SCDOT

South Carolina
Department of Transportation

August 27, 2013

Mr. Stephen R. Ikerd
Director of Engineering and Operations
Federal Highway Administration
1835 Assembly Street, Suite 1279
Columbia, South Carolina 29201

RE: I-26/Port Access Road Interchange Modification Report – Charleston County
Federal-Aid Project GEN8 - File 10.037345A - PIN 37345

Dear Mr. Ikerd:

Enclosed is the Interchange Modification Report (IMR) for the I-26/Port Access Road interchange improvement project in Charleston County for your review and concurrence. The South Carolina Department of Transportation (SCDOT) has reviewed the IMR and concurs with its contents. The environmental assessment was signed on April 17, 2013, a public hearing was held on May 23, 2013, and FHWA issued a FONSI on August 8, 2013.

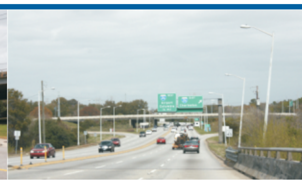
In association with these approvals and the proposed project, SCDOT is requesting your concurrence of the IMR.

Sincerely,

David A. Kinard, P.E.
Program Manager

DAK:gg
Enclosure
File: PC/Charleston/DAK

APPROVED: 9/9/2013
Division Administrator
By: Stephen R Ikerd
FEDERAL HIGHWAY ADMINISTRATION

INTERSTATE 26

I-26 / Naval Base Terminal Access Road Interchange

INTERCHANGE MODIFICATION REPORT

CHARLESTON COUNTY, SOUTH CAROLINA

Prepared for:

South Carolina Department of Transportation

SCDOT

Prepared by:

Parsons Brinckerhoff, Inc.

May 2012

PARSONS BRINCKERHOFF

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EXECUTIVE SUMMARY

The planning for a new marine container terminal began in 1999 when the South Carolina State Ports Authority (SCSPA) applied to the U.S. Army Corps of Engineers (USACE) and the South Carolina Department of Health and Environmental Control (SCDHEC) for a permit to construct a marine cargo terminal on its property on Daniel Island in Charleston, South Carolina. This planning process ended in 2007 when a Final Environmental Impact Statement (FEIS) was issued and a Record of Decision (ROD) was reached for development of a container terminal at the old Navy Base in North Charleston, with a controlled-access 4-lane roadway connecting to I-26 with a new directional T-interchange in lieu of the current Exit 218 ramps. This is now an adopted project in the region's land use and transportation plan, and is slated for implementation by year 2020.

The project was evaluated in the Port EIS study as Alternative 1D and was ultimately selected as the Preferred Build Alternative. This Alternative 1D was determined to be the most feasible option for meeting the purpose and need of the project after considering numerous site locations, modal options, roadway alignments, interchange designs and local roadway improvements. The project is currently referred to as the Navy Base Terminal (NBT) and the access road to I-26 is referred to as the Port Access Road. The purpose of the current Interchange Modification Report (IMR) study is to document the traffic operational impact of this project on I-26 mainline within the immediate influence area interchanges and prepare an IMR as per the Federal Highway Administration's 8-point policy. A summary of responses to the FHWA eight policy points are documented in a matrix below.

The latest traffic operational analysis revealed that I-26 would slightly worsen from LOS D to LOS E traffic conditions in forecast year 2035 conditions during the highest peak hours of the day (i.e., 7-8 am and 5-6 pm) and in the peak travel direction, between the proposed new interchange and the Cosgrove Avenue interchange. This traffic impact is less than what was anticipated during the Port EIS study due to the reduced traffic growth projections in the region and reduced land use growth projections along the immediate interchange areas. The latest traffic simulation analysis found no significant queuing impact along I-26 mainline operations within the influence area of the Port Access Road.

The modification to the I-26 Interchange at Exit 218 to implement a new fully directional T-interchange with the Port Access Road is necessary because the current roadway infrastructure is inadequate to serve the truck traffic from the NBT. The traffic operations of the modified interchange have been studied extensively as part of the Port EIS and the current IMR study and the interchange design would provide acceptable LOS E or better traffic operations in the design year (2035). With all federal requirements outlined and addressed in this document met, FHWA approval to proceed with the interchange modification at I-26 to provide access to the Naval Base Terminal via the Port Access Road should be granted.

FHWA Eight-Point Policy Response Summary Matrix

Policy Point	Summary Response
1. Existing Network	A detailed traffic study during the Port EIS concluded that the existing roadway network is inadequate to accommodate the future traffic demand from the new container terminal. This was due to several reasons including inadequate capacities of north-south arterials, turning radius restrictions at intersections, busy interchanges at Cosgrove Avenue and Dorchester Road, and trucks traveling through residential areas or circuitous routes in order to reach I-26. The use of the existing road network for truck travel would impact several historic Environmental Justice communities.
2. Alternatives	Numerous alternatives were evaluated for locating the new container terminal in the region. Once the old Navy Base site was selected as the preferred location, numerous roadway alignment alternatives were evaluated during the Port EIS study. The Port EIS selected Alternative 1D as the Preferred Build Alternative, which included a new roadway connecting the NBT with I-26 near Exit 218. The TSM alternative was deemed as inadequate to fulfill the project's purpose and need. Other alternatives such as HOT lane and ramp metering were deemed infeasible based on follow on studies conducted by the SCDOT.
3. Operation & Safety	Detailed traffic operational analyses were carried out for the IMR study using HCS2010 and CORSIM simulation models. The operational analysis explored the full range of impacts of the project on I-26 (between Mt. Pleasant Street and Dorchester Road) in design year 2035 conditions during Commuter AM peak hour (7-8 am), Port AM peak hour (9-10 am), Port PM peak hour (2-3 pm), and Commuter PM peak hour (5-6 pm). The analysis shows that I-26 would maintain LOS E or better operations during commuter AM and PM peak hours while accommodating year 2035 Build traffic demand. The simulation analysis confirmed that there would be no traffic flow breakdowns within the study area I-26 segments in year 2035 Build conditions. This traffic LOS finding shows improvement (compared to the results documented in the Port EIS study), primarily due to the reduced growth forecasts in the region and along the I-26 corridor that took into account the effects of the recent economic recession. Previously anticipated large-scale mixed-use land development projects such as the Magnolia development and the Noisette development were significantly reduced in the region's updated growth forecast. The project is also anticipated to improve traffic safety along I-26 by eliminating the substandard ramps at Spruill Avenue and by incorporating higher design standards for the new ramps.
4. Full Interchange	The new Port Access Road and the fully directional T-interchange will substantively improve access to the industrial Neck area. The directional T-interchange will provide access in both directions of I-26. The Port Access Road will provide local connections to Spruill Avenue, Bainbridge Avenue, and other local businesses.
5. Plan Compatibility	The Port Access Road and the new I-26 interchange is now part of the BCDCOG's adopted Long Range Transportation Plan (LRTP) and the SCDOT's Statewide Transportation Improvement Program (STIP).
6. Cumulative Effects	There are no other proposed interchange modifications within the general vicinity. The current IMR study utilized the BCDCOG's regional travel demand model to develop year 2035 traffic forecasts along I-26. The regional demand model took into consideration the effects of all other roadway improvements in the region.
7. Stakeholder Coordination	Extensive stakeholder coordination took place throughout the Port EIS project. This stakeholder coordination process resulted in the selection of a Preferred Alternative (1D), which not only serves the purpose and need of the NBT, but also provides significant mobility benefit to local communities and businesses.
8. NEPA Compliance	A Final EIS was issued in 2006 and a Record of Decision was reached in 2007 on the Navy Base Terminal and the Port Access Road. The current Preferred Alternative design was included in the FEIS as Alternative 1D.

1. INTRODUCTION

Project Location

The proposed Port Access Road interchange is located in the City of North Charleston, Charleston County, South Carolina, in the industrial “Neck” area near the old Charleston Navy Base. The proposed project is a new freeway interchange on I-26, located south of the existing Meeting Street ramps (Exit 217).

The proposed project will remove the existing Spruill Avenue ramps (Exit 218) and build a new full movement directional T-interchange connecting to a new Port Access Road. The new Port Access Road will connect to the Navy Base Terminal (NBT) that is currently under construction by the South Carolina State Ports Authority (SCSPA) on the west banks of the Cooper River at the old Navy Base.

Figure 1-1 illustrates the project location within the broader context of the state and the Charleston region.

Project History

The planning for a new marine terminal began in 1999 when the SCSPA applied to the U.S. Army Corps of Engineers (USACE) and the South Carolina Department of Health and Environmental Control (SCDHEC) for a permit to construct a marine cargo terminal on its property on Daniel Island in Charleston, South Carolina. The SCSPA prepared a Draft Environmental Impact Statement (DEIS) to support their Daniel Island site permit application. During the public hearing on the DEIS, the project faced strong public opposition. Consequently, the SCSPA withdrew its permit application in 2001.

Recognizing the need for the SCSPA to expand its facilities in support of its mission, the South Carolina General Assembly approved a Joint Resolution in 2002, requiring the SCSPA to begin environmental impact studies and other required actions to obtain a permit for a new terminal facility on the West Bank of the Cooper River on the former Navy Base site. The Charleston Naval Complex Redevelopment Authority (RDA) was authorized by the General Assembly to convey portions of the former Charleston Naval Complex (CNC) to the SCSPA for the construction and operation of a marine terminal. This new legislative directive jump-started a new environmental planning process around the Navy Base site. The 2002 planning process started with a Needs Assessment study conducted by the SCSPA that outlined the future terminal capacity needs to accommodate the projected growth in containerized cargo through the Port of Charleston. The Needs Assessment study recommended for a new marine container terminal with a throughput capacity of 1.4 million TEU to meet the projected year 2025 demand for container cargo movements through the Port of Charleston.

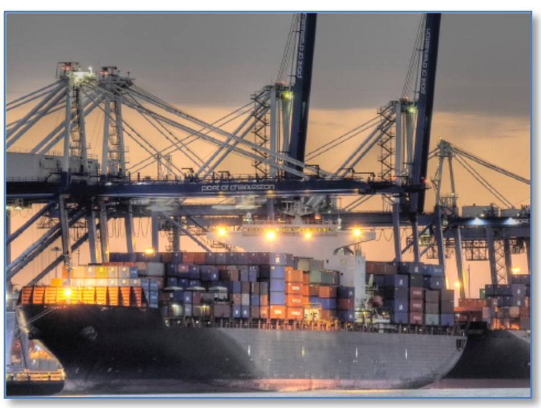
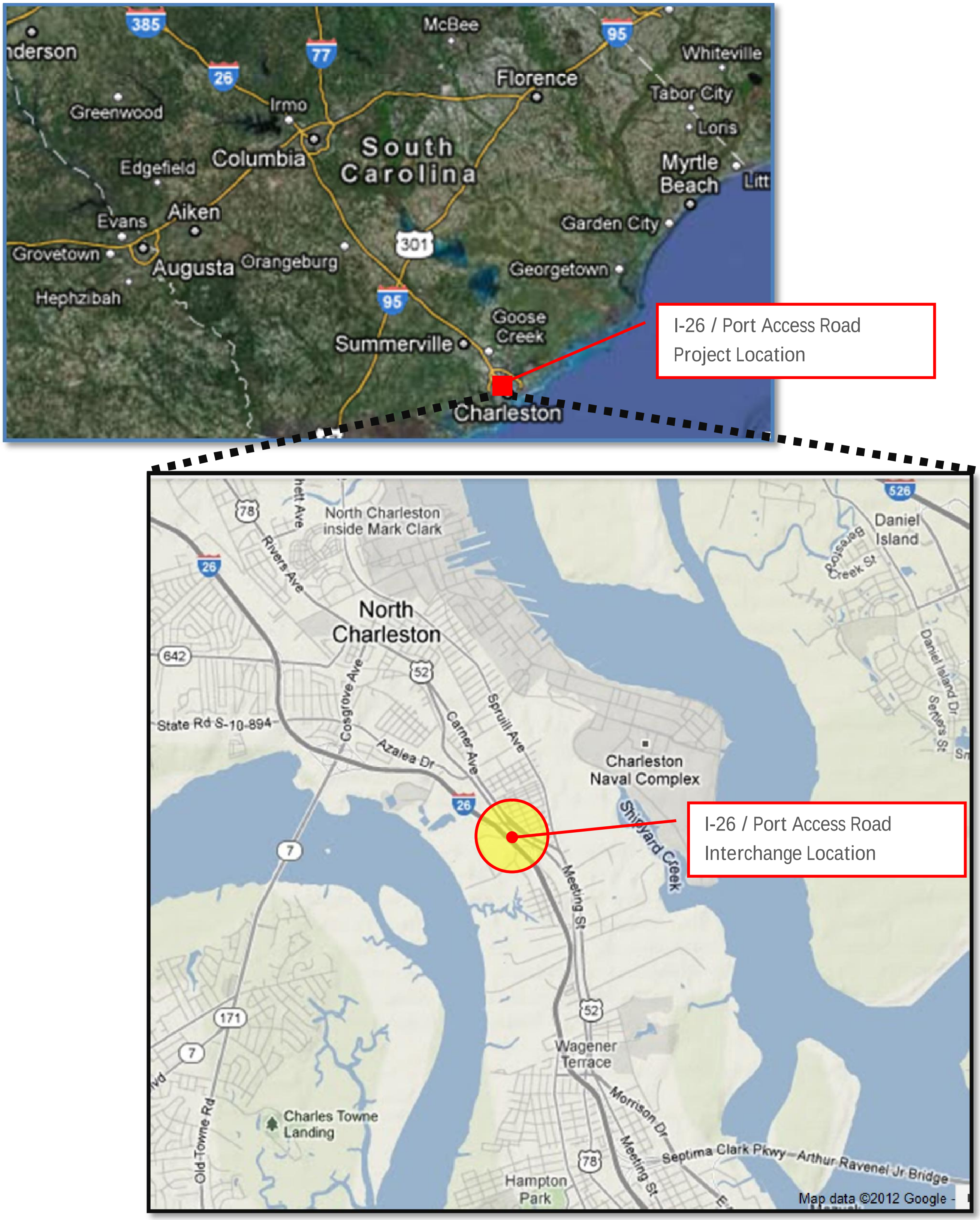


FIGURE 1-1 PROJECT LOCATION

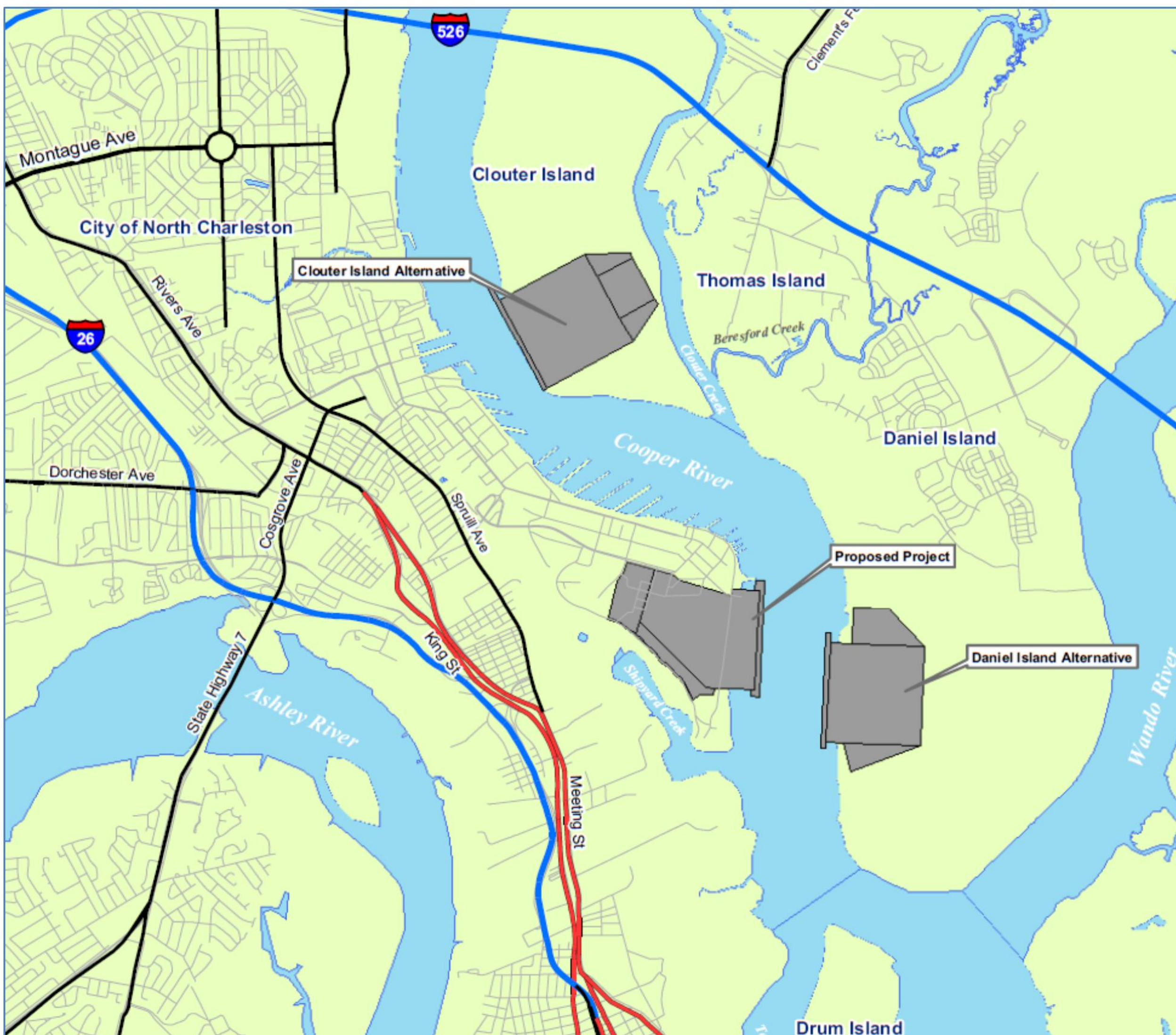


The next step in the planning process involved a new site evaluation process to compare the merits of the Navy Base site with alternate locations. The site comparison process evaluated several available alternate sites based on the following project purpose:

"To provide state-owned port facilities that meet the reasonably projected throughput capacity for containerized cargo in the state of South Carolina for the next twenty years."

The process screened 59 potential sites to 24 alternate sites based on several criteria: Navigation Access, Available Backland, Minimum Shoreline and Road and Rail Access. These 24 alternate sites were further screened using a set of detailed criteria to a list of three finalists. The final three alternate sites were carried forward in the Environmental Impact Statement (EIS) study. These three sites, depicted in Figure 1-2, were in Daniel Island, Clouter Island and the Old Navy Base. The evaluation process led to the selection of the Navy Base site as the preferred site for the new terminal.

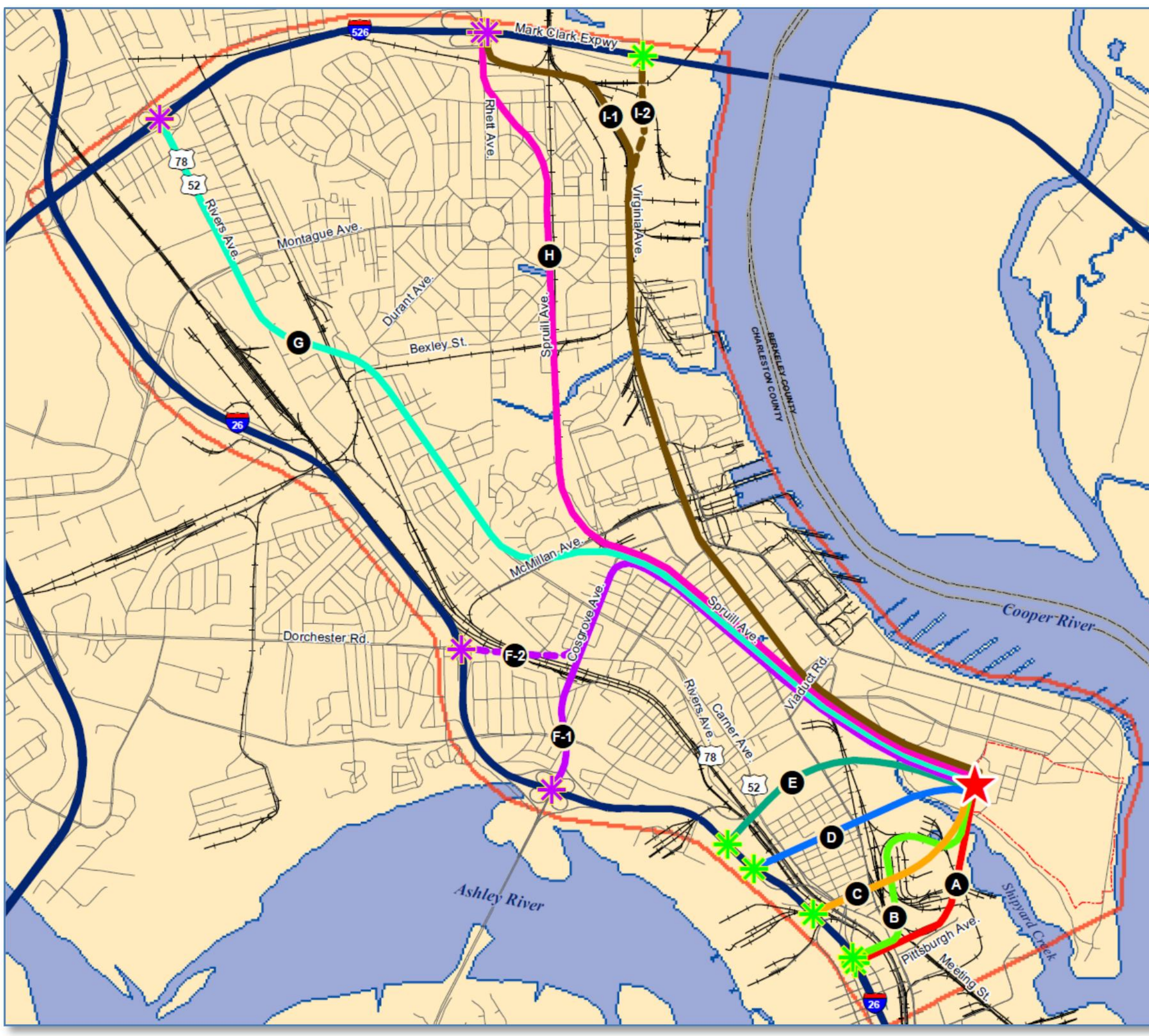
FIGURE 1-2 ALTERNATE SITES EVALUATED IN THE PORT EIS



The Navy Base site was evaluated with several access options from the Interstate system. These access options were evaluated in 2005/2006 as part of the Access Road Feasibility Study (ARFS). The ARFS first considered an option of building no new access roads and using the existing roadways and interchanges to serve the new terminal. Because of the impacts identified to local roads and interchanges, the ARFS then identified several alternatives of building a new direct access road to connect the terminal with the Interstate System (depicted in Figure 1-3 as Access Routes A through H). The ARFS recommended the Alignment D direct access road with a new interchange configuration to minimize community impacts and for the terminal to function efficiently in the build-out.

A Final Environmental Impact Statement (FEIS) was issued in 2006 and a Record of Decision (ROD) on the Navy Base Terminal and the Port Access Road alignment was reached in 2007. The Phase 1 of the Navy Base Terminal is currently under construction is scheduled for completion in 2018.

