Developing and Delivering Pedestrian Safety Projects

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Brian Mayhew, North Carolina DOT
Jed Niffenegger, City of Raleigh
June 4, 2020
Meet the Panelists

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FHWA Office of Safety

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

<table>
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<th>Year</th>
<th>Fatal</th>
<th>Injury</th>
<th>Total</th>
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<td>2018</td>
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<tr>
<td>2019</td>
<td>225</td>
<td>2017</td>
<td>2438</td>
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</tbody>
</table>

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

2019

North Carolina Highway Safety Improvement Program

Traffic Safety Systems Section

11

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

2019 - 122 Intersections Identified
- 51 in Charlotte
- 29 in Raleigh
- 10 in Durham
- 7 in Asheville
- 7 in Greensboro
HSIP Spot Locations

- Requests from Municipalities
- Public Requests – Universities, School Systems, Citizens
- Fatal Investigation Program
2020 - 131 Corridors Identified
• 49 in Charlotte
• 20 in Raleigh
• 14 in Durham
• 14 in Greensboro
• 11 Wilmington
HSIP Corridors

Corridor Risk Scoring

Crash
Severity
Frequency
Density (Crashes / Mile)

Roadway
Speed
Crossing Distance
AADT
Signal Spacing
Sidewalk

Demographics
Transit Density
Land Use
Population Density
Household Vehicle Ownership
These cities represent:

56% of statewide pedestrian crashes
41% of statewide KAB pedestrian crashes
Risk Based Screening

Pedestrian Volume Generators

Prioritized Road Sections

Income Levels
HSIP Program Delivery

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

Program Choices

Program Delivery
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

1. Safety Planning: Network Screening & Analysis
2. Countermeasure Selection, Field Review, Project Development
3. Design, LET & Construction
4. Project Evaluation

QUARTERLY project selection and funding
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

- 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.
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)
Study Overview

In partnership with City of Raleigh and Consultant VHB
**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.

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**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).

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**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.
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:
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  ⇒ Jed Niffenegger Jed.Niffenegger@raleighnc.gov
  ⇒ General Inquiries pbic@pedbikeinfo.org

⇒ Archive at www.pedbikeinfo.org/webinars