

4.15 Section 4(f) Resources

Resources evaluated for Section 4(f) considerations are defined in the section below. Resources are identified and described, along with any potential impacts which could occur as a result of the proposed project. Potential mitigation measures are also discussed.

4.15.1 What is Section 4(f)?

Section 4(f) of the US Department of Transportation Act (the DOT Act) provides protection for publicly owned parks, recreation areas, and wildlife and waterfowl refuges as well as significant historic sites. Historic sites protected by this regulation include sites that are eligible for listing or listed on the NRHP. The following paragraphs provide details on the public recreational facilities protected under the Act. There are no wildlife or waterfowl refuges located within the project study area. In addition, the Bethune School (described in Section 4.14.4) is eligible for NRHP listing and is a Section 4(f) resource.

4.15.2 What 4(f) Recreational Resources were Impacted within the Project Study Area?

The City of North Charleston maintains many recreational facilities throughout its jurisdiction. There are five City-maintained recreational resources located within the immediate vicinity of the project corridor. These facilities are detailed in the following paragraphs. There are no recreational facilities within the immediate vicinity of the project corridor in the West Ashley portion of the proposed project. In addition to the services and functions described below, each of the City’s recreational facilities serves as distribution locations for USDA Summer Food Service Program, which provides meals to children 18 years old and younger without charge. Refer to Figure 4.21.

4.15.2.1 Highland Terrace-Liberty Park Community Center

The Highland Terrace-Liberty Park Community Center is located at 2401 Richardson Drive, directly west of I-26 within the Highland Terrace neighborhood. Facilities include a basketball court, playground, and community center. The City of North Charleston hosts after school programs for up to 30 children and a summer camp for up to 30 children. Children often walk to and from this facility and their homes in the adjacent neighborhoods. The indoor community center is available to rent from 9:00am to 10:00pm, with a maximum capacity of 30 people. The City of North Charleston’s website notes that community members use this facility for meetings and events,



Photograph 3 Highland Terrace-Liberty Park Community Center

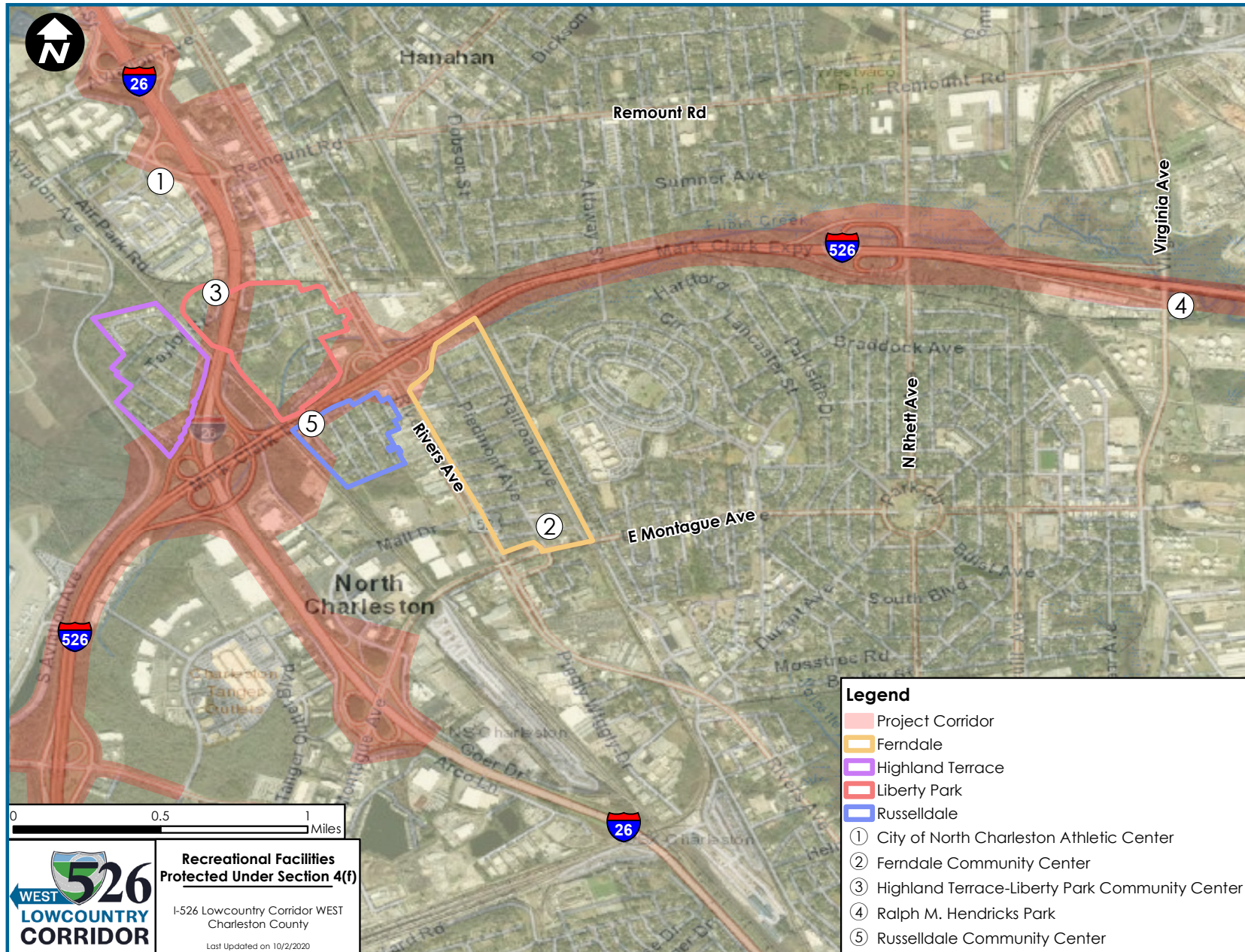


Figure 4.19 Recreational Facilities Protected under Section 4(f)

for example Neighborhood Council Meetings on the third Saturday of each month. It also serves as a Charleston County voting center.

Outdoor facilities are open to the public from dawn to dusk. According to the North Charleston Parks and Recreation Department Director, the facility's basketball courts are often utilized by community members on both weeknights and weekends, with approximately 150 people using the park per month.

4.15.2.2 Russelldale Community Center

The Russelldale Community Center is located at 2248 Russelldale Avenue, directly north of the Russelldale neighborhood. The Russelldale Community Center includes a basketball court, playground equipment, and a community center for the public. The facility was built on a 0.83-acre property adjacent to I-526 to mitigate impacts from the original construction of I-526. The outdoor facilities are open to the public from dawn to dusk, with approximately 150 people using them per month. The indoor event center is available to rent from 9:00am to 10:00pm, with a maximum capacity of 15 people per event. The City of North Charleston hosts a yearly after school program for up to 30 children and a summer camp for up to 30 children at the Russelldale Community Center.



Photograph 4 Russelldale Community Center

4.15.2.3 Ferndale Community Center

Located at 1919 Bolton Avenue at the south end of the Ferndale neighborhood, Ferndale Community Center facilities include a playground and an indoor basketball court that is frequently used as a meeting space for public events. The facility is located on 1.56 acres, is managed by the City of North Charleston, and is open to the public from 2:00pm to 5:00pm, Monday through Friday. This facility is used by basketball leagues for tournaments and games, and for other events such as a Bible study hosted by Seacoast Dream Center every Thursday from 6:30pm – 8:30pm. It also hosts The Ceramic House, which is a group that offers ceramic art classes. Past activities at the Ferndale Community Center have also included cultural or artistic events such as the Deninufay African Drum & Dance Kids Festival and the NCHS Arts Fest: Children's Visual Art Workshop.

The City of North Charleston also hosts an after school program at the community center for up to 30 children and a summer camp for up to 40 children.



Photograph 5 Ferndale Community Center

4.15.2.4 Ralph M. Hendricks Park

Ralph M. Hendricks Park is located at 5250 Virginia Avenue along the Cooper River. Facilities include a picnic shelter, restrooms, playground, walking path, dock, and a public boat launch. The picnic shelter is available for daily rental between 9:00am and 10:00pm. The park is open daily from dawn to dusk.



Photograph 6 Ralph M. Hendricks Park

4.15.2.5 North Charleston Athletic Center

Located at 5794 Casper Padgett Way in North Charleston, the City of North Charleston Athletic Center includes event space and three indoor gymnasiums to host a variety of sports such as basketball, volleyball, cheerleading, soccer, pickleball, wrestling, and many others. The facility opened on October 16, 2019 and is open Monday through Thursday from 9:00am to 9:00pm, Fridays and Saturdays from 9:00am to 5:00pm, and Sundays from 12:00pm to 5:00pm. The 51,000 square-foot facility is expected to be an economic driver for the city due to its ability to host larger sports tournaments. Its location and capacity will serve the low to moderate income North Charleston communities and its indoor setting provides a safe environment during the hot summer months.



Photograph 7 Visualization of North Charleston Athletic Center (open as of October 2019)

4.15.3 What 4(f) Historic Resources were impacted within the Project Study Area?

The proposed project would not require a use of historic resources protected by Section 4(f). The Bethune School is eligible for NRHP listing and is a Section 4(f) resource but would not be impacted by the proposed project. SHPO concurred on the findings of no adverse effect to historic resources on June 1, 2020.

4.15.4 What 4(f) Wildlife and Waterfowl Refuges were impacted within the Project Study Area?

The current project study area does not include any wildlife or waterfowl refuges.

4.15.5 How would the No-Build Alternative Impact Section 4(f) Resources?

The No-Build Alternative would not create any Section 4(f) impacts.

4.15.6 How would the Reasonable Alternatives Impact Section 4(f) Resources?

Section 4(f) of the Department of Transportation Act of 1966, codified in federal law as 49 U.S.C. 303, declares, “It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.” Section 4(f) also states, “The Secretary [of Transportation] may approve a transportation program or project... requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if:

1. there is no prudent and feasible alternative to using that land; and
2. the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

Section 4(f) further requires consultation with the Department of Interior and, as appropriate, the involved offices of the Department of Agriculture and Housing and Urban Development in developing transportation projects and programs which use lands protected by Section 4(f).

FHWA guidance on Section 4(f) outlines the evaluation process. As noted in Section 4.15, Section 4(f) requires consideration of publicly-owned recreational areas/refuges and historic sites that are listed, or eligible for inclusion, in the National Register of Historic Places (NRHP). Section 4(f) properties are identified early in the planning stages so that complete avoidance of the protected resources can be given full consideration in the project development process. After Section 4(f) properties are identified, project alternatives are developed and refined to avoid and minimize impacts. Under Section 4(f) evaluation guidance, state transportation agencies must consider alternatives that would avoid impacts to Section 4(f) resources. If impacts are unavoidable, it is then necessary to determine the alternative’s “use” of the Section 4(f) resource (i.e., permanent use, temporary occupancy, and constructive use). As discussed in Sections 4.10.11.1 and 4.10.11.2, the I-526 LCC WEST project would create a permanent use of Section 4(f) resources that exceeds documentation thresholds for minor impacts. As such, an individual Section 4(f) Evaluation, contained in Appendix Q, was developed to document the evaluation of the proposed use of Section 4(f) properties. The individual Section 4(f) evaluation must demonstrate that: that there is no feasible and prudent alternative that completely avoids the use of Section 4(f) property; and, that the project includes all possible planning to minimize harm to the Section 4(f) property.

