



## NCDOT Bike-Ped Planning: Lessons Learned, New Directions

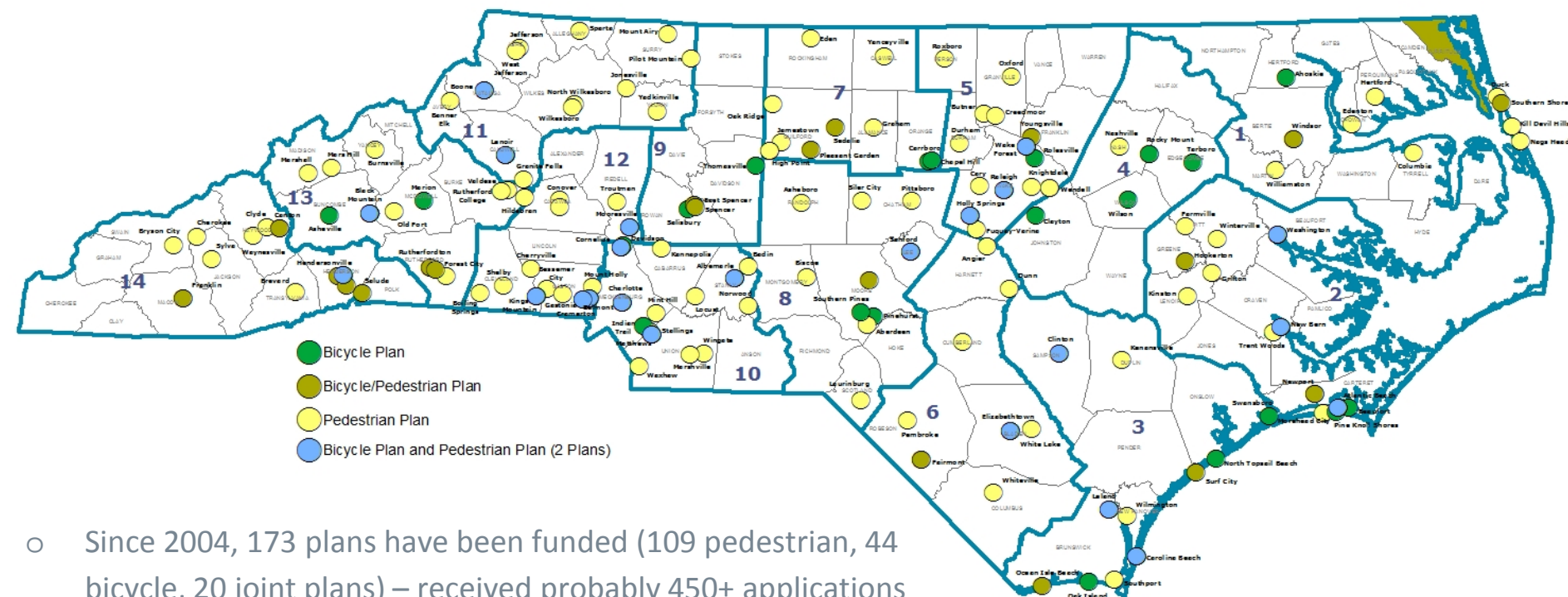
John Vine-Hodge, Betsy Kane



# *Outline*

- A. Bike/Pedestrian Planning Grant Initiative
- B. Regional Bicycle Planning Program
- C. Design Guidance
- D. Data - PBIN, Crash, Counts
- E. Bike/Pedestrian Facility Cost Tool
- F. Survey for Bike/Pedestrian Plan Implementation

# Bike/Pedestrian Planning Grant Initiative



- Since 2004, 173 plans have been funded (109 pedestrian, 44 bicycle, 20 joint plans) – received probably 450+ applications
- \$4M+ awarded to date
- Covers approximately 40% of state population
- Fund approximately 10 per year
- Types of Plans - bike, pedestrian, bike/pedestrian, county, area/corridor
- Plan administration – locally administered or on-call firm

**Next Call –  
August 2016**

<https://connect.ncdot.gov/municipalities/PlanningGrant/Pages/default.aspx>

# *Content Standards for NCDOT Bicycle and Pedestrian Plans*

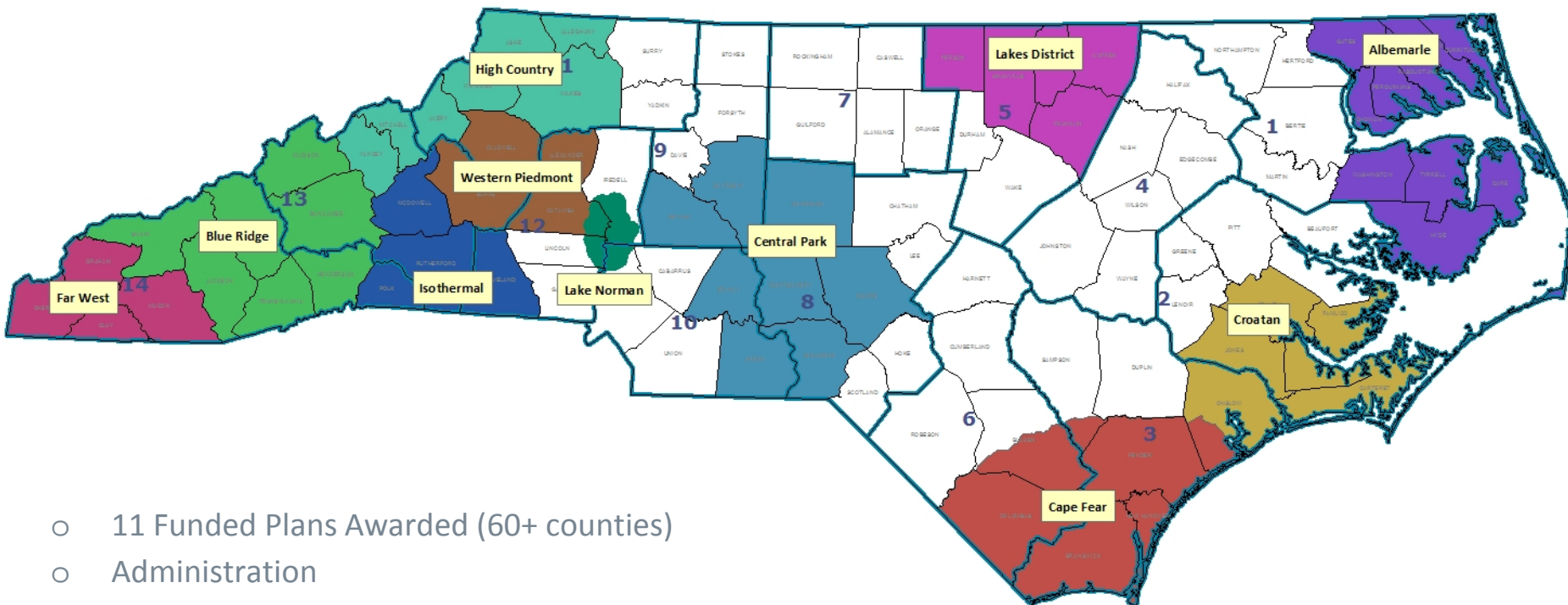


<http://www.walkbikenc.com/>

- a) Executive Summary (standalone document)
- b) Introduction (Vision/Goals and Benefits)
- c) Current Conditions
- d) Recommended Bicycle and/or Pedestrian System Plan – Projects
- e) Recommended Programs and Policies
- f) Implementation Plan



## Regional Bicycle Planning Program



- 11 Funded Plans Awarded (60+ counties)
- Administration
- Primary plan content
- Plan focus – regional connections, intracity connections (on and off road)
- Connections - natural resource, municipalities, other points of interest
- Purpose: economic/tourism, recreational (route delineation), transportation
- Outcomes: regional coordination, signage, map products, resurfacing, incidental

