Fair or Better	None	None	100%	Fair or Better	None	Low
60E-19	199 - 205	6	Urban	Interrupted	1.20	1.14	Fair or Better	None	None	42%	Fair or Better	High	High
60E-20	194.3 - 199	4.7	Urban	Uninterrupted	1.06	1.06	Fair or Better	None	None	100%	Fair or Better	None	High

Mobility Performance Area - Needs Analysis Step 2

Segment	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments Recent Projects Since 2020	Final Need	Planned and Programmed Future Projects
191-1	0 - 24	24	Low	None	Low	**Programmed:** None **Planned:** None
191-2	24 - 67	43	None	None	None	**Programmed:** None **Planned:** None
191-3	87 - 104	17	Low	None	Low	**Programmed:** None **Planned:** None
191-4	104 - 116	12	None	None	None	**Programmed:** None **Planned:** Restripe to 5 lanes between Atresia Road and Lebanon Road (to 2023) MP 110.9-116
191-5	116 - 121	5	Low	None	Low	**Programmed:** None **Planned:** Restripe to 5 lanes between 11th Street and US 70 (to 2023) MP 120-121
70-6	330 - 339	9	Low	None	Low	**Programmed:** None **Planned:** None
70-7	300 - 330	30	Low	None	Low	**Programmed:** None **Planned:** None
70-8	298 - 300	2	Low	None	Low	**Programmed:** None **Planned:** None
70-9	293 - 298	5	Low	None	Low	**Programmed:** None **Planned:** None
70-10	274 - 293	19	Low	None	Low	**Programmed:** None **Planned:** None
70-11	270 - 274	4	Low	None	Low	**Programmed:** None **Planned:** None
70-12	255 - 270	15	Low	None	Low	**Programmed:** None **Planned:** None

Mobility Performance Area - Needs Analysis Step 2 (continued)

Segment	Segment Mileposts (MP)	Segment Length (miles)	Initial Need	Need Adjustments	Final Need	Planned and Programmed Future Projects
				Recent Projects Since 2020		
70/60E-13	243 - 255	12	Low	FY19 MP 247 New DMS Sign Eastbound (Arizona Statewide DMS Plan) and Construct new sidewalks on northside from MP 243-252 (Cobre Valley Comprehensive Transportation Study)	Low	**Programmed:** Construct alternative alignment/Widen to 4 lanes (2030) MP243-252; Implement access management through Miami (2030) 243-245.5 **Planned:** None
60E-14	227 - 243	16	High	None	High	**Programmed:** Construct alternative alignment/Widen to 4 lanes (2030) MP227-243; Realign intersection (2030) MP 242 **Planned:** None
60E-15	225 - 227	2	Low	None	Low	**Programmed:** Construct alternative alignment/Widen to 4 lanes (2030) MP225-227 **Planned:** None
60E-16	223 - 225	2	Low	None	Low	**Programmed:** Construct alternative alignment/Widen to 4 lanes (2030) MP223-225 **Planned:** None
60E-17	212 - 223	11	None	Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek and Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit	None	**Programmed:** Construct alternative alignment/Widen to 4 lanes (2030) MP212-223 **Planned:** None
60E-18	205 - 212	7	Low		Low	**Programmed:** None **Planned:** None
60E-19	199 - 205	6	High		High	**Programmed:** None **Planned:** None
60E-20	194.3 - 199	4.7	High		High	**Programmed:** None **Planned:** None

Mobility Performance Area - Needs 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	
191-1	0 - 24	24	Low	State Highway	Rural	Level	2	55	No	Non-Divided	12%	A/B	A/B	15%	This segment includes one rest area
191-2	24 - 67	43	None	State Highway	Rural	Level	2	55	No	Non-Divided	26%	A/B	A/B	27%	This segment includes a Border patrol Check Point effecting NB traffic
191-3	87 - 104	17	Low	State Highway	Rural	Level	4	55	No	Divided	3%	A/B	A/B	21%	
191-4	104 - 116	12	None	State Highway	Rural	Level	4	65	No	Non-Divided	30%	A/B	A/B	16%	
191-5	116 - 121	5	Low	State Highway	Urban	Level	4	40	No	Non-Divided	13%	A-C	A-C	10%	
70-6	330 - 339	9	Low	State Highway	Urban	Level	4	40	No	Non-Divided	0%	A-C	A-C	13%	This segment includes one rest area
70-7	300 - 330	30	Low	State Highway	Rural	Level	2	55	No	Non-Divided	13%	A/B	A/B	27%	
70-8	298 - 300	2	Low	State Highway	Rural	Level	2	65	No	Non-Divided	6%	A/B	A/B	25%	
70-9	293 - 298	5	Low	State Highway	Rural	Level	2	50	No	Non-Divided	53%	A/B	A/B	25%	This segment includes one rest area
70-10	274 - 293	19	Low	State Highway	Rural	Level	2	55	No	Non-Divided	37%	A/B	A/B	25%	
70-11	270 - 274	4	Low	State Highway	Rural	Level	2	55	No	Non-Divided	77%	A/B	A/B	25%	
70-12	255 - 270	15	Low	State Highway	Rural	Level	2	60	No	Non-Divided	10%	A/B	A/B	17%	This segment includes a climbing/passing lane
70/60E-13	243 - 255	12	Low	State Highway	Urban	Level	4	45	No	Non-Divided	0%	A-C	A-C	11%	This segment includes one eastbound DMS.
60E-14	227 - 243	16	High	State Highway	Rural	Mountainous	2	50	No	Non-Divided	68%	D-F	D-F	11%	
60E-15	225 - 227	2	High	State Highway	Rural	Rolling	2	45	No	Non-Divided	98%	D-F	D-F	18%	This segment includes one rest area
60E-16	223 - 225	2	High	State Highway	Rural	Level	2	55	No	Non-Divided	55%	A/B	D-F	13%	
60E-17	212 - 223	11	None	State Highway	Rural	Level	4	65	No	Divided	0%	A/B	A/B	13%	
60E-18	205 - 212	7	Low	State Highway	Rural	Level	2	65	No	Divided	0%	A/B	C	13%	This segment includes one eastbound DMS.
60E-19	199 - 205	6	High	State Highway	Urban	Level	2	55	No	Divided	0%	E/F	D	11%	
60E-20	194.3 - 199	4.7	High	State Highway	Urban	Level	2	65	No	Divided	0%	A-C	A-C	9%	This segment includes one westboound DMS.

Safety Performance Area - Needs Analysis Step 1

Segment	Operating Environment	Offset	Segment Length (miles)	Segment Mileposts (MP)	Safety Index			Directional Safety Index				% of Fatal + Suspected Serious Injury Crashes at Intersections		
					Performance Score	Performance Objective	Level of Need	NB/EB Performance Score	SB/WB Performance Score	NB/EB Level of Need	SB/WB Level of Need	Performance Score	Performance Objective	Level of Need
191-1	2 or 3 Lane Undivided Highway	0	24	0 - 24	0.39	Average or Better	None	0.04	0.73	None	None	*Insufficient Data*	Average or Better	N/A
191-2	2 or 3 Lane Undivided Highway	0	43	24 - 67	0.49	Average or Better	None	0.54	0.44	None	None	*Insufficient Data*	Average or Better	N/A
191-3	2 or 3 or 4 Lane Divided Highway	1	17	87 - 104	0.59	Average or Better	None	0.00	1.18	None	Medium	*Insufficient Data*	Average or Better	N/A
191-4	2 or 3 Lane Undivided Highway	0	12	104 - 116	0.58	Average or Better	None	1.06	0.11	Medium	None	*Insufficient Data*	Average or Better	N/A
191-5	4 or 5 Lane Undivided Highway	2	5	116 - 121	0.06	Average or Better	None	0.12	0.00	None	None	*Insufficient Data*	Average or Better	N/A
70-6	4 or 5 Lane Undivided Highway	2	9	330 - 339	0.38	Average or Better	None	0.67	0.08	None	None	*Insufficient Data*	Average or Better	N/A
70-7	2 or 3 Lane Undivided Highway	0	30	300 - 300	0.68	Average or Better	None	0.89	0.48	None	None	*Insufficient Data*	Average or Better	N/A
70-8	2 or 3 Lane Undivided Highway	0	2	298 - 300	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
70-9	2 or 3 Lane Undivided Highway	0	5	293 - 298	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
70-10	2 or 3 Lane Undivided Highway	0	19	274 - 293	1.63	Average or Better	High	0.76	2.50	None	High	*Insufficient Data*	Average or Better	N/A
70-11	2 or 3 Lane Undivided Highway	0	4	270 - 274	3.37	Average or Better	High	6.74	0.00	High	None	*Insufficient Data*	Average or Better	N/A
70-12	2 or 3 Lane Undivided Highway	0	15	255 - 270	2.63	Average or Better	High	2.97	2.28	High	High	*Insufficient Data*	Average or Better	N/A
60|70-13	2 or 3 Lane Undivided Highway	0	12	243 - 255	2.97	Average or Better	High	3.36	2.57	High	High	*Insufficient Data*	Average or Better	N/A
60-14	2 or 3 Lane Undivided Highway	0	16	227 - 243	1.78	Average or Better	High	1.498123938	2.068352263	High	High	*Insufficient Data*	Average or Better	N/A
60-15	2 or 3 Lane Undivided Highway	0	2	225 - 227	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
60-16	2 or 3 Lane Undivided Highway	0	2	223 - 225	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	*Insufficient Data*	N/A	N/A	*Insufficient Data*	Average or Better	N/A
60-17	2 or 3 or 4 Lane Divided Highway	1	11	212 - 223	1.23	Average or Better	Medium	1.816933945	0.645038045	High	None	*Insufficient Data*	Average or Better	N/A
60-18	2 or 3 or 4 Lane Divided Highway	1	7	205 - 212	0.50	Average or Better	None	0.906787638	0.089862971	None	None	*Insufficient Data*	Average or Better	N/A
60-19	2 or 3 or 4 Lane Divided Highway	1	6	199 - 205	0.95	Average or Better	Low	1.623453821	0.268706189	High	None	*Insufficient Data*	Average or Better	N/A
60-20	Urban 4 Lane Freeway	6	4.7	194.3 - 199	1.29	Average or Better	Medium	1.89364123	0.692238644	High	None	*Insufficient Data*	Average or Better	N/A

Safety Performance Area - Needs Analysis Step 1 (continued)

Segment	Operating Environment	Segment Length (miles)	Segment Mileposts (MP)	% 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			Initial Need
				Performance Score	Performance Objective	Level of Need	Performance Score	Performance Objective	Performance Score	Performance Objective	Level of Need	
191-1	2 or 3 Lane Undivided Highway	24	0 - 24	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	None
191-2	2 or 3 Lane Undivided Highway	43	24 - 67	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	None
191-3	2 or 3 or 4 Lane Divided Highway	17	87 - 104	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	Low
191-4	2 or 3 Lane Undivided Highway	12	104 - 116	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	Low
191-5	4 or 5 Lane Undivided Highway	5	116 - 121	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	None
70-6	4 or 5 Lane Undivided Highway	9	330 - 339	25%	Average or Better	None	Insufficient Data	Average or Better	Insufficient Data	Average or Better	N/A	None
70-7	2 or 3 Lane Undivided Highway	30	300 - 300	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	None
70-8	2 or 3 Lane Undivided Highway	2	298 - 300	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	N/A
70-9	2 or 3 Lane Undivided Highway	5	293 - 298	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	N/A
70-10	2 or 3 Lane Undivided Highway	19	274 - 293	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	High
70-11	2 or 3 Lane Undivided Highway	4	270 - 274	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	High
70-12	2 or 3 Lane Undivided Highway	15	255 - 270	22%	Average or Better	None	Insufficient Data	Average or Better	Insufficient Data	Average or Better	N/A	High
60|70-13	2 or 3 Lane Undivided Highway	12	243 - 255	21%	Average or Better	None	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	High
60-14	2 or 3 Lane Undivided Highway	16	227 - 243	81%	Average or Better	High	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	High
60-15	2 or 3 Lane Undivided Highway	2	225 - 227	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	N/A
60-16	2 or 3 Lane Undivided Highway	2	223 - 225	*Insufficient Data*	Average or Better	N/A	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	N/A
60-17	2 or 3 or 4 Lane Divided Highway	11	212 - 223	78%	Average or Better	High	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	High
60-18	2 or 3 or 4 Lane Divided Highway	7	205 - 212	17%	Average or Better	None	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	None
60-19	2 or 3 or 4 Lane Divided Highway	6	199 - 205	60%	Average or Better	Low	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	Medium
60-20	Urban 4 Lane Freeway	4.7	194.3 - 199	50%	Average or Better	None	*Insufficient Data*	Average or Better	*Insufficient Data*	Average or Better	N/A	Medium

Safety Performance Area - Needs 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)
191-1	24	0 - 24	None		None	None	None
191-2	43	24 - 67	None		None	None	None
191-3	17	87 - 104	Low		None	Low	None
191-4	12	104 - 116	Low		None	Low	Road Rehabilitation SR-266 to SR-366 milepost 104.5 to 113.5 (9 mile)
191-5	5	116 - 121	None		Restripe to 5 lanes between 11th Street and US 70 (MP 120-121)	None	None
70-6	9	330 - 339	None	MP 336.5 - JCT US191	Traffic Signal or Roundabout Construction (MP 335.5) Construct Pedestrian Bridge Extension (MP 299-300)	Low	None
70-7	30	300 - 300	None		None	None	None
70-8	2	298 - 300	N/A		None	N/A	None
70-9	5	293 - 298	N/A		Reduced Speed from 50 MPH to 40 MPH (MP 294-298) Eliminate passing zone through Bylas (MP 294.6-295.5) Pedestrian Safety improvements – Pedestrian crossings, warning signs/flashing lights, ADA compliant pedestrian gates (MP 294- 298) Curb installation on north side of US 70 (MP 296.5)	N/A	None
70-10	19	274 - 293	High		None	High	None
70-11	4	270 - 274	High		None	High	None
70-12	15	255 - 270	High		Install Lighting and Center Turn Lane at US 70 & 177 intersection (US 70 Cutter Safety Improvements previous round Prioritized solution)	High	None
60|70-13	12	243 - 255	High	MP 247 - 253.4	Construct new sidewalks on north side (MP 243-252) DMS Sign Eastbound Installed (MP 247) Lighting MP 247.6-247.9 FY 2022 F035201D, F035201C	High	Lighting installation from N Cherry Ave to Radanovich Blvd (MP 247.6-247.9) Planned for FY22
60-14	16	227 - 243	High	MP 241 - 242.6, MP 227 - 232.3	None	High	None
60-15	2	225 - 227	N/A		None	N/A	None
60-16	2	223 - 225	N/A		None	N/A	None
60-17	11	212 - 223	High	MP 214.3 - 216.7	Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek (MP 219.9-222.3) Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit (MP 216.3-219.9)	High	None
60-18	7	205 - 212	None	MP 206 - 208	None	Low	None
60-19	6	199 - 205	Medium	MP 200.4 - 203.5	None	Medium	None
60-20	4.7	194.3 - 199	Medium	MP 195 - 197	None	Medium	None

Safety Performance Area - Needs Analysis Step 3

Segment Number	191-1	191-2	191-3	191-4	191-5	70-6	70-7	70-8	70-9
Segment Length (miles)	24	43	17	12	5	9	30	2	5
Segment Milepost (MP)	0 - 24	24 - 67	87 - 104	104 - 116	116 - 121	330 - 339	300 - 300	298 - 300	293 - 298
Final Need	None	None	Low	Low	None	Low	None	N/A	N/A
Segment Crash Overview	1 Crashes were fatal 2 Crashes had suspected serious injuries 0% Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	2 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 3 Crashes had suspected serious injuries 0 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 4 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	0 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 11 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	3 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 0 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 0 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 1 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes) – First Harmful Event Type	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	60% Involve Collision with Motor Vehicle 20% Involve Collision with Fixed Object 20% Involve Overturning	N/A - Sample size too small	42% Involve Collision with Motor Vehicle 25% Involve Collision with Fixed Object 8% Involve Collision With Animal	80% Involve Collision with Motor Vehicle 20% Involve Collision with Pedestrian	N/A - Sample size too small	N/A - Sample size too small
Collision Type	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	40% Involve Single Vehicle 40% Involve Left Turn 20% Involve Head On	N/A - Sample size too small	33% Involve Single Vehicle 33% Involve Left Turn 25% Involve Other	40% Involve Head On 20% Involve Sideswipe (opposite) 20% Involve Rear End	N/A - Sample size too small	N/A - Sample size too small
Violation or Behavior	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	40% Involve Speed too Fast for Conditions 40% Involve Failure to Yield Right-of-Way 20% Involve Unsafe Lane Change	N/A - Sample size too small	42% Involve No Improper Action 25% Involve Failure to Yield Right-of-Way 17% Involve Failure to Keep in Proper Lane	40% Involve Drove in Opposing Lane 20% Involve Walked on Wrong Side of Road 20% Involve Passed in No Passing Zone	N/A - Sample size too small	N/A - Sample size too small
Lighting Conditions	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	40% Occur in Daylight Conditions 20% Occur in Dawn Conditions 20% Occur in Dusk Conditions	N/A - Sample size too small	50% Occur in Daylight Conditions 33% Occur in Dark-Lighted Conditions 8% Occur in Dusk Conditions	80% Occur in Dark-Unlighted Conditions 20% Occur in Daylight Conditions	N/A - Sample size too small	N/A - Sample size too small
Surface Conditions	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	80% Involve Dry Conditions 20% Involve Wet Conditions	N/A - Sample size too small	92% Involve Dry Conditions 8% Involve Wet Conditions	80% Involve Dry Conditions 20% Involve Wet Conditions	N/A - Sample size too small	N/A - Sample size too small
First Unit Event	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	40% Involve a first unit event of Motor Vehicle in Transport 20% Involve a first unit event of Ran Off the Road (Right) 20% Involve a first unit event of Crossed Centerline	N/A - Sample size too small	50% Involve a first unit event of Motor Vehicle in Transport 25% Involve a first unit event of Ran Off the Road (Right) 17% Involve a first unit event of Collision with Pedestrian	100% Involve a first unit event of Motor Vehicle in Transport	N/A - Sample size too small	N/A - Sample size too small
Driver Physical Condition	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	100% No Apparent Influence	N/A - Sample size too small	75% No Apparent Influence 17% Illness 8% Under the Influence of Drugs or Alcohol	60% Under the Influence of Drugs or Alcohol 20% No Apparent Influence 20% Unknown	N/A - Sample size too small	N/A - Sample size too small
Safety Device Usage	N/A - Sample size too small	N/A - Sample size too small	N/A - Sample size too small	60% Shoulder And Lap Belt Used 40% None Used	N/A - Sample size too small	42% Shoulder And Lap Belt Used 25% None Used 8% Air Bag Deployed	60% Shoulder And Lap Belt Used 20% Not Applicable 20% None Used	N/A - Sample size too small	N/A - Sample size too small
Hot Spot Crash Summaries						MP 336.5 - JCT US191			
Previously Completed Safety-Related Projects					Restripe to 5 lanes between 11th Street and US 70 (MP 120-121)	Traffic Signal or Roundabout Construction (MP 335.5) Construct Pedestrian Bridge Extension (MP 299-300)			Reduced Speed from 50 MPH to 40 MPH (MP 294-298) Eliminate passing zone through Bylas (MP 294.6-295.5) Pedestrian Safety improvements – Pedestrian crossings, warning signs/flashing lights, ADA compliant pedestrian gates (MP 294- 298) Curb installation on north side of US 70 (MP 296.5)

Safety Performance Area - Needs Analysis Step 3 (continued)

Segment Number	191-1	70-10	70-11	70-12	60|70-13	60-14
Segment Length (miles)	24	19	4	15	12	16
Segment Milepost (MP)	0 - 24	274 - 293	270 - 274	255 - 270	243 - 255	227 - 243
Final Need	None	High	High	High	High	High
Segment Crash Overview	1 2 0% 0 0 0 0	4 Crashes were fatal 3 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	2 Crashes were fatal 0 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	7 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 1 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	7 Crashes were fatal 17 Crashes had suspected serious injuries 3 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	5 Crashes were fatal 21 Crashes had suspected serious injuries 0 Crashes at intersections 5 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 1 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes) – First Harmful Event Type	ple size	43% Involve Collision with Fixed Object 14% Involve Collision with Pedalcyclist 14% Involve Other Non-Collision	N/A - Sample size too small	44% Involve Collision with Motor Vehicle 33% Involve Collision with Pedestrian 22% Involve Collision with Fixed Object	79% Involve Collision with Motor Vehicle 8% Involve Overturning 4% Involve Collision with Pedestrian	54% Involve Collision with Fixed Object 35% Involve Collision with Motor Vehicle 4% Involve Collision with Pedalcyclist
Collision Type	ple size	71% Involve Single Vehicle 14% Involve Head On 14% Involve Other	N/A - Sample size too small	44% Involve Other 22% Involve Rear End 22% Involve Single Vehicle	29% Involve Angle 21% Involve Rear End 17% Involve Single Vehicle	54% Involve Single Vehicle 19% Involve Head On 15% Involve Other
Violation or Behavior	ple size	29% Involve No Improper Action 29% Involve Unknown 14% Involve Failure to Yield Right-of-Way	N/A - Sample size too small	44% Involve Unknown 33% Involve Speed too Fast for Conditions 11% Involve Made Improper Turn	25% Involve Unknown 21% Involve Speed too Fast for Conditions 17% Involve Failure to Yield Right-of-Way	50% Involve Speed too Fast for Conditions 15% Involve Drove in Opposing Lane 8% Involve Drove Left of Center Line
Lighting Conditions	ple size	43% Occur in Daylight Conditions 29% Occur in Dark-Unknown Lighting 29% Occur in Dark-Unlighted Conditions	N/A - Sample size too small	44% Occur in Daylight Conditions 33% Occur in Dark-Unlighted Conditions 22% Occur in Dark-Unknown Lighting Conditions	75% Occur in Daylight Conditions 13% Occur in Dark-Lighted Conditions 4% Occur in Dusk Conditions	62% Occur in Daylight Conditions 27% Occur in Dark-Unlighted Conditions 8% Occur in Dawn Conditions
Surface Conditions	ple size	71% Involve Dry Conditions 29% Involve Unknown Conditions	N/A - Sample size too small	78% Involve Dry Conditions 22% Involve Unknown Conditions	92% Involve Dry Conditions 4% Involve Unknown Conditions 4% Involve Wet Conditions	88% Involve Dry Conditions 12% Involve Wet Conditions
First Unit Event	ple size	29% Involve a first unit event of Ran Off the Road (Right) 29% Involve Overturn 14% Involve a first unit event of Collision with Pedestrian	N/A - Sample size too small	56% Involve a first unit event of Motor Vehicle in Transport 22% Involve a first unit event of Overturn 11% Collision with Pedestrian	75% Involve a first unit event of Motor Vehicle in Transport 13% Involve a first unit event of Ran Off the Road (Left) 8% Involve a first unit event of Overturn	35% Involve a first unit event of Motor Vehicle in Transport 27% Involve a first unit event of Overturn 19% Involve a first unit event of Ran Off the Road (Right)
Driver Physical Condition	ple size	43% Unknown 29% Under the Influence of Drugs or Alcohol 29% No Apparent Influence	N/A - Sample size too small	67% Unknown 11% Fatigued/Fell Asleep 11% Under the Influence of Drugs or Alcohol	54% No Apparent Influence 25% Unknown 17% Under the Influence of Drugs or Alcohol	46% No Apparent Influence 31% Under the Influence of Drugs or Alcohol 12% Unknown
Safety Device Usage	ple size	43% Unknown 43% Shoulder And Lap Belt Used 14% None Used	N/A - Sample size too small	33% Unknown 22% Not Applicable 22% None Used	46% Shoulder And Lap Belt Used 25% None Used 17% Unknown	35% None Used 27% Shoulder And Lap Belt Used 15% Air Bag Deployed/Shoulder-Lap Belt
Hot Spot Crash Summaries					MP 247 - 253.4	MP 241 - 242.6, MP 227 - 232.3
Previously Completed Safety-Related Projects				Install Lighting and Center Turn Lane at US 70 & 177 intersection (US 70 Cutter Safety Improvements previous round Prioritized solution)	Construct new sidewalks on north side (MP 243-252) DMS Sign Eastbound Installed (MP 247)	

