The Grand Strand Expressway

An Alternative to the Proposed I-73 to Myrtle Beach, South Carolina

Prepared for South Carolina Coastal Conservation League

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A Fiscally and Environmentally Responsible Alternative to I-73 Highway in South Carolina

Introduction

The South Carolina Department of Transportation (SCDOT) has been advancing the construction of a new interstate highway, I-73, between the Rockland NC bypass and Myrtle Beach. There are two Environmental Impact Statements (EIS) that evaluate the impacts of this new freeway for the northern (north of I-95) and southern (I-95 to SC 22) sections. While the southern section of I-73, from I-95 to the Myrtle Beach area, is the highest priority, both sections are the subject of wetlands permitting. In this report, the primary focus is on evaluating alternatives for the southern, higher priority section of I-73. However, there is also discussion of the northern section of I-73 in South Carolina, and of the corridor as a whole.

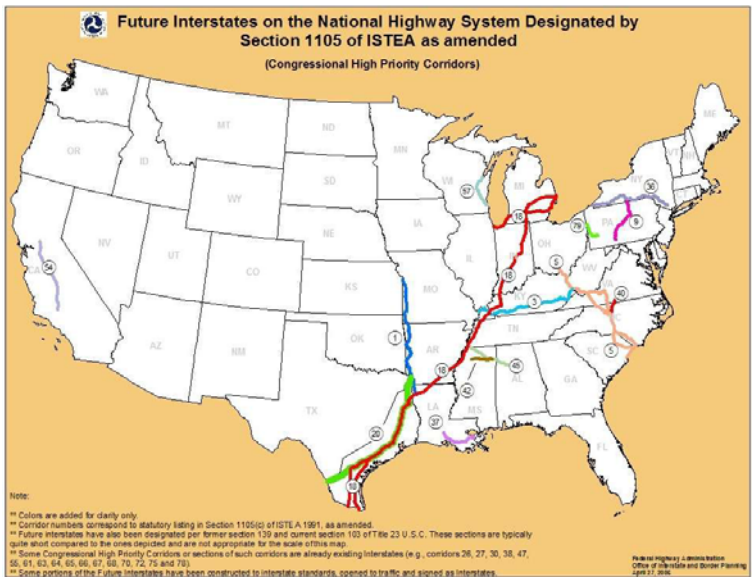
The proposed I-73 Interstate Highway connecting I-95 with the Myrtle Beach area will be a costly project, and result in environmental impacts to the region's fragile wetlands ecosystem and other aquatic and terrestrial resources. The EIS identified greater connectivity between I-95 and Myrtle Beach as a primary need for this project, but only examined a new interstate highway as the solution. However, there are numerous variations of roadway design that could be applied to the same purpose which could greatly reduce the costs and environmental impacts. These alternatives should be considered by the SCDOT before it proceeds further in the planning, design and permitting of this significant investment. This report provides several alternative concepts for consideration.

I-73 Background

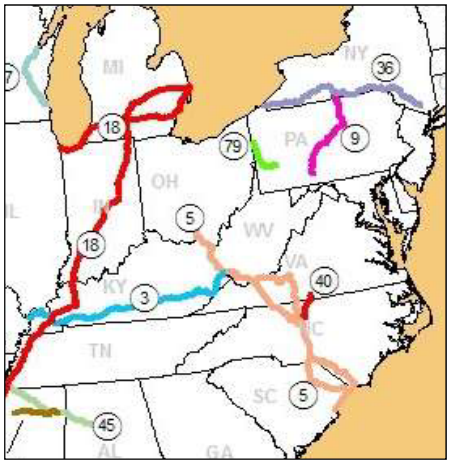
The EIS cites "congressional intent" as a primary reason for only considering interstate highway construction to meet the needs of this project. The new highway proposed between I-95 and the Myrtle Beach area would be part of a larger "corridor" as defined in legislation as "Priority Corridor 5", as follows:

> A. I-73/74 North-South Corridor from Charleston, South Carolina, through Winston-Salem, North Carolina, to Portsmouth, Ohio, to Cincinnati, Ohio, to termini at Detroit, Michigan and Sault Ste. Marie, Michigan. The Sault Ste. Marie terminus shall be reached via a corridor connecting Adrian, Jackson, Lansing, Mount Pleasant, and Grayling, Michigan.

