



# Pamlico County Comprehensive Transportation Plan Bicycle Element

Prepared for  
NCDOT Transportation Planning Branch

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# Highway Classification

- **Arterial System** - These highways, including expressways, accommodate moderate to high volumes of traffic for travel between major points. These highways are primarily for through traffic, usually on a continuous route, and are generally the top 10% of the total highway system based on relative importance for statewide travel.
- **Collector System** - Provide primarily intra-county service with shorter travel distances and generally more moderate speeds. These routes provide service to county seats and towns not on the arterial system. Routes, which carry traffic from local roads to arterials, are collectors.
- **Local System** - Provides access to farms, residences, businesses, or other abutting properties. The traffic volumes generated by the abutting land uses are largely short trips or a relatively small part of longer trips where the local road connects with major streets or highways of higher classifications.

# Introduction

Bicycle travel has played an historic role in transportation. Even before the invention of the automobile, the League of American Wheelmen promoted improved traveled ways. Increasingly, transportation officials throughout the United States are recognizing the bicycle as a viable transportation mode. While recreational cycling is still the primary use of bicycles in this country, the number of people using bicycles for commuting and other travel purposes has been increasing since the early 1970s. Nationwide, people are recognizing the energy efficiency, cost effectiveness, health benefits and environmental advantages of bicycling.

# Design

Design of new bicycle facilities, as well as improvements to existing facilities is an ongoing process that should be consistent with a Comprehensive Transportation Plan (CTP) considering the different bicycle users, existing conditions and community goals. A wide range of facility improvements can enhance bicycle transportation. An improvement can be simple and involve minimal design considerations (e.g., changing drainage grate inlets) or it can be more extensive (e.g., providing a shared use path). For example, improvements such as bicycle lanes depend on the roadway's design.

# Different Types Bicycle of Lanes

## Striped Bike Lane



This photo illustrates ideal conditions for striped bike lanes:

two –lane residential /collector street; low posted speed limit; 6-foot wide bike lanes placed beside 12-foot wide travel lanes; and an absence of complicated intersections.

**DEFINITION:** A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists.

# Different Types Bicycle of Lanes

## Multi-Use Pathways Bike Lane



This photo illustrates bicycle paths that are physically separated from roadways. It is generally not advisable to locate a two-way bicycle path immediately adjacent to a roadway because of confusion at driveways and intersections.

### DEFINITION:

A multi-use pathway is physically separated from motor vehicle traffic, and can be either within the highway right-of-way or within an independent right-of-way. Multi-use pathways include bicycle paths, rail-trails or other facilities built for bicycle and pedestrian traffic.

# Different Types Bicycle of Lanes

## Signed Bicycle Routes



This photo illustrates that signed bicycle routes are best implemented on existing low traffic volume residential or secondary roadways where the need for additional construction is not necessary.

**DEFINITION:** A signed bicycle route is typically designated along more lightly traveled residential or secondary roads and is indicated by signs with or without a specific route number. This type of facility should have appropriate directional and informational markers. Signed bicycle routes are designated by the jurisdiction having authority over the roadways included in the bicycle route system. Adding pavement width to the existing roads signed as bicycle routes is not normally required; however, choosing routes with minimal traffic hazards is typically part of the process to create a good route. Bicycle routes are often utilized to direct bicyclists to less-congested roadways that may follow the same general corridor as more heavily traveled arterial highways.

# Different Types Bicycle of Lanes

## Wide Outside Lanes



Wide outside lanes allow motorists to more safely pass slower moving bicyclists without changing lanes. Wide outside lanes are intended for bicyclists with traffic-handling skills.

**DEFINITION:** A wide outside lane (or wide curb lane) refers to the through lane closest to the curb and gutter of a roadway. Dedicated right turn only lanes are not used for wide outside lanes. Two ways to obtain widened outside lanes are:

1. Differential striping on an existing road: when existing multi-lane roadways are being re-surfaced, the inside lane can be narrowed to provide extra space for widening the outside lane; bicyclists and motorists can more safely operate in the same lane. This type of treatment is a non-construction alternative.
2. Widened outside lanes as a part of roadway improvement projects; new roadways can have additional width provided in the outside (or curb) lane as a part of the overall roadway construction project.

# Different Types Bicycle of Lanes

## Wide Paved Shoulders



This photo illustrates that wide paved shoulders may be added to sections of existing roadways where there is a need to more safely accommodate bicycles.

