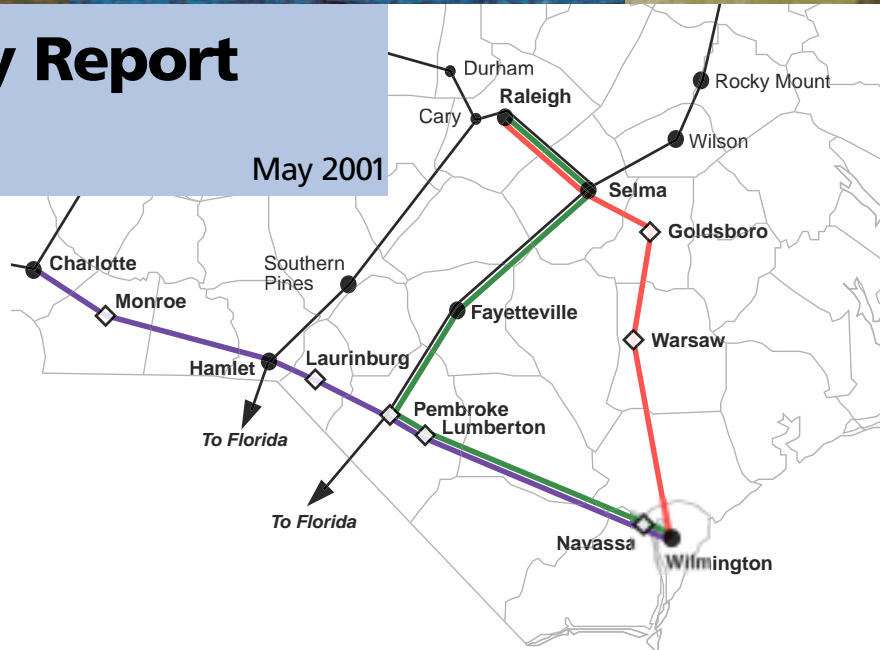


# Southeastern North Carolina Passenger Rail Feasibility Study



## Summary Report



North Carolina Department of Transportation  
Lyndo Tippett, Secretary

## **Introduction**

Between July 1999 and February 2001 the North Carolina Department of Transportation (NCDOT) studied the feasibility and desirability of restoring passenger rail service to Wilmington. To complete this feasibility study, the NCDOT contracted with the Institute for Transportation Research and Education (ITRE) and AECOM Consulting (formerly KPMG).

The Institute for Transportation Research and Education conducted research and public outreach activities to determine attitudes toward and interest in passenger rail service to Wilmington. AECOM Consulting (KPMG) forecasted potential ridership and revenue and estimated possible operating costs for such service.

While the studies initially focused on determining the need and desirability of a Charlotte–Wilmington rail service, early travel surveys and interviews quickly showed there was a far greater interest in a rail service that would give Wilmington residents interstate access to the Northeast Corridor and Raleigh. Thus, the study was amended to include two potential passenger routes to Raleigh with connections to the Northeast Corridor.

This summary describes and compares the routes that were analyzed and outlines the projected ridership, revenues and costs for passenger rail service to Wilmington.

In analyzing ridership and travel time, the study assumed that necessary modifications would be made to each of the routes. For each route, it was assumed that some signals would be upgraded, curves elevated and passing sidings added or upgraded to efficiently accommodate both freight and passenger trains on the route. For the Wilmington-Goldsboro-Raleigh alternate, it was assumed that 22 miles of track would be restored between Wallace and Castle Hayne. For the Wilmington-Fayetteville-Raleigh alternate, it was assumed that connecting tracks would be built at the track intersections in Pembroke and Selma.

While significant capital investments will be needed to begin service on any of the possible routes, specific needs and associated costs were not addressed in this feasibility study. Further studies are needed to determine which infrastructure improvements are needed and estimate the cost of making those improvements.

