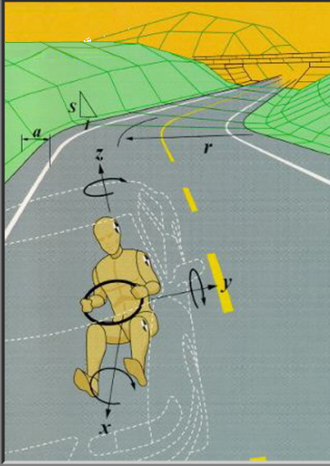


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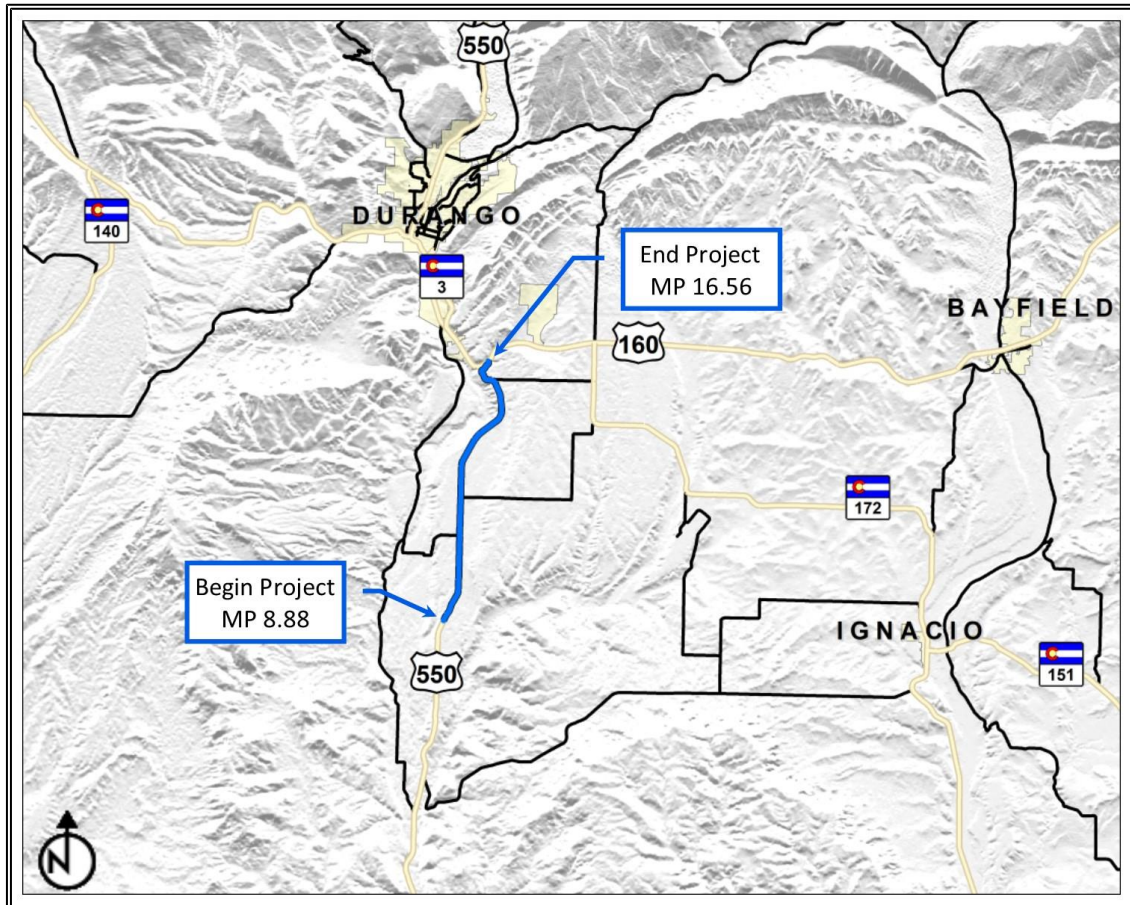
# Safety Assessment Report

SH550A MP 8.88 - MP 16.56  
Highway Reconstruction  
November 2018

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Prepared for: *The Colorado Department of Transportation  
Safety and Traffic Engineering Branch  
2829 W. Howard Place  
Denver, Colorado 80204*

Prepared by: *Muller Engineering Company*



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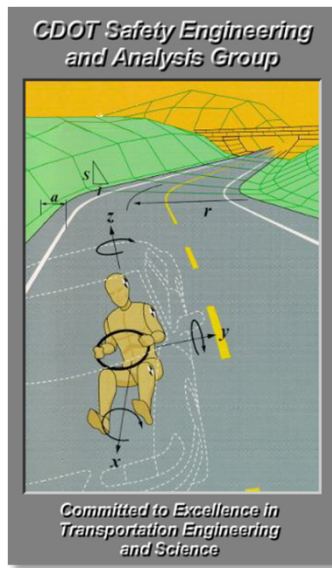


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## A Statement of Philosophy

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The efficient and responsible investment of resources in addressing safety problems is a difficult task. Since crashes occur on all highways in use, it is inappropriate to say of any highway that it is safe. However, it is correct to say that highways can be built to be safer or less safe. Road safety is a matter of degree. When making decisions effecting road safety, it is critical to understand that the expenditure of limited available funds on improvements in places where it prevents few injuries and saves few lives can mean that injuries will occur and lives will be lost by not spending them in places where more accidents could have been prevented.<sup>1</sup> It is CDOT's objective to maximize accident reduction within the limitations of available budgets by making road safety improvements at locations where it does the most good or prevents the most accidents.

## Introduction

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The primary intent of this project is to increase the capacity and drivability of State Highway 550A (US 550) between milepost (MP) 8.88 and MP 16.56. In conjunction with the reconstruction project, an opportunity exists for the detection of safety problems and the implementation of selected improvements at locations where it is justified by crash experience.

The scope of this report is as follows:

- Assess the magnitude and nature of the safety problem within the project limits;
- Relate crash causality to roadway geometrics, roadside features, traffic control devices, traffic operations, driver behavior, and vehicle type;
- Suggest cost effective counter measures to address identified problems; and
- Provide guidance on how to maximize crash reduction within the scope of a resurfacing project.

This report is based on the comprehensive analysis of five years of crash history, a review of aerial imagery, and video log review. The Region is advised to verify, through field survey, the information included in this report regarding physical features and roadside characteristics in the study area.

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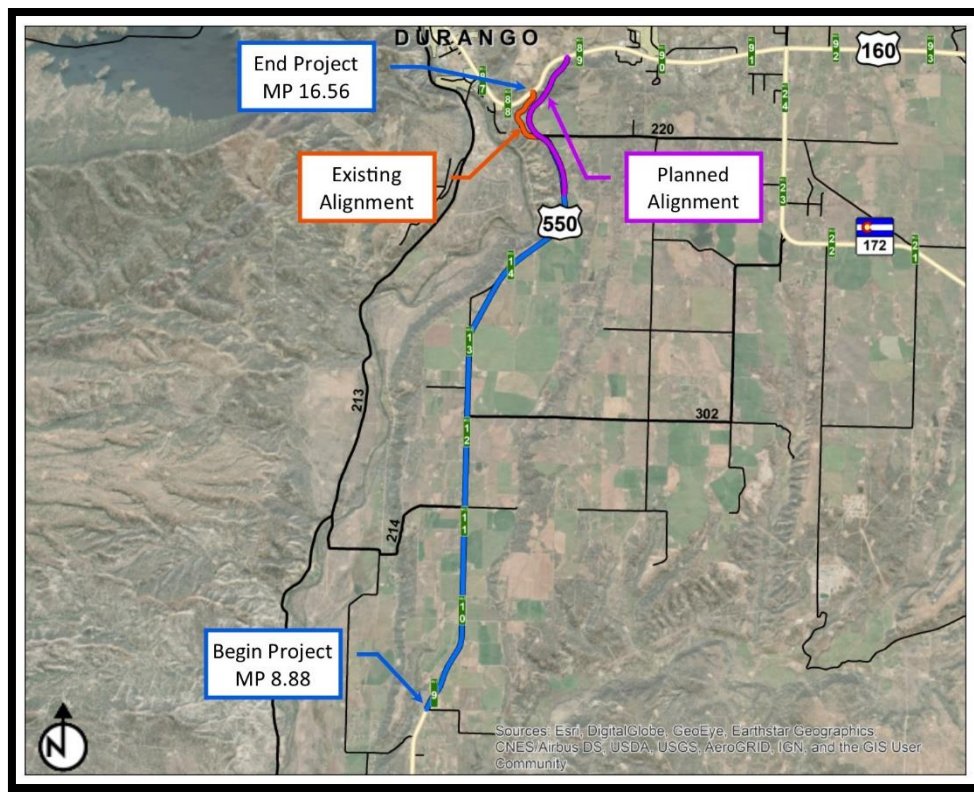
<sup>1</sup> Hauer, E., (1999) Safety Review of Highway 407: Confronting Two Myths. TRB

## Site Location and Conditions

This safety assessment report addresses US 550 in La Plata County southeast of the City of Durango, beginning at MP 8.88, north of the intersection with County Road (CR) 218, to MP 16.56 at the intersection with US 160. The reconstruction project is 7.68 miles in length. US 550 is classified as a “Principal Arterial – Other” in mountainous terrain through the study section.

A major feature of the highway widening and reconstruction project changes the alignment of the highway approaching the US 160 intersection on the north end of the study section. The new alignment will connect US 550 to the Grandview Interchange with US 160. A vicinity map showing an aerial view of the study corridor and the general location of the change in alignment is shown on **Figure 1**.

**Figure 1: Vicinity Map**



The primary direction of increasing milepost on this east/west roadway is from south to north, though most crashes along US 550 are coded as eastbound or westbound.

The 2016 average daily traffic (ADT) was approximately 6,900 vehicles per day (vpd) with 8.6 percent truck traffic. The following observations of the US 550 study corridor were based on a review of aerial photography, the CDOT video log, and the 2016 CORIS data:

- US 550 can generally be described as a 2-lane, undivided highway with 4-foot wide combination material shoulders (asphalt / stabilized).
- The posted speed limit is 60 mph through most of the corridor, dropping to 45 mph in the vicinity of CR 220 (MP 15.68) and to 35 mph at MP 15.81 down Farmington Hill to the US 160 intersection.

- There is an improved section of US 550 proximate to the CR 302 intersection (MP 12.19) from MP 11.75 and 12.56 with the following features:
  - Four (4) 12-foot lanes.
  - Depressed, 35-foot wide median.
  - Left-turn decel lanes (both directions) at CR 302.
  - Left-turn accel lane (secondary direction only) at CR 302.
  - Right-turn accel and decel lanes (primary direction only) at CR 302.
  - Paved, 4-foot wide inside shoulders.
  - Paved, 10-foot wide outside shoulders.

The planned roadway improvements will ultimately widen US 550 to match the improved section listed above. Auxiliary lanes and turnarounds are planned where needed, and the realignment between MP 15.00 and MP 16.56 will connect to the Grandview Interchange with US 160. The slope is not expected to exceed 3-percent as the roadway descends from the top of the mesa to the new interchange.

A predictive analysis for the proposed virgin alignment was conducted in support of the design-build project and is included as an **Appendix** to this report.

## US 550 Study Corridor Crash History and Problem Analysis

### Crash History

The US 550 crash history for the five-year period, July 1<sup>st</sup>, 2012 through June 30<sup>th</sup>, 2017 was examined between MP 8.88 and MP 16.56 to locate clusters and identify crash causes. One hundred seventy-nine (179) crashes were reported along this section of US 550 during the study period; 41 crashes resulted in 59 injuries and no crashes resulted in fatality. **Table 1** summarizes the crash totals for this segment of US 550 over the five-year study period.

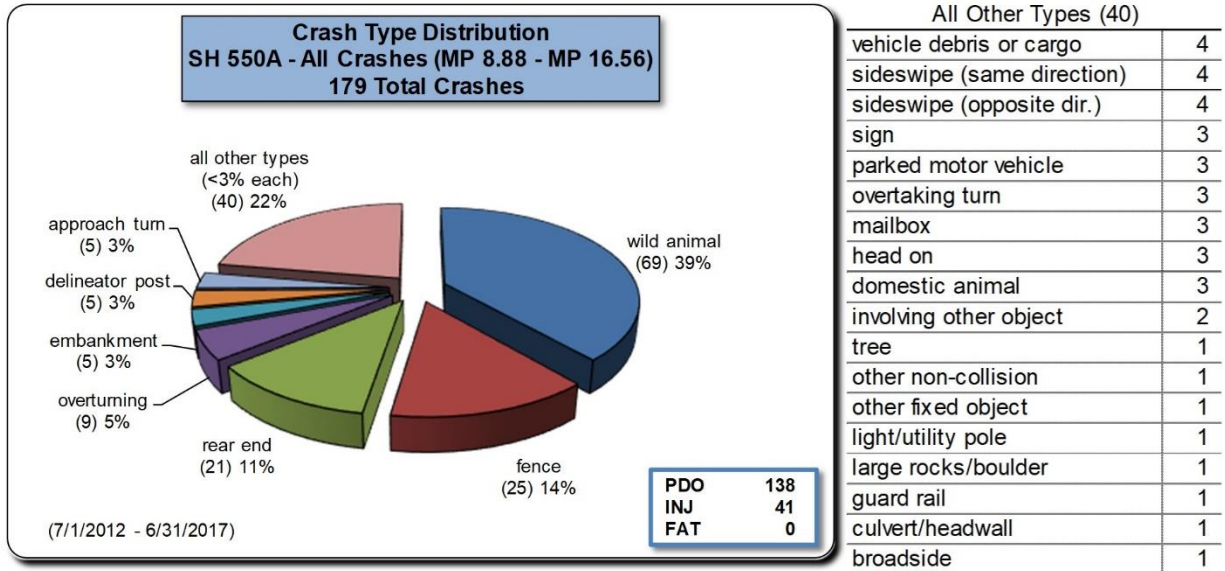
**Table 1: US 550 Crash History from MP 8.88 to MP 16.56 by Year**

Year	Crashes				Persons	
	PDO*	Injury	Fatal	Total	Injured	Killed
7/1/2012 to 6/30/2013	34	10	0	44	18	0
7/1/2013 to 6/30/2014	19	11	0	30	12	0
7/1/2014 to 6/30/2015	25	9	0	34	16	0
7/1/2015 to 6/30/2016	27	5	0	32	6	0
7/1/2016 to 6/30/2017	33	6	0	39	7	0
<b>Total</b>	<b>138</b>	<b>41</b>	<b>0</b>	<b>179</b>	<b>59</b>	<b>0</b>
<b>Average/Yr</b>	<b>27.6</b>	<b>8.2</b>	<b>0.0</b>	<b>35.8</b>	<b>11.8</b>	<b>0.0</b>

\*PDO – Property Damage Only

*Wild Animal* crashes were the most common crash type observed, accounting for 39 percent of the total crashes; followed by *fence* type crashes at 14 percent, and *rear end* type crashes at 11 percent. **Figure 2** displays the crash distribution, by type, for the study segment.

**Figure 2: US 550 Crash Distribution by Type**



**General Crash Patterns and Mitigation**

The improvements made to the roadway surface inherent to a resurfacing project are expected to have a positive impact on the safety performance. Improved skid resistance, improved drainage through reduction in roadway rutting or crown correction, and new or upgraded pavement markings are several examples of mitigation measures.

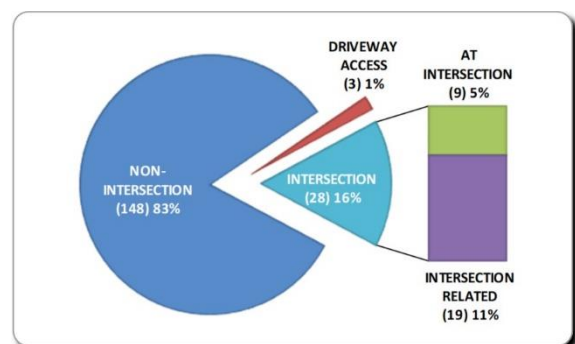
**Fatal Crashes**

There were no fatal crashes during the five-year study period.

**Crash Locations**

The majority of the crashes along the US 550 corridor occurred at non-intersection locations (148 of 179, 83%), followed by crashes in the vicinity of intersections (28 of 179, 16%), with the remaining crashes occurring at driveway accesses (3 of 179, 1%). This breakdown is shown in **Figure 3**. The magnitude of safety problems at intersections was assessed using Safety Performance Functions, and specific patterns were determined using direct diagnostic analysis techniques. The complete listing and detailed crash summary sheets for the study corridor of US 550 are provided in the **Appendix**.

**Figure 3: Crashes by Location**



**Safety Performance Function**

The assessment of the magnitude of safety problems is refined through the use of Safety Performance Functions (SPF). The SPF reflects the complex relationship between traffic exposure measured in Average Daily Traffic (ADT), and crash count measured in crashes per year. The SPF model provides an estimate of the normal or expected crash frequency and severity for a range of ADT among similar facilities. Two kinds of SPF's were calibrated. The first addresses the total number of crashes, and the



second addresses crashes involving an injury or fatality, allowing the assessment of the magnitude of the safety problem from the frequency and severity standpoint.

All dataset preparation was performed using the Colorado Department of Transportation (CDOT) crash databases. Crash history for each facility was prepared using the most recent five years of crash data. The ADT for each roadway and/or intersection approach (major and minor) over the five years were entered into the same dataset. Each dataset is corrected for the regression to the mean bias using the Empirical Bayes (EB) procedure.

Development of the SPF lends itself to the conceptual formulation of the Level of Service of Safety (LOSS). The concept of level of service uses qualitative measures that characterize safety of an intersection in reference to its expected performance. If the level of safety predicted by the SPF will represent a normal or expected number of crashes at a specific level of ADT, selected percentiles within the frequency distribution can be stratified to represent specific levels of safety.

- LOSS I – Below 20<sup>th</sup> Percentile  
Indicates a low potential for crash reduction.
- LOSS II – 20<sup>th</sup> Percentile to Mean  
Indicates a low to moderate potential for crash reduction.
- LOSS III – Mean to 80<sup>th</sup> Percentile  
Indicates a moderate to high potential for crash reduction.
- LOSS IV – Above 80<sup>th</sup> Percentile  
Indicates a high potential for crash reductions.

LOSS reflects how the roadway or intersection is performing in regard to its expected crash frequency at a specific level of ADT (major and minor). It does not, however, provide any information related to the nature of the safety problem itself. If a safety problem is present, LOSS will only describe its magnitude from the frequency and severity standpoints. The nature of the problem is determined through diagnostic analysis using direct diagnostic and pattern recognition techniques discussed later in this assessment.

