NORTH CAROLINA
Department of Transportation

Work Zone Traffic Control Breakout Session

Steve Kite, PE, CPM- State Work Zone Engineer

Wade Lackey, General Manager,
Stay Alert Safety Services

February 21-22, 2019

Work Zone Traffic Control Break Out Topics

1. Interstate Resurfacing Provision Updates
2. Safety & Work Zone Crash Statistics
3. Work Zone Presence Lights, Digital Speed Limit Signs and Sequential Flashing Lights, Connected Lane Closure Devices
4. Potential Revised Lane Closure Time Restrictions

Interstate Resurfacing Provision

1. "Pre-Staging" of Lane Closures

2. Commencement of Work

3. Discussion of the Lane Closure "Per Each" Pay Item

Interstate Resurfacing Provision

1. "Pre-Staging" of Lane Closures

- "Pre-Staging" of the Lane Closure allows the Contractor to "pre-position" the signs and devices prior to the allowable closure time.
- This is normally up to 1 hour prior to the Lane Closure Time
- The CMS's and Flashing Arrow Boards aren't to display lane closure info until 30 min or less prior to the Lane Closure

Interstate Resurfacing Provision

2. Commencement of Work

- Once the Lane Closure is in place, work is to begin. The Work Zone Presence Lights may be installed after work begins

- During lane closure removal, the Work Zone Presence Lights may be removed up to 1 hour before lane is to be reopened.

Interstate Resurfacing Provision

3. Discussion of the "Per Each" Lane Closure Pay Item

- The intent is to make the item easier to estimate and bid
- The "Per Each" pay item is for the devices and labor to install *RSD 1101.02, sheet 4*
- All other devices such as the Digital Speed Limit Signs, Work Zone Presence Lights and Sequential Flashing Lights are paid separately

Interstate Resurfacing Provision

4. Is it Working for DOT….and for the Contractors??????

- Have heard about price escalation associated with it
- Have heard additional devices such as CMS's are difficult to get reasonable prices after bidding
- Have heard there's more "risk" for the Contractor when bidding the item