Feasible and Prudent Avoidance Alternative Analysis – Federal regulations (23 CFR 774.17) state that a feasible and prudent avoidance alternative: avoids using Section 4(f) property and does not cause other severe problems “of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property.” In assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the resource to the preservation purpose of the statute. The following bullets summarize the alternatives evaluated and the basis for conclusion that they are not feasible or prudent avoidance alternatives.

- The No-Build Alternative would serve as a total avoidance alternative; however, it is not prudent or feasible due to traffic implications and localized air quality increase associated with congestion. These outcomes would not be compatible with the purpose and need of the proposed project and therefore the no-build alternative is not considered a prudent avoidance alternative. Further information about the no-build alternative can be found in Section 3.5.1 of the DEIS.
- SCDOT initiated an evaluation of alternate routes that satisfy the purpose and need of the I-526 LCC WEST project. The study evaluated the enhancement of existing roadway facilities along with the creation of new alignment corridors. Due to large scale impacts to development flanking existing roadways, improving alternate routes is not a prudent avoidance alternative. Evaluation of alternate corridors can be found in Section 3.5.2 of the DEIS.
- The development of additional, new routes is restricted by several regional landmarks and environmental features. Impacts to these landmarks and features are detrimental to the community as a whole; and any alternate route containing such impacts are deemed unreasonable for improving congestion along I-526. As such, there are no feasible and prudent avoidance new location alternatives. Additional details on new location alternatives can be found in Section 3.5.3 of the DEIS.
- Managed lanes may be feasible on I-526 if they extended westward on I-26 at least as far as the US 52 Connector near Ashley Phosphate Road. However, there are currently no programmed improvements to I-26 between I-526 and the US 52 Connector. Whereas managed lanes alone do not meet the project's purpose and need and therefore not considered a viable stand-alone alternative, the 12-foot shoulders included in the proposed project could accommodate future managed lane options on I-26 or potential bus-on-shoulder transfers between the two interstates. As such, managed lanes are not a prudent avoidance alternative. Additional details on managed lanes can be found in Section 3.5.4 of the DEIS.
- As a standalone alternative, TSM and TDM improvements do not adequately improve the corridor and meet the purpose and need to increase capacity and reduce congestion given the current and future level of service (LOS). TSM/TDM strategies alone do not meet the project's purpose and need and are not a prudent avoidance alternative. Additional details TSM/TDM strategies can be found in Section 3.5.5 of the DEIS.
- The use of retaining walls was evaluated as an avoidance measure that would allow a more symmetrical widening of I-26 near the Highland Terrace-Liberty Park Community Center and could be paired with any of the reasonable alternatives. A retaining wall paralleling I-26 was considered along Taylor Street, near the Highland Terrace-Liberty Park Community Center, at a length of 550 feet, average height of 26 feet, and total cost of approximately \$715,000.00. Construction of the retaining walls would avoid displacing the Highland Terrace-Liberty Park Community Center and four residences; however, there are several issues with this avoidance measure.

An alternative is considered not feasible if it cannot be built as a matter of sound engineering judgment.

An alternative is not prudent if:

- It compromises the project to a degree that is unreasonable to proceed with the project in light of its stated purpose and need;
- It results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes:
 - > Severe social, economic, or environmental impacts;
 - > Severe disruption to established communities;
 - > Severe disproportionate impacts to minority or low income populations; or
 - > Severe impacts to environmental resources protected under other Federal statutes;
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- It causes other unique problems or unusual factors; or
- It involves multiple factors listed above, that while individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Source: 23 CFR 774.17

The use of a retaining wall on I-26 would create a near-term solution by avoiding the relocation of a handful of homes and a community center but these properties would be exposed to new noise and visual effects and would still potentially be in jeopardy from future impacts, which contributes to the overall cumulative effects residents experienced from area transportation projects. This avoidance measure also has the potential to alter mitigation plans to construct a larger community center to offset impacts to both the Highland Terrace-Liberty Park Community Center and Russelldale Community Center and mitigate broader disproportionate, adverse effects on Environmental Justice populations as part of a Community Mitigation Plan. It has been noted by residents that the current building at the Highland Terrace-Liberty Park Community Center is very small and limits the types of activities and number of participants in the Center's current programs. Under these circumstances, preserving the Center provides limited benefit when compared to elements of the Environmental Justice Community Mitigation Plan, Appendix H. Adding retaining walls on I-26 as part of any reasonable alternative was determined not to be a prudent avoidance alternative due to the unique problems associated with its construction, primarily the contribution of additional cumulative effects on Environmental Justice populations in the form of additional encroachment and the creation of noise and visual impacts on homes that would not be displaced through the construction of the retaining wall. There are no similar options to evaluate retaining walls at the Russelldale Community Center.

- The total potential congestion reduction with mass transit strategies is estimated to be 7.4% with the implementation of short-term transit and freight improvements. Because mass transit does not meet the purpose and need as a standalone alternative, it is not carried forward as an alternative for the I-526 LCC WEST Corridor project and is not a prudent avoidance alternative. Additional details on mass transit can be found in Section 3.5.6 of the DEIS.

Alternatives that would improve the existing corridor could meet the purpose and need by increasing capacity and thereby reducing congestion. However, all four build alternatives in the International Boulevard to Rivers Avenue section of the project would impact the Highland Terrace-Liberty Park Community Center and the Russelldale Community Center and are not avoidance alternatives. Alternatives 1, 1A, 2, and 2A are described in Chapter 3.

Least Overall Harm Analysis – Because there is no feasible and prudent avoidance alternative and there are two or more alternatives that use Section 4(f) property, a least overall harm analysis was developed to maintain consistency with Section 4(f) requirements. Alternatives 1, 1A, 2, and 2A would impact the Section 4(f) resources at Highland Terrace-Liberty Park Community Center and Russelldale Community Center to the same extent. According to FHWA's Section 4(f) Policy Paper, "Pursuant to substantial case law, if the assessment of overall harm finds that two or more alternatives are substantially equal, FHWA can approve any of those alternatives." As such, the Recommended Preferred Alternative (Alternative 2) can be selected as the Least Overall Harm Alternative based on it having the same or less impacts than the other reasonable alternatives, a lower cost estimate than two of the four reasonable alternatives, while best meeting the project purpose and need. After mitigation measures are in place, the replacement facilities would reestablish the infrastructure, programs, and services that originally qualified the Highland Terrace-Liberty Park Community Center and Russelldale Community Center as Section 4(f) resources.

The following sections describe the impacted Section 4(f) resources and proposed measures to minimize and mitigate impacts.

4.15.6.1 Highland Terrace-Liberty Park Community Center

All Proposed Reasonable Alternatives have the same alignment in this portion of the project; therefore, impacts are identical for all Reasonable Alternatives. The proposed I-526 LCC WEST project would impact a portion of the Highland Terrace-Liberty Park Community Center and associated recreational facilities (approximately 0.27-acres out of 0.87 acres). Figure 4.20 shows that the Highland Terrace-Liberty Park Community Center falls within the proposed right-of-way for all Proposed Reasonable Alternatives.

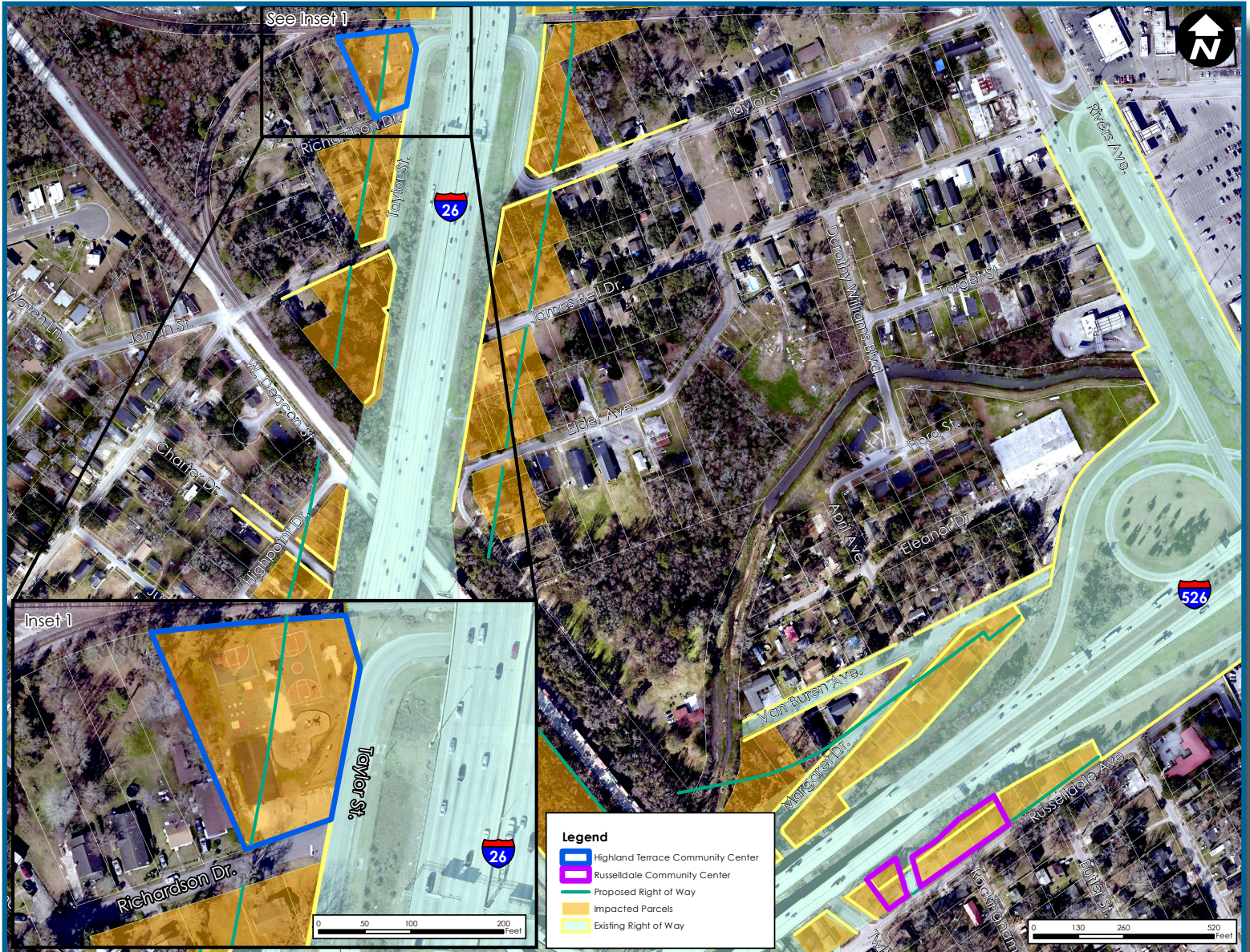


Figure 4.20 Proposed Right-of-Way at Highland Terrace-Liberty Park Community Center

