

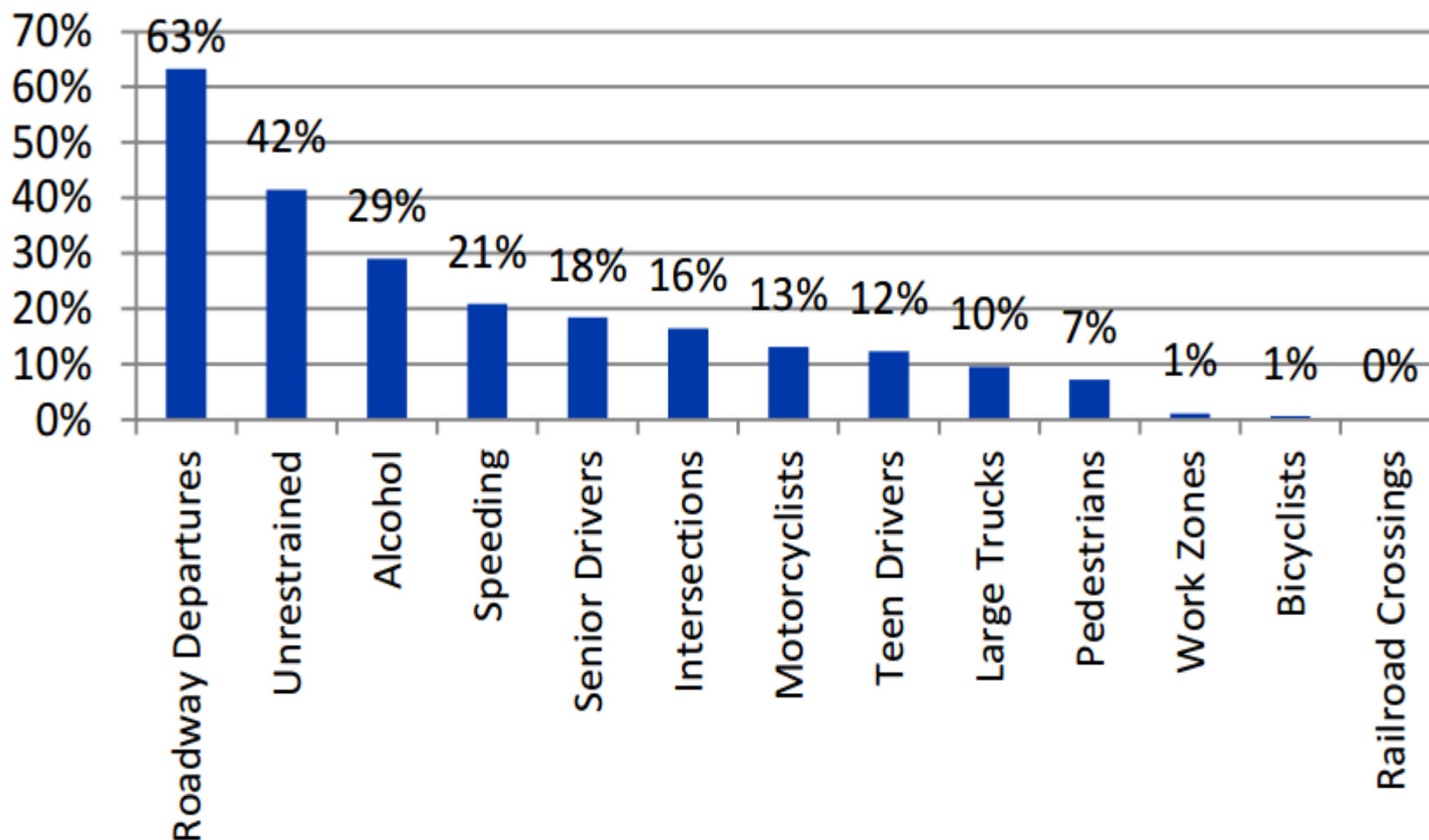


# Innovative Safety Projects that Maximize Funding

Nathan Vatter, P.E.

