

STEP

Safe Transportation for
Every Pedestrian



Developing and Delivering Pedestrian Safety Projects

Becky Crowe, FHWA Office of Safety
Brian Mayhew, North Carolina DOT
Jed Niffenegger, City of Raleigh
June 4, 2020



U.S. Department of Transportation
Federal Highway Administration

Meet the Panelists



Becky Crowe
**FHWA Office of
Safety**



Brian Mayhew
North Carolina DOT



Jed Niffenegger
City of Raleigh

Housekeeping

- ⇒ **Submit your questions**
- ⇒ **Webinar archive: www.pedbikeinfo.org/webinars**
- ⇒ **Certificates and professional development hours**
- ⇒ **Follow-up email later today**
- ⇒ **Look for upcoming STEP webinars on road diets and regional approaches to improving pedestrian safety**



Safe Transportation for Every Pedestrian (STEP)





The Spectacular Seven

STEP

Safe Transportation for Every Pedestrian

Pedestrian Hybrid Beacon (PHB)

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET

High speeds and multiple lanes of traffic create challenges for pedestrians crossing at unsignalized locations.

PHBs can warn and control traffic at unsignalized locations and assist pedestrians in crossing a street or highway at a marked crosswalk.

PHBs can reduce pedestrian crashes by **55%**

FEATURES:

- Beacons stop all lanes of traffic, which can reduce pedestrian crashes.

A Pedestrian Hybrid Beacon head consists of two red lenses above a single yellow lens. Unlike a traffic signal, the PHB rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate the pedestrian walk interval and when it is safe for drivers to proceed (see figure on back page). The PHB is often considered for installation at locations

Tech Sheets & Case Studies

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN CASE STUDY

Publicly-Supported Road Diet Reduces Speeds in Alexandria

Alexandria Department of Transportation and Environmental Services

KEY ELEMENTS:

- Public support
- Speed reduction

Community members can provide valuable insights into pedestrian safety on their streets, adding support to local projects such as the King Street Road Diet in Alexandria, Virginia. The City of Alexandria's Complete Streets policy requires that city maintenance and capital projects improve the transportation network for all users, so when a 1.6-mile segment of King Street was slated for resurfacing, the city had an opportunity to address longstanding community concerns and seek feedback on design options for improving the corridor.

This section of King Street has a bus line, residences, multiple churches, a

stops, and upgraded curb ramps. Staff also presented options for more comprehensive corridor improvements such as a Road Diet, buffered bike lanes, new crosswalks, vehicle turning restrictions, and crosswalk visibility enhancements. In addition to dedicated space for bicyclists and shorter, safer pedestrian crossings at seven locations, the city also identified driver benefits from slower vehicle speeds, increased sight distance, and the addition of a center turn lane.



VIDEOS



U.S. Department of Transportation
Federal Highway Administration

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https://safety.fhwa.dot.gov/ped_bike/step/resources/



NORTH CAROLINA

Department of Transportation

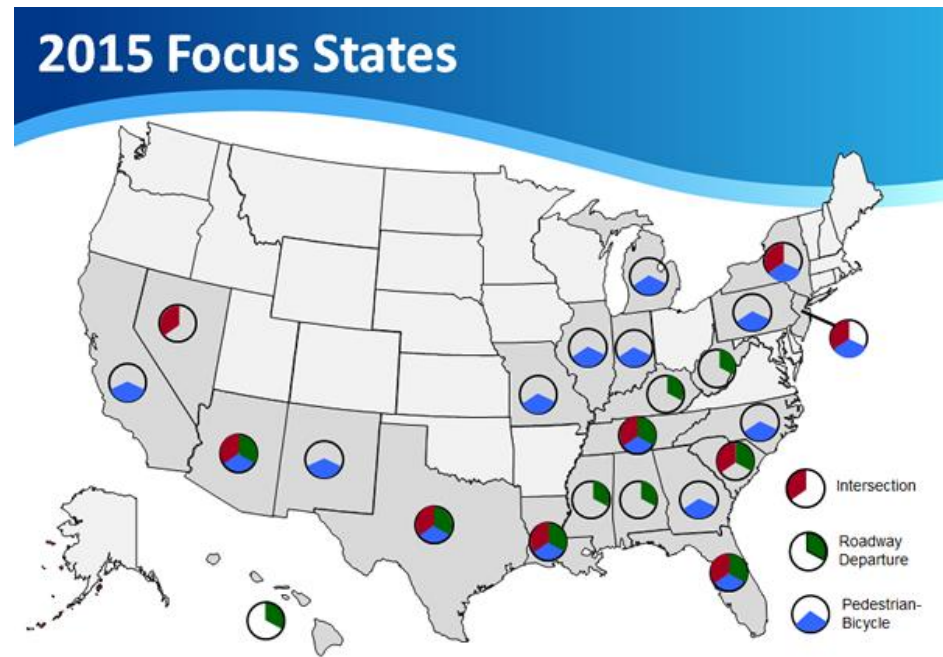


Pedestrian Safety Project Development in North Carolina

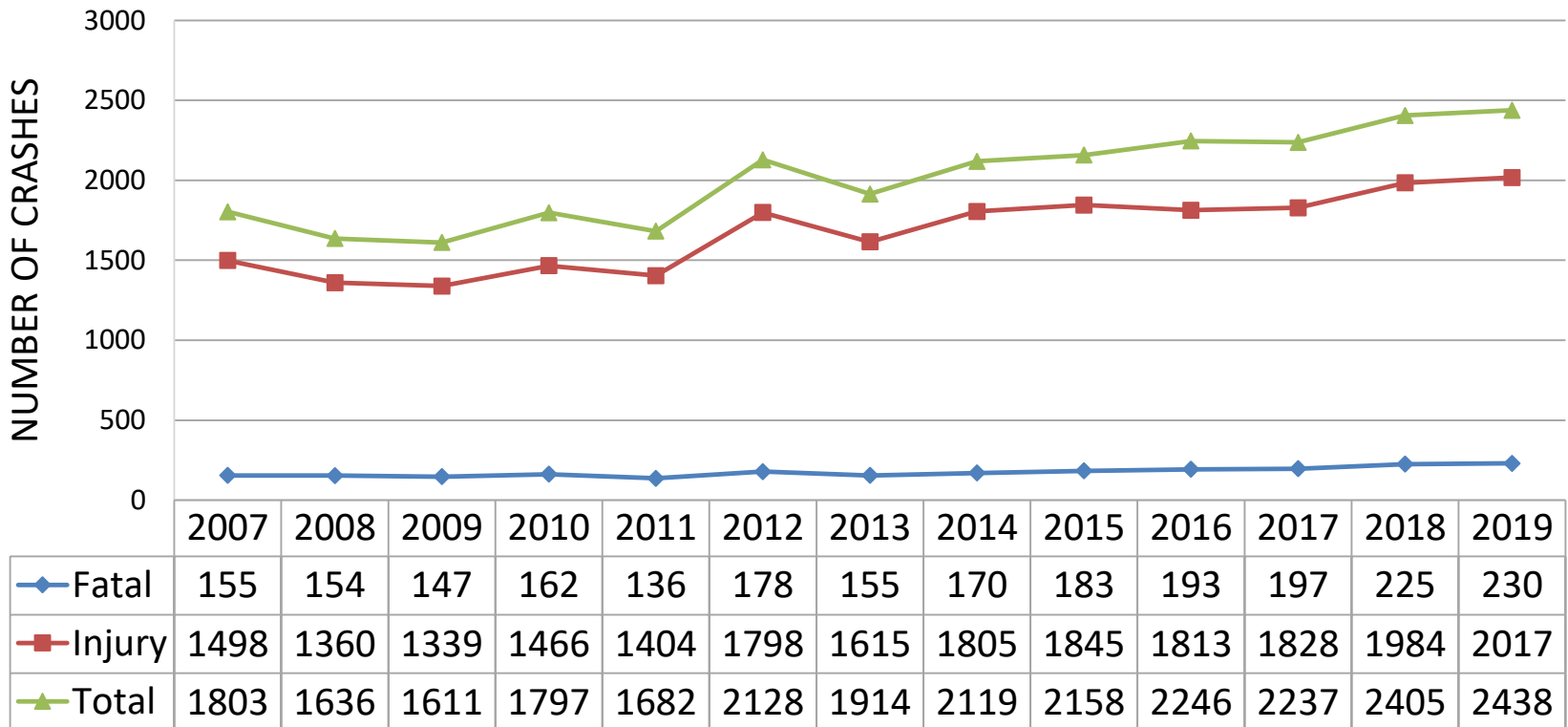
Brian Mayhew, PE
NCDOT, State Safety Engineer
June 4, 2020

National Perspective

- FHWA has listed pedestrian safety as one of its three main safety focus areas.
- NC is a pedestrian and bicycle focus state, meaning that our urban pedestrian fatalities rank among the highest in the nation.

