

## 4.8 TRAFFIC AND TRANSPORTATION

Alternative 1 (Proposed Project) would alter vehicular and rail traffic patterns within the TSA. Section 3.8 describes the existing transportation system infrastructure and operations. The purpose of this environmental consequences section is to document potential beneficial or adverse impacts to the transportation system that would result from construction and operation of Alternative 1 (Proposed Project) and the alternatives.

Transportation projects included in the No-Action and Project alternatives analysis are consistent with the following local transportation plans:

- 2035 Charleston Area Transportation Study (CHATS) Long Range Transportation Plan (LRTP)
- SCDOT Statewide Transportation Improvement Program (STIP) 2014-2019, May 2014 Revision

Within the TSA, the Port Access Road project is the only committed roadway project included in the future year analysis. The Port Access Road project will replace the existing I-26 directional interchange at Spruill Avenue with a full movement interchange connecting to the future Port Access Road. The Port Access Road will connect to the future HLT and include a half-diamond interchange with a local access roadway providing connectivity to Hobson Avenue, Bainbridge Avenue, and Spruill Avenue. Roadway improvements associated with the Port Access Road are shown in Figure 4.8-1.

The I-526 improvements project from I-26 west to SC 7 (Sam Rittenberg Boulevard) was not included in the future year analysis, despite being partially funded for construction in the FY 2014-2019 CHATS TIP financial statement. The I-526 improvements project was not included due to uncertainties with what improvements will be made as part of the project. Also, the proposed Airport Connector Road on new alignment between Montague Avenue and Michaux Parkway was not included due to uncertainties with the design.

In addition, Partnership for Prosperity: A Master Plan for the Neck Area of Charleston and North Charleston (Neck Area Plan) is being developed by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG). The Neck Area Plan will provide a clear, community-based vision for growth and redevelopment of key sites in the area and future transportation networks, while providing economic opportunity and preserving the historic fabric of those neighborhoods. Focusing on the transportation component, the plan is to develop a transportation system that provides options in mode of travel for both people and goods. The plan will increase safety, mobility and access through the use of access management, directing truck traffic, planning for transit and creating more pedestrian friendly roadways.

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## Local Jurisdictions

Alternative 1 (Proposed Project) is located within two municipal jurisdictions - the City of Charleston and the City of North Charleston. In accordance with 40 C.F.R. 1506.2, both of these municipalities have been involved throughout the EIS process and have raised concerns regarding the potential impacts to the surrounding communities; specifically, with regards to transportation.

### City of North Charleston

The City of North Charleston and the Applicant reached a Settlement Agreement in 2012 (see Section 1.5.1 for details) regarding mitigation for the ICTF. The Settlement Agreement included a commitment to prepare a Surface Transportation Impact Study (in cooperation with the City of North Charleston, South Carolina Ports Authority, and SCDOT) to identify impacts of rail and highway traffic related to state port and rail operations throughout North Charleston and to formulate mitigation and management of such impacts. The Settlement Agreement also required the Applicant to compensate the City of North Charleston with a mitigation payment of \$8 million for rail access impacts. In addition to the mitigation payment, the Applicant also assumed responsibility for the repayment of \$6.5 million in Tax Increment Financing (TIF) as part of the agreement. A copy the Settlement Agreement can be found in the Community Mitigation Plan in Appendix N.

### City of Charleston

Specific coordination between the Applicant and the City of Charleston has been ongoing since spring 2015 when the Applicant changed the Proposed Project to include a southern rail connection which is in the northern limits of the City of Charleston. The City of Charleston provided scoping comments in a November 25, 2015, letter (Appendix C), comments on the Draft EIS in a July 8, 2016, letter (Appendix O) and comments on the joint permit application in a letter dated November 16, 2016. The City of Charleston's letters expressed concerns with the negative impacts within its municipal jurisdiction from the southern rail connection of Alternative 1 (Proposed Project); specifically, traffic impacts that would result at the southern rail connection with the addition of the new at-grade crossing at Meeting Street, mobility, access restrictions, property impacts, and the relocation of the proposed Public Service and Safety Operations Center. The City of Charleston's letters also detailed requested mitigation actions to lessen negative impacts.

Numerous coordination meetings and actions have transpired since spring 2015, and are detailed in an April 24, 2018, letter from the Applicant to the Corps (Appendix B). The Applicant contracted with a third-party firm (HDR, Inc.) to evaluate the City of Charleston's requested mitigation, analyze the feasibility of the infrastructure improvements requested, and provide supplementary recommendations for infrastructure or other improvements. The City of Charleston also contracted with a different third-party firm (Bihl Engineering) to analyze impacts from Alternative 1 (Proposed Project) and to study potential mitigation options. Mitigation proposed as part of this report

estimated the costs for the improvements between \$40 and \$55 million. As a result, a meeting was held between Applicant, the South Carolina Department of Commerce, and the City of Charleston to discuss the information presented in the City of Charleston's engineering study. According to the Applicant, "at that meeting, PR [Palmetto Railways] agreed to increase the amount of mitigation funding to \$4.5 million for mitigation efforts and infrastructure the City could prioritize based on its assessment of immediate needs" (Appendix B).

In an effort to reach an agreement concerning the impacts and potential mitigation options for the City of Charleston, the Applicant prepared a draft Transportation Memorandum of Agreement (draft Transportation MOA) between the Applicant, South Carolina Department of Transportation (SCDOT), the South Carolina Department of Commerce, and the City of Charleston. This draft Transportation MOA was prepared to address transportation and safety impacts; specifically, with ICTF-related grade crossings within the City of Charleston. The draft Transportation MOA recognizes the importance of the ICTF to facilitate and enhance economic growth and development in the region, while ensuring an adequate and functioning transportation system in the surrounding jurisdictions. The draft Transportation MOA identifies the scope of evaluation activities, sources of funding, and roles and responsibilities of the parties. As part of the draft Transportation MOA, the parties will conduct a Crossing Analysis (funded by the Applicant) to examine conditions at the crossings and identify potential improvements, where warranted. The draft Transportation MOA does not specifically identify, or commit the Applicant to construct, any new grade separated crossings; however, it proposes to study the impacts and needs for these improvements. In addition to the Crossing Analysis, the Applicant also proposes in the draft Transportation MOA to provide funds up to \$4.5 million to the City of Charleston (or another government body) for its use on mitigation measures for transportation improvements. The draft Transportation MOA is included in Appendix N. Although the Applicant and the City of Charleston have not reached a final agreement on the specific terms of mitigation for the City of Charleston, the Applicant has represented by letter dated December 6, 2017, that it is "committed to fulfilling the items in Section 2 of the MOA as mitigation for the [ICTF] impact on the City [of Charleston]" (Appendix B).

#### 4.8.1 Methods and Impact Definitions

The following section describes the methodology used to evaluate and define impacts to the transportation network.

**Methods:** Traffic forecasts were developed using the 2012 version of the BCDCOG/CHATS 2010-2035 travel demand model. A travel demand model estimates traffic demand on regional transportation infrastructure based on the magnitude and location of population and employment in the region. Mathematical parameters within the travel demand model are initially estimated and calibrated to ensure the model accurately represents existing travel characteristics when given existing population and employment, inputs and existing infrastructure. Then future traffic demands

are estimated by applying the model using regional forecasts of the future magnitude and location of population and employment, and planned future infrastructure.

Atkins developed a traffic forecast for each future year alternative as documented in Appendix F. In summary, traffic forecasts were developed by first estimating the movement of heavy trucks to and from port terminals and intermodal rail facilities for each alternative. These externally estimated trips were introduced into the BCDCOG/CHATS 2010-2035 travel demand model, along with population and employment inputs associated with each alternative, as well as transportation network revisions associated with each alternative. Alternative specific inputs were used in travel demand model applications to generate the regional travel flows associated with each alternative. Since existing North Charleston truck restrictions, which are shown in Figure 4.8-1, are important in the TSA but are not currently included in the regional travel demand model, travel flows estimated for each alternative were used in refined travel demand model traffic assignments that included truck restrictions that are enforced in North Charleston. The resulting traffic volumes were used to generate the final traffic forecasts.

The traffic forecast volumes were used to evaluate the operations of the roadway network for each of the future year alternatives. The future year operations analysis is documented in Appendix F. The methodology used to perform the operations analysis and definitions of LOS is provided in Section 3.8.1.

**Impact Definitions:** Adverse and beneficial impacts to the freeway and local roadway network were determined by comparing the operations of the No-Action and Project alternatives. LOS was determined based on guidance from the Highway Capacity Manual (HCM) 2010 (Transportation Research Board 2010) to estimate impacts to freeways, intersections and at-grade rail crossings as defined in Table 4.8-1. LOS A to C is considered Good, LOS D Fair, and LOS E or F Poor. In addition, for at-grade rail crossings, an impact was major if an interstate off-ramp queue would spillback to the mainline in a Project alternative as a result of a Navy Base ICTF intermodal train occurrence but would not in the No-Action Alternative as a result of another commodity train. An off-ramp would be impacted by a train occurrence at an at-grade rail crossing, if the queue on the roadway backs up to the off-ramp. This queue hinders traffic from being able to turn onto the roadway from the off-ramp.

Table 4.8-1  
Impact Definitions, Traffic and Transportation

Negligible	Minor	Moderate	Major
No change in LOS. No perceivable impacts to the intersection delay, at-grade rail crossing delay or freeway density.	LOS changes one LOS grade. Impacts cause slightly perceptible change in intersection delay, at-grade rail crossing delay or freeway density.	LOS changes two LOS grades or LOS degrades (adverse impact) to LOS E or improves (beneficial impact) from LOS E to LOS D. Impacts cause perceptible change in intersection delay, at-grade rail crossing delay or freeway density.	LOS changes three or more LOS grades or LOS degrades (adverse impact) to LOS F or improves (beneficial impact) from LOS F to LOS E or LOS D. Additionally, for at-grade rail crossings, if off-ramp queue impacts interstate mainline. Impacts cause very noticeable change in intersection delay, at-grade rail crossing delay or freeway density.

### 4.8.2 No-Action Alternative

The following sections describe the transportation impacts associated with No-Action Alternative, which is described in detail in Section 2.4.1 The operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. The No-Action Alternative impacts are summarized in Section 4.8.11.

Existing traffic patterns within the TSA would change due to the Port Access Road project. While the proposed HLT would not be opened in 2018, the Port Access Road project is expected to be completed. The Port Access Road project would alter traffic patterns in 2018 with the addition of the Port Access Road and Local Access Road and the replacement of the directional I-26 Spruill Avenue ramps, which provide movements to and from downtown Charleston only with the Port Access Road interchange. With the HLT open by the design year 2038, traffic volumes on the Port Access Road increase substantially. The existing year 2013 and No-Action Alternative daily volumes for the major roadways within the TSA are shown in Appendix F. The average annual growth rate for the No-Action Alternative would be a little under 2 percent on the major roadways between the existing year 2013 and opening year 2018. Traffic growth slows down to less than 1 percent from the opening year 2018 to the design year 2038.

#### Interstate 26

Consistent with the existing conditions, most of the congestion would occur in the eastbound direction in the morning and westbound in the evening for the opening year 2018 under the No-

Action Alternative. Approximately 12 percent of the total analyzed segments would operate at Poor LOS and 26 percent would operate at Fair LOS, which is nearing unstable traffic flow.

By the design year 2038, the number of I-26 freeway segments over capacity would double from the opening year 2018. The additional segments operating over capacity would occur in the peak direction of travel, which is eastbound in the AM peak hour and westbound in the PM peak hour. Approximately 23 percent of the total analyzed segments would operate at Poor LOS and 27 percent would operate at Fair LOS, which is nearing unstable traffic flow.

A summary of the opening year 2018 and design year 2038 No-Action Alternative I-26 freeway segment LOS by direction and peak hour is shown in Table 4.8-2.

Table 4.8-2  
I-26 Operations, No-Action Alternative

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	15 Segments (36%)	13 Segments (31%)	37 Segments (88%)	29 Segments (69%)	35 Segments (92%)	29 Segments (76%)	13 Segments (34%)	10 Segments (26%)
Fair	18 Segments (43%)	10 Segments (24%)	3 Segments (7%)	10 Segments (24%)	1 Segment (3%)	7 Segments (19%)	19 Segments (50%)	16 Segments (42%)
Poor	9 Segments (21%)	19 Segments (45%)	2 Segments (5%)	3 Segments (7%)	2 Segments (5%)	2 Segments (5%)	6 Segments (16%)	12 Segments (32%)

Note: Segments were developed based on guidance from the *Highway Capacity Manual (HCM) 2010* (Transportation Research Board 2010) and include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-26.

Source: Appendix F.

## Interstate 526

By the year 2018, congestion would occur on a greater portion of the corridor due to growth in traffic, in part due to the proposed Boeing Aircraft plant expansion (see description in Chapter 5). The majority of the congestion along I-526 would occur between Paul Cantrell Boulevard and Long Point Road. Approximately 23 percent of the total analyzed segments would operate at Poor LOS and 40 percent would operate at Fair LOS, which is nearing unstable traffic flow.

By the design year 2038, the number of I-526 freeway segments over capacity would increase by approximately one-third from the opening year 2018. The majority of the congestion along I-526 would still occur between Paul Cantrell Boulevard and Long Point Road. Approximately 31 percent of the total analyzed segments would operate at Poor LOS and 36 percent would operate at Fair LOS, which is nearing unstable traffic flow.

A summary of the opening year 2018 and design year I-526 freeway segment LOS by direction and peak hour is shown in Table 4.8-3.

Table 4.8-3  
I-526 Operations, No-Action Alternative

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	17 Segments (38%)	15 Segments (33%)	13 Segments (29%)	14 Segments (31%)	16 Segments (37%)	14 Segments (33%)	19 Segments (44%)	15 Segments (35%)
Fair	17 Segments (38%)	13 Segments (29%)	22 Segments (49%)	18 Segments (40%)	15 Segments (35%)	13 Segments (30%)	16 Segments (37%)	19 Segments (44%)
Poor	11 Segments (24%)	17 Segments (38%)	10 Segments (22%)	13 Segments (29%)	12 Segments (28%)	16 Segments (37%)	8 Segments (19%)	9 Segments (21%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-526.

Source: Appendix F.

## U.S. Highway 17

Although congestion is projected to increase on US 17 from existing levels, the majority of the corridor would still operate at Good or Fair levels. Only one freeway segment and one intersection (4 percent of the total analyzed elements) would operate at Poor LOS in either the AM or PM peak hour.

By the design year 2038, the number of freeway segments and intersections over capacity would more than double along US 17 from the opening year 2018. However, because few locations operated over capacity in 2018, the majority of the corridor would still operate at Good or Fair levels in the design year 2038. Only two freeway segments and three intersections (10 percent of the total analyzed elements) would operate at Poor LOS in either the AM or PM peak hour.

A summary of the opening year 2018 and design year 2038 US 17 freeway segment LOS by direction and peak hour is shown in Table 4.8-4. A summary of the opening year 2018 and design year 2038 US 17 signalized intersection operations is shown in Table 4.8-5. The worst of the No-Action Alternative AM or PM peak hour LOS for the opening year 2018 is shown in Figure 4.8-2 and the design year 2038 in Figure 4.8-3.



Table 4.8-4  
US 17 Freeway Operations, No-Action Alternative

LOS	Northbound				Southbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	9 Segments (90%)	9 Segments (90%)	8 Segments (80%)	5 Segments (50%)	10 Segments (91%)	8 Segments (73%)	11 Segments (100%)	10 Segments (91%)
Fair	1 Segment (10%)	1 Segment (10%)	1 Segment (10%)	3 Segments (30%)	1 Segment (9%)	3 Segments (27%)	0 Segments (0%)	1 Segment (9%)
Poor	0 Segments (0%)	0 Segments (0%)	1 Segment (10%)	2 Segments (20%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between northbound and southbound US 17.

Source: Appendix F.

Table 4.8-5  
US 17 Intersection Operations, No-Action Alternative

LOS	AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038
Good	3 Intersections (60%)	2 Intersections (40%)	2 Intersections (40%)	2 Intersections (40%)
Fair	1 Intersection (20%)	2 Intersections (40%)	3 Intersections (60%)	1 Intersection (20%)
Poor	1 Intersection (20%)	1 Intersection (20%)	0 Intersections (0%)	2 Intersections (40%)

Source: Appendix F.

### North Charleston Intersections

The opening year 2018 No-Action Alternative analyzed 32 signalized intersections and 15 stop-controlled intersections within North Charleston, which are shown in Figure 4.8-2. The proposed Port Access Road project would create additional intersections as well as modify existing intersections with the addition of turn lanes and traffic signals. Along the proposed Local Access Road, two new signalized intersections are created at Bainbridge Avenue and the Stromboli Avenue Extension and two unsignalized intersections at the Port Access Road on- and off-ramps. Additionally, Alternative 1 (Proposed Project) would extend Stromboli Avenue converting the two existing stop-controlled intersections of Spruill Avenue at Stromboli Avenue and Carner Avenue and Meeting Street (future Stromboli Avenue Extension) to signalized intersections. Meeting Street would no longer connect to Carner Avenue as part of the Port Access Road project.

Similar to existing conditions, within North Charleston, the majority of the analyzed intersections operate with little delay. During the AM peak hour, all 32 signalized intersections and 11 stop-controlled intersections would operate at Good LOS (92 percent of total intersections), one stop-controlled intersection would operate at Fair LOS (2 percent of total intersections), and three stop-

controlled intersections would operate at Poor LOS (6 percent of total intersections). During the PM peak hour, 30 signalized intersections and 14 stop-controlled intersections would operate at Good LOS (94 percent of total intersections), two signalized intersections and one stop-controlled intersection would operate at Fair LOS (6 percent of total intersections), and none would operate at Poor LOS (0 percent of total intersections). The stop-controlled intersections of Avenue B at Virginia Avenue, the I-526 Eastbound Off-Ramp at Virginia Avenue, and the ramps from Viaduct Road at Bainbridge Road are the only intersections that would operate with a Poor LOS. The worst of the AM and PM peak hour intersection LOS for the opening year 2018 No-Action Alternative is shown in Figure 4.8-2.

In the design year 2038 No-Action Alternative, the majority of the intersections within North Charleston would continue to operate with little delay. During the AM peak hour, 30 signalized intersections and 11 stop-controlled intersections would operate at Good LOS (87 percent of total intersections), one signalized intersection would operate at Fair LOS (2 percent of total intersections), and one signalized and four stop-controlled intersections would operate at Poor LOS (11 percent of total intersections). During the PM peak hour, 27 signalized intersections and 13 stop-controlled intersections would operate at Good LOS (85 percent of total intersections), three signalized intersections and one stop-controlled intersection would operate at Fair LOS (9 percent of total intersections), and two signalized and one stop-controlled intersections would operate at Poor LOS (6 percent of total intersections).

In addition to the three, opening year 2018 No-Action stop-controlled intersections that operate at Poor LOS, four other intersections would also operate at Poor LOS in the design year 2038. The four additional intersections are the signalized intersections of Rivers Avenue at Cosgrove Avenue, Spruill Avenue at McMillan Avenue, and Cosgrove Avenue at Azalea Avenue, and the stop-controlled intersection of Noisette Boulevard at McMillan Avenue. The worst of the AM and PM peak hour intersection LOS for the design year 2038 No-Action Alternative is shown in Figure 4.8-3.

A summary of the opening year 2018 and design year 2038 North Charleston intersection LOS by traffic control type and peak hour is shown in Table 4.8-6.

Table 4.8-6  
North Charleston Intersection Operations, No-Action Alternative

LOS	Signalized Intersections				Stop-Controlled Intersections			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	32 (100%)	30 (94%)	30 (94%)	27 (85%)	11 (73%)	11 (73%)	14 (93%)	13 (86%)
Fair	0 (0%)	1 (3%)	2 (6%)	3 (9%)	1 (7%)	0 (0%)	1 (7%)	1 (7%)
Poor	0 (0%)	1 (3%)	0 (0%)	2 (6%)	3 (20%)	4 (27%)	0 (0%)	1 (7%)

Source: Appendix F.

The I-26 ramp terminal intersections at Cosgrove Avenue and I-26 Eastbound ramp terminal intersection at Montague Avenue are neither signalized nor stop-controlled. The ramp terminal intersections act as merge, diverge or weave elements along Cosgrove Avenue and Montague Avenue. All ten of the elements would operate at Good LOS during both the AM and PM peak hours in the opening year 2018 and design year 2038 No-Action Alternative, with the exception of the weave section on southbound Cosgrove Avenue during the PM peak hour in the design year 2038, which would operate at Fair LOS.

In the opening year 2018, the Corps analyzed two freeway elements on the Port Access Road. The HLT would not be open to traffic in the year 2018, so all eastbound Port Access Road traffic would be destined to the Local Access Road and all westbound Port Access Road traffic would come from the Local Access Road. The two analyzed elements were the eastbound Port Access Road merge from the eastbound and westbound I-26 ramps and the split of the westbound Port Access Road to eastbound and westbound I-26. Both of these elements would operate at Good LOS during both the AM and PM peak hours in the opening year.

In the design year 2038, the analysis also included the on- and off- ramps from the Port Access Road to the Local Access Road. The HLT would be open and the Port Access Road would serve most of the traffic to and from the facility along with the traffic destined to the Local Access Road. All four freeway elements on the Port Access Road would operate at Good LOS during both the AM and PM peak hours in the design year 2038.

### At-Grade Rail Crossings

Over time, due to an increase in train lengths, the Corps anticipates that roadways would be blocked for longer periods of times at most at-grade rail crossings. The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase approximately 8 percent from the year 2013 existing conditions to opening year 2018 No-Action Alternative. The daily combined total rail occupancy time would continue to increase, nearly 30 percent, from the opening year 2018 to design year 2038 under the No-Action Alternative. Same as the year 2013 existing conditions, the at-grade rail crossing of Avenue B east of Virginia Avenue would be the only location to operate with a Poor LOS in the opening year 2018 No-Action Alternative. By the design year 2038, three additional at-grade crossings would operate with a Poor LOS. These three additional at-grade locations are North Rhett Avenue south of I-526, Hackemann Avenue between Meeting Street and King Street, and Discher Street between Meeting Street and King Street. In both the opening year 2018 and design year 2038, the at-grade rail crossing of Virginia Avenue north of Empire Avenue would operate LOS D, slightly better than the Poor LOS.

Several at-grade crossings would have substantial queuing during other commodity train occurrences in the opening year 2018 and design year 2038 No-Action Alternative. The queue at two of these locations, Virginia Avenue north of Empire Avenue and North Rhett Avenue south of I-526, would impact the I-526 interstate mainline. The mainline would be impacted by the queue from the at-grade crossing backing up through the intersection with the off-ramp, which would cause additional queueing on the off-ramp that impacts the I-526 mainline. In the design year 2038, the queue from the at-grade crossing at Rivers Avenue north of I-526 would also impact the I-526 interstate mainline.

The opening year 2018 and design year 2038 No-Action Alternative at-grade rail crossing analysis results, which are used to determine impacts for the respective year proposed action alternatives, are shown in Table 4.8-7 and Table 4.8-8, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 No-Action Alternative is shown in Figure 4.8-4.

Table 4.8-7  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for the No-Action Alternative

Map ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Daily Other Commodity Trains		Max Queue (feet)	Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS
			Number of Train Crossings	Average Duration of Crossing (min:sec)				
1	Rivers Avenue (US 78)	31,900	2.2	04:09	2,300	No	7.7	A
2	Attaway Street	4,500	4.9	03:47	600	No	6.3	A
3	North Rhett Avenue	16,300	4.9	07:16	>5,280	Yes	43.9	D
4	Virginia Avenue	8,600	1.1	26:07	3,750	Yes	50.9	D
5	Avenue B	7,100	1.1	34:36	>5,280	No	81.8	F
6	Dorchester Road (SC 642)	16,700	5.3	04:01	1,525	No	10.3	B
7	Accabee Road	3,100	5.3	03:09	225	No	3.9	A
8	Misroon Street	500	5.3	03:09	50	No	6.2	A
9	Hackemann Avenue	1,500	3.1	04:06	2,650	No	21.3	C
10	Discher Street	3,100	5.3	03:09	1,275	No	16.4	B
11	Pittsburgh Avenue	2,000	0.0	00:00	0	No	0.0	A

1. Analyzed at-grade crossing locations are shown in Figure 4.8-4.

Source: Appendix F.

Table 4.8-8  
Design Year 2038 At-Grade Rail Crossings Analysis Results for the No-Action Alternative

Map ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Daily Other Commodity Trains		Max Queue (feet)	Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS
			Number of Train Crossings	Average Duration of Crossing (min:sec)				
1	Rivers Avenue (US 78)	36,400	2.2	05:14	4,525	Yes	11.3	B
2	Attaway Street	6,200	4.9	06:21	1,150	No	18.1	B
3	North Rhett Avenue	24,700	4.9	09:44	>5,280	Yes	100.4	F
4	Virginia Avenue	9,900	1.1	27:10	4,275	Yes	53.4	D
5	Avenue B	8,500	1.1	35:29	>5,280	No	84.9	F
6	Dorchester Road (SC 642)	17,400	5.3	05:13	1,925	No	18.6	B
7	Accabee Road	3,100	5.3	05:13	350	No	8.7	A
8	Misroon Street	500	5.3	04:13	50	No	9.3	A
9	Hackemann Avenue	1,500	3.1	05:29	>5,280	No	72.3	E
10	Discher Street	3,200	5.3	04:12	4,500	No	75.9	E
11	Pittsburgh Avenue	2,100	0.0	00:00	0	No	0.0	A

1. Analyzed at-grade crossing locations are shown in Figure 4.8-4.

Source: Appendix F.

### 4.8.3 Alternative 1: Applicant's Proposed Project (South via Milford / North via Hospital District)

The following sections describe the transportation impacts associated with Alternative 1 (Proposed Project), which is described in detail in Section 1.7 and shown in Figures 1.7-1 through 1.7-8. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. The impacts are summarized in Section 4.8.11.

As mentioned in Section 1.7.1.2.3, Alternative 1 (Proposed Project) creates a new at-grade rail crossing at the intersection of Meeting Street (US 52) and Herbert Street. This analyzed at-grade rail crossing network is identified by ID 12 in Tables 4.8-18 and 4.8-19.

The distribution of truck traffic between the ICTF and the four container terminals along with other regional sites would change from the opening year 2018 to the design year 2038. In the opening year 2018, the Wando Welch and North Charleston port facilities would handle a higher percentage of the containers, because the HLT would not be open. Additionally, the other regional sites, which include local distribution centers and routes out of the region such as I-26 and US 17, would decrease from

15 percent in the opening year 2018 to 9 percent in the design year 2038. The year 2018 and 2038 distribution of the ICTF truck traffic is shown in Exhibit 4.8-1.

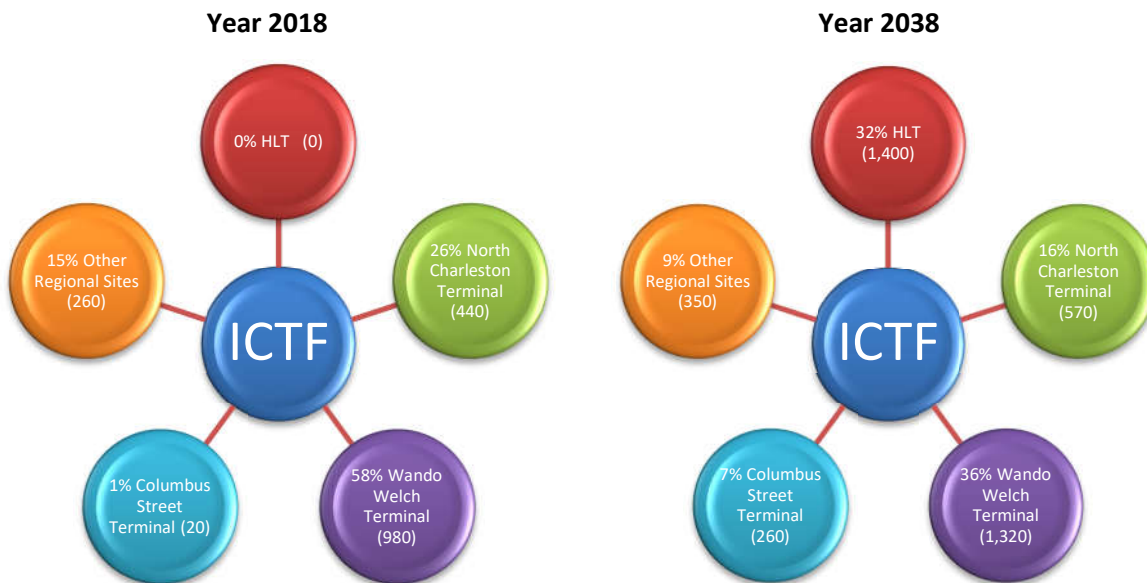


Exhibit 4.8-1: Build Proposed Project ICTF Truck Distributions

Source: Appendix F.

