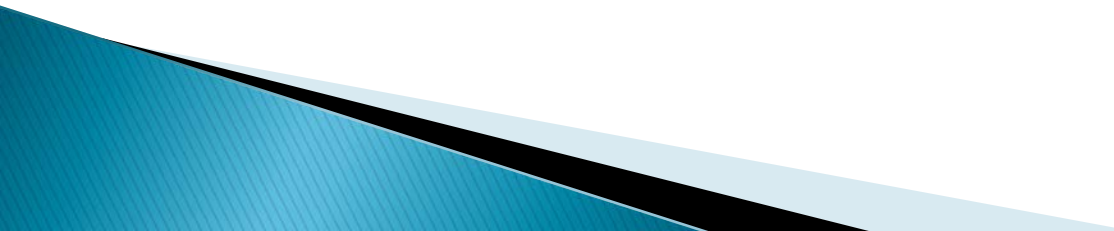


US 550 SAFETY

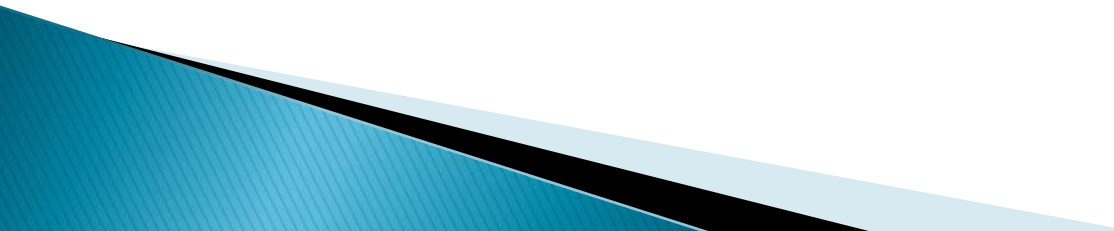
NMDOT

OCTOBER 5, 2017

History

- ▶ NM 44 from Bernalillo to Bloomfield 151 miles
 - ▶ Two lane road with narrow lanes, non-existent shoulders, limited sight distance and passing distance, narrow bridges, non-forgiving roadside features
 - ▶ Crash rate of 1.56 million vehicle miles
- 

New road improvements

- ▶ Narrow lanes were replaced
 - ▶ 10' shoulders provided
 - ▶ Seven bridges were reconstructed
 - ▶ Re-alignment of severe curves
 - ▶ Improved sight distance
 - ▶ Many Fixed objects removed
 - ▶ Roadside Flattened
- 