Safety & Work Zone Crash Statistics

Traffic Control Breakout Session

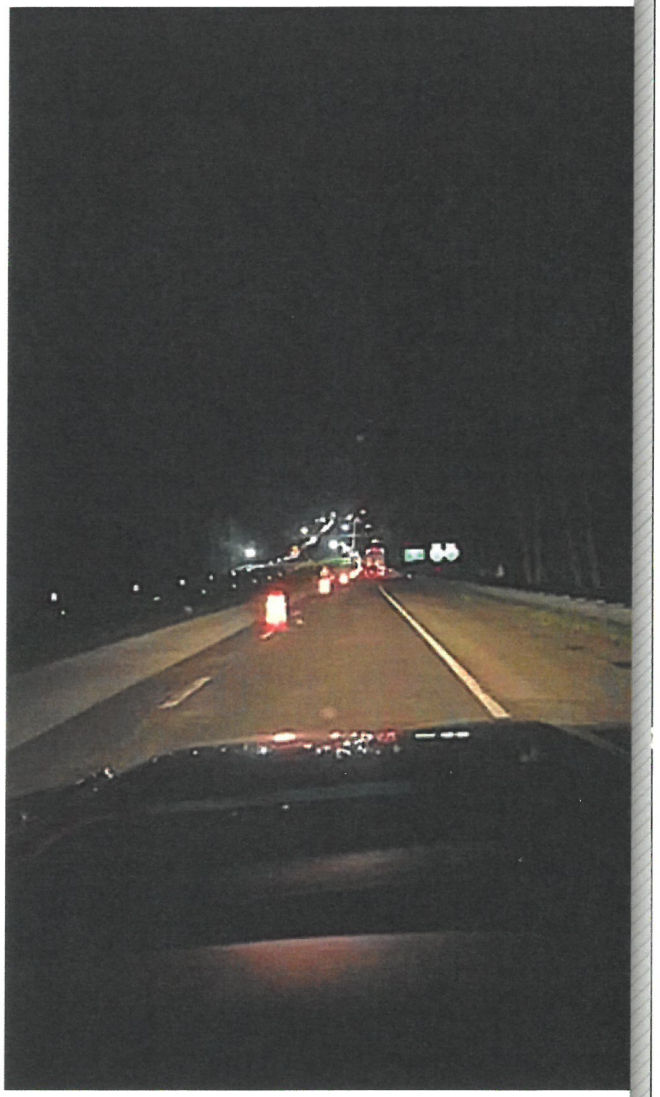
Work Zone Safety and Crash Statistics

Look at the Trends…

Year	Work Zone Crashes	Work Zone Fatalities and (Type A-Serious Injury)
2014	4120	24 (31)
2015	4635	19 (42)
2016	5831	26 (50)
2017	7292	38 (108)
2018		

Work Zone Presence Lighting

- What are Presence Lights?
- Why we use them?
- What "Types of Projects" are best suited for Presence Lighting?
- Where's the best location for their use?



Work Zone Presence Lighting

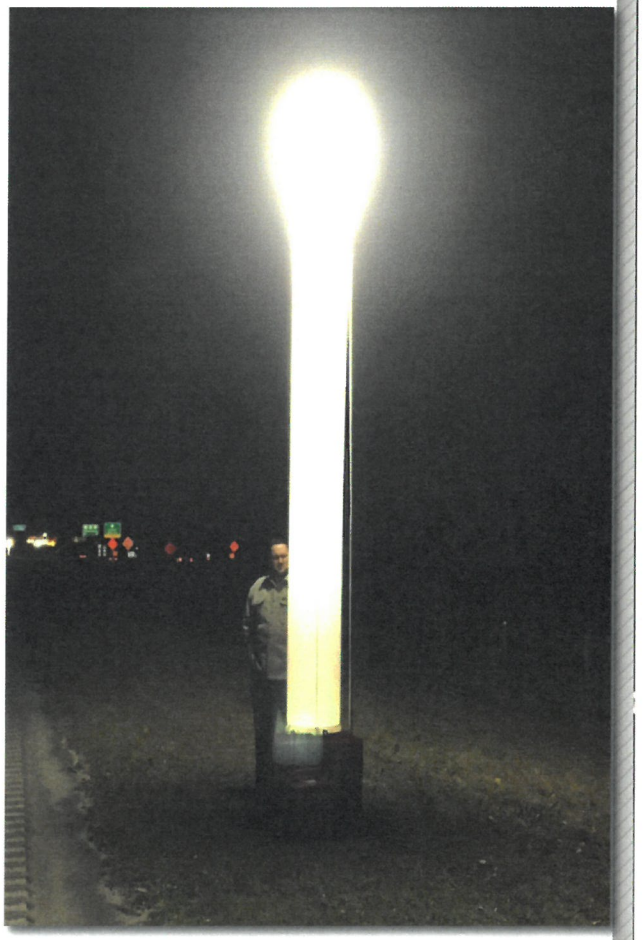
1) What are Presence Lights?

WZ Presence Lighting is simply "balloon" type lighting used as *Illuminated* Traffic Control Devices either in advance of or inside the lane closure….or both

Work Zone Presence Lighting

2) Why would we use them?

- Night Driving has higher prevalence of "Drowsy, Zoned Out"/"Highway Hypnotic" Drivers
- Lower visibility at Night
- More Impaired Drivers
- More Night Work involving Interstate/Freeway Resurfacing/Rehabilitation
- Workers feeling more vulnerable to traffic



Work Zone Presence Lighting

2) Interstate Crashes are increasing

Year	Interstate Crashes	% of WZ Crashes on Interstates
2014	1605	39
2015	1610	35
2016	2406	41
2017	3715	51
2018	4428	53.5

Work Zone Presence Lighting

2) Their role in reducing Interstate Crashes

- To increase the "conspicuity"/ "visual footprint" of the work zone
- To make Drivers more alert and aware of the work zone
- To reduce speeding…and improve uniform work zone speeds throughout the full length of the lane closure
- Improve Worker Visibility