Traffic patterns around the ICTF would change compared to the No-Action Alternative due to the ICTF and modifications to the roadway network. In its opening year 2018, the ICTF would handle 1,100 trucks per day and 500 employee and visitor vehicles per day with access via North Hobson Avenue. By the design year 2038, the ICTF would handle 3,900 trucks and 1,100 employee and visitor vehicles per day. Of the 3,900 trucks per day, 1,400 would be on the drayage road between the ICTF and the HLT, effectively removing 1,400 trucks from public roadways. In the No-Action Alternative, the 1,400 truck trips would be on public roadways. All trucks exiting the ICTF would turn right onto North Hobson Avenue heading towards the Local Access Road and Port Access Road. Roadway modifications including the Cosgrove Avenue / McMillan Avenue realignment and overpass and the removal of Viaduct Road between Spruill Avenue and North Hobson Avenue lead to increased volumes on Noisette Boulevard, Cosgrove Avenue, and the Local Access Road compared to the No-Action Alternative. The opening year 2018 and design year 2038 Alternative 1 (Proposed Project) daily volumes are shown in Appendix F.

**4.8.3.1 Construction**

During construction of the ICTF and associated roadway improvements, Alternative 1 (Proposed Project) would have a negligible impact on I-26, I-526, and US 17 and a minor adverse impact on North Charleston intersections. The Corps anticipates that at the peak of construction, up to 200 trips

per day would be generated. The construction traffic would primarily use major arterial roadways such as I-26, I-526, Cosgrove Avenue, McMillan Avenue, Viaduct Road, North Hobson Avenue, Rivers Avenue and Spruill Avenue. The 200 construction trips per day would only be a small fraction of the daily volumes on these roadways, especially the interstates. A maintenance of traffic (MOT) plan has not been developed but may include detours and temporary lane closures. MOTs are typically developed once final design is complete, prior to construction, and the applicant will develop a MOT at that time.

#### 4.8.3.2 Operations

##### Interstate 26

Consistent with the opening year 2018 No-Action Alternative, the morning congestion on I-26 occurs in the eastbound direction, and the evening congestion occurs in the westbound direction for Alternative 1 (Proposed Project). Approximately 13 percent of the total analyzed segments (AM and PM peak hours for eastbound and westbound I-26) would operate at Poor LOS and 25 percent would operate at Fair LOS. By the design year 2038, approximately 21 percent of the total analyzed segments would operate at Poor LOS and 24 percent would operate at Fair LOS. A summary of the I-26 freeway segment LOS by direction and peak hour is shown in Table 4.8-9.

Table 4.8-9  
I-26 Operations, Alternative 1 (Proposed Project)

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	15 Segments (36%)	13 Segments (31%)	36 Segments (86%)	31 Segments (74%)	35 Segments (92%)	33 Segments (87%)	14 Segments (37%)	11 Segments (29%)
Fair	17 Segments (40%)	11 Segments (26%)	4 Segments (9%)	8 Segments (19%)	1 Segment (3%)	3 Segments (8%)	18 Segments (47%)	16 Segments (42%)
Poor	10 Segments (24%)	18 Segments (43%)	2 Segments (5%)	3 Segments (7%)	2 Segments (5%)	2 Segments (5%)	6 Segments (16%)	11 Segments (29%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-26.

Source: Appendix F.

In the opening year 2018 and design year 2038, Alternative 1 (Proposed Project) would have a negligible impact on the majority of the I-26 corridor in comparison with the No-Action Alternative. Alternative 1 (Proposed Project) would have a beneficial or adverse impact on a few segments due to a LOS change. The LOS change is a result of the segments having a density near a LOS threshold. All segments would only have a slight increase or decrease in density. A summary of the opening year 2018 and design year 2038 I-26 freeway impacts by direction and peak hour is shown in Table 4.8-10.

Table 4.8-10  
I-26 Freeway Segment Impacts for Alternative 1 (Proposed Project)

Impact		Eastbound				Westbound			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038	2018	2038	2018	2038
Beneficial	Major	0	2	0	0	0	0	0	0
	Moderate	1	2	0	0	0	0	0	1
	Minor	2	2	0	2	0	4	2	1
Negligible		36	35	41	40	38	33	35	36
Adverse	Minor	1	0	1	0	0	1	1	0
	Moderate	2	1	0	0	0	0	0	0
	Major	0	0	0	0	0	0	0	0

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-26.

Source: Appendix F.

### Interstate 526

Similar to the opening year 2018 No-Action Alternative, the majority of the congestion along I-526 would occur between Paul Cantrell Boulevard and Long Point Road. Approximately 25 percent of the total analyzed segments (AM and PM peak hours for eastbound and westbound I-526) would operate at Poor LOS and 39 percent would operate at Fair LOS. By the design year 2038, approximately 32 percent of the total analyzed segments would operate at Poor LOS and 37 percent would operate at Fair LOS. A summary of the I-526 freeway segment LOS by direction and peak hour is shown in Table 4.8-11.



Table 4.8-11  
I-526 Operations, Alternative 1 (Proposed Project)

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	18 Segments (40%)	14 Segments (31%)	13 Segments (29%)	13 Segments (29%)	15 Segments (34%)	12 Segments (28%)	18 Segments (42%)	15 Segments (35%)
Fair	15 Segments (33%)	14 Segments (31%)	23 Segments (51%)	19 Segments (42%)	14 Segments (33%)	15 Segments (35%)	17 Segments (39%)	18 Segments (42%)
Poor	12 Segments (27%)	17 Segments (38%)	9 Segments (20%)	13 Segments (29%)	14 Segments (33%)	16 Segments (37%)	8 Segments (19%)	10 Segments (23%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-526.

Source: Appendix F.

In the opening year 2018 and design year 2038, Alternative 1 (Proposed Project) would have a negligible impact on the majority of the I-526 corridor in comparison with the No-Action Alternative. Alternative 1 (Proposed Project) would have a beneficial or adverse impact on a few segments due to a LOS change. The LOS change is a result of the segments having a density near a LOS threshold. All segments would only have a slight increase or decrease in density. A summary of the opening year 2018 and design year 2038 I-526 freeway impacts by direction and peak hour is shown in Table 4.8-12.

Table 4.8-12  
I-526 Freeway Segment Impacts for Alternative 1 (Proposed Project)

Impact	Eastbound				Westbound				
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
	2018	2038	2018	2038	2018	2038	2018	2038	
Beneficial	Major	1	0	0	2	0	0	0	0
	Moderate	0	0	1	1	0	0	0	0
	Minor	1	0	0	0	0	0	0	0
Negligible		42	44	44	40	39	40	42	41
Adverse	Minor	0	1	0	1	2	3	1	1
	Moderate	1	0	0	1	1	0	0	1
	Major	0	0	0	0	1	0	0	0

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-526.

Source: Appendix F.

## U.S. Highway 17

Similar to the opening year 2018 No-Action Alternative, the majority of the US 17 corridor would operate at Good or Fair levels for Alternative 1 (Proposed Project). Only one freeway segment and one intersection would operate at Poor LOS in either the AM or PM peak hour. By the design year 2038, one additional freeway segment and two additional intersections would operate at Poor LOS in either the AM or PM peak hour. A summary of the US 17 freeway segment LOS by direction and peak hour is shown in Table 4.8-13. A summary of the US 17 signalized intersection operations is shown in Table 4.8-14.

Table 4.8-13  
US 17 Freeway Operations, Alternative 1 (Proposed Project)

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	9 Segments (90%)	9 Segments (90%)	7 Segments (70%)	5 Segments (50%)	10 Segments (91%)	8 Segments (73%)	11 Segments (100%)	10 Segments (91%)
Fair	1 Segment (10%)	1 Segment (10%)	2 Segments (20%)	3 Segments (30%)	1 Segment (9%)	3 Segments (27%)	0 Segments (0%)	1 Segment (9%)
Poor	0 Segments (0%)	0 Segments (0%)	1 Segment (10%)	2 Segments (20%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between northbound and southbound US 17.

Source: Appendix F.

Table 4.8-14  
US 17 Intersection Operations, Alternative 1 (Proposed Project)

LOS	AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038
Good	3 Intersections (60%)	2 Intersections (40%)	2 Intersections (40%)	2 Intersections (40%)
Fair	1 Intersection (20%)	2 Intersections (40%)	3 Intersections (60%)	1 Intersection (20%)
Poor	1 Intersection (20%)	1 Intersection (20%)	0 Intersections (0%)	2 Intersections (40%)

Source: Appendix F.

In the opening year 2018, Alternative 1 (Proposed Project) would have a negligible impact on the majority of the US 17 corridor in comparison with the No-Action Alternative, including all five of the signalized intersections. Alternative 1 (Proposed Project) would not have a beneficial impact on any of the US 17 segments in either the AM or PM peak hour. Alternatively, Alternative 1 (Proposed

Project) would have an adverse impact on three of the US 17 segments (7 percent of the total segments) in either the AM or PM peak hour, all of which are categorized as minor. In the design year 2038, Alternative 1 (Proposed Project) would have a negligible impact on all of the analyzed US 17 freeway segments and intersections. A summary of the opening year 2018 and design year 2038 US 17 freeway impacts by direction and peak hour is shown in Table 4.8-15. A table of impacts is not shown for the US 17 intersections, because Alternative 1 (Proposed Project) would result in a negligible impact on all intersections in both opening year 2018 and design year 2038.

Table 4.8-15  
US 17 Freeway Segment Impacts for Alternative 1 (Proposed Project)

Impact		Northbound				Southbound			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038	2018	2038	2018	2038
Beneficial	Major	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	0
	Minor	0	0	0	0	0	0	0	0
Negligible		8	10	9	10	11	11	11	11
Adverse	Minor	2	0	1	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	0
	Major	0	0	0	0	0	0	0	0

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between northbound and southbound US 17.

Source: Appendix F.

### North Charleston Intersections

Alternative 1 (Proposed Project) included the analysis of 32 signalized intersections and 14 stop-controlled intersections within North Charleston. The ICTF employee and visitor driveway and truck driveway created two new stop-controlled intersections along North Hobson Avenue. As part of the Alternative 1 (Proposed Project), McMillan Avenue is realigned and grade separated from the new ICTF railroad tracks, which eliminated the stop-controlled intersection of St. Johns Avenue at McMillan Avenue. Additionally, the removal of Viaduct Road eliminates two stop-controlled intersections, which are at the ramps connecting Viaduct Road and Bainbridge Avenue. The existing stop-controlled Viaduct Road intersection at North Hobson Avenue and South Hobson Avenue is replaced with a stop-controlled intersection, where the Local Access Road, North Hobson Avenue and South Hobson Avenue meet. Finally, Bainbridge Avenue would be slightly realigned and “T” into the Local Access Road as a signalized intersection.

The worst of the AM and PM peak hour intersection LOS for the Alternative 1 (Proposed Project) opening year 2018 and design year 2038 are shown in Figure 4.8-5 and Figure 4.8-6, respectively. A summary of the North Charleston intersection operations is shown in Table 4.8-16.

Consistent with the opening year 2018 No-Action Alternative, within North Charleston, the majority of the analyzed intersections operate with little delay. The stop-controlled intersections of Noisette Boulevard at McMillan Avenue, Avenue B at Virginia Avenue, and the I-526 Eastbound Off-Ramp at Virginia Avenue are the only intersections that would operate with a Poor LOS in the opening year 2018.

By the design year 2038, a few additional intersections would operate with Poor LOS, but the majority of the intersections would still operate with little delay. The signalized intersections of Cosgrove Avenue at Rivers Avenue, Cosgrove Avenue at Spruill Avenue, and Cosgrove Avenue at Azalea Drive and the stop-controlled intersections of Avenue B at Virginia Avenue, the I-526 Eastbound Off-Ramp at Virginia Avenue, Turnbull Avenue at Noisette Boulevard, and Noisette Boulevard at McMillan Avenue are the only intersections that would operate with a Poor LOS in the design year 2038.

Table 4.8-16  
North Charleston Intersection Operations, Alternative 1 (Proposed Project)

LOS	Signalized Intersections				Stop-Controlled Intersections			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	31 (97%)	29 (91%)	29 (91%)	28 (88%)	11 (79%)	10 (71%)	13 (93%)	12 (86%)
Fair	1 (3%)	2 (6%)	3 (9%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Poor	0 (0%)	1 (3%)	0 (0%)	3 (9%)	3 (21%)	4 (29%)	1 (7%)	2 (14%)

Source: Appendix F.

A summary of the opening year 2018 and design year 2038 Alternative 1 (Proposed Project) North Charleston intersection impacts by peak hour is shown in Table 4.8-17. Two intersections, the ICTF truck driveway at North Hobson Avenue and ICTF employee and visitor driveway at North Hobson Avenue, did not exist in the No-Action Alternative, so were only analyzed in Alternative 1 (Proposed Project). An impact cannot be defined for these intersections because they were not analyzed in the No-Action Alternative. However, both intersections are projected to operate at Good LOS in the opening year 2018 and design year 2038 Alternative 1 (Proposed Project) for both the AM and PM peak hours.

In the opening year 2018, Alternative 1 (Proposed Project) would have a negligible impact on the majority of the analyzed intersections in North Charleston compared with the No-Action Alternative. Alternative 1 (Proposed Project) would have a beneficial impact on three intersections (3 percent of the total intersections) in either the AM or PM peak hour. All of the three intersections would have a

minor beneficial impact, which equates to an improvement of one LOS grade. Alternatively, Alternative 1 (Proposed Project) would have an adverse impact on 12 intersections (14 percent of the total intersections) in either the AM or PM peak hour. Eight of the 12 intersections would have a minor adverse impact, which equates to a degradation of one LOS grade. Moderate adverse impacts would occur at the signalized Spruill Avenue at McMillan Avenue/ Cosgrove Avenue Realignment intersection in the PM peak hour and the stop-controlled Noisette Boulevard at McMillan Avenue intersection in both the AM and PM peak hours.

The stop-controlled Avenue B at Virginia Avenue intersection would have a major adverse impact in the AM peak hour, as the LOS degrades from LOS E to LOS F. The traffic volume at the intersection is projected to increase, as Avenue B and Noisette Boulevard would potentially serve as part of a route between the ICTF and I-526 for employees. Trucks would not use this route as they are restricted on Noisette Boulevard. Additionally, traffic patterns in the area would shift due to roadway modifications such as the connection of St. Johns Avenue with McMillan Avenue being severed. The stop-controlled left-turn movement that would operate at LOS F is a low volume movement, less than 20 vehicles in the AM peak hour.

In the design year 2038, similar to the opening year 2018, Alternative 1 (Proposed Project) would have a negligible impact on the majority of the analyzed intersections in North Charleston compared with the No-Action Alternative. Alternative 1 (Proposed Project) would have a beneficial impact on seven intersections (8 percent of the total intersections) in either the AM or PM peak hour. Five of the seven intersections would have a minor beneficial impact, which equates to an improvement of one LOS grade. A moderate beneficial impact would be experienced by the signalized intersection of Spruill Avenue at McMillan Avenue in the AM peak hour and the stop-controlled intersection of North Hobson Avenue at McMillan Avenue in the PM peak hour. Alternative 1 (Proposed Project) would remove McMillan Avenue from St. Johns Avenue to Kephart Street, which would improve the Spruill Avenue at McMillan Avenue intersection operations, by reducing the volumes on McMillan Avenue. The North Hobson Avenue at McMillan Avenue intersection would have a moderate beneficial impact in the PM peak hour due to mitigation measures including lane geometry improvements.

Alternatively, Alternative 1 (Proposed Project) would have an adverse impact on ten intersections (11 percent of the total intersections) in either the AM or PM peak hour. Four of the 10 intersections would have a minor adverse impact, which equates to a degradation of one LOS grade. The four-way stop-controlled Noisette Boulevard at Turnbull Avenue intersection would have an adverse moderate impact in both the AM and PM peak hours, while the signalized intersection of Spruill Avenue at McMillan Avenue/ Cosgrove Avenue Realignment would have an adverse moderate impact in the AM peak hour.

The signalized intersection of Spruill Avenue at McMillan Avenue/ Cosgrove Avenue Realignment would have a major adverse impact in the PM peak hour. Alternative 1 (Proposed Project) would degrade the LOS at this intersection due to higher volumes on Cosgrove Avenue as a result of the

proposed ICTF and McMillan Avenue/ Cosgrove Avenue Realignment. Details on LOS changes are included in Appendix F.

The stop-controlled intersection of Noisette Boulevard and McMillan Avenue would have a major adverse impact in both the AM and PM peak hours as the LOS degrades from LOS E to LOS F. Alternative 1 (Proposed Project) would degrade the LOS at this intersection due to higher volumes on McMillan Avenue and Noisette Boulevard as a result of the proposed ICTF and McMillan Avenue/ Cosgrove Avenue Realignment.

The I-26 ramp terminal intersections at Cosgrove Avenue and I-26 Eastbound ramp terminal intersection at Montague Avenue are neither signalized nor stop-controlled. The ramp terminal intersections act as merge, diverge or weave elements along Cosgrove Avenue and Montague Avenue. All ten of the elements would operate at Good LOS during both the AM and PM peak hours in the opening year 2018 and design year 2038 Alternative 1 (Proposed Project) with the exception of the weave section on southbound Cosgrove Avenue during the PM peak hour in the design year 2038, which would operate at Fair LOS.

Table 4.8-17  
North Charleston Intersection Impacts for Alternative 1 (Proposed Project)

Impact		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038
Beneficial	Major	0	0	0	0
	Moderate	0	1	0	1
	Minor	1	3	2	2
Negligible		36	36	37	35
Adverse	Minor	5	1	3	3
	Moderate	1	2	2	1
	Major	1	1	0	2

Source: Atkins 2017 (Appendix F).

In the opening year 2018, two freeway elements were analyzed on the Port Access Road. The HLT would not be open to traffic in the year 2018, so all eastbound Port Access Road traffic would be destined to the Local Access Road and all westbound Port Access Road traffic would come from the Local Access Road. The two analyzed elements were the eastbound Port Access Road merge from the eastbound and westbound I-26 ramps and the split of the westbound Port Access Road to eastbound and westbound I-26. Same as the No-Action Alternative, both of these elements would operate at Good LOS during both the AM and PM peak hours in the opening year.

In the design year 2038, the analysis also included the on- and off- ramps from the Port Access Road to the Local Access Road. The HLT would be open, and the Port Access Road would serve most of the traffic to and from the facility, along with the traffic destined to the Local Access Road. Same as the No-Action Alternative, all four freeway elements on the Port Access Road would operate at Good LOS during both the AM and PM peak hours in the design year.

### At-Grade Rail Crossings

The design of Alternative 1 (Proposed Project), and the presence of two separate arrival/departure tracks that allow connectivity to both CSX and NS rail lines, provides the opportunity for equal access by the Class I rail carriers. The Proposed Project's design allows it to manage and switch two trains at the same time. Assumptions for the number of train occurrences and average crossing time was based on a rail simulation model provided by Palmetto Railways and its consultants at the request of the Corps and included certain assumptions of Class I rail carrier service design that are outside the control of Palmetto Railways. In the initial years of operation, the analysis assumed that the facility would load/unload up to eight trains (i.e., two inbound and two outbound trains for NS and CSX for a total of eight train movements) every day. However, depending on capacity needs and service designs at facility opening and through initial years of operation, the distribution of arrival/departure trains connecting to NS or CSX rail lines may vary. Average train lengths may be less than 8,000 feet considering the TEU throughput that would occur at the ICTF. By the year 2038 (full build-out), the facility is expected to load/unload approximately eight trains (i.e., two inbound and two outbound trains for NS and CSX for a total of eight train movements) every day (based on assumed service design which may vary), although the average train lengths would be greater than 8,000 feet.

The opening year 2018 and design year 2038 Alternative 1 (Proposed Project) at-grade rail crossing analysis results are shown in Table 4.8-18 and Table 4.8-19, respectively. The number of train occurrences and average crossing time in Table 4.8-18 and Table 4.8-19 was based on a rail simulation model provided by Palmetto Railways and included certain assumptions of Class I rail carrier service design that are outside the control of Palmetto Railways. The rail model data provided the average number of trains and duration of occurrences for both intermodal and other commodity trains. The number of daily ICTF trains analyzed as passing each rail crossing is four as four trains were anticipated in the rail simulation model to arrive or depart from the southern rail connection and the northern rail connection. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 1 (Proposed Project) is shown in Figure 4.8-7.

Compared with the No-Action Alternative, Alternative 1 (Proposed Project) would reroute approximately 1.2 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley corridors. The impact Alternative 1 (Proposed Project) would have on the at-grade crossings along the Park Circle and Bexley corridors was not analyzed, because no ICTF trains would use these corridors.

Alternative 1 (Proposed Project) would have an impact on several of the at-grade rail crossings in North Charleston due to changing train and vehicular volumes and routes. The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 120 percent from the opening year 2018 No-Action Alternative to Alternative 1 (Proposed Project). In the design year 2038, the daily combined total rail occupancy time would increase over 180 percent.

In the opening year 2018, four at-grade crossings would operate with a Poor LOS. These four locations are the at-grade crossings of Virginia Avenue north of Empire Avenue, Avenue B east of Virginia Avenue, Hackemann Avenue between Meeting Street and King Street, and Discher Street between Meeting Street and King Street. Only the at-grade rail crossing of Discher Street would have a major adverse impact, as the LOS would degrade from LOS B in the No-Action Alternative to LOS E in Alternative 1 (Proposed Project). The at-grade rail crossing of Avenue B would have a negligible impact, because it would operate with a LOS F in both the No-Action Alternative and Alternative 1 (Proposed Project) and the average vehicle delay would increase less than 10 percent. The at-grade rail crossings of Virginia Avenue and Hackemann Avenue would have moderate adverse impacts as the LOS would degrade from a LOS D and a LOS C in the No-Action Alternative, respectively, to a LOS E in Alternative 1 (Proposed Project). None of the at-grade rail crossings would create a queue from an ICTF train occurrence that impacts an interstate mainline in the opening year 2018.

By the design year 2038, the average ICTF train crossing duration time would approximately double from the opening year 2018 value. The longer ICTF train crossing durations, as well as higher roadway volumes and longer other commodity train crossing durations, would lead to seven of the 12 at-grade crossing locations operating with a Poor LOS and eight of the twelve analyzed at-grade rail crossings having a major adverse impact in the design year 2038. Additionally, the at-grade rail crossings of Rivers Avenue north of Taylor Street, North Rhett Avenue south of I-526, and Dorchester Road west of Meeting Street would create a queue from an ICTF train occurrence that impacts an interstate mainline in the design year 2038. However, in the No-Action Alternative, only the Dorchester Road at-grade crossing would not impact an interstate mainline.



Table 4.8-18  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 1 (Proposed Project)

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,800	2.2	4.0	04:07	05:34	2,850	No	19.7	B	Minor	A
2	Attaway Street	4,500	3.7	4.0	03:47	05:38	800	No	14.5	B	Minor	A
3	North Rhett Avenue	16,200	3.7	4.0	07:16	05:38	>5,280	No	47.4	D	Negligible	D
4	Virginia Avenue	9,100	1.1	4.0	26:09	05:42	900	No	59.8	E	Moderate	D
5	Avenue B	9,000	1.1	4.0	34:34	05:40	2,500	No	89.2	F	Negligible	F
6	Dorchester Road (SC 642)	17,400	5.3	4.0	03:57	05:33	1,975	No	21.9	C	Minor	B
7	Accabee Road	3,100	5.3	4.0	03:10	05:32	450	No	14.4	B	Minor	A
8	Misroon Street	500	5.3	4.0	03:10	05:32	75	No	13.5	B	Minor	A
9	Hackemann Avenue	1,500	3.1	4.0	04:06	05:32	3,700	No	55.4	E	Moderate	C
10	Discher Street	3,100	5.3	4.0	03:09	05:31	2,950	No	64.2	E	Major	B
11	Pittsburgh Avenue	2,000	0.0	4.0	00:00	05:32	400	No	9.0	A	Negligible	A
12	Meeting Street & Herbert Street	19,700 & 900	0.0	4.0	00:00	05:32	2,800	No	9.1	A	Negligible	--

1. Analyzed at-grade crossing locations are shown in Figure 4.8-7.

Source: Appendix F.

Table 4.8-19  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 1 (Proposed Project)

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,000	2.1	4.0	05:13	10:52	>5,280	Yes	65.9	E	Major	B
2	Attaway Street	6,200	3.7	4.0	06:21	10:52	2,150	No	49.5	D	Moderate	B
3	North Rhett Avenue	24,200	3.7	4.0	09:44	10:52	>5,280	Yes	170.0	F	<sup>2</sup> Negligible	F
4	Virginia Avenue	10,400	1.1	4.0	27:22	10:51	2,075	No	81.3	F	Major	D
5	Avenue B	10,100	1.1	4.0	35:38	10:50	>5,280	No	120.2	F	<sup>2</sup> Negligible	F
6	Dorchester Road (SC 642)	18,400	5.2	4.0	05:05	11:34	5,000	Yes	84.3	F	Major	B
7	Accabee Road	3,100	5.2	4.0	05:05	11:34	875	No	33.4	C	Moderate	A
8	Misroon Street	500	5.2	4.0	04:13	11:31	125	No	42.6	D	Major	A
9	Hackemann Avenue	1,500	3.1	4.0	05:29	11:31	>5,280	No	367.3	F	Major	E
10	Discher Street	3,200	5.2	4.0	04:12	10:46	>5,280	No	334.6	F	Major	E
11	Pittsburgh Avenue	2,100	0.0	4.0	00:00	10:46	875	No	44.1	D	Major	A
12	Meeting Street & Herbert Street	24,900 & 2,800	0.0	4.0	00:00	10:46	>5,280	No	36.6	D	Major	--

1. Analyzed at-grade crossing locations are shown in Figure 4.8-7.

2. Although the relative impact as compared to the No-Action is negligible the average delay per vehicle increased >20%.

Source: Appendix F.

#### 4.8.4 Alternative 2: Proposed Project Site (South via Milford / North via S-line)

The following sections describe the transportation impacts associated with Alternative 2, which is described in detail in Section 2.4.3 and shown in Figure 2.4-1. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. Alternative 2 impacts are summarized in Section 4.8.11.

Alternative 2 would be a variation of Alternative 1 (Proposed Project) where the Northern Rail Connection would be relocated along Spruill Avenue within existing CSX ROW to the S-line, and turn east along Aragon Avenue to the existing NCTC rail line. As a result of the rail alignment, a cul-de-sac would be constructed at the southern end of St. Johns Avenue. The former Charleston Naval Complex gate at Turnbull Avenue will be open to provide future access between St. Johns Avenue and Noisette Boulevard. Due to these roadway changes, the Alternative 2 daily volumes on Spruill Avenue, St. Johns Avenue, and the proposed Cosgrove Avenue/ McMillan Avenue Bypass would differ from Alternative 1 (Proposed Project). The opening year 2018 and design year 2038 Alternative 2 daily volumes are shown in Appendix F.

Same as Alternative 1 (Proposed Project), Alternative 2 creates a new at-grade rail crossing at the intersection of Meeting Street (US 52) and Herbert Street. This analyzed at-grade rail crossing is identified by ID 12 in the tables. Additionally, Alternative 2 creates a new at-grade rail crossing of O-Hear Avenue south of Bexley Street, which is identified by ID 13 in the tables.

### **Construction, Interstate 26, Interstate 526 and U.S. Highway 17**

Alternative 2 would have the same impacts during construction in opening year 2018 and design year 2038 to I-26, I-526 and US 17 as Alternative 1 (Proposed Project), which is described in Section 4.8.3.