Since this legislation initially passed, the corridor definition has been modified by Congress to terminate Myrtle Beach, South Carolina. The following graphic shows the configurations of these corridors.



Excerpt from map showing Corridor 5, which is the designated routes for I-73 and I-74.

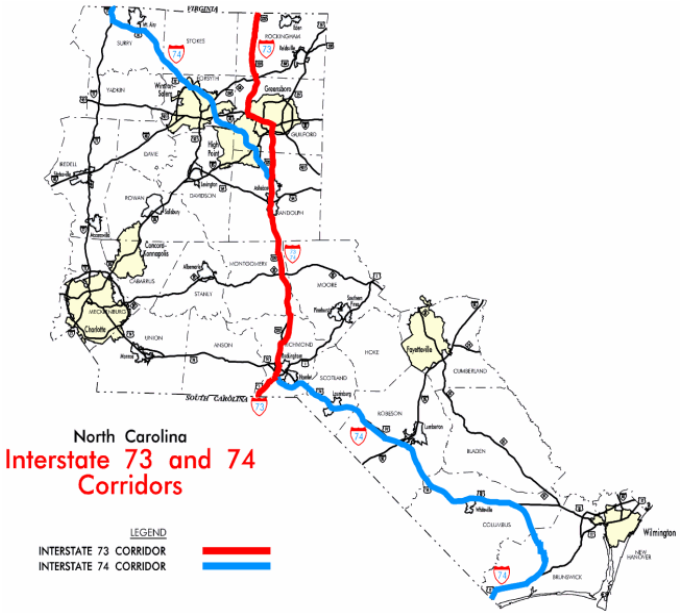


There are several important things to note from the above map, which was prepared in April 27, 2006.

1) The I-73 and I-74 corridors are closely intertwined. Constructing full interstate highways along both corridors would be redundant, excessive, result in unnecessary environmental impacts, and be wasteful of public and/or private funds. Currently, both North Carolina and South Carolina are proceeding with separate studies for each corridor, and neither considers the potential of the other corridor in their analysis.

