

ROADS AND TRAFFIC – PROPOSED SHIPYARD CREEK PROJECT

Existing Roadways

The overwhelming majority of traffic accessing the Shipyard Creek site on existing roadways will arrive via Interstate 26 (I-26), using the Meeting Street / Spruill Avenue interchange. From there, traffic will access the site via Pittsburgh Avenue.

I-26 is the primary route for business travel from outside the Tri-County region and commuter traffic from the northwest parts of the Tri-County region to the greater Charleston area. I-26 is an eight-lane facility in the vicinity of the site. In 2012, SCDOT records list an estimated 84,000 average annual daily traffic near the Meeting Street Bridge.

Meeting Street is classified as a principal arterial with a posted speed limit of 40 mph. Its five-lane cross-section consists of two northbound lanes, two southbound lanes, and a center two-way left turn lane. Traffic counts performed in 2013 indicate 9,840 vehicles per day travel on Meeting Street in the vicinity of the site.

Spruill Avenue is a three-lane arterial that splits off North Meeting Street and continues north to its intersection and terminus at Montague Avenue in North Charleston. In the vicinity of the site, Spruill Avenue provides a connection to the eastbound lanes of I-26 as well as local road access to traffic exiting the I-26 westbound lanes and is classified as a minor arterial.

Pittsburgh Avenue is a two-lane facility linking Meeting Street and the waterfront along Shipyard Creek. The roadway is aligned in an east-west direction and, since there is not a posted speed limit, the statutory 30 mph speed limit applies.

The traffic study for this environmental document analyzed existing (2013), no-build (2018), and build (2018) conditions for egress and ingress traffic at the Shipyard Creek site. This current analysis was based on the 2005 study performed by SRS Engineering and the 2013 update performed by Davis & Floyd (D&F) targeted specifically at the Shipyard Creek site and its intended use as a bulk cargo facility. Future changes in traffic user patterns were derived from the USACE 2006 EIS for the Port Terminal Access Road. Both the SRS and D&F studies utilized average daily traffic numbers from the Berkeley-Charleston-Dorchester Council of Government (BCDCOG study). Subsequently, vehicle per day counts from the BCDCOG data were compared to site-specific traffic counts performed by SRS.

Existing Traffic Volumes and LOS

The 2013 traffic impact study in the vicinity of the Shipyard Creek site (Davis & Floyd, 2013) looked at a number of traffic movement factors. Table 1 shows the intersection control as well as the counted traffic of the Meeting Street at Pittsburgh Avenue intersection, which is the primary gateway into the site.

Table 1: Meeting Street at Pittsburgh Avenue Intersection Control and Counted Traffic Volumes

Scenario	Northbound			Southbound			Westbound		
Traffic Control	Uncontrolled			Uncontrolled			Stop-Controlled		
2012 (counted) AM Peak Hour Traffic Volumes (vph)	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	N/A	207	7	82	533	N/A	24	N/A	28
2012 (counted) PM Peak Hour Traffic Volumes (vph)	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
	N/A	552	4	31	283	N/A	15	N/A	97

Since the 2013 study included only the intersection of Meeting Street at Pittsburgh Avenue, a capacity analysis for the intersections of Meeting Street at Spruill Avenue and Spruill Avenue at the I-26 ramps was performed by Moffatt & Nichol in 2014. This analysis used the same methodology as the previous traffic studies. Additionally, turning movement traffic counts were available at the intersection of Meeting Street and Spruill Avenue. Traffic volumes for the intersection of Spruill Avenue at I-26 ramps were surmised from these counts and regional patterns as well. Traffic signal plans were provided by SCDOT at the signalized intersections, however specific AM and PM peak hour timing data were not made available. Therefore, traffic signal timing for the two signalized intersections was developed using Synchro software (www.trafficware.com) in which traffic volumes and movement patterns generated a level of service at each intersection. The resultant capacity analysis was performed using methodologies outlined in the 2010 Highway Capacity Manual (TRB 2010).