Segment Number	60-15	60-16	60-17	60-18	60-19	60-20	Corridor-Wide Crash Characteristics
Segment Length (miles)	High	None	None	0	0	0	
Segment Milepost (MP)	MP 241 - 242.6, MP 227 - 232.3	High	0	0	0	0	
Final Need	N/A	N/A	High	Low	Medium	Medium	
Segment Crash Overview	0 Crashes were fatal 0 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	0 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	4 Crashes were fatal 5 Crashes had suspected serious injuries 0 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	1 Crashes were fatal 5 Crashes had suspected serious injuries 0 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	2 Crashes were fatal 8 Crashes had suspected serious injuries 1 Crashes at intersections 1 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	4 Crashes were fatal 2 Crashes had suspected serious injuries 0 Crashes at intersections 0 Crashes involve lane departures 0 Crashes involve pedestrians 0 Crashes involve trucks 0 Crashes involve bicycles	47 Crashes were fatal 91 Crashes had suspected serious injuries 4 Crashes at intersections 11 Crashes involve lane departures 2 Crashes involve pedestrians 0 Crashes involve trucks 1 Crashes involve bicycles
Segment Crash Summaries (Fatal and Suspected Serious Injury Crashes) – First Harmful Event Type	N/A - Sample size too small	N/A - Sample size too small	44% Involve Overturning 33% Involve Collision with Motor Vehicle 11% Involve Collision with Pedestrian	67% Involve Collision with Motor Vehicle 17% Involve Collision with Non-Fixed Object 17% Involve Overturning	40% Involve Overturning 40% Involve Collision with Motor Vehicle 20% Involve Collision with Fixed Object	50% Involve Collision with Motor Vehicle 33% Involve Overturning 17% Involve Collision with Fixed Object	50% Involve Collision with Motor Vehicle 18% Involve Collision with Fixed Object 16% Involve Overturning
Collision Type	N/A - Sample size too small	N/A - Sample size too small	56% Involve Single Vehicle 11% Involve Head On 11% Involve Sideswipe (same)	50% Involve Rear End 33% Involve Single Vehicle 17% Involve Angle	40% Involve Single Vehicle 30% Involve Rear End 20% Involve Other	50% Involve Rear End 50% Involve Single Vehicle	40% Involve Single Vehicle 25% Involve Rear End 12% Involve Other
Violation or Behavior	N/A - Sample size too small	N/A - Sample size too small	44% Involve Speed too Fast for Conditions 22% Involve Unknown 11% Involve Drove in Opposing Lane	83% Involve Speed too Fast for Conditions 17% Involve Failure to Yield Right-of-Way	100% Involve No Improper Action 60% Involve Exceeded Lawful Speed 10% Involve Unknown	100% Involve No Improper Action 67% Involve Exceeded Lawful Speed 17% Involve Other Unsafe Passing	46% Involve Speed too Fast for Conditions 13% Involve Unknown 10% Involve No Improper Action
Lighting Conditions	N/A - Sample size too small	N/A - Sample size too small	44% Occur in Dark-Unlighted Conditions 44% Occur in Daylight Conditions 11% Occur in Dawn Conditions	50% Occur in Daylight Conditions 33% Occur in Dark-Unlighted Conditions 17% Occur in Dawn Conditions	60% Occur in Daylight Conditions 30% Occur in Dark-Unlighted Conditions 10% Occur in Dark-Lighted Conditions	67% Occur in Daylight Conditions 33% Occur in Dark-Lighted Conditions	62% Occur in Daylight Conditions 16% Occur in Dark-Lighted Conditions 14% Occur in Dark-Unlighted Conditions
Surface Conditions	N/A - Sample size too small	N/A - Sample size too small	100% Involve Dry Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	100% Involve Dry Conditions	87% Involve Dry Conditions 7% Involve Wet Conditions 4% Involve Unknown Conditions
First Unit Event	N/A - Sample size too small	N/A - Sample size too small	44% Involve a first unit event of Ran Off the Road (Left) 33% Involve a first unit event of Motor Vehicle in Transport 11% Involve a first unit event of Crossed Centerline	50% Involve a first unit event of Motor Vehicle in Transport 17% Involve a first unit event of Other Non-Fixed Object 17% Involve a first unit event of Collision with Fixed Object	50% Involve a first unit event of Motor Vehicle in Transport 30% Involve a first unit event of Overturn 20% Involve a first unit event of Ran Off the Road (Left)	33% Involve a first unit event of Ran Off the Road (Left) 33% Involve a first unit event of Motor Vehicle in Transport 17% Involve a first unit event of Collision with Fixed Object	50% Involve a first unit event of Motor Vehicle in Transport
Driver Physical Condition	N/A - Sample size too small	N/A - Sample size too small	33% Unknown 33% Under the Influence of Drugs or Alcohol 22% No Apparent Influence	50% No Apparent Influence 33% Unknown 17% Under the Influence of Drugs or Alcohol	40% No Apparent Influence 30% Under the Influence of Drugs or Alcohol 20% Fatigued/Fell Asleep	40% No Apparent Influence 30% Under the Influence of Drugs or Alcohol 20% Fatigued/Fell Asleep	59% No Apparent Influence 18% Under the Influence of Drugs or Alcohol 17% Unknown
Safety Device Usage	N/A - Sample size too small	N/A - Sample size too small	56% None Used 22% Shoulder And Lap Belt Used 11% Not Applicable	50% None Used 17% Unknown 17% Air Bag Deployed/Shoulder-Lap Belt	40% Shoulder And Lap Belt Used 20% None Used 10% Lap Belt Used	67% Shoulder And Lap Belt Used 17% Unknown 17% None Used	43% Shoulder And Lap Belt Used 23% None Used 10% Unknown
Hot Spot Crash Summaries			MP 214.3 - 216.7	MP 206 - 208	MP 200.4 - 203.5	MP 195 - 197	
Previously Completed Safety-Related Projects			Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek (MP 219.9-222.3) Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit (MP 216.3-219.9)				-

Freight Performance Area - Needs 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	
							NB/EB	SB/WB		NB/EB	SB/WB
191-1*	Interrupted	1-24	24	2.26	Fair or Better	High	1.40	1.39	Fair or Better	None	None
191-2*	Interrupted	24-67	43	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
191-3^	Uninterrupted	87-104	17	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
191-4^	Uninterrupted	104-116	12	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
191-5*	Interrupted	116-121	5	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-6*	Interrupted	339-330	9	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-7^	Uninterrupted	330-300	30	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-8^	Uninterrupted	300-298	2	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-9^	Uninterrupted	298-293	5	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-10^	Uninterrupted	293-274	19	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-11^	Uninterrupted	274-270	4	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70-12^	Uninterrupted	270-255	15	*No Data*	Fair or Better	N/A	*No Data*	*No Data*	Fair or Better	N/A	N/A
70/60E-13*	Interrupted	255-243	12	1.58	Fair or Better	None	1.16	1.15	Fair or Better	None	None
60E-14^	Uninterrupted	243-227	16	1.49	Fair or Better	High	1.12	1.17	Fair or Better	None	None
60E-15^	Uninterrupted	227-225	2	1.32	Fair or Better	Medium	1.18	1.14	Fair or Better	None	None
60E-16^	Uninterrupted	225-223	2	1.28	Fair or Better	Low	1.05	1.12	Fair or Better	None	None
60E-17^	Uninterrupted	223-212	11	1.18	Fair or Better	None	1.05	1.09	Fair or Better	None	None
60E-18^	Uninterrupted	212-205	7	1.22	Fair or Better	Low	1.12	1.05	Fair or Better	None	None
60E-19*	Interrupted	205-199	6	1.63	Fair or Better	Low	1.20	1.14	Fair or Better	None	None
60E-20^	Uninterrupted	199-194.3	4.7	1.20	Fair or Better	None	1.06	1.06	Fair or Better	None	None
Emphasis Area?	Yes	Weighted Corridor Average		1.64	Good	High					

Freight Performance Area - Needs Analysis Step 1 (continued)

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	
				NB/EB	SB/WB		NB/EB	SB/WB				
191-1*	Interrupted	1-24	24	3.02	1.00	Fair or Better	None	None	No UP	Fair or Better	None	High
191-2*	Interrupted	24-67	43	2.67	1.78	Fair or Better	None	None	22.04	Fair or Better	None	N/A
191-3^	Uninterrupted	87-104	17	2.47	0.00	Fair or Better	None	None	No UP	Fair or Better	None	N/A
191-4^	Uninterrupted	104-116	12	12.23	5.00	Fair or Better	None	None	No UP	Fair or Better	None	N/A
191-5*	Interrupted	116-121	5	26.08	16.96	Fair or Better	None	None	None	Fair or Better	None	N/A
70-6*	Interrupted	339-330	9	1.33	4.67	Fair or Better	None	None	No UP	Fair or Better	None	N/A
70-7^	Uninterrupted	330-300	30	4.55	5.40	Fair or Better	None	None	17.03	Fair or Better	None	N/A
70-8^	Uninterrupted	300-298	2	14.30	0.00	Fair or Better	None	None	No UP	Fair or Better	None	N/A
70-9^	Uninterrupted	298-293	5	2.40	3.00	Fair or Better	None	None	None	Fair or Better	None	N/A
70-10^	Uninterrupted	293-274	19	8.63	2.51	Fair or Better	None	None	No UP	Fair or Better	None	N/A
70-11^	Uninterrupted	274-270	4	0.00	0.00	Fair or Better	None	None	No UP	Fair or Better	None	N/A
70-12^	Uninterrupted	270-255	15	17.39	0.00	Fair or Better	None	None	No UP	Fair or Better	None	N/A
70/60E-13*	Interrupted	255-243	12	22.75	26.52	Fair or Better	None	None	15.84	Fair or Better	Medium	Low
60E-14^	Uninterrupted	243-227	16	63.60	344.95	Fair or Better	None	High	13.03	Fair or Better	High	High
60E-15^	Uninterrupted	227-225	2	0.00	90.50	Fair or Better	None	Low	16.79	Fair or Better	None	Medium
60E-16^	Uninterrupted	225-223	2	52.20	12.25	Fair or Better	None	None	No UP	Fair or Better	None	Low
60E-17^	Uninterrupted	223-212	11	3.27	61.40	Fair or Better	None	None	No UP	Fair or Better	None	None
60E-18^	Uninterrupted	212-205	7	0.00	22.29	Fair or Better	None	None	No UP	Fair or Better	None	Low
60E-19*	Interrupted	205-199	6	14.00	20.30	Fair or Better	None	None	No UP	Fair or Better	None	Low
60E-20^	Uninterrupted	199-194.3	4.7	74.94	7.11	Fair or Better	Low	None	No UP	Fair or Better	None	Low

Freight Performance Area - Needs Analysis Step 2

Segment	Segment Length (miles)	Segment Mileposts (MP)	Initial Need	Truck Height Restriction Hot Spots (Clearance < 16.25')	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)
191-1*	24	1-24	High			High	
191-2*	43	24-67	N/A			N/A	
191-3^	17	87-104	N/A			N/A	
191-4^	12	104-116	N/A			N/A	Restripe to 5 lanes between Atresia Road and Lebanon Road (to 2023) MP 110.9-116
191-5*	5	116-121	N/A			N/A	One mile of planned restriping to 5 lanes between 11th Street and US 70
70-6*	9	339-330	N/A			N/A	
70-7^	30	330-300	N/A			N/A	
70-8^	2	300-298	N/A			N/A	
70-9^	5	298-293	N/A			N/A	
70-10^	19	293-274	N/A			N/A	
70-11^	4	274-270	N/A			N/A	
70-12^	15	270-255	N/A			N/A	
70/60E-13*	12	255-243	Low	Pinal SPRR UP	FY19 MP 247 New DMS Sign EastBound (Arizona Statewide DMS Plan) and Construct new sidewalks on northside from MP 243-252 (Cobre Valley Comprehensive Transportation Study)	Low	Projects planned: to Construct alternative alignment/Widen to 4 lanes (2030) MP243-252; to implement access management through Miami (2030) 243-245.5
60E-14^	16	243-227	High	Queen Creek Tunnel		High	Projects Planned: to construct alternative alignment/Widen to 4 lanes (2030) MP243-252; to implement access management through Miami (2030) throughout the segment
60E-15^	2	227-225	Medium			Medium	Projects Planned: to construct alternative alignment/Widen to 4 lanes (2030) MP243-252; Implement access management through Miami (2030) throughout the segment
60E-16^	2	225-223	Low			Low	Projects Planned: to construct alternative alignment/Widen to 4 lanes (2030) MP243-252; Implement access management through Miami (2030) throughout the segment
60E-17^	11	223-212	None		Picket Post- Construct new EB lanes parallel to existing, between Reymert Wash and Queen Creek and Gonzales Pass- Construct new EB lanes west of the summit, construct new WB lanes east of the summit	None	Projects Planned: to construct alternative alignment/Widen to 4 lanes (2030) MP243-252; Implement access management through Miami (2030) throughout the segment
60E-18^	7	212-205	Low			Low	
60E-19*	6	205-199	Low			Low	
60E-20^	4.7	199-194.3	Low			Low	

Freight Performance Area - Needs 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	
191-1*	1-24	24	High	State Highway	Rural	Level	2	55	No	Undivided	12%	A/B	A/B	15%	This segment includes one rest area
191-2*	24-67	43	N/A	State Highway	Rural	Level	2	55	No	Undivided	26%	A/B	A/B	27%	This segment includes a Border patrol Check Point effecting NB traffic
191-3^	87-104	17	N/A	State Highway	Rural	Level	4	55	No	Divided	3%	A/B	A/B	21%	
191-4^	104-116	12	N/A	State Highway	Rural	Level	4	65	No	Undivided	30%	A/B	A/B	16%	
191-5*	116-121	5	N/A	State Highway	Urban	Level	4	40	No	Undivided	13%	A-C	A-C	10%	
70-6*	339-330	9	N/A	State Highway	Urban	Level	4	40	No	Undivided	0%	A-C	A-C	13%	This segment includes one rest area
70-7^	330-300	30	N/A	State Highway	Rural	Level	2	55	No	Undivided	13%	A/B	A/B	27%	
70-8^	300-298	2	N/A	State Highway	Rural	Level	2	65	No	Undivided	6%	A/B	A/B	25%	
70-9^	298-293	5	N/A	State Highway	Rural	Level	2	50	No	Undivided	53%	A/B	A/B	25%	This segment includes one rest area
70-10^	293-274	19	N/A	State Highway	Rural	Level	2	55	No	Undivided	37%	A/B	A/B	25%	
70-11^	274-270	4	N/A	State Highway	Rural	Level	2	55	No	Undivided	77%	A/B	A/B	25%	
70-12^	270-255	15	N/A	State Highway	Rural	Level	2	60	No	Undivided	10%	A/B	A/B	17%	This segment includes a climbing/passing lane
70/60E-13*	255-243	12	Low	State Highway	Urban	Level	4	45	No	Undivided	0%	A-C	A-C	11%	This segment includes one eastbound DMS.
60E-14^	243-227	16	High	State Highway	Rural	Mountainous	2	50	No	Undivided	68%	D-F	D-F	11%	
60E-15^	227-225	2	Medium	State Highway	Rural	Rolling	2	45	No	Undivided	98%	D-F	D-F	18%	This segment includes one rest area
60E-16^	225-223	2	Low	State Highway	Rural	Level	2	55	No	Undivided	55%	A/B	D-F	13%	
60E-17^	223-212	11	None	State Highway	Rural	Level	4	65	No	Divided	0%	A/B	A/B	13%	
60E-18^	212-205	7	Low	State Highway	Rural	Level	2	65	No	Divided	0%	A/B	C	13%	This segment includes one eastbound DMS.
60E-19*	205-199	6	Low	State Highway	Urban	Level	2	55	No	Divided	0%	E/F	D	11%	
60E-20^	199-194.3	4.7	Low	State Highway	Urban	Level	2	65	No	Divided	0%	A-C	A-C	9%	This segment includes one eastbound DMS.

Needs Summary Table

Performance Area	191-1 MP 0-24	191-2 MP 24-67	191-3 MP 87-104	191-4 MP 104-116	191-5 MP 116-121	70-6 MP 339-330	70-7 MP 330-300	70-8 MP 300-298	70-9 MP 298-293	70-10 MP 293-274	70-11 MP 274-270	70-12 MP 270-255	70/60E-13 MP 255-243	60E-14 MP 243-227	60E-15 MP 227-225	60E-16 MP 225-223	60E-17 MP 223-212	60E-18 MP 223-213	60E-19 MP 223-214	60E-20 MP 223-215
Pavement	Medium	High	Low	Low	Medium	Medium	High	High	High	High	High	Low	Medium	Low	None	None	Low	Medium	Low	None
Bridge	None	Medium	Low	Low	N/A	Low	Low	None	N/A	None	Low	Low	Medium	Medium	None	Medium	Low	Low	Low	None
Mobility*	Low	None	Low	None	Low	Low	Low	Low	Low	Low	Low	Low	Low	High	Low	Low	None	Low	High	High
Safety*	None	None	Low	Low	None	Low	None	N/A	N/A	High	High	High	High	High	N/A	N/A	High	Low	Medium	Medium
Freight*	High	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Low	High	Medium	Low	None	Low	Low	Low
Average Need	1.23	0.77	0.77	0.54	0.54	0.92	0.85	0.69	0.69	1.38	1.54	1.23	1.77	2.54	0.69	0.77	1.00	1.15	1.69	1.38

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 US60|US 70|US 191 Corridor
# 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

Appendix E: Life-Cycle Cost Analysis

Pavement Life-Cycle Cost Analysis Worksheet

Project Details	
Project title	US191 Pavement Preservations South of Safford
Route	US191 Pavement Preservations South of Safford
Milepost begin	87
Milepost end	104

Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	<<Select from Pull-down List>>
# of directions of travel (1 = one-way; 2 = two-way)	=	2	
# of lanes (in one direction)	=	2	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=	4	
Right shoulder width (ft)	=	10.3	
Total roadway analysis segment length (centerline miles)	=	17	
Current year	=	2022	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	<<Select from Pull-down List>>
Roadway width (ft) [each direction lanes & shoulders]	=	38.3	
Total lane-miles [total traffic direction lanes & shoulders]	=	108.5	
Total square feet [total traffic direction lanes & shoulders]	=	6,875,616	
Total square yards [total traffic direction lanes & shoulders]	=	763,957	

LCCA Parameters		
Analysis period (years)	=	40
Year of net present value	=	2023
First year of improvements	=	2027
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

Characteristics			Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor
1.60

Rehab: Other Materials Cost Factor
1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)
2.44

			Total Unit Cost ($) [includes material costs and indirect costs]			Total Bi-Directional Cost ($)
Treatment Type	Pavement Thickness	Typical Service Life (years)	Lane-miles	Square Feet	Square Yards	Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$258,002,282
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$206,317,095
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$41,623,521
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$27,643,102
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$58,145,834
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$38,763,890

Pavement Service Life, Intervals, and Sequence of Improvements

US191 Pavement Preservations South of Safford MP 87 - MP 104

Design Alternative	Typical Service Life Value	Typical Service Life Range	Average Historical Interval Value	Interval to Use in LCCA Before Reconstruction	Interval to Use in LCCA After Reconstruction
Concrete Reconstruction	32	30-34	0	-	16
Asphalt Reconstruction	28	26-30	4	-	14
Concrete Medium Rehab	26	24-28	0	13	13
Concrete Light Rehab	20	18-22	0	10	10
Asphalt Medium Rehab	22	20-24	6	6	11
Asphalt Light Rehab	16	14-18	0	8	8
None	0	0	-	-	-

Note: The typical service life values and ranges are determined based on the elevation of the roadway segment using the reference tables below. The typical service life values should be used as the intervals between improvements in the design alternatives except when historical frequency values are available based on the frequency and type of improvements in the past at this location. Historical frequency values should only be used if they are lower than the typical values and only up until reconstruction is implemented, after which typical service life values should be used.

Elevation Below 4000' (Desert Environment)

Design Alternative	Typical Service Life Value	Typical Service Life Range
Concrete Reconstruction	32	30-34
Asphalt Reconstruction	28	26-30
Concrete Medium Rehab	26	24-28
Concrete Light Rehab	20	18-22
Asphalt Medium Rehab	22	20-24
Asphalt Light Rehab	16	14-18
None	0	0

Assumed LCCA Sequence of Improvements Based on the Initial Design Alternative Improvement

Concrete Reconstruction (CR):	CR, CLR, CMR, CLR, CR, CLR, CMR. . .
Asphalt Reconstruction (AR):	AR, ALR, AMR, ALR, AR, ALR, AMR. . .
Concrete Medium Rehab (CMR):	CMR, CLR, CR, CLR, CMR, CLR, CR. . .
Concrete Light Rehab (CLR):	CLR, CR, CLR, CMR, CLR, CR, CLR. . .
Asphalt Medium Rehab (AMR):	AMR, ALR, AR, ALR, AMR, ALR, AR. . .
Asphalt Light Rehab (ALR):	ALR, AR, ALR, AMR, ALR, AR, ALR. . .

Elevation Above 4000' (Mountain Environment)

Design Alternative	Typical Service Life Value	Typical Service Life Range
Concrete Reconstruction	28	26-30
Asphalt Reconstruction	24	22-26
Concrete Medium Rehab	22	20-24
Concrete Light Rehab	16	14-18
Asphalt Medium Rehab	18	16-20
Asphalt Light Rehab	12	10-14
None	0	0

Pavement Improvement Project History

US191 Pavement Preservations South of Safford MP 87 - MP 104

Year	Project Number	Tracs No.	Direction of Improvement	Treatment Type	Improvement Description	Thickness (inches)	Beg. MP	End MP	Length (miles)
2005	STP-191-B(003)B	H503703C	NB/SB	Asphalt Reconstruction	New AB	8	87	91	4
				Asphalt Reconstruction	New AC	5	87	91	4
				Asphalt Reconstruction	New ACFC	0.5	87	91	4
2005	STP-191-B(004)B	H503706C	NB/SB	Asphalt Reconstruction	AB	8	97.5	99.5	2
				Asphalt Reconstruction	AC	5	97.5	99.5	2
				Asphalt Reconstruction	AR-ACFC	0.5	97.5	99.5	2
2008	-	H735401C	NB/SB	Asphalt Light Rehab	Seal Coat	0.3	92	93.5	1.5
2008	-	H736101C	NB/SB	Asphalt Light Rehab	Seal Coat	0.3	96	104	8
2009	STP -191-B(006)B	H503705C	NB/SB	Asphalt Reconstruction	AB	4	93.5	98	4.5
				Asphalt Reconstruction	AC	5	93.5	98	4.5
				Asphalt Reconstruction	AR-ACFC	0.5	93.5	98	4.5
2011	ARRA-191-B(200)A	H503704C	NB/SB	Asphalt Reconstruction	AB	8	91.5	95	3.5
				Asphalt Reconstruction	Remove	0.5	91.5	95	3.5
				Asphalt Reconstruction	AR-ACFC	0.5	91.5	95	3.5
2012	STP-191-B(201)A	H818501C	NB/SB	Asphalt Medium Rehab	AC	2.5	100	103.5	3.5
				Asphalt Medium Rehab	AR-ACFC	0.5	100	103.5	3.5
2018	STP-191-Y(200)T	F007701C	NB/SB	Asphalt Medium Rehab	Remove	2.5	87	91	4
				Asphalt Medium Rehab	AC	2.5	87	91	4
				Asphalt Medium Rehab	DC	0.6	87	91	4

Interval between Improvements in Years	Treatment Type Options	Estimated Historical Interval Value between Improvements in Years
After Asphalt Reconstruction: 4	Concrete Reconstruction	
After Asphalt Reconstruction: 2	Asphalt Reconstruction	4
After Asphalt Medium Rehab: 6	Concrete Medium Rehab	
	Concrete Light Rehab	
	Asphalt Medium Rehab	6
	Asphalt Light Rehab	

Design Alternative # 1 - Concrete Reconstruction

US191 Pavement Preservations South of Safford MP 87 - MP 104

Enter Name of Design Alternative

Number of Years	Year	Concrete Reconstruction	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Concrete Reconstruction	$258,002,282	$229,231,686	$196,828,705
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	None	$0	$0	$0
20	2042	None	$0	$0	$0
21	2043	Concrete Light Rehab	$27,643,102	$15,305,315	$7,143,503
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	None	$0	$0	$0
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	Concrete Medium Rehab	$41,623,521	$17,148,339	$5,467,962
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	Concrete Light Rehab	$27,643,102	$7,755,077	$1,506,900
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Concrete Light Rehab	$26,260,947	$7,152,741	$1,337,902
Enter Year of Last Used DA Improvement ››		2066	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$262,287,676	$209,609,168
AGENCY COST	$328,651,059	