### Intersection Crash Analysis

Crashes that can be attributed to intersections (located at intersections or that are intersection related) accounted for 16% of the total crashes (28 of 179). **Table 2** lists the intersection, number of legs, signalization, crash frequency and LOSS.

**Table 2: Intersection Crashes by Location**

MP	Description	Legs	Signal	Number of Crashes				LOSS Total	LOSS Severe
				PDO <sup>1</sup>	Injury	Fatal	Total		
11.17	CR 214	4	No	1	1	0	2	II	III
12.19	CR 302	4	No	0	2	0	2	II	II
15.68	CR 220 (South)	3	No	3	0	0	3	II	II
15.81	CR 220 (North)	3	No	0	1	0	1	II	III
16.56	Jct US 160	3	Yes	6	4	0	10	I	I
<i>Non-Specific Intersection Crashes (&gt;100-ft from intersection)</i>				8	2	0	10		
<b>Total</b>				<b>18</b>	<b>10</b>	<b>0</b>	<b>28</b>		
<b>Average/Year</b>				<b>3.6</b>	<b>2.0</b>	<b>0.0</b>	<b>5.6</b>		

<sup>1</sup> PDO – Property Damage Only crashes

All intersections along the US 550 study corridor with more than two (2) total crashes were in the LOSS I or LOSS II categories for both severe and total crashes, indicating better than expected safety performance and a low to moderate potential for crash reduction.

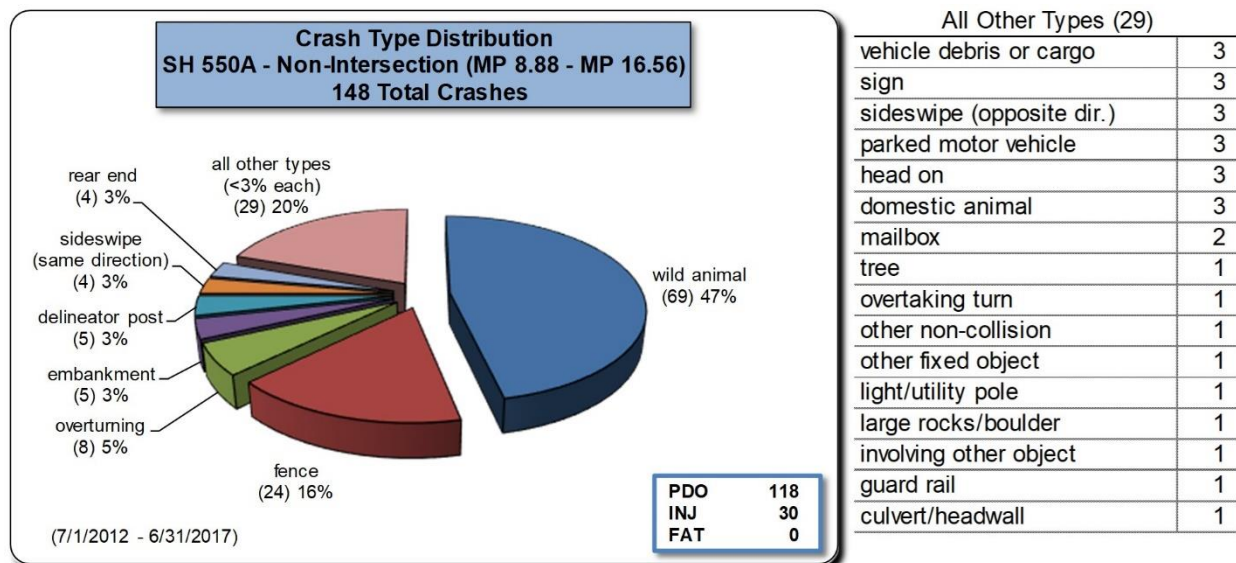
### Intersection Specific Recommendations

Pattern recognition and detailed analysis was not conducted for the intersections along this segment of US 550. The reconstruction and widening project will eliminate the current US 550 intersection with US 160. The connection to US 160 at the end of the realigned corridor will occur at a roundabout intersection at the eastbound ramp terminal intersection at the Grandview Interchange. There were three (3) or fewer crashes at any of the remaining intersections; no recommendations are made for any of these locations at this time.

### Non-Intersection Crash Analysis

There were 148 non-intersection crashes during the five-year study period on US 550. *Wild animal* crashes were predominant (47%), followed by *fence* crashes (16%), and *overturning* type crashes (5%). **Figure 4** shows the crash distribution, by type, for the study segment.

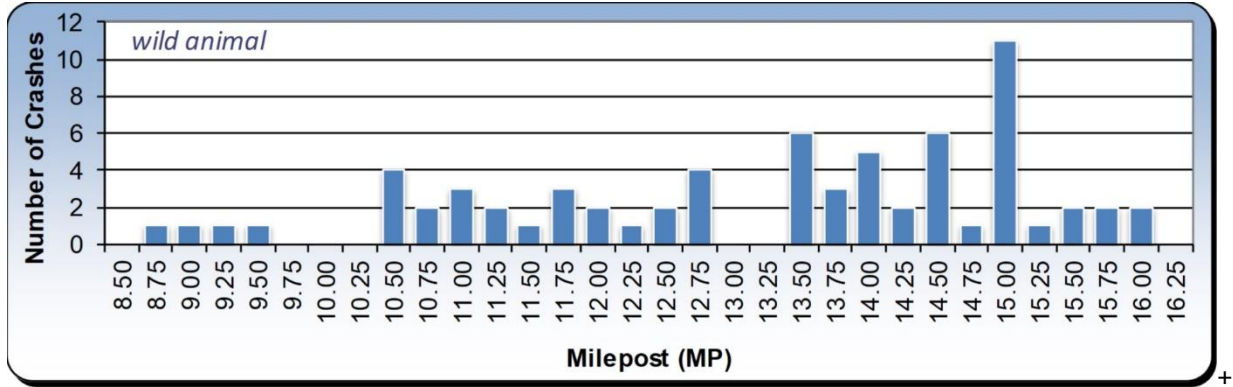
**Figure 4: US 550 Non-Intersection Crash Distribution by Type**



### Wild Animal

There were 69 *wild animal* type crashes during the five-year study period along this segment of US 550; one (1) involving an elk, the rest involving deer. There were approximately 1.8 *wild animal* crashes per mile per year (CPMPY) through this section, with a higher concentration between MP 10.5 and MP 13.0 (1.9 CPMPY), and a much higher concentration between MP 13.50 and MP 16.25 (3.0 CPMPY). **Figure 5** shows the frequency of *wild animal* crashes in ¼ mile increments along the study corridor.

**Figure 5: Wild Animal Type Crashes by ¼ Mile Increments**

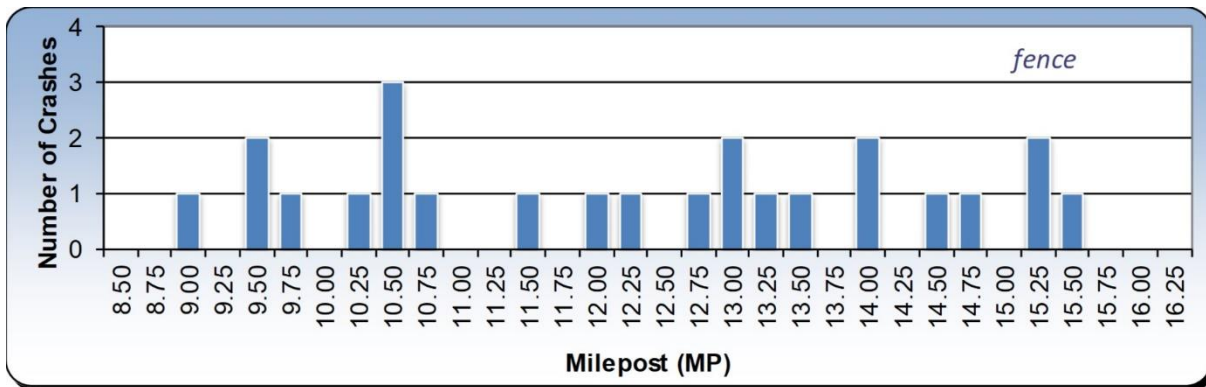


The widening and reconstruction project is expected to include wildlife fencing along the entire length of the corridor and several wildlife crossing structures. Two underpasses, one near MP 14.25 and another near MP 15.40, and an overpass near MP 16.14. Two bridge structures (Gulch A and Gulch B) will also provide for wildlife crossings. These proposed improvements should help reduce the frequency of *wild animal* crashes associated with the northern of the two concentrations. Similar facilities should be considered through the southern concentration at appropriate intervals.

**Fence Collisions**

There were 24 *fence* type crashes during the five-year study period along this segment of US 550. Most occurred when lighting conditions were poor (14 of 24), and four (4) of the daytime crashes occurred when roadway conditions were poor. No locations were detected with a consistent pattern of crashes occurring under similar circumstances.

**Figure 6: Fence Crashes by ¼ Mile Increments**



Even considering all run-off-road type crashes (55 of 148), there were few locations with more than two (2) or three (3) crashes that could be readily associated with the proximate roadway characteristics (curve, access point, etc.). The proposed widening and reconstruction project represents a significant change in the roadway geometry, and no recommendations for mitigation at specific locations are made at this time.

**Driveway Access Crashes**

There were only three (3) driveway crashes during the five-year study period, each at a different driveway access; no recommendations for improvement are made at this time.

## Conclusions and Recommendations

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These conclusions and recommendations are based on the analysis of five years of crash history on US 550, and a review of aerial imagery and the video log. The Region is advised to verify through field survey, the observations made in this report regarding physical features, roadside characteristics and traffic control devices.

### General Recommendations

The conditions on US 550 between MP 8.88 and MP 16.56 are expected to undergo a significant change following completion of this widening and reconstruction project, including a new alignment on the north end of the study area. The following features typically associated with construction projects should be provided:

- Good skid resistance and drainage of the roadway surface.
- Adjustment, repair, and upgrade of existing guardrail to meet current standards.
- Elimination of pavement edge drop-offs (Safety Edge Application).
- Crown correction where required.
- Appropriate advance warning signing of curves, interchanges and intersections.
- Replace all button reflectors and guardrail reflectors to ensure good nighttime and inclement weather (fog, snow, rain, etc.) delineation.
- Upgrade pavement markings to meet current retroreflectivity standards.
- Review signal timing plans to ensure appropriate signal change period.

### Non-Intersection Recommendations

#### Wild Animal Crashes

*69 Total Crashes (6 Injury Crash)*

*Causal Factors: The location of the roadway lies between grazing land on top of the Mesa and water sources to the northwest, with the easiest descent located on the north side of the study area where the concentration of crashes was the highest.*

- The proposed widening and reconstruction project is expected to provide wildlife fencing and several crossing structures that should help reduce the frequency of wild animal crashes.

#### Fence Crashes

*24 Total Crashes (6 Injury Crash)*

*Causal Factors: Most crashes occurred when lighting or roadway conditions were poor.*

- No additional recommendations for the widening and reconstruction are made at this time.

## Appendix

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### **Detailed Summary of Crash History:**

- Overall Detailed Summary (July 1, 2012 – June 30, 2017)
- Individual Year General Summary
  - Year 1: 7/1/2012 to 6/30/2013
  - Year 2: 7/1/2013 to 6/30/2014
  - Year 3: 7/1/2014 to 6/30/2015
  - Year 4: 7/1/2015 to 6/30/2016
  - Year 5: 7/1/2016 to 6/30/2017

### **Strip Maps**

#### **Highway CORIS (Colorado Roadway Inventory System)**

#### **Crash Listing (July 1, 2012 through June 30, 2017)**

#### **Predictive Analysis for New Alignment (MP 15.00 to MP 16.56) Memorandum**





**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**Detailed Summary of Crashes Report**

09/17/2018

Job #: 20180917160654

**Location: 550A 160A Begin: 8.88 End: 16.56 From:07/01/2012 To:06/30/2017**

**Severity**

PDO:	138	
INJ:	41	59 :Injured
FAT:	0	0 :Killed
<b>Total:</b>	<b>179</b>	

**Number of Vehicles**

One Vehicle:	131
Two Vehicles:	43
Three or More:	5
Unknown:	0
<b>Total:</b>	<b>179</b>

**Location**

On Road:	120
Off Road Left:	18
Off Road Right:	39
Off Road at Tee:	1
Off in Median:	1
Unknown:	0
<b>Total:</b>	<b>179</b>

**Lighting Conditions**

Daylight:	95
Dawn or Dusk:	23
Dark - Lighted:	2
Dark - Unlighted:	59
Unknown:	0
<b>Total:</b>	<b>179</b>

**Weather Conditions**

None:	147
Rain:	10
Snow/Sleet/Hail:	19
Fog:	0
Dust:	0
Wind:	3
Unknown:	0
<b>Total:</b>	<b>179</b>

**Crash Rates**

PDO:	1.55*	* MVMT
INJ:	0.46*	** 100 MVMT
FAT:	0.00**	
<b>Total:</b>	<b>2.02*</b>	

**Crash Type**

Overtuning:	9	Bridge Abutment:	0
Other Non Collision:	1	Column/Pier:	0
Pedestrians:	0	Culvert/Headwall:	1
Broadside:	1	Embankment:	5
Head On:	3	Curb:	0
Rear End:	21	Delineator Post:	5
Sideswipe (Same):	4	Fence:	25
Sideswipe (Opposite):	4	Tree:	1
Approach Turn:	5	Large Boulders or Rocks:	1
Overtaking Turn:	3	Barricade:	0
Parked Motor Vehicle:	3	Wall/Building:	0
Railway Vehicle:	0	Crash Cushion:	0
Bicycle:	0	Mailbox:	3
Motorized Bicycle:	0	Other Fixed Object:	1
Domestic Animal:	3	Total Fixed Objects:	47
Wild Animal:	69	Rocks in Roadway:	0
Light/Utility Pole:	1	Vehicle Cargo/Debris:	4
Traffic Signal Pole:	0	Road Maintenance Equipment:	0
Sign:	3	Involving Other Object:	2
Bridge Rail:	0	Total Other Objects:	6
Guard Rail:	1	Unknown:	0
Cable Rail:	0	<b>Total:</b>	<b>179</b>
Concrete Barrier:	0		

**Mainline/Ramps/Frontage Roads**

Mainline:	179	<b>Frontage/Ramp Intersections</b>
Crossroad (A):	0	M: 0 N: 0 O: 0 P: 0
<b>Ramps</b>		
B: 0 F: 0 J: 0		Left Frontage Rd (L): 0
C: 0 G: 0 K: 0		Rt Frontage Rd (R): 0
D: 0 H: 0 T: 0		HOV Lanes (V): 0
E: 0 I: 0		Unknown: 0
		<b>Total:</b> 179

**Road Description**

At Intersection:	9
At Driveway Access:	3
Intersection Related:	19
Non Intersection:	148
In Alley:	0
Roundabout:	0
Ramp:	0
Parking Lot:	0
Unknown:	0
<b>Total:</b>	<b>179</b>

**Road Conditions**

Dry:	145
Wet:	10
Muddy:	0
Snowy:	6
Icy:	11
Slushy:	3
Foreign Material:	1
With Road Treatment:	0
Dry w/Icy Road Treatment:	0
Wet w/Icy Road Treatment:	1
Snowy w/Icy Road Treatment:	2
Icy w/Icy Road Treatment:	0
Slushy w/Icy Road Treatment:	0
Unknown:	0
<b>Total:</b>	<b>179</b>

**ADT: 6,401 Length: 7.59**



**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**Detailed Summary of Crashes Report**

09/17/2018

Job #: 20180917160654

**Location: 550A 160A Begin: 8.88 End: 16.56 From:07/01/2012 To:06/30/2017**

Vehicle Type	Veh 1	Veh 2	Veh 3
Passenger Car/Van:	71	20	1
Passenger Car/Van w/Trl:	1	0	0
Pickup Truck/Utility Van:	49	13	1
Pickup Truck/Utility Van w/Trl:	7	3	0
SUV:	45	7	2
SUV w/Trl:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Bus > 15 People:	1	4	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	1	0	0
Motorcycle:	3	1	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	1
Other:	1	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>179</b>	<b>48</b>	<b>5</b>

Vehicle Movement	Veh 1	Veh 2	Veh 3
Going Straight:	120	19	2
Slowing:	6	7	1
Stopped in Traffic:	0	9	1
Making Right Turn:	2	1	0
Making Left Turn:	5	6	0
Making U-Turn:	1	0	0
Passing:	8	0	0
Backing:	3	0	0
Enter/Leave Parked Position:	1	0	0
Starting in Traffic:	0	0	0
Parked:	0	4	1
Changing Lanes:	0	1	0
Avoiding Object/Veh in Road:	3	1	0
Weaving:	5	0	0
Wrong Way:	0	0	0
Other:	25	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>179</b>	<b>48</b>	<b>5</b>

Contributing Factor	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	116	47	5
Asleep at the Wheel:	8	0	0
Illness:	4	0	0
Distracted by Passenger:	1	0	0
Driver Inexperience:	15	0	0
Driver Fatigue:	1	0	0
Driver Preoccupied:	11	0	0
Driver Unfamiliar with Area:	4	0	0
Driver Emotionally Upset:	0	0	0
Evading Law Enforcement Officer:	0	0	0
Physical Disability:	0	0	0
Unknown:	19	1	0
<b>Total:</b>	<b>179</b>	<b>48</b>	<b>5</b>

Direction	Veh 1	Veh 2	Veh 3
North:	18	4	1
Northeast:	0	0	0
East:	76	17	1
Southeast:	0	0	0
South:	17	4	0
Southwest:	0	0	0
West:	67	23	2
Northwest:	1	0	0
Unknown:	0	0	1
<b>Total:</b>	<b>179</b>	<b>48</b>	<b>5</b>

Condition of Driver	Veh 1	Veh 2	Veh 3
No Impairment Suspected:	165	48	5
Alcohol Involved:	13	0	0
RX, Medication, or Drugs Involved:	1	0	0
Illegal Drugs Involved:	0	0	0
Alcohol and Drugs Involved:	0	0	0
Driver/Pedestrian not Observed:	0	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>179</b>	<b>48</b>	<b>5</b>