### DEFINITION:

A paved shoulder refers to the part of the highway that is adjacent to the regularly traveled portion of the highway and is on the same level as the highway. Ideally, wide paved shoulders should be included in the construction of new highways and the upgrade of existing highways where there is a significant level of current/potential bicycle travel.

A wide paved shoulder refers to additional pavement width of at least 4' that has been added to an existing roadway in order to more safely accommodate bicycles.

### WHEN TO CONSIDER THIS TYPE OF FACILITY:

On urban streets with curb and gutter, wide outside lanes and bicycle lanes are usually the preferred facilities. Shoulders for bicycle use are not typically provided on roadways with curb and gutter.

# Current State

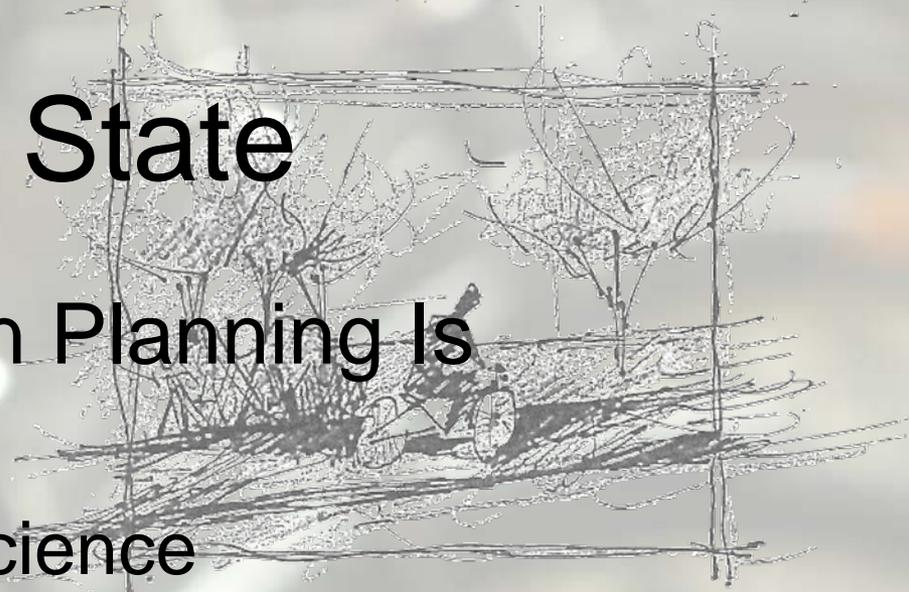
## Bicycle and Pedestrian Planning Is...

- 🌀 Governed in North Carolina by NCDOT Bicycle and Pedestrian Grant Program
- 🌀 Incorporated as Components of Comprehensive Transportation Plans (CTP)
- 🌀 Increasing in Importance: Riders ⬆️ As...
  - 🌀 Fuel Prices ⬆️
  - 🌀 Population in Poverty ⬆️
  - 🌀 Ecologically-Minded Population ⬆️

# Future State

## Bicycle and Pedestrian Planning Is Becoming...

- More Mature As a Science
- Integrated with Other Sustainability Programs
- Less Dominated by Advocate Interests
- Respected as a Legitimate Travel Option for an Increasing Number of People
- More Economically Attractive



# Benefits of Bicycle-Pedestrian Travel

## Economics

United States Bicycle Market, 1991-2000			
Year	Total Shipments	Imports	Domestic Production
Million Units			
1991	15.1	6.5	8.6
1992	15.4	6.3	9.1
1993	16.8	7.1	9.7
1994	16.7	7.0	9.7
1995	16.2	7.2	9.0
1996	15.5	7.5	8.0
1997	15.2	9.8	5.4
1998	15.8	13.8	2.0
1999	17.5	16.3	1.2
2000	20.9	20.2	0.7

Source: Bicycle Retailer & Industry News Directory, from The Bicycle Council, U.S. Department of Commerce, and Bicycle Retailer & Industry News.

More Bicycles Were Sold in the US than Cars in  
2004 – 2005 Markets.

