

## **Report on Western North Carolina Rail Operations and Station Right-of-Way Acquisition**

North Carolina has made significant investments to expand the state's transportation system and provide safe and efficient alternative transportation. As our population continues to grow, it becomes even more critical to build a seamless, integrated transportation system that includes trains, buses, and regional transit, as well as highways, airports and accommodations for bicycles and pedestrians.

Operation of the high-speed passenger rail route via North Carolina's populous piedmont crescent will be enhanced through extensions of conventional passenger service to the mountains in the west and across the coastal plain to the southeast. This report provides more detailed information for consideration of service to western North Carolina.

### **Background**

The state of North Carolina financed, built and operated the Western North Carolina Railroad until 1886 when it was leased, then sold to the Richmond and Danville Railroad. In 1894, that railroad became part of the Southern Railway Company. Southern Railway took over operation of the Western North Carolina Railroad in 1896. While regular passenger train service to Asheville and western North Carolina ended in 1975, the area still attracts millions of visitors each year—many from cities served by existing Amtrak service. Increased support for passenger rail service has sparked renewed interest in re-establishing service to Asheville to enhance economic development and improve the state's transportation infrastructure.

The North Carolina Department of Transportation (department) first considered extending passenger rail service to western North Carolina at the request of the western North Carolina delegation to the General Assembly during the mid-1990s. In 1997 the department reported on five alternatives for extending passenger rail service to Asheville and western North Carolina. Based on an evaluation of each alternative's projected ridership, revenue production and costs, that study identified service from Raleigh to Asheville via Salisbury as the preferred route. The 2000 session of the North Carolina General Assembly directed the Department to re-evaluate western North Carolina service based on a Salisbury to Asheville route and to develop more detailed cost estimates and conceptual plans. The study was designed to update and expand the 1997 Western North Carolina Passenger Rail Study.

Up to \$250,000 was appropriated during the 2001 session of the General Assembly for an engineering study to determine the necessary infrastructure improvements and costs of those improvements to provide passenger rail service to western North Carolina. The Department worked with Norfolk Southern Corporation to select The Woodside Consulting Group, Inc. to evaluate the improvements needed for the Salisbury to Asheville segment of the Norfolk Southern "S-line."

The Asheville Area Chamber of Commerce, in conjunction with other regional leaders, formed the Western North Carolina Rail Corridor Committee in March 2000 to promote restoration of passenger rail service to the foothills and mountains of North Carolina and to provide assistance and support to the Department. This committee consists of stakeholders and representatives from communities along the proposed route between Salisbury and Asheville. The committee has encouraged each community to form a local task force to provide support for station restoration projects and they have organized and hosted monthly committee meetings to inform members of the progress and status of the passenger rail initiative.

## Route of the Proposed Western North Carolina Passenger Rail Service



### Study Scope

Norfolk Southern's stated objective for the study is to facilitate implementation of passenger trains while minimizing interference with their freight trains operating between Salisbury and Asheville. The study determined the impacts of the proposed passenger trains on the operations of Norfolk Southern's freight trains, identified track capacity required to mitigate the impact of the passenger trains, and estimated the costs for the physical improvements. In addition, the study identified passenger schedules for the proposed passenger train operations.

The engineering analysis evaluated the current freight operations and the required passenger improvements across the 139 miles of the Norfolk Southern S-line. The number of tracks, length and number of sidings and signaling system restrict the capacity of the railroad to accommodate additional trains. For instance, the Salisbury to Asheville segment is a single-track railroad with train control signals along only two of the 139 miles. To efficiently accommodate passenger and freight trains, train control signals will need to be added along the remaining route. Additionally, there are 14 sidings, ranging from 2,000 to 13,500 feet long, which allow trains to pass each other along stretches of single-track railroad. The existing sidings limit train speeds to 15 miles per hour when entering or exiting sidings. The sidings would need to be upgraded to allow for timely and efficient train movements.

The S-line gradient varies between 0.75 to 1.5 percent between Salisbury and Old Fort and between Ridgecrest and Asheville. Curvature ranges from 1 to 4 degrees. From Old Fort to Ridgecrest there are about 11 miles of gradient, ranging from 1.5 to 2.9 percent as the line climbs the summit of the Blue Ridge Mountains traversing seven tunnels. Curvature in this portion ranges from 8 to 14 degrees. There are 192 highway-railroad crossings and 74 bridges or grade separations on the S-line. The steeper the gradient and higher the curvature, the slower the trains can run.

