526 EAST
LOWCOUNTRY
CORRIDOR

PLANNING AND ENVIRONMENTAL LINKAGES (PEL) STUDY REPORT

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ACRONYMS

AADT	Average Annual Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effect
ATM	Active Traffic Management
BCD	Berkeley-Charleston-Dorchester
BCDCOG	Berkeley-Charleston-Dorchester Council of Governments
CAV	Connected and Autonomous Vehicles
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CHATS	Charleston Area Transportation Study
CFR	Code of Federal Regulations
CMAQ	Congestion Management and Air Quality
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FY	Fiscal Year
GHG	Greenhouse Gas
HSIP	Highway Safety Improvement Program
BIL	Bipartisan Infrastructure Law
IAR	Interchange access report
INFRA	National Infrastructure Project Assistance
LCC	Lowcountry Corridor
MPO	Metropolitan Planning Organizations
NEPA	National Environmental Policy Act
NHFN	National Highway Freight Network
NHPP	National Highway Performance Program
NHS	National Highway System
NMFN	National Multimodal Freight Network
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service

NOFO	Notice of Funding Opportunity
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natura Resource Conservation Service
NSFHP	Nationally Significant Freight and Highway Projects
OCRM	Ocean and Coastal Resource Management
PEL	Planning and Environmental Linkages
PIM	Public Information Meeting
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation
RWIS	Road Weather Information Systems
SCDAH	South Carolina Department of Archives and History
SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
SCDOT	South Carolina Department of Transportation
SCTIB	South Carolina Transportation Infrastructure Bank
SHEP	State Highway Emergency Program
SHF	State Highway Fund
SHPO	State Historic Preservation Office
STBG	Surface Transportation Block Grant
TAZ	Traffic Analysis Zones
TTI	Travel Time Index
TDM	Travel Demand Model
TSMO	Transportation Systems Management and Operations
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
VMS	Variable Message Signs
VSL	Variable Speed Limits

1.0 INTRODUCTION

The South Carolina Department of Transportation (SCDOT) conducted this Planning and Environmental Linkages (PEL) study for the Interstate 526 (I-526) Lowcountry Corridor (LCC) EAST project. I-526 is an interstate facility that provides a partial beltway around Charleston and acts as a bypass for traffic on U.S. 17 through Mount Pleasant, downtown Charleston, and portions of the West Ashley area.

1.1 WHAT IS A PEL STUDY?

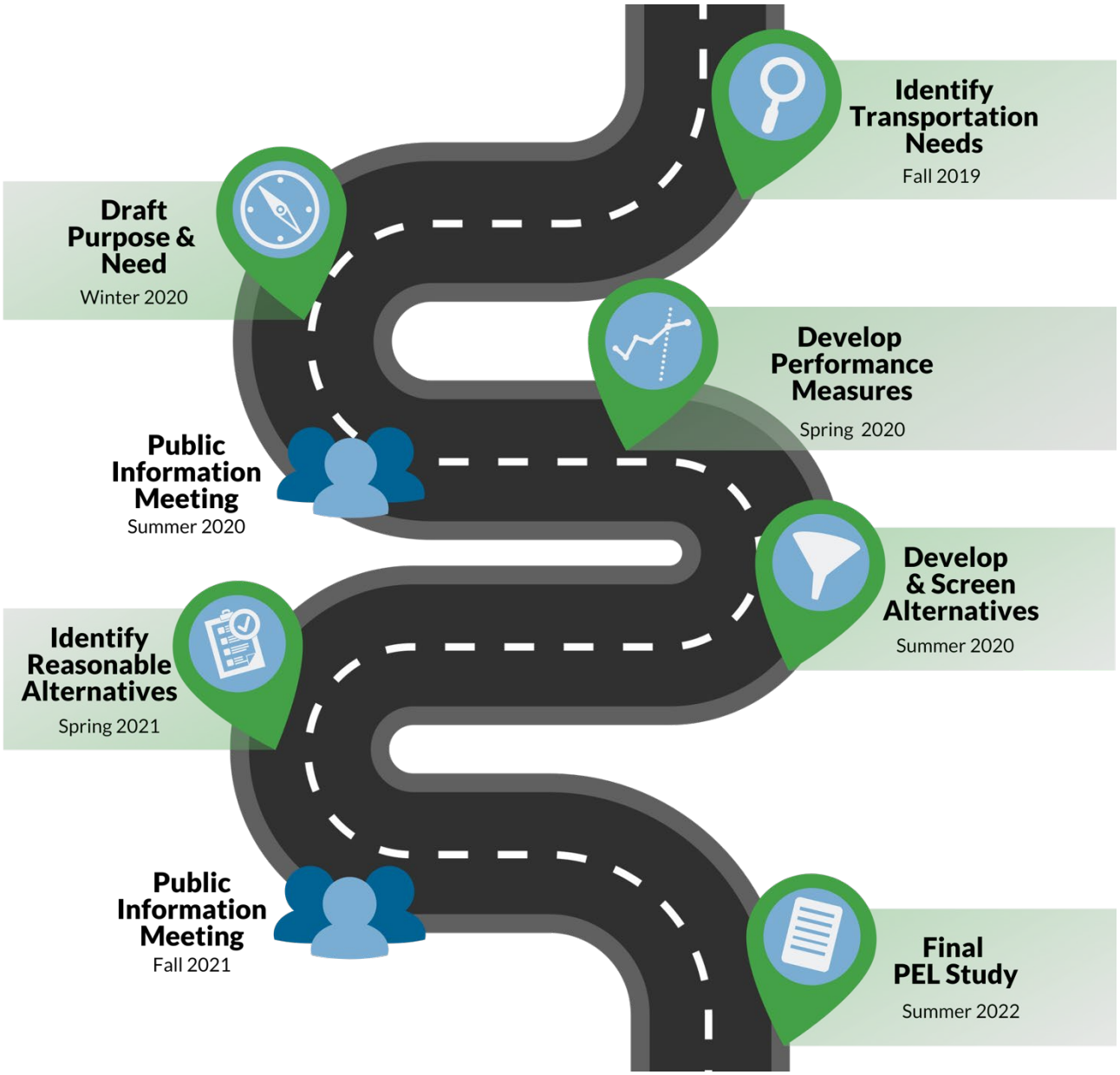
Planning and Environmental Linkages (PEL) is a Federal Highway Administration (FHWA) initiative to link the transportation planning process with the National Environmental Policy Act (NEPA) process. Transportation agencies can use the FHWA PEL process to conduct a "PEL study," which is a transportation planning study conducted at the corridor or subarea level; that considers environmental, community, and economic goals early in the planning stage and carries them through project development, design, and construction.

FHWA encourages the use of PEL under the provisions of both 23 United States Code (U.S.C.) 139(f)(4)(E) and 23 U.S.C. 168 together, to the extent practicable, to preserve the option to use the planning products and decisions (such as purpose and need and elimination of unreasonable alternatives in the environmental review process). Using the two statutory provisions together may maximize the potential benefits of PEL. However, flexibilities in PEL allow the use of either approach alone. [1]

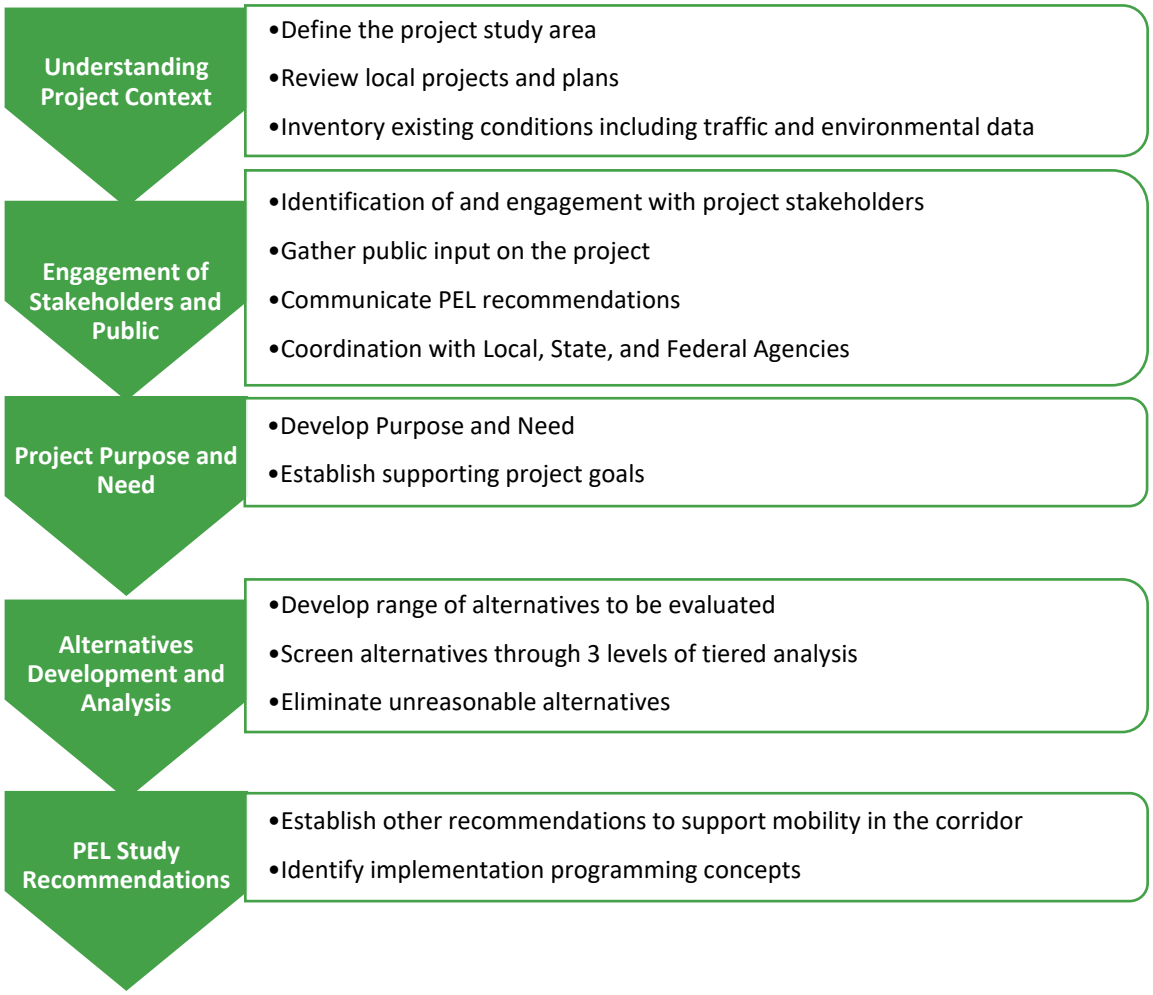
The goals of a PEL study are to: 1) consider environmental, community, and economic goals early in the transportation planning process, and 2) use the information, analysis, and products developed during planning to inform the environmental review process. This PEL study is intended to provide the framework for the long-term implementation of transportation improvements as funding is available. **Figure 1-1** illustrates the PEL process used for the I-526 LCC EAST PEL study.

[1] Integration of Planning and Environmental Review Statute 23 U.S.C. 168; Efficient Environmental Reviews Statute 23 U.S.C. 139(f)(4)(E)(ii). Planning Regulations 23 CFR 450.212 (a)-(c) & 450.318 (a)-(d); CEQ NEPA Regulations 40 CFR 1500.4(j) and 1502.21; Programmatic Mitigation Planning (PMP) Statute 23 U.S.C. 169; and Planning Regulations 23 CFR 450.214 and 320.

Figure 1-1: I-526 LCC EAST PEL Process



The following principles were followed for this PEL study:



The project Purpose and Need, the process used to eliminate unreasonable alternatives, and the identification of reasonable range of alternatives were developed in accordance with the Council of Environmental Quality (CEQ) NEPA guidance (40 CFR 1506.13 and 40 CFR 1502.14), 23 U.S.C. 168, and 23 U.S.C. 139.

This PEL study summarizes the findings and recommendations for the I-526 LCC EAST corridor. Technical studies completed during this PEL study provide additional information and are appended to this report. They are also available on the project website: https://www.526lowcountrycorridor.com/east/. In accordance with 23 U.S.C. 168(d)(4), the public was notified that the information and decision-making produced during the PEL study will be carried forward into the next phase of project development, the environmental review process.

2.0 What is the Context of the Study Corridor?

I-526 is an interstate facility that provides a partial beltway around Charleston and acts as a bypass for traffic on U.S. 17 through Mount Pleasant, downtown Charleston, and portions of the West Ashley area. This corridor serves as a major commuter corridor and economic connector in the Lowcountry, linking workers and goods movement to and from the South Carolina Port Authority (SCPA) Wando Welch Terminal (WWT) with Interstate 26 (I-26) and other integral components of the state's freight network. The corridor is also heavily used by tourists traveling to Sullivan's Island, Isle of Palms, and other Charleston-area destinations.

2.1 Study Area

The I-526 LCC EAST study corridor is approximately 10 miles long, extending along I-526 from Virginia Avenue in North Charleston to U.S. 17 in Mount Pleasant, South Carolina. The study area includes a 250-to-350-foot buffer on each side of I-526 and is approximately 1,183 acres. I-526 EAST currently includes two regionally significant river crossings in the study area, the Don Holt Bridge over the Cooper River and the James B. Edwards Bridge over the Wando River. **Figure 2-1** illustrates the study corridor. Major trip generators in the area include the Volvo Car Stadium, Charleston International Airport, Boeing, Centre Point Retail Center, the Family Circle Tennis Center, the Central Island Square development, WWT, North Charleston Port Terminal, Joint Base Charleston, and the East Cooper Medical Center (**Figure 2-2**).

Within the study corridor, I-526 provides access to arterials through five interchanges, including Virginia Avenue, Clements Ferry Road, River Landing Drive/Seven Farms Drive, Long Point Road, and its terminus at U.S. 17 in Mount Pleasant. The travel lane widths are a standard 12 feet throughout the study corridor in each direction and are separated by a grass or barrier median, with a shoulder on each side of the travel lane. Approximately 53 percent of the corridor is located on elevated bridge structure with 47 percent at ground level. Both large river crossings include truck climbing lanes but do not include full emergency shoulders.

Figure 2-1: I-526 LCC EAST Study Corridor

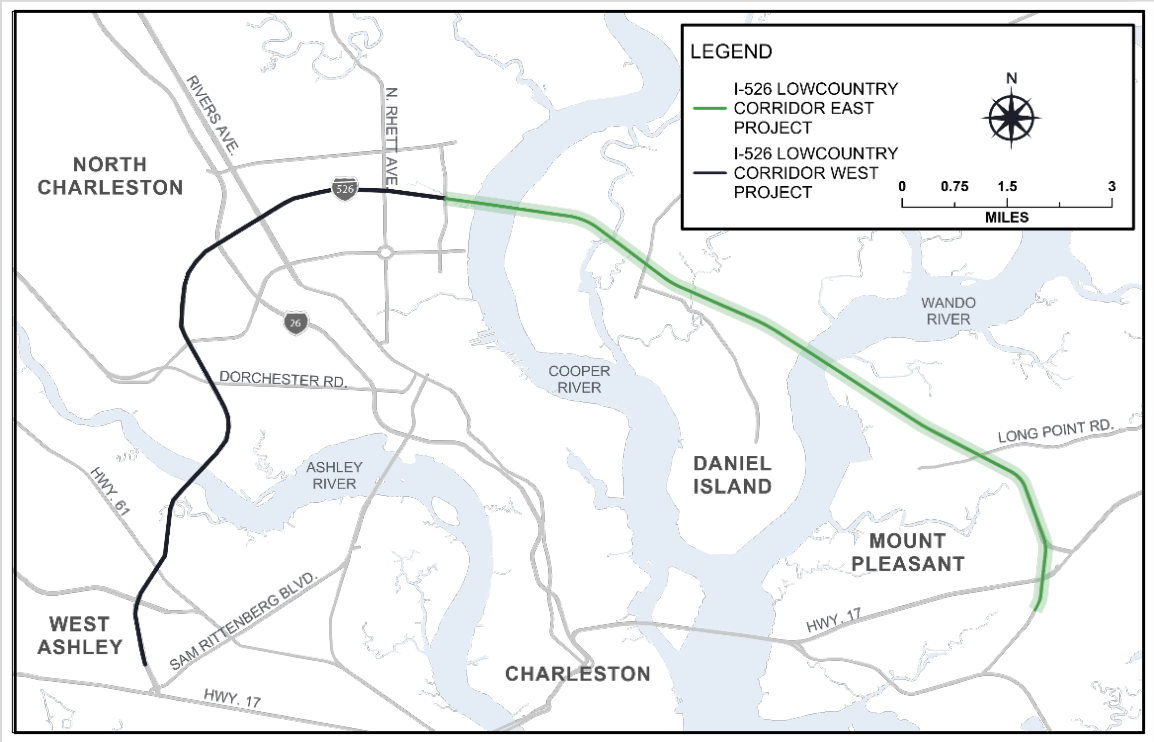
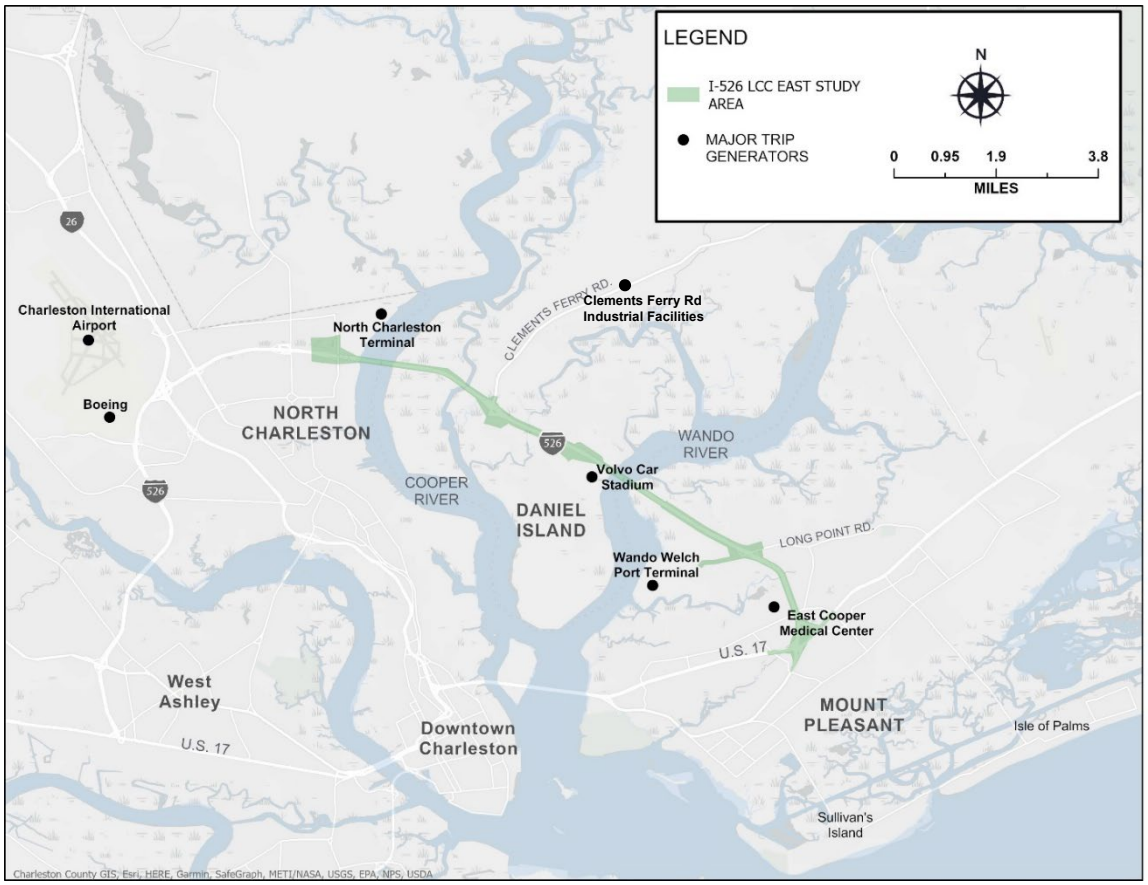


Figure 2-2: Major Trip Generators in Charleston Region



2.2 PREVIOUS STUDIES AND PLANS

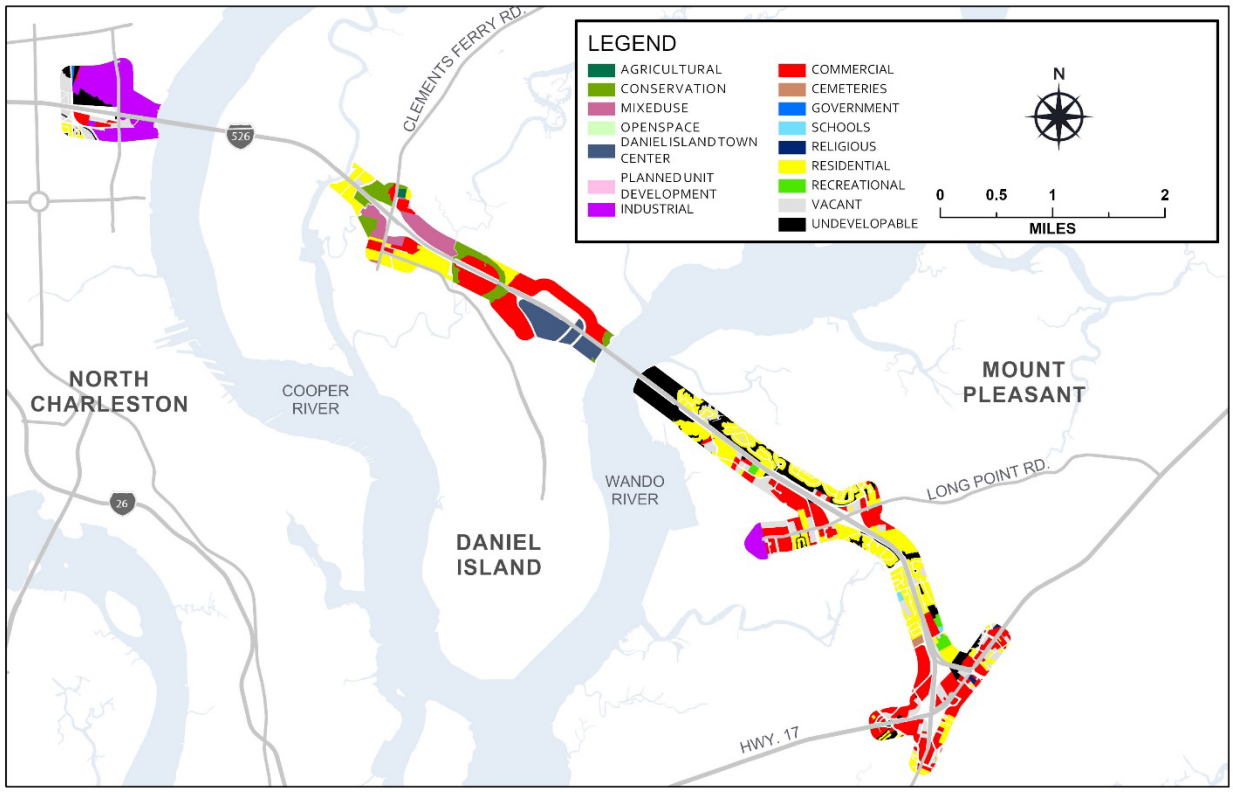
Several transportation studies and plans relate to the I-526 LCC EAST study corridor in various capacities. These studies and plans were reviewed to determine planning and project history associated with the I-526 LCC EAST corridor and help determine the PEL study goals described in **Chapter 3**. The studies and plans reviewed for this PEL study are summarized in **Appendix A** and are listed below:

- I-526 LCC WEST Draft Environmental Impact Study (DEIS). Final EIS (FEIS) and Record of Decision anticipated 2022
- Mark Clark Extension Supplemental Environmental Impact Statement (SEIS) 2021. FEIS Anticipated 2023
- Berkeley-Charleston-Dorchester (BCD) Regional Freight Mobility Plan (2022)
- South Carolina Statewide Freight Plan Update (2020)
- Charleston Area Transportation Study (CHATS) 2040 Long Range Transportation Plan (2019)
- Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) Regional Transit Framework Plan (2018)
- 2018–2023 BCD Region Comprehensive Economic Development Strategy (CEDS) (2018)
- CHATS Congestion Management Process (CMP) Report (2019)
- BCDCOG Transportation Demand Management Study (2016)
- South Carolina 2040 Statewide Multimodal Transportation Plan (July 2020 Update)
- BCDCOG Our Region Our Plan (2012)
- BCDCOG Lowcountry Rapid Transit Purpose and Need Technical memorandum (2018)
- BCDCOG WalkBike BCD, 2017 Regional Pedestrian and Bicycle Master Plan
- BCDCOG 2018 Park and Ride Study
- Berkeley County 2018 Comprehensive Plan 5-year Review
- Charleston County 2018 Comprehensive Plan
- City of North Charleston 2020 Comprehensive Plan
- City of Charleston 2021 Comprehensive Plan
- City of Charleston 2018 Citywide Transportation Plan
- Town of Mount Pleasant 2019-2029 Comprehensive Plan
- Town of Mount Pleasant 2013 Bicycle and Pedestrian Master Plan

2.3 LAND USE

Land uses within and adjacent to the PEL study area vary, including those identified as residential, commercial, industrial, and undevelopable (**Figure 2-3**). From the western extent of the corridor in North Charleston, the dominant land use is industrial, with some residential use on the south side of the corridor. Moving east across the Cooper River, land uses on Daniel Island include residential, commercial, and vacant or undevelopable land due to the marsh and wetlands on the island. Moving east across the Wando River into Mount Pleasant, the surrounding land use is dominated by undevelopable, residential, and commercial uses. This section also includes industrial use at WWT off Long Point Road. From Long Point Road to the western terminus of the project at U.S. 17, recreational uses are also present along with residential, and commercial uses at U.S. 17. This eastern portion of the corridor also includes vacant and undevelopable land.

Figure 2-3: Existing Land Use



Source: BCDCOG (2018), Charleston County (2019), Berkeley County (2021), and City of Charleston (2018)

2.4 DEMOGRAPHIC TRENDS AND FORECASTS

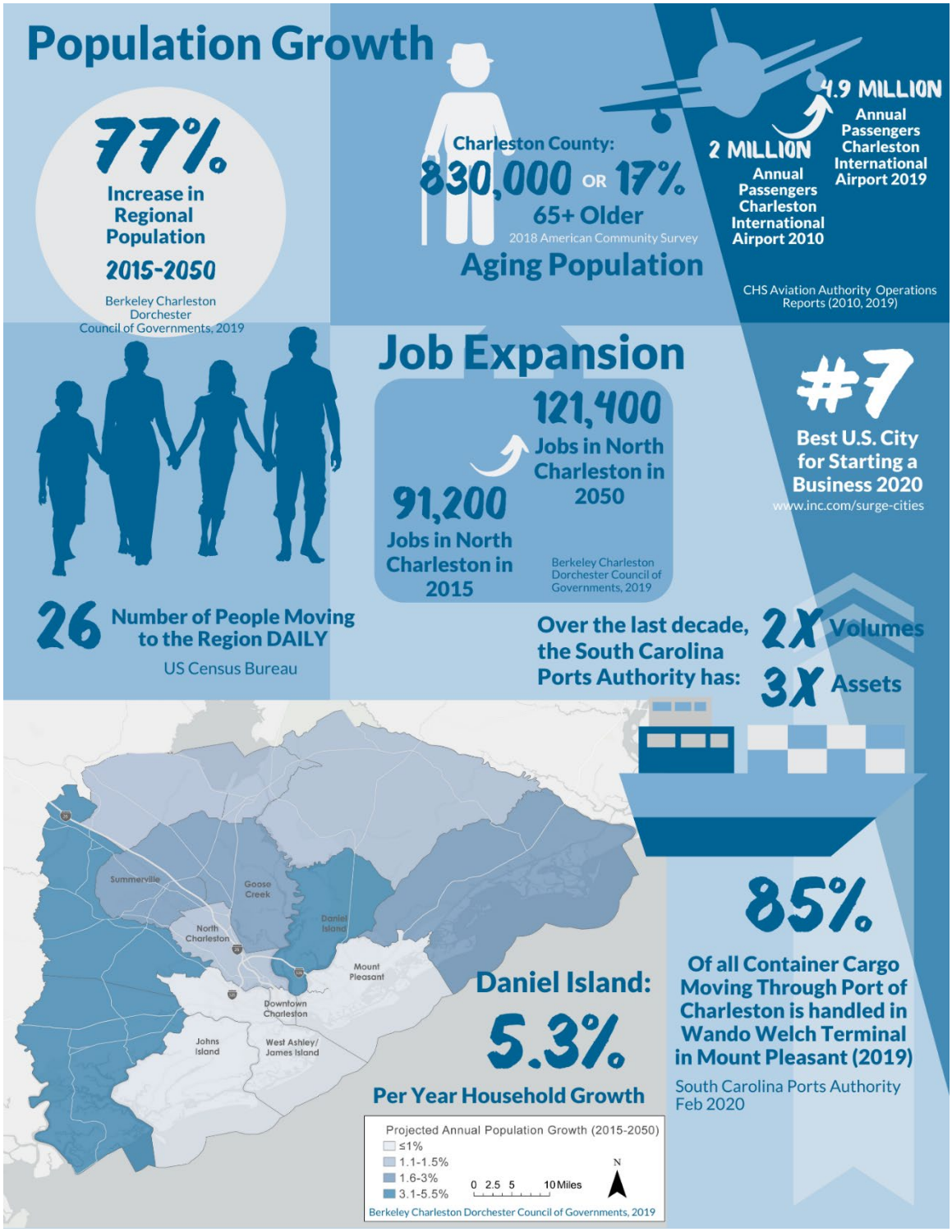
The Charleston region has experienced higher than average growth—almost three times faster than the national average—with 26 new people moving to the region each day. [2] Population growth is projected to continue in the Charleston area for the next 30 years. [3] The Daniel Island traffic analysis zone (TAZ) is expected to see the largest percent growth in population from 2015 to 2050, with an increase of over 500 percent. The Wando Terminal TAZ is expected to see the lowest percent growth in population for

[2] "2019: EXACTLY HOW MANY PEOPLE MOVE INTO THE CHARLESTON REGION EACH DAY?" Charleston Regional Development Alliance, https://www.crda.org/news/2019-exactly-how-many-people-move-into-the-charleston-region-each-day/.

[3] The BCDCOG CHATS Interim Regional Travel Demand Model (TDM) was used to forecast various traffic analysis zones (TAZs) from 2015 to 2040. The project team collaborated with SCDOT to forecast additional growth to estimate 2050 travel demand.

TAZs adjacent to the I-526 study corridor, at about 32 percent growth. Employment in the Charleston region is also forecasted to increase by almost 51 percent by 2050[4] (**Figure 2-4**). Tourism and container cargo volume at the Port of Charleston are also forecast to increase substantially.[5]

Figure 2-4: Population, Employment, and Economic Growth in Charleston Region



[4] BCDCOG, 2019.
[5] South Carolina Ports Authority, February 2020.

2.5 TRAFFIC GROWTH

Relative to population, employment, and economic growth in the Charleston region, traffic volumes have been steadily increasing on the I-526 LCC EAST corridor at multiple locations. This corridor regularly experiences extreme and prolonged congestion. The existing traffic volumes on I-526 approach capacity along some portions of the corridor, resulting in heavy congestion and delays. **Table 2-1** shows the 2017 and projected 2050 No-Build average daily traffic (ADT) volumes along segments of the study area.

Table 2-1: Average Total, Two-Way Daily Interstate Traffic (2017-2050)

Segment Limits on I-526	2017 ADT	2050 No-Build ADT	Change
Virginia Avenue and Clements Ferry Road	86,489[1]	146,033	59,544 (69%)
Clements Ferry Road and Daniel Island	61,400[2]	103,671	42,271 (69%)
Daniel Island and Long Point Road	77,941[1]	131,600	53,659 (69%)
Long Point Road and bridge over Mathis Ferry Road	64,492[1]	108,892	44,400 (69%)
Bridge over Mathis Ferry Road and split between U.S. 17 North and U.S. 17 South	29,600[2]	49,978	20,378 (69%)

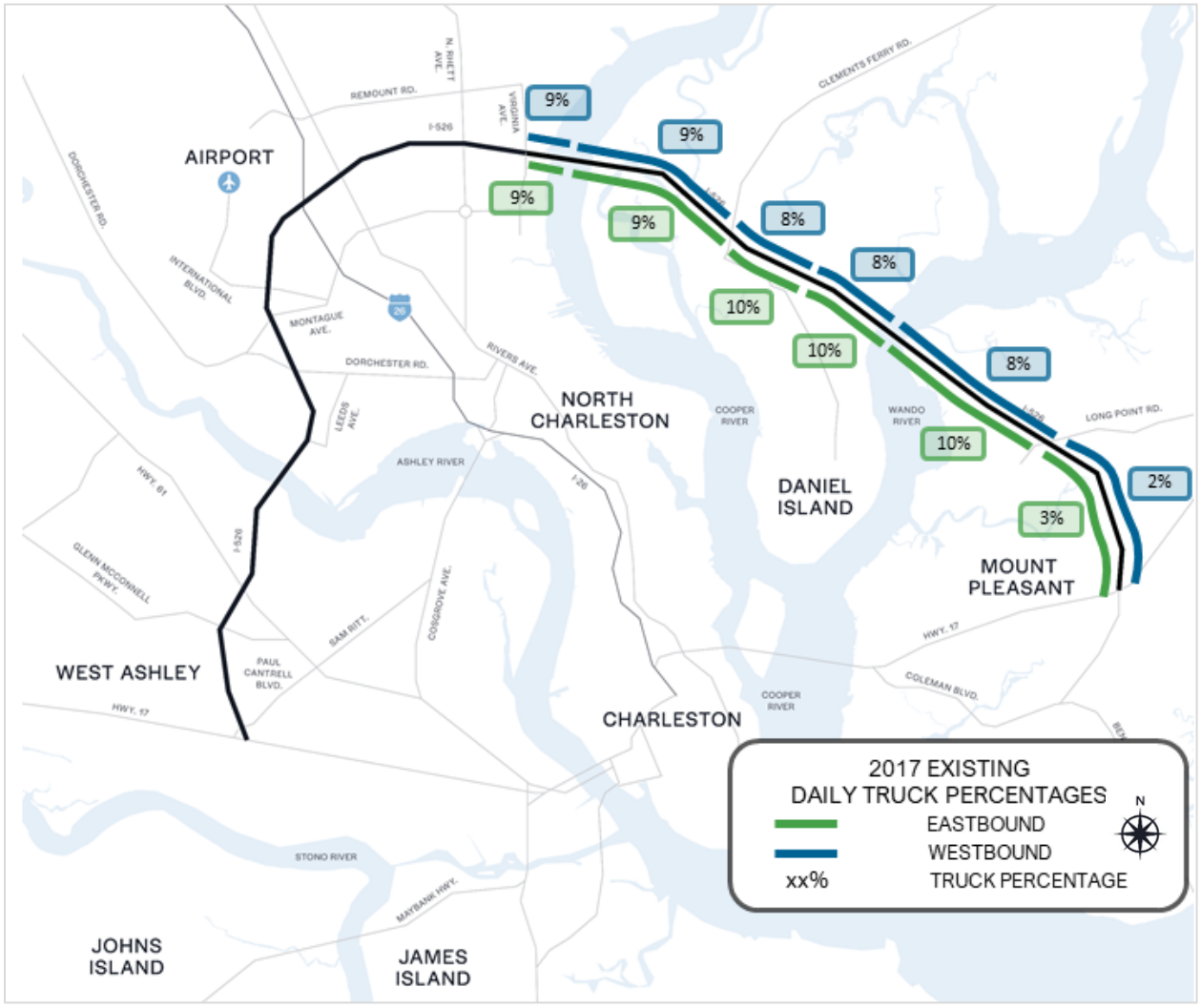
Source: Traffic counts provided by SCDOT and CDM Smith
Notes: [1]CDM Smith counts were collected via video and radar recording methods over a two-day period during the week, and the volumes listed represent the average daily volume. [2]SCDOT volumes listed represent estimated AADT volumes from data collected at the respective locations. A recommended compound annual growth rate of 1.6% was applied to the 2017 traffic volumes to derive the projected future traffic volumes.