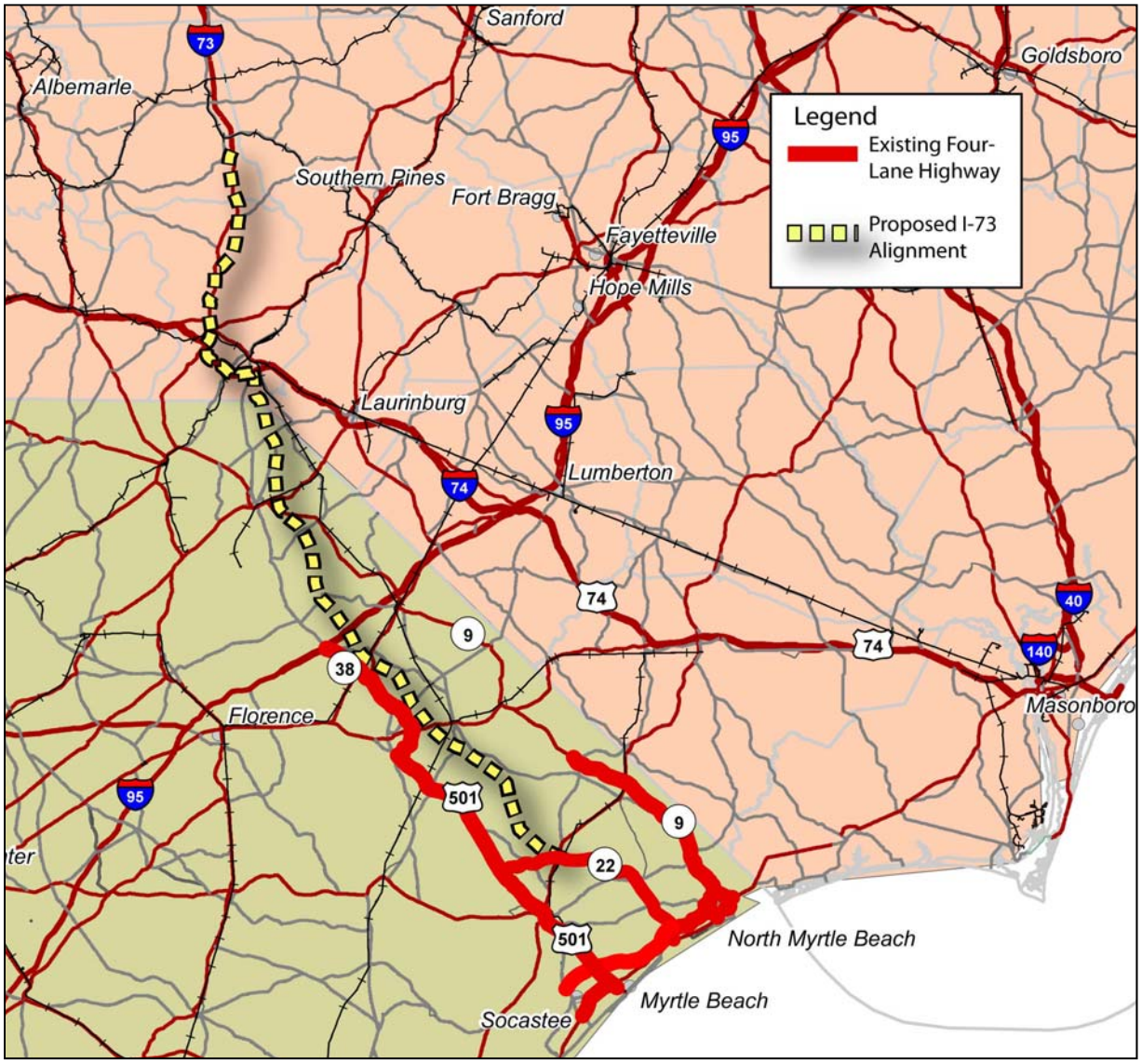
2) The above map indicates (correctly) that I-73 is no longer planned through Ohio and Michigan. These states have both dropped the interstate corridor from their long range plans for both fiscal and environmental reasons. The states of Michigan and Ohio are both fulfilling the congressional intent of Priority Corridor 5 by improving existing roadway corridors. The legislative description of this as a priority corridor does not in any way constrain or require the states to construct a new interstate highway.

3) Another factor that is not considered in the EIS is the redundancy with the proposed I-74 corridor in North Carolina. This corridor is nearly parallel with the proposed I-73, but this is not considered in defining the need for or consideration of alternatives in the EIS.



TSM (Transportation System Management) Alternatives Were Not Studied in the EIS

There are currently several routes that connect I-95 to the Myrtle Beach area, with the Route 38/501 corridor being the most heavily traveled. Providing an improved connection to I-95 does not require an interstate highway, and there are significant opportunities to improve the existing conditions through additional strategic investments in the existing corridor, which could include intersection improvements, grade separated interchanges, and some bypass segments where appropriate. A set of improvements to existing corridors has the potential to have nearly all of the same benefits of the proposed interstate highway at a fraction of the cost, and with far less impact to the environment. The following map shows that there are several existing corridors that run parallel to the proposed I-73, which could be upgraded to meet the needs of this project. In particular, there are several corridors of four lane roadways parallel to the southern I-73 section in South Carolina, which could provide the basis for a TSM alternative.



The EIS's single focus on a new interstate highway eliminates numerous opportunities to reduce environmental impacts and save taxpayer money. The states of Michigan and Ohio are intending to fulfill congressional intent through modest improvements to existing corridors, an approach that should be included in this EIS essentially as a "TSM" alternative. Federal guidance states that TSM alternatives should be included in environmental documentation, including in cases where a new road is proposed as a "connecting link", such as this I-73 EIS. Federal Highway Administration (FHWA) also clearly states that projects that propose a roadway on new alignment in a rural area should examine the potential of upgrades on existing roads to address the needs.