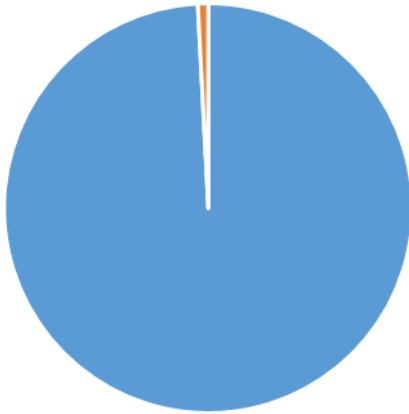


Statewide Pedestrian Crashes by Year

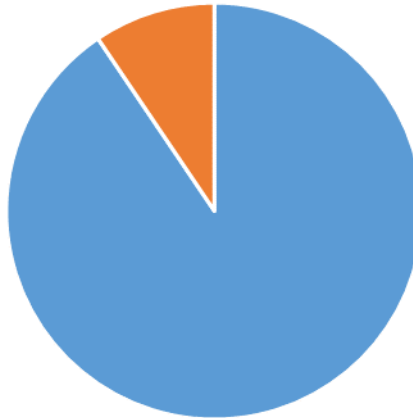


Crash Severity in NC

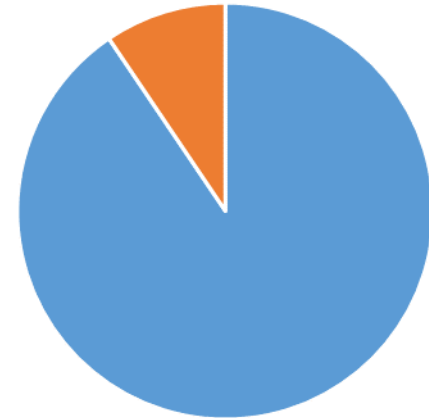
Total Crashes



Fatal and Serious Injury Crashes



Fatal Crashes



Pedestrian Crashes



Non-Pedestrian Crashes

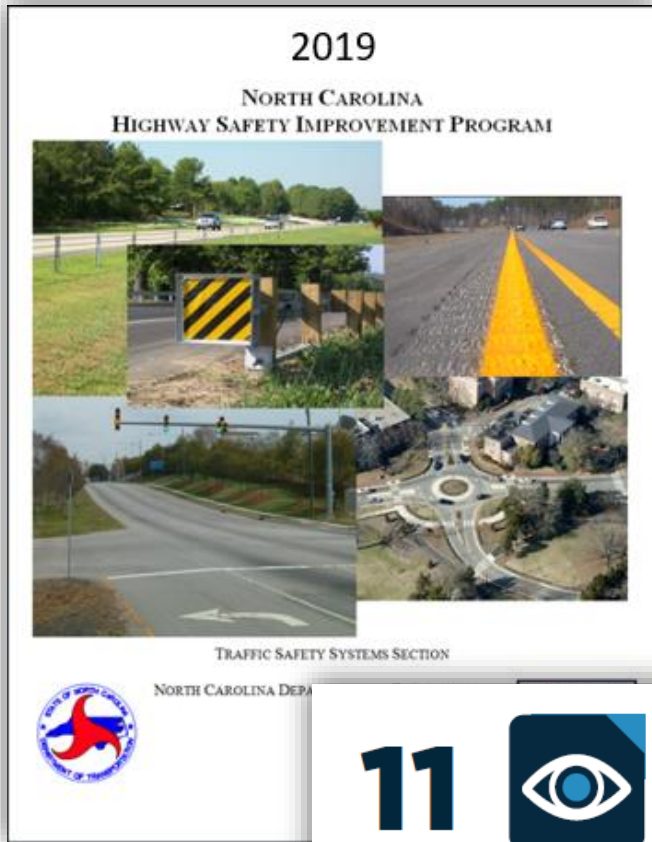


SHSP Goal:

Reduce pedestrian and bicyclist-involved fatalities and serious injuries by half by 2035, moving towards zero by 2050.



NC Highway Safety Improvement Program



11 Emphasis Areas	 Alertness	 Emerging Issues and Data	 Intersections	 Lane Departure	 Occupant Protection
 Older Drivers	 Motorcyclists	 Pedestrians, Bicyclists, and Personal Mobility	 Speed	 Substance Impaired Driving	 Younger Drivers



Pedestrian Safety Improvement Program

City / Area

- Systemic
- Risk
- Corridors
- Hot Spot

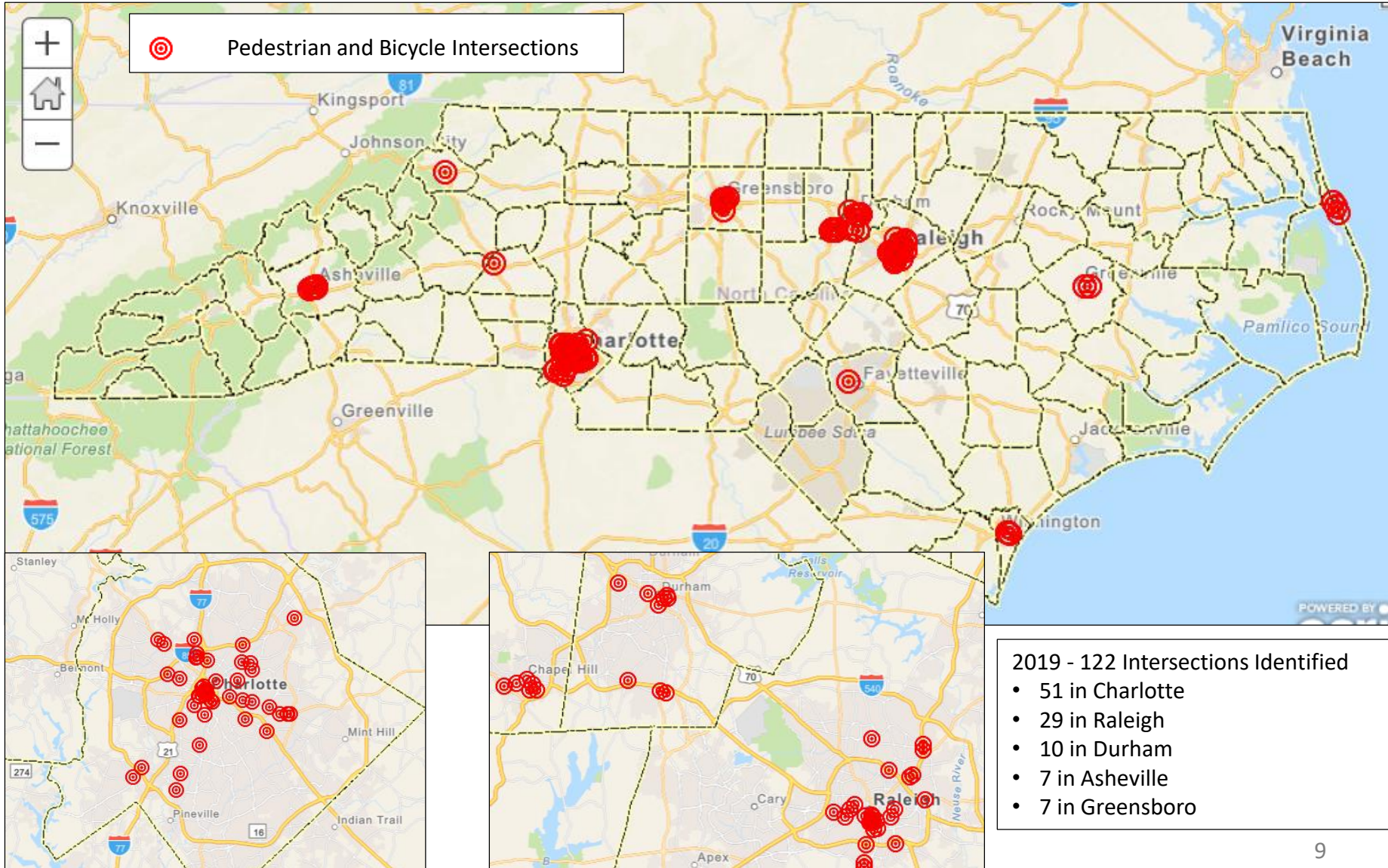
Corridor

- Risk & Crash
- Multi-Modal

Hot Spot

- Reactive Based
- Crash Data

HSIP Spot Locations

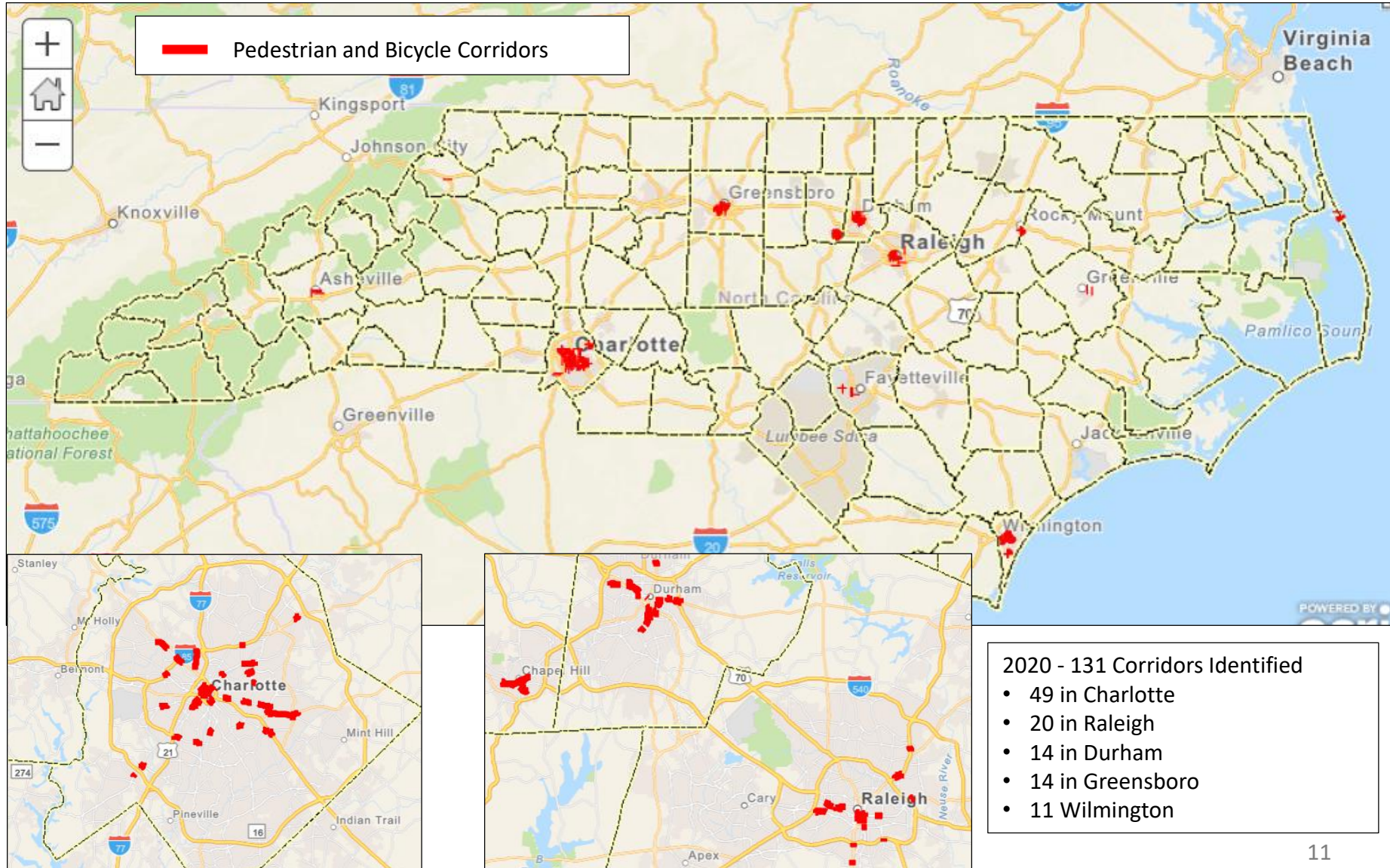


HSIP Spot Locations

- Requests from Municipalities
- Public Requests – Universities, School Systems, Citizens
- Fatal Investigation Program