### **North Charleston Intersections**

Alternative 2 included the analysis of 32 signalized intersections and 15 stop-controlled intersections within North Charleston. All of the same intersections analyzed for Alternative 1 (Proposed Project) were analyzed for Alternative 2, plus the stop-controlled Turnbull Avenue at St. Johns Avenue intersection. The intersection operations and impacts described for Alternative 1 (Proposed Project) in Section 4.8.3 would be the same for Alternative 2 except for two intersections. The signalized intersection of Spruill Avenue at McMillan Avenue and the stop-controlled intersection of Turnbull Avenue at St. Johns Avenue would differ.

The worst of the AM and PM peak hour intersection LOS for the Alternative 2 opening year 2018 and design year 2038 are shown in Figure 4.8-8 and Figure 4.8-9, respectively. A summary of the North Charleston Alternative 2 intersection operations is shown in Table 4.8-20. A summary of the opening year 2018 and design year 2038 Alternative 2 North Charleston intersection impacts by peak hour is shown in Table 4.8-21.

The new stop-controlled intersection of Turnbull Avenue at St. Johns Avenue would operate at LOS A in opening year 2018 and design year 2038 AM and PM peak hours. An impact cannot be defined for the intersection because it did not exist in the No-Action Alternative.

In the opening year 2018 AM and PM peak hours, Spruill Avenue at McMillan Avenue would operate with the same LOS in both Alternative 1 (Proposed Project) and Alternative 2, as the No Action Alternative. Both Alternatives would have a negligible impact on this intersection. In the design year 2038 AM peak hour, the intersection would improve one LOS grade, compared to the No Action Alternative, to LOS D. Both Alternative 1 (Proposed Project) and Alternative 2 would have a moderate beneficial impact since the LOS improved from LOS E in the No Action Alternative. In the design year 2038 PM peak hour, compared to the No Action Alternative, the intersection would improve one LOS grade to LOS C. Alternative 1 (Proposed Project) and Alternative 2 would both have a minor beneficial impact.

Table 4.8-20  
North Charleston Intersection Operations, Alternative 2

LOS	Signalized Intersections				Stop-Controlled Intersections			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	31 (97%)	29 (91%)	29 (91%)	28 (88%)	12 (80%)	11 (73%)	14 (93%)	13 (87%)
Fair	1 (3%)	2 (6%)	3 (9%)	1 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Poor	0 (0%)	1 (3%)	0 (0%)	3 (9%)	3 (20%)	4 (27%)	1 (7%)	2 (13%)

Source: Appendix F.

Table 4.8-21  
North Charleston Intersection Impacts for Alternative 2

Impact		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038
Beneficial	Major	0	0	0	0
	Moderate	0	1	0	1
	Minor	1	3	2	2
Negligible		36	36	37	35
Adverse	Minor	5	1	3	3
	Moderate	1	2	2	1
	Major	1	1	0	2

Source: Appendix F.

The I-26 ramp terminal intersections at Cosgrove Avenue and I-26 Eastbound ramp terminal intersection at Montague Avenue, along with the Port Access Road freeway elements, would operate the same and have the same impacts as Alternative 1 (Proposed Project).

## At-Grade Rail Crossings

Alternative 2 would have the same operations and impacts to ten of the 12 at-grade rail crossings analyzed in Alternative 1 (Proposed Project). The at-grade rail crossing of Attaway Street south of Greenbay Drive and North Rhett Avenue south of I-526 would differ in Alternative 2. The at-grade rail crossings of Attaway Street and North Rhett Avenue would differ in Alternative 2 because it reroutes approximately 0.4 more other commodity trains per day from the Reads Branch line than Alternative 1 (Proposed Project). Compared with the No-Action Alternative, Alternative 2, would reroute approximately 1.6 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley Corridors. The impact Alternative 2 would have on the at-grade crossings along the Park Circle and Bexley corridors was not analyzed, because no ICTF trains would use these corridors.

Additionally, because the Northern Rail Connection would be relocated to the S-line, and turn east along Aragon Avenue to the existing NCTC rail line, an additional at-grade rail crossing would be created at O'Hear Avenue south of Bexley Street. The at-grade crossing of O'Hear Avenue would operate at LOS A in the opening year 2018 and LOS B in the design year 2038. The opening year 2018 and design year 2038 Alternative 2 at-grade rail crossing analysis results are shown in Table 4.8-22 and Table 4.8-23, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 2 is shown in Figure 4.8-10.

The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase approximately 125 percent from the opening year 2018 No-Action Alternative to Alternative 2. In the design year 2038, the daily combined total rail occupancy time would increase nearly 200 percent.

Table 4.8-22  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 2

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,800	2.2	4.0	04:07	05:34	2,850	No	19.7	B	Minor	A
2	Attaway Street	4,500	3.3	4.0	03:47	05:38	800	No	14.0	B	Minor	A
3	North Rhett Avenue	16,200	3.3	4.0	07:16	05:38	>5,280	No	45.8	D	Negligible	D
4	Virginia Avenue	9,100	1.1	4.0	26:09	05:42	900	No	59.7	E	Moderate	D
5	Avenue B	9,000	1.1	4.0	34:34	05:40	2,500	No	89.1	F	Negligible	F
6	Dorchester Road (SC 642)	17,400	5.3	4.0	03:57	05:33	1,975	No	21.9	C	Minor	B

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
7	Accabee Road	3,100	5.3	4.0	03:10	05:32	450	No	14.4	B	Minor	A
8	Misroon Street	500	5.3	4.0	03:10	05:32	75	No	13.5	B	Minor	A
9	Hackemann Avenue	1,500	3.1	4.0	04:06	05:32	3,700	No	55.4	E	Moderate	C
10	Discher Street	3,100	5.3	4.0	03:09	05:31	2,950	No	64.2	E	Major	B
11	Pittsburgh Avenue	2,000	0.0	4.0	00:00	05:32	400	No	9.0	A	Negligible	A
12	Meeting Street & Herbert Street	19,700 & 900	0.0	4.0	00:00	05:32	2,800	No	9.1	A	Negligible	--
13	O'Hear Avenue	1,600	0.0	4.0	00:00	05:32	225	No	7.3	A	Negligible	--

1. Analyzed at-grade crossing locations are shown in Figure 4.8-10.

Source: Appendix F.

Table 4.8-23  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 2

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,000	2.2	4.0	05:13	10:52	>5,280	Yes	66.1	E	Major	B
2	Attaway Street	6,200	3.3	4.0	06:21	10:52	2,150	No	48.5	D	Moderate	B
3	North Rhett Avenue	24,200	3.3	4.0	09:44	10:52	>5,280	Yes	166.0	F	Negligible <sup>2</sup>	F
4	Virginia Avenue	10,400	1.1	4.0	27:22	10:51	2,075	No	82.3	F	Major	D
5	Avenue B	10,100	1.1	4.0	35:38	10:50	>5,280	No	122.0	F	Negligible <sup>2</sup>	F
6	Dorchester Road (SC 642)	18,400	5.3	4.0	05:05	11:34	5,000	Yes	84.5	F	Major	B
7	Accabee Road	3,100	5.3	4.0	05:05	11:34	875	No	33.3	C	Moderate	A
8	Misroon Street	500	5.3	4.0	04:13	11:31	125	No	42.7	D	Major	A
9	Hackemann Avenue	1,500	3.1	4.0	05:29	11:31	>5,280	No	367.5	F	Major	E
10	Discher Street	3,200	5.3	4.0	04:12	10:46	>5,280	No	334.7	F	Major	E

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
11	Pittsburgh Avenue	2,100	0.0	4.0	00:00	10:46	875	No	44.1	D	Major	A
12	Meeting Street & Herbert Street	24,900 & 2,800	0.0	4.0	00:00	10:46	>5,280	No	36.6	D	Major	-
13	O'Hear Avenue	3,100	0.0	4.0	00:00	10:49	450	No	12.4	B	Minor	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-10.

2. Although the relative impact as compared to the No-Action is negligible the average delay per vehicle increased >20%.

Source: Appendix F.

#### 4.8.5 Alternative 3: Proposed Project Site (South via Kingsworth / North via Hospital District)

The following sections describe the transportation impacts associated with Alternative 3, which is described in detail in Section 2.4.4. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. Alternative 3 impacts are summarized in Section 4.8.11.

Alternative 3 would be a variation of Alternative 1 (Proposed Project) where the southern rail connection would connect to an existing rail line near Kingsworth Avenue. The daily volumes for Alternative 3 would be the same as Alternative 1 (Proposed Project), which are shown in Appendix F.

#### Construction, Interstate 26, Interstate 526, U.S. Highway 17 and North Charleston Intersections

Alternative 3 would have the same impacts during construction in the opening year 2018 and design year 2038 to I-26, I-526, US 17 and North Charleston intersections as Alternative 1 (Proposed Project), which is described in Section 4.8.3.

## At-Grade Rail Crossings

Alternative 3 would have the same impacts to the first nine at-grade rail crossings analyzed in Alternative 1 (Proposed Project). Compared with the No-Action Alternative, same as Alternative 1 (Proposed Project), Alternative 3 would reroute approximately 1.2 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley Corridors. The impact Alternative 3 would have on the at-grade crossings along the Park Circle and Bexley corridors was not analyzed because no ICTF trains would use these corridors.

In Alternative 3 the southern alignment would only go down to around Kingsworth Avenue. Therefore, the existing at-grade crossings of Pittsburgh Avenue and Discher Street would not be impacted with ICTF train occurrences and the new at-grade crossing of Meeting Street at Herbert Street would not be created for Alternative 3. Alternative 3 would create two new at-grade crossings. One at-grade crossing would be at Meeting Street and the other at Spruill Avenue, near Kingsworth Avenue. Because these two at-grade crossings are located close together and their operations would influence each other, their impacts were identified as one location. The at-grade crossings of Meeting Street and Spruill Avenue would operate at LOS A in the opening year 2018 and at LOS D in the design year 2038. Alternative 3 would have a major adverse impact on these two new at-grade crossings in the design year 2038. When there is an ICTF train occurrence, only I-26 and King Street Extension would serve as a connection between North Charleston and Charleston. The opening year 2018 and design year 2038 Alternative 3 at-grade rail crossing analysis results are shown in Table 4.8-24 and Table 4.8-25, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 3 is shown in Figure 4.8-11.

The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 100 percent from the opening year 2018 No-Action Alternative to Alternative 3. In the design year 2038, the daily combined total rail occupancy time would increase approximately 150 percent.



Table 4.8-24  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 3

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,800	2.2	4.0	04:07	05:34	2,850	No	19.7	B	Minor	A
2	Attaway Street	4,500	3.7	4.0	03:47	05:38	800	No	14.5	B	Minor	A
3	North Rhett Avenue	16,200	3.7	4.0	07:16	05:38	>5,280	No	47.3	D	Negligible	D
4	Virginia Avenue	9,100	1.1	4.0	26:09	05:42	900	No	59.7	E	Moderate	D
5	Avenue B	9,000	1.1	4.0	34:34	05:40	2,500	No	89.0	F	Negligible	F
6	Dorchester Road (SC 642)	17,400	5.3	4.0	03:57	05:33	1,975	No	21.9	C	Minor	B
7	Accabee Road	3,100	5.3	4.0	03:10	05:32	450	No	14.4	B	Minor	A
8	Misroon Street	500	5.3	4.0	03:10	05:32	75	No	13.5	B	Minor	A
9	Hackemann Avenue	1,500	3.1	4.0	04:06	05:32	3,700	No	55.4	E	Moderate	C
10	Discher Street	3,100	5.3	0.0	03:09	00:00	-	-	-	-	-	B
11	Pittsburgh Avenue	2,000	0.0	0.0	00:00	00:00	-	-	-	-	-	A
14	Meeting Street & Spruill Avenue	6,700 & 13,100	0.0	4.0	00:00	05:32	>5,280	No	9.4	A	Negligible	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-11.

Source: Appendix F.

Table 4.8-25  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 3

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,000	2.1	4.0	05:13	10:52	>5,280	Yes	65.9	E	Major	B
2	Attaway Street	6,200	3.7	4.0	06:21	10:52	2,150	No	49.5	D	Moderate	B
3	North Rhett Avenue	24,200	3.7	4.0	09:44	10:52	>5,280	Yes	169.9	F	<sup>2</sup> Negligible	F
4	Virginia Avenue	10,400	1.1	4.0	27:22	10:51	2,075	No	81.0	F	Major	D
5	Avenue B	10,100	1.1	4.0	35:38	10:50	>5,280	No	119.6	F	<sup>2</sup> Negligible	F
6	Dorchester Road (SC 642)	18,400	5.2	4.0	05:05	11:34	5,000	Yes	84.3	F	Major	B
7	Accabee Road	3,100	5.2	4.0	05:05	11:34	875	No	33.4	C	Moderate	A
8	Misroon Street	500	5.2	4.0	04:13	11:31	125	No	42.6	D	Major	A
9	Hackemann Avenue	1,500	3.1	4.0	05:29	11:31	>5,280	No	367.2	F	Major	E
10	Discher Street	3,200	5.3	0.0	04:12	0:00	-	-	-	-	-	E
11	Pittsburgh Avenue	2,100	0.0	0.0	00:00	00:00	-	-	-	-	-	A
14	Meeting Street & Spruill Avenue	9,700 & 15,600	0.0	4.0	00:00	10:45	>5,280	No	38.4	D	Major	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-11.

2. Although the relative impact as compared to the No-Action is negligible the average delay per vehicle increased >20%.

Source: Appendix F.

#### 4.8.6 Alternative 4: Proposed Project Site (South via Milford)

The following sections describe the transportation impacts associated with Alternative 4, which is described in detail in Section 2.4.5. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. Alternative 4 impacts are summarized in Section 4.8.11.

Alternative 4 would be a variation of Alternative 1 (Proposed Project), where all rail traffic would enter and exit the Navy Base ICTF from a dual southern rail connection near Milford Street. Proposed rail through the Hospital District would stop short of Noisette Creek. The daily volumes for Alternative 3 would be the same as Alternative 1 (Proposed Project), which are shown in Appendix F.

### **Construction, Interstate 26, Interstate 526, U.S. Highway 17 and North Charleston Intersections**

Alternative 4 would have the same impacts during construction, opening year 2018 and design year 2038 to I-26, I-526, US 17 and North Charleston intersections as Alternative 1 (Proposed Project), which is described in Section 4.8.3.

### **At-Grade Rail Crossings**

In Alternative 4 all rail traffic would use the southern rail alignment to Milford Street. Since no intermodal trains would use the Alternative 1 (Proposed Project) northern alignment, Alternative 4 would not impact the at-grade crossings of Rivers Avenue, Virginia Avenue and Avenue B. The at-grade rail crossings of Attaway Street and North Rhett Avenue would differ compared to the No-Action Alternative because Alternative 4 reroutes approximately 1.6 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley Corridors. The impact Alternative 4 would have on the at-grade crossings along the Reads Branch, Park Circle and Bexley corridors was not analyzed because no ICTF trains would use these corridors.

Alternative 4 would have twice as many ICTF train occurrences than Alternative 1 (Proposed Project), eight per day, at the at-grade crossings along the southern alignment. The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 135 percent from the opening year 2018 No-Action Alternative for Alternative 4. In the design year 2038, the daily combined total rail occupancy time would increase approximately 215 percent.

Alternative 4 would have an impact on all seven of the analyzed at-grade rail crossings along the southern alignment. In the opening year 2018, two at-grade crossings would operate with a Poor LOS. These two locations are the at-grade crossings of Hackemann Avenue and Discher Street, both of which are located between Meeting Street and King Street. Alternative 4 would have a major adverse impact on both of these crossings, as Meeting Street and King Street would experience queueing and delay. None of the at-grade rail crossings would create a queue from an ICTF train occurrence that impacts an interstate mainline in the opening year 2018.

By the design year 2038, the average ICTF train crossing duration time would approximately double from the opening year 2018 value. The longer ICTF train crossing durations, as well as higher roadway volumes and longer other commodity train crossing durations, would lead to all seven of the at-grade crossing locations along the southern alignment operating with a Poor LOS. Alternative 4 would have a major adverse impact on all seven at-grade crossing locations. Additionally, the at-grade rail crossing of Dorchester Road west of Meeting Street would create a queue from an ICTF train occurrence that impacts an interstate mainline in the design year 2038.

The opening year 2018 and design year 2038 Alternative 4 at-grade rail crossing analysis results are shown in Table 4.8-26 and Table 4.8-27, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 4 is shown in Figure 4.8-12.

Table 4.8-26  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 4

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,800	2.2	0.0	04:07	00:00	-	-	-	-	-	A
2	Attaway Street	4,500	3.3	0.0	03:47	00:00	-	-	-	-	-	A
3	North Rhett Avenue	16,200	3.3	0.0	07:16	00:00	-	-	-	-	-	D
4	Virginia Avenue	9,100	1.2	0.0	26:09	00:00	-	-	-	-	-	D
5	Avenue B	9,000	1.2	0.0	34:34	00:00	-	-	-	-	-	F
6	Dorchester Road (SC 642)	17,400	5.3	8.0	03:57	05:33	1,975	No	34.4	C	Minor	B
7	Accabee Road	3,100	5.3	8.0	03:10	05:32	450	No	20.9	C	Moderate	A
8	Misroon Street	500	5.3	8.0	03:10	05:32	75	No	21.8	C	Moderate	A
9	Hackemann Avenue	1,500	3.1	8.0	04:06	05:32	3,700	No	89.9	F	Major	C
10	Discher Street	3,100	5.3	8.0	03:09	05:31	2,950	No	108.1	F	Major	B
11	Pittsburgh Avenue	2,000	0.0	8.0	00:00	05:32	400	No	18.1	B	Minor	A
12	Meeting Street & Herbert Street	19,700 & 900	0.0	8.0	00:00	05:32	2,800	No	18.1	B	Minor	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-12.

Source: Appendix F.

Table 4.8-27  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 4

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,000	2.2	0.0	05:13	00:00	-	-	-	-	-	B
2	Attaway Street	6,200	3.3	0.0	06:21	00:00	-	-	-	-	-	B
3	North Rhett Avenue	24,200	3.3	0.0	09:44	00:00	-	-	-	-	-	F
4	Virginia Avenue	10,400	1.2	0.0	27:22	00:00	-	-	-	-	-	D
5	Avenue B	10,100	1.2	0.0	35:38	00:00	-	-	-	-	-	F
6	Dorchester Road (SC 642)	18,400	5.3	8.0	05:05	11:34	5,000	Yes	149.1	F	Major	B
7	Accabee Road	3,100	5.3	8.0	05:05	11:34	875	No	58.8	E	Major	A
8	Misroon Street	500	5.3	8.0	04:13	11:31	125	No	75.9	E	Major	A
9	Hackemann Avenue	1,500	3.1	8.0	05:29	11:31	>5,280	No	679.2	F	Major	E
10	Discher Street	3,200	5.3	8.0	04:12	10:46	>5,280	No	591.8	F	Major	E
11	Pittsburgh Avenue	2,100	0.0	8.0	00:00	10:46	875	No	88.1	F	Major	A
12	Meeting Street & Herbert Street	24,900 & 2,800	0.0	8.0	00:00	10:46	>5,280	No	73.2	E	Major	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-12.

Source: Appendix F.

#### 4.8.7 Alternative 5: River Center Project Site (South via Milford / North via Hospital District)

The following sections describe the transportation impacts associated with Alternative 5, which is described in detail in Section 2.4.6. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. The Alternative 5 impacts are summarized in Section 4.8.11.

Alternative 5 would be a variation of Alternative 1 (Proposed Project), with the Project site being moved to the River Center project site. Road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site. The primary roadway network change would be the elimination of the McMillan Avenue/ Cosgrove Avenue Realignment in Alternative 5.

As with as Alternative 1 (Proposed Project), Alternative 5 would also create a new at-grade rail crossing at the intersection of Meeting Street (US 52) and Herbert Street. This analyzed at-grade rail crossing network is identified by ID 12 in the tables.

Traffic patterns around the proposed ICTF at River Center site change compared to the No-Action Alternative due to the ICTF and modifications to the roadway network. The distribution of the River Center project site ICTF truck traffic between the container Port Terminals and other regional sites would be the same as the Project site, which is shown in Exhibit 4.8-1 in Section 4.8.3. Additionally, the total volume of truck, employee, and visitor traffic destined to and from the proposed ICTF at River Center would be the same as the Project site shown in Section 4.8.3. Roadway modifications, which are discussed in Section 2.4.6, lead to increased volumes compared to the No-Action Alternative primarily on Spruill Avenue north of McMillan Avenue, Noisette Boulevard, and the Local Access Road. The opening year 2018 and design year 2038 Alternative 5 daily volumes are shown in Appendix F.

#### Construction

During construction of the ICTF and associated roadway improvements, Alternative 5 would have a negligible impact on I-26, I-526 and US 17 and a minor adverse impact on the operations of the North Charleston intersections. The Corps anticipates that at the peak of construction, up to 200 trips per day would be generated. The construction traffic would primarily use major arterial roadways such as I-26, I-526, Cosgrove Avenue, McMillan Avenue, Rivers Avenue and Spruill Avenue. The 200 construction trips per day would only be a small fraction of the daily volumes on these roadways, especially the interstates. A maintenance of traffic (MOT) plan has not been developed but may include detours and temporary lane closures. MOTs are typically developed once final design is complete, prior to construction.

## Interstate 26

Consistent with the opening year 2018 No-Action Alternative, the morning congestion on I-26 occurs in the eastbound direction, and the evening congestion occurs in the westbound direction for Alternative 5. Approximately 13 percent of the total analyzed segments (AM and PM peak hours for eastbound and westbound I-26) would operate at Poor LOS and 26 percent would operate at Fair LOS. By the design year 2038, approximately 24 percent of the total analyzed segments would operate at Poor LOS and 21 percent would operate at Fair LOS. A summary of the I-26 freeway segment LOS by direction and peak hour is shown in Table 4.8-28.

Table 4.8-28  
I-26 Operations, Alternative 5

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	15 Segments (36%)	13 Segments (31%)	36 Segments (86%)	31 Segments (74%)	34 Segments (90%)	33 Segments (87%)	13 Segments (34%)	11 Segments (29%)
Fair	17 Segments (40%)	9 Segments (21%)	4 Segments (9%)	8 Segments (19%)	2 Segments (5%)	3 Segments (8%)	19 Segments (50%)	14 Segments (37%)
Poor	10 Segments (24%)	20 Segments (48%)	2 Segments (5%)	3 Segments (7%)	2 Segments (5%)	2 Segments (5%)	6 Segments (16%)	13 Segments (34%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-26.

Source: Appendix F.

In the opening year 2018 and design year 2038, Alternative 5 would have a negligible impact on the majority of the I-26 corridor in comparison with the No-Action Alternative. Alternative 5 would have a beneficial or adverse impact on a few segments due to a LOS change. The LOS change is a result of the segments having a density near a LOS threshold. All segments would only have a slight increase or decrease in density. A summary of the opening year 2018 and design year 2038 I-26 freeway impacts by direction and peak hour is shown in Table 4.8-29.



Table 4.8-29  
Number of I-26 Freeway Segment Impacts, Alternative 5

Impact		Eastbound				Westbound			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038	2018	2038	2018	2038
Beneficial	Major	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	1	0
	Minor	1	2	0	2	0	4	1	1
Negligible		39	39	41	40	36	34	34	35
Adverse	Minor	1	0	1	0	2	0	1	1
	Moderate	1	1	0	0	0	0	1	1
	Major	0	0	0	0	0	0	0	0

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-26.

Source: Appendix F.

## Interstate 526

Similar to the opening year 2018 No-Action Alternative, the majority of the congestion along I-526 would occur between Paul Cantrell Boulevard and Long Point Road. Approximately 23 percent of the total analyzed segments (AM and PM peak hours for eastbound and westbound I-526) would operate at Poor LOS and 39 percent would operate at Fair LOS. By the design year 2038, approximately 35 percent of the total analyzed segments would operate at Poor LOS and 34 percent would operate at Fair LOS. A summary of the I-526 freeway segment LOS by direction and peak hour is shown in Table 4.8-30.

Table 4.8-30  
I-526 Operations, Alternative 5

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	17 Segments (38%)	14 Segments (31%)	13 Segments (29%)	13 Segments (28%)	17 Segments (40%)	12 Segments (28%)	19 Segments (44%)	16 Segments (37%)
Fair	16 Segments (35%)	14 Segments (31%)	23 Segments (51%)	16 Segments (36%)	14 Segments (32%)	14 Segments (33%)	16 Segments (37%)	15 Segments (35%)
Poor	12 Segments (27%)	17 Segments (38%)	9 Segments (20%)	16 Segments (36%)	12 Segments (28%)	17 Segments (39%)	8 Segments (19%)	12 Segments (28%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-526.

Source: Appendix F.

In the opening year 2018 and design year 2038, Alternative 5 would have a negligible impact on the majority of the I-526 corridor in comparison with the No-Action Alternative. Alternative 5 would have a beneficial or adverse impact on a few segments due to a LOS change. The LOS change is a result of the segments having a density near a LOS threshold. All segments would only have a slight increase or decrease in density. A summary of the opening year 2018 and design year 2038 I-526 freeway impacts by direction and peak hour is shown in Table 4.8-31.

Table 4.8-31  
Number of I-526 Freeway Segment Impacts, Alternative 5

Impact	Eastbound				Westbound				
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
	2018	2038	2018	2038	2018	2038	2018	2038	
Beneficial	Major	1	1	0	2	2	0	0	0
	Moderate	0	0	1	0	0	0	0	0
	Minor	0	1	0	0	1	0	0	1
Negligible		43	41	44	39	40	38	43	36
Adverse	Minor	0	2	0	1	0	3	0	1
	Moderate	1	0	0	3	0	1	0	3
	Major	0	0	0	0	0	1	0	2

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between eastbound and westbound I-526.

Source: Appendix F.

## U.S. Highway 17

Similar to the opening year 2018 No-Action Alternative, the majority of the US 17 corridor would operate at Good or Fair levels for Alternative 5. Only one freeway segment and no intersections would operate at Poor LOS in either the AM or PM peak hour. By the design year 2038, no additional freeway segments and three additional intersections would operate at Poor LOS in either the AM or PM peak hour. A summary of the US 17 freeway segment LOS by direction and peak hour is shown in Table 4.8-32. A summary of the US 17 signalized intersection operations is shown in Table 4.8-33.

Table 4.8-32  
US 17 Freeway Operations, Alternative 5

LOS	Eastbound				Westbound			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	10 Segments (100%)	9 Segments (90%)	8 Segments (80%)	5 Segments (50%)	11 Segments (100%)	8 Segments (73%)	11 Segments (100%)	10 Segments (91%)
Fair	0 Segments (10%)	1 Segment (10%)	1 Segment (10%)	4 Segments (40%)	0 Segments (0%)	3 Segments (27%)	0 Segments (0%)	1 Segment (9%)
Poor	0 Segments (0%)	0 Segments (0%)	1 Segment (10%)	1 Segment (10%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)	0 Segments (0%)

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between northbound and southbound US 17.

Source: Appendix F.

Table 4.8-33  
US 17 Intersection Operations, Alternative 5

LOS	AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038
Good	2 Intersections (40%)	2 Intersections (40%)	3 Intersections (60%)	2 Intersections (40%)
Fair	3 Intersections (60%)	2 Intersections (40%)	2 Intersections (40%)	1 Intersection (20%)
Poor	0 Intersections (0%)	1 Intersection (20%)	0 Intersections (0%)	2 Intersections (40%)

Source: Appendix F.

In the opening year 2018, Alternative 5 would have a negligible impact on the majority of the US 17 corridor in comparison with the No-Action Alternative. Alternative 5 would have a beneficial impact on four US 17 segments (10 percent of the total segments) and two US 17 intersections (20 percent of the total intersections) in either the AM or PM peak hour. All four of the freeway segments and one of the two intersections would have a minor beneficial impact, which equates to an improvement of one LOS grade. The intersection of US 17 at Shelmore Boulevard would have a moderate beneficial

impact in the AM peak hour. Alternatively, Alternative 5 would have an adverse impact on no US 17 segments and one US 17 intersection (10 percent of the total intersections) in either the AM or PM peak hour. The one intersection would have a minor adverse impact, which equates to a degradation of one LOS grade. In the design year 2038, Alternative 5 would have a negligible impact on all but one of the analyzed US 17 freeway segments and all of the US 17 intersections. Alternative 5 would have a moderate beneficial impact on the northbound US 17 diverge to Coleman Boulevard in the PM peak hour but would only experience a small decrease in density. A summary of the opening year 2018 and design year 2038 US 17 freeway impacts by direction and peak hour is shown in Table 4.8-34. A summary of the opening year 2018 and design year 2038 US 17 intersection impacts by peak hour is shown in Table 4.8-35.