Level of service (LOS) is a six-point scale and varies from letter grade A, representing almost free-flow conditions, to letter grade F, representing highly congested or “stop-and-go” conditions. LOS E represents at-capacity conditions and LOS D represents near-capacity conditions. Table 2 lists the LOS of the study intersections as they operated under existing traffic conditions.

Table 2: Existing (2013) Level of Service

Intersection	Meeting Street at Pittsburgh Avenue	Meeting Street at Spruill Avenue	Spruill Avenue at I-26 Ramps*
Intersection Control	Stop-Controlled	Signalized	Signalized
AM Peak Hour LOS	C	B	A
PM Peak Hour LOS	D	B	B

*The eastbound right-turn at this intersection is a channelized right that operates under a yield sign and not the traffic signal at the intersection. To be conservative, this eastbound right-turn was removed from the intersection level of service calculation.

Intersection control refers to the mechanism for which traffic is regulated at the respective intersection. Meeting Street at Pittsburgh Avenue is controlled by a stop sign on Pittsburgh Avenue. The intersections of Meeting Street at Spruill Avenue and Spruill Avenue at the I-26 ramps are controlled by a traffic signal (i.e. signalized).

The 2013 study then projected (i.e. grew) traffic at a rate of 3.0 percent per year to the envisioned build-out year of 2018. This is often referred to as “background traffic” and attempts to determine operational characteristics in the build-out year without the proposed development. It should be noted that the 2013 study determined historical growth rates in the area to be 1.8 percent but grew the traffic at the aforementioned 3.0 per cent rate per year in order to account for the additional traffic expected from the initial phase of the Navy Base Container Terminal as well as all other unspecified background growth in traffic.

Table 3 lists the LOS of the study intersections as they operate under expected 2018 background traffic conditions.

Table 3: Background (2018) Level of Service

Intersection	Meeting Street at Pittsburgh Avenue	Meeting Street at Spruill Avenue	Spruill Avenue at I-26 Ramps*
Intersection Control	Stop-Controlled	Signalized	Signalized
AM Peak Hour LOS	D	B	B
PM Peak Hour LOS	D	B	B

*The eastbound right-turn at this intersection is a channelized right that operates under a yield sign and not the traffic signal at the intersection. To be conservative, this eastbound right-turn was removed from the intersection level of service calculation.

Trip Generation and Impacts to LOS

In the 2013 study, the developable area at the Shipyard Creek site was envisioned to be 88 acres. Based on preliminary planning, the site is envisioned to currently consist of 74 developable acres. The 2013 study generated traffic for the development based upon a projected number of 110 employees. The anticipated employment for the proposed project is projected to be within a reasonable range or less than the employees projected in the 2013 study. Table 4 lists the trip generation from the 2013 study. This includes both truck and personal vehicle (i.e. car) traffic.

Table 4: Trip Generation

Land Use	Weekday Daily			AM Peak Hour			PM Peak Hour		
	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit
Bulk Transfer Facility	650	325	325	150	102	48	155	50	105

For comparison purposes, the trip generation potential of the Shipyard Creek development was calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual (ITE, 9th edition). ITE generates trips based upon the acreage of the site that is attributed to ship berths, areas for transferring cargo, storage areas, and office space. Under these criteria, the area of the site generating traffic is estimated as 50 acres. The daily trip generation numbers using the ITE methodology resulted in fewer trips than what was presented in Table 4. To be conservative, the trip generation provided in Table 4 will be used in the operational analysis presented herein.

Without improvements, the 2013 study notes that site traffic causes the LOS at the intersection of Meeting Street and Pittsburgh Avenue to erode from LOS D (under background traffic) to LOS F (under build-out traffic) during both AM and PM peak hours. Those figures as well as the levels of service for the AM and PM peak hours for the intersections of Meeting Street at Spruill Avenue and Spruill Avenue at the I-26 ramps are listed in Table 5.