## **Resources**

*Ridership and Revenue Forecasts* – AECOM Consulting, McLean, Va. October 2000

*Summary of Attitudinal and Business Travel Survey Responses; And Potential Economic Impacts* – Institute for Transportation Research & Education, Raleigh, NC. September 2000

*Financial Summary for Passenger Rail Service to Wilmington*  
Darrell Smith, Jacksonville, Florida. December 2000

*Cover photos: NC Division of Tourism, Film and Sports Development & NC Department. of Transportation  
200 reports were printed at a cost of 62¢ each.*

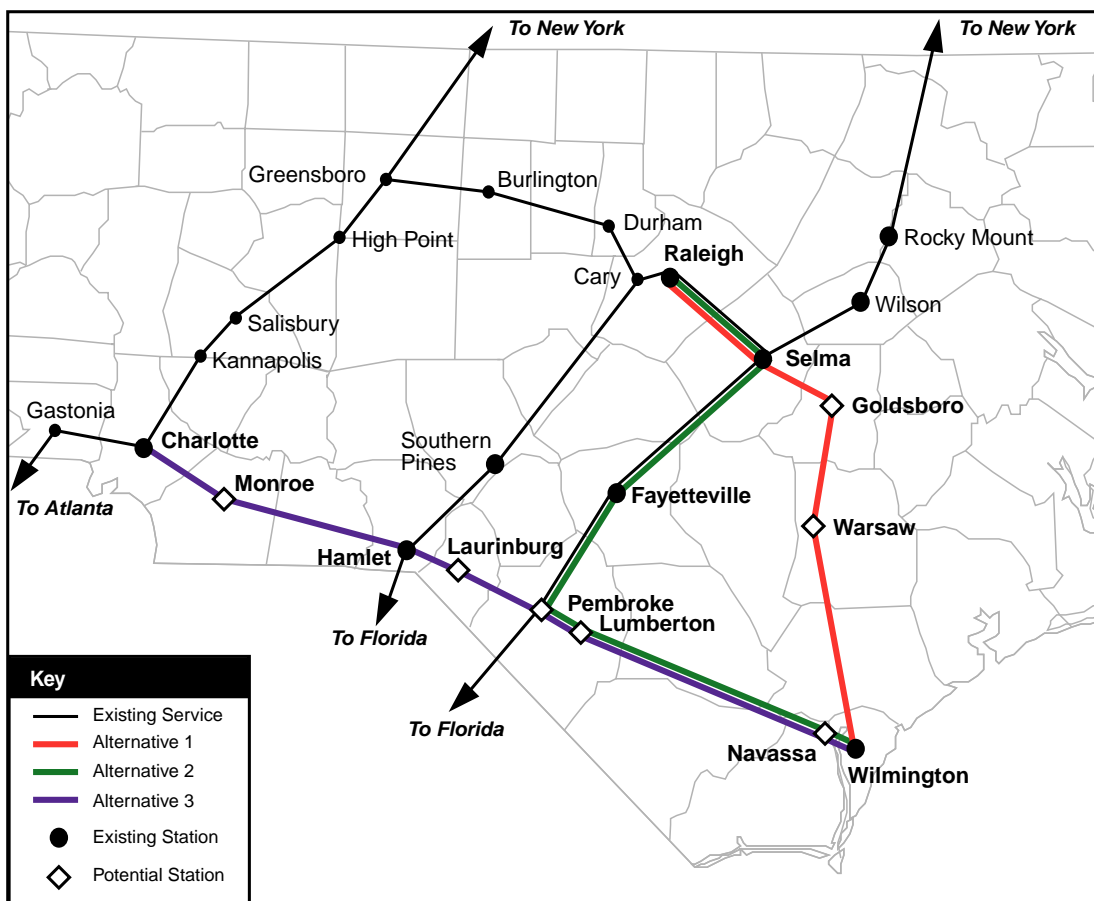
## Study Methods

The North Carolina Department of Transportation developed ridership and revenue forecasts for rail service to Wilmington using information assembled for the Southeast High Speed Rail Study (1996) and Piedmont High Speed Corridor Study (1996). The models used to forecast ridership demand incorporated factors such as comparative travel cost, travel time, frequency and other travel characteristics.

Due to the specific markets of interest in this study, additional data about travel origins and destinations was collected along I-40 near Warsaw and US-74 near Lumberton. More than 4,500 travelers were surveyed during two weekends in March 2000. Additional attitudinal surveys were conducted in Wilmington during the October Riverfest and April Azalea Festivals. Also, local business leaders and Chamber of Commerce members participated in surveys about business travel patterns.