The proposed I-526 LCC WEST project would impact a portion of the Highland Terrace-Liberty Park Community Center and associated recreational facilities (approximately 0.27-acres out of 0.87 total acres). Impacted facilities would include one community center, one outdoor basketball court, one half-size basketball court, one multi-use court, playground equipment on a mulch play area, one picnic shelter, multiple benches and picnic tables throughout the park, and a small parking lot. The displacement of the community center would impact local community cohesion because this facility is often used to host events or gather as a group by residents living in the Highland Terrace and Liberty Park neighborhoods. To address the impact to the park, SCDOT proposes to utilize the remaining land to replace some of the amenities and services displaced by the project. Based on input received from the CAC, a full and half-size basketball court, open air pavilion, playground, and additional parking are proposed at the Highland Terrace-Liberty Park Community Center. Per the request of the CAC and coordination with the City of Charleston, an enclosed building will not be constructed at the site. Refer to Section 4.15.7 and Appendix Q for additional details on proposed mitigation.

4.15.6.2 Russelldale Community Center

The proposed I-526 LCC WEST project would displace the entire Russelldale Community Center and its surrounding recreational facilities. Refer to Figure 4.21. The proposed impacts to the Russelldale facilities include the community center building, an outdoor basketball court, playground equipment on a mulch play area, a multiuse field, and multiple benches and picnic tables throughout the park. The displacement of the community center would impact local community cohesion because this facility is often used to host events or gather as a group by residents living in the Russelldale neighborhood. To address the displacement of the Russelldale Community Center, a new pocket park and a centrally located community center is proposed along Filbin Creek between Elder Avenue and Margaret Drive. The new community center will include, at a minimum, the same amenities as the Russelldale Community Center. Based on input received from residents and the CAC, amenities such as larger classroom and multi-purpose indoor space, improved vehicular circulation, additional parking, and greenway connections over Filbin Creek are proposed. Additionally, connectivity improvements such as new and improved sidewalks, traffic calming measures, and improved bus stops along Rivers Avenue are proposed to improve safety for pedestrians and bicyclists. Refer to Section 4.15.7 and Appendix Q for additional details on proposed mitigation.

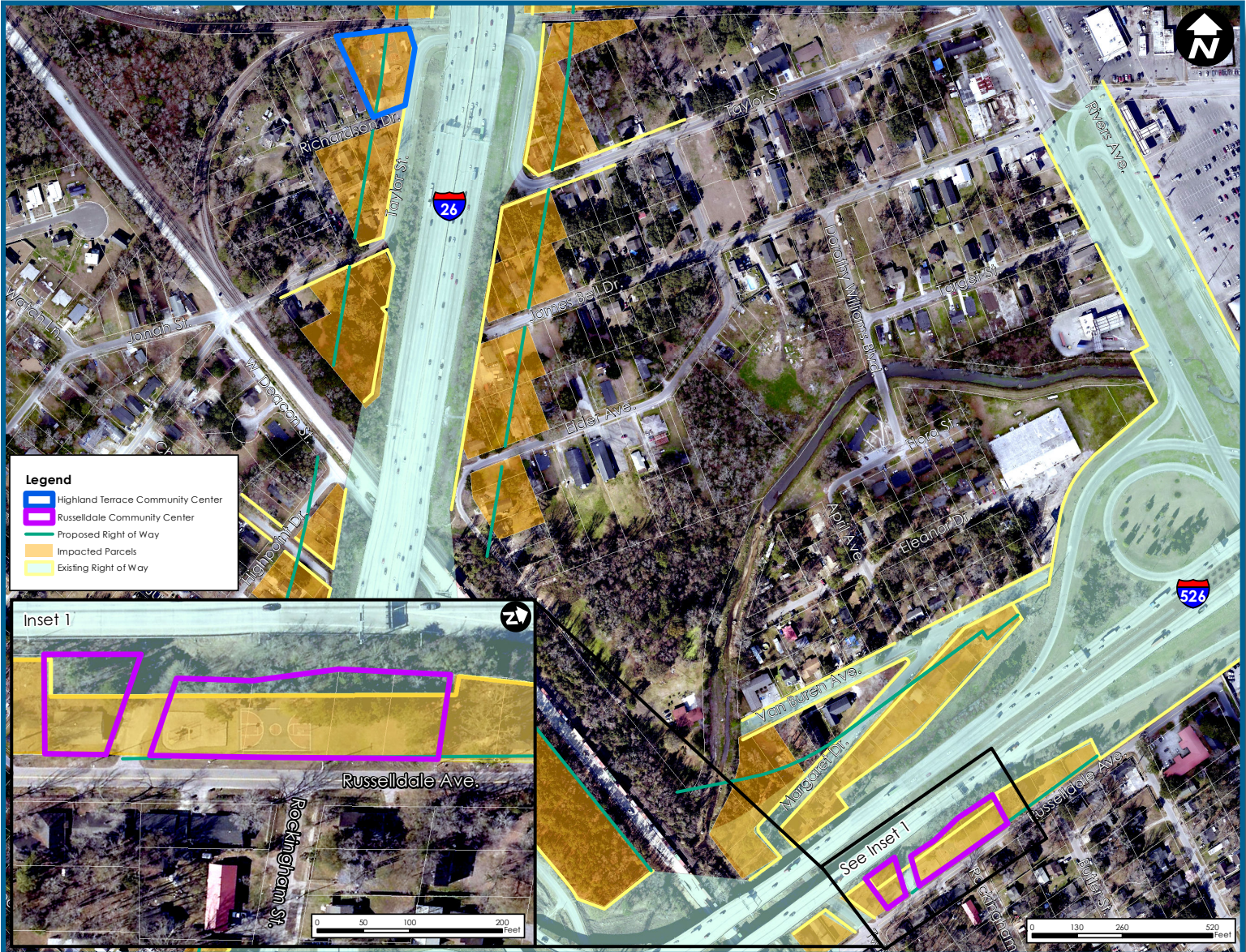


Figure 4.21 Proposed Right-of-Way at Russelldale Community Center

4.15.7 How would Unavoidable Impacts to Section 4(f) Properties be Minimized or Mitigated?

Measures to mitigate impacts to affected Section 4(f) resources include the in-kind replacement of impacted facilities as well as the construction of additional recreational amenities. Section 4(f) mitigation measures were developed through extensive coordination with the CAC, the public, and the City of North Charleston. SCDOT will acquire parcels located within the affected neighborhoods and provide funding to the City of North Charleston to construct one large, centrally located community center complex and two pocket parks. Prior to the FEIS/ROD, SCDOT will develop an inter-agency agreement with the City of North Charleston to implement the programs, services, structural components, and arrangements for long-term operation and maintenance of the replacement community centers and recreational facilities, and programs. The agreement will include language that gives residents priority in areas such as program enrollment/participation, reserving spaces, and volunteer opportunities. The City of North Charleston has also agreed to continue to look for qualified community center employee candidates that live in the impacted EJ neighborhoods. The City of North Charleston will post job openings within the neighborhoods and encourage the CAC and neighborhood councils to submit qualified applicants. Final details related to programs and amenities at the recreational facilities will be included in the FEIS/ROD. In addition, SCDOT will identify and construct infrastructure improvements necessary to facilitate the safe travel for residents between the replacement community centers and the surrounding communities. Additional Section 4(f) resource mitigation details are included in Appendix Q.

4.16 Section 6(f) Resources

This section provides a description of resources within the project study area that were evaluated for Section 6(f) considerations. Identified resources are described, along with potential impacts that could occur as a result of the proposed project. This section also discusses appropriate mitigation measures that would be implemented.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 (16 USC 460I-4) requires federal agencies to analyze potential impacts to lands acquired or developed with LWCF grants.

4.16.1 What 6(f) Resources were Identified within the Project Study Area?

The Highland Terrace-Liberty Park Community Center in North Charleston was partially funded through the LWCF Act, qualifying it as a Section 6(f) resource. Community center services and functions of the Highland Terrace-Liberty Park Community Center are detailed in Section 4.15.2.

4.16.2 How would the No-Build Alternative Impact Section 6(f) Resources?

The No-Build Alternative would not create any Section 6(f) impacts.

4.16.3 How would the Proposed Reasonable Alternatives Affect Section 6(f) Resources?

As discussed in Section 4.15.6.1, all Proposed Reasonable Alternatives for the I-526 LCC WEST project would displace the entire Highland Terrace-Liberty Park Community Center and its surrounding recreational facilities. Section 6(f) coordination included identifying a suitable replacement property for the Highland Terrace-Liberty Park Community Center and related amenities. The parcel at 5260 Deacon Street was selected, and environmental surveys were conducted to determine potential impacts on historic architectural resources, archaeological resources, and the natural environment at both the conversion property and the replacement property. Concurrence on effects determinations was received from US Fish and Wildlife Service and SC State Historic Preservation Offices, and is included in the Section 6(f) Environmental Assessment. Section 6(f) coordination with National Parks Service is ongoing, and the Section 6(f) conversion package is currently under review.

Section 6(f) prohibits the conversion of these properties to non-recreational use without replacement of land and facilities of equivalent value, usefulness, location, and approval of the National Park Service.

4.16.4 How would Impacts to Section 6(f) Resources be Avoided, Minimized and/or Mitigated?

LWCF regulations require the replacement of Section 6(f) facilities that are converted to other uses. As such, SCDOT is coordinating with the City of North Charleston, the project Community Advisory Council, and others to develop plans for a new community center and pocket park facilities that, in total, would replace the Section 6(f) facilities affected by the proposed project. The City of North Charleston currently owns the Highland Terrace-Liberty Park Community Center parcel and plans to acquire a property at 5260 Deacon Street in the Liberty Park neighborhood through conveyance by SCDOT. The partial land conversion at the current Highland Terrace-Liberty Park Community Center would allow for permanent right-of-way acquisition as a part of the I-526 LCC WEST transportation improvement project as well as the creation of a 0.60-acre pocket park on the remainder of the parcel. Approximately 4.90 acres of the newly acquired property on Deacon Street and the city-owned parcel to the north would be included within the Section 6(f) replacement boundary. Proposed amenities at this location include a full-size outdoor basketball court, rain garden, playground, multi-use field, fitness loop, among others. Refer to Appendix R for additional details on the Section 6(f) coordination, impacts, and proposed replacement facilities. Refer to the Draft Section 4(f) Evaluation in Appendix Q and the draft Section 6(f) Evaluation in Appendix R for detail, impacts, and proposed replacement facilities.

