

Transportation Safety Considerations in Planning Process

Reza Jafari, PhD, PE
NCDOT – Planning Branch



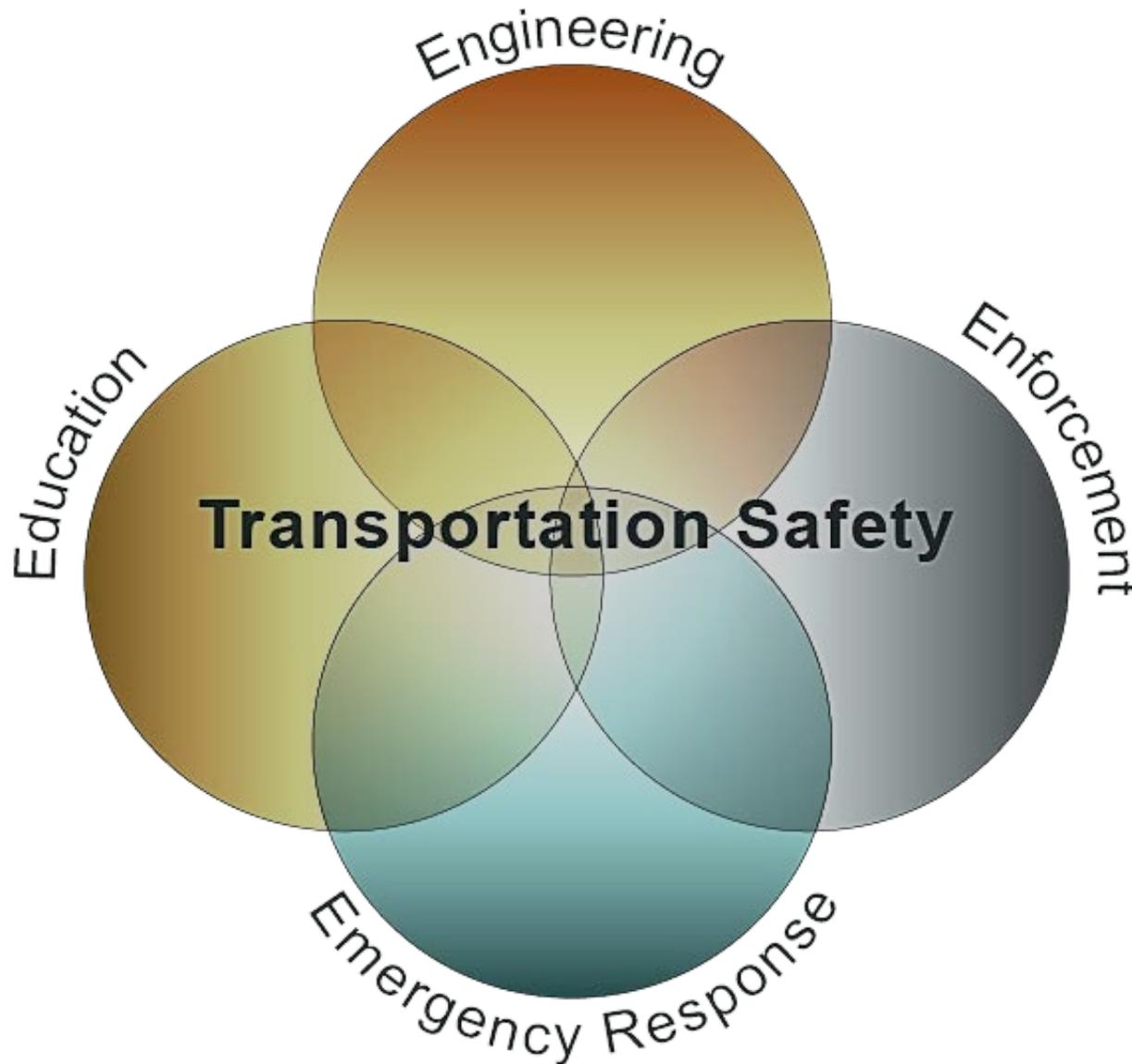
NCAMPO 2016 Conference – Thursday, May 12, 2016

Transportation Safety Planning

Reducing fatalities and serious injuries by supporting comprehensive, system-wide, multimodal, and proactive process that...