Table 4.8-34  
US 17 Freeway Segment Impacts for Alternative 5

Impact		Northbound				Southbound			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038	2018	2038	2018	2038
Beneficial	Major	0	0	0	0	0	0	0	0
	Moderate	0	0	0	1	0	0	0	0
	Minor	2	0	0	0	2	0	0	0
Negligible		8	10	10	9	9	11	11	11
Adverse	Minor	0	0	0	0	0	0	0	0
	Moderate	0	0	0	0	0	0	0	0
	Major	0	0	0	0	0	0	0	0

Note: Segments include basic freeway, weave, and ramp merge and diverge locations, which may vary in number between northbound and southbound US 17.

Source: Appendix F.

Table 4.8-35  
US 17 Intersection Impacts for Alternative 5

Impact		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038
Beneficial	Major	0	0	0	0
	Moderate	1	0	0	0
	Minor	0	0	1	0
Negligible		3	5	4	5
Adverse	Minor	1	0	0	0
	Moderate	0	0	0	0
	Major	0	0	0	0

Source: Appendix F.

### North Charleston Intersections

Alternative 5 included the analysis of 32 signalized intersections and 12 stop-controlled intersections within North Charleston. The ICTF truck driveway would replace the east leg of Cosgrove Avenue at the signalized intersection with Spruill Avenue. The ICTF employee and visitor driveway would create a new stop-controlled intersection at St. Johns Avenue where Turnbull Avenue currently exists. The segment of McMillan Avenue between St. Johns Avenue and Noisette Boulevard would be closed, which eliminates two of the stop-controlled intersections analyzed as part of the No-Action Alternative. Additionally, the removal of Viaduct Road eliminates two stop-controlled intersections, which are the ramps connecting Viaduct Road and Bainbridge Avenue. The existing stop-controlled Viaduct Road intersection at North Hobson Avenue and South Hobson Avenue is replaced with a stop-controlled intersection where the Local Access Road, North Hobson Avenue, and South Hobson Avenue meet. Finally, Bainbridge Avenue would be slightly realigned at "T" into the Local Access Road as a signalized intersection.

The worst of the AM and PM peak hour intersection LOS for the Alternative 5 opening year 2018 and design year 2038 are shown in Figure 4.8-13 and Figure 4.8-14 respectively. A summary of the North Charleston intersection operations is shown in Table 4.8-36.

Consistent with the opening year 2018 No-Action Alternative, within North Charleston, the majority of the analyzed intersections operate with little delay. The stop-controlled intersections of Virginia Avenue at Avenue B and the I-526 Eastbound Off-Ramp at Virginia Avenue are the only intersections that would operate with a Poor LOS.

Table 4.8-36  
North Charleston Intersection Operations, Alternative 5

LOS	Signalized Intersections				Stop-Controlled Intersections			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	2018	2038	2018	2038	2018	2038	2018	2038
Good	32 (100%)	30 (94%)	30 (94%)	28 (88%)	10 (83%)	8 (67%)	11 (92%)	11 (92%)
Fair	0 (0%)	2 (6%)	2 (6%)	2 (6%)	0 (0%)	1 (8%)	1 (8%)	0 (0%)
Poor	0 (0%)	0 (0%)	0 (0%)	2 (6%)	2 (17%)	3 (25%)	0 (0%)	1 (8%)

Source: Appendix F.

By the design year 2038, a few additional intersections would operate with Poor LOS but the majority of the intersections would still operate with little delay. The signalized intersection of Cosgrove Avenue at Rivers Avenue and Cosgrove Avenue at Azalea Drive, the stop-controlled intersections of Turnbull Avenue at Noisette Boulevard, Avenue B at Virginia Avenue, Montague Avenue at Virginia Avenue, and the I-526 Eastbound Off-Ramp at Virginia Avenue are the only intersections that would operate with a Poor LOS.

A summary of the opening year 2018 and design year 2038 Alternative 5 North Charleston intersection impacts by peak hour is shown in Table 4.8-37. The stop-controlled intersection of the ICTF employee and visitor driveway at St. Johns Avenue did not exist in the No-Action Alternative so it was only analyzed in Alternative 5. An impact cannot be defined for this intersection, because it was not analyzed in the No-Action Alternative. However, the intersection would operate at Good LOS in the opening year 2018 and design year 2038 Alternative 5 for both the AM and PM peak hours.

In the opening year 2018, Alternative 5 would have a negligible impact on the majority of the analyzed intersections in North Charleston compared with the No-Action Alternative. Alternative 5 would have a beneficial impact on two intersections (2 percent of the total intersections) in either the AM or PM peak hour. Both of the intersections would have a minor beneficial impact, which equates to an improvement of one LOS grade. Alternatively, Alternative 5 would have an adverse impact on seven intersections (8 percent of the total intersections) in either the AM or PM peak hour. All seven of the intersections would have a minor adverse impact, which equates to a degradation of one LOS grade.

Table 4.8-37  
North Charleston Intersection Impacts, Alternative 5

Impact		AM Peak Hour		PM Peak Hour	
		2018	2038	2018	2038
Beneficial	Major	0	0	0	0
	Moderate	0	1	0	0
	Minor	2	4	0	4
Negligible		38	33	39	35
Adverse	Minor	3	4	4	3
	Moderate	0	0	0	0
	Major	0	1	0	1

Source: Appendix F.

In the design year 2038, similar to the opening year 2018, Alternative 5 would have a negligible impact on the majority of the analyzed intersections in North Charleston compared with the No-Action Alternative. Alternative 5 would have a beneficial impact on nine intersections (10 percent of the total intersections) in either the AM or PM peak hour. Eight of the nine intersections would have a minor beneficial impact, which equates to an improvement of one LOS grade. A moderate beneficial impact would be experienced by the signalized intersection of Spruill Avenue at McMillan Avenue in the AM peak hour. The intersection LOS would improve, because the traffic volume on McMillan Avenue would go down in Alternative 5 as McMillan Avenue would be closed between St. Johns Avenue and Noisette Boulevard to accommodate the ICTF.

Alternatively, in the design year 2038, Alternative 5 would have an adverse impact on nine intersections (10 percent of the total intersections) in either the AM or PM peak hour. Seven of the nine intersections would have a minor adverse impact, which equates to a degradation of one LOS grade. The stop-controlled Montague Avenue at Virginia Avenue intersection would have an adverse major impact in both the AM and PM peak hours. Traffic volumes at this intersection would increase due to the closure of McMillan Avenue between St. Johns Avenue and Noisette Boulevard and due to the additional ICTF employee and visitor traffic.

The I-26 ramp terminal intersections at Cosgrove Avenue and I-26 Eastbound ramp terminal intersection at Montague Avenue are neither signalized nor stop-controlled. The ramp terminal intersections act as merge, diverge or weave elements along Cosgrove Avenue and Montague Avenue. All ten of the elements would operate at Good LOS during both the AM and PM peak hours in the opening year 2018 and design year 2038 Alternative 5.

In the opening year 2018, two freeway elements were analyzed on the Port Access Road. The HLT would not be open to traffic in the year 2018, so all eastbound Port Access Road traffic would be destined to the Local Access Road and all westbound Port Access Road traffic would come from the Local Access Road. The two analyzed elements were the eastbound Port Access Road merge from the eastbound and westbound I-26 ramps and the split of the westbound Port Access Road to eastbound and westbound I-26. Same as the No-Action Alternative, both of these elements would operate at Good LOS during both the AM and PM peak hours in the opening year.

In the design year 2038, the analysis also included the on- and off- ramps from the Port Access Road to the Local Access Road. The HLT would be open, and the Port Access Road would serve most of the traffic to and from the facility along with the traffic destined to the Local Access Road. Same as the No-Action Alternative, all four freeway elements on the Port Access Road would operate at Good LOS during both the AM and PM peak hours in the design year.

### At-Grade Rail Crossings

For Alternative 5, the number of ICTF and other commodity train occurrences and the average duration of the occurrences would be the same as Alternative 1 (Proposed Project), while the roadway volumes would be different. The opening year 2018 and design year 2038 Alternative 5 at-grade rail crossing analysis results are shown in Table 4.8-38 and Table 4.8-39, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 5 is shown in Figure 4.8-15.

Compared with the No-Action Alternative, Alternative 5 would reroute approximately 1.2 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley corridors. The impact Alternative 5 would have on the at-grade crossings along the Park Circle and Bexley corridors was not analyzed, because no ICTF trains would use these corridors.

Alternative 5 would have an impact on several of the at-grade rail crossings in North Charleston due to changing train and vehicular volumes and routes. The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 120 percent from the opening year 2018 No-Action Alternative to Alternative 5. In the design year 2038, the daily combined total rail occupancy time would increase over 180 percent.



Table 4.8-38  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 5

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,600	2.2	4.0	04:07	05:34	2,925	No	18.2	B	Minor	A
2	Attaway Street	4,500	3.7	4.0	03:47	05:38	775	No	14.3	B	Minor	A
3	North Rhett Avenue	16,400	3.7	4.0	07:16	05:38	>5,280	Yes	50.3	D	Negligible	D
4	Virginia Avenue	9,200	1.1	4.0	26:09	05:42	900	No	57.6	E	Moderate	D
5	Avenue B	7,500	1.1	4.0	34:34	05:40	1,925	No	90.4	F	Negligible	F
6	Dorchester Road (SC 642)	17,000	5.3	4.0	03:57	05:33	2,125	No	25.3	C	Minor	B
7	Accabee Road	3,100	5.3	4.0	03:10	05:32	450	No	15.1	B	Minor	A
8	Misroon Street	500	5.3	4.0	03:10	05:32	75	No	13.5	B	Minor	A
9	Hackemann Avenue	1,500	3.1	4.0	04:06	05:32	3,675	No	48.9	D	Minor	C
10	Discher Street	3,100	5.3	4.0	03:09	05:31	3,450	No	58.7	E	Major	B
11	Pittsburgh Avenue	2,000	0.0	4.0	00:00	05:32	400	No	10.3	B	Minor	A
12	Meeting Street & Herbert Street	18,000 & 900	0.0	4.0	00:00	05:32	2,900	No	8.8	A	Negligible	--

1. Analyzed at-grade crossing locations are shown in Figure 4.8-15.

Source: Appendix F.

Table 4.8-39  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 5

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,200	2.1	4.0	05:13	10:52	>5,280	Yes	64.3	E	Major	B
2	Attaway Street	6,300	3.7	4.0	06:21	10:52	2,200	No	50.4	D	Moderate	B
3	North Rhett Avenue	23,900	3.7	4.0	09:44	10:52	>5,280	Yes	185.1	F	<sup>2</sup> Negligible	F
4	Virginia Avenue	11,300	1.1	4.0	27:22	10:51	2,700	Yes	87.5	F	Major	D
5	Avenue B	9,600	1.1	4.0	35:38	10:50	>5,280	No	117.2	F	<sup>2</sup> Negligible	F
6	Dorchester Road (SC 642)	17,300	5.2	4.0	05:05	11:34	4,650	Yes	84.0	F	Major	B
7	Accabee Road	3,100	5.2	4.0	05:05	11:34	875	No	37.6	D	Major	A
8	Misroon Street	500	5.2	4.0	04:13	11:31	125	No	43.2	D	Major	A
9	Hackemann Avenue	1,500	3.1	4.0	05:29	11:31	>5,280	No	386.6	F	Major	E
10	Discher Street	3,200	5.2	4.0	04:12	10:46	>5,280	No	330.8	F	Major	E
11	Pittsburgh Avenue	2,100	0.0	4.0	00:00	10:46	825	No	45.5	D	Major	A
12	Meeting Street & Herbert Street	23,600 & 2,800	0.0	4.0	00:00	10:46	>5,280	No	36.6	D	Major	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-15.

2. Although the relative impact as compared to the No-Action is negligible the average delay per vehicle increased >20%.

Source: Appendix F.

In the opening year 2018, three at-grade crossings would operate with a Poor LOS. These three locations are the at-grade crossings of Virginia Avenue north of Empire Avenue, Avenue B east of Virginia Avenue, and Discher Street between Meeting Street and King Street. Only the at-grade rail crossing of Discher Street would have a major adverse impact. The at-grade rail crossing of Avenue B would have a negligible impact, because it would operate with a LOS F in both the No-Action Alternative and Alternative 5 and the average vehicle delay would only increase approximately ten percent. The at-grade rail crossing of Virginia Avenue would have a moderate adverse impact, as the LOS would degrade from a LOS D in the No-Action Alternative to a LOS E in Alternative 5. None of the at-grade rail crossings would create a queue from an ICTF train occurrence that impacts an interstate mainline in the opening year 2018. The at-grade rail crossings of North Rhett Avenue south of I-526 would create a queue from an ICTF train occurrence that impacts the I-526 mainline in the opening year 2018. However, this would also occur with another commodity train occurrence in the opening year 2018 No-Action Alternative.

By the design year 2038, the average ICTF train crossing duration time would approximately double from the opening year 2018 value. The longer ICTF train crossing durations, as well as higher roadway volumes and longer other commodity train crossing durations, would lead to seven of the 12 at-grade crossing locations operating with a Poor LOS and nine of the 12 analyzed at-grade rail crossings having a major adverse impact in the design year 2038. Additionally, the at-grade rail crossings of Rivers Avenue north of Taylor Street, North Rhett Avenue south of I-526, Virginia Avenue north of Empire Avenue, and Dorchester Road west of Meeting Street would create a queue from an ICTF train occurrence that impacts an interstate mainline in the design year 2038. However, in the No-Action Alternative, only the Dorchester Road at-grade crossing would not impact an interstate mainline.

#### **4.8.8 Alternative 6: River Center Project Site (South via Kingsworth / North via Hospital District)**

The following sections describe the transportation impacts associated with Alternative 6, which is described in detail in Section 2.4.7. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. The Alternative 6 impacts are summarized in Section 4.8.11.

Alternative 6 would be a variation of Alternative 1 (Proposed Project) with the Project site being moved to the River Center project site and the southern rail connection would connect to an existing rail line near Kingsworth Avenue. Road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site. The daily volumes for Alternative 6 would be the same as Alternative 5, which are shown in Appendix F.

## Construction, Interstate 26, Interstate 526, U.S. Highway 17 and North Charleston Intersections

Alternative 6 would have the same impacts during construction in opening year 2018 and design year 2028 to I-26, I-526, US 17, and the North Charleston Intersections as Alternative 5, which is described in Section 4.8.7.

### At-Grade Rail Crossings

Alternative 6 would have the same operations and impacts to the first nine at-grade rail crossings analyzed in Alternative 5. Compared with the No-Action Alternative, same as Alternative 5, Alternative 6 would reroute approximately 1.2 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley corridors. The impact Alternative 6 would have on the at-grade crossings along the Park Circle and Bexley corridors was not analyzed because no ICTF trains would use these corridors.

In Alternative 6, the southern alignment would only go down to around Kingsworth Avenue. Therefore, the existing at-grade crossings of Pittsburgh Avenue and Discher Street would not be impacted with ICTF train occurrences and the new at-grade crossing of Meeting Street at Herbert Street would not be created for Alternative 6. Alternative 6 would create two new at-grade crossings. One at-grade crossings would be at Meeting Street and the other at Spruill Avenue, near Kingsworth Avenue. Because these two at-grade crossings are located close together and their operations would influence each other, their impacts were identified as one location. The at-grade crossings of Meeting Street and Spruill Avenue would operate at LOS A in the opening year 2018 and LOS C in the design year 2038. Alternative 6 would have a negligible impact on these two new at-grade crossings in the opening year 2018 and a moderate adverse impact in the design year 2038. When there is an ICTF train occurrence, only I-26 and King Street Extension would serve as a connection between North Charleston and Charleston. The opening year 2018 and design year 2038 Alternative 6 at-grade rail crossing analysis results are shown in Table 4.8-40 and Table 4.8-41, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 6 is shown in Figure 4.8-16.

The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 100 percent from the opening year 2018 No-Action Alternative to Alternative 6. In the design year 2038, the daily combined total rail occupancy time would increase approximately 150 percent.

Table 4.8-40  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 6

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,600	2.2	4.0	04:07	05:34	2,925	No	18.2	B	Minor	A
2	Attaway Street	4,500	3.7	4.0	03:47	05:38	775	No	14.3	B	Minor	A
3	North Rhett Avenue	16,400	3.7	4.0	07:16	05:38	>5,280	Yes	50.3	D	Negligible	D
4	Virginia Avenue	9,200	1.1	4.0	26:09	05:42	900	No	57.5	E	Moderate	D
5	Avenue B	7,500	1.1	4.0	34:34	05:40	1,925	No	90.1	F	Negligible	F
6	Dorchester Road (SC 642)	17,000	5.3	4.0	03:57	05:33	2,125	No	25.3	C	Minor	B
7	Accabee Road	3,100	5.3	4.0	03:10	05:32	450	No	15.1	B	Minor	A
8	Misroon Street	500	5.3	4.0	03:10	05:32	75	No	13.5	B	Minor	A
9	Hackemann Avenue	1,500	3.1	4.0	04:06	05:32	3,675	No	48.9	D	Minor	C
10	Discher Street	3,100	5.3	0.0	03:09	00:00	-	-	-	-	-	B
11	Pittsburgh Avenue	2,000	0.0	0.0	00:00	00:00	-	-	-	-	-	A
14	Meeting Street & Spruill Avenue	6,800 & 11,400	0.0	4.0	00:00	05:32	4,775	No	7.5	A	Negligible	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-16.

Source: Appendix F.

Table 4.8-41  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 6

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,200	2.1	4.0	05:13	10:52	>5,280	Yes	64.2	E	Major	B
2	Attaway Street	6,300	3.7	4.0	06:21	10:52	2,200	No	50.4	D	Moderate	B
3	North Rhett Avenue	23,900	3.7	4.0	09:44	10:52	>5,280	Yes	185.0	F	<sup>2</sup> Negligible	F
4	Virginia Avenue	11,300	1.1	4.0	27:22	10:51	2,700	Yes	87.1	F	Major	D
5	Avenue B	9,600	1.1	4.0	35:38	10:50	>5,280	No	116.6	F	<sup>2</sup> Negligible	F
6	Dorchester Road (SC 642)	17,300	5.2	4.0	05:05	11:34	4,650	Yes	84.0	F	Major	B
7	Accabee Road	3,100	5.2	4.0	05:05	11:34	875	No	37.6	D	Major	A
8	Misroon Street	500	5.2	4.0	04:13	11:31	125	No	43.2	D	Major	A
9	Hackemann Avenue	1,500	3.1	4.0	05:29	11:31	>5,280	No	386.6	F	Major	E
10	Discher Street	3,200	5.3	0.0	04:12	0:00	-	-	-	-	-	E
11	Pittsburgh Avenue	2,100	0.0	0.0	00:00	00:00	-	-	-	-	-	A
14	Meeting Street & Spruill Avenue	9,800 & 14,200	0.0	4.0	00:00	10:46	>5,280	No	34.7	C	Moderate	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-16.

2. Although the relative impact as compared to the No-Action is negligible the average delay per vehicle increased >20%.

Source: Appendix F.

#### 4.8.9 Alternative 7: River Center Project Site (South via Milford)

The following sections describe the transportation impacts associated with Alternative 7, which is described in detail in Section 2.4.8. Potential impacts discussed in this section include both temporary construction impacts and permanent impacts resulting from operations of the facility. The permanent operations analysis was performed for the year in which the proposed ICTF would open, 2018, and the design year 2038. The Alternative 7 impacts are summarized in Section 4.8.11.

Alternative 7 would be a variation of Alternative 1 (Proposed Project) with the Project site being moved to the River Center project site and all rail traffic would enter and exit the Navy Base ICTF from a southern rail connection. Road and rail improvements would be adjusted accordingly to facilitate rail and road traffic at the new site. The daily volumes for Alternative 7 would be the same as Alternative 5, which are shown in Appendix F.

### **Construction, Interstate 26, Interstate 526, U.S. Highway 17 and North Charleston Intersections**

Alternative 7 would have the same impacts during construction in opening year 2018 and design year 2038 to I-26, I-526, US 17 and the North Charleston Intersections as Alternative 5, which is described in Section 4.8.7.

### **At-Grade Rail Crossings**

In Alternative 7 all rail traffic would use the southern rail alignment to Milford Street. Since no ICTF trains would use the Alternative 5 northern alignment, Alternative 7 would not impact the at-grade crossings of Rivers Avenue, Virginia Avenue and Avenue B. The at-grade rail crossings of Attaway Street and North Rhett Avenue would differ compared to the No-Action Alternative because Alternative 7 reroutes approximately 1.6 other commodity trains per day from the Reads Branch line to the Park Circle and Bexley corridors. The impact Alternative 7 would have on the at-grade crossings along the Reads Branch, Park Circle, and Bexley corridors was not analyzed because no ICTF trains would use these corridors.

Alternative 7 would have twice as many ICTF train occurrences than Alternative 5, eight per day, at the at-grade crossings along the southern alignment. The daily combined total rail occupancy time at the analyzed roadway crossings, which is defined by the number of occurrences multiplied by the average duration of each occurrence, would increase nearly 135 percent from the opening year 2018 No-Action Alternative to Alternative 4. In the design year 2038, the daily combined total rail occupancy time would increase approximately 215 percent.

Alternative 7 would have an impact on all seven of the analyzed at-grade rail crossings along the southern alignment. In the opening year 2018, two at-grade crossings would operate with a Poor LOS. These two locations are the at-grade crossings of Hackemann Avenue and Discher Street, both of which are located between Meeting Street and King Street. Alternative 7 would have a major adverse impact on both of these crossings, as Meeting Street and King Street would experience queuing and delay. None of the at-grade rail crossings would create a queue from an ICTF train occurrence that impacts an interstate mainline in the opening year 2018.

Table 4.8-42  
Opening Year 2018 At-Grade Rail Crossings Analysis Results for Alternative 7

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	32,600	2.2	0.0	04:07	00:00	-	-	-	-	-	A
2	Attaway Street	4,500	3.3	0.0	03:47	00:00	-	-	-	-	-	A
3	North Rhett Avenue	16,400	3.3	0.0	07:16	00:00	-	-	-	-	-	D
4	Virginia Avenue	9,200	1.2	0.0	26:09	00:00	-	-	-	-	-	D
5	Avenue B	7,500	1.2	0.0	34:34	00:00	-	-	-	-	-	F
6	Dorchester Road (SC 642)	17,000	5.3	8.0	03:57	05:33	2,125	No	39.5	D	Moderate	B
7	Accabee Road	3,100	5.3	8.0	03:10	05:32	450	No	22.1	C	Moderate	A
8	Misroon Street	500	5.3	8.0	03:10	05:32	75	No	21.8	C	Moderate	A
9	Hackemann Avenue	1,500	3.1	8.0	04:06	05:32	3,675	No	77.7	E	Moderate	C
10	Discher Street	3,100	5.3	8.0	03:09	05:31	3,450	No	99.7	F	Major	B
11	Pittsburgh Avenue	2,000	0.0	8.0	00:00	05:32	400	No	20.7	C	Moderate	A
12	Meeting Street & Herbert Street	18,000 & 900	0.0	8.0	00:00	05:32	2,900	No	17.7	B	Minor	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-17.

Source: Appendix F.

By the design year 2038, the average ICTF train crossing duration time would approximately double from the opening year 2018 value. The longer ICTF train crossing durations, as well as higher roadway volumes and longer other commodity train crossing durations, would lead to all seven of the at-grade crossing locations along the southern alignment operating with a Poor LOS. Alternative 7 would have a major adverse impact on all seven at-grade crossing locations. Additionally, the at-grade rail crossing of Dorchester Road west of Meeting Street would create a queue from an ICTF train occurrence that impacts an interstate mainline in the design year 2038.



Table 4.8-43  
Design Year 2038 At-Grade Rail Crossings Analysis Results for Alternative 7

ID <sup>1</sup>	Roadway Segment at Rail Crossing	Daily Volume (vehicles per day)	Number of Daily Train Crossings		Average Crossing Duration (min:sec)		Max ICTF Train Queue (feet)	ICTF Train Impact to Interstate Mainline	Roadway Network Delay per Vehicle (seconds per vehicle)	LOS	Impact	No-Action LOS
			Other	ICTF	Other	ICTF						
1	Rivers Avenue (US 78)	37,200	2.2	0.0	05:13	00:00	-	-	-	-	-	B
2	Attaway Street	6,300	3.3	0.0	06:21	00:00	-	-	-	-	-	B
3	North Rhett Avenue	23,900	3.3	0.0	09:44	00:00	-	-	-	-	-	F
4	Virginia Avenue	11,300	1.2	0.0	27:22	00:00	-	-	-	-	-	D
5	Avenue B	9,600	1.2	0.0	35:38	00:00	-	-	-	-	-	F
6	Dorchester Road (SC 642)	17,300	5.3	8.0	05:05	11:34	4,650	Yes	148.8	F	Major	B
7	Accabee Road	3,100	5.3	8.0	05:05	11:34	875	No	63.0	E	Major	A
8	Misroon Street	500	5.3	8.0	04:13	11:31	125	No	76.8	E	Major	A
9	Hackemann Avenue	1,500	3.1	8.0	05:29	11:31	>5,280	No	721.0	F	Major	E
10	Discher Street	3,200	5.3	8.0	04:12	10:46	>5,280	No	584.1	F	Major	E
11	Pittsburgh Avenue	2,100	0.0	8.0	00:00	10:46	825	No	91.0	F	Major	A
12	Meeting Street & Herbert Street	23,600 & 2,800	0.0	8.0	00:00	10:46	>5,280	No	73.2	E	Major	-

1. Analyzed at-grade crossing locations are shown in Figure 4.8-17.

Source: Appendix F.

The opening year 2018 and design year 2038 Alternative 7 at-grade rail crossing analysis results are shown in Table 4.8-42 and Table 4.8-43, respectively. The at-grade rail crossing daily LOS for the opening year 2018 and design year 2038 of Alternative 7 is shown in Figure 4.8-17.

#### 4.8.10 Related Activities

For traffic and transportation, the impacts associated with the related activity being built are incorporated into the impacts previously described for each of the alternatives in Section 4.8. The impacts to the transportation network are a result of the trains to and from the Navy Base ICTF not the physical tracks.

### 4.8.11 Summary of Impacts Table

Table 4.8-22 summarizes the environmental consequences to traffic and transportation from Alternative 1 (Proposed Project) and all the alternatives.

Table 4.8-44  
Summary of Impacts, Traffic and Transportation

Alternative	I-26	I-526	US 17	North Charleston Intersections	At-Grade Rail Crossings
<b>No-Action</b>	None	None	None	None	None
<b>1: Proposed Project: South via Milford / North via Hospital District</b>	Negligible, short-term impact during construction. Negligible, permanent impact on majority of I-26 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to an LOS change.	Negligible, short-term impact during construction. Negligible, permanent impact on majority of I-526 corridor in the opening year 2018 and design year 2038; beneficial or adverse permanent impact on a few segments due to an LOS change.	Negligible, short-term impact during construction. Negligible, permanent impact on the opening year 2018 and design year 2038 US 17 operations as Alternative 1 (Proposed Project) would have minimal influence on the US 17 traffic volumes.	Minor, short-term adverse impact during construction. Minor, permanent adverse impact on the opening year 2018 and design year 2038 North Charleston intersection operations. Traffic patterns would change but slightly more intersections would degrade than improve operations.	Negligible, short-term impact during construction. Moderate, permanent adverse impact on the opening year 2018 and major, permanent adverse impact design year 2038 at-grade crossing operations as Alternative 1 (Proposed Project) would increase the frequency and number of train occurrences in North Charleston. Additionally, one new at-grade crossing would be created.
<b>2: South via Milford / North via S-line</b>	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project) but with a slightly different number of intersections degrading or improving operations.	Similar to Alternative 1 (Proposed Project) but with different at-grade rail crossing locations and operations. Additionally, two new at-grade crossings would be created.