Design Alternative # 2 - Asphalt Reconstruction

US191 Pavement Preservations South of Safford MP 87 - MP 104

Enter Name of Design Alternative

Number of Years	Year	Asphalt Reconstruction	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Reconstruction	$206,317,095	$183,310,067	$157,398,324
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	Asphalt Light Rehab	$38,763,890	$22,769,700	$11,468,836
20	2042	None	$0	$0	$0
21	2043	None	$0	$0	$0
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	Asphalt Medium Rehab	$58,145,834	$26,961,917	$10,012,451
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	Asphalt Light Rehab	$38,763,890	$12,985,242	$3,171,229
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Light Rehab	$21,804,688	$5,938,982	$1,110,871
Enter Year of Last Used DA Improvement ››		2060	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$240,087,944	$180,939,969
AGENCY COST	$320,186,021	

Design Alternative # 3 - Asphalt Medium Rehab

US191 Pavement Preservations South of Safford MP 87 - MP 104

Enter Name of Design Alternative

Number of Years	Year	Asphalt Medium Rehab Focus	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Medium Rehab	$58,145,834	$51,661,821	$44,359,179
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	Asphalt Light Rehab	$38,763,890	$28,843,974	$19,705,596
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	Asphalt Reconstruction	$206,317,095	$121,189,549	$61,041,784
20	2042	None	$0	$0	$0
21	2043	None	$0	$0	$0
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	None	$0	$0	$0
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	None	$0	$0	$0
33	2055	Asphalt Light Rehab	$38,763,890	$15,053,454	$4,447,812
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	Asphalt Medium Rehab	$58,145,834	$17,825,003	$3,883,001
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Medium Rehab	$47,573,865	$12,957,778	$2,423,719
Enter Year of Last Used DA Improvement ››		2063	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$221,616,023	$131,013,653
AGENCY COST	$352,562,679	

Design Alternative # 4 - Asphalt Light Rehab

US191 Pavement Preservations South of Safford MP 87 - MP 104

Enter Name of Design Alternative

Number of Years	Year	Asphalt Light Rehab Focus	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Light Rehab	$38,763,890	$34,441,214	$29,572,786
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	Asphalt Reconstruction	$206,317,095	$144,706,660	$91,607,258
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	None	$0	$0	$0
20	2042	None	$0	$0	$0
21	2043	None	$0	$0	$0
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	Asphalt Light Rehab	$38,763,890	$17,974,611	$6,674,967
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	Asphalt Medium Rehab	$58,145,834	$21,283,986	$5,827,337
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Medium Rehab	$31,715,910	$8,638,519	$1,615,812
Enter Year of Last Used DA Improvement ››		2057	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$209,767,952	$132,066,536
AGENCY COST	$310,274,799	

Summary of LCCA Results

US191 Pavement Preservations South of Safford MP 87 - MP 104

	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehab Focus	Asphalt Light Rehab Focus
Net Present Value - 3%	$262,287,676	$240,087,944	$221,616,023	$209,767,952
Net Present Value - 7%	$209,609,168	$180,939,969	$131,013,653	$132,066,536
Agency Cost	$328,651,059	$320,186,021	$352,562,679	$310,274,799

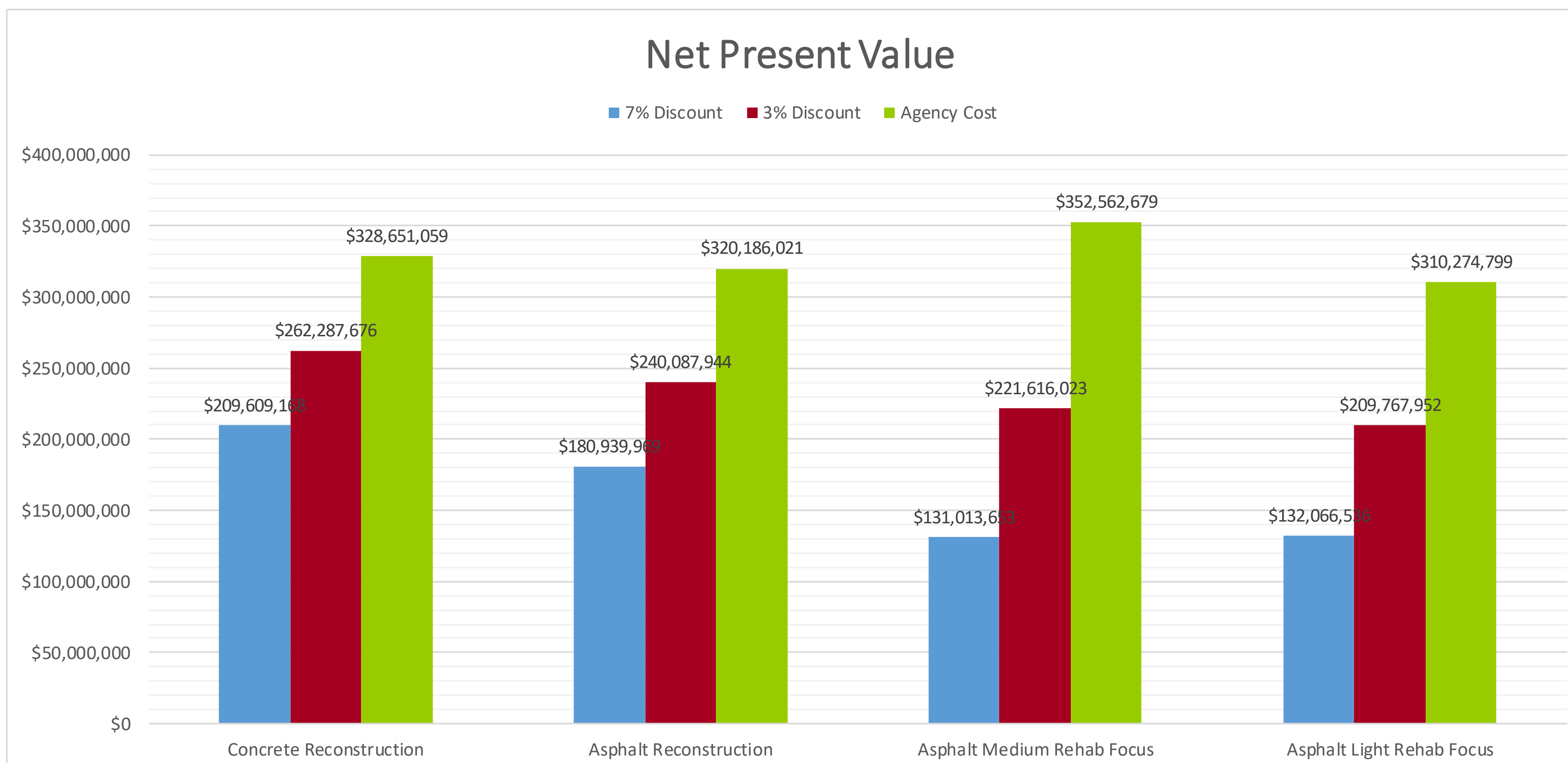
Cost Ratio at 3% Discount Rate

1.25 Ratio of Concrete Reconstruction to Lowest Cost Rehab
1.14 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Cost Ratio at 7% Discount Rate

1.60 Ratio of Concrete Reconstruction to Lowest Cost Rehab
1.38 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of reconstruction is within 15% of the NPV of the lowest cost rehab so reconstruction should likely be the initial improvement solution. A cost ratio > 1.15 means the NPV of reconstruction is more than 15% of the NPV of the lowest cost rehab so rehab should likely be the initial improvement solution.



Pavement Life-Cycle Cost Analysis Worksheet

Project Details	
Project title	Bylas Area Pavement Preservation
Route	US70
Milepost begin	293
Milepost end	298

Existing Roadway Characteristics			
Surface type (Asphalt or Concrete)	=	Asphalt	<<Select from Pull-down List>>
# of directions of travel (1 = one-way; 2 = two-way)	=	2	
# of lanes (in one direction)	=	1	
Width of typical lane (ft)	=	12	
Left shoulder width (ft)	=		
Right shoulder width (ft)	=	5.85	
Total roadway analysis segment length (centerline miles)	=	5	
Current year	=	2022	
Elevation (> 4,000 ft or < 4,000 ft)?	=	< 4,000 ft	<<Select from Pull-down List>>
Roadway width (ft) [each direction lanes & shoulders]	=	17.85	
Total lane-miles [total traffic direction lanes & shoulders]	=	14.9	
Total square feet [total traffic direction lanes & shoulders]	=	942,480	
Total square yards [total traffic direction lanes & shoulders]	=	104,720	

LCCA Parameters		
Analysis period (years)	=	40
Year of net present value	=	2023
First year of improvements	=	2027
Discount rate (%) - low	=	3%
Discount rate (%) - high	=	7%

Design Alternatives (DA)

Characteristics			Pavement Material Cost ($)		
Treatment Type	*Pavement Thickness*	*Typical Service Life (years)*	*Lane-miles*	*Square Feet*	*Square Yards*
Concrete Reconstruction	8"-12"	30-34	$609,000	$9.6	$87
Asphalt Reconstruction	8"-12"	26-30	$487,000	$7.7	$69
Concrete Medium Rehab	1"-3"	24-28	$131,000	$2.1	$19
Concrete Light Rehab	<1"	18-22	$87,000	$1.4	$12
Asphalt Medium Rehab	3"-8"	20-24	$183,000	$2.9	$26
Asphalt Light Rehab	<3"	14-18	$122,000	$1.9	$17

Reconstruction: Other Materials Cost Factor
1.60

Rehab: Other Materials Cost Factor
1.20

Total Cost Factor (e.g., includes design, mobilization, traffic control, contingency, etc.)
2.44

			Total Unit Cost ($) [includes material costs and indirect costs]			Total Bi-Directional Cost ($)
Treatment Type	Pavement Thickness	Typical Service Life (years)	Lane-miles	Square Feet	Square Yards	Total Cost
Concrete Reconstruction	8"-12"	30-34	$2,377,536	$37.5	$338	$35,365,848
Asphalt Reconstruction	8"-12"	26-30	$1,901,248	$30.0	$270	$28,281,064
Concrete Medium Rehab	1"-3"	24-28	$383,568	$6.1	$54	$5,705,574
Concrete Light Rehab	<1"	18-22	$254,736	$4.0	$36	$3,789,198
Asphalt Medium Rehab	3"-8"	20-24	$535,824	$8.5	$76	$7,970,382
Asphalt Light Rehab	<3"	14-18	$357,216	$5.6	$51	$5,313,588

Pavement Service Life, Intervals, and Sequence of Improvements

US70 MP 293 - MP 298

Design Alternative	Typical Service Life Value	Typical Service Life Range	Average Historical Interval Value	Interval to Use in LCCA Before Reconstruction	Interval to Use in LCCA After Reconstruction
Concrete Reconstruction	32	30-34	0	-	16
Asphalt Reconstruction	28	26-30	0	-	14
Concrete Medium Rehab	26	24-28	0	13	13
Concrete Light Rehab	20	18-22	0	10	10
Asphalt Medium Rehab	22	20-24	0	11	11
Asphalt Light Rehab	16	14-18	5	5	8
None	0	0	-	-	-

Note: The typical service life values and ranges are determined based on the elevation of the roadway segment using the reference tables below. The typical service life values should be used as the intervals between improvements in the design alternatives except when historical frequency values are available based on the frequency and type of improvements in the past at this location. Historical frequency values should only be used if they are lower than the typical values and only up until reconstruction is implemented, after which typical service life values should be used.

Elevation Below 4000' (Desert Environment)		
Design Alternative	Typical Service Life Value	Typical Service Life Range
Concrete Reconstruction	32	30-34
Asphalt Reconstruction	28	26-30
Concrete Medium Rehab	26	24-28
Concrete Light Rehab	20	18-22
Asphalt Medium Rehab	22	20-24
Asphalt Light Rehab	16	14-18
None	0	0

Assumed LCCA Sequence of Improvements Based on the Initial Design Alternative Improvement	
Concrete Reconstruction (CR):	CR, CLR, CMR, CLR, CR, CLR, CMR. . .
Asphalt Reconstruction (AR):	AR, ALR, AMR, ALR, AR, ALR, AMR. . .
Concrete Medium Rehab (CMR):	CMR, CLR, CR, CLR, CMR, CLR, CR. . .
Concrete Light Rehab (CLR):	CLR, CR, CLR, CMR, CLR, CR, CLR. . .
Asphalt Medium Rehab (AMR):	AMR, ALR, AR, ALR, AMR, ALR, AR. . .
Asphalt Light Rehab (ALR):	ALR, AR, ALR, AMR, ALR, AR, ALR. . .

Elevation Above 4000' (Mountain Environment)		
Design Alternative	Typical Service Life Value	Typical Service Life Range
Concrete Reconstruction	28	26-30
Asphalt Reconstruction	24	22-26
Concrete Medium Rehab	22	20-24
Concrete Light Rehab	16	14-18
Asphalt Medium Rehab	18	16-20
Asphalt Light Rehab	12	10-14
None	0	0

Pavement Improvement Project History

US70 MP 293 - MP 298

Year	Project Number	Tracs No.	Direction of Improvement	Treatment Type	Improvement Description	Thickness (inches)	Beg. MP	End MP	Length (miles)
2000	022-4(39)	H422201C	EB/WB	Asphalt Medium Rehab	Remove	3	287.5	301	13.5
				Asphalt Medium Rehab	New AC	3	287.5	301	13.5
				Asphalt Medium Rehab	New AR	2	287.5	301	13.5
2004	U-070-A-509	H593602C	EB/WB	Asphalt Light Rehab	Fog Coat	-	295	295.5	0.5
2009	-	H764001C	EB/WB	Asphalt Light Rehab	Fog Coat	-	283.5	308	24.5
2013	STP-070-A(204)A	H691001C	EB/WB	Asphalt Reconstruction	New AB	5	292	295	3
				Asphalt Reconstruction	New AC	5	292	295	3
				Asphalt Reconstruction	New ACFC	0.5	292	295	3

Interval between Improvements in Years	Treatment Type Options	Estimated Historical Interval Value between Improvements in Years
After Asphalt Reconstruction:	Concrete Reconstruction	
After Asphalt Medium Rehab:	Asphalt Reconstruction	
After Asphalt Light Rehab: 5	Concrete Medium Rehab	
	Concrete Light Rehab	
	Asphalt Medium Rehab	
	Asphalt Light Rehab	5

Design Alternative # 1 - Concrete Reconstruction

US70 MP 293 - MP 298

Enter Name of Design Alternative

Number of Years	Year	Concrete Reconstruction	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Concrete Reconstruction	$35,365,848	$31,422,098	$26,980,436
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	None	$0	$0	$0
20	2042	None	$0	$0	$0
21	2043	Concrete Light Rehab	$3,789,198	$2,097,987	$979,201
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	None	$0	$0	$0
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	Concrete Medium Rehab	$5,705,574	$2,350,621	$749,525
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	Concrete Light Rehab	$3,789,198	$1,063,033	$206,559
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Concrete Light Rehab	$3,599,738	$980,467	$183,394
Enter Year of Last Used DA Improvement ››		2066	Remaining Service Life Cost ^^		

		Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE		$35,953,272	$28,732,327
AGENCY COST		$45,050,080	

Design Alternative # 2 - Asphalt Reconstruction

US70 MP 293 - MP 298

Enter Name of Design Alternative

Number of Years	Year	Asphalt Reconstruction	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Reconstruction	$28,281,064	$25,127,359	$21,575,488
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	Asphalt Light Rehab	$5,313,588	$3,121,173	$1,572,099
20	2042	None	$0	$0	$0
21	2043	None	$0	$0	$0
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	Asphalt Medium Rehab	$7,970,382	$3,695,824	$1,372,464
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	Asphalt Light Rehab	$5,313,588	$1,779,961	$434,698
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	None	$0	$0	$0
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Light Rehab	$2,988,893	$814,090	$152,273
Enter Year of Last Used DA Improvement ››		2060	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$32,910,227	$24,802,476
AGENCY COST	$43,889,729	

Design Alternative # 3 - Asphalt Medium Rehab

US70 MP 293 - MP 298

Enter Name of Design Alternative

Number of Years	Year	Asphalt Medium Rehab Focus	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Medium Rehab	$7,970,382	$7,081,581	$6,080,566
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	None	$0	$0	$0
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	Asphalt Light Rehab	$5,313,588	$3,410,590	$1,925,889
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	None	$0	$0	$0
20	2042	None	$0	$0	$0
21	2043	Asphalt Reconstruction	$28,281,064	$15,658,539	$7,308,364
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	None	$0	$0	$0
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	None	$0	$0	$0
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	None	$0	$0	$0
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	Asphalt Light Rehab	$5,313,588	$1,945,012	$532,524
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	Asphalt Medium Rehab	$7,970,382	$2,303,115	$464,901
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Medium Rehab	$7,245,802	$1,973,552	$369,148
Enter Year of Last Used DA Improvement ››		2065	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$28,425,286	$15,943,097
AGENCY COST	$47,603,202	

Design Alternative # 4 - Asphalt Light Rehab

US70 MP 293 - MP 298

Enter Name of Design Alternative

Number of Years	Year	Asphalt Light Rehab Focus	Agency Cost ($)	Net Present Value @ 3%	Net Present Value @ 7%
0	2022	None	$0	$0	$0
1	2023	None	$0	$0	$0
2	2024	None	$0	$0	$0
3	2025	None	$0	$0	$0
4	2026	None	$0	$0	$0
5	2027	Asphalt Light Rehab	$5,313,588	$4,721,054	$4,053,711
6	2028	None	$0	$0	$0
7	2029	None	$0	$0	$0
8	2030	None	$0	$0	$0
9	2031	None	$0	$0	$0
10	2032	Asphalt Reconstruction	$28,281,064	$21,675,081	$15,383,025
11	2033	None	$0	$0	$0
12	2034	None	$0	$0	$0
13	2035	None	$0	$0	$0
14	2036	None	$0	$0	$0
15	2037	None	$0	$0	$0
16	2038	None	$0	$0	$0
17	2039	None	$0	$0	$0
18	2040	None	$0	$0	$0
19	2041	None	$0	$0	$0
20	2042	None	$0	$0	$0
21	2043	None	$0	$0	$0
22	2044	None	$0	$0	$0
23	2045	None	$0	$0	$0
24	2046	Asphalt Light Rehab	$5,313,588	$2,692,351	$1,120,885
25	2047	None	$0	$0	$0
26	2048	None	$0	$0	$0
27	2049	None	$0	$0	$0
28	2050	None	$0	$0	$0
29	2051	None	$0	$0	$0
30	2052	None	$0	$0	$0
31	2053	None	$0	$0	$0
32	2054	Asphalt Medium Rehab	$7,970,382	$3,188,050	$978,548
33	2055	None	$0	$0	$0
34	2056	None	$0	$0	$0
35	2057	None	$0	$0	$0
36	2058	None	$0	$0	$0
37	2059	None	$0	$0	$0
38	2060	None	$0	$0	$0
39	2061	None	$0	$0	$0
40	2062	None	$0	$0	$0
41	2063	None	$0	$0	$0
42	2064	None	$0	$0	$0
43	2065	Asphalt Light Rehab	$5,313,588	$1,535,410	$309,934
44	2066	None	$0	$0	$0
45	2067	None	$0	$0	$0
Pick Last Used DA treatment type to calculate Remaining Service Life ››		Asphalt Light Rehab	$4,649,390	$1,266,363	$236,870
Enter Year of Last Used DA Improvement ››		2065	Remaining Service Life Cost ^^		

	Net Present Value ($) @ 3%	Net Present Value ($) @ 7%
NET PRESENT VALUE	$32,545,584	$21,609,233
AGENCY COST	$47,542,821	

Summary of LCCA Results

US70 MP 293 - MP 298

	Concrete Reconstruction	Asphalt Reconstruction	Asphalt Medium Rehab Focus	Asphalt Light Rehab Focus
Net Present Value - 3%	$35,953,272	$32,910,227	$28,425,286	$32,545,584
Net Present Value - 7%	$28,732,327	$24,802,476	$15,943,097	$21,609,233
Agency Cost	$45,050,080	$43,889,729	$47,603,202	$47,542,821

Cost Ratio at 3% Discount Rate

1.26 Ratio of Concrete Reconstruction to Lowest Cost Rehab

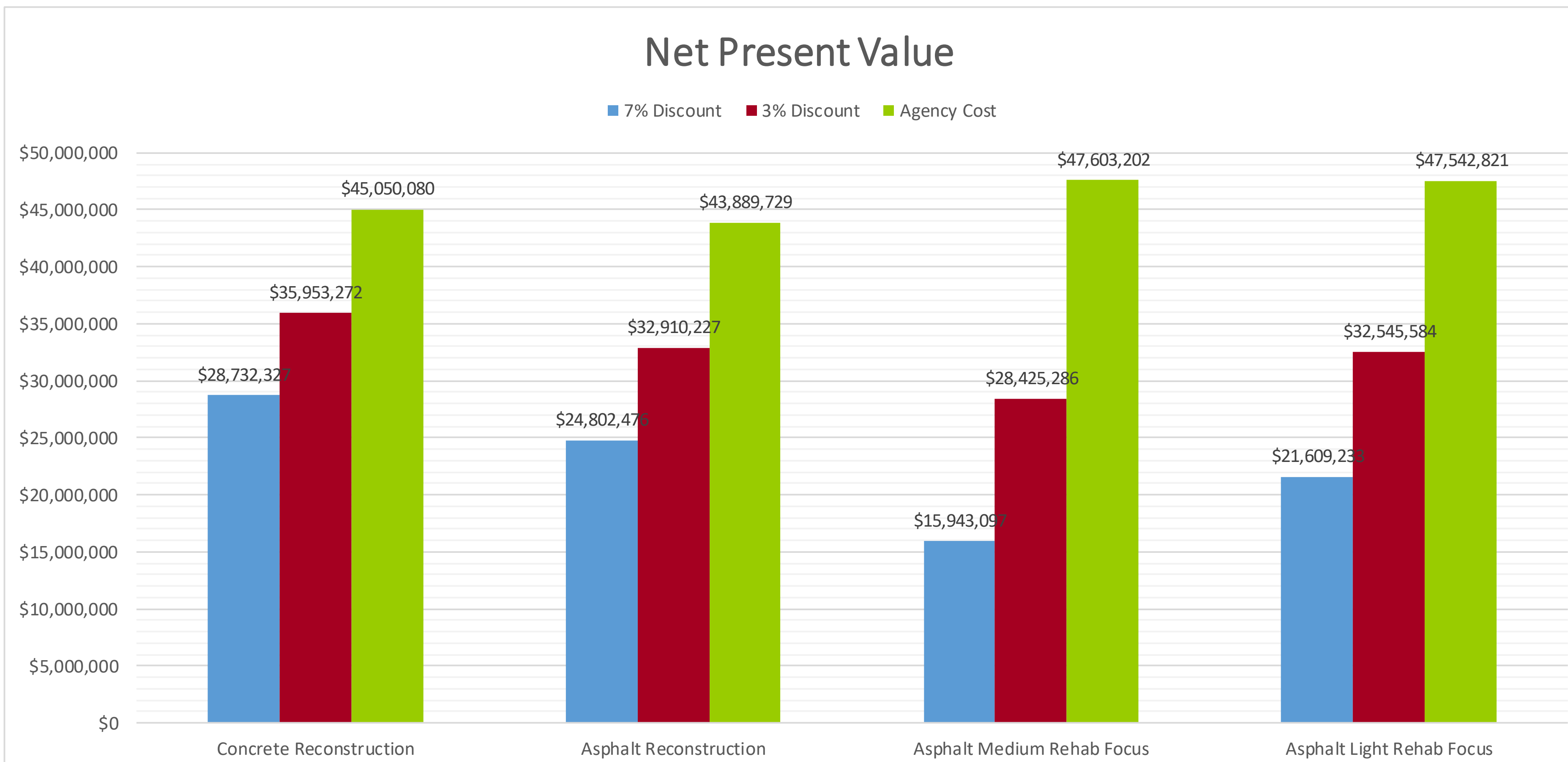
1.16 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Cost Ratio at 7% Discount Rate

1.80 Ratio of Concrete Reconstruction to Lowest Cost Rehab

1.56 Ratio of Asphalt Reconstruction to Lowest Cost Rehab

Note: A cost ratio < 1.15 means the Net Present Value (NPV) of reconstruction is within 15% of the NPV of the lowest cost rehab so reconstruction should likely be the initial improvement solution. A cost ratio > 1.15 means the NPV of reconstruction is more than 15% of the NPV of the lowest cost rehab so rehab should likely be the initial improvement solution.



Appendix F: Crash Modification Factors and Factored Unit Construction Costs

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	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	0.68	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	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	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	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	0.65	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

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	From HSM
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	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	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	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;	0.75	From HSM

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
								applicable to areas with small or moderate fills and cuts, minimal retaining walls		
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	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	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	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	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	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.