The study analyzed five alternatives over three routes:

- 1) Wilmington to Raleigh via Goldsboro with no connections to other routes
- 1a) Wilmington to Raleigh via Goldsboro with connections to the *Carolinian* (and Northeast corridor)
- 2) Wilmington to Raleigh via Fayetteville with no connections to other routes
- 2a) Wilmington to Raleigh via Fayetteville with connections to the *Carolinian* (and Northeast corridor)
- 3) Wilmington to Charlotte with no connections to other routes



To evaluate and compare the alternatives, the studies estimated ridership and revenue performance for each route using a combination of measures: total population, population density along the route, train speed and route length. In general, ridership increases with higher and denser populations. Average speed and route length provide a measure of how competitive passenger rail service is with other modes, particularly travel by car. Intercity passenger rail generally is not competitive in short distance markets.

Operating costs were estimated based on past performance of similar trains including the *Piedmont* and *Carolinian*. The estimated expenses include all normal operating costs for passenger trains, such as: crews to operate the train, fuel, payments to the railroad for track use, insurance, maintenance of equipment, station services and other associated costs. (Station costs incorporate expenses for a staffed Wilmington station and an additional ticket agent in Raleigh, Fayetteville and/or Charlotte, depending on the alternative.) Cost estimates assume equipment maintenance and some on-board services would be contracted through other vendors (similar to *Piedmont* operations).

The potential for Wilmington passenger trains varies among alternatives, but is similar in route length, speed and number of passengers to the *Piedmont* corridor, while total population and population density are about half that of the *Piedmont* route.

**Alternative 1–Wilmington-Goldsboro-Raleigh** - has the lowest total population but, combined with the shortest route distance, it has the highest population per mile of the three alternatives (10-15 percent more than Alternatives 2 and 3) – though still significantly lower than the *Piedmont* corridor. This route provides a fairly direct path between Wilmington and Raleigh, however, the average speed in this alternative is only 37 mph.

**Alternatives 2–Wilmington-Fayetteville-Raleigh** - and Alternate 3 are slightly longer routes than the *Piedmont* with roughly half of the total population. The improved speed in Alternative 2 – an average 51 mph – allows a route that is 40 percent longer to serve another metropolitan area while adding only 13 minutes to the three-hour and 30-minute schedule for Alternative 1.

**Alternative 3–Wilmington-Charlotte** - is very similar to Alternative 2 in regards to these measures, with a route distance of 188 miles and average speed of 49 mph.

### Forecasted Results for Wilmington Passenger Rail Service

	<b>Alternative 1</b> Wilmington Goldsboro Raleigh	<b>Alternative 1a</b> Wilmington Goldsboro Raleigh New York	<b>Alternative 2</b> Wilmington Fayetteville Raleigh	<b>Alternative 2a</b> Wilmington Fayetteville Raleigh New York	<b>Alternative 3</b> Wilmington Charlotte
Route Length	132 mi.	132 mi.+ 531 mi.(RGH-NYC)	188 mi.	188 mi.+ 531 mi.(RGH- NYC)	188 mi.
Travel Time	3:30	3:30+ 9:52 (RGH-NYC)	3:43	3:43+ 9:52 (RGH-NYC)	3:50
Average Speed	38 mph	38 mph	51 mph	51 mph	49 mph
Ridership	31,500	39,700	34,700	43,700	28,500
Revenue	\$406,000	\$980,000	\$428,000	\$1,033,000	\$486,000
Operating Cost	\$2,284,000	\$2,284,000	\$2,696,000	\$2,696,000	\$2,555,000
Operating Loss (subsidy)	\$1,878,000	\$1,304,000	\$2,268,000	\$1,663,000	\$2,069,000

All figures reflect North Carolina portion of the route only unless otherwise indicated.  
Forecasted costs and revenues reflect annual estimates.