Work Zone Presence Lighting

5) Results

State	Route	WZ Speed Limit	Speeds Without PL	Speeds With PL	Ave Speed Reduction
NC	US 17	55	57.7	51.94	5.76
Michigan	US 23	55	56.92	51.27	5.65
Michigan	I-94	60	65.19	57.94	7.25
Michigan	I-94	60	67.78	62.82	4.96
Michigan	I-94	60	68.48	62.82	6.95
Tennessee	I-40	65	68.76	63.82	4.94
Tennessee	I-40	70	74.76	68.89	5.87
Virginia	I-64	65	67.47	60.62	6.85
Georgia	I-85	60	64.76	60.05	4.71

Work Zone Presence Lighting

5) Results

To date Work Zone Presence Light Demo's have been performed in Tennessee, South Carolina, Virginia, Michigan and Georgia with similar results.

The average speed reduction is 5.88 MPH with the highest speed reduction slightly over 7 MPH reduction with the lowest at slightly below 5 MPH.

Work Zone Presence Lighting

5) More Research

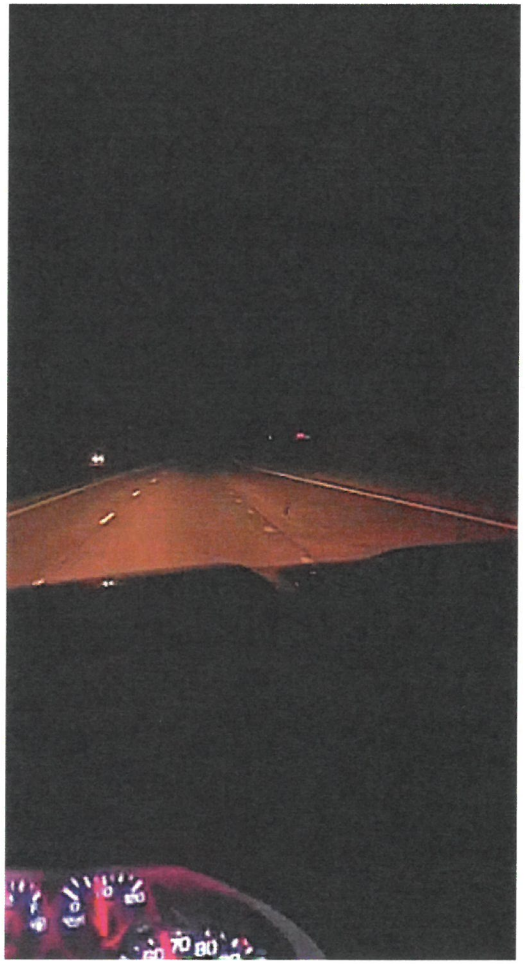
North Carolina will conduct additional speed studies in 2019. Randomly selecting up to 8 Interstate Resurfacing Projects for speed data collection.

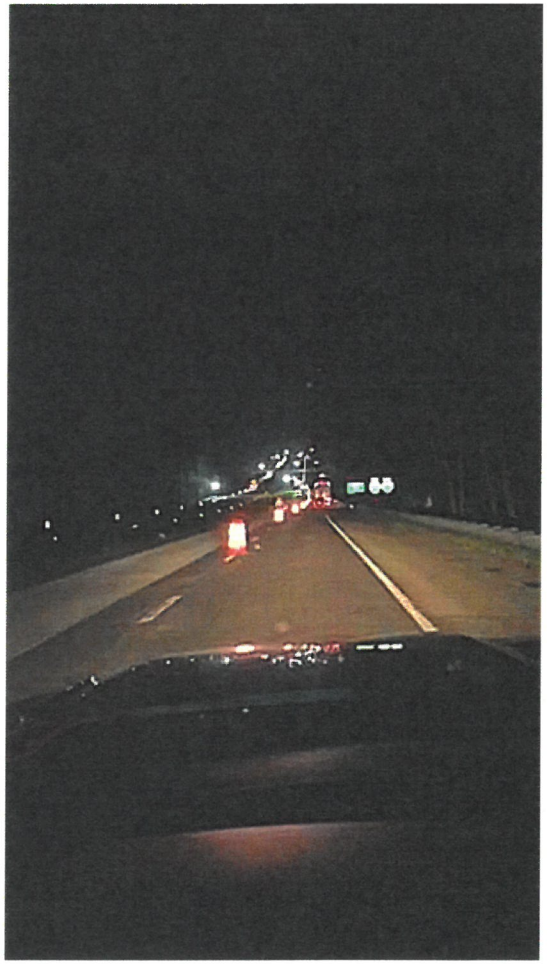
Results will be available in Late Summer/Early Fall