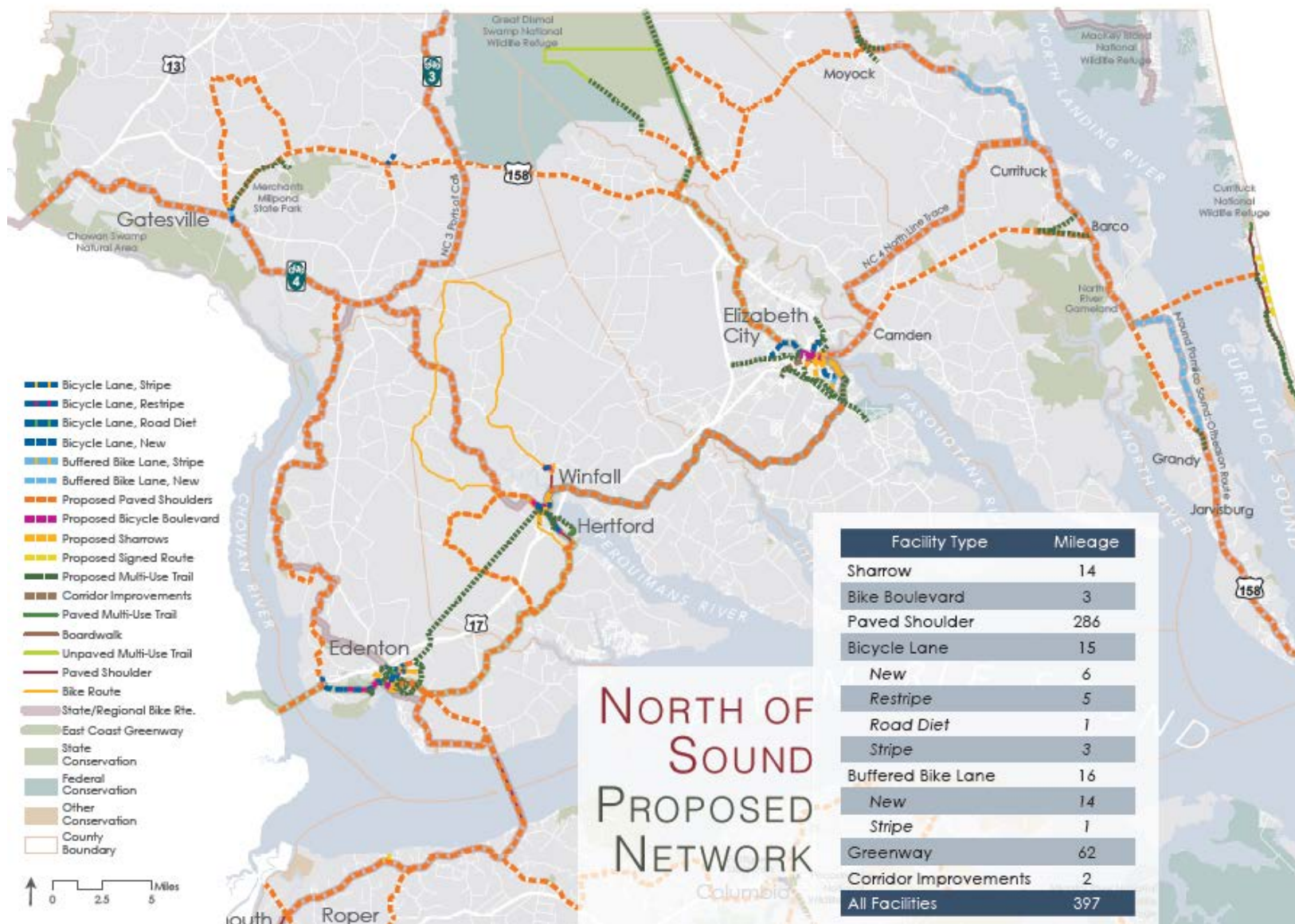


## Regional Bicycle Plans – Regional Route Focus





# Regional Bicycle Plans – Intracity/Regional Focus



## *Design Guidance in Bicycle and Pedestrian Plans*

### *Which bike and ped plans should address design guidance?*

Local or regional bike and pedestrian plans:

- that are prepared using NCDOT sponsorship through the Planning Grant program
- or that are prepared independently by cities and towns, consultants, MPO/RPO staff, or others

DBPT intention: To provide clear guidance so that all bike and pedestrian plans prepared in the state are implementable and useful





# *What is design guidance?*

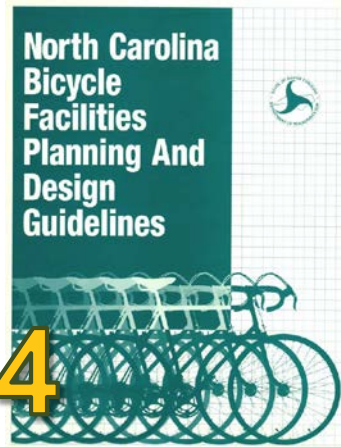
Design guidance = Recommended standards and specifications for bicycle and pedestrian facilities, by type

- Bike lane, multi-use path, sidewalk, curb ramps, signage, pavement markings, intersection improvements, crossing elements, and so on
  - Each is a distinct type of facility
- Where to find descriptions of facility types:
  - WalkBikeNC plan, p. 6-12 through 6-32
    - <http://www.walkbikenc.com/>
  - Pedestrian-Bicycle Infrastructure Network (PBIN) Glossary:
    - <https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf>

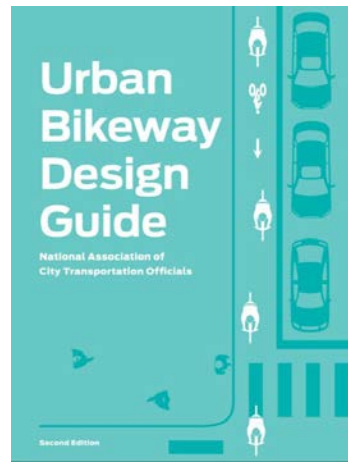
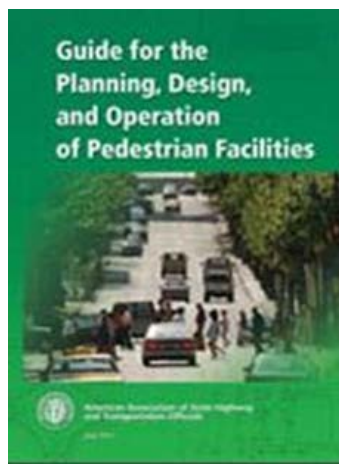
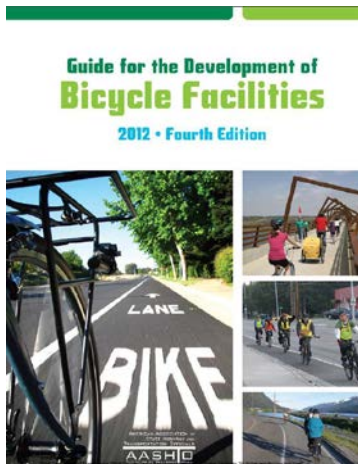


# Typical sources of design guidance

- Published as engineering handbook (AASHTO Bike Guide & AASHTO Ped Guide)
- Promulgated by a professional group (NACTO)
- Federal guidelines (ADA, PROWAG – US Access Board)
- State official standards (NCDOT Roadway Design Manual)
- Federal standards issued by FHWA (MUTCD; particular topics)



1994



# *How to include design guidance in bike and pedestrian plans*

Bike-Ped Division has eliminated the requirement that plans include a section on general design guidance

Instead:

- Use our website to find current sources of design guidance
- Determine which guidance is appropriate to use for proposed improvements
- Localize the guidance: Apply and adapt it to specific plan recommendations
  - To specific corridors, intersections, and conditions
  - Through project cut sheets, project descriptions, cross-sections, recommendations for signage or pavement markings at key locations, conceptual plans

Bike-Ped Division website on design guidance:

**<https://connect.ncdot.gov/projects/BikePed/Pages/Guidance.aspx>**

Statewide Bike-Ped Statewide Strategic Plan:

**[www.walkbikenc.com](http://www.walkbikenc.com)**





Don't	✓ Do
Regurgitate pages of general design guidance for facilities	<b>Tailor designs to local needs</b> (such as topography, right-of-way constraints, community context, types of users, key issues, and facility types)
Provide generic diagrams or cross-sections of facility types*	<b>Provide cutsheets that adapt and apply the standards</b> to the specifics of a particular context in the community  * If plan users need to know what a facility generally looks like, can include photo or sketch of an example
Reprint in every plan identical versions of how a facility should be designed	Take general standards for a facility, and <b>show how they would be applied to priority projects</b> that are recommended in the plan
Create a general design guidance reference manual	<b>Refer to the NCDOT Bike-Ped website</b> for the sources of guidance that should be consulted in facility design
Refer to facilities by unique, invented, or proprietary terminology, or colloquial terms ("bike path")	<b>Use the PBIN Glossary</b> to apply consistent, common vocabulary to facilities
Disregard local issues and needs (varying or constrained right-of-way or pavement width, built pattern, transitions between facility types)	<b>Go into more detail</b> where specially relevant to the community or to plan goals



# Example

## Project Cutsheet 7:

### MIDLAND ROAD

TO/FROM: Knoll Rd Greenway/ Knoll Road

DISTANCE (FEET): 1,900

FACILITY TYPE: Sidepaths

CONSTRUCTION METHOD: New Construction:

1) Extend the 10' greenway trail through the pines to join the southeast corner of the intersection of Midland/Dr. Neal Rd.

2) Stripe a high-visibility crosswalk on the east side of Dr. Neal Rd at Midland, crossing Midland Rd.

3) The nose of the landscaped (but not raised) median does not go far enough west to meet the location of where the crosswalk will be striped so part of this recommendation is to extend the median so that vehicles turning left will not interfere with ped safety in the crosswalk.

4) Install advance warning signs (pedestrian crossing ahead) in both directions for motorists on Midland Rd.

5) Install warning sign for northbound motorists on Dr. Neal Rd. (exiting the Mid Pines South neighborhood) "Right Turns Yield to Pedestrians"

6) Build 10' sidepath along the north side of Midland Rd.

TRIP GENERATORS: Knoll Rd Greenway and Pincrest High School to the south, park and schools to the north.

DEVELOPMENT/FUNDING MECHANISM: Secure an easement from the Mid Pines South homeowners association/developer and an encroachment agreement from NCDOT. Construction funding unidentified.

ROAD/LAND OWNERSHIP:

NCDOT/3 private parcels.

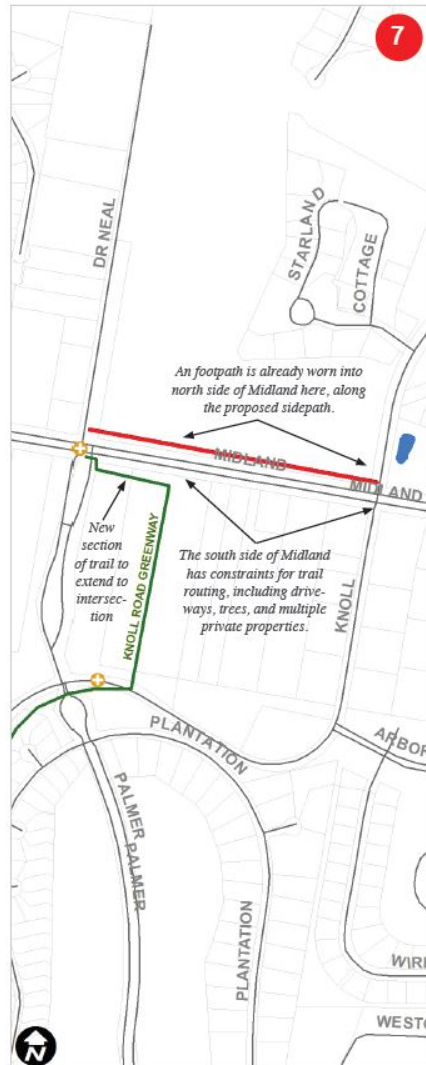
EXISTING LANE CONFIGURATION:

2 Lanes Each Way, Divided (60' w/ 15' Median):  
11 | 11 | 15 M | 11 | 11

PROPOSED LANE CONFIGURATION: Same

CONSTRAINTS: ROW needs to be researched; easements from nearby properties may be necessary. Mid-block crossing warrants are also needed.

NOTES/COMMENTS: People are already crossing at this location; in fact, there is a worn asphalt slab in the median, where the greenway currently meets Midland.



Below: Existing Conditions



Below: Rendering with new trail crossing and sidepaths (looking west on Midland with Dr. Neal Drive at right)



### Project Cutsheet 7

Project Segment Road	Midland Rd
From	Knoll Rd Greenway
To	Knoll Rd Greenway
Facility Type	Side Path/Multi Use Trail
Method	New Construction
Miles	0.36
Feet	1,900
10' Wide Multi-Use Trail Distance (mile)	0.36
\$/foot*	133
Subtotal	\$252,700.00
# of High Visibility Cross Walks (at Midland/Dr. Neal)	1
\$/each	\$1,500.00
Subtotal	\$1,500.00
# of Curb Ramps with Truncated Domes	2
\$/each	\$800.00
Subtotal	\$1,600.00
Total Estimate	\$255,800.00
Contingency	0.15
Grand Total	\$294,170.00

\*Project cost of \$133/LF is on the high end of state-wide averages

Sources include NCDOT, past projects, and current projects in other locations. ROW costs, if applicable, are not included.

## *Pedestrian & Bicycle Infrastructure Network*

The **Pedestrian and Bicycle Infrastructure Network** (PBIN) is a statewide Geographic Information System (GIS) inventory of existing and planned bicycling and walking facilities in North Carolina.

- Data Solicitation – counties, regional planning agencies, municipalities w/ 5,000+ population, CTPs, Planning Grant Initiative, etc.
- Data Integration

To date, approximately 300 datasets have been added and converted into the PBIN Geodatabase.