4.17 Hazardous Materials

This section provides a preliminary identification of known properties that could potentially contain hazardous waste sites or hazardous materials. The Proposed Reasonable Alternatives are analyzed on these properties or potentially hazardous sites, including evaluation of the presence of contaminated soils within the construction footprint of the alternatives, and if remediation or additional field analysis may be required. This section also evaluates the health and safety effects on construction workers or people who live near any identified hazardous waste sites impacted by the Proposed Reasonable Alternatives.

4.17.1 What are Hazardous Materials and Hazardous Waste Sites?

The Resource Conservation and Recovery Act of 1976 (RCRA), as amended; the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Amendments and Reauthorization Act of 1986 (SARA) largely regulate hazardous materials and waste sites. Hazardous waste sites are defined as having hazardous materials storage tanks, generating hazardous waste, or containing hazardous materials.

Hazardous materials are defined as any material that has or will have, alone or when combined with other materials, a harmful effect on humans or the natural environment. They may be characterized as reactive, toxic, infectious, flammable, explosive, corrosive, or radioactive (RCRA Subtitle C, 40 CFR 251).

4.17.2 What is the Affected Environment within the Project Study Area?

Commercial development in the project study area includes gas stations, auto repair businesses, restaurants, hotels, office buildings, shopping centers, and dry cleaners. Some strip mining (soil borrow pits) and phosphate mining occurred in the vicinity of the subject project in years past. These past mining activities typically don't represent an environmental concern, but sometimes resulted in creating wetland areas and unstable soil conditions.

4.17.3 What Methodology was used for Hazardous Materials and Hazardous Site Analysis?

A Phase I Environmental Site Assessment (ESA) was performed for the project study area to determine the presence of potentially hazardous materials or waste sites located within or in proximity to the project study area.

The ESA was conducted using the American Society for Testing and Materials (ASTM) E 1527-13, Standard Practice for Environmental Site Assessments: Phase I ESA Process. The following process was completed to determine properties with potential for or known to contain existing environmental contamination.

A review was conducted of reasonably ascertainable public records for the site and the immediate vicinity. This review was performed to characterize environmental features of the site and to identify past and present land use activities on or in the vicinity of the site, which may indicate a potential for recognized environmental conditions (RECs). The review of the reasonably ascertainable public records included:

- Examination of federal, state, tribal and reasonably ascertainable local public records for the site and immediate vicinity.
- Examination of one or more of the following standard sources: aerial photographs, fire insurance maps, tax files, building department records, zoning/land use records, street directories and topographic maps of the site and vicinity for evidence suggesting past uses that might have involved hazardous substances or petroleum products.

A site reconnaissance was performed to identify visual signs of past or existing contamination on or adjacent to the site. This reconnaissance was also performed to evaluate evidence found in the public record review that might indicate activities resulting in hazardous substances or petroleum products being used or deposited on the site. The site reconnaissance included the following activities:

- A reconnaissance of the site and adjacent properties was performed to look for evidence of current and past property uses, signs of spills, stressed vegetation, buried waste, underground or above ground storage tanks, subsidence, transformers, or unusual soil discoloration which may indicate the possible presence of contaminants on the properties. Photographs are provided to document these conditions.
- The exterior reconnaissance involved a viewing of the periphery of the property, and a walkthrough of accessible areas was performed of the site interior.

Interviews with appropriate local officials were conducted to consider any local knowledge of hazardous substances or petroleum products on the property or on adjacent properties.

4.17.4 What Hazardous Materials and Hazardous Waste Sites Exist in the Project Study Area?

Using the methodology above, 44 properties with potential environmental contamination concerns were identified in the project study area, refer to Table 4.24. For more details regarding these sites refer to the Phase I ESA in Appendix S.

4.17.5 How would the No-Build Alternative Impact Hazardous Materials?

The No-Build alternative would not impact sites with potential hazardous materials or contamination.

Table 4.24 Types of High-Risk Sites in the Hazardous Materials Project Study Area

Site Type	Number of Sites
Impacted Leaking Underground Storage Tank (LUST) / Underground Storage Tank (UST)	26
Solid Waste Processing	2
Dry Cleaners	2
Unknown	2
Brownfields	7
Toxic Chemical Use	1
RCRA Site	4
Total	44

4.17.6 How would the Reasonable Alternatives Impact Hazardous Materials?

All Proposed Reasonable Alternatives are located within the project study area. 35 of the 44 REC sites are located within this project study area. As discussed in Chapter 3, the Proposed Reasonable Alternatives were divided into three sections. These include the widening of the mainline to 8-lanes and the interchange alternatives. The number of REC sites impacted for each of the three sections are:

- Paul Cantrell to International Boulevard: 6
- International Boulevard to Rivers Avenue: 23
- Rivers Avenue to Virginia Avenue: 4

Table 4.25 shows the REC sites from the Phase I ESA which fall within the alignment for the Recommended Preferred Alternative. These seven REC sites were further evaluated using the construction limits of the Recommended Preferred Alternative and it was determined six sites will require additional investigation. For more details regarding these sites refer to the Phase I ESA and Project Study Area Figures in Appendix S.

Table 4.25 Recognized Environmental Condition (REC) Sites within the Recommended Preferred Alternative

Facility	Location	Database	Comments
Former Amoco	50 feet east 6001 Rivers Ave N Charleston, SC (cross-gradient)	RCRA NonGen/NLR, UST, LUST GWCI	Facility ID: 01426 Release #1: 12/16/89 CNFA: 6/6/05 Release #2: 2/19/02 NFA: 6/24/03 Eleven abandoned USTs. Groundwater flow direction: East
Westvaco Paper Mill (currently operating as Kapstone/ Westrock)	Adjoining to northeast 5600 Virginia Ave N Charleston, SC	SEMS-Archive, RCRA- TSD, Airs, Manifest, GWCI	Facility has had violations and incidents of soil and groundwater contamination. Site will require Phase II ESA.
Coburg Dairy / Borden Dairy	Within Site Boundary 5001 Lacross Road N Charleston, SC	FINDS, ECHO, RMP, TRIS	Facility uses toxic chemicals. No other information. Site will require Phase II ESA.
Former Classic Dry Cleaners	Within Site Boundary 2177 Ashley River Rd Charleston, SC	EDR Historical Cleaners (identified through street directory listings)	Dry-cleaning facility (closed 2017). Dry cleaner reportedly opted out of joining the SC Dry cleaning Restoration Fund.
Circle K 2720882	Adjacent to the east 5154 N Rhett Avenue N Charleston, SC (cross-gradient)	UST, LUST, GWCI, Financial Assurance	Facility ID: 01506. Three USTs removed in 2017. Release #1: 3/1/93 (active) Release #2: 9/18/06 (active)
Former Asbestos Manufacturer (Reybestos-Manhattan)	under portions of I-526 near the Virginia Avenue exit	None - However, it does represent an environmental concern if excavations are planned in this area.	Unpermitted landfill area, Previous assessments revealed the former manufacturer disposed of asbestos waste in the marsh and other areas near this location.
US Defense Fuel Support Pipeline	5862 N Rhett Avenue	None - However, it does represent an environmental concern if excavations are planned in this area.	Jet fuel storage facility delivers aircraft fuel to the Charleston Air Force Base via underground pipelines. The pipeline runs south in line with North Rhett Avenue, then west in line with Remount Road, crossing I-26 and continuing onto the Air Force Base property.

4.17.7 How would Hazardous Materials Impacts Be Mitigated?

When feasible, it is SCDOT's practice to avoid the acquisition of USTs as well as other hazardous material sites and avoidance or minimization is the primary mitigation for identified hazardous materials sites. Six of the seven REC sites will require additional investigation based on the construction limits of the Recommended Preferred Alternative.

Prior to construction, the project contractor will perform Phase II ESAs on the two properties identified in Table 4.23. Ultimately, the Phase II ESAs would include environmental sample collection (e.g. soil, soil gas, and groundwater), specifically, in areas where a potential for disturbance of soil and/or groundwater exists. For UST/LUST sites, the sampling strategy for the Phase II ESA will follow the field screening and sampling procedures, as directed in the SCDHEC Underground Storage Tank Programs Quality Assurance Program Plan (QAPP) to determine the presence of hydrocarbons. Samples should be analyzed for those parameters listed in the QAPP and those typical of a petroleum release, as noted in the research of the subject property. If relocation or removal of an AST or UST is necessary, the removal/relocation would be addressed in accordance with the applicable laws and regulation of the State of South Carolina.

During the construction phase of the project, the following measures and activities will be implemented by the construction contractors to ensure the safety of the workers, as well as the public and environment:

SCDOT will ensure that hazardous materials sites are avoided where practicable or sufficiently remediated so that the public would not be exposed to health risk. Contractors will follow SCDOT's Standard Specifications, which include provisions to protect the health and safety of persons in the proximity of construction and staging sites. Lead and asbestos testing would be conducted prior to demolition to ensure that these materials are handled appropriately.

Asbestos Containing Material and/or Lead Based Paint testing will be assessed separately. Materials containing asbestos and lead-based paints will be managed and disposed of properly at an appropriate permitted facility to minimize impact during the construction and cleanup. Activities will be monitored by a professional that is certified in the removal, handling and disposal of lead-based paint and/or asbestos-containing materials.

A spill prevention, control, and countermeasures (SPCC) plan will be prepared in accordance with 40 CFR 112, for the handling of oils or oil-based products during construction to prevent discharge of oil into navigable waters.

A hazardous waste management plan will be prepared for the handling of hazardous materials during construction, and an on-site health and safety plan will be developed for construction activities to protect human health (i.e. workers, residents, recreation and trespassers) and the environment within proximate to the site. The hazardous waste management plan will also state that the disposal of waste materials will be disposed of in approved landfills.

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated are encountered during construction, the South Carolina Department of Health and Environmental Control (SCDHEC) will be informed immediately. Hazardous materials will be tested and removed and/or treated in accordance with the United States Environmental Protection Agency and SCDHEC requirements, if necessary. SCDHEC Hazardous Waste Treatment, Storage, and Disposal compliance staff can be contacted at 803-898-0290.

4.18 Construction

Temporary impacts to the human and natural environments would occur during the construction of the proposed I-526 LCC WEST project. Temporary impacts would occur from disturbing the ground and operating construction equipment, but these are short-term and intermittent. Construction could affect both the human environment (traffic flow, businesses and noise environments) and the natural environment (wetlands and streams). Most impacts associated with construction are anticipated to be travel delays on the interstate and local streets.