Work Zone Presence Lighting

3) What types of Projects are best suited for their use?

- We are targeting our Rural Interstate Resurfacing Projects.
- No Ambient Lighting
- Little Roadside Development





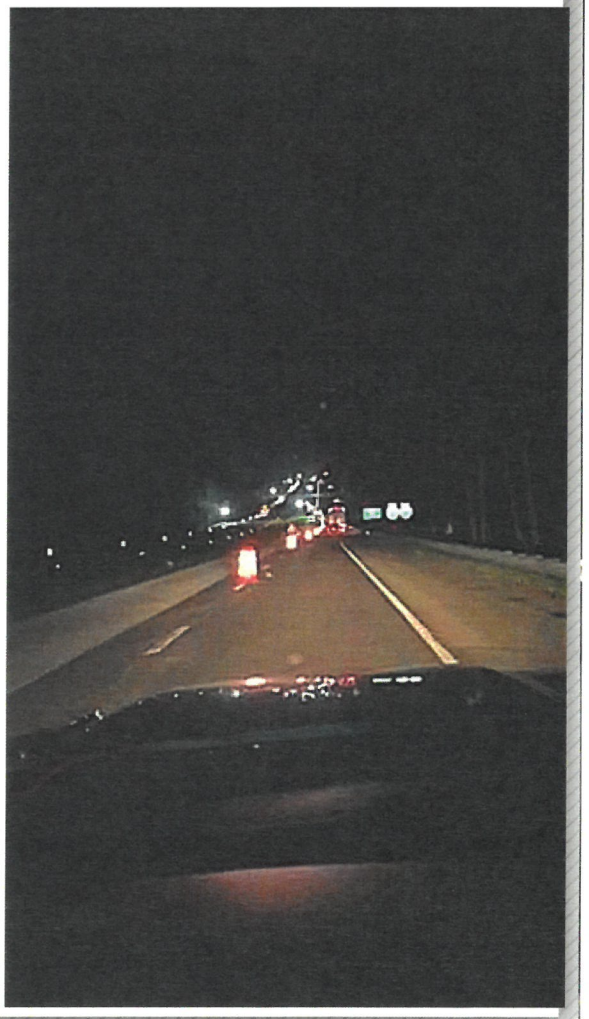
Work Zone Presence Lighting

Video Clip of Presence Lighting on I-77

Work Zone Presence Lighting

4) What's the best location for their use?

- In advance of Lane Closure?
- Inside Lane Closure?
- Or maybe both?