> While the above discussion relates primarily to major projects in urbanized areas, the concept of achieving maximum utilization of existing facilities is equally important in rural areas. Before selecting an alternative on new location for major projects in rural areas, it is important to demonstrate that reconstruction and rehabilitation of the existing system will not adequately correct the identified deficiencies and meet the project need. (FHWA Environmental Toolkit, http://www.environment.fhwa.dot.gov/projdev/impta6640.asp#alts, accessed 2/16/2011 5:56:26 PM
>
> Transportation System Management must be included as an alternative or design option where applicable. http://www.environment.fhwa.dot.gov/projdev/tdmpdo.asp, accessed 9/20/2007 4:09 PM

Because it lacks a TSM alternative, the EIS is not comprehensive, and should be amended before further environmental permitting is undertaken.

An Alternative: The Grand Strand Expressway

An expressway does not have a single definition, but many state departments of transportation have their own working definition of an expressway. In general, an expressway is a four lane divided roadway, with access limited but not completely controlled, and a combination of some at-grade intersections with grade-separated interchanges at the major junctions. A Grand Strand Expressway could be constructed primarily by upgrading existing roadways, and could possibly include some short segments of new roadway where bypasses are required.

The SC 38/501 corridor between I-95 and SC 22 has had many upgrades in recent years, providing a foundation for additional improvements to create a continuous expressway. The North Carolina DOT has upgraded many corridors to an expressway[1] as an alternative to full interstate highway standards as a more affordable and more easily implemented project design.

The benefits of the expressway option provide far greater flexibility as implementation can unfold in stages, which is much more difficult when constructing a limited access highway on a new alignment. The cost of an expressway will be far lower than an interstate highway, as the amount of property acquisition would be considerable lower due to the smaller footprint and right-of-way costs. This would also reduce the environmental impact of the corridor improvements, as very little new construction through undisturbed areas would be required.

An expressway could take advantage of innovative intersection designs, which are currently being used very successfully in North Carolina along several rural expressway corridors. The North Carolina

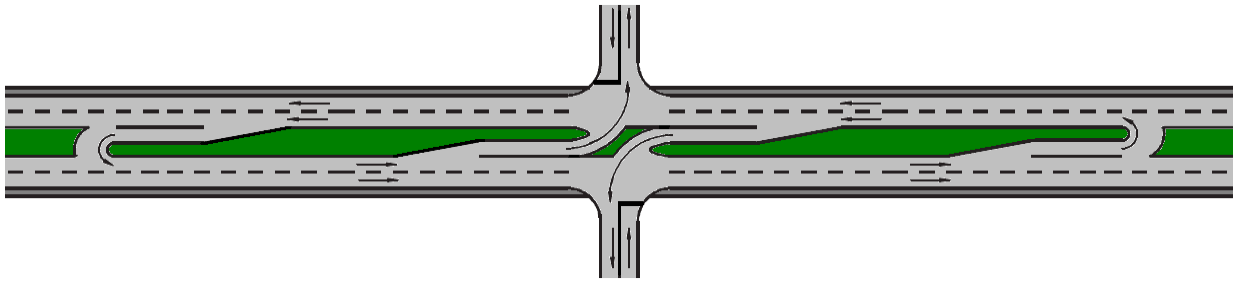
[1] http://www.ncdot.org/doh/preconstruct/tpb/SHC/facility/Expressways/

Department of Transportation (NCDOT) has completed a comprehensive research program on "superstreet" design, which could be applied to the Grand Strand Expressway to improve the safety and efficiency of the corridor's at-grade intersections.