In 2017, the highest ADT within the study area occurs in North Charleston near Virginia Avenue at approximately 86,500 vehicles per day (vpd). The lowest ADT in 2017 is at the opposite end of the study corridor in Mount Pleasant where I-526 terminates at Chuck Dawley Boulevard. Using an average annual growth rate of 1.6 percent [6], the future daily traffic demand is projected to increase approximately 69 percent by the year 2050.

Consideration of trucks, and the speeds at which they can traverse the bridges, is a critical part of traffic flow within the study area due to the location of the WWT on Long Point Road. Percentages of trucks using the corridor are shown in **Figure 2-5**. It is important to note that these percentages only consider tractor trailer trucks (heavy vehicles) and do not include medium sized vehicles such as buses, dump trucks, or local delivery trucks. When medium sized vehicles are included with the heavy vehicle percentage, the percentage jumps from 18 percent to 24 percent of daily bi-directional traffic on the Wando River Bridge west of Long Point Road.

[6] The average annual growth rate of 1.6 percent is documented in the I-526 Lowcountry Corridor EAST Growth Factor Justification Technical Memo, July 2018.

Figure 2-5: Percent Daily Trucks by Segment (2017)



Source: CDM Smith

Density is the number of vehicles occupying a road segment and relates to the flow of traffic.

As growth and development in the region continues, the associated increase in traffic volumes and traffic density will result in increased congestion and more delays. **Table 2-2** shows the 2017 and projected 2050 No-Build densities for the six corridor segments of I-526 EAST. It should be noted that I-526 LCC WEST connector-distributor road at the North Rhett Avenue interchange was considered in the No-Build condition. This was included because the traffic volumes at this location impact the density results of the analysis, especially in the North Charleston portion of the study area. Densities along freeway segments greater than 35 passenger cars per mile per lane (pc/mi/ln) are considered to be unacceptable and experience unstable flow and are noted in red font in the table below.

Table 2-2: 2017 and 2050 No-Build Density of I-526 Segments

Segment Location	2017 Density (pc/mi/ln)				2050 No-Build Density (pc/mi/ln)			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	EB	WB	EB	WB	EB	WB	EB	WB
North Rhett Avenue Interchange to the Cooper River	64.5	37.0	37.7	71.3	91.6	28.5*	106.4	13*
Cooper River to Clements Ferry Road Interchange	40.1	35.1	35.7	75.3	49.4	26.9*	77.7	14*
Clements Ferry Road Interchange to Daniel Island Interchange	23.2	25.2	27.4	29.9	26.7	31.6	26.7	12.2
Daniel Island Interchange to Wando River	22.7	28.2	39.3	23.9	25.8	36.7	55.6	114.8
Wando River to Long Point Road Interchange	21.9	29.4	37.4	24.5	24.0	40.9	59.2	89.1
Long Point Road Interchange to U.S. 17 Interchange	17.6	16.9	29.8	19.6	19.7	22.8	44.1	112.4

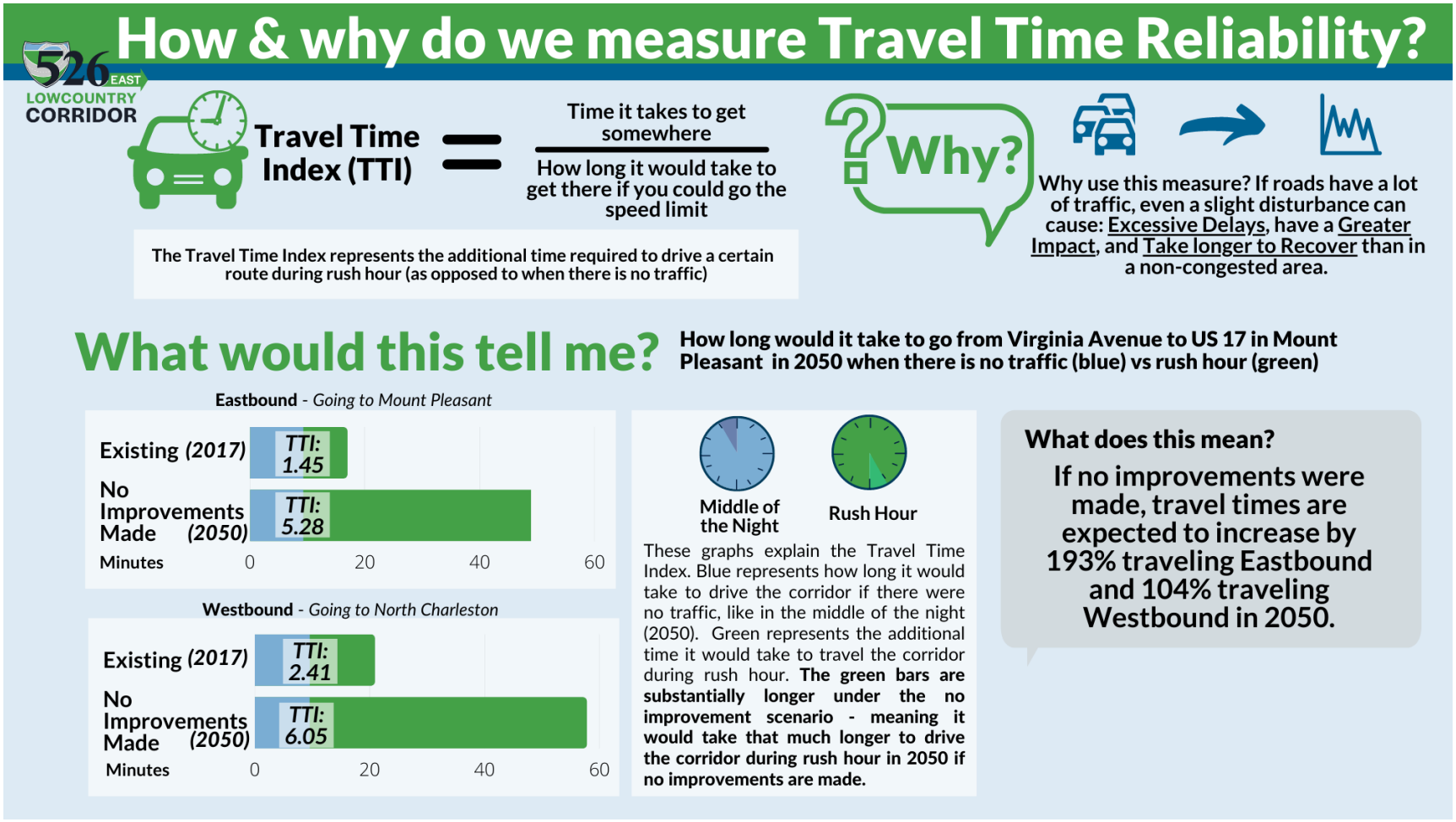
**Density impacted by Interchange Breakdowns. Note: Red text indicates unacceptable density. Based on the Transportation Research Board's Highway Capacity Manual, 6th Edition, densities along freeway segments greater than 35 passenger cars per mile per lane (pc/mi/ln) are considered to be unacceptable and experience unstable flow.*
Source: SCDOT and CDM Smith

Under the 2050 No-Build condition, most of the eastbound corridor operates at poor conditions during the PM peak hour. The anticipated increase of demand on the corridor will result in drivers experiencing longer delays, slower travel speeds, and longer travel times throughout the study area. Lower densities along this corridor are caused by interchange breakdowns which do not allow traffic to flow properly on and off I-526.

Figure 2-7 illustrates the PM peak hour traffic flow that occurs, demonstrating the breakdown of the interchanges. Although the density analysis identifies the flow of traffic along the mainline will be acceptable, the interchange breakdowns do not allow for free flow of traffic; thus, resulting in mimicking the operation of a lower density. The segments of I-526 LCC EAST will not operate at acceptable densities based on the 2050 projected traffic demands.

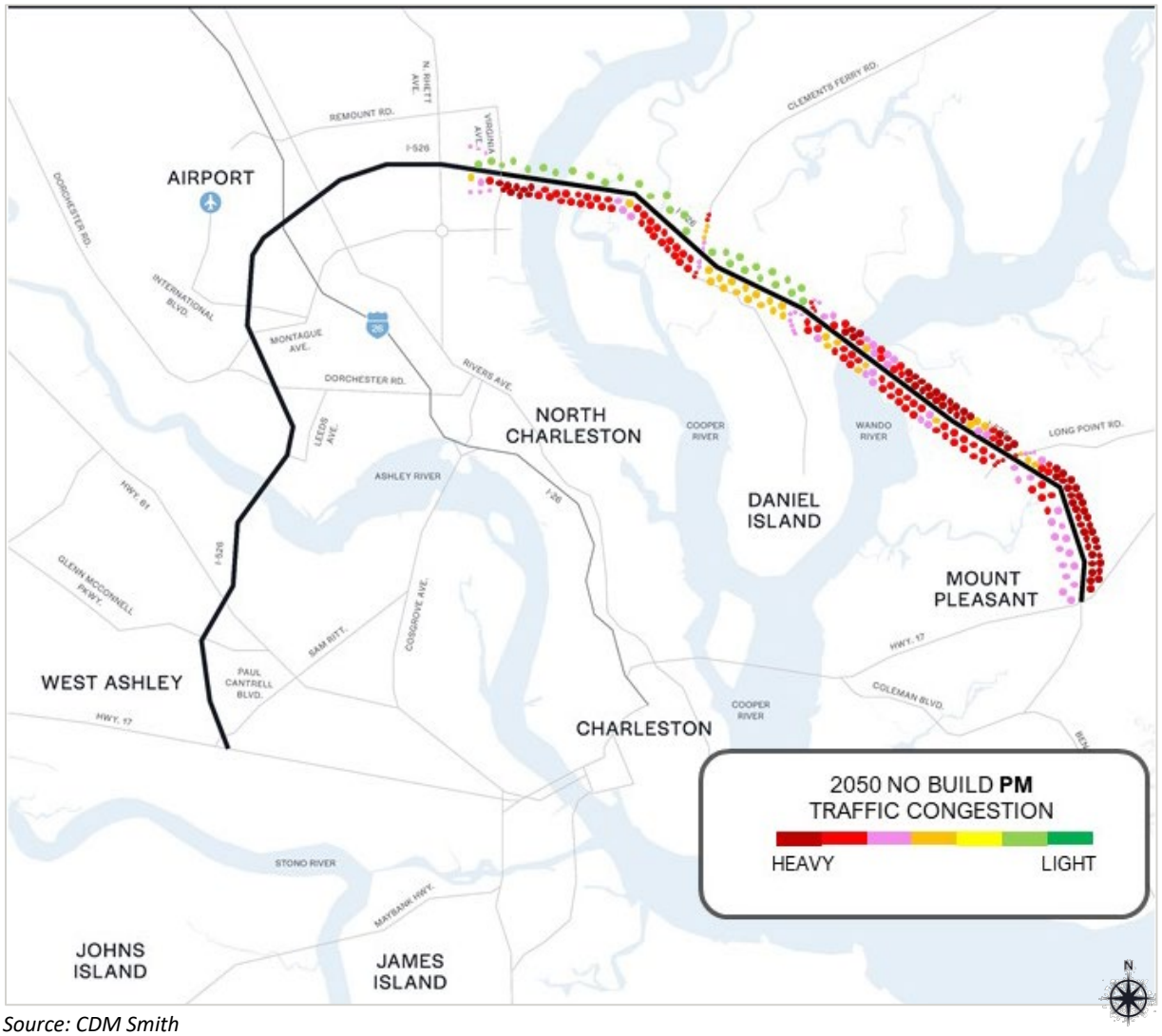
Travel time reliability is a performance indicator that shows the level of variability in travel times. The trave time reliability analysis included one metric for congestion and two metrics for reliability. **Table 2-3** shows the Travel Time Index (TTI) for 2017 traffic and the projected 2050 No-Build condition. TTI is a unitless ratio that compares the average travel time during periods of free-flow with the average travel time during periods of congestion. A summary of how and why travel time reliability was measured is shown in **Figure 2-6**.

Figure 2-6: How and Why Travel Time Reliability Was Measured



Based on the Transportation Research Board's *Highway Capacity Manual, 6th Edition*, TTI defines reliable travel times as having a value less than **1.33**. This threshold approximates the points beyond which travel times become much more variable or unreliable.

Figure 2-7: 2050 No-Build PM Peak Hour Traffic Flow



Source: CDM Smith

Table 2-3: 2017 and 2050 No-Build All Vehicles Travel Time Index

All Traffic TTI				
Direction	Common Paths		2017	2050 No-Build
	Origin	Destination		
Eastbound	I-526 west of N. Rhett Ave.	N. Rhett Ave.	3.0	15.1
	I-526 west of N. Rhett Ave.	Clements Ferry Rd.	2.0	6.6
	I-526 west of N. Rhett Ave.	Long Point Rd.	1.5	3.7
	I-526 west of N. Rhett Ave.	U.S. 17 East of I-526	1.4	3.3
	I-526 west of N. Rhett Ave.	Bowman Rd. S. of I-526	1.4	3.2
Westbound	N. Rhett Ave.	I-526 west of N. Rhett Ave.	2.6	1.0*
	Clements Ferry Rd.	I-526 west of N. Rhett Ave.	3.3	1.1*
	Long Point Rd.	I-526 west of N. Rhett Ave.	2.6	2.9
	U.S. 17 East of I-526	I-526 west of N. Rhett Ave.	2.4	3.6
	Bowman Rd. S. of I-526	I-526 west of N. Rhett Ave.	2.3	4.1

**Impacted by bottlenecks from the Wando bridge and Long Point Road Interchange*

A common path is composed of an origin and a destination. The common path of I-526 between North Rhett Avenue to Clements Ferry Road (eastbound) has a 2.0 TTI in 2017. A 2.0 TTI suggests that it takes two times as long to travel the same distance as compared to traveling under free-flow conditions. In 2050, the same common path will result in a TTI of 6.6, suggesting that it will take six times as long to travel this distance as compared to free-flow conditions. **All segments in the study area are currently unreliable and will become more variable with time.**

Table 2-4 demonstrates TTI of trucks for 2017 and the projected 2050 No-Build condition. All segments in the study area are currently unreliable for trucks and will continue to be unreliable under the No-Build condition.

Table 2-4: 2017 and 2050 No-Build Trucks Only Travel Time Index

Trucks Only TTI				
Direction	Common Paths		2017 Existing	2050 No-Build
	Origin	Destination		
Eastbound	I-526 west of N. Rhett Ave.	N. Rhett Ave.	3.0	9.7
	I-526 west of N. Rhett Ave.	Clements Ferry Rd.	2.0	5.5
	I-526 west of N. Rhett Ave.	Long Point Rd.	1.5	3.2
	I-526 west of N. Rhett Ave.	U.S. 17 East of I-526	1.4	2.9
	I-526 west of N. Rhett Ave.	Bowman Rd. S. of I-526	1.4	2.7
Westbound	N. Rhett Ave.	I-526 west of N. Rhett Ave.	2.6	1.1*
	Clements Ferry Rd.	I-526 west of N. Rhett Ave.	3.3	1.2*
	Long Point Rd.	I-526 west of N. Rhett Ave.	2.6	2.9
	U.S. 17 East of I-526	I-526 west of N. Rhett Ave.	2.4	3.5
	Bowman Rd. S. of I-526	I-526 west of N. Rhett Ave.	2.3	4.0

**Impacted by bottlenecks from the Wando bridge and Long Point Road Interchange*

Comparing the existing (2017) travel time reliability to the 2050 No-Build condition demonstrates how the degradation of traffic conditions along the I-526 LCC EAST corridor will impact drivers on a day-to-day basis in terms of time spent driving in congestion due to excessive traffic. Looking at both, all vehicle traffic and truck only TTI, reveals that congestion and travel time reliability patterns in the corridor are similar under the 2050 No-Build condition with trucks typically experiencing slightly slower travel times. The 2050 No-Build condition for the corridor shows the TTI at extremely high levels of congestion with nearly twice the acceptable TTI values, except for the two most eastern segments of the corridor that show improvement due to bottlenecks that occur to the west at the Wando bridge and Long Point Road interchange that stifle the flow of traffic.

2.6 CONDITION OF THE CORRIDOR

There are several geometric deficiencies along the existing corridor that contribute to congestion and reduced travel times. A brief summary of the deficiencies including inadequate shoulder widths, insufficient acceleration/deceleration ramp lengths, and tightly curved ramps are provided in the following sections.

2.6.1 Inadequate Shoulder Widths

Shoulder widths vary throughout the EAST corridor. In sections where there are two travel lanes (along bridges), the inside and outside shoulders are typically 10 feet wide. In the sections of the corridor that include the additional truck climbing lane, the inside and outside shoulders have been reduced from 10 feet to four feet and six feet, respectively. East of the Wando River Bridge, the inside paved shoulder varies between 4 and 5 feet, while the outside shoulder increases from six to 10 feet.

The shoulder width deficiencies in the three-lane sections, which are located on the Don Holt and Wando bridges as truck climbing lanes are reduced from the typical width of 10 feet to six feet. These reduced shoulder widths do not provide enough space for disabled vehicles pull-outs or crash investigations. When an incident occurs in the areas with shoulders that are insufficient to accommodate parked vehicles and provide access to emergency vehicles, the fastest and safest resulting action to alleviate the incident will most likely require a lane closure. A lane closure along this corridor further amplifies the congestion already experienced by drivers.

2.6.2 Insufficient Acceleration/Deceleration Ramp Lengths

Acceleration lanes provide the opportunity for vehicles entering a freeway to achieve the speed of traffic prior to merging with the traffic flow. Deceleration lanes provide the opportunity for vehicles exiting an interstate to slow down enough to stop or merge with lower speed roadway at the end of a ramp. The required length of acceleration and deceleration lanes is based on the relative speeds of both roadways – the interstate mainline and the intersecting road. Insufficient acceleration and deceleration ramp lengths make it difficult for a vehicle to achieve the appropriate speed prior to merging with the mainline of the interstate. These insufficient ramp lengths require traffic on the mainline to speed up or slow down to accommodate entering or exiting vehicles, causing additional congestion and delays.

Of the five interchanges located in the EAST corridor, the Long Point Road and U.S. 17 interchange locations have insufficient acceleration and deceleration ramp lengths.

2.6.3 Tightly Curved Ramps

Of the five interchanges located in the EAST corridor, the existing interchange ramp curves within the corridor are designed for 25 miles per hour. Ramp speeds are determined to ensure that the speed differential a vehicle on a ramp must gain/reduce to enter or exit a highway is not too great. For loop ramps, the desirable minimum speed for the ramp is approximately 50 percent of the speed on the mainline highway, which ranges from 55 to 60 miles per hour along I-526. A vehicle can navigate a larger curve at higher speeds, requiring shorter acceleration/deceleration lengths to and from the mainline facility. There is a balance in design speed for the ramp and acceleration/deceleration length.

2.7 Incident Management Services

Incident management on the I-526 LCC EAST corridor is currently covered by the SCDOT State Highway Emergency Program (SHEP) from the western limits of the corridor to Long Point Road. SHEP responders help motorists by changing tires, performing basic repairs, and providing small amounts of gasoline. SHEP responders are also trained in clearing wrecked vehicles from travel lanes.

2.8 Transportation Projects in the Vicinity

There are multiple active transportation projects within the vicinity of the I-526 LCC EAST corridor including the I-526 LCC WEST EIS, the Mark Clark Extension EIS and the Clements Ferry Road widening project. This PEL incorporates data collection, analyses, and recommendations of these various plans to support the alignment of regional goals and anticipated project outcomes.

2.8.1 I-526 LCC WEST Corridor

The I-526 LCC WEST corridor project is located adjacent to the I-526 LCC EAST corridor. It begins at Paul Cantrell Boulevard in West Ashley and spans approximately 9.7 miles ending at Virginia Avenue in North Charleston coinciding with the western terminus of the I-526 LCC EAST corridor project. The goal of the I-526 LCC WEST project is to increase capacity and improve operations at the I-526 and I-26 interchange and along the I-526 mainline. Improvements within the project corridor include interchange improvements at North Rhett Avenue and Virginia Avenue, Rivers Avenue, minor ramp repairs at other service interchanges, and widening the mainline from four to eight lanes. Operational and capacity improvements along the I-526 LCC WEST corridor may improve the facility's level of service (LOS) leading to an increase in drivers along the entire I-526 corridor. The I-526 LCC EAST corridor must also be able to accommodate the potential increase in traffic volumes from drivers opting to drive on I-526. Additional project details are summarized in **Table 2-5**.

Table 2-5: I-526 LCC WEST Project Details

Project Type	Interstate widening
Project Active State	FEIS and ROD completion anticipated in 2022
Right-of-Way Year	2023 (estimated)
Construction Year	2028 (estimated)
Anticipated Contract Completion	Undetermined

2.8.2 Mark Clark Extension

The Mark Clark Extension project consists of a new 7.9-mile-long parkway, with an additional 1.6 miles of connector roads on Johns Island, for a total length of 9.5 miles, which includes 4.5 miles of structure and two crossings of the Atlantic Intracoastal Waterway. A multiuse path for bicycle and pedestrian use is included along the entire length of the roadway. The Mark Clark Extension project extends from the existing interchange at I-526/U.S. 17 in West Ashley to Johns Island as a four-lane parkway, crossing the Stono River then traverses James Island along the northern boundary of the James Island County Park and ties into the existing James Island Connector at Folly Road.

Table 2-6: Mark Clark Extension Project Details

Project Type	New alignment
Project Active State	FEIS and ROD completion anticipated 2023
Right-of-Way Year	2024
Construction Year	2024
Anticipated Contract Completion	Undetermined

The purpose and need of the Mark Clark Extension is to increase the capacity of the regional transportation system and enhance mobility to and from the West Ashley, Johns Island, and James Island areas of the Charleston Metropolitan Area. This project is an extension of the existing I-526 facility in West Ashley connecting to the James Island Expressway on James Island. This project will allow commuters living in West Ashley, Johns Island, and James Island access to I-526 providing them a more direct route to I-526 EAST and destinations on Daniel Island and Mount Pleasant. Additional project details are summarized in **Table 2-6.**

2.8.3 Clements Ferry Road – Phase 2

The Clements Ferry Road Phase 2 widening project will add two lanes to Clements Ferry Road for approximately 4.5 miles from Jack Primus Road to South Carolina Highway 41. One of the goals of the project is to reduce congestion along the corridor. Clements Ferry Road has seen higher than average growth in recent years. The development of Cainhoy Plantation is expected to build out to 18,252 units in addition to other developments built along Clements Ferry Road. With an increase in residential development, an increase in traffic volumes will occur. As a result, the increased traffic along Clements Ferry Road will likely result in increased traffic volumes along the I-526 LCC EAST corridor. Additional project details are summarized in **Table 2-7.**

Table 2-7: Clements Ferry Road – Phase 2 Project Details

Project Type	Widening
Project Active State	Construction
Right-of-Way Year	2018
Construction Year	2020
Anticipated Contract Completion	Fall 2024

3.0 What Are the Desired Outcomes of This Project?

The purpose and need statement was developed in coordination with FHWA and SCDOT and refined with input from the general public, agencies, and project stakeholders representing local public agencies, businesses, residents, non-profit organizations, and special interest groups in the project vicinity. The specific needs summarized below are based on the analysis and findings documented in this report and in the *I-526 LCC EAST PEL Study Purpose and Need Technical Memorandum* in **Appendix B** and *I-526 LCC EAST PEL Study Travel Time Reliability Analysis Technical Memorandum* in **Appendix C**.

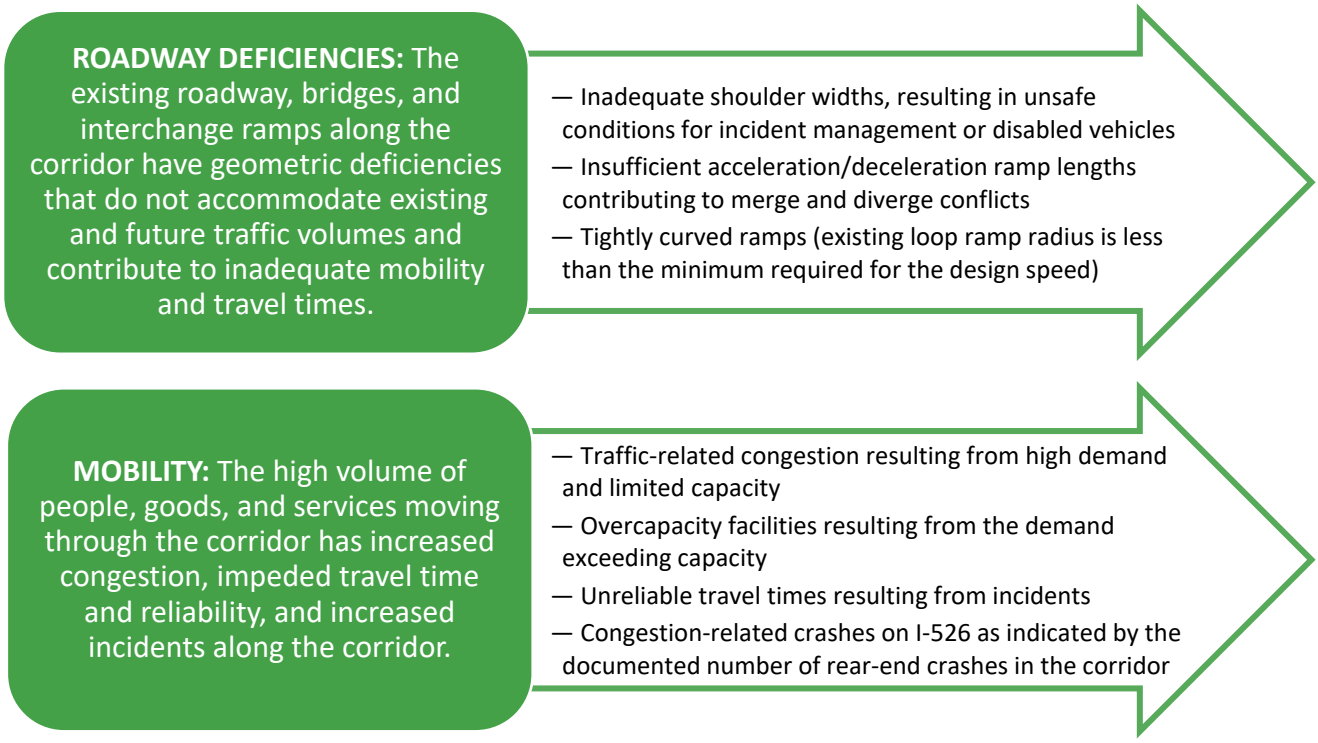
3.1 Purpose of the Project

The purpose of the project is to reduce congestion and improve travel time reliability[7] along I-526 from Virginia Avenue in North Charleston to U.S. 17 in Mount Pleasant. Travelers on the I-526 EAST corridor currently experience heavy congestion, delay, and unreliable travel times. Forecast growth in population and development in the region will result in a continued increase in traffic volumes, congestion, and more delays. Improvements considered for implementation should provide an acceptable volume to capacity ratio, reduced vehicle hours of delay, increased average speeds, and more reliable travel times.

3.2 Need for Improvements

Improvements to this corridor are needed to address congestion and unreliable travel times in the corridor. Mobility and roadway deficiencies that contribute to the congestion and unreliable travel times are discussed below.

[7] Travel time reliability is the comparison of free-flow conditions to congested conditions.



Comparing the existing reliability to the 2050 No-Build condition reflect how the degradation of traffic conditions along the I-526 LCC EAST corridor will impact drivers on a day-to-day basis in terms of time spent driving and possible time loss due to excessive traffic. The 2050 No-Build condition shows the TTI at high levels of congestion with nearly twice the acceptable TTI values, except for the two segments that are improved by the planned I-526 LCC WEST project.

3.3 Supporting Goals for this Corridor Improvement Project

The following goals were developed in conjunction with the SCDOT project management team and input from the public. Supplemental to the stated project purpose and needs, these goals for corridor improvements provided guidance for alternatives development and evaluation throughout the PEL process. These supporting goals were also factored in the eventual design guidelines and final operational considerations for the project.

The following goals have been established for the I-526 LCC EAST PEL study:

COMPATABILITY: Align with local land use plans and projects. If recommendations align with local land use or transportation plans identified in the BCDCOG Existing and Committed projects, it supports this goal area.

DEMAND: Improve roadway infrastructure to accommodate increased traffic volumes. If recommendation is expected to increase the ability of the corridor to accommodate or better manage estimated travel demand, it is assumed to support the project goal.

SAFETY: Reduce congestion-related incidents throughout the corridor. If congestion is improved and geometric deficiencies are corrected, it is assumed that this crash rate should improve by improving safer driving conditions.

MULTIMODAL: Enhance mobility for people and goods through the corridor. This includes modes other than single occupancy vehicles, such as carpool, transit, walk, bike, or truck. If the recommendation is designed to support such modes, it supports this goal area.

SEISMIC: Improve seismic resiliency of the infrastructure in the case of an earthquake or other seismic event. If roadways or bridges are modified or reconstructed, it is assumed that new infrastructure will be built to current, improved seismic standards, supporting this goal area.

TECHNOLOGY: Accommodate future transportation technologies, including vehicle technologies, communications technologies, system monitoring systems, driver information and traffic operations technologies. If the recommendation supports these technologies, it is supportive of the technology goal area.

CONNECTIVITY: Improve connections with area ports, rail intermodal facilities, and transit assets. If the recommendation is designed to provide new or improved connections to intermodal assets, it supports the connectivity goal area.

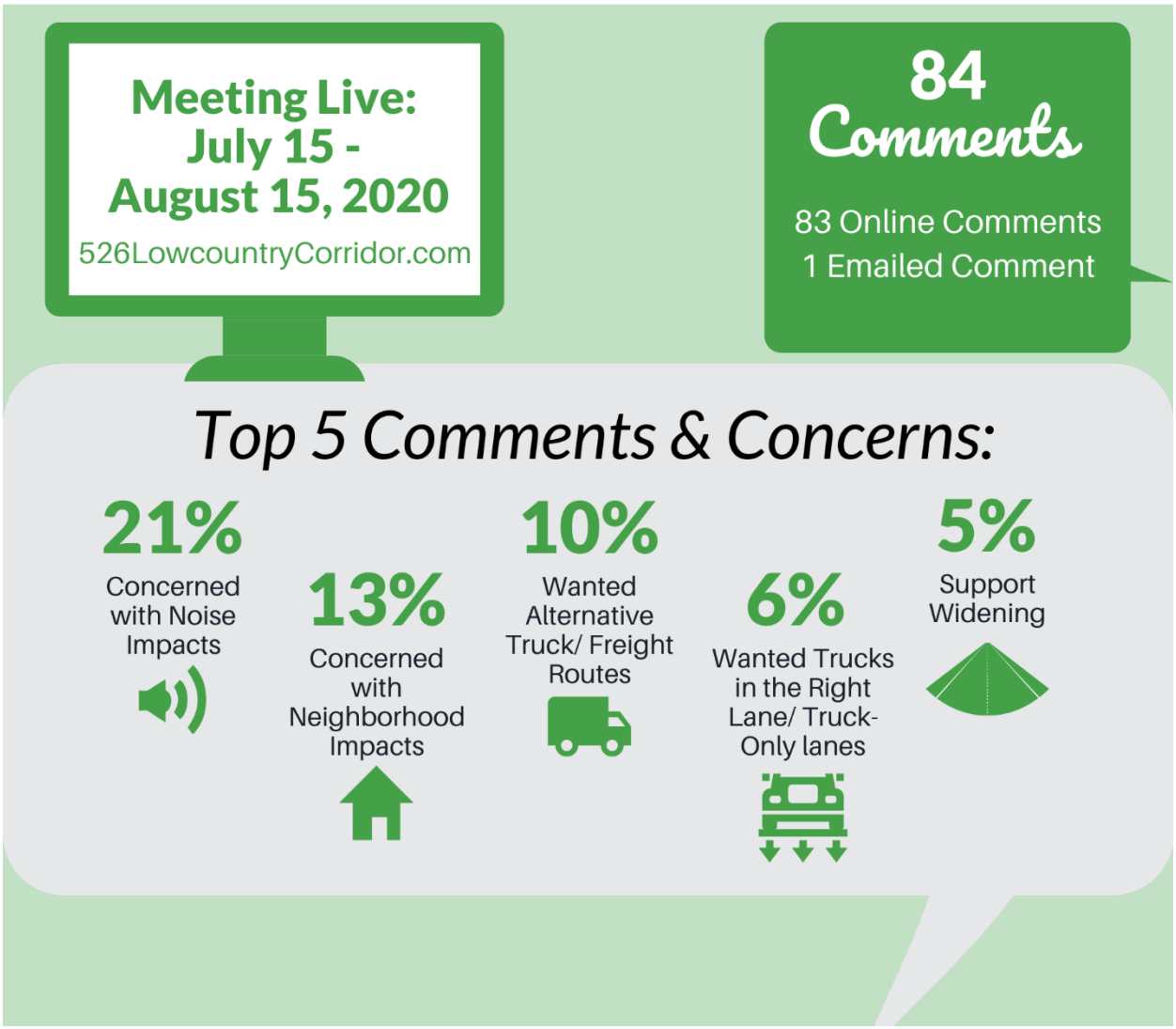
3.4 INPUT FROM THE PUBLIC

During the initial months of the PEL study, data were collected and traffic studies were conducted to understand the context of the I-526 LCC EAST corridor. A public engagement effort was also conducted to gain a better understanding of the issues and concerns along the corridor. This input was used to obtain a comprehensive view of the issues currently being experienced by users of the corridor.

The public had an opportunity to review the draft Purpose and Need during an on-demand, Public Information Meeting (PIM) hosted online at www.526lowcountrycorridor.com/vpim-east/ from July 15 to August 15, 2020[8].