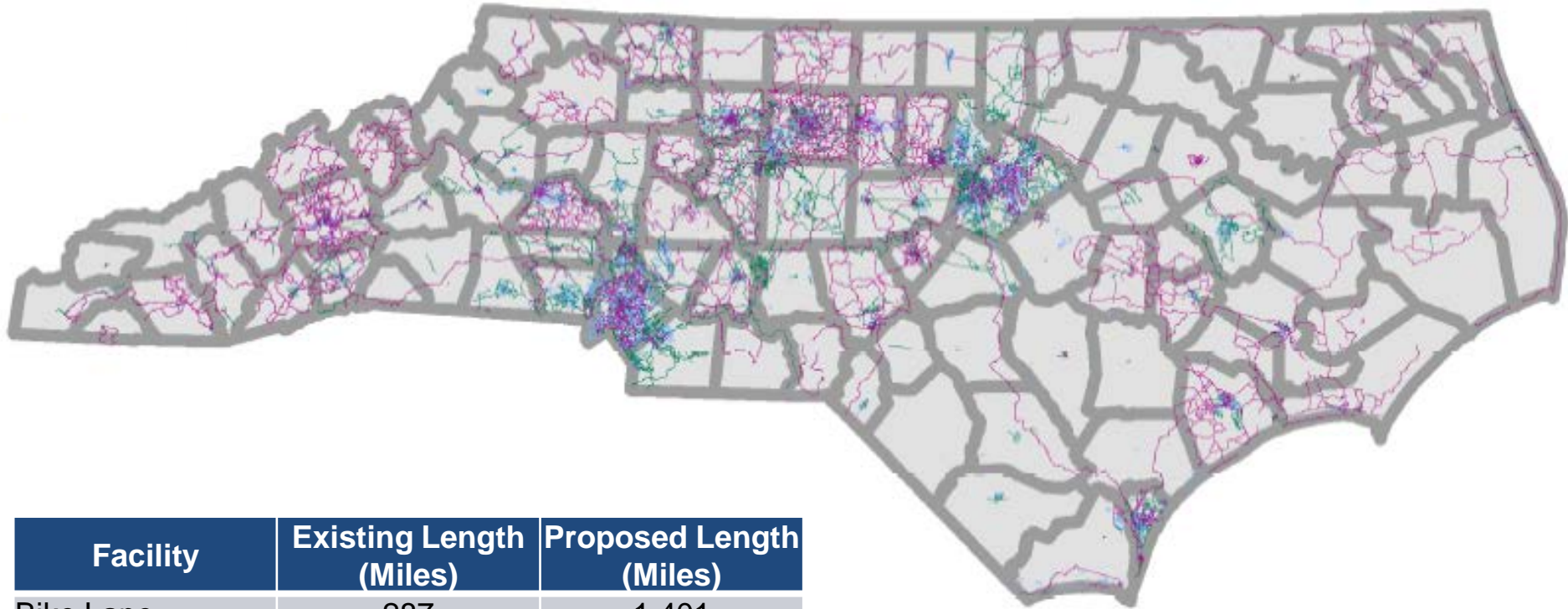
### Common Facility Data Collected

- Bicycle Facility Data – bike lane, paved shoulder, cycle tracks, bike route, shared lane markings, bicycle boulevard, bike parking, signage
- Pedestrian Facility Data – sidewalk, footpath, crosswalk, mid-block crossing, rectangular rapid flashing beacon, signage
- Shared Use Facility Data – shared use path, sidepath, unimproved trail, trailhead, signage

<https://connect.ncdot.gov/projects/BikePed/Pages/PBIN.aspx>

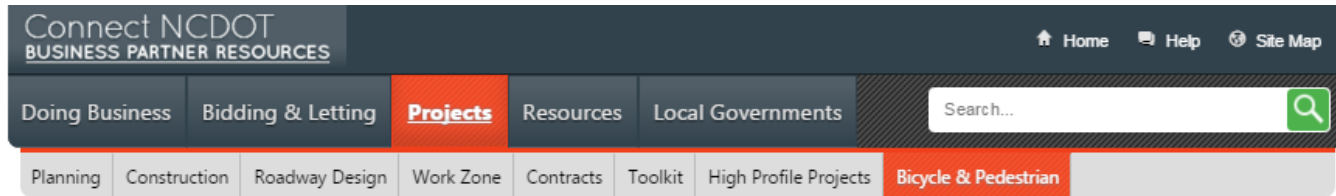


## *PBIN Coverage*



Facility	Existing Length (Miles)	Proposed Length (Miles)
Bike Lane	287	1,401
Paved Shoulder	266	2,034
Bike Route	8,459	3,304
Sidewalk	10,119	2,740
Footpath	2,769	13
Shared Use Path	1,958	6,367
Sidepath	133	293

# PBIN Info Online



## Pedestrian and Bicycle Infrastructure Network (PBIN)

A statewide Geographic Information System (GIS) inventory of existing and planned bicycling and walking facilities in North Carolina

Home > Connect NCDOT > Projects > Bicycle & Pedestrian > Pedestrian and Bicycle Infrastructure Network (PBIN)

### About the PBIN

The Pedestrian and Bicycle Infrastructure Network (PBIN) is a geodatabase that includes data on existing and proposed bicycle and pedestrian facilities throughout North Carolina. The initial data was collected by NCDOT partners at the North Carolina State University-Institute for Transportation Research and Education (ITRE). The PBIN data is not comprehensive, however, and updates to the geodatabase are ongoing. Municipalities are encouraged to submit their data, in a standardized format compatible with NCDOT's existing geodatabase.

### Viewing and Downloading Data

The geodatabase includes current and proposed bicycle and pedestrian facilities, arranged in six separate layer classes: pedestrian facilities, bicycle facilities, and shared use path facilities in both polyline and point formats. This data is updated on a quarterly basis.

In order to download, analyze, and/or manipulate the data, ArcGIS is required. The **Data Catalog** provides detailed attribute information. The **Geospatial Standards for Planning Grant Communities** document outlines specific requirements of data developed for bicycle and/or pedestrian plans awarded through NCDOT's Planning Grant Initiative Program.

- [PBIN Geodatabase \(December 2015\)](#)
- [PBIN Data Catalog \(December 2015\)](#)
- [Geospatial Standards for Planning Grant Communities \(January 2016\)](#)

### Related Links

- [Planning Grant Program](#)
- [NCDOT Statewide Pedestrian and Bicycle Plan](#)
- [NCDOT Division of Bicycle and Pedestrian Transportation Public Site](#)

### Key Downloads


- [North Carolina Terminology for Active Travel](#)
- [PBIN Geodatabase \(December 2015\)](#)
- [Blank Geodatabase Template \(January 2016\)](#)

To upload data, please use the following contact form below.



<https://connect.ncdot.gov/projects/BikePed/Pages/PBIN.aspx>

# Bicycle & Pedestrian Crash Data

**NCDOT** NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
*Connecting people, products, and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina.*

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Business | DMV | Newsroom | Programs | Projects | Travel & Maps

Home » Division of Bicycle and Pedestrian Transportation » Research & Reports » Crash Data Tool

## North Carolina Pedestrian and Bicycle Crash Data Tool


Home | Pedestrian Crash Data | Bicycle Crash Data | About | Help | Contact

Use our online database to learn about these North Carolina police reported bicycle and pedestrian crashes. Information for almost 40,000 bicycle and pedestrian crashes with motor vehicles in North Carolina has been compiled to create an interactive database. You can look for standard data tables for certain years or geographic areas, or create your own using our online query tool. Select bicycle data or pedestrian data below to begin.



### Pedestrian Data





Get information on nearly 30,000 NC police-reported pedestrian-motor vehicle crashes for 1997 through 2012.



### Bicycle Data

Get information on nearly 12,000 NC police-reported bicycle-motor vehicle crashes for 1997 through 2012.

### Resources

-  [NC Pedestrian Crash Facts Summary Report – 2008-2012](#)
-  [NC Bicycle Crash Facts Summary Report – 2008-2012](#)
-  [NC Pedestrian Crash Types Summary Report – 2008-2012](#)
-  [NC Bicycle Crash Types Summary Report – 2008-2012](#)