Typical 1976 NM 44 roadway cross section



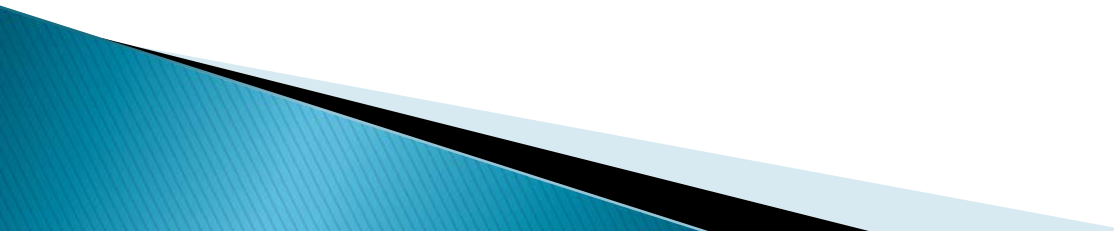
Typical reconstructed cross section



Roadside Treatments

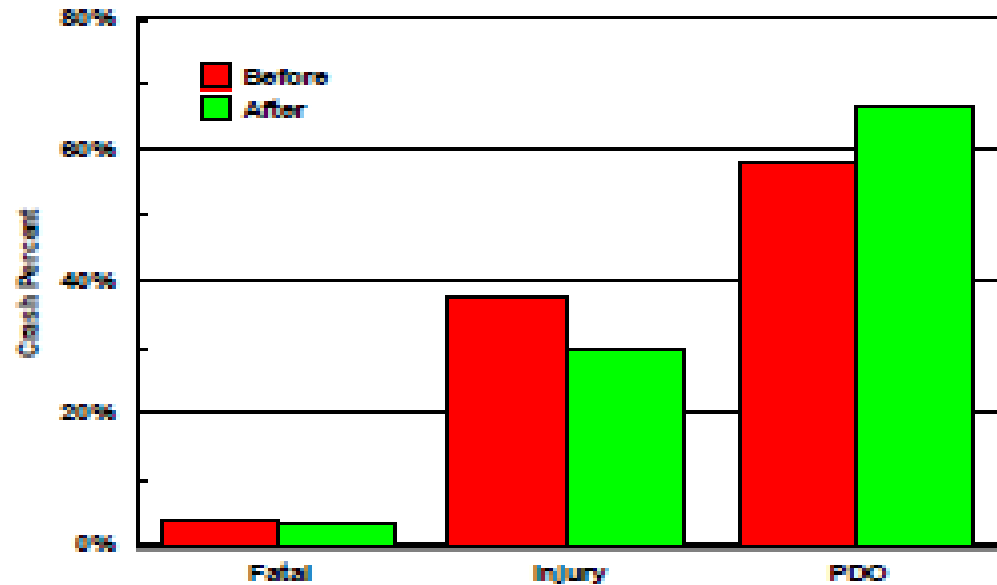


Benefits

- ▶ Economic Development
 - ▶ Travel time, design speed of 65 MPH, posted at 70 MPH
 - ▶ Safety, horizontal curves with advisory speed of 65 MPH
 - ▶ Seven Vertical curves with supplemental signs
- 

Quick crash comparison

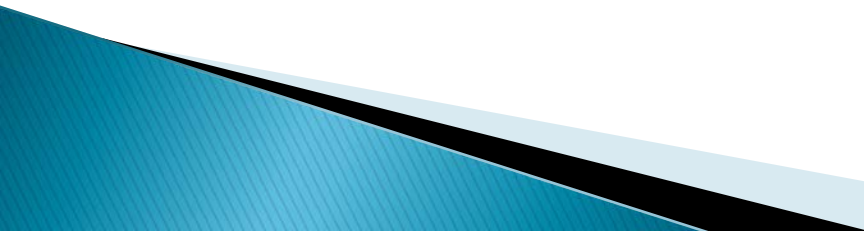
- ▶ 1999 reconstruction
- ▶ Crashes 3 years before 1999
- ▶ Crashes 2002 to 2003



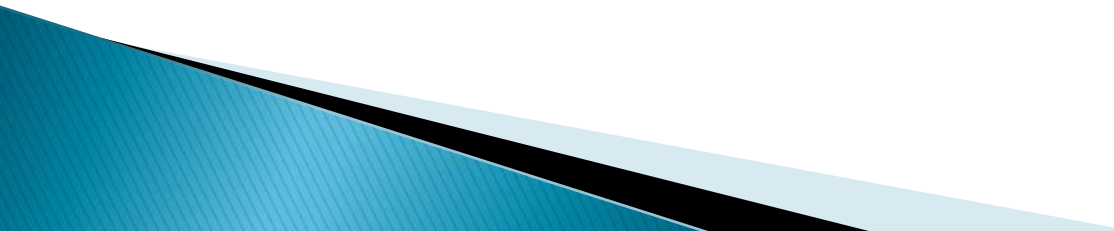
Crashes before and after

- ▶ Before averaged 85
- ▶ After 106
- ▶ After Properly located
- ▶ Change of pattern of crashes
- ▶ 43% opposite direction crashes changed to 11%
- ▶ Rear-end and side swipe increased from 25% to 60%
- ▶ Fixed objects increased from 25% to 60% but they were hitting softer targets like guardrail and fences

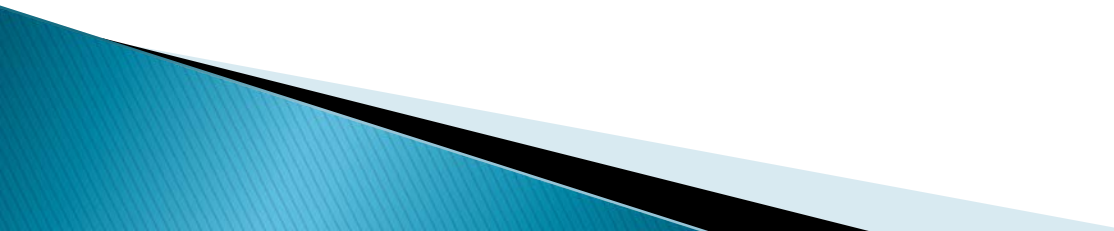
Other crashes

- ▶ No Passing Zone crashes dropped from 18% to 3%
 - ▶ Alcohol crashes dropped from 12% to 7%
 - ▶ Crashes in clear weather dropped from 79% to 72%
 - ▶ At first glance 25% increase shows no benefit but higher severity decreased
- 