Superstreet Intersection Design

The North Carolina DOT has conducted detailed research on "superstreet" intersection designs along both suburban arterial and rural expressway corridors, and found that these design techniques have promise to improve safety and capacity of intersections[2,3]. Several schematics below show a typical expressway unsignalized intersection, where the minor roadway stops before entering or crossing the expressway. The Superstreet, or "J" unsignalized intersection design, shown below, is an alternative that can improve both the safety and efficiency of an existing four lane roadway, especially during high volume periods such as summer changer over weeks.

J Intersection for Superstreet Expressway Design



The primary reason for the greater efficiency is that through traffic on the main road only has to stop for left turning traffic. Side street traffic enters or crosses the road by making a right turn, during the main road's left turn green phase, and then reverses direction at a U-turn location. This design also makes the corridor more accessible to side street local users. A recently completed "superstreet" upgrade of an arterial on Route 17 in Wilmington, NC provides a nearby example of this intersection configuration. While this application is in an area with more suburban development patterns with signalized intersections and higher traffic volumes, it does offer an example of these intersection designs.

There are also many unsignalized corridors that have used these intersection design concepts. Two examples are shown below as illustrative examples of superstreet corridors and intersections.

[2] An Update on Superstreet Implementation and Research, Hummer, Joseph E. Ph.D. and P.E., and Jagannathan, Ram. Submitted to Eighth National Conference on Access Management, Transportation Research Board, Baltimore, MD, July 2008. http://www.accessmanagement.info/AM08/AM0807Hummer/AM0807Hummer.pdf

[3] North Carolina DOT website on Superstreets: http://www.ncdot.gov/doh/preconstruct/tpb/SHC/facility/superstreet/

Route 17, Wilmington NC, Signalized Superstreet Intersection

Route 17, Wilmington NC, Unsignalized Superstreet Intersection

Expressway Alternative Concepts

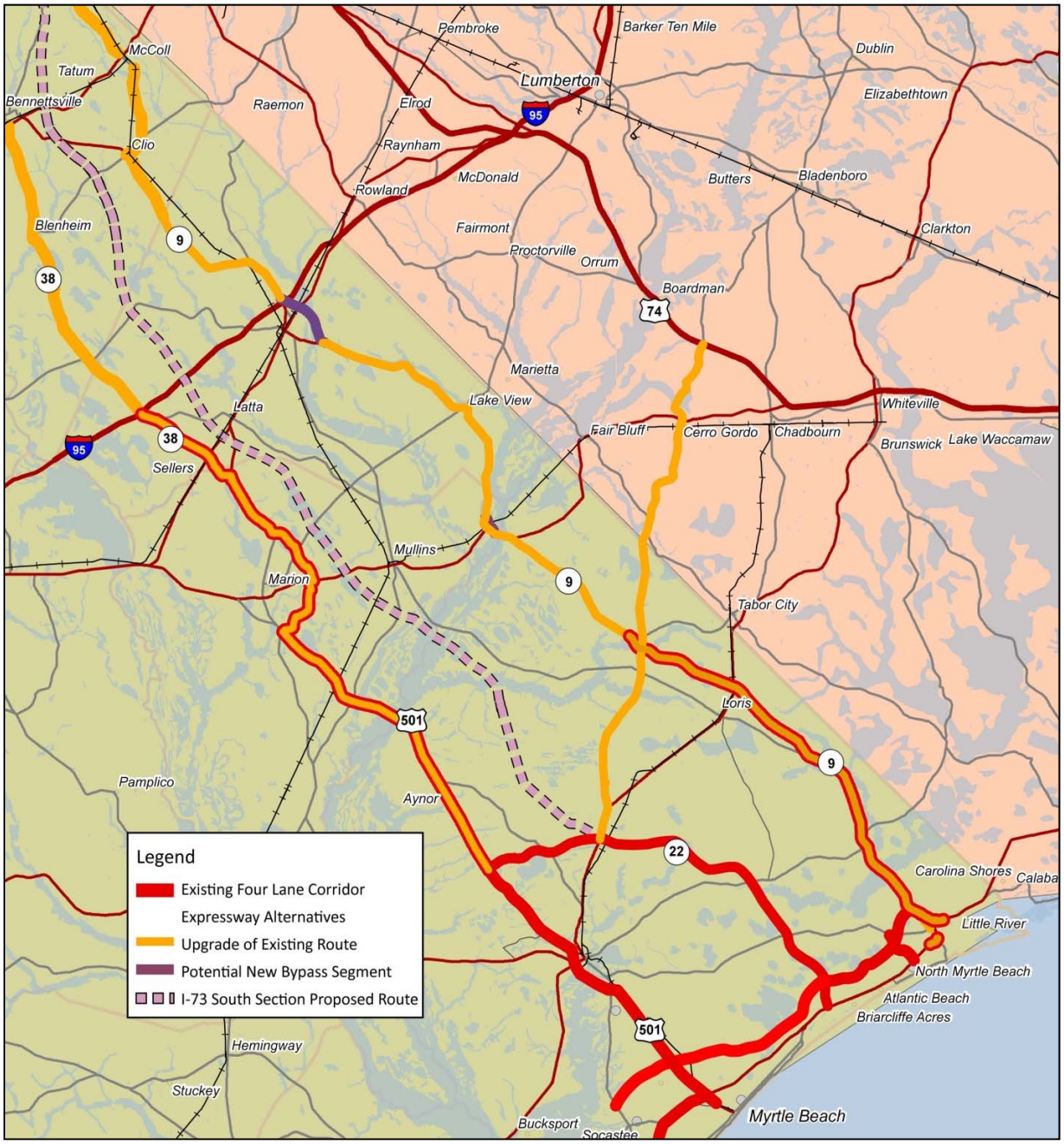
For purposes of illustrating how the concepts of expressway upgrades could be considered for alternatives to the proposed I-73, several alternative concepts are presented in this report for consideration. These are presented as planning level concepts offered for consideration and discussion, and in no way are proposed as engineered designs. However, these concepts may merit further consideration in the EIS and permitting process, which could be amended to include non-interstate highway alternatives. Because the EIS documents for the two sections of I-73 are incomplete in their analysis of alternatives, a new or supplemental EIS could be prepared that considers a balance of environmental consequences, economic benefits, and transportation utility of a wider range of alternatives. Such an analysis would allow for a more serious consideration of the costs and benefits of various investment and design options.