Integrates safety into surface transportation decision-making

The Safety 4E Approach



Integrating Safety

- **Multidisciplinary**
- **Multimodal**
- **System-wide**
- **Collaborative**
- **Proactive**

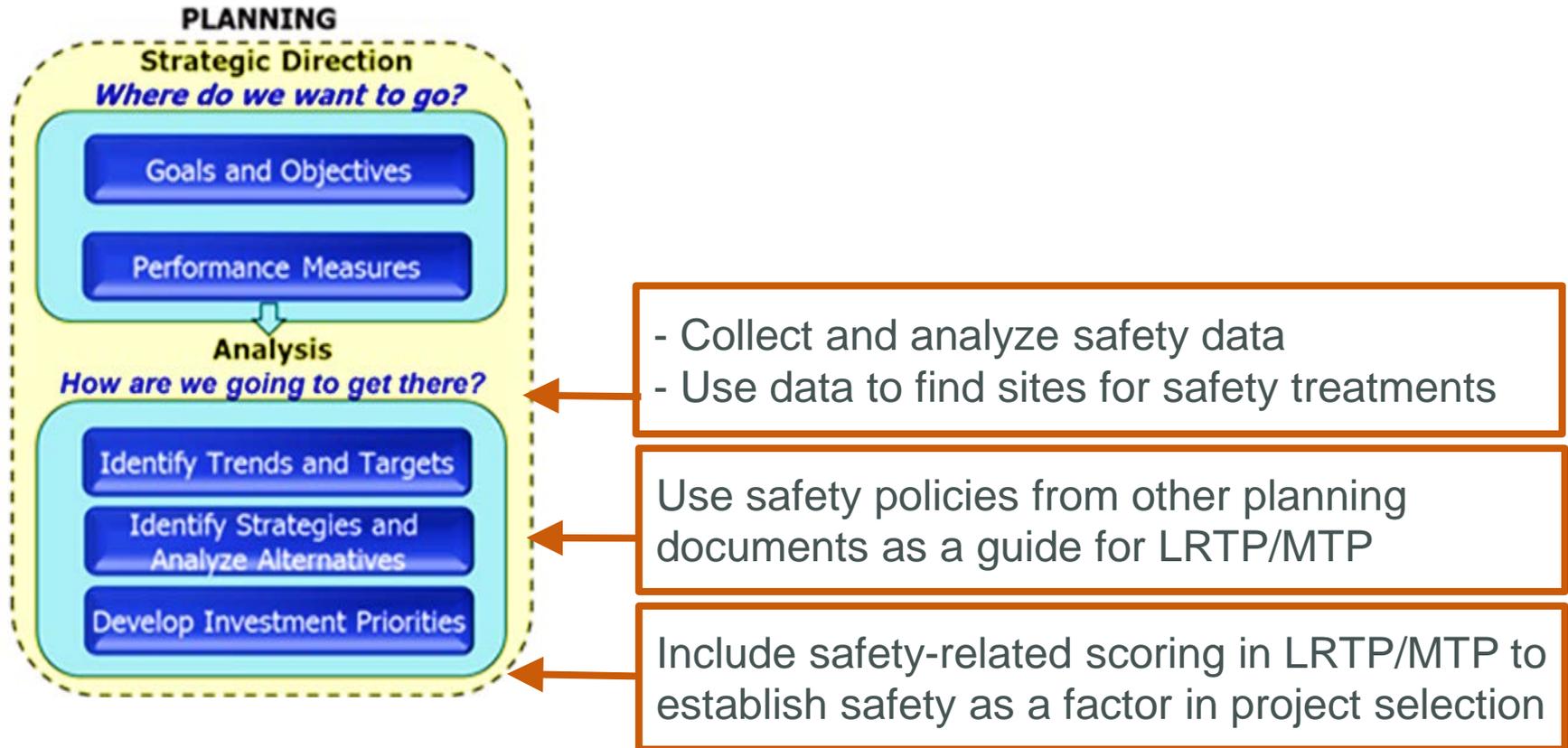
Performance-Based Transportation Planning Process



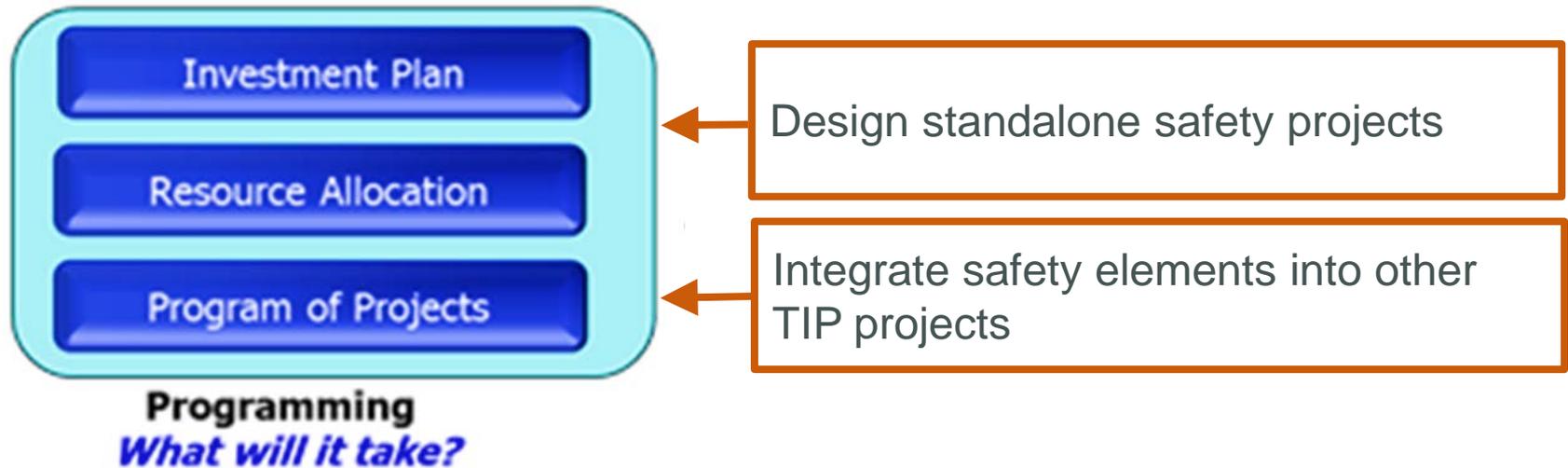
Integrating Safety into Planning Process