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
								existing ramp; does not include any major structures or improvements on crossroad		
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	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	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	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	Same as rehab

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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	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	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	Assumed - should have a minor effect on crashes at the bridge
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	0.1 (pedestrian only)	Assumed direct access on both sides of structure

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
								leading to the 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)	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)	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)	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	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	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	Same as rehab; CMF applied to crashes 1/8 mile upstream/downstream of the structure

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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)	From CMF Clearinghouse Avg of 6 values from FHWA Desktop Reference
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)	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	0.91 (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	0.91 (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

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	0.91 (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	0.91 (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	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	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	Assumed
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)	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

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
										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	0.78 (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 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	0.65	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')	0.86 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.)

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	0.98 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.)
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	0.98 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	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	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)	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)	Average of 3 values on clearinghouse for snow/ice

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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 (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)	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)	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)	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	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
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	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	Assumed - similar to Install Other General Warning Signs; CMF applied to crashes within 0.25 miles after sign
INTERSECTION IMPROVEMENTS										

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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	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	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	From HSM; CMF applied to crashes within intersection only

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	0.76	Updated to include 2 additional values (in addition to 1 previous value) from CMF Clearinghouse
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	0.56	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	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	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.)

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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)	Average of 3 values on clearinghouse & consistent with HSM
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)	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	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)	Average of 3 values from FHWA Desktop Reference for Crash Reduction Factors; CMF applies to crashes within 0.25 miles after a sign

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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	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	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	Assumed; CMF applies to crashes within 0.25 miles after a sign
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)	Assumed; CMF applies to wildlife-related crashes within 0.5 miles both upstream and downstream of the wildlife crossing in both directions

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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 Beacon (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	0.53	CMF Clearinghouse
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	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	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	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	Not expected to reduce crashes

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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	Not expected to reduce crashes
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	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	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	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	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	Assumed to be slightly lower than converting from a 4-lane to a 5-lane highway

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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	Assumed
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)	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)	Removes all train-related crashes at at-grade crossing; all other crashes CMF = 0.72

SOLUTION	2016 CONSTRUCTION UNIT COST	INFLATION FACTOR 2016-2022	2022 CONSTRUCTION UNIT COST	UNIT	FACTOR^	2016 FACTORED CONSTRUCTION UNIT COST	2022 FACTORED CONSTRUCTION UNIT COST	DESCRIPTION	2022 CMF FOR CORRIDOR PROFILE STUDIES	CMF NOTES
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	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	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	Assuming new alignment for a bypass

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
- Buffer Index (PTI-TTI)
- 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

Buffer Index

Buffer Index x 10

Score	Condition
0	Buffer Index = 0.00
0-5	Buffer Index 0.00-0.50
5	Buffer Index > 0.50

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 Buffer Index (TPTI-TTTI)
- 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

Truck Buffer Index

Truck Buffer Index x 10

Score	Condition
0	Buffer Index = 0.00
0-5	Buffer Index 0.00-0.50
5	Buffer Index > 0.50

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	Segment	Bridge	Pavement	Mobility	Safety	Freight
CS191.1A	2,617	16		4,047				393		3	N	10.29	Y	191.3	N	N	N	Y	N
CS191.1B	2,617	16		4,047				393		3	N	10.29	Y	191.3	N	N	N	Y	N
CS70.2	11,553	0.21		2,895				1,502		1	Y	2.85	N	70.6	N	N	N	Y	N
CS70.3A	2,749	5		2,626				687		3	N	11.74	Y	70.9	N	N	N	N	N
CS70.3B	2,749	5		2,626				687		3	N	11.74	Y	70.9	N	N	N	N	N
CS70.4	2,749	18		2,000				687	Y	3	N	5.07	Y	70.10	N	N	Y	Y	N
CS70.5	5,790	15		2,000				984	Y	3	N	10.76	Y	70.12	N	N	Y	Y	N
CS70|60.6	11,143	12		3,500				1,226	Y	3	Y	9.18	N	70|60.13	N	N	Y	Y	Y
CS70|60.7A	11,143	0.5		3,500	8	Y	15.84	1,226	Y	3	Y	9.18	N	70|60.13	N	N	N	Y	Y
CS70|60.7B	11,143	0.5		3,500	8	Y	15.58	1,226	Y	3	Y	9.18	N	70|60.13	N	N	Y	Y	Y
CS60.8	10,128	16		3,500				1,114	Y	5	N	4.82	Y	60.14	N	N	Y	Y	Y
CS60.9A	10,128	0.23	37	3,500	8	Y	15.70	1,114	Y	5	N	4.82	Y	60.14	N	N	N	Y	Y
CS60.9B	10,128	0.23	37	3,500	8	Y	15.70	1,114	Y	5	N	4.82	Y	60.14	N	N	Y	Y	Y
CS60.10	11,048	7		2,156				1,436	Y	3	N	10.06	N	60.17	N	N	Y	Y	Y
CS60.11	14,003	3		1,844				1,820	Y	1	N	8.08	Y	60.18	N	N	Y	Y	Y
CS60.12	18,653	7		1,755				2,052	Y	2	Y	15.05	Y	60.19	N	N	Y	Y	Y
CS60.13	48,507	4.7		1,643				4,366	N	1	N	10	Y	60.20	N	N	Y	Y	Y
CS60.14	48,507	2.7		1,643				4,366	N	1	N	10	Y	60.20	N	N	Y	Y	Y

Solution Number	Bridge	Pavement	Mobility	Safety	Freight	Risk Score (0 to 10)				
						Bridge	Pavement	Mobility	Safety	Freight
CS191.1B	N	N	N	Y	N	0.00	0.00	0.00	0.21	0.00
CS70.2	N	N	N	Y	N	0.00	0.00	0.00	4.72	0.00
CS70.4	N	N	Y	Y	N	0.00	0.00	8.28	2.17	0.00
CS70.5	N	N	Y	Y	N	0.00	0.00	5.67	0.40	0.00
CS70|60.6	N	N	Y	Y	Y	0.00	0.00	6.15	3.03	4.22
CS70|60.7A	N	N	N	Y	Y	0.00	0.00	0.00	3.03	4.22
CS70|60.7B	N	N	Y	Y	Y	0.00	0.00	3.58	3.03	4.22
CS60.8	N	N	Y	Y	Y	0.00	0.00	9.65	3.85	7.48
CS60.9A	N	N	N	Y	Y	0.00	0.00	0.00	3.85	7.48
CS60.9B	N	N	Y	Y	Y	0.00	0.00	6.77	3.85	7.48
CS60.10	N	N	Y	Y	Y	0.00	0.00	5.53	0.69	4.34
CS60.11	N	N	Y	Y	Y	0.00	0.00	6.09	1.60	5.84
CS60.12	N	N	Y	Y	Y	0.00	0.00	6.12	3.03	4.68
CS60.13	N	N	Y	Y	Y	0.00	0.00	3.19	1.69	2.22
CS60.14	N	N	Y	Y	Y	0.00	0.00	2.79	1.69	2.22

Appendix H: Candidate Solution Cost Estimates

Candidate Solution #	Location #	Candidate Solution Name	Investment Category (Preservation [P], Modernization [M], Expansion [E])	Scope	BMP	EMP	Unit	Quantity	Factored Construction Unit Cost	Preliminary Engineering Cost	Design Cost	Right-of-Way Cost ($6/SF for rural areas and $12/SF for urban areas)	Construction Cost	Total Cost	Notes
CS191.A	L5	US191 Pavement Preservation South of Safford	P	Rehabilitate Pavement (AC)	88.0	104.0	mi	32.0	$1,060,000	$1,018,000	$3,392,000	$0	$33,920,000	$38,330,000	Cost only accounts for one direction of travel so quantity is doubled
									Solution Total	**$1,018,000**	**$3,392,000**	**$0**	**$33,920,000**	**$38,330,000**	
CS191.1B			M	Replace Pavement (AC) (with overexcavation)	88.0	104.0	mi	32.0	$5,540,000	$5,318,000	$17,728,000	$0	$177,280,000	$200,326,000	Cost only accounts for one direction of travel so quantity is doubled
									Solution Total	**$5,318,000**	**$17,728,000**	**$0**	**$177,280,000**	**$200,326,000**	
CS70.2	L9	East Safford Safety Improvements	M	Provide flashing traffic signal warning signs at Milepost 337.82 and Milepost 338.03	337.8	338.0	ea	2.0	$41,300	$2,000	$8,000	$0	$82,600	$92,600	In both directions; includes warning sign, post, and foundation, and flashing beacons (assumes solar power) at one location
				Consider installing speed zone signs in both directions at 20th Avenue			ea	1.0	$6,900	$0	$1,000	$0	$6,900	$7,900	
									Solution Total	**$2,000**	**$9,000**	**$0**	**$90,000**	**$101,000**	
CS70.3A	L13	Bylas Area Pavement Preservation	P	Rehabilitate Pavement (AC)	293.0	298.0	mi	10.0	$1,060,000	$318,000	$1,060,000	$0	$10,600,000	$11,978,000	Cost only accounts for one direction of travel so quantity is doubled
									Solution Total	**$318,000**	**$1,060,000**	**$0**	**$10,600,000**	**$11,978,000**	
CS70.3B			M	Replace Pavement (AC) (with overexcavation)	293.0	298.0	mi	10.0	$5,540,000	$1,662,000	$5,540,000	$0	$55,400,000	$62,602,000	Uses "Replace Bridge (Short)" costs from appendix F
									Solution Total	**$1,662,000**	**$5,540,000**	**$0**	**$55,400,000**	**$62,602,000**	
CS70.4	L15	Bylas to Peridot Safety Improvements	M	Widen Shoulders	274.0	278.0	mi	4.0	$980,000	$118,000	$392,000	$0	$3,920,000	$4,430,000	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
				Install shoulder rumble strips MP 275.5-276.5,MP 279.5-287.5	275.5	287.5	mi	18.0	$0	$0	$0	$0	$0	$0	Cost included in widen shoulders solution
				Install centerline rumble strips MP 275.5-276.5,MP 279.5-287.5	275.5	287.5	mi	9.0	$11,000	$3,000	$10,000	$1	$99,000	$112,001	
				Install high visibility striping MP 274-278	274.0	278.0	mi	8.0	$29,700	$7,000	$24,000	$0	$237,600	$268,600	2 edge lines and lane line - one direction of travel

				Improve existing pedestrian / speed warning signs to also include flashing beacons and speed feedback signs	278.5	292.0	ea	3.0	$110,100	$10,000	$33,000	$0	$330,300	$373,300	$68800 FC Unit Cost for Dynamic Speed Feedback sign, $41,300 for flashing beacons
				Construct passing lanes WB	288.2	289.6	mi	1.4	$5,742,000	$241,000	$804,000	$0	$8,038,800	$9,083,800	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls
				Formalize pullouts (signage, ROW for pullouts) (WB MP 274.5 = 9,200 SF, EB MP 279 = 11,900 SF, EB MP 289 = 40,600, WB 292 = 34,000)	274.5	292.0	ea	1.0	$750,000	$23,000	$75,000	$0	$750,000	$848,000	4x pullout costs summed to determine FCU cost. MP 274.5 = $29,000; MP 279 = $105,000; MP 289 = $308,000; MP 292 = $308,000 (using proportions of small, medium, and large formalized pullouts from Appendix F.
									Solution Total	**$402,000**	**$1,338,000**	**$1**	**$13,376,000**	**$15,116,000**	
CS70.5	L19	East of Globe Safety Improvements	M	Widen Shoulders	255.0	270.0	mi	15.0	$980,000	$441,000	$1,470,000	$0	$14,700,000	$16,611,000	
				Install centerline rumble strips MP 255-270	255.0	270.0	mi	15.0	$11,000	$5,000	$17,000	$1	$165,000	$187,001	
				Install improved lighting	269.0	270.0	mi	1.0	$1,034,000	$31,000	$103,000	$0	$1,034,000	$1,168,000	
				Construct passing lane in each direction	255.0	256.0	mi	2.0	$5,742,000	$345,000	$1,148,000	$1	$11,484,000	$12,977,001	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls
				Install warning signs to include flashing beacons and speed feedback signs	273.0	-	ea	1.0	$110,100	$3,000	$11,000	$0	$110,100	$124,100	$68,800 FC Unit Cost for Dynamic Speed Feedback sign, $41,300 for flashing beacons
									Solution Total	**$825,000**	**$2,749,000**	**$2**	**$27,493,000**	**$31,067,000**	
CS70|60.6	L26	Globe Area Safety Improvements	M	Install speed feedback signs (2 EB and 2 WB)	246.0	250.0	ea	4.0	$68,800	$8,000	$28,000	$0	$275,200	$311,200	
				High visibility striping	243.0	255.0	mi	24.0	$29,700	$21,000	$71,000	$0	$712,800	$804,800	2 edge lines and lane line - one direction of travel
				Install warning signs with beacons in advance of SR 188 intersection	247.1	-	ea	2.0	$41,300	$2,000	$8,000	$0	$82,600	$92,600	
				Construct passing lane in each direction MP 243-243.25 and MP 253.6-255	243.0	255.0	mi	3.3	$5,742,000	$568,000	$1,895,000	$1	$18,948,600	$21,411,601	In one direction; all costs except bridges; applicable to areas with small or moderate fills and cuts, minimal retaining walls
									Solution Total	**$599,000**	**$2,002,000**	**$1**	**$20,019,000**	**$22,620,000**	
CS70|60.7	L27		E	Reconstruct Pinal SPRR UP to increase	253.63	253.63	SF	11916.0	$610	$218,000	$727,000	$0	$7,268,760	$8,213,760	**Medium bridge**

		Globe Area Freight Improvements		vertical clearance											
									Solution Total	**$218,000**	**$0**	**$0**	**$7,269,000**	**$8,214,000**	
			M	Reprofile mainline to increase vertical clearance	253.63	253.634	mi	0.5000	$3,730,000	$56,000	$187,000	$1	$1,865,000	$2,108,001	
									Solution Total	**$56,000**	**$0**	**$1**	**$1,865,000**	**$2,108,000**	
CS60.8	L32	Miami Area West Safety Improvements	M	Consider installing speed feedback signs MP 229.9, 236, and 241	229.9	241.0	ea	3.0	$68,800	$6,000	$21,000	$0	$206,400	$233,400	
				Install centerline rumble strips	229.0	231.0	mi	2.0	$11,000	$1,000	$2,000	$0	$22,000	$25,000	
				Install high visibility striping	227.0	243.0	mi	32.0	$29,700	$29,000	$95,000	$0	$950,400	$1,074,400	2 edge lines and lane line - one direction of travel
				Install high visibility delineators MP 228-228.3 & MP 241-242	228.0	242.0	mi	2.6	$17,900	$1,000	$5,000	$1	$46,540	$52,541	Both edges - one direction of travel
				Rehabilitate shoulder	227.0	243.0	mi	32.0	$433,000	$416,000	$1,386,000		$13,856,000	$15,658,000	
									Solution Total	**$453,000**	**$1,509,000**	**$1**	**$15,081,000**	**$17,043,000**	
CS60.9	L34	Miami Area West Freight Improvements	E	Reconstruct Pinal Queen Creek Tunnel to increase vertical clearance	228.47		SF	48341.0	$610	$885,000	$2,949,000	$0	$29,488,010	$33,322,010	**Medium bridge**
									Solution Total	**$885,000**	**$2,949,000**	**$0**	**$29,488,000**	**$33,322,000**	
			M	Reprofile mainline to increase vertical clearance	228.47	228.7	mi	0.5	$3,730,000	$51,000	$172,000		$1,715,800	$1,938,800	
									Solution Total	**$51,000**	**$172,000**	**$0**	**$1,716,000**	**$1,939,000**	
CS60.10	L39	Superior Area Safety Improvements	M	Consider installing speed feedback signs (2 EB and 2 WB)	212.5	-	ea	4.0	$68,800	$8,000	$28,000	$0	$275,200	$311,200	
				Install lighting at N Queen Valley Road and US 60 intersection	214.2	-	ea	2.0	$38,300	$2,000	$8,000	$0	$76,600	$86,600	2 poles for the intersection - 1 each at WB and EB legs; not high-mast; solar power LED
				Install chevrons	219.3	219.7	mi	0.7	$50,600	$1,000	$4,000	$0	$37,444	$42,444	On one side of road - includes signs, posts, and foundations
				Install curve warning sign	219.3	-	ea	1.0	$6,900	$0	$1,000	$0	$6,900	$7,900	Includes 2 signs, posts, and foundations
									Solution Total	**$11,000**	**$41,000**	**$0**	**$396,000**	**$448,000**	
CS60.11	L43	US-60 SW of Gold Canyon Safety Improvements	M	Consider installing speed feedback signs	205.0	208.0	ea	2.0	$68,800	$4,000	$14,000	$0	$137,600	$155,600	
				Install lighting	205.0	207.0	mi	2.0	$1,034,000	$62,000	$207,000	$0	$2,068,000	$2,337,000	One side of road only; offset lighting, not high-mast; does not include power supply; includes poles, luminaire, pull boxes, conduit, conductor

				Widen inside shoulder	208.3	212.0	mi	1.3	$980,000	$38,000	$127,000	$0	$1,274,000	$1,439,000	4' of widening, including paving, striping, high visibility delineators, RPMs, safety edge, and rumble strip
									Solution Total	**$104,000**	**$348,000**	**$0**	**$3,480,000**	**$3,932,000**	
CS60.12	L44	Gold Canyon Area Mobility and Safety Improvements	E	Add SB/EB through lane	199.1	206.0	mi	6.9	$4,590,000	$947,000	$3,158,000	$437,184	$31,579,200	$36,121,384	There are some guardrails in a few places that would need to get moved. Description from Appendix F: "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"
				Widen shoulders	199.1	205.0	mi	5.9	$980,000	$173,000	$576,000	$124,608	$5,762,400	$6,636,008	Assumes 10' of existing shoulder (combined left and right - must be confirmed), 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
				Install speed feedback sign	201.0	-	ea	1.0	$68,800	$2,000	$7,000	$0	$68,800	$77,800	
				Install lighting	201.0	202.0	mi	1.0	$1,034,000	$31,000	$103,000	$0	$1,034,000	$1,168,000	
									Solution Total	**$1,153,000**	**$3,844,000**	**$562,000**	**$38,444,000**	**$44,003,000**	
CS60.13	L46	Apache Junction Area Mobility and Freight Improvements	M	Add through lane in NB/WB direction	194.3	199.0	mi	4.7	$4,590,000	$647,000	$2,157,000	$297,792	$21,573,000	$24,674,792	from Appendix F: "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" Includes two places where existing road passes over surface street and existing structure may not be sufficient
									Solution Total	**$647,000**	**$2,157,000**	**$297,792**	**$21,573,000**	**$24,675,000**	
CS60.14	L47	Apache Junction Area Safety Improvements	M	Consider installing speed feedback signs	195.0	-	ea	2.0	$68,800	$4,000	$14,000	$0	$137,600	$155,600	
				Install inside and edgeline rumble strips	194.3	197.0	mi	5.4	$21,000	$3,000	$11,000	$0	$113,400	$127,400	
									Solution Total	**$7,000**	**$25,000**	**$0**	**$251,000**	**$283,000**	

Appendix I: Performance Effectiveness Scores

Need Reduction

		Solution #	191.1A	191.1B	70.2	70.3A	70.3B	70.4	70.5	70/60.6	70/60.7A	70/60.7B	60.8	60.9A	60.9B
		Description	US191 Pavement Preservation South of Safford	US191 Pavement Preservation South of Safford	Shea Boulevard Safety Improvements	Bylas Area Pavement Preservation	Bylas Area Pavement Preservation	Bylas to Peridot Safety Improvements	East of Globe Safety Improvements	Globe Area Safety Improvements	Globe Area Freight Improvements	Globe Area Freight Improvements	Miami Area West Safety Improvements	Miami Area Freight Improvements	Miami Area Freight Improvements
LEGEND:		Project Beg MP	88	88	338.03	298	298	289.6	270	255	255	255	243	243	243
		Project End MP	104	104	337.82	293	293	288.2	255	243	243	243	227	227	227
		Project Length (miles)	16	16	0.21	5	5	1.4	15	1.65	12	12	16	16	16
		Segment Beg MP	87	87	330	293	293	274	255	243	243	243	227	227	227
		Segment End MP	104	104	339	298	298	293	270	255	255	255	243	243	243
		Segment Length (miles)	17	17	9	5	5	19	15	12	12	12	16	16	16
		Segment #	191-3	191-3	70-6	70-9	70-9	70-10	70-12	70/60-13	70/60-13	70/60-13	60-14	60-14	60-14
		Current # of Lanes (both directions)	4	4	4	2	2	2	2	4	4	4	2	2	2
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)						1	0.25	1					
		Pro-Rated # of Lanes	4.00	4.00	4.00	2.00	2.00	2.07	2.50	4.28	4.00	4.00	2.00	2.00	2.00
		Description													
SAFETY	DIRECTIONAL SAFETY	Orig Segment Directional Safety Index (NB)	0.000	0.000	0.670	insuff data	insuff data	0.760	2.970	3.360	3.360	3.360	1.500	1.500	1.500
		Orig Segment Directional Fatal Crashes (NB)	0	0	1	0	0	1	4	4	4	4	2	2	2
		Orig Segment Directional Suspected Serious Crashes (NB)	0	0	8	0	0	1	0	9	9	9	10	10	10
		Original Fatal Crashes in project limits (NB)	0	0	1	0	0	1	4	4	4	4	2	2	2
		Original Suspected Serious Crashes in project limits (NB)	0	0	5	0	0	1	0	9	9	9	10	10	10
		CMF 1 (NB)(lowest CMF)	0.68	0.7		0.68	0.7				1	0.7		1	0.7
		CMF 2 (NB)	1	1		1	1				1	1		1	1
		CMF 3 (NB)	1	1	Total CMF Calculated in Separate Workbook	1	1	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	1	1	Total CMF Calculated in Separate Workbook	1	1
		CMF 4 (NB)	1	1		1	1				1	1		1	1
		CMF 5 (NB)	1	1		1	1				1	1		1	1
		Total CMF (NB)	0.680	0.700	1.000	0.680	0.700	1.000	1.000	1.000	1.000	0.700	1.000	1.000	0.700
		Fatal Crash reduction (NB)	0.000	0.000	0.000	0.000	0.000	0.467	3.314	1.040	0.000	1.200	0.676	0.000	0.600
		Suspected Serious Crash reduction (NB)	0.000	0.000	0.900	0.000	0.000	0.497	0.000	2.430	0.000	2.700	3.528	0.000	3.000
		Post-Project Segment Directional Fatal Crashes (NB)	0.000	0.000	1.000	0.000	0.000	0.533	0.686	2.960	4.000	2.800	1.324	2.000	1.400
		Post-Project Segment Directional Suspected Serious Crashes (NB)	0.000	0.000	7.100	0.000	0.000	0.503	0.000	6.570	9.000	6.300	6.472	10.000	7.000
		Post-Project Segment Directional Safety Index (NB)	0.000	0.000	0.650	insuff data	insuff data	0.410	0.510	2.480	3.360	2.350	0.990	1.500	1.050
		Post-Project Segment Directional Safety Index (NB)	0.000	0.000	0.650	insuff data	insuff data	0.410	0.510	2.480	3.360	2.350	0.990	1.500	1.050
		Orig Segment Directional Safety Index (SB)	1.180	1.180	0.080	insuff data	insuff data	2.500	2.280	2.570	2.570	2.570	2.070	2.070	2.070
		Orig Segment Directional Fatal Crashes (SB)	1	1	0	1	1	3	3	3	3	3	3	3	3
		Orig Segment Directional Suspected Serious Crashes (SB)	3	3	3	0	0	2	2	8	8	8	11	11	11
		Original Fatal Crashes in project limits (SB)	1	1	0	1	1	3	3	3	3	3	3	3	3
		Original Suspected Serious Crashes in project limits (SB)	3	3	2	0	0	2	2	8	8	8	11	11	11
		CMF 1 (SB)(lowest CMF)	0.68	0.7		0.68	0.7				1	0.7		1	0.7
		CMF 2 (SB)	1	1		1	1				1	1		1	1
		CMF 3 (SB)	1	1	Total CMF Calculated in Separate Workbook	1	1	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	1	1	Total CMF Calculated in Separate Workbook	1	1
		CMF 4 (SB)	1	1		1	1				1	1		1	1
		CMF 5 (SB)	1	1		1	1				1	1		1	1
		Total CMF (SB)	0.680	0.700	1.000	0.680	0.700	1.000	1.000	1.000	1.000	0.700	1.000	1.000	0.700
		Fatal Crash reduction (SB)	0.320	0.300	0.000	0.320	0.300	0.567	2.431	0.690	0.000	0.900	1.163	0.000	0.900
		Suspected Serious Crash reduction (SB)	0.960	0.900	0.000	0.000	0.000	0.497	1.657	2.510	0.000	2.400	7.942	0.000	3.300
		Post-Project Segment Directional Fatal Crashes (SB)	0.680	0.700	0.000	0.680	0.700	2.433	0.569	2.310	3.000	2.100	1.837	3.000	2.100
		Post-Project Segment Directional Suspected Serious Crashes (SB)	2.040	2.100	3.000	0.000	0.000	1.503	0.343	5.490	8.000	5.600	3.058	11.000	7.700
		Post-Project Segment Directional Safety Index (SB)	0.800	0.830	0.080	insuff data	insuff data	2.020	0.430	1.950	2.570	1.800	1.150	2.070	1.450
		Post-Project Segment Directional Safety Index (SB)	0.800	0.830	0.080	insuff data	insuff data	2.020	0.430	1.950	2.570	1.800	1.150	2.070	1.450
	SAFETY INDEX	Current Safety Index	0.590	0.590	0.375	#DIV/0!	#DIV/0!	1.630	2.625	2.965	2.965	2.965	1.785	1.785	1.785
		Post-Project Safety Index	0.400	0.415	0.365	#DIV/0!	#DIV/0!	1.215	0.470	2.215	2.965	2.075	1.070	1.785	1.250
	Needs	Original Segment Safety Need	**0.509**	**0.509**	**0.243**	**0.000**	**0.000**	**5.129**	**9.593**	**11.096**	**11.096**	**11.096**	**6.380**	**6.380**	**6.380**
		Post-Project Segment Safety Need	**0.357**	**0.358**	**0.233**	**insuff data**	**insuff data**	**3.410**	**0.291**	**7.783**	**11.095**	**10.441**	**2.802**	**6.38**	**5.944**