Three options presented for consideration in this report include:

- **SC 38/US 501:** SC Route 38 to US 501 From I-95 to Route 22
- **Route 9:** From I-95 SC Route 9 to SC 31 (Carolina Bays Parkway)
- **US 74 Connector:** From US 74 (future I-74 in North Carolina), near Whiteville, to SC Route 22 via a combination of new construction and upgrade of local roadways

The following map provides the locations of these alternatives.

Potential Corridors for Grand Strand Expressway Alternatives to I-73 to Myrtle Beach



These concepts are illustrated on the above map, with upgrade of existing facilities shown in orange and new bypass sections shown in purple. The facilities could be four lane expressways, with 2 lanes in each direction separated by a median of 40 feet or more. Intersections with major roads could be grade separated interchanges at major junctions, and local intersections could be upgraded to “superstreet” design, or other modern arterial intersection designs suitable for rural environments.

SC 38/US 501

This route already provides a direct connection between Route 22 and I-95, and is four lanes along its entire length. There are already grade separated interchanges at major crossings, making this route essentially an expressway in its current configuration. For the vast majority of its length, there is a wide median. The following aerial photographs show typical conditions on these corridors.

Route 38 at Gun Swamp Road

US Route 501 at Zion Road

Further study of this corridor would be needed to determine if additional improvements would be appropriate to improve the corridor operations, such as:

- Construct modern superstreet arterial intersections where needed.
- Conduct access management improvements in areas of frequent curb cuts.
- Construct grade separated interchanges at high volume crossings if needed for traffic capacity.

This alternative would have by far the lowest cost and environmental impacts, and corridor improvements would benefit both local residents as well as travelers headed to the Myrtle Beach area.