In addition to the PIM, an interactive online survey (MetroQuest) was released on May 14, 2020 and remained open until August 15, 2020. Public comments received covered a wide range of topics. The top comments and concerns were associated with noise, neighborhood impacts, and trucks. The MetroQuest survey was designed to solicit input on the draft purpose and need; provide feedback on what travelers' experience while using the EAST corridor; and provide feedback on types of improvements that the public would like to see. Two of the top safety-related issues that were reported in the survey are congestion and truck merging, aligning with the safety and traffic analyses described in **Figure 3-1** and **Figure 3-2** illustrates the summary of comments received for the PIM and MetroQuest survey.

Figure 3-1: Summary of Comments Received at Public Information Meeting 1

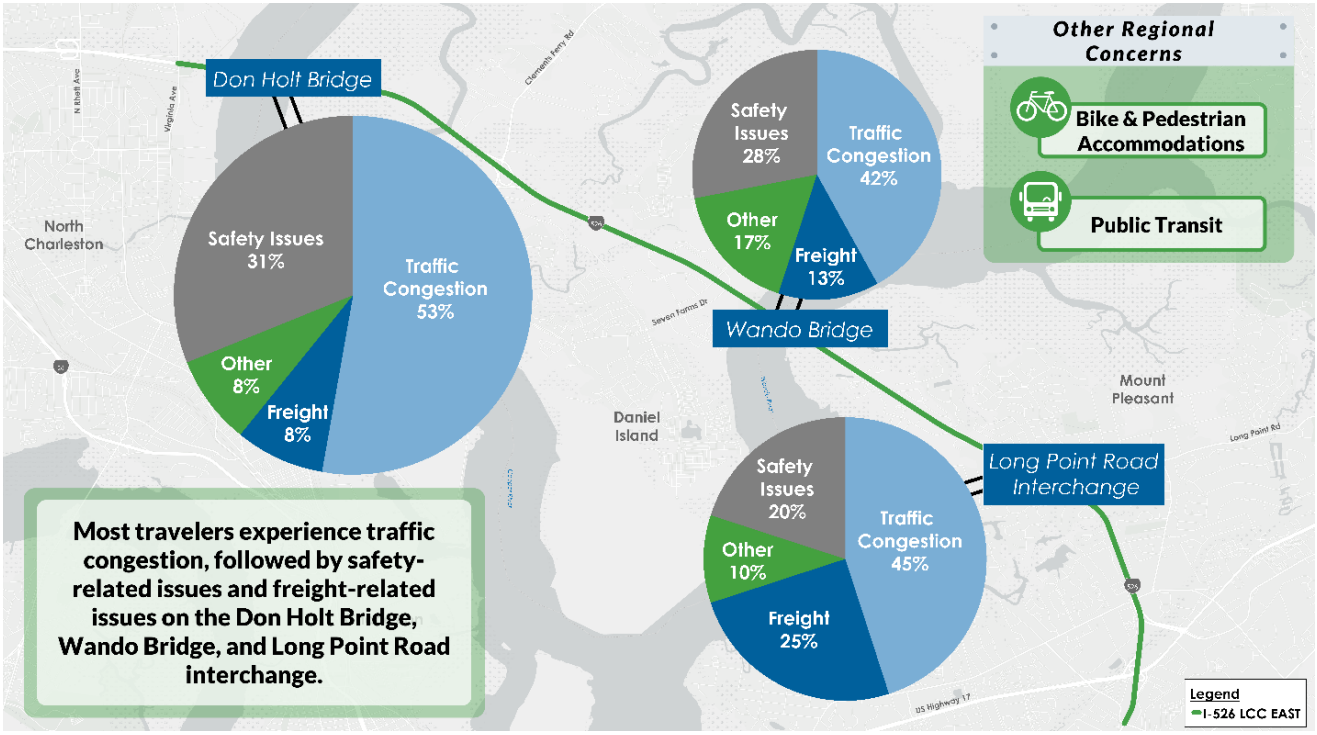


[8] The meeting was originally scheduled as an in-person meeting, however due to the public health crisis, it was rescheduled as an online PIM.

Figure 3-2: Summary of MetroQuest Survey Responses

The MetroQuest survey also included an interactive map that allowed respondents to input locations and type of concerns that travelers experience using the EAST corridor. Most of the responses indicated that travelers are experiencing travel concerns on the Don Holt Bridge, Wando Bridge, and the Long Point Road interchange as summarized on **Figure 3-3**.

Figure 3-3: Summary of Mapped MetroQuest Comments



The input and feedback from the public and stakeholders helped confirm the draft purpose and need and was utilized in the development of the alternative concepts.

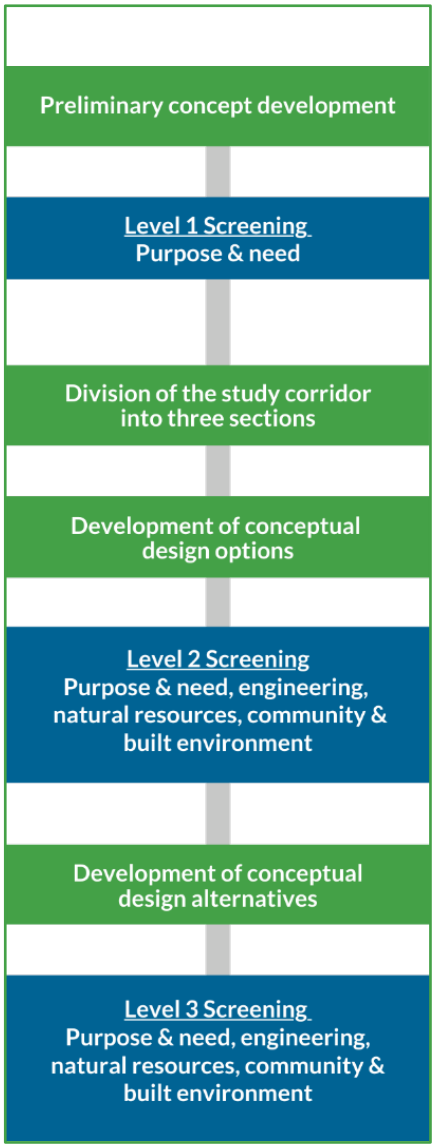
4.0 What Was the Process for Developing and Evaluating Alternatives?

The intent of the alternatives development and evaluation process was to identify and screen a broad range of concepts for the study corridor to address the project's purpose and need, culminating in the identification of a range of reasonable alternatives. The alternatives evaluation process included a multilevel screening approach that started with the identification of the range of concepts, development of screening criteria based on the purpose and need, and narrowing of options, through a documented and tiered screening process. The Level 1 screening used a qualitative and quantitative methodology to compare each concept against the baseline and future no-build condition to determine whether the concept met the purpose and need or is fatally flawed. As concepts progressed through the Level 2 and Level 3 screening, the level of detail in analyses and refinement in preliminary engineering design increased.

The alternatives concept development and screening process was developed in coordination with FHWA and SCDOT and refined with input from the general public, agencies, and project stakeholders. Input received from the first public meeting and MetroQuest survey contributed to refining the purpose and need and contributing to the development of preliminary concepts. The second public meeting provided an overview of the screening process, the elimination of the unreasonable alternatives, and the potential environmental impacts for the reasonable alternatives.

An overview of the concept development and screening process is described in this chapter and illustrated in **Figure 4-1**. For more detailed information regarding the concept development and screening process is documented in the *I-526 LCC EAST PEL Study Alternatives Analysis Technical Memorandum* (**Appendix D**).

Figure 4-1: I-526 LCC EAST PEL Alternative Concept Development and Screening Process

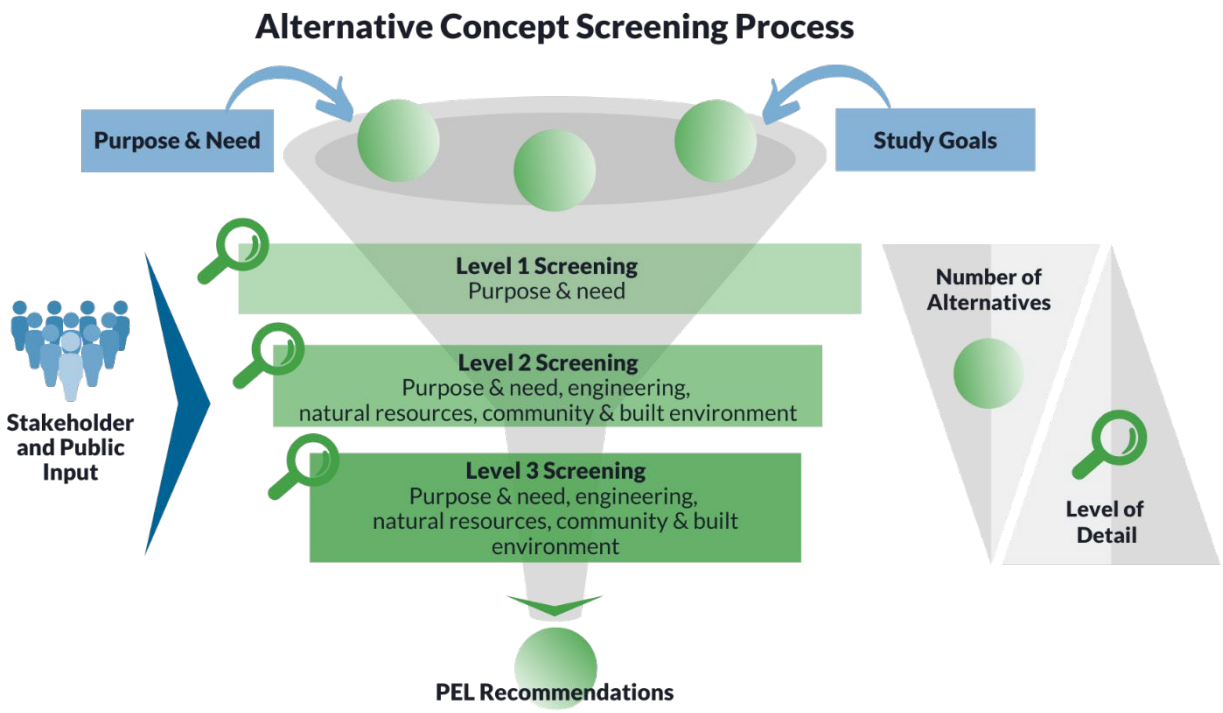


4.1 Overview of the Alternatives Screening Process

The three-level screening process, illustrated in **Figure 4-2,** began with an evaluation to determine if the preliminary concepts meet the purpose and need. The second level divided the corridor into three sections to develop conceptual design options. The conceptual design options were evaluated based on the four categories listed below to determine which options perform the best in each section. The third level of evaluation consisted of combining the best performing conceptual design options from each section of the corridor into end-to-end alternatives. The end-to-end alternatives were evaluated based on the same categories as in the Level 2 screening.

- **Purpose and Need** (quantitative based on traffic analysis)
- **Engineering** (qualitative based on preliminary engineering evaluation)
- **Natural Resources** (quantitative based on potential impacts to resources)
- **Communities and Built Environment** (quantitative based on potential impacts)

Figure 4-2: I-526 LCC EAST PEL Alternative Concept Screening Process



4.2 PRELIMINARY CONCEPT DEVELOPMENT – RANGE OF ALTERNATIVES

Preliminary concepts were developed using a combination of the existing and future transportation conditions analyses; review of previous plans and studies related to the study area; and public and stakeholder input to address the purpose, need, and goals of the study. The preliminary concepts identified within the study area include the No-Build alternative, additional lanes, interchange improvements, and transportation systems management and operations (TSMO) strategies. An improvement via a parallel route located outside of the immediate study area was also evaluated.

No-Build Alternative – The No-Build alternative presents the anticipated future condition if no action is taken. This concept includes the planned mobility improvements in the region within the 2040 regional planning horizon as identified in the CHATS Metropolitan Planning Organizations (MPO) 2040 Long Range Transportation Plan.[9] The No-Build alternative provides a foundation for a comparison of traffic, environmental, and human conditions against the proposed build concepts through all levels of analysis.

Additional Lanes – Additional lanes concepts include two scenarios for adding capacity to existing I-526 mainline.

Interchange Improvements – It is assumed that the existing interchange configurations will be maintained, if possible, and only modified if geometric modifications are necessary to accommodate mainline widening or forecast traffic volumes. In addition, a new direct ramp connection to the WWT was included as a proposed interchange concept.

TSMO Strategies – TSMO is a set of strategies that focus on operational improvements that can help maintain and even restore the existing transportation system's performance before extra capacity is needed. TSMO strategies aim to maximize traveler choices by offering incentives, providing users with information about travel conditions to guide transportation decisions, and encouraging travel behavior changes. TSMO strategies were evaluated at the planning level prior to reaching a conclusion of how TSMO strategies may or may not be incorporated into the proposed corridor improvements.

Parallel Route – The parallel route would be a new alignment alternative to help alleviate congestion by reducing traffic demand on the existing I-526 mainline from U.S. 17 in Mount Pleasant to Virginia Avenue in North Charleston by providing a conceptualized alternative route. This proposed connection extends from the current eastern terminus of Liberty Hall Road and Henry E. Brown Jr. Boulevard and continues eastward just north of Foster Creek, crossing the Back River with a connection at Bushy Park Road. The alignment then continues east, crossing the Cooper River and terminating at Highway 41. A map of the alignment is provided in **Appendix D**.

4.3 LEVEL 1 SCREENING

The Level 1 screening evaluation used a quantitative and qualitative methodology to evaluate the alternatives against the No-Build condition to determine whether the concept met the purpose and need. This included measures of improved congestion and roadway deficiencies. Congestion was assessed using quantitative traffic performance metric outputs from the BCDCOG CHATS Interim Regional TDM, which was the official model at the time of the study is detailed in **Table 4-1**. In the Level

[9] CHATS Metropolitan Planning Organization 2040 Long Range Transportation Plan, https://www.bcdcog.com/long-range-transportation-plan/

1 screening, infrastructure improvement concepts were evaluated with the goal of quantifying the amount of mainline capacity needed to provide mobility improvement at the corridor-wide level.

The performance measure outputs from the CHATS Interim Regional TDM used in the Level 1 screening included:

- **Improved Level of Service and Volume to Capacity Ratios** – A traditional measure of roadway performance is level of service (LOS). A LOS output in TDM is a rating based on the estimated V/C ratio. This represents the total volume (or demand) on a roadway against the capacity of the lane configuration under consideration. To evaluate the ability of a concept to improve congestion, it is necessary to estimate a forecast year V/C ratio and provide a relatively acceptable operation. For this Level 1 analysis, the CHATS Interim Regional TDM was used to calculate the estimated V/C ratio for annual daily traffic conditions for the design year of 2050. It was determined, based on the Transportation Research Board's Highway Capacity Manual (2000),[10] that an average daily V/C ratio over 0.88 would not provide an acceptable operation and would not have the potential to meet the purpose and need of this project.

- **Reduced Delay and Improve Travel Speed in the Corridor** – Delay is calculated as the difference in travel speeds between posted speed, or free-flow speed, and congested speed. For drivers, this is the additional time it takes to travel a roadway under congested conditions compared to uncongested conditions. For the Level 1 screening, the CHATS Interim Regional TDM was used to estimate the corridor-wide delay for each concept presented. The average speed of the I-526 corridor provides insight into the congestion, as speed is directly related to congestion that is being experienced based on the CHATS Interim Regional TDM. The I-526 posted speed limits within the study area are 55, 60, and 65 mph. For this corridor, daily average speeds less than 45 mph were considered undesirable.

To provide a quantifiable "yes" or "no" scoring for congestion in the Level 1 screening, the performance of these concepts was compared with the No-build performance using the CHATS Interim Regional TDM results presented in **Table 4-1** and **Table 4-2.**

Table 4-1: Summary of Level 1 Concepts TDM Results

Infrastructure Improvement Concept	Model Year	Daily Volume to Capacity (V/C ≤ 0.88)	Daily Vehicle Hours of Delay (vehicle-hours)[1]	Average Speed (mph)	Total Two-Way Vehicle Miles Traveled Average Daily[1]
No-build	2050	1.20	10,400	37	1,026,200
No-build + one lane each way	2050	0.91	6,300	45	1,181,000
No-build + two lanes each way	2050	0.73	3,300	55	1,246,000
New location alignment route (new alignment from Bushy Park Road to SC 41)	2050	1.18	9,200	38	997,600

[10] The Highway Capacity Manual (HCM) is a publication of the Transportation Research Board of the National Academies of Science in the U.S. It serves as the principal resource for the analysis for capacity and level of service of U.S. streets and highways.

Infrastructure Improvement Concept	Model Year	Daily Volume to Capacity (V/C ≤ 0.88)	Daily Vehicle Hours of Delay (vehicle-hours)[1]	Average Speed (mph)	Total Two-Way Vehicle Miles Traveled Average Daily[1]

Source: CHATS Interim Regional TDM
Notes: For planning purposes only. Outputs are for the I-526 mainline. [1] Rounded to the hundreds.
Red text indicates V/C ratios that are greater than 0.88.

Table 4-2: Level 1 Screening Results

Infrastructure Improvement Concept	Improves Congestion	Addresses Roadway Deficiencies	Summary of Results	Explanation
No-build	n/a	n/a	Carried forward	The No-build is the baseline condition and was carried forward into the Level 2 and Level 3 screenings to compare benefits and impacts with other concepts.
Infrastructure Concepts				
Alternative Alignment				
New alignment alternative route	No	No	Eliminated	The addition of a new alignment would reduce the total demand on I-526 LCC EAST, but it would provide minimal improvement for delay and travel speed on the I-526 mainline. This concept will not result in an acceptable operational improvement of V/C and fails to improve roadway deficiencies on the I-526 mainline.
Mainline Improvements				
No-build + one lane each way	No	Yes	Eliminated	Adding two general-purpose lanes will not provide an acceptable operational improvement in the V/C, delay, and travel speed. Roadway deficiencies would be addressed with the addition of new lanes.
No-build + two lanes each way	Yes	Yes	Carried forward	Adding four general-purpose lanes will have operational improvement of congestion and improve roadway deficiencies on the I-526 mainline.
Interchange /Ramp Improvements				
Interchange Improvements	No	No	Carried forward as a supplemental option	Interchange improvements cannot provide an acceptable operational improvement on their own; however, if improvements are made to the I-526 mainline, subsequent changes to the interchanges will be required to accommodate the mainline improvements and the geometric deficiencies.
Dedicated truck ramp to port (additional facility)	No	No	Carried forward as a supplemental option	Adding a dedicated truck ramp would not improve congestion or address roadway deficiencies as a standalone option for the entire corridor; however, this truck ramp could be added to any of the infrastructure improvements and potentially improve flow and connections to the Wando Welch Terminal, helping to achieve the project goal of improving access to port facilities. It could also improve the geometric deficiencies of inadequate acceleration/deceleration ramp lengths, tight ramp curves, and improve operations of the Long Point Road Interchange and mainline.

The CHATS Interim Regional TDM analysis also guided the refinement of concepts carried forward from the Level 1 screening into Level 2 screening to accommodate capacity needs based upon the estimated travel demand. The results of the CHATS Interim Regional TDM analysis determined that a minimum of eight lanes, or four through lanes in each direction, would be required to achieve a V/C ratio below the

0.88 threshold outlined in the Transportation Research Board's Highway Capacity Manual (2000)[11] for an acceptable level of congestion and has guided the further development of the infrastructure improvement concepts.

The existing roadway, bridges, and interchange ramps in the corridor have geometric deficiencies that do not accommodate existing and future traffic volumes and contribute to inadequate mobility and travel times. To evaluate roadway deficiency, concepts were evaluated on their ability to satisfy the question, "Does the concept have the potential to meet SCDOT roadway design standards on I-526 mainline and/or the interchanges?" The following criteria were considered when answering the question:

- Shoulder width
- Acceleration and deceleration ramps
- Tight ramp curves (existing loop ramp radius is less than the minimum required for the design speed)

The results of the Level 1 screening, based on traffic analysis to evaluate the total capacity needs for corridor-wide capacity traffic performance resulted in the definitive direction that the entire I-526 EAST corridor requires two additional mainline travel lanes in each direction. It was determined that the other conceptual alternatives including a new alignment on an alternate route, adding only one mainline travel lane or interchange improvements alone, did not meet the criteria to move forward into the Level 2 screening.

Alternatives carried forward based on the CHATS Interim Regional TDM analysis include the No-Build and the No-Build plus two additional lanes in each direction. The addition of two lanes in each direction passed the 0.88 V/C ratio deemed necessary for achieving a desirable average daily operation for the entire corridor. This assumption of total capacity of four mainline lanes in each direction will be carried forward and design refined through subsequent levels of analysis.

Concepts that were moved forward as supplemental options cannot satisfy the project's purpose and need on their own and were eliminated as standalone concepts. Although eliminated as standalone concepts, these options may increase the effectiveness of other concepts if combined to create a more implementable solution or built as standalone projects to accomplish mobility improvement goals on a more localized level within the corridor.

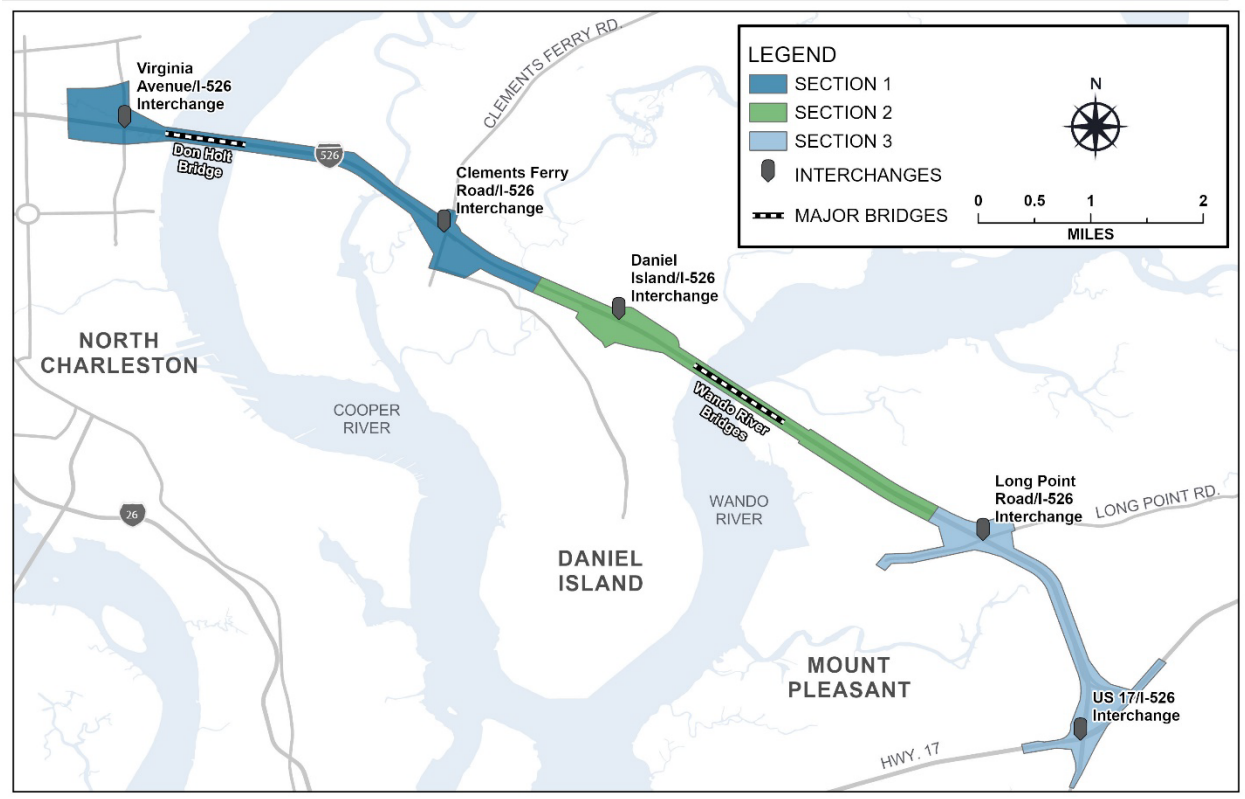
Improvements to interchanges ramps would help to address geometric deficiencies on-ramps within the project study area. However, interchange improvements will not satisfy the purpose and need of improving I-526 mainline congestion and address geometric deficiencies and will be eliminated as standalone options. If improvements are made to the I-526 mainline, subsequent changes to the interchanges will be required. Thus, interchange improvement concepts were moved forward to Level 3 as supplemental options.

[11] Transportation Research Board. Highway Capacity Manual: U.S. Customary Units. 2000. 23-4.

4.4 Development of Conceptual Engineering Design Options for Level 2 Screening

Following the results of the Level 1 screening, the project team evaluated the corridor in three sections based on engineering and environmental constraints which are largely driven by the approaches to the Don Holt and Wando bridges as illustrated in **Figure 4-3**. The three sections of the corridor do not represent standalone projects and were only used to streamline analysis of engineering and environmental screening criteria. Reducing the relative scale of the corridor into smaller sections allowed engineering experts to evaluate potential design and construction constraints more efficiently and at a localized level. Conceptual design options were developed for each section to include two additional lanes in each direction (totaling eight through lanes) as deemed necessary in Level 1. The project development process was to work at these section levels to evaluate refined design engineering concepts, quantify the impacts and constructability of these design options, and then create combinations of sections into a series of corridor wide alternatives for further analysis.

Figure 4-3: I-526 LCC EAST Corridor Sections



The governing factors for developing the design concepts at this smaller section level included additional mainline capacity and two major bridge structures—the Don Holt and Wando bridges. A concept to evaluate a higher bridge structure for the Don Holt bridge was also included as an option to improve maritime freight connectivity to the North Charleston Port Terminal. The concepts to replace the Wando bridge assume a lower bridge structure in alignment with US Coast Guard clearance requirements. A total of 21 infrastructure improvement concepts were developed across the three sections of the corridor using the following scenarios:

- Symmetrical – Adding capacity symmetrically to each side of the existing alignment
- North – Adding capacity to the north of the existing alignment
- South – Adding capacity to the south of the existing alignment
- Retain – Retaining the current bridge structure
- Replace – Replacing the current bridge structure

Concept engineering design options within each section are summarized in **Table 4-3**.

Table 4-3: Design Concept Options for Sections 1, 2, and 3

Design Option	Concept Details	Added Capacity Options
Section 1		
Option 1-A	Retain the Don Holt bridge and widen symmetrically for a total of eight lanes.	Retain/Symmetrical
Option 1-B	Retain Don Holt bridge and add two lanes in each direction by adding parallel bridge structures on each side, for a total of eight lanes.	Retain/Symmetrical
Option 1-C	Retain the Don Holt bridge and add a new four-lane bridge north of the existing bridge to carry westbound traffic. Existing Don Holt bridge retained to carry eastbound traffic, for a total of eight lanes.	Retain/North
Option 1-D	Retain the Don Holt bridge and add a new four-lane bridge south of the existing bridge to carry eastbound traffic. Existing Don Holt bridge retained to carry westbound traffic, for a total of eight lanes.	Retain/South
Option 1-E	Replace the Don Holt bridge (increase navigational clearance by 31 feet) by constructing two new four-lane bridges on each side, for a total of eight lanes.	Replace/Symmetrical
Option 1-F	Replace the Don Holt bridge (increase navigation clearance by 31 feet) by constructing a new eight-lane bridge north of the existing bridge.	Replace/North
Option 1-G	Replace the Don Holt bridge (increase navigation clearance by 31 feet) by constructing a new eight-lane bridge south of the existing bridge.	Replace/South
Option 1-H	Construct a new, higher four-lane bridge north of existing and replace the Don Holt bridge (increase navigation clearance by 31 feet) in place, for a total of eight lanes.	Replace/North
Option 1-I	Construct a new/higher four-lane bridge south of the existing bridge and replace the Don Holt bridge (increase navigation clearance by 31 feet) in place, for a total of eight lanes.	Replace/South
Section 2		
Option 2-A	Retain the Wando bridges and add two lanes in each direction by adding parallel bridge structures on each side (outside), for a total of eight lanes.	Retain/Symmetrical
Option 2-B	Retain the Wando bridges and add two lanes in each direction by adding parallel bridge structures on each side (outside), for a total of eight lanes.	Retain/Symmetrical
Option 2-C	Retain the Wando bridges and add a new four-lane bridge north of the existing bridge to carry westbound traffic. The existing Wando bridge would be retained to carry eastbound traffic, for a total of eight lanes.	Retain/North
Option 2-D	Retain the Wando bridges and add a new four-lane bridge south of the existing bridge to carry westbound traffic. The existing Wando bridge would be retained to carry eastbound traffic, for a total of eight lanes.	Retain/South
Option 2-E	Replace the Wando bridges by constructing two new four-lane bridges on each side of the existing structures, for a total of eight lanes (single-stage with larger footprint).	Replace/Symmetrical
Option 2-F	Replace the Wando bridges by constructing a new eight-lane bridge north of the existing structures (single-stage construction).	Replace/North
Option 2-G	Replace the Wando bridges by constructing a new eight-lane bridge south of the existing structures (single-stage construction).	Replace/South
Option 2-H	Replace the Wando bridges and construct a new four-lane bridge to the north. The existing Wando bridges would be removed, and a new four-lane bridge would be built within the footprint of the existing structure, for a total of eight lanes.	Replace/North

Design Option	Concept Details	Added Capacity Options
Option 2-I	Replace the Wando bridges and construct a new four-lane bridge to the south. The existing Wando bridges would be removed, and a new four-lane bridge would be built within the footprint of the existing structure, for a total of eight lanes.	Replace/South
Option 2-J	Replace the Wando bridges by adding two-lane parallel bridge structures on each side of the existing structures. Remove the existing Wando bridges and widen the newly constructed bridges to four lanes each way, for a total of eight lanes (staged construction, but smaller footprint).	Replace/Symmetrical (Staged Construction)
Section 3		
Option 3-A	Widen both inside and outside using the existing median, for a total of eight lanes (smaller footprint).	Symmetrical
Option 3-B	Widen to the outside and retain existing median, for a total of eight lanes (larger footprint).	Symmetrical

4.5 LEVEL 2 SCREENING

While the Level 1 screening depended upon high level travel demand modeling and engineering judgement, the Level 2 screening determines which conceptual engineering design options have the highest potential to meet the purpose and need of the project, improving congestion and roadway deficiencies. Level 2 screening also evaluated engineering and the environmental impacts associated with each of the conceptual design options resulting in four major evaluation categories outlined in **Table 4-4.**

Table 4-4: Level 2 Screening Categories and Methods

Category	Criteria	Key Measures	Quantification for Screening
Purpose and Need	Highway Capacity Software analysis	Traffic performance	LOS
Engineering (Design and Constructability)	**Design**		
	Compatible with local plans and projects	Connections to existing roadway improvement projects	Scored (1 to 5)
	Improve seismic resiliency	Bridge replacement/new bridge structures/modification to existing bridges	Scored (1 to 5)
	Ports and transit access	Improves access to ports and transit facilities	Scored (1 to 5)
	Constructability		
	Constructability	Potential construction and staging issues, traffic disruption, construction complexity	Scored (1 to 5)
Natural Resources	Aquatic Resources	Acreage of impact	Scored (1 to 5)
Community and Built Environment (Relocation and Parks)	Residential/business and recreational facilities	Residential/business and recreational facilities impacted by the right-of-way footprint	Scored (1 to 5)
	Parks (4f)	Impacts on park facilities	Scored (Parks Impacted)

The Level 2 evaluation results are based on the LOS grade for the purpose and need while the remaining categories are scored on a scale with a minimum score of 1 to a maximum of 5 for each category. The lowest score identified concepts with the highest potential to meet the project's purpose and need, considering natural and human environment impacts.

Each of the conceptual design options was evaluated using the Highway Capacity Software (HCS) by section. This provides a more sophisticated analysis of the refined roadway configurations under peak time conditions compared with the regional travel demand modeling analysis applied in Level 1. This step builds upon the average daily, corridor-wide analysis conducted during Level 1 screening. HCS enables the analyst to assess the existing conditions of a given location quickly, confirm "hot spot" locations, and realize the cause and effects of modified geometry and operational schemes.

The mainline LOS was determined for each conceptual design option and a grade was assigned. The LOS specifies traffic flow and is graded A through F (**Table 4-5**). A LOS of A represents free flow, whereas a LOS of F equates to sitting in traffic with little movement through the corridor.

Table 4-5: HCM Scoring Results for Purpose and Need Analysis

Design Option	Capacity Option	Performance (2050 Peak Hour Performance)
Section 1		
1-A	Retain/Symmetrical	LOS F
1-B	Retain/Symmetrical	LOS F
1-C	Retain/North	LOS E
1-D	Retain/South	LOS E
1-E	Replace/Symmetrical	LOS E
1-F	Replace/North	LOS E
1-G	Replace/South	LOS E
1-H	Replace/North	LOS E
1-I	Replace/South	LOS E
Section 2		
2-A	Retain/Symmetrical	LOS F
2-B	Retain/Symmetrical	LOS F
2-C	Retain/North	LOS F
2-D	Retain/South	LOS F
2-E	Replace/Symmetrical	LOS E
2-F	Replace/North	LOS E
2-G	Replace/South	LOS E
2-H	Replace/North	LOS E
2-I	Replace/South	LOS E
2-J[+]	Replace/Symmetrical	LOS E
Section 3		
3-A	Symmetrical	LOS D
3-B	Symmetrical	LOS D
+ Staged construction		

The next step evaluated the infrastructure improvement concepts for engineering, natural resource, and the community and built environment considerations. The results of this analysis are provided in **Table 4-6**.

Table 4-6: Key Measures and Scoring Matrix for Engineering

Key Measures	Score	Comments
Design		
Consistency with local plans and projects		
High	1	Ties into existing and proposed projects along the corridor
Medium	3	Potential issues tying into existing and proposed corridor projects
Low	5	Significant impacts to existing and proposed corridor projects
Improves seismic resiliency		
High	1	Replaces all bridge structures
Medium	3	Retains the existing bridges and builds additional bridges for additional capacity
Low	5	No improvements to resiliency
Improves connections with area ports and transit system		
High	1	Improves connections
Medium	3	Provides some improvements
Low	5	Does not improve connection with areas ports and transit facilities
Constructability		
Low	1	Minor issues with staging, construction, traffic disruption, and complexity
Medium	3	Moderate issues with staging construction, traffic disruption, and complexity
High	5	Complex issues with staging construction, traffic disruption, and complexity

The conceptual designs were developed using the SCDOT *Roadway Design Manual 2017*. Each option was designed to improve the roadway infrastructure, correct roadway geometric deficiencies, and increase the number of lanes (eight lanes total). The project team, which included roadway, traffic, construction, and bridge engineers, evaluated each conceptual design option based on the constructability criteria related to staging and construction, along with disruption to traffic flow and complexity (high, medium, low).

Areas included in the engineering evaluation also overlapped with some of the project goals outlined in the purpose and need. Each of the conceptual design options were evaluated by the project team using the criteria below, and each option was scored on a scale of 1 (most desirable) to 5 (least desirable).

A desktop environmental review and preliminary field studies identified key issues, natural resource concerns, and potential constraints to assist with the PEL study decision-making. **Table 4-7** shows the natural resources identified within the study area. The table also identifies whether the resource was used as an elimination criterion.