Alternative	I-26	I-526	US 17	North Charleston Intersections	At-Grade Rail Crossings
<b>3: South via Kingsworth / North via Hospital</b>	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project) but with a different number of new at-grade rail crossing locations (Meeting Street and Spruill Avenue at Kingsworth Avenue) and operations. Additionally, two new at-grade crossings would be created.
<b>4: South via Milford</b>	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Same as Alternative 1 (Proposed Project)	Similar to Alternative 1 (Proposed Project) but with different at-grade rail crossing locations and operations as this Alternative would have double (8/day) the number of train occurrences on the southern rail connection as Alternative 1.

Alternative	I-26	I-526	US 17	North Charleston Intersections	At-Grade Rail Crossings
<p><b>5: River Center Project Site: South via Milford / North via Hospital District</b></p>	<p>Negligible, short-term impact during construction. Negligible, permanent impact on majority of I-26 corridor in the opening year 2018 and design year 2038; beneficial or adverse, permanent impact on a few segments due to an LOS change.</p>	<p>Negligible, short-term impact during construction. Negligible, permanent impact on majority of I-526 corridor in the opening year 2018 and design year 2038; beneficial or adverse, permanent impact on a few segments due to an LOS change.</p>	<p>Negligible, short-term impact during construction. Negligible, permanent impact on the opening year 2018 and design year 2038 US 17 operations as Alternative 5 would have minimal influence on the US 17 traffic volumes.</p>	<p>Minor, short-term adverse impact during construction. Minor, permanent adverse impact on the opening year 2018 and design year 2038 North Charleston intersection operations. Traffic patterns would change but slightly more intersections would degrade than improve operations.</p>	<p>Negligible, short-term impact during construction. Moderate, permanent adverse impact on the opening year 2018 and major, permanent adverse impact on design year 2038 at-grade crossing operations as Alternative 5 would increase the frequency and number of train occurrences in North Charleston. Additionally, one new at-grade crossing would be created.</p>
<p><b>6: River Center Project Site: South via Kingsworth / North via Hospital District</b></p>	<p>Same as Alternative 5</p>	<p>Same as Alternative 5</p>	<p>Same as Alternative 5</p>	<p>Same as Alternative 5</p>	<p>Similar to Alternative 5 but with different at-grade rail crossing locations and operations. Additionally, two new at-grade crossings would be created.</p>

Alternative	I-26	I-526	US 17	North Charleston Intersections	At-Grade Rail Crossings
<b>7: River Center Project Site: South via Milford</b>	Same as Alternative 5	Same as Alternative 5	Same as Alternative 5	Same as Alternative 5	Similar to Alternative 5 but with different at-grade rail crossing locations and operations as this alternative would have double (8/day) the number of train occurrences on the southern rail connection as Alternative 5.

#### Traffic and Transportation Impact Definitions

**Negligible** = No change in LOS. No perceivable impacts to the intersection delay, at-grade rail crossing delay or freeway density.

**Minor** = LOS changes one LOS grade. Impacts cause slightly perceptible change in intersection delay, at-grade rail crossing delay or freeway density.

**Moderate** = LOS changes two LOS grades or LOS degrades (adverse impact) to LOS E or improves (beneficial impact) from LOS E to LOS D. Impacts cause perceptible change in intersection delay, at-grade rail crossing delay or freeway density.

**Major** = LOS changes three or more LOS grades or LOS degrades (adverse impact) to LOS F or improves (beneficial impact) from LOS F to LOS E or LOS D. Additionally, for at-grade rail crossings, if off-ramp queue impacts interstate mainline. Impacts cause very noticeable change in intersection delay, at-grade rail crossing delay or freeway density.

## 4.8.12 Mitigation

### 4.8.12.1 Applicant's Proposed Avoidance and Minimization Measures

The Applicant has committed to several measures that avoid and/or minimize potential impacts of Alternative 1 (Proposed Project). These measures are taken from Palmetto Railways Mitigation Plan provided in Appendix N. Some of these measures are required under federal, state, and local permits; others are measures that Palmetto Railways has incorporated into the design and operations of Alternative 1 (Proposed Project). Each mitigation measure is also designated as one that either helps to avoid an impact or one that minimizes an impact.

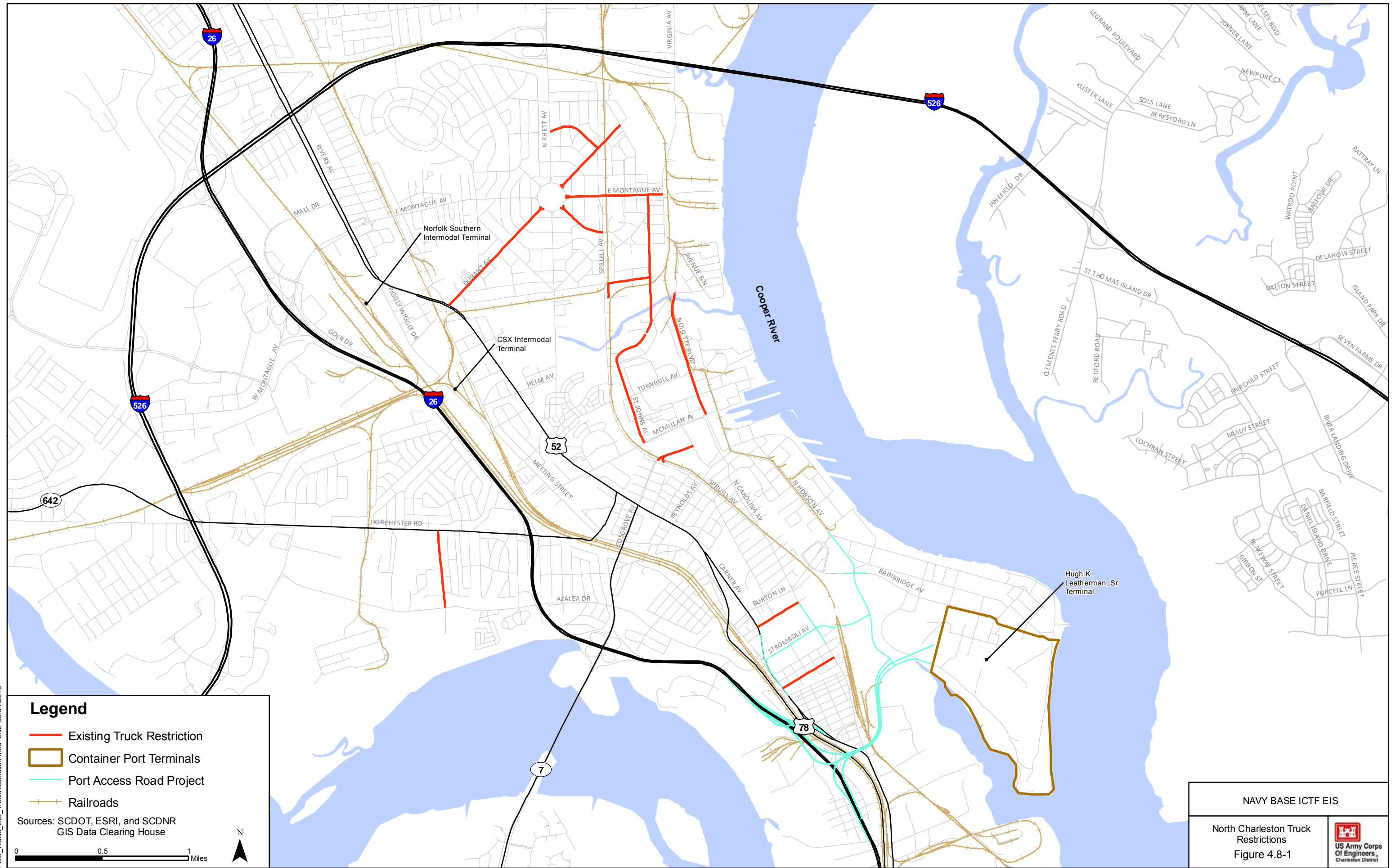
- Perform a separate Surface Transportation Impact Study (in cooperation with the City of North Charleston, South Carolina Ports Authority, and SCDOT) to study and provide guidance regarding rail and highway traffic related to the facility; including the identification of optimal truck routes to and from the facility (see Appendix B for the proposal/scope of this study). \* (Minimization)

- To minimize impacts to at-grade crossings outside of the facility footprint, automated switches will be used throughout the Project area to facilitate a continuous movement of trains while arriving or departing the facility. (Minimization)
- All at-grade crossings within the facility footprint will be eliminated to provide safe and unfettered movements through the facility. (Minimization)
- Provide access to St. Johns Avenue for residents and businesses located on the former Navy Base and west of Project North Lead railroad track. (Minimization)
- Automated gates and additional turn lanes will be constructed to reduce truck idling, wait times and congestion on North Hobson Avenue. When exiting the facility, a right-only turn onto North Hobson Avenue will direct truck traffic to the Port Access Road highway ramps. (Minimization)
- Cosgrove Avenue will be extended and an overpass over the facility's north rail lead will be constructed to facilitate public access to the CNC and adjoining neighborhoods. During construction, McMillan Avenue will be detoured. Once construction of the overpass is completed, McMillan Avenue will be closed east of Spruill Avenue and a cul-de-sac will be constructed. (Minimization)
- Improvements to Bainbridge Avenue and North Hobson Avenue intersection will be constructed to facilitate traffic flows in the southern portion of the CNC, including the Federal Law Enforcement Training Complex (FLETC), U.S. Coast Guard (USCG) complex and Veterans Terminal. (Minimization)
- A drayage road will be constructed to eliminate truck traffic on local roadways when transporting containers to the intermodal facility. (Minimization)
- Palmetto Railways will support the City of North Charleston to develop a truck route and restriction plan for the area. Additionally, Palmetto Railways will work to inform facility truck traffic of streets where truck traffic is not permitted when traveling to and from the intermodal facility. \* (Minimization)
- Maintain Viaduct Road overpass until the local segment of the port access road is complete. (Minimization)
- Locate roadway improvements to minimize/avoid at-grade crossings and traffic delays associated with rail operations. \* (Minimization)
- Additional intermodal capacity will encourage rail use and reduce truck traffic on local roads. \* (Minimization)
- The Applicant worked with multiple parties to develop standards on studying public at-grade crossings (Crossing Analysis) impacted by the ICTF within the City of Charleston and drafted a Transportation Memorandum of Agreement (MOA) with the City of Charleston, the South Carolina Department of Commerce, and South Carolina Department of Transportation (SCDOT). The draft Transportation MOA commits these parties to conducting a joint Crossing Analysis and the Applicant proposes to fund up to \$4.5 million for five transportation mitigation measures to be undertaken by the City of Charleston (or another government body). See Appendix B and N for additional details.\* (Minimization)

These avoidance and minimization measures, except the items noted with an asterisk (\*), have been considered in the preceding impact analysis. The complete list of Applicant-proposed avoidance and minimization measures related to traffic and transportation is also provided in Chapter 6.

#### **4.8.12.2 Additional Potential Mitigation Measures**

No additional mitigation measures have been identified for Traffic and Transportation by the Corps. Additional avoidance, minimization, and mitigation may be considered by the Corps in its decision-making process. Final mitigation measures may be adopted as conditions of the DA permit and documented in the Record of Decision (ROD).



**Legend**

- Existing Truck Restriction
- Container Port Terminals
- Port Access Road Project
- Railroads


Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.5 1 Miles

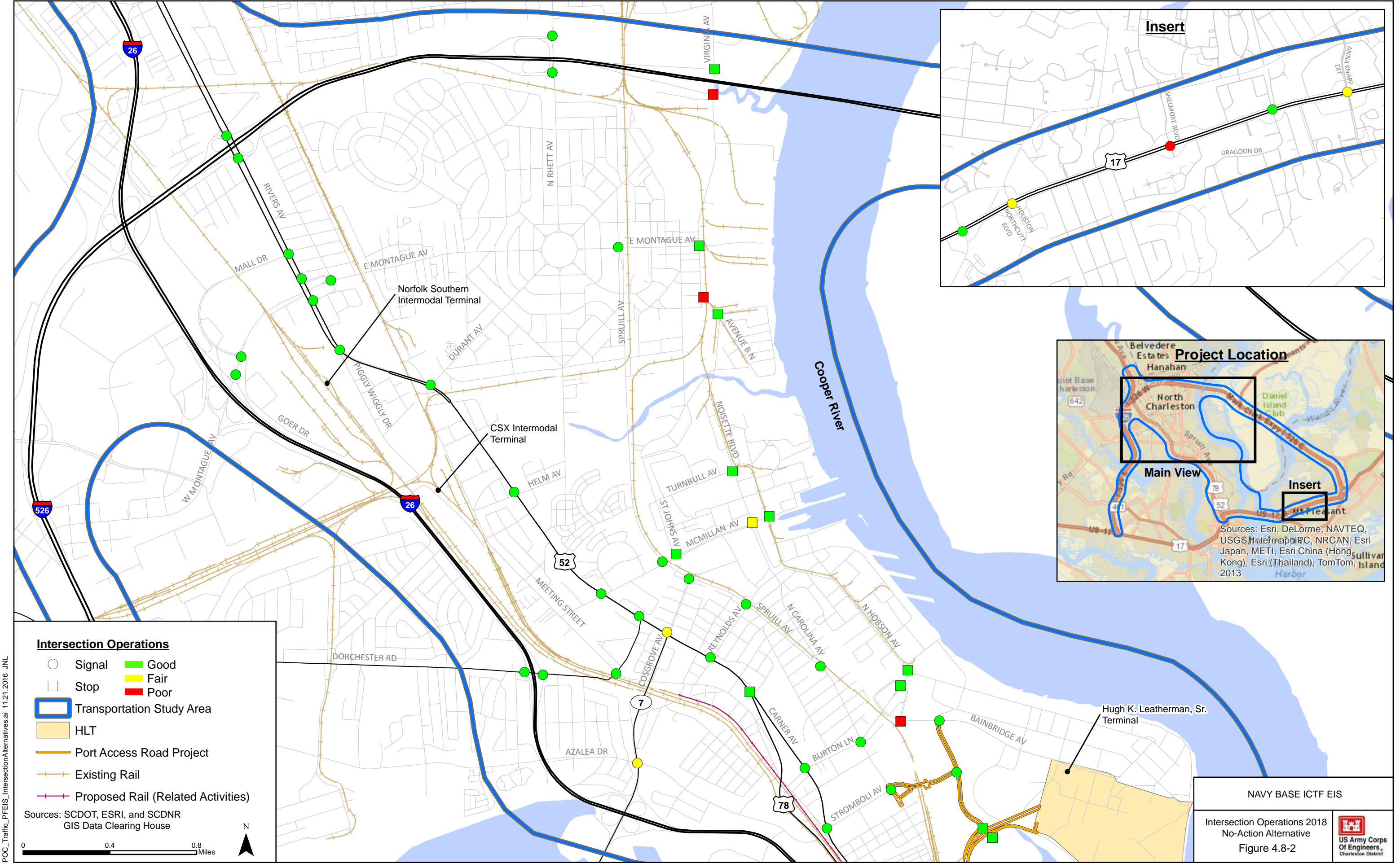
N

NAVY BASE ICTF EIS

North Charleston Truck Restrictions  
Figure 4.8-1







**Intersection Operations**

- Signal
- Stop
- Good
- Fair
- Poor
- ▭ Transportation Study Area
- ▭ HLT
- Port Access Road Project
- Existing Rail
- Proposed Rail (Related Activities)

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.4 0.8 Miles

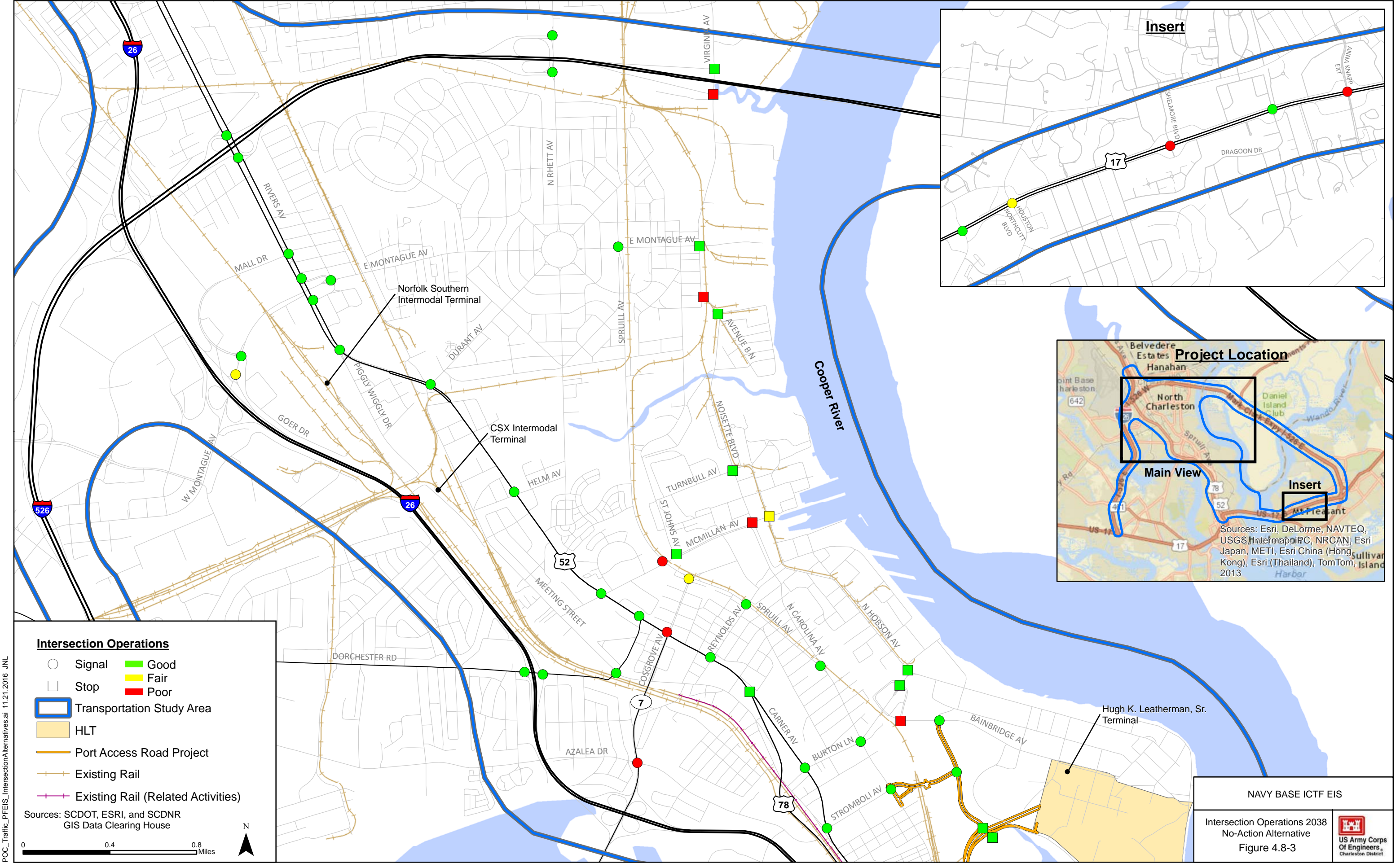
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NAVY BASE ICTF EIS

Intersection Operations 2018  
No-Action Alternative  
Figure 4.8-2

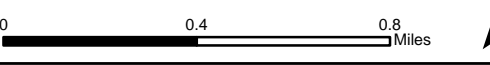
US Army Corps  
Of Engineers  
Charleston District

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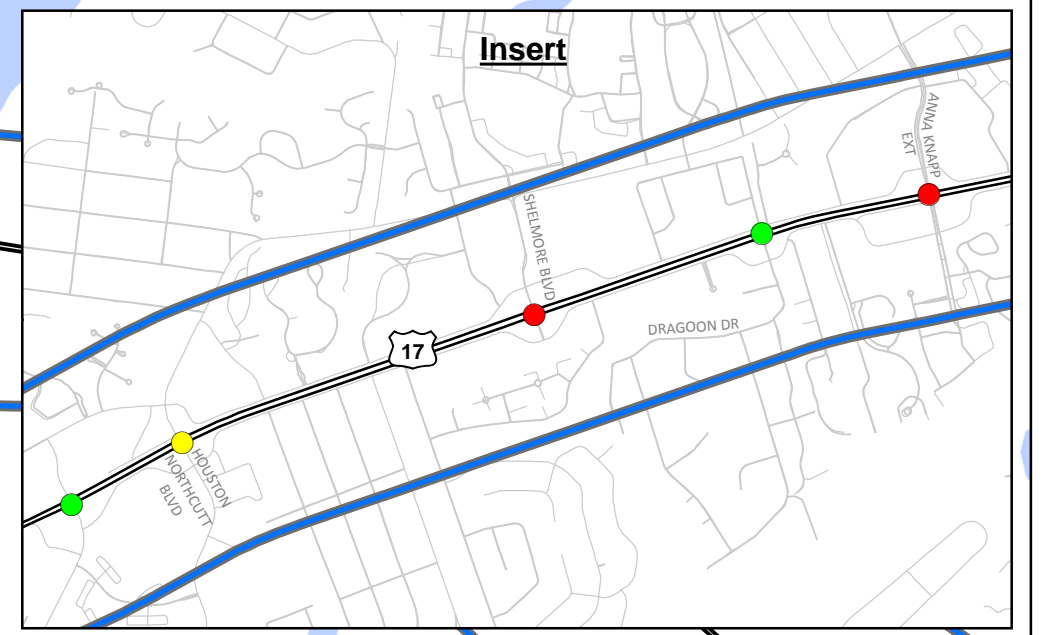
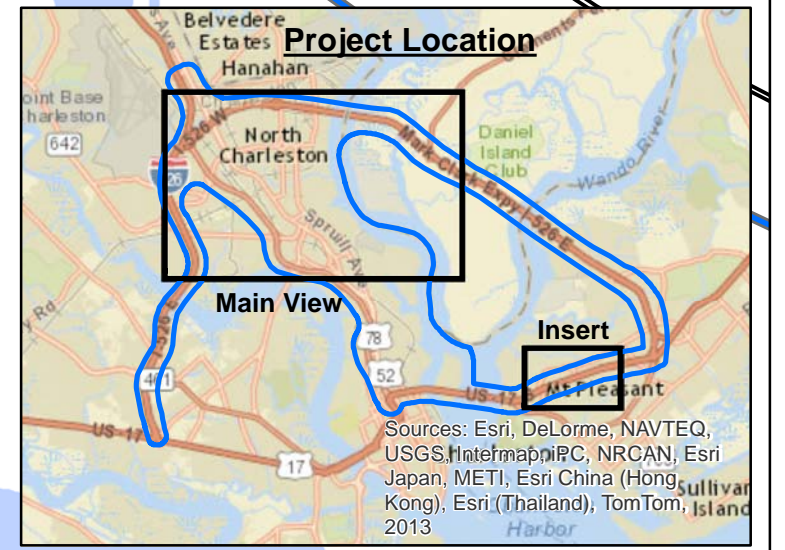
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- Intersection Operations**
- Signal
  - Stop
  - Good
  - Fair
  - Poor
- Transportation Study Area  
 HLT  
 Port Access Road Project  
 Existing Rail  
 Existing Rail (Related Activities)
- Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

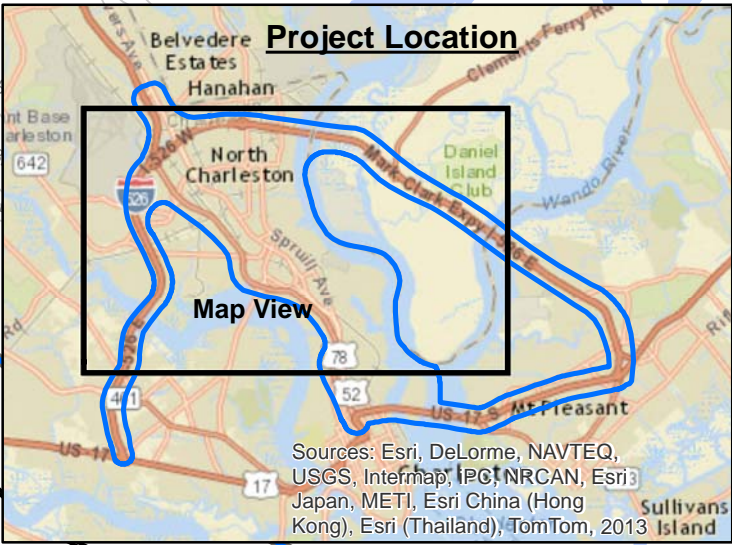
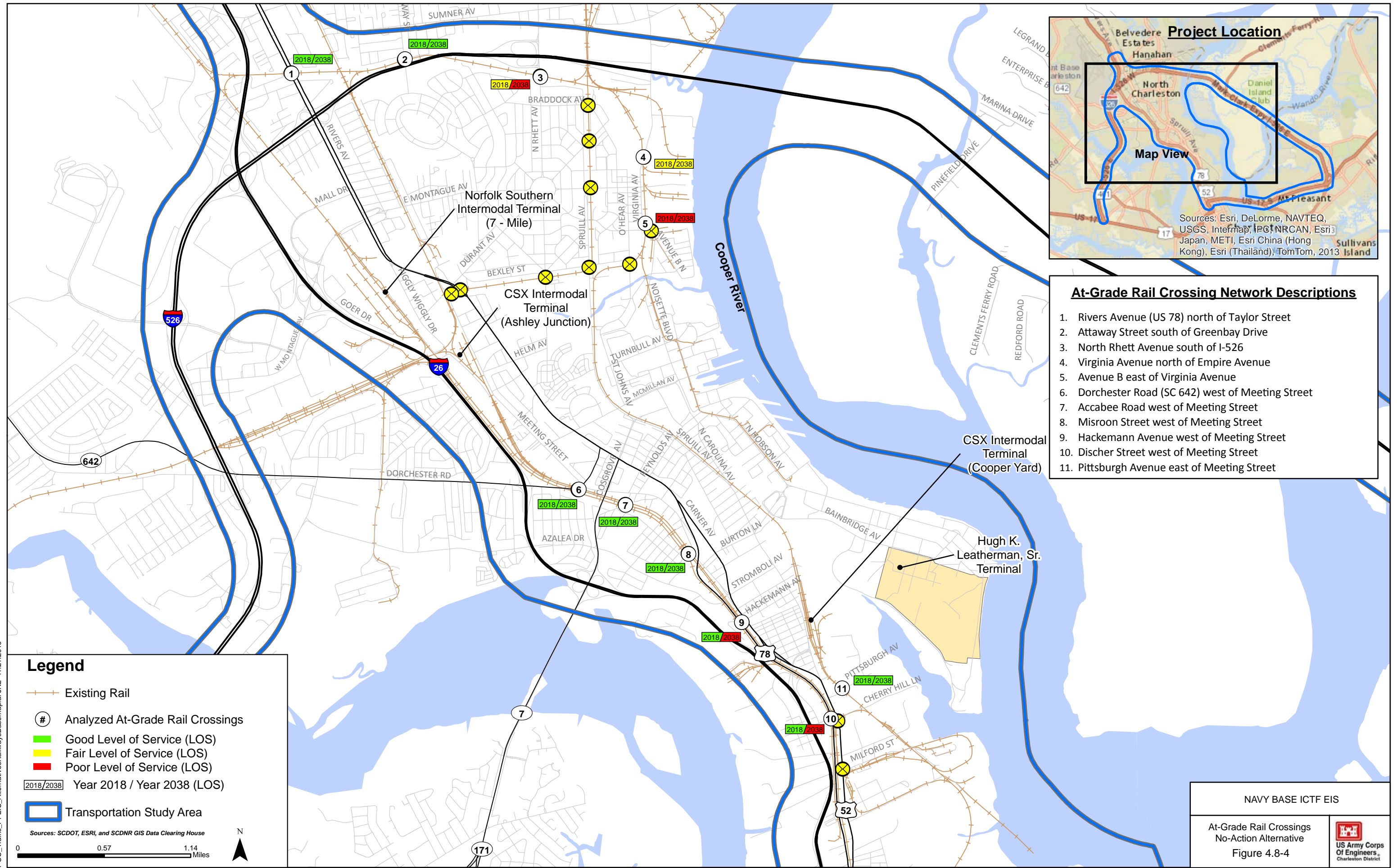