The initial study scope was revised to increase the passenger train speeds to the maximum conventional top speed of 80 miles per hour where practical, and to increase the number of passenger trains to two per day per direction. This action was taken to develop an estimate for the minimum travel time and to facilitate transfers to the state-sponsored *Piedmont* (Amtrak trains 73 and 74) and *Carolinian* (Amtrak trains 79 and 80) passenger trains. The department initially requested operating schedules of no more than 3 hours and 45 minutes; Norfolk Southern responded with a scheduled run time of 3 hours and 15 minutes.

During the course of the study two key variables changed which also impacted the study:

- Norfolk Southern revised regional freight operations to add trains and to initiate scheduled freight service.
- In December 2001, Norfolk Southern discontinued Asheville to Greenville, SC service via the “Saluda Line” and re-routed 10 freight trains per week over the Asheville to Salisbury line, increasing traffic on an already busy stretch of railroad.

The consultant asserts that introduction of passenger service under current conditions would have a significant adverse effect on Norfolk Southern operations. Each Norfolk Southern freight train that must meet or pass a passenger train could experience delays of 45 minutes to one hour. The study identified 33 instances where freight and passenger trains would meet and need to pass each other.

### Engineering Study Recommendations

The proposed station stops are: Salisbury, Statesville, Hickory, Valdese, Morganton, Marion, Old Fort, Black Mountain and Asheville.

#### Proposed Schedules for the Salisbury-Asheville Passenger Trains

Service	Train No.	Direction	Salisbury	Asheville
<b>Connecting Amtrak Trains</b>	80	Eastbound	8:45 AM ar.	-
	73	Westbound	9:25 AM ar.	-
	74	Eastbound	6:30 PM ar.	-
	79	Westbound	7:05 PM ar.	-
<b>Salisbury-Asheville Line Trains</b>	72	Eastbound	8:15 AM ar.	5:00 AM dp.
	75	Westbound	10:00 AM dp.	1:15 PM ar.
	76	Eastbound	5:45 PM ar.	2:30 PM dp.
	71	Westbound	7:35 PM dp.	10:50 PM ar.

Schedules for connecting Amtrak trains numbers 80, 73, 74 and 79 assume 20 minutes of travel time reduction following completion of the North Carolina Railroad Improvement Program between Greensboro and Raleigh in 2004.

### Recommended Infrastructure Improvements

- Construction projects include installing power turnouts; extending to 10,000 feet and/or rehabilitating 10 sidings; upgrading seven shorter sidings; upgrading track and bridges to accommodate higher speed operations; and increasing super-elevation and lengthening curve spirals. The estimated cost is \$101,400,000.

- Installing train signal controls over the 138.9 miles and modifying or upgrading grade crossing warning systems will cost an estimated \$33,300,000.

The total estimated costs for the recommended infrastructure improvements are \$134,700,000. Appendix A provides a detailed listing of the proposed improvements.

### **Station Improvement Program**

The primary purpose of the Station Improvement Program is to provide safe, clean and functional passenger stations in cities that are or will be served by passenger rail service. The program includes both restoration of historic stations and construction of new stations. For the western North Carolina route, each community must provide a minimum of 10% matching funds, and develop a plan for use of the facility that serves the traveling public and provides for broader, alternative community uses.

The Department works with communities along the route to help transfer existing station properties from the railroads to the municipality. The communities make a long-term commitment to manage and maintain their facility. We work with the localities to develop partnerships with chambers of commerce, the development community, transit and intercity bus interests, historic preservation groups, and travel and tourism destinations.

All historic stations are restored in accordance with the U.S. Secretary of the Interior's Standards and Guidelines and make use of federal Transportation Enhancement Program funding, as well as other public/private restoration grants. All passenger facility improvements comply with the Americans with Disabilities Act.

We work with the localities to develop existing community resources into a center of activity to serve the rail passenger market and other mixed uses. The Station Improvement Program often serves as a catalyst for downtown re-development, incorporating multiple uses into the facility proper, and attracting significant additional development to adjacent areas.