# Fatalities in Tennessee

*Figure 9 - Fatalities Percent of Total by Contributing Factor (2008-2012)*

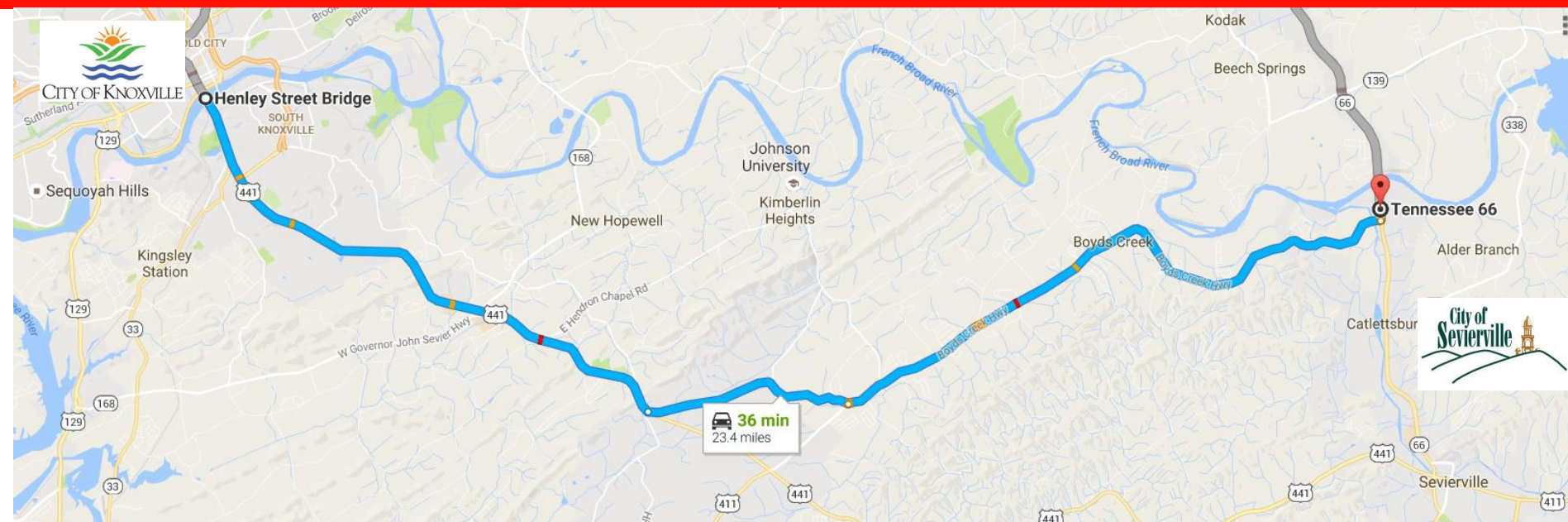


# Safety Initiatives and Projects

- **Lane Reconfiguration**
  - Chapman Highway (Rural Road Diet/ Lane Reduction)
- **Interstate**
  - Weaving
  - Bottlenecks
  - Drainage
- **Road Safety Audits vs. Spot Safety Projects**
  - Types of Projects
  - Safety benefits
- **Limitation of Safety Funding**
  - Leverage Funding
  - Partnering with locals
  - Selling your projects



# US 441, Chapman Highway

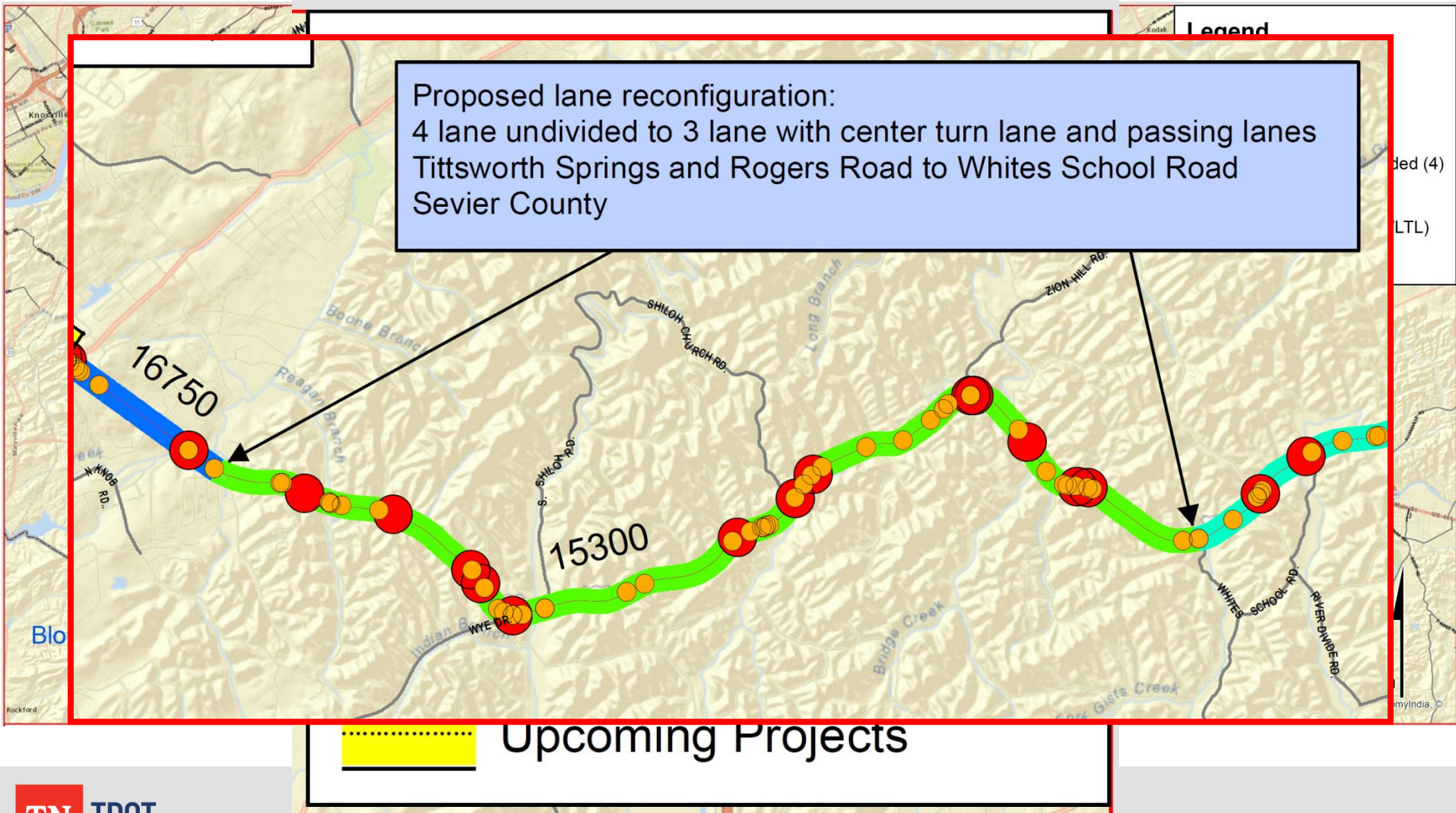


- Begins in Knoxville terminates in Sevierville, 24-miles
- Through 3 counties, the route has 5 different State Routes designations
- Varies from urban 5-Lane to rural multilane
- Before Interstate 40 was built, Chapman Highway was the Gateway to the Smoky Mountains