## Study Alternatives

### Alternative 1 and 1a—Wilmington to Raleigh via Goldsboro

The first alternative connects Wilmington to Raleigh via Warsaw, Goldsboro and Selma—a 132-mile route with an average speed of 38 mph. The travel time between Wilmington and Raleigh would be 3 hours 30 minutes. (The speed limits are largely determined by the condition of the railroad tracks.)

#### Sample Schedule Alternat 1 (Wilmington–Raleigh only) & Alternative 1a (with connection)

##### Southbound

6:05 am depart  
10:20 am depart  
3:26 pm depart  
4:22 pm arrive  
5:00 pm depart  
5:45 pm depart  
6:15 pm depart  
6:55 pm depart  
8:30 pm arrive



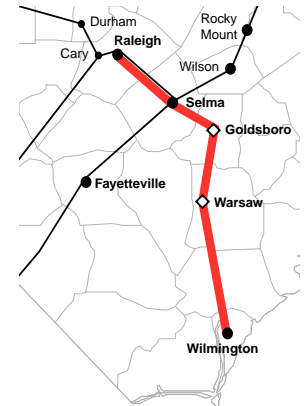
New York  
Wash. DC  
Selma  
Raleigh  
Raleigh  
Selma  
Goldsboro  
Warsaw  
Wilmington



##### Northbound

9:55 pm arrive  
5:55 pm arrive  
12:42 pm arrive  
11:57 am depart  
11:55 am arrive  
11:10 am depart  
10:40 am depart  
10:00 am depart  
8:25 am depart

Alternative 1a makes connection to the Carolinian. (The Carolinian also makes intermediate stops along the route.)



### Alternative 2 and 2a—Wilmington to Raleigh via Fayetteville

The second alternative connects Wilmington to Raleigh via Navassa, Lumberton, Pembroke, Fayetteville and Selma—a 188-mile trip with an average speed of 50 mph. The travel time between Wilmington and Raleigh along this route would be about 3 hours 45 minutes.

#### Sample Schedule Alternat 2 (Wilmington–Raleigh only) & Alternative 2a (with connection)

##### Southbound

6:05 am depart  
10:20 am depart  
3:26 pm depart  
4:22 pm arrive  
5:00 pm depart  
5:45 pm depart  
6:27 pm depart  
7:03 pm depart  
7:18 pm depart  
8:28 pm depart  
8:43 pm arrive



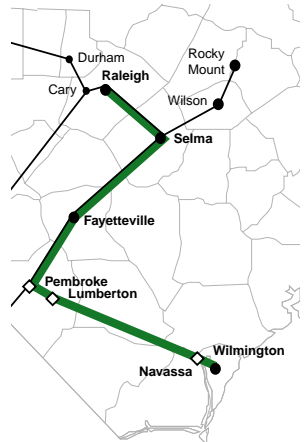
New York  
Wash. DC  
Selma  
Raleigh  
Raleigh  
Selma  
Fayetteville  
Pembroke  
Lumberton  
Navassa  
Wilmington



##### Northbound

9:55 pm arrive  
5:55 pm arrive  
12:42 pm arrive  
11:57 am depart  
11:55 am arrive  
11:10 am depart  
10:28 am depart  
9:52 am depart  
9:37 am depart  
8:27 am depart  
8:12 am depart

Alternative 2a makes connection to the Carolinian. (The Carolinian also makes intermediate stops along the route.)



### Alternative 3—Wilmington to Charlotte

The third alternative connects Wilmington to Charlotte via Navassa, Lumberton, Pembroke, Laurinburg, Hamlet and Monroe—a 188-mile trip with an average speed of 49 mph. The travel time would be 3 hours 50 minutes.