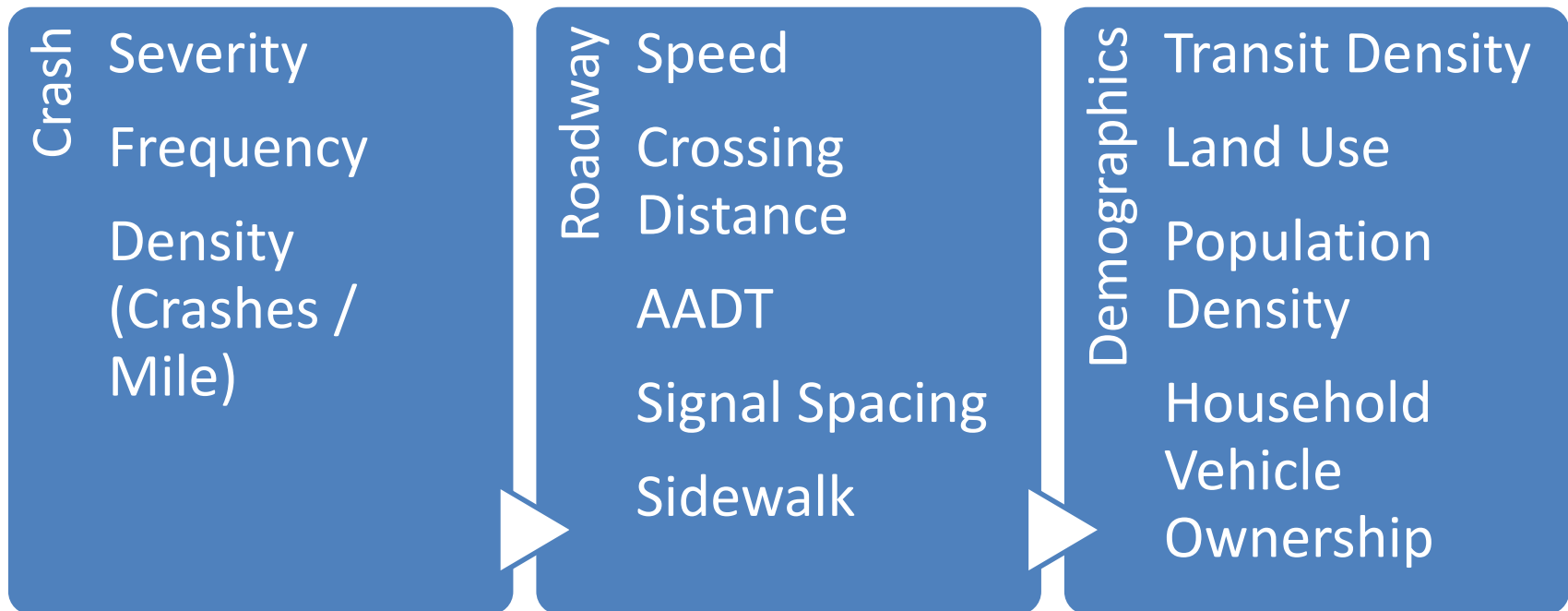


HSIP Corridors (Risk & Crash Data)

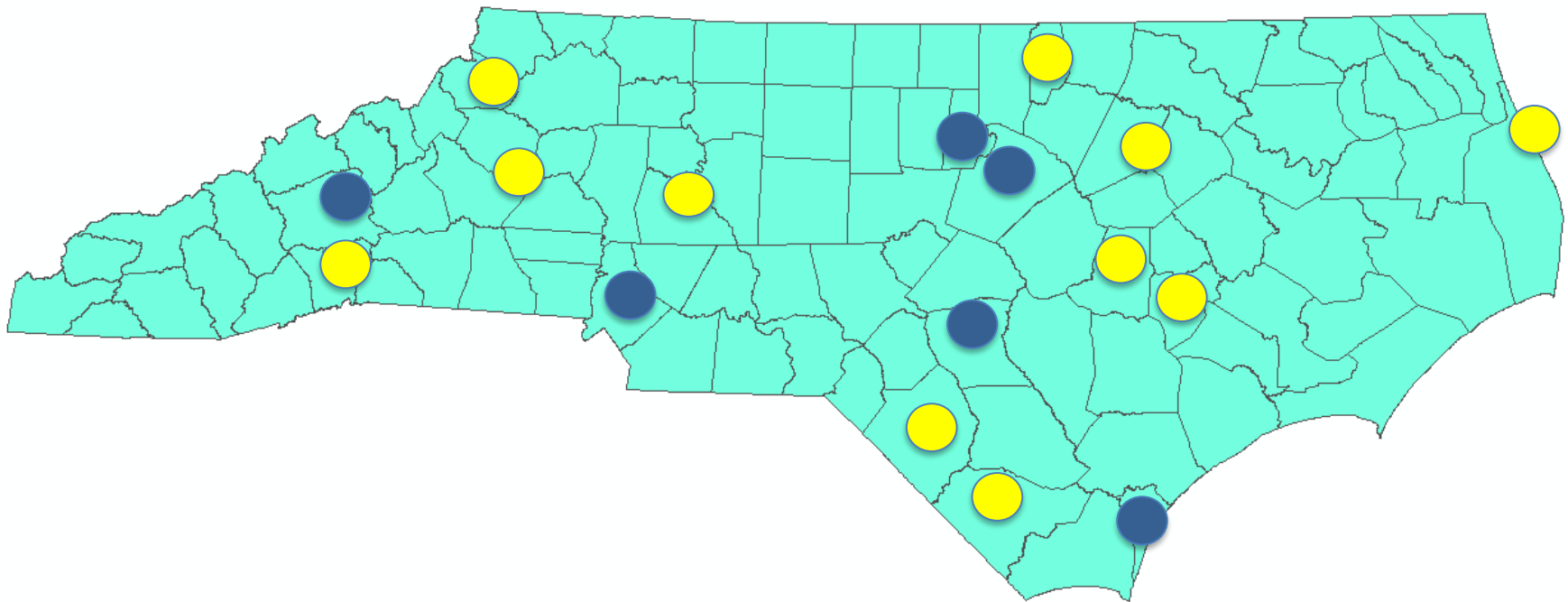


HSIP Corridors

Corridor Risk Scoring



Large and Mid-Size Focus Cities




These cities represent:

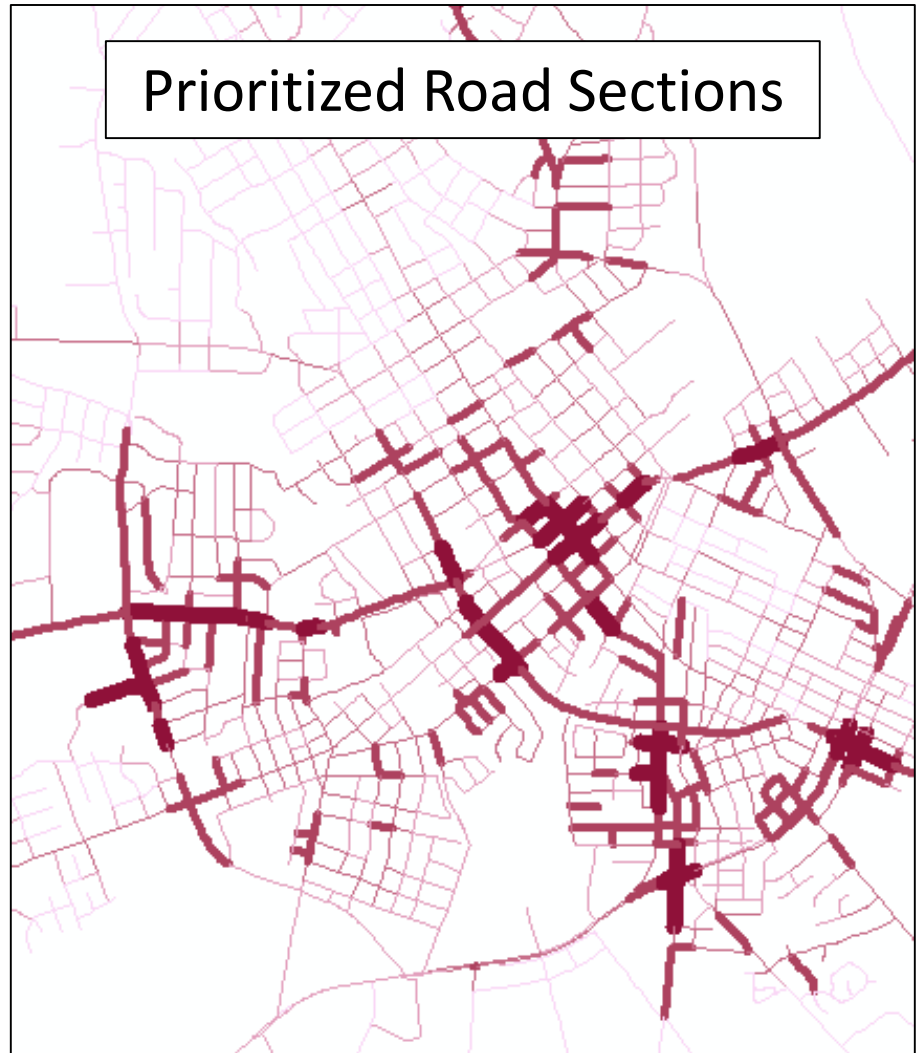
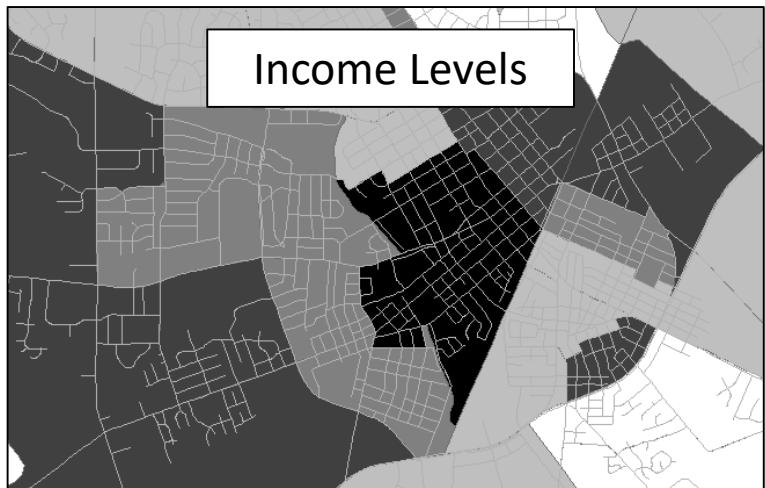
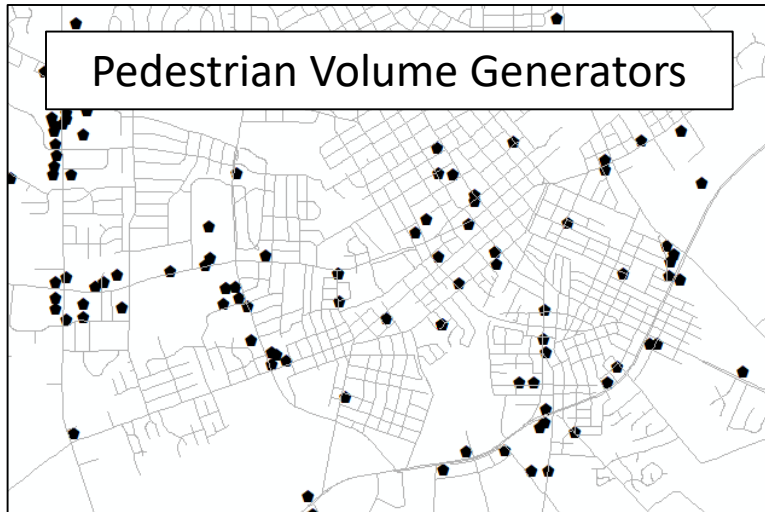
56% of statewide pedestrian crashes