# US 441, Chapman Highway



# Chapman Highway - Existing Conditions



**7.2 mile long section**

**From 2006 – 2015, there were  
14 Fatal Crashes**

**48 Incapacitating Injury Crashes**

**198 Other Injury Crashes**

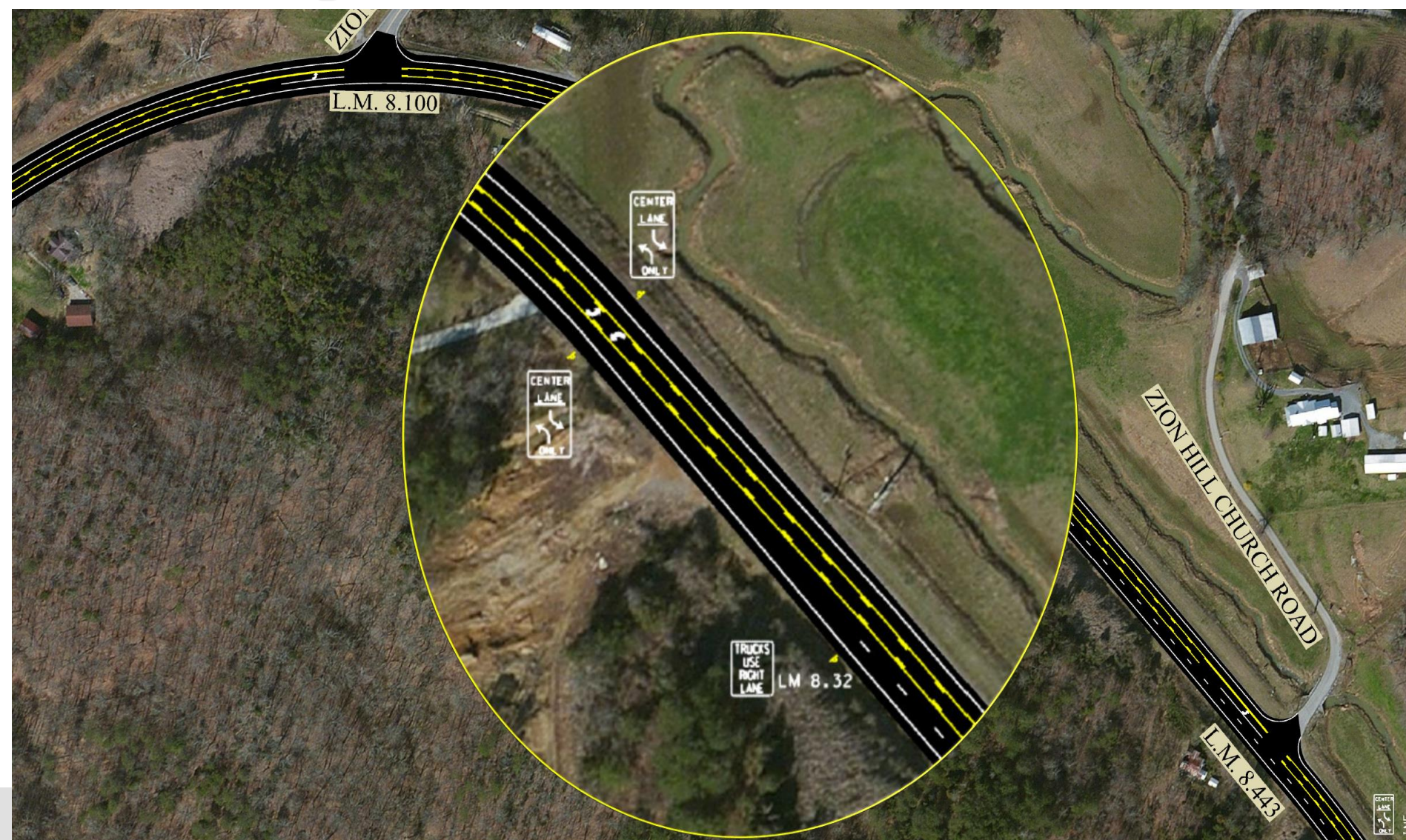
**685 Total Crashes**

**38% Severe Crashes**

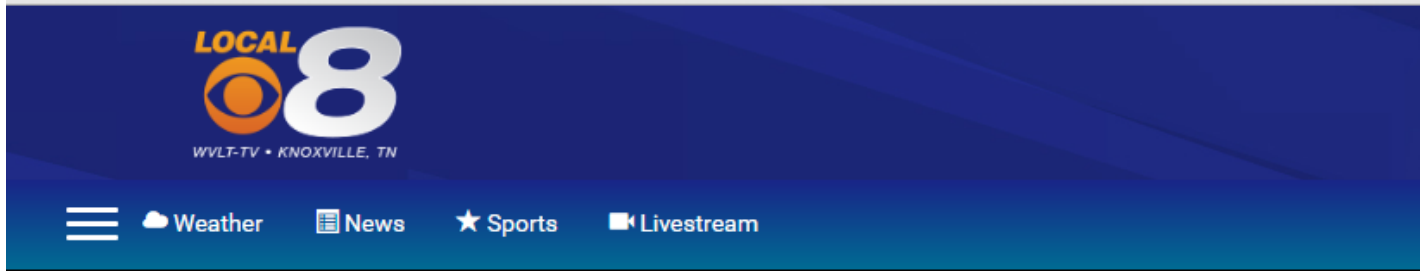
- (4) Narrow lanes (10.5 feet wide)
- Limited Shoulders (2 to 4 feet)
- No buffer between opposing traffic
- Speed Limit 55 mph
- Significant Vertical and Horizontal Curves
- Challenging Topography with rock banks and steep slopes



# Chapman Highway - Lane Reconfiguration



# Who's in the news?



Metro Area	Metro Area Population	World Rank	US Rank	AM Delay	PM Delay
Chattanooga	547,776	N/A	N/A	N/A	N/a
Knoxville	851,715	174/174	71/71	12%	22%
Memphis	1,341,746	142/174	41/71	22%	34%
Nashville	1,757,912	105/174	19/71	22%	61%