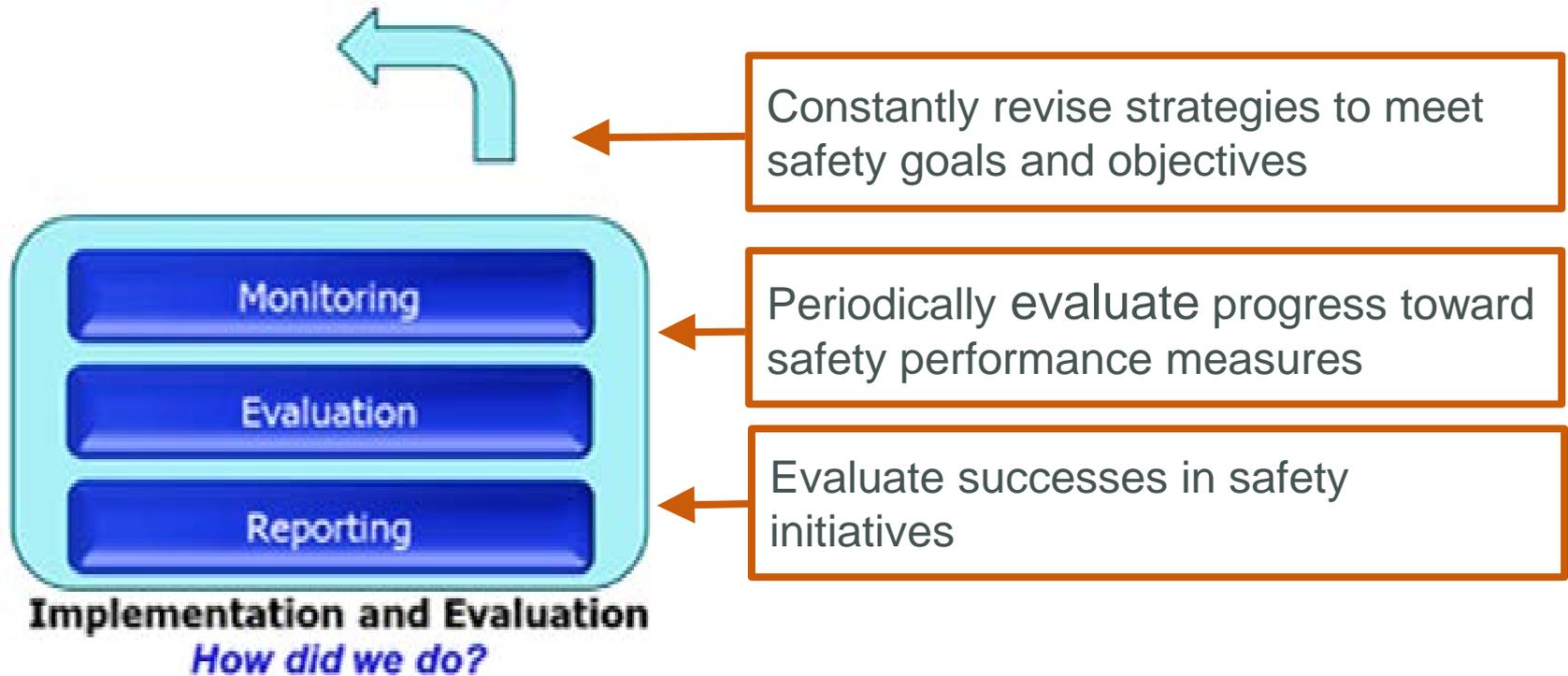
Integrating Safety into Planning Process