Route 9

This option would require widening of about 30 miles of rural four lane roadway into an expressway, and an additional 30 miles of rural two lane roadway into a four lane expressway. The path would generally follow SC Route 9, but could use local roads for bypass routes around several communities, which could result in up to 4 miles of new expressway construction to avoid impacts to communities. The following aerial photograph shows typical conditions along the rural portions of Route 9.

Route 9 at Long Bay Road (Four Lane Section)

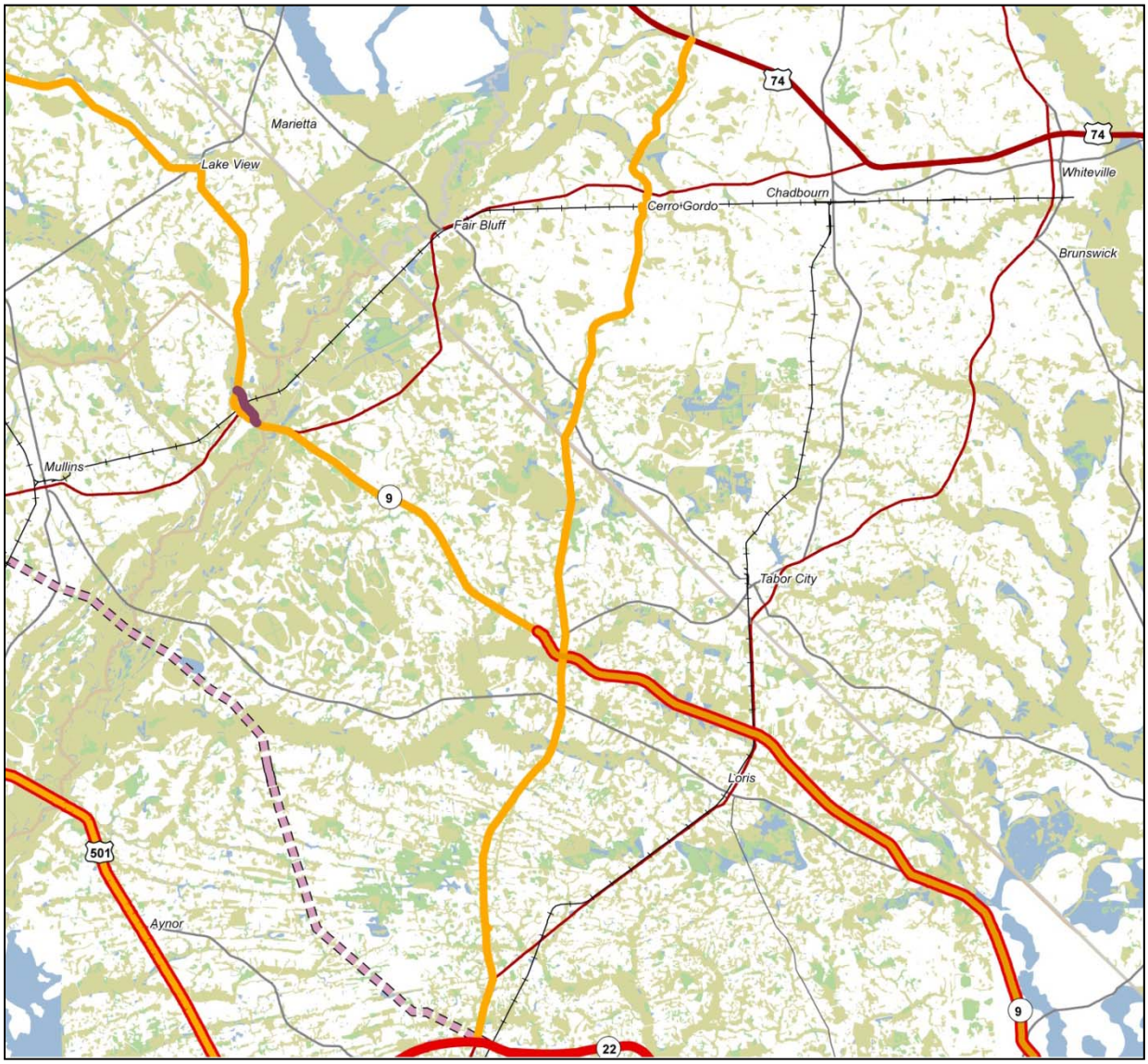
Route 9 at South Fordtown Road (Two Lane Section)

It is possible that at least one grade separated interchange would be needed along this corridor.