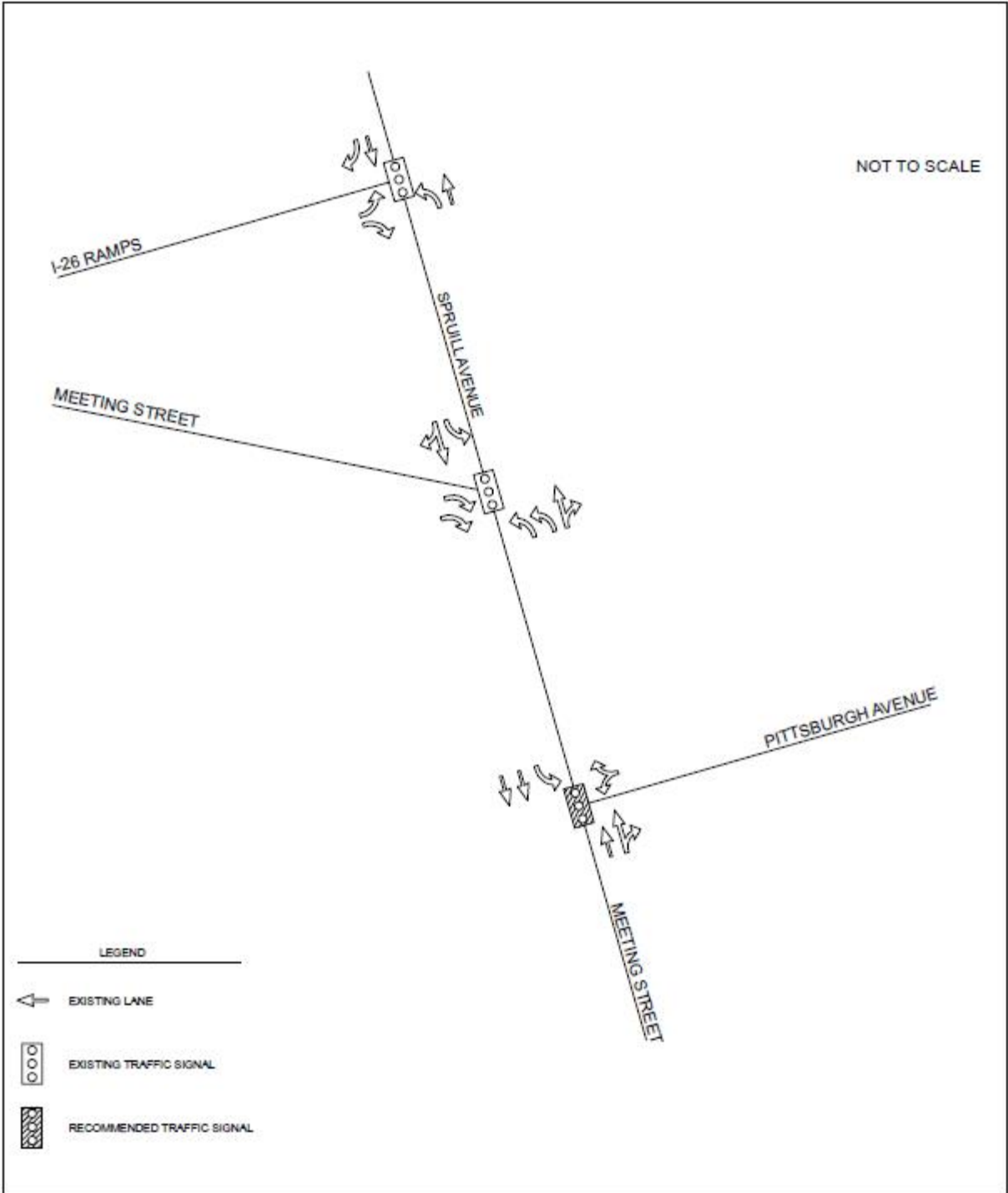
Table 5: Build Out (2018) Level of Service without Improvements

Intersection	Meeting Street at Pittsburgh Avenue	Meeting Street at Spruill Avenue	Spruill Avenue at I-26 Ramps*
Intersection Control	Stop-Controlled	Signalized	Signalized
AM Peak Hour LOS	F	B	B
PM Peak Hour LOS	F	B	B

*The eastbound right-turn at this intersection is a channelized right that operates under a yield sign and not the traffic signal at the intersection. To be conservative, this eastbound right-turn was removed from the intersection level of service calculation.