FIGURE 1-3 ALTERNATE ACCESS ROUTES EVALUATED IN THE PORT EIS



PROJECT DESCRIPTION

The South Carolina State Ports Authority (SCSPA) and the South Carolina Department of Transportation (SCDOT) worked cooperatively to complete a Final Environmental Impact Statement (FEIS) between 2003 and 2006, and to obtain the necessary permits from the US Army Corps of Engineers (USACE) in 2007 for building a new Port terminal at the south end of the old Naval Base in North Charleston, Charleston County, South Carolina, and directly connect the new Port terminal to Interstate 26 (I-26) with a new Port Access Roadway and an interchange.

The new Port terminal will be built on approximately 240 acres of land, just south of the SCSPA's Veterans Terminal (VT) and north of the Cooper River Marina on the west bank of the Cooper River. This terminal, referred to as the Charleston Naval Complex (CNC) terminal in the FEIS, was projected to have an annual throughput capacity of 1.4 million twenty-foot equivalent units (TEU) of container cargo by design year and 0.62 million TEUs of container cargo capacity at the year of opening. During the FEIS, the design year was assumed to be year 2025 and the year of opening was assumed to be year 2012. The new terminal will be built and operated by the SCSPA.

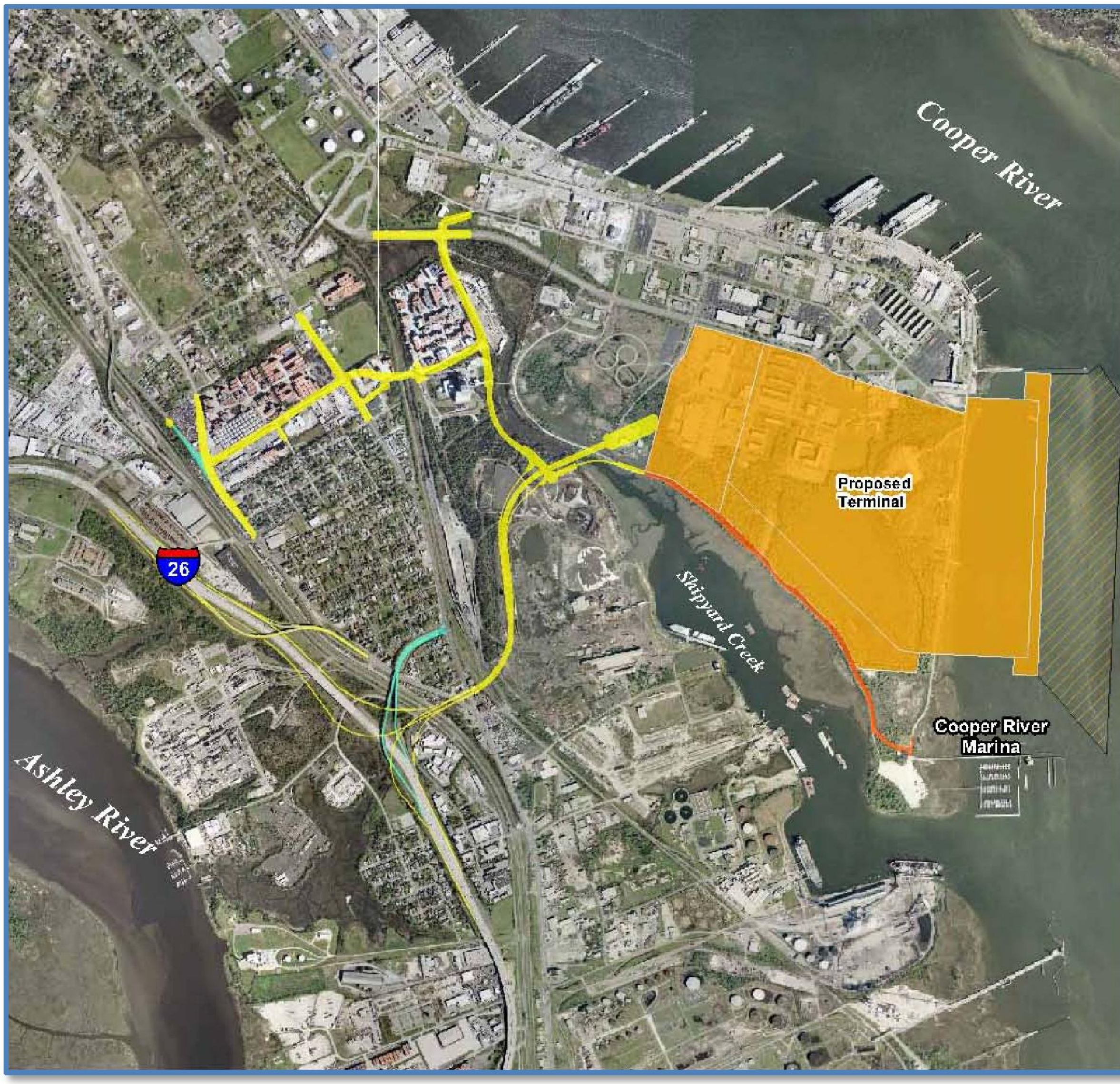
The 2006 FEIS included the planning and engineering work for an access road to the new terminal, which was prepared as part of the Access Road Feasibility Study (ARFS). The ARFS selected a Locally Preferred Alternative (LPA) for the Port Access Road and an interchange with I-26 based on detailed alternatives analysis and environmental impact assessment. This LPA is referred to as the Port Access Road - Alternative 1D in the FEIS. This Alternative 1D is depicted in Figure 1-4.

The Alternative 1D starts with a new full-movement directional T-interchange with I-26 in between the Meeting Street (Exit 217) and Spruill Avenue (Exit 218) ramps. It then extends eastward on elevated structures towards the new Port terminal site as a four-lane 50 miles per hour design speed highway. It overpasses several railroad tracks and north-south arterials, and provides a local access connection to Spruill Avenue. The Port Access Road ends at the front gate of the new Port terminal. The Port Access Road and the interchange will be built and maintained by the SCDOT.

This new Port terminal and the new Port Access Road are considered cumulatively as the "Project" within the context of the current Interchange Modification Report (IMR) study. The traffic volume and related road network changes due to the "Project" are referred to as the "Build" conditions in this IMR study. The future traffic conditions without the "Project" traffic are referred to as the "No-Build" conditions.

Currently, the new Port terminal is referred to as the Naval Base Terminal (NBT). It is currently projected to open in year 2018 with a throughput capacity of 0.74 million TEUs, and reach the maximum capacity of 1.4 million TEUs of container cargo by the new design year 2035. This reflects a change in the implementation phasing plan for the new terminal compared to what was envisioned during the FEIS, but the ultimate throughput capacity remained the same as analyzed in the FEIS. Consequently, the "Project" related traffic volumes for the current Interchange Modification Report (IMR) study remained the same as in the 2006 Port EIS study.

FIGURE 1-4 PORT EIS PREFERRED ALTERNATIVE



PROJECT PURPOSE AND NEED

The global marine ports and services market was estimated to have a volume of 6.4 billion metric tonnes of cargo, generating a total market value of $45 trillion in 2009[1]. This global market is projected to increase to 8.1 billion metric tonnes of cargo by year 2014, for a total market value of $63.5 trillion. The Asia-Pacific region dominates this market with 52 percent of the market share, followed by Europe which accounts for 22 percent, and the Americas region which accounts for 18 percent. The market segmentation by commodity category is more or less a three-way split, with liquid bulk cargo accounting for 37 percent, dry bulk cargo accounting for 32 percent, and container and general cargo accounting for 31 percent of the market share. The effects of this global trend translate into growth in container cargo movements between the Asia-Pacific region and the South Carolina's Port of Charleston.

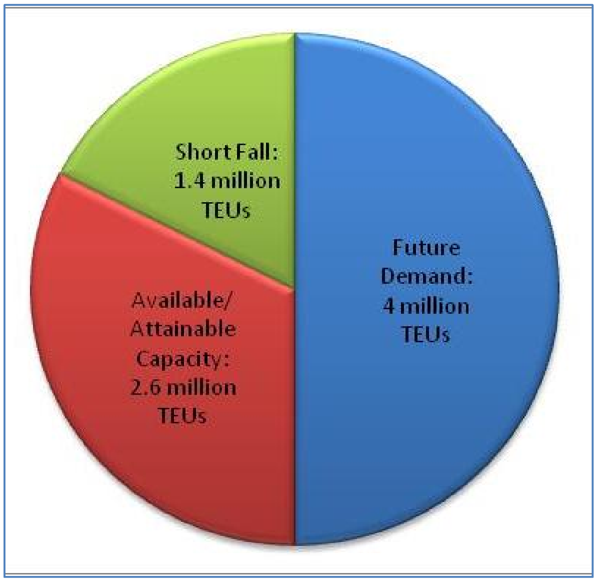
The Port of Charleston was ranked as the eighth largest port district in the United States based on the value of the goods handled, which was over $50 billion total for the import and export cargo in 2010[2]. It is considered a pillar of the regional and state economy. The SCSPA data showed that container cargo volumes through the Port of Charleston have grown at approximately six percent per year between 1998 and 2003. This level of high growth was attributed to the Port of Charleston's cost-competitive location, good highway and railroad accessibility, good navigation channels, proximity to the Atlanta and Charlotte markets, and the overall name recognition of the Charleston location. The projections prepared during the FEIS show that container cargo volume through the Port of Charleston is projected to grow from 1.65 million TEUs in 2004 to 4 million TEUs in 2025. This represented an annual growth rate of approximately four percent.

When this projected demand of 4 million TEUs is compared to the available/attainable maximum terminal capacity of 2.6 million TEUs of annual throughput for the Port of Charleston's three container terminals -- Columbus Street Terminal, North Charleston Terminal, and Wando Welch Terminal, it was determined that there is a capacity shortfall of 1.4 million TEUs, as depicted in Figure 1-5. The new Naval Base Terminal (NBT) is expected to fill this capacity shortfall.

The NBT will provide approximately 200 acres of active container marshalling area with 11,300 container slots, and implement an advanced stacking equipment system to yield 70 containers per slot. This design will ensure that the NBT can accommodate 791,000 containers or 1.4 million TEUs per year once fully built-out.

[1] Global Marine Ports & Services Industry Profile, DataMonitor, April 2010
[2] U.S. Census Bureau, Trade Data Branch Report, 2010.

FIGURE 1-5 PORT OF CHARLESTON CONTAINER CARGO: DEMAND VS. CAPACITY



In addition to the capacity needs, the NBT also fulfills several legislative policy commitments that mandated reusing and revitalizing the Charleston Naval Base area in a way that supports the local and regional economy and the land use vision for the surrounding area. The cost to develop the NBT and the Port Access Road is projected to be almost one billion dollars. This is a significant investment for the region. It will serve as a catalyst for increase in container cargo, and new jobs on the terminal site, at distribution centers, at trucking companies, and other maritime support services within the region. The development of the NBT is projected to result in 1,895 construction jobs and $72 million in wages per year that would generate $20 million per year in state and local tax revenues during the construction period. In addition, the operation of the proposed port facility would result in 1,790 full time equivalent jobs and $66 million in wages per year that would generate $13 million in state and local tax revenues per year.

The purpose of the Port Access Road is to provide a direct connection between the NBT and I-26 with a controlled-access facility and a new interchange that can serve as the main access roadway for employee and truck traffic to and from I-26. This direct connection eliminates the need for Port traffic to use existing local roads or existing I-26 interchanges that are already congested due to local and regional traffic generated to and from the Charleston region.

The traffic demand is expected to increase in the future, once major industrial projects including the Boeing Plant Expansion, Macalloy Industrial Park and Kinder Morgan Expansion are fully built-out. The Boeing Plant Expansion involves building an assembly plant south of the Charleston International Airport for its newest 787 Dreamliner aircrafts. The new plant is expected to employ 4,000 people when completed. The Macalloy Industrial Park is a superfund clean-up site and planned to include industrial facilities in the future. The Kinder Morgan plant, located along the west bank of the Shipyard Creek, is being expanded to handle 10 million tons of coal imports per year, which represents 286% percent increase from its current operations.

The Port Access Road is expected to improve mobility of the Port-generated traffic and improve traffic safety along local roads by diverting freight traffic away from local streets and away from interchanges at Cosgrove Avenue and Dorchester Road.

Project Conceptual Design

The conceptual design of the Port Access Road and the interchange with I-26 is shown in Figure 1-6. The detailed functional design plans and profiles of the Preferred Alternative (Alternative 1D in the FEIS) is presented in Appendix A. This preferred design is referred to as the Alternative 1D in the 2006 Ports FEIS. The Port Access Road is a 4-mile highway proposed to be built on a new alignment connecting the container port with I-26 by replacing the partial Spruill Avenue (Exit 218) interchange ramps with a full interchange. In this preferred design, the Meeting Street (Exit 217) ramps will be tied with the Port Access Road ramps with collector-distributor roads. This preferred design best suited the needs of local communities and stakeholders as well as the roadway capacity needs to adequately serve the auto and truck traffic from the new NBT. The Port Access Road will be built mostly on elevated structures in order to overpass the CSX King Street Extension line, Norfolk-Southern line, CSX Five-Mile Track Right-of-Way, Meeting Street, Spruill Avenue, and the CSX Cooper Yard tracks that run north-south and parallel to I-26.

The functional design of the new I-26 interchange includes barrier-separation for certain distance between the on-ramp traffic from the westbound Port Access Road and the westbound I-26 main line traffic in order to have the traffic merge with the Meeting Street on-ramp traffic on the collector facility. This allows a single merge point with westbound I-26 for Port Access Road and Meeting Street on-ramp traffic. Similarly, the interchange design allows for eastbound I-26 traffic to have one exit point, located approximately thousand feet west of the current Exit 217, in order to reach southbound Meeting Street and eastbound Port Access Road.

The existing partial Spruill Avenue interchange (Exit 218) that only serves traffic movements to and from Charleston will need to be demolished to accommodate the new full-movement Port Access Road interchange. To accommodate the traffic movements from the eliminated Spruill Avenue ramps, the new Port Access Road design provides a new half-diamond interchange just north of the future Macalloy Industrial Park site with a new Local Access Road connecting to the north with Spruill Avenue at Stromboli Avenue and with Bainbridge Avenue just south of Viaduct Road. The Local Access Road will also have a connection to the south to Tidewater Road to provide an employee-only entrance for the NBT and access to and from the Cooper River Marina. This half-diamond interchange will also provide access to the future Macalloy Industrial Park.

These proposed modifications to the I-26 facility triggered the need to prepare an Interchange Modification Report (IMR) to address eight policy points adopted by the Federal Highway Administration (FHWA). The FHWA has adopted eight standards or requirements that require analysis and evaluation as part of requesting for access point changes to the current interstate system.

Figure 1-6 Conceptual Design of the Preferred Alternative

Interchange Modification Report (IMR) Scope

Because the proposed project involved modifications to the Interstate System, an IMR is needed to obtain approval from the Federal Highway Administration (FHWA). The IMR is required to document the operational and safety impacts to the Interstate System due to the proposed access modifications.

In order to prepare and submit an IMR as per the FHWA policies, the following updates and changes were necessary to the 2006 FEIS traffic analysis:

- Update the background traffic conditions from FEIS' data (2003-2005) to available latest data (2009-2011) within the project influence area
- Revise the traffic forecasts for the project influence area by utilizing the latest available travel demand model from the Berkeley Charleston Dorchester Council of Governments (BCDCOG), which included the region's latest 2035 socio-economic forecasts
- Prepare hourly traffic volumes for peak commuting and peak Port operation periods in the morning and afternoon
- Update the traffic impact analysis by utilizing the latest 2010 Highway Capacity Software (HCS) model and the latest CORSIM simulation model
- Update the impacts of the "Project" traffic on the operations of I-26 using Level of Service and other measures of effectiveness (MOE)
- Address the needs and justifications for the new I-26 interchange according to the Federal Highway Administration's (FHWA) interchange policies

IMR Applicant Information

The interchange policy is administered by the Federal Highway Administration (FHWA). Therefore, FHWA is required to approve all new access or changes in access points pursuant to this policy.

As the owner and operator of the Interstate System, the South Carolina Department of Transportation (SCDOT) is responsible for submitting a formal request to the FHWA in the form of an Interchange Modification Report (IMR) that documents the analysis, the rationale for the proposed change in access, and the recommended action.

SCDOT on behalf of the SCSPA is the sponsoring agency for the I-26 access modification request. SCDOT has prepared the Interchange Modification Report for the I-26 / Naval Base Terminal Access Road interchange with a step-wise review and coordination process. The step-wise process involved several coordination meetings with the following agencies for guidance on methodology, existing conditions data, and review of performance measures:

- SCDOT's Traffic Engineering Division
- FHWA's South Carolina Division Office (Engineering & Operations)
- SCDOT's Planning & Environmental Division
- SCDOT's Engineering District 6

Once the IMR is accepted and approved by the FHWA, SCDOT will be the agency responsible for updating the Environmental Assessment document and then implementing the Port Access Road and the I-26 interchange improvements.

The contact information for the I-26 IMR study is provided in Table 1-1.

TABLE 1-1 IMR APPLICANT INFORMATION

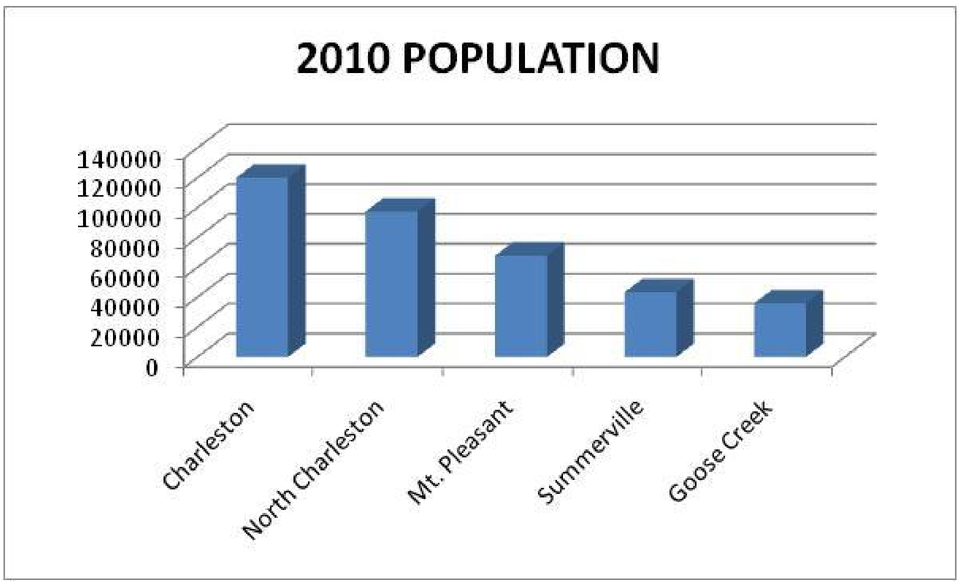
I-26 / Naval Base Terminal Access Road Interchange	Contact Information
Applicant	Joe Bryant South Carolina State Sports Authority 176 Concord Street Charleston, SC 29401 (843) 856-7048 JBryant@SCSPA.com
Sponsor	David A. Kinard, P.E. Program Manager South Carolina Department of Transportation 955 Park Street, Room 401 Columbia, South Carolina 29202 (803) 737-1963 (Columbia) (843) 873-5763 (Summerville) KinardDA@scdot.org

2. STUDY AREA

DEMOGRAPHICS

The project is located in the greater Charleston metropolitan area and is part of the Charleston Area Transportation Study (CHATS) region that includes three counties – Berkeley, Charleston, and Dorchester (BCD) with a total population of 549,000 in 2000. The CHATS region's population grew to 664,607 people in 2010, or 21 percent in 10 years. In year 2010, approximately 53 percent of this population lived in Charleston county, 27 percent in Berkeley County, and 21 percent in Dorchester county. As shown in Figure 2-1, the five largest cities or towns in this region are: Charleston, North Charleston, Mt. Pleasant, Summerville, and Goose Creek. This BCD region is projected to attract an additional 100,000 people by year 2035. The region's projected growth is attributable to the rich history and culture that defines the quality of life in the Lowcountry and the growing job and business opportunities in the region.

FIGURE 2-1 YEAR 2010 POPULATION



The Charleston region has a diverse economic mix of companies and jobs. The region's economy is driven by a multi-billion dollar tourism industry, one of the busiest container ports along the Southeast and Gulf coasts, a strong manufacturing base, as well as large military and medical establishments. The region's jobs profile counted 330,000 jobs in 2008, or one job per two people. The region's jobs forecast improved when the Boeing Company announced in 2009 to build their second 787 Dreamliner assembly plant in North Charleston. The region is currently expected to add 84,000 jobs by year 2035.

LAND USE

As depicted in Figure 2-2, the study area is predominantly flat plains bounded by water, Ashley River to the west and Cooper River to the East, and pockets of marsh land. These two tidal rivers join together in Charleston to form Charleston Harbor before discharging into the Atlantic Ocean.

FIGURE 2-2 AERIAL VIEW OF THE STUDY AREA (LOOKING SOUTHEAST)

As depicted in Figure 2-3, the existing land uses within the study area are predominantly industrial and institutional, intermixed with pockets of residential, commercial and mixed uses. Development of the site as a marine container terminal will change the site land use to industrial use. Development of the Proposed Project may be reasonably expected to spur ancillary commercial and industrial development within the region. Maritime support industries are likely to locate within the Port Overlay District that was established by the City of North Charleston.

The region's Population projections are depicted in Figure 2-4 and Employment projections are depicted in Figure 2-5, in terms of bar charts (2035 vs. 2008) by Traffic Analysis Zones (TAZ)[3].

The proposed access roadway would cause minor adverse impacts to existing industrial and commercial land uses. Property owned and operated by several industries and businesses would need to be acquired to construct the proposed port access roadway and a new interchange on Interstate 26. The Proposed Project would likely have some beneficial impacts to land uses along Meeting Street, Spruill Avenue, and Stromboli Avenue as they would likely become more commercial in nature. Vacation of Meeting Street at the intersection with Carner Avenue could open area to expand existing businesses or could create land area for higher density land uses.

[3] Source: BCDCOG Travel Demand Model (Dec 2010 Version).

The access roadway was designed to avoid direct impacts to existing residential land use, and as a result of the Proposed Project would not take any residential land. The removal of Exit 218 would potentially be a beneficial land use impact by creating open space. This space could be used for housing or to create an open area for residents. The eastbound interchange ramps of the proposed access roadway would have a minor adverse impact to Rosemont Field, but it would not prevent the intended use of this land.