Table 4-7: Natural Resources Screening

Resource	Screening Criterion	Comments
Air Quality – South Carolina Department of Health and Environmental Control	No	The study area is within attainment of air quality standards.
Water resources	No	All infrastructure improvement options would impact resources similarly.
Floodplains	No	All infrastructure improvement options would impact resources similarly.
Aquatic Habitats/Wetlands – U.S. Army Corps of Engineers	**Yes**	**Data was quantifiable.** The total acreage of aquatic resources identified within the conceptual design ROW footprint, including but not limited to wetlands, streams, tidal creeks, ponds, and marshes. Open water that would be bridged was not included in the quantification.
Protected species/critical habitat – United States Fish and Wildlife Service	No	All infrastructure improvement options would impact resources similarly
Coastal Zone – South Carolina Department of Health and Environmental Control Ocean and Coastal Resource Management	No	All infrastructure improvement options would impact resources similarly

The difference between the highest and lowest values was identified and a scoring range was developed. A score of 1 had lower impacts on the resource, and a score of 5 had higher impacts. The total score for each option was used in the screening process.

Desktop surveys were also completed to obtain residential, business, parks, and cultural and historic resources. **Table 4-8** shows the human and environmental resources identified within the study area. The table also determines if the resource was used in the elimination screening.

Table 4-8: Community and Built Environment Resources

Resource	Screening Criterion	Comments
Environmental Justice	No	All infrastructure improvement options would impact environmental justice communities similarly
Relocations (Residential/Businesses)	**Yes**	**Data was quantifiable. Inventory of residential and business structures were identified and quantified to the number of units impacted for each design options.**
Hazardous Materials – South Carolina Department of Health and Environmental Control	No	All infrastructure improvement options would impact resources similarly
Farmland – U.S. Department of Agriculture	No	All infrastructure improvement options would impact resources similarly
Cultural and Historic Resources	**Yes**	**There is one eligible resource (Long Point Schoolhouse) and two cemeteries identified within the project study area**

Resource	Screening Criterion	Comments
Parks (4f)	**Yes**	**Data was quantifiable.** The number of impacted properties was quantified for each conceptual design option.

Resources that would provide quantifiable data for the screening include:

- **Relocations –**The number of units impacted for each design option was quantified during an inventory of residential and business structures. Impacts associated with relocations were counted. The difference between the highest and lowest values was identified, and a scoring range was developed. A score of 1 would have a lower number of relocations, and a score of 5 would have a higher number of relocations. The total score for each option was used in the screening process.

- **Parks –** Because of the proximity to these facilities, shifts in the current alignment can impact these properties differently. The number of impacted properties was quantified for each conceptual design option.

- **Cultural Resources –** There is one historic resource, the Long Point Schoolhouse, located on Long Point Road north of I-526. There are also two cemeteries, New Hope Church Cemetery and an African American cemetery. These cemeteries are not historic but are protected. All the infrastructure improvement concepts would avoid the New Hope Church Cemetery. Because of its proximity to I-526, the African American cemetery was evaluated for each of the design concept options. If the roadway facility did not impact the site, the option moved forward. Options that slightly touched the site were reviewed with design engineers to determine if the site could be avoided. If the site could be avoided, it was noted for that option and moved forward. If the roadway facility impacted the majority of the site, it was eliminated from further consideration.

The next step evaluated the infrastructure improvement concepts for engineering, natural resource, and the community and built environment considerations. The results of this analysis are provided **Table 4-9** and **Table 4-10**.

The criteria and scoring metrics used for screening the conceptual design options are not the final factors in determining if an option is to be eliminated or moved forward. The goal of the Level 2 screening is to ensure that higher-performing conceptual design options are moved forward; however, to also identify those options that would have higher impacts on the natural and human environment.

Table 4-9: Level 2 Project Goals, Engineering, and Impacts Scoring Results

Design Option	Capacity Option	Engineering		Natural Resource	Community and Built Environment		Total Score
		Constructability	Design		Relocations	Park (4f)	
Section 1							
1-A	Retain Symmetrical	3.8	3.3	1.0	3.0	1.0	12.1
1-B	Retain Symmetrical	1.4	2.9	4.0	4.0	1.0	13.3
1-C	Retain North	3.0	3.5	3.0	1.0	1.0	11.5
1-D	Retain South	3.0	3.5	2.0	4.0	1.0	13.5
1-E	Replace Symmetrical	3.4	2.1	5.0	4.0	1.0	15.5
1-F	Replace North	5.0	2.6	2.0	1.0	1.0	11.6
1-G	Replace South	5.0	2.6	1.0	5.0	1.0	14.6
1-H	Replace North	3.0	3.5	3.0	1.0	1.0	11.5
1-I	Replace South	3.0	2.9	2.0	4.0	1.0	12.9
Section 2							
2-A	Retain Symmetrical	1.8	2.9	4.0	1.0	2.0	11.7
2-B	Retain Symmetrical	1.8	2.9	4.0	1.0	2.0	11.7
2-C	Retain North	3.0	3.0	5.0	1.0	2.0	14.0
2-D	Retain South	3.0	3.0	4.0	2.0	2.0	14.0
2-E	Replace Symmetrical	2.2	1.5	5.0	4.0	2.0	14.7
2-F	Replace North	1.8	2.7	3.0	4.0	1.0	12.5
2-G	Replace South	1.8	2.7	1.0	5.0	1.0	11.5
2-H	Replace North	3.0	3.0	5.0	1.0	2.0	14.0
2-I	Replace South	3.0	2.3	4.0	2.0	2.0	13.3
2-J^{+}	Replace Symmetrical	3.0	1.7	4.0	1.0	2.0	11.7
Section 3							
3-A	Symmetrical	3.0	2.3	1.0	1.0	0.0	7.3
3-B	Symmetrical	1.8	2.7	2.0	5.0	0.0	11.5

Table 4-10: Level 2 Screening Results Conceptual Design Options Moved Forward

Design Option	Capacity Option	Eliminated or Carried Forward	Explanation
Section 1			
1-A	Retain/Symmetrical	**Eliminated**	Failing LOS
1-B	Retain/Symmetrical	**Eliminated**	Failing LOS
1-C	Retain/North	**Carried Forward**	Retain the Don Holt bridge and add a new four-lane bridge north of the existing bridge to carry westbound traffic. The existing Don Holt bridge will be retained to carry eastbound traffic, for a total of eight lanes
1-D	Retain/South	**Carried Forward**	Retain the Don Holt bridge and add a new four-lane bridge south of the existing bridge to carry eastbound traffic. The existing Don Holt bridge will be retained to carry westbound traffic, for a total of eight lanes.
1-E	Replace/Symmetrical	**Carried Forward**	Replace the Don Holt bridge (increase navigational clearance by 31 feet) by constructing two new four-lane bridges on each side, for a total of eight lanes.
1-F	Replace/North	**Carried Forward**	Replace the Don Holt bridge (increase navigational clearance by 31 feet) by constructing a new eight-lane bridge north of the existing bridge.
1-G	Replace/South	**Eliminated**	Alignment Incompatibility
1-H	Replace/North	**Carried Forward**	Construct a new, higher four-lane bridge north of the existing bridge and replace the Don Holt bridge (increase navigation clearance by 31 feet) in place, for a total of eight lanes.
1-I	Replace/South	**Carried Forward**	Construct a new, higher four-lane bridge south of the existing bridge and replace the Don Holt bridge (increase navigation clearance by 31 feet) in place, for a total of eight lanes.
Section 2			
2-A	Retain/Symmetrical	**Eliminated**	Failing LOS
2-B	Retain/Symmetrical	**Eliminated**	Failing LOS
2-C	Retain/North	**Eliminated**	Failing LOS
2-D	Retain/South	**Eliminated**	Failing LOS
2-E	Replace/Symmetrical	**Carried Forward**	Replace the Wando bridges by constructing two new four-lane bridges on each side of the existing structures, for a total of eight lanes (single-stage with larger footprint).
2-F	Replace/North	**Carried Forward**	Replace the Wando bridges by constructing a new eight-lane bridge north of the existing structures (single-stage construction).
2-G	Replace/South	**Eliminated**	Impact to Cultural Site (African American Cemetery)
2-H	Replace/North	**Carried Forward**	Replace the Wando bridges and construct a new four-lane bridge to the north. The existing Wando bridges would be removed, and a new four-lane bridge would be built within the footprint of the existing structure, for a total of eight lanes.
2-I	Replace/South	**Carried Forward**	Replace the Wando bridges and construct a new four-lane bridge to the south. The existing Wando bridges would be removed, and a new four-lane bridge would be built within the footprint of the existing structure, for a total of eight lanes.
2-J	Replace/Symmetrical	**Carried Forward**	Replace the Wando bridges by adding two-lane parallel bridge structures on each side of the existing structures. Remove the existing Wando bridges and widen the newly constructed bridges to four lanes each way, for a total of eight lanes.
Section 3			
3-A	Symmetrical	**Carried Forward**	Widen both inside and outside using the existing median, for a total of eight lanes (smaller footprint).
3-B	Symmetrical	**Eliminated**	High natural resource and community impacts and scored low in engineering performance

4.6 Development of Conceptual End-to-End Alternatives for Level 3 Screening

Progressing the findings of the Level 2 screening, where the corridor had been broken into sections for the engineering analysis, the sections were combined into end-to-end scenarios to then revisit and re-evaluate the performance of those infrastructure improvements at the full corridor level. Returning to the overarching purpose, need and goals for the project, the project team combined sections approved to carry forward to address the performance of the alternatives at the complete corridor level for further screening. In Level 2 screening, the corridor was evaluated in sections for design engineering and environmental screening at a smaller scale. The conceptual design options that resulted from the Level 2 screening were combined to create conceptual end-to-end alternatives. In total, seven end-to-end alternatives were developed and are outlined in **Table 4-11.** The Level 3 screening re-evaluated the performance of the infrastructure improvements at the full corridor level.

At this phase of screening and project refinement, the interchanges are evaluated for performance in support of the additional mainline capacity. The interchange improvement concepts do not satisfy the project's purpose and need independently. However, improvements to the interchanges do have the potential to increase the mainline improvement conceptual alternatives' performance. There are five existing interchanges within the I-526 LCC EAST corridor located at Virginia Avenue, Clements Ferry Road, River Landing Drive/Seven Farms Drive (Daniel Island), Long Point Road, and U.S. 17. Each of the seven conceptual alternatives adds capacity to the I-526 mainline which may require modifications to either the capacity of the existing interchange or the configuration itself. The project team utilized HCS and FHWA's Capacity Analysis for Planning of Junctions (Cap-X) Tool to determine whether modifications are needed.

Results of the HCS evaluation identify the operation of merge and diverge locations for each interchange along the study corridor. The HCS results also indicate when there is a need for additional lanes on the ramps. The Cap-X Tool considers the need for interchange configuration modifications as well as the need for additional lanes on ramps by evaluating the traffic movements at the intersection of ramp termini and secondary roads.

The results of the HCS and Cap-X evaluation do not identify deficiencies in the existing configurations; however, they do identify where additional lane capacity is needed for existing interchanges to accommodate the projected growth in traffic demand. Improvements to these interchanges would also correct the roadway deficiencies identified in the purpose and need for the project. The roadway deficiencies include insufficient acceleration/deceleration ramp lengths contributing to merge and diverge conflicts; and tightly curved ramps (existing loop ramp radius is less than the minimum required for the design speed). This provides a preliminary screening of the footprint of the recommended improvements for environmental impacts.

Table 4-11: End-to-End Conceptual Alternatives for Level 3 Screening

Conceptual Alternatives	Description
Alternative 1	• Retain the Don Holt bridge while adding four-lanes to the north (Option 1-C). • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes (Option 2-J). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 2	• Retain the Don Holt bridge while adding four lanes to the south (Option 1-D). • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes (Option 2-J). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 3	• Replace the Don Holt bridge by constructing two new four-lane bridges on each side of the existing bridge (Option 1-E). • Replace Wando bridges with two new four-lane bridges on each side of the existing bridge (Option 2-E). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 4	• Replace the Don Holt bridge with a new eight-lane bridge north of the existing bridge (Option 1-F). • Replace Wando bridges with eight-lane bridge north of the existing bridges (Option 2-F). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 5	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located (Option 1-H). • Replace the Wando bridges with a new four-lane bridge north of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located (Option 2-H). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 6	• Replace the Don Holt bridge with a new four-lane bridge south of the existing bridge, remove existing bridge, and add a new four-lane bridge where the existing bridge is located (Option 1-I). • Replace the Wando bridges with a new four-lane bridge south of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located (Option 2-I). • Widen to the inside and outside using the existing median (Option 3-A).
Alternative 7	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located (Option 1-H). • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes. (Option 2-J). • Widen to the inside and outside using the existing median (Option 3-A).

Based on this analysis, no improvements are recommended for the Virginia Avenue interchange, however, improvements are recommended at the remaining four interchanges in the corridor to accommodate the added capacity associated with the widening of the mainline. These interchange improvements are consistent for each of the preliminary mainline improvement alternatives and are incorporated to the design footprint of the end-to-end alternatives for Level 3 screening for traffic performance and impacts.

4.7 LEVEL 3 SCREENING

The Level 3 screening evaluation provided the most detailed round of analysis as complete end-to-end conceptual alternatives were evaluated. Similar to the Level 2 screening, this level focused on four major evaluation categories: Purpose and Need, Engineering, Natural Resources, and Community and Built Environment shown in **Table 4-12**. The Level 3 screening categories and criteria are the same as Level 2 except for the VISSIM traffic model used for the purpose and need criteria.

Table 4-12: Level 3 Screening Categories and Methods

Category	Criteria	Key Measures	Quantification for Screening
Purpose and Need	VISSIM Traffic Model Results	Travel Time Index	Travel Time Index
Engineering (Design and Constructability)	**Design**		
	Compatibility with local plans and projects	Connections to the existing roadway improvement projects	Sum of Scores from Section 1-3 (1 to 5)
	Improves seismic resiliency	Bridge replacement/new bridge structures/modification to existing bridges	Sum of Scores from Section 1-3 (1 to 5)
	Ports and transit access	Improves access to ports and transit facilities	Sum of Scores from Section 1-3 (1 to 5)
	Constructability		
	Constructability	Potential construction and staging issues, traffic disruption, construction complexity	Scored (1 to 5)
Natural Resources	Aquatic resources	Acreage of impact	Scored (1 to 5)
Community and Built Environment	Residential/business and recreational facilities	Residential/business and recreational facilities impacted by the ROW footprint	Scored (1 to 5)
	Park facilities	Impacts to park facilities	Scored (number of parks impacted)
	Cultural Resources	Impacts to cultural resources	Yes/No

Table 4-13: Level 3 Engineering and Environmental Impact Scoring Results

Alternative	Engineering		Natural Resource	Community and Built Environment		Total Score
	Constructability*	Design*		Relocations	Park	
Alternative 1	9.0	7.5	1.0	4.0	3.0	24.5
Alternative 2	9.0	7.5	2.0	4.0	3.0	25.5
Alternative 3	7.8	5.8	5.0	5.0	3.0	26.6
Alternative 4	9.8	7.6	1.0	4.0	2.0	24.4
Alternative 5	9.0	8.8	1.0	3.0	3.0	24.8
Alternative 6	9.0	7.5	1.0	1.0	3.0	21.5
Alternative 7	9.0	7.5	2.0	4.0	3.0	25.5

*Sum of Level 2 scoring for Sections 1-3.

How well each alternative meets the purpose and need was evaluated in Level 3 using a VISSIM [12] microsimulation model. The VISSIM model assesses the travel time and speed on the I-526 mainline with the added capacity improvements of the conceptual alternatives, interchange configurations recommended, and the geometric features of the corridor. Each of the seven conceptual alternatives considers the same 8-lane capacity improvements and has traffic operational similarities. Individual microsimulation models for each of the conceptual alternatives will not provide significantly different results between shifts in the alignment to the north or south. Therefore, the results of the VISSIM model assessment for the added capacity to the I-526 mainline are considered to be the same for each of the seven conceptual alternatives for this PEL study. As the reasonable alternatives move into NEPA, unique interchange types should provide similar and slightly difference travel time reliability performance.

Travel Time Index (TTI): *is the average peak-period travel time compared to free flow travel time. TTI is expressed as a ratio. For example, a TTI value of 1.3 means the average peak travel times are 30 percent longer than travel times during free flow.*

The results of VISSIM model, detailed in **Table 4-14**, indicate that all but two critical routes in the study area show a reduction in TTI when compared to the No-build. Furthermore, most critical routes show a reduction in TTI to a level below the severe congestion threshold of 2.0. Although the 2050 8-lane conceptual alternative addresses several of the congestion concerns along the corridor compared to 2050 No-build, additional TSMO measures should be considered as mentioned in **Section 5-1** as the TTI results indicate significant or severe congestion. As traffic demands grow, there are limits to construction of additional lanes, creating a need for additional TSMO measures.

Table 4-14: TTI Change Critical Routes

Common Origin-Destination Path		2050 No Build Average Peak-Hour TTI	2050 Build Average Peak-Hour TTI	2050 TTI Change
Eastbound	I-526 west of N. Rhett Ave. to. U.S. 17 S	5.28	1.83	-3.44
	N. Rhett Ave. to Clements Ferry Rd. Northbound	6.11	1.63	-4.47
	N. Rhett Ave. to Long Point Rd.	4.39	1.92	-2.47
	Clements Ferry Rd. to U.S. 17 N	3.62	1.90	-1.73
	River Landing Drive to U.S. 17 S	3.48	1.82	-1.66
	Long Point Rd. to U.S. 17 N	2.50	1.23	-1.27
Westbound	U.S. 17 N to I-526 west of N Rhett Ave.	6.05	2.19	-3.86
	U.S. 17 N to Seven Farms Drive.	11.85	1.69	-10.17
	Long Point Rd. to Clements Ferry Rd.	10.73	1.88	-8.85
	Long Point Rd. to I-526 west of N. Rhett Ave.	5.46	2.36	-3.10
	Seven Farms Dr. to N Rhett Ave.	2.61	2.63	+0.02
	Clements Ferry Rd. to I-526 west of N Rhett Ave.	2.91	3.09	+0.18

Source: VISSIM model

[12] PTV Group's VISSIM, Version 9 is a microscopic computer software that simulates realistic and detailed traffic flow while considering human behavior. This software is used to build a model network based on the design of an 8-lane scenario.

TTI can be used to describe the severity of congestion under the following scheme [13]:

- Moderate Congestion: 1.1 < TTI ≤ 1.5
- Significant Congestion: 1.5 < TTI ≤ 2.0
- Severe Congestion: TTI > 2.0

The TTI of both the AM and PM 2050 No-build conditions reflect severe congestion along all routes with a TTI greater than 2.0. The 2050 8-lane conceptual alternative show TTI metrics are less than 2.0 for all routes except four routes in the westbound direction.

The results of the engineering, natural resources, and community and built environment resources screening are provided in **Table 4-15**.

Table 4-15: Level 3 Engineering and Environmental Impact Scoring Results

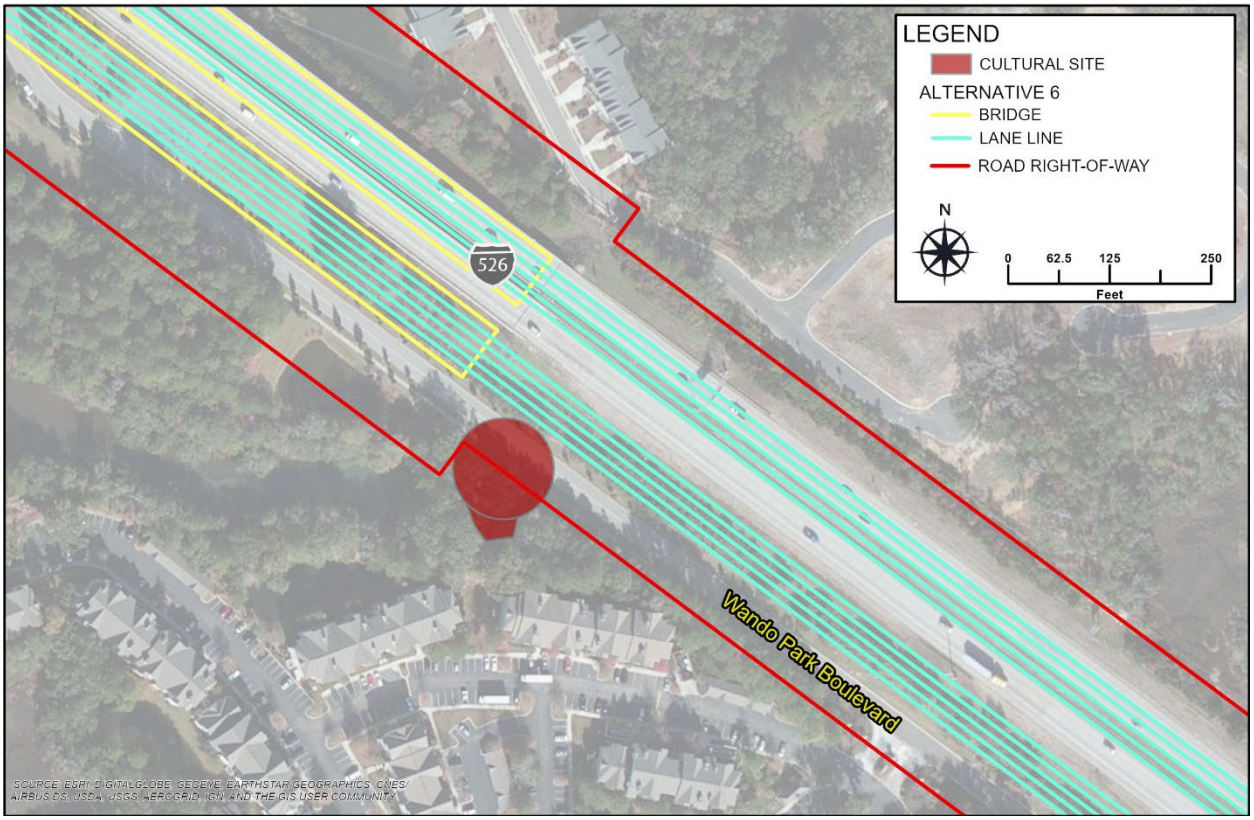
Alternative	Engineering		Natural Resource	Community and Built Environment*		Total Score	Eliminated or Carried Forward
	Constructability*	Design*		Relocations	Park		
Alternative 1	9.0	7.5	1.0	4.0	3.0	24.5	Deemed Reasonable
Alternative 2	9.0	7.5	2.0	4.0	3.0	25.5	Deemed Reasonable
Alternative 3	7.8	5.8	5.0	5.0	3.0	26.6	Eliminated due to cultural resource impact
Alternative 4	9.8	7.6	1.0	4.0	2.0	24.4	Deemed Reasonable
Alternative 5	9.0	8.8	1.0	3.0	3.0	24.8	Deemed Reasonable
Alternative 6	9.0	7.5	1.0	1.0	3.0	21.5	Eliminated due to cultural resource impact
Alternative 7	9.0	7.5	2.0	4.0	3.0	25.5	Deemed Reasonable

*Sum of Level 2 scoring for Sections 1-3.

The Level 3 screening resulted in the elimination of two conceptual alternatives from further analysis and five conceptual alternatives were carried forward. Alternative 3 and Alternative 6 were eliminated due to their potential impact on a cultural site. To accommodate the southward expansion of Alternative 3, Wando Park Boulevard would need to be relocated. The relocation of Wando Park Boulevard would impact a cultural site (African American cemetery) illustrated in **Figure 4-4**. In addition, due to the larger footprint, Alternative 3 impacts 215 acres of aquatic resources, resulting in the greatest number of impacts when compared to the other alternatives. Due to the combination of constraints from impacts to the cultural site, relocations, and aquatic resources that may prevent successful implementation, Alternative 3 was eliminated from further evaluation.

[13] Sisiopiku, V. P., and S. Rostami-Hosuri. "Congestion Quantification Using the National Performance Management Research Data Set." Data 2, № 4 (2017): 39.

Figure 4-4: Alternative 3 and 6 Cultural Site Impact



4.8 Reasonable Alternatives

Based on the results of the alternatives evaluation process, the no-build alternative and five build alternatives were presented at the second round of public meetings in October 2021 as reasonable alternatives to be carried forward in the NEPA phase. The five reasonable build alternatives are shown in **Table 4-16** and illustrated in **Figure 4-5**, **Figure 4-6**, **Figure 4-7**, **Figure 4-8**, and **Figure 4-9**.

Table 4-16: Reasonable Alternatives Presented to the Public

Conceptual Alternatives	Description of Alternative
Alternative 1	• Retain the Don Holt bridge while adding four lanes to the north. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes. • Widen to the inside and outside using the existing median.
Alternative 2	• Retain the Don Holt bridge while adding four lanes to the south. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes. • Widen to the inside and outside using the existing median.
Alternative 4	• Replace the Don Holt bridge with a new eight-lane bridge north of the existing bridge. • Replace Wando bridges with eight-lane bridge north of the existing bridges. • Widen to the inside and outside using the existing median.
Alternative 5	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with a new four-lane bridge north of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located. • Widen to the inside and outside using the existing median.
Alternative 7	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes. • Widen to the inside and outside using the existing median.