Integrating Safety into Planning Process



Integrating Safety into Planning Process



Safety Planning at Federal Level

- Guide progress of performance-based planning through education and training
- Proactively *promote, monitor, educate* and *communicate* ways for State DOTs and planning organizations to integrate safety in planning

Safety Planning at State Level

- Performance-based planning requires greater coordination across agencies and between functional areas (i.e., safety, congestion, etc.)
- Use crash and GIS data to identify safety concerns and assist improving safety strategies
- Work with enforcement at corridor-level
- Integrate safety goals, objectives, and strategies in transportation planning process

Safety Planning at MPO Level

- **Help educate local elected officials and public.**
- **Demonstrate the economic impact of improving transportation safety**
- **Identify low-cost safety improvements (start small)**
- **Work with private/public entities for funding**
- **Pursue the 4E approach to improve safety**

Safety Planning at RPO Level

- **Participate with MPOs; integrate rural safety concerns into the planning process**
- **Align with State Plans to capture state funding for safety**
- **Educate local elected officials and public**
- **Demonstrate economic impact of safety improvements**
- **Leverage local funds**
- **Identify low-cost safety improvements**
- **Improve availability and accuracy of safety data**

Safety Planning for Elected & Appointed Officials

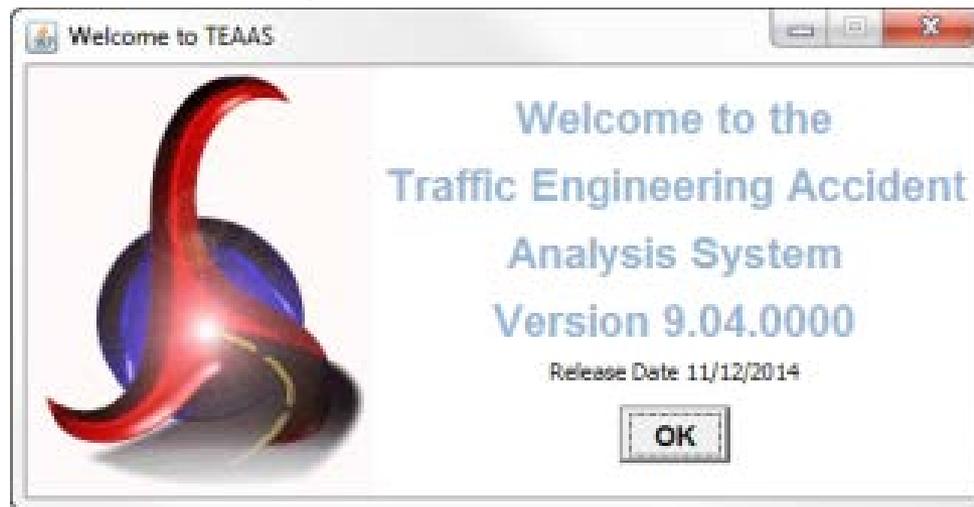
- **Laws passed by legislatures impact safety significantly (i.e., helmet laws)**
- **Judicial decisions in traffic safety cases**
- **Encourage local planners to prioritize for safety**
- **Set-aside funding to advance safety projects**
- **Promote the importance of safety**

Safety Implementation

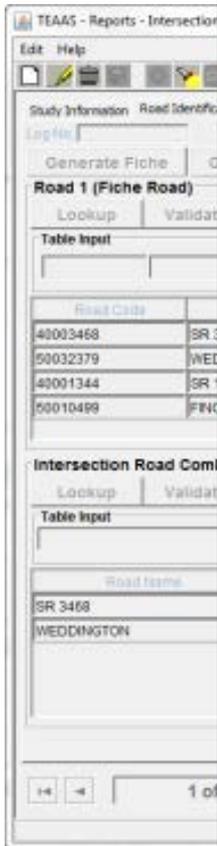
- **Work closely together to identify safety integration opportunities**
- **Leverage planning process to impact safety**
- **Engage transportation planners & committees**
- **Build consistency between long range plans and safety plans**
- **Use data and analysis to benchmark and measure safety issues**

Safety Resources

- **Traffic Engineering Accident Analysis System (TEAAS)**
 - **Intersection Analysis**
 - **Section Analysis**
 - **City / County Reports**



Safety Resources



County: MECKLENBURG		
Date: 12/01/2009 to		
Location: SR 3468 (Weddingt		
Acc No	Crash ID	Date
1	102764787	12/21/2009 14:03
Unit 1 : 4	Alchl/Drugs:	
Unit 2 : 1	Alchl/Drugs:	
2	102822715	03/11/2010 15:36
Unit 1 : 1	Alchl/Drugs:	
Unit 2 : 4	Alchl/Drugs:	
3	102986283	10/08/2010 13:34
Unit 1 : 1	Alchl/Drugs:	
Unit 2 : 2	Alchl/Drugs:	
4	102998088	10/22/2010 12:03
Unit 1 : 4	Alchl/Drugs:	
Unit 2 : 1	Alchl/Drugs:	
5	103077679	01/14/2011 18:04
Unit 1 : 2	Alchl/Drugs:	
Unit 2 : 4	Alchl/Drugs:	
6	103081011	01/20/2011 18:04
Unit 1 : 3	Alchl/Drugs:	
Unit 2 : 4	Alchl/Drugs:	

