



*Think he's  
close enough  
to the work  
area?*





## *Flagging Operations w/ “Technology”*

### **Automated Flagger Assistance Devices (AFAD’s)**

- Removes human flagger from roadway
- Does require human to operate from safe location such as work vehicle



*Interstate  
Resurfacing/Reconstruction  
- Digital Speed Limit Signs*



- NCDOT is utilizing Digital Speed Limit Signs in addition to the Work Zone “Presence” Lights.
- We are reducing the speeds during lane closures and returning at the end of each night's operation to the existing Speed Limit



# Digital Speed Limit Signs

- The Key to Speed Compliance is to return speeds to existing levels and turn off beacons when lane closures are removed
- A key important feature is these devices allow “segments” of roadway to be reduced while others remain at current speed limits





## *Interstate/Freeway Resurfacing Projects- Drums w/ “Sequential Lights”*

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- Recommend use of Drums with “Sequential Flashing Lights” in Tapers for Night Work.

# “CONNECTED” Flashing Arrow Boards

## Goals and Objectives

- Identify all “active” lane closures on Interstates and Freeways
- Quickly in “real time as possible” provide the location information to our State Transportation Operations Center (STOC)
- Quickly in “real time as possible” send this information about closures to Navigational App Companies/3rd party data and autonomous/connected vehicles



# Interstate/Freeway Resurfacing- “Presence Lighting”



- Utilizes “balloon/anti-glare” lighting systems that *supplement* task/tower lighting...not replacements
- Installed in advance of the lane closure



## *“Presence Lighting”- Primarily Used for Interstate/Freeway Resurfacing Projects*



- Improves “visual footprint” of the work zone
- Reduces excessive speeding
- Improves Worker Visibility
- Gives drivers the idea of an “active” work zone to generate more “awareness”





## *Speed Results on Previous Projects*

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- There is an average speed reduction of approximately 6 MPH with the presence lights

# Human Behavior/Distracted Driving-How do we combat this in our work zones?



Drowsy Driving



Distracted-"Multi-tasking"



Distracted Driving- Email/Texting



Distracted Driving-"Selfies"

# “Night Driving Behaviors”

- Night hours also have a larger number of drivers driving “zoned out” in rural areas
- Larger number of Interstate drivers driving “distracted” by Out of State Drivers

Dark, Rural “DARK” Interstate Travel

Out of State Drivers



# Interstate traffic control

The high speed environment of an Interstate or Freeway coupled with mostly night work make this role the *most dangerous* for the traffic control installer

There are many factors that make night work *more dangerous* for the installer.

- Night hours also have a larger number of drivers driving drowsy
- Larger number of drivers driving “distracted” by electronics



## ***Struggles we see in Traffic Control Operations***

- 1. Blue lights*
- 2. Median signs & equipment*
- 3. Access (barrier wall / Guardrail)*
- 4. Presence light placement*
- 5. Exposure*
- 6. Communication*
- 7. Labor force*