FIGURE 2-3 EXISTING LAND USES IN THE STUDY AREA

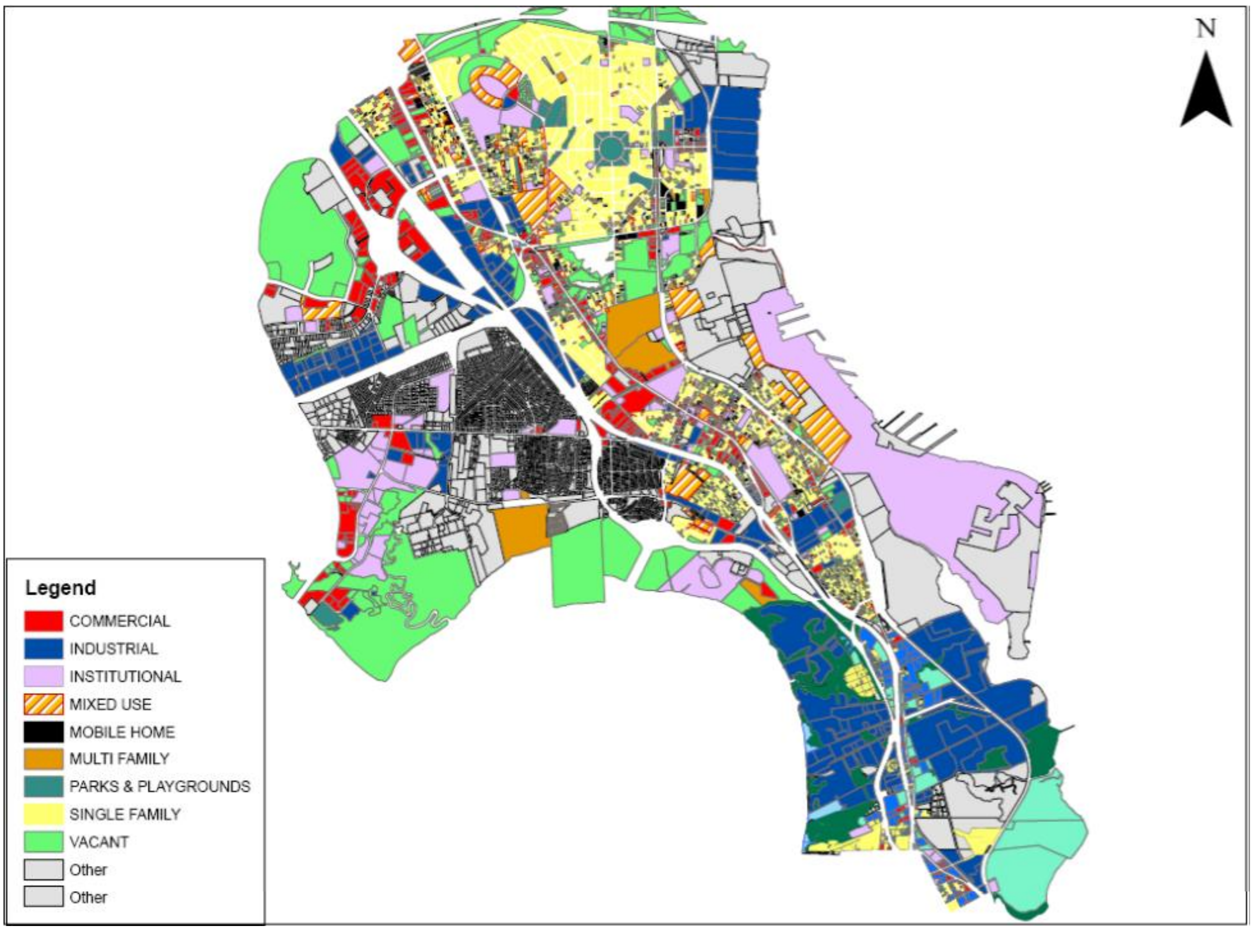
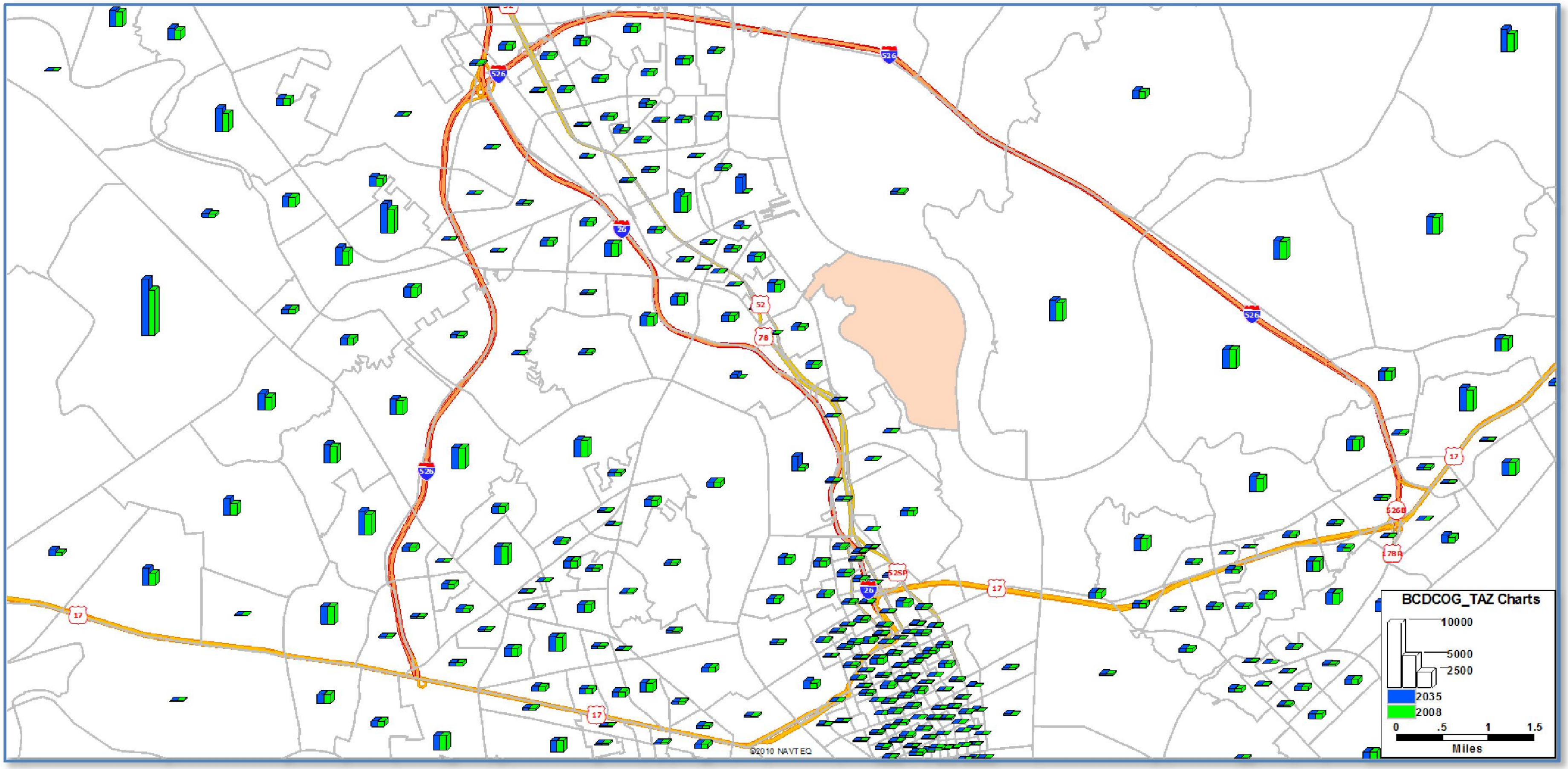
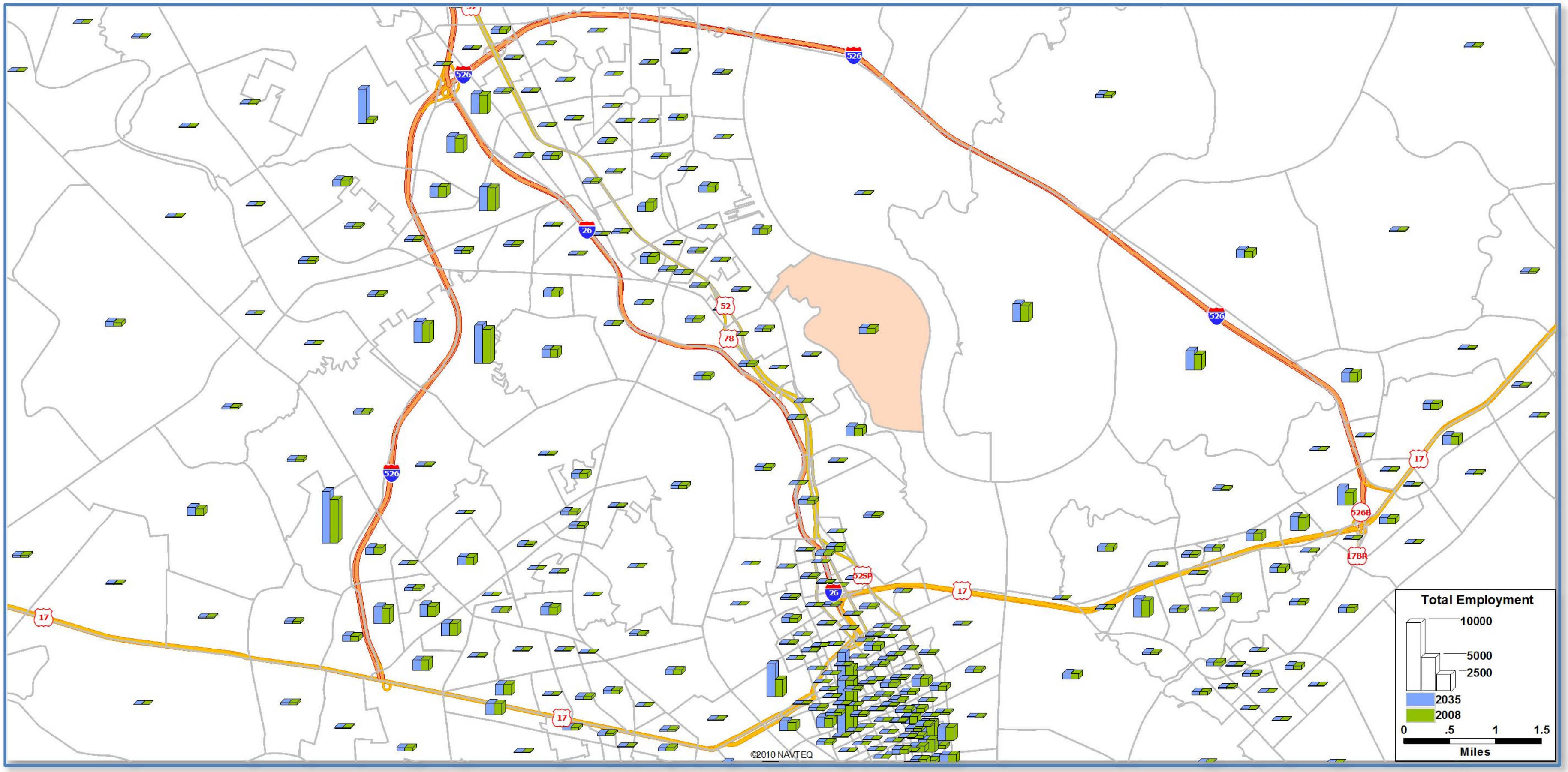


FIGURE 2-4 POPULATION GROWTH IN THE STUDY AREA



Data Source: BCDCOG Travel Demand Model (Dec 2010 version)

FIGURE 2-5 EMPLOYMENT GROWTH IN THE STUDY AREA



Data Source: BCDCOG Travel Demand Model (Dec 2010 version)

Transportation System

The project study area roadway transportation system is depicted in Figure 2-6. The Charleston region is accessed via I-26, which is an east-west freeway (but physically more northwest-southeast) connecting to I-95 corridor and Columbia to the west. The region is also served by a loop freeway – I-526 (Mark Clark Expressway) connecting Mt. Pleasant to the east and West Ashley to the west.

For the IMR study, a focused roadway system was evaluated. It consisted of I-26 mainline and the interchanges within the vicinity of the Port Access Road interchange. Specifically, I-26 eastbound and westbound mainline segments between Mt. Pleasant Street and Montague Avenue were evaluated for traffic conditions during different hours of the day. In addition, six existing interchanges from Mt. Pleasant St in Charleston to Dorchester Road in North Charleston and the proposed new interchange with Port Access Road were evaluated.

It should be noted that this IMR study area is a subset of the broader study area that was analyzed during the Ports EIS study in terms of geographic and modal coverage. The Ports EIS study evaluated the impacts of the Naval Base Terminal on other land uses, communities, and the broader highway and railroad networks in the study area. The focus of the IMR study is on the I-26 Interstate highway corridor. The additional focus is on Interstate traffic operations. Consequently, three additional time of day analyses were prepared for the IMR study beyond the typical PM peak hour that was considered during the Port EIS study. This additional time of day analysis allowed evaluation of I-26 traffic operational conditions during commuter peak as well as Port peak hours. The focused geographic scale of the IMR study area allowed evaluation of the I-26 mainline operations where it is expected to have the most direct and measurable impact from the Port-generated traffic volumes.

I-26

I-26 is a 6-lane urban freeway (between Mt. Pleasant Street and Montague Avenue) with concrete median barrier separating the eastbound and westbound lanes (see picture below). There are six interchanges in the IMR study area:

1. Dorchester Road (SC 642) Interchange (Exit 215) in North Charleston
2. Cosgrove Avenue (SC 7) Interchange (Exits 216A and 216B) in North Charleston
3. North Meeting Street (US 52) Interchange (Exit 217) in Charleston
4. Spruill Avenue Interchange (Exit 218) in Charleston
5. Rutledge Avenue/ Heriot Street Interchange (Exit 219A) in Charleston

6. Mt. Pleasant Street/ Morrison Drive/ East Bay Street Interchange (Exit 219B) in Charleston

The interchange with Dorchester Road is a full-movement interchange in tight urban diamond configuration with signalized operations at the ramp junctions. The Dorchester Road interchange serves both local and regional traffic in North Charleston.

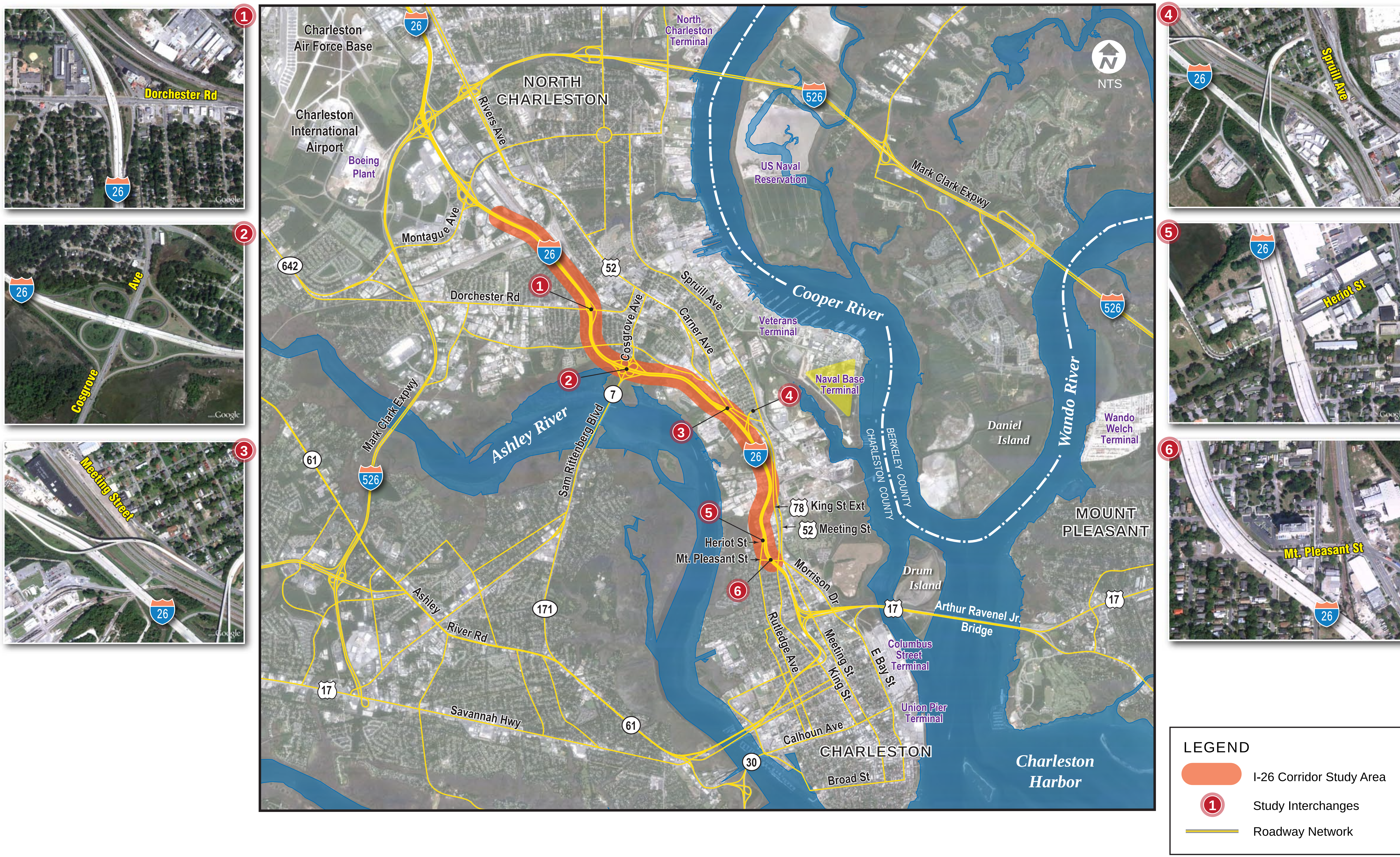
The interchange with Cosgrove Avenue (see picture) is a full clover interchange serving traffic to and from communities west of the Ashley River along Sam Rittenberg Boulevard (SC 7).

The interchange with Meeting Street is a partial interchange allowing eastbound exit and westbound entrance movements and serving industrial traffic along Meeting Street.

The interchange with Spruill Avenue (see picture) is also a partial interchange allowing eastbound entrance and westbound exit movements and serving federal complex and local residential communities in North Charleston including Rosemont and Union Heights.

The interchange with Rutledge Avenue (at Heriot Street) allows eastbound exit and westbound entrance movements and serves The Citadel College and the Hampton Park area, located southwest of the interchange area.

The interchange with Mt. Pleasant Street allows eastbound exit and westbound entrance movements, and serves Charleston commercial traffic via Meeting Street, Morrison Drive and East Bay Street.



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STUDY AREA TRANSPORTATION SYSTEM

Figure 2-6

3. METHODOLOGY

This section summarize the approach and methodology utilized in updating traffic forecasts for the study area freeway and interchanges, revised Level of Service (LOS) analysis, and traffic simulation analysis.

This section also describes the methodological changes made in the current IMR study as compared to the methodology utilized in the prior Port EIS study.

SCENARIOS ANALYZED

PORT EIS STUDY

In 2006, Parsons Brinckerhoff (PB) prepared traffic impact analysis to support the preparation of the Final Environmental Impact Statement (FEIS) for the Naval Base Terminal. This FEIS traffic analysis included the following two scenarios:

- FEIS No-Build Scenario – This scenario reflected future year (2025) projected background traffic conditions during the PM peak hour, defined as the highest hourly traffic volume along study area freeways and arterials between 4-6 pm. The No-Build scenario did not include any traffic or committed roadway improvements related to the Naval Base Terminal. This is equivalent to trend-line growth in background PM peak hour commuter traffic.
- FEIS Build "Worst Case" Scenario – This scenario reflected future year (2025) projected traffic conditions during the same afternoon peak hour between 4-6 pm, but considered the addition of the NBT's build-out traffic and the changes in trip pattern due to the Port Access Road. This scenario is equivalent to "worst case" PM peak hour traffic condition because it combined the highest hourly commuter traffic with highest hourly Port-generated traffic, regardless of the actual hour of these two different traffic patterns. Although the Ports operations data show that 2-3 pm as the peak hour for Port-generated traffic, the FEIS methodology adopted a "worst case" scenario by combining the two traffic peaks – commuter traffic peak and port traffic peak.

IMR STUDY

In the current IMR study, the No-Build scenario was updated to reflect the latest traffic pattern and growth projections in the area. The Build scenario remained the same as in FEIS with the exception of moving the horizon year to 2035. In both scenarios, however, refinements were made to separate the Commuter peak traffic from the Port peak traffic and to realistically evaluate the traffic conditions along I-26 segments where the Port traffic is going to have the most direct impacts. Consequently, two peak hours during the morning period and two peak hours during the afternoon period for a total of four peak hours were analyzed. These four peak hours, analyzed for both No-Build and Build scenarios, are listed below.

- Commuter AM Peak Hour – Based on review of the hourly traffic data along I-26 north of Dorchester Road for typical weekdays during March through May in 2009, the Commuter AM peak hour was defined as the highest hourly traffic volume along I-26 between 7-8 am. The IMR study evaluated traffic conditions during this Commuter AM Peak Hour for Existing (2009) conditions, Future (2035) No-Build conditions (i.e., without the proposed Naval Base

Terminal and associated road improvements), and Future (2035) Build conditions (i.e., including the traffic from the Naval Base Terminal and the Port Access Road with a new interchange).

- Port AM Peak Hour – Based on review of the Port of Charleston's May 2009 gate movement data, the Port AM peak hour was defined as the highest hourly traffic volume between 9-10 am. The IMR study evaluated traffic conditions during this Port AM Peak Hour for Existing (2009) conditions, Future (2035) No-Build conditions, and Future (2035) Build conditions.
- Port PM Peak Hour – Based on review of the Port of Charleston's May 2009 gate movement data, the Port PM peak hour was defined as the highest hourly traffic volume between 2-3 pm. The IMR study evaluated traffic conditions during this Port PM Peak Hour for Existing (2009) conditions, Future (2035) No-Build conditions, and Future (2035) Build conditions.
- Commuter PM Peak Hour – Based on review of the hourly traffic data along I-26 north of Dorchester Road for typical weekdays during March through May in 2009, the Commuter PM peak hour was defined as the highest hourly traffic volume along I-26 between 4-6 pm. The IMR study evaluated traffic conditions during this Commuter PM Peak Hour for Existing (2009) conditions, Future (2035) No-Build conditions, and Future (2035) Build conditions.

No-Build Traffic Forecasts

Port EIS Study

The No-Build traffic during the Port EIS study was defined as the year 2025 background traffic without the Port's Naval Base Terminal (NBT) traffic. The 2025 No-Build traffic forecasting process during the Port EIS study involved estimating peak hour growth rates for different study area freeways and arterials. The growth rate for background traffic along I-26 was estimated using the following three steps:

1. Review the observed ADT traffic trends between 2000 and 2003 for ten I-26 segments from Mt. Pleasant Street to US 52 Connector Road.
2. Estimate an annual average traffic growth rate for the I-26 corridor between Mt. Pleasant Street and US 52 Connector Road for daily and PM peak hour conditions.
3. Check reasonableness of the traffic growth rates against the projected household and employment growth rates along the corridor that showed high growth rates in the Noisette and Magnolia project areas.

This count-based 2025 No-Build growth rate estimation process resulted in PM peak hour traffic growth rate by study area roadway corridors. For the I-26 corridor, a uniform growth rate of 1.17 percent per year was estimated for peak hour mainline and ramp traffic. This count-based No-Build growth forecasting approach was necessary because the BCDCOG travel demand model was going through an update and re-validation cycle in September of 2004. Consequently, the BCDCOG travel demand model could not be directly applied for 2025 No-Build traffic forecasting during the Port EIS study.