2013 study

- ▶ Senate Memorial 36 for feasibility of installing center guardrail to prevent opposite direction crashes.
 - ▶ CH2M Hill did a study using Highway Safety Manual
 - ▶ Crashes from 2006 to 2010 data to establish pattern
 - ▶ Crash severity, date and time, location, environmental condition, among others
- 

Result

- ▶ Total 754 crashes
 - ▶ 30% injury or fatality
 - ▶ 37 fatalities as the result of 26 crashes
 - ▶ 15% cross median, 30% multi-vehicle
 - ▶ Of fatal and injury, cross median was 14 out of 26 (54%)
 - ▶ 38 incapacitating which 15 were cross median
- 

Focus areas

Focus Area	Top Segments	Number of Focus Area Crashes
Total Crashes without Animal Crashes ^a	MP 110 to MP 120 MP 103 to MP 113	59
Fatal Crashes	MP 83 to MP 93	6
Fatal and Injury Crashes	MP 14 to MP 24 MP 99 to MP 109 MP 101 to MP 111 MP 112 to MP 122	28
Cross-Median Crashes	MP 107 to MP 117 MP 108 to MP 118 MP 109 to MP 119 MP 110 to MP 120 MP 114 to MP 124	19
Alcohol-Related Crashes	MP 2 to MP 12 MP 14 to MP 24 MP 15 to MP 25 MP 16 to MP 26 MP 17 to MP 27 MP 18 to MP 28 MP 91 to MP 101 MP 94 to MP 104 MP 99 to MP 109 MP 100 to MP 110	5