The following section reviews expected construction impacts of the proposed I-526 LCC WEST project and the mitigation measures proposed for those impacts. The No-Build alternative does not include construction activities; therefore, it does not create construction-related impacts and is not included in this discussion. Furthermore, since the proposed Build Alternatives are comparable in terms of construction impacts, the following discussion represents a collection of all the Build Alternatives.

4.18.1 What types of Construction Activities would Occur on the Proposed Project?

4.18.1.1 Final Design

Final design occurs following the approval of the Recommended Preferred Alternative and Final Environmental Impact Statement/Record of Decision (FEIS/ROD). For the proposed I-526 LCC WEST project, SCDOT has not determined a project delivery system at this time. SCDOT uses either a project delivery system known as design-build (D/B) or a design-bid-build (D/B/B). Under the D/B system, a project is designed and constructed by a single entity, often referred to as the D/B contractor, under a single contract with a single point of responsibility. The D/B/B system allows the final design and construction to be completed by two separate entities.

4.18.1.2 Pre-Construction Activities

Pre-construction activities take place before construction begins. In addition to planning and environmental studies like this NEPA document, activities in this phase often include developing and executing construction contracts, community outreach, the acquiring of environmental permits or agency approvals, property acquisition, and utility relocation. If the Recommended Preferred Alternative is selected for the proposed I-526 LCC WEST project, these pre-construction activities would begin shortly following the FEIS and the signing of the ROD.

4.18.1.3 Construction Activities

Construction activities begin once the pre-construction activities have completed and would include construction of additional lanes on I-526, interchange improvements, collector-distributor (C-D) roadway improvements as well as supplementary improvements such as installing new traffic signals, lighting, or drainage basins. To widen I-526 and to improve the associated intersections and feeder roads, heavy equipment would be utilized to clear vegetation, shape earthen side slopes, and fill areas. Motor graders, compactors, dump trucks, excavators, bulldozers, backhoes, cranes, and impact hammers are all common types of equipment that would be utilized. To construct the widened bridges over the Ashley River, new structures would be built to the south and to the

center of the existing bridges. Temporary work trestles are proposed for use in wetland marsh areas near the Ashley River. Barges are proposed for use in the channel of the Ashley River.

4.18.1.4 Post-Construction Activities

A period of post-construction activities follows the completion of the construction phase. This phase includes activities such as removal of construction signage and barriers, removal of construction equipment, removal of silt fencing or other stormwater control measures, and clean-up of construction debris.

4.18.2 What Other Activities Related to Construction will Occur?

4.18.2.1 Construction Easements

To construct the Recommended Preferred Alternative, construction easements may be required for certain properties. These properties are not included in the right-of-way analysis and the properties would be fully returned to the owner when the use of the property is no longer required, typically when construction is complete. These properties may experience temporary impacts, but long-term impacts are not anticipated.

These easements would be required for properties outside the proposed right-of-way (ROW) limits of the Recommended Preferred Alternative but either would need modified access to fit the proposed design or would be impacted by the embankment required during construction.

4.18.2.2 Construction Phasing

FHWA will document the decision of selecting one of the Reasonable Alternatives for the project in a ROD. Due to the size of the I-526 LCC WEST project, it can be anticipated that the project will be implemented through a series of at least 4 separate contracts for individual sections of the project.

4.18.2.3 Public Notification During Construction

A public information strategy will be implemented by the Contractor to outline measures to notify the public of periods when construction is scheduled to take place, potential impacts to traffic operations, planned construction work hours, and alternate routes where applicable. To reduce peak hour impacts, night and weekend work could be scheduled. Motorists would also be notified about construction activities and changes in traffic patterns, such as detours by utilizing construction signs throughout the corridor.

4.18.3 How would Construction Affect the Environment and How would it be Mitigated?

4.18.3.1 Transportation and Traffic

Temporary impacts associated with construction on the I-526 LCC WEST corridor could include traffic detours, lane shifts and temporary road closures throughout construction. Detours and road closures could temporarily result in longer commute times, an increase in fuel use and air pollutant emissions as well as a potential loss of revenue for some businesses due to temporary access changes to residential and commercial areas. Construction could also temporarily increase response times for emergency service vehicles. **SCDOT and the contractor would coordinate with emergency service providers such as police, fire protection, and ambulance services prior to the start of construction to ensure access for emergency vehicles would be maintained.**

Coordination with local municipalities to establish a community outreach program during construction will be necessary to communicate temporary closures or detours for pedestrians and bicyclists, what types of closures to expect (i.e., temporary, long-term), when to expect them, and who to contact, if needed.

A maintenance-of-traffic plan will be developed by the Contractor to outline measures to minimize construction impacts on transportation and traffic. To the extent possible, the plan would require access to existing residential and commercial areas be maintained and existing roads be kept open unless an alternate route can be provided.

4.18.3.2 Land Use, Communities, Businesses, and Utilities

Land Use and Easements

New right-of-way, permanent easements and temporary construction easements would be necessary for the construction of the proposed project. The temporary construction easements are typically needed to provide the necessary room for construction.

Communities

As previously discussed, nighttime and weekend construction work could be scheduled to reduce peak hour traffic impacts. Since nighttime construction may occur, lights used for nighttime construction could impact residents within proximity of the construction. Impacts from the use of these lights would be minimized by aiming construction lights directly at the work area and/or shielding the lights to reduce any disturbance to nearby residences. The presence of construction machinery, building materials, construction cranes, temporary construction fences, screens and traffic control devices could result in visual impacts, but these will be temporary in nature and removed when construction is complete.

Businesses

While SCDOT would require the construction contractor to maintain access to properties to the extent practicable, access could be temporarily limited due to temporary detours and driveways. During construction this could temporarily discourage customers from patronizing businesses in construction areas.

Utilities

Temporary disruption to utility service (electrical, water, sewer, telecommunication, natural gas) during construction is anticipated, particularly along frontage roads and at interchange locations. Any utility service interruptions would be communicated to the public prior to the disruption and would be temporary in nature. Many utility relocations would occur prior to the start of major construction activities to minimize service interruptions and schedule conflicts.

4.18.3.3 Air Quality

Potential air quality impacts would include increases in dust, particulates, and gaseous pollutant emissions from mobile and stationary construction equipment. Emissions would be generated during construction activities such as excavation, trucks delivering and hauling construction supplies and debris, and on-site construction equipment. Detoured vehicles and vehicles slowed by congestion caused by construction activities could result in increased mobile emissions. Air quality impacts would be minimized through construction control measures such as shutting off construction equipment when not in use, routing truck traffic away from residential communities where possible, repaving or replanting exposed areas following construction, and preventing idling of equipment for extended periods of time.

Increases in construction related pollutant emissions from the Recommended Preferred Alternative would be temporary in nature with exposure to construction dust lasting only the duration of construction.

4.18.3.4 Noise

Construction noise would be an inconvenience to nearby residential and commercial areas. Construction noise impacts may occur due to the proximity of noise-sensitive receptors to anticipated project construction activities. Noise sources during construction associated with this project are expected to be earth removal, hauling, grading, and paving. Relatively loud construction noise activities such as usage of pile-drivers and impact-hammers (jack hammer, hoe-ram) can create sporadic, temporary, and acute construction noise impacts to nearby noise-sensitive receptors. Temporary and localized construction noise impacts may occur because of these activities.

All reasonable efforts should be made to minimize exposure of noise sensitive land uses to construction noise. Low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications (e.g. work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of “tail gate banging”, ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication and rapport).

Consideration of potential construction noise impacts was assessed for all noise-sensitive land uses in the project corridor, and in areas outside the project corridor near anticipated project construction activities (e.g. construction haul routes). According to the I-526 LCC WEST Detailed Noise Analysis the efforts outlined below are recommended. Refer to Appendix K for more details on the noise analysis.

The Department should utilize the public involvement process to ensure the public is aware of the schedule of project activities that may create construction noise impacts.

Construction noise impacts associated with earth removal, grading, hauling, and paving activities should be thoroughly evaluated in conjunction with development of the construction plan.

Pile-driving and impact hammer activities should be performed during weekday hours and should not be performed during evening and nighttime hours, or any hours during weekends and/or holidays.

If meeting the project schedule requires that pile-driving and impact hammer activities must occur during evening, nighttime and / or weekend hours near residences within the project corridor, the Contractor shall notify SCDOT as soon as possible. In such instance(s), all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise impacts upon the affected property owners and / or residents.

4.18.3.5 Water Quality

Sediment from construction has the potential to enter receiving waters; however, any siltation from construction would be temporary. The contractor would avoid and minimize impacts resulting from surface runoff through the implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and S.C. Code of Regulations 72-400 and following SCDOT's 2015 Engineering Directive Memorandum (Number 23), regarding procedures to ensure compliance with S.C. Code of 72-400, Standards for Stormwater Management and Sediment Reduction. Exposed areas may be stabilized by following the Department's Supplemental Technical Specification for Seeding (SCDOT Designation SC-M-810 (11-08)).

The 404/401 permitting process would establish specific requirements for additional water quality protection measures if required by SCDHEC.

The contractor is responsible for development of a project specific stormwater pollution prevention plan (SWPPP) and for obtaining a Section 402 NPDES permit for the project before ground disturbing construction activities begin.

While the project does not propose to release sources of fecal coliform into adjacent streams, the contractor would be responsible for identifying and avoiding all point sources of fecal coliform during construction. Due to the existing water quality impairments and approved total maximum daily loads (TMDLs) for Charleston Harbor, Cooper, Ashley, and Wando Rivers. The contractor is responsible for development of a project specific stormwater pollution prevention plan (SWPPP) and for obtaining a Section 402 NPDES permit for the project before ground disturbing construction activities begin.

4.18.3.6 Water Resources

Under Section 402 of the Clean Water Act, a NPDES permit, stormwater pollution prevention plan, and permanent best management practices would be required. The project contractor will be responsible for obtaining this permit and developing these plans and practices. For construction in, over, or through state navigable water, a state Navigable Waters permit may be required from SCDHEC. The construction contractor will be responsible for obtaining this permit. Section 10 of the Rivers and Harbors Act requires a permit for any construction activities that may obstruct the navigability or modify the channel of a navigable WOUS. Approval of these activities are administrated by USACE during the Section 404 permitting process.

A USACE Section 404 Individual Permit (IP) and a SCDHEC Section 401 Water Quality Certification (WQC) would be required to permit unavoidable impacts to WOUS. Compensatory mitigation would be required for all impacts to WOUS.