# Benefits of Bicycle-Pedestrian Travel

## Economics

New and Used Passenger Car Sales and Leases (Thousands)										
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>New passenger car sales<sup>a</sup></b>	<b>9,300</b>	<b>8,175</b>	<b>8,213</b>	<b>8,518</b>	<b>8,991</b>	<b>8,635</b>	<b>R8,526</b>	<b>8,272</b>	<b>R8,139</b>	<b>U</b>
<b>Used passenger car sales<sup>b</sup></b>	<b>37,530</b>	<b>37,290</b>	<b>36,950</b>	<b>38,057</b>	<b>40,141</b>	<b>41,758</b>	<b>40,828</b>	<b>40,270</b>	<b>R40,220</b>	<b>40,890</b>
Value of transactions (\$ billions)	219	230	247	279	312	338	337	338	R335	361
Average price (current \$)	5,830	6,157	6,693	7,335	7,781	8,093	8,257	8,399	R8,341	8,828
<b>Total new and used passenger car sales</b>	<b>46,830</b>	<b>45,465</b>	<b>45,163</b>	<b>46,575</b>	<b>49,132</b>	<b>50,393</b>	<b>R49,354</b>	<b>48,542</b>	<b>R48,359</b>	<b>U</b>
<b>New passenger car leases<sup>c</sup></b>	<b>534</b>	<b>667</b>	<b>882</b>	<b>1,197</b>	<b>1,715</b>	<b>1,795</b>	<b>R1,806</b>	<b>2,062</b>	<b>R2,174</b>	<b>2,271</b>

<sup>a</sup> Includes leased cars.

<sup>b</sup> Used car sales include sales from franchised dealers, independent dealers, and casual sales.

<sup>c</sup> Consumer leases only.

**KEY:** R = revised; U = data are not available.

### SOURCES:

#### New passenger car sales:

1994-98: Ward's, *Motor Vehicle Facts & Figures, 1999* (Southfield, MI: 1999)

#### Used passenger car sales:

ADT Automotive, *2000 Used Car Market Report* (Nashville, TN: 2000), p. 5.

#### Leased passenger cars:

CNW Marketing/Research, personal communication, May 31, 2000.

# Benefits of Bicycle-Pedestrian Travel

## Safety

- 35% of All Cyclists Injured are 15 or younger
- Cyclist Injuries and Deaths decreased between 1995 and 2005
- More Cycling by More People – Many of Whom are Not Experienced – Will Reverse This Trend
- 20% of All Pedestrians Injured are 50 or older
- Accidents for Younger Pedestrians Tend to Occur between 3:00 p.m. and 7:00 p.m., and are much more likely to occur on Friday, Saturday, or Sunday

# Benefits of Bicycle-Pedestrian Travel

## Health & Mobility Options

Teaching Young Ones to Ride

Obesity

Staying Fit as You Get Older

- A 15-minute bike ride to and from work five times a week burns off the equivalent of 11 pounds of fat in a year.
- Physically active older people have much reduced rates of hip fracture.
- Pedestrians and cyclists breathe in less fumes from cars than auto riders.
- New cyclists covering short distances can reduce their risk of death by as much as 22 %.

# Benefits of Bicycle-Pedestrian Travel Sustainability

- Integrate Walking and Biking Into Sustainability
- Land Use Factors (3 Ds)
  - Density
  - Diversity
  - Design
- (Really) Complete Streets: Reconnecting Kids to the Outdoors



# All Pamlico County City and Rural Bicycle Crashes\*

City Name	1997	1998	1999	2000	2001	2002	2003	2004	Totals
Alliance	0	0	0	0	0	1	0	0	1
Bayboro	1	0	0	0	1	1	0	0	3
Grantsboro	0	0	0	0	0	0	0	0	0
Non-City (Rural)	3	1	3	1	0	2	1	0	11
Stonewall	0	0	0	0	0	0	0	1	1
<b>Totals</b>	4	1	3	1	1	4	1	1	16

\*Counts are of Crashes where at least one (1) unit was a bicycle.  
(data provided by The NCDOT Division of Bicycle and Pedestrian Transportation.)

# All Pamlico County City and Rural Pedestrian Crashes\*

City Name	1997	1998	1999	2000	2001	2002	2003	2004	Totals
Alliance	1	0	0	0	0	0	0	0	1
Arapahoe	0	0	0	0	0	0	0	0	0
Bayboro	0	2	2	0	0	1	1	0	6
Grantsboro	0	0	0	0	0	1	1	0	2
Non-City (Rural)	2	1	1	1	0	1	1	1	8
Stonewall	0	0	0	0	0	1	0	0	1
<b>Totals</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>3</b>	<b>1</b>	<b>18</b>

\*Counts are of Crashes where at least one (1) person was a pedestrian.  
(data provided by The NCDOT Division of Bicycle and Pedestrian Transportation.)