# I-40 & I-640 WB Merge - West Knoxville

**STAY  
IN  
LANES**

R4-9

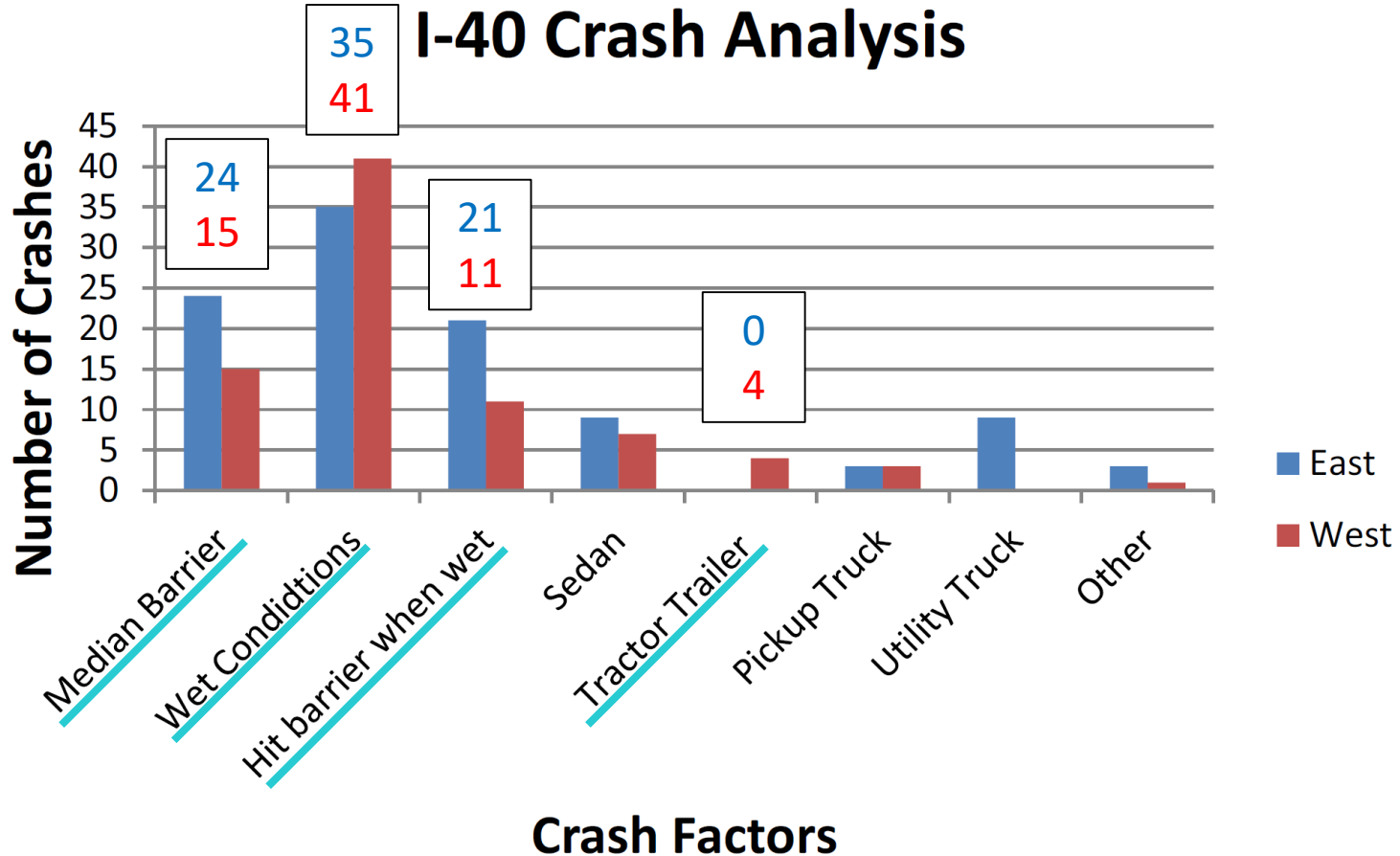


## NOTES

1. EXTEND EXISTING SOLID WHITE LINE SEPARATING THE I-640 TRAFFIC FROM I-40 WEST (LENGTH APPROXIMATELY 1,600 FT) SHOULD BE 12" WIDE WITH SNOWPLOWABLES ON EITHER SIDE
2. INSTALL 3 SETS OF STRAIGHT ARROWS (6 TOTAL) IN RIGHT TWO LANES SYMMETRICALLY FOR GUIDANCE THAT THESE LANES CONTINUE FOR AN EXTENDED DISTANCE