IMR Study

The No-Build traffic for the current IMR study was defined as the year 2035 background traffic without the Port's Naval Base Terminal (NBT) traffic. The 2035 No-Build traffic forecasting process involved applying the BCDCOG's latest travel demand model (December 2010 version) within a focused study area along I-26 from Mt. Pleasant Street to Dorchester Road. This BCDCOG model-based No-Build forecasting approach was deemed a refinement compared to the Port EIS' count-based approach because it is forward-looking and it yields more realistic projections. The model-based approach takes into account segment- and interchange-specific variable growth pattern along I-26 as opposed to a uniform growth pattern for the whole I-26 corridor (mainline and ramps). The growth rate applied during the Port EIS study is representative of a longer I-26 corridor between Mt. Pleasant Street to US 52 Connector Road that includes the Ashley Phosphate junction, a high growth area. In contrast, the traffic growth estimated in the IMR study represents a shorter I-26 corridor from Mt. Pleasant Street to Dorchester Road that serves built-out areas.

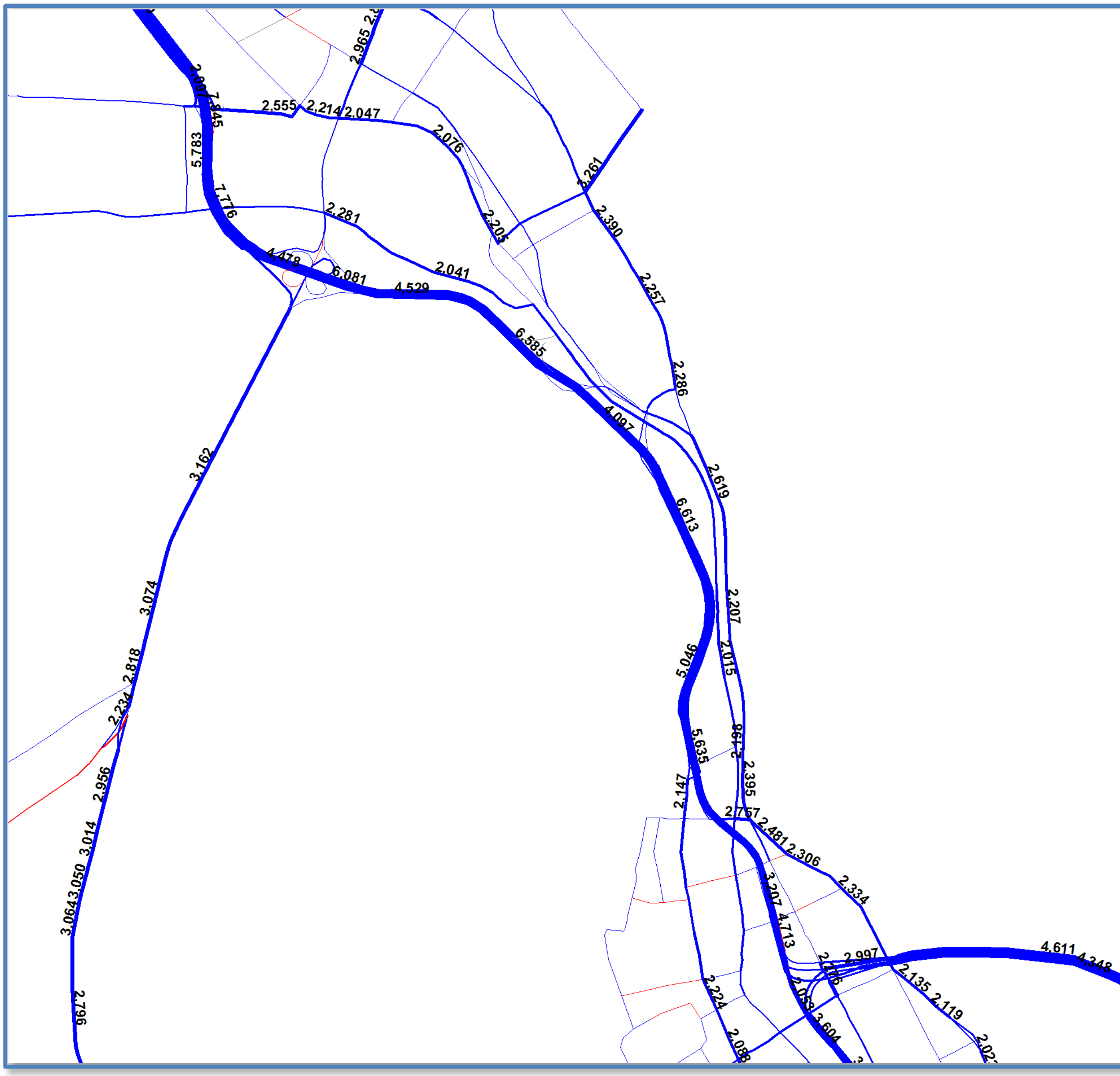
The BCDCOG travel demand model (December 2010 version) had been validated to 2008 traffic conditions. This BCDCOG model includes updated 2035 growth forecasts in the region. The updated 2035 land use forecasts from the BCDCOG model show reduced growth for the North Charleston's Magnolia and Noisette projects compared to the growth projections prepared previously for year 2025. In addition, the updated 2035 land use forecasts show the proposed Ingleside project, a large-scale new development in North Charleston located along I-26 north of the US 52 Connector Road, which is likely to influence the future trip distribution pattern in the region compared to what has been observed in the past.

The traffic forecasting process for determining future year 2035 No-Build or background traffic along I-26 involved the following four steps:

1. Run the BCDCOG travel demand model for 2035 daily conditions without the Navy Base Terminal project and without the Port Access Road and associated interchange modifications.
2. Compute the daily growth in trips between year 2035 and year 2008 model runs for each I-26 mainline segment and ramp within the study area (see Figure 3-1 for projected growth in daily traffic volume based on differences between 2008 Model Volumes and 2035 Model Volumes).
3. Add daily growth in trips from the model to 2009 Average Weekday Traffic (AWDT) counts for each mainline segment and ramp to obtain 2035 No-Build daily mainline and ramp volumes.
4. Estimate 2035 No-Build hourly volumes for four peak hours by applying a set of peaking coefficients derived from the 2009 base year counts.

This model-based No-Build forecasting process resulted in different traffic growth rates depending on the direction of travel (i.e., westbound versus eastbound), location of segment, and facility type (i.e., mainline, on-ramp, and off-ramp). Overall, the resulting I-26 growth rates varied from 0.5 to 0.8 percent per year for I-26 mainline segments, and from 0.4 to 1.2 percent per year for I-26 ramps between Mt. Pleasant Street to Dorchester Road. These lower background traffic growth rates for the I-26 corridor south of Dorchester Road were deemed reasonable given the revised scaled-down forecasts for the Magnolia and Noisette projects, expected traffic shifts towards Summerville and Goose Creek areas, and the general built-out land uses in downtown Charleston and the North Charleston areas.

FIGURE 3-1 PROJECTED GROWTH IN DAILY TRAFFIC VOLUMES



Data Source: BCDCOG Travel Demand Model (Dec 2010 version)

Build Traffic Forecasts

Port EIS Study

The Build traffic during the Port EIS study was defined as the year 2025 total traffic including the Port's Naval Base Terminal (NBT) traffic. The 2025 Build traffic forecasting process involved estimating daily and PM peak hour traffic volumes for the NBT that is anticipated to have a build-out throughput capacity of 1.4 million TEUs, and adding the NBT traffic to the 2025 No-Build traffic volumes. The trip generation rate for the NBT was estimated at 780 vehicle trips per day per 100,000 TEUs, of which 63 percent were truck trips. This trip rate was developed based on a prior study[4].

IMR Study

The Build traffic for the current IMR study was defined as the year 2035 total traffic including the Port's Naval Base Terminal (NBT) traffic. The 2035 Build traffic forecasting process involved estimating daily and four peak hour traffic volumes for the NBT that is anticipated to have a build-out throughput capacity of 1.4 million TEUs, and adding the NBT traffic to the 2035 No-Build traffic volumes. The trip generation rate for the NBT was estimated at 780 vehicle trips per day per 100,000 TEUs, of which 63 percent were truck trips. This trip rate was the same as used in the prior Port EIS study.

[4] Terminal Traffic projections for the Port of Charleston, September 2002, Prepared by the South Carolina State Ports Authority.

Traffic Analysis

Port EIS Study

The traffic analysis during the Port EIS study utilized the HCS+ (Version 5.1) model and the CORSIM micro-simulation model (TSIS-CORSIM Version 5.1) for analyzing the operations of I-26 with and without the Port project traffic. The operational parameters utilized in the HCS+ model are summarized in Table 3-1.

Table 3-1 HCS Modeling Assumptions in the Port EIS Study

HCS Model Parameter	Value	Comments
Peak Hour Factor	0.90 for I-26 and Ramps	Assumed for "worst case" analysis
Trucks and Buses	8 % for I-26 2% for Ramps	Assumed for "worst case" analysis
Recreational Vehicles	1%	Assumed for "worst case" analysis
Terrain Type	2 % Up Grade	Assumed for "worst-case" analysis
Free Flow Speed	57.9 mph for I-26 35 mph for Ramps	Calculated for "worst case" analysis

The detailed LOS criteria used in the HCS model is presented in Table 3-2 for different types of freeway segments (i.e., Basic, Weaving and Ramp Merge/Diverge).

Table 3-2 Level of Service Definition for Freeway Segments based on HCM 2000

LOS	Basic Freeway Segment Density (pc/mi/ln)	Weaving Segment Density (pc/mi/ln)	Merge/Diverge Area Density (pc/mi/ln)
A	<= 11	<= 10	<= 10
B	> 11-18	> 10-20	> 10-20
C	> 18- 26	> 20- 28	> 20- 28
D	> 26-35	> 28-35	> 28-35
E	> 35-45	> 35-43	> 35
F	> 45	> 43	Demand exceeds capacity

Source: Highway Capacity Manual 2000

IMR Study

The traffic analysis for IMR study utilized the HCS 2010 (Version 6.1) model and the CORSIM micro-simulation model (TSIS-CORSIM Version 6.2) for analyzing the operations of I-26 with and without the Port project traffic. The modeling assumptions were revised in the IMR study based on field observations in 2010. These assumptions are documented in Table 3-3.

Table 3-3 HCS Modeling Assumptions in the IMR Study

HCS Model Parameter	Value	Comments
Peak Hour Factor	0.92	Typical value for urban area
Trucks & Buses	Commuter AM Peak: 4% Port AM Peak: 7% Port PM Peak: 7% Commuter PM Peak: 4%	Observed in 2010 for Background Traffic along I-26
Recreational Vehicles	0 %	Observed in 2010 for Background Traffic along I-26
Terrain Type	Level	Existing Condition
Free Flow Speed	65 mph for I-26 35 mph for Ramps	Measured based on Travel Time Runs in 2010

The detailed LOS criteria used in the HCS model is presented in Table 3-4 for different types of freeway segments (i.e., Basic, Weaving and Ramp Merge/Diverge).

Table 3-4 Level of Service Definition for Freeway Segments Based on HCM 2010

LOS	Basic Freeway Segment Density (pc/mi/ln)	Weaving Segment Density (pc/mi/ln)	Merge/Diverge Area Density (pc/mi/ln)
A	<= 11	<= 10	<= 10
B	> 11-18	> 10-20	> 10-20
C	> 18- 26	> 20- 28	> 20- 28
D	> 26-35	> 28-35	> 28-35
E	> 35-45	> 35-43	> 35
F	> 45	> 43	Demand exceeds capacity

Source: Highway Capacity Manual 2010

4. TRAFFIC VOLUMES

This section presents the updated traffic volumes utilized in preparing the IMR study. The traffic volumes were first prepared for Existing (2009) conditions, and then for Future (2035) No-Build and Build conditions. The updated traffic forecasts for the study area were prepared for daily and four peak hour conditions. The daily traffic volumes are presented for general traffic information along I-26. The four peak hour volumes were utilized in the Level of Service (LOS) and traffic simulation analyses.

Existing (2009) Traffic Volumes

I-26, south of the Cosgrove Avenue interchange, carried the highest Average Daily Traffic (ADT) of 87,100 vehicles in year 2009 within the IMR study area, of which approximately 8.4 percent traveled during the Commuter AM peak hour (7-8 am) with 63.4 percent directional split in the eastbound direction, or 4,660 vehicles per hour. In comparison, around 6 percent of the ADT traveled during the Port AM peak hour (9-10 am) with 56.2 percent directional split in the eastbound direction, or 2,920 vehicles per hour.

During the Commuter PM peak hour (4-6 pm), the same I-26 location carried 9 percent of ADT with 57 percent, or 4,480 vehicles per hour, traveling in the westbound direction. In comparison, around 6.9 percent of the ADT traveled during the Port PM peak hour (2-3 pm) with 52.5 percent, or 3,150 vehicles per hour, traveling in the westbound direction.

The Existing (2009) traffic volumes are depicted in Figures 4-1, 4-2, and 4-3 by segmenting the study corridor into three parts.

Future No-Build (2035) Traffic Volumes

I-26, north of the Cosgrove Avenue interchange, is projected to carry the highest Average Daily Traffic (ADT) of 102,120 vehicles in year 2035 No-Build condition, of which approximately 8.4 percent would travel during the Commuter AM peak hour with 62.6 percent traveling in the eastbound direction, or 5,350 vehicles per hour. In comparison, approximately 6 percent of the ADT would travel during the Port AM peak hour with 55.7 percent traveling in the eastbound direction, or 3,400 vehicles per hour.

During the Commuter PM peak hour, the same I-26 location would carry 9 percent of ADT with 58.2 percent, or 5,380 vehicles per hour, traveling in the westbound direction. In comparison, approximately 7.1 percent of the ADT would travel during the Port PM peak hour with 53.5 percent, or 3,850 vehicles per hour, traveling in the westbound direction.

The Future (2035) No-Build traffic volumes are depicted in Figures 4-4, 4-5, and 4-6.

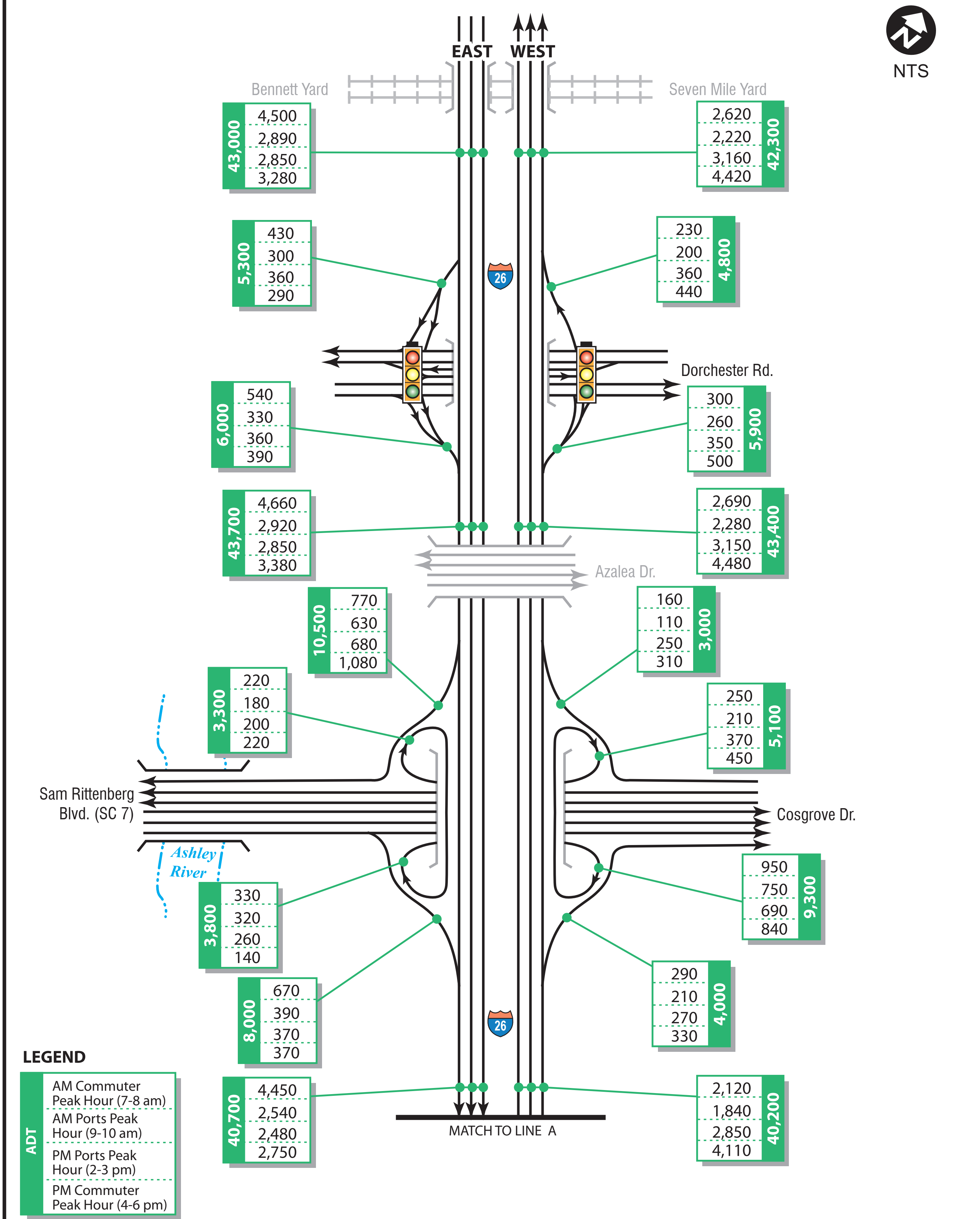
Future Build (2035) Traffic Volumes

I-26, south of the Cosgrove Avenue interchange, is projected to carry the highest Average Daily Traffic (ADT) of 109,410 vehicles in year 2035 Build condition, of which approximately 8.6 percent would travel during the Commuter AM peak hour with 63.7 percent traveling in the eastbound direction, or 6,000 vehicles per hour. In comparison, approximately 6.2 percent of the

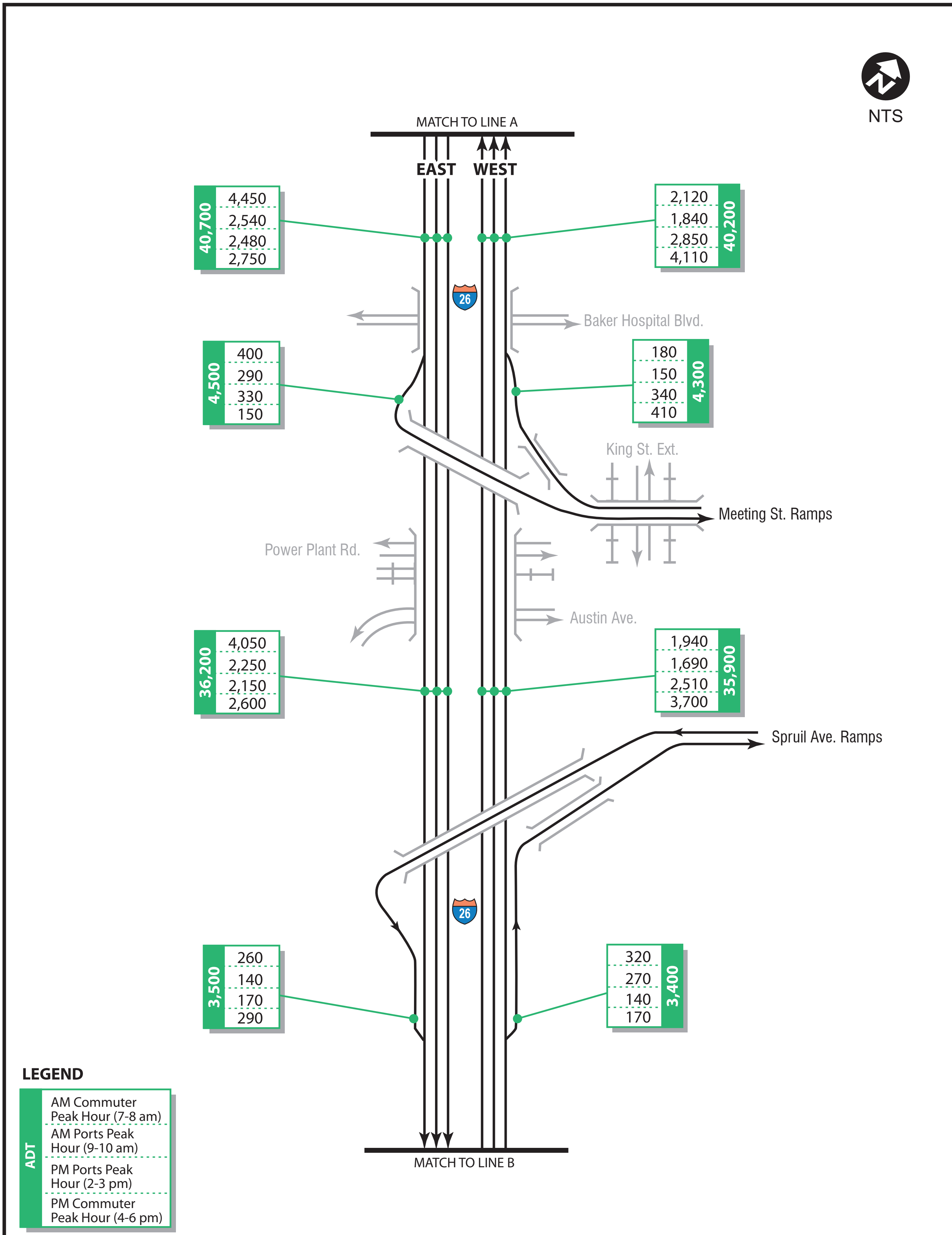
ADT would travel during the Port AM peak hour with 55.1 percent traveling in the eastbound direction, or 3,720 vehicles per hour.

During the Commuter PM peak hour, the same I-26 location would carry approximately 9.1 percent of ADT with 59.3 percent, or 5,870 vehicles per hour, traveling in the westbound direction. In comparison, approximately 7 percent of the ADT would travel during the Port PM peak hour with 53.6 percent, or 4,120 vehicles per hour, traveling in the westbound direction.

The Future (2035) Build traffic volumes are depicted in Figures 4-7, 4-8, and 4-9.