High Level Cras	
Crash Type	
Total Crashes	
Fatal Crashes	
Non-Fatal Injury Crashes	
Total Injury Crashes	
Property Damage Only Crashes	
Night Crashes	
Wet Crashes	
Alcohol/Drugs Involvement Cras	
Crash Severity	
Crash Type	
Total Crashes	
Fatal Crashes	
Class A Crashes	
Class B Crashes	
Class C Crashes	
Property Damage Only Crashes	
Vehicle	
Annual AD	
Total Vehicle Exposur	
Crash Rate	
Total Crash Rate	
Fatal Crash Rate	
Non Fatal Crash Rate	
Night Crash Rate	
Wet Crash Rate	
EPDO Rate	

Miscellaneous Statistics		
Severity Index -		7.24
EPDO Crash Index -		173.80
Estimated Property Damage Total - \$		127600.00
Accident Type Summary		
Accident Type	Number of Crashes	Percent of Total
ANGLE	10	41.67
HEAD ON	1	4.17
LEFT TURN, DIFFERENT ROADWAYS	2	8.33
LEFT TURN, SAME ROADWAY	5	20.83
PEDALCYCLIST	1	4.17
RAN OFF ROAD - LEFT	1	4.17
RAN OFF ROAD - RIGHT	1	4.17
REAR END, SLOW OR STOP	3	12.50
Injury Summary		
Injury Type	Number of Injuries	Percent of Total
Fatal Injuries	1	5.88
Class A Injuries	0	0.00
Class B Injuries	6	35.29
Class C Injuries	10	58.82
Total Non-Fatal Injuries	16	94.12
Total Injuries	17	100.00

Safety Resources

TEAAS - Report - County-Wide Accident

Edit Help

General Information

Report Type

- Month, Day and Hourly Summary
- Accident Types and Violations
- Age and Sex of Driver
- Alcohol, Ambulance and Vision
- Environmental Conditions
- High Accident Intersections
- Injuries and Restraint Usage
- Month, Day and Hourly Summary**
- Severity at High Accident Intersections

Report Specific

Reference

Begin Date End Date Years

Y-Line Feet Minimum Accidents

150

Generate Report

Month, Day and Hourly Summary in Wake County for the period 1/1/2013 through 12/31/2014

Monthly Summary

Month	Number of Crashes	Percent	Cumulative Crashes	Cumulative Percent
Jan	6,012	8.2	6,012	8.2
Feb				
Mar				
Apr				
May				
Jun				
Jul				
Aug				
Sep				
Oct				
Nov				
Dec				

Day of the Week Summary

Day of the Week	Number of Crashes	Percent	Cumulative Crashes	Cumulative Percent
Mon				
Tue				
Wed				
Thu				
Fri				
Sat				
Sun				

Hour Summary

Hour Span	Number of Crashes	Percent	Cumulative Crashes	Cumulative Percent
0000-0059	984	1.3	984	1.3
0100-0159	722	1.0	1,706	2.3
0200-0259	745	1.0	2,451	3.3
0300-0359	723	1.0	3,174	4.3
0400-0459	496	0.7	3,670	5.0
0500-0559	549	0.7	4,219	5.7

Alcohol, Ambulance and Vision in Wake County for the period 1/1/2013 through 12/31/2014