# I-40 Downtown Knoxville



# I-40 Downtown Knoxville



# I-40 Downtown Knoxville Video Before (From I-40 West)

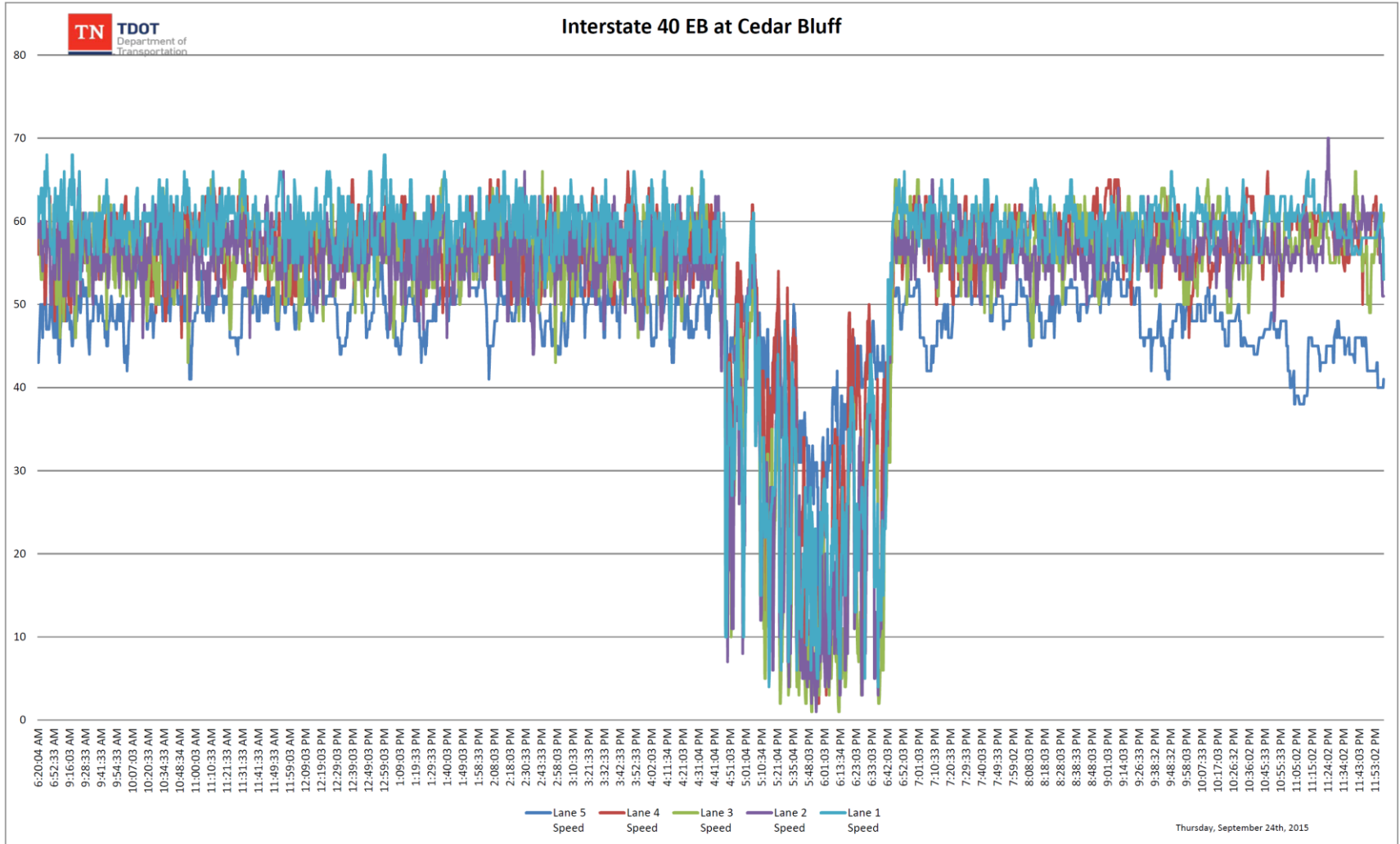




# I-40 Downtown Knoxville Video After (From I-275 South to I- 40 West)

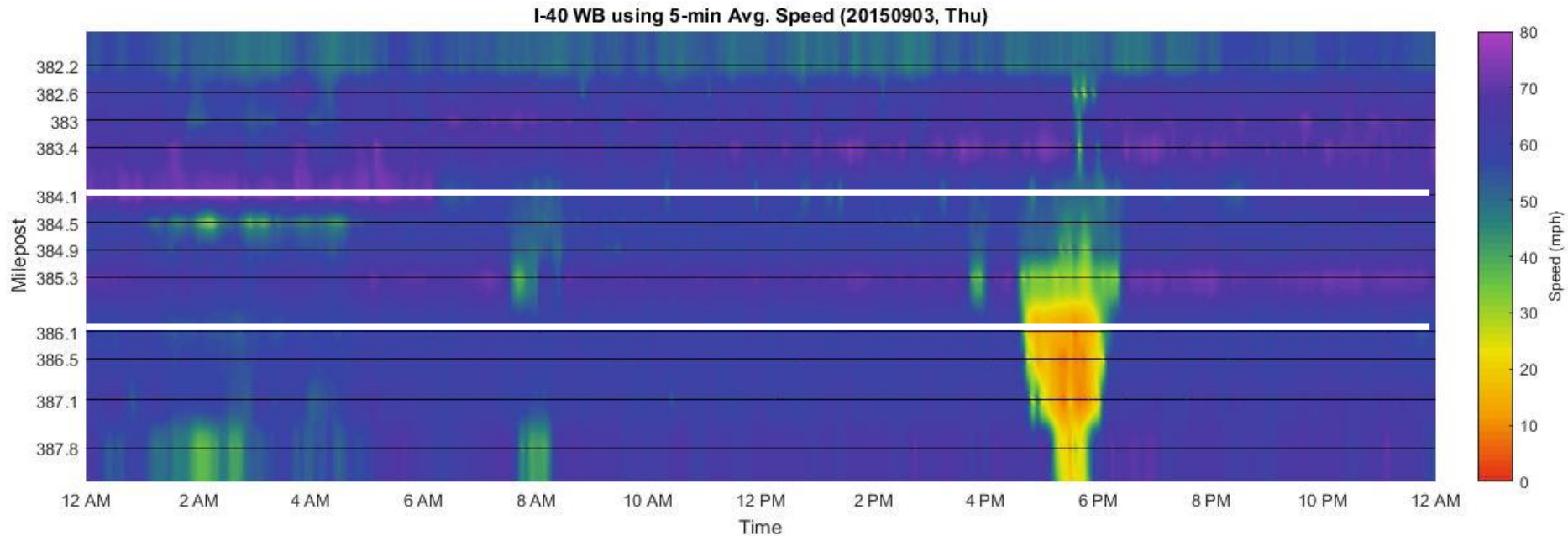


# RDS Speed Data





# Speed HeatMap: Before - Sep-03-15 (Thu)



- *Black-colored horizontal lines refer to detector stations*
- *White horizontal lines refer to influence area*
- *UT prepared 18 maps, (10 hours each)*
- *Credit to Dr. Lee Han, Mr. Bumjoon Bae and Brandon Whetsel*



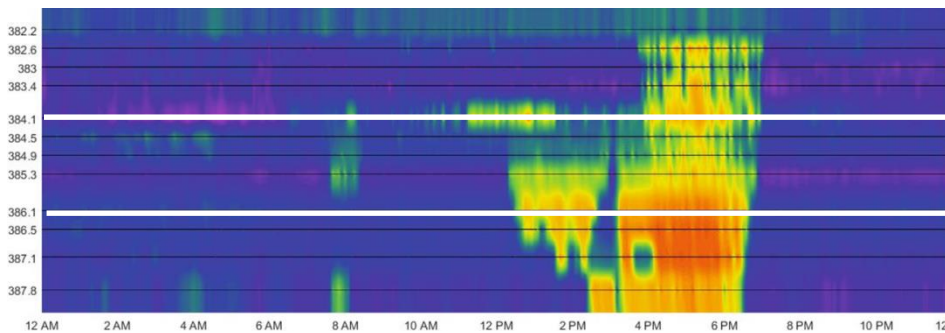
THE UNIVERSITY OF  
TENNESSEE  
KNOXVILLE

# Before & After

Friday in September (Labor Day Weekend)