EAST
WEST
NTS
Bennett Yard
Seven Mile Yard
43,000
4,500
2,890
2,850
3,280
42,300
2,620
2,220
3,160
4,420
5,300
430
300
360
290
4,800
230
200
360
440
Dorchester Rd.
6,000
540
330
360
390
5,900
300
260
350
500
43,700
4,660
2,920
2,850
3,380
43,400
2,690
2,280
3,150
4,480
Azalea Dr.
10,500
770
630
680
1,080
3,000
160
110
250
310
3,300
220
180
200
220
5,100
250
210
370
450
Sam Rittenberg Blvd. (SC 7)
Cosgrove Dr.
Ashley River
3,800
330
320
260
140
9,300
950
750
690
840
8,000
670
390
370
370
4,000
290
210
270
330
40,700
4,450
2,540
2,480
2,750
40,200
2,120
1,840
2,850
4,110
MATCH TO LINE A
26
LEGEND
ADT
AM Commuter Peak Hour (7-8 am)
AM Ports Peak Hour (9-10 am)
PM Ports Peak Hour (2-3 pm)
PM Commuter Peak Hour (4-6 pm)



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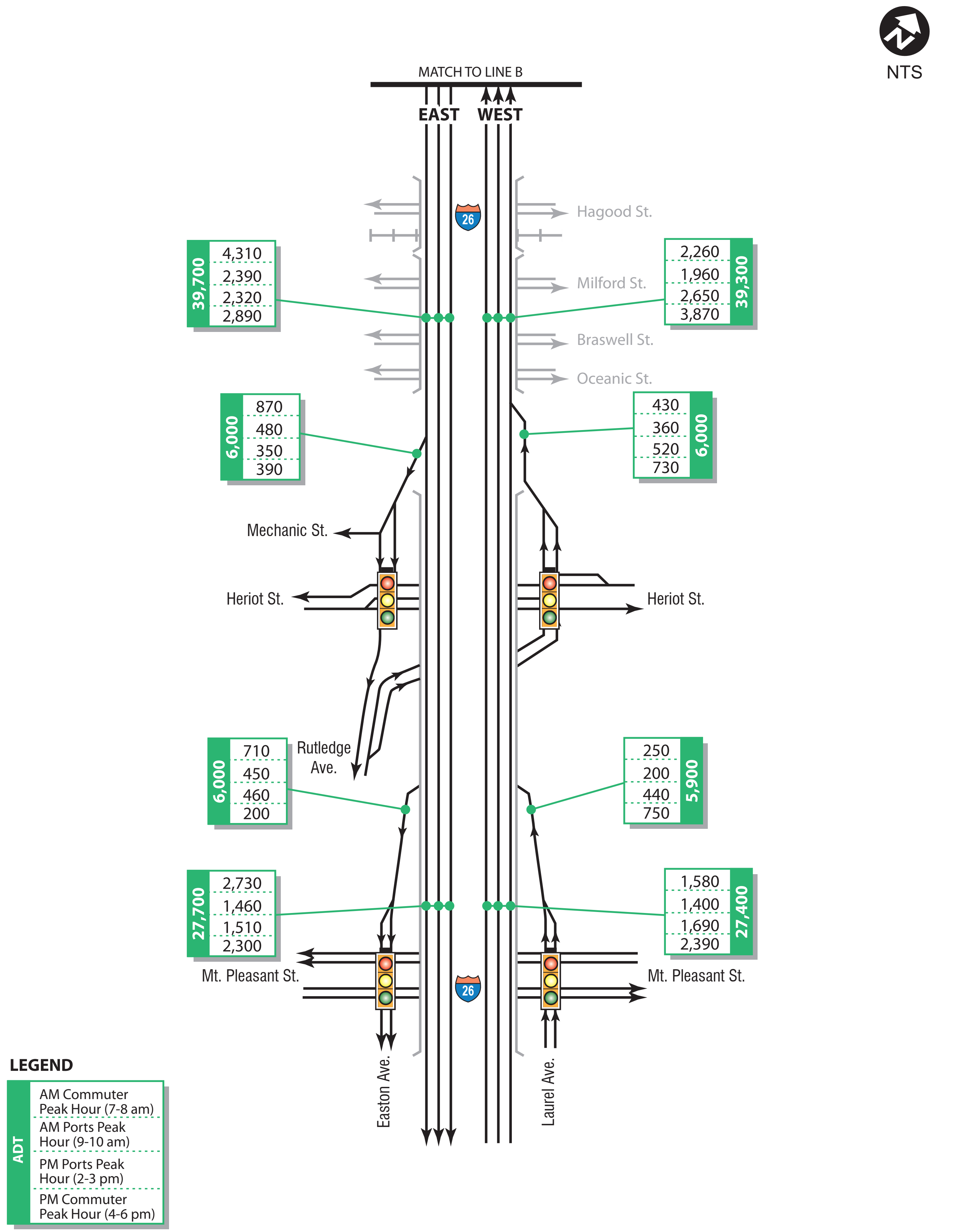
EXISTING CONDITIONS (2009) TRAFFIC VOLUMES – PART 2

Figure 4-2



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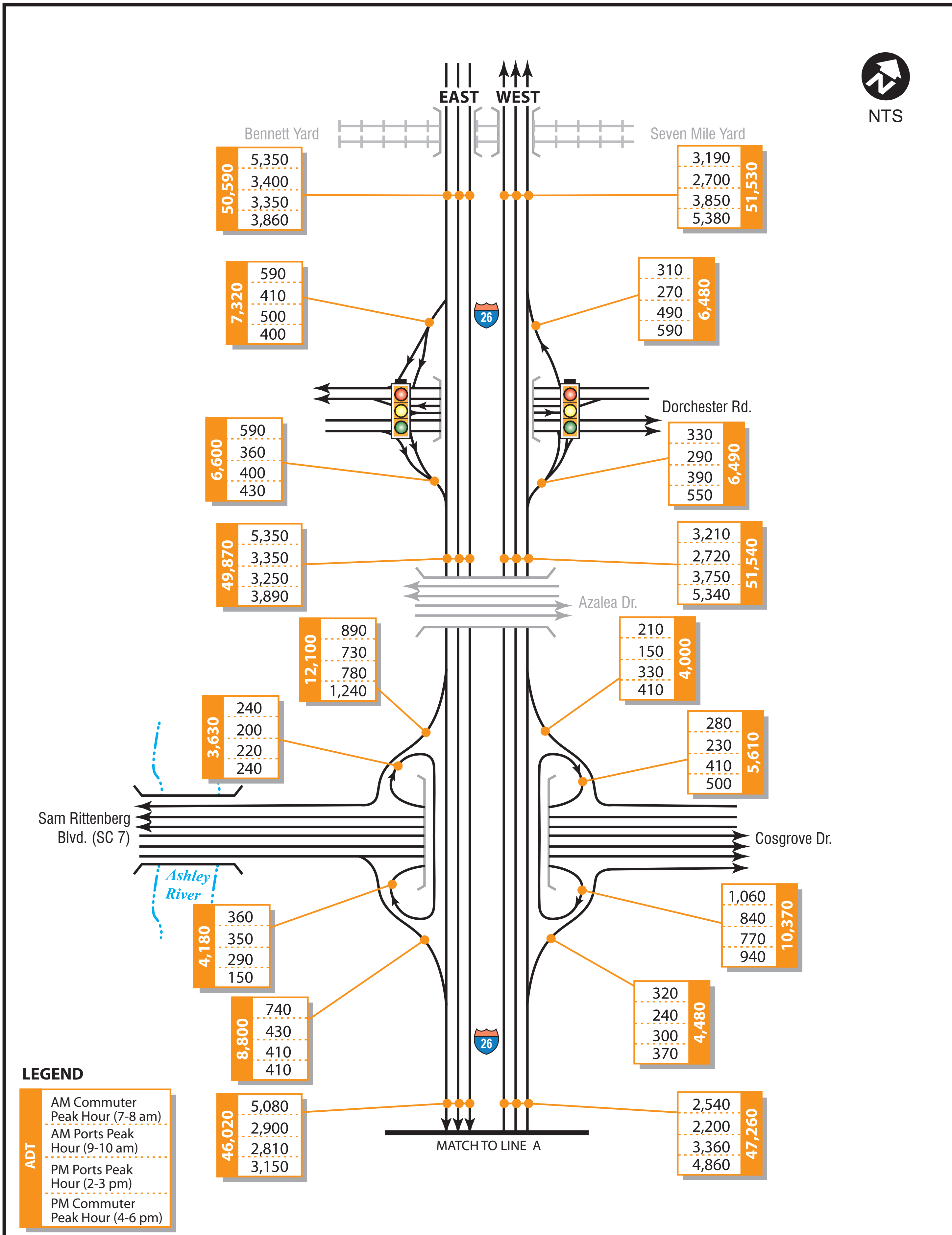
PB 125 YEARS

EXISTING CONDITIONS (2009)
TRAFFIC VOLUMES – PART 3

Figure 4-3



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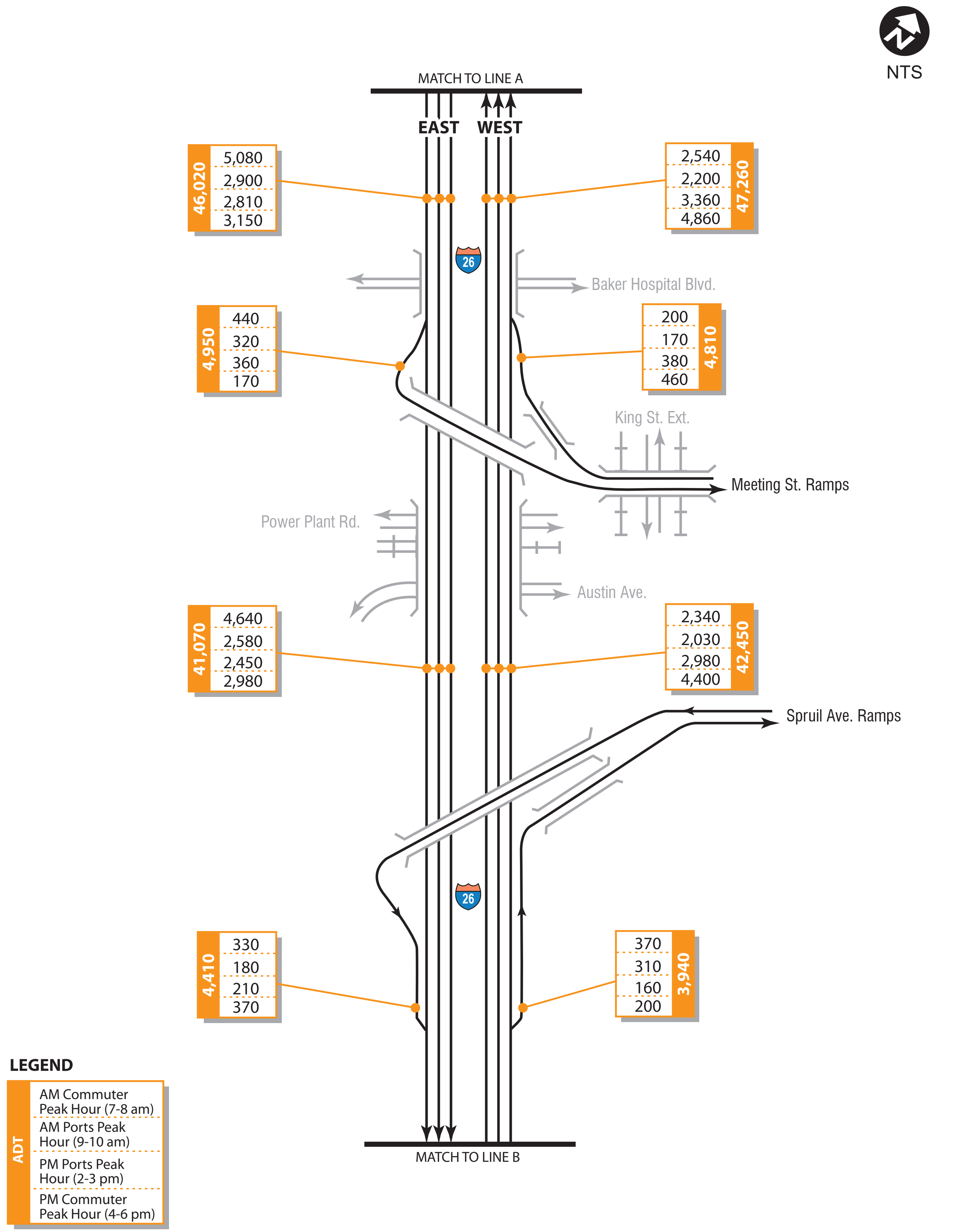
FUTURE CONDITIONS (2035) NO-BUILD TRAFFIC VOLUMES – PART 1

Figure 4-4



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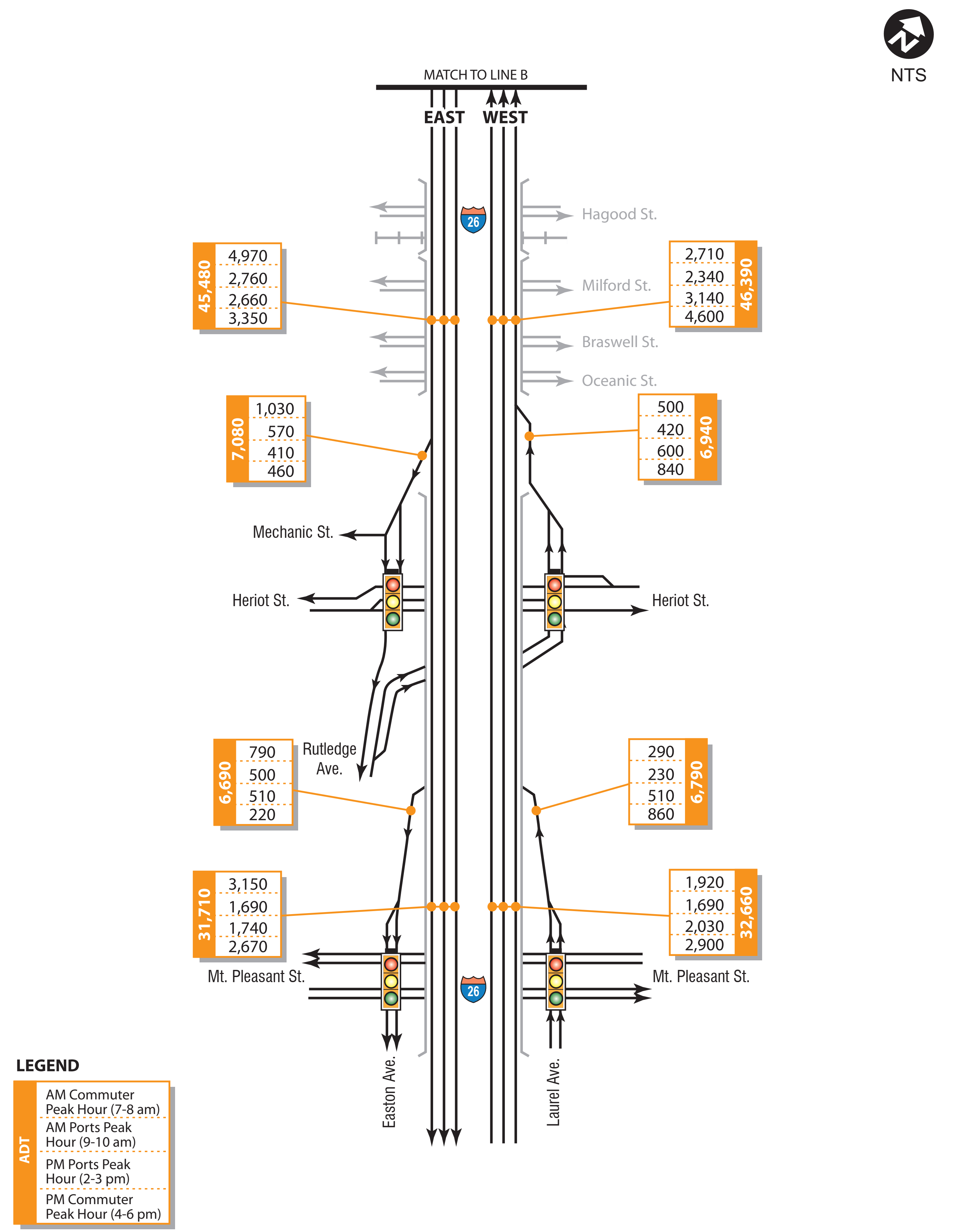
FUTURE CONDITIONS (2035) NO-BUILD TRAFFIC VOLUMES – PART 2

Figure 4-5



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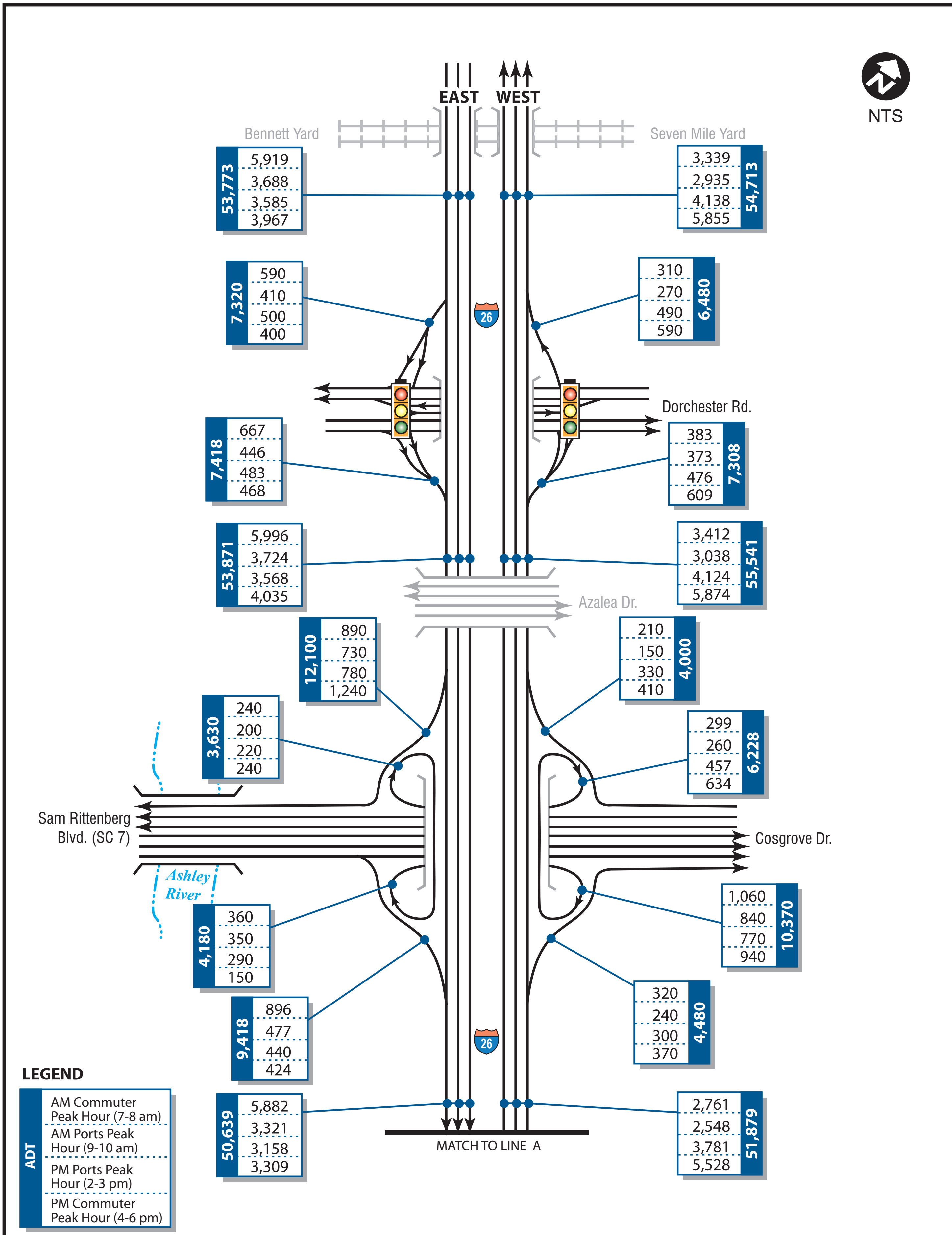
FUTURE CONDITIONS (2035) NO-BUILD TRAFFIC VOLUMES – PART 3

Figure 4-6



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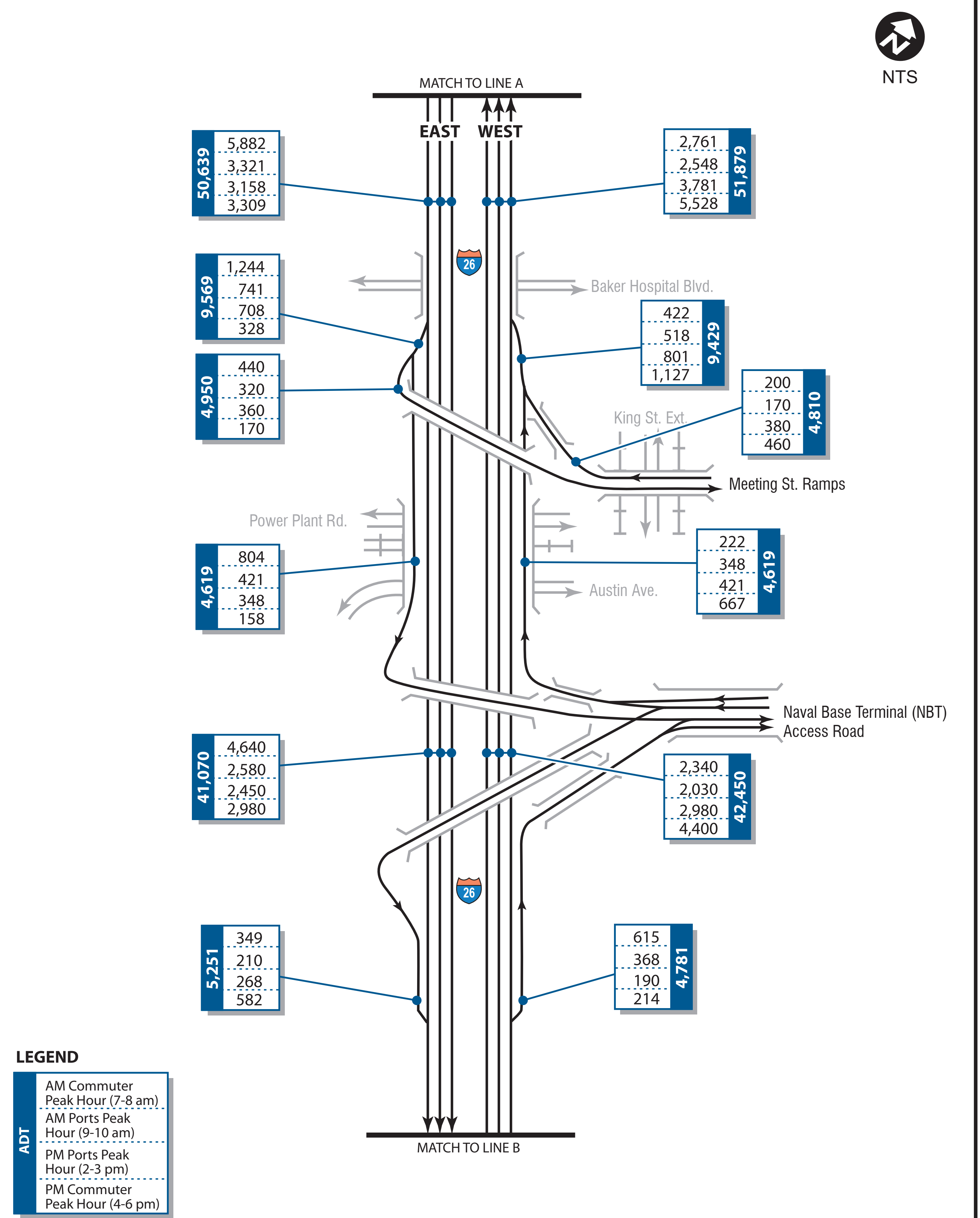
FUTURE CONDITIONS (2035) BUILD TRAFFIC VOLUMES – PART 1