NAVY BASE ICTF EIS

Intersection Operations 2038  
No-Action Alternative  
Figure 4.8-3

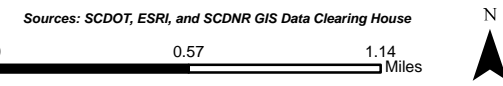


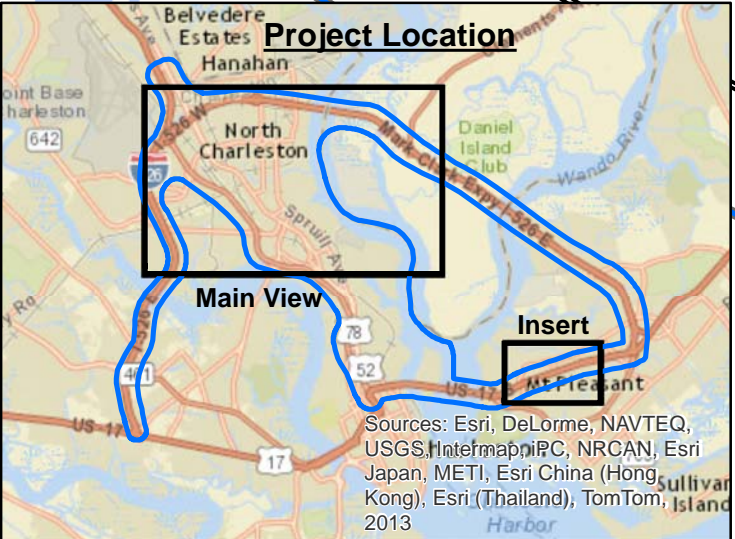
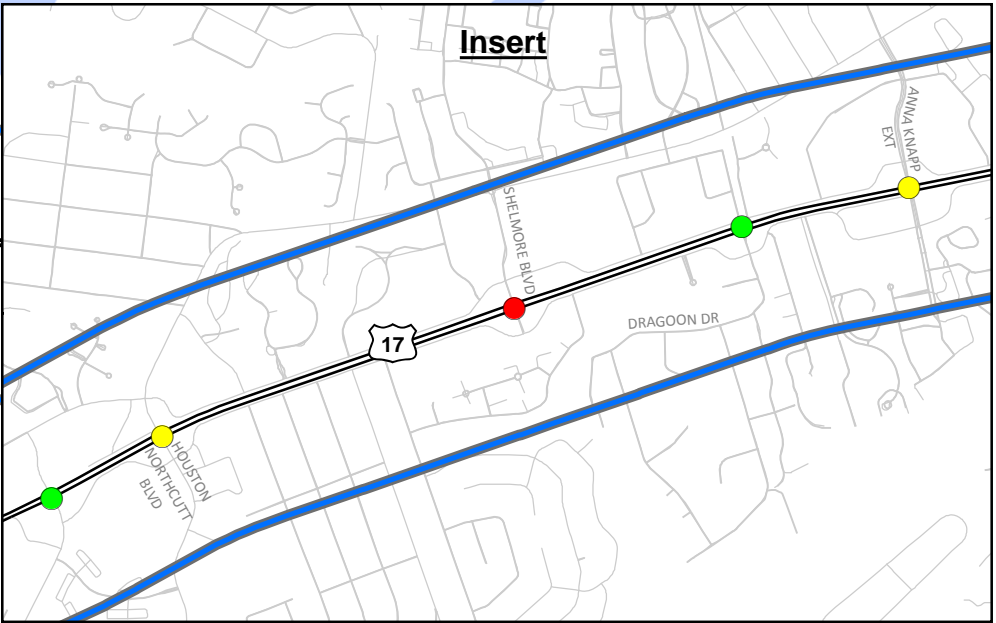
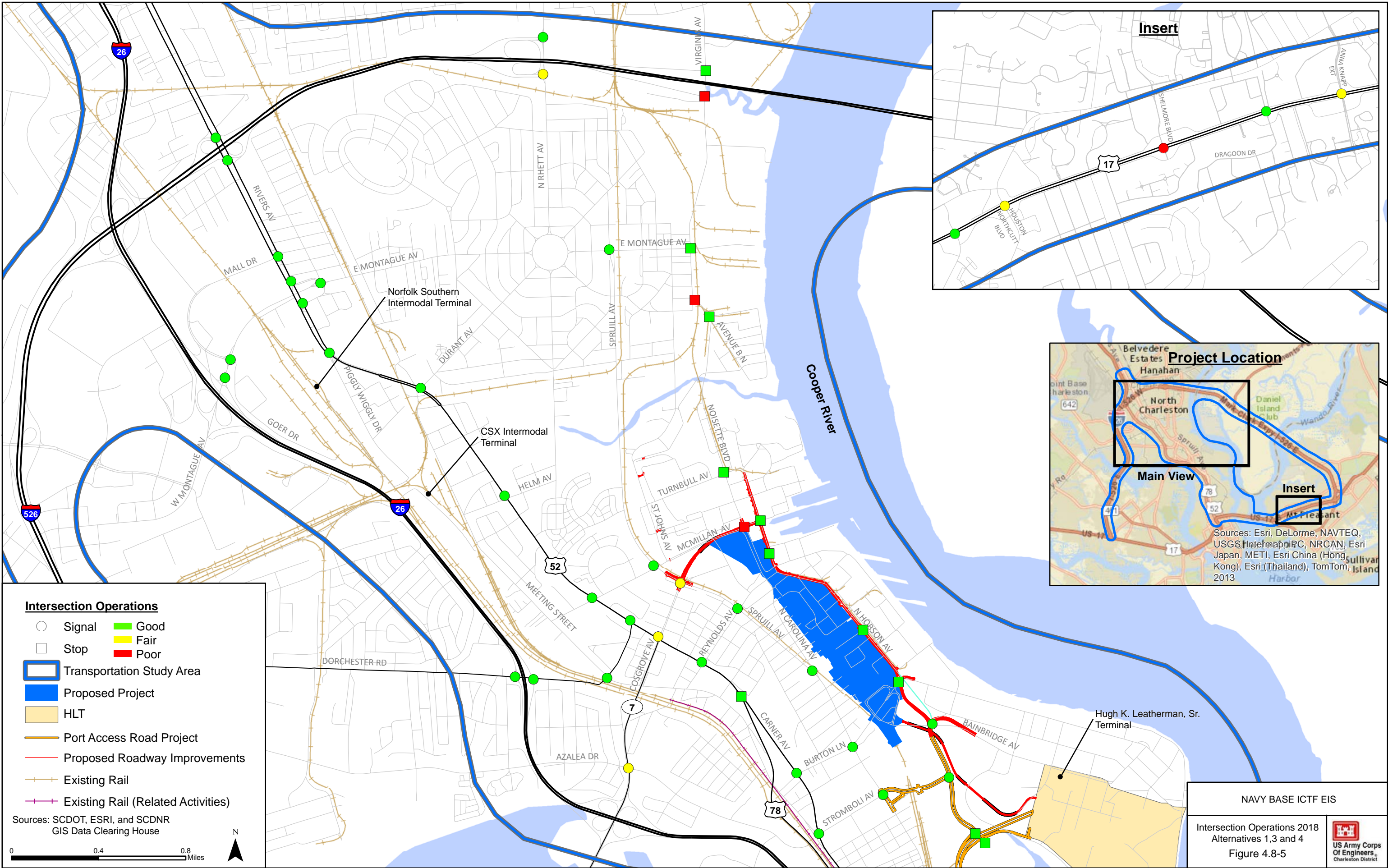
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- ### At-Grade Rail Crossing Network Descriptions
1. Rivers Avenue (US 78) north of Taylor Street
  2. Attaway Street south of Greenbay Drive
  3. North Rhett Avenue south of I-526
  4. Virginia Avenue north of Empire Avenue
  5. Avenue B east of Virginia Avenue
  6. Dorchester Road (SC 642) west of Meeting Street
  7. Accabee Road west of Meeting Street
  8. Misroon Street west of Meeting Street
  9. Hackemann Avenue west of Meeting Street
  10. Discher Street west of Meeting Street
  11. Pittsburgh Avenue east of Meeting Street

- ### Legend
- Existing Rail
  - # Analyzed At-Grade Rail Crossings
  - Good Level of Service (LOS)
  - Fair Level of Service (LOS)
  - Poor Level of Service (LOS)
  - 2018/2038 Year 2018 / Year 2038 (LOS)
  - Transportation Study Area





**Intersection Operations**

- Signal
- Stop
- ▭ Transportation Study Area
- ▭ Proposed Project
- ▭ HLT
- Port Access Road Project
- Proposed Roadway Improvements
- Existing Rail
- Existing Rail (Related Activities)
- Good
- Fair
- Poor

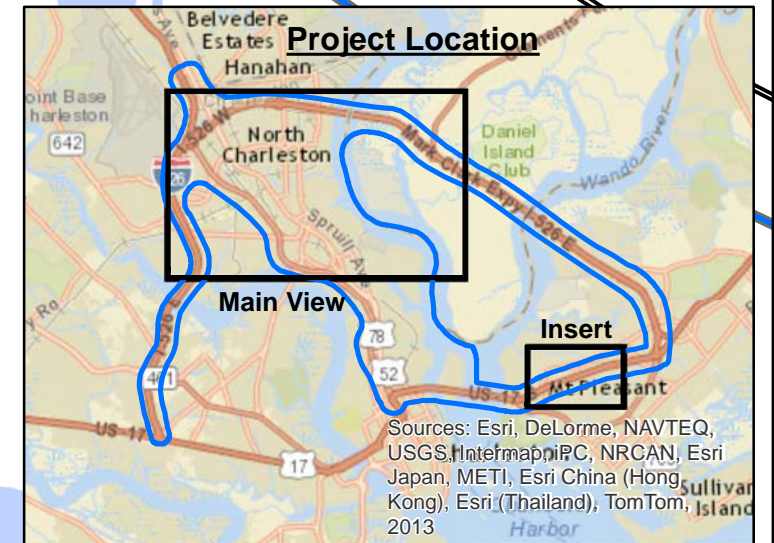
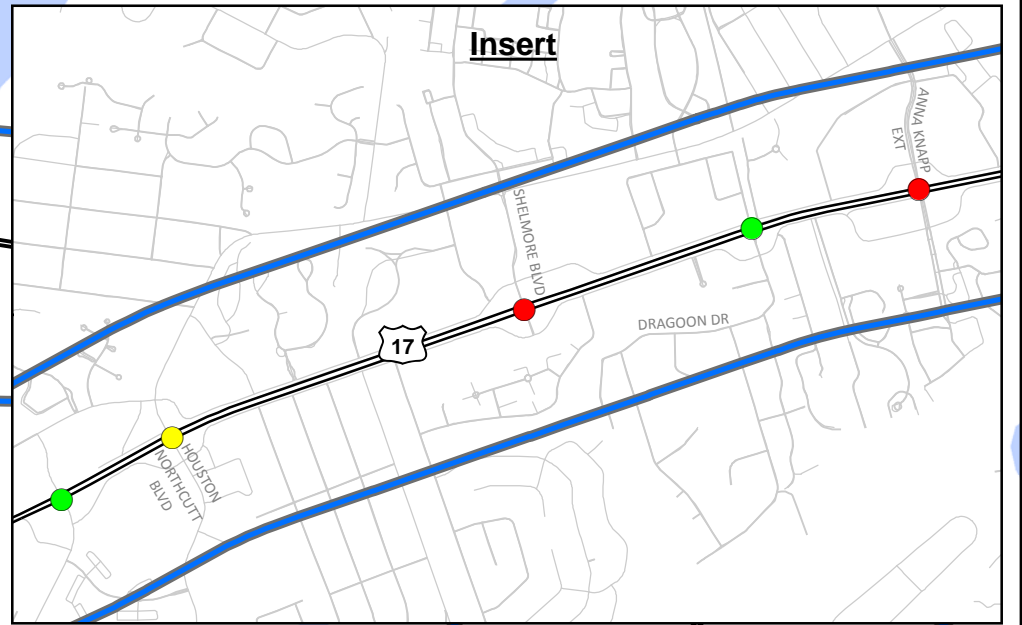
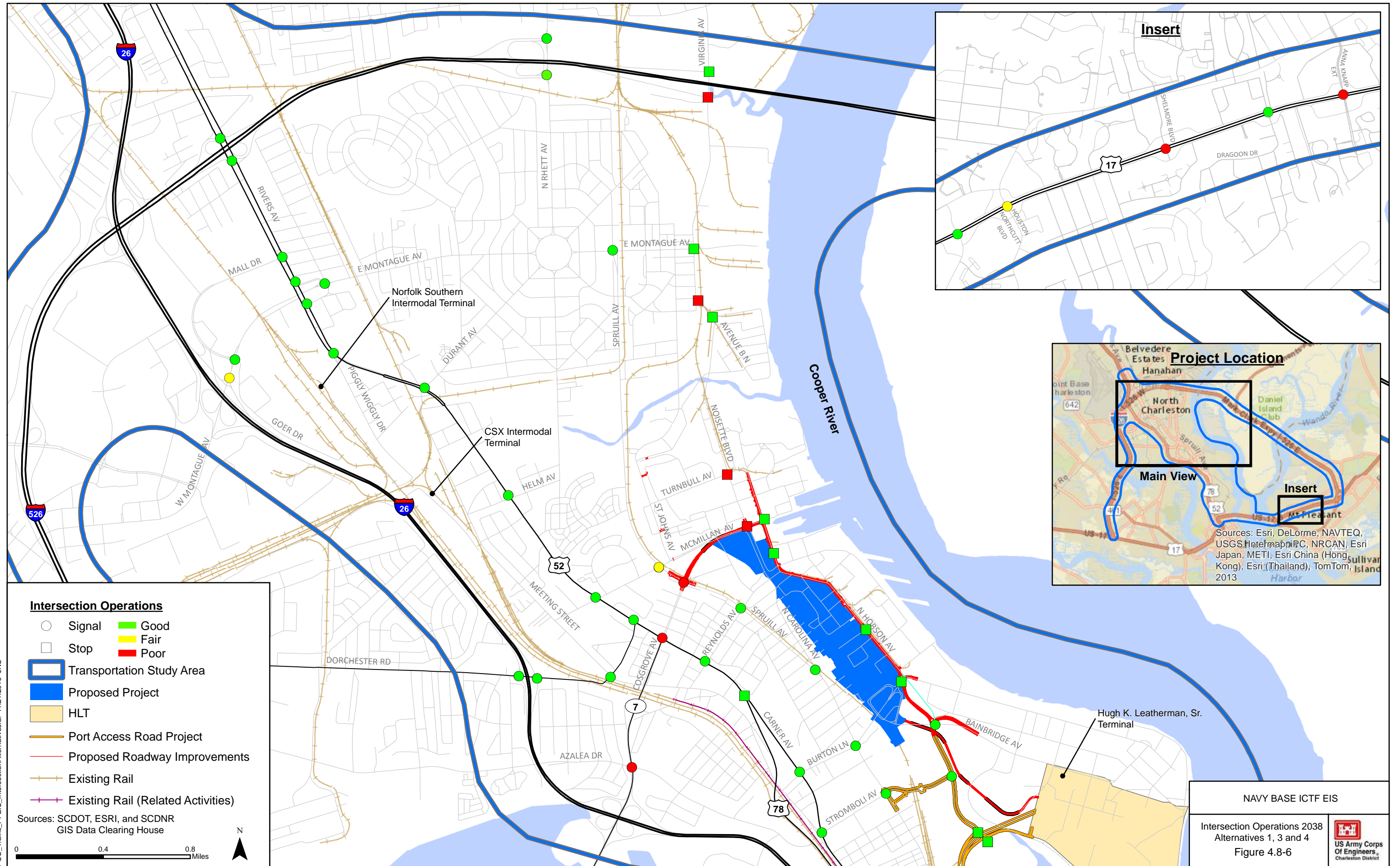
Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.4 0.8 Miles

NAVY BASE ICTF EIS

Intersection Operations 2018  
Alternatives 1,3 and 4  
Figure 4.8-5

POC\_Traffic\_PFEIS\_IntersectionAlternatives.ai 11.21.2016 JNL



**Intersection Operations**

- Signal
- Stop
- Good
- Fair
- Poor
- Transportation Study Area
- Proposed Project
- HLT
- Port Access Road Project
- Proposed Roadway Improvements
- Existing Rail
- Existing Rail (Related Activities)

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.4 0.8 Miles

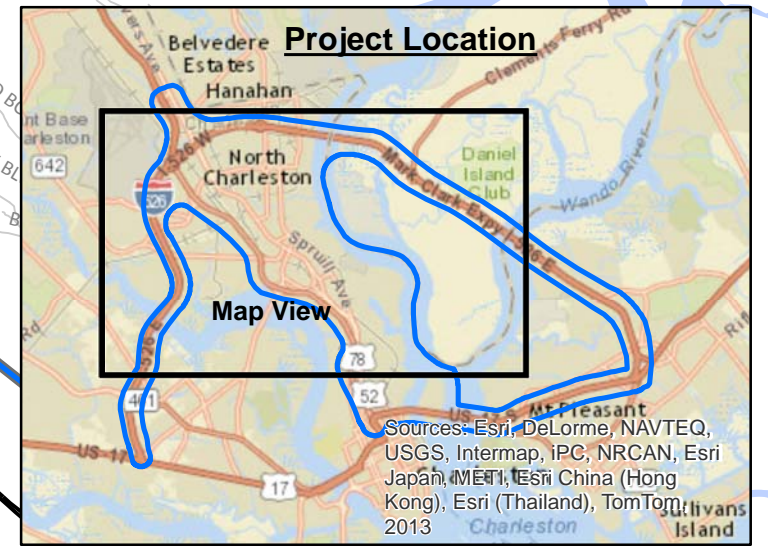
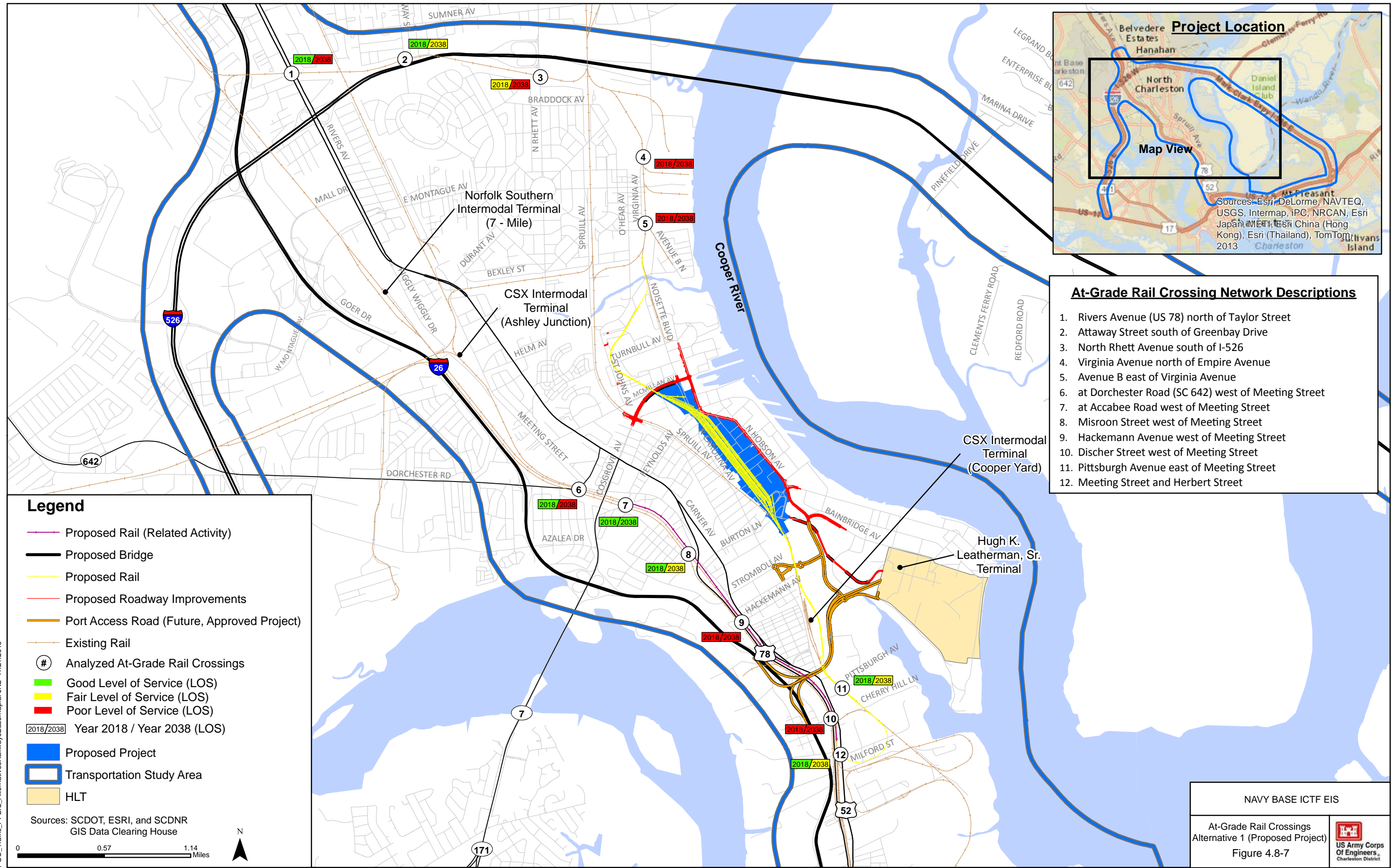
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NAVY BASE ICTF EIS

Intersection Operations 2038  
Alternatives 1, 3 and 4  
Figure 4.8-6

POC\_Traffic\_PFEIS\_IntersectionAlternatives.ai 11.21.2016 JNL

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



- At-Grade Rail Crossing Network Descriptions**
1. Rivers Avenue (US 78) north of Taylor Street
  2. Attaway Street south of Greenbay Drive
  3. North Rhett Avenue south of I-526
  4. Virginia Avenue north of Empire Avenue
  5. Avenue B east of Virginia Avenue
  6. at Dorchester Road (SC 642) west of Meeting Street
  7. at Accabee Road west of Meeting Street
  8. Misroon Street west of Meeting Street
  9. Hackemann Avenue west of Meeting Street
  10. Discher Street west of Meeting Street
  11. Pittsburgh Avenue east of Meeting Street
  12. Meeting Street and Herbert Street

**Legend**

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- Year 2018 / Year 2038 (LOS)
- Proposed Project
- Transportation Study Area
- HLT

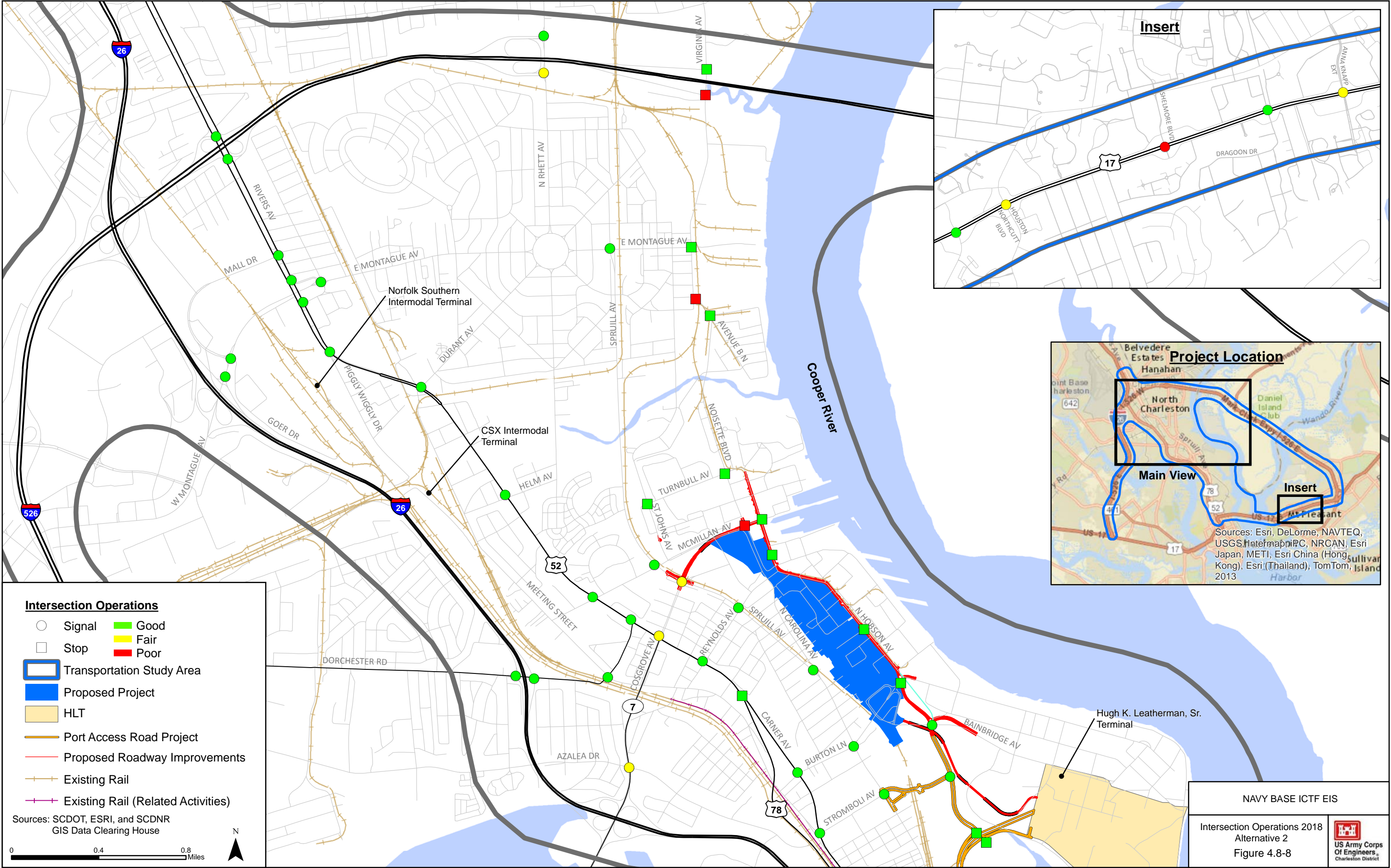
Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

NAVY BASE ICTF EIS

At-Grade Rail Crossings  
Alternative 1 (Proposed Project)  
Figure 4.8-7

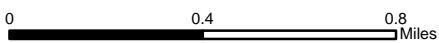
US Army Corps  
Of Engineers  
Charleston District



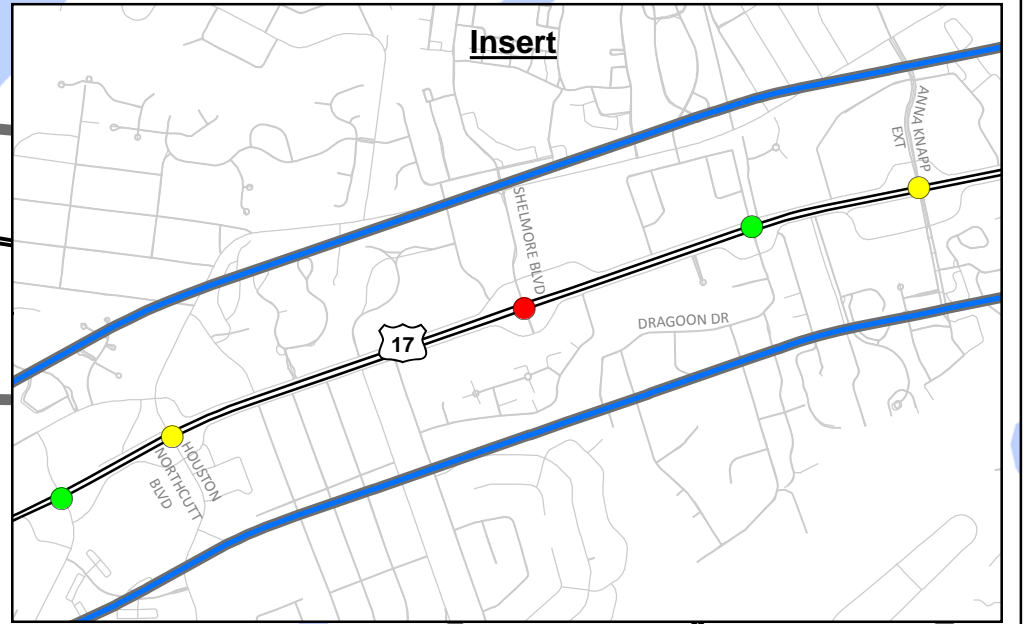
**Intersection Operations**

- Signal
- Stop
- Transportation Study Area
- Proposed Project
- HLT
- Port Access Road Project
- Proposed Roadway Improvements
- Existing Rail
- Existing Rail (Related Activities)
- Good
- Fair
- Poor