		Solution #	60.10	60.11	60.12	60.13	60.14
		Description	Superior Area Safety Improvements	US-60 SW of Gold Canyon Safety Improvements	Gold Canyon Area Mobility and Safety Improvements	Apache Junction Area Mobility and Freight Improvements	Apache Junction Area Safety Improvements
	LEGEND:	Project Beg MP	212	208	205	199	199
		Project End MP	219	206	199	194.3	194.3
		Project Length (miles)	7	2	6.88	4.7	4.7
		Segment Beg MP	212	205	199	194.3	194.3
		Segment End MP	223	212	205	199	199
		Segment Length (miles)	11	7	6	4.7	4.7
		Segment #	60-17	60-18	60-19	60-20	60-20
		Current # of Lanes (both directions)	4	2	2	2	2
		Project Type (one-way or two-way)	two-way	two-way	one-way	one-way	two-way
		Additional Lanes (one-way)			1	1	
		Pro-Rated # of Lanes	4.00	2.00	3.15	3.00	2.00
		Description					
SAFETY	DIRECTIONAL SAFETY	Orig Segment Directional Safety Index (NB)	1.820	0.910	1.620	1.890	1.890
		Orig Segment Directional Fatal Crashes (NB)	3	1	2	3	3
		Orig Segment Directional Suspected Serious Crashes (NB)	3	3	2	0	0
		Original Fatal Crashes in project limits (NB)	3	1	2	3	3
		Original Suspected Serious Crashes in project limits (NB)	3	2	2	0	0
		CMF 1 (NB)(lowest CMF)	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	0.9	Total CMF Calculated in Separate Workbook
		CMF 2 (NB)				1	
		CMF 3 (NB)				1	
		CMF 4 (NB)				1	
		CMF 5 (NB)				1	
		Total CMF (NB)	1.000	1.000	1.000	0.900	1.000
		Fatal Crash reduction (NB)	0.250	0.060	0.250	0.300	0.330
		Suspected Serious Crash reduction (NB)	0.060	0.940	0.250	0.000	0.000
		Post-Project Segment Directional Fatal Crashes (NB)	2.750	0.940	1.750	2.700	2.670
		Post-Project Segment Directional Suspected Serious Crashes (NB)	2.940	2.060	1.750	0.000	0.000
		Post-Project Segment Directional Safety Index (NB)	1.670	0.790	1.420	1.700	1.690
		Post-Project Segment Directional Safety Index (NB)	1.670	0.790	1.420	1.700	1.690
		Orig Segment Directional Safety Index (SB)	0.650	0.090	0.270	0.690	0.690
		Orig Segment Directional Fatal Crashes (SB)	1	0	0	1	1
		Orig Segment Directional Suspected Serious Crashes (SB)	2	2	6	2	2
		Original Fatal Crashes in project limits (SB)	1	0	0	1	1
		Original Suspected Serious Crashes in project limits (SB)	2	1	6	2	2
		CMF 1 (SB)(lowest CMF)	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	Total CMF Calculated in Separate Workbook	0.9	Total CMF Calculated in Separate Workbook
		CMF 2 (SB)				1	
		CMF 3 (SB)				1	
		CMF 4 (SB)				1	
		CMF 5 (SB)				1	
		Total CMF (SB)	1.000	1.000	1.000	0.900	1.000
		Fatal Crash reduction (SB)	0.527	0.000	0.000	0.100	0.110
		Suspected Serious Crash reduction (SB)	0.000	0.630	2.580	0.200	0.280
		Post-Project Segment Directional Fatal Crashes (SB)	0.473	0.000	0.000	0.900	0.890
		Post-Project Segment Directional Suspected Serious Crashes (SB)	2.000	1.370	3.420	1.800	1.720
		Post-Project Segment Directional Safety Index (SB)	0.330	0.090	0.150	0.620	0.610
		Post-Project Segment Directional Safety Index (SB)	0.330	0.090	0.150	0.620	0.610
	SAFETY INDEX	Current Safety Index	1.235	0.500	0.945	1.290	1.290
		Post-Project Safety Index	1.000	0.440	0.785	1.160	1.150
	Needs	Original Segment Safety Need	**3.111**	**0.318**	**1.023**	**2.515**	**2.515**
		Post-Project Segment Safety Need	**1.858**	**0.281**	**0.812**	**2.440**	**2.038**

		191.1A	191.1B	70.2	70.3A	70.3B	70.4	70.5	70/60.6	70/60.7A	70/60.7B	60.8	60.9A	60.9B
	Solution #	191.1A	191.1B	70.2	70.3A	70.3B	70.4	70.5	70/60.6	70/60.7A	70/60.7B	60.8	60.9A	60.9B
	Description	US191 Pavement Preservation South of Safford	US191 Pavement Preservation South of Safford	Shea Boulevard Safety Improvements	Bylas Area Pavement Preservation	Bylas Area Pavement Preservation	Bylas to Peridot Safety Improvements	East of Globe Safety Improvements	Globe Area Safety Improvements	Globe Area Freight Improvements	Globe Area Freight Improvements	Miami Area West Safety Improvements	Miami Area Freight Improvements	Miami Area Freight Improvements
LEGEND:	Project Beg MP	88	88	338.03	298	298	289.6	270	255	255	255	243	243	243
	Project End MP	104	104	337.82	293	293	288.2	255	243	243	243	227	227	227
	Project Length (miles)	16	16	0.21	5	5	1.4	15	1.65	12	12	16	16	16
	Segment Beg MP	87	87	330	293	293	274	255	243	243	243	227	227	227
	Segment End MP	104	104	339	298	298	293	270	255	255	255	243	243	243
	Segment Length (miles)	17	17	9	5	5	19	15	12	12	12	16	16	16
	Segment #	191-3	191-3	70-6	70-9	70-9	70-10	70-12	70/60-13	70/60-13	70/60-13	60-14	60-14	60-14
	Current # of Lanes (both directions)	4	4	4	2	2	2	2	4	4	4	2	2	2
	Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
	Additional Lanes (one-way)	0	0	0	0	0	1	0.25	1	0	0	0	0	0
	Pro-Rated # of Lanes	4.00	4.00	4.00	2.00	2.00	2.07	2.50	4.28	4.00	4.00	2.00	2.00	2.00
	Description													
MOBILITY INDEX	Original Segment Mobility Index	0.050	0.050	0.410	0.240	0.240	0.150	0.240	0.400	0.400	0.400	1.420	1.420	1.420
	Post-Project # of Lanes (both directions)	4.00	4.00	4.00	2.00	2.00	2.07	2.50	4.28	4.00	4.00	2.00	2.00	2.00
	Post-Project Segment Mobility Index	0.05	0.05	0.41	0.24	0.24	0.15	0.19	0.37	0.40	0.40	1.42	1.42	1.42
	Post-Project Segment Mobility Index	0.050	0.050	0.410	0.240	0.240	0.150	0.190	0.370	0.400	0.400	1.420	1.420	1.420
FUT V/C	Original Segment Future V/C	0.050	0.050	0.450	0.260	0.260	0.170	0.270	0.450	0.450	0.450	1.710	1.710	1.710
	Post-Project Segment Future V/C	0.050	0.050	0.450	0.260		0.170	0.210	0.420	0.450	0.450	1.710	1.710	1.710
	Post-Project Segment Future V/C	0.050	0.050	0.450	0.260	0.000	0.170	0.210	0.420	0.450	0.450	1.710	1.710	1.710
PEAK HOUR V/C	Original Segment Peak Hour V/C (NB)	0.030	0.030	0.310	0.160	0.160	0.110	0.160	0.260	0.260	0.260	0.790	0.790	0.790
	Original Segment Peak Hour V/C (SB)	0.030	0.030	0.290	0.120	0.120	0.080	0.170	0.250	0.250	0.250	1.140	1.140	1.140
	Adjusted total # of Lanes for use in directional peak hr	N/A	N/A	N/A	N/A	N/A	2.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Post-Project Segement Peak Hr V/C (NB)	0.030	0.030	0.310	0.160	0.160	0.100	0.130	0.24	0.26	0.26	0.79	0.79	0.79
	Post-Project Segement Peak Hr V/C (SB)	0.030	0.030	0.290	0.120	0.120	0.070	0.140	0.24	0.25	0.25	1.14	1.14	1.14
	Post-Project Segment Peak Hr V/C (NB)	0.030	0.030	0.310	0.160	0.160	0.100	0.130	0.240	0.260	0.260	0.790	0.790	0.790
	Post-Project Segment Peak Hr V/C (SB)	0.030	0.030	0.290	0.120	0.120	0.070	0.140	0.240	0.250	0.250	1.140	1.140	1.140
LOTTR	Safety Reduction Factor	0.678	0.703	0.973	#DIV/0!	#DIV/0!	0.745	0.179	0.747	1.000	0.700	0.599	1.000	0.700
	Safety Reduction	0.322	0.297	0.027	#DIV/0!	#DIV/0!	0.255	0.821	0.253	0.000	0.300	0.401	0.000	0.300
	Mobility Reduction Factor	1.000	1.000	1.000	1.000	1.000	1.000	0.792	0.925	1.000	1.000	1.000	1.000	1.000
	Mobility Reduction	0.000	0.000	0.000	0.000	0.000	0.000	0.208	0.075	0.000	0.000	0.000	0.000	0.000
	Mobility effect on LOTTR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
	Safety effect on LOTTR	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
	Original Directional Segment LOTTR (NB)	no data	no data	no data	no data	no data	no data	no data	1.160	1.160	1.160	1.120	1.120	1.120
	Original Directional Segment LOTTR (SB)	no data	no data	no data	no data	no data	no data	no data	1.150	1.150	1.150	1.170	1.170	1.170
	Reduction Factor for Segment LOTTR	0.097	0.089	0.008	#DIV/0!	#DIV/0!	0.076	0.288	0.091	0.000	0.090	0.120	0.000	0.090
	Post-Project Directional Segment LOTTR (NB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.055	1.160	1.056	1.060	1.120	1.019
	Post-Project Directional Segment LOTTR (SB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	no data	#VALUE!	1.045	1.150	1.046	1.029	1.17	1.06
CLOSURE EXTENT	Orig Segment Directional Closure Extent (NB)	0.020	0.020	0.020	0.040	0.040	0.070	0.170	0.220	0.220	0.220	0.670	0.670	0.670
	Orig Segment Directional Closure Extent (SB)	0.000	0.000	0.040	0.040	0.040	0.050	0.000	0.350	0.350	0.350	1.840	1.840	1.840
	Segment Closures with fatalities/injuries	0	0	0	0	0	1	0	6	6	6	12	12	12
	Total Segment Closures	2	2	3	2	2	12	3	29	29	29	99	99	99
	% Closures with Fatality/Injury	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.21	0.21	0.21	0.12	0.12	0.12
	Closure Reduction	0.000	0.000	0.000	#DIV/0!	#DIV/0!	0.021	0.000	0.052	0.000	0.062	0.049	0.000	0.036
	Closure Reduction Factor	1.000	1.000	1.000	#DIV/0!	#DIV/0!	0.979	1.000	0.948	1.000	0.938	0.951	1.000	0.964
	Post-Project Segment Directional Closure Extent (NB)	0.020	0.020	0.020	#DIV/0!	#DIV/0!	0.069	0.170	0.208	0.220	0.206	0.637	0.670	0.646
	Post-Project Segment Directional Closure Extent (SB)	0.000	0.000	0.040	#DIV/0!	#DIV/0!	0.050	0.000	0.332	0.350	0.328	1.751	1.840	1.773
BICYCLE ACCOM	Orig Segment Bicycle Accomodation %	49.0%	49.0%	46.0%	26.0%	26.0%	4.0%	23.0%	54.0%	54.0%	54.0%	49.0%	49.0%	49.0%
	Orig Segment Outside Shoulder width	10.3	10.3	2.9	5.9	5.9	5.1	5.4	4.6	4.6	4.6	4.8	4.8	4.8
	Post-Project Segment Outside Shoulder width	10.3	10.3	2.9	5.9	5.9	5.1	5.4	4.6	4.6	4.6	4.8	49.0	4.8
	Post-Project Segment Bicycle Accomodation (%)	49.0%	49.0%	46.0%	26.0%	26.0%	4.0%	23.0%	54.0%	54.0%	54.0%	49.0%	4.8%	49.0%
	Post-Project Segment Bicycle Accomodation (%)	49.0%	49.0%	46.0%	26.0%	26.0%	4.0%	23.0%	54.0%	54.0%	54.0%	49.0%	4.8%	49.0%
Needs	Original Segment Mobility Need	**0.562**	**0.562**	**0.888**	**0.863**	**0.863**	**0.862**	**0.894**	**0.983**	**0.983**	**0.983**	**10.954**	**10.954**	**10.954**
	Post-Project Segment Mobility Need	**0.562**	**0.562**	**0.888**	**0.863**	**0.863**	**0.860**	**0.839**	**0.946**	**0.983**	**0.970**	**10.901**	**10.954**	**10.913**

	60.10	60.11	60.12	60.13	60.14
	Superior Area Safety Improvements	US-60 SW of Gold Canyon Safety Improvements	Gold Canyon Area Mobility and Safety Improvements	Apache Junction Area Mobility and Freight Improvements	Apache Junction Area Safety Improvements
LEGEND:	212	208	205	199	199
	219	206	199	194.3	194.3
	7	2	6.88	4.7	4.7
	212	205	199	194.3	194.3
	223	212	205	199	199
	11	7	6	4.7	4.7
	60-17	60-18	60-19	60-20	60-20
	4	2	2	2	2
	two-way	two-way	one-way	one-way	two-way
	0	0	1	1	0
	4.00	2.00	3.15	3.00	2.00
MOBILITY INDEX	0.260	0.530	1.010	1.310	1.310
	4.00	2.00	3.15	3.00	2.00
	0.26	0.53	0.64	0.87	1.31
	0.260	0.530	0.640	0.870	1.310
FUT V/C	0.370	0.660	0.860	1.450	1.450
	0.370	0.660	0.550	0.960	1.450
	0.370	0.660	0.550	0.960	1.450
PEAK HOUR V/C	0.150	0.300	0.860	0.840	0.840
	0.140	0.320	0.910	0.880	0.880
	N/A	N/A	4.29	4.00	N/A
	0.15	0.30	0.54	0.56	0.84
	0.14	0.32	0.58	0.58	0.88
	0.150	0.300	0.540	0.560	0.840
	0.140	0.320	0.580	0.580	0.880
LOTTR	0.810	0.880	0.831	0.899	0.891
	0.190	0.120	0.169	0.101	0.109
	1.000	1.000	0.634	0.664	1.000
	0.000	0.000	0.366	0.336	0.000
	0.20	0.20	0.20	0.20	0.20
	0.30	0.30	0.30	0.30	0.30
	1.050	1.120	1.200	1.060	1.060
	1.090	1.050	1.140	1.060	1.060
	0.057	0.036	0.124	0.097	0.033
	1.025	1.080	1.051	1.030	1.025
	1.028	1.012	1.140	1.060	1.025
CLOSURE EXTENT	0.040	0.000	0.100	0.680	0.680
	0.230	0.230	0.300	0.090	0.090
	3	2	3	4	4
	12	8	12	18	18
	0.25	0.25	0.25	0.22	0.22
	0.048	0.030	0.042	0.022	0.024
	0.952	0.970	0.958	0.978	0.976
	0.038	0.000	0.096	0.665	0.664
	0.219	0.223	0.300	0.090	0.088
BICYCLE ACCOM	96.0%	100.0%	42.0%	100.0%	100.0%
	10.1	8.1	7.5	10.0	10.0
	10.1	8.1	7.5	10.0	
	96.0%	100.0%	42.0%	100.0%	
	96.0%	100.0%	42.0%	100.0%	0.0%
Needs	**0.431**	**0.790**	**4.421**	**7.502**	**7.502**
	0.426	**0.786**	**1.233**	**2.736**	**7.493**

		Solution #	**191.1A**	**191.1B**	**70.2**	**70.3A**	**70.3B**	**70.4**	**70.5**	**70/60.6**	**70/60.7A**	**70/60.7B**	**60.8**	**60.9A**	**60.9B**
		Description	US191 Pavement Preservation South of Safford	US191 Pavement Preservation South of Safford	Shea Boulevard Safety Improvements	Bylas Area Pavement Preservation	Bylas Area Pavement Preservation	Bylas to Peridot Safety Improvements	East of Globe Safety Improvements	Globe Area Safety Improvements	Globe Area Freight Improvements	Globe Area Freight Improvements	Miami Area West Safety Improvements	Miami Area Freight Improvements	Miami Area Freight Improvements
	LEGEND:	Project Beg MP	88	88	338.03	298	298	289.6	270	255	255	255	243	243	243
		Project End MP	104	104	337.82	293	293	288.2	255	243	243	243	227	227	227
		Project Length (miles)	16	16	0.21	5	5	1.4	15	1.65	12	12	16	16	16
		Segment Beg MP	87	87	330	293	293	274	255	243	243	243	227	227	227
		Segment End MP	104	104	339	298	298	293	270	255	255	255	243	243	243
		Segment Length (miles)	17	17	9	5	5	19	15	12	12	12	16	16	16
		Segment #	191-3	191-3	70-6	70-9	70-9	70-10	70-12	70/60-13	70/60-13	70/60-13	60-14	60-14	60-14
		Current # of Lanes (both directions)	4	4	4	2	2	2	2	4	4	4	2	2	2
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	1	0.25	1	0	0	0	0	0
		Pro-Rated # of Lanes	4.00	4.00	4.00	2.00	2.00	2.07	2.50	4.28	4.00	4.00	2.00	2.00	2.00
		Description													
Freight	**TTTR**	Mobility effect on TTTR	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
		Safety effect on TTTR	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
		Original Directional Segment TTTR (NB)	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	1.670	1.670	1.670	1.520	1.520	1.520
		Original Directional Segment TTTR (SB)	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	1.150	1.490	1.490	1.460	1.460	1.460
		Reduction Factor for Segment TTTR (both directions)	0.048	0.044	0.004	#DIV/0!	#DIV/0!	0.038	0.144	0.045	0.000	0.045	0.060	0.000	0.045
		Post-Project Directional Segment TTTR (NB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.594	1.670	1.595	1.429	1.520	1.452
		Post-Project Directional Segment TTTR (SB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	insuff data	#VALUE!	1.098	1.490	1.423	1.372	1.460	1.394
	FREIGHT INDEX	Original Segment MAX TTTR (NB)	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	1.670	1.670	1.670	1.520	1.520	1.520
		Original Segment MAX TTTR (SB)	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	insuff data	1.150	1.490	1.490	1.460	1.460	1.460
		Original Segment Freight Index	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	1.4100	1.5800	1.5800	1.4900	1.4900	1.4900
		Post-Project Segment MAX TTTR (NB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.594	1.670	1.595	1.429	1.520	1.452
		Post-Project Segment MAX TTTR (SB)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	insuff data	#VALUE!	1.098	1.490	1.423	1.372	1.460	1.394
		Post-Project Segment Freight Index	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	1.346	1.580	1.509	1.400	1.490	1.423
	CLOSURE DURATION	Orig Segment Directional Closure Duration (dir 1)	2.470	2.470	1.330	2.400	2.400	8.630	17.390	22.750	22.750	22.750	63.600	63.600	63.600
		Orig Segment Directional Closure Duration (dir 2)	0.000	0.000	4.670	3.000	3.000	2.510	0.000	26.520	26.520	26.520	344.950	344.950	344.950
		Segment Closures with fatalities	0	0	0	0	0	1	0	6	6	6	12	12	12
		Total Segment Closures	2	2	3	2	2	12	3	29	29	29	99	99	99
		% Closures with Fatality	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.21	0.21	0.21	0.12	0.12	0.12
		Closure Reduction	0.000	0.000	0.000	#DIV/0!	#DIV/0!	0.021	0.000	0.052	0.000	0.062	0.049	0.000	0.036
		Closure Reduction Factor	1.000	1.000	1.000	#DIV/0!	#DIV/0!	0.979	1.000	0.948	1.000	0.938	0.951	1.000	0.964
		Post-Project Segment Directional Closure Duration (NB)	2.470	2.470	1.330	#DIV/0!	#DIV/0!	8.447	17.390	21.559	22.750	21.337	60.512	63.600	61.289
		Post-Project Segment Directional Closure Duration (SB)	0.000	0.000	4.670	#DIV/0!	#DIV/0!	2.510	0.000	25.132	26.520	24.873	328.202	344.950	332.418
	VERT CLR	Original Segment Vertical Clearance	No Up	No Up	No Up	None	None	No Up	No Up	15.84	15.84	15.84	13.03	13.03	13.03
		Original vertical clearance for specific bridge	No Up	No Up	No Up	None	None	No Up	No Up	15.84	15.84	15.84	13.03	13.03	13.03
		Post-Project vertical clearance for specific bridge	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	16.50	16.09	No Change	16.50	13.28
		Post-Project Segment Vertical Clearance	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	16.50	16.09	No Change	16.50	13.28
		Post-Project Segment Vertical Clearance	No Change	No Change	No Change	No Change	No Change	No Change	No Change	No Change	16.50	16.09	No Change	16.50	13.28
	Needs	Original Segment Freight Need	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**1.178**	**1.178**	**1.178**	**4.875**	**4.875**	**4.875**
		Post-Project Segment Freight Need	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**0.642**	**0.728**	**0.818**	**4.007**	**4.368**	**4.218**

		Solution #	**191.1A**	**191.1B**	**70.2**	**70.3A**	**70.3B**	**70.4**	**70.5**	**70/60.6**	**70/60.7A**	**70/60.7B**	**60.8**	**60.9A**	**60.9B**	**60.1**
		Description	US191 Pavement Preservation South of Safford	US191 Pavement Preservation South of Safford	Shea Boulevard Safety Improvement	Bylas Area Pavement Preservation	Bylas Area Pavement Preservation	Bylas to Peridot Safety Improvements	East of Globe Safety Improvements	Globe Area Safety Improvements	Globe Area Freight Improvements	Globe Area Freight Improvements	Miami Area West Safety Improvements	Miami Area Freight Improvements	Miami Area Freight Improvements	Superior Area Safety Improvements
	LEGEND:	Project Beg MP	88	88	338.03	298	298	289.6	270	255	255	255	243	243	243	212
		Project End MP	104	104	337.82	293	293	288.2	255	243	243	243	227	227	227	219
		Project Length (miles)	16	16	-0.21	-5	-5	-1.4	-15	-12	-12	-12	-16	-16	-16	7
		Segment Beg MP	87	87	330	293	293	274	255	243	243	243	227	227	227	212
		Segment End MP	104	104	339	298	298	293	270	255	255	255	243	243	243	223
		Segment Length (miles)	17	17	9	5	5	19	15	12	12	12	16	16	16	11
		Segment #	191-3	191-3	70-6	70-9	70-9	70-10	70-12	70/60-13	70/60-13	70/60-13	60-14	60-14	60-14	60-17
		Current # of Lanes (both directions)	4	4	4	2	2	2	2	4	4	4	2	2	2	4
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	1	0.25	1	0	0	0	0	0	0
		Pro-Rated # of Lanes	4.00	4.00	4.00	2.00	2.00	1.93	1.50	2.00	4.00	4.00	2.00	2.00	2.00	4.00
		Description														
BRIDGE	BRIDGE INDEX	Original Segment Bridge Index														
		Original lowest rating for specific bridge														
		Post-Project lowest rating for specific bridge														
		Post-Project lowest rating for specific bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Segment Bridge Index														
		Post-Project Segment Bridge Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SUFF RATING	Original Segment Sufficiency Rating														
		Original Sufficiency Rating for specific bridge														
		Post-Project Sufficiency Rating for specific bridge														
		Post-Project Sufficiency Rating for specific bridge	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Post-Project Segment Sufficiency Rating														
		Post-Project Segment Sufficiency Rating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	BR RTNG	Original Segment Bridge Rating														
		Post-Project Segment Bridge Rating														
		Post-Project Segment Bridge Rating	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Needs	Original Segment Bridge Need														
		Post-Project Segment Bridge Need														