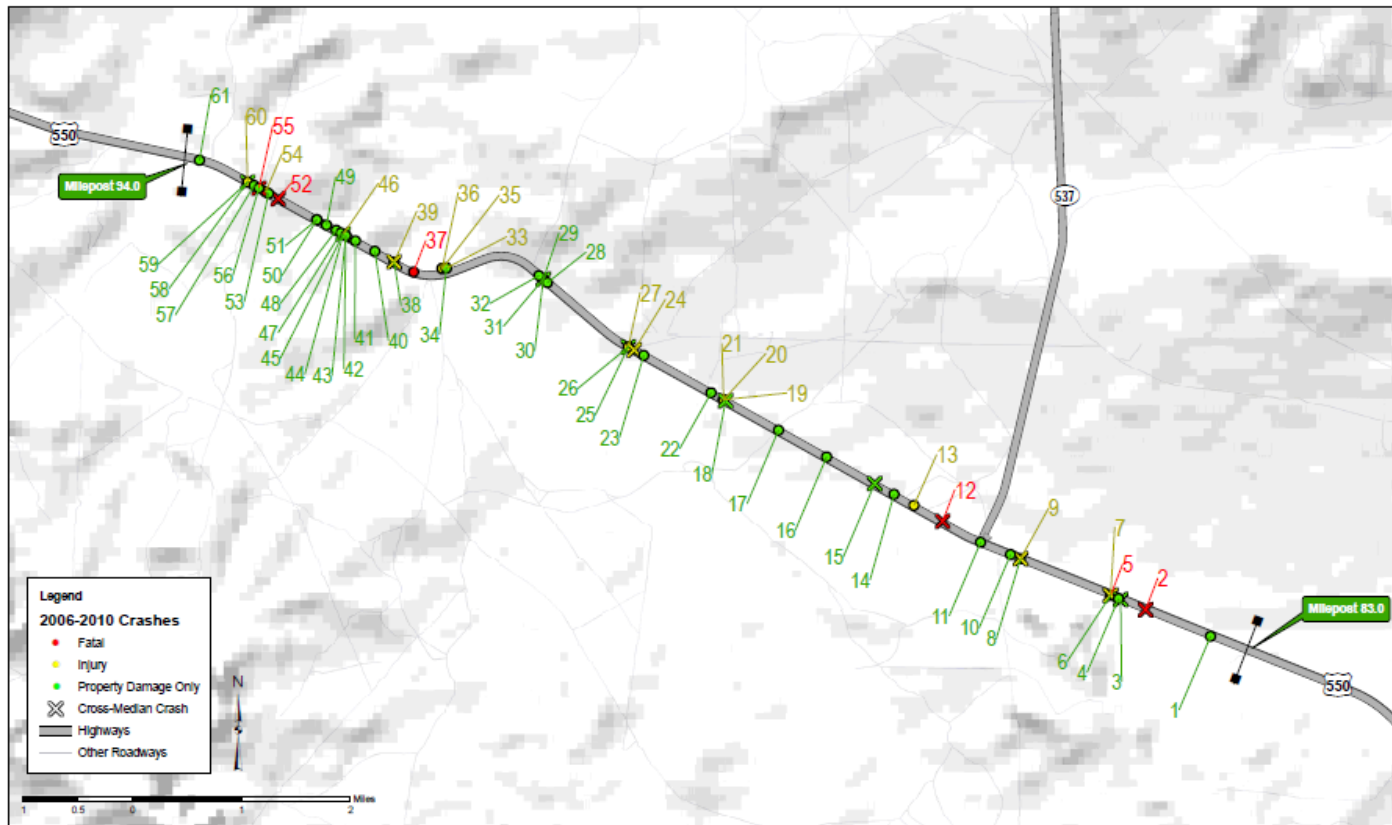
Recommended study site

- ▶ MP 83 to MP 94
- ▶ MP 107 to MP 121

Segment	Milepost	Focus Area Crash Frequency							Alcohol - Related
		Total	Total w/o Animal	Fatal	Fatal and Injury	Cross- Median	Fatal Cross- Median	Fatal and Injury Cross- Median	
1	MP 83-94	60	<u>55</u>	<u>6</u>	21	17	<u>4</u>	10	3
2	MP 107-121	<u>97</u>	<u>78</u>	4	19	<u>23</u>	1	<u>11</u>	3