Alcohol Involvement

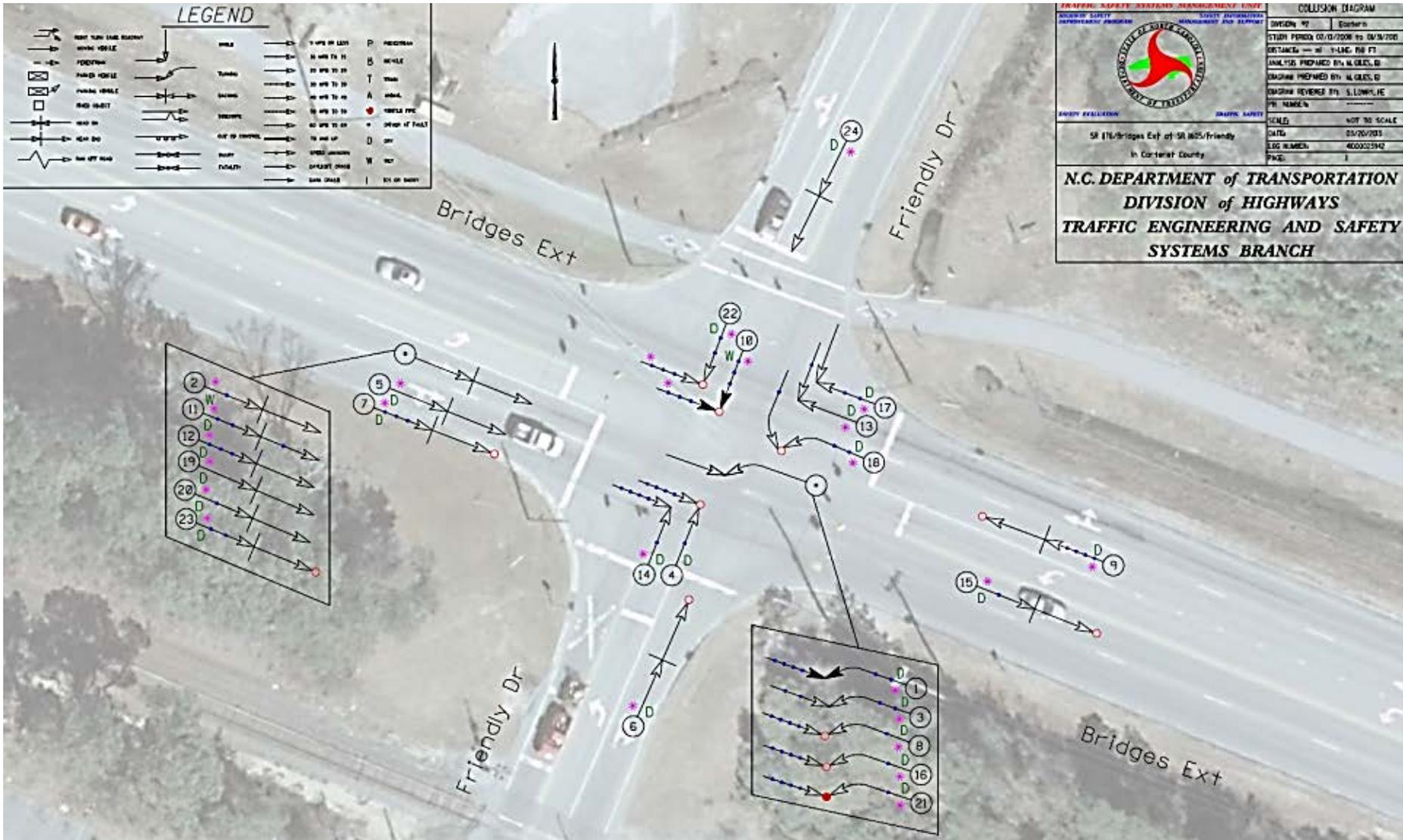
Alcohol/Drugs Suspected	Number of Drivers	Percent
NO	117,816	92.9
YES - ALCOHOL, IMPAIRMENT SUSPECTED	2,098	1.7
YES - ALCOHOL, NO IMPAIRMENT DETECTED	246	0.2
YES - OTHER DRUGS, IMPAIRMENT SUSPECTED	226	0.2
YES - OTHER DRUGS, NO IMPAIRMENT DETECTED	41	0.0
YES - ALCOHOL AND OTHER DRUGS, IMPAIRMENT SUSPECTED	152	0.1
YES - ALCOHOL AND OTHER DRUGS, NO IMPAIRMENT DETECTED	19	0.0
UNKNOWN	6,193	4.9

Safety Resources

NC 2 (Midland Road) From Beaver Lane to 50 Feet East of NC 22 (Central Drive)
(04/01/2009 - 03/31/2014)