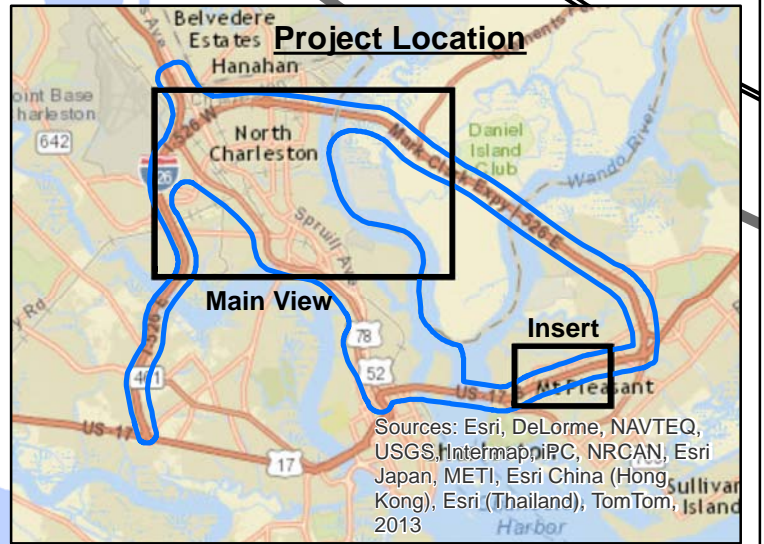
Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House



**Insert**



**Project Location**



**Main View**

**Insert**

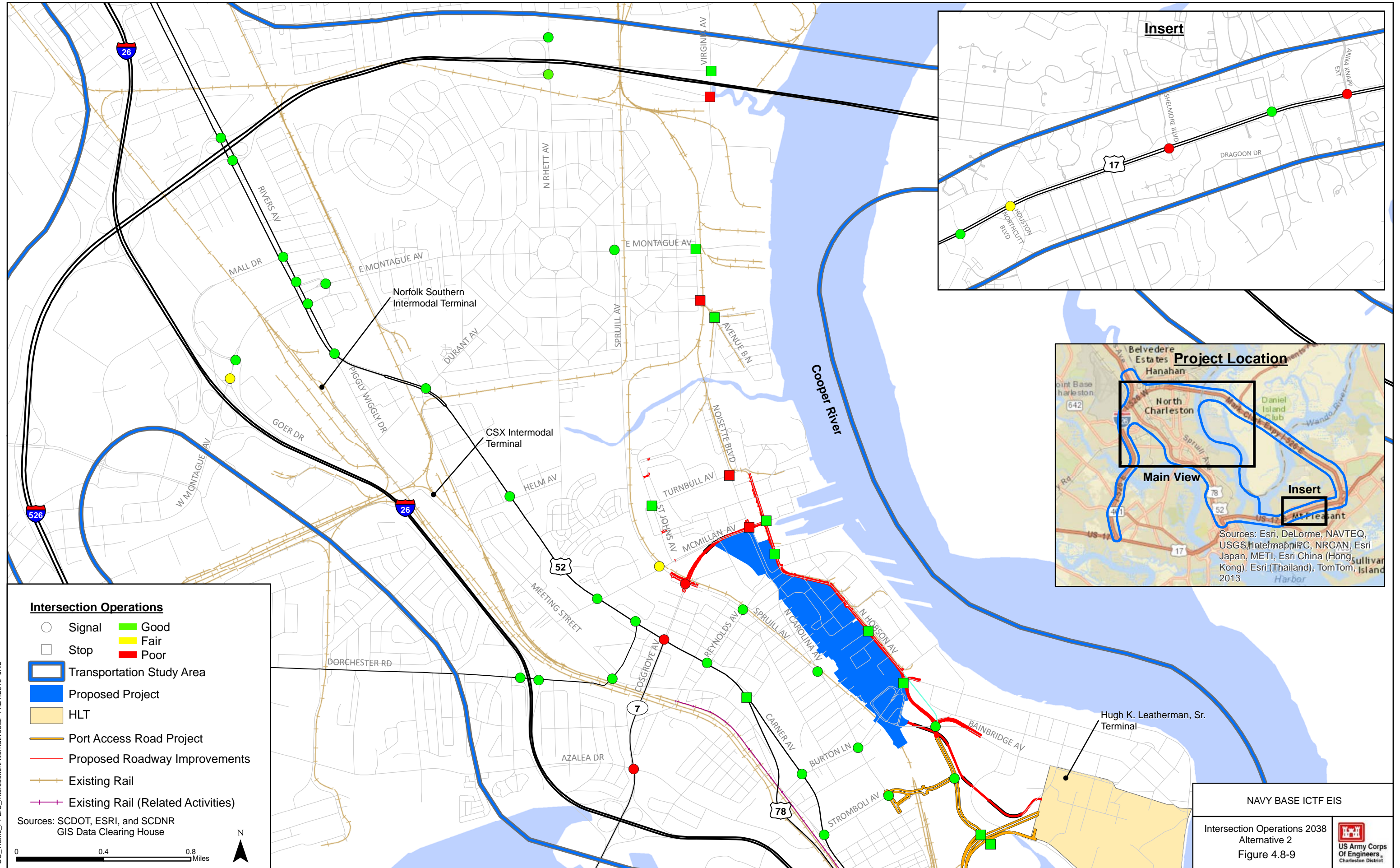
Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

NAVY BASE ICTF EIS

Intersection Operations 2018  
Alternative 2  
Figure 4.8-8



POC\_Traffic\_PFEIS\_Intersection/Alternatives.ai 11.21.2016 JNL



POC\_Traffic\_PFEIS\_Intersection/Alternatives.ai 11.21.2016 JNL

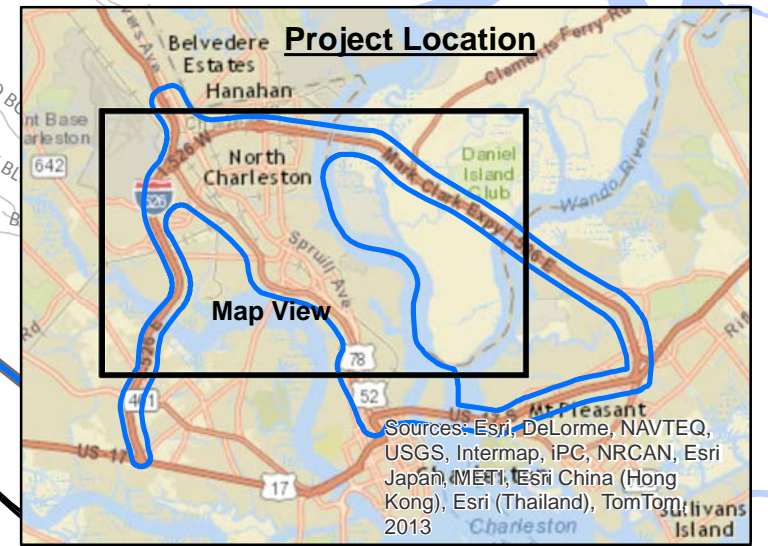
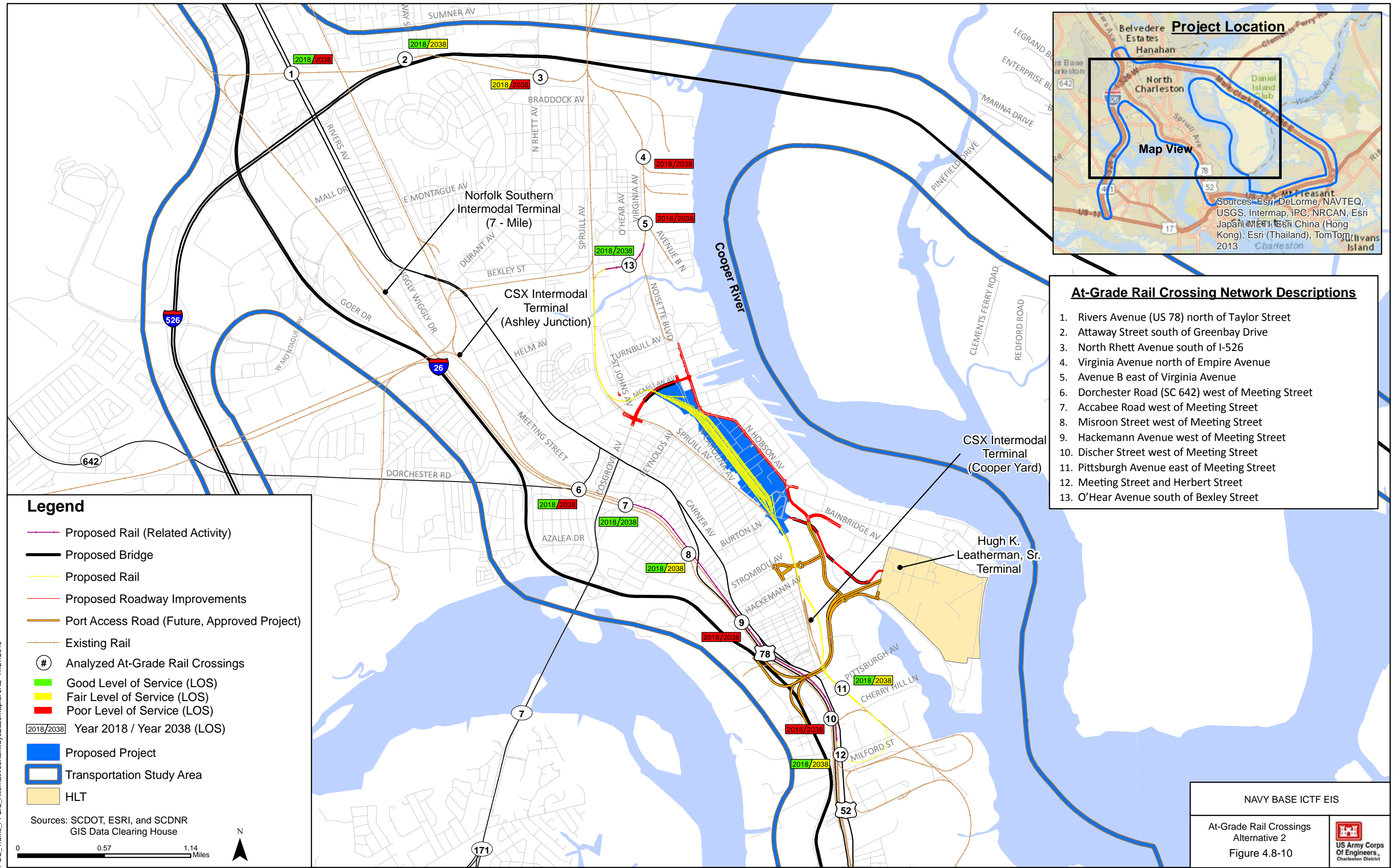
NAVY BASE ICTF EIS

Intersection Operations 2038  
Alternative 2  
Figure 4.8-9

US Army Corps  
Of Engineers  
Charleston District



POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



- At-Grade Rail Crossing Network Descriptions**
1. Rivers Avenue (US 78) north of Taylor Street
  2. Attaway Street south of Greenbay Drive
  3. North Rhett Avenue south of I-526
  4. Virginia Avenue north of Empire Avenue
  5. Avenue B east of Virginia Avenue
  6. Dorchester Road (SC 642) west of Meeting Street
  7. Accabee Road west of Meeting Street
  8. Misroon Street west of Meeting Street
  9. Hackemann Avenue west of Meeting Street
  10. Discher Street west of Meeting Street
  11. Pittsburgh Avenue east of Meeting Street
  12. Meeting Street and Herbert Street
  13. O'Hear Avenue south of Bexley Street

**Legend**

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- Year 2018 / Year 2038 (LOS)
- Proposed Project
- Transportation Study Area
- HLT

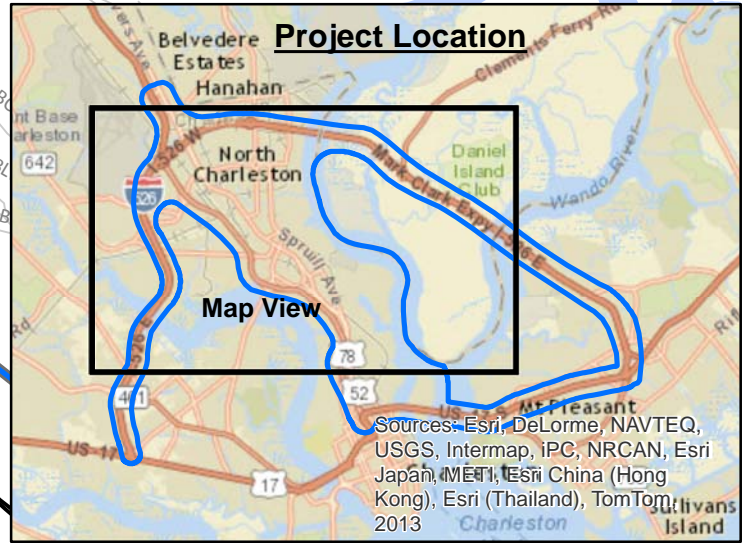
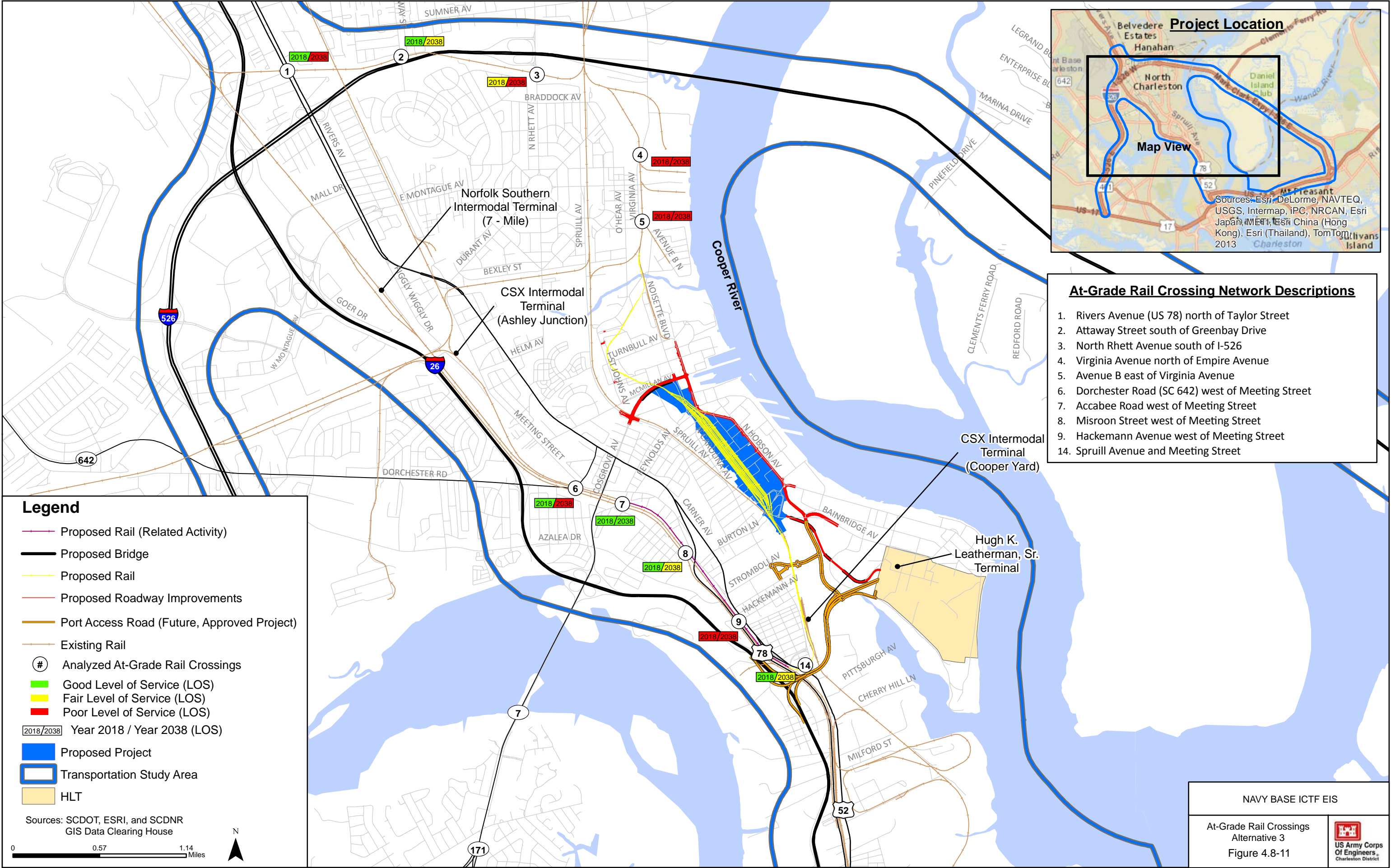
Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

NAVY BASE ICTF EIS

At-Grade Rail Crossings  
Alternative 2  
Figure 4.8-10

US Army Corps  
Of Engineers  
Charleston District



- ### At-Grade Rail Crossing Network Descriptions
1. Rivers Avenue (US 78) north of Taylor Street
  2. Attaway Street south of Greenbay Drive
  3. North Rhett Avenue south of I-526
  4. Virginia Avenue north of Empire Avenue
  5. Avenue B east of Virginia Avenue
  6. Dorchester Road (SC 642) west of Meeting Street
  7. Accabee Road west of Meeting Street
  8. Misroon Street west of Meeting Street
  9. Hackemann Avenue west of Meeting Street
  14. Spruill Avenue and Meeting Street

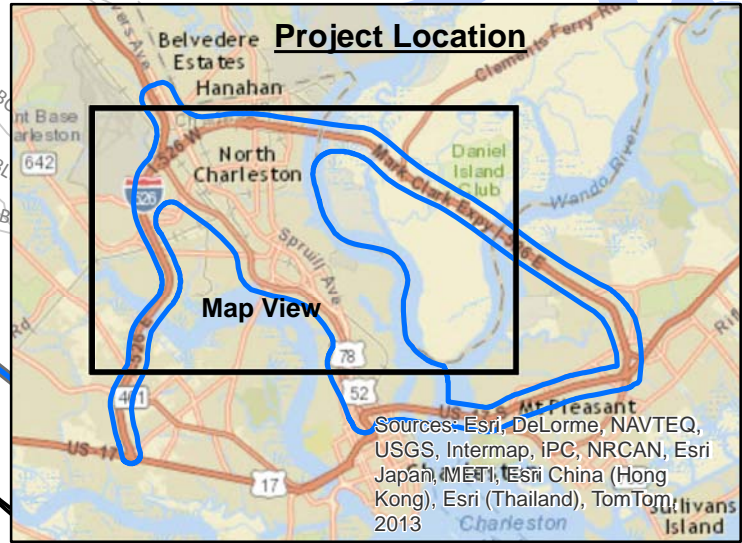
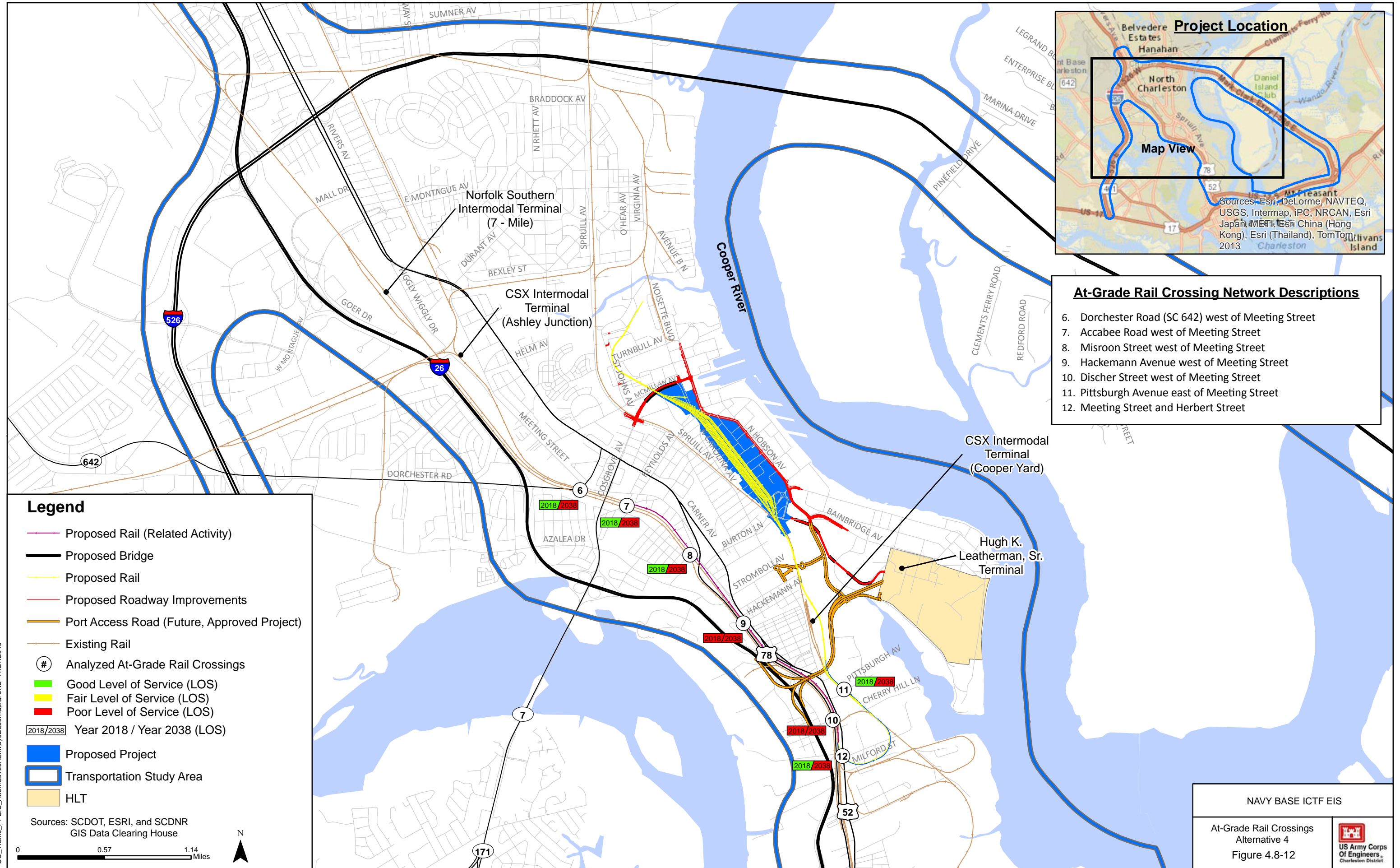
### Legend

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- Year 2018 / Year 2038 (LOS)
- Proposed Project
- Transportation Study Area
- HLT

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



- ### At-Grade Rail Crossing Network Descriptions
- Dorchester Road (SC 642) west of Meeting Street
  - Accabee Road west of Meeting Street
  - Misroon Street west of Meeting Street
  - Hackemann Avenue west of Meeting Street
  - Discher Street west of Meeting Street
  - Pittsburgh Avenue east of Meeting Street
  - Meeting Street and Herbert Street