Impacts to jurisdictional waters will be permitted under a Department of the Army Section 404 permit from the U.S. Army Corps of Engineers. Based on preliminary design, it is anticipated that the proposed project would be permitted under an Individual Army Corps of Engineers Permit (IP). SCDOT will provide the Army Corps with information regarding any proposed demolition activities during the Section 404 permitting process. The required mitigation for this project will be determined through consultation with the USACE and other resource agencies.

4.18.3.7 Natural Resources

As previously discussed, construction activities would likely result in erosion and sediment runoff which would be minimized through the implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and S.C. Code of Regulations 72-400. Disturbed areas with exposed soils would be stabilized as required by SCDOT's Supplemental Technical Specification for Seeding. If borrow areas are required for fill dirt a field review and assessment would occur to identify the presence of any jurisdictional features. Best management practices would be applied prior to any disturbance to avoid and/or minimize sediment runoff and erosion.

If threatened or endangered species are observed during construction, construction activities in that area would stop and the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) would be notified, as applicable.

Construction activities would occur within the disturbed footprint of the existing roadway and utility ROW to the maximum extent practicable. Natural habitat community impacts would be minimized to construct the project. USFWS would be consulted if additional species are listed as federally threatened endangered prior to the start of project construction. In order to comply with the MBTA, as discussed in Section 4.13.2.2, the construction contractor will notify the Resident Construction Engineer (RCE) at least four (4)

weeks prior to the construction, demolition, or maintenance of any artificial habitat structures including bridges and box culverts. Subsequently, the RCE will notify SCDOT Environmental Services Office (ESO) Compliance Division. The ESO Compliance Division will coordinate with the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) to conduct inspections for migratory birds. Any migratory birds' nests will be removed by USDA APHIS staff. If any migratory bird nests are observed after construction, demolition, or maintenance activities have begun, the contractor will cease work and immediately notify the RCE who will notify

the ESO Compliance Division. Deterrents may be implemented to prevent birds from nesting after construction has begun if approved by the RCE through coordination from the ESO Compliance Division.

4.18.3.8 Cultural Resources

The contractor and subcontractors must notify all construction employees to watch for the presence of any prehistoric or historic items, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations. If any such items are encountered during construction, the RCE would be notified immediately and all work in the vicinity shall cease until a SCDOT Archaeologist provides direction to continue. Archaeological investigations identified Anomaly 006-1 could be associated with an early ferry vessel or bridge structure. The site is of indeterminate eligibility and further investigations to determine the site's NRHP eligibility status are not necessary as avoidance is recommended. A project commitment has been made to avoid the site, including a 100-ft radius buffer surrounding the resource.

4.18.3.9 Section 4(f) Resources

There are no special considerations or coordination needs related to Section 4(f) resources currently identified for the construction phase of the proposed project. Mitigation for impacts to Section 4(f) resources is being implemented in the project development process with construction-related mitigation (i.e., construction of replacement recreational facilities) to occur separate from construction of the proposed I-526 WEST LCC project.

This discussion will be revisited prior to the finalization of the FEIS/ROD and modified as needed to reflect any new Section 4(f)-related information that would require special consideration during construction of the proposed project.

4.18.3.10 Section 6(f) Resources

There are no special considerations or coordination needs related to Section 6(f) resources during project construction.

4.18.3.11 Hazardous and Contaminated Materials

Properties containing hazardous materials were identified within the project limits. The Phase I Environmental Site Assessments (ESA) identified 44 REC sites in the project study area. Of these properties, only five are directly impacted by right-of-way acquisition or construction activities. Based on lack of proximity to the alternative footprints or lack of RECs, the other properties would not require additional investigation. Ultimately, the Phase II ESAs would include environmental sample collection (e.g. soil, soil gas, and groundwater), specifically, in areas where a potential for disturbance of soil and/or groundwater exists.

A hazardous waste management plan will be prepared as a guide for handling hazardous materials during construction, and an on-site health and safety plan will be developed for construction activities to protect human health (i.e. workers, residents and pedestrians) and the environment within the construction area. The hazardous waste management plan would require use of approved landfills for disposal of waste materials.

During the demolition of existing bridge structures, construction activities would likely encounter lead-based paint (LBP) and asbestos containing materials (ACM). Hazardous materials should be managed and disposed of at an appropriate permitted facility to minimize impacts during the cleanup process. The potential release of these materials during construction could affect the health and safety of the workers. **A professional certified in the removal, handling and disposal of LBP and/or ACM may monitor construction activities. Asbestos Containing Material and/or Lead Based Paint testing would be completed if deemed necessary on a site-specific basis. These tests would be done independently from the Phase II ESAs as it outside of ASTM guidelines.**

SCDHEC would be informed if contaminated soils are encountered during construction and measures will be employed to avoid, reduce, or otherwise mitigate environmental impacts associated with the proposed project. As the construction moves forward, any discovery of previously unknown contamination (groundwater or soil) would be evaluated and addressed in accordance with regulatory requirements prior to the continuation of construction activities at that site. Tanks and other hazardous materials will be tested and removed and/or treated in accordance with USEPA and SCDHEC requirements. Cost of necessary remedial actions will be considered during the right-of-way appraisal and acquisition process. **The contractor will prepare a spill prevention, control, and countermeasures (SPCC) plan in accordance with 40 CFR 112, for the handling of oils or oil-based products during construction to prevent discharge of oil into navigable waters.**

4.19 Energy

This section evaluates the existing energy use of the project corridor as well as the change in energy use from the proposed corridor improvements. Energy impacts for transportation actions are often evaluated in the form of vehicle fuel consumption, which varies with traffic characteristics. Traffic characteristics include the average vehicle speed, driver behavior, the geometric configuration of the highway, the vehicle mix, and climate and weather.

4.19.1 What are the Existing Energy Consumption Conditions in the Corridor?

In 2018, 28 percent of energy used in the US was attributed to transportation and petroleum products accounted for about 92 percent of the total U.S. transportation sector energy use. Biofuels, such as ethanol and biodiesel, contributed about five percent. Natural gas accounted for about three percent, most of which was used in natural gas pipeline compressors. Electricity provided less than one percent of total transportation sector energy use and nearly all of that in mass transit systems. As petroleum products account for nearly 92 percent of transportation energy, the analysis is focused on vehicles using the project corridor to characterize the existing conditions.

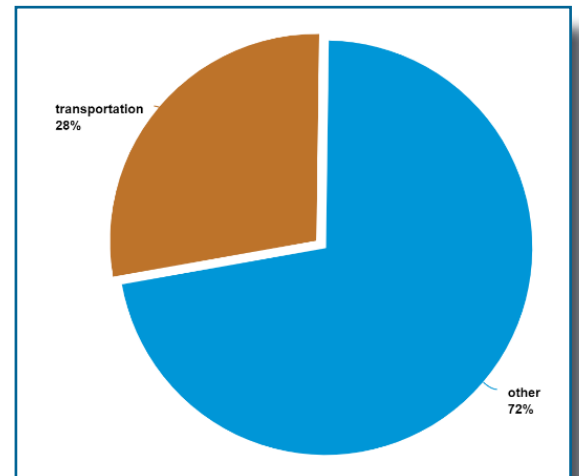


Figure 4.22 Monthly Energy Review, April 2019

The existing (2015) traffic models show that on average 73,670 vehicles use the project corridor each day and that the existing conditions result in congestion throughout much of the corridor. Based on analysis from fueleconomy.gov, traffic congestion results in direct reductions in fuel economy by limiting speeds to below optimum conditions as shown in the graphic below.

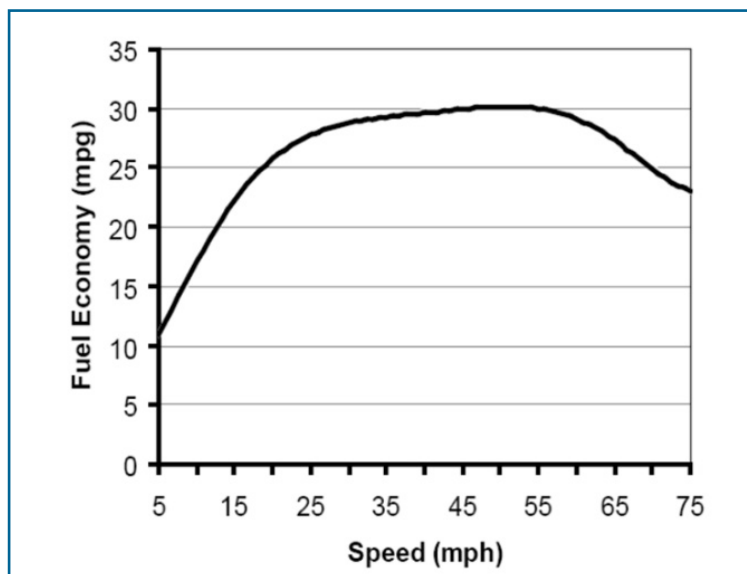


Figure 4.23 Correlation Between Fuel Economy and Speed

4.19.2 What are the Effects of the Reasonable Alternatives on Existing Energy Consumption Conditions in the Corridor?

A comparison of fuel consumption in the AM and PM peak hours of the day was completed for the 2015 Base Year Conditions, 2050 No-Build Condition, and the 2050 Recommended Preferred Alternative Build Condition. An assumption is used that fuel efficiency in 2050 would be improved from present averages. The difference in total number of vehicles coupled with the projected level of congestion between the two alternatives is representative of the energy impacts caused by the Recommended Preferred Alternative.

To estimate the fuel consumption within the I-526 LCC WEST corridor, two values were obtained from the VISSIM microsimulation model for each of these conditions: Total Vehicle Miles Traveled (VMT) and Total Stopped Delay.

Published values of predicted fuel consumption were used to determine the total consumption that applies to each of these two conditions. The total fuel consumed by vehicles in motion was estimated by the Total VMT divided by the predicted consumption rate in miles per gallon. A consumption rate for moving vehicles of 22 miles per gallon was used for the 2015 Base Year and 38 miles per gallon for the 2050 Design Year.⁴⁰ The total fuel consumed by stopped vehicles was estimated by the Total Stopped Delay (hours) multiplied by the predicted idling consumption rate in gallons per hour. The consumption rate of 0.3 gallons per hour was used for idling vehicles in both the base and future years.⁴¹

These consumption rates were applied to the VMT and Total Stopped Delay from the VISSIM model to determine the total fuel usage for each peak hour of each condition. Tables 4.26 and 4.27 show the values obtained from the VISSIM models.