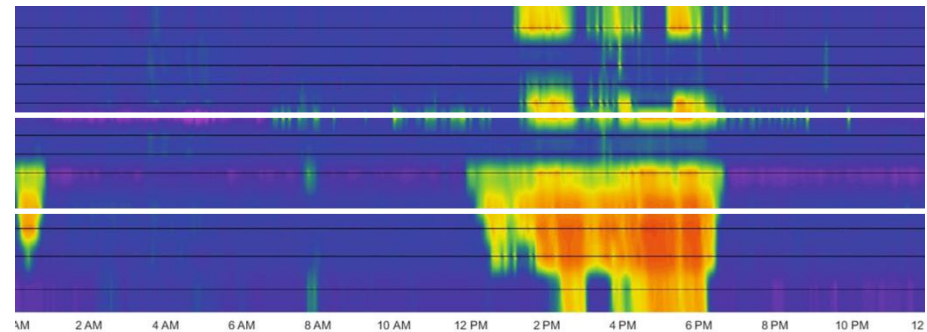
## Before

9-4-2015



## After

9-2-2016



*Credit to Dr. Lee Han, Mr. Bumjoon Bae and Brandon Whetsel*



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**TENNESSEE**  
KNOXVILLE

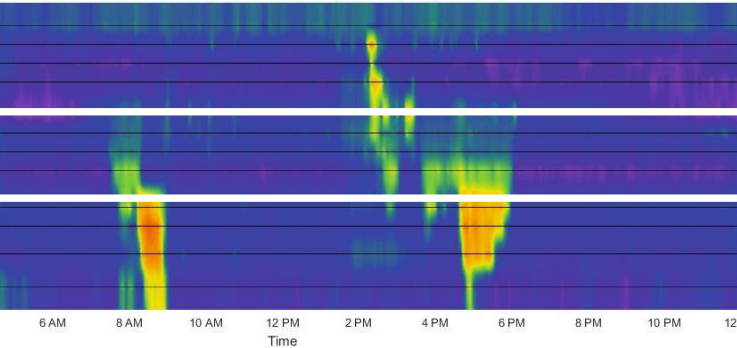
# Before & After

Wednesday in September (After Labor day)

## Before

9-9-2015

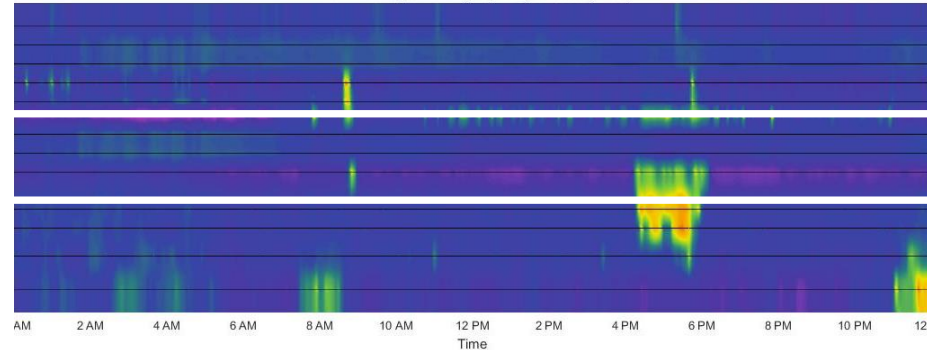
I-40 WB using 5-min Avg. Speed (20150909, Wed)



## After

9-7-2016

I-40 WB using 5-min Avg. Speed (20160907, Wed)