41% of statewide KAB pedestrian crashes

 Large city

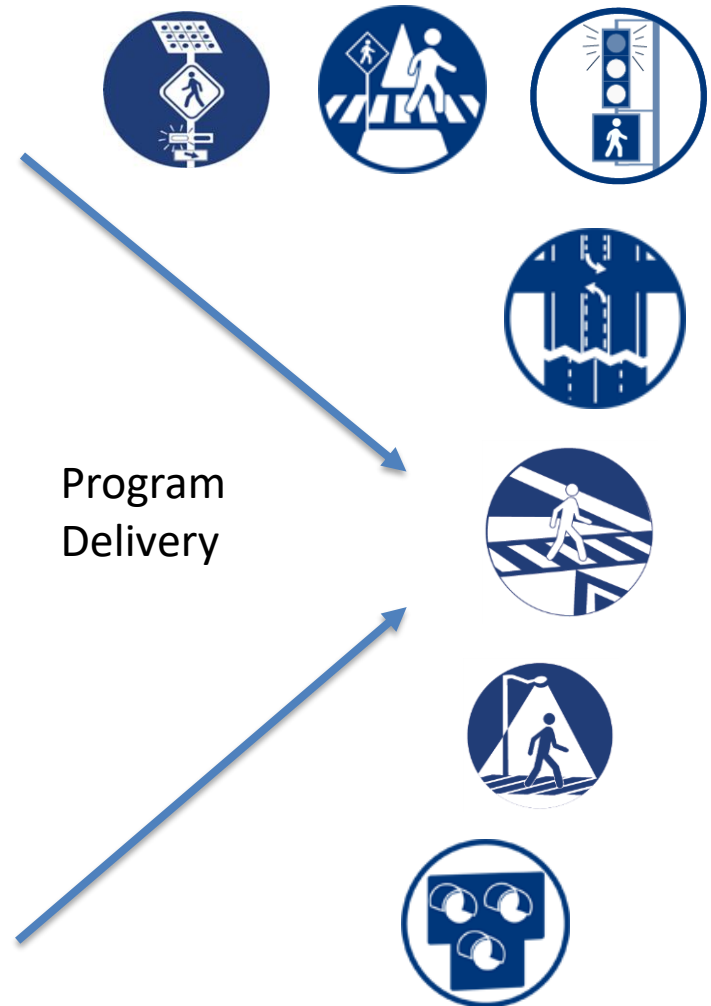
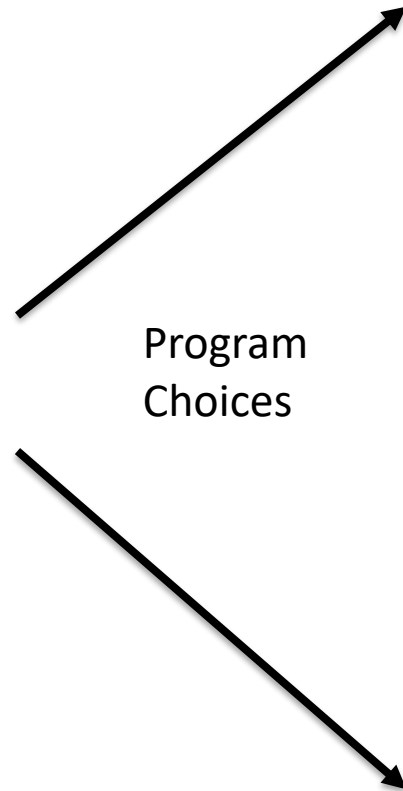
 Mid size city

Risk Based Screening



HSIP Program Delivery

- Crash Data
- Risk Analysis
- Reactive Hot Spots
- Corridors
- Small Areas / Cities
- Local Government Requests



NC Highway Safety Improvement Program

The Purpose of the NC Highway Safety Improvement Program

- **Implement Effective Safety Projects**

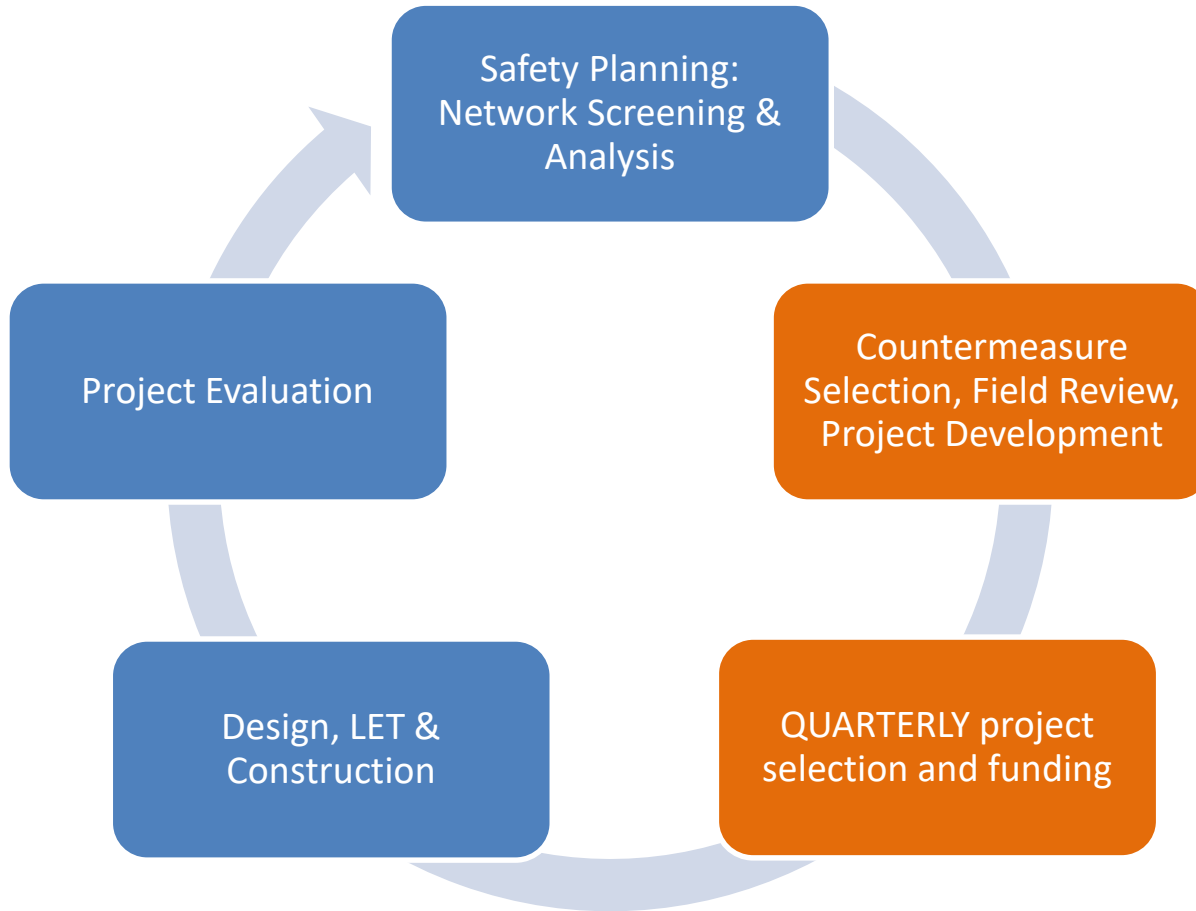
- **Reduce Fatalities and Injuries**

- **Maximize Value (lower cost with high returns)**

- **Get Safety Projects “On the Ground”**



Safety Project Cycle



Countermeasure Development

Signalized Locations – Countermeasures

- Pedestrian Signal Heads
- Marked Crosswalk
- Leading Pedestrian Interval (LPI)
- Prohibit Right Turns on Red
- Lighting
- Curb Extension