Safety Resources



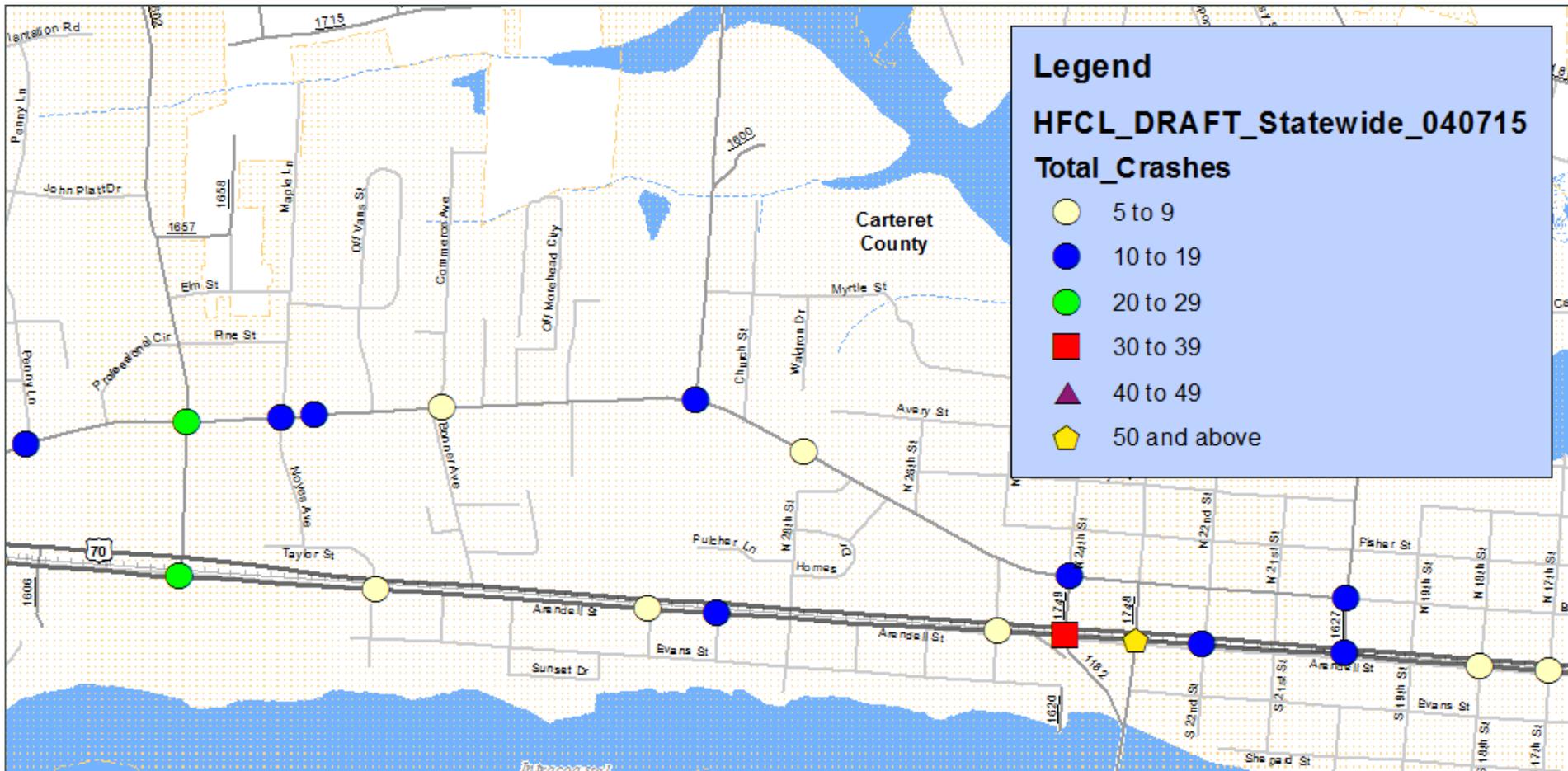
Safety Resources

Highway Safety Improvement Program (HSIP)