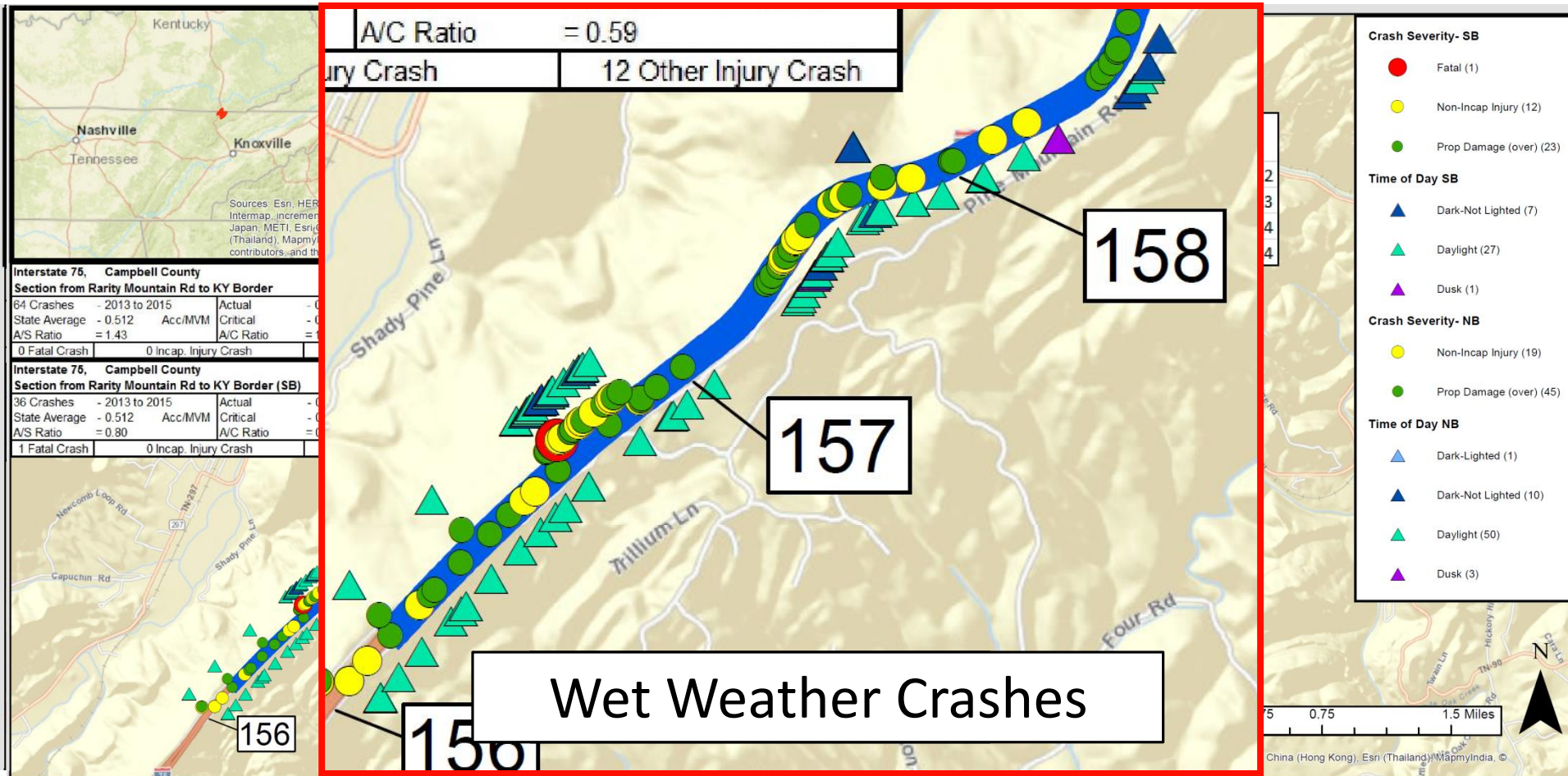


*Credit to Dr. Lee Han, Mr. Bumjoon Bae and Brandon Whetsel*



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KNOXVILLE

# Campbell County I-75 - Drainage





# Spot Safety Projects

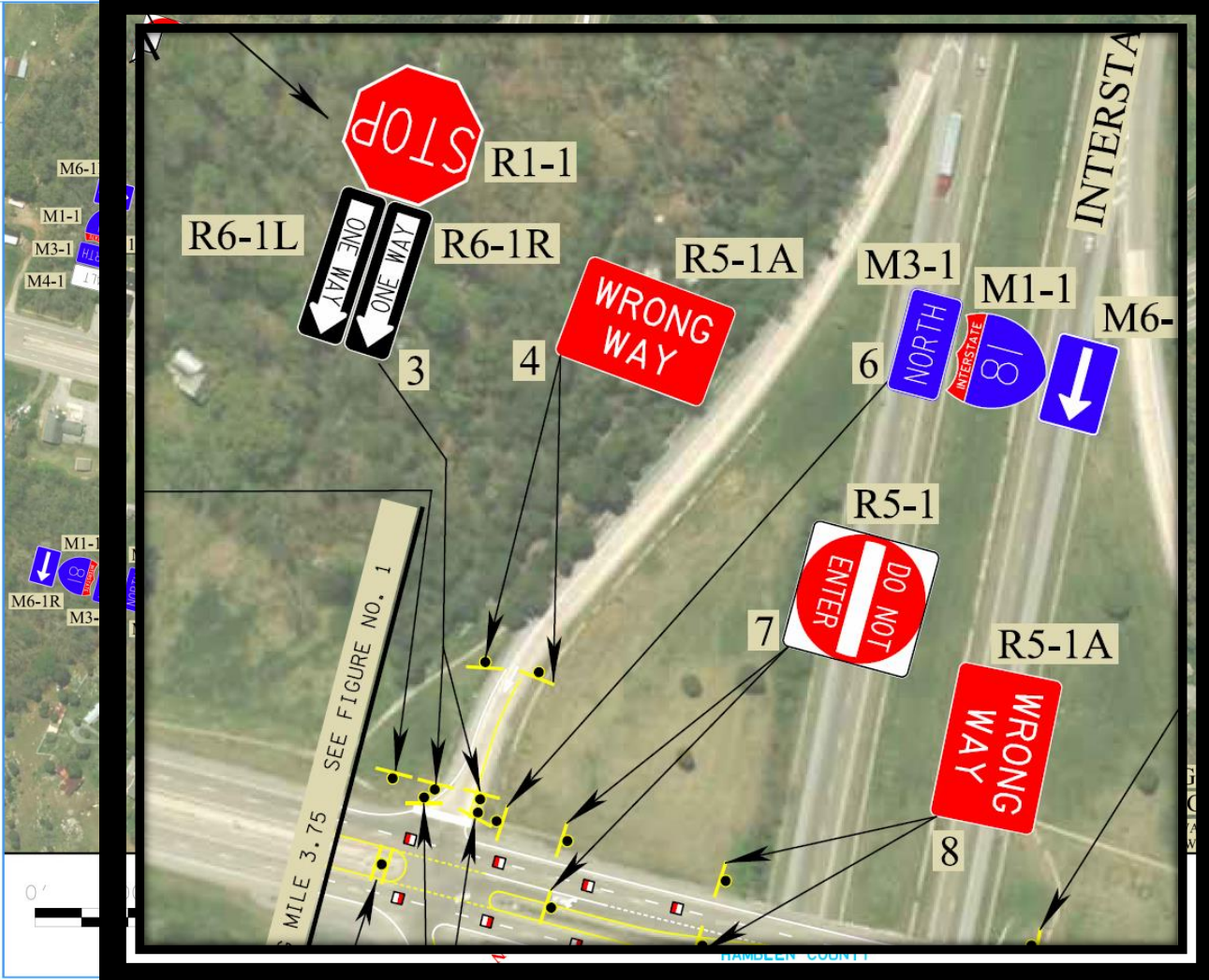
- Projects
  - Signalization
  - Geometric improvements
  - Flashing Beacons
  - Other safety improvements
- SSP 2012
  - Total Number of Project: 20
  - Cost: \$ 6,373,605
- SSP 2013
  - Total Number of Projects: 20
  - Cost: \$ 9,255,322
- SSP 2014
  - Total Number of Projects: 17
  - Cost : \$8,928,100
- SSP 2015
  - Total Number of Projects: 18
  - Cost: \$8,407,500





# Road Safety Audits

TENNESSEE B.A.T.  
 STRATEGIC TRANSPORTATION  
 INVESTMENTS DIVISION  
 FILE NO.