Source: www.pedbikeimages.org / Dan Burden

Countermeasure Development

Uncontrolled Crossings – Countermeasures

- Crosswalks
- Refuge Islands
- PHB
- RRFB
- Traffic Signal
- Overhead Lighting
- Curb Extension

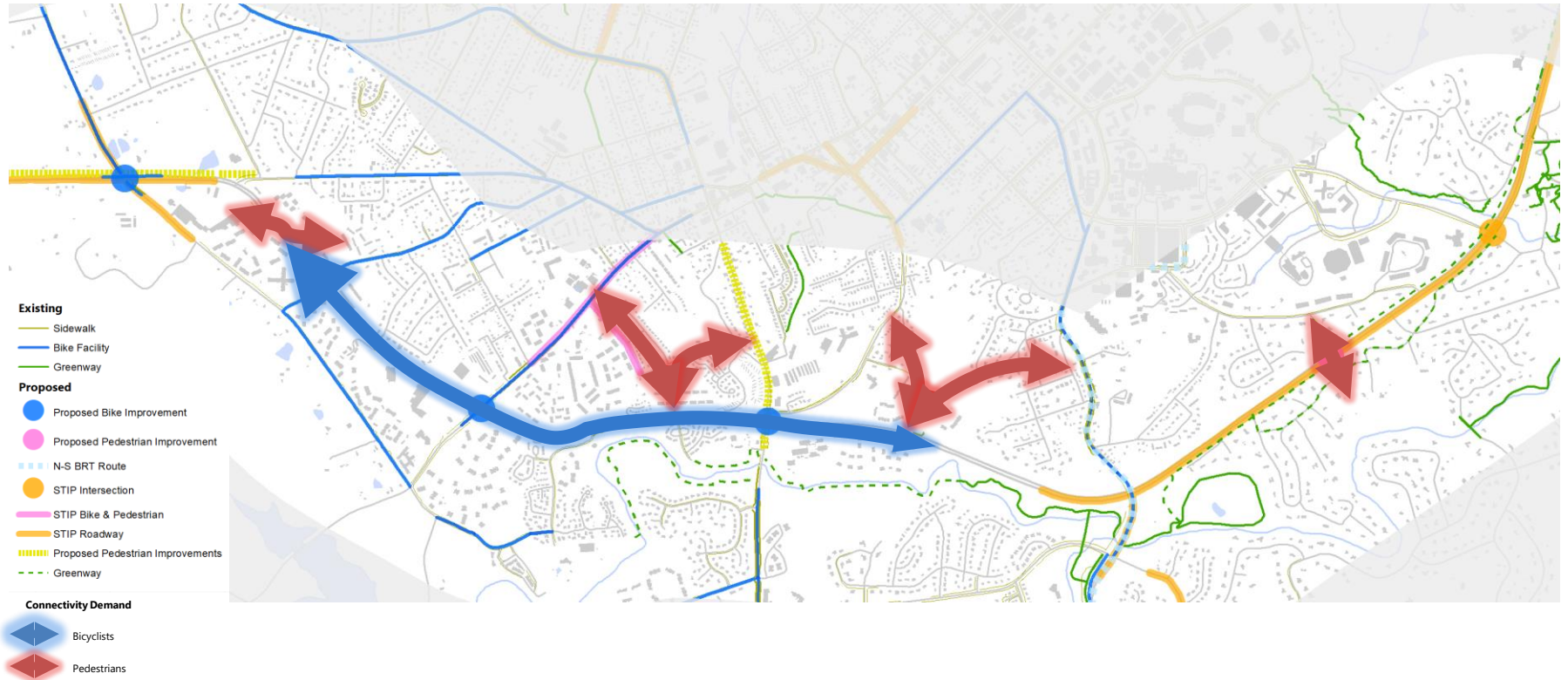




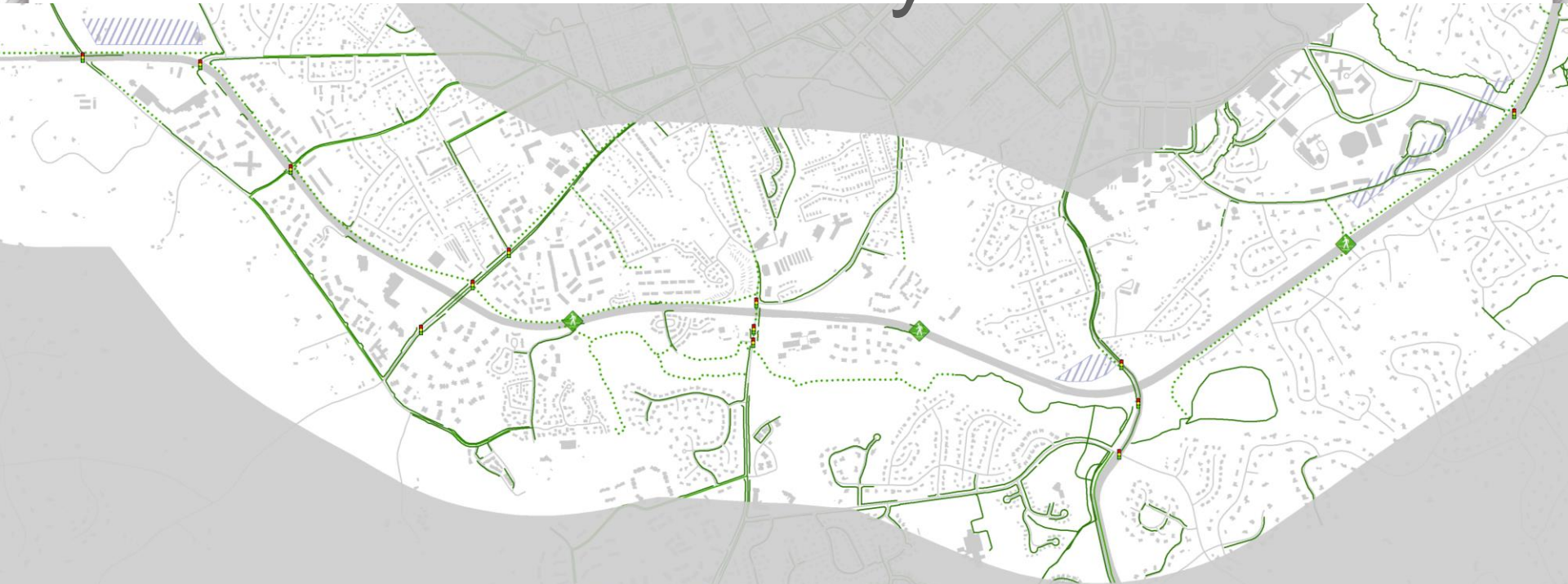
NC 54 Corridor Bicycle and Pedestrian Safety Study

In partnership with the Towns Carrboro & Chapel Hill and consultant VHB

Planned Improvements / Demand for Connectivity




Draft Connectivity Plan



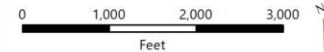
Proposed Connections

-  Crossings
-  Bike-Pedestrian Connections
-  New Land Use Plans

Existing Facilities

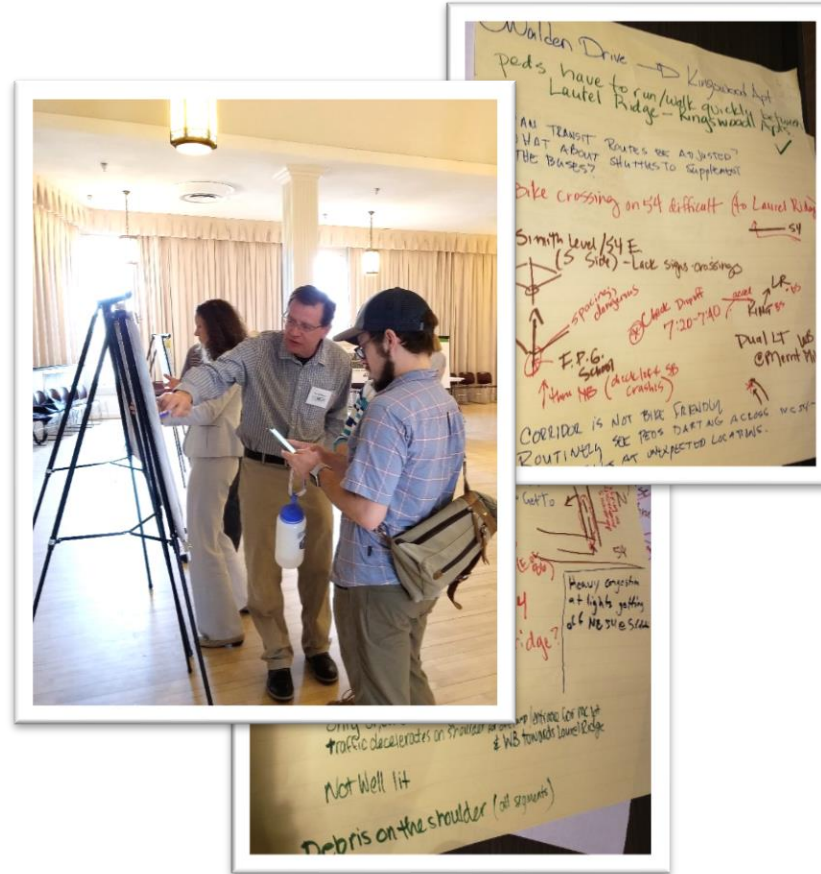
-  Sidewalk, Greenway, Bicycle
-  Intersections

- **Where does the network currently cross NC 54?**
- **What new E-W connections may reduce demand or risk for crossing NC 54?**
- **What network should be added to support new crossings?**



Public Workshop

- Validate information
- Receive Perspective
- Validate Recommendations



Project Development & Delivery

Countermeasures – near term

Signal Phasing Improvements

Signs and Markings

Visibility

Refuge Islands

Crosswalks



Project Development & Delivery

Countermeasures – mid term

- Pedestrian Signals
- Pedestrian Hybrid Beacons
- Access Control
- Lane Utilization / Road Diets