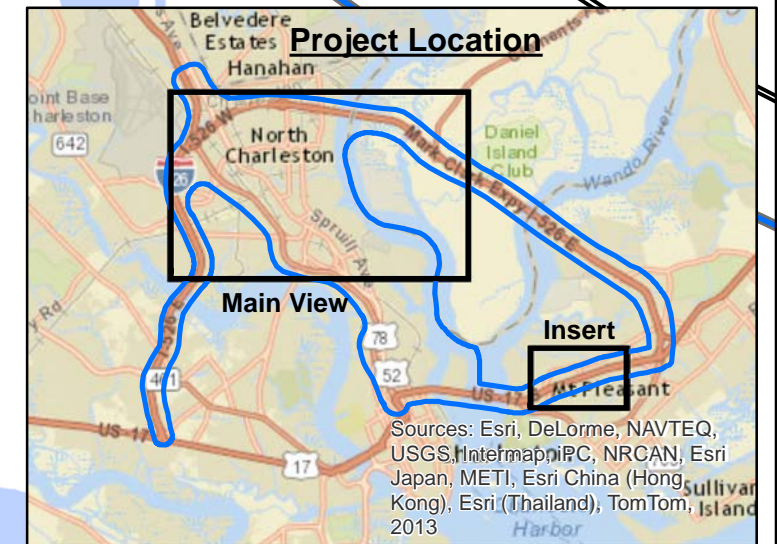
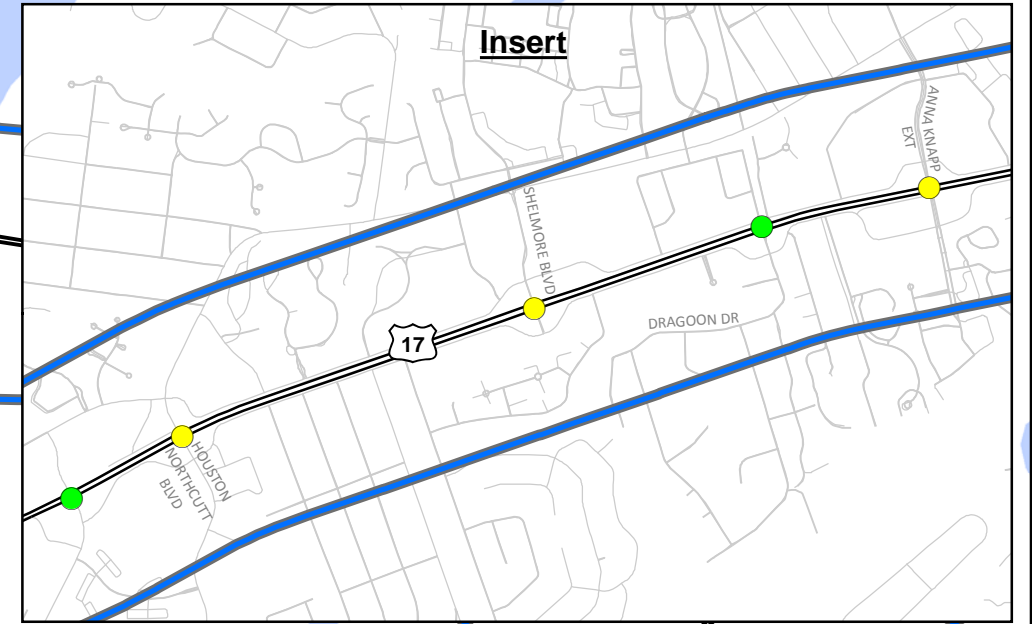
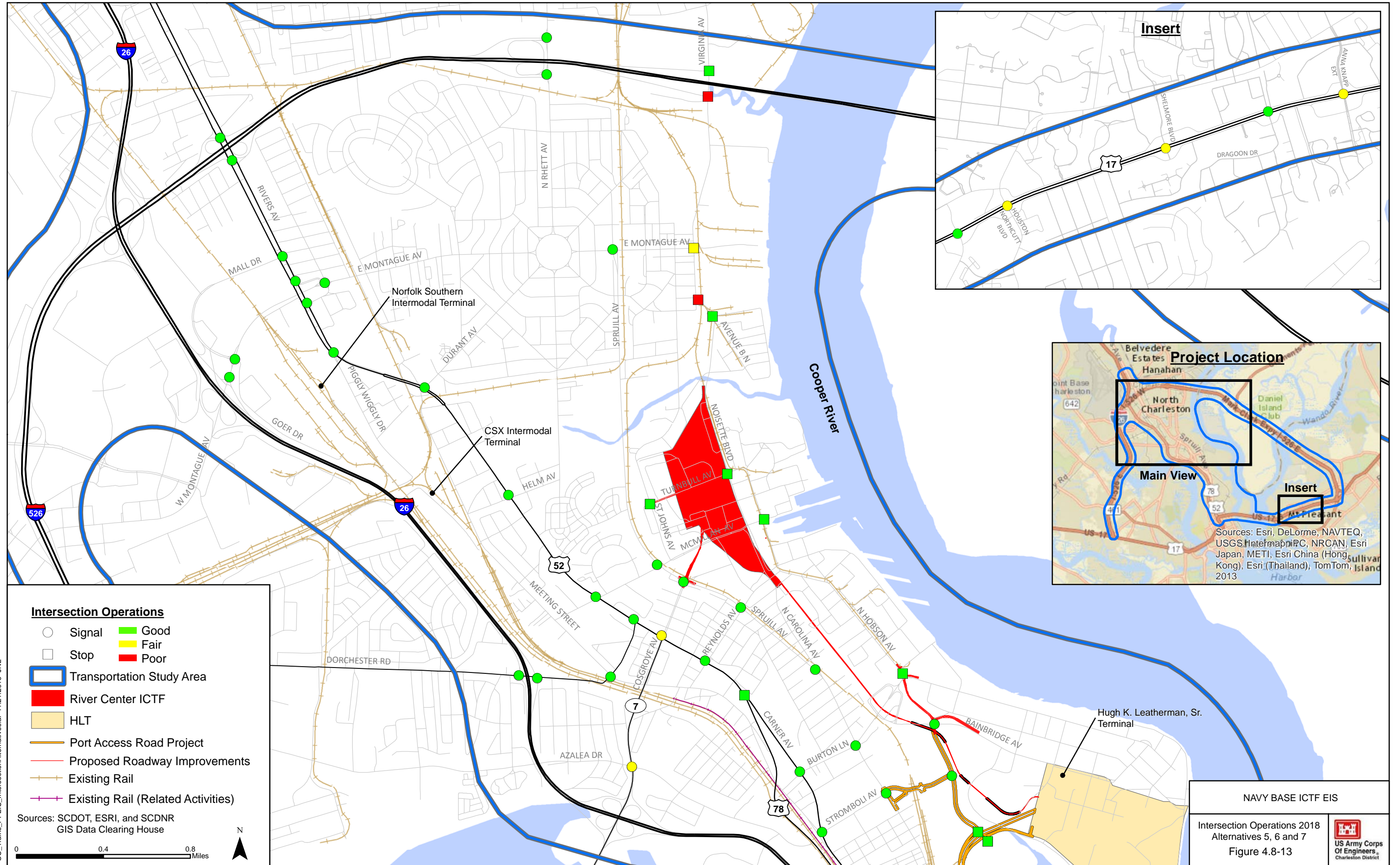
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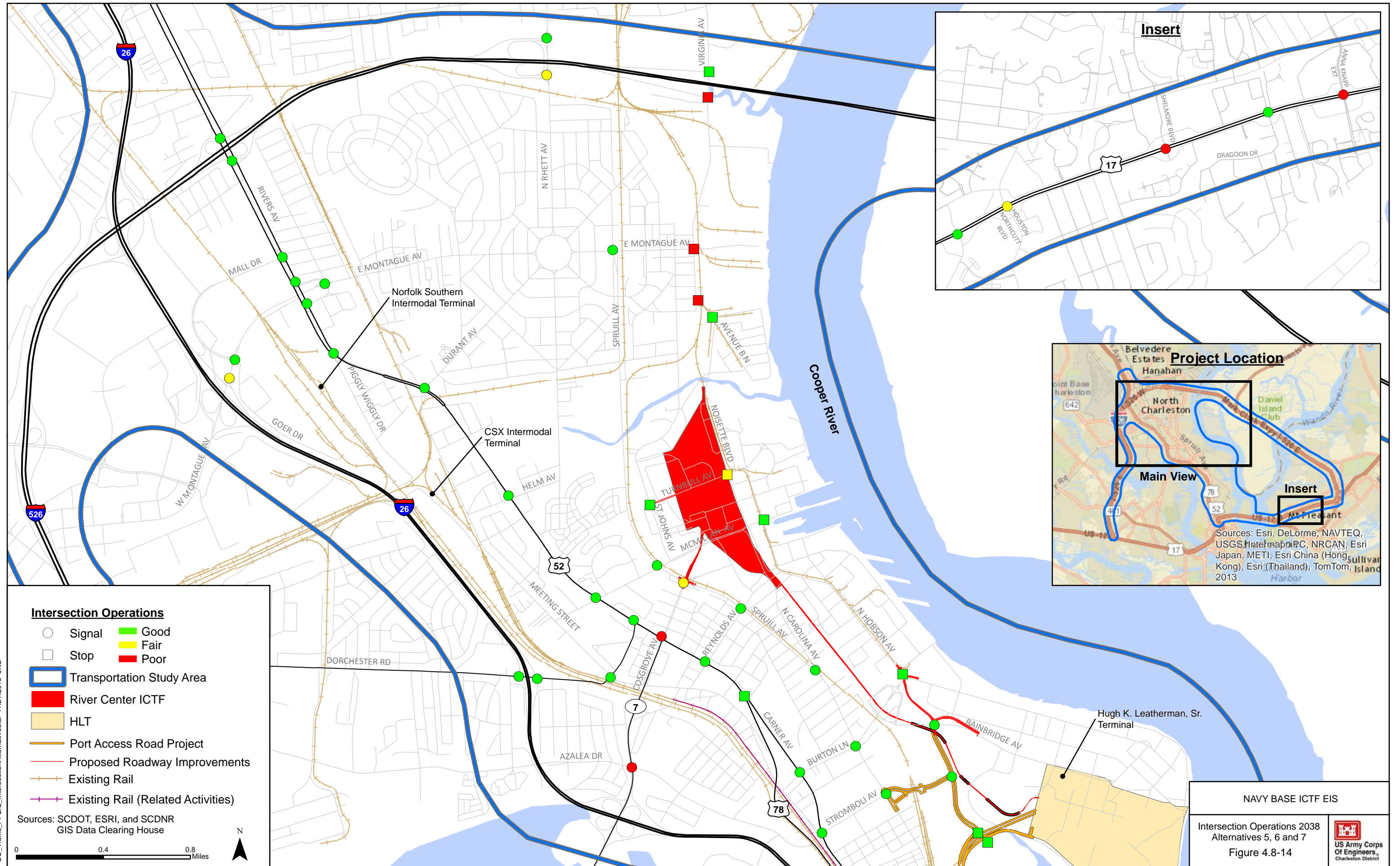
- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- Year 2018 / Year 2038 (LOS)
- Proposed Project
- Transportation Study Area
- HLT

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016

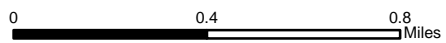




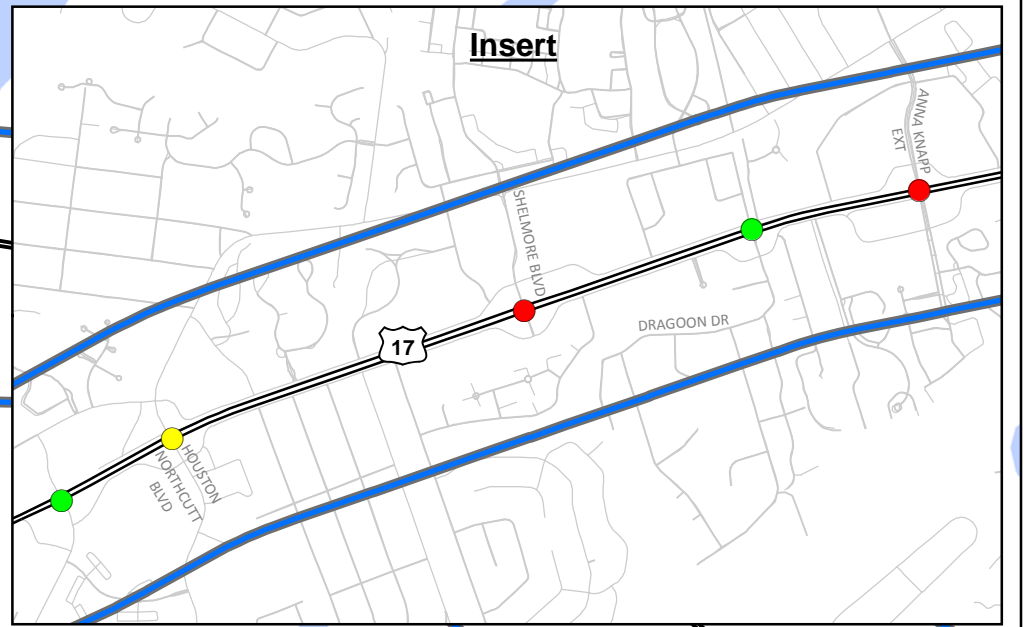
**Intersection Operations**

- Signal
- Stop
- ▭ Transportation Study Area
- ▭ River Center ICTF
- ▭ HLT
- Port Access Road Project
- Proposed Roadway Improvements
- Existing Rail
- Existing Rail (Related Activities)
- Good
- Fair
- Poor

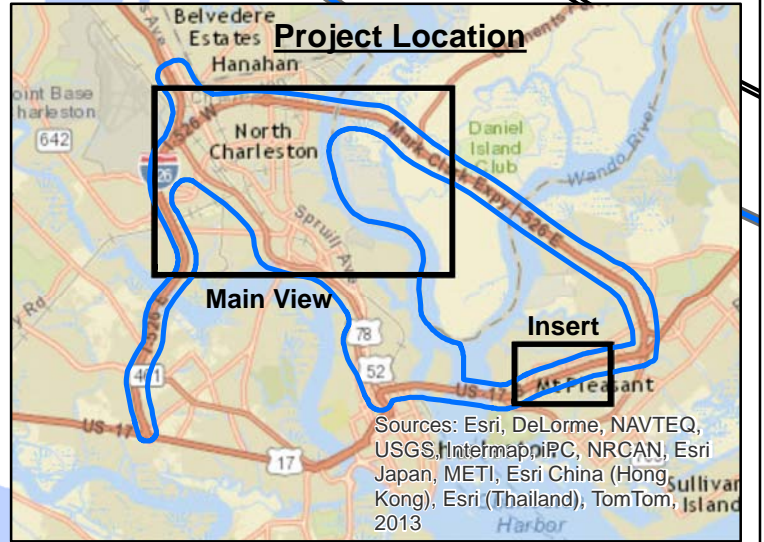
Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House



**Insert**



**Project Location**



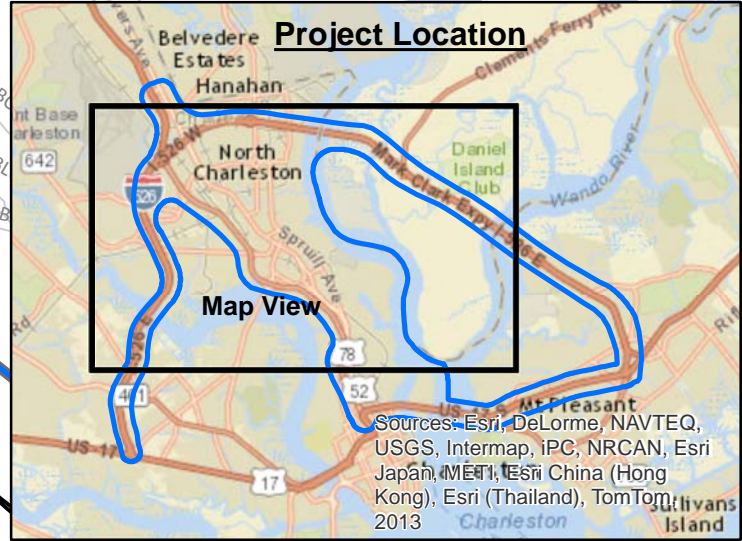
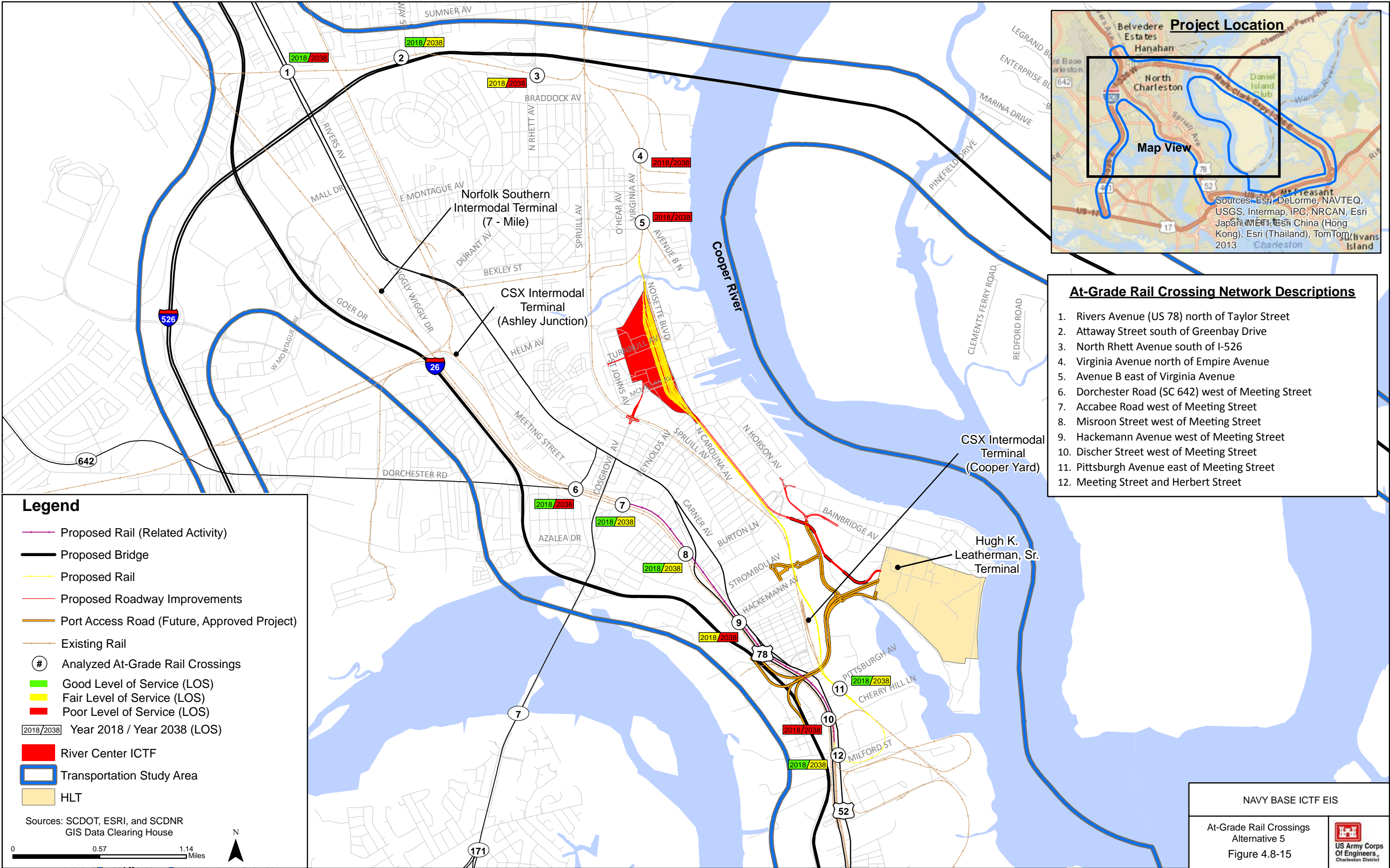
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Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

**NAVY BASE ICTF EIS**

Intersection Operations 2038  
Alternatives 5, 6 and 7  
Figure 4.8-14





- ### At-Grade Rail Crossing Network Descriptions
1. Rivers Avenue (US 78) north of Taylor Street
  2. Attaway Street south of Greenbay Drive
  3. North Rhett Avenue south of I-526
  4. Virginia Avenue north of Empire Avenue
  5. Avenue B east of Virginia Avenue
  6. Dorchester Road (SC 642) west of Meeting Street
  7. Accabee Road west of Meeting Street
  8. Misroon Street west of Meeting Street
  9. Hackemann Avenue west of Meeting Street
  10. Discher Street west of Meeting Street
  11. Pittsburgh Avenue east of Meeting Street
  12. Meeting Street and Herbert Street

### Legend

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- Year 2018 / Year 2038 (LOS)
- River Center ICTF
- Transportation Study Area
- HLT

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

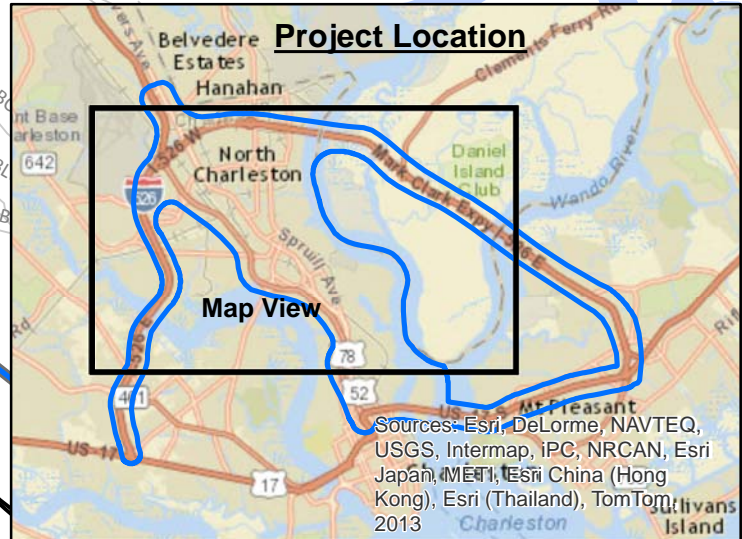
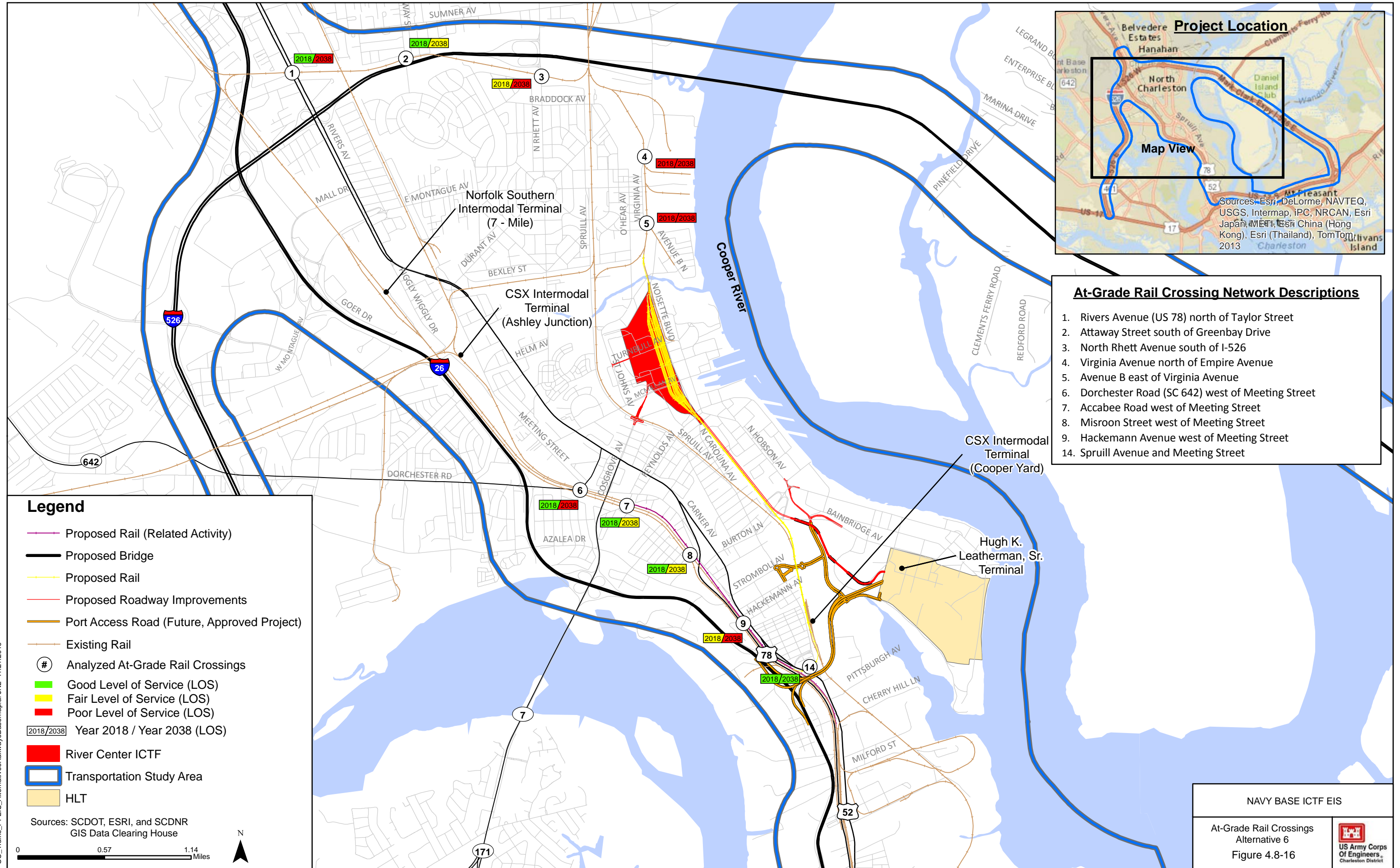
0 0.57 1.14 Miles

NAVY BASE ICTF EIS

At-Grade Rail Crossings  
Alternative 5  
Figure 4.8-15

US Army Corps  
Of Engineers  
Charleston District

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



### At-Grade Rail Crossing Network Descriptions

1. Rivers Avenue (US 78) north of Taylor Street
2. Attaway Street south of Greenbay Drive
3. North Rhett Avenue south of I-526
4. Virginia Avenue north of Empire Avenue
5. Avenue B east of Virginia Avenue
6. Dorchester Road (SC 642) west of Meeting Street
7. Accabee Road west of Meeting Street
8. Misroon Street west of Meeting Street
9. Hackemann Avenue west of Meeting Street
14. Spruill Avenue and Meeting Street

### Legend

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- # Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- 2018/2038 Year 2018 / Year 2038 (LOS)
- River Center ICTF
- Transportation Study Area
- HLT

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

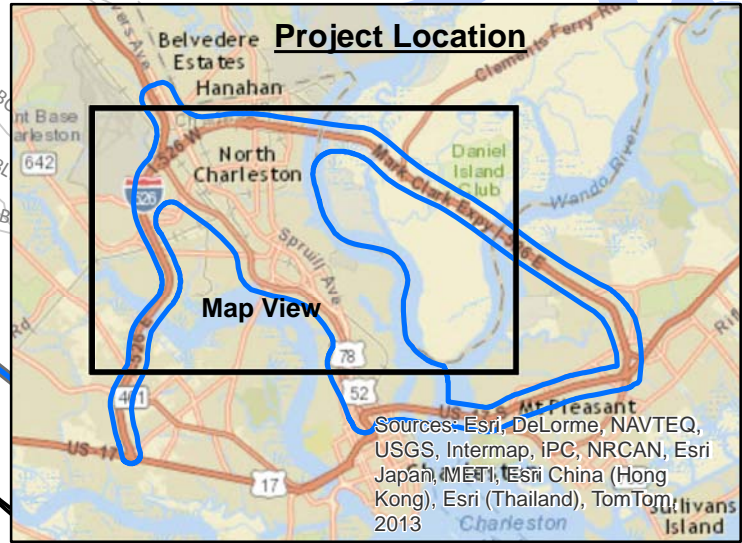
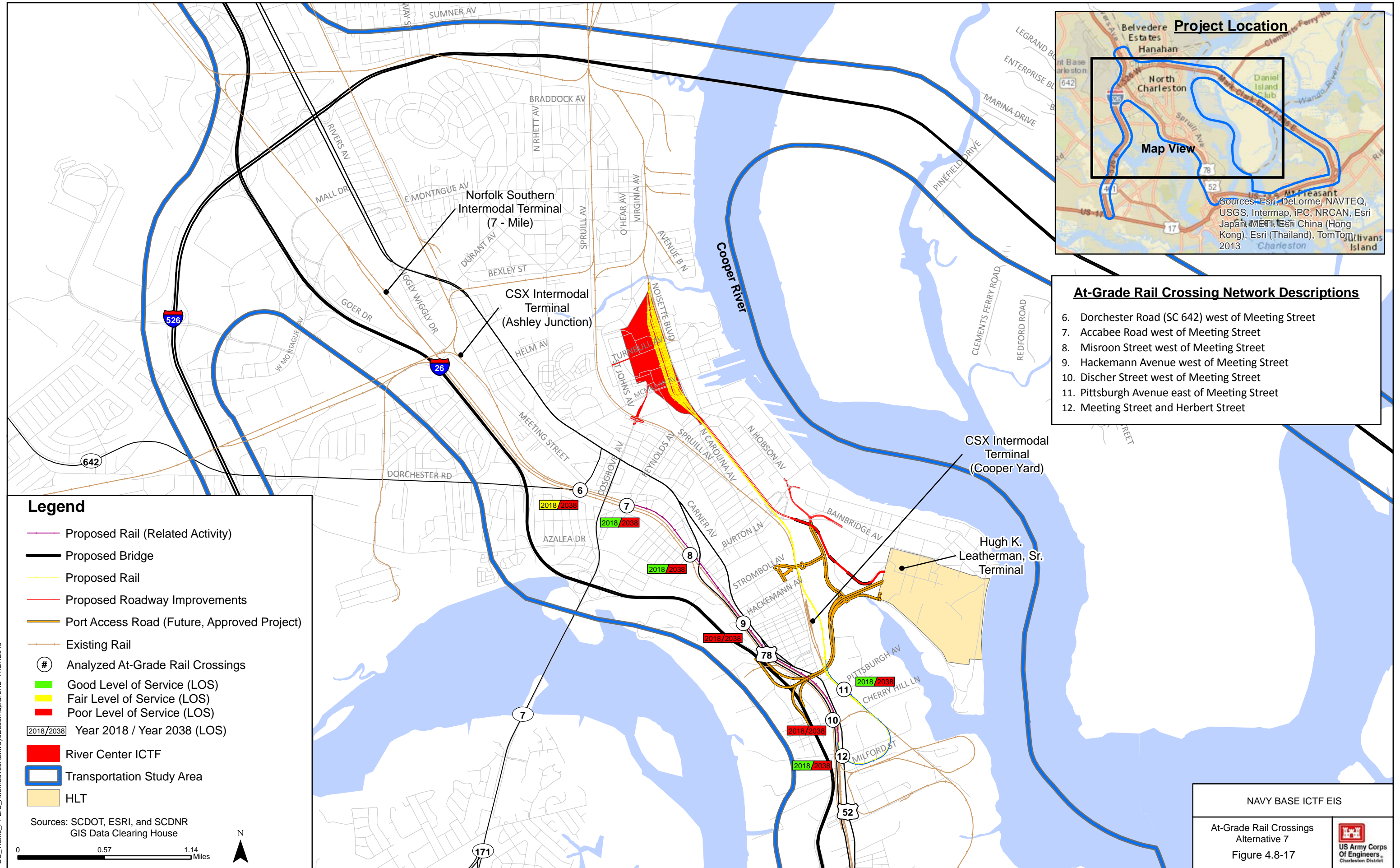
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NAVY BASE ICTF EIS

At-Grade Rail Crossings  
Alternative 6  
Figure 4.8-16

US Army Corps  
Of Engineers  
Charleston District

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



- ### At-Grade Rail Crossing Network Descriptions
- Dorchester Road (SC 642) west of Meeting Street
  - Accabee Road west of Meeting Street
  - Misroon Street west of Meeting Street
  - Hackemann Avenue west of Meeting Street
  - Discher Street west of Meeting Street
  - Pittsburgh Avenue east of Meeting Street
  - Meeting Street and Herbert Street

### Legend

- Proposed Rail (Related Activity)
- Proposed Bridge
- Proposed Rail
- Proposed Roadway Improvements
- Port Access Road (Future, Approved Project)
- Existing Rail
- # Analyzed At-Grade Rail Crossings
- Good Level of Service (LOS)
- Fair Level of Service (LOS)
- Poor Level of Service (LOS)
- [2018/2038] Year 2018 / Year 2038 (LOS)
- River Center ICTF
- Transportation Study Area
- HLT

Sources: SCDOT, ESRI, and SCDNR  
GIS Data Clearing House

0 0.57 1.14 Miles

NAVY BASE ICTF EIS

At-Grade Rail Crossings  
Alternative 7  
Figure 4.8-17

US Army Corps  
Of Engineers  
Charleston District

POC\_Traffic\_PFEIS\_AlternativesRailwaysBasemap.ai\_JNL\_11.21.2016



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