The 2013 study only included the intersection of Meeting Street at Pittsburgh Avenue as traffic volumes generated by the proposed development would constitute a small portion of the traffic on I-26. Specifically, average daily traffic counts collected in 2012 show traffic on I-26 in the vicinity of the development to be 83,300 vehicles per day. Traffic generated by Shipyard Creek would constitute an increase of less than one-percent on this section of I-26, assuming ALL project-related traffic utilized I-26. As such, no impacts to LOS on I-26 are foreseen as a result of this development.

As a result of the capacity analysis of existing laneage operating under full build-out traffic volumes, the study recommends installing a traffic signal at the intersection of Meeting Street and Pittsburgh Avenue (Figure 1). This was shown to improve the LOS at the intersection from LOS F to LOS C. The proposed project contemplates the installation of this recommended traffic signal. No improvements are recommended at the intersections of Meeting Street at Spruill Avenue and Spruill Avenue at the I-26 ramps. These intersections were found to operate at excellent levels of service across all analysis scenarios and the Shipyard Creek development traffic is not expected to impact the intersections in a manner that would warrant mitigation.



Data Sources: Moffatt & Nichol Engineers

Recommended Roadway Improvements
Shipyard Creek
 Charleston, SC



Figure 1: Recommended Road Improvement

Future Traffic Changes

In 2025, the Charleston Naval Complex is envisioned to begin operation. This 287-acre port facility will be located on the east side of Shipyard Creek. As part of this development, a full control of access facility connecting Interstate 26 and the Charleston Naval Complex Marine Container Terminal will be constructed. The facility will be entirely on new location, have a posted speed of 50 mph, and be classified as an urban freeway. This facility will potentially provide alternative access to the Shipyard Creek development. Figure 2 illustrates the new access road.