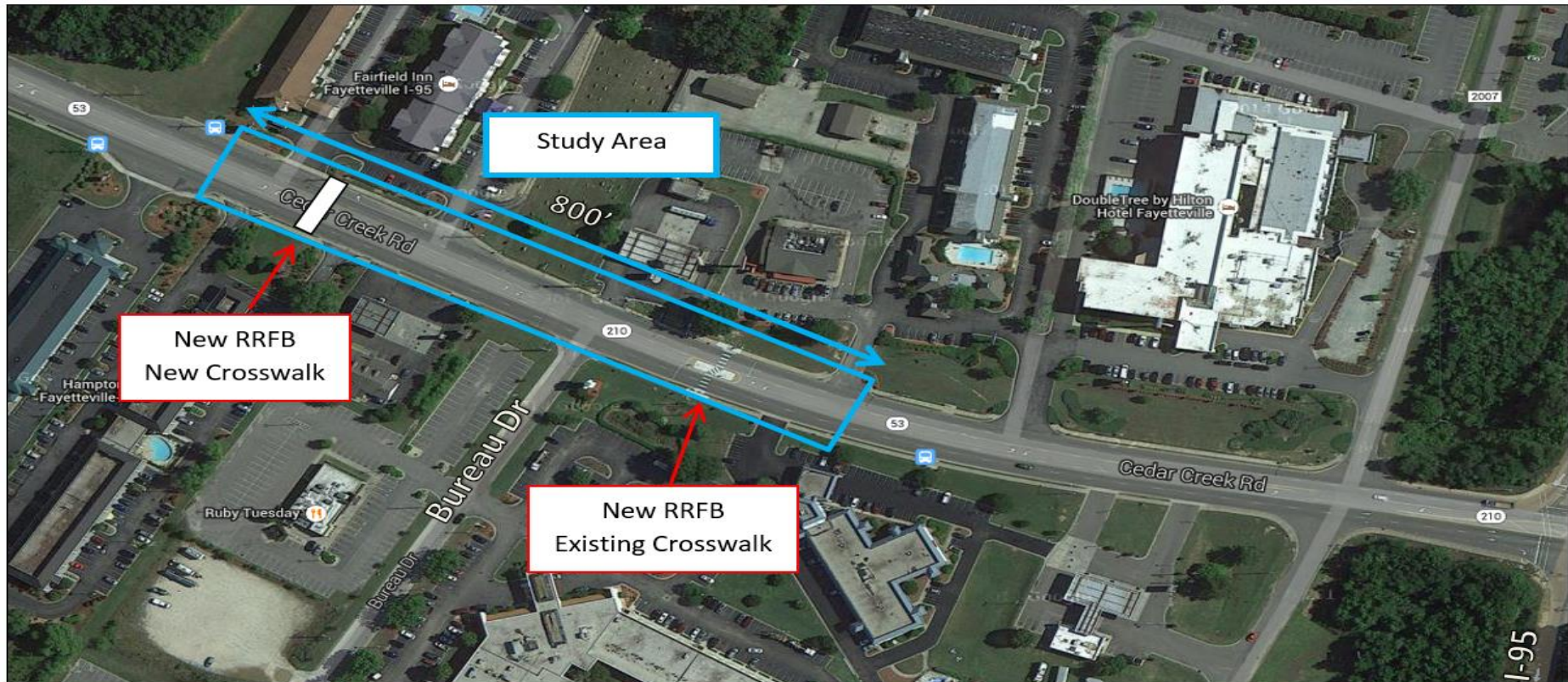
Cedar Creek Road Pedestrian Safety Project Implementation **City of Fayetteville**



Project Development & Delivery

NC 53 Cedar Creek Road in Fayetteville NC

- Multiple Pedestrian Fatal Crashes
- Reactive  Corridor Project



Project Development & Delivery

Interim Solutions Delivered Quickly

- Install 2 RRFBs in 2014 (approx. 500' apart).
- Pedestrian Road Safety Audit was conducted to help develop solutions for location.



Before

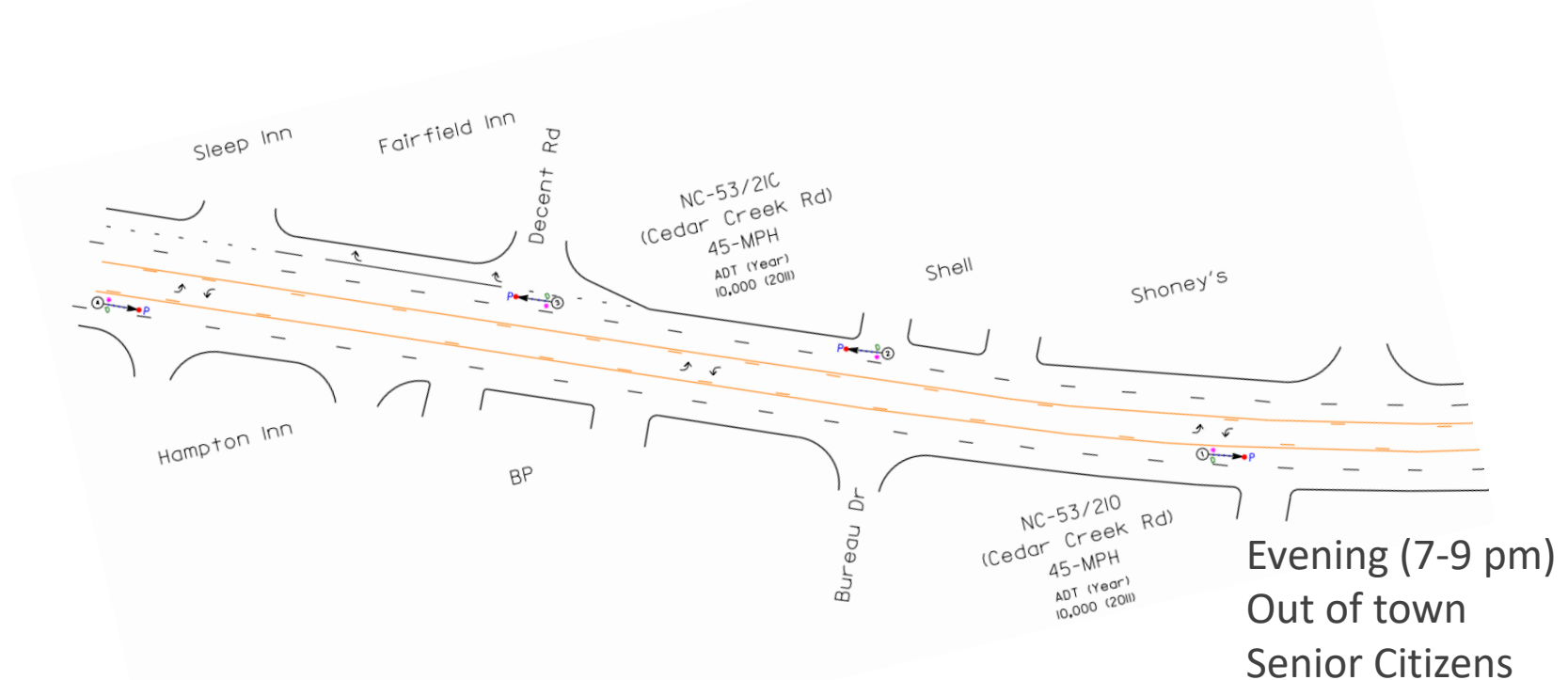


After

Project Development & Delivery

NC 53/NC 210 (Cedar Creek Rd) near I-95 in Fayetteville

- 4 fatal pedestrian crashes in 3 years prior to RRFBs and no pedestrian crashes in 2.5 years after RRFBs