Table 4.26 VISSIM Output Metrics - AM & PM Peak Hours

Condition	Vehicle Miles Traveled		Total Stopped Delay (hr)	
	AM	PM	AM	PM
2015 Base Year	272,274	276,760	703.4	889.9
2050 No-Build	281,225	291,442	2,794.7	4,741.3
2050 Build Pref. Alt.	329,655	355,881	1,944.3	3,504.1

Table 4.27 Fuel Consumption Comparison - AM & PM Peak Hours

Condition	In-Motion Fuel Consumption		Idling Fuel Consumption		Total Peak Hour Fuel Consumption	
	AM	PM	AM	PM	AM	PM
2015 Base Year	12,376	12,580	211	367	12,587	12,847
2050 No-Build	7,401	7,670	838	1,422	8,239	9,092
2050 Build Pref. Alt.	8,675	9,365	583	1,051	9,258	10,417

40 "Annual Energy Outlook 2020 with Projections to 2050," U.S. Energy Information Administration, January 2020. <https://www.eia.gov/aeo>

41 "Fact #861 February 23, 2015 Idle Fuel Consumption for Selected Gasoline and Diesel Vehicles," Office of Energy Efficiency & Renewable Energy, February 2015, <https://www.energy.gov/eere/vehicles/fact-861-february-23-2015-idle-fuel-consumption-selected-gasoline-and-diesel-vehicles>

4.19.2.1 No-Build Alternative

With the No-Build alternative, the proposed I-526 LCC WEST project would not be constructed. In the 2050 No-Build scenario, the VMT increased by approximately 3 percent and 5 percent in the AM and PM peak hours, respectively over the 2015 Base Year scenario. The Total Stopped Delay also significantly increased, with increases of approximately 300 percent in the AM peak and 430 percent in the PM peak. The 34 percent reduction in fuel consumption in the AM peak, and 29 percent decrease in the PM peak are based solely on the anticipated 73 percent increase in vehicle fuel efficiency by the year 2050. The No-Build Alternative increases the vehicle energy consumption over existing conditions based on the reduction of free flow traffic conditions and the increase in stop and go driving.

4.19.2.2 Reasonable Alternatives

The 2050 Build Recommended Preferred Alternative produced a total VMT that was approximately 17 percent greater in the AM peak hour and 22 percent greater in the PM peak hour, than the 2050 No-Build condition. The Total Stopped Delay for the Build Recommended Preferred Alternative was approximately 30 percent lower in the AM peak and 26 percent lower in the PM peak, than the 2050 No-Build condition.

The total fuel usage in the 2050 Build Recommended Preferred Alternative increased by approximately 12 percent in the AM peak and 15 percent in the PM peak, compared to the 2050 No-Build scenario. The greater increase in VMT compared to Total Stopped Delay, 17 percent versus 12 percent in the AM peak hour and 22 percent versus 15 percent in the PM peak hour, indicates that vehicles are able to move through the network much more efficiently in the Build Recommended Preferred Alternative than in the No-Build. This was validated by calculating the net mileage using the total peak hour fuel consumption divided by the total VMT for each peak hour. For the 2050 No-Build condition, the net vehicle mileage was 34.1 mpg and 32.1 mpg in the AM and PM peak hours, respectively. In the 2050 Build Recommended Preferred Alternative, the net vehicle mileage was determined to be 35.6 mpg and 34.2 mpg in the AM and PM peak hours, respectively.

Energy resources such as fuel and electricity would be consumed to produce materials used for project construction and would also be consumed during the construction of the project itself; however, the quantity of this energy resource consumption is unknown.

4.19.3 What Mitigation Measures would be Taken for Energy Consumption?

The proposed project is anticipated to increase capacity and reduce congestion which are both shown to limit energy use in vehicles. Although no mitigation measures are proposed, multiple travel demand alternatives have been implemented in the region. Refer to Chapter 3 for more information.

4.20 Short-Term Uses versus Long-Term Productivity

The short-term use of the environment's resources relates to changing the natural productivity of the land, which is viewed as a renewable resource. The long-term, natural productivity of the I-526 LCC WEST project study area comes from mostly developed land within the right-of-way of the I-526 LCC WEST Reasonable Alternatives along with the area's wildlife productivity, vegetation habitat, and wetlands. Instead of being used for its natural productivity, the land within the right-of-way would be used for the I-526 LCC WEST Reasonable Alternatives. The proposed project is based on state and local transportation planning documents. These planning documents considered the need for present and future traffic capacity consistent with present and future land-use planning. These planning documents are discussed in Section 4.1.4 (Land Use). The I-526 LCC WEST project provides several lasting efficiency improvements for the local area including more efficient transportation facilities.

This use of the environment is consistent with local land-use and transportation plans which demonstrate the need for the I-526 LCC WEST improvements.

4.21 Irreversible and Irretrievable Commitment of Resources

Land used for constructing the I-526 LCC WEST corridor improvement alternatives is an irreversible commitment of natural, physical, human and fiscal resources during the time the land is used for the project. If the transportation system is no longer needed or a more critical need for the land materializes, the land could be adapted to another use. At this time, a conversion is not anticipated to be necessary or desirable.

The use of construction materials such as fossil fuels and construction materials are not projected to have an adverse effect on the continued availability of these resources. The availability of skilled laborers may be a challenge for the contractors as there are multiple projects under construction in the region. A lack of available labor and multiple projects needing the same construction materials may put a short-term stress on these resources.

The commitment of irretrievable financial resources is based on the premise that residents in the area, the region, and the state benefits from the improved quality of the transportation facility. While construction of the I-526 LCC WEST corridor improvements requires a sizeable expenditure, the benefits consist of improved mobility and savings in travel time, both of which are anticipated to outweigh the commitment of these resources.

The proposed I-526 LCC WEST project does not completely avoid impacts to wetlands and waters. Impacts have been minimized and would be mitigated through restoration, enhancement or preservation of wetlands, streams, and other aquatic resources.

4.22 Permits

Federal and State permits are required for construction activities for the I-526 LCC WEST reasonable alternatives. The agencies issuing these permits are either cooperating or participating agencies and have been involved during the project development process. Information related to each type of permit is listed below.

4.22.1 Section 404 of the Clean Water Act

A Department of the Army permit is required for impacts to WOUS, pursuant to Section 404 of the CWA. Section 404 is administered by the USACE with a consistency determination from SCDHEC-OCRM. Section 404 regulates the discharge of dredged or fill material into WOUS. Depending on the type and extent of impacts, permitting requirements range from activities considered exempt or preauthorized to those requiring pre-construction notification for a Nationwide Permit or an Individual Permit from the USACE. **Impacts to jurisdictional waters will be permitted under a Department of the Army Section 404 permit from the U.S. Army Corps of Engineers. Based on preliminary design, it is anticipated that the proposed project would be permitted under an Individual Army Corps of Engineers Permit (IP). SCDOT will provide the Army Corps with information regarding any proposed demolition activities during the Section 404 permitting process. The required mitigation for this project will be determined through consultation with the USACE and other resource agencies.**

4.22.2 Section 401 of the Clean Water Act

Section 401 of the CWA requires any request for a federal permit involving activities which impact WOUS (Section 404 permit) to also acquire a Water Quality Certification. This certification involves a review of the proposed project and analysis of its potential effects on water quality. In South Carolina, SCDHEC has direct responsibility for granting, denying, or waiving Section 401 Water Quality Certifications. SCDHEC has permitting authority over critical areas and a permit must be received before any alterations occur.

Critical area is defined as coastal waters, tidelands, beaches, and dune/beach system.

SCDHEC-OCRM is required to review all state and federal permit applications for activities within the eight-county coastal zone for consistency with the State’s Coastal Zone Management Plan (SCCZMP) and grant a Coastal Zone Consistency (CZC) Certification. A CZC Certification ensures the activity protects the quality of the coastal environment and promotes the economic and social improvement of the coastal zone.

Since the Reasonable Alternatives require a Section 404 Individual permit, a Section 401 Water Quality Certification is also required. A Section 401 Water Quality Certification is required before the USACE will act on the Section 404 Permit.

4.22.3 Section 402 of the Clean Water Act

The USEPA is authorized by Section 402 of the CWA to regulate point sources which discharge pollutants, including surface runoff, into WOUS through the NPDES permit program. In South Carolina, the USEPA authority is delegated to SCDHEC. A Stormwater Pollution Prevention Plan must also be developed for the project to identify potential sources of stormwater pollution and describe measures to reduce or eliminate pollutants. The NPDES permit requires that measures be implemented to control stormwater runoff prior to discharging into receiving waters. Projects disturbing more than one acre of land require a NPDES permit, also referred to as a Land Disturbance Permit. Projects which disturb greater than five acres of land necessitate the development and approval of permanent best management practices, along with a signed maintenance agreement for continued water quality protection.

Given that the Reasonable Alternatives disturb greater than five acres of land, a NPDES Permit, stormwater pollution prevention plan, and permanent best management practices are required.

4.22.4 Critical Area Permitting

The Federal Coastal Zone Management Act of 1972 requires that activities in the coastal zone comply with approved state coastal management guidelines. The South Carolina Coastal Zone Management Act (1977, as amended 1993 by Act 181) gives authority to SCDHEC-OCRM to promote the economic and social welfare of the citizens of South Carolina while protecting the sensitive and fragile areas in the coastal counties and promoting sound development of coastal resources. A permit would be required from SCDHEC-OCRM for activities within the critical area and the coastal zone and the project would be classified by SCDHEC-OCRM as a Major Activity.

4.22.5 Construction in State Navigable Waters

A permit for Construction in State Navigable Waters is required from SCDHEC for bridge construction over state navigable waters, such as the Ashley River. State navigable waters are defined in South Carolina as “waters which are navigable, have been navigable, or can be made navigable by removal of incidental obstructions by rafts of lumber or timber by small pleasure or sport fishing boats.”

4.22.6 Section 9 of the Rivers and Harbors Act

Section 9 of the Rivers and Harbors Act requires approval from the U.S. Coast Guard (USCG) for any construction of a dam, dike, bridge, or causeway across navigable WOUS. Navigable WOUS are not always the same as state navigable waters. Navigable WOUS are those waters presently used, used in the past, or susceptible to use to transport interstate or foreign commerce.

The Reasonable Alternatives involve construction in the Ashley River; therefore, Section 9 and 10 Permits will be required.

FHWA initially determines if a USCG permit is required for projects impacting navigable waters. The Reasonable Alternatives include the replacement of bridges over the Ashley River and FHWA concluded a USCG permit was necessary for the Ashley River Crossing. The USCG concurred with FHWA's determination; therefore, a USCG permit is necessary for the proposed project. See Chapter 5 for more detailed information.

4.22.7 Section 10 of the Rivers and Harbors Act

According to Section 10 of the Rivers and Harbors Act, a permit is required for any construction activities with the potential to obstruct the navigability or modify the channel of a navigable WOUS. The USACE manages the approval of these activities during the Section 404 permitting process.

4.23 Sustainability

The goal of sustainability is the fulfillment of basic social, environmental and economic needs in the present as well as the future. Sustainability includes the responsible use of natural resources to maintain and/or improve the welfare of the environment to meet the needs of current generations, while not compromising the capacity to meet the needs of future generations.