Figure 4-5: Alternative 1

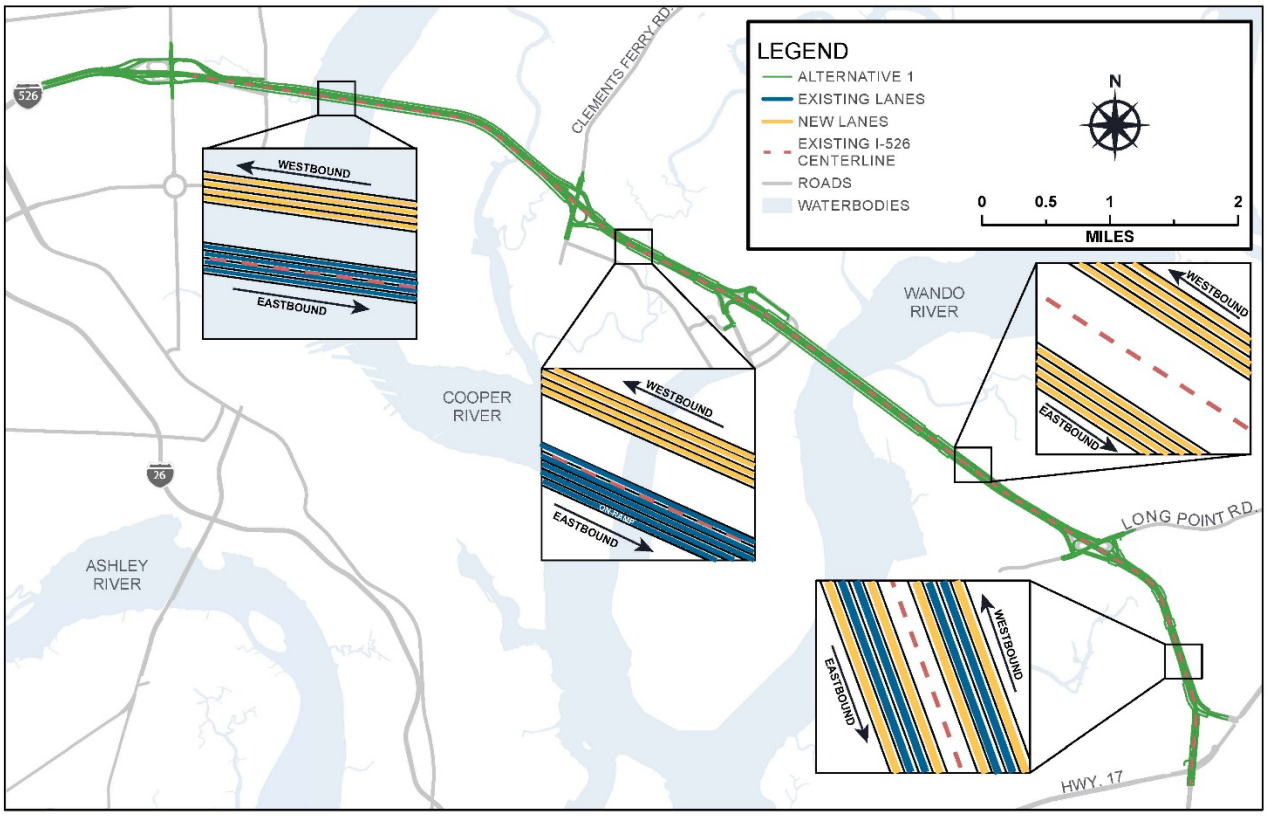


Figure 4-6: Alternative 2

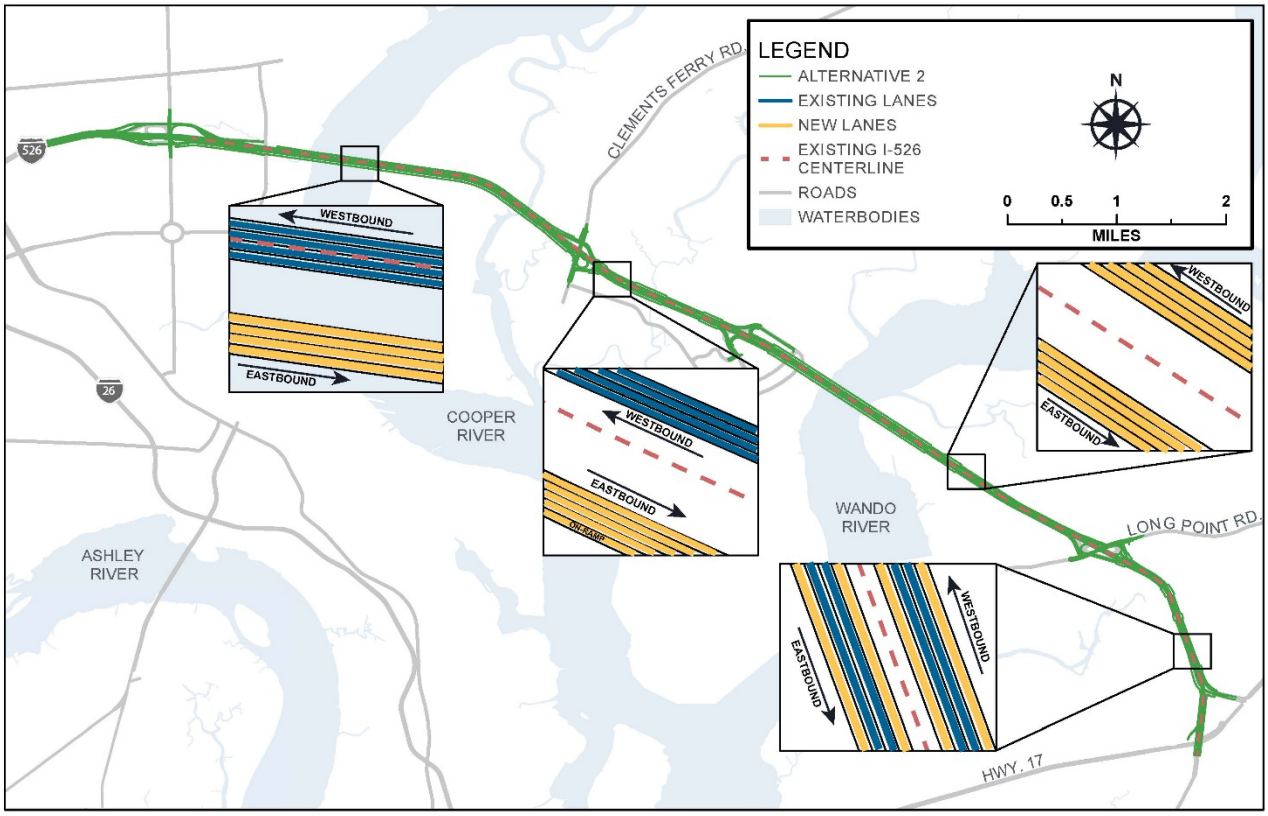


Figure 4-7: Alternative 4

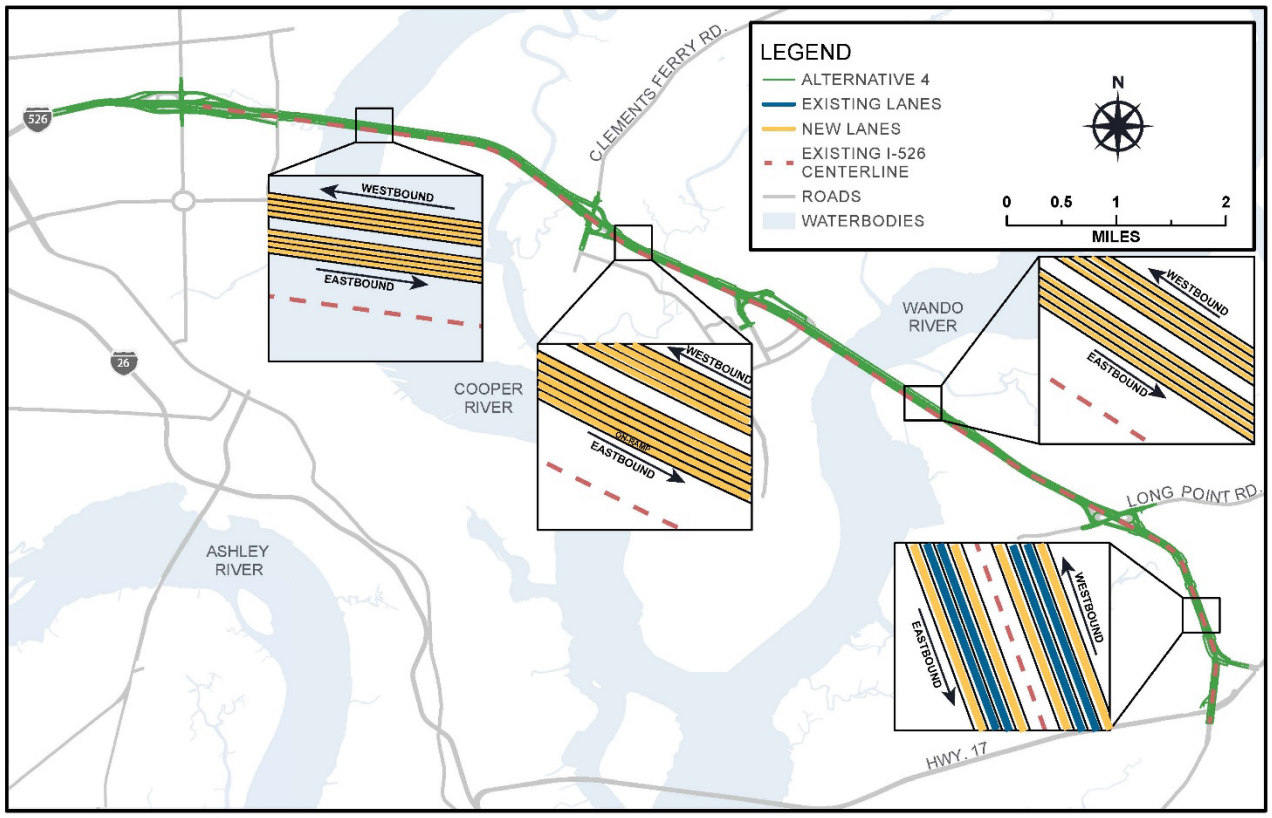


Figure 4-8: Alternative 5

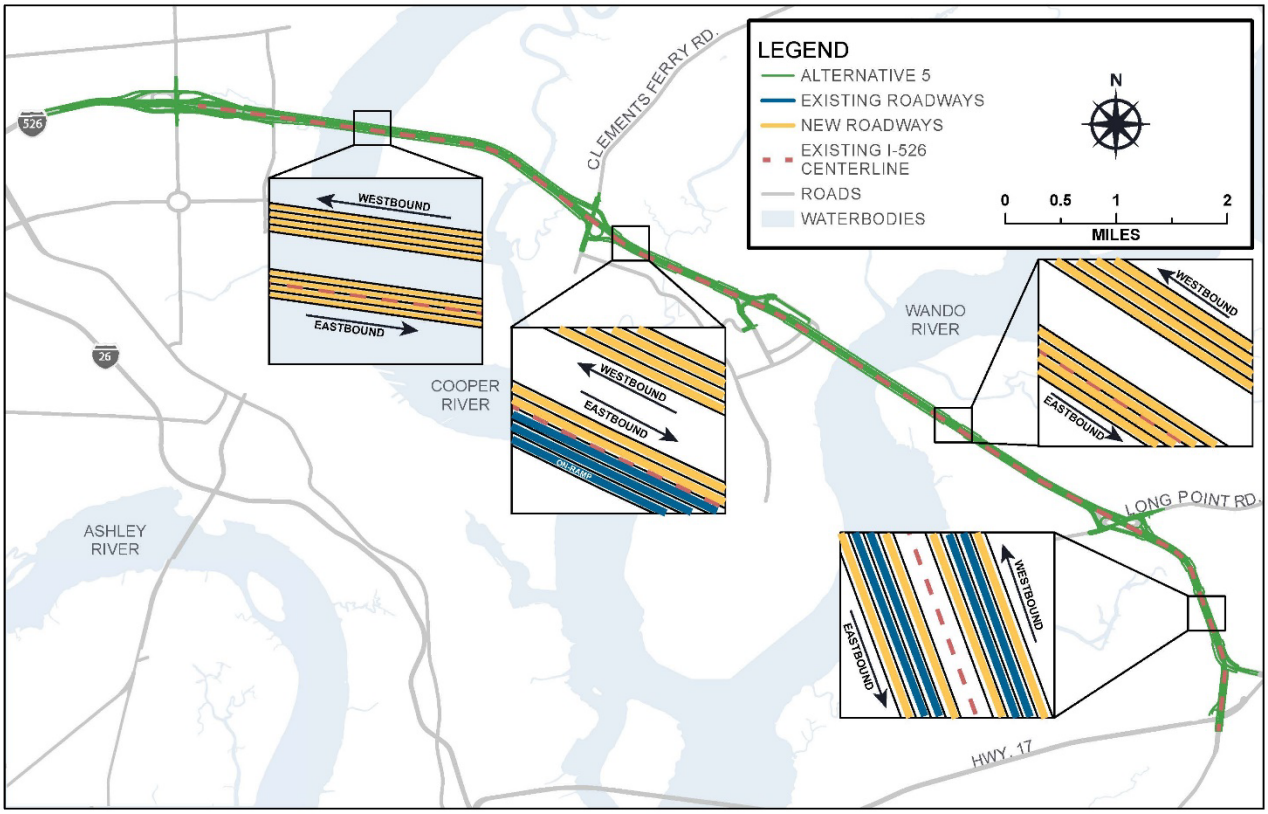
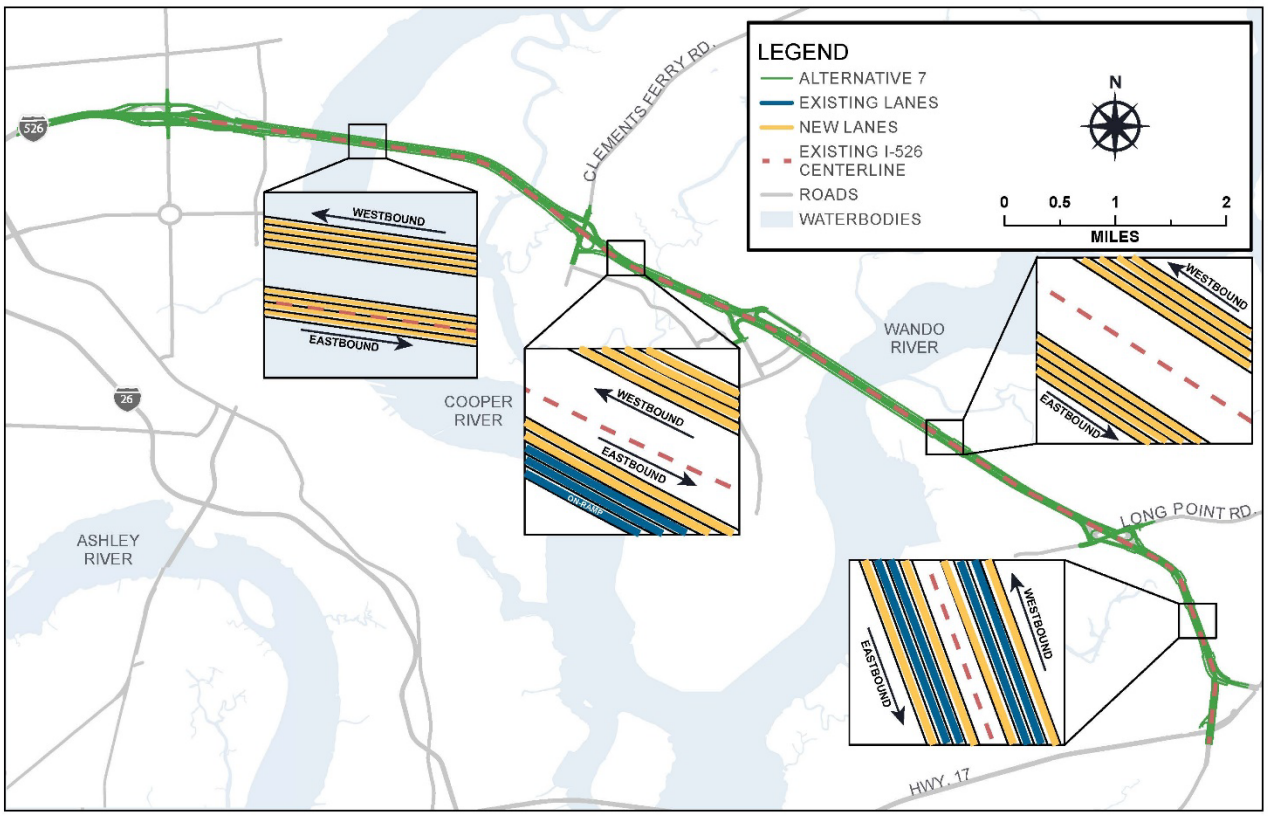


Figure 4-9: Alternative 7



4.9 Public and Stakeholder Input on Reasonable Alternatives

The five alternatives that were advanced through Levels 1, 2, and 3 of the alternatives analysis screening process were presented to the public as reasonable alternatives in the fall of 2021. These reasonable alternatives were presented to the public and project stakeholders through a combination of an online, on-demand PIM held from October 11 to December 1, 2021, and two in person open houses on October 27 and October 28, 2021, in Mount Pleasant and North Charleston, respectively.

The goals of the meetings were to present the following:

- Range of alternative
- Alternative screening process
- Reasonable alternative performance
- Conceptual options for the Long Point Road Interchange

At these meetings, frequently expressed comments included:

- Support for the Long Point Road interchange improvements
- Concerns about impacts to residential relocations
- Truck traffic concerns
- Noise and safety concerns

A total of 558 comments were received during the formal comment period. The largest number of comments were related to supporting improvements to the Long Point Road interchange, specifically the second option presented at the public meeting. Public and stakeholder comments on the reasonable alternatives also indicated a desire to look at ways to reduce impacts to the residential areas. This sentiment was expressed specifically in the area north of I-526 between the Wando River and Long Point Road. A summary of the public meetings is included in **Chapter 8**.

4.10 Additional Alternatives to be Carried Forward

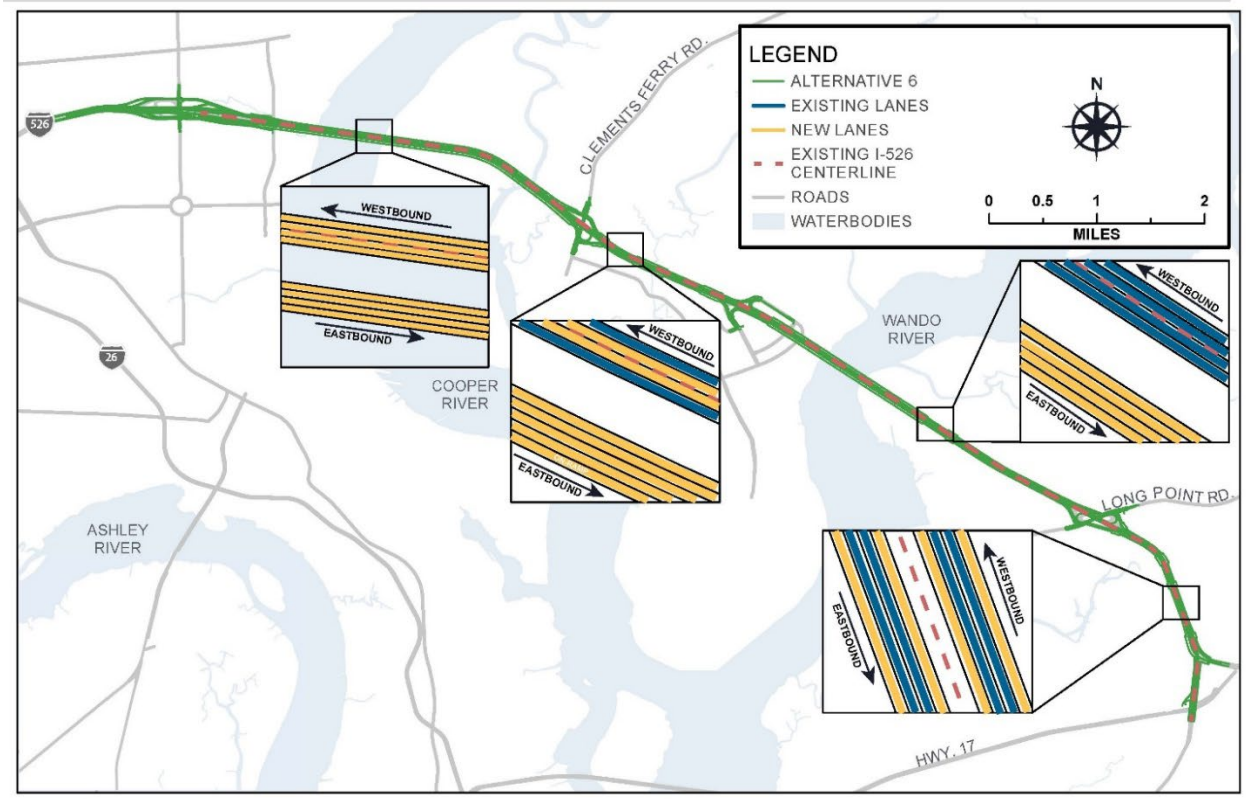
Feedback from SCDOT and FHWA following the public meetings indicated the need to advance alternatives that were previously eliminated due to potential impacts to a cultural site (African American Cemetery). The potential impact to the cultural site should not be considered a fatal flaw at the level of detail used in this planning study. In addition, public feedback received during the public comment period indicated a desire to have additional options that not only meet the project needs, but also reduce the number of relocations. Due to this, the project team advanced Alternative 6 and Alternative 8 as Reasonable Alternatives which are further described below.

4.10.1 Alternative 6

Alternative 6 was previously eliminated in the Level 3 screening due to potential impacts on a cultural site. This alternative consists of constructing a new, four-lane bridge south of the existing Don Holt bridge, then the existing Don Holt bridge will be removed, and a new four-lane structure would be constructed where the current alignment is located. Traveling east of the Clements Ferry Road interchange, the Wando bridges would be replaced with a new four-lane bridge to the south. The existing Wando bridges would then be removed, and a new four-lane bridge would be built within the footprint of the existing structure. The existing facility's remaining section would be widened to the

inside and outside using the existing median. This widening would begin before the Long Point Road interchange and travel east to the U.S. 17 interchange.

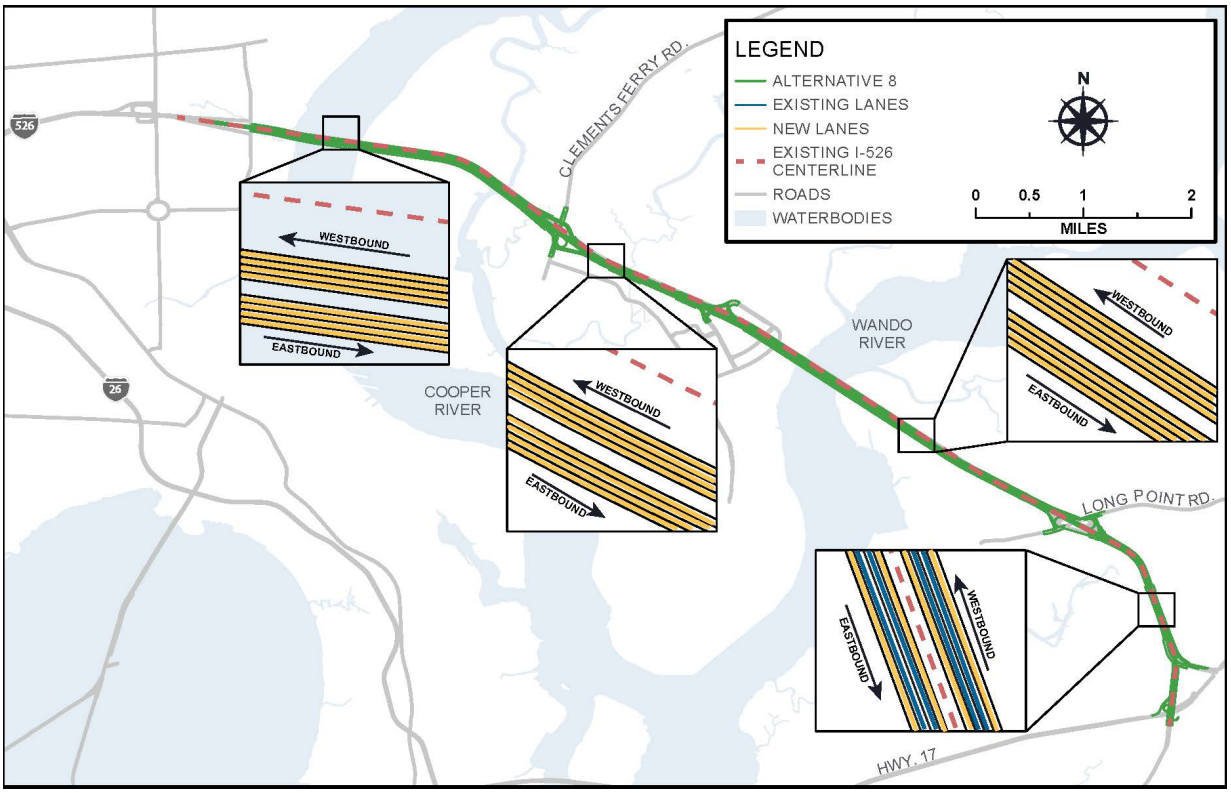
Figure 4-10: Alternative 6



4.10.2 Alternative 8

Alternative 8 was developed using conceptual design options 1-G and 2-G which were previously eliminated in the Level 2 screening due to potential impacts to a cultural site combined with option 3-A. This alternative consists of constructing a new eight-lane bridge south of the existing Don Holt bridge, then the existing Don Holt bridge will be removed. The new eight-lane section would continue along the south of the existing facility to the east of Clements Ferry Road interchange. This concept would replace the Wando bridge by constructing a new eight-lane bridge south of the existing structures, the existing Wando bridge would then be removed. The existing facility's remaining section would be widened to the inside and outside using the existing median. This widening would begin before the Long Point Road interchange and travel east to the U.S. 17 interchange.

Figure 4-11: Alternative 8



4.10.3 Alternative 3

Alternative 3 was eliminated in screening Level 3 due to poor performance and potential impacts on a cultural site. Due to its larger footprint, Alternative 3 impacts 82 relocations and 215 acres of aquatic resources resulting in the greatest number of impacts when compared to the other alternatives. Due to the combination of constraints from relocations and aquatic resource impacts, resulted in a poor score. Alternative 3 remained eliminated from further evaluation.

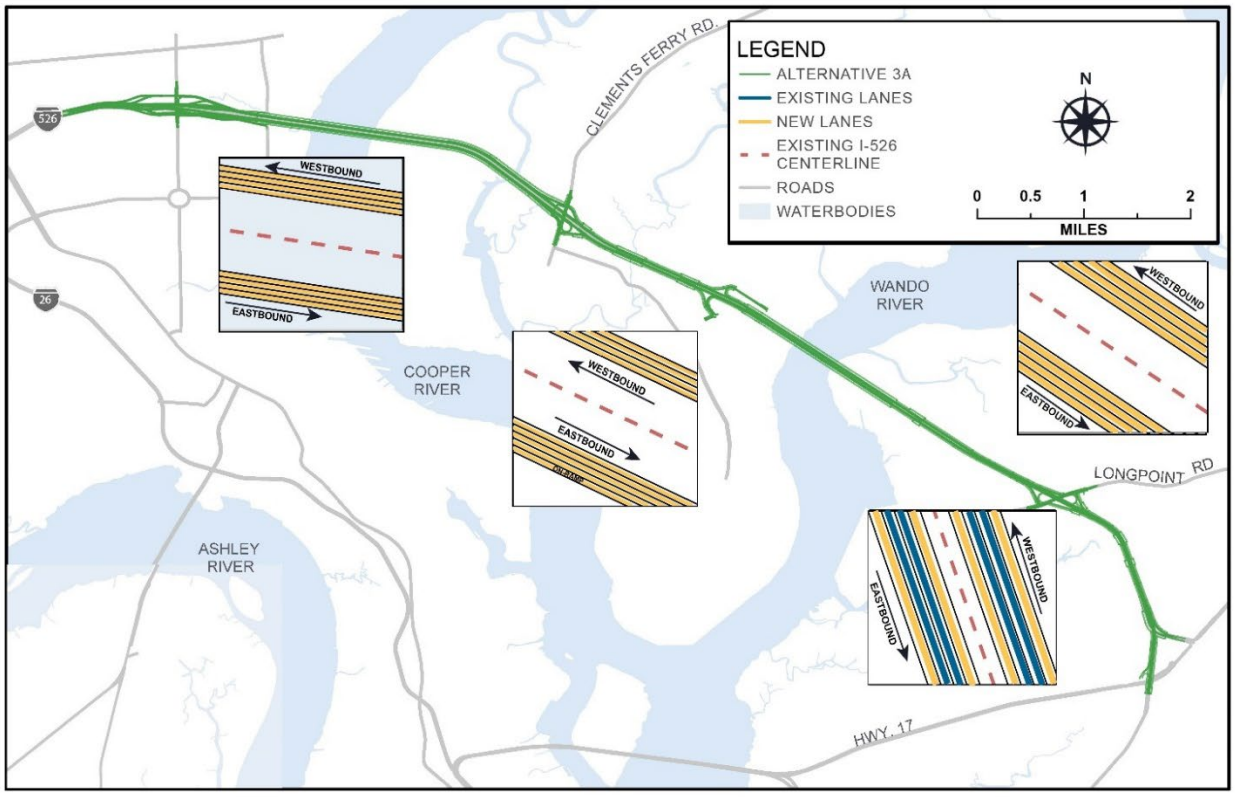
4.10.4 Alternative 3A

Alternative 3 was the best performing alternative from a constructability and design perspective due to its compatibility with the I-526 LCC WEST project and ability to redirect traffic during the construction process. As a result, the project team developed an additional alternative that retains some of the constructability and design performance from Alternative 3 while also reducing environmental and community impacts between the Wando River and Long Point Road based on comments received from the public.

Alternative 3A was developed to be included as a reasonable alternative to reduce the size of the facility's footprint between the Wando River and Long Point Road. This alternative would replace the Wando River bridges in stages by first constructing two new parallel two-lane bridges, then removing the existing bridges, and widening the newly built bridges to four lanes as illustrated in **Figure 4-12**. This alternative was developed based on a modification of Alternative 3 and provides the benefit of a more

compatible connection with the I-526 LCC WEST project that were present in Alternative 3, while also reducing the footprint and associated impacts.

Figure 4-12: Alternative 3A



While Alternatives 3A and 8 were not included in the initial screening process, the overall evaluation scores are comparable with other reasonable alternatives as outlined in **Table 4-17**. Alternatives 3A, 6, and 8 meet the criteria to be moved forward as a reasonable alternative.

Table 4-17: Alternative 3A Engineering and Environmental Impact Scoring Results

Alternative	Engineering		Natural Resource	Community and Built Environment		Total Score
	Constructability	Design		Relocations	Park	
Alternative 3A	8.6	5.9	4.0	4.0	2.0	24.5
Alternative 6	9.0	7.5	1.0	1.0	3.0	21.5
Alternative 8	9.8	7.6	1.0	5.0	2.0	25.4

4.11 IMPACT COMPARISON FOR REASONABLE ALTERNATIVES

Figure 4-13 illustrates how each of the reasonable alternatives compare based on the identified criteria discussed previously in this chapter.

Figure 4-13: Reasonable Alternatives Impact Matrix

	Alternative 1	Alternative 2	Alternative 4	Alternative 5	Alternative 7	Alternative 3A	Alternative 6	Alternative 8
Replaces Don Holt Bridge?	Keep	Keep	NEW Replace + Raise	NEW Replace + Raise	NEW Replace + Raise	NEW Replace + Raise	NEW Replace + Raise	NEW Replace + Raise
Replaces Wando Bridge?	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower	NEW Replace + Lower
Impacts to Aquatic Resources (acres)	175 Acres	177 Acres	167 Acres	174 Acres	178 Acres	203 Acres	165 Acres	146 Acres
Relocations	73 (48 / 25)	73 (46 / 27)	80 (68 / 12)	64 (49 / 15)	72 (46 / 26)	72 (48 / 24)	39 (11 / 28)	83 (50 / 33)

5.0 What Non-Widening Options were Considered for this Corridor?

During Level 1 screening and analysis, it was determined that the corridor wide project of LCC EAST required two additional travel lanes in each direction to accommodate the forecast traffic demand for the corridor. In the more refined traffic engineering analysis of Level 3 screening, it was determined that these additional lanes will accommodate the growth in total average daily traffic but may still experience congestion during peak hours. It was determined that additional refinements and mobility options should be evaluated and incorporated into the planned improvements. Those supplemental options and TSMO strategies, and their ability to support the various project goals, are summarized here. Detailed information on the TSMO evaluation is in **Appendix D**.

5.1 Which TSMO Concepts are Recommended for Further Consideration?

A planning level analysis of TSMO strategies that included a high-level managed lanes analysis was conducted to identify which strategies support the project goals and which strategies may have enough benefit to traffic performance to be incorporated into the eventual project design and later phases of project development. The TSMO-related concepts were identified based on the recommended strategies in the *CHATS MPO 2019 Congestion Management Process Report*, existing and future transportation conditions, and feedback received through public and stakeholder outreach efforts. A summary of the managed lanes analysis results is provided in **Table 5-1** and a summary of the TSMO strategies analysis results is provided in **Table 5-2**.

Table 5-1: Managed Lanes Concept to Carry Forward

Managed Lane Concept	Description	Project Goals Supported	Ability to Standalone & Recommended Action
Shoulder lane use (existing facility)	This concept would bring the shoulders of I-526 LCC EAST up to current highway standards or construct new shoulders to be used as flexible travel lanes during peak travel periods, accommodating transit vehicles or autos.	• COMPATIBILITY • DEMAND • MULTIMODAL • SEISMIC (if new construction) • TECHNOLOGY • CONNECTIVITY	Current lane widths within the corridor are not sufficient to support shoulder lane usage without construction. Will carry forward as a design consideration for traffic analysis of the recommended preferred alternative in the NEPA phase to account for ROW and appropriate design of shoulders, etc.

Table 5-2: TSMO Strategies to Carry Forward

Strategy	Description	Project Goals Supported	Ability to Standalone & Recommended Action
Traveler information	This concept provides information to travelers in-route so they can plan trips or adjust routes based on roadway conditions such as congestion, incidents, or other unsafe conditions.	• COMPATIBILITY • SAFETY • MULTIMODAL • TECHNOLOGY • CONNECTIVITY	Will carry forward as an improvement concept, as it aligns with the purpose and need. This action will be excluded from alternatives comparison as it is a common improvement concept across all infrastructure improvement alternatives.
Incident management	This concept combines a strategy of unified policies, procedures, operations, and communication systems for traffic incident responders.	• COMPATIBILITY • SAFETY • MULTIMODAL • TECHNOLOGY	Will carry forward as an improvement concept, as it aligns with the purpose and need. This action will be excluded from alternatives comparison as it is a common improvement concept across all infrastructure improvement alternatives.
Road weather management	This concept incorporates road weather management technologies and strategies that include information dissemination, interagency coordination plans, and weather response plans.	• COMPATIBILITY • SAFETY • MULTIMODAL • TECHNOLOGY	Will carry forward as an improvement concept, as it aligns with the purpose and need of improving travel time reliability. This action will be excluded from alternatives comparison as it is a common improvement concept across all infrastructure improvement alternatives.
Work zone management	This concept incorporates a broad range of strategies designed to enhance work zone safety and mobility. Strategies may include variable message signs, traveler information, and automated speed enforcement.	• SAFETY • TECHNOLOGY	Will carry forward as an improvement concept, as it aligns with the purpose and need. This action will be excluded from alternatives comparison as it is a common improvement concept across all infrastructure improvement alternatives.
Enhanced lane markings	This element improves the lane markings and striping to interstate standard.	• SAFETY • TECHNOLOGY	Will carry forward as an improvement concept. This action will be excluded from alternative comparison as it is a common improvement concept across all infrastructure improvement alternatives.
Ramp metering	This element incorporates managing access to I-526 EAST at interchange on-ramps using ramp traffic signals.	• DEMAND • SAFETY • TECHNOLOGY	Will carry forward as an improvement. While this concept may have potential negative impacts on the surface network and this requires system-wide evaluation, there was interest in carrying those potential solution forward for consideration in future studies.
Accommodation of connected and autonomous vehicles	This element incorporates smart technology infrastructure to accommodate connected and autonomous vehicles.	• COMPATIBILITY • DEMAND • SAFETY • MULTIMODAL • TECHNOLOGY	Will carry forward as an improvement concept and exclude from alternative comparison as it is a common concept across all proposed infrastructure improvement alternatives.

Strategy	Description	Project Goals Supported	Ability to Standalone & Recommended Action
Variable Speed Limits (VSL)	This technology uses information based on traffic speed, volume detection, and road weather information systems to determine the appropriate speed for optimal traffic flow.	• DEMAND • SAFETY • TECHNOLOGY	Will carry forward as an improvement concept and exclude from alternative comparison as it is a common concept across all proposed infrastructure improvement alternatives.
Park-and-Ride	This concept provides locations for people to park their personal vehicles and transfer to a higher occupancy mode of transportation.	• COMPATIBILITY • DEMAND • MULTIMODAL • TECHNOLOGY • CONNECTIVITY	Will carry forward as an improvement concept. This could be incorporated into the local connections on adjacent roadways and conjunction with BCDCOG regional transit planning efforts.

The managed lanes and TSMO strategies recommended to be carried forward are further described below:

Part-Time Shoulder Lane Use[14] – Part-time shoulder use is a form of Active Traffic Management (ATM) and modifies roadway conditions and controls such as the number of lanes in response to forecast or observed traffic conditions. It may be used in combination with other ATM strategies, such as overhead lane control signs, dynamic speed limits, and queue warning. According to FHWA, part-time shoulder use is consolidated into three types:

- Bus-only use of shoulders (Bus on Shoulder, or BOS) to improve bus travel time and reliability
- Static (fixed hours of operation) shoulder use for most vehicles during predetermined hours of operation
- Dynamic (variable hours in response to traffic conditions) shoulder use for most vehicles based on need and real-time traffic conditions

Specified vehicle-use restrictions vary by facility, but static and dynamic shoulder use is typically open to all vehicles except trucks. Part-time shoulder use is primary used on freeways and requires minimum geometric clearance, visibility, and pavement requirements.

Benefits: Part-time shoulder use has primarily been used on facilities where recurring congestion is related to a deficit in capacity during peak periods. Part-time shoulder use can offer an addition lane during times of day when the adjoining lanes are heavily congested or when lanes are closed for incidents or construction. When not needed as an additional lane, the shoulder can be restored for its original purpose as a "shoulder." In combination with other TSMO and ATM strategies, part-time shoulder lane use can help reduce delays and improve travel-time reliability.

Traveler Information[15, 16] – Traveler information refers to the real-time and customizable information that is relevant to a user's specific travel needs. This can be location-based information about delays, incidents, weather-related messages, travel times, emergency alerts, and route guidance. This

[14] https://ops.fhwa.dot.gov/publications/fhwahop15023/ch1.htm
[15] https://tsmowa.org/category/Traveler%20Information
[16] https://tsmowa.org/category/traveler-information/variable-message-signs

information allows travelers to plan trips and adjust routes because of congestion, incidents, or unsafe conditions. Some types of traveler information systems include:

- Social media and web applications – The South Carolina 511 website (www.511SC.org) and mobile application is an example that provides real-time access to traffic and traveler information.
- Variable message signs (VMS) – Electronic roadside signs used to post traveler information messages that are operated remotely by traffic management centers. VMS can offer queue warnings, weather information, public service announcements, and notifications of delay, incidents, emergency alerts, and route guidance.
- Road weather information systems (RWIS) – Systems that monitor local roadway and weather condition information. RWIS sensors are installed at locations along a corridor that experiences hazardous weather conditions, especially at bridges or flood-prone areas. RWIS sensors can measure pavement temperatures and detect wet or icy conditions.

Traffic Incident management[17] – Traffic incident management consists of a planned and coordinated multidisciplinary process to detect, verify, respond, and clear traffic incidents so traffic flow may be restored as safely and quickly as possible. This strategy can help improve how well incident responders and transportation agencies execute the following:

- Detect and verify the location and severity of an incident
- Reduce the response time to the scene
- Safely manage and control the scene
- Safely and efficiently clear the incident and reopen lanes

Benefits:

- Improves safety for responders by reducing the time exposed to traffic
- Reduces the number of secondary collisions that occur in the congestion caused by the traffic incident
- Delays the onset and shortens the duration of freeway congestion
- Reduces environmental impacts and energy use (less air pollution and wasted fuel from idling vehicles
- Minimizes delay for trucks moving commercial goods

Work zone management[18, 19] – Work zone management strategies help manage traffic during construction to minimize traffic delays, maintain motorist and worker safety, complete the road construction in a timely manner, and allow access for businesses and residents. Some strategies include coordinating road projects, incident management, lane closure policies, traffic control, ITS, and work zone speed management.

Benefits: Strategies such as speed monitoring, speed control, and traveler information in a work zone can improve driver awareness and increase worker safety.

[17] https://tsmowa.org/category/operations-supporting-infrastructure/traffic-incident-management-operations
[18] https://ops.fhwa.dot.gov/Wz/traffic_mgmt/index.htm
[19] https://tsmowa.org/category/work-zone-construction/work-zone-intelligent-transportation-systems

Accommodation of Connected and Autonomous Vehicles[20] – Connected and autonomous vehicles (CAV) is inclusive of various emerging technologies that allow vehicles to communicate with roadway infrastructure and other vehicles in an effort to automate driving tasks including steering, braking, and accelerating. CAVs have the potential to improve safety, mobility, and efficiency. CAVs rely on wireless communication technology and infrastructure including fiber optic, radio towers, and small cell technology such as wireless transmitters and receivers. Communications infrastructure that may be needed includes design parameters such as splice box parameters, roadside unit locations, power, conduit, and wireless communication devices.

Benefits: Widespread deployment of CAV technologies is limited because the technology and standards continue to evolve. However, investing in the accommodation of CAVs for planned transportation projects can be cost-effective and efficient.

Variable Speed Limits (VSL)[21] – Variable speed limit signs can change the regulatory speed limit based on road, traffic, and weather conditions. VSL signs can be used on multilane highways providing varying speed limits for each lane using overhead changeable message signs.

Benefits: VSL signs can improve traffic flow and safety by restricting speeds during adverse conditions.

Park-and-Ride Lots[22] – Park-and-ride lots are specialized parking lots strategically located outside of major commuter corridors. They are intended to be used for parking for commuters using transit or shared use services such as vanpools or carpools. Commuters who would typically use highways to travel to and from work during the week may find these as a viable alternative to avoid current congestion levels or having to pay high prices typical in city centers.

Benefits: Increased transit usage and ridesharing can help reduce the number of single-occupancy vehicles on highways.

Shared-Use Path

Each of the reasonable alternatives include a 14-foot shared-use path to be located on the north side of the new Don Holt and Wando River bridge crossings. Public and stakeholder comments questioned whether the shared-use path can be on either side of the interstate. An analysis of the alternatives' preliminary design indicate that the shared-use path can be added on either side of the bridges and will be further evaluated during the NEPA phase and later during the final design of the recommended alternative.

5.2 WHICH TSMO CONCEPTS ARE NOT RECOMMENDED FOR FURTHER CONSIDERATION?

TSMO strategies not recommended for further consideration are detailed in **Table 5-3**. These managed lanes concepts were evaluated using a combination of the I-26 Corridor Management Plan and other case studies to anticipate potential benefits. The I-26 Corridor Management Plan and planning level managed lanes modeling analysis were conducted at the regional level. Based on the results of the

[20] http://www.dot.state.mn.us/automated/docs/cav-stategic-plan.pdf

[21] https://tsmowa.org/category/physical-design-elements/speed-management

[22] https://mobility.tamu.edu/mip/strategies-pdfs/system-modification/technical-summary/Park-And-Ride-Lots-4-Pg.pdf

evaluations, the following strategies did not meet the purpose and need of the project without regional implementation. Detailed information on these evaluations are outlined in **Appendix D**.