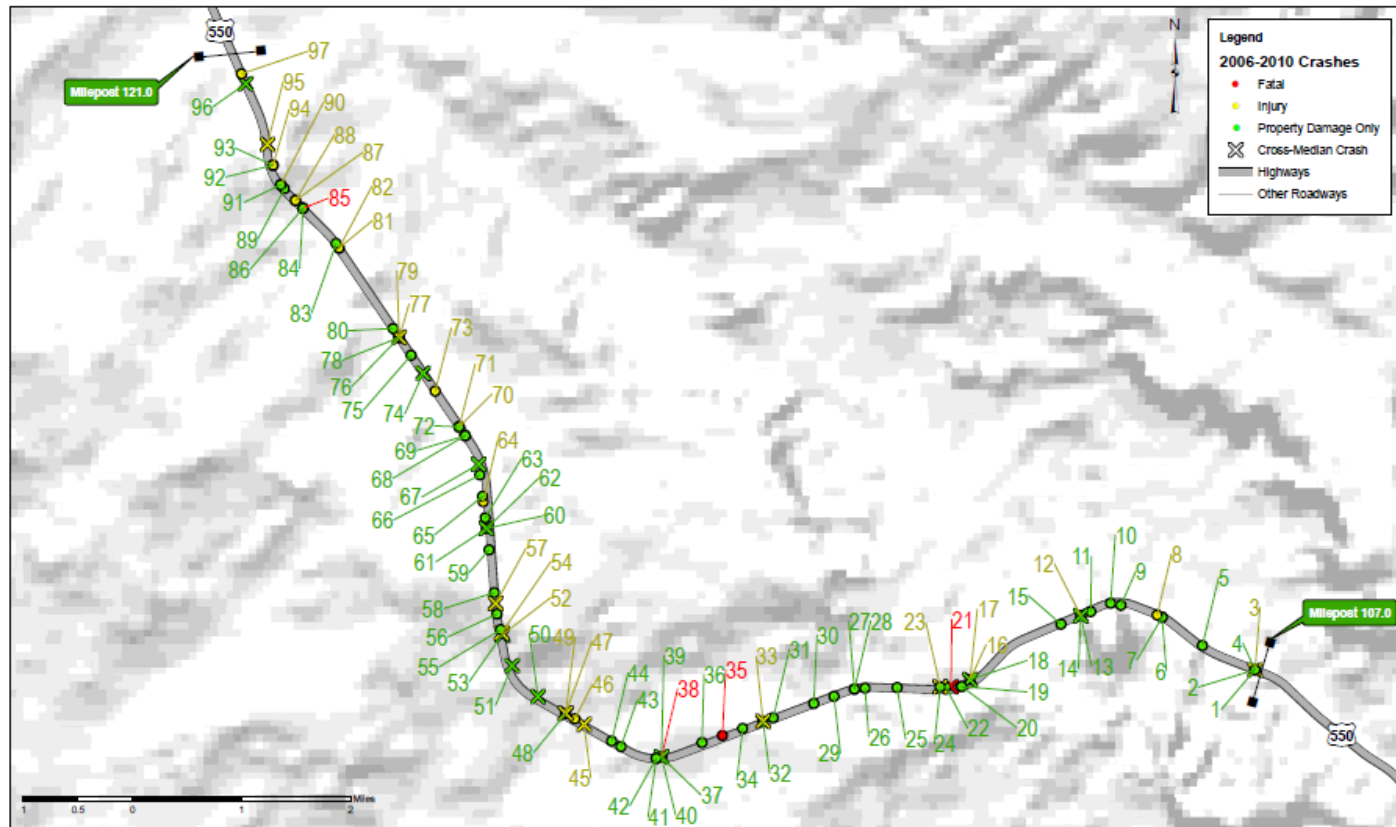
Segment 1: MP 83 to MP 94

US 550 Safety Analysis (Segment 1: Milepost 83 to Milepost 94)



Segment 2: MP 107 to MP 121

US 550 Safety Analysis (Segment 2: Milepost 107 to Milepost 121)



Potential future Segment Study

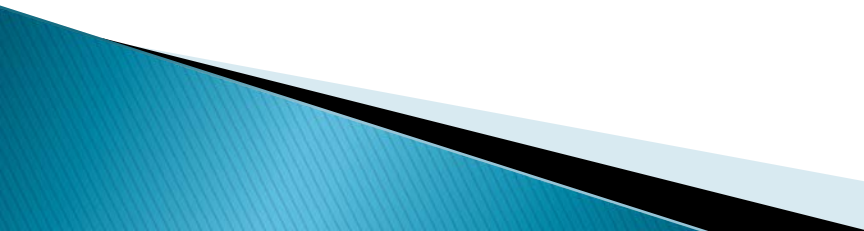
Segment	Milepost	Crash Frequency			
		Total (without Animal)	Fixed Object	Animal	Alcohol-Related
A	MP 57-67	47	<u>23</u>	13	2
B	MP 68-78	31	11	<u>60</u>	1
C	MP 91-101	<u>58</u>	19	14	<u>5</u>

Mitigation and crash modification factors (CMF)

Countermeasure	CMF	Std. Error	Applicable Crash Types
Weather Station, Pavement Condition Monitors	Related to Variable Speed Limit & Advanced Warning Signs (see below)		
Advance Warning Signs	Will be updated with current research		All Types (All severities)
Changeable Speed Warning Signs	0.54	0.2	All Types (All severities)
Horizontal Alignment/Advisory Speed Signs	.87	0.09	All Types (Injury)
	0.71	0.2	All Types (non-Injury)
Increase Pavement Marking Retroreflectivity	Will be updated with current research		All Types (Night)
Centerline/Edgeline Rumble Stripes	Will be updated with current research		All types, cross-median, night crashes
Highway/Intersection Lighting	0.72	0.06	All Types (night) (Injury)
	0.83	0.07	All Types (night) (non-Injury)
Median Barrier Treatment – install any type of median barrier (width of median unspecified)	0.57	0.10	All Types (cross-median) (fatal)
	0.70	0.06	All Types (Injury)
Speed Enforcement	Will be updated with current research		All Types

Increased Winter Maintenance

Study Conclusion

- ▶ While Senate Memorial 36 has suggested that center guardrails along US 550 could be a potential solution, there are other factors to consider and that this treatment isn't necessarily the most reasonable first course of action
 - ▶ Potential effects to cross median traffic which would necessitate providing u-turn and/or turn-around locations
 - ▶ Other countermeasures, such as ITS, changes to pavement marking, signing, lighting, and increased enforcement may reduce the frequency of all crashes including cross-median without the costs and impacts of installing median barrier.
- 

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