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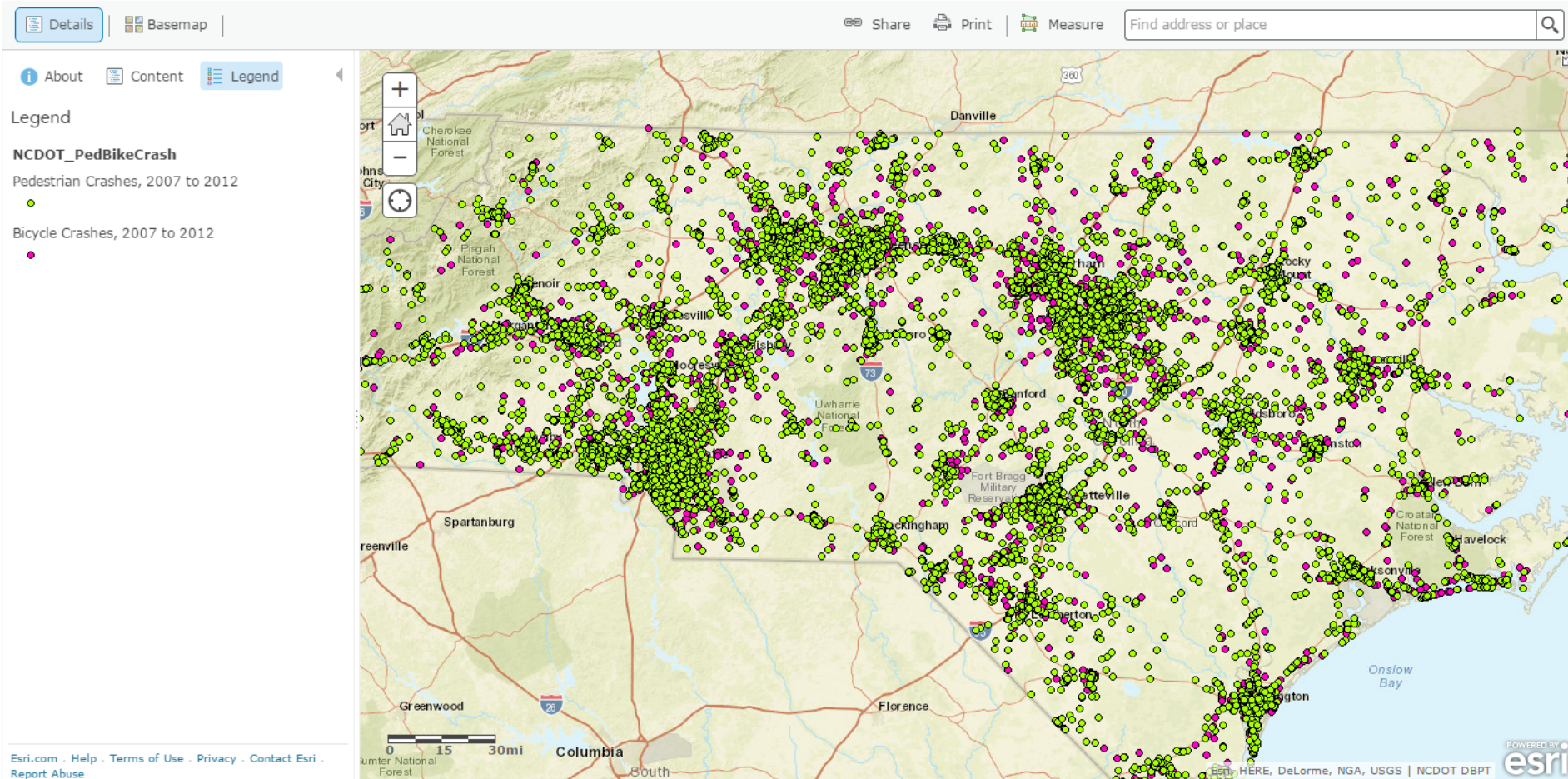
[http://www.pedbikeinfo.org/pbcata\\_nc/](http://www.pedbikeinfo.org/pbcata_nc/)



# Bicycle & Pedestrian Crash Data

ArcGIS ▾ NCDOT Bicyclist and Pedestrian Crash Map

Modify Map Sign In

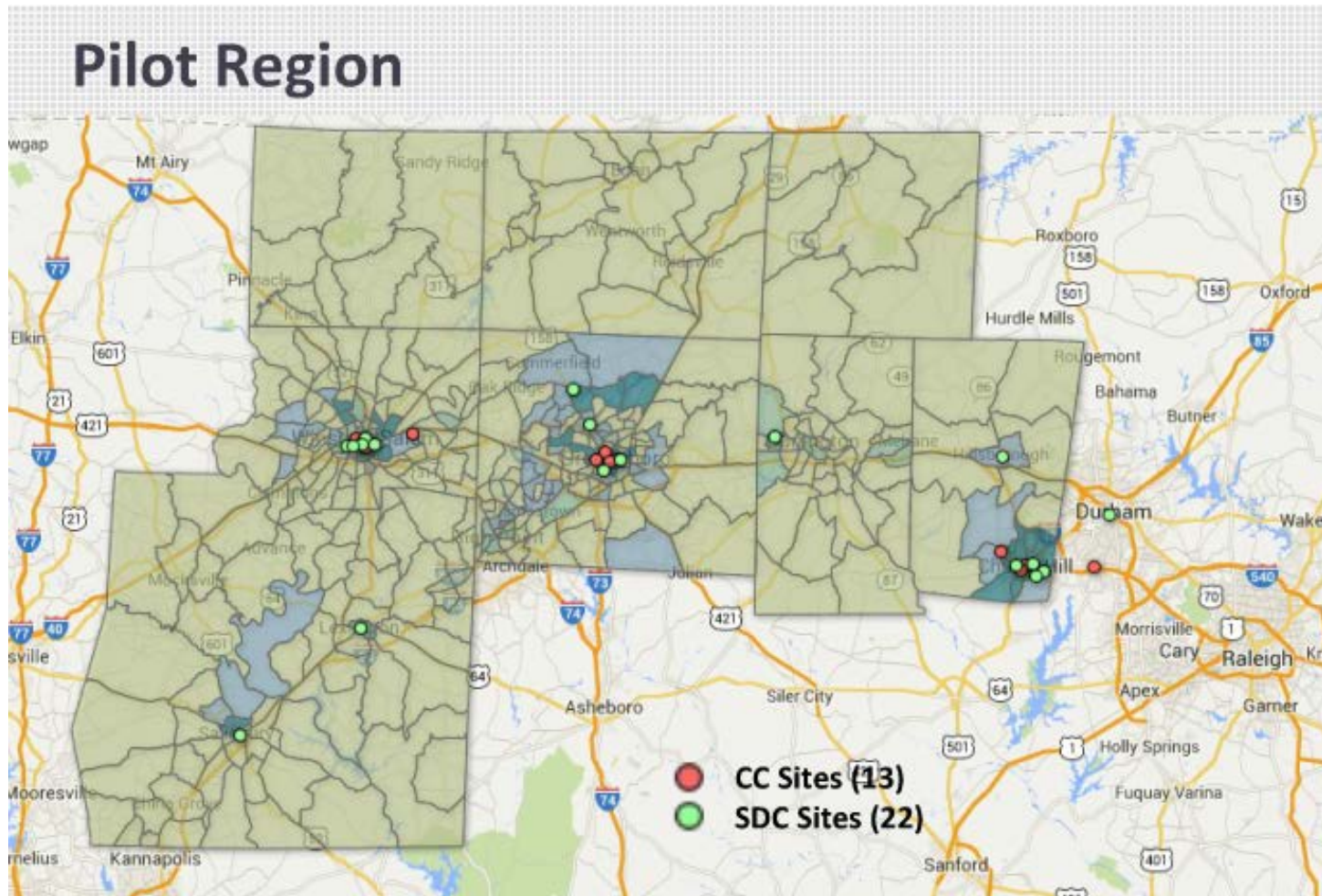


<http://www.arcgis.com/home/item.html?id=b4fcdc266d054a1ca075b60715f88aef>

# *Non-Motorized Traffic Monitoring Program (Pedestrian and Bicycle Counts)*

Pilot  
Region:  
Divisions 7  
& 9

Current  
Region:  
Divisions  
4, 5, 8 and  
10



<https://itre.ncsu.edu/focus/bike-ped/non-motorized-volume-data-monitoring/>

## *Bike/Pedestrian Facility Cost Tool*

- Tool capable of providing bike/pedestrian infrastructure cost estimates based on project info inputs provided by user
- Facility types: sidewalk, bicycle lane, shared use path, mid-block crosswalk, paved shoulder, pedestrian intersection treatments, shared lane markings, bicycle/pedestrian bridge
- Sample project cost data obtained from locals, NCDOT, consultants
- Potential use in strategic prioritization, planning documents, etc.
- Usability of tool is strongly dependent on the input of additional datasets



# Bike/Pedestrian Facility Cost Tool

## Shared-Use Facilities / Greenway Cost Estimation

<b>Name of Project:</b>		<b>Date:</b>
<b>Location/Decription:</b>		
<b>Enter the Following Information for Cost Estimate</b>		
Length of Shared-Use Path/Greenway (Feet)	1320	
Width of Shared-Use Path/Greenway (Feet)	10	
Required Length of Curb & Gutter (Feet)	0	Please enter the required length of curb & gutter to be constructed
No. of Intersections	2	
No. of Signals	8	Please enter the total number of signals required for the project
No. of Driveways	10	
Terrain	Level	
Crosswalk Thermoplastic Lines Length (Feet)	0	Enter either the length of croswalk thermoplastic lines or no. of crosswalks, whichever value is known
No. of Crosswalks	8	
Include Design Cost	YES	Select 'NO' if these costs are internal
Include Right of Way Cost	YES	
Include Construction Engineering & Inspection Cost	YES	