# Bicycle and Pedestrian

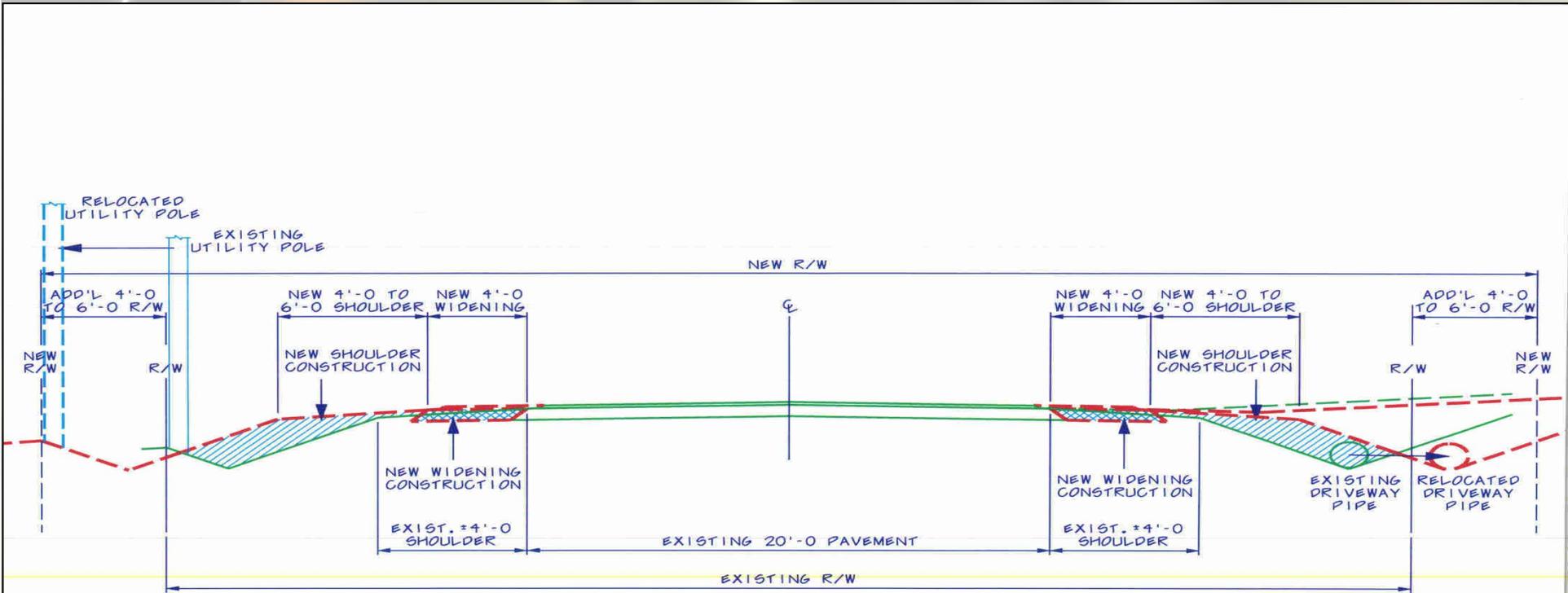
## An NCDOT study

An NCDOT study shows 46 percent of North Carolina households own bicycles. Eighty percent of households with four or more members own bikes.

The Bicycle and Pedestrian Planning Grant Initiative is an annual matching grant program that encourages municipalities to develop a comprehensive system of bicycle and pedestrian facilities. Since 2004, 80 municipalities have been awarded a total of more than \$1.9 million through this planning grant program.

Since 1987, the Division of Bicycle and Pedestrian Transportation has successfully completed a broad range of projects, including the design and construction of multi-use paths and rail trails; provision of on-road improvements such as bike lanes and bicycle-safe bridges; and mapping and signing more than 5,000 miles of local, regional and cross-state bicycle route systems.

# Typical Pavement Widening Section



# Best Existing Case



# Ideal Case



# Difficult to Bike or Walk



# Cost Comparison

- Adding 4-foot Paved Shoulders
- \$271,800\* per mile plus utility costs

\*Assumes 10 new driveway pipes, 4 cross line extensions, and 5' R/W needed on each side

Versus

- Resurfacing Only
- \$91,500 per mile

Thus, for every 1 mile of 4-foot paved shoulder, it “costs” 3 miles of resurfacing.

# Commons Questions

1 of 2

What are the criteria to add a facility as a state bike route? Traffic counts, scenery view, safety, request by the County Commissioners, or elected officials?