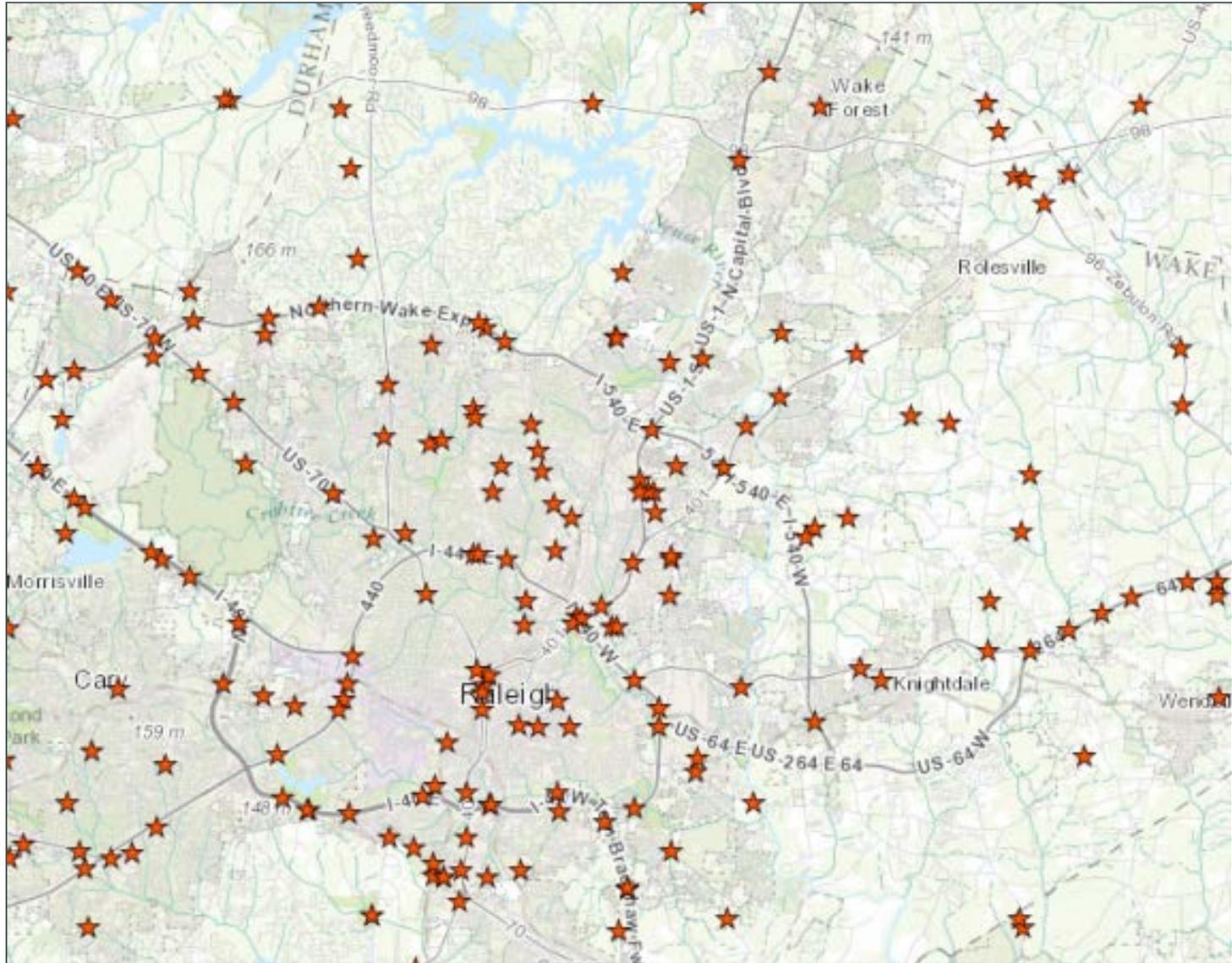
North Carolina Highway Safety Improvement Program											
Potentially Hazardous Intersection Locations in North Carolina - Statewide Rank of 400 or Higher											
2014 Cycle											
PH Number	State Rank	Total Weight	Division SHP Troop	Region	Location	Overall Crashes Severity Index					
9100959	1	7.89	5 C	CAPITAL	WAKE (RALEIGH) SR 2026 (MP 0.85) AT SR 2684 (MP 0.75)	59 6.23	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
9101780	2	5.79	10 H	METROLINA	MECKLENBURG (CHARLOTTE) SR 3998 (MP 4.73) AT GROVE	69 8.05	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
7800087	3	5.32	7 D	TRIAD	ROCKINGHAM (EDEN) US 311 (MP 25.53) AT NC 14 (MP 12.51) * POSSIBLE LOOP *	59 5.95	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
8200039	4	5.3	8 H	CAPITAL	SCOTLAND (RURAL) US 15 (MP 11.74) AT NC 144 (MP 5.83)	60 7.97	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
9101548	5	5.27	5 C	CAPITAL	WAKE (RALEIGH) SR 2542 (MP 4.67) AT SR 2697 (MP 4.30)	46 5.9	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
9101411	6	4.79	10 H	METROLINA	MECKLENBURG (CHARLOTTE) US 29 (MP 15.55) AT ARROWHEAD	34 9.81	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
8900181	7	4.64	10 H	METROLINA	UNION (MONROE) SR 2188 (MP 0.68) AT WINDSOR	28 10.4	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											
1100093	8	4.47	13 F	BLUE RIDGE	BURKE (MORGANTON) US 70 (MP 9.09) AT SR 1142 (MP 7.70)	35 7.45	WARRANT INFORMATION				
							Warrant	Crashes	Percent	Severity	Weight
Excluded: <input type="checkbox"/> Comments:											

Safety Resources

High Collision Sites Data



Safety Resources



Case Studies

High Collision Sites Greenville, NC

NC Department of Transportation
Transportation Planning Branch



June 30, 2015



Case Studies

- Document number and type of collisions occurring at high collision sites
- Provide potential preliminary safety countermeasures for identified collision types
- High collision sites were obtained from
 - Highway Safety Improvement Program (HSIP)
 - Traffic Engineering Accident Analysis System (TEAAS)

Case Studies

- **Total number of Collisions in a five year period**
 - **Greenville: 2009-2013**
 - **Elizabeth City: 2010-2014**
- **No collision diagrams to identify the actual location and number of specific collision types**
- **Greenville, 68 sites**
- **Elizabeth City, 27 sites**

Questions?



Reza Jafari, PhD, PE
NCDOT - Planning Branch
rrjafari@ncdot.gov
919-604-0808