Project Development & Delivery

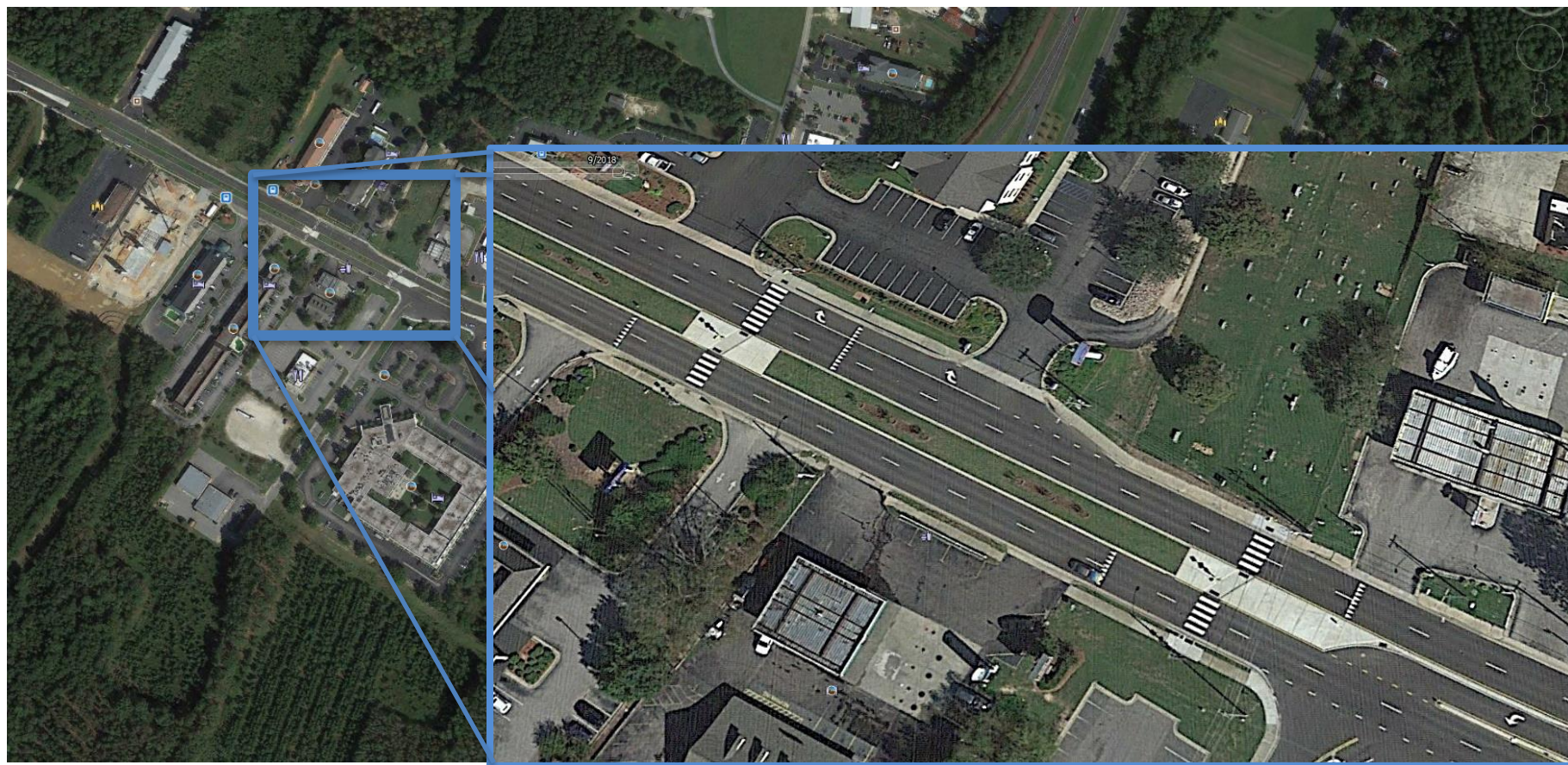
Collaboration with City of Fayetteville

- Lighting
- Public Meetings and Outreach
- Public Education



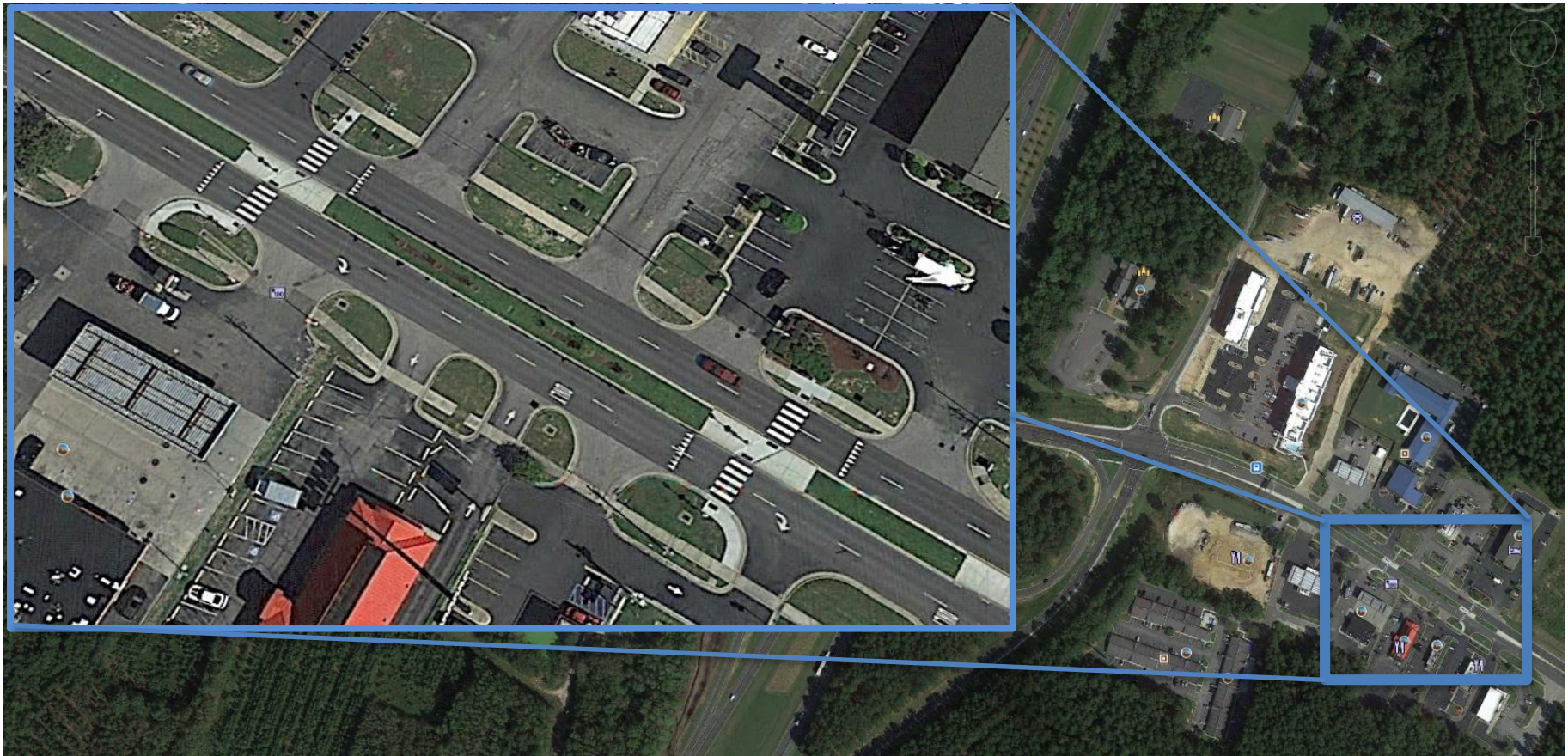
Project Development & Delivery

The crosswalks, median islands, and RRFBs were an interim treatment.... This is what the corridor looks like now (2018)



Project Development & Delivery

The crosswalks, median islands, and RRFBs were an interim treatment.... This is what the corridor looks like now (2018)