**ADT: 6,401 Length: 7.59**





**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**General Summary of Crashes Report**

09/17/2018

Job #: 20180917161935

**Location: 550A 160A Begin: 8.88 End: 16.56 From:07/01/2012 To:06/30/2013**

**Severity**

PDO:	34	
INJ:	10	18 :Injured
FAT:	0	0 :Killed
<b>Total:</b>	<b>44</b>	

**Number of Vehicles**

One Vehicle:	26
Two Vehicles:	17
Three or More:	1
Unknown:	0
<b>Total:</b>	<b>44</b>

**Location**

On Road:	25
Off Road:	19
Unknown:	0
<b>Total:</b>	<b>44</b>

**Mainline/Ramps/Frontage Rds**

Mainline:	44
Ramps:	0
Frontage/Ramp Intsx:	0
Frontage Roads:	0
HOV Lanes:	0
Unknown:	0
<b>Total:</b>	<b>44</b>

**Lighting Conditions**

Daylight:	27
Dawn or Dusk:	4
Dark - Lighted:	0
Dark - Unlighted:	13
Unknown:	0
<b>Total:</b>	<b>44</b>

**Crash Rates**

PDO:	2.07*	* Per MVMT
INJ:	0.61*	** Per 100 MVMT
FAT:	0.00**	
<b>Total:</b>	<b>2.68*</b>	

**Crash Type**

Overtuning:	2
Other Non Collision:	0
Pedestrians:	0
Broadside:	1
Head On:	3
Rear End:	5
Sideswipe Same:	1
Sideswipe Opposite:	2
Approach Turn:	0
Overtaking Turn:	2
Parked Motor Vehicle:	3
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	0
Wild Animal:	10
Fixed Objects:	14
Other Objects:	1
Unknown:	0
<b>Total:</b>	<b>44</b>

**Weather Conditions**

None:	31
Rain:	1
Snow/Sleet/Hail:	11
Fog:	0
Dust:	0
Wind:	1
Unknown:	0
<b>Total:</b>	<b>44</b>

**Road Conditions**

Dry:	30
Wet:	1
Muddy:	0
Snowy:	3
Icy:	7
Slushy:	1
Foreign Material:	1
With Road Treatment:	1
Unknown:	0
<b>Total:</b>	<b>44</b>

**Vehicle Types**

	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	17	4	0
Passenger Car/Van w/Trailer:	1	0	0
Pickup Truck/Utility Van:	18	6	1
Pickup Truck/Utility Van w/Trailer:	1	2	0
SUV:	6	4	0
SUV w/Trailer:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	0	2	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	1	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	0	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>44</b>	<b>18</b>	<b>1</b>

**ADT: 5,922 Length: 7.59**



**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**General Summary of Crashes Report**

09/17/2018

Job #: 20180917162008

**Location: 550A 160A Begin: 8.88 End: 16.56 From:07/01/2013 To:06/30/2014**

**Severity**

PDO:	19	
INJ:	11	12 :Injured
FAT:	0	0 :Killed
<b>Total:</b>	<b>30</b>	

**Number of Vehicles**

One Vehicle:	24
Two Vehicles:	5
Three or More:	1
Unknown:	0
<b>Total:</b>	<b>30</b>

**Location**

On Road:	20
Off Road:	10
Unknown:	0
<b>Total:</b>	<b>30</b>

**Mainline/Ramps/Frontage Rds**

Mainline:	30
Ramps:	0
Frontage/Ramp Intsx:	0
Frontage Roads:	0
HOV Lanes:	0
Unknown:	0
<b>Total:</b>	<b>30</b>

**Lighting Conditions**

Daylight:	16
Dawn or Dusk:	4
Dark - Lighted:	0
Dark - Unlighted:	10
Unknown:	0
<b>Total:</b>	<b>30</b>

**Crash Rates**

PDO:	1.10*	* Per MVMT
INJ:	0.64*	** Per 100 MVMT
FAT:	0.00**	
<b>Total:</b>	<b>1.74*</b>	

**Crash Type**

Overtuning:	1
Other Non Collision:	0
Pedestrians:	0
Broadside:	0
Head On:	0
Rear End:	5
Sideswipe Same:	0
Sideswipe Opposite:	0
Approach Turn:	1
Overtaking Turn:	0
Parked Motor Vehicle:	0
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	1
Wild Animal:	12
Fixed Objects:	8
Other Objects:	2
Unknown:	0
<b>Total:</b>	<b>30</b>

**Weather Conditions**

None:	24
Rain:	4
Snow/Sleet/Hail:	1
Fog:	0
Dust:	0
Wind:	1
Unknown:	0
<b>Total:</b>	<b>30</b>

**Road Conditions**

Dry:	25
Wet:	4
Muddy:	0
Snowy:	0
Icy:	0
Slushy:	1
Foreign Material:	0
With Road Treatment:	0
Unknown:	0
<b>Total:</b>	<b>30</b>

**Vehicle Types**

	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	15	3	0
Passenger Car/Van w/Trailer:	0	0	0
Pickup Truck/Utility Van:	5	0	0
Pickup Truck/Utility Van w/Trailer:	0	1	0
SUV:	8	1	1
SUV w/Trailer:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	0	0	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	2	1	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	0	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>30</b>	<b>6</b>	<b>1</b>

**ADT: 6,225 Length: 7.59**



**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**General Summary of Crashes Report**

09/17/2018

Job #: 20180917162037

**Location: 550A 160A      Begin: 8.88    End: 16.56    From:07/01/2014    To:06/30/2015**

Severity	
PDO:	25
INJ:	9      16 :Injured
FAT:	0      0 :Killed
<b>Total:</b>	<b>34</b>

Number of Vehicles	
One Vehicle:	28
Two Vehicles:	5
Three or More:	1
Unknown:	0
<b>Total:</b>	<b>34</b>

Location	
On Road:	21
Off Road:	13
Unknown:	0
<b>Total:</b>	<b>34</b>

Mainline/Ramps/Frontage Rds	
Mainline:	34
Ramps:	0
Frontage/Ramp Intsx:	0
Frontage Roads:	0
HOV Lanes:	0
Unknown:	0
<b>Total:</b>	<b>34</b>

Lighting Conditions	
Daylight:	15
Dawn or Dusk:	6
Dark - Lighted:	1
Dark - Unlighted:	12
Unknown:	0
<b>Total:</b>	<b>34</b>

Crash Rates	
PDO:	1.41 *      * Per MVMT
INJ:	0.51 *      ** Per 100 MVMT
FAT:	0.00 **
<b>Total:</b>	<b>1.92 *</b>

Crash Type	
Overtuning:	3
Other Non Collision:	0
Pedestrians:	0
Broadside:	0
Head On:	0
Rear End:	1
Sideswipe Same:	1
Sideswipe Opposite:	0
Approach Turn:	2
Overtaking Turn:	0
Parked Motor Vehicle:	0
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	1
Wild Animal:	14
Fixed Objects:	10
Other Objects:	2
Unknown:	0
<b>Total:</b>	<b>34</b>

Weather Conditions	
None:	29
Rain:	3
Snow/Sleet/Hail:	2
Fog:	0
Dust:	0
Wind:	0
Unknown:	0
<b>Total:</b>	<b>34</b>

Road Conditions	
Dry:	29
Wet:	2
Muddy:	0
Snowy:	1
Icy:	0
Slushy:	1
Foreign Material:	0
With Road Treatment:	1
Unknown:	0
<b>Total:</b>	<b>34</b>

Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	14	6	1
Passenger Car/Van w/Trailer:	0	0	0
Pickup Truck/Utility Van:	3	0	0
Pickup Truck/Utility Van w/Trailer:	2	0	0
SUV:	14	0	0
SUV w/Trailer:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	0	0	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	0	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	1	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>34</b>	<b>6</b>	<b>1</b>

**ADT: 6,395      Length: 7.59**



**Colorado Department of Transportation  
DiExSys™ Roadway Safety Systems  
General Summary of Crashes Report**

09/17/2018

Job #: 20180917162112

**Location: 550A 160A      Begin: 8.88    End: 16.56    From:07/01/2015    To:06/30/2016**

Severity	
PDO:	27
INJ:	5      6 :Injured
FAT:	0      0 :Killed
<b>Total:</b>	<b>32</b>

Number of Vehicles	
One Vehicle:	25
Two Vehicles:	6
Three or More:	1
Unknown:	0
<b>Total:</b>	<b>32</b>

Location	
On Road:	22
Off Road:	10
Unknown:	0
<b>Total:</b>	<b>32</b>

Mainline/Ramps/Frontage Rds	
Mainline:	32
Ramps:	0
Frontage/Ramp Intsx:	0
Frontage Roads:	0
HOV Lanes:	0
Unknown:	0
<b>Total:</b>	<b>32</b>

Lighting Conditions	
Daylight:	17
Dawn or Dusk:	4
Dark - Lighted:	0
Dark - Unlighted:	11
Unknown:	0
<b>Total:</b>	<b>32</b>

Crash Rates	
PDO:	1.45*      * Per MVMT
INJ:	0.27*      ** Per 100 MVMT
FAT:	0.00**
<b>Total:</b>	<b>1.72*</b>

Crash Type	
Overtuning:	1
Other Non Collision:	1
Pedestrians:	0
Broadside:	0
Head On:	0
Rear End:	4
Sideswipe Same:	1
Sideswipe Opposite:	1
Approach Turn:	1
Overtaking Turn:	0
Parked Motor Vehicle:	0
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	1
Wild Animal:	12
Fixed Objects:	10
Other Objects:	0
Unknown:	0
<b>Total:</b>	<b>32</b>

Weather Conditions	
None:	29
Rain:	0
Snow/Sleet/Hail:	2
Fog:	0
Dust:	0
Wind:	1
Unknown:	0
<b>Total:</b>	<b>32</b>

Road Conditions	
Dry:	27
Wet:	0
Muddy:	0
Snowy:	1
Icy:	3
Slushy:	0
Foreign Material:	0
With Road Treatment:	1
Unknown:	0
<b>Total:</b>	<b>32</b>

Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	12	3	0
Passenger Car/Van w/Trailer:	0	0	0
Pickup Truck/Utility Van:	9	2	0
Pickup Truck/Utility Van w/Trailer:	2	0	0
SUV:	8	0	0
SUV w/Trailer:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	0	2	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	1	0	0
Motorcycle:	0	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	1
Other:	0	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>32</b>	<b>7</b>	<b>1</b>

**ADT: 6,678      Length: 7.59**



**Colorado Department of Transportation**  
**DiExSys™ Roadway Safety Systems**  
**General Summary of Crashes Report**

09/17/2018

Job #: 20180917162147

**Location: 550A 160A      Begin: 8.88    End: 16.56    From:07/01/2016    To:06/30/2017**

Severity	
PDO:	33
INJ:	6      7 :Injured
FAT:	0      0 :Killed
<b>Total:</b>	<b>39</b>

Number of Vehicles	
One Vehicle:	28
Two Vehicles:	10
Three or More:	1
Unknown:	0
<b>Total:</b>	<b>39</b>

Location	
On Road:	32
Off Road:	7
Unknown:	0
<b>Total:</b>	<b>39</b>

Mainline/Ramps/Frontage Rds	
Mainline:	39
Ramps:	0
Frontage/Ramp Intsx:	0
Frontage Roads:	0
HOV Lanes:	0
Unknown:	0
<b>Total:</b>	<b>39</b>

Lighting Conditions	
Daylight:	20
Dawn or Dusk:	5
Dark - Lighted:	1
Dark - Unlighted:	13
Unknown:	0
<b>Total:</b>	<b>39</b>

Crash Rates	
PDO:	1.73*      * Per MVMT
INJ:	0.31*      ** Per 100 MVMT
FAT:	0.00**
<b>Total:</b>	<b>2.04*</b>

Crash Type	
Overtuning:	2
Other Non Collision:	0
Pedestrians:	0
Broadside:	0
Head On:	0
Rear End:	6
Sideswipe Same:	1
Sideswipe Opposite:	1
Approach Turn:	1
Overtaking Turn:	1
Parked Motor Vehicle:	0
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	0
Wild Animal:	21
Fixed Objects:	5
Other Objects:	1
Unknown:	0
<b>Total:</b>	<b>39</b>

Weather Conditions	
None:	34
Rain:	2
Snow/Sleet/Hail:	3
Fog:	0
Dust:	0
Wind:	0
Unknown:	0
<b>Total:</b>	<b>39</b>

Road Conditions	
Dry:	34
Wet:	3
Muddy:	0
Snowy:	1
Icy:	1
Slushy:	0
Foreign Material:	0
With Road Treatment:	0
Unknown:	0
<b>Total:</b>	<b>39</b>

Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	13	4	0
Passenger Car/Van w/Trailer:	0	0	0
Pickup Truck/Utility Van:	14	5	0
Pickup Truck/Utility Van w/Trailer:	2	0	0
SUV:	9	2	1
SUV w/Trailer:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	1	0	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	0	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	0	0	0
Unknown:	0	0	0
<b>Total:</b>	<b>39</b>	<b>11</b>	<b>1</b>

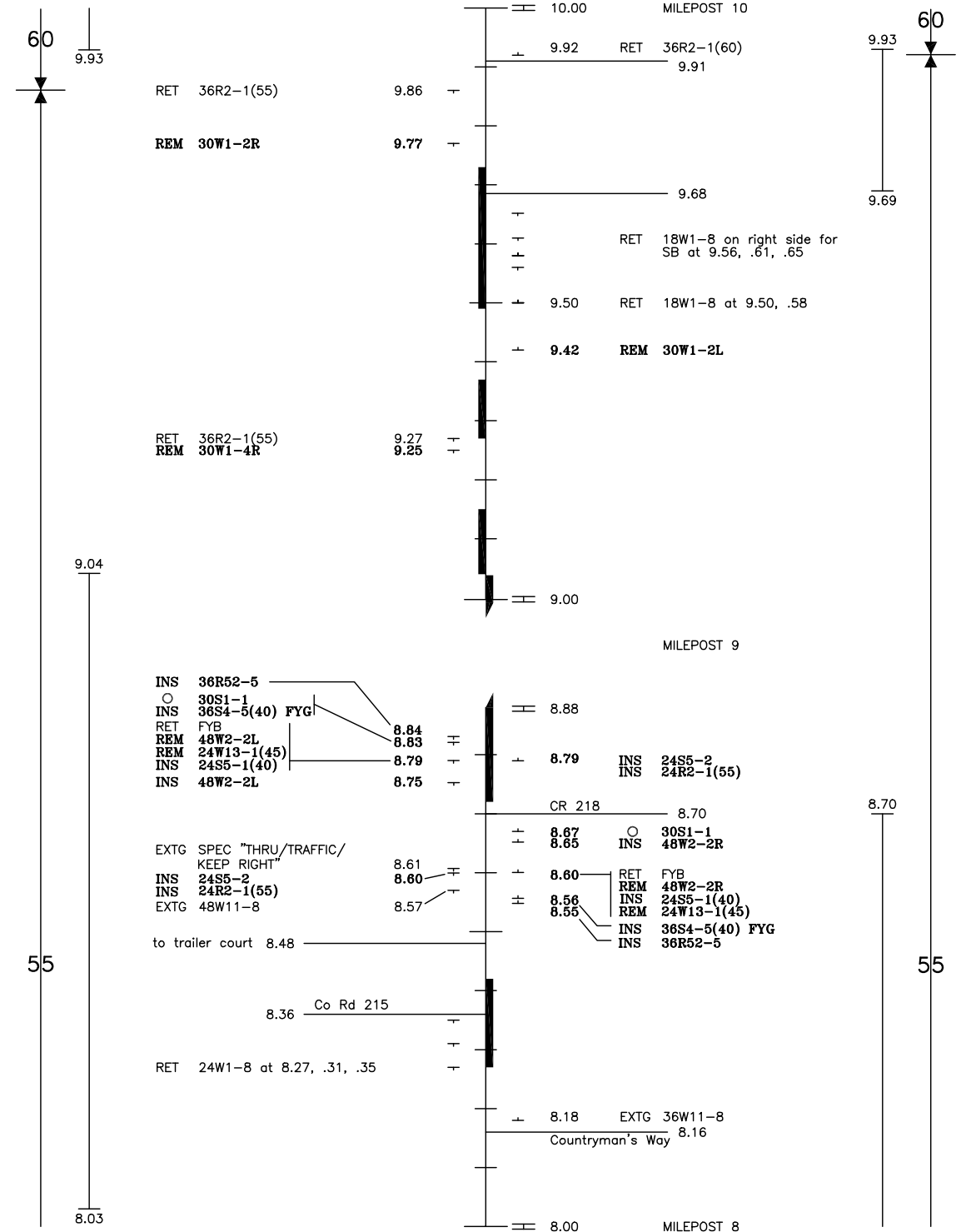
**ADT: 6,886      Length: 7.59**



# AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



AUTHORIZED SPEED LIMITS



\_\_\_\_\_  
Traffic Engineer  
Date: \_\_\_\_\_



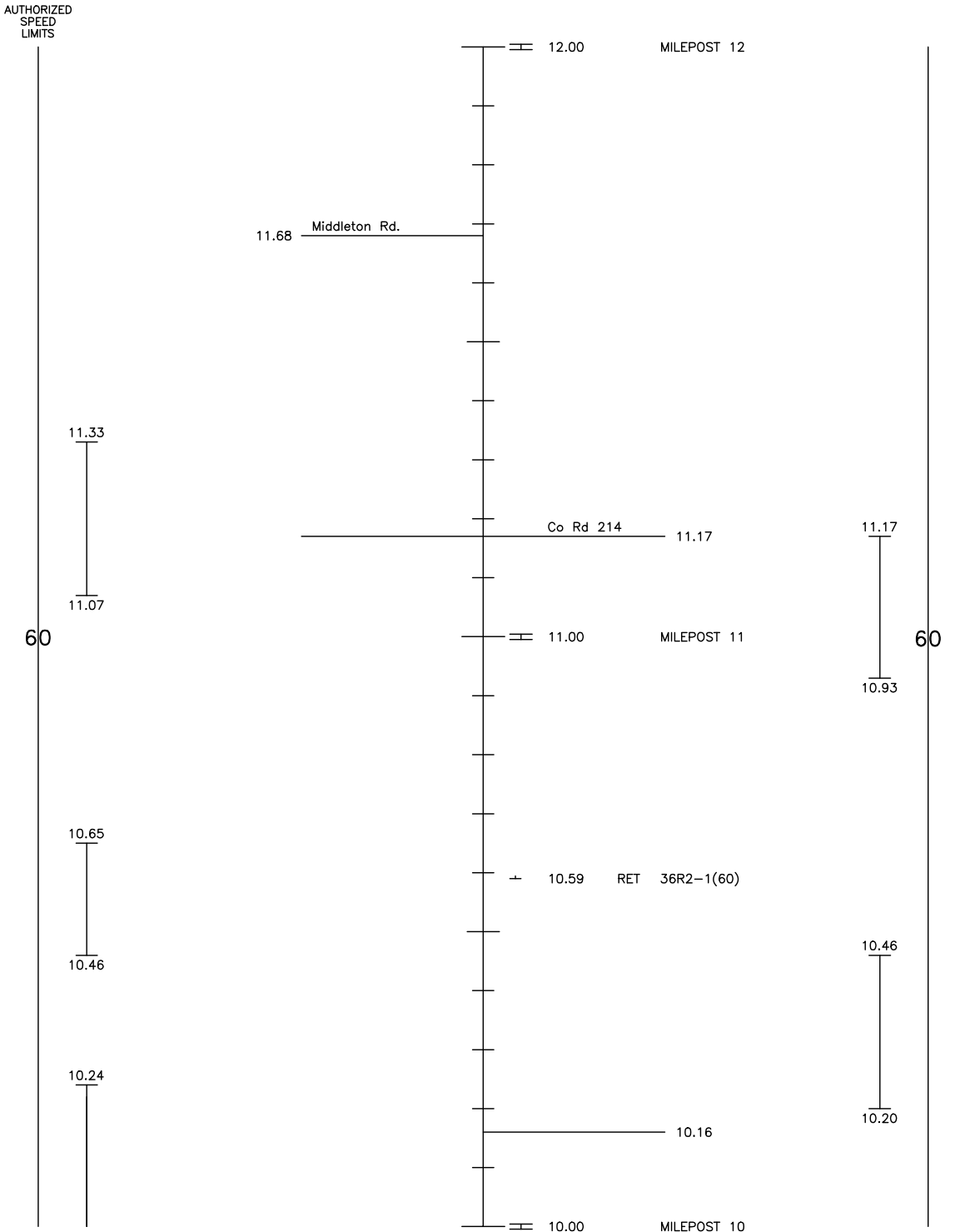
⊥ = EXTG NO-PASSING ZONE



○ MISSING DO NOT REINSTALL  
\*MISSING ON 04-20-06  
SIGNLOG ON 04-20-06

	<b>FILE</b>	<b>MEMO</b>	<b>SHEET</b>	Implemented with changes as marked
	880.550.01A	6471	3A	Date: _____ By: _____

# AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



\_\_\_\_\_  
Traffic Engineer  
Date: \_\_\_\_\_



⊥ = EXTG NO-PASSING ZONE



SIGNLOG ON 04-20-06

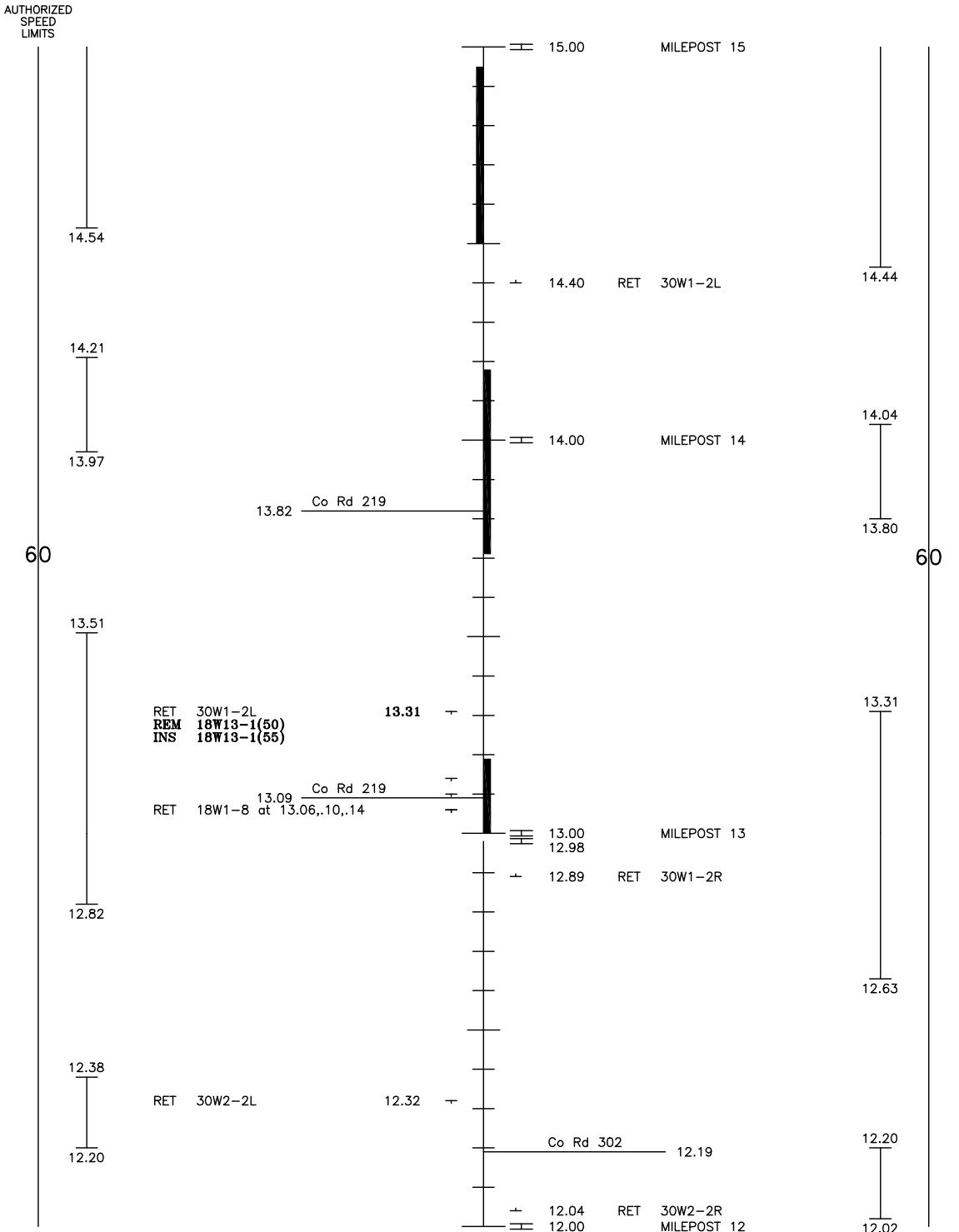
FILE	MEMO	SHEET	Implemented with changes as marked
880.550.01A	6471	3B	Date: _____ By: _____

**SH 550A FROM NEW MEXICO STATE LINE TO SH 160A S/O DURANGO**

**SUPERSEDES SHEET 3, MEMO 5937, 12-12-96**



# AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



Signed By: Matthew Reay

\_\_\_\_\_  
Staff Traffic Engineer

Date: \_\_\_\_\_



⊥ = EXTG NO-PASSING ZONE



SIGNLOG ON 08-20-96

	<b>FILE</b>	<b>MEMO</b>	<b>SHEET</b>	Implemented with changes as marked
	880.550.01	5937	4	Date: _____ By: _____

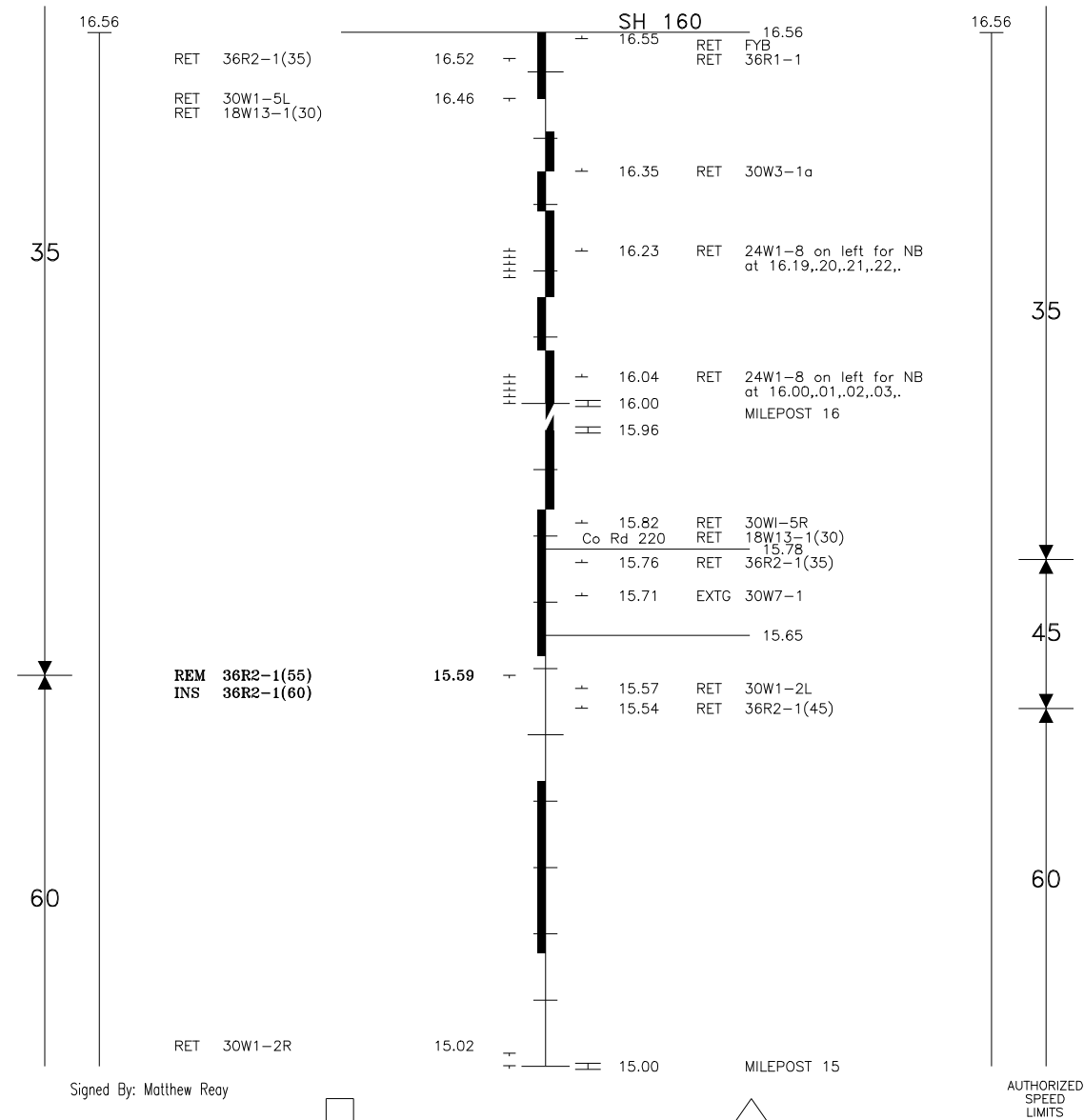
**SH 550 FROM NEW MEXICO STATE LINE TO SH 160 S/O DURANGO**

**SUPERSEDES** SHEET 4, MEMO 5738, 01-11-94

# AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



AUTHORIZED  
SPEED  
LIMITS



Signed By: Matthew Reay

\_\_\_\_\_  
Staff Traffic Engineer

Date: \_\_\_\_\_



⏏ = EXTG NO-PASSING ZONE



SIGNLOG ON 08-20-96

	<b>FILE</b>	<b>MEMO</b>	<b>SHEET</b>	Implemented with changes as marked
	880.550.01	5937	5	Date: _____ By: _____

**SH 550 FROM NEW MEXICO STATE LINE TO SH 160 S/O DURANGO**

**SUPERSEDES SHEET 5, MEMO 5738, 01-11-94**

highway	milepoint	description	rucode	func class	ptrucks	adt	adt_year
550A	8.80	RD E (CO RD 218)	Rural	Principal Arterial	10.2	6,500	2016
550A	9.00	MILEPOST 9	Rural	Principal Arterial	10.2	6,500	2016
550A	10.00	MILEPOST 10	Rural	Principal Arterial	10.2	6,500	2016
550A	10.93	RD W (BROKEN WHEEL)	Rural	Principal Arterial	10.2	6,500	2016
550A	11.00	MILEPOST 11	Rural	Principal Arterial	10.2	6,500	2016
550A	11.17	RD E AND W (CO RD 214)	Rural	Principal Arterial	10.2	6,500	2016
550A	12.00	MILEPOST 12	Rural	Principal Arterial	10.2	6,500	2016
550A	12.19	RD E (CO RD 302)	Rural	Principal Arterial	7.7	7,300	2016
550A	12.50	RD W (CO RD 219A)	Rural	Principal Arterial	7.7	7,300	2016
550A	13.00	MILEPOST 13	Rural	Principal Arterial	7.7	7,300	2016
550A	13.10	RD N (CO RD 219)	Rural	Principal Arterial	7.7	7,300	2016
550A	13.78	RD W (CO RD 219)	Rural	Principal Arterial	7.7	7,300	2016
550A	14.00	MILEPOST 14	Rural	Principal Arterial	7.7	7,300	2016
550A	14.36	MINORSTR (550A014360BL) UNNAMED IRRIGATION DITCH	Rural	Principal Arterial	7.7	7,300	2016
550A	14.48	MINORSTR (550A014470BR) UNNAMED IRRIGATION DITCH	Rural	Principal Arterial	7.7	7,300	2016
550A	15.00	MILEPOST 15	Rural	Principal Arterial	7.7	7,300	2016
550A	15.68	RD N (TO CO RD 220)	Rural	Principal Arterial	6.3	6,700	2016
550A	15.81	RD E (CO RD 220)	Rural	Principal Arterial	6.3	6,700	2016
550A	16.00	MILEPOST 16	Rural	Principal Arterial	6.3	6,700	2016
550A	16.56	JCT U.S. 160A (FARMINGTON HILL)	Rural	Principal Arterial	6.3	6,700	2016



#	Hwy	MP	Date	Time	Sev	Location	Road Description	# of Veh	Contour	Road Condition	Lighting	Weather
1	550A	8.94	05/26/16	545	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
2	550A	9.02	08/18/15	2350	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
3	550A	9.10	07/05/13	1410	INJ	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
4	550A	9.10	09/11/12	703	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
5	550A	9.10	08/21/14	1511	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
6	550A	9.10	03/27/15	1858	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
7	550A	9.10	11/29/15	2025	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
8	550A	9.16	04/11/15	1620	PDO	ON	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
9	550A	9.30	10/09/14	700	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	WET	DAWN OR DUSK	RAIN
10	550A	9.30	08/20/13	1630	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
11	550A	9.50	12/09/14	2015	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
12	550A	9.60	01/25/15	600	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
13	550A	9.60	02/09/13	1345	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL
14	550A	9.70	01/29/13	336	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
15	550A	9.80	11/02/15	1000	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
16	550A	9.90	01/11/13	1524	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	NONE
17	550A	10.20	04/03/13	1508	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
18	550A	10.40	01/11/16	20	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DARK-UNLIGHTED	WIND
19	550A	10.50	01/14/17	1424	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
20	550A	10.50	10/23/13	1905	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
21	550A	10.50	05/20/14	330	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
22	550A	10.50	05/20/17	523	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
23	550A	10.50	10/11/12	1720	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
24	550A	10.60	10/20/15	525	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
25	550A	10.69	09/21/12	24	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
26	550A	10.70	11/24/12	1831	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
27	550A	10.70	10/15/16	1955	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
28	550A	10.70	04/16/13	1631	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	WIND
29	550A	10.80	11/21/14	1850	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
30	550A	10.80	05/17/15	451	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
31	550A	10.80	09/27/13	344	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	WET	DARK-UNLIGHTED	RAIN
32	550A	10.90	07/05/12	2045	INJ	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
33	550A	10.96	11/16/13	244	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	WET	DARK-UNLIGHTED	RAIN
34	550A	11.00	05/21/16	600	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
35	550A	11.04	08/08/12	2100	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
36	550A	11.10	04/11/15	2145	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE
37	550A	11.16	10/11/12	1743	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
38	550A	11.17	12/07/15	800	INJ	OFF RIGHT	INTERSECTION RELATED	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
39	550A	11.20	03/02/13	429	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
40	550A	11.30	07/07/16	1127	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
41	550A	11.40	10/18/13	2000	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
42	550A	11.40	08/15/15	2100	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
43	550A	11.40	11/27/12	1801	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
44	550A	11.40	01/26/14	8	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
45	550A	11.40	02/01/16	1730	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-GRADE	ICY	DAWN OR DUSK	SNOW/SLEET/HAIL
46	550A	11.50	01/04/14	1740	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
47	550A	11.50	12/26/14	1440	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	NONE
48	550A	11.50	01/18/13	915	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
49	550A	11.80	09/16/15	1500	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
50	550A	11.80	10/02/16	1625	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
51	550A	11.80	12/14/16	650	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAWN OR DUSK	NONE
52	550A	11.80	09/26/12	1845	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
53	550A	11.90	06/03/16	1015	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
54	550A	11.92	09/02/14	755	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	RAIN
55	550A	11.95	01/03/14	1850	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
56	550A	12.00	01/07/15	1745	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
57	550A	12.00	10/01/16	1950	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
58	550A	12.02	05/10/17	1637	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN
59	550A	12.10	12/27/15	1615	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
60	550A	12.19	05/22/14	1559	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE

#	Hwy	MP	Date	Time	Ramp	Accident Type	Dir	Vehicle Type	Driver Factor	Human Factor	Speed	Vehicle Movement
1	550A	8.94	05/26/16	545	N	WILD ANIMAL	E	PASS CAR/VAN	ALCOHOL	NONE APPARENT	55	GOING STRAIGHT
2	550A	9.02	08/18/15	2350	N	EMBANKMENT CUT/FILL SLOPE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	OTHER
3	550A	9.10	07/05/13	1410	N	REAR-END	E	SUV	NO IMPAIRMENT	NONE APPARENT	55	PASSING
4	550A	9.10	09/11/12	703	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
5	550A	9.10	08/21/14	1511	N	DELINEATOR POST	E	PASS CAR/VAN	ALCOHOL	UNKNOWN	55	GOING STRAIGHT
6	550A	9.10	03/27/15	1858	N	OVERTURNING	E	SUV	NO IMPAIRMENT	DRIVER INEXPERIENCE	55	GOING STRAIGHT
7	550A	9.10	11/29/15	2025	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	55	GOING STRAIGHT
8	550A	9.16	04/11/15	1620	N	SIDESWIPE SAME DIRECTION	N	SUV	NO IMPAIRMENT	DRIVER INEXPERIENCE	65	PASSING
9	550A	9.30	10/09/14	700	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
10	550A	9.30	08/20/13	1630	N	EMBANKMENT CUT/FILL SLOPE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	AVOIDING OBJECT/VEHICLE IN ROAD
11	550A	9.50	12/09/14	2015	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
12	550A	9.60	01/25/15	600	N	CULVERT/HEADWALL	S	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	55	GOING STRAIGHT
13	550A	9.60	02/09/13	1345	N	FENCE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	35	WEAVING
14	550A	9.70	01/29/13	336	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	OTHER
15	550A	9.80	11/02/15	1000	N	DELINEATOR POST	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	67	WEAVING
16	550A	9.90	01/11/13	1524	N	FENCE	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	OTHER
17	550A	10.20	04/03/13	1508	N	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	50	PASSING
18	550A	10.40	01/11/16	20	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	35	GOING STRAIGHT
19	550A	10.50	01/14/17	1424	N	SIDESWIPE OPPOSITE DIRECTION	N	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	UK	GOING STRAIGHT
20	550A	10.50	10/23/13	1905	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
21	550A	10.50	05/20/14	330	N	FENCE	E	PASS CAR/VAN	RX/MEDICATION/DR	DRIVER PREOCCUPIED	65	OTHER
22	550A	10.50	05/20/17	523	N	FENCE	S	PASS CAR/VAN	ALCOHOL	NONE APPARENT	10	GOING STRAIGHT
23	550A	10.50	10/11/12	1720	N	OVERTAKING TURN	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	45	PASSING
24	550A	10.60	10/20/15	525	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	64	GOING STRAIGHT
25	550A	10.69	09/21/12	24	N	EMBANKMENT CUT/FILL SLOPE	S	PASS CAR/VAN	ALCOHOL	UNKNOWN	UK	GOING STRAIGHT
26	550A	10.70	11/24/12	1831	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
27	550A	10.70	10/15/16	1955	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
28	550A	10.70	04/16/13	1631	N	FENCE	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	60	GOING STRAIGHT
29	550A	10.80	11/21/14	1850	N	WILD ANIMAL	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
30	550A	10.80	05/17/15	451	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
31	550A	10.80	09/27/13	344	N	MAILBOX	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
32	550A	10.90	07/05/12	2045	N	HEAD-ON	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	ILLNESS	50	WEAVING
33	550A	10.96	11/16/13	244	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
34	550A	11.00	05/21/16	600	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
35	550A	11.04	08/08/12	2100	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
36	550A	11.10	04/11/15	2145	N	WILD ANIMAL	W	SUV	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
37	550A	11.16	10/11/12	1743	N	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	65	SLOWING
38	550A	11.17	12/07/15	800	N	FENCE	N	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	15	MAKING RIGHT TURN
39	550A	11.20	03/02/13	429	N	DELINEATOR POST	E	PASS CAR/VAN	ALCOHOL	UNKNOWN	5	ENTERING/LEAVING PARKED POSITION
40	550A	11.30	07/07/16	1127	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	61	OTHER
41	550A	11.40	10/18/13	2000	N	DOMESTIC ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	AVOIDING OBJECT/VEHICLE IN ROAD
42	550A	11.40	08/15/15	2100	N	DOMESTIC ANIMAL	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DISTRACTED BY PASSENGER	65	GOING STRAIGHT
43	550A	11.40	11/27/12	1801	N	WILD ANIMAL	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	20	SLOWING
44	550A	11.40	01/26/14	8	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
45	550A	11.40	02/01/16	1730	N	MAILBOX	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	45	OTHER
46	550A	11.50	01/04/14	1740	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
47	550A	11.50	12/26/14	1440	N	SIGN	N	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	60	GOING STRAIGHT
48	550A	11.50	01/18/13	915	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
49	550A	11.80	09/16/15	1500	N	SIDESWIPE SAME DIRECTION	W	MOTOR HOME	NO IMPAIRMENT	NONE APPARENT	65	PASSING
50	550A	11.80	10/02/16	1625	N	SIDESWIPE SAME DIRECTION	W	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	UNKNOWN	65	PASSING
51	550A	11.80	12/14/16	650	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
52	550A	11.80	09/26/12	1845	N	INVOLVING OTHER OBJECT	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
53	550A	11.90	06/03/16	1015	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
54	550A	11.92	09/02/14	755	N	OVERTURNING	E	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	65	PASSING
55	550A	11.95	01/03/14	1850	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	30	GOING STRAIGHT
56	550A	12.00	01/07/15	1745	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
57	550A	12.00	10/01/16	1950	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
58	550A	12.02	05/10/17	1637	N	APPROACH TURN	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	15	MAKING LEFT TURN
59	550A	12.10	12/27/15	1615	N	APPROACH TURN	W	SUV	NO IMPAIRMENT	NONE APPARENT	20	MAKING LEFT TURN
60	550A	12.19	05/22/14	1559	N	APPROACH TURN	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	5	MAKING LEFT TURN

#	Hwy	MP	Date	Time	Sev	Location	Road Description	# of Veh	Contour	Road Condition	Lighting	Weather
61	550A	12.19	02/20/13	1135	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SLUSHY	DAYLIGHT	SNOW/SLEET/HAIL
62	550A	12.19	02/20/15	720	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
63	550A	12.40	10/28/16	1841	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
64	550A	12.40	03/25/17	100	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
65	550A	12.45	01/18/15	413	PDO	OFF AT TEE	AT INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE
66	550A	12.50	01/06/16	535	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	SNOWY	DARK-UNLIGHTED	SNOW/SLEET/HAIL
67	550A	12.50	11/27/16	2248	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	WET	DARK-UNLIGHTED	RAIN
68	550A	12.50	07/17/16	9	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
69	550A	12.80	07/01/12	1314	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
70	550A	12.90	10/25/13	1720	PDO	OFF RIGHT	AT DRIVEWAY ACCESS	1	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN
71	550A	12.95	12/05/16	640	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
72	550A	12.97	02/06/15	1900	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
73	550A	12.97	02/06/15	1900	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
74	550A	12.98	11/15/15	100	INJ	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
75	550A	13.00	03/26/13	1326	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
76	550A	13.02	02/22/15	430	INJ	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	SNOWY W/VIS ICY ROAD TREATMENT	DARK-UNLIGHTED	SNOW/SLEET/HAIL
77	550A	13.05	08/19/16	1235	PDO	ON	INTERSECTION RELATED	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
78	550A	13.20	12/14/12	1040	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL
79	550A	13.20	12/24/12	1710	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DARK-UNLIGHTED	SNOW/SLEET/HAIL
80	550A	13.30	01/04/14	1430	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	WIND
81	550A	13.40	04/25/13	2103	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
82	550A	13.50	01/26/16	1845	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
83	550A	13.50	06/25/16	1757	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
84	550A	13.50	09/26/14	1045	PDO	OFF LEFT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
85	550A	13.50	07/05/14	1935	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
86	550A	13.60	03/11/14	645	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
87	550A	13.60	02/12/15	1835	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
88	550A	13.60	09/19/15	625	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
89	550A	13.70	10/08/16	650	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
90	550A	13.80	07/18/16	1915	PDO	ON	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
91	550A	13.80	12/14/12	1040	INJ	ON	NON-INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY W/VIS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL
92	550A	13.80	05/20/15	1600	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
93	550A	13.90	07/30/15	620	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
94	550A	13.92	01/25/13	1935	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
95	550A	14.00	06/20/14	711	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
96	550A	14.00	10/10/16	645	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE
97	550A	14.00	03/01/14	831	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	SLUSHY	DAWN OR DUSK	SNOW/SLEET/HAIL
98	550A	14.00	05/20/17	1402	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
99	550A	14.04	03/06/17	730	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAIL
100	550A	14.04	01/05/15	1600	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
101	550A	14.10	06/21/14	1000	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
102	550A	14.20	06/01/13	520	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
103	550A	14.20	06/21/17	535	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
104	550A	14.20	02/14/14	1144	INJ	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
105	550A	14.30	05/27/13	1845	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
106	550A	14.30	12/11/16	1800	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
107	550A	14.30	09/20/16	740	INJ	ON	NON-INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
108	550A	14.50	07/04/14	524	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DAWN OR DUSK	NONE
109	550A	14.60	11/27/16	1645	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
110	550A	14.60	12/08/16	1530	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
111	550A	14.60	11/26/12	1455	INJ	OFF IN MEDIA	NON-INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
112	550A	14.65	01/09/14	719	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAWN OR DUSK	NONE
113	550A	14.70	09/18/14	2000	INJ	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
114	550A	14.70	11/01/12	945	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
115	550A	14.70	11/26/13	741	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
116	550A	14.70	06/25/17	1800	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
117	550A	14.80	08/04/12	200	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
118	550A	14.80	07/16/12	1702	INJ	OFF RIGHT	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
119	550A	14.85	09/09/12	2237	PDO	ON	NON-INTERSECTION	2	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
120	550A	14.90	01/08/17	830	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL

#	Hwy	MP	Date	Time	Ramp	Accident Type	Dir	Vehicle Type	Driver Factor	Human Factor	Speed	Vehicle Movement
61	550A	12.19	02/20/13	1135	N	FENCE	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	OTHER
62	550A	12.19	02/20/15	720	N	APPROACH TURN	W	SUV	NO IMPAIRMENT	NONE APPARENT	10	MAKING LEFT TURN
63	550A	12.40	10/28/16	1841	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
64	550A	12.40	03/25/17	100	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	60	GOING STRAIGHT
65	550A	12.45	01/18/15	413	N	MAILBOX	W	PASS CAR/VAN	ALCOHOL	UNKNOWN	UK	GOING STRAIGHT
66	550A	12.50	01/06/16	535	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
67	550A	12.50	11/27/16	2248	N	WILD ANIMAL	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
68	550A	12.50	07/17/16	9	N	SIGN	S	SUV	NO IMPAIRMENT	ASLEEP AT WHEEL	60	GOING STRAIGHT
69	550A	12.80	07/01/12	1314	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
70	550A	12.90	10/25/13	1720	N	INVOLVING OTHER OBJECT	S	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER UNFAMILIAR W/AREA	5	BACKING
71	550A	12.95	12/05/16	640	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
72	550A	12.97	02/06/15	1900	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
73	550A	12.97	02/06/15	1900	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
74	550A	12.98	11/15/15	100	N	FENCE	W	SUV	ALCOHOL	DRIVER INEXPERIENCE	60	OTHER
75	550A	13.00	03/26/13	1326	N	REAR-END	S	PASS CAR/VAN	NO IMPAIRMENT	DRIVER FATIGUE	50	GOING STRAIGHT
76	550A	13.02	02/22/15	430	N	FENCE	W	SUV	NO IMPAIRMENT	UNKNOWN	80	OTHER
77	550A	13.05	08/19/16	1235	N	REAR-END	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
78	550A	13.20	12/14/12	1040	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	15	GOING STRAIGHT
79	550A	13.20	12/24/12	1710	N	FENCE	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	55	OTHER
80	550A	13.30	01/04/14	1430	N	VEHICLE CARGO/DEBRIS	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
81	550A	13.40	04/25/13	2103	N	FENCE	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	75	PASSING
82	550A	13.50	01/26/16	1845	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
83	550A	13.50	06/25/16	1757	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
84	550A	13.50	09/26/14	1045	N	FENCE	W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	60	GOING STRAIGHT
85	550A	13.50	07/05/14	1935	N	OTHER FIXED OBJECT	E	PASS CAR/VAN	ALCOHOL	UNKNOWN	60	GOING STRAIGHT
86	550A	13.60	03/11/14	645	N	WILD ANIMAL	E	MOTORCYCLE	NO IMPAIRMENT	NONE APPARENT	45	SLOWING
87	550A	13.60	02/12/15	1835	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
88	550A	13.60	09/19/15	625	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	60	GOING STRAIGHT
89	550A	13.70	10/08/16	650	N	WILD ANIMAL	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
90	550A	13.80	07/18/16	1915	N	VEHICLE CARGO/DEBRIS	E	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
91	550A	13.80	12/14/12	1040	N	HEAD-ON	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	30	OTHER
92	550A	13.80	05/20/15	1600	N	WILD ANIMAL	S	SUV	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
93	550A	13.90	07/30/15	620	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
94	550A	13.92	01/25/13	1935	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
95	550A	14.00	06/20/14	711	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
96	550A	14.00	10/10/16	645	N	WILD ANIMAL	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
97	550A	14.00	03/01/14	831	N	LIGHT/UTILITY POLE	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
98	550A	14.00	05/20/17	1402	N	FENCE	E	SUV	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
99	550A	14.04	03/06/17	730	N	OVERTURNING	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	OTHER
100	550A	14.04	01/05/15	1600	N	DOMESTIC ANIMAL	S	SUV	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
101	550A	14.10	06/21/14	1000	N	WILD ANIMAL	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
102	550A	14.20	06/01/13	520	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
103	550A	14.20	06/21/17	535	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
104	550A	14.20	02/14/14	1144	N	FENCE	W	SUV	NO IMPAIRMENT	ASLEEP AT WHEEL	60	GOING STRAIGHT
105	550A	14.30	05/27/13	1845	N	WILD ANIMAL	N	PASS CAR/VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
106	550A	14.30	12/11/16	1800	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
107	550A	14.30	09/20/16	740	N	REAR-END	N	SUV	NO IMPAIRMENT	NONE APPARENT	30	SLOWING
108	550A	14.50	07/04/14	524	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
109	550A	14.60	11/27/16	1645	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
110	550A	14.60	12/08/16	1530	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
111	550A	14.60	11/26/12	1455	N	SIDESWIPE OPPOSITE DIRECTION	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	50	GOING STRAIGHT
112	550A	14.65	01/09/14	719	N	FENCE	E	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	55	GOING STRAIGHT
113	550A	14.70	09/18/14	2000	N	OVERTURNING	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	AVOIDING OBJECT/VEHICLE IN ROAD
114	550A	14.70	11/01/12	945	N	WILD ANIMAL	W	SUV	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
115	550A	14.70	11/26/13	741	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
116	550A	14.70	06/25/17	1800	N	WILD ANIMAL	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
117	550A	14.80	08/04/12	200	N	DELINEATOR POST	W	PICKUP TRUCK/UTILITY VAN	ALCOHOL	UNKNOWN	70	OTHER
118	550A	14.80	07/16/12	1702	N	FENCE	N	PICKUP TRUCK/UTILITY VAN	ALCOHOL	UNKNOWN	UK	GOING STRAIGHT
119	550A	14.85	09/09/12	2237	N	SIDESWIPE OPPOSITE DIRECTION	W	SUV	ALCOHOL	UNKNOWN	55	OTHER
120	550A	14.90	01/08/17	830	N	DELINEATOR POST	N	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	UK	OTHER



#	Hwy	MP	Date	Time	Sev	Location	Road Description	# of Veh	Contour	Road Condition	Lighting	Weather
121	550A	14.94	06/06/14	800	INJ	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
122	550A	14.99	11/14/15	1315	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
123	550A	15.00	01/10/14	1600	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
124	550A	15.00	12/05/14	1845	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE
125	550A	15.00	08/02/16	2048	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
126	550A	15.00	10/06/16	600	INJ	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
127	550A	15.00	12/20/16	1710	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
128	550A	15.00	12/20/16	1715	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
129	550A	15.00	11/13/15	830	PDO	ON	NON-INTERSECTION	3	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
130	550A	15.01	11/07/12	250	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
131	550A	15.04	02/11/16	1610	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
132	550A	15.10	03/21/14	725	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
133	550A	15.10	05/20/16	744	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
134	550A	15.10	10/28/16	2110	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DARK-LIGHTED	NONE
135	550A	15.20	07/03/14	1645	INJ	ON	NON-INTERSECTION	1	HILLCREST	DRY	DAYLIGHT	NONE
136	550A	15.20	11/20/14	710	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE
137	550A	15.40	11/18/16	1920	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
138	550A	15.40	11/29/15	2200	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	ICY	DARK-UNLIGHTED	NONE
139	550A	15.40	01/01/16	1920	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE
140	550A	15.40	09/28/14	1435	PDO	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-GRADE	WET	DAYLIGHT	RAIN
141	550A	15.50	02/09/13	1530	INJ	ON	NON-INTERSECTION	2	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL
142	550A	15.50	05/19/17	1802	PDO	ON	NON-INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
143	550A	15.50	11/01/13	1835	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
144	550A	15.50	12/07/14	704	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
145	550A	15.60	10/10/13	2343	INJ	OFF RIGHT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE
146	550A	15.60	12/26/14	755	PDO	OFF LEFT	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL
147	550A	15.60	09/20/14	1640	INJ	ON	NON-INTERSECTION	3	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
148	550A	15.68	02/13/13	748	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
149	550A	15.68	04/06/13	1515	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
150	550A	15.70	11/03/15	1644	PDO	ON	INTERSECTION RELATED	2	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE
151	550A	15.80	10/15/13	1633	INJ	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
152	550A	15.80	01/20/17	1814	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-GRADE	WET	DARK-UNLIGHTED	SNOW/SLEET/HAIL
153	550A	15.90	07/09/15	1140	INJ	ON	INTERSECTION RELATED	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
154	550A	15.90	10/24/15	1610	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
155	550A	15.90	04/12/17	1730	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
156	550A	16.00	10/05/12	700	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE
157	550A	16.10	04/19/16	1050	PDO	ON	NON-INTERSECTION	1	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
158	550A	16.10	07/26/13	945	INJ	ON	NON-INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
159	550A	16.20	03/31/15	700	PDO	ON	NON-INTERSECTION	2	CURVE ON-GRADE	DRY	DAWN OR DUSK	NONE
160	550A	16.20	10/20/16	1640	PDO	ON	AT INTERSECTION	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
161	550A	16.20	02/25/14	714	PDO	ON	NON-INTERSECTION	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE
162	550A	16.20	12/05/15	930	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	WET W/VIS ICY ROAD TREATMENT	DAYLIGHT	NONE
163	550A	16.30	06/11/14	1300	PDO	ON	INTERSECTION RELATED	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
164	160A	88.32	07/02/12	1625	PDO	ON	INTERSECTION RELATED	1	CURVE ON-LEVEL	FOREIGN MATERIAL	DAYLIGHT	NONE
165	160A	88.32	12/05/14	1600	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
166	160A	88.31	07/13/12	1720	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	WET	DAYLIGHT	RAIN
167	160A	88.32	06/09/13	1810	INJ	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
168	160A	88.32	07/06/16	800	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
169	160A	88.30	08/09/16	1305	INJ	ON	INTERSECTION RELATED	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE
170	160A	88.30	06/08/17	1720	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
171	160A	88.30	05/04/16	1420	PDO	ON	INTERSECTION RELATED	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE
172	160A	88.32	04/11/15	1927	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE
173	160A	88.30	02/09/13	1135	INJ	OFF RIGHT	NON-INTERSECTION	2	CURVE ON-GRADE	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL
174	160A	88.30	02/09/13	1140	PDO	OFF RIGHT	NON-INTERSECTION	2	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL
175	160A	88.30	02/10/13	1140	PDO	OFF RIGHT	NON-INTERSECTION	3	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL
176	160A	88.30	02/09/13	1135	PDO	OFF RIGHT	NON-INTERSECTION	1	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL
177	160A	88.32	11/13/15	1252	PDO	ON	NON-INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE
178	160A	88.30	02/09/13	1125	INJ	ON	NON-INTERSECTION	2	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL
179	160A	88.30	09/22/13	1728	INJ	ON	INTERSECTION RELATED	3	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN

#	Hwy	MP	Date	Time	Ramp	Accident Type	Dir	Vehicle Type	Driver Factor	Human Factor	Speed	Vehicle Movement
121	550A	14.94	06/06/14	800	N	OVERTURNING	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	55	GOING STRAIGHT
122	550A	14.99	11/14/15	1315	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
123	550A	15.00	01/10/14	1600	N	WILD ANIMAL	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
124	550A	15.00	12/05/14	1845	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
125	550A	15.00	08/02/16	2048	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
126	550A	15.00	10/06/16	600	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
127	550A	15.00	12/20/16	1710	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
128	550A	15.00	12/20/16	1715	N	WILD ANIMAL	W	SUV	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
129	550A	15.00	11/13/15	830	N	REAR-END	N	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	55	GOING STRAIGHT
130	550A	15.01	11/07/12	250	N	TREE/SHRUBBERY	W	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	50	OTHER
131	550A	15.04	02/11/16	1610	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
132	550A	15.10	03/21/14	725	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
133	550A	15.10	05/20/16	744	N	WILD ANIMAL	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	30	GOING STRAIGHT
134	550A	15.10	10/28/16	2110	N	WILD ANIMAL	N	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
135	550A	15.20	07/03/14	1645	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
136	550A	15.20	11/20/14	710	N	EMBANKMENT CUT/FILL SLOPE	E	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	65	OTHER
137	550A	15.40	11/18/16	1920	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
138	550A	15.40	11/29/15	2200	N	FENCE	W	SUV	ALCOHOL	NONE APPARENT	40	GOING STRAIGHT
139	550A	15.40	01/01/16	1920	N	FENCE	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
140	550A	15.40	09/28/14	1435	N	LARGE BOULDERS OR ROCKS	E	SUV	NO IMPAIRMENT	DRIVER UNFAMILIAR W/AREA	45	GOING STRAIGHT
141	550A	15.50	02/09/13	1530	N	HEAD-ON	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	35	WEAVING
142	550A	15.50	05/19/17	1802	N	OVERTAKING TURN	W	SUV	NO IMPAIRMENT	DRIVER UNFAMILIAR W/AREA	15	MAKING U-TURN
143	550A	15.50	11/01/13	1835	N	WILD ANIMAL	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
144	550A	15.50	12/07/14	704	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	55	GOING STRAIGHT
145	550A	15.60	10/10/13	2343	N	SIGN	E	SUV	NO IMPAIRMENT	ILLNESS	45	OTHER
146	550A	15.60	12/26/14	755	N	FENCE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
147	550A	15.60	09/20/14	1640	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	35	GOING STRAIGHT
148	550A	15.68	02/13/13	748	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	10	GOING STRAIGHT
149	550A	15.68	04/06/13	1515	N	OVERTAKING TURN	W	SUV	NO IMPAIRMENT	NONE APPARENT	5	MAKING LEFT TURN
150	550A	15.70	11/03/15	1644	N	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	20	GOING STRAIGHT
151	550A	15.80	10/15/13	1633	N	REAR-END	W	SUV	NO IMPAIRMENT	DRIVER PREOCCUPIED	35	GOING STRAIGHT
152	550A	15.80	01/20/17	1814	N	WILD ANIMAL	E	SUV	NO IMPAIRMENT	NONE APPARENT	60	GOING STRAIGHT
153	550A	15.90	07/09/15	1140	N	REAR-END	S	SUV	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
154	550A	15.90	10/24/15	1610	N	REAR-END	W	SUV	NO IMPAIRMENT	DRIVER PREOCCUPIED	35	GOING STRAIGHT
155	550A	15.90	04/12/17	1730	N	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
156	550A	16.00	10/05/12	700	N	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
157	550A	16.10	04/19/16	1050	N	OTHER NON-COLLISION	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	25	GOING STRAIGHT
158	550A	16.10	07/26/13	945	N	REAR-END	E	MOTORCYCLE	NO IMPAIRMENT	DRIVER INEXPERIENCE	35	GOING STRAIGHT
159	550A	16.20	03/31/15	700	N	VEHICLE CARGO/DEBRIS	E	PICKUP TRUCK/UTILITY VAN W/TRAILER	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
160	550A	16.20	10/20/16	1640	N	REAR-END	S	SUV	NO IMPAIRMENT	DRIVER PREOCCUPIED	35	SLOWING
161	550A	16.20	02/25/14	714	N	WILD ANIMAL	W	SUV	NO IMPAIRMENT	NONE APPARENT	30	GOING STRAIGHT
162	550A	16.20	12/05/15	930	N	EMBANKMENT CUT/FILL SLOPE	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	35	GOING STRAIGHT
163	550A	16.30	06/11/14	1300	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
164	160A	88.32	07/02/12	1625	N	OVERTURNING	E	MOTORCYCLE	NO IMPAIRMENT	NONE APPARENT	10	MAKING RIGHT TURN
165	160A	88.32	12/05/14	1600	N	VEHICLE CARGO/DEBRIS	W	OTHER - SEE REPORT	NO IMPAIRMENT	NONE APPARENT	UK	OTHER
166	160A	88.31	07/13/12	1720	N	REAR-END	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	10	OTHER
167	160A	88.32	06/09/13	1810	N	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	5	BACKING
168	160A	88.32	07/06/16	800	N	REAR-END	NW	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	DRIVER UNFAMILIAR W/AREA	5	BACKING
169	160A	88.30	08/09/16	1305	N	REAR-END	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
170	160A	88.30	06/08/17	1720	N	REAR-END	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	25	GOING STRAIGHT
171	160A	88.30	05/04/16	1420	N	SIDESWIPE OPPOSITE DIRECTION	W	SUV	ALCOHOL	ILLNESS	50	WEAVING
172	160A	88.32	04/11/15	1927	N	APPROACH TURN	E	SUV	NO IMPAIRMENT	DRIVER PREOCCUPIED	50	GOING STRAIGHT
173	160A	88.30	02/09/13	1135	N	PARKED MOTOR VEHICLE	W	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	UNKNOWN	40	OTHER
174	160A	88.30	02/09/13	1140	N	PARKED MOTOR VEHICLE	W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	20	SLOWING
175	160A	88.30	02/10/13	1140	N	PARKED MOTOR VEHICLE	W	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	35	OTHER
176	160A	88.30	02/09/13	1135	N	GUARD RAIL	W	SUV	NO IMPAIRMENT	UNKNOWN	30	OTHER
177	160A	88.32	11/13/15	1252	N	OVERTURNING	E	PICKUP TRUCK/UTILITY VAN	NO IMPAIRMENT	ILLNESS	35	GOING STRAIGHT
178	160A	88.30	02/09/13	1125	N	SIDESWIPE SAME DIRECTION	W	SUV	NO IMPAIRMENT	DRIVER INEXPERIENCE	35	OTHER
179	160A	88.30	09/22/13	1728	N	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	UNKNOWN	50	OTHER

## **MEMORANDUM**

**Project:** US 550 South Connection to US 160  
**To:** David Swenka, PE  
**From:** Kenneth A. Ryan, PE, PTOE  
**Date:** November 1, 2018  
**Subject:** Predictive Analysis for New Alignment MP 15.00 to MP 16.56

This memorandum summarizes the existing safety conditions on US 550 up to and including the US 160 intersection. It also examines the potential future safety conditions for the new alignment of the US 550 south connection to US 160 between milepost (MP) 15.00 and MP 16.56. Information provided in this review is based on existing crash data, projected traffic volumes, and the roadway geometry shown in the design-build reference documents. Graphics showing the study limits and the basic configuration of the roadway are provided in **Appendix A**.

### **EXISTING SAFETY CONDITIONS**

The existing conditions portion of this memorandum is a summary of five years of reported crash data between July 1, 2012 and June 30, 2017. A comprehensive analysis of the five-year crash history associated with the US 550 project will be documented in the safety assessment report associated with the TSM&O process for the project limits between MP 8.88 and MP 16.56.

There were 51 crashes reported along this section of US 550 during the study period; twelve crashes resulted in 20 injuries and no crashes resulted in fatality. **Table 1** summarized the total number and severity of crashes in this section of US 550 over the five-year study period.

**Table 1: US 550 Total Crash History from MP 15.00 to MP 16.56 by Year**

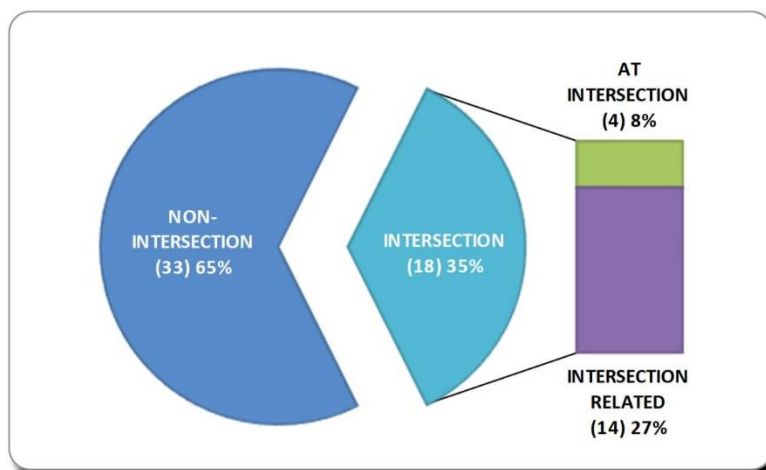
Year	Crashes				Persons	
	PDO*	Injury	Fatal	Total	Injured	Killed
7/1/2012 to 6/30/2013	6	2	0	8	5	0
7/1/2013 to 6/30/2014	5	4	0	9	5	0
7/1/2014 to 6/30/2015	7	3	0	10	7	0
7/1/2015 to 6/30/2016	10	1	0	11	1	0
7/1/2016 to 6/30/2017	11	2	0	13	2	0
<b>Total</b>	<b>39</b>	<b>12</b>	<b>0</b>	<b>51</b>	<b>20</b>	<b>0</b>
<b>Average/Yr</b>	<b>7.8</b>	<b>2.4</b>	<b>0.0</b>	<b>10.2</b>	<b>4.0</b>	<b>0.0</b>

\*PDO – Property Damage Only

The majority of the crashes along the study corridor were non-intersection (33 of 51, or 65 percent). The remaining crashes (35 percent) were described as intersection-related or at-intersection crashes (27 percent and 8 percent, respectively). This breakdown is shown in **Figure 1**.



Figure 1: Crashes by Location



### Intersection Crashes

Intersection crashes accounted for 35 percent of the total crashes on this section of highway (18 of 51). **Table 2** lists the location, number of legs, signalization, number of crashes, and the Level of Service of Safety (LOSS) for each of the three intersections.

Table 2: US 550 Intersection Crashes by Location

MP	Description	Legs	Signal	Number of Crashes				LOSS Total	LOSS Severe
				PDO <sup>1</sup>	Injury	Fatal	Total		
15.68	CR 220 (North Leg)	3	No	3	0	0	3	III	II
15.81	CR 220 (East Leg)	3	No	0	1	0	1	II	II
16.56	US 160	3	Yes	6	4	0	10	I	I
<i>Non-Specific Intersection Crashes (&gt;100-ft from intersection)</i>				3	1	0	4		
<b>Total</b>				<b>12</b>	<b>6</b>	<b>0</b>	<b>18</b>		
<b>Average/Year</b>				<b>2.4</b>	<b>1.2</b>	<b>0.0</b>	<b>3.6</b>		

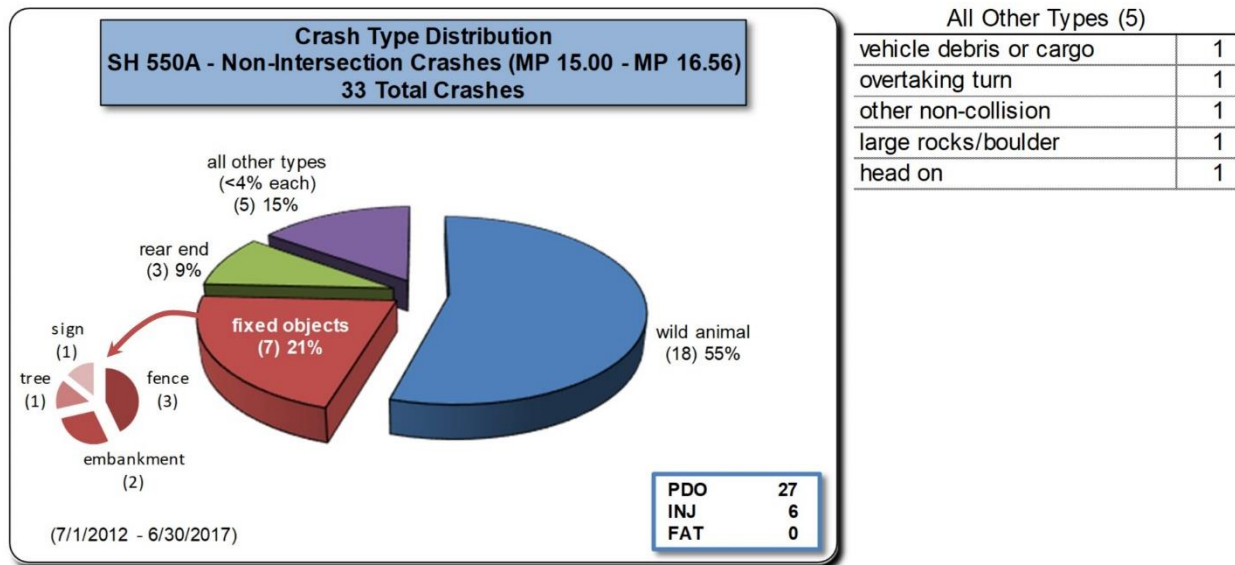
<sup>1</sup> PDO – Property Damage Only crashes

The proposed improvements associated with the US 550 South Connection to US 160 project will consolidate the two CR 220 intersections into a single four-leg intersection connecting US 550 to both the existing CR 220 and the planned Frontage Road along the west side of US 550 associated with the project. The current intersection with US 160 will be removed completely as the new alignment connects US 550 at the Grandview Interchange.

### Non-Intersection Crashes

There were 33 crashes within the project limits over the five-year study period that can be categorized as non-intersection crashes. *Wild animal* type crashes were predominant (55 percent), followed by crashes involving fixed objects (21 percent) and *rear end* type crashes (9 percent). **Figure 2** shows the crash type distribution for the study section.

Figure 2: US 550 Non-Intersection Crashes



Wild Animal Collisions

A higher than expected frequency of *wild animal* crashes occurred along this section of US 550 when compared to similar facilities statewide (55 percent compared to 15 percent). There were 18 crashes involving wild animals (all deer) during the study period, approximately 2.3 crashes per mile per year (CPMPY). A review of the crash data indicated that 15 of the crashes occurred south of the CR 220 intersection. Most occurred in dark-unlighted or dawn/dusk conditions (12 of 18) and were more common during the fall and winter months (13 of 18).

The proposed improvements associated with the US 550 South Connection to US 160 project includes wild animal fencing along US 550 atop the mesa, as well as two dedicated wildlife crossing structures and two bridges that also act as wildlife crossing structures. These measures should significantly reduce the frequency of collisions involving wild animals.

**FUTURE SAFETY CONDITIONS**

Future (2040) traffic volumes were estimated by Fehr & Peers. These volumes were applied using the *Highway Safety Manual* (HSM) (AASHTO, 2010) predictive method to provide an estimate of the future crash frequency of the new roadway alignment based on the geometric features of the roadway geometry shown in the design-build reference documents. The Interactive Highway Safety Design Model (IHSDM) software developed by the Federal Highway Administration (FHWA), last updated in March 2018, was used as the primary analysis tool.

Predictive analysis is typically used to evaluate the effectiveness of alternatives in terms of their potential safety impacts. To date, several such analyses have been performed to arrive at the roadway geometry associated with the Preferred Alternative as documented in the 2015 Record of Decision and shown in the design-build reference documents. Since the “no action” scenario is no longer a potential scenario, the focus of this predictive analysis is to provide some insight as to how certain geometric features can

impact the predicted safety performance of the roadway. This analysis may also provide a starting point for future evaluations of significant geometric changes proposed during the design-build process.

### **The Highway Safety Manual Predictive Method**

In the HSM predictive models, the number of expected crashes is derived by combining nationally developed safety performance functions (SPFs) with crash modification factors (CMFs) along with calibration factors based on observed crash experience. The SPFs derived by CDOT, though in many ways more robust than the HSM models, were derived for use in evaluating roadway segments with similar general characteristics, which does not lend itself to the application of CMFs for specific features within a segment. Thus, the SPF models from the HSM were used for this analysis.

The SPFs developed for the HSM apply to a generic cross section, and then modified by CMFs to account for features that deviate from the base assumptions. For example, the HSM model for a two-lane divided highway assumes no horizontal or vertical curves, 12-foot wide lanes, and 6-foot paved shoulders. A CMF is then derived for each horizontal or vertical curve and applied to the crash prediction for those specific sections of roadway.