Figure 4-7



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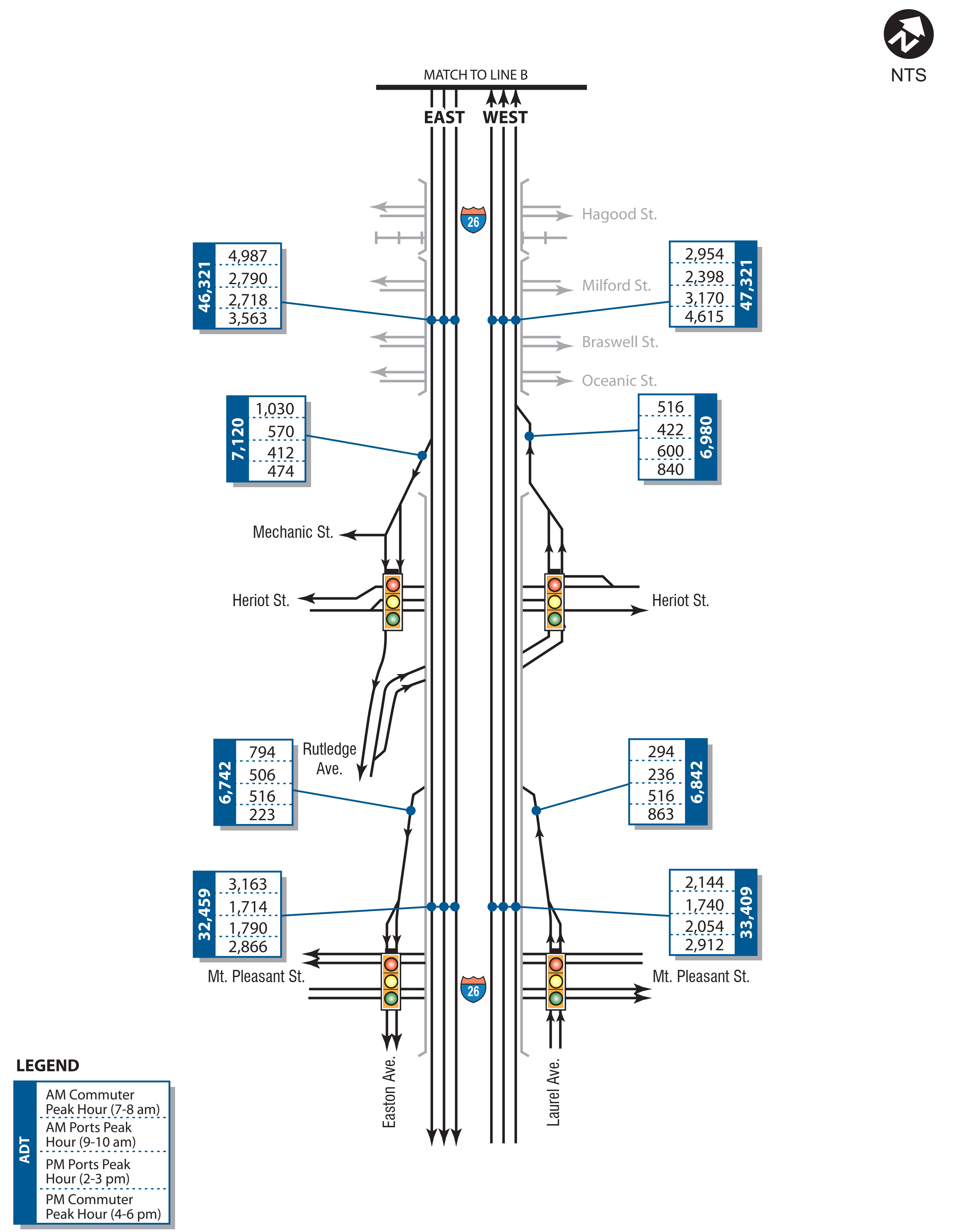
FUTURE CONDITIONS (2035) BUILD TRAFFIC VOLUMES – PART 2

Figure 4-8



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PB 125 YEARS ®

FUTURE CONDITIONS (2035) BUILD TRAFFIC VOLUMES – PART 3

Figure 4-9

5. TRAFFIC OPERATIONS

This section presents updated traffic operational analysis results prepared for the I-26 corridor, starting from the segment west of Dorchester Road and ending at the segment east of Mt. Pleasant Street. These updated analyses included:

- Existing Condition (2009)
- Future No-Build Condition (2035)
- Future Build Condition (2035)

The traffic operational analysis involved capacity analysis using the latest Highway Capacity Software (HCS 2010) model, and freeway operational analysis using the latest CORSIM micro-simulation model (for worst condition scenarios). As described in section 3 (Methodology) of this report, traffic operational analysis was carried out for four peak hours in order to evaluate Future Build traffic conditions as compared to Existing and Future No-Build conditions:

- Commuter AM Peak Hour (7-8 am)
- Port AM Peak Hour (9-10 am)
- Port PM Peak Hour (2-3 pm)
- Commuter PM Peak Hour (5-6 pm)

The traffic operational analysis results are summarized by different location along the I-26 study corridor, in terms of basic freeway segments, ramp merge area, ramp diverge area and weave segment. It should be noted that these segment locations were comparable (one to one) across Existing and No-Build scenarios, but was approximated when compared to the Build scenario due to modifications at the Spruill Avenue interchange and addition of the Port Access Road.

HCS(2010) Traffic Level of Service

I-26 Between Dorchester Road and Montague Avenue

The traffic capacity analysis results, presented in Table 5-1 (Density in passenger cars per mile per lane) and in Table 5-2 (Level of Service), reveal that I-26 Eastbound basic freeway segment located between Montague Avenue and Dorchester Road would slightly worsen from LOS D to LOS E conditions with traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour.

Similarly, I-26 Westbound basic freeway segment located between Dorchester Road and Montague Avenue would slightly worsen from LOS D to LOS E conditions with traffic from the NBT during the Commuter PM peak hour.

In other words, the I-26 segment between Dorchester Road and Montague Avenue is projected to operate at near-capacity conditions in year 2035 conditions as traffic density would increase (between 35 and 45 passenger cars per mile per lane) within the current land configuration. During Port AM and PM peak hours, this I-26 basic freeway segment is expected to operate slightly better, or at LOS C or better conditions, with and without traffic from the NBT.

TABLE 5-1 I-26 TRAFFIC DENSITY BETWEEN DORCHESTER ROAD AND MONTAGUE AVENUE

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	26.0	32.8	39.6	14.9	18.1	19.4
Port AM Peak (9 - 10 AM)	16.7	19.6	21.9	12.8	15.6	17.5
Port PM Peak (2 - 3 PM)	16.4	19.3	21.3	18.2	22.2	24.6
Commuter PM Peak (5 - 6 PM)	18.6	22.0	22.9	25.4	33.1	38.8

TABLE 5-2 I-26 TRAFFIC LOS BETWEEN DORCHESTER ROAD AND MONTAGUE AVENUE

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	E	B	C	C
Port AM Peak (9 - 10 AM)	B	C	C	B	B	B
Port PM Peak (2 - 3 PM)	B	C	C	C	C	C
Commuter PM Peak (5 - 6 PM)	C	C	C	C	D	E

I-26 At Dorchester Road Ramps To/From Columbia

The traffic capacity analysis results, presented in Table 5-3 (Density) and Table 5-4 (Level of Service), reveal that I-26 Eastbound diverge segment located at the Dorchester Road exit ramp would slightly worsen from LOS D to LOS E conditions with traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound merge segment at the Dorchester Road entrance ramp would operate at LOS D, with or without traffic from the NBT.

During Port AM and Port PM peak hours, both diverge and merge segment at this location are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-3 I-26 Traffic Density at Dorchester Road Ramps To/From Columbia

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	28.5	32.7	35.2	15.8	19.1	20.1
Port AM Peak (9 - 10 AM)	20.2	23.2	25.3	13.9	16.8	18.2
Port PM Peak (2 - 3 PM)	20.0	23.1	24.9	19.2	23.2	25.1
Commuter PM Peak (5 - 6 PM)	22.1	25.3	26.2	28.8	31.1	33.8

Table 5-4 I-26 Traffic LOS at Dorchester Road Ramps To/From Columbia

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	D	D	E	B	B	C
Port AM Peak (9 - 10 AM)	C	C	C	B	B	B
Port PM Peak (2 - 3 PM)	C	C	C	B	C	C
Commuter PM Peak (5 - 6 PM)	C	C	C	D	D	D

I-26 Between Dorchester Road Ramps

The traffic capacity analysis results, presented in Table 5-5 (Density) and Table 5-6 (Level of Service), reveal that I-26 Westbound basic freeway segment located between Dorchester Road exit and entrance ramps would slightly worsen from LOS D to LOS E conditions, with traffic from Naval Base Terminal (NBT) during the Commuter PM peak hour. In comparison, I-26 Eastbound basic freeway segment at this location would operate at LOS D, with or without traffic from the NBT.

During Port AM and Port PM peak hours, I-26 Eastbound and Westbound segments at this location are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-5 I-26 Traffic Density Between Dorchester Road Ramps

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	23.2	27.8	33.1	13.6	16.4	17.6
Port AM Peak (9 - 10 AM)	14.9	17.2	19.5	11.6	14.0	15.9
Port PM Peak (2 - 3 PM)	14.4	16.4	18.3	16.2	19.4	21.6
Commuter PM Peak (5 - 6 PM)	17.0	19.7	20.6	25.8	28.1	32.5

Table 5-6 I-26 Traffic LOS Between Dorchester Road Ramps

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	B	C	B	B	B
Port PM Peak (2 - 3 PM)	B	B	C	B	C	C
Commuter PM Peak (5 - 6 PM)	B	C	C	C	D	E

I-26 At Dorchester Road Ramps To/From Charleston

The traffic capacity analysis results, presented in Table 5-7 (Density) and Table 5-8 (Level of Service), reveal that I-26 Eastbound merge segment located at the Dorchester Road entrance ramp would slightly worsen from LOS D to LOS E conditions, with traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound diverge segment located at the Dorchester Road exit ramp would slightly worsen from LOS D to LOS E conditions with the NBT traffic during the Commuter PM peak hour.

During Port AM and PM peak hours, these I-26 merge and diverge segments are projected to operate at LOS D or better, with and without traffic from the NBT.

Table 5-7 I-26 Traffic Density at Dorchester Road Ramps To/From Charleston

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	27.5	31.4	35.6	18.8	21.8	23.5
Port AM Peak (9 - 10 AM)	18.4	20.8	23.9	16.5	19.2	22.0
Port PM Peak (2 - 3 PM)	18.2	20.4	23.0	21.7	25.3	28.1
Commuter PM Peak (5 - 6 PM)	20.8	23.5	24.8	28.6	33.2	35.6

Table 5-8 I-26 Traffic LOS at Dorchester Road Ramps To/From Charleston

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	E	B	C	C
Port AM Peak (9 - 10 AM)	B	C	C	B	B	C
Port PM Peak (2 - 3 PM)	B	C	C	C	C	D
Commuter PM Peak (5 - 6 PM)	C	C	C	D	D	E

I-26 At Cosgrove Avenue Ramps To/From Columbia

The traffic capacity analysis results, presented in Table 5-9 (Density) and Table 5-10 (Level of Service), reveal that I-26 Eastbound diverge segment located at the Cosgrove Avenue exit ramp would operate at LOS E during the Commuter AM peak hour, with or without the NBT traffic. In comparison, I-26 Westbound merge segment located at the Cosgrove Avenue entrance ramp would slightly worsen from LOS D to LOS E conditions with traffic from the Naval Base Terminal (NBT) during the Commuter PM peak hour.

During Port AM and Port PM peak hours, these I-26 merge and diverge segments are projected to operate at LOS D or better, with and without traffic from the NBT.

Table 5-9 I-26 Traffic Density at Cosgrove Avenue Ramps To/From Columbia

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	31.7	35.0	38.0	17.1	21.0	21.6
Port AM Peak (9 - 10 AM)	22.8	25.4	28.1	15.1	17.5	19.8
Port PM Peak (2 - 3 PM)	22.5	25.0	27.4	20.1	23.6	26.5
Commuter PM Peak (5 - 6 PM)	26.1	29.1	30.1	27.4	32.2	36.1

Table 5-10 I-26 Traffic LOS at Cosgrove Avenue Ramps To/From Columbia

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	D	E	E	B	C	C
Port AM Peak (9 - 10 AM)	C	C	D	B	B	B
Port PM Peak (2 - 3 PM)	C	C	C	C	C	C
Commuter PM Peak (5 - 6 PM)	C	D	D	C	D	E

I-26 Between Cosgrove Avenue Loop Ramps

The traffic capacity analysis results, presented in Table 5-11 (Density) and Table 5-12 (Level of Service), reveal that I-26 Westbound weave segment located between the Cosgrove Avenue loop ramps would slightly worsen from LOS D to LOS E conditions, with traffic from the Naval Base Terminal (NBT) during the Commuter PM peak hour. In comparison, I-26 Eastbound weave segment between the Cosgrove Avenue loop ramps would slightly worsen from LOS C to LOS D, with NBT traffic.

During Port AM and Port PM peak hours, these I-26 weave segments are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-11 I-26 Traffic Density Between Cosgrove Avenue Loop Ramps

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Weave Segment)			I-26 Westbound (Weave Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	20.7	24.1	28.3	14.8	17.9	20.0
Port AM Peak (9 - 10 AM)	12.0	14.1	16.6	12.3	14.8	17.8
Port PM Peak (2 - 3 PM)	11.5	13.2	15.4	16.7	21.1	24.7
Commuter PM Peak (5 - 6 PM)	11.9	13.8	14.8	25.8	31.6	37.6

Table 5-12 I-26 Traffic LOS Between Cosgrove Avenue Loop Ramps

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Weave Segment)			I-26 Westbound (Weave Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	C	D	B	B	C
Port AM Peak (9 - 10 AM)	B	B	B	B	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	C	C
Commuter PM Peak (5 - 6 PM)	B	B	B	C	D	E

I-26 At Cosgrove Avenue Ramps To/From Charleston

The traffic capacity analysis results, presented in Table 5-13 (Density) and Table 5-14 (Level of Service), reveal that I-26 Eastbound merge segment located at the Cosgrove Avenue entrance ramp would slightly worsen from LOS D to LOS E conditions with traffic from Naval Base Terminal (NBT) during the Commuter AM peak hour.

During other peak hours analyzed, these I-26 merge and diverge segments are projected to operate at LOS D or better, with and without traffic from the NBT.

Table 5-13 I-26 Traffic Density at Cosgrove Avenue Ramps To/From Charleston

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	27.1	30.5	35.5	14.5	17.0	18.9
Port AM Peak (9 - 10 AM)	16.6	23.1	21.8	12.8	15.1	18.1
Port PM Peak (2 - 3 PM)	16.3	18.1	20.8	19.0	21.9	24.9
Commuter PM Peak (5 - 6 PM)	17.5	19.7	20.8	25.6	29.2	32.4

Table 5-14 I-26 Traffic LOS at Cosgrove Avenue Ramps To/From Charleston

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	E	B	B	B
Port AM Peak (9 - 10 AM)	B	C	C	B	B	B
Port PM Peak (2 - 3 PM)	B	B	C	B	C	C
Commuter PM Peak (5 - 6 PM)	B	B	C	C	D	D

I-26 Between Cosgrove Avenue and Meeting Street/Port Access Road

The traffic capacity analysis results, presented in Table 5-15 (Density) and Table 5-2 (Level of Service), reveal that I-26 Eastbound basic freeway segment located between Cosgrove Avenue and Meeting Street/Port Access Road would slightly worsen from LOS D to LOS E conditions with traffic from Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound segment located between Meeting Street/Port Access Road and Cosgrove Avenue would slightly worsen from LOS D to LOS E conditions with traffic from Naval Base Terminal (NBT) during the Commuter PM peak hour.

During the Port peak hours, these I-26 basic freeway segments are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-15 I-26 Traffic Density Between Cosgrove Avenue and Meeting Street/Port Access Road

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	25.6	30.4	39.5	12.0	14.4	16.3
Port AM Peak (9 - 10 AM)	14.6	16.7	20.1	10.6	12.7	15.6
Port PM Peak (2 - 3 PM)	14.3	16.2	17.0	16.4	19.4	22.7
Commuter PM Peak (5 - 6 PM)	15.6	17.9	19.3	23.4	28.6	35.1

Table 5-16 I-26 Traffic LOS Between Cosgrove Avenue and Meeting Street/Port Access Road

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	E	B	B	B
Port AM Peak (9 - 10 AM)	B	B	C	A	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	C	C
Commuter PM Peak (5 - 6 PM)	B	B	C	C	D	E

I-26 At Meeting Street/Port Access Road Ramps To/From Columbia

The traffic capacity analysis results, presented in Table 5-17 (Density) and Table 5-18 (Level of Service), reveal that I-26 Eastbound diverge segment located at the Meeting Street/Port Access Road exit ramp would operate at LOS D during the Commuter AM peak hour without or with the NBT traffic. In comparison, I-26 Westbound merge segment located at the Meeting Street/Port Access Road entrance ramp would slightly worsen from LOS C to LOS D conditions with traffic from Naval Base Terminal (NBT) during the Commuter PM peak hour.

During the Port peak hours, these I-26 merge and diverge segments are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-17 I-26 Traffic Density at Meeting Street/Port Access Road Ramps To/From Columbia

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	29.0	32.3	33.1	12.3	14.5	14.1
Port AM Peak (9 - 10 AM)	18.1	20.3	18.0	10.9	12.8	13.5
Port PM Peak (2 - 3 PM)	17.8	19.8	16.8	16.7	19.5	21.1
Commuter PM Peak (5 - 6 PM)	18.8	21.1	15.6	23.2	27.2	30.9

Table 5-18 I-26 Traffic LOS at Meeting Street/Port Access Road Ramps To/From Columbia

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	D	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	C	B	B	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	B	C
Commuter PM Peak (5 - 6 PM)	B	C	B	C	C	D

I-26 Between Meeting Street/Port Access Road and Spruill Avenue/Port Access Road Ramps

The traffic capacity analysis results, presented in Table 5-19 (Density) and Table 5-20 (Level of Service), reveal that I-26 Eastbound basic freeway segment located between Meeting Street/Port Access Road and Spruill Avenue/Port Access Road ramps would operate at LOS D conditions, with or without traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound basic freeway segment located between Spruill Avenue/Port Access Road and Meeting Street/Port Access Road ramps would operate at LOS C conditions, with or without traffic from the Naval Base Terminal (NBT) during the Commuter PM peak hour.

During Port peak hours, these I-26 basic freeway segments are projected to operate at LOS B or better, with and without traffic from the NBT.

Table 5-19 I-26 Traffic Density Between Meeting Street/Port Access Road and Spruill Avenue/Port Access Road Ramps

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	23.1	27.0	27.0	11.0	13.3	13.3
Port AM Peak (9 - 10 AM)	13.0	14.9	14.9	9.8	11.7	11.7
Port PM Peak (2 - 3 PM)	12.4	14.1	14.1	14.5	17.2	17.2
Commuter PM Peak (5 - 6 PM)	14.8	16.9	16.9	21.0	25.3	25.3

Table 5-20 I-26 Traffic LOS Between Meeting Street/Port Access Road and Spruill Avenue/Port Access Road Ramps

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	B	B	A	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	B	B
Commuter PM Peak (5 - 6 PM)	B	B	B	C	C	C

I-26 At Spruill Avenue/Port Access Road Ramps To/From Charleston

The traffic capacity analysis results, presented in Table 5-21 (Density) and Table 5-22 (Level of Service), reveal that I-26 Eastbound merge area located at the Spruill Avenue/Port Access Road entrance ramp would operate at LOS C conditions, with or without traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound diverge area would operate at LOS C, with or without the NBT.

During Port peak hours, these I-26 merge and diverge segments are projected to operate at LOS B or better, with and without traffic from the NBT.

Table 5-21 I-26 Traffic Density at Spruill Avenue/Port Access Road Ramps To/From Charleston

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	23.0	26.7	25.4	8.6	11.4	13.3
Port AM Peak (9 - 10 AM)	12.9	14.9	14.8	6.9	9.3	9.9
Port PM Peak (2 - 3 PM)	12.6	14.5	13.4	10.8	13.7	14.0
Commuter PM Peak (5 - 6 PM)	15.7	18.3	18.4	17.3	21.0	21.1

Table 5-22 I-26 Traffic LOS at Spruill Avenue/Port Access Road Ramps To/From Charleston

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Merge Area)			I-26 Westbound (Diverge Area)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	C	C	A	B	B
Port AM Peak (9 - 10 AM)	B	B	B	A	A	A
Port PM Peak (2 - 3 PM)	B	B	B	B	B	B
Commuter PM Peak (5 - 6 PM)	B	B	B	B	C	C

I-26 Between Spruill Avenue/Port Access Road and Rutledge Avenue

The traffic capacity analysis results, presented in Table 5-23 (Density) and Table 5-24 (Level of Service), reveal that I-26 Eastbound basic freeway segment located between Spruill Avenue/Port Access Road and Rutledge Avenue would operate at LOS D conditions, with or without traffic from the Naval Base Terminal (NBT) during the Commuter AM peak hour. In comparison, I-26 Westbound segment located between Rutledge Avenue and Spruill Avenue/Port Access Road would operate at LOS D conditions, with or without traffic from the NBT during the Commuter PM peak hour.

During Port peak hours, these I-26 basic segments are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-23 I-26 Traffic Density Between Spruill Avenue/Port Access Road and Rutledge Avenue

Peak Hour	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	24.7	29.5	29.6	12.8	15.4	16.8
Port AM Peak (9 - 10 AM)	13.8	15.9	16.2	11.3	13.5	13.9
Port PM Peak (2 - 3 PM)	13.4	15.3	15.8	15.3	18.1	18.4
Commuter PM Peak (5 - 6 PM)	16.4	19.0	20.3	22.0	26.7	26.8

Table 5-24 I-26 Traffic LOS Between Spruill Avenue/Port Access Road and Rutledge Avenue

Peak Hour	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	B	B	B	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	C	C
Commuter PM Peak (5 - 6 PM)	B	C	C	C	D	D

I-26 AT RUTLEDGE AVENUE RAMPS TO/FROM CHARLESTON

The traffic capacity analysis results, presented in Table 5-25 (Density) and Table 5-26 (Level of Service), reveal that I-26 Eastbound diverge segment located at the Rutledge Avenue exit ramp would operate at LOS D during the Commuter AM peak hour, with or without the NBT traffic. In comparison, I-26 Westbound merge segment located at the Rutledge Avenue entrance ramp would operate at LOS D conditions, with or without traffic from NBT traffic during the Commuter PM peak hour.

During Port peak hours, these I-26 merge and diverge segments are projected to operate at LOS C or better, with and without traffic from the NBT.