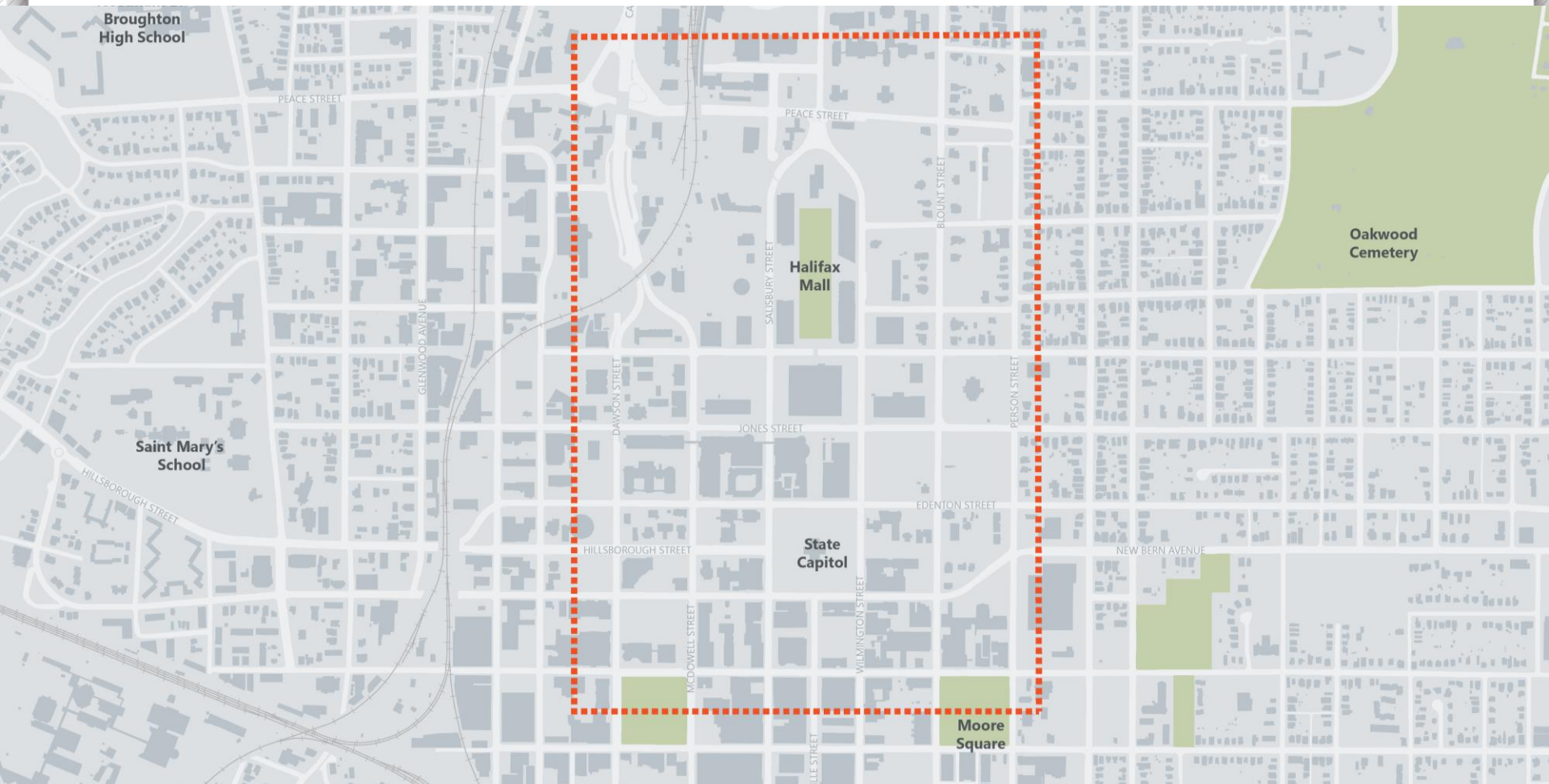
Project Development & Delivery

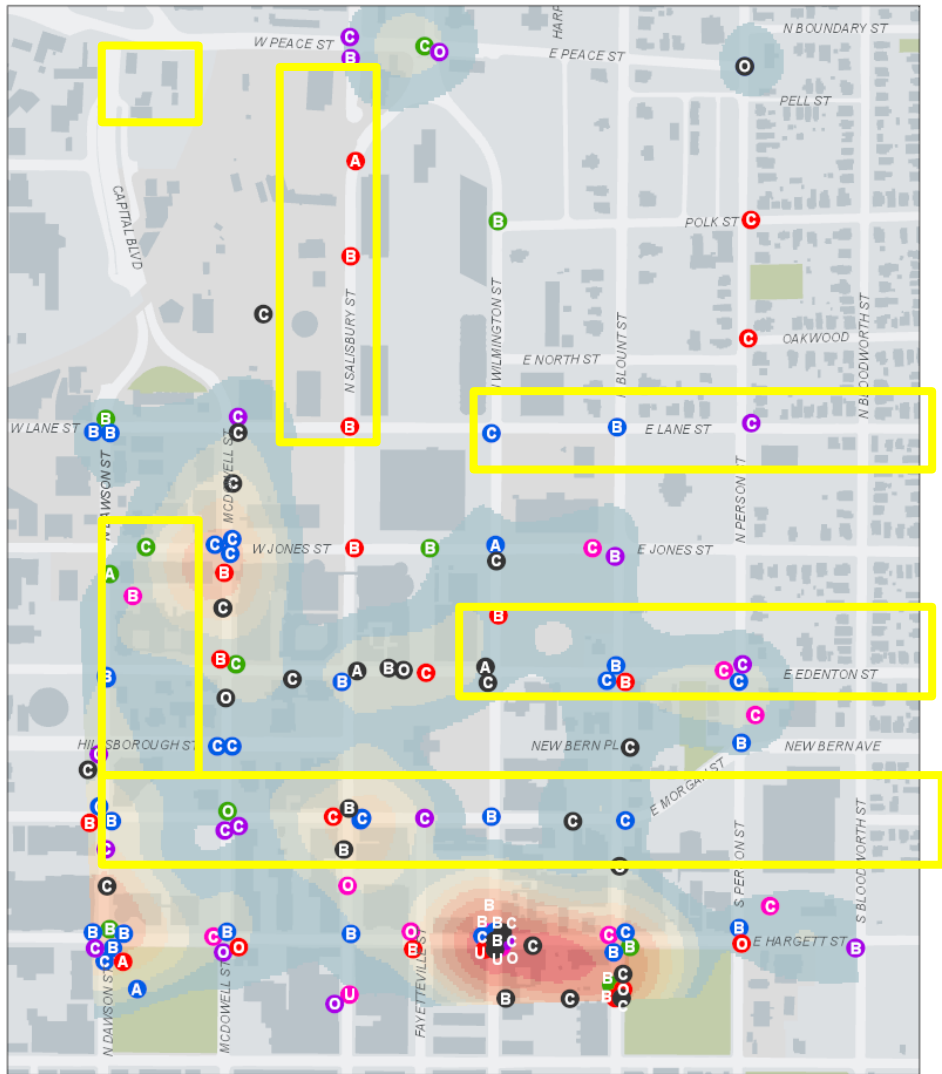
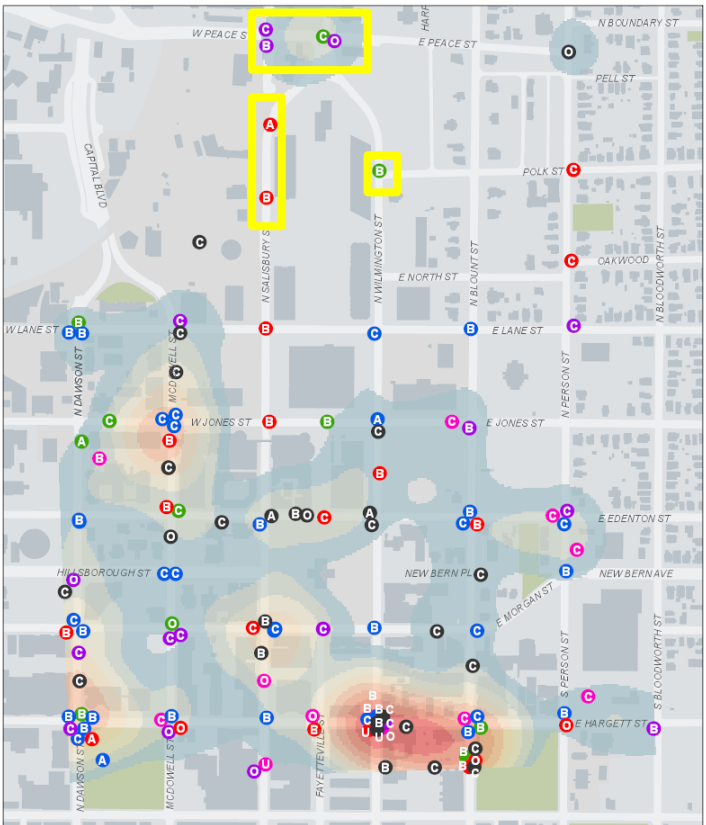
The crosswalks, median islands, and RRFBs were an interim treatment.... This is what the corridor looks like now (2018)





DOWNTOWN
RALEIGH
PEDESTRIAN SAFETY STUDY





Pedestrian Crashes
2007-2018

- Crash Type**
- Backing
 - Dash/Dart-out
 - Left-Turn
 - Right-Turn
 - Not Turning
 - Other
- Crash Severity**
- K - Fatal Injury
 - A - Serious Injury
 - B - Evident Injury
 - C - Possible Injury
 - O - Property Damage



Pedestrian Crashes
2007-2018

- Crash Type**
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Deficiency

EDENTON AT CAPITOL BUILDING

Long delay before pedestrians get signal, promotes walking against signal.

EDENTON AT WILMINGTON

Bus stop on right curb of NE corner reducing visibility of pedestrians to oncoming traffic.

EDENTON AT BLOUNT

Limited visibility for drivers on Blount turning right onto Edenton - one-way WB detracts from attentiveness to east crossing.

EDENTON AT PERSON

Bus stop at NE corner is in location with poor curbing and access management. Fast right-turns from Edenton onto NB Person.

Short-Term

1. Remove push button at midblock crossing at Capitol Building, coordinate timing with signals at Wilmington and Edenton.
2. Extend the LPI and implement No Right on Red at the intersection of Edenton and Wilmington.
3. Implement both an LPI and No Right on Red at the intersection of Edenton and Blount.
4. Consider moving the bus stop from the east of person to the far side of the intersection (west of Person).

Long-Term

1. Curb extensions on north side of midblock at Capitol Building.
2. Curb extensions on both Blount and Edenton on the NW corner of the intersection.
3. Curb extension on Person at Edenton NW corner.





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Safe Transportation for Every Pedestrian (STEP)

Jed Niffenegger, PE
City Traffic Engineer





Agenda

- A City's perspective -Project Development and Delivery
 - Problems/Solutions
 - Pedestrian crashes
 - Spectacular 7
 - Successes
 - Examples



Problem/Solutions

- Raleigh is growing very quickly
 - Over the last 15 years, the population of the greater metro area has doubled
 - With growth, number of potential conflicts has increased
- Mode shifts
 - Raleigh was predominantly built around a vehicle
 - Number of walkers/pedestrians has increased
 - New development and infrastructure built to encourage walking
- Problem?
 - Items above are far from a “problem” but have played role in the increased number of pedestrian crashes



Problem/Solutions

- FHWA and NCDOT have done good job of developing solutions
 - The “spectacular 7” - road diets, PHBs, RRFBs, pedestrian refuge islands, raised crosswalks, general crosswalk visibility enhancements, and LPIs
- Solutions can come with Problems/issues
 - Funding in government is always a struggle
 - Change is not always welcome (PHB reluctance)
 - Can be a demand for new “solutions”
 - Locations often fall in multi-jurisdictional areas
 - e.g. City limits yet State Highway System road
 - Added bureaucracy

Problem/Solutions

- As previously mentioned, government has limited funding and safety projects are usually not viewed as favorable as “shining” new projects. (e.g. CIP funding)





Successes

- Working together you achieve more
 - Partner with State in traditional and non manners
- Carefully consider countermeasure
 - One size doesn't fit all
- Educate and inform policy markers
 - Local elected officials can be your biggest cheerleader
- Plan implementation strategy
 - e.g. LPI roll out and interim measures

Successes Examples

- Changing old and applying two mitigation measures



Successes - Examples

- Reiterative process
 - Constant improvements and interim solutions



Successes - Examples

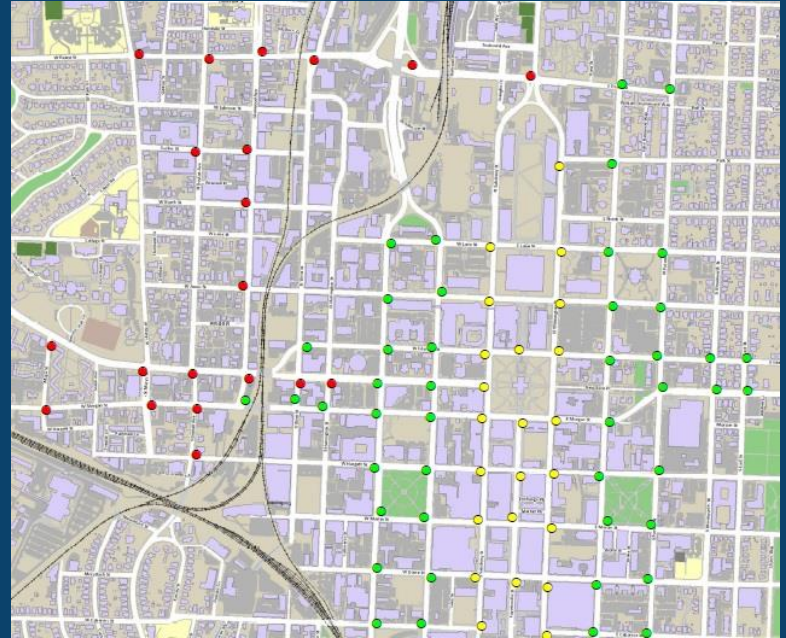
- Creative application of spectacular seven





Successes - Examples

- LPI roll out
 - locations
 - Channelization changes
 - NRTOR
- Implementation Strategy
 - Manage Change (LPI's)
- Complications/Adaptation
 - Had to shift strategies
 - Worked with State





Questions?

Discussion

⇒ **Send us your questions**

⇒ **Follow up with us:**

⇒ **Becky Crowe Rebecca.Crowe@dot.gov**

⇒ **Brian Mayhew BMayhew@ncdot.gov**

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⇒ **Archive at www.pedbikeinfo.org/webinars**