Table 5-3: Managed Lanes and TSMO Strategies Not Recommended for Further Consideration

Concept	Description	Project Goals Supported	Ability to Standalone & Recommended Action
HOV lanes	This concept adds an HOV lane that can only be used by vehicles with more than one passenger.	• COMPATIBILITY • DEMAND • SEISMIC (if new construction) • TECHNOLOGY	Will not carry forward as a reasonable alternative, as it does not meet the purpose and need of this corridor without regional implementation.
HOT lanes	This concept includes a reserved lane for single-occupancy vehicles that pay a toll for use while HOV users can access the lane for free.	• COMPATIBILITY • DEMAND • SEISMIC (if new construction) • TECHNOLOGY	Will not carry forward as a reasonable alternative, as it does not meet the purpose and need of this corridor without regional implementation.
Congestion pricing	This concept incorporates a toll designed to shift discretionary rush hour highway travel to other transportation modes or to off-peak periods, reducing non-commuter demand during peak travel hours.	• COMPATIBILITY • DEMAND • SEISMIC (if new construction) • TECHNOLOGY	Will not carry forward as a reasonable alternative, as it does not meet the purpose and need of this corridor without regional implementation.
Dedicated truck lanes	This concept adds a travel lane for trucks only.	• COMPATIBILITY • DEMAND • SAFETY • MULTIMODAL • SEISMIC (if new construction) • CONNECTIVITY	Will not carry forward as a reasonable alternative, as it does not meet the purpose and need of this corridor without regional implementation. Should regional efforts make dedicated truck lanes a priority, this action will be incorporated into NEPA studies.
Truck platooning	This concept uses technology such as radar and vehicle-to-vehicle communication to electronically align trucks to reduce gaps between them to maintain a tight formation.	• COMPATIBILITY • DEMAND • SAFETY • MULTIMODAL • TECHNOLOGY • CONNECTIVITY	Will not carry forward as an improvement concept as there are concerns regarding impact on non-truck traffic.

5.3 WHICH TSMO STRATEGIES CAN BE IMPLEMENTED WITHOUT WIDENING THE CORRIDOR?

As mentioned previously, TSMO strategies provide operational improvements while maintaining the performance of the existing transportation system. Many of the TSMO strategies are recommended for advancement to the NEPA phase to be evaluated for implementation with the proposed improvements on the full I-526 LCC EAST corridor. These strategies are recommended to increase operational benefits to the new facility by utilizing the additional lanes. However, some TSMO strategies as outlined below can provide added benefit to the existing facility.

5.3.1 Incident Management

Incident management consists of a planned and coordinated multidisciplinary process to detect, verify, respond, and clear traffic incidents so traffic flow may be restored as safely and quickly as possible. Additional details are summarized in **Table 5-4.** SCDOT is already proactively implementing incident management strategies where possible. This TSMO strategy is included to ensure that incident management strategies are considered as part of future planning phases of improvements to the corridor.

Table 5-4: Incident Management Strategy Details

Incident Management Strategy Details	
Cost information	Costs include ongoing funding to support coordination, personnel, equipment, and maintenance
Pros	• Improves safety for first responders by reducing the time exposed to traffic • Reduces the number of secondary collisions that occur in the congestion caused by the traffic incident • Delays the onset and shortens the duration of freeway congestion • Reduces environmental impacts and energy use (less air pollution and wasted fuel from idling vehicles) • Minimizes delay for trucks moving commercial goods
Cons	Does not provide congestion improvements during normal conditions
Potential Funding Sources	Federal Funding Programs • Congestion Relief Program • Advanced Technology Deployment Program • CMAQ
Next Steps	• Define project(s) • Identify funding

5.3.2 Ramp Metering

Ramp metering is an active traffic management strategy that uses specialized traffic signals at highway on-ramps to control the number of vehicles merging onto the highway. Ramp meters typically operate by allowing one car to proceed per green light. The flow of traffic can be varied by the length of time between the green signals. Additional details are summarized in **Table 5-5.**

Table 5-5: Ramp Metering Strategy Details

Ramp Metering Strategy Details	
Cost information	Costs for ramp metering include equipment and installation of signals, signage, lighting, pavement markings, and communications software
Pros	• Delays the onset and shortens the duration of recurring highway congestion • Increases safety by reducing the likelihood of stop-and-go traffic collisions • Increases highway volume and speed that reduces travel times for all vehicles
Cons	• May cause vehicles to queue beyond on-ramp capacity, backing up traffic onto adjacent streets
Potential Funding Sources	Federal Funding Programs • Congestion Relief Program • Advanced Technology Deployment Program • CMAQ
Next Steps	• Define project(s) locations • Identify funding

5.3.3 Park-and-Ride Lots

Park-and-ride lots are specialized parking lots strategically located outside of major commuter corridors. They are intended to be used for parking for commuters using transit or shared use services such as vanpools or carpools. Commuters who would typically use highways to travel to and from work during the week may find these as a viable alternative to avoid current congestion levels or having to pay for expensive parking in city centers. Additional details are summarized in **Table 5-6**.

Table 5-6: Park-and-Ride Lot Strategy Details

Park-and-Ride Lots Strategy Details	
Cost information	Planning and implementation costs vary depending on type of park-and-ride lot planned. Preexisting parking lots may only require memorandum of understanding or lease agreement. Costs for new lots will vary, depending on real estate costs and amenities provided.
Pros	• Increased transit usage and ridesharing can help reduce the number of single-occupancy vehicles on highways. • Supports regional efforts by BCDCOG
Cons	• Availability and cost of real estate in highly valued areas
Potential Funding Sources	Federal Funding Programs • Congestion Relief Program • CMAQ • Bus and Bus Facilities Program (49 USC 5339) • Urban Area Formula Program (49 USC 5307)
Next Steps	• Define project(s) • Identify funding

5.4 Long Point Road and I-526 Interchange Improvements

The current Long Point Road and I-526 interchange configuration is deficient because it does not have the capacity to accommodate the forecast 2050 traffic as outlined in the *I-526 LCC EAST PEL Study Alternatives Analysis Technical Memorandum*. The following modifications are recommended to accommodate future traffic demand:

- An additional lane along the I-526 westbound on-ramp from Long Point Road.
- An additional lane along the I-526 eastbound off-ramp to Long Point Road.
- An additional left-turn lane along the I-526 eastbound off-ramp approach of the intersection of Long Point Road and I-526 eastbound off-ramp.
- An additional northeast through-lane along Long Point Road beginning as a receiving lane for the left turns from the I-526 eastbound off-ramp and continuing towards the intersection with the I-526 westbound on-ramp.

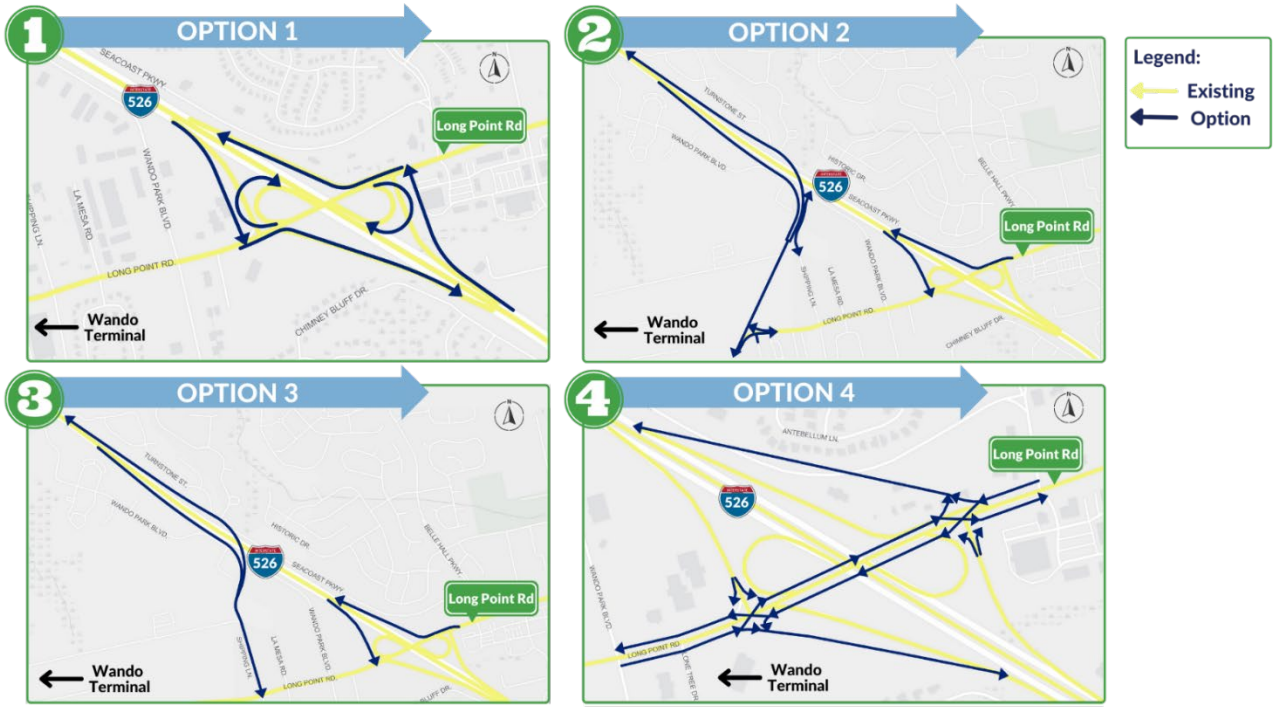
Improving the Long Point Road and I-526 interchange would help satisfy the roadway deficiency portion of the PEL study's purpose and need while also improving operations that will improve performance on the I-526 mainline. While upgrading the interchange deficiencies, it would be beneficial to include additional ramps to the I-526 mainline that can provide additional access for traffic originating from Wando Welch Terminal. One proposed recommendation would include the construction of new eastbound and westbound access ramps along I-526 to provide travelers with direct access to Shipping

Lane. This connection would create an additional connection to the Wando Welch Terminal and to neighborhoods along Long Point Road (Hidden Cove, Oak Park, and Hobcaw Creek Plantation). The overpass would extend from near the Wando Park Boulevard and Wando Place Drive intersection, cross back to the gate terminal entrance off Shipping Lane and terminate at the main gate at the end of Long Point Road. Upgrades to this interchange can provide added benefit and independent utility to the facility that currently exists. In addition, coordination with the port to determine the feasibility of altering entry and exit times outside of passenger car peak times due to the high truck volumes in the AM and PM is recommended as a potential mitigation measure. Additional details are summarized in **Table 5-7**. **Figure 5-1** illustrates some initial concepts for the Long Point Road and I-526 interchange improvements.

Table 5-7: Long Point Road and I-526 Additional Interchange Improvements Details

Long Point Road and I-526 Interchange Improvements Details	
Estimated Programming Cost	$165 million
Project Duration	• NEPA Compliance – 12 months • Project Design/Construction – 32 months
Pros	• There are no project dependencies; this project can progress first and simultaneously with other recommendations • Provides alternative access to neighborhoods along Long Point Road • Provides alternative access to Wando Welch Port Terminal • Contributes to satisfying the roadway deficiency portion of the purpose and need • Diversion of truck traffic along Long Point Road would align with the Town of Mount Pleasant's Port District Economic Development plan, which includes beautification of Long Point Road while also supporting the 2021 SCDOT Complete Street Policy
Cons	• Requires alignment with the eventual mainline preferred alternative • Insignificant impact to improving overall mainline traffic performance • Does not meet expected geometric interstate requirements necessitating higher level approvals
Potential Funding Sources	Federal Funding Programs • Nationally Significant Freight and Highway Projects • National Infrastructure Project Assistance • Local and Regional Project Assistance • PROTECT Discretionary Program • National Highway Performance Program • Surface Transportation Block Grant Program • National Highway Freight Program • PROTECT Formula Program South Carolina Funding Programs • State Highway Fund • Infrastructure Maintenance Trust Fund • South Carolina Transportation Infrastructure Bank
Next Steps	• Identify funding • Initiate additional traffic analysis and NEPA documentation

Figure 5-1: Options for Long Point Road and I-526 Interchange Improvements



The alternatives for improvements in the vicinity of the I-526 and Long Point Road interchange are conceptual in nature currently. Furthermore, two of the alternatives do not provide all basic movements and would therefore require a higher level of analysis to justify constructing versus a full interchange. This PEL study does not imply operational acceptance of any of the alternatives identified by FHWA. SCDOT will need to engage FHWA early in the subsequent traffic analysis stage. Also, since partial interchanges are found acceptable only in rare instances, SCDOT would consider requesting Engineering & Operational Acceptance of the various alternatives early in the NEPA phase prior to designating Reasonable Alternatives.

The Long Point Road and I-526 interchange improvements concept is compatible with all eight mainline build alternatives.

6.0 What Are the Environmental Considerations for the Corridor?

This Environmental Summary Chapter presents and identifies next steps to be completed during future NEPA processes. An environmental inventory was performed for this PEL study to identify human and natural resources present within the study area boundary. The primary methodology used to identify social and community resources included a desktop analysis, while field investigations were utilized to identify and complete studies for aquatic resources, Essential Fish Habitat (EFH), protected species, and cultural resources studies. The information collected to develop the technical reports for the PEL study will support the advancement of the proposed project and help in determining the appropriate NEPA class of action for the recommended corridor improvements.

The reasonable alternatives carried forward from this PEL study involve improvements to I-526. Because federal funds would be used for the completion of the project, compliance with NEPA would be required. During the NEPA process, environmental impacts would need to be identified and avoided if possible. If impacts are unavoidable, minimization and mitigation measures will need to be implemented. Additional information on environmental resources identified during the PEL study are included in *I-526 LCC EAST PEL Study Environmental Inventory Technical Memorandum* in **Appendix E**.

6.1 Environmental Resources Assessed for this PEL Study

Environmental resources identified during the PEL study include:

- Social and Community Resources
  - Land Use
  - Schools and Places of Worship
  - Parks and Recreational Facilities
  - Environmental Justice
  - Relocations
- Natural Resources
  - Wetlands
  - Floodplains
  - Federally Protected Species
  - Essential Fish Habitat
  - Farmlands
  - Air Quality
  - Hazardous Materials Site
- Cultural Resources
- Climate Change/Greenhouse Gas Emissions

6.1.1 Social Resources

Land Use – Land use in the study area is composed primarily of residential, commercial, and industrial. From the western extent of the corridor in North Charleston, the dominant land use is industrial, with some residential use on the south side of the corridor. Moving east across the Cooper River, the land use on Daniel Island includes residential, commercial, and vacant or undevelopable uses because of the natural wetlands on the island. Moving east across the Wando River, the land use in Mount Pleasant is dominated by residential and commercial uses. Recreational uses are present, along with industrial uses at the western terminus of Long Point Road. This portion of the corridor also includes vacant or undevelopable uses because of the presence of wetlands.

Ongoing conversations with property owners, businesses, and residences potentially affected should be a critical part of the NEPA process and future project development.

Schools and Places of Worship – Eight schools and 19 places of worship are located within the project study area and within 2,000 feet of the project study area. Ongoing conversations with the schools and places of worship potentially affected should be a critical part of the NEPA process and future project development.

Parks and Recreational Facilities – Eight parks and recreational areas are located within and adjacent to the study area. Three parks are considered Section 4(f) resources: Ralph M. Hendricks, Governor's Park, and Kearns Park Trail. These three parks must be evaluated for potential Section 4(f) impacts during future NEPA phases. The remaining resources are either private recreational facility or will not be impacted by the project due to their location.

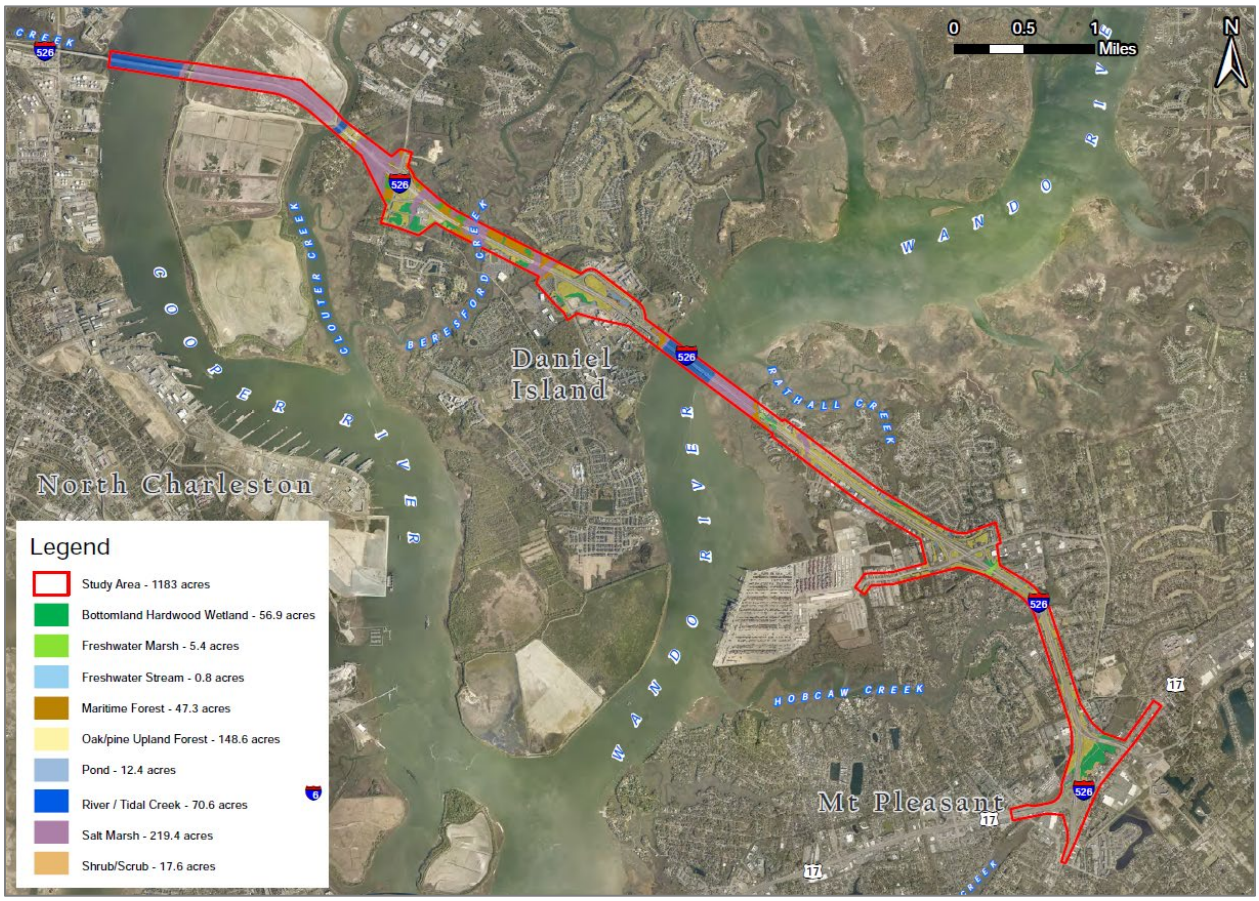
Environmental Justice Populations – The study area contains low-income, minority, and limited English proficiency households, however the majority of the study area would be considered non-environmental justice populations. A full environmental justice analysis would need to be undertaken during future NEPA processes to determine whether a recommended alternative would cause disproportionately high and adverse impacts to these protected populations.

6.1.2 Natural Resources

Field investigations were conducted in 2018 and 2019 to identify and complete natural resource studies for aquatic resources, EFH, and protected species. The *I-526 LCC EAST Natural Resources Survey* provides additional information on these resources and is included in **Appendix F**.

Aquatic Resources – Aquatic resources found within the study area include salt marsh, rivers and large tidal creeks, maritime forests, freshwater marshes, bottomland hardwood forest, freshwater streams, and ponds as illustrated in **Figure 6-1**. Impacts to wetlands should be avoided where feasible. Portions of wetlands may potentially be impacted, and best management practices should be implemented to reduce direct and indirect impacts to these resources. Updated delineations of impacted wetlands would need to be performed during the NEPA phase.

Figure 6-1: Wetland Habitat Types



Source: Study Team Natural Resources Survey (March 2019)

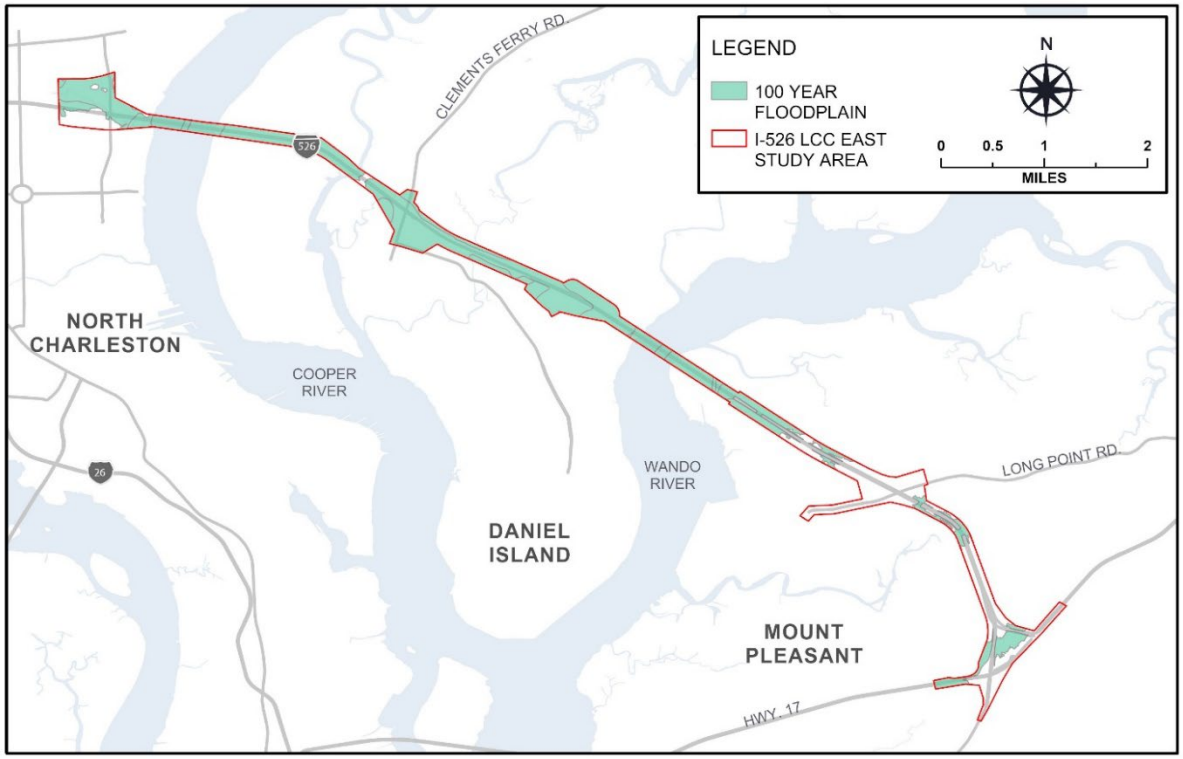
Floodplains – Most of the I-526 LCC EAST corridor is located within the 100-year flood zone as illustrated in **Figure 6-2**; however, a majority of the existing facility is elevated bridge structure. If proposed cuts and fills are identified in the floodplains, a Conditional Letter of Map Revision from the Federal Emergency Management Administration will be required.

Federally Protected Species – Habitat surveys conducted in 2018 and 2019 within the study area determined that 12 protected species have suitable habitat present. Further coordination on potential impacts to protected species would be required during the NEPA phase.

Essential Fish Habitat – Field investigations were conducted in 2018 and 2019 to identify EFH within the study area associated with the Cooper River and Wando River systems. These types include estuarine emergent wetland, oyster reef and shell, unconsolidated bottom, sub/intertidal flat, and tidal creek as illustrated in **Figure 6-3**. Further coordination on potential impacts to EFH during the NEPA phase would be required.

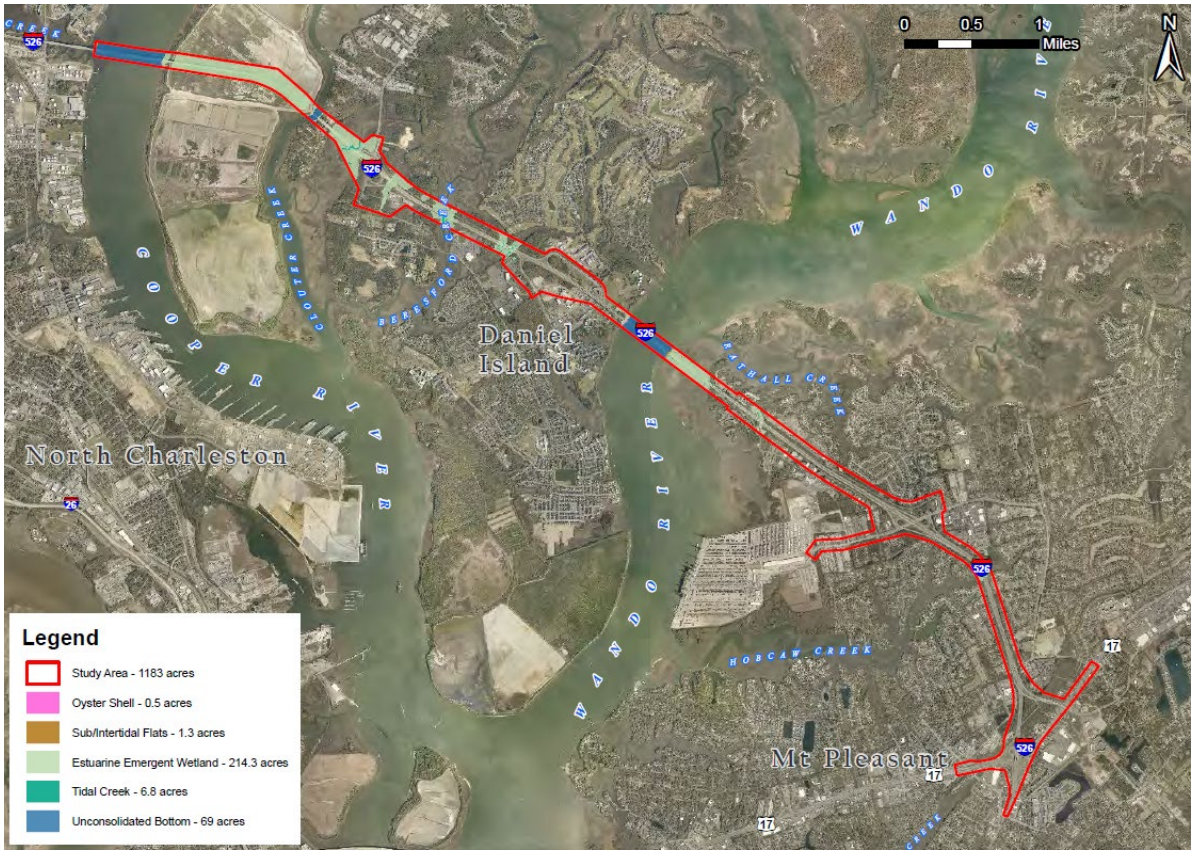
Farmlands – According to soil data collected from the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), prime farmland and farmland of statewide importance is located within the study area as illustrated in **Figure 6-4**. Coordination with USDA NRCS and a Farmland Conversion Impact Rating Form AD-1006 will be required during the NEPA phase.

Figure 6-2: Floodplains



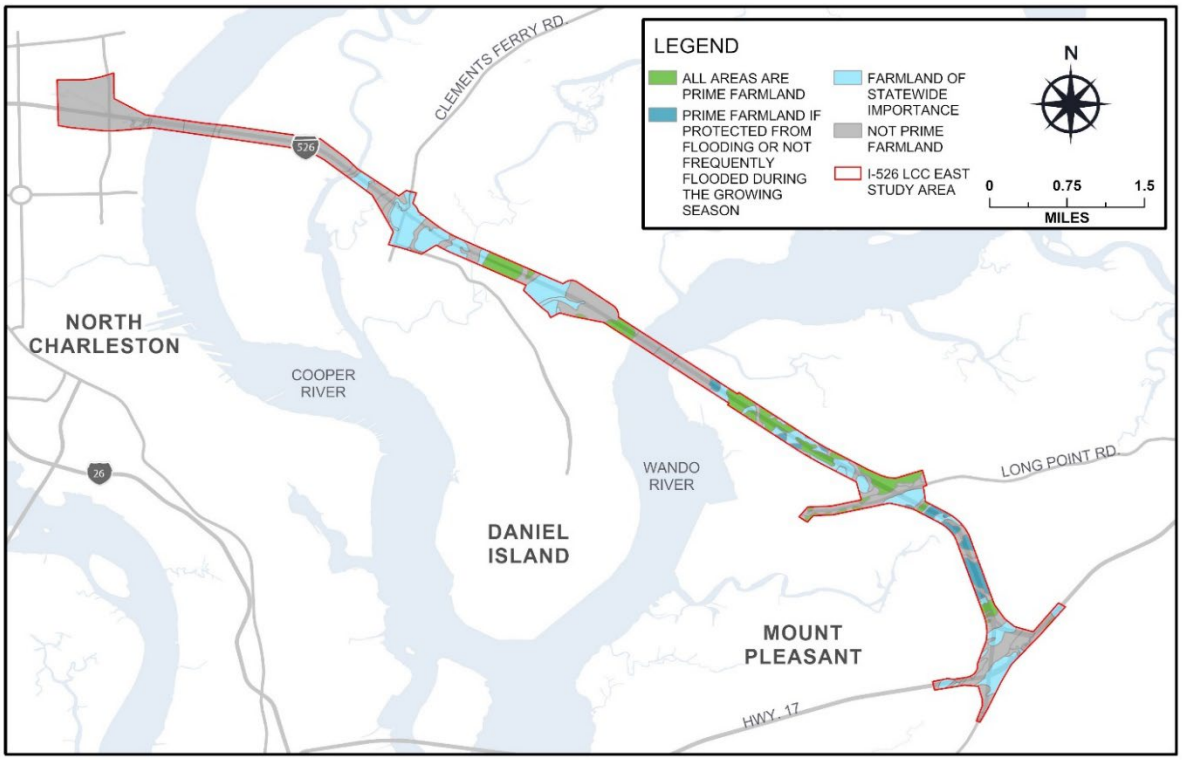
Source: FEMA Special Flood Hazard Areas (2018)

Figure 6-3: Essential Fish Habitat Types



Source: Study Team Natural Resources Field Survey (2019)

Figure 6-4: Farmlands



Source: U.S. Department of Agriculture Natural Resources Conservation Service (2019)

Air Quality – The I-526 LCC EAST project study area is in Charleston and Berkeley Counties, which are both are in attainment as established by the National Ambient Air Quality Standards. Based on the 2050 design year traffic projections, portions of the corridor could reach an AADT of 150,000. Based on these projections the project may have higher potential mobile source air toxic effects and will require a quantitative analysis to forecast local-specific emission trends during the NEPA phase of the project. [23]

Hazardous Materials Site – An Environmental Record Search report was compiled for the study area to determine the presence of hazardous materials sites. A total of 82 records were identified in the study area. An Environmental Site Assessment would be required during the NEPA phase to investigate and evaluate hazardous materials sites that may be impacted by the recommended alternative.

6.1.3 Cultural Resources

Archaeological and architectural resources were surveyed in 2018 for the I-526 LCC EAST PEL study using an Area of Potential Effect (APE), a study area used for assessing cultural resources. The APE encompasses a 300-foot buffer around the PEL study area. A total of 36 archaeological resources and 15 aboveground architectural resources were identified in the APE. Adverse effects on eligible or listed resources in the National Register of Historic Places have been avoided during the development of the Reasonable Alternatives. Future NEPA processes will require early and ongoing consultation with the State Historic Preservation Office (SHPO) for potential updates to the APE and determination of potential Section 106 of the National Historic Preservation Act impacts. Additional cultural resource investigations may be required during the NEPA phase.

[23] https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

6.1.4 Climate Change/Greenhouse Gas Emissions

Climate change is an issue relevant to a broad geographic scope and time scale. Therefore, the regional and statewide planning process is a more appropriate place to consider it than the project development process. GHG emissions are not a project-level issue since all emissions have similar effects on the global climate. Climate change adaptation requires a systemwide approach to assess vulnerability to climate and extreme weather risks. [24] Therefore, the project was not evaluated for specific quantities of GHG emissions nor was a vulnerability or criticality assessment completed. Instead, the project was evaluated for qualitative elements that are known to reduce GHG emissions, increase adaptability to climate change, and serve as resiliency methods to protect the investment in highway infrastructure.

GHG and Emissions Reduction

The project has been planned and designed to incorporate strategies that improve the efficiency of transportation operations within the project corridor and regional transportation system. The same strategies to provide congestion relief, that translate into time savings to travelers and reduced costs to shippers, also have co-benefits of reducing emissions. [25] Reductions in vehicle miles traveled (VMT) has similar co-benefits as well. By reducing VMT, future emissions are expected to be reduced. Additionally, infrastructure improvements allow for integration of improved technology that can also reduce GHG emissions. Use of light-emitting diode (LED) traffic signals, roadway lighting, and highway message boards consume less energy and thereby reduce emissions associated with the generation of electricity.

Climate Change Adaptation

The magnitude of the impact of climate change is difficult to predict, but the scientific consensus is that impacts are occurring now and will continue during the rest of this century and beyond. Even in the absence of the recommended system-wide vulnerability and criticality assessments, planning for infrastructure improvements, rebuilding existing facilities, and planning and designing new projects are opportunities to include adaptations to the effects of climate change. [26] The I-526 LCC EAST project will incorporate adaptation strategies for coastal areas by constructing new facilities and making improvements to existing facilities with higher design standards. New bridges and roadway segments will be constructed to meet the latest hydrologic, seismic, and structural design standards. Existing bridges and roadways will either be reconstructed, reinforced, or retrofitted to also meet current design standards. Additional adaptation options can be incorporated into the final project design adaptation options using criteria such as cost, usable life, level of performance, flexibility of the design to accommodate future adaptation methods, and social and environmental considerations. [27]

Climate Change Resilience

The Fixing America's Surface Transportation (FAST) Act, signed into law in December 2015, requires transportation agencies to take resilience into consideration during transportation planning processes. [28] The proposed bridges associated with the project will be designed with special consideration given to the *Hydraulic Engineering Circular No. 25–Volume 2--Highways in the Coastal Environment: Assessing*

[24] Bracing for Hard Times Ahead. FHWA-HRT-15-001. Vol. 78 No. 3. November/December 2014. https://highways.dot.gov/public-roads/novemberdecember-2014/bracing-hard-times-ahead (Accessed 4/25/22).
[25] Taking Stock: Climate Change and Transportation. FHWA-HRT-10-003. Vol. 73 No. 5. March/April 2010. https://highways.dot.gov/public-roads/marchapril-2010/taking-stock-climate-change-and-transportation (Accessed 4/25/22).
[26] Preparing for Change. FHWA-HRT-17-002. Vol. 80 No. 4. January/February 2017. https://highways.dot.gov/public-roads/januaryfebruary-2017/preparing-change (Accessed 4/25/22).
[27] Vulnerability Assessment and Adaptation Framework, 3rd Edition. FHWA-HEP-18-020. https://www.fhwa.dot.gov/environment/sustainability/resilience/adaptation_framework/chap06.cfm#toc498351508 (Accessed 4/25/22).
[28] Fixing America's Surface Transportation Act or "FAST Act". https://www.fhwa.dot.gov/fastact/ (Accessed 4/25/22).