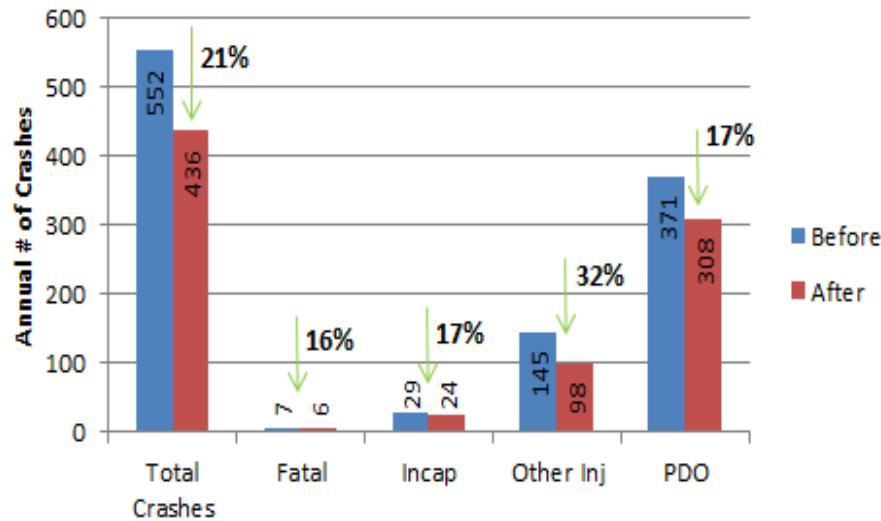
TYPE	YEAR	COUNTY	FIGURE NO.
RSA	2015	HAMBLETON	2A

SEE FIGURE 2B FOR GUIDANCE  
 SEE FIGURE 2A FOR STRIPING  
 REFLECTIVE PAVEMENT MARKER  
 REFLECTIVE PAVEMENT MARKER

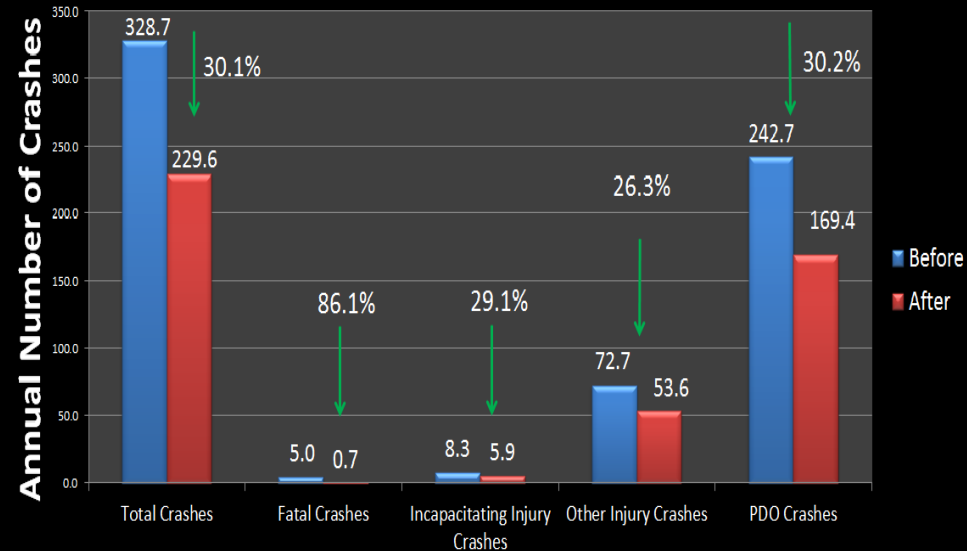
STATE OF TENNESSEE  
 DEPARTMENT OF TRANSPORTATION  
 STRATEGIC TRANSPORTATION  
 INVESTMENTS DIVISION  
**FIGURE 2A**  
 S.R. 160  
 L.M. 3.75 to  
 L.M. 3.98

# Benefits to Safety Projects

RSAR Crash Data



Spot Safety Annual Crash Comparison



- 40 completed RSARs since 2011
- 21% Crash Reduction

- 50 completed SSPs since 2012
- 30% Crash Reduction

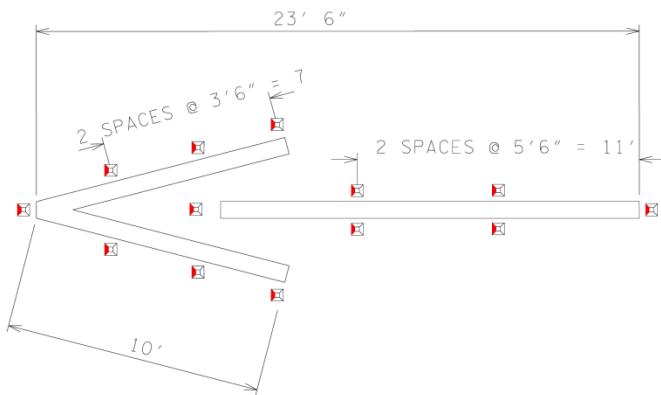
**Need more funding for more projects!**

# Wrong Way Initiative

- Increase
- Variable

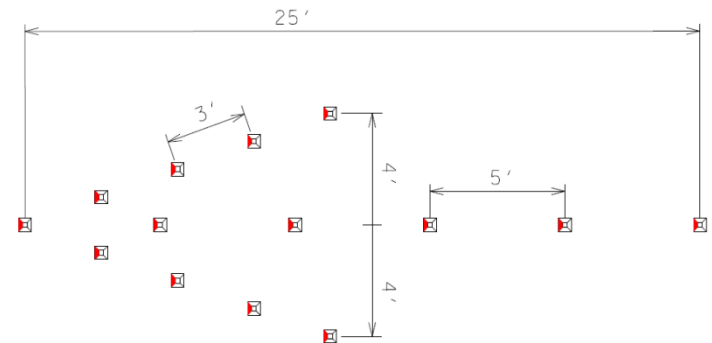


pe  
way



13 BI-DIRECTIONAL RED AND WHITE SPMS

WRONG WAY PAVEMENT ARROW WITH  
SNOWPLOWABLE PAVEMENT MARKERS TO  
BE USED ON SINGLE-LANE RAMPS ONLY



14 MONO-DIRECTIONAL RED ONE-DIRECTIONAL SPMS

WRONG WAY ARROW USING SNOWPLOWABLE  
PAVEMENT MARKERS TO BE USED ON  
MULTI-LANE RAMPS ONLY



# Limitation of Safety Funds

- Sub
- beco





Thank you

Nathan.Vatter@tn.gov 865-594-2456