US 74 Connector

This route would connect the US 74 corridor in North Carolina (currently a four lane US highway, but planned for upgrade to an interstate) with SC Route 22 primarily by the upgrade of about 34 miles of two lane rural roadways. In some areas, bypass sections might be appropriate to avoid natural or socioeconomic impacts. The following map shows a potential route for this connection. In general, this corridor is somewhat higher, so while there would be some wetlands impacts, there would be no need to fragment or disturb pristine natural areas.

US 74 Connector Route



Transit Service

Providing a corridor for future rail transit service is also mentioned as a long term goal of the I-73 south project, although no detail or analysis is provided of its feasibility, cost or impacts. AMTRAK service is currently provided to Florence, and there are many potential alternatives to improved transit connections to and within Myrtle Beach that would be far more cost effective than a new rail corridor. A premium, convenient bus service could be provided to meet trains at the AMTRAK station and bring passengers to their destination. Local service that operates for extended hours, nights and weekends, would allow travelers to explore tourist destinations in the area. This could be supplemented by improved bicycle facilities and car sharing services, making Myrtle Beach a great destination for visitors seeking active travel and outdoor experiences. New rail service directly to Myrtle Beach is unlikely to be a cost effective solution to promote transit, and there are many more appealing and cost effective options to meet this goal that have not yet been explored.

Comparative Features of the Alternatives for the Grand Strand Expressway

The following table summarizes the basic project components and rough cost levels for Grand Strand Expressway TSM alternatives for the f I-73 South project, proposed between I-95 and the Myrtle Beach area.

	Project Units (miles, units)				Estimated Project Cost(millions)*		
Project Component	SC 38/ US 501	SC 9	US 74 Connector	Unit Costs	SC 38/ US 501	SC 9	US 74 Connector
Upgrade of four lane arterial to Expressway	42	30	0	$3,500	$147,000	$105,000	$ -
Upgrade of two lane roadway to expressway	0	30	34	$7,500	-	225,000	255,000
New Expressway Construction	0	8	2	$22,000	-	88,000	44,000
Interchanges	0	1	2	$10,000	-	10,000	20,000
					$147,000	$428,000	$319,000

** Planning level costs based on typical unit costs for projects in North and South Carolina, not based on site specific engineering analysis.*

Compare Expressway Alternatives to Proposed I-73

The table below compares the proposed I-73 with the for a Grand Strand Expressway alternatives.

	I-73 (South) as Proposed in EIS	**Grand Strand Expressway Alternatives**
Design	New Interstate Highway, 44 miles of new construction	Upgrade of existing 2 or 4 lane roads, with bypass sections of new construction where needed
Right of way width	About 300 feet	About 100 feet right of way, which can be accommodated on most existing arterial corridors
Wetlands impacts	Inflexible and excessive interstate highway design criteria result in significant impacts to wetlands areas. Proposed alignment requires crossing of major wetlands and filling	Minimizes wetlands impacts by upgrading existing roadways, many of which need only minor upgrades, and minimizing need to cross wetland areas with new facilities. More flexible expressway design criteria will reduce impact areas where new roadway construction is required.
Posted Speed limit	65 mph	Varies; typically 45 to 65 mph
Cost	$1,300 million	$147 to $428 million
Ability to phase construction	Limited; route will not operate effectively until entire corridor is complete	Route 501 option can easily be phased and will have utility as soon as first phase is constructed. NC and Route 9 options cannot be phases as easily due to limited capacity of existing roadway network

The above table shows the substantial costs savings to South Carolina taxpayers that could result from this approach to addressing the region's transportation needs. In addition, any of these alternatives would result in substantially lower wetlands impacts, habitat fragmentation, and disturbance of pristine natural areas.