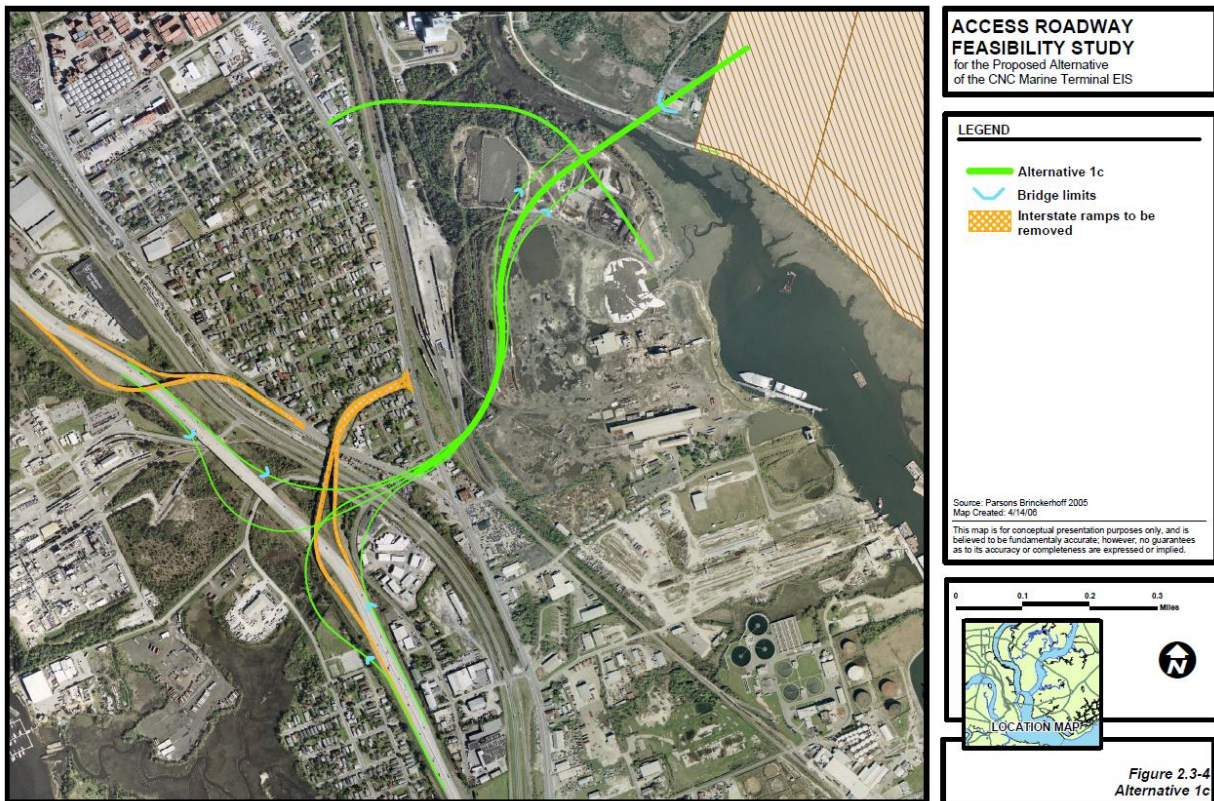