There are currently nine state bike routes. These were created over 15 years ago with only minor route modifications occurring due to road closures, conversions to full access control, etc. Originally, the routes were chosen due to bike-friendliness (based on road characteristics, such as traffic counts, truck traffic, speed limits, roadway space, etc.), directness between origins and destinations (thus paralleling many primary roadways), etc. There are no plans to add any additional state bike routes, but any suggestions for adding a more safe facility to the state bike route system will be considered.

What are the criteria to assign a facility as a state bike route? Or to propose new bike facilities to be approved by the NCDOT?

Bike facilities (bike lanes, wide outside lanes, paved shoulders, multi-use paths) can be constructed as an independent TIP project or as an incidental TIP project. Guidance on this process can be found here: [http://ncdot.org/transit/bicycle/funding/funding\\_TIP.html](http://ncdot.org/transit/bicycle/funding/funding_TIP.html) (The Bicycle and Pedestrian TIP process) and here: [http://ncdot.org/transit/bicycle/funding/funding\\_criteria.html](http://ncdot.org/transit/bicycle/funding/funding_criteria.html) (TIP Project Selection Criteria). The NCDOT Bicycle Policy can be found here: [http://ncdot.org/transit/bicycle/laws/laws\\_bikepolicy2.html](http://ncdot.org/transit/bicycle/laws/laws_bikepolicy2.html)

# Commons Questions

2 of 2

**How do you propose new sidewalks facilities to be approved by the NCDOT, as part of a TIP project?**

Pedestrian projects commonly are funded as incidental projects in the TIP (or when an independent project then through enhancement funding). The NCDOT Pedestrian Policy Guidelines can be found here: [http://ncdot.org/transit/bicycle/laws/laws\\_pedpolicy.html](http://ncdot.org/transit/bicycle/laws/laws_pedpolicy.html) and in more detail here:

<http://www.ncdot.org/doh/preconstruct/altern/value/manuals/ppm/ppm28/ppm28-1.pdf>

**How many miles of assigned bike routes are in Pamlico County?**

There are approximately 19 miles of State Bike Route no. 7 – Ocracoke Option in Pamlico County and approximately 35 miles of Around Pamlico Sound: Bicycling North Carolina's Outer Banks Region.

**Do you have the latest Typical Bike Lane Cross Section in color?**

I am only aware of a bike lane cross section in black and white – here:

[http://ncdot.org/transit/bicycle/projects/project\\_types/Bike\\_Lanes.pdf](http://ncdot.org/transit/bicycle/projects/project_types/Bike_Lanes.pdf) and page 24 of the current AASHTO Guide for the Development of Bicycle Facilities (publication of the updated AASHTO Guide in late 2009 or early 2010)

[http://www.sccrtc.org/bikes/AASHTO\\_1999\\_BikeBook.pdf](http://www.sccrtc.org/bikes/AASHTO_1999_BikeBook.pdf)

**Are there any documents about Bike Lane markings?**

AASHTO Guide for the Development of Bicycle Facilities ([http://www.sccrtc.org/bikes/AASHTO\\_1999\\_BikeBook.pdf](http://www.sccrtc.org/bikes/AASHTO_1999_BikeBook.pdf)) and Chapter 9C of the Manual on Uniform Traffic Control Devices found here:

<http://mutcd.fhwa.dot.gov/htm/2003r1r2/part9/part9c.htm>

A background image of a bicycle, showing the handlebars, front fork, and a portion of the front wheel with a fender. The image is slightly blurred and has a light, semi-transparent overlay.

# Transportation Improvement Program 2006-2012 State TIP (Incidental Projects\*) Bicycle & Pedestrian Program

City	Description	Facility
Oriental	Broad Street (NC 55) from Church St. to Post Office (in Broad St.)	Bicycle and Pedestrian Improvements

\*Bicycle/Pedestrian Facilities as Incidental Features of Highway Projects are Considered at the Highway Project Planning State

Not all Needs have a Corresponding Highway Project Scheduled at This Time. All Schedules are Subject to Availability of Funds and Further Study

# Conclusion...

I. More People Are Doing Bicycle and Pedestrian Plans and Design Work

II. Biking and Walking Can:

- A. Contribute Economically to a Community
- B. Provide More Alternatives More Often
- C. Be Integrated Into Roadway Design Better Than What is Occurring Now
- D. Provide an Important Component of Sustainable Design and Development