4.23.1 What is a Sustainable Highway?

A sustainable approach looks at access and (in addition to mobility), movement of people and goods (in addition to vehicles), and provisions for safe and comfortable routes for alternate transportation sources such as walking, bicycling, and transit. FHWA views sustainable highways as an integral part of sustainable development. The sustainability characteristics of a roadway project should be evaluated and considered for its full lifecycle which includes conception through construction, operations, and maintenance.

Transportation agencies address sustainability during the NEPA process. Measures of project success include a wide range of indicators, such as travel performance, gains achieved through material selection, and construction methods.

4.23.2 Key Sustainability Considerations for the Project

The key sustainability considerations for the project are discussed in the following sections.

4.23.2.1 Communities and Public Outreach

Public and Agency Involvement

Public and agency involvement have played an important role for the I-526 LCC WEST project and the project team continues to be committed to encourage and lobby public and agency participation while documenting feedback. Chapter 6 of the DEIS provides a detailed discussion of public involvement communication tools and stakeholder involvement throughout the process. In order to meet the project's sustainability goals comprehensive public involvement continues to be a critical component.

Community Mobility

Community mobility is assessed by improvements to access, commute time reductions, and navigation to existing facilities and transportation. SCDOT is evaluating how to design and construct the I-526 LCC WEST project to increase capacity and improve operations. Through this process, SCDOT is measuring community mobility by evaluating projected traffic volumes as well as flows, preferred methods of access, and effects of design alternatives on mobility.

The public, agencies and stakeholders have been engaged in this process through public involvement efforts in order to optimize design choices and ensure access and mobility requirements are incorporated into the project.

Impact Assessment

Various technical studies were done to assess impacts the proposed project may have on community resources including, but not limited to: a noise impact analysis, natural resource studies, cultural resource surveys, hazardous materials assessment, and a community impact assessment. The impact assessment of these key components is critical in assessing the sustainability of the proposed project.

4.23.2.2 Natural World

Prime Habitats

High areas of ecological value are considered prime habitat and include, but are not limited to: Essential Fish Habitat (EFH), tidal waters, national parks, wildlife refuges, wild & scenic rivers and old-growth forests. Avoiding and minimizing impacts to these resources is a key component of the sustainability of a project. EFH as well as salt marsh and tidal waters are present in the proposed project area.

4.23.2.3 Resiliency

The I-526 LCC WEST project is being planned and designed for short- and long-term climate resiliency specific to its location and geography. According to the USEPA 2017 emissions records, carbon dioxide, methane, nitrous oxide and fluorinated gases are the main pollutants contributing to climate change with carbon dioxide accounting for 82 percent of U.S. greenhouse gas emissions.

One of the benefits of the proposed I-526 LCC WEST project is a potential reduction in emissions through improving mobility by increasing capacity and improving operations. This mobility improvement will result in a decrease in idling vehicles which result from existing congestion issues.

4.23.3 Documentation of Sustainability During Construction and Operation of the Project

4.23.3.1 Environmental Compliance

SCDOT's Compliance Division is tasked with confirming that environmental commitments are followed during the construction phase and that any post-construction monitoring commitments are met. The Compliance Division is comprised of the Compliance Division Manager, District Compliance Managers, and a QA/QC Manager.

During the design of the project, environmental permits may be obtained specifying additional construction requirements. The FEIS and ROD would define required mitigation for the I-526 LCC WEST project. A compliance team would provide support to SCDOT staff during construction of the project and assist in monitoring compliance with environmental requirements and NEPA commitments. **Preparing a complete environmental closeout packet at the end of every USACE permitted project is also a responsibility of the compliance team.**

The compliance team would compile environmental commitments, permit standard/special conditions, and maintain an environmental journal with the appropriate environmental compliance forms.

A detailed Environmental Compliance Plan would be developed and updated to include environmental commitments from the FEIS and ROD, environmental permits, and other environmental approvals. All coordination with state and federal agencies must be done through SCDOT’s Environmental Services Office.

Typical tasks in the Environmental Compliance Plan may include:

- Attend project pre-bid meeting and preconstruction/partnering meetings
- Participate as needed in regular contractor meetings
- Participate as needed with resource agencies
- Check construction site with environmental compliance forms; provide copies of all reports as required
- Review Weekly Sediment and Erosion Control Site Inspection Reports as needed
- Review permit plans, construction plans, construction contracts, and reconcile differences
- Monitor NEPA commitments
- Track compensatory mitigation
- Ensure project jurisdictional boundaries are clearly identified and marked
- Respond within 24 hours to any requests from SCDOT project authority regarding changing site conditions
- Evaluate debris pile areas, staging areas, borrow pits, and lay-down sites in environmentally sensitive locations
- Review construction access through jurisdictional crossings
- Act as the liaison for jurisdictional violations and develop resolution agreements as needed
- Coordinate major environmental concerns through the SCDOT Environmental Compliance Division Manager
- Complete deliverables (environmental compliance forms, environmental construction close-out packet)

4.23.3.3 Public Outreach during Construction

A communications plan for the construction phase of the proposed project would be developed by the contractor to ensure the public is aware of any changes in traffic patterns during construction. Routes of construction vehicles and reduction of construction noise would be considered in the development of the public outreach plan.

An essential element of sustainability for the proposed I-526 LCC WEST project is public outreach.

4.24 404(b)1 Guidelines

The proposed project would require a U.S. Army Corps of Engineers (USACE) Section 404 Individual Permit. The Section 404 permit along with the concurrent Section 401 Water Quality Certification, issued by SCDHEC Bureau of Water, would be addressed through a joint application process with USACE. For more detailed information on the Section 404 Individual Permit please refer to Section 4.18.

Section 404 of the Clean Water Act (CWA) authorizes USACE to issue permits regulating the discharge of dredge or fill material into waters of the United States (WOUS).

4.24.1 Clean Water Act Section 404(b)1 Guidelines

4.24.1.1 Regulatory Background and Existing Conditions

Under Section 404(b)1 of the Clean Water Act, the Environmental Protection Agency, in conjunction with USACE, developed “Guidelines” to ensure compliance with Section 404 of the Clean Water Act when evaluating permit applications. The 404(b)1 Guidelines specifically outline four conditions that must be satisfied to determine that a proposed discharge complies with these guidelines. These conditions are referred to as “restrictions on discharge”. In general, these four “restrictions on discharge” do not allow USACE to issue a permit if a discharge would:

1. have a “practicable” alternative which would have less adverse impact on the aquatic ecosystem if the alternative does not have other significant adverse environmental consequences. The USACE may only issue a permit for the least environmentally damaging practicable alternative (LEDPA). Practicability considers cost, existing technology, and logistics of the alternatives. The “overall” project purpose is used to determine whether “practicable” alternatives exist to a proposed project.
2. cause or contribute to violations of any applicable State water quality standard; violate toxic effluent standards; jeopardize the continued existence of an endangered or threatened species; or violate any marine sanctuary.
3. cause or contribute to significant degradation of the waters of the U.S.
4. not have taken appropriate and practicable steps to minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Each of these “restrictions” has specific requirements in order to determine compliance.

4.24.1.2 404(b) 1 Guidelines for the Practicable Alternatives

As described in Section 4.20.1.1, the 404(b)1 Guidelines outline four conditions that must be satisfied in order for USACE to make a finding that the proposed discharge (of dredged or fill material) complies with these guidelines. The analysis of the Practicable Alternatives assists USACE in evaluating the first condition which states that USACE cannot issue a permit if the proposed discharge would have a practicable alternative which would have less adverse impact on the aquatic ecosystem as long as the alternative does not have other significant adverse environmental consequences.

In order to perform a detailed impact evaluation on the above alternatives, the widening of the mainline to 8-lanes was combined with the interchange alternatives into three sections. Each section was evaluated in consideration of the 404(b)(1) Guidelines.

When evaluating the proposed project, 404(b)1 Guidelines were considered during the analysis of the Reasonable Alternatives. Refer to Chapter 3 for more details on the alternatives analysis. Possible impacts to the aquatic ecosystem were included in the analysis along with the evaluation of other environmental resources. The preliminary range of alternatives was evaluated to determine if the proposed alternatives meet the need and purpose of the project. In addition to the purpose and need, several environmental categories were also used to narrow the range of alternatives to the Reasonable Alternatives. This thorough exploration and detailed analysis of the Reasonable Alternatives should lead USACE to identify the “least environmentally damaging practicable alternative.”

Paul Cantrell Boulevard to International Boulevard

The I-526 at Paul Cantrell Boulevard interchange has only one Reasonable Alternative. While impacts to wetlands and waters would occur, this alternative meets the project purpose and need. Therefore, this alternative meets the 404(b)1 Guidelines.

International Boulevard to Rivers Avenue

The I-26/I-526 System & I-526 at Rivers Avenue interchange has four Reasonable Alternatives. The four alternatives that were carried through the preliminary alternatives analysis to become Reasonable Alternatives had fewer impacts than the initial alternatives evaluated. The Reasonable Alternatives were then evaluated in detail with respect to the various resources (which included the aquatic ecosystem). All four Reasonable Alternatives have the same amount of impacts to freshwater wetlands and freshwater streams. Alternative 2 is the Recommended Preferred Alternative because of improved traffic operations and reduced impacts to environmental justice communities. Therefore, Alternative 2 meets the 404(b)1 Guidelines.

Rivers Avenue to Virginia Avenue

The I-526 at North Rhett Avenue/Virginia Avenue interchange has five Reasonable Alternatives. The five alternatives that were carried through the preliminary alternatives analysis to become Reasonable Alternatives had fewer impacts than the initial alternatives evaluated. The Reasonable Alternatives were then evaluated in detail with respect to the various resources (which included the aquatic ecosystem). Alternative 2A is the Recommended Preferred Alternative for the Rivers Avenue to Virginia Avenue portion of the project. Alternative 2A has the fewest impacts to freshwater wetlands of any of the Reasonable Alternatives. Alternative 2A has fewer critical area impacts than two of the Reasonable Alternatives (Alternatives 5 and 6), and slightly more critical area impacts than two of the Reasonable Alternatives (Alternatives 1 and 2). Alternative 2A has the fewest impacts to freshwater streams of any of the Reasonable Alternatives. While Alternative 2A has a slightly higher critical area impact compared to Alternatives 1 and 2, this alternative was selected because it results in the fewest amount of relocations of any of the Reasonable Alternatives. Therefore, Alternative 2A meets the 404(b)(1) Guidelines.

The One Federal Decision process has allowed USACE to provide input throughout the project to ensure that the evaluation of the alternatives is sufficient to make a decision pertaining to the 404(b)(1) Guidelines. At the conclusion and signing of this EIS, USACE should have enough information to make an informed decision regarding permit issuance or denial.