# *Bike/Pedestrian Facility Cost Tool*

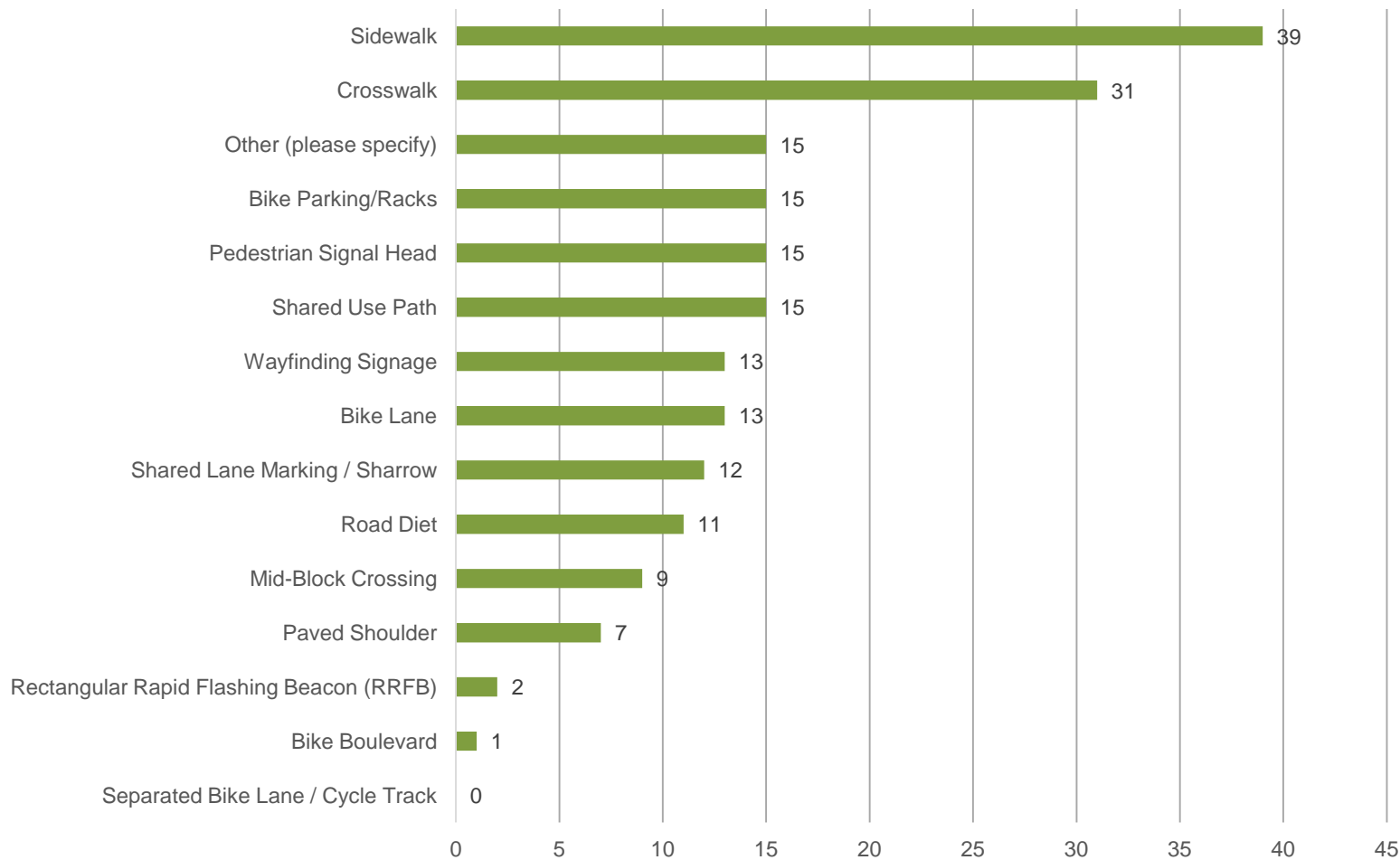
Facility Type	Construction Cost Elements
Sidewalk	Cleaning and Grubbing, Crosswalk, Curb and Gutter, Drainage (Per Ft), Earthwork (grading) (CY/Ft), Erosion Control (AC/Ft), Pavement Marking, Sidewalk Concrete, Signalization (EA), Signing, Traffic Control, Utilities and Wheelchair Ramp
Bicycle Lane	Cleaning and Grubbing, Crosswalk, Curb and Gutter, Drainage (Per Ft), Earthwork (grading) (CY/Ft), Erosion Control (AC/Ft), Pavement Marking, Signalization (EA), Signing, Traffic Control, Utilities, Pavement Widening and Wheelchair Ramp
Shared Use Path	Cleaning and Grubbing, Concrete Barrier, Crosswalk, Crosswalk Stripes, Curb and Gutter, Drainage (Per Ft), Earthwork (grading) (CY/Ft), Erosion Control (AC/Ft), Pavement Marking, Asphalt Surface for Greenway, Signalization (EA), Signing, Traffic Control, Utilities, and Wheelchair Ramp

COST CATEGORIES	Minimum Cost	Average Cost	Maximum Cost
Preliminary Engineering / Design Cost	\$0	\$129,841	\$247,232
Right-of-Way Cost	\$0	#DIV/0!	\$0
Construction Cost	\$80,432	\$254,749	\$799,247
Overhead Cost	\$0	\$0	\$0
Mobilization Cost	\$1,411	\$3,908	\$11,134
Construction Engineering & Inspection Cost	\$23,388	\$23,388	\$23,388
NCDOT Review Costs (\$5000 or 5% whichever is greater)	\$6,468	#DIV/0!	\$66,039
Contingency (30%)	\$24,130	\$76,425	\$239,774
<b>TOTAL COST</b>	\$111,699	#DIV/0!	\$1,147,040

## *Survey for Bike/Pedestrian Plan Implementation*

- Purpose of survey
- 61 responses from cities/towns of various sizes
- Median population size – 8,000
- Types of plans adopted by survey responders: pedestrian plan (41), bicycle plan (21), joint bicycle/pedestrian plan (11)
- Average/median year of adoption 2010/2011