		Solution #	191.1A	191.1B	70.2	70.3A	70.3B	70.4	70.5	70/60.6	70/60.7A	70/60.7B	60.8	60.9A	60.9B	60.1
		Description	US191 Pavement Preservation South of Safford	US191 Pavement Preservation South of Safford	Shea Boulevard Safety Improvements	Bylas Area Pavement Preservation	Bylas Area Pavement Preservation	Bylas to Peridot Safety Improvements	East of Globe Safety Improvements	Globe Area Safety Improvements	Globe Area Freight Improvements	Globe Area Freight Improvements	Miami Area West Safety Improvements	Miami Area Freight Improvements	Miami Area Freight Improvements	Superior Area Safety Improvements
	LEGEND:	Project Beg MP	88	88	338.03	298	298	289.6	270	255	255	255	243	243	243	212
		Project End MP	104	104	337.82	293	293	288.2	255	243	243	243	227	227	227	219
		Project Length (miles)	16	16	0.21	5	5	1.4	15	1.65	12	12	16	16	16	7
		Segment Beg MP	87	87	330	293	293	274	255	243	243	243	227	227	227	212
		Segment End MP	104	104	339	298	298	293	270	255	255	255	243	243	243	223
		Segment Length (miles)	17	17	9	5	5	19	15	12	12	12	16	16	16	11
		Segment #	191-3	191-3	70-6	70-9	70-9	70-10	70-12	70/60-13	70/60-13	70/60-13	60-14	60-14	60-14	60-17
		Current # of Lanes (both directions)	4	4	4	2	2	2	2	4	4	4	2	2	2	4
		Project Type (one-way or two-way)	two-way	two-way	two-way	two-way	two-way	one-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way	two-way
		Additional Lanes (one-way)	0	0	0	0	0	1	0.25	1	0	0	0	0	0	0
		Pro-Rated # of Lanes	4.00	4.00	4.00	2.00	2.00	2.07	2.50	4.28	4.00	4.00	2.00	2.00	2.00	4.00
		Description														
PAVEMENT	PAVEMENT INDEX	Original Segment Pavement Index		3.42												
		Original Segment IRI in project limits		80.73												
		Original Segment Cracking in project limits		11.44												
		Original Segment Rutting in project limits		0.15												
		Post-Project IRI in project limits		30												
		Post-Project IRI in project limits	0	30	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Cracking in project limits		0												
		Post-Project Cracking in project limits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Rutting in project limits		0												
		Post-Project Rutting in project limits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Segment Pavement Index		4.28												
		Post-Project Segment Pavement Index	0	4.28	0	0	0	0	0	0	0	0	0	0	0	0
	DIRECTION PSR	Original Segment Directional PSR (NB)		3.63												
		Original Segment Directional PSR (SB)		3.69												
		Original Segment IRI in project limits	0	80.73	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project directional IRI in project limits	0	30	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Segment Directional PSR (NB)		4.46												
		Post-Project Segment Directional PSR (SB)		4.46												
		Post-Project Segment Directional PSR (NB)	0	4.46	0	0	0	0	0	0	0	0	0	0	0	0
		Post-Project Segment Directional PSR (SB)	0	4.46	0	0	0	0	0	0	0	0	0	0	0	0
	% FAIL	Original Segment % Failure		72.0%												
		Post-Project Segment % Failure		32.0%												
		Post-Project Segment % Failure	0.0%	32.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Needs	Original Segment Pavement Need		**1.802**												
		Post-Project Segment Pavement Need		**0.6**												

CMF Application

US 6070191| Corridor Profile Study
CMF Application

=user input

CS70.2 (MP 298-293)

							Effective	Crashes in Segment Limits		Crashes in Solution Limits		Post-Solution Crashes		Total Crash Reduction	
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap	Fatal	Incap
337.82	337.82	0.61	1.00	1.00	1.00	NB	0.610			0	1	0.000	0.610	0.000	0.390
337.82	337.82	0.61	1.00	1.00	1.00	SB	0.610			0	0	0.000	0.000	0.000	0.000
338.03	338.03	0.61	1.00	1.00	1.00	NB	0.610			0	1	0.000	0.610	0.000	0.390
338.03	338.03	0.61	1.00	1.00	1.00	SB	0.610			0	0	0.000	0.000	0.000	0.000
20th ave	20th ave	0.94	1.00	1.00	1.00	NB	0.940			0	2	0.000	1.880	0.000	0.120
20th ave	20th ave	0.94	1.00	1.00	1.00	SB	0.940			0	0	0.000	0.000	0.000	0.000
						NB/WB		1	2	0	4	**1.000**	**1.100**	0.000	0.900
						SB/EB		1	3	0	0	**1.000**	**3.000**	0.000	0.000

CS70.4 (MP 293-274)

							Effective	Crashes in Segment Limits		Crashes in Solution Limits		Post-Solution Crashes		Total Crash Reduction	
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap	Fatal	Incap
274	278	0.68	0.77	0.77	1.00	NB	0.532593			1	1	0.533	0.533	0.467	0.467
274	278	0.68	0.77	0.77	1.00	SB	0.532593			0	1	0.000	0.533	0.000	0.467
275.5	276.5	0.85	0.89	1.00	1.00	NB	0.80325			0	0	0.000	0.000	0.000	0.000
275.5	276.5	0.85	0.89	1.00	1.00	SB	0.80325			0	0	0.000	0.000	0.000	0.000
279.5	287.5	0.85	0.89	1.00	1.00	NB	0.80325			0	0	0.000	0.000	0.000	0.000
279.5	287.5	0.85	0.89	1.00	1.00	SB	0.80325			1	0	0.803	0.000	0.197	0.000
292	292	0.75	0.94	1.00	1.00	NB	0.7275			0	0	0.000	0.000	0.000	0.000
292	292	0.75	0.94	1.00	1.00	SB	0.7275			0	0	0.000	0.000	0.000	0.000
280	280	0.75	0.94	1.00	1.00	NB	0.7275			0	0	0.000	0.000	0.000	0.000
280	280	0.75	0.94	1.00	1.00	SB	0.7275			0	0	0.000	0.000	0.000	0.000
278.5	278.5	0.75	0.94	1.00	1.00	NB	0.7275			0	0	0.000	0.000	0.000	0.000
278.5	278.5	0.75	0.94	1.00	1.00	SB	0.7275			0	0	0.000	0.000	0.000	0.000
282	288	0.63	1.00	1.00	1.00	NB	0.63			0	0	0.000	0.000	0.000	0.000
282	288	0.63	1.00	1.00	1.00	SB	0.63			1	0	0.630	0.000	0.370	0.000
274.5	274.5	0.97	1.00	1.00	1.00	WB	0.97			0	1	0.000	0.970	0.000	0.030
279	279	0.97	1.00	1.00	1.00	EB	0.97			0	0	0.000	0.000	0.000	0.000
289	289	0.97	1.00	1.00	1.00	EB	0.97			0	1	0.000	0.970	0.000	0.030
292	292	0.97	1.00	1.00	1.00	WB	0.97			0	0	0.000	0.000	0.000	0.000
						NB/WB		1	1	2	2	**0.533**	**0.503**	0.467	0.497
						SB/EB		3	2	1	2	**2.433**	**1.503**	0.567	0.497

CS70.5 (MP 270-255)

							Effective	Crashes in Segment Limits		Crashes in Solution Limits		Post-Solution Crashes		Total Crash Reduction	
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap	Fatal	Incap
255	270	0.68	0.85	1	1.00	NB	0.629			4	0	2.516	0.000	1.484	0.000
255	270	0.68	0.85	1	1.00	SB	0.629			3	2	1.887	1.258	1.113	0.742
255	256	0.63	1	1	1.00	NB	0.630			2	0	1.260	0.000	0.740	0.000
255	256	0.63	1	1	1.00	SB	0.630			0	1	0.000	0.630	0.000	0.370
269	270	0.75	1.00	1.00	1.00	NB	0.750			0	0	0.000	0.000	0.000	0.000
269	270	0.75	1.00	1.00	1.00	SB	0.750			2	0	1.500	0.000	0.500	0.000
255	270	0.75	0.94	1.00	1.00	NB	0.728			4	0	2.910	0.000	1.090	0.000
255	270	0.75	0.94	1.00	1.00	SB	0.728			3	2	2.183	1.455	0.818	0.545
						NB/WB						**-3.314**	**0.000**	3.314	0.000
						SB/EB						**-2.431**	**-1.657**	2.431	1.657

CS70|60.6 (MP255-243)

							Effective	Crashes in Segment Limits		Crashes in Solution Limits		Post-Solution Crashes		Total Crash Reduction	
BMP	EMP	CMF1	CMF2	CMF3	CMF4	Dir	CMF	Fatal	Incap	Fatal	Incap	Fatal	Incap	Fatal	Incap
246	250	0.94	1.00	1.00	1.00	EB	0.940			0	5	0.000	4.700	0.000	0.300
246	250	0.94	1.00	1.00	1.00	WB	0.940			2	6	1.880	5.640	0.120	0.360
243	255	0.77	1.00	1.00	1.00	NB	0.770			4	9	3.080	6.930	0.920	2.070
243	255	0.77	1.00	1.00	1.00	SB	0.770			3	8	2.310	6.160	0.690	1.840
SR188 INTER.	SR188 INTER.	0.75	1.00	1.00	1.00	NB	0.750			0	0	0.000	0.000	0.000	0.000
SR188 INTER.	SR188 INTER.	0.75	1.00	1.00	1.00	SB	0.750			0	0	0.000	0.000	0.000	0.000
243	243.25	0.63	1.00	1.00	1.00	NB	0.630			0	0	0.000	0.000	0.000	0.000
243	243.25	0.63	1.00	1.00	1.00	SB	0.630			0	0	0.000	0.000	0.000	0.000
253.6	255	0.63	1.00	1.00	1.00	NB	0.630			0	0	0.000	0.000	0.000	0.000
253.6	255	0.63	1.00	1.00	1.00	SB	0.630			0	1	0.000	0.630	0.000	0.370
						NB/WB						**-1.040**	**-2.430**	1.040	2.430
						SB/EB						**-0.690**	**-2.510**	0.690	2.510

CS60.8 (MP 243-227)

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 Reductior Fatal	Total Crash Reductior Incap
229.9	229.9	0.94	1.00	1.00	1.00	NB	0.940			0	0	0.000	0.000	0.000	0.000
229.9	229.9	0.94	1.00	1.00	1.00	SB	0.940			0	1	0.000	0.940	0.000	0.060
236	236	0.94	1.00	1.00	1.00	NB	0.940			0	0	0.000	0.000	0.000	0.000
236	236	0.94	1.00	1.00	1.00	SB	0.940			0	0	0.000	0.000	0.000	0.000
241	241	0.94	1.00	1.00	1.00	NB	0.940			0	0	0.000	0.000	0.000	0.000
241	241	0.94	1.00	1.00	1.00	SB	0.940			0	0	0.000	0.000	0.000	0.000
229	231	0.85	1.00	1.00	1.00	NB	0.850			0	1	0.000	0.850	0.000	0.150
229	231	0.85	1.00	1.00	1.00	SB	0.850			1	3	0.850	2.550	0.150	0.450
227	243	0.77	0.72	1.00	1.00	NB	0.662			2	10	1.324	6.622	0.676	3.378
227	243	0.77	0.72	1.00	1.00	SB	0.662			3	22	1.987	14.568	1.013	7.432
						NB/WB						**-0.676**	**-3.528**	0.676	3.528
						SB/EB						**-1.163**	**-7.942**	1.163	7.942

CS60.10 (MP 223-212)

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 Reductior Fatal	Total Crash Reductior Incap
Queen Valley	US60	0.75	1.00	1.00	1.00	ntersectior	0.750			1	0	0.750	0.000	0.250	0.000
212.5	212.5	0.94	1.00	1.00	1.00	NB	0.940			0	1	0.000	0.940	0.000	0.060
212.5	212.5	0.94	1.00	1.00	1.00	SB	0.940			0	0	0.000	0.000	0.000	0.000
219.33	219.33	0.79	0.83	1.00	1.00	NB	0.723			0	0	0.000	0.000	0.000	0.000
219.33	219.33	0.79	0.83	1.00	1.00	SB	0.723			1	0	0.723	0.000	0.277	0.000
						NB/WB						**-0.250**	**-0.060**	0.250	0.060
						SB/EB						**-0.527**	**0.000**	0.527	0.000

CS60.11 (MP 208-206)

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 Reductior Fatal	Total Crash Reductior Incap
205	207	0.75	1.00	1.00	1.00	NB	0.750			0	2	0.000	1.500	0.000	0.500
205	207	0.75	1.00	1.00	1.00	SB	0.750			0	1	0.000	0.750	0.000	0.250
206	208	0.94	1.00	1.00	1.00	NB	0.940			1	2	0.940	1.880	0.060	0.120
206	208	0.94	1.00	1.00	1.00	SB	0.940			0	1	0.000	0.940	0.000	0.060
208.3	212	0.68	1.00	1.00	1.00	NB	0.680			0	1	0.000	0.680	0.000	0.320
208.3	212	0.68	1.00	1.00	1.00	SB	0.680			0	1	0.000	0.680	0.000	0.320
						NB/WB						**-0.060**	**-0.940**	0.060	0.940
						SB/EB						**0.000**	**-0.630**	0.000	0.630

CS60.12 (MP 205-199)

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 Reductior Fatal	Total Crash Reductior Incap
199.12	205	0.68	0.90	1.00	1.00	SB/EB	0.646			0	5	0.000	3.230	0.000	1.770
199.12	205	0.68	1.00	1.00	1.00	NB	0.680			2	2				
201	201	0.94	1.00	1.00	1.00	NB	0.940			0	0	0.000	0.000	0.000	0.000
201	201	0.94	1.00	1.00	1.00	SB	0.940			0	1	0.000	0.940	0.000	0.060
201	202	0.75	1.00	1.00	1.00	NB	0.750			1	1	0.750	0.750	0.250	0.250
201	202	0.75	1.00	1.00	1.00	SB	0.750			0	3	0.000	2.250	0.000	0.750
						NB/WB						**-0.250**	**-0.250**	0.250	0.250
						SB/EB						**0.000**		0.000	2.580

CS60.14 (MP 199-194.3)

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 Reductior Fatal	Total Crash Reductior Incap
197	194.3	0.89	1.00	1.00	1.00	NB	0.890			3	0	2.670	0.000	0.330	0.000
197	194.3	0.89	1.00	1.00	1.00	SB	0.890			1	2	0.890	1.780	0.110	0.220
195	195	0.94	1.00	1.00	1.00	NB	0.940			0	0	0.000	0.000	0.000	0.000
195	195	0.94	1.00	1.00	1.00	SB	0.940			0	1	0.000	0.940	0.000	0.060
						NB/WB						**-0.330**	**0.000**	0.330	0.000
						SB/EB						**-0.110**	**-0.280**	0.110	0.280

Performance Effectiveness 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	
191.1B	US191 Pavement Preservation South of Safford	88-104	200.326	1.802	0.600	1.202	1.54	1.851			0.000		0.000	0.509	0.357	0.152	0.21	0.03	0.562	0.562	0.000	0.00	0.00	0.002	0.002	0.000	0.00	0.00	1.883
70.2	East Safford Safety Improvements	336.5-339	0.1			0.000		0.000			0.000		0.000	0.243	0.233	0.010	4.72	0.05	0.888	0.888	0.000	0.00	0.00	0.004	0.004	0.000	0.00	0.00	0.047
70.4	Bylas to Peridot Safety Improvements	274-292	15.116			0.000		0.000			0.000		0.000	5.129	3.410	1.719	2.17	3.74	0.862	0.860	0.002	8.28	0.02	0.008	0.008	0.000	0.00	0.00	3.753
70.5	East of Globe Safety Improvements	255-270	31.067			0.000		0.000			0.000		0.000	9.593	0.291	9.302	0.40	3.73	0.894	0.839	0.055	5.67	0.31	0.012	0.012	0.000	0.00	0.00	4.040
70|60.6	Globe Area Safety Improvements	243-255	22.62			0.000		0.000			0.000		0.000	11.096	7.783	3.313	3.03	10.03	0.983	0.946	0.037	6.15	0.23	1.178	0.642	0.536	4.22	2.26	12.518
70|60.7A	Globe Area Freight Improvements	253.63	8.21			0.000		0.000			0.000		0.000	11.096	11.095	0.001	3.03	0.00	0.983	0.983	0.000	0.00	0.00	1.178	0.728	0.450	4.22	1.90	1.901
70|60.7B	Globe Area Freight Improvements	253.63	2.11			0.000		0.000			0.000		0.000	11.096	10.441	0.655	3.03	1.98	0.983	0.970	0.013	3.58	0.05	1.178	0.818	0.360	4.22	1.52	3.548
60.8	Miami Area West Safety Improvements	228-247.3	17.04			0.000		0.000			0.000		0.000	6.380	2.802	3.578	3.85	13.77	10.954	10.901	0.053	9.65	0.51	4.875	4.007	0.868	7.48	6.49	20.772
60.9A	Miami Area Freight Improvements	228.47	33.32			0.000		0.000			0.000		0.000	6.380	6.380	0.000	3.85	0.00	10.954	10.900	0.054	0.00	0.00	4.875	4.368	0.507	7.48	3.79	3.793
60.9B	Miami Area Freight Improvements	228.47	1.939			0.000		0.000			0.000		0.000	6.380	5.944	0.436	3.85	1.68	10.954	10.913	0.041	6.77	0.28	4.875	4.218	0.657	7.48	4.91	6.870
60.1	Superior Area Safety Improvements	212-223	0.448			0.000		0.000			0.000		0.000	3.111	1.858	1.253	0.69	0.87	0.431	0.426	0.005	5.53	0.03	0.473	0.303	0.170	4.34	0.74	1.637
60.11	US-60 SW of Gold Canyon Safety Improvements	208-206	3.932											**0.318**	**0.281**	0.037	1.60	0.06	**0.790**	**0.786**	0.004	6.09	0.02	0.827	0.633	0.194	5.84	1.13	1.216
60.12	Gold Canyon Area Mobility and Safety Improvements	205-199	44.003											**1.023**	**0.812**	0.211	3.03	0.64	**4.421**	**1.233**	3.188	6.12	19.52	1.096	0.635	0.461	4.68	2.16	22.314
60.13	Apache Junction Area Mobility and Freight Improvements	199-194.3	24.68											**2.515**	**2.440**	0.075	1.69	0.13	**7.502**	**2.736**	4.766	3.19	15.22	0.634	0.124	0.510	2.22	1.13	16.476
60.14	Apache Junction Area Safety Improvements	199-194.3	0.283											**2.515**	**2.038**	0.477	1.69	0.81	**7.502**	**7.493**	0.009	2.79	0.03	0.634	0.494	0.140	2.22	0.31	1.144

Emphasis Area Scoring

				Safety Emphasis Area						Mobility Emphasis Area						Freight Emphasis Area					
Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Existing Corridor Need	Post-Solution Corridor	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
191.1B	US191 Pavement Preservation South of Safford	88-104	200.3	1.801	1.801	0.000	0.21	1.50	0.00	0.310	0.310	0.000	0.00	1.50	0.00	2.995	2.995	0.000	0.00	1.50	0.00
70.2	East Safford Safety Improvements	336.5-339	0.1	1.801	1.796	0.005	4.72	1.50	0.04	0.310	0.310	0.000	0.00	1.50	0.00	2.995	2.995	0.000	0.00	1.50	0.00
70.4	Bylas to Peridot Safety Improvements	274-292	15.1	1.801	1.571	0.230	2.17	1.50	0.75	0.310	0.310	0.000	8.28	1.50	0.00	2.995	2.995	0.000	0.00	1.50	0.00
70.5	East of Globe Safety Improvements	255-270	31.1	1.801	0.890	0.911	0.40	1.50	0.55	0.310	0.307	0.003	5.67	1.50	0.03	2.995	2.995	0.000	0.00	1.50	0.00
70|60.6	Globe Area Safety Improvements	243-255	22.6	1.801	1.538	0.263	3.03	1.50	1.19	0.310	0.309	0.001	6.15	1.50	0.01	2.995	2.817	0.178	4.22	1.50	1.13
70|60.7A	Globe Area Freight Improvements	253.63	8.2	1.801	1.801	0.000	3.03	1.50	0.00	0.310	0.310	0.000	0.00	1.50	0.00	2.995	2.994	0.001	4.22	1.50	0.01
70|60.7B	Globe Area Freight Improvements	253.63	2.1	1.801	1.801	0.000	3.03	1.50	0.00	0.310	0.310	0.000	3.58	1.50	0.00	2.995	2.94	0.055	4.22	1.50	0.35
60.8	Miami Area West Safety Improvements	228-247.3	17.0	1.801	1.470	0.331	3.85	1.43	1.82	0.310	0.310	0.000	9.65	1.50	0.00	2.995	2.902	0.093	7.48	1.50	1.04
60.9A	Miami Area Freight Improvements	228.47	33.3	1.801	1.801	0.000	3.85	1.50	0.00	0.310	0.310	0.000	0.00	1.50	0.00	2.995	2.993	0.002	7.48	1.50	0.02
60.9B	Miami Area Freight Improvements	228.47	1.9	1.801	1.801	0.000	3.85	1.50	0.00	0.310	0.310	0.000	6.77	1.50	0.00	2.995	2.925	0.070	7.48	1.50	0.79
60.1	Superior Area Safety Improvements	212-223	0.4	1.801	1.727	0.074	0.69	1.50	0.08	0.310	0.310	0.000	5.53	1.50	0.00	2.995	2.970	0.025	4.34	1.50	0.16
60.11	US-60 SW of Gold Canyon Safety Improvements	208-206	3.9	1.801	1.789	0.012	1.60	1.50	0.03	0.310	0.310	0.000	6.09	1.50	0.00	2.995	2.986	0.009	5.84	1.50	0.08
60.12	Gold Canyon Area Mobility and Safety Improvements	205-199	44.0	1.801	1.773	0.028	3.03	1.50	0.13	0.310	0.301	0.009	6.12	1.50	0.08	2.995	2.974	0.021	4.68	1.50	0.15
60.13	Apache Junction Area Mobility and Freight Improvements	199-194.3	24.7	1.801	1.801	0.000	1.69	1.50	0.00	0.310	0.302	0.008	3.19	1.50	0.04	2.995	2.928	0.067	2.22	1.50	0.22
60.14	Apache Junction Area Safety Improvements	199-194.3	0.3	1.801	1.781	0.020	1.69	1.50	0.05	0.310	0.310	0.000	2.79	1.50	0.00	2.995	2.989	0.006	2.22	1.50	0.02