TABLE 5-25 I-26 TRAFFIC DENSITY AT RUTLEDGE AVENUE RAMPS TO/FROM CHARLESTON

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	28.5	32.6	32.7	16.0	18.5	19.8
Port AM Peak (9 - 10 AM)	17.6	20.0	20.2	14.4	16.6	16.9
Port PM Peak (2 - 3 PM)	16.9	19.0	19.5	18.4	15.9	21.4
Commuter PM Peak (5 - 6 PM)	20.1	22.8	23.9	25.1	29.1	29.2

TABLE 5-26 I-26 TRAFFIC LOS AT RUTLEDGE AVENUE RAMPS TO/FROM CHARLESTON

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	D	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	B	C	B	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	B	C
Commuter PM Peak (5 - 6 PM)	C	C	C	C	D	D

I-26 At Mt. Pleasant Street Ramps To/From Charleston

The traffic capacity analysis results, presented in Table 5-27 (Density) and Table 5-28 (Level of Service), reveal that I-26 Eastbound diverge area located at the Mt. Pleasant Street exit ramp would operate at LOS D during the Commuter AM peak hour, with or without the NBT traffic. In comparison, I-26 Westbound merge area located at the Mt. Pleasant Street entrance ramp would operate at LOS C conditions, with or without traffic from the NBT during the Commuter PM peak hour.

During Port peak hours, these I-26 merge and diverge segments are projected to operate at LOS C or better, with and without traffic from the NBT.

Table 5-27 I-26 Traffic Density at Mt. Pleasant Street Ramps To/From Charleston

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	25.6	28.3	28.4	13.9	15.9	17.1
Port AM Peak (9 - 10 AM)	16.4	18.3	18.5	12.7	14.4	14.8
Port PM Peak (2 - 3 PM)	16.8	17.7	19.1	16.1	18.4	18.7
Commuter PM Peak (5 - 6 PM)	19.3	21.6	22.7	22.0	25.5	25.6

Table 5-28 I-26 Traffic LOS at Mt. Pleasant Street Ramps To/From Charleston

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Diverge Area)			I-26 Westbound (Merge Area)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	C	D	D	B	B	B
Port AM Peak (9 - 10 AM)	B	B	B	B	B	B
Port PM Peak (2 - 3 PM)	B	B	B	B	B	B
Commuter PM Peak (5 - 6 PM)	B	C	C	C	C	C

I-26 south of Mt. Pleasant Street

The traffic capacity analysis results, presented in Table 5-29 (Density) and Table 5-30 (Level of Service), reveal that I-26 Eastbound and I-26 Westbound basic freeway segments located south of Mt. Pleasant Street would operate at LOS B conditions, with or without traffic from the Naval Base Terminal (NBT) during all four peak hours analyzed in the IMR study.

Table 5-29 I-26 Traffic Density south of Mt. Pleasant Street

	Traffic Density (pc/mi/ln)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	15.5	17.9	18.0	9.0	10.9	12.2
Port AM Peak (9 - 10 AM)	8.4	9.8	9.9	8.1	9.8	10.1
Port PM Peak (2 - 3 PM)	8.7	10.0	10.4	9.8	11.7	11.9
Commuter PM Peak (5 - 6 PM)	13.1	15.2	16.3	13.6	16.5	16.6

Table 5-30 I-26 Traffic LOS south of Mt. Pleasant Street

	Traffic Level of Service (LOS)					
	I-26 Eastbound (Basic Freeway Segment)			I-26 Westbound (Basic Freeway Segment)		
Peak Hour	Existing	No Build	Build	Existing	No Build	Build
Commuter AM Peak (7 - 8 AM)	B	B	B	A	A	B
Port AM Peak (9 - 10 AM)	A	A	A	A	A	A
Port PM Peak (2 - 3 PM)	A	A	A	A	B	B
Commuter PM Peak (5 - 6 PM)	B	B	B	B	B	B

CORSIM Simulation of Freeway Operations

To evaluate freeway operational impacts of the proposed access modification, CORSIM micro-simulation modeling was performed for the two commuter peak hours (7-8 am and 5-6 pm). The results were compared across Existing, No-Build and Build conditions for the peak direction of travel, which is I-26 Eastbound during the morning commuter peak hour and I-26 Westbound during the afternoon commuter peak hour.

The comparative evaluation entailed running the CORSIM simulation model for 30 runs and post-processing simulation outputs to prepare average simulated volume, speed and density for each merge, diverge, weave and basic freeway segment in the study I-26 corridor. The freeway segments used in the simulation are listed in Table 5-31 for I-26 Eastbound and in Table 5-32 for I-26 Westbound.

Commuter AM Peak Hour (7-8 am)

The simulation analysis of the Commuter AM peak hour (7-8 am) are summarized in Table 5-33 for I-26 Eastbound. The results reveal that I-26 Eastbound is able to process the increased traffic demand in the Build condition with marginal reduction in the traffic flow speed. The traffic flow density measure would increase by 20 percent or more in the Build condition in two segments just south of the Cosgrove Avenue on-ramp merge due to increased traffic demand. However, the density increase would not exceed jam density in any of the freeway segment. The jam density varies from 35 to 45 passenger cars per mile per lane depending on the type of freeway segment.

The simulation visualization during middle of the simulated hour revealed no queuing conditions or traffic jams along I-26 mainline or at any of the ramp locations in the study area. Figure 5-1 depicts mainline simulation snapshots west of the proposed interchange with good flow conditions.

Commuter PM Peak Hour (5-6 pm)

The simulation analysis of the Commuter PM peak hour (5-6 pm) are summarized in Table 5-34 for I-26 Westbound. The results reveal that I-26 Westbound is able to process the increased traffic demand in the Build condition with some reduction in the traffic flow speed. The traffic flow density measure would increase by 20 percent or more in the Build condition in four segments just north of the new Port Access Road interchange and up to Cosgrove Avenue interchange due to increased traffic demand. However, the density increase would not exceed jam density in any of the freeway segment.

The simulation visualization during middle of the simulated hour revealed no queuing conditions or traffic jams along I-26 mainline or at any of the ramp locations in the study area. Figure 5-2 depicts mainline simulation snapshots west of the proposed interchange with good flow conditions.

TABLE 5-31 I-26 EASTBOUND SEGMENT DESCRIPTION

I-26 East Segment#	I-26 Eastbound Segment Location	Freeway Segment Type
1	North of Dorchester Road	Basic
2	Off-Ramp to Dorchester Road	Diverge
3	Between Dorchester Road Ramps	Basic
4	On Ramp from Dorchester Road	Merge
5	Off-Ramp to Cosgrove Avenue	Diverge
6	Between Cosgrove Avenue Loop Ramps	Weave
7	On Ramp from Cosgrove Ave	Merge
8	Between Cosgrove Ave and Meeting Street/Port Access Road	Basic
9	Off-Ramp to Meeting Street/Port Access Road	Diverge
10	Between Meeting Street and Spruill Avenue/Port Access Road	Basic
11	On Ramp from Spruill Avenue/Port Access Road	Merge
12	Between Spruill Ave/Port Access Road and Rutledge Avenue	Basic
13	Off-Ramp to Rutledge Avenue	Diverge
14	Off-Ramp to Mt. Pleasant Street	Diverge
15	South of Mt. Pleasant Street	Basic

TABLE 5-32 I-26 WESTBOUND SEGMENT DESCRIPTION

I-26 West Segment#	I-26 Westbound Segment Description	Freeway Segment Type
1	North of Dorchester Road	Basic
2	On Ramp from Dorchester Road	Merge
3	Between Dorchester Road Ramps	Basic
4	Off-Ramp to Dorchester Road	Diverge
5	On Ramp from Cosgrove Avenue	Merge
6	Between Cosgrove Avenue Loop Ramps	Weave
7	Off-Ramp to Cosgrove Avenue	Diverge
8	Between Meeting Street/Port Access Road and Cosgrove Avenue	Basic
9	On Ramp from Meeting Street/Port Access Road	Merge
10	Between Spruill Avenue/Port Access Road and Meeting Street/Port Access Road	Basic
11	Off-Ramp to Spruill Avenue/Port Access Road	Diverge
12	Between Rutledge Avenue and Spruill Avenue/Port Access Road	Basic
13	On Ramp from Rutledge Avenue	Merge
14	On Ramp from Mt. Pleasant Street	Merge
15	South of Mt. Pleasant Street	Basic

TABLE 5-33 I-26 EASTBOUND SIMULATION RESULTS FOR COMMUTER AM PEAK HOUR (7-8 AM)

I-26 East Segment# (Note1)	Existing (2009) Conditions Simulation			No-Build (2035) Conditions Simulation			Build (2035) Conditions Simulation			Build to No-Build Ratio		
	Average Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Average Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Average Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Average Volume	Average Speed	Average Density
1	4547	63	24	5347	63	29	5917	62	32	1.11	1.00	1.11
2	4547	62	24	5347	61	28	5917	60	32	1.11	0.99	1.12
3	4138	62	22	4754	61	26	5321	61	29	1.12	0.99	1.13
4	4674	58	24	5346	57	28	5984	53	33	1.12	0.94	1.19
5	4674	58	26	5345	57	30	5983	55	35	1.12	0.96	1.16
6	4118	60	17	4720	60	20	5318	59	23	1.13	0.99	1.14
7	4425	60	23	5046	59	27	5813	57	32	1.15	0.96	1.20
8	4425	62	24	5045	61	28	5814	57	34	1.15	0.94	1.23
9	4424	61	23	5049	60	26	5815	58	28	1.15	0.97	1.07
10	4030	62	22	4636	61	25	4605	61	25	0.99	1.00	0.99
11	4287	61	20	4894	60	23	4887	60	21	1.00	1.00	0.90
12	4287	61	23	4894	61	27	4884	60	27	1.00	1.00	1.00
13	4288	58	24	4895	57	28	4883	56	28	1.00	0.99	1.01
14	3421	60	19	3879	59	22	3841	59	22	0.99	0.99	1.00
15	2681	63	14	3080	62	16	3049	62	16	0.99	1.00	0.99

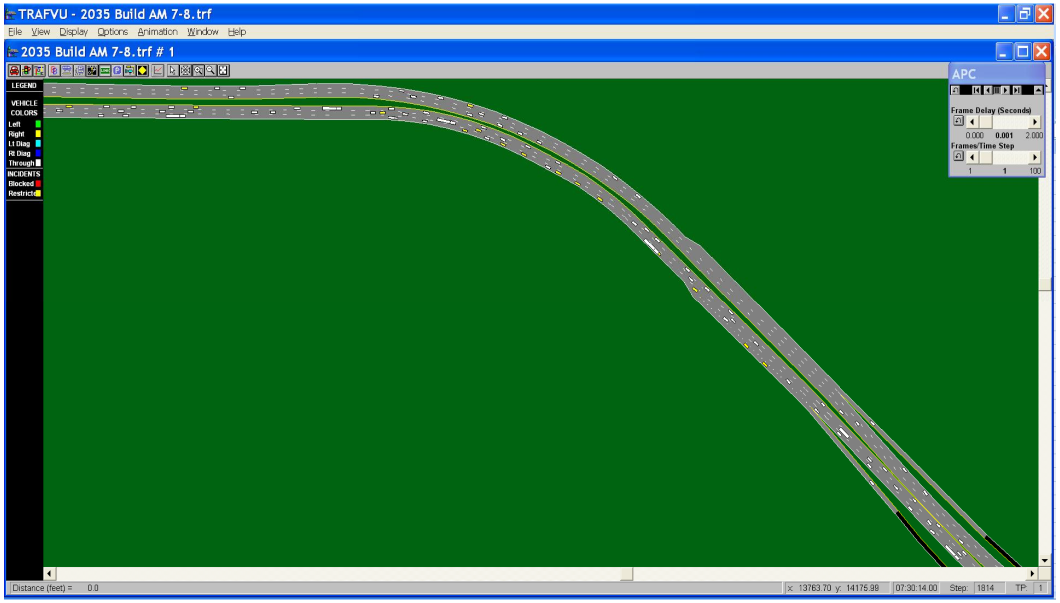
Note 1: See Table 5-31 for description of the I-26 East Segments

TABLE 5-34 I-26 WESTBOUND SIMULATION RESULTS FOR COMMUTER PM PEAK HOUR (5-6 PM)

I-26 West Segment# (Note 1)	Existing (2009) Conditions Simulation			No-Build (2035) Conditions Simulation			Build (2035) Conditions Simulation			Build to No-Build Ratio		
	Simulated Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Simulated Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Simulated Volume (veh/hr)	Average Speed (mph)	Average Density (pc/mi/ln)	Simulated Volume	Average Speed	Average Density
1	4366	62	24	5262	61	29	6043	60	33	1.15	0.99	1.16
2	4367	59	24	5262	57	30	6041	55	35	1.15	0.97	1.18
3	3928	62	21	4704	61	26	5484	61	30	1.17	0.99	1.18
4	4419	61	21	5258	60	25	6105	59	30	1.16	0.98	1.18
5	4419	60	22	5259	58	27	6108	57	33	1.16	0.97	1.19
6	4579	55	21	5340	55	24	6369	54	29	1.19	0.99	1.21
7	4082	61	21	4820	60	25	5811	60	30	1.21	0.99	1.21
8	4082	62	22	4821	61	26	5810	57	34	1.21	0.93	1.30
9	4081	61	19	4821	60	23	5810	53	29	1.21	0.88	1.23
10	3670	62	20	4361	61	24	4363	61	24	1.00	1.00	1.00
11	3828	62	16	4551	61	20	4587	62	19	1.01	1.00	0.99
12	3828	62	20	4550	62	25	4587	62	25	1.01	1.00	1.01
13	3829	60	20	4549	58	24	4589	58	25	1.01	1.00	1.01
14	3096	59	17	3704	58	20	3742	58	21	1.01	1.00	1.01
15	2389	64	12	2898	64	15	2911	64	15	1.00	1.00	1.00

Note 1: See Table 5-32 for description of the I-26 West Segments

FIGURE 5-1 I-26 SIMULATION SNAPSHOT DURING COMMUTER AM PEAK HOUR (7-8 AM)



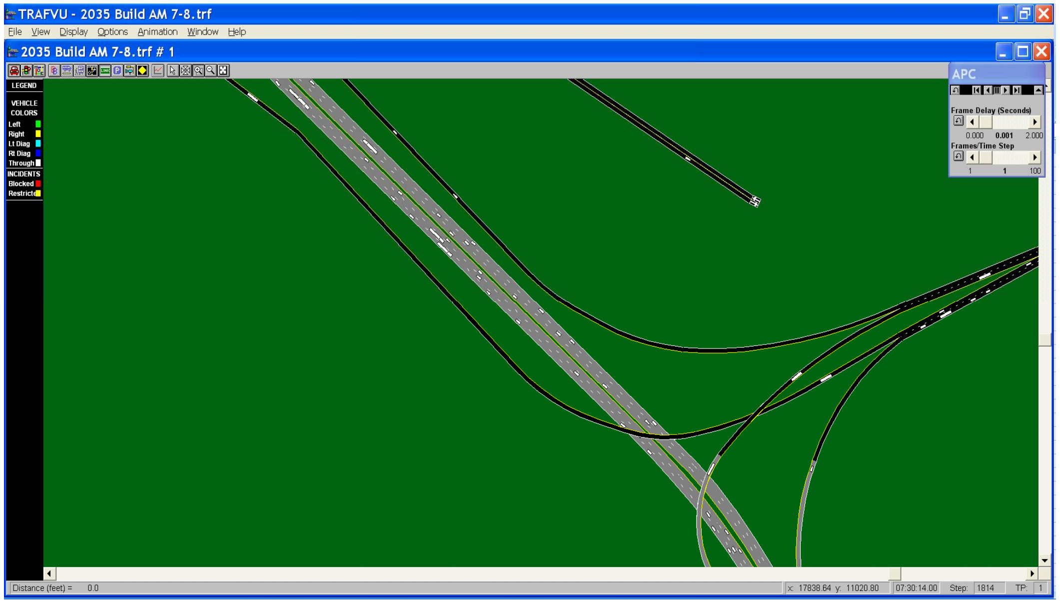
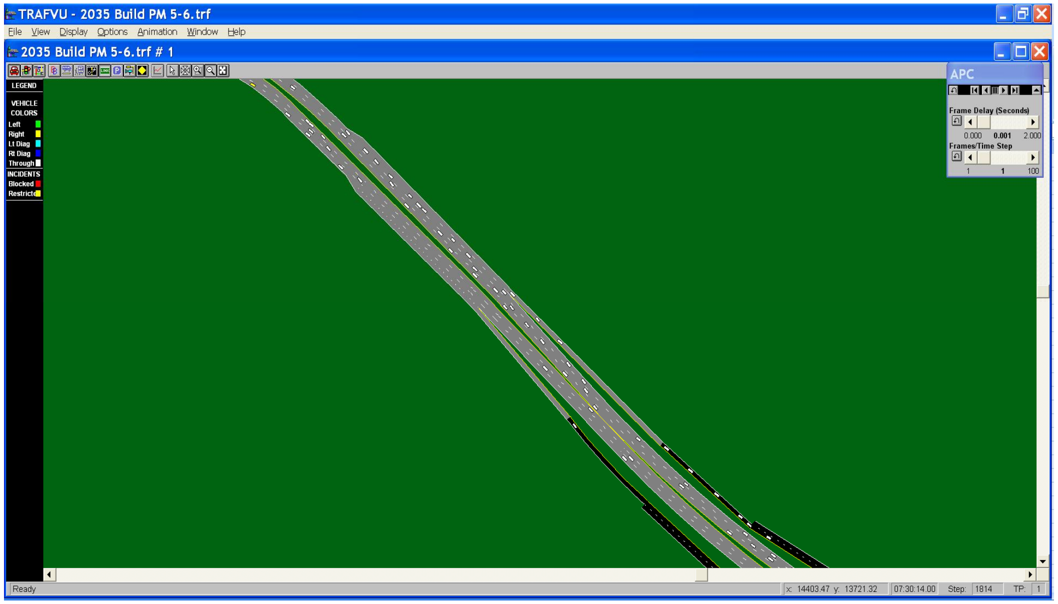
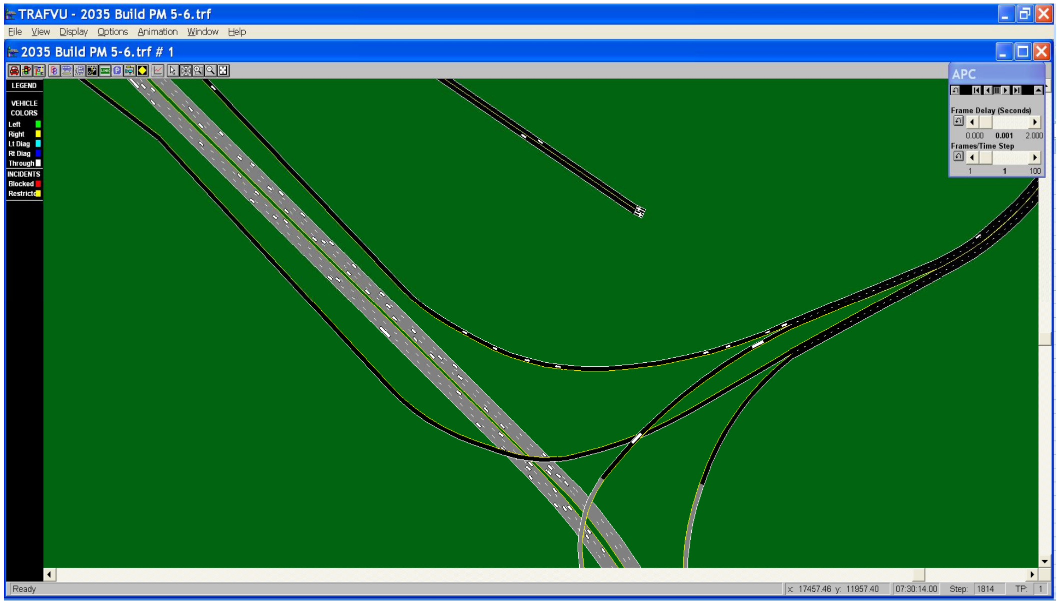


FIGURE 5-2 I-26 SIMULATION SNAPSHOT DURING COMMUTER PM PEAK HOUR (5-6 PM)





6. INTERCHANGE JUSTIFICATION

A policy statement for justifying the need for additional or modified access to the existing sections of the Interstate System was first published in the Federal Register on October 22, 1990 entitled *Access to the Interstate System*. It was then modified and updated on February 11, 1998 and on August 27, 2009. The objectives of this policy are to ensure that all new or revised access points do not adversely impact the operations and safety of the Interstate System, and all new or revised access points have been vetted through a systematic evaluation process.

In order to explain the intent and requirements of this new policy, FHWA published the *Interstate System Access Information Guide* in August 2010. This FHWA Guide was followed in preparing the current Interchange Modification Report (IMR) for the I-26 / Naval Base Terminal Access Road Interchange in Charleston County, South Carolina.

Policy Point 1 – Existing Network Capacity is Inadequate

This policy requirement is stated below:

> *The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).*

As explained in the FHWA's *Interstate System Access Information Guide*, "the intent of the Policy Point 1 is to demonstrate that an access point is needed for regional traffic needs and not to solve the needs associated with local traffic. While the Interstate facility should not be allowed to become part of the local circulation system, it should be maintained as the main regional facility. Improvements to parallel facilities should be considered in lieu of new access wherever feasible."

Existing Roadway Network

The existing I-26 interchanges and local street network in North Charleston cannot accommodate the traffic demand associated with the Naval Base Terminal (NBT). The existing transportation network within the study area has a north-south orientation with three primary north-south arterials:

- US 78 (King Street / King Street Extension)
- US 52 (Meeting Street / Carner Avenue / Rivers Avenue)
- Spruill Avenue (S 10-32)

The existing road network has a limited number of east-west roads:

- SC 7 (Sam Rittenberg Boulevard / Cosgrove Avenue)
- SC 642 (Dorchester Road)
- Azalea Drive (S 10-894)

The east-west traffic movements are further constrained due to the presence of multiple railroad tracks that crosses through the study area:

- CSX King Street Extension Line, which runs parallel to King Street Extension on the west side
- Norfolk-Southern (NS) Line, which runs parallel to King Street Extension on the east side
- CSX 5 Mile Track ROW, which runs parallel to King Street Extension on the east side of the NS line
- CSX Cooper Yard, which runs parallel to Spruill Avenue on the east side, north of Meeting Street
- Cherry Hill Lane Connector, which runs parallel to Cherry Hill Lane, and crosses Meeting Street
- Seaboard Main, which is out of service, located south of Greenleaf Road and east of the Magnolia Cemetery

Consequently, the existing road network does not provide a direct freeway connection to the NBT.

The only existing access point to the NBT site is along Bainbridge Avenue, a local roadway. Port traffic accessing the NBT from I-26 East would either have to use the existing Cosgrove Avenue interchange and travel via Cosgrove Avenue, Spruill Avenue, Viaduct Road and Bainbridge Avenue, or use the Meeting Street interchange and travel via Meeting Street, Spruill Avenue, Viaduct Road and Bainbridge Avenue. Port traffic accessing the NBT from I-26 West would have to use the existing Spruill Avenue interchange and travel via Spruill Avenue, Viaduct Road and Bainbridge Avenue. All of these access routes require significantly longer travel distance and travel time, and higher number of turning movements at intersections where turning geometry are constrained for commercial vehicles.