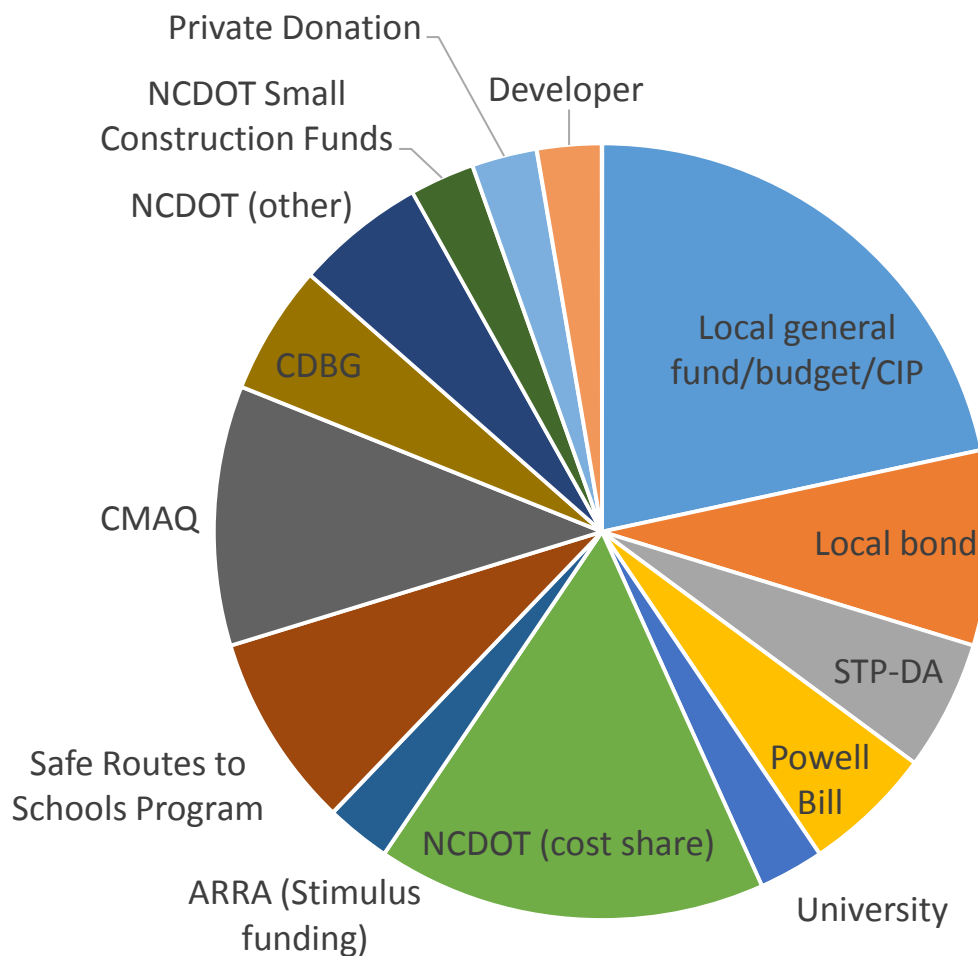
## *Bike/Ped Facilities Constructed*





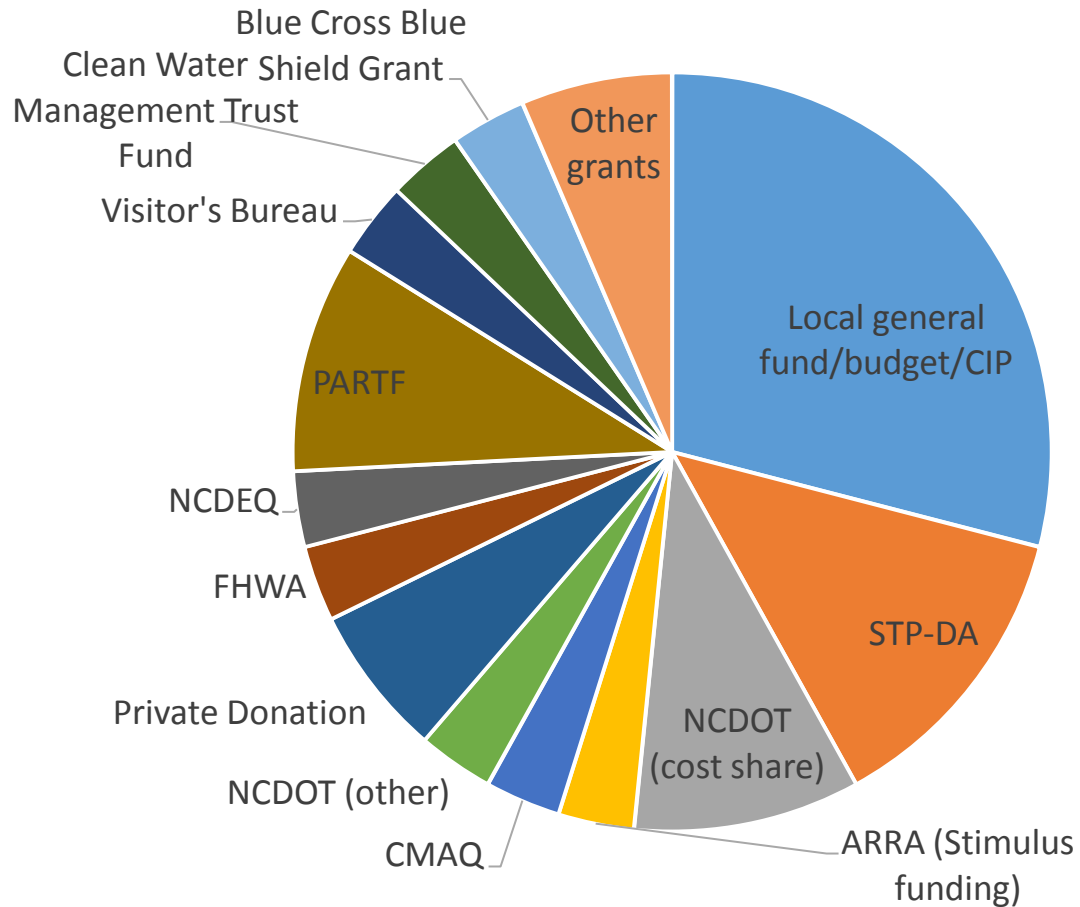
## Common Partners/Funding Sources - Sidewalk

37 count



# Common Partners/Funding Sources – Shared Use Paths

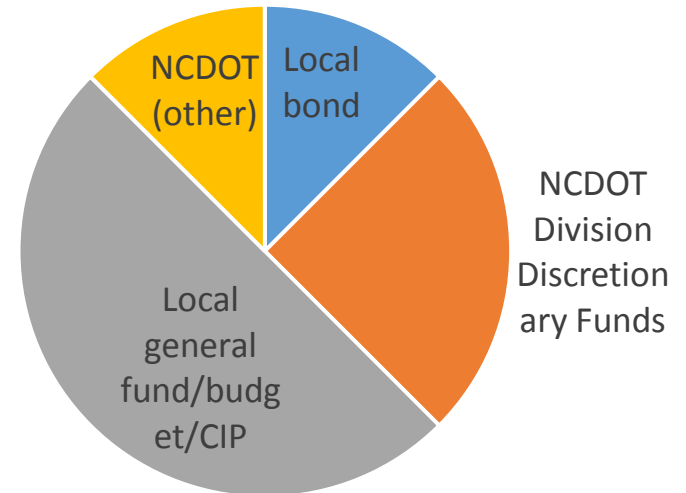
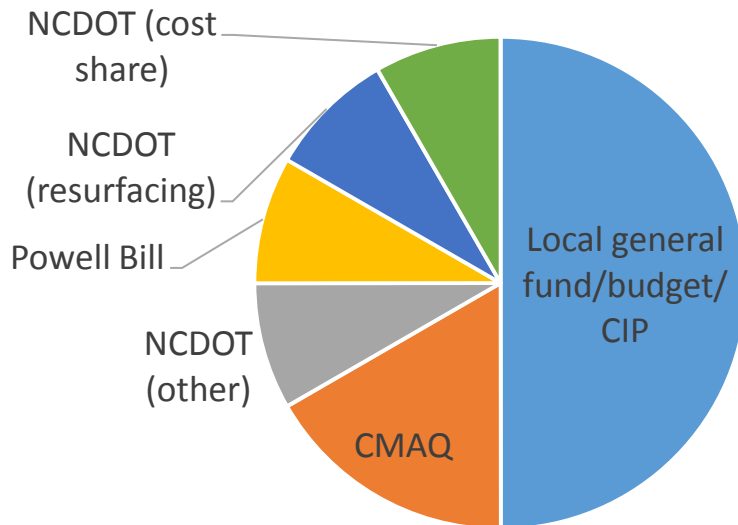
31 count



# Common Partners/Funding Sources – Other Facilities

On-Road Bicycle Facilities (12 count)

Intersection Improvements (8 count)