**Statesville:** The city of Statesville has decided to delay their participation in the Transportation Enhancement Program that would restore the historic Statesville train station to active service. The city determined it was not currently financially feasible to participate in the 80-10-10 matching fund program. They plan to reconsider their participation later.

**Hickory:** The city of Hickory has adopted a municipal agreement to use Transportation Enhancement Program funds to restore the historic train station. The city has selected an architectural firm to begin the conceptual design and construction-drawing phase of the project. Completion of the conceptual plan is expected in mid-summer 2002, and final construction plans by early 2003.

**Valdese:** The town of Valdese does not have a historic train station, and the General Assembly declined the Governor's Budget recommendation to fund property acquisition for a new station. The town has worked with the department to develop a new train station design, station layout and site plan. The plan calls for the new train station to share space with a bakery that would use the historic Waldensian recipes.

**Morganton:** The city of Morganton has adopted a municipal agreement to use Transportation Enhancement Program funds to restore the historic train station. The city has selected an architectural firm to begin the conceptual design and construction-drawing phase of the project. The anticipated completion of the construction plans is late 2002, with construction scheduled for early 2003.

**Marion:** The city of Marion has adopted a municipal agreement to use Transportation Enhancement Program funds to restore the historic train station. The city has selected an architectural firm to begin the conceptual design and construction-drawing phase of the project. The anticipated completion of the construction plan is late 2002, with construction scheduled for early 2003. The city is currently working with department staff and Norfolk Southern personnel to determine whether or not the station can remain in its current location or if it must be relocated outside the Norfolk Southern right of way.

**Old Fort:** The town of Old Fort has adopted a municipal agreement to use Transportation Enhancement Program funds to restore the historic train station. The town has selected an architectural firm to begin the conceptual design and construction-drawing phase of the project. The anticipated completion of the construction plans is late 2002, with construction scheduled for early 2003.

**Black Mountain:** The town of Black Mountain has adopted a municipal agreement to use Transportation Enhancement Program funds to restore the historic train station. The town has selected an architectural firm to begin the conceptual design and construction-drawing phase of the project. The town is working with the design firm, department staff, and Norfolk Southern personnel to determine whether or not the station will require relocation or if it can be restored in its current location.

**Asheville:** The city of Asheville is currently working with department staff to select an architectural firm to begin the conceptual design of a multi modal transportation facility located in the Biltmore Station shopping center located adjacent to Biltmore Village. The facility will likely incorporate two historic commercial buildings, thereby qualifying for federal Transportation Enhancement Program funds. This is a change from the earlier initiative to acquire right of way in Asheville to construct a new station. The anticipated completion of the conceptual plan is mid to late summer. Following the completion of the conceptual plans, the city will negotiate property acquisition for the future transportation facility.

### **Crossing Safety**

The 139-mile rail line between Salisbury and Asheville has a large number of highway-railroad at-grade crossings and grade separations or bridges. There are 192 highway-railroad at-grade crossings and 74 grade separations (or bridges) on the line. The engineering study recommends a program to upgrade the track circuits to revise the crossing warning predictors for the proposed increased train operating speeds.

## Inventory of Highway Railroad Crossings between Salisbury and Asheville

At-Grade Public			At-grade Private		Grade Separations	
Flashing Lights & Gates	Flashing Lights Only	Crossbuck Signs	Crossbuck Signs	No Signs	Highway Overpass	Highway Underpass
102	2	29	14	15	53	21

The department has a policy of crossing closure or installation of flashing lights and gates on all highway-railroad at-grade crossings traversed by passenger trains. Federal funds are used to implement this policy. The department has worked with the communities of Hickory, Claremont, Conover, Newton, Hildebran and Long View to develop a program to consolidate crossings and improve crossing safety. This program is currently being implemented.

The department is conducting a research and demonstration project directed at improving safety at private crossings on the federally designated high-speed rail corridor between Raleigh and Charlotte. The results of the research project will help guide the department’s recommendations for development of a program to improve safety at private crossings.

### Recommendations and Next Steps

Due to the state’s current financial condition, full implementation of rail passenger service to western North Carolina is not recommended at this time. However, the department should continue to work with communities along the route and the Western North Carolina Rail Corridor Committee to complete projects that are primarily supported with federal funds and that have broader public benefits. These programs include station restoration, new station development activities and crossing safety improvements.