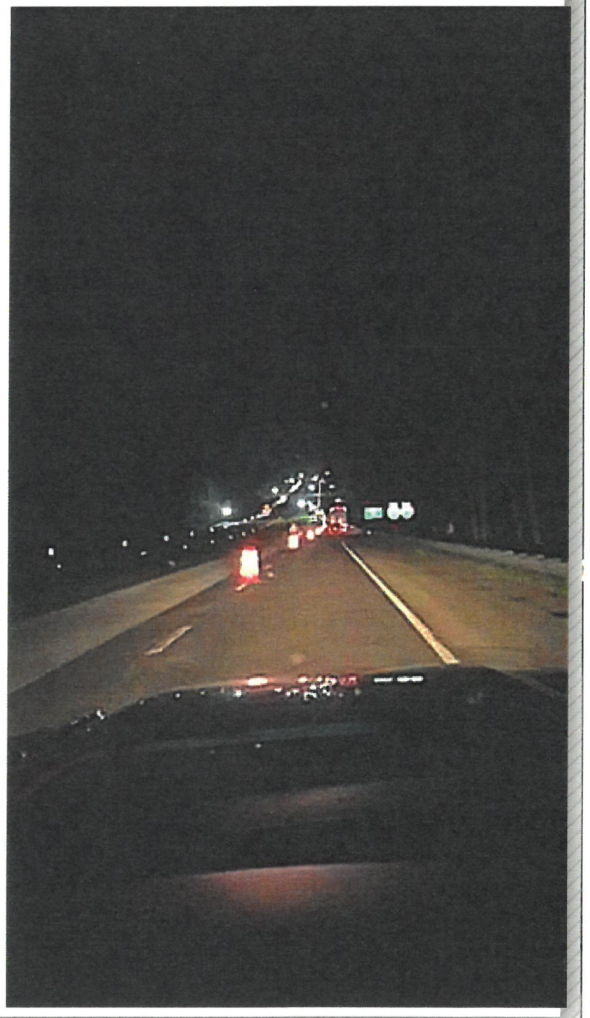


Work Zone Presence Lighting

Thinking about changing their locations

- Proposing using them in 'advance' of the lane closure. This will eliminate the need to move the lights and eliminate conflicts with tower lighting

- Using them in the "dark gaps" between multiple operations such as "mill and fills"



Digital Speed Limit Signs

- Commonly used to Reduce Work Zone Speed Limits…especially during lane closures
- Used to capture motorists "attention" to the posted Work Zone Speed Limit
- Are enforceable by Law. Requires a signed Ordinance

Digital Speed Limit Signs

Changes to the Specification for 2019

1. The Flashing Beacons aren't to be activated until the Speed Limit is Reduced

2. Each Unit is to be equipped with Radar

- This will allow speeds to be detected and once the Speed Threshold is broken, the Speed Limit "number" will flash at motorist

Sequential Flashing Lights

No Changes are being made for 2019 for Sequential Flashing Lights

- They are to be used on the Drums in the Merge Taper
- They are to flash in sequence
- Make sure the lights are facing traffic

Connected Lane Closure Devices

What are Connected Arrow Boards?

- They will be equipped with "technology" that transmits their location to the Navigational Companies such as Google Maps, WAZE, HERE, etc.
- We'll also place technology at the end of the lane closure that will enable the lane closure length to be determined
- It will tell the Drivers where the lane closure is located and how long the closure is

Revised Interstate Lane Closure Time Restrictions

- Traditional Lane Closure Time Restrictions on Interstates/Freeways are being re-evaluated to determine if more work time is available

1. Looking into dividing the Year into Quarters
2. Looking into more Directional Split's during Weekdays and Weekends
3. Looking into Directional Splits during Holidays and not "blocking out" large windows of time

Potential Interstate Lane Closure Time Restrictions

Interstate Designation: I-95
Direction of Travel: Northbound

Time of Year	Weekday Restriction	Weekend Restriction	Holiday Restriction
1st Quarter (January-March)	None	Sunday from Noon to 7 PM	New Years: Same as Weekend Restriction
2nd Quarter (April-June)	11 AM to 6 PM	Sunday from 10 AM to 8 PM	Easter and Memorial Day: Friday at Noon to 8 PM. Sunday-same as Weekend Restriction
3rd Quarter (July-September)	9 AM to 7 PM	Sunday from 10 AM to 8 PM	Independence Day: From 9 AM Friday to 8 PM Sunday Labor Day: Same as Weekend Restriction
4th Quarter (October-December)	11 AM to 6 PM	Sunday from Noon to 7 PM	Thanksgiving: From 9 AM Wednesday to 7 PM Sunday Christmas: Same as Weekend Restriction

Volunteers to Try Revised Time Restrictions?

Questions?

Contact Information
Steve Kite, PE, CPM State Work Zone Engineer
Telephone: (919) 814-4937
Email: skite@ncdot.gov