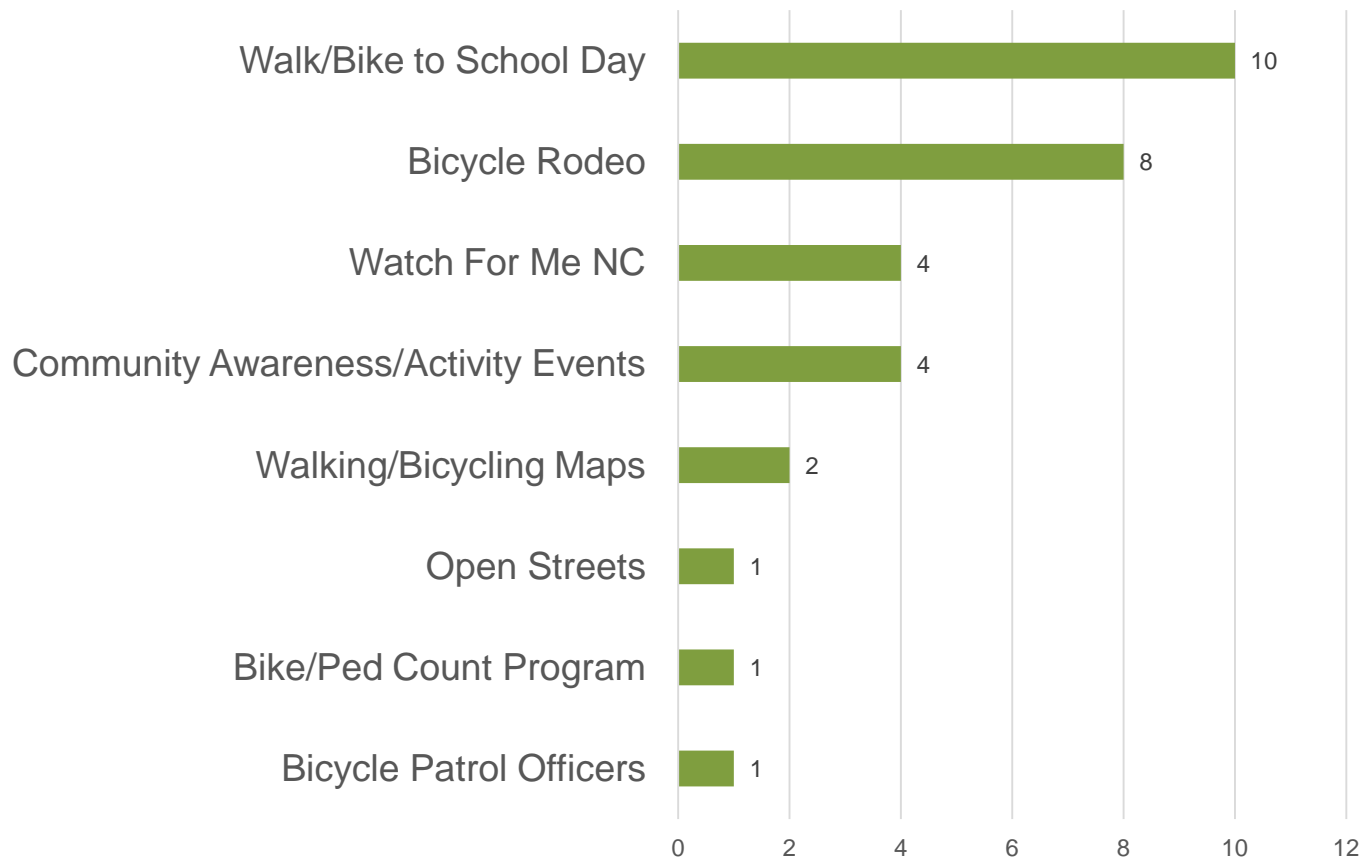
- *Wayfinding* (3) - Local general fund/budget/CIP, Downtown Special Tax District funds, Non-profit
- *Bike Racks* (2) - Local general fund/budget/CIP
- *Bike Boulevard* (1) - Blue Cross Blue Shield Grant

## *Projects Not Implemented*

- 41 projects (19 shared use paths / 15 sidewalks)
- Funding was the overwhelming constraint – either a very expensive project or limited local funds combined w/ limited state funds and grant opportunities
- 34 of 41 projects had good local support
- About ½ of project had right-of-way limitations
- Almost ½ had utility relocation issues (primarily sidewalk projects)



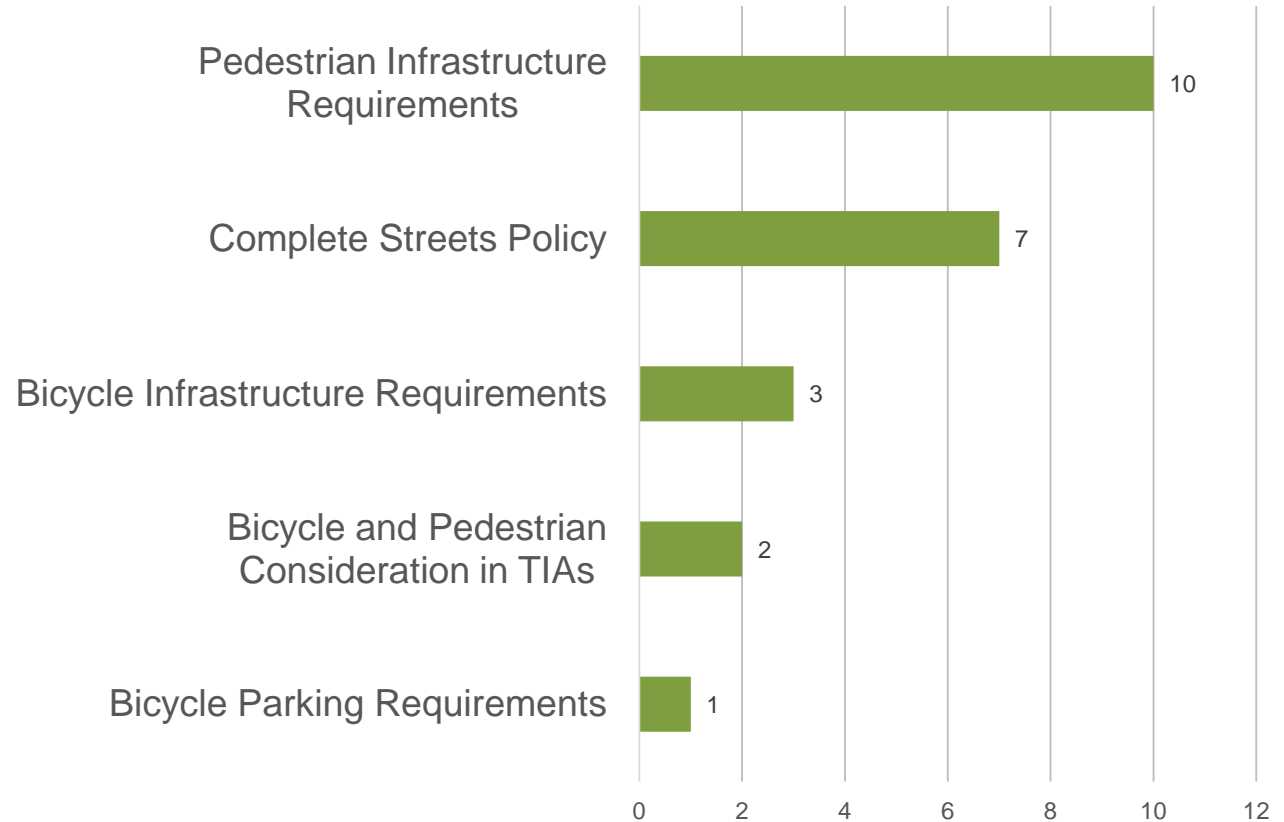
## Programs Implemented



### Primary Partners for Implementation

Municipal staff  
 BPAC  
 Schools  
 Police Dept.  
 Parents  
 Active Routes to School Coordinators  
 Health organizations

# Policies Implemented



Also, 10 communities indicated that a bicycle and/or pedestrian advisory committee was created after adoption of the bike and/or pedestrian plan.



**Division of  
Bicycle &  
Pedestrian  
Transportation**

John Vine-Hodge, Planning Program Manager  
Betsy Kane, Transportation Planner II  
[javinehodge@ncdot.gov](mailto:javinehodge@ncdot.gov) / [eakane@ncdot.gov](mailto:eakane@ncdot.gov)



*Transportation*