Extreme Events (HEC-25, Vol. 2; FHWA-NHI-14-006) and *Hydraulic Engineering Circular No. 17–2nd Edition--Highways in the River Environment: Floodplains, Extreme Events, Risk, and Resilience* (HEC-17; FHWA-HIF-16-018). HEC-25 provides technical guidance on how to incorporate extreme events and climate change into coastal highway designs, with a focus on sea level rise, storm surge, and wave action. HEC-17 provides technical methods on how to incorporate floodplain management, risk, extreme events, resilience, and adaptation for highways in the riverine environment. The guidance in these manuals draws on the best action-able engineering and scientific methods and data.

The project will also be designed to incorporate practicable elements from the FHWA *Nature-Based Solutions for Coastal Highway Resilience: An Implementation Guide* (FHWA-HEP-19-042). Nature-based solutions provide risk-reduction benefits to coastal highways by reducing coastal flooding, wave heights, and erosion using natural materials and processes to reduce erosion, wave damage, and flood risks, serving as alternatives to, or ecological enhancements of, traditional shoreline stabilization and infrastructure protection techniques. [29]

Further Studies on Environmental Resources

Major regulatory requirements associated with the proposed project include the Clean Water Act, Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act (ESA), the National Historic Preservation Act Section 106, Department of Transportation Act (DOT Act) of 1966, Section 4(f), and the South Carolina Perpetual Care Cemetery Act. To ensure compliance of all federal, state, and local regulations, in-depth analysis and data collection would be required. The following major resources would need further study in the NEPA phase:

- Social and Community Resources
- Environmental Justice
- Natural Resources
- Waters of the U.S.
- Section 4(f)/6(f)
- Federal- and State-Protected Species
- Water Quality/Floodplain
- Update to the Cultural Resources
- Hazardous Waste
- Climate Change/GHG Emissions

One of the main studies that will be required that was not evaluated during the PEL study is a traffic noise analysis. This study consists of conducting field measurements of the existing roadway to establish a baseline for current noise levels. These results are compared to the no-build and build models based on peak hourly volumes (worse-case scenario) in the design year. Noise studies are not conducted during the PEL process because of limited design details available during the planning study. However, noise studies are required during the NEPA phase of project development and include the development of noise models for the reasonable alternatives. The noise studies will be conducted in compliance with Title 23 of the Code of Federal Regulations, Part 772, and the SCDOT Traffic Noise Abatement Policy

[29] Nature-Based Solutions for Coastal Highway Resilience: An Implementation Guide (FHWA-HEP-19-042). https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/implementation_guide/#toc18511925

(September 2019 or current). Noise-impacted receptors identified in the design year would require additional analysis to determine if mitigation is reasonable and/or feasible.

6.2 Anticipated Resource Agency Coordination

Resource agency coordination with the following federal and state agencies is anticipated during the NEPA phase:

- National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) is responsible for the nation's ocean resources stewardship. Coordination would be required to assess impacts to the EFH within the project limits.
- South Carolina Department of Health and Environmental Control (SCDHEC) – 401 water quality certification.
- SCDHEC – Ocean and Coastal Resource Management (OCRM) – Coordination with the OCRM will be required, and the consistency of the project with the coastal zone management plan be evaluated.
- South Carolina Department of Natural Resources (SCDNR)
- South Carolina Department of Archives and History (SCDAH)
- SHPO – Investigations will need to be conducted as required by Section 106 of the National Historic Preservation Act. Coordination with the SHPO and tribal coordination would be necessary.
- Tribal Historic Preservation Office (THPO)
- U.S. Army Corps of Engineers (USACE) – A Jurisdictional Determination and a 404 Individual Permit will be required for construction activities impacting wetlands, streams, and critical areas within the limits of the project.
- EPA – Coordination with EPA is required for environmental impact statements (EIS). The project will need to comply with Section 309 of the Clean Air Act and a National Pollutant Discharge Elimination System permit may be required.
- U.S. Fish and Wildlife Service (USFWS) – The project must comply with Section 7 of the Endangered Species Act, and a Biological Assessment Report may be required.
- U.S. Coast Guard (USCG) – Coordination will be required, and a navigation survey conducted for the two major river crossings over the Cooper River and Wando River. A USCG permit is required for modification of an existing bridge or construction of a new bridge over navigable waters of the U.S.

6.3 Anticipated Permitting Requirements

During the NEPA phase of the project, the following major permits are anticipated:

- SCDHEC-OCRM Critical Area Plat
- USACE Jurisdictional Determination and 404 Individual Permit
- SCDHEC 401 Water Quality Certification
- USCG permits for the two river crossings of the Cooper River and the Wando River, which will include navigation studies for each river crossing that includes waterway characteristics, waterway vessel navigation, and design information of the proposed bridge structures
- EPA National Pollutant Discharge Elimination System permit

Additional permits not listed above may be required and will be determined during the NEPA phase in consultation with SCDOT, FHWA, and resource agencies.

6.4 ANTICIPATED MITIGATION

6.4.1 Aquatic Resources

Following regulatory requirements, impacts to waters of the U.S. will require compensatory mitigation. The CEQ defines mitigation in 40 CFR 1508.20 to include avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. The authorization of a proposed discharge or impact to waters of the U.S. requires an applicant to take all appropriate and practicable measures to (first) avoid and then minimize impacts. In accordance with 40 CFR 230.92, compensatory mitigation (referred to as mitigation) is used to offset unavoidable impacts to aquatic resources.

The EPA's 2008 Mitigation Rule establishes performance standards and criteria for generating and using mitigation. Mitigation for impacts authorized by Department of the Army permits is generated through four methods: (1) restoration of a previously existing wetland or other aquatic site, (2) enhancement of an existing aquatic site's functions, (3) establishment (i.e., creation) of a new aquatic site, or (4) preservation of an existing aquatic site. Mitigation is provided through three mechanisms: permittee-responsible mitigation, mitigation banks, and in-lieu fee programs.

Completing any of the build alternatives would be anticipated to result in unavoidable impacts to the wetlands and other aquatic resources that are presumed to be waters of the U.S. Construction of build alternatives would potentially impact tidal salt marsh/critical areas and freshwater wetlands in the Cooper River watershed (HUC 03050201) in the Sea Island/Coastal Marsh Level IV Ecoregion (75j).

The Clean Water Act Section 404(b)(1) Guidelines establish substantive environmental criteria that must be met for activities to be permitted under Section 404 of the Clean Water Act. The types of mitigation required by the 404(b)(1) Guidelines can be combined to form three general types of mitigation: avoidance, minimization, and compensatory mitigation. Compensatory mitigation means offsetting an aquatic resource impact by replacing or providing substitute aquatic resources for impacts that remain after avoidance and minimization measures have been applied. This is typically achieved through the restoration, establishment, enhancement, and/or preservation of aquatic resource functions and services. The use of approved mitigation banks is the preferred method of compensatory mitigation as outlined by the Compensatory Mitigation for Losses of Aquatic Resources, Final Rule (EPA 2008) and the 2010 USACE Charleston Regulatory District Guidelines for Preparing a Compensatory Mitigation Plan: Working Draft (herein, 2010 Charleston District Guidelines). Furthermore, SCDHEC and OCRM routinely require compensation for wetland impacts, which includes impacts to critical areas.

Therefore, SCDOT would propose the purchase of compensatory mitigation credits from a combination of USACE-approved mitigation banks to offset unavoidable impacts to wetlands and other aquatic resources. If credits are not available from approved banks, SCDOT would follow the 2010 Charleston District Guidelines and identify suitable permittee responsible mitigation. This may include a solicitation for mitigation bank credits in the Cooper River watershed or teaming with ecological restoration practitioners to identify suitable restoration sites and develop a permittee responsible mitigation plan.

At the time of this writing, the following USACE-approved mitigation banks have available credits [30, 31]:

- Caton Creek Mitigation Bank
- Congaree Carton
- Palmetto Umbrella Mitigation Bank – Big Run Site
- Swallow Savannah
- Poplar Grove Mitigation Bank
- Clydesdale

Per the Mitigation Rule, an applicant's preferred mitigation alternative should increase the likelihood of successfully implementing mitigation (while reducing the risk and uncertainty of providing the required mitigation) and reduce the time lag between the loss of an aquatic resource function caused by the permitted impacts and the replacement of aquatic resource functions at the mitigation site.

6.4.1.1 Wetland Habitats

Wetland and stream delineations were performed within the project study area to identify protected wetland habitats. Wetland habitats present within the study area include brackish/saline habitats, freshwater habitats, and non-wetland habitats. During the NEPA process, wetland habitats will be further examined to identify potential impacts. Impact types may include permanent wetland loss as a result of the placement of fill or temporary impacts resulting from construction activities.

6.4.1.2 Essential Fish Habitats

EFH is the aquatic habitat required for marine species to spawn, breed, feed, and grow to maturity. [32] EFH and managed marine species are under the jurisdiction of the NOAA Fisheries. They must be consulted before construction activities can begin. Several EFH types are found within the project corridor associated with the Cooper and Wando River systems. During the NEPA process, EFH will be further examined to identify potential impacts.

Coordination with USACE (wetland habitats) and NOAA (EFH) will be needed, and a mitigation plan developed and acquired for the proposed project. Measures to avoid, minimize, and mitigate impacts will continue to be evaluated and identified during project development.

6.4.2 Parks and Recreation Resources, Sections 4(f) and 6(f)

Under Section 4(f) of the USDOT Act, public recreation resources are protected. Section 4(f) requirements specify that FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless: 1) there is no feasible and prudent avoidance alternative to the use of land, and the action includes all possible planning to minimize harm to the property resulting from such use; or 2) FHWA determines that the use of the property will have a *de minimis* (negligible) impact. Section 6(f) of the Land and Water Conservation Act protects recreation resources developed with Land and Water Conservation Funds.

[30] Source: Regulator In-lieu Fee and Bank Information Tracking System
[31] Credit availability is subject to change.
[32] National Oceanic and Atmospheric Administration. 2019. "Habitat Conservation: Essential Fish Habitat." Accessed February 15, 2021, https://www.fisheries.noaa.gov/national/habitat-conservation/essential-fish-habitat#essentially,-fish-habitat.

There are several parks and recreation resources adjacent to the project corridor. Because of the close proximity of these resources, there may be potential impacts that include partial acquisition, visual, and noise. These resources will be further evaluated during the NEPA process to determine the full extent of the impacts.

6.4.3 Noise

There are several neighborhoods, parks, and businesses adjacent to the project corridor that contain noise-sensitive receptors. The proposed alternatives in this project will result in substantial changes as defined by 23 CFR 772.5 to the location of the roadway necessitating a noise study during the NEPA process to determine noise impacts. The noise studies will be conducted in compliance with 23 CFR Part 772, and the SCDOT Traffic Noise Abatement Policy (September 2019 or current). Noise-impacted receptors identified in the design year would require additional analysis to determine if mitigation is reasonable and/or feasible. Noise barriers are a common noise abatement measures that are evaluated as part of a noise study.

6.4.4 Other Mitigation Needs

Other potential mitigation for this project is anticipated for impacts to conservation easements, communities, threatened and endangered species, and viewsheds. A determination on the level of Visual Impact Assessment (VIA) required would be determined as part of the NEPA process. Federal, state, and local agencies that are responsible for a specific resource would be coordinated with and mitigation would be determined on a case-by-case basis.

7.0 What Public Agencies Participated in the PEL?

The public, stakeholder, and agency involvement are critical to understanding the perspectives, needs, and issues of the public and stakeholders during the PEL process. Federal, state, and local agencies and community members were engaged throughout the study and feedback was solicited at key milestones to guide the development of the purpose and need, alternatives evaluation, and study recommendations. This chapter summarizes the coordination and involvement conducted. Detailed summaries of the public, stakeholder, and agency involvement are included in **Appendix G**.

7.1 SCDOT and FHWA Coordination

Project coordination meetings were held monthly with SCDOT and FHWA during the development of the PEL study. In addition, formal coordination with FHWA occurred during four coordination points that served as check-in points to confirm progress to date, review any issues or concerns, and lay out next steps to achieve the next coordination point. The coordination points coincided with the following milestones and are documented in **Appendix H**:

- Coordination Point 1 – PEL Initiation (March 23, 2020)
- Coordination Point 2 – Purpose and Need Statement (February 18, 2021)
- Coordination Point 3 – Alternatives Screening (September 13, 2021)
- Coordination Point 4 – PEL Document

7.2 Resource Agency Coordination

The SCDOT distributed an Invitation to Participate on the I-526 LCC EAST PEL study to the following agencies in April 2020:

- USACE
- USEPA
- USFWS
- NOAA Fisheries
- SCDHEC OCRM
- SCDNR
- SCDAH
- SCDHEC

These are critical agencies that were specifically engaged in the PEL process based upon the identified resources that are anticipated to be affected. A more expansive list will be developed as part of the NEPA Coordination Plan, which will also identify NEPA Participating and Cooperating agencies. The Public Involvement Plan for the project presents a more expansive list of stakeholders.

The invitation included a project location map and the draft purpose and need. Agencies were asked to provide comments on the draft purpose and need and information that may be helpful in evaluating potential environmental impacts of the project. A summary of the resource agency input is shown in **Table 7-1**. The invitation letter and agency responses received are included in **Appendix G**.

Table 7-1: Resource Agency Responses

Resource Agency	Input
USFWS	Partner consultation under Section 7 of the ESA will be required. Once a preferred alternative is selected, a survey of the selected corridor for the presence of species protected under the ESA would be required. Salt marsh wetlands are predominant along the I-526 EAST corridor and may be significantly impacted by any selected alternative. The PEL study must also consider potential impacts to migratory birds. Flight patterns, foraging, and nesting of migratory birds may be adversely affected by the corridor improvements, particularly during construction phases of the project.
NOAA Fisheries	We want to participate in the I-526 LCC EAST PEL study.
SCDNR	SCDNR accepts the invitation to participate in the environmental review of this project.

The state and federal agencies listed above were also invited to attend two agency coordination effort (ACE) meetings and all PEL public informational meetings. ACE meetings with these agencies were held to discuss specific subjects of interest, concerns, and recommendations at key milestones in the PEL process.

ACE Meeting #1 January 9, 2020 – PEL Initiation and Draft Purpose and Need

Agencies in Attendance: SCDOT, FHWA, USACE, SCDAH-SHPO, OCRM, SCDNR, USEPA

Meeting Purpose: Provided resource agencies with an overview of the I-526 LCC EAST project including the draft purpose and need, project goals, and a walkthrough of the PEL process.

Resource Agency	Summary of Agency Comments – ACE meeting 1/9/2020	How the Comment Was Addressed
USACE	With regards to the accessibility of the Cooper River upstream, if the current bridges aren't going to work, then the purpose and need can be revised to include navigation improvements.	During discussions with FHWA and SCDOT, navigational improvements was not used as part of the purpose and need.
USACE	It will be helpful to go ahead and include the Section 404 and Section 10 information at this stage, so it's included in the alternatives analysis.	A discussion of anticipated mitigation and permitting requirements is included in Chapter 6.
NOAA	Increasing the bridge size will increase the size and number of vessels that can move upstream. A detailed analysis of the indirect and cumulative impacts to EFH and sturgeon habitats would be needed during the NEPA stage.	This has been noted in Chapter 6 discussing the need for further studies on environmental resources.

ACE Meeting #2 July 8, 2021 – Alternatives Development and Screening Process

Agencies in Attendance: SCDOT, FHWA, USFWS, USACE, SCDNR, OCRM, USEPA

Meeting Purpose: Provided resource agencies with an overview of the I-526 LCC EAST Concept Development and Alternatives Analysis process.

Resource Agency	Summary of Agency Comments – ACE meeting 7/8/2021	How the Comment Was Addressed
USFWS	There is existing development along the corridor and after reviewing the database there are no threatened and endangered species of concern at this time.	Comment noted.
SCDOT	The previous administration did not focus on areas such as climate change and sustainability. The new administration will be placing more emphasis on these areas going forward. Has the project team addressed these topics in their study?	A discussion on climate change, greenhouse gas emissions is included in Chapter 6.
FHWA	The highway bill is up for re-authorization and may contain additional guidance on topics such as environmental justice, climate change, and sustainability. These guidelines may include potential bridge heights to account for future climatic conditions.	The Infrastructure Investment and Jobs Act of 2021 was authorized in November 2021. Some guidance is still under agency development at the time of this PEL study completion.
USACE	Has the project team worked with the US Coast Guard to discuss bridge work along the corridor?	Coordination with the US Coast Guard will be initiated during the NEPA stage.

ACE meeting presentations, meeting notes, and supporting documents are included in **Appendix G**. Each agency will also receive a copy of the Final PEL study for review. This is the only planning product contemplated for submission to these agencies for review.

One federally recognized tribal nation, the Catawba Nation, is active in the PEL study area. Coordination with the Catawba Nation will include notification of and invitation to review the Final PEL study.

8.0 How Did the Public Participate in the PEL?

While the I-526 LCC EAST was a Planning and Environmental Linkages study, the public involvement was developed to be consistent with public involvement requirements under NEPA, Title VI of the Civil Rights Act, Executive Order 12898 – Environmental Justice, and other federal regulations to ensure that members of the public receive key information about the project and have opportunities to provide meaningful input on decisions that may affect their community. Community input is critical to the success of any project, and SCDOT is committed to providing meaningful public involvement opportunities throughout the project development process. The public and stakeholder engagement is summarized below.

Two rounds of public meetings were held during the PEL process. The first round was held virtually in the summer of 2020, and the second round was held in person and virtually in October 2021. A summary of the public engagement is provided below, and detailed summaries are included in **Appendix G**.

8.1 Round 1 Public Engagement

The first round of public engagement for the PEL study was held as an online, on-demand public information meeting (PIM) from May 14 to August 15, 2020, and an interactive MetroQuest online survey conducted during the same time frame. The content of the PIM and MetroQuest survey was intended to educate the public on the existing transportation conditions of the I-526 LCC EAST corridor and the purpose and need of the project. Participants were asked to share their concerns and issues related to traveling on I-526, provide input on the draft purpose and need and study goals, and offer input on potential solutions to address the project needs.

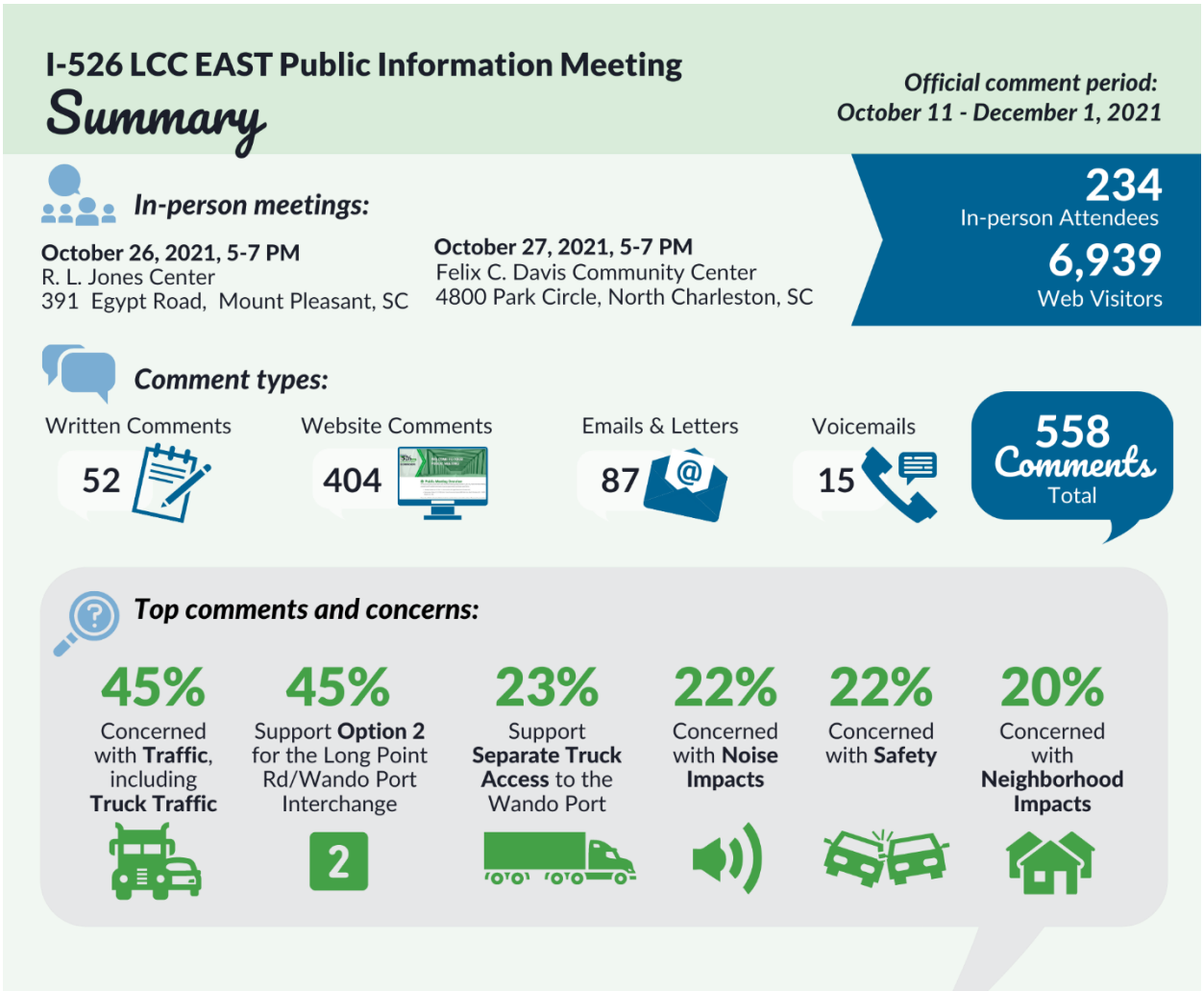
A total of 84 comments were received during the PIM comment period and a total of 2,129 PIM webpage sessions, or views, occurred during the same time frame. The MetroQuest online survey had 3,103 responses. The highest number of comments and concerns were associated with noise and neighborhood impacts. Comments received expressed support for alternative truck routes and truck-only lanes. The top two safety-related issues reported were congestion and truck merging. A summary of the PIM and MetroQuest survey comments are located in **Chapter 3** in **Figure 3-1**, **Figure 3-2**, and **Figure 3-3**Figure 3-3. Responses to comments received were prepared in an Asked and Answered "Frequently Asked Questions" or FAQ format and sent to all commenters and interested parties on October 15, 2020. The general comment response letter with the FAQs is provided in **Appendix G**. The input and feedback from the public and stakeholders helped confirm the purpose and need, refine project goals, and was used in the development of the alternative concepts.

8.2 ROUND 2 PUBLIC ENGAGEMENT

The second round of public engagement was a combination of an online, on-demand PIM held from October 11 to December 1, 2021, and two in person open houses on October 27 and October 28, 2021, in Mount Pleasant and North Charleston, respectively. The PIM webpage had 6,939 views during the time frame. A total of 558 comments were received during the formal comment period. The highest number of comments were related to supporting improvements to the Long Point Road interchange, specifically the second option presented at the public meeting. The second and third most common comments were related to traffic concerns, primarily related to truck traffic. About 23 percent of comments received supported dedicated truck access to/from the Wando Port. Others were related to trucks needing to stay in the right lane or designated truck-only lanes. Many comments mentioned that trucks travel in the left lanes and slow traffic.

Noise and safety concerns were both frequently noted too. Most noise comments were related to present and future noise concerns, in particular communities adjacent to the I-526 corridor in Mount Pleasant and Daniel Island. Comments that expressed concerns about or need for safety were typically related to speeding, trucks in the left-lane, emergency vehicles, and reducing accidents. A summary of what was heard from the public during the 2021 public meetings is shown in **Figure 8-1**.

Figure 8-1: Summary of Public Information Meeting 2



Responses to comments were prepared as individual comment responses and sent through email and mail. In addition, an Asked and Answered "Frequently Asked Questions" or FAQ document was sent to all commenters and interested parties on April 1, 2022. All comment responses along with the FAQs are provided in **Appendix G**.

8.3 ADDITIONAL STAKEHOLDER AND CHATS MPO COORDINATION

Stakeholder group meetings were held during the development of the PEL study. The list of participants was drawn from local public agencies, businesses, residents, non-profit organizations, and special interest groups in the project vicinity. The stakeholders' role is to provide information and concerns to the project team and to share project information with their constituencies. During stakeholder meetings, updates were provided on both I-526 LCC WEST and EAST projects. Summaries of the stakeholder meetings and the full stakeholder invitee list are provided in **Appendix G**. These meetings occurred as follows in **Table 8-1**.

Table 8-1: Stakeholder Coordination Meetings

Date of Meeting	Topic	Number of Attendees
May 2017	All Stakeholders: I-526 LCC EAST and WEST project update	32
May 2018	All Stakeholders: I-526 LCC EAST and WEST project update	33
April 2019	All Stakeholders: I-526 LCC EAST schedule, WEST project update	27
November 2019	All Stakeholders: Status update of EAST, WEST public information meetings materials	19
Summer 2020 (Virtual)	All Stakeholders: Information about the EAST project and upcoming EAST public information meeting, WEST project updates and major milestones, follow-on from public information meeting	28
Fall 2021 (Virtual)	All Stakeholders: Project update on the EAST public information meetings, including meeting materials such as reasonable alternatives	22

The I-526 stakeholders will continue to be engaged throughout the I-526 LCC EAST project development process. Additional stakeholder coordination included meeting with the CHATS MPO on May 20, 2021. During this meeting, the results from Levels 1 and 2 of the Alternative Concept Screening Process were presented. The MPO was encouraged by the wide range of infrastructure and TSMO alternatives examined in the screening process and recommended the inclusion of ramp metering as an additional TSMO option. Previously, ramp metering was eliminated because of its current lack of use in South Carolina as well as a perceived lack of effectiveness within the corridor. Based on input received during the meeting, this strategy was included as an option being carried forward for further evaluation.

The CHATS MPO was also provided an opportunity to review and comment on the Draft PEL Report.

9.0 What Are the Next Steps for the Widening of I-526?

This action plan is intended to explore and identify a framework for implementing the reasonable alternatives identified through the alternatives analysis. Eight build alternatives are proposed for carrying forward for further evaluation in the NEPA phase. The principal intent of this action plan is to assist the SCDOT with understanding the potential benefits, cost, funding sources, and issues to address for each recommendation in order to expedite environmental clearance and project readiness. The outcome of this plan will assist SCDOT in better navigating project prioritization as funding becomes available. In addition, TSMO strategies and improvements to the Long Point Road interchange are recommended to be considered as supplemental options to the reasonable alternatives or as interim improvements to help address congestion and certain roadway deficiencies but will not fully resolve the issues outlined in the purpose and need.

9.1 Mainline Build Alternatives

Each of the eight mainline build alternatives expands the I-526 LCC EAST corridor from a 4-lane facility to an 8-lane facility and has similar traffic operations. **Table 9-1** summarizes the capacity options and lane expansion details for each.

As traffic demand is forecast to increase, there are limits to construction of additional lanes, creating a need for additional strategies to further support project goals by improving upon the performance of the infrastructure improvements with supplemental options. Although each of the eight-lane mainline build alternatives addresses several of the congestion concerns along the corridor and meets the purpose and need of the project, additional supplemental measures such as TSMO strategies and improvements to Long Point Road interchange should be considered.

Table 9-1: Mainline Build Alternatives for I-526 LCC EAST PEL Study

Mainline Build Alternatives	Capacity Option	Lane Expansion	
Alternative 1	• Retain the Don Holt bridge while adding four lanes to the north. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.		
Alternative 2	• Retain the Don Holt bridge while adding four lanes to the south. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.		
Alternative 3A	• Replace the Don Holt bridge with a two new four-lane bridges on either side of the existing facility. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.		
Alternative 4	• Replace the Don Holt bridge with a new eight-lane bridge north of the existing bridge. • Replace Wando bridges with eight-lane bridge north of the existing bridges.		
Alternative 5	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with a new four-lane bridge north of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located.		
Alternative 6	• Replace the Don Holt bridge with a new four-lane bridge south of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with a new four-lane bridge south of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located.		
Alternative 7	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.		

Mainline Build Alternatives	Capacity Option	Lane Expansion	
Alternative 8	• Replace the Don Holt bridge with a new eight-lane bridge south of the existing bridge. • Replace Wando bridges with eight-lane bridge south of the existing bridges.	 Replace Don Holt Bridge  Expand to the south	 Replace Wando Bridges Expand to the south

9.2 ESTIMATED COSTS

For planning purposes, preliminary cost estimates were prepared for each of the eight mainline reasonable alternatives and are included in **Table 9-2**. The reasonable alternatives range from $2.3 billion to $3.9 billion, which includes the preliminary design, NEPA phase, utility relocation, right-of-way acquisition, and construction.

Table 9-2: Mainline Build Alternative Estimated Costs

Mainline Build Alternatives	Capacity Option	Costs[1]
Alternative 1	• Retain the Don Holt bridge while adding four lanes to the north. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.	$2.2 billion
Alternative 2	• Retain the Don Holt bridge while adding four lanes to the south. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.	$2.4 billion
Alternative 3A	• Replace the Don Holt bridge with two new four-lane bridges on either side of the existing facility. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.	$3.9 billion
Alternative 4	• Replace the Don Holt bridge with a new eight-lane bridge north of the existing bridge. • Replace Wando bridges with an eight-lane bridge north of the existing bridges.	$3.9 billion
Alternative 5	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with a new four-lane bridge north of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located.	$4.2 billion
Alternative 6	• Replace the Don Holt bridge with a new four-lane bridge south of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with a new four-lane bridge south of the existing bridge, remove the existing bridges, and add a new four-lane bridge where the existing bridge is located.	$3.8 billion
Alternative 7	• Replace the Don Holt bridge with a new four-lane bridge north of the existing bridge, remove the existing bridge, and add a new four-lane bridge where the existing bridge is located. • Replace the Wando bridges with two new parallel two-lane bridges, remove existing bridges, and then widen newly built bridges to four lanes.	$3.9 billion
Alternative 8	• Replace the Don Holt bridge with a new eight-lane bridge south of the existing bridge. • Replace Wando bridges with eight-lane bridge south of the existing bridges.	$3.9 billion

Note: [1] Cost estimates are in year 2021 dollars. 2% per year for inflation has been included based on forecasted availability of funds for each phase of work. Number of years for inflation vary from 12 to 15 years by segment.

10.0 Is it Possible to Phase the Widening of the Corridor?

As mentioned above, the full corridor includes the reconstruction or replacement of two major bridge structures. The design variance between the six alternatives is largely driven by the approach to these structures; however, the extent of the corridor from Long Point Road to the project terminus at U.S. 17/Johnnie Dodds Boulevard is consistent for all alternatives. This provides an opportunity to phase future project development of the corridor. One phase option would encompass from Long Point Road to the project terminus and another phase would include Virginia Avenue to Long Point Road.

10.1 Full Corridor – Virginia Avenue to U.S. 17

This option encompasses the entire I-526 LCC EAST corridor and includes the widening of I-526 to eight lanes, spanning approximately 10 miles from Virginia Avenue in North Charleston to U.S. 17 in Mount Pleasant as illustrated in **Figure 10-1.** This corridor includes the reconstruction or replacement of the Don Holt Bridge over the Cooper River and the replacement of the James B. Edwards bridges over the Wando River. The full corridor option includes evaluation of the six reasonable alternatives described previously: Alternative 1, Alternative 2, Alternative 3A, Alternative 4, Alternative 5, Alternative 6, Alternative 7, and Alternative 8. Supplemental options that should also be evaluated for the full corridor project include the TSMO strategies and the access to the Wando Welch Port Terminal. Details are provided in **Table 10-1**. The potential funding sources listed in the table are further described in **Chapter 12**.

Figure 10-1: Full Corridor – Virginia Avenue to U.S. 17

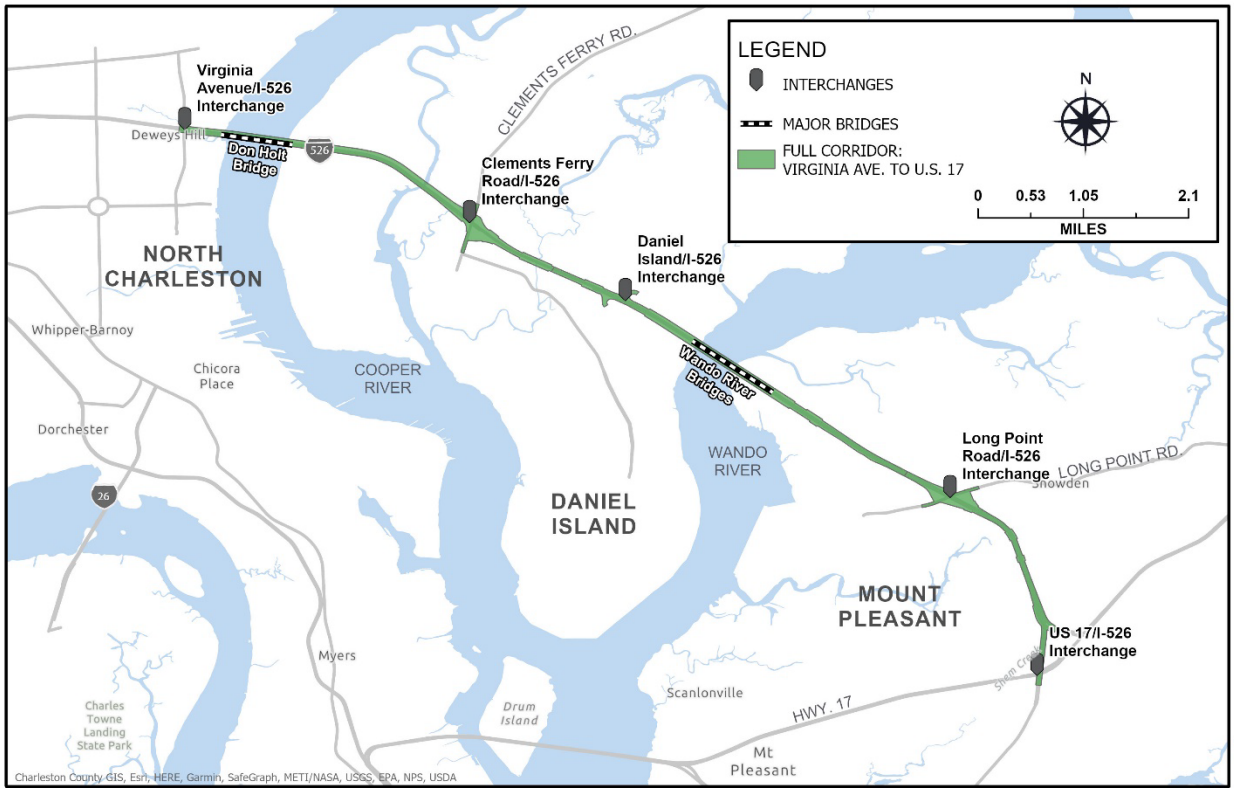


Table 10-1: Full Corridor – Virginia Avenue to U.S. 17

Full Corridor – Virginia Avenue to U.S. 17	
Project Termini	The proposed project termini are from Virginia Avenue to U.S. 17. Coordination with SCDOT and FHWA will be required prior to NEPA initiation
Estimated Programming Cost	$2 to $3.4 billion (dependent on selected preferred alternative)
Potential Impacts	**Aquatic Resources (acres)**: 167.1-203.9 **Relocations:** 64-80 **Parks (4f):** 2-3 (dependent on selected preferred alternative)
Project Duration	• NEPA Compliance – 12 to 24 months • Project Design/Construction – 5 years
Pros of Phasing	• High priority • One comprehensive NEPA process may result in potential cost savings • All traffic congestion issues addressed cohesively
Cons of Phasing	• Funding availability
Potential Funding Sources	Federal Funding Programs • Bridge Investment Program • Nationally Significant Freight and Highway Projects • Congestion Relief Program • National Infrastructure Project Assistance • Local and Regional Project Assistance • PROTECT Discretionary Program • Bridge Formula Program • National Highway Performance Program • Surface Transportation Block Grant Program • National Highway Freight Program • PROTECT Formula Program

Full Corridor – Virginia Avenue to U.S. 17	
	South Carolina Funding Programs • State Highway Fund • Infrastructure Maintenance Trust Fund • South Carolina Transportation Infrastructure Bank
Next Steps	• Identify funding • Initiate NEPA documentation

10.2 PHASED OPTION – LONG POINT ROAD TO U.S. 17

This portion of the corridor begins at Long Point Road and spans approximately 2.8 miles to the project terminus at U.S. 17/Johnnie Dodds Boulevard. Within this phase, the existing facility would be widened by one lane to the inside using the existing median and one lane to the outside for a total of eight lanes. As illustrated in **Figure 10-2**. Details are provided in **Table 10-2**. The potential funding sources listed in the table are further described in **Chapter 12**.