It is recommended that the funds allocated to acquire right of way for a new station in Asheville be re-programmed to acquire right of way in Valdese and to match available federal funds for the acquisition and renovation of historic properties that can be used for a passenger rail station in Asheville. Additional planning studies should be conducted to update ridership and revenue projections to reflect the additional service availability and more timely travel schedules. The department should continue planning, design and environmental permitting work as funding and staff resources permit.

Norfolk Southern has been a full partner in completing this engineering study and has indicated their support for implementation of its recommendations.

The department will continue to work with the Congress to develop a more comprehensive intercity passenger rail program with a viable state / federal partnership. More than a dozen bills are currently before the Congress that could impact or assist implementation of rail passenger service to western North Carolina. Our delegation is aware of the importance of this legislation to the western North Carolina passenger rail initiative and they are working with the appropriate committees to gain program authorization and funding.

Appendix A

**Summary of Recommended Construction Projects for Salisbury-Asheville Line**

<b>A.</b>	<b>Site Specific Station Work</b>	<b>\$ Millions</b>
1.	Rehabilitate and upgrade Salisbury trackage, MP S0.0	\$ 2.26
2.	Upgrade Majolica turnout, MP S2.1	.74
3.	Construct siding at Fiberton between MP S8.0 and MP S10.3	6.56
4.	Convert siding to main track at Barber and extend new main track to MP S13.2	3.72
5.	Convert siding to main track and construct new siding between Elmwood and Statesville, between MP S20.1 and MP S22.2	6.44
6.	Construct power turnouts, rehabilitate and rearrange trackage at Statesville, MP S25.8	3.95
7.	Extend siding at Eufola easterly to MP S31.3	4.16
8.	Reconstruct east leg of Catawba wye track, MP S37.9	1.97
9.	Construct coal train storage track at Claremont, between MP S40.0 and MP S42.5	11.05
10.	Convert siding to main track at Oyama and extend new main track easterly to MP S52.9 and westerly to MP S55.0	4.22
11.	Extend siding at Connelly Springs easterly to MP S64.3	8.08
12.	Rehabilitate and upgrade Drexel siding, MP S73.7	1.86
13.	Connect and rehabilitate sidings at Morganton, MP S78.6	2.28
14.	Construct siding between Morganton and Glen Alpine at Jamestown Road between MP S81.0 and MP S83.2	6.59
15.	Rehabilitate and upgrade Bridgewater siding, MP S89.4	2.43
16.	Rehabilitate and upgrade Clinchcross siding, MP S97.5	2.67
17.	Rehabilitate and upgrade Greenlee siding, MP S105.1	1.67
18.	Construct siding between Greenlee and Old Fort between MP S107.1 and MP S109.2	6.23
19.	Construct bypass main track at Old Fort, rehabilitate center and south sidings, convert existing main track to siding, and extend bypass main track and two sidings easterly to MP S109.7	8.42
20.	Rehabilitate and upgrade Coleman siding, MP S118.6	1.88
21.	Rehabilitate and upgrade Ridgecrest sidings, MP S123.0	1.70
22.	Grovestone Option 1: extend siding at Grovestone easterly to MP S125.3 and construct universal crossovers at MP S126.0	7.04
23.	Rehabilitate and upgrade Azalea siding, MP S134.1	1.63
24.	Construct double ended passenger siding at Asheville, MP S138.9, and rehabilitate the wye track	3.89
	<b>Subtotal</b>	<b>\$101.44</b>

Appendix A (continued)