#### Sample Schedule Alternative 3

##### Eastbound

5:30 pm depart  
6:05 pm depart  
7:05 pm depart  
7:21 pm depart  
7:40 pm depart  
7:55 pm depart  
9:05 pm depart  
9:20 pm arrive

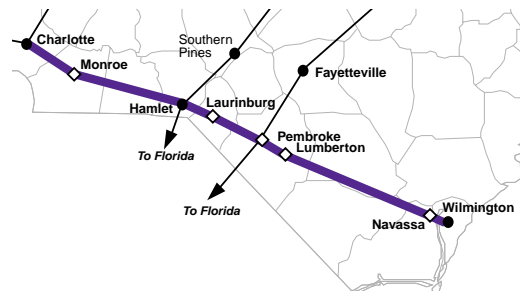


Charlotte  
Monroe  
Hamlet  
Laurinburg  
Pembroke  
Lumberton  
Navassa  
Wilmington



##### Westbound

12:20 pm arrive  
11:45 am depart  
10:45 am depart  
10:29 am depart  
10:10 am depart  
9:55 am depart  
8:45 am depart  
8:30 am depart



## **The Results**

### **Preferred Destinations**

The travel surveys showed that business travelers from Wilmington journey most often to Raleigh, Richmond/Washington, D.C., Florida, Philadelphia/New York City, Greensboro and Charlotte. Surveys also showed that the majority of visitors come to the Wilmington area five times or more each year. Most of those visitors come from the Triangle area, followed by the Charlotte and Triad areas. Residents from the Wilmington area travel most often for pleasure to (in descending order): Asheville, Philadelphia/New York City, Richmond/Washington, D.C., Florida and Atlanta.

### **Ridership and Revenue Estimates**

AECOM Consulting used the traffic/travel studies, along with existing information about rail in the Southeast, to determine the potential ridership and revenue for the three routes under consideration. When the numbers were calculated, the results showed that potential annual ridership ranged from 28,500 (Wilmington–Charlotte) to 43,700 passengers (Wilmington–Fayetteville–Raleigh with connections to the Northeast). The revenue variances were even more dramatic with ranges from \$406,000 to \$1,033,000 annually. The two routes that offered direct connections to the Northeast were projected to produce more than double the revenues of the routes that did not have onward travel connections.

Each of the in-state routes evaluated generated less revenue than the current *Piedmont* due to the lower population per mile. However, when the routes included connections to the Northeast, the Wilmington – Fayetteville–Raleigh route was projected to attract about 43,700 passengers annually—comparable to the *Piedmont's* annual ridership of about 54,000. Also, with the greater trip length into the Northeast, the Wilmington-Fayetteville-Raleigh-with-Northeast-connections route option was forecast to produce \$1,033,000 in revenues.

### **Cost Estimates**

Two cost estimates were developed for each route option. The first cost estimate assumed that Amtrak would provide all necessary personnel and services to operate the route; the second cost estimate assumed that, similar to the operation of the *Piedmont*, maintenance of equipment and onboard service (dining and beverage supplies and personnel) would be contracted out.

Using the "contract out" options as examples, the Wilmington–Goldsboro–Raleigh alternative incurred lower operating costs annually at \$2,284,000 than did the other two options and thereby produced the lowest annual operating loss of the three options at \$1,304,000. While the Wilmington–Fayetteville–Raleigh route produced the highest revenues, because of the circuitous route via Fayetteville, it incurred an annual operating loss approximately \$360,000 greater than the Goldsboro route. The annual operating loss of the Wilmington–Charlotte route because of its lack of onward connections, was the highest of the three routes, at \$2,069,000. The Charlotte route's revenues also were approximately one-half those of the two Raleigh options, when onward connections were factored in.

## **Recommendations**

The preliminary feasibility studies indicate that there is potential for future passenger rail service to Wilmington. While initial evaluations showed that none of the three proposed routes would provide a breakeven operation in the near term, the two Wilmington–Raleigh routes that include connections to long-distance trains produced financial results similar to other short distance Amtrak services and merit additional consideration.

Based on the results of this initial feasibility study, the North Carolina Department of Transportation recommends the next major steps toward service implementation:

- 1) conduct further studies to determine what capacity and safety improvements to existing tracks would be needed to add passenger trains to the routes in question
- 2) begin discussions with CSX and Norfolk Southern railroads about operating passenger rail service over their property to and from Wilmington,
- 3) begin securing property to develop a multi-modal station in Wilmington that would serve rail and bus passengers,
- 4) conduct an inventory of stations along the route alternatives,
- 5) work with the State Ports Authority to assess economic impacts of route alternatives, and
- 6) conduct additional attitudinal and travel surveys centered on Fayetteville.