Figure 10-2: Phased Option – Long Point Road to U.S. 17

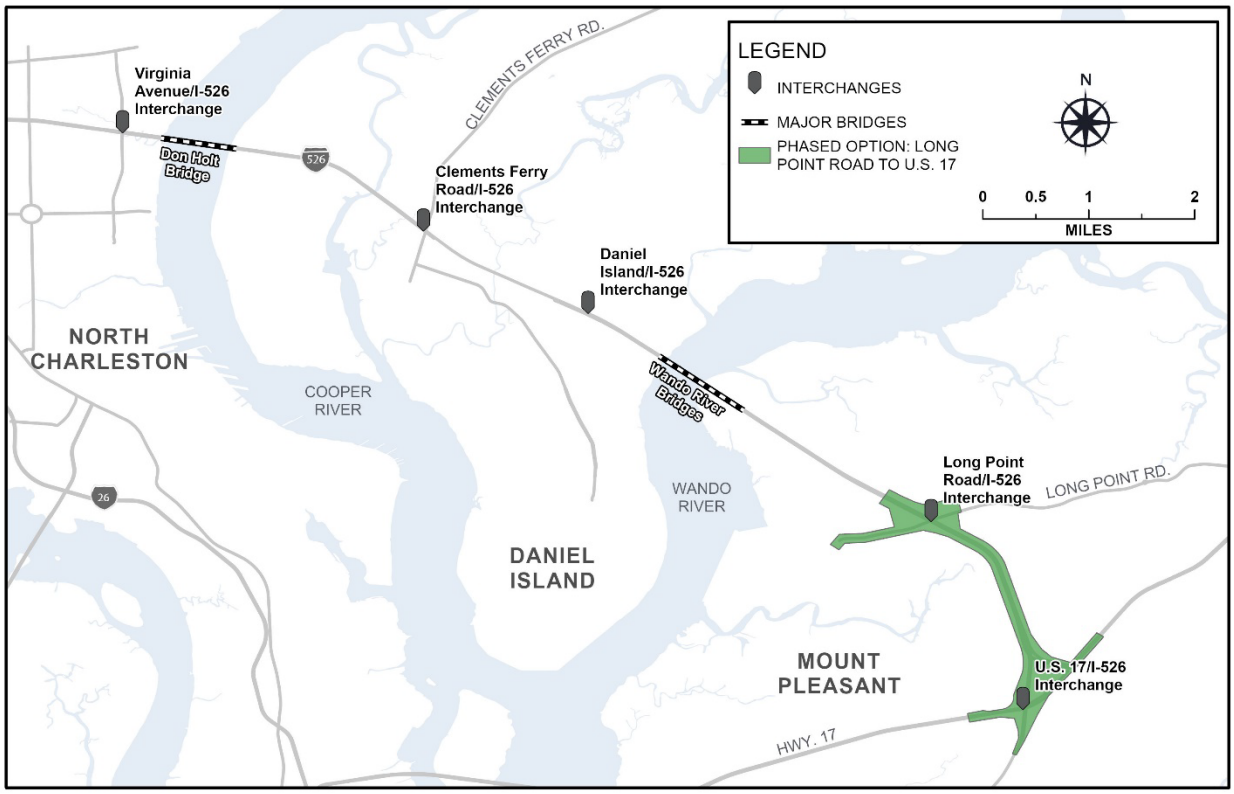


Table 10-2: Phased Option – Long Point Road to U.S. 17

Phased Option – Long Point Road to U.S. 17	
Project Termini	The proposed project termini are from Long Point Road to U.S. 17. Coordination with SCDOT and FHWA will be required prior to NEPA initiation

Phased Option – Long Point Road to U.S. 17	
Estimated Programming Cost	$215 million
Potential Impacts	**Aquatic Resources (acres)**: 9.6 **Relocations:** 2
Project Duration	• NEPA Compliance – 12 to 24 months • Project Design/Construction – 32 months
Pros of Phasing	• There are no project dependencies; this project can progress first and simultaneously with other recommendations • Potential to move expeditiously through the environmental approval process
Cons of Phasing	• Insignificant impact to overall corridor traffic issues • Funding availability – appropriating funding for this extent of the corridor first may consume potential funding for the remainder of the corridor, which has more significant congestion issues
Potential Funding Sources	Federal Funding Programs • Bridge Investment Program • Nationally Significant Freight and Highway Projects • Congestion Relief Program • National Infrastructure Project Assistance • Local and Regional Project Assistance • PROTECT Discretionary Program • Bridge Formula Program • National Highway Performance Program • Surface Transportation Block Grant Program • National Highway Freight Program • PROTECT Formula Program South Carolina Funding Programs • State Highway Fund • Infrastructure Maintenance Trust Fund • South Carolina Transportation Infrastructure Bank
Next Steps	• Identify funding • Initiate NEPA documentation

10.3 PHASED OPTION – VIRGINIA AVENUE TO LONG POINT ROAD

This phase includes the construction of an eight-lane facility spanning approximately 8.3 miles from Virginia Avenue in North Charleston and terminates at mile marker 27 near Shoals Drive in Mount Pleasant just west of Long Point Road as illustrated in **Figure 10-3.** This project would include the reconstruction or replacement of the Don Holt Bridge over the Cooper River and the replacement of the James B. Edwards bridges over the Wando River. Because of the required shift in potential alignments between bridge structures and traffic staging issues, it is recommended that the bridge structures are integrated in the same project phase. The western section of the corridor experiences the highest demand, making it the highest priority within the corridor. Ending the widening prior to the Wando bridge would not have the desired reduction in congestion for the corridor because of the relatively high and consistent traffic demand through Long Point Road.

The Virginia Avenue to Long Point Road phased option includes evaluation of the eight reasonable alternatives described previously: Alternative 1, Alternative 2, Alternative 3A, Alternative 4, Alternative 5, Alternative 6, Alternative 7, and Alternative 8. Supplemental options that should also be evaluated for

this phased option project include the TSMO strategies and the access to the Wando Welch Port Terminal. Details are provided in **Table 10-3**. The potential funding sources listed in the table are further described in **Chapter 12**.

Figure 10-3: Phased Option – Virginia Avenue to Long Point Road

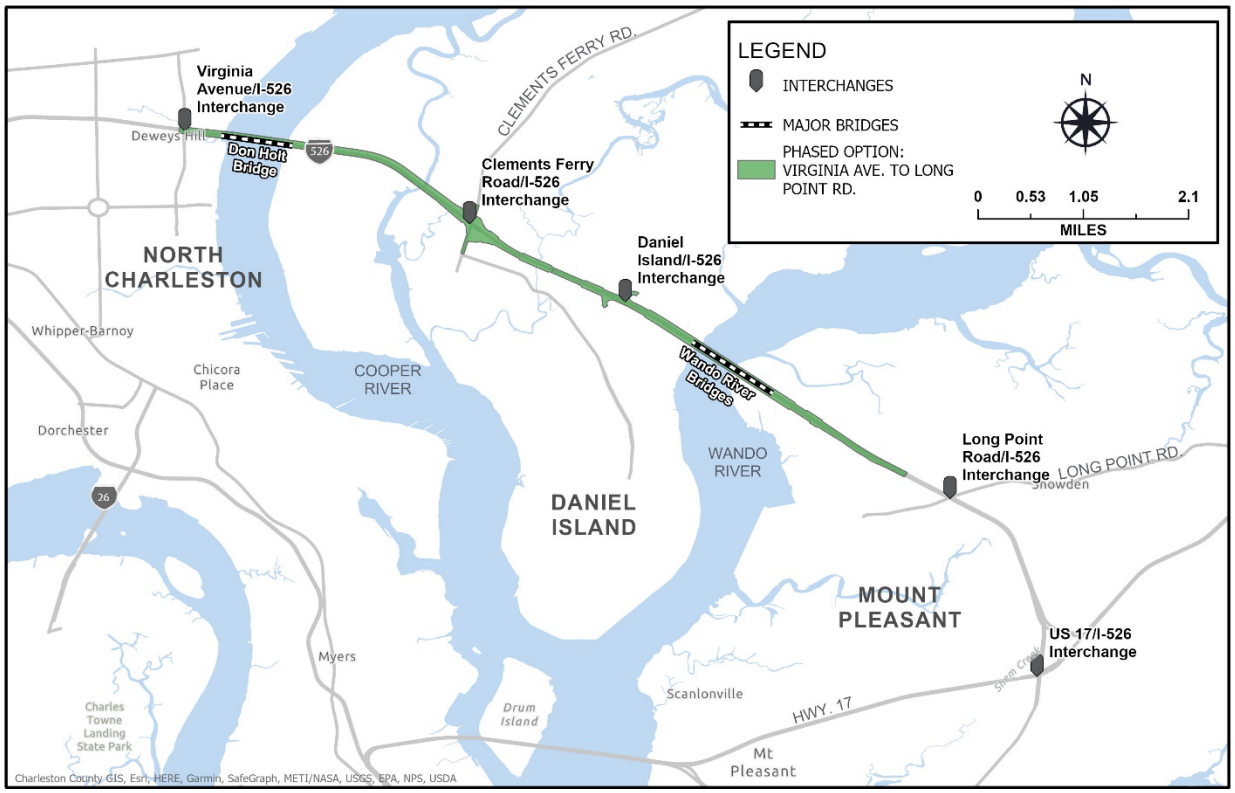


Table 10-3: Phased Option – Virginia Avenue to Long Point Road

Phased Option – Virginia Avenue to Long Point Road	
Project Termini	The proposed project termini are from Virginia Avenue to Long Point Road. Coordination with SCDOT and FHWA will be required prior to NEPA initiation
Estimated Programming Cost	$2 to $3.4 billion (dependent on selected preferred alternative)
Potential Impacts	**Aquatic Resources (acres)**: 157.5-194.3 **Relocations:** 62-78 **Parks (4f):** 2-3 (dependent on selected preferred alternative)
Project Duration	• NEPA Compliance – 12 to 24 months • Project Design/Construction – 5 years
Pros of Phasing	• High priority • Majority of congestion issues addressed cohesively
Cons of Phasing	• Funding availability

Phased Option – Virginia Avenue to Long Point Road	
Potential Funding Sources	Federal Funding Programs • Bridge Investment Program • Nationally Significant Freight and Highway Projects • Congestion Relief Program • National Infrastructure Project Assistance • Local and Regional Project Assistance • PROTECT Discretionary Program • Bridge Formula Program • National Highway Performance Program • Surface Transportation Block Grant Program • National Highway Freight Program • PROTECT Formula Program South Carolina Funding Programs • State Highway Fund • Infrastructure Maintenance Trust Fund • South Carolina Transportation Infrastructure Bank
Next Steps	• Identify funding • Initiate NEPA documentation

11.0 What Are the Programming Options for These Corridor Improvements?

At this time, funding for the proposed improvements to the I-526 LCC EAST corridor has not been identified. Because of the anticipated high costs associated with the reconstruction or replacement of two major bridge structures along the corridor, the study identifies programming options as next steps in implementing the proposed improvements to the I-526 LCC EAST corridor. These programming options are intended as potential standalone projects that can be moved forward in the project development process to make implementation of the full corridor improvements more manageable. The programming options are summarized in **Table 11-1**. A more detailed discussion of each option follows.

Table 11-1: Programming Options Summary

Programming Option	Description	Estimated Cost[1]
Long Point Road and I-526 Interchange Improvements	Interchange improvements to address interchange deficiencies, while also incorporating additional ramps to the I-526 mainline that can provide additional access for traffic originating from the Wando Welch Terminal and neighborhoods along Long Point Road.	$165 million[2]
Phased Option: Long Point Road to U.S. 17	Widen the existing facility by one lane in each direction to the inside using the existing median and one lane to the outside for a total of eight lanes from Long Point Road to U.S. 17, approximately 2.8 miles.	$215 million[3]
Phased Option: Virginia Avenue to Long Point Road	Widen the existing facility by four lanes totaling eight lanes for approximately 8.3 miles from Virginia Avenue in North Charleston to mile marker 27 near Shoals Drive in Mount Pleasant just west of Long Point Road. This phase includes the reconstruction or replacement of the Don Holt and Wando Bridges.	$2–$3.4 billion[3]
Full Corridor: Virginia Avenue to U.S. 17	This option encompasses the entire I-526 LCC EAST corridor. It includes the widening of I-526 to eight lanes for approximately 10 miles from Virginia Avenue to U.S. 17 and the reconstruction or replacement of the Don Holt and Wando Bridges.	$2.3–3.7 billion[3]

Notes: [1] Cost estimates are in year 2021 dollars. 2% per year for inflation has been included based on forecasted availability of funds for each phase of work. [2] Assumes 2 years for inflation. [3] Number of years for inflation vary from 12 to 15 years by segment.

12.0 What Are the Funding Options for These Corridor Improvements?

Funding for the proposed improvements has not been identified and most likely will require a mix of federal and state sources to implement the full corridor improvements.

12.1 Federal Grant Programs

The Infrastructure Investment and Jobs Act also known as the Bipartisan Infrastructure Law (BIL) of 2021 is the multiyear surface transportation reauthorization and infrastructure bill that distributes federal aid for highway, transit, highway safety, motor carrier, research, hazardous materials, and rail programs of the USDOT. The BIL reauthorizes several surface transportation programs and establishes some new formula-based and competitive funding programs as well. **Table 12-1** lists the formula-based grant programs and **Table 12-2** lists the competitive grant programs that are potential sources for preparing a financing package for the I-526 LCC EAST project. Formula-based grants are allocated based on formulas set by Congress. Unlike federal competitive grant programs, state governments are not required to compete against each other to receive formula grant funds. Competitive grant programs, also known as discretionary grant programs, solicit applications and select projects based on program eligibility, evaluation criteria, and USDOT or program priorities.

Table 12-1: Summary of Federal Formula-Based Funding Programs

Program	Purpose	Amount (FY 2022 – FY 2026) [33]	Eligibility	Relevance
National Highway Performance Program (NHPP) [23 USC 119]	Construction, rehabilitation, or replacement projects on the National Highway System (NHS)	FHWA estimates $2.60 billion for SC. Federal share is 90% on interstates, 80% on other state projects [23 USC 120]	Formula grant to states.	As an Interstate the I-526 LCC EAST is part of the NHS and qualifies for NHPP funds.
Surface Transportation Block Grant Program (STBG) [23 USC 133]	Wide array of transportation projects, including construction of facilities, operational improvements, and planning programs	FHWA estimates $1.26 billion for SC. Federal share is 90% on interstates, 80% on other state projects [23 USC 120]	STBG has set asides (State Planning and Research, Transportation Alternatives Program, Off-System Bridges) and suballocation (between states and urbanized areas).	As a Federal-aid highway the I-526 LCC EAST Project qualifies for STBG funds.
Highway Safety Improvement Program (HSIP) [23 USC 148 BIL Sec. 11111]	Projects included in a state's Strategic Highway Safety Plan that improve safety	FHWA estimates $270.8 million for SC. Federal share of HSIP projects is 90%.	Apportioned to states with suballocation.	Elements of the project that align with SCDOT's SHSP may qualify for HSIP funds (e.g., TSMO strategies such as incident management and improvements that improve safety for people walking/biking in the vicinity of interchanges.
Congestion Mitigation and Air Quality Program (CMAQ) [23 USC 149 BIL Sec. 11115]	Projects that reduce congestion and/or improve air quality	FHWA estimates $74.3 million for SC. The federal share of CMAQ projects is 80%.	Apportioned to states with suballocation.	Elements of the project that reduce overall emissions could qualify. (e.g., park and ride lots, transit facilities, and TSMO strategies such as ramp metering, incident management systems, etc.)

[33] Funding estimates for South Carolina are from the AASHTO [publication] located here: https://policy.transportation.org/wp-content/uploads/sites/59/2021/11/IIJA-Highway-Apportionment-Estimates-August-2021.pdf

Program	Purpose	Amount (FY 2022 – FY 2026) [33]	Eligibility	Relevance
National Highway Freight Program [23 USC 167 BIL Sec. 11114]	Projects supporting efficient freight movement on the National Highway Freight Network (NHFN)	FHWA estimates $1.20.9 million for SC. Federal share 90% on interstates, 80% on other state projects [23 USC 120]	Apportioned to states. BIL increases the maximum number of highway miles that can be designated as critical rural and urban freight corridors.	The I-526 LCC EAST project is part of the NHFN and provides connectivity to the Port of Charleston, one of the top ten US ports based on both container volume and cargo value.
Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) *(NEW)* [BIL Sec. 11405]	Projects and plans that improve resiliency of transportation infrastructure	FHWA estimates $128.2 million for SC. Federal share is 80% but can be reduced if certain planning requirements are met.	Allocated to states. No more than 40% of PROTECT funds can be used for increasing capacity. Sec. 11405 also includes provisions for a competitive PROTECT program.	The I-526 LCC EAST project will facilitate future hurricane evacuations and provides a critical connection between areas accessible by limited number of bridges.
Bridge Formula Program *(NEW)* [BIL Division J Title VIII, HR 3684-992]	Bridge replacement, rehabilitation, and construction	Each state will receive not less than $45 million. Federal share is 90% on interstates, 80% on other state projects [23 USC 123] or 100% on off-system bridges owned by local governments.	Formula grant to states based on the condition of bridges in the state relative to the condition of bridges nationwide.	The Don Holt and Wando bridges are both eligible for the new Bridge Formula Program.

Table 12-2: Summary of Federal Competitive Funding Programs

Program	Purpose	Amount	Eligibility	Relevance
Nationally Significant Freight and Highway Projects (NSFHP) [23 USC 117. NSFHP, National Infrastructure Project Assistance (INFRA) Sec. 11110]	Highway and rail projects of regional and national economic significance	A large project in SC has a minimum total cost of $100 million. The threshold for a "large project" varies by state.	The program includes several set-asides: 15% for applications with the highest nonfederal share; 10% for multistate corridor organizations; 15% for small projects.	The I-526 LCC EAST project is part of the NHFN and provides connectivity to the Port of Charleston, one of the top ten US ports based on both container volume and cargo value.
Local and Regional Project Assistance Programs (Rebuilding American Infrastructure with Sustainability and Equity, Better Utilizing Investments to Leverage Development, Transportation Investment Generating Economic Recovery) [BIL Sec. 21202]	Highway or bridge projects, passenger or freight rail projects, port infrastructure projects, etc.	Minimum grant of $5 million in an urbanized area. Maximum grant is $25 million. Maximum federal share of 80% of eligible costs.	Awards will be divided in half between rural and urban projects.	The I-526 LCC EAST project is part of the NHFN and provides connectivity to the Port of Charleston, one of the top ten US ports based on both container volume and cargo value.
Advanced Transportation Technologies and Innovative Mobility Deployment [BIL Sec. 13006]	Technology projects that improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment	Federal share may not exceed 50%.	This is a modification of the Fixing America's Surface Transportation (FAST) Act program, Advanced Transportation and Congestion Management Technologies Deployment	Technology elements of the project would qualify for this source (e.g., traveler or freight information systems, accommodation of connected/autonomous vehicles, variable speed limits, ramp metering, etc.)
Active Transportation Infrastructure Investment Program *(NEW)* [BIL Sec. 11529]	Active transportation infrastructure projects	$500 million annually nationwide. Federal share is 80% unless the projects serves a disadvantaged community, in which case the federal share is 100%.	Eligible applicants include states, MPOs, local governments, special purpose districts, tribes, etc.	Elements of the project that benefit people walking/biking would qualify for this source. Examples include safety improvements where the project intersects with local roadways and the inclusion of a multiuse path offering greenway connectivity.

Program	Purpose	Amount	Eligibility	Relevance
Bridge Investment Program *(NEW)* [BIL Sec. 11118]	Bridge rehabilitation, replacement	Minimum grant amount for a large project (total cost over $100 million) is $50 million. Federal share is a maximum of 50%. There is no specified maximum dollar amount.	This program prioritizes certain projects within states that have applied for but have yet to receive grants, and requires the secretary of transportation, during the period of FYs 2022 through 2026, to award each state with at least one large project, or two projects not considered large.	The Don Holt and Wando bridges are both eligible for the new Bridge Formula Program.
Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) *(NEW)*	Projects and plans that improve resiliency of transportation infrastructure. There are suballocations for planning grants, resilience improvement grants, evacuation route grants, and at-risk coastal infrastructure grants.	$1.4 billion is available for competitive PROTECT grants nationwide over 5 years.	Eligible applicants include states, MPOs, local governments, special purpose districts, tribes, etc.	The I-526 LCC EAST project will facilitate future hurricane evacuations and foster resilience of the regional freight and commuting network. This corridor provides a critical connection between areas accessible by a limited number of bridges.
Congestion Relief Program *(NEW)* [BIL Sec. 11405]	Planning, design, implementation, and construction activities that reduce congestion by optimizing capacity or encourage mode shift.	Minimum grant of $10 million. Federal share is 80%.	Eligible applicants include states, MPOs, and local governments. USDOT will prioritize projects in urban areas with high levels of recurrent congestion.	TSMO elements of the project that optimize capacity or promote more shift (including transit facilities and park and ride lots) could be eligible for these funds. Guidance has not been released about eligibility for TSMO measures associated with capacity expansions.
National Infrastructure Project Assistance *(NEW)* [BIL Sec. 21201]	Highway or bridge projects, freight rail projects, railway-highway grade separation or elimination projects, intercity passenger rail projects, and certain public transportation projects.	Maximum grant is $25 million. Maximum federal share is 60% of total eligible cost.	Eligible applicants include states, MPOs, local governments, special purpose districts, tribes, etc. The project should generate national or regional economic, mobility, or safety benefits. Highway projects must be part of NMFN, NHFN, or NHS.	The I-526 LCC EAST project is part of the NHFN and provides connectivity to the Port of Charleston, one of the top ten US ports based on both container volume and cargo value. The Virginia Avenue interchange also provides interstate access to Joint Base Charleston.

12.2 SOUTH CAROLINA FUNDING SOURCES

The following South Carolina transportation funding programs are also potential funding sources for the I-526 LCC EAST project:

State Highway Fund (SHF) – SCDOT's major state funding program is the SHF. It functions similar to a general revenue account for the agency. The SHF is formally administered by the Secretary of Transportation and governed by the SCDOT Commission. The SHF funds maintenance and operations, construction, transit, debt service, payroll and other overhead expenses, and provides the local match for federal funding. There are annual statutory transfers from this fund to the South Carolina Transportation Infrastructure Bank and C-Fund (SC Code 57-11-20).

Infrastructure Maintenance Trust Fund – In 2017, the South Carolina General Assembly passed legislation to increase the State gas tax by 12 cents by phasing in the increase at 2 cents per year for 6 years. These funds are deposited into a new trust fund called the Infrastructure Maintenance Trust Fund. These new revenues, coupled with other federal and state funds, form the financial foundation of SCDOT's 10-year Plan and performance targets (SC Code 57-11-20).

SCDOT 10-year Plan – SCDOT prepared a 10-year plan in 2017 to program the anticipated funding from the State gas tax increase. The 10-year plan focuses on four areas of greatest need[34, 35]:

- Pavements/Resurfacing – $700 million toward improving poor pavement conditions on interstates and major routes connecting cities, town, and secondary roads
- Bridge Replacements – An average of $151 million annually to replace 465 bridges over the next ten years ($114.5 million on structurally deficient bridges and $36.5 million on load restricted bridges)
- Rural Road Safety Program – A new program using targeted data to identify and implement needed safety features on 1,000 miles of the state's rural roads
- Interstate Capacity Improvements – Initially focusing on improving 140 miles of existing interstates including I-26 from Exit 125 to Exit 169 (43 miles), I-95 from Georgia Line to Exit 33 (33 miles), I-26 from Exit 169 to Exit 187 (18 miles), I-85 from Georgia Line to Exit 19 (19 miles), and I-77 from Exit 65 to Exit 77 (12 miles)

South Carolina Transportation Infrastructure Bank (SCTIB) – The SCTIB has an independent board composed of members including the SCDOT Commission Chairman, two appointed by the Governor, two appointed by the Speaker of the House, and two appointed by the President Pro Tempore of the Senate. Any state or local agency/district can apply for a SCTIB loan to construct an eligible project.[36] Federal Guideshare funds allocated to MPOs cannot be used for debt service on SCTIB loans without prior approval from SCDOT and SCTIB. Eligible projects include major projects that provide a public benefit required by the South Carolina Transportation Infrastructure Bank Act (the Act), SC Code Sections 11-43-

[34] https://www.scfor.org/scdots-plan/
[35] https://www.scdot.org/projects/ten-year-plan.aspx
[36] South Carolina Code Section 11-43-130

110 et seq. are eligible for financial assistance from the Bank. [37] There are two requirements for eligibility:

- Major Projects – Construction of or improvements to highways, including bridges, with at least $25 million in cost are eligible for financial assistance. This cost includes preliminary engineering; traffic and revenue studies; environmental studies; ROW acquisition; legal and financial services associated with the development of projects; construction; construction management; facilities; and other costs necessary for the project. The cost must not include financial costs or interest on loans used for the project. While the total cost must be at least $25 million, the final assistance requested may be less than $25 million. Projects may not be combined to meet the minimum project cost of $25 million. No minimum cost has been established for transit facilities.

- Public Benefit – The proposed project must provide a public benefit in one or more of the following areas: enhancement of mobility and safety, promotion of economic development, or increase in the quality of life and general welfare of the public.

Local and Nontraditional Funding Sources – Over the past 2 decades, local governments have played an increasing role in funding transportation projects. Since 1996, SCDOT estimates local investment in federal aid projects to be about $1.2 billion. A large majority of that amount served as matching dollars for investment dollars from the SCTIB. The State's Transportation Infrastructure Task Force report stated that local investment in SCTIB projects averaged about $89 million annually.

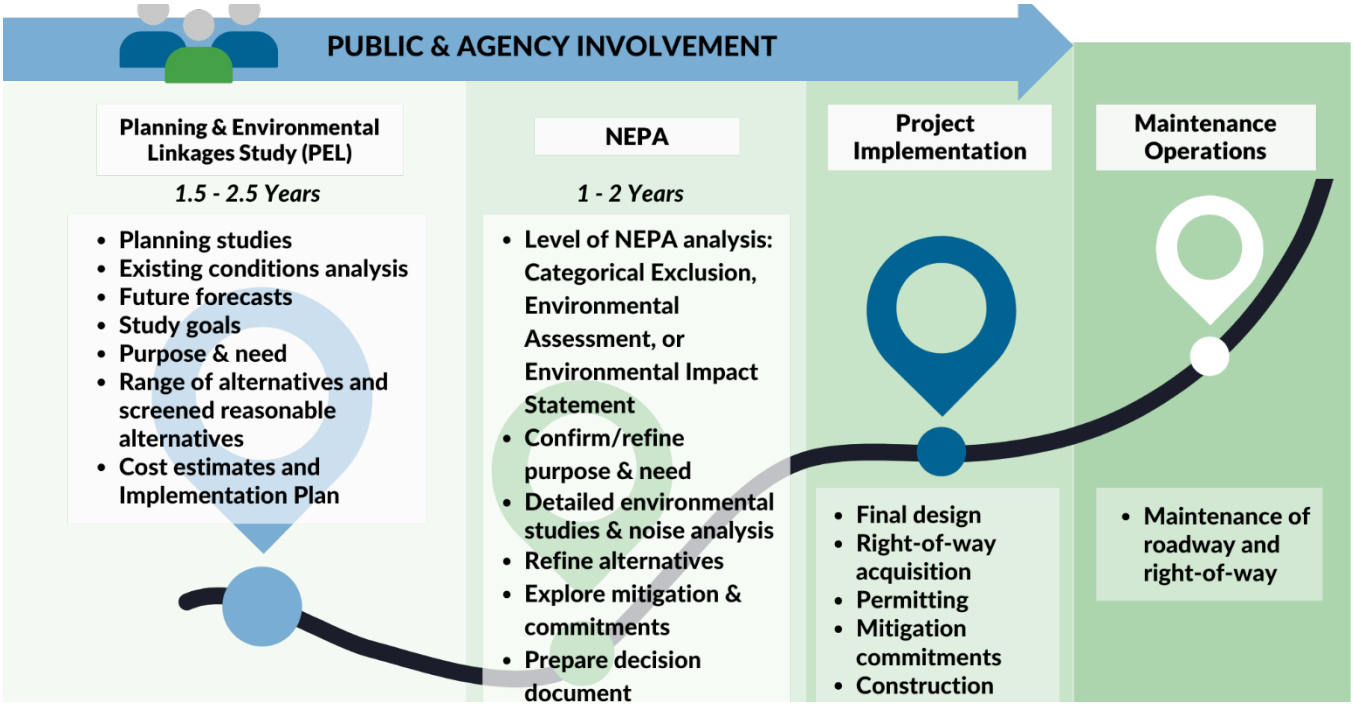
[37] South Carolina Transportation Infrastructure Bank ("Bank"), Financial Assistance Application Process

13.0 How Does This Corridor Widening Progress Into NEPA?

This PEL study is intended to streamline the implementation of recommended improvements by facilitating early consideration of environmental constraints and feedback from interested stakeholders. The following planning products developed during the PEL process may be directly incorporated in future NEPA stages:

- Environmental baseline condition information
- Purpose and need for future improvements
- Range of conceptual alternatives
- Screening outcomes and reasonable alternatives
- Avoidance, minimization, and mitigation options
- Documented public, stakeholder, and agency participation

Figure 13-1: Next Steps after the PEL



In addition, ten conditions identified in 23 U.S.C. 168(d) must be met to directly adopt the PEL planning products in future NEPA phases. **Table 13-1** lists the ten conditions and documents how each condition was met. The FHWA PEL Questionnaire provided in **Appendix I** also documents how the conditions were met.

Table 13-1: PEL Conditions Required to Adopt Planning Products into NEPA

PEL Conditions	Documentation
1. The planning product was developed through a planning process conducted pursuant to applicable federal law.	The I-526 LCC EAST PEL was consistent with planning processes outlined in federal law in that a detailed transportation plan was developed that included the analysis of impacts to mobility, study area communities, and the environment. This project initiative has been approved by the local MPO and the state and is included in the STIP. Details regarding the planning and impact analysis process are outlined in **Appendix D.**
2. The planning product was developed in consultation with appropriate federal and state resource agencies and Indian tribes.	The planning process for the I-526 LCC EAST PEL consulted with the following agencies: •FHWA •SCDHEC OCRM •USACE •SCDNR •USEPA •SCDAH •USFWS •SCDHEC •NOAA Fisheries Further details are provided above in **Section 7.2**.
3. The planning process included broad multidisciplinary consideration of systems-level or corridor-wide transportation needs and potential effects, including effects on the human and natural environment.	This PEL study examined corridor wide transportation improvements needs to reduce congestion as well as roadway deficiencies that included inadequate shoulder widths and insufficient acceleration/deceleration ramp lengths. The effects of the proposed transportation improvements are outlined in **Appendix D**.
4. The planning process included public notice that the planning products produced in the planning process may be adopted during a subsequent environmental review process in accordance with this section.	The public was notified during the July 15-August 15, 2020 virtual public meeting that the information and decision-making produced during the PEL study will be carried forward into the next phase of project development, the environmental review process. All project communication and coordination products shared with the public included an overview of the PEL process and described NEPA as the environmental review process that would follow the PEL. Details outlining the public information materials used for this study are outlined in **Appendix G**.
5. During the environmental review process, the relevant agency has: • Made the planning documents available for public review and comment by members of the general public and federal, state, local, and tribal governments that may have an interest in the proposed project • Provided notice of the intention of the relevant agency to adopt or incorporate by reference the planning product • Considered any resulting comments	In accordance with 23 USC 168(d)(5)(a), the public was asked to provide input on the draft Purpose and Need during the July 15-August 15, 2020 virtual PIM and again during the October 26 and 27, 2021 in-person PIMs. The PEL study and technical memorandums produced during the PEL process will be integrated into NEPA to reference the study's decision-making process. Project information contained in the PEL reports have been published on the project website and presented to the public and agencies at various meetings throughout the PEL process. A public comment period was initiated in the fall of 2021. The public had the opportunity to submit comments online and at two in-person public information meetings. One federally recognized tribal nation, the Catawba Nation, is active in the PEL study area. Coordination with the Catawba

PEL Conditions	Documentation
	Nation will include notification of and invitation to review the Final PEL study.
6. There is no significant new information or new circumstance that has a reasonable likelihood of affecting the continued validity or appropriateness of the planning product.	No additional information would be relevant for inclusion at this time.
7. The planning product has a rational basis and is based on reliable and reasonably current data and reasonable and scientifically acceptable methodologies.	This planning study relied on acceptable methodologies that utilized the most current data available for forecasting traffic volumes (Travel Demand Models), and environmental resource analysis (GIS analysis). Sections 7.0 and 8.0 in **Appendix I** provide additional detail.
8. The planning product is documented in sufficient detail to support the decision or the results of the analysis and to meet requirements for use of the information in the environmental review process.	To ensure adequate documentation of the decision-making process the project team developed tech memos listed in the **Appendices Section on Page V** of this document as support of the results and conclusions contained within the. PEL study document.
9. The planning product is appropriate for adoption or incorporation by reference and use in the environmental review process for the Project and is incorporated in accordance with, and is sufficient to meet the requirements of, the National Environmental Policy Act of 1969 (42 USC 4321 et seq.) and Section 1502.21 of Title 40, Code of Federal Regulations (as in effect on the date of enactment of the FAST Act).	The PEL process and decision-making documentation is also provided in the FHWA PEL Questionnaire in **Appendix I**.
10. The planning product was approved within the 5-year period ending on the date on which the information is adopted or incorporated by reference.	PEL anticipated to be approved in July 2022.