**Summary of Recommended Construction Projects for Salisbury-Asheville Line**

<b>B.</b>	<b>General Signal Work</b>	<b>\$ Millions</b>
1.	Communications, coded track circuits, and 9 intermediate signals (138.9 train mile @ \$100,000/ train mile)	13.9
2.	Expand central communications and dispatching capacity	1.5
3.	Electric locks for spur track switches between sidings (approximately 60 spur tracks between existing and proposed sidings @ \$60,000 per electric lock)	3.6
4.	Reconstruct existing grade crossing warning systems to accommodate TC and higher train speeds (approximately 102 at-grade crossings with flashing lights and gates @ \$80,000 each)	8.2
5.	Modify 3 at-grade warning systems by adding gates @ \$120,000 each	0.5
6.	Add flashing lights and gates to 12 crossings @ \$200,000 each	2.4
	<b>Subtotal</b>	<b>\$30.1</b>
<b>C.</b>	<b>General Track Work</b>	
1.	Retire turnouts to spur tracks between stations no longer required (8 @ \$12,000 each, including replacing switch ties)	\$0.1
2.	Increase superelevation, lengthen spirals, shift curves to increase train speeds, including spot ties, surface, line, ballast for about 165 curves totaling 37 train mile @ \$7/track foot	1.4
3.	Relocate turnouts of new spiral lengths (7 turnouts @ \$40,000 each)	0.3
	<b>Subtotal</b>	<b>\$1.8</b>
<b>D.</b>	<b>General Bridge Work</b>	
1.	Raise ballast guards at abutments to 11 bridges to contain ballast from higher superelevation (11 bridges @ \$20,000 each)	\$0.2
2.	Replace bridge ties on 4 bridges and provide dapped bridge ties for superelevation (4 bridge decks @ \$35,000 each)	0.1
	<b>Subtotal</b>	<b>\$0.3</b>
<b>E.</b>	<b>Work Train Service, Flagging and Project Equipment Rental</b>	
1.	100 work days @ 3 work trains/day @ \$2,000 per crew start	\$0.6
2.	100 work days @ 15 flaggers per day \$200/day including overtime	0.3
3.	Rental of pickup trucks, cranes, camp trailers, etc.	0.2
	<b>Subtotal</b>	<b>\$1.1</b>
	<b>GRAND TOTAL</b>	<b>\$134.7</b>

NOTE: This estimate does not include relocation of utilities (including fiber optics, permits and remediation, if required), purchase of additional right-of-way that might be required for siding extensions, costs of mobilization and demobilization, and miscellaneous items, such as roadbed stabilization, undercutting for ballast cleaning or lowering track structure, application of switch heaters to new turnouts, application of geotextile fiber (sometimes required under turnouts and at-grade crossings).



Appendix B  
**Western North Carolina Passenger Rail Service Study Resources**

1. *Study of Passenger Train Service Between Salisbury and Asheville* prepared for Norfolk Southern Corporation and the North Carolina Department of Transportation, The Woodside Consulting Group, Inc., February 2002
2. *North Carolina Rail Plan*, North Carolina Department of Transportation, June 2001
3. *Amtrak Thruway Bus Analysis* - Greyhound Lines Inc., Atlanta, Georgia, February 2001
4. *Asheville Station Location Study* - Gannett Flemming Corddry and Carpenter, Inc., Charlotte, NC, February 2001
5. *Capital Cost Analysis* - North Carolina Department of Transportation Rail Division, Raleigh, NC, February 2001
6. *Financial Analysis* - William Gallagher, McLean, Virginia, February 2001
7. *Operating Cost Analysis* - Darrell Smith, Jacksonville, Florida, February 2001
8. *Ridership/Revenue Forecasting Study* - KPMG Consulting, McLean, Virginia, February 2001
9. *Summary of Attitudinal Surveys for Implementing Passenger Rail Service to Western North Carolina* - Institute For Transportation Research and Education, Raleigh, NC, August 2000
10. *Track Capacity and Improvements Study* - Ralph Whitehead Associates, Inc., Charlotte, NC, February 2001
11. *Train Station Conceptual Site Plans* - Carter + Burgess, Raleigh, NC, February 2001
12. *Train Station Design, Layout and Site Plans: Black Mountain, Old Fort, Marion and Morganton* - David Gall, AIA, Winston-Salem, NC, February 2001
13. *Train Station Design, Layout and Site Plans: Valdese, Hickory, Statesville and Salisbury* - Gomes & Staub, AIA, Raleigh, NC, February 2001
14. *North Carolina Rural Prosperity Task Force Final Recommendations Report*, Rural Prosperity Task Force, February 21, 2000
15. *Western Piedmont Traffic Separation Studies for the Towns of Hickory, Claremont, Conover, Newton, Hildebran and Long View*, Gannett Flemming Corddry and Carpenter, Inc., Charlotte, NC August 1998
16. *Report of the Transit 2001 Commission*, Transit 2001 Commission, February 1997