### **Safety Performance Function and Crash Modification Factor Selection**

The planned roadway improvements will include a four-lane cross section with a depressed or barrier separated median. Therefore, the base SPF model selected for this study is the rural, multi-lane, divided highway SPF (HSM Chapter 11). The base assumptions for this type of facility are:

- Lane width: 12-feet
- Outside shoulder width: 8-feet
- Median width: 30-feet
- Lighting: None
- Automated speed enforcement: None

The CMFs associated with each of these elements were applied as per the HSM methodology using the IHSDM software. However, these five elements alone (only three of which apply to this facility) were not sufficient to account for the design features of the proposed roadway alignment. As such, CMFs for features not addressed in the rural, multi-lane, divided highway SPF that were developed for freeway segments were additionally applied for the following features:

- Horizontal Alignment
- Median Barrier
- Outside Barrier

The horizontal alignment CMF considers the radius and length of each curve, and the barrier CMFs account for the presence of median barrier or guard rail where present. The effect of horizontal curvature and median barrier is an important distinction through the northern section of US 550 approaching the interchange, and the guard rail CMFs help account for the reduction in clear zone associated with the bridge structures. Each of these CMFs have a separate calculation for fatal and injury (FI) crashes, and for property damage only (PDO) crashes. In addition, there are separate calculations for multi-vehicle and

single-vehicle CMFs in the horizontal curve and median barrier CMFs, while the outside barrier CMFs only apply to single-vehicle crashes.

**Traffic Volumes Used for Analysis**

The 2040 weekday traffic forecasts for segments of US 550 and CR 220 were adjusted using the difference method to account for model error in the calibration. The difference between the 2040 and 2016 model was added to the observed counts to provide the forecasted volumes used in the analysis. The data provided by Fehr & Peers is shown in **Table 3**.

**Table 3: Observed and Forecasted Traffic Volumes**

Roadway Segment	Observed	2016 Model	2040 Model	2040 Forecast
US 550 (s/o US 160)	9,214	11,385	16,917	<b>14,800</b>
US 550 (n/o CR 302)	8,824	9,942	11,808	<b>10,700</b>
CR 220 (e/o US 550)	1,679	1,848	8,951	<b>8,800</b>

Observed traffic counts source:  
 - US 550: CDOT (counted 7/27/16 & 7/28/16)  
 - CR 220: La Plata County (counted 2014)

**Safety Performance Function Application**

The geometric features associated with the reference document roadway geometry were entered into the IHSDM software for mainline US 550. The new roadway alignment connecting to the Grandview Interchange is slightly (0.24 miles) longer than the existing alignment and is expected to begin operations in the year 2021. The analysis was performed for future traffic conditions between 2021 and 2040 (inclusive) to provide a total number of FI and PDO crash estimate over 20 years. The IHSDM output report is provided in **Appendix B**. The results of the HSM analysis output are summarized in terms of the total crashes over the 20-year time period over the 1.80-mile segment of US 550 and are provided in **Table 4**.

**Table 4: HSM Analysis Results (Unadjusted)**

Element	Crash Type	Fatal and Injury	Property Damage Only	Total
Highway Segment	Multi-Vehicle	13.93	10.90	24.83
Highway Segment	Single-Vehicle	26.70	27.47	54.17
<b>Grand Total</b>	<b>All</b>	<b>40.63</b>	<b>38.37</b>	<b>79.00</b>

These results were then imported into a spreadsheet where the CMFs for the horizontal alignment, median barrier, and outside barrier were applied to the relevant segments of US 550.

**Crash Modification Factor Details**

The CMFs were applied on a segment by segment basis using the methodology documented in HSM Chapter 11 for the base rural multilane highway CMFs and in Chapter 18 for the secondary CMFs typically applied to freeway facilities. The split between multi-vehicle and single-vehicle crashes was based on the CDOT diagnostic data for rural, four-lane, divided highways, while the split between FI and PDO crashes as calculated by the IHSDM was maintained.

Lane Width (Rural Multilane)

The base assumption for lane width on rural multilane highways is 12-foot wide lanes. All lane widths within the study segment are presently designed as 12-foot lanes, thus the CMF is 1.00 throughout. For this facility, a CMF of 1.03 would apply to segments with 11-foot lanes, and a CMF of 1.15 would apply to segments with 10-foot lanes.

Outside Shoulder Width (Rural Multilane)

The base assumption for outside shoulder width on rural multilane highways is 8-foot wide paved shoulders. Except where auxiliary lanes are present (which count as shoulder width for the through lane) outside shoulders are 10-foot wide, thus the CMF is 1.00 throughout. The CMF for outside shoulder widths less than 8-feet increases at a rate of approximately 4.5% per 2-foot reduction up to a CMF of 1.18 for 0-foot wide shoulders.

Median Width (Rural Multilane)

The base assumption for median width on rural multilane highways is a 30-foot wide median. The median width is measured as the distance between the through lanes, including inside shoulders and auxiliary lanes, and the CMF only applies to traversable medians (4:1 slope or flatter) with no barrier. Unlike the previous two CMFs, exceeding the width of the base assumption yields a CMF less than 1.00 (crash reduction). The median width prior to the beginning of the median barrier is approximately 40-feet in width, resulting in a CMF between 0.98 and 0.99. Reducing the total median width (including auxiliary lanes and inside shoulders) to 20-feet or 10-feet would result in a CMF of 1.02 or 1.04, respectively.

Horizontal Curve (Freeway Facilities)

There are four horizontal curves through the study section. The first carries through the CR 220 intersection while the remaining three curves are north of CR 220 approaching US 160. The CMF function is based on the curve radius with an overdispersion parameter associated with each of the four general crash categories. **Table 5** shows the resulting CMF values.

**Table 5: Horizontal Curve CMFs**

Horizontal Curve	Curve Radius	Multi-Vehicle Fatal + Injury	Multi-Vehicle PDO	Single-Vehicle Fatal + Injury	Single-Vehicle PDO
Curve 1	3,500 feet	1.0461	1.0911	1.1927	1.1678
Curve 2	1,060 feet	1.5026	1.9935	3.1010	2.8292
Curve 3	4,000 feet	1.0353	1.0698	1.1475	1.1285
Curve 4	4,000 feet	1.0353	1.0698	1.1475	1.1285

Smaller curve radii result in higher CMF values, thus a higher number of predicted crashes when applied to the SPF values. Longer curves of the same radius require the application of the CMF over greater distances, likewise increasing the predicted crash frequency.

Median Barrier (Freeway Facilities)

The median barrier begins north of the CR 220 intersection where the median changes from depressed to level with 8-foot wide inside shoulders. The median barrier terminates just before the interchange with



US 160. The CMF function is based on the distance from the edge of traveled way to the barrier, which is the inside shoulder width in this case, and the overdispersion parameter associated with each of the four general crash categories. **Table 6** shows the resulting CMF values.

**Table 6: Median Barrier CMFs**

Median Barrier	Distance from Thru Lane	Multi-Vehicle Fatal + Injury	Multi-Vehicle PDO	Single-Vehicle Fatal + Injury	Single-Vehicle PDO
Barrier 1	8 feet	1.0165	1.0213	1.0165	1.0213

Decreasing the distance from the edge of traveled way to the median barrier will increase the CMF, resulting in additional predicted crashes. Additional median barrier installation will apply the CMF more broadly and increase the number of predicted crashes.

Outside Barrier (Freeway Facilities)

There are three primary locations with outside barrier (guardrail) relevant to the safety conditions on the roadway. The first is in the secondary direction only near the southbound approach to CR 220. The second two are on both sides of the road associated with the two bridge structures between CR 220 and US 160. The CMF function is based on the distance from the edge of traveled way to the barrier, adjusted for the proportion of the roadway for which guardrail is located (0.5 when only located on one side of the roadway), and the overdispersion parameter associated with each of two single-vehicle general crash categories. **Table 7** shows the resulting CMF values.

**Table 7: Outside Barrier CMFs**

Outside Barrier	Distance from Thru Lane	Proportion of Segment	Multi-Vehicle Fatal + Injury	Multi-Vehicle PDO	Single-Vehicle Fatal + Injury	Single-Vehicle PDO
Barrier 1	10 feet	0.5	1.000	1.000	1.0066	1.0085
Barrier 2	10 feet	1.0	1.000	1.000	1.0132	1.0170
Barrier 3	10 feet	1.0	1.000	1.000	1.0132	1.0170

Decreasing the distance from the edge of traveled way to the outside barrier will increase the CMF, resulting in additional predicted crashes. Additional guard rail location or increased length of guard rail installation will result in the CMF being applied more broadly and increase the number of predicted crashes.

**Crash Modification Factor Application**

The results of the SPF calculations summarized in **Table 4** were adjusted using the CMFs for horizontal curve, median barrier, and outside barrier on a segment by segment basis in accordance with HSM methodologies. The adjusted crash prediction for a 20-year period is shown in **Table 8**.

**Table 8: HSM Analysis Results (Adjusted)**

Element	Crash Type	Fatal and Injury	Property Damage Only	Total
Highway Segment	Multi-Vehicle	15.68	13.59	29.27
Highway Segment	Single-Vehicle	40.22	39.85	80.07
<b>Grand Total</b>	<b>All</b>	<b>55.90</b>	<b>53.44</b>	<b>109.34</b>

These adjustments accounting for geometric features associated with the roadway geometry shown in the reference documents resulted in an 18 percent increase in multi-vehicle crashes and a 48 percent increase in single-vehicle collisions. The factors applied for horizontal curvature had the greatest impact on the predicted number of single vehicle collisions, subtly exacerbated by the median barrier and guard rail sections on the roadway leading up to the US 160 interchange.

### Adjusted Crash Rate Over Time

The HSM analysis performed using the IHSDM was calculated for each year between 2021 (opening year) and 2040 (inclusive). This was based on a linear interpolation of ADT volumes between 2016 and 2040 using the volumes from **Table 3**. The adjusted crash rate for the 1.80-mile study section over this 20-year time period was approximately 3.04 CPMPY. **Table 9** provides additional detail showing the total crashes and crash rates for the existing highway facility versus the planned highway in the opening year as well as the 2040 horizons. Since the Grandview interchange was excluded from the HSM analysis, the crashes that occurred at the US 550 intersection with US 160 were excluded from the existing crash rate calculation.

**Table 9: Adjusted Crash Rates Over Time**

Horizon	Time Period	Segment Length	Fatal + Injury Crashes	Property Damage Only	Total Crashes	Crash Rate (CPMPY)
Existing <sup>1</sup>	5 years	1.56 mi	6	27	33	4.23
Year 2021	1 year	1.80 mi	2.39	2.21	4.60	2.56
Year 2040	1 year	1.80 mi	3.19	3.14	6.33	3.52
20-year	20 years	1.80 mi	55.90	53.44	109.34	3.04

<sup>1</sup> Existing, non-intersection related crashes only.

There are inherently some discrepancies between the existing (field observed) crashes and those predicted by the HSM methodology, yet the analysis indicates that the project should result in a roadway with fewer overall crashes.

### CONCLUSIONS AND RECOMMENDATIONS

The purpose of this memorandum is to document the predictive crash analysis based on the draft roadway geometry provided. The adjusted HSM results predict that the average crash rate between 2021 and 2040 over this 1.80-mile section of US 550 to be approximately 3.04 CPMPY. In the opening year (2021) the improved highway would have approximately 2.56 CPMPY, which is less than the current crash rate even with the increased amount of traffic on US 550.

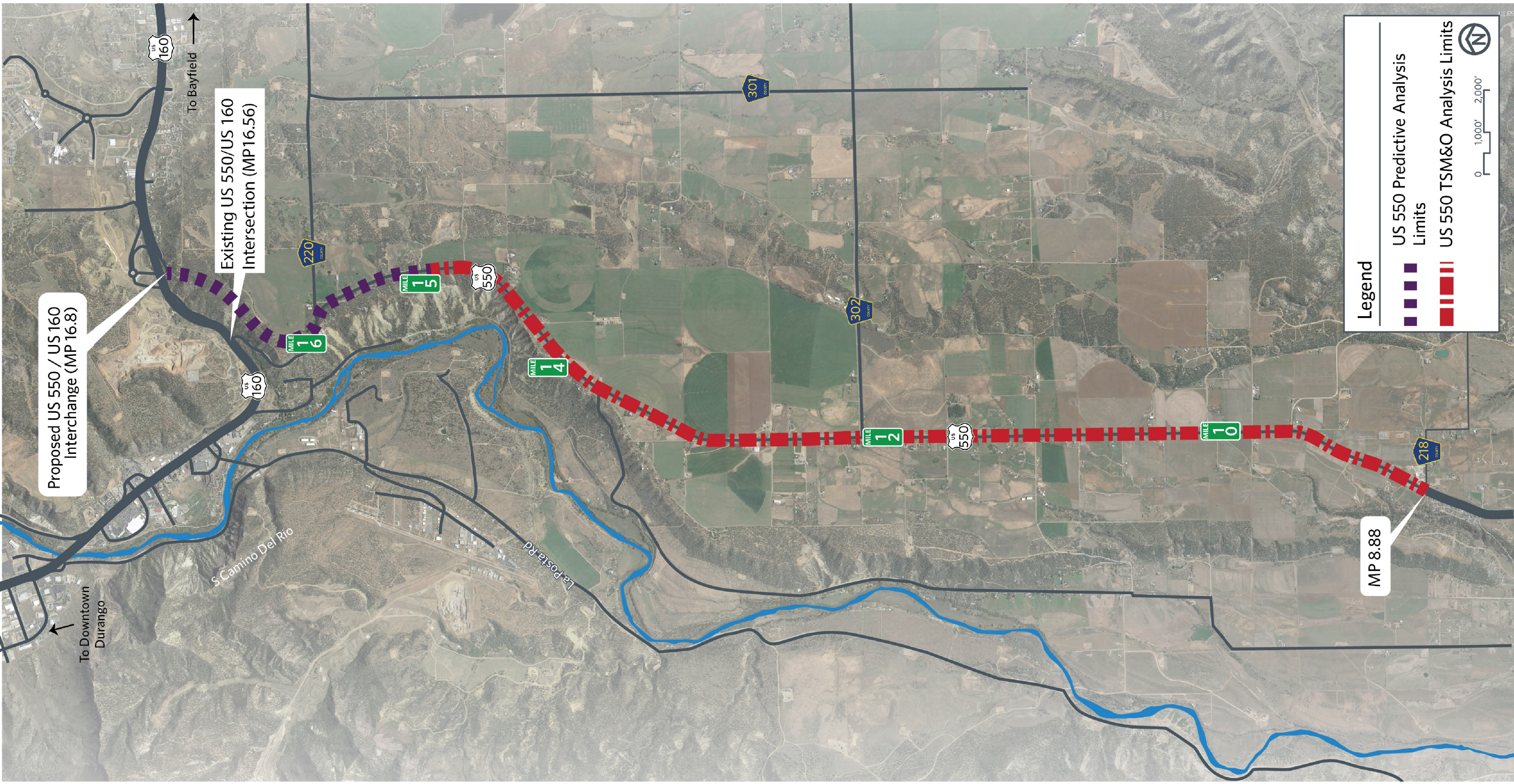
Several of the design decisions regarding inside and outside shoulder widths, median width, barrier placement, and the horizontal alignment of the road were explicitly accounted for as part of this analysis. Careful consideration should be given when changing features that would likely have a significant impact on potential crashes, such as reducing curve radius or longer curves.



## **APPENDIX A**

### **Roadway Configuration Graphic**





Proposed US 550 / US 160 Interchange (MP 16.8)

Existing US 550/US 160 Intersection (MP 16.56)

MP 8.88

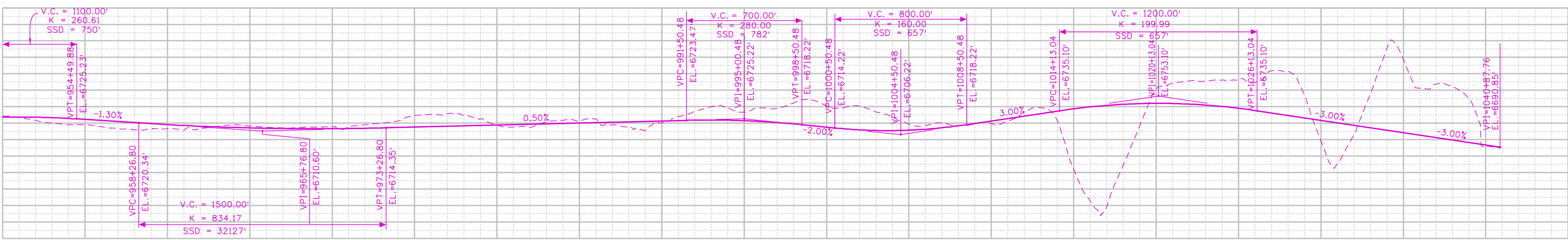
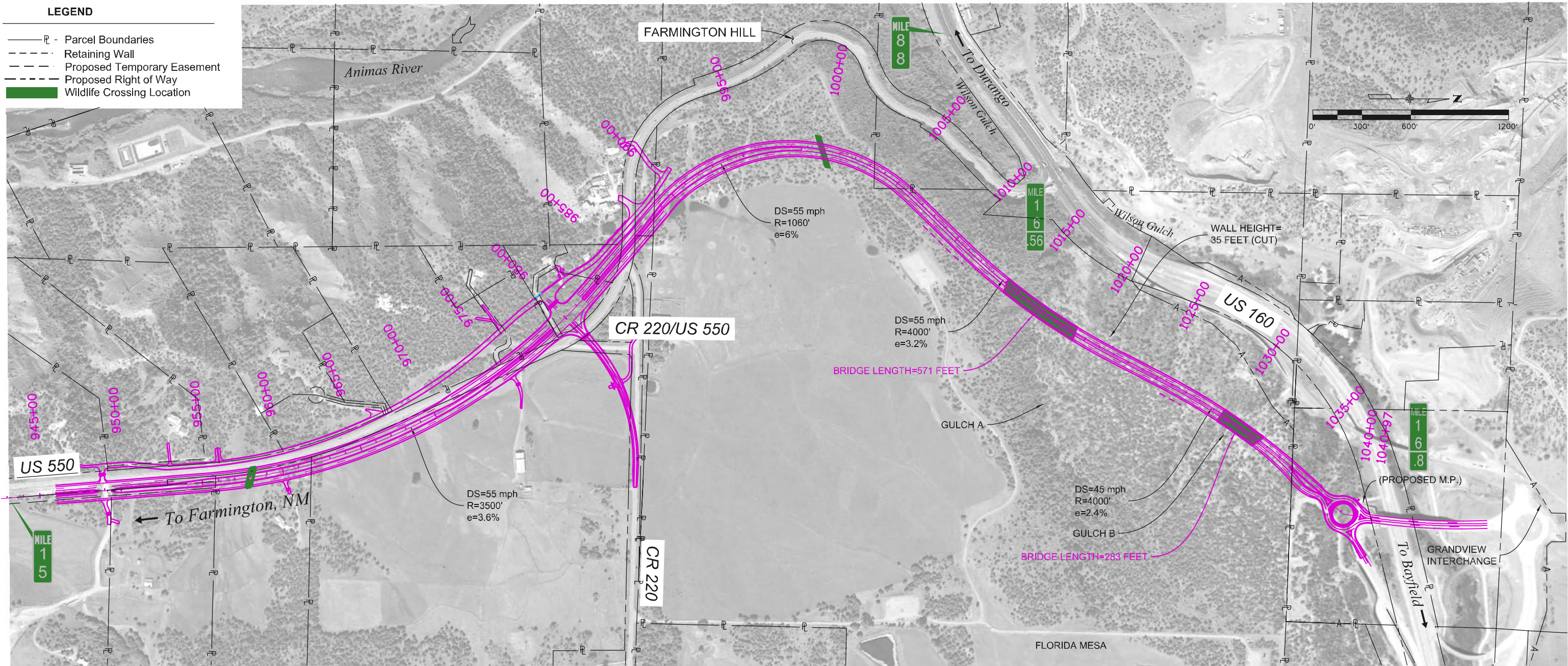
**Legend**