Performance Effectiveness Scoring

Candidate Solution #	Candidate Solution Name	Milepost Location	Estimated Cost ($ millions)	Total Factored Benefit	VMT Factor	NPV Factor	Performance Effectiveness Score		miles	2020 ADT	1-way or 2-way	VMT
191.1B	US191 Pavement Preservation South of Safford	88-104	200.3	1.88	2.21	20.2	0.4		16.00	2617	two-way	41872
70.2	East Safford Safety Improvements	336.5-339	0.1	0.08	0.17	15.3	2.1		0.21	11553	two-way	2426.13
70.4	Bylas to Peridot Safety Improvements	274-292	15.1	4.50	0.13	20.2	0.8		1.40	2749	1	1924.3
70.5	East of Globe Safety Improvements	255-270	31.1	4.61	3.50	20.20	10.5		15.00	5790	two-way	86850
70|60.6	Globe Area Safety Improvements	243-255	22.6	14.85	1.13	20.20	15.0		1.65	11143	two-way	18385.95
70|60.7A	Globe Area Freight Improvements	253.63	8.2	1.91	0.37	20.20	1.7		0.50	11143	two-way	5571.5
70|60.7B	Globe Area Freight Improvements	253.63	2.1	3.90	0.37	20.20	13.9		0.50	11143	two-way	5571.5
60.8	Miami Area West Safety Improvements	228-247.3	17.0	23.63	4.47	8.80	54.6		16.00	10128	two-way	162048
60.9A	Miami Area Freight Improvements	228.47	33.3	3.82	0.34	20.20	0.8		0.50	10128	two-way	5064
60.9B	Miami Area Freight Improvements	228.47	1.9	7.66	0.34	20.20	27.1		0.50	10128	two-way	5064
60.1	Superior Area Safety Improvements	212-223	0.4	1.88	3.29	8.80	121.4		7.00	11048	two-way	77336
60.11	US-60 SW of Gold Canyon Safety Improvements	208-206	3.9	1.32	1.61	15.30	8.3		2.00	14003	two-way	28006
60.12	Gold Canyon Area Mobility and Safety Improvements	205-199	44.0	22.67	4.16	20.20	43.3		6.90	18653	two-way	128705.7
60.13	Apache Junction Area Mobility and Freight Improvements	199-194.3	24.7	16.74	3.97	20.20	54.5		4.70	48507	1	113991.45
60.14	Apache Junction Area Safety Improvements	199-194.3	0.3	1.21	4.19	8.80	158.2		2.70	48507	two-way	130968.9

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			
191.1B	US191 Pavement Preservation South of Safford	88-104	200.326	1.851	98.3%	0.000	0.0%	0.032	1.7%	0.000	0.0%	0.000	0.0%	1.883	1.14	1.51	1.78	1.36	1.36	1.15	0.77	**0**
70.2	East Safford Safety Improvements	336.5-339	0.1	0.000	0.0%	0.000	0.0%	0.083	100.0%	0.000	0.0%	0.000	0.0%	0.083	1.14	1.51	1.78	1.36	1.36	1.78	0.92	**3**
70.4	Bylas to Peridot Safety Improvements	274-292	15.116	0.000	0.0%	0.000	0.0%	4.486	99.6%	0.017	0.4%	0.000	0.0%	4.503	1.14	1.51	1.78	1.36	1.36	1.78	1.38	**2**
70.5	East of Globe Safety Improvements	255-270	31.067	0.000	0.0%	0.000	0.0%	4.276	92.7%	0.337	7.3%	0.000	0.0%	4.614	1.14	1.51	1.78	1.36	1.36	1.75	1.23	**23**
70|60.6	Globe Area Safety Improvements	243-255	22.62	0.000	0.0%	0.000	0.0%	11.225	75.6%	0.237	1.6%	3.386	22.8%	14.848	1.14	1.51	1.78	1.36	1.36	1.68	1.77	**44**
70|60.7A	Globe Area Freight Improvements	253.63	8.214	0.000	0.0%	0.000	0.0%	0.003	0.2%	0.000	0.0%	1.904	99.8%	1.907	1.14	1.51	1.78	1.36	1.36	1.36	1.77	**4**
70|60.7B	Globe Area Freight Improvements	253.63	2.11	0.000	0.0%	0.000	0.0%	1.983	50.9%	0.047	1.2%	1.866	47.9%	3.896	1.14	1.51	1.78	1.36	1.36	1.57	1.77	**39**
60.8	Miami Area West Safety Improvements	228-247.3	17.043	0.000	0.0%	0.000	0.0%	15.585	65.9%	0.511	2.2%	7.537	31.9%	23.634	1.14	1.51	1.78	1.36	1.36	1.64	2.54	**227**
60.9A	Miami Area Freight Improvements	228.47	33.322	0.000	0.0%	0.000	0.0%	0.000	0.0%	0.000	0.0%	3.815	100.0%	3.815	1.14	1.51	1.78	1.36	1.36	1.36	2.54	**3**
60.9B	Miami Area Freight Improvements	228.47	1.939	0.000	0.0%	0.000	0.0%	1.678	21.9%	0.278	3.6%	5.700	74.5%	7.656	1.14	1.51	1.78	1.36	1.36	1.45	2.54	**100**
60.1	Superior Area Safety Improvements	212-223	0.448	0.000	0.0%	0.000	0.0%	0.948	50.5%	0.028	1.5%	0.901	48.0%	1.877	1.14	1.51	1.78	1.36	1.36	1.57	1.00	**191**
60.11	US-60 SW of Gold Canyon Safety Improvements	208-206	3.93	0.000	0.0%	0.000	0.0%	0.088	6.7%	0.024	1.8%	1.211	91.5%	1.324	1.14	1.51	1.78	1.36	1.36	1.39	1.15	**13**
60.12	Gold Canyon Area Mobility and Safety Improvements	205-199	44.003	0.000	0.0%	0.000	0.0%	0.766	3.4%	19.602	86.5%	2.303	10.2%	22.671	1.14	1.51	1.78	1.36	1.36	1.37	1.69	**101**
60.13	Apache Junction Area Mobility and Freight Improvements	199-194.3	24.675	0.000	0.0%	0.000	0.0%	0.127	0.8%	15.255	91.1%	1.356	8.1%	16.738	1.14	1.51	1.78	1.36	1.36	1.36	1.38	**102**
60.14	Apache Junction Area Safety Improvements	199-194.3	0.283	0.000	0.0%	0.000	0.0%	0.858	70.7%	0.025	2.1%	0.331	27.3%	1.214	1.14	1.51	1.78	1.36	1.36	1.66	1.38	**362**

Appendix K: Preliminary Scoping Reports for Prioritized Solutions

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: Huachuca City Area Safety Improvements – Options A and B (CS90.1)	
City/Town: Huachuca City	**County: Cochise**
COG/MPO: SEAGO and SVMPO	**ADOT District: Southcentral**
Primary Route/Street: SR 90	
Beginning Limit: MP 313	
End Limit: MP 317	
Project Length: 4 miles	
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: Crash hot spots at MP 313-315 and MP 316-317

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address identified Safety Need by installing a raised median barrier (MP 313-314) and by either installing centerline rumble strips or widening the roadway and installing a raised median (MP 314-317)			

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: Will need to coordinate with adjacent properties regarding access management	

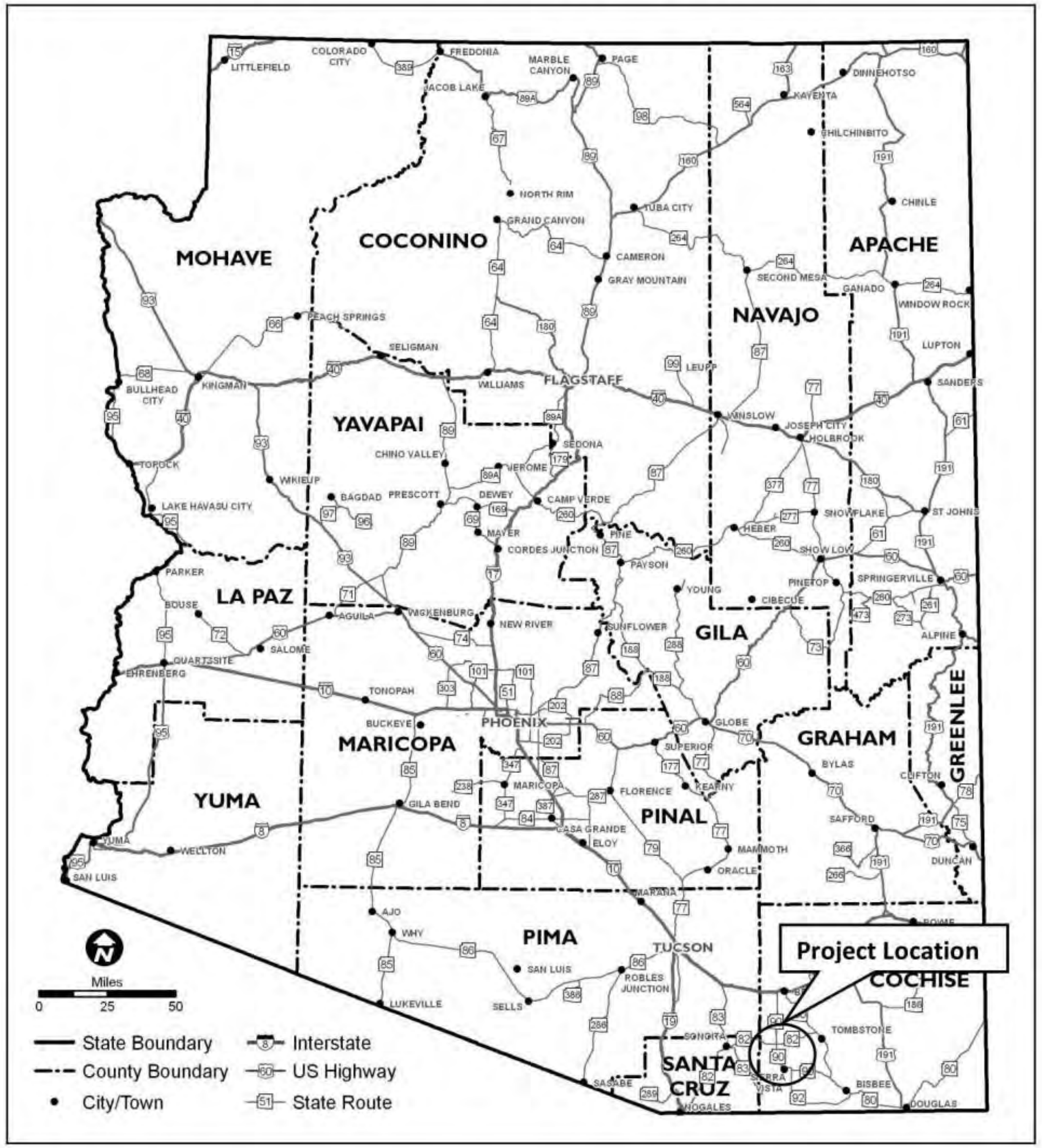
POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

COST ESTIMATE				
Preliminary Engineering	Design	Right-of-Way	Construction	Total
\$ 25,000 (Option A) \$215,000 (Option B)	\$ 81,000 (Option A) \$717,000 (Option B)	\$0 (Option A) \$0 (Option B)	\$ 810,000 (Option A) \$7,173,000 (Option B)	\$ 916,000 (Option A) \$8,105,000 (Option B)

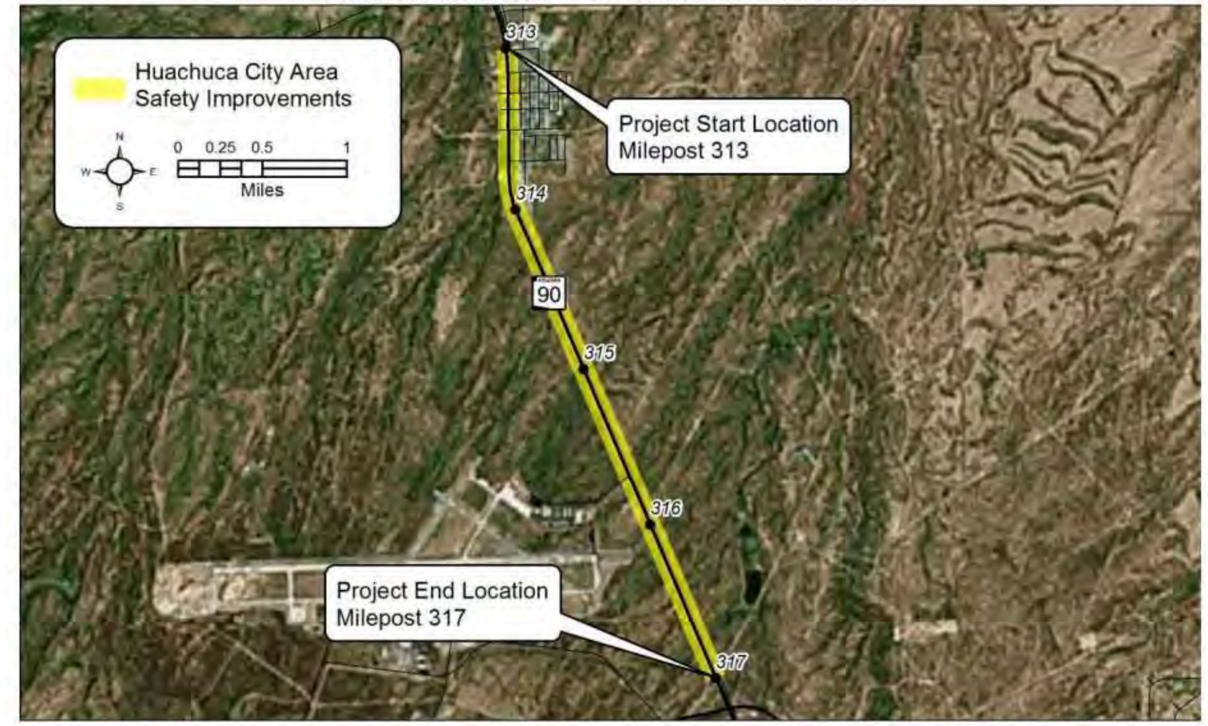
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS
1) **State Location Map** 2) **Project Vicinity Map** 3) **Project Scope of Work**

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
Option A: • Install raised median, MP 313-314 • Install centerline rumble strips, MP 314-317 Option B: • Install raised median, MP 313-314 • Widen roadway to install raised median, MP 314-317

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: Sierra Vista Area Safety and Freight Improvements (CS90.2)	
City/Town: Sierra Vista	**County: Cochise**
COG/MPO: SVMPO	**ADOT District: Southcentral**
Primary Route/Street: SR 90	
Beginning Limit: MP 317	
End Limit: MP 324	
Project Length: 7 miles	
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: Crash hot spot at MP 319-323 Freight Need: High level of need based on the overall Freight Index and SB/EB Directional TPTI ratings

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address identified Safety and Freight Needs by implementing signal coordination for 9 signals, installing speed feedback and signal ahead signs, installing centerline rumble strips, and constructing a raised median			

1

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: Will need to coordinate with adjacent properties regarding access management	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG ☐ Local	☐ TAP ☐ Private	☐ HSIP ☐ Tribal	☐ State ☐ Other:

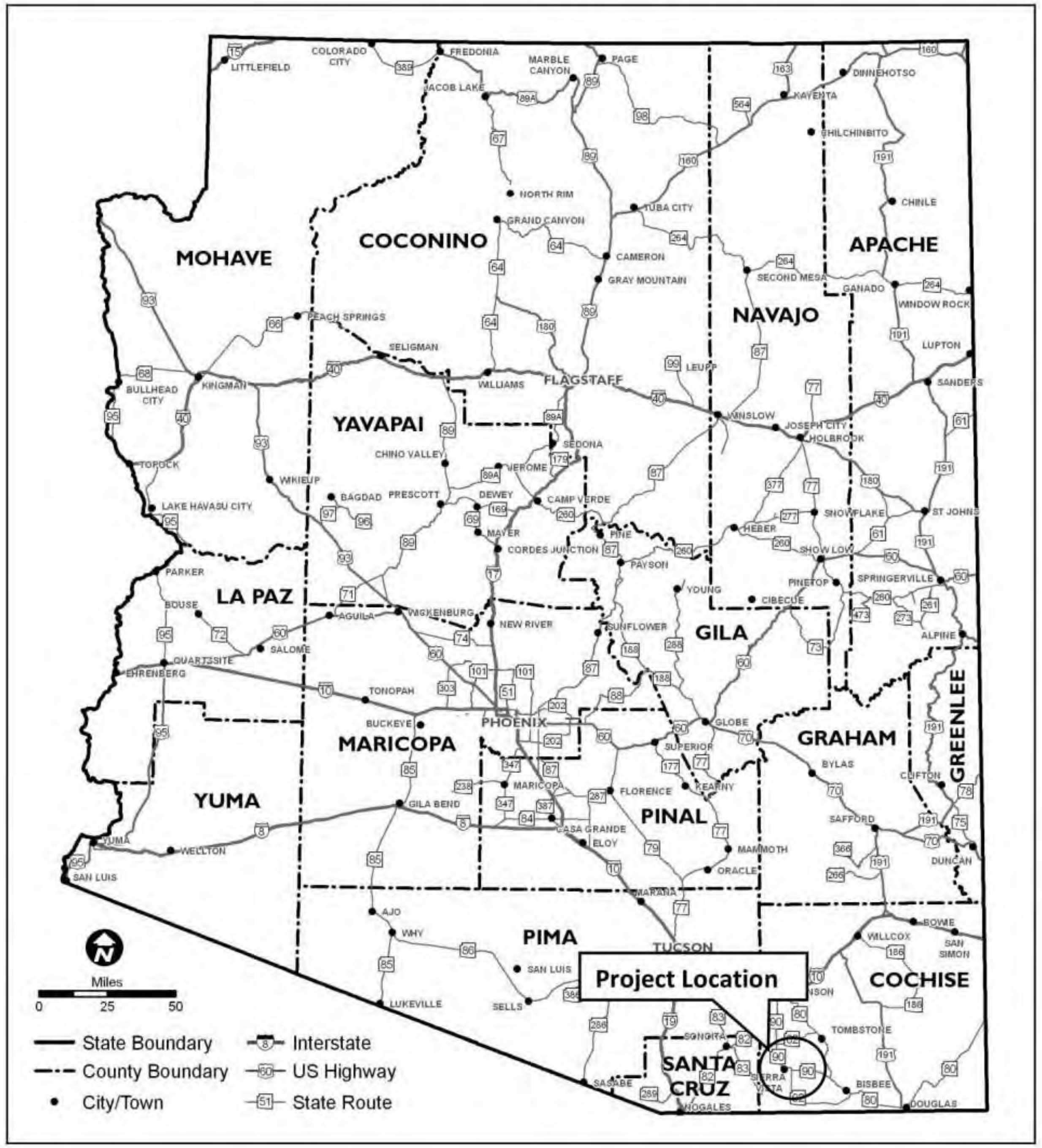
COST ESTIMATE				
Preliminary Engineering $78,000	Design $260,000	Right-of-Way $0	Construction $2,581,000	Total $2,919,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

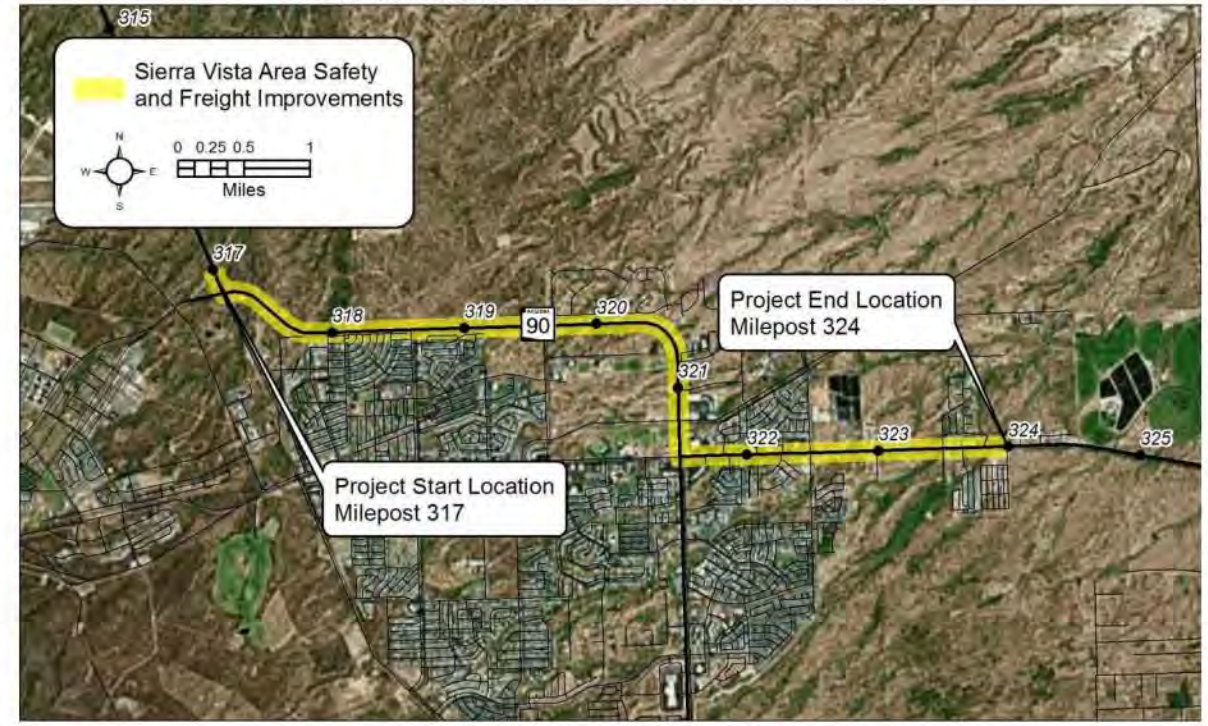
ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

2

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Implement signal coordination for 3 signals from Hatfield St/Buffalo Soldier Trail intersection (MP 317.2) to Coronado Dr (MP 319.6), and for 6 signals from Campus Dr (MP 321.0) to Colonia De Salud (MP 323.0) • Install speed feedback and signal ahead signs, MP 318 EB and MP 320 WB • Install centerline rumble strips, MP 317.2-320.8 • Construct raised median, MP 321.5-323.7

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: San Pedro River Area Safety Improvement (CS90.3)	
City/Town: -	**County: Cochise**
COG/MPO: SVMPO and SEAGO	**ADOT District: Southcentral**
Primary Route/Street: SR 90	
Beginning Limit: MP 324	
End Limit: MP 336	
Project Length: 12 miles	
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: Safety Index and NB/WB Directional Safety Index above the statewide average, MP 324-336

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address identified Safety Need by widening shoulders to 8 feet in both directions and installing centerline rumble strips			

1

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:	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG	☐ TAP	☐ HSIP	☐ State
	☐ Local	☐ Private	☐ Tribal	☐ Other:

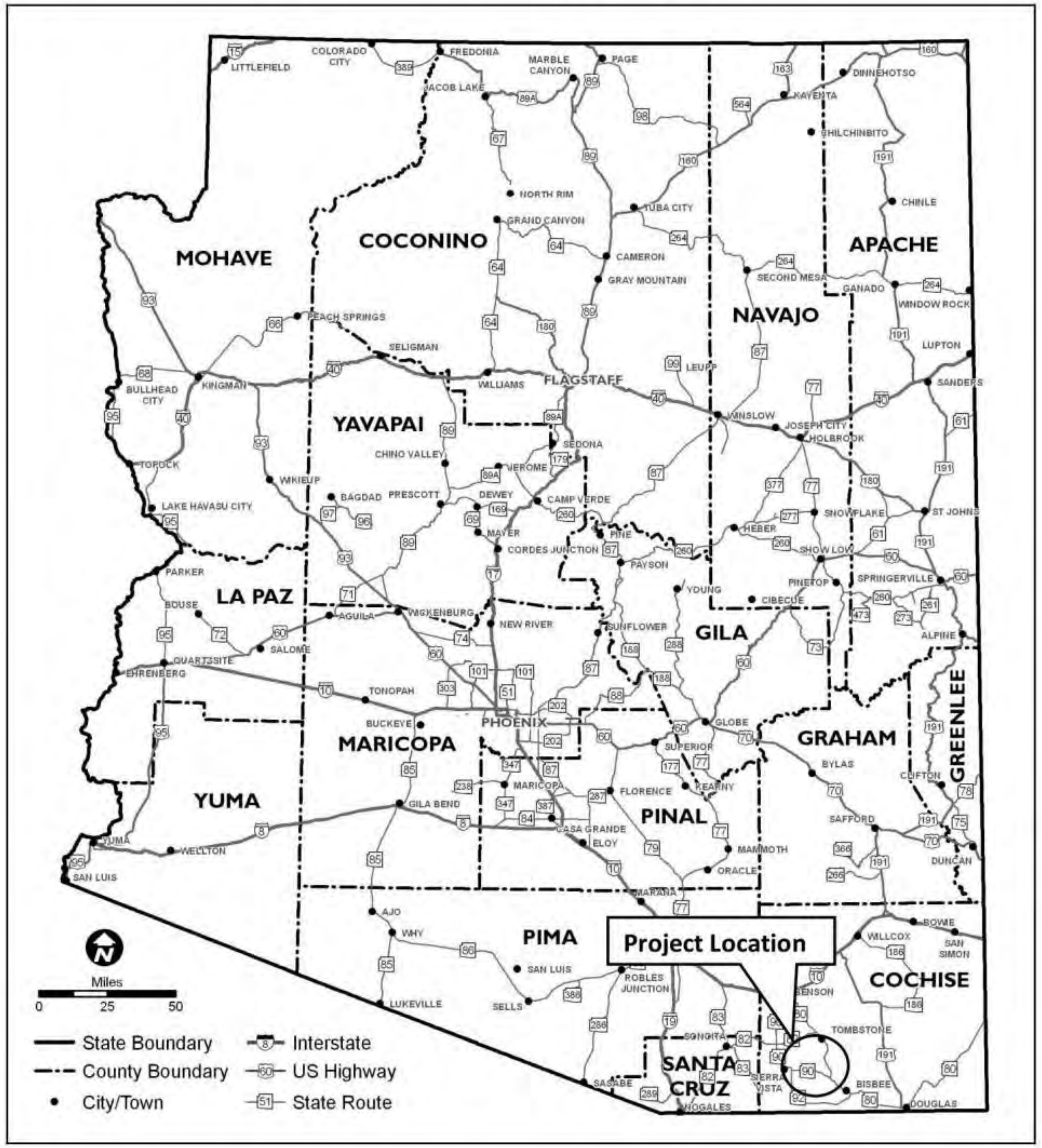
COST ESTIMATE				
Preliminary Engineering $260,000	Design $867,000	Right-of-Way $0	Construction $8,675,000	Total $9,802,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