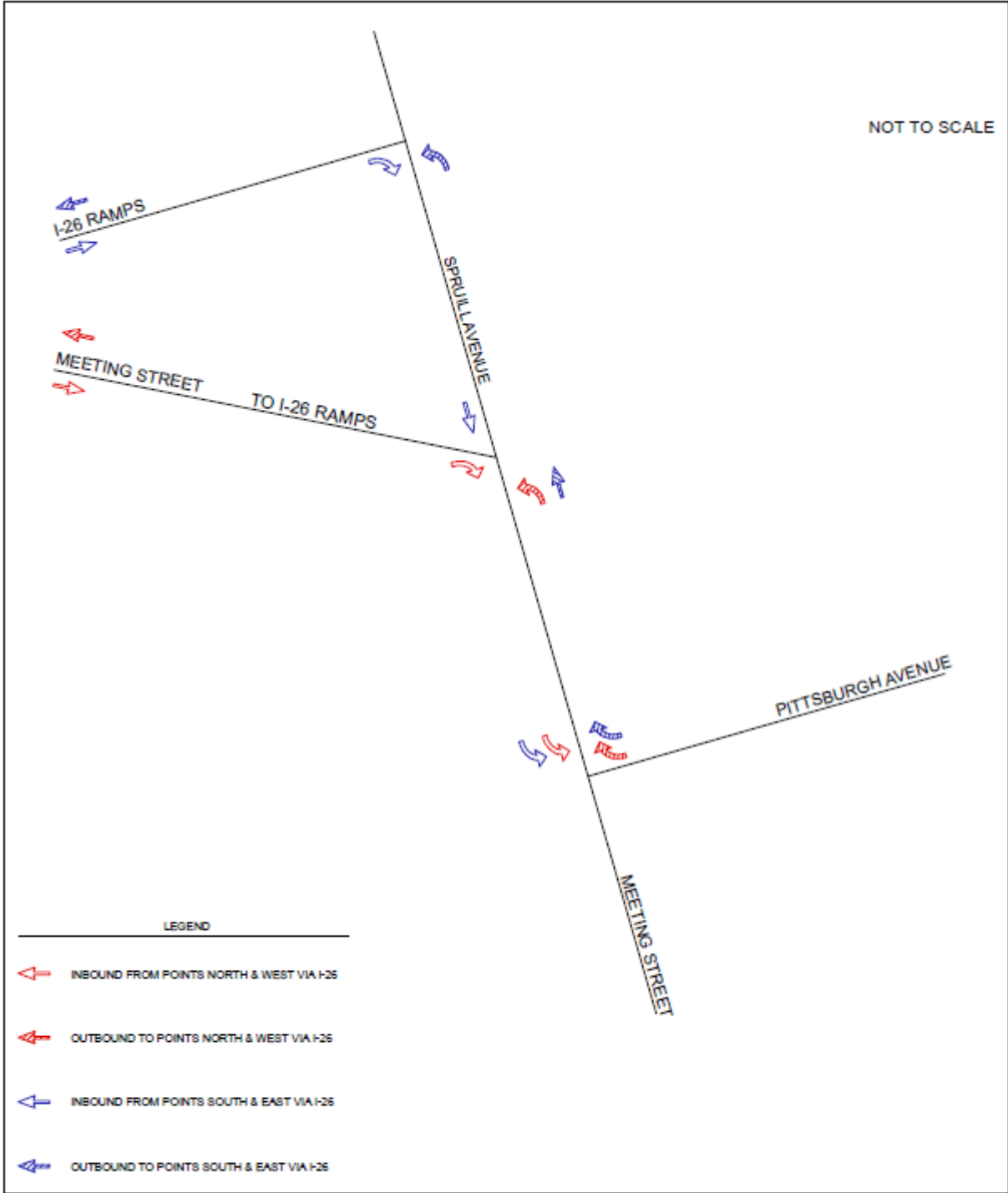