- US 550 Predictive Analysis Limits
- US 550 TSM&O Analysis Limits

0 1,000' 2,000'

**LEGEND**

- P — Parcel Boundaries
- - - Retaining Wall
- - - Proposed Temporary Easement
- - - Proposed Right of Way
- █ Wildlife Crossing Location



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**US 550 SOUTH CONNECTION: DESIGN-BUILD  
BASIC CONFIGURATION PLAN AND PROFILE**



## **APPENDIX B**

### **Interactive Highway Safety Design Model Crash Prediction Evaluation Report**



*Interactive Highway Safety Design Model*

**Crash Prediction Evaluation Report**

August 22, 2018



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## Report Overview

**Report Generated:** Aug 22, 2018 1:29 PM

**Report Template:** System: Single Page [System] (mlcpm3, Apr 20, 2018 10:26 AM)

**Evaluation Date:** Wed Aug 22 13:28:54 MDT 2018

**IHSDM Version:** v13.1.0 (Mar 16, 2018)

**Crash Prediction Module:** v8.1.0 (Mar 16, 2018)

**User Name:** kryan

**Organization Name:**

**Phone:**

**E-Mail:**

**Project Title:** SA42(Copy 1)

**Project Comment:** SH 550A - MP 15.00 to MP 16.56

**Project Unit System:** U.S. Customary

**Highway Title:** SH550A

**Highway Comment:** 2018-07-18 Current Plan Set

**Highway Version:** 2

**Evaluation Title:** HSM Crash Prediction

**Evaluation Comment:** Created Wed Aug 22 13:28:39 MDT 2018

**Minimum Location:** 946+00.000

**Maximum Location:** 1040+87.340

**Policy for Superelevation:** AASHTO 2011 U.S. Customary

**Calibration:** HSM Configuration

**Crash Distribution:** CDOT Diagnostic Adjustments

**Model/CMF:** HSM Configuration

**Empirical-Bayes Analysis:** None

**Highway with Crash History:** SH550A

**Highway with Crash History Comment:** 2018-07-18 Current Plan Set

**Highway with Crash History Version:** 2

**First Year of Analysis:** 2021

**Last Year of Analysis:** 2040

## **Section Types**

### **Section 1 Evaluation**

**Section:** Section 1

**Evaluation Start Location:** 946+00.000

**Evaluation End Location:** 1040+87.340

**Area Type:** Rural

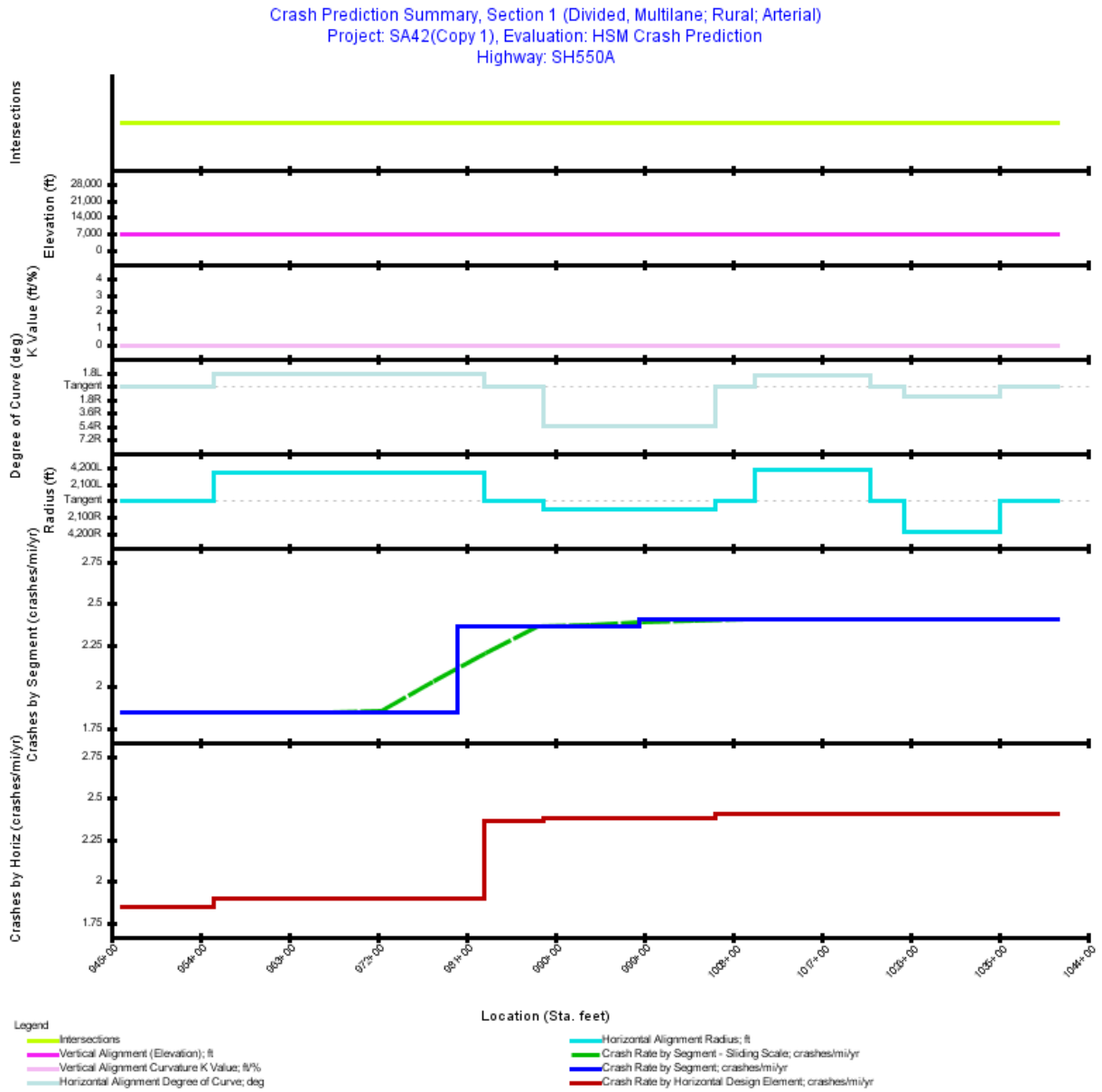
**Functional Class:** Arterial

**Type of Alignment:** Divided, Multilane

**Model Category:** Rural, Multilane

**Calibration Factor:** 4D=1.0;





**Figure 1. Crash Prediction Summary (Section 1)**

**Table 1. Evaluation Highway - Homogeneous Segments (Section 1)**

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length (mi)	AADT	Left Lane Width (ft)	Right Lane Width (ft)	Left Shoulder Width (ft)	Right Shoulder Width (ft)	Median Width (ft)	Median Type	Effective Median Width (ft)	Lighting	Automated Speed Enforcement	Left Side Slope	Right Side Slope
1	4D	946+00.000	953+00.000	700.00	0.1326	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
2	4D	953+00.000	955+29.530	229.53	0.0435	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
3	4D	955+29.530	961+00.000	570.47	0.1080	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
4	4D	961+00.000	963+00.000	200.00	0.0379	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
5	4D	963+00.000	964+00.000	100.00	0.0189	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
6	4D	964+00.000	971+50.000	750.00	0.1421	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
7	4D	971+50.000	974+60.000	310.00	0.0587	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	24.00	Traversable Median	44.00	false	false		
8	4D	974+60.000	980+00.500	540.50	0.1024	2021: 9,214; 2022: 9,293; 2023: 9,371; 2024: 9,449; 2025: 9,527; 2026: 9,605; 2027: 9,683; 2028: 9,762; 2029: 9,840; 2030: 9,918; 2031: 9,996; 2032: 10,074; 2033: 10,152; 2034: 10,231; 2035: 10,309; 2036: 10,387; 2037: 10,465; 2038: 10,543; 2039: 10,621; 2040: 10,700	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
9	4D	980+00.500	982+80.680	280.18	0.0531	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
10	4D	982+80.680	984+00.000	119.32	0.0226	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
11	4D	984+00.000	985+00.000	100.00	0.0189	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
12	4D	985+00.000	985+50.000	50.00	0.0095	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
13	4D	985+50.000	986+00.000	50.00	0.0095	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
14	4D	986+00.000	987+50.000	150.00	0.0284	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	12.00	Traversable Median	44.00	false	false		
15	4D	987+50.000	988+80.860	130.86	0.0248	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	24.00	Traversable Median	44.00	false	false		
16	4D	988+80.860	989+00.000	19.14	0.0036	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	24.00	Traversable Median	44.00	false	false		
17	4D	989+00.000	990+00.000	100.00	0.0189	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		
18	4D	990+00.000	998+50.000	850.00	0.1610	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	36.00	Traversable Median	44.00	false	false		

Seg. No.	Type	Start Location (Sta. ft)	End Location (Sta. ft)	Length (ft)	Length (mi)	AADT	Left Lane Width (ft)	Right Lane Width (ft)	Left Shoulder Width (ft)	Right Shoulder Width (ft)	Median Width (ft)	Median Type	Effective Median Width (ft)	Lighting	Automated Speed Enforcement	Left Side Slope	Right Side Slope
19	4D	998+50.000	1001+00.000	250.00	0.0474	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
20	4D	1001+00.000	1006+18.730	518.73	0.0982	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
21	4D	1006+18.730	1009+00.000	281.27	0.0533	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
22	4D	1009+00.000	1010+17.680	117.68	0.0223	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
23	4D	1010+17.680	1015+00.000	482.32	0.0914	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
24	4D	1015+00.000	1020+00.000	500.00	0.0947	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
25	4D	1020+00.000	1021+98.880	198.88	0.0377	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
26	4D	1021+98.880	1025+39.120	340.24	0.0644	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
27	4D	1025+39.120	1030+00.000	460.88	0.0873	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
28	4D	1030+00.000	1033+00.000	300.00	0.0568	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
29	4D	1033+00.000	1035+11.230	211.23	0.0400	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
30	4D	1035+11.230	1036+50.000	138.77	0.0263	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		
31	4D	1036+50.000	1040+87.340	437.34	0.0828	2021: 10,377; 2022: 10,610; 2023: 10,843; 2024: 11,076; 2025: 11,308; 2026: 11,541; 2027: 11,774; 2028: 12,007; 2029: 12,239; 2030: 12,472; 2031: 12,705; 2032: 12,938; 2033: 13,170; 2034: 13,403; 2035: 13,636; 2036: 13,869; 2037: 14,101; 2038: 14,334; 2039: 14,567; 2040: 14,800	12.00	12.00	10.00	10.00	20.00	Non-Traversable Median	36.00	false	false		

**Table 2. Expected Highway Crash Rates and Frequencies (Section 1)**

First Year of Analysis	2021
Last Year of Analysis	2040
Evaluated Length (mi)	1.7968
Average Future Road AADT (vpd)	11,645
<b>Expected Crashes</b>	
Total Crashes	79.00
Fatal and Injury Crashes	40.63
Fatal and Serious Injury Crashes	25.77
Property-Damage-Only Crashes	38.37
<b>Percent of Total Expected Crashes</b>	
Percent Fatal and Injury Crashes (%)	51
Percent Fatal and Serious Injury Crashes (%)	33
Percent Property-Damage-Only Crashes (%)	49
<b>Expected Crash Rate</b>	
Crash Rate (crashes/mi/yr)	2.1982
Fatal and Injury Crash Rate (crashes/mi/yr)	1.1305
Fatal and Serious Injury Crash Rate (crashes/mi/yr)	0.7171
Property-Damage-Only Crash Rate (crashes/mi/yr)	1.0677
<b>Expected Travel Crash Rate</b>	
Total Travel (million veh-mi)	152.75
Travel Crash Rate (crashes/million veh-mi)	0.52
Travel Fatal and Injury Crash Rate (crashes/million veh-mi)	0.27
Travel Fatal and Serious Injury Crash Rate (crashes/million veh-mi)	0.17
Travel Property-Damage-Only Crash Rate (crashes/million veh-mi)	0.25

**Table 3. Expected Crash Frequencies and Rates by Highway Segment (Section 1)**

Segment Number/Intersection Name/Cross Road	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Expected No. Crashes for Evaluation Period	Crash Rate (crashes/mi/yr)	Travel Crash Rate (crashes/million veh-mi)
1	946+00.000	953+00.000	0.1326	4.900	1.8478	0.51
2	953+00.000	955+29.530	0.0435	1.607	1.8478	0.51
3	955+29.530	961+00.000	0.1080	3.993	1.8478	0.51
4	961+00.000	963+00.000	0.0379	1.400	1.8478	0.51
5	963+00.000	964+00.000	0.0189	0.700	1.8478	0.51
6	964+00.000	971+50.000	0.1420	5.250	1.8478	0.51
7	971+50.000	974+60.000	0.0587	2.170	1.8478	0.51
8	974+60.000	980+00.500	0.1024	3.783	1.8478	0.51
9	980+00.500	982+80.680	0.0531	2.509	2.3638	0.51
10	982+80.680	984+00.000	0.0226	1.068	2.3638	0.51
11	984+00.000	985+00.000	0.0189	0.895	2.3638	0.51
12	985+00.000	985+50.000	0.0095	0.448	2.3638	0.51
13	985+50.000	986+00.000	0.0095	0.448	2.3638	0.51
14	986+00.000	987+50.000	0.0284	1.343	2.3638	0.51
15	987+50.000	988+80.860	0.0248	1.172	2.3638	0.51
16	988+80.860	989+00.000	0.0036	0.171	2.3638	0.51
17	989+00.000	990+00.000	0.0189	0.895	2.3638	0.51
18	990+00.000	998+50.000	0.1610	7.611	2.3638	0.51
19	998+50.000	1001+00.000	0.0473	2.279	2.4071	0.52
20	1001+00.000	1006+18.730	0.0982	4.730	2.4071	0.52
21	1006+18.730	1009+00.000	0.0533	2.565	2.4071	0.52
22	1009+00.000	1010+17.680	0.0223	1.073	2.4071	0.52
23	1010+17.680	1015+00.000	0.0913	4.398	2.4071	0.52
24	1015+00.000	1020+00.000	0.0947	4.559	2.4071	0.52
25	1020+00.000	1021+98.880	0.0377	1.813	2.4071	0.52
26	1021+98.880	1025+39.120	0.0644	3.102	2.4071	0.52
27	1025+39.120	1030+00.000	0.0873	4.202	2.4071	0.52
28	1030+00.000	1033+00.000	0.0568	2.735	2.4071	0.52
29	1033+00.000	1035+11.230	0.0400	1.926	2.4071	0.52
30	1035+11.230	1036+50.000	0.0263	1.265	2.4071	0.52
31	1036+50.000	1040+87.340	0.0828	3.988	2.4071	0.52

**Table 4. Expected Crash Frequencies and Rates by Horizontal Design Element (Section 1)**

Title	Start Location (Sta. ft)	End Location (Sta. ft)	Length (mi)	Expected No. Crashes for Evaluation Period	Crash Rate (crashes/mi/yr)	Travel Crash Rate (crashes/million veh-mi)
Tangent	946+00.000	955+29.530	0.1760	6.506	1.8478	0.51
Simple Curve 1	955+29.530	982+80.680	0.5211	19.804	1.9004	0.51
Tangent	982+80.680	988+80.860	0.1137	5.374	2.3638	0.51
Simple Curve 2	988+80.860	1006+18.730	0.3291	15.686	2.3829	0.52
Tangent	1006+18.730	1010+17.680	0.0756	3.638	2.4071	0.52
Simple Curve 3	1010+17.680	1021+98.880	0.2237	10.770	2.4071	0.52
Tangent	1021+98.880	1025+39.120	0.0644	3.102	2.4071	0.52
Simple Curve 4	1025+39.120	1035+11.230	0.1841	8.864	2.4071	0.52
Tangent	1035+11.230	1040+87.340	0.1091	5.253	2.4071	0.52

**Table 5. Expected Segment Crash Type Distribution (Section 1)**

Element Type	Crash Type	Fatal and Injury		Fatal and Serious Injury		Property Damage Only		Total	
		Crashes	Crashes (%)	Crashes	Crashes (%)	Crashes	Crashes (%)	Crashes	Crashes (%)
Highway Segment	Angle Collision	0.77	1.0	0.77	1.0	0.00	0.0	0.00	0.0
Highway Segment	Head-on Collision	0.45	0.6	0.41	0.5	0.08	0.1	0.40	0.5
Highway Segment	Other Collision	3.09	3.9	2.04	2.6	3.19	4.0	6.56	8.3
Highway Segment	Rear-end Collision	7.39	9.4	3.27	4.1	3.45	4.4	10.27	13.0
Highway Segment	Sideswipe	2.23	2.8	1.16	1.5	4.18	5.3	6.95	8.8
Highway Segment	Single	26.69	33.8	18.11	22.9	27.47	34.8	54.82	69.4
	Total Crashes	40.63	51.4	25.77	32.6	38.37	48.6	79.00	100.0

**Note:** *Fatal and Injury Crashes* and *Property Damage Only Crashes* do not necessarily sum up to *Total Crashes* because the distribution of these three crashes had been derived independently.