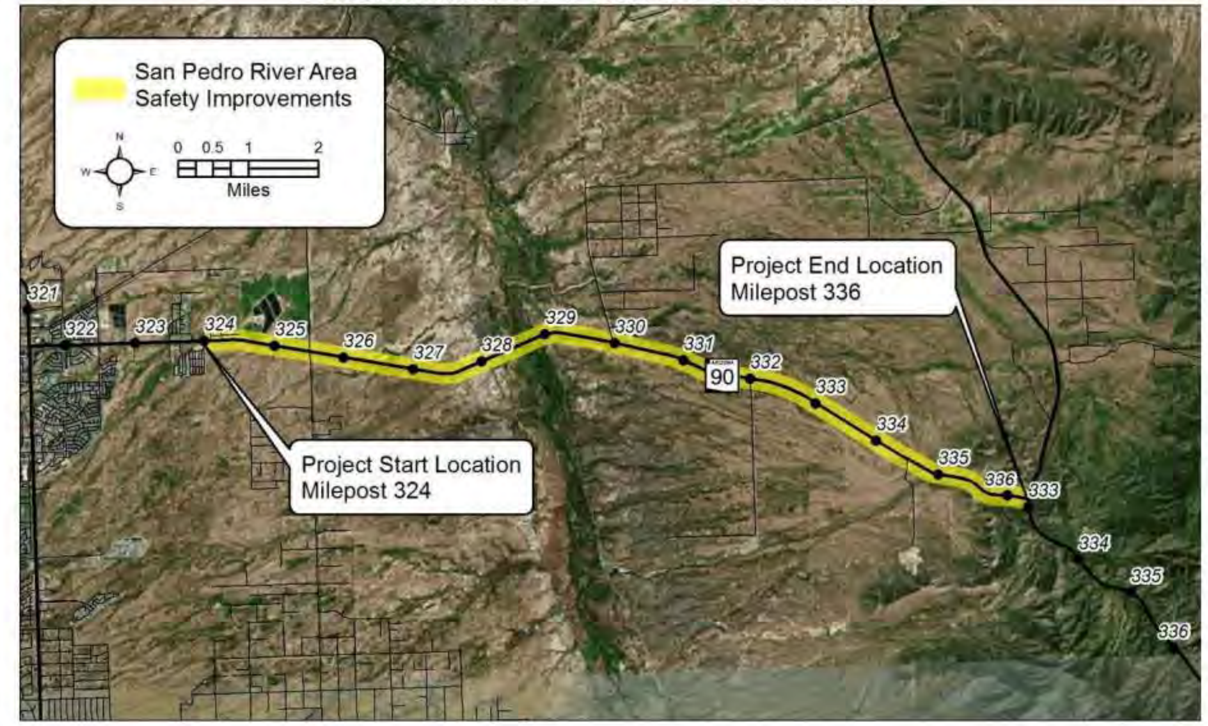
ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

2

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Widen shoulders to 8 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders), MP 324-336 • Install centerline rumble strips, MP 324-336

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: Banning Creek Area Climbing Lane (CS80.4)	
City/Town: -	**County: Cochise**
COG/MPO: SEAGO	**ADOT District: Southeast**
Primary Route/Street: SR 80	
Beginning Limit: MP 336	
End Limit: MP 338	
Project Length: 2 miles	
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: High level of need based on the overall Freight Index and SB/EB Directional TPTI ratings

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address identified Freight Need by constructing a climbing lane			

1

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: Potential rock cuts
Risk Description: Could potentially require rock cuts	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG ☐ Local	☐ TAP ☐ Private	☐ HSIP ☐ Tribal	☐ State ☐ Other:

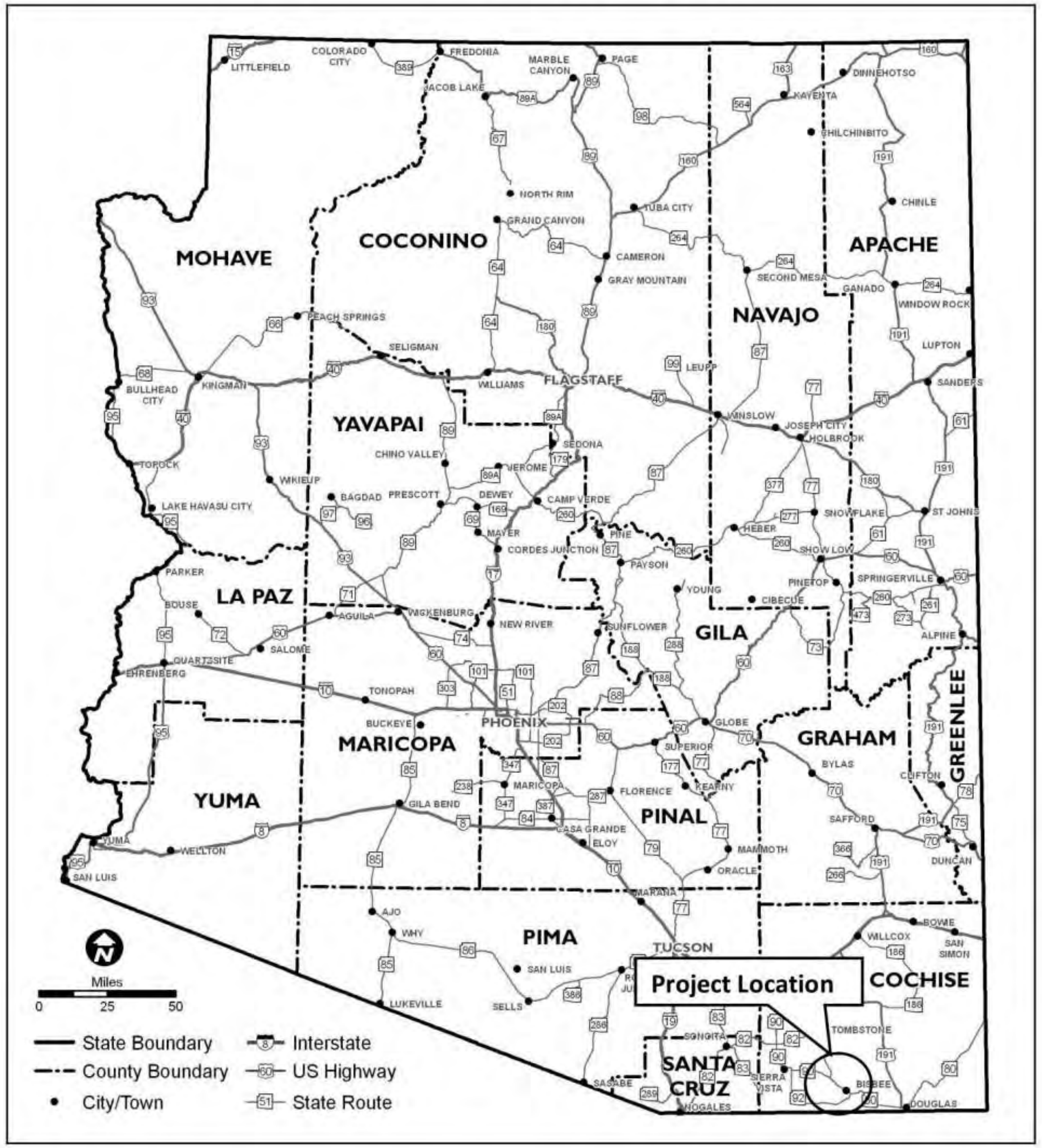
COST ESTIMATE				
Preliminary Engineering $193,000	Design $644,000	Right-of-Way $0	Construction $6,435,000	Total $7,272,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

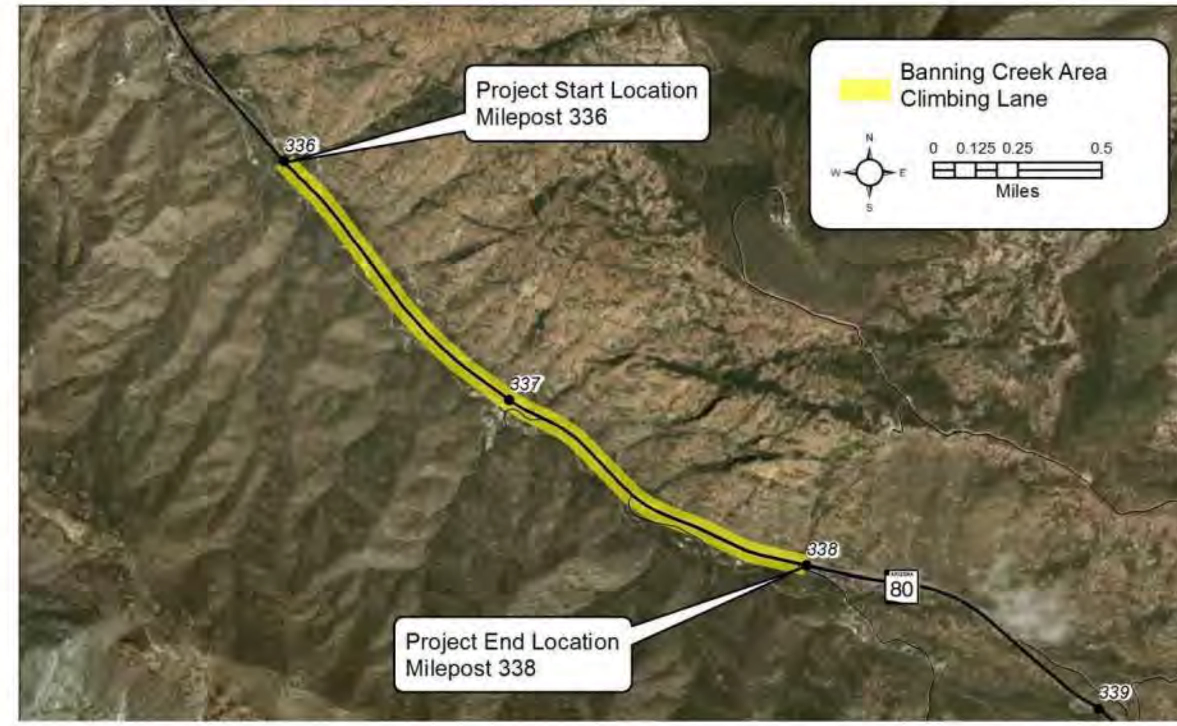
ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

2

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct climbing lane EB, MP 336.0-337.3

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: Banning Creek Area Freight Improvements (CS80.5)	
City/Town: -	**County: Cochise**
COG/MPO: SEAGO	**ADOT District: Southeast**
Primary Route/Street: SR 80	
Beginning Limit: MP 333	
End Limit: MP 339	
Project Length: 6 miles	
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: High level of need based on the overall Freight Index and SB/EB Directional TPTI ratings

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address identified Freight Need by widening shoulders to 8 feet in both directions			

1

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: Potential rock cuts
Risk Description: Could potentially require rock cuts	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG ☐ Local	☐ TAP ☐ Private	☐ HSIP ☐ Tribal	☐ State ☐ Other:

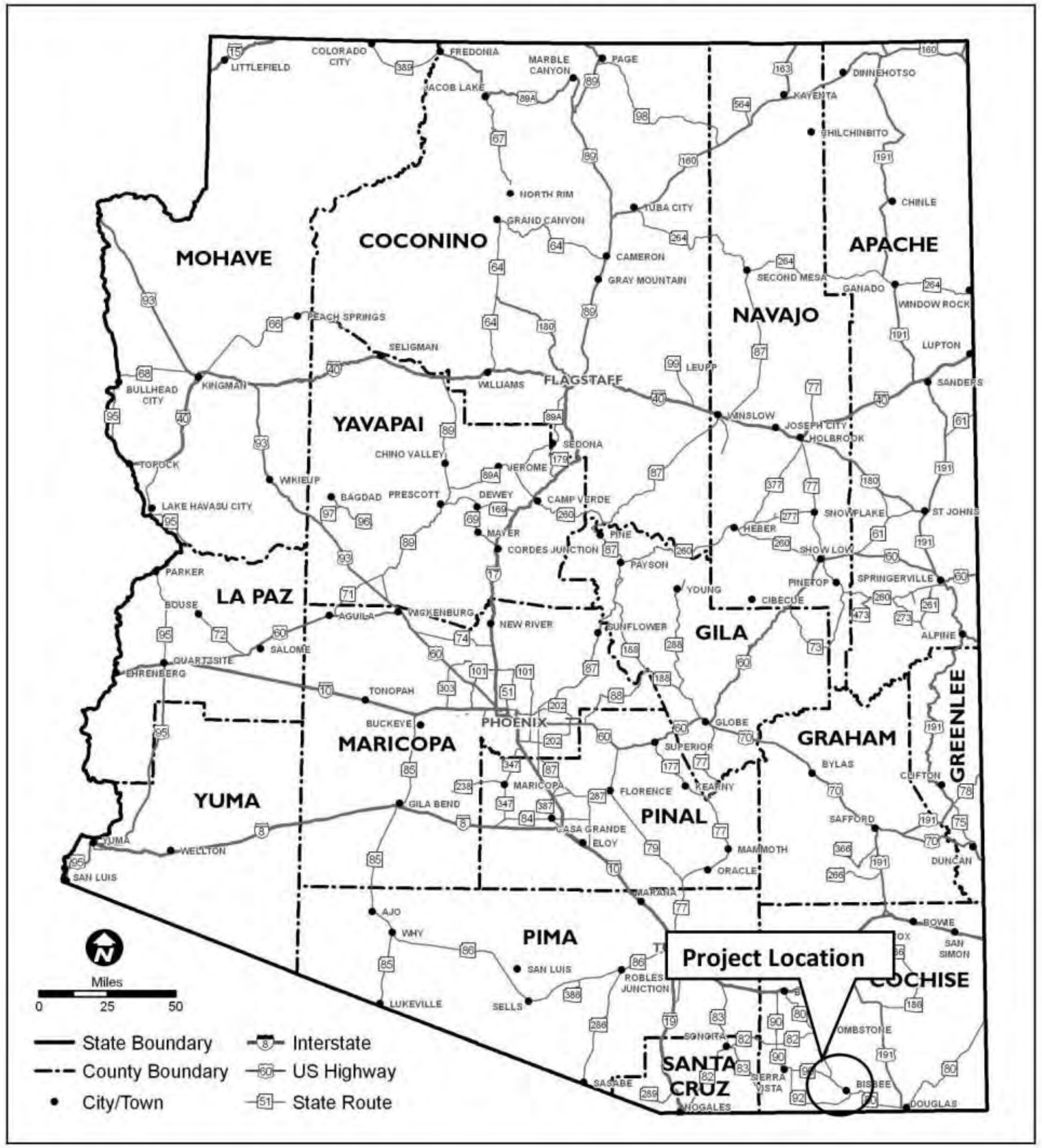
COST ESTIMATE				
Preliminary Engineering $106,000	Design $355,000	Right-of-Way $0	Construction $3,548,000	Total $4,009,000

RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

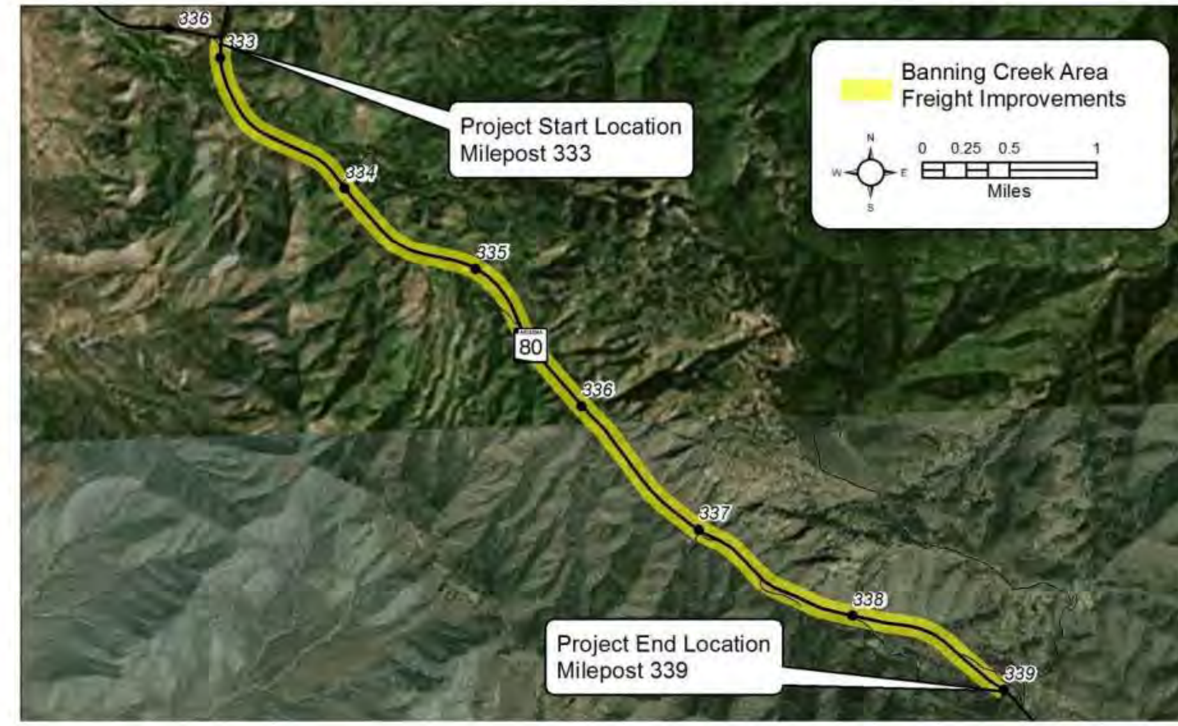
ATTACHMENTS
1) State Location Map **2) Project Vicinity Map** **3) Project Scope of Work**

2

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP



ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Widen shoulders to 8 feet in both directions (striping, delineators, RPMs, safety edge, and rumble strips for both shoulders), MP 333-339

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.

ADOT

PRELIMINARY SCOPING REPORT

GENERAL PROJECT INFORMATION	
Date: 01-24-18	**ADOT Project Manager:**
Project Name: Mule Gulch Area Freight Improvements (CS80.6)	
City/Town: -	**County: Cochise**
COG/MPO: SEAGO	**ADOT District: Southeast**
Primary Route/Street: SR 80	
Beginning Limit: MP 345	
End Limit: MP 348	
Project Length: 3 miles	
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
Freight Need: High level of need based on the overall Freight Index and NB/WB Directional TPTI ratings

PROJECT PURPOSE			
What is the Primary Purpose of the Project?	Preservation ☐	Modernization ☒	Expansion ☐
Address Freight Need by constructing passing lanes			

1

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:	

POTENTIAL FUNDING SOURCE(S)				
Anticipated Project Design/Construction Funding Type: *(Check all that apply)*	☐ STBG ☐ Local	☐ TAP ☐ Private	☐ HSIP ☐ Tribal	☐ State ☐ Other:

COST ESTIMATE				
Preliminary Engineering $119,000	Design $396,000	Right-of-Way $0	Construction $3,960,000	Total $4,475,000

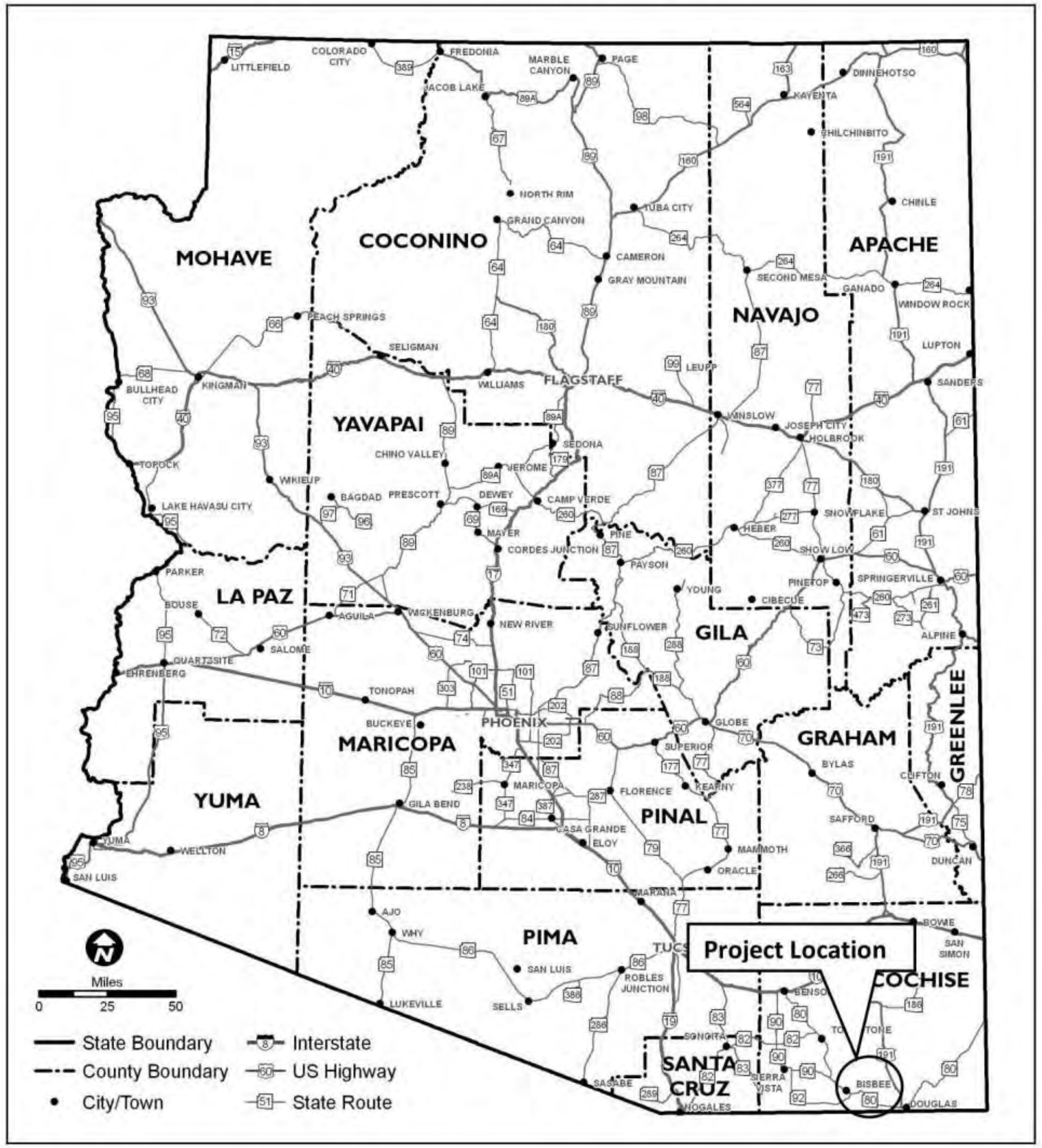
RECOMMENDED PROJECT DELIVERY
Delivery: ☐ Design-Bid-Build ☐ Design-Build ☐ Other:
Design Program Year: FY
Construction Program Year: FY

ATTACHMENTS

1) **State Location Map**
2) **Project Vicinity Map**
3) **Project Scope of Work**

2

ATTACHMENT 1 – STATE LOCATION MAP



ATTACHMENT 2 – PROJECT VICINITY MAP

ATTACHMENT 3 – SCOPE OF WORK

SCOPE OF WORK
• Construct passing lane WB, MP 346.9-347.6 • Construct passing lane EB, MP 345.6-346.1

SCOPE ITEMS CONSIDERED, BUT NOT INCLUDED

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 data.