Figure 2: Charleston Naval Port Terminal Access Road

This design is expected to replace the existing interchange with Spruill Avenue. New access could be provided to the Shipyard Creek site via a proposed urban interchange and an east-west access road (see Figure 2). It can be postulated that the new urban freeway will have the following impacts to proposed development traffic and traffic patterns in the surrounding area:

- The elimination of the existing I-26 ramps on Spruill Avenue will decrease the amount of traffic on local roads near the site;
- Travel times to/from I-26 for development traffic will be shortened due to the new access road.
- Possible truck routes pre- and post-Port Terminal Access Road as shown on Figure 3 and Figure 4.



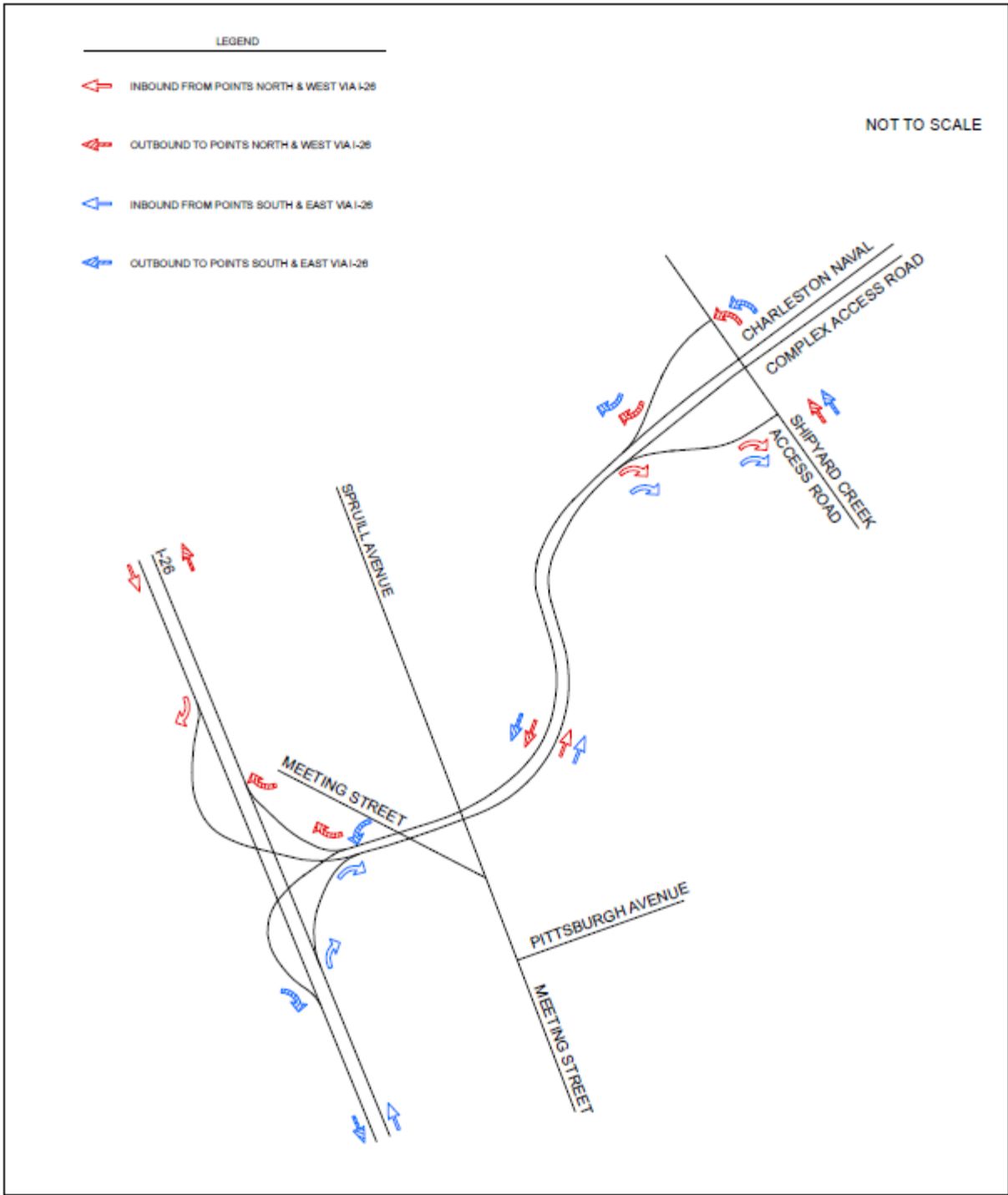
Data Sources: Moffatt & Nichol Engineers

**Possible Truck Routes Before
Port Access Road**

Shipyard Creek
Charleston, SC



Figure 3: Possible Truck Routes Before Port Terminal Access Road



Data Sources: Moffatt & Nichol Engineers

**Possible Truck Routes After
Port Access Road**

Shipyard Creek
Charleston, SC



Figure 4: Possible Truck Routes After Port Terminal Access Road

The traffic feasibility study for the proposed port terminal access road (USACE 2006) used between 3,030 vehicles per hour (vph) and 4,780 vph per direction (depending on the section and time period) for the capacity analysis. Traffic generated by the Shipyard Creek development was included in the design of this proposed freeway. While the USACE 2006 study does not explicitly state the amount of traffic generated by the Shipyard Creek development, it appears that 205 vehicles per hour was anticipated from the project. This is greater than the trip generation numbers used for this current analysis.

Furthermore, the USACE 2006 study analyzed the new intersections of the proposed port terminal access road eastbound off-ramps at the local access road into the Shipyard Creek site. It was determined that this intersection could provide access to the urban freeway for the traffic generated from the Shipyard Creek project. The study found this intersection would operate at LOS C in the design year of 2025, which is more than adequate to handle traffic generated by the project.

Using these traffic volumes, the traffic generated by the proposed project would account for a maximum of approximately five percent of the total traffic on the new urban freeway. Therefore, it is anticipated that the Shipyard Creek development traffic will have a negligible impact to the planned port terminal access road.

The project will have some additional direct, indirect, and cumulative impacts on traffic in the area. Traffic patterns will not be changed as a result of the project and additional traffic volumes will be relatively minimal. As a result, the project will only represent a minor increase to the cumulative traffic in the Charleston area. I-26 will remain the primary route for business travel into the development and to the Charleston area in general. All regional studies and long-range transportation planning for I-26 have accounted for these anticipated traffic increases, inclusive of what will be generated by the Shipyard Creek development.