In this existing roads scenario, Port-related truck traffic accessing the NBT will need to mix with local traffic, and thereby cause queuing at intersections. The mixing of Port-related truck traffic with local traffic was deemed unsafe as there are several residential neighborhoods along the existing routes. These residential neighborhoods in the study area included the following:

- Chicora
- Howard Heights
- Windsor
- Union Heights
- Rosemont

These communities are historically African American and Environmental Justice (EJ) communities with declining housing and economic conditions. Additional truck traffic from the NBT on local roads were deemed a major impact on these EJ neighborhoods as these communities are seeking revitalization through new residential, retail, commercial, office and park developments[5].

[5] LAMC Area Revitalization Plan, Final Plan, April 16, 2010, Low Country Alliance for Model Communities.

The traffic analysis prepared for the Port EIS[6] demonstrated that NBT traffic would cause several local intersections and ramp junctions along Dorchester Road, Rivers Avenue, Spruill Avenue, Cosgrove Avenue, McMillan Avenue and Meeting Street to fail if the NBT traffic is accommodated via existing interchanges and arterial street network. The analysis revealed that around 12 intersections in the North Charleston study area would experience significant degradation as Level of Service (LOS) would worsen to E and F conditions from D or better. Traffic operations under existing conditions and under the No–Build Alternative in the design year illustrated that access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays, or lengthening storage cannot satisfactorily accommodate design-year traffic demands.

The updated traffic analysis also shows that the existing I-26 interchanges have limited reserve capacity. The existing (2009) conditions analysis revealed that I-26 in the vicinity of the interchanges with Dorchester Road, Cosgrove Avenue and Meeting Street are approaching capacity and operate under congested conditions during the peak periods. For example, during the Commuter AM peak hour (7-8 am) with peak traffic heading towards Charleston, I-26 East operates at LOS D as it approaches the Dorchester Road interchange (Exit 215), the SC 7 / Cosgrove Avenue interchange (Exit 216A), the Meeting Street interchange (Exit 217), and the Rutledge Avenue/Heriot Street interchange (Exit 219A). Average speeds within these ramp-diverge segments are approximately 17 percent below the free flow speed. Similarly, during the Commuter PM peak hour (5-6 pm) with peak traffic heading out of Charleston, I-26 West operates at LOS D as it approaches the Dorchester Road interchange (Exit 215). Average speeds are 15 percent below the free flow speed at those ramps-diverge segments.

Therefore, the updated traffic analysis confirm that the existing roadway network is inadequate to accommodate the design year (2035) NBT traffic demand if it is loaded on to I-26 with already busy interchanges and capacity-constrained local roads.

Policy Point 2 – Reasonable Alternatives Have Been Evaluated

This policy requirement is stated below:

> *The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).*

The intent of the Policy Point 2 is to demonstrate that a new access point is still needed even after implementation of system management or design improvements to the existing interstate system.

Alternatives Evaluated

The proposed Interstate modification project is needed to serve a new container terminal that will have a significant number of truck movements during late morning, noon and early afternoon hours. The Port EIS study selected a Preferred Build Alternative by conducting an

[6] Port FEIS, December 2006, US Army Corps of Engineers, Charleston District (Appendix T, Existing Roadway Traffic Study for North Charleston Study Area).

extensive alternatives analysis[7]. The Preferred Build Alternative represents the most feasible option for meeting the purpose and need of the project. The Preferred Build Alternative was selected after considering numerous interchange designs and alternate roadway alignments providing direct access to either I-26 or I-526. The development of design alternatives was an iterative process that involved detailed engineering, planning, and environmental analysis as well as extensive public and stakeholder inputs. All alternatives went through extensive review and comment by stakeholders, refinement and revision. These alternatives screening process have been documented in Appendix M of the Port EIS (Summary of the Alternatives Screening Process).

The alternative analysis process considered minimizing impacts on the traffic operations along I-26. For example, the Meeting Street ramps were retained at their current locations, but were combined with the Port Access Road ramps in a Collector-Distributor Road prior to the connection with I-26. This C-D roadway will create single exit and entry points to I-26. The proposed access modification will replace the Spruill Avenue ramps, thereby minimizing the number of new access points with I-26. The access to Spruill Avenue is maintained through the Port Access Road with connections using Stromboli Avenue and the constructed Bainbridge Connector road. The interchange modification will create a design that accommodates a future eight lane section on I-26. South Carolina Department of Transportation (SCDOT) has developed right-of-way plans for the interchange modification. The design represents a significant design improvement compared to existing conditions as it eliminates a substandard half-interchange (Spruill Avenue ramps) and replaces it with a new full-movement interchange connected with a new access road that provides grade separation over several railroad tracks and north-south roads (King Street Extension, Meeting Street and Spruill Avenue).

During the Port EIS study, numerous geometric designs and alternate alignments were considered for the proposed interchange (see Table 6-1 for a summary). The evaluation process is documented in detail in the Appendix W of the Port EIS (Access Road Feasibility Study and Supplemental Report). The Port EIS study determined that the Preferred Alternative (#1D) is the most feasible and reasonable option for meeting the purpose and need of the project.

[7] Port FEIS, December 2006, US Army Corps of Engineers, Charleston District (Appendix W, Access Roadway Feasibility Study & Supplemental Report)

TABLE 6-1 BUILD ALTERNATIVES EVALUATED IN THE PORT EIS

Alt. #	Alternative Description	Evaluation Results & Decisions
A	New high design speed access road (1.1 mile) parallel to Pittsburg Avenue and connecting to I-26 with a new interchange just south of current Exit 218 and replacing the ramps at Exits 217 and 218	Passed Fatal Flaw analysis. Passed Conceptual Alternatives Screening. Carried forward in the DEIS as Alternative 1a. The DEIS further refined Alternative 1a. In addition, a derivative Alternative 1c was developed with an alternate interchange design. Alternative 1c was selected as the best alternative during the DEIS. The Alternative 1c was further refined into Alternative 1d during the FEIS, which was selected as the Preferred Build Alternative.
B	Similar to Alternative A, with the exception of the curved alignment to avoid crossing the Copper Yard property	Passed Fatal Flaw analysis. Passed Conceptual Alternatives Screening. Carried forward in the DEIS as Alternative 1b and further refined.
C	Similar to Alternative A, with the exception of roadway alignment and interchange location. The roadway alignment has been pushed to the north parallel to the Spruill Avenue ramps. The new interchange was placed in between the current Exits 217 and 218.	Passed Fatal Flaw analysis. Passed Conceptual Alternatives Screening. Carried forward in the DEIS as Alternative 2 and further refined.
D	Similar to Alternative A, with the exception of roadway alignment and interchange location. The roadway alignment has been pushed to further north parallel to Boxwood Avenue. The new interchange was placed in near Exit 217.	Community Impacts deemed a fatal flaw. Dropped from further consideration.
E	Similar to Alternative A, with the exception of roadway alignment and interchange location. The roadway alignment has been pushed to further north parallel to Stromboli Avenue. The new interchange was placed north of Exit 217.	Passed Fatal Flaw analysis. Passed Conceptual Alternatives Screening. Carried forward in the DEIS as Alternative 3 and further refined.
F1	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-26 interchange at SC 7. The alternative assumed minor interchange improvement at SC 7.	Passed Fatal Flaw analysis. Failed Conceptual Alternatives Screening.
F2	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-26 interchange at Dorchester Road via Cosgrove Avenue. The alternative assumed minor interchange improvement at Dorchester Road.	Passed Fatal Flaw analysis. Failed Conceptual Alternatives Screening.
G	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-526 interchange at Rivers Avenue. The alternative assumed minor interchange improvement at Rivers Avenue.	Passed Fatal Flaw analysis. Failed Conceptual Alternatives Screening.
H	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-526 interchange at Rhett Avenue. The alternative assumed minor interchange improvement at Rhett Avenue.	Community and Environmental Impacts deemed as fatal flaws. Dropped from further consideration.
I1	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-526	Passed Fatal Flaw analysis. Failed Conceptual Alternatives Screening.

Alt. #	Alternative Description	Evaluation Results & Decisions
	interchange at Rhett Avenue via North Carolina Avenue, Noisette Boulevard, Virginia Avenue, and a new connector road paralle to the railroad tracks. The alternative assumed minor interchange improvement at Rhett Avenue.	
I2	Arterial access road, first connecting to existing Spruill Avenue and then connecting to the existing I-526 interchange at Virginia Avenue via North Carolina Avenue, Noisette Boulevard, and Virginia Avenue. The alternative assumed minor interchange improvement at Virginia Avenue.	Environmental Impacts surrounding a full movement interchange deemed a fatal flaw. Dropped from further consideration.

TSM Improvements

A prior study by SCDOT[8] evaluated the feasibility of implementing ramp metering along I-26 and at the proposed new interchange. This study concluded that ramp metering will have marginal benefit to the operations of I-26. In addition, ramp metering implementation at the proposed Port Access Road interchange would require increasing the storage length at the entry ramps due to the number of truck volumes, which could not be accommodated without revising the current interchange design. In the future, Transportation System Management (TSM) and Intelligent Transportation System (ITS) measures could be implemented as part of a broader I-26 corridor strategy, but would require regional coordination and policy development.

Overall, the TSM alternative was viewed inadequate as a stand-alone alternative. While TSM improvements such as intersection turn lanes, upgrading or coordinating traffic signals, and additional bus services could improve traffic operations , they were deemed either inadequate or a partial solution to address the purpose and need of this project. Therefore the TSM alternative was eliminated in the Port EIS as a viable stand-alone alternative.

HOV, Transit & Multi-Modal Improvements

A prior study by SCDOT[9] evaluated the feasibility of implementing High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) lanes along I-26 in the greater Charleston region. This study concluded the following:

"Because of existing capacity and design constraints in the corridor and lack of sufficient modal options necessary to facilitate a change in travel behavior, conversion of an existing general purpose lane for either HOV or HOT lane use is not supported by the analysis at this time. This finding is supported by analyzing the potential impact on traffic conditions in the remaining general purpose lanes, and the lack of sufficient transit service and ridesharing infrastructure needed to minimize that impact. Based on the assumptions and analyses outlined in this report, construction of a new HOV/HOT lane fully funded through variable tolling does not appear to be

[8] Interstate 26 Traffic Analysis Review (Ramp Metering Study), Prepared for SCDOT by CDM Smith, August 3, 2009.

[9] Analysis of the I-26 Corridor for the Introduction of HOV/HOT Lanes, Berkeley – Charleston – Dorchester Region, Prepared by SCDOT Office of Planning, November, 2008.

viable at this time due to the level of HOT lane usage necessary to satisfy annualized debt service."

While HOV and HOT lane options is not feasible in the current conditions, it is likely to be explored more as funding becomes scarce to build general purpose lanes and when I-26 is targeted for additional capacity expansion.

Policy Point 3 –No Significant Adverse Impacts to Interstate Safety & Operation

This policy requirement is stated below:

An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

The intent of the Policy Point 3 is to require detailed operational and safety analysis of the relevant interstate segments and provide a comparison of the no-build and build conditions that are anticipated to occur through the design year of the project.

Interstate Operation and Safety

The current IMR study analyzed I-26 operations for four peak hours to explore the full range of likely impacts due to the added traffic from the Naval Base Terminal (NBT). The analysis utilized HCS-2010 and CORSIM simulation models. The analysis results have been summarized in section 5 of this report. Analysis of the Build Alternative illustrates that the project would not have any significant negative impact on the safety and the operation of the facilities within the project area. The I-26 mainline operation would maintain LOS E or better during all four peak hours analyzed, with traffic from the NBT. The new merge/diverge areas along I-26 would also maintain LOS E or better during all four peak hours analyzed, with the NBT traffic. The existing weave areas at the Cosgrove Avenue interchange would also maintain LOS E or better during all four peak hours analyzed, with NBT traffic. In other words, the analysis revealed no LOS F operations in any of the study area segments. This was further confirmed through CORSIM simulation that there are no breakdowns in traffic flow conditions along I-26 during the Commuter AM and PM peak hours.[10]

Because of the direct access roadway that connects the Port's NBT with I-26, truck traffic from the Port is anticipated to stay away from local roads and away from already congested interchanges in the study area such as the Cosgrove Avenue and Dorchester Road.

By replacing the substandard ramps at Spruill Avenue, the proposed new I-26 interchange with Port Access Road provides for higher design standards, and thus the new interchange is anticipated to contribute in improving traffic safety.

By combining the new Port Access Road interchange ramps with the Meeting Street ramps with a C-D road, the project would avoid two merge or diverge areas in close proximity. Thus, the new interchange design would provide auxiliary and acceleration/deceleration lanes for safer movement onto and off of the freeway. The new interchange design would avoid unsafe conditions such as weaving maneuvers.

The interchange design kept the provision of an additional travel lane in each direction along I-26 in the future. This design provision would enhance the operational efficiency of the corridor, thereby increasing capacity and improving levels of service in the long term.

Policy Point 4 – Connects to a Public Road and Provide All Movements

This policy requirement is stated below:

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).

The intent of the Policy Point 4 is to require implementation of an interchange design for the new access that allows for all relevant movements for general purpose traffic, whenever feasible.

Interchange Movements

The existing I-26 interchange at Spruill Avenue is a half-interchange that provides movements only to and from Charlestion. The proposed new interchange will replace the Spruill Avenue ramps, and build a fully directional interchange with the Port Access Road. The Port Access Road

[10] It should be noted that the traffic analysis was conducted under current year (2009) and future year (2035) traffic conditions, and included I 26 mainline and all interchanges within the project limits, as well as the adjacent interchange beyond either end of the project limits. Since the Port FEIS was completed in 2007, economic recession have impacted traffic patterns and show reduction in base year traffic counts as well as drop in future growth projections along the corridor. This drop in traffic volumes, combined with separation of Port traffic into multiple peak hours, and better field conditions resulted in better traffic operations along the corridor than what was reported during the Port EIS.

will be designed and built as a four-lane controlled-access facility and maintained by the SCDOT. The conceptual design plan for the new roadway and the interchange is provided in Appendix A. The design of the Port Access Road reflects AASHTO policy guidance for ramp design in urban areas and no design exceptions are expected for the interchange improvements.

The new interchange will significantly improve access to the industrial Neck area as it allows for: 1) I-26 movements to/from Columbia, 2) I-26 movements to/from Charleston, and 3) local access to Spruill Avenue, Bainbridge Avenue, future MacAlloy site development, and Cooper River Marina (via Tidewater Road).

Policy Point 5 – Compatible with Local & Regional Plans

This policy requirement is stated below:

The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

The intent of the Policy Point 5 is to ensure consistency of the access request with local and regional plans.

Local and Regional Plan Compatibility

The Port Access Road and the new interchange with I-26 is part of the region's transportation plan. It is currently included in the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG)'s Charleston Area Transportation Study (CHATS) Transportation Improvement Program (TIP) FY 2010-2015, as a SAFETEA-LU Earmark Project (SAFETEA-LU #4872).

The Navy Base Terminal and the Port Access Road is an important freight mobility element of the BCDCOG's 2035 CHATS Long Range Transportation Plan (LRTP). The Port Access Road project supports the LRTP goal to provide efficient, safe, and secure freight transportation facilities to ensure the region's future economic stability.

The Port Access Road is currently included in the South Carolina Statewide Transportation Improvement Program (STIP)[11], which is the State's six-year transportation improvement program for all projects or program areas receiving federal funding. The STIP covers all federally funded improvements for which funding has been approved and that are expected to be undertaken during the upcoming six-year period.

The project is also part of the City of North Charleston's Comprehensive Plan Update[12]. The project also supports the City's transportation safety goals to reduce trucks, commuter, and cut-through traffic on residential streets.

[11] STIP, District 6, Charleston County, Revision 29, February 16, 2012.
[12] North Charleston Comprehensive Plan Update, 2008, Chapter 8 Transportation.

Overall, the project is a major project in the Charleston region that not only supports the region's and state's economic development goals, but also supports local community revitalization goals in North Charleston.

Policy Point 6 – Network Study for Cumulative Effects

This policy requirement is stated below:

In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).

The intent of the Policy Point 6 is to ensure coordinated network study and evaluation of cumulative effects for those cases when multiple new access requests are involved within the same vicinity.

Network Evaluation

As part of the Access Road Feasibility Study and the Port EIS study, the impacts of the Navy Base Terminal were analyzed on multiple tiers of study area networks. During the initial stages of the Port EIS when roadway alignment alternatives were at the preliminary stage, the Tier 1 study area included evaluation of I-26, I-526, and all major arterial corridors within the influence area of the Navy Base Terminal. When the access roadway alignment option was finalized to Alternative 1D configuration, a more focused Tier 2 windowed study area was defined to prepare detailed capacity and freeway operations analysis for the EIS alternatives. In the current IMR study, a further windowed Tier 3 study area was defined to explore freeway merge/diverge issues and queuing at different time of day related to Commuter peak hours and Port peak hours. The Tier 3 study area allowed detailed simulation analysis of the immediate influence area interchanges, where operations can be observed in detail and directly compared to No-Build conditions.

The capacity and simulation analysis prepared for the IMR study confirms that the cumulative traffic impacts due to the Naval Base Terminal would cause mainline operations to worsen slightly from LOS D to LOS E conditions within the immediate influence area of the new interchange. However, the flow and average travel speed conditions would remain at acceptable level and traffic density is anticipated to remain below jam density so as not to cause any significant queuing.

Policy Point 7- Stakeholder Coordination & Agreements

This policy requirement is stated below:

When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to *assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).*

The intent of the Policy Point 7 is to ensure coordination and cooperation with relevant stakeholders when the need for interchange is primarily due to new developments.

Stakeholder Coordination

During the Port EIS study, extensive stakeholder coordination was carried out in order to ensure that the proposed Port Access Road not only works for the Port, but also for local communities and businesses. The stakeholder coordination process resulted in providing a half-diamond interchange along the Port Access Road with connections to Spruill Avenue for residential communities, to Bainbridge Avenue for the Federal Law Enforcement Training Center (FLETC) and Veterans Terminal, to Tidewater Road for accessing the Cooper River Marina, and to the future MacAlloy development site.

The stakeholder coordination process ensured that the proposed access modifications can adequately accommodate traffic associated with the proposed growth in the Department of Homeland Security (DHS) facilities along Bainbridge Avenue, and the shifts in Port operations to the Veterans terminal.

Currently, the South Carolina Department of Transportation (SCDOT) is managing the Port Access Road project on behalf of the South Carolina State Ports Authority (SCSPA) through an intergovernmental agreement. The project has already received partial funding from the South Carolina General Assembly for construction of the Port Access Road within the next 6 years. The project is currently being considered for a design-build type construction project for expedited implementation and cost savings. SCDOT is currently in the process of moving this interchange and roadway project with necessary permits and right-of-way acquisition.

Policy Point 8 – Compliance with NEPA Process

This policy requirement is stated below:

The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

The intent of the Policy Point 8 is to ensure that the National Environmental Policy Act (NEPA) process is completed for environmental evaluation.

NEPA Compliance

A Final Environmental Impact Statement (FEIS) was issued in 2006 and a Record of Decision (ROD) on the Navy Base Terminal and the Port Access Road alignment was reached in 2007. The current Preferred Alternative design was included in the FEIS as Alternative 1D.

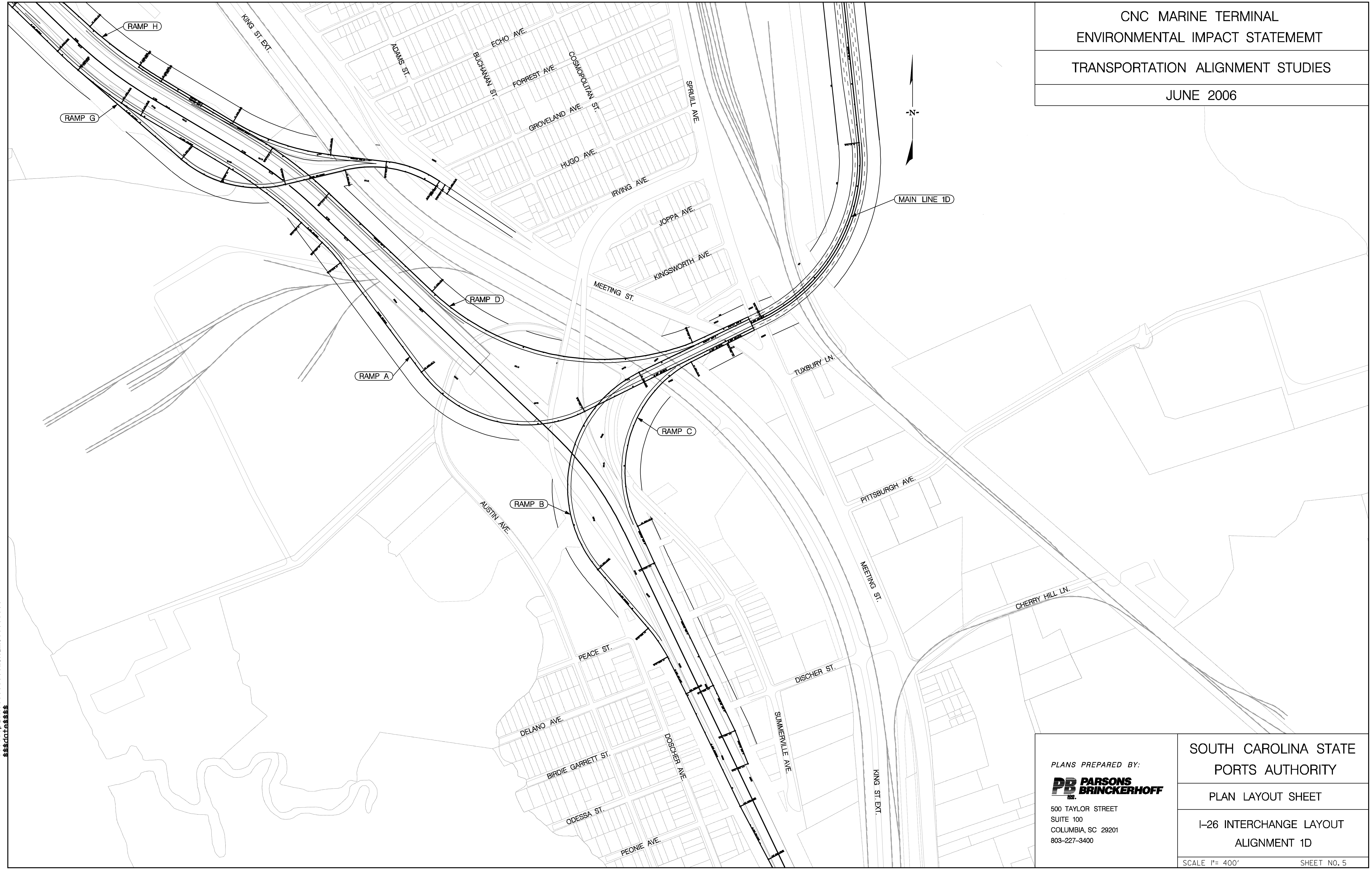
The Phase 1 of the Navy Base Terminal is currently under construction, which is scheduled for completion in 2018.

APPENDIX – A: PREFERRED ALTERNATIVE DESIGN PLAN

CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

JUNE 2006



PLANS PREPARED BY:

PARSONS BRINCKERHOFF

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SOUTH CAROLINA STATE PORTS AUTHORITY

PLAN LAYOUT SHEET

I-26 INTERCHANGE LAYOUT
ALIGNMENT 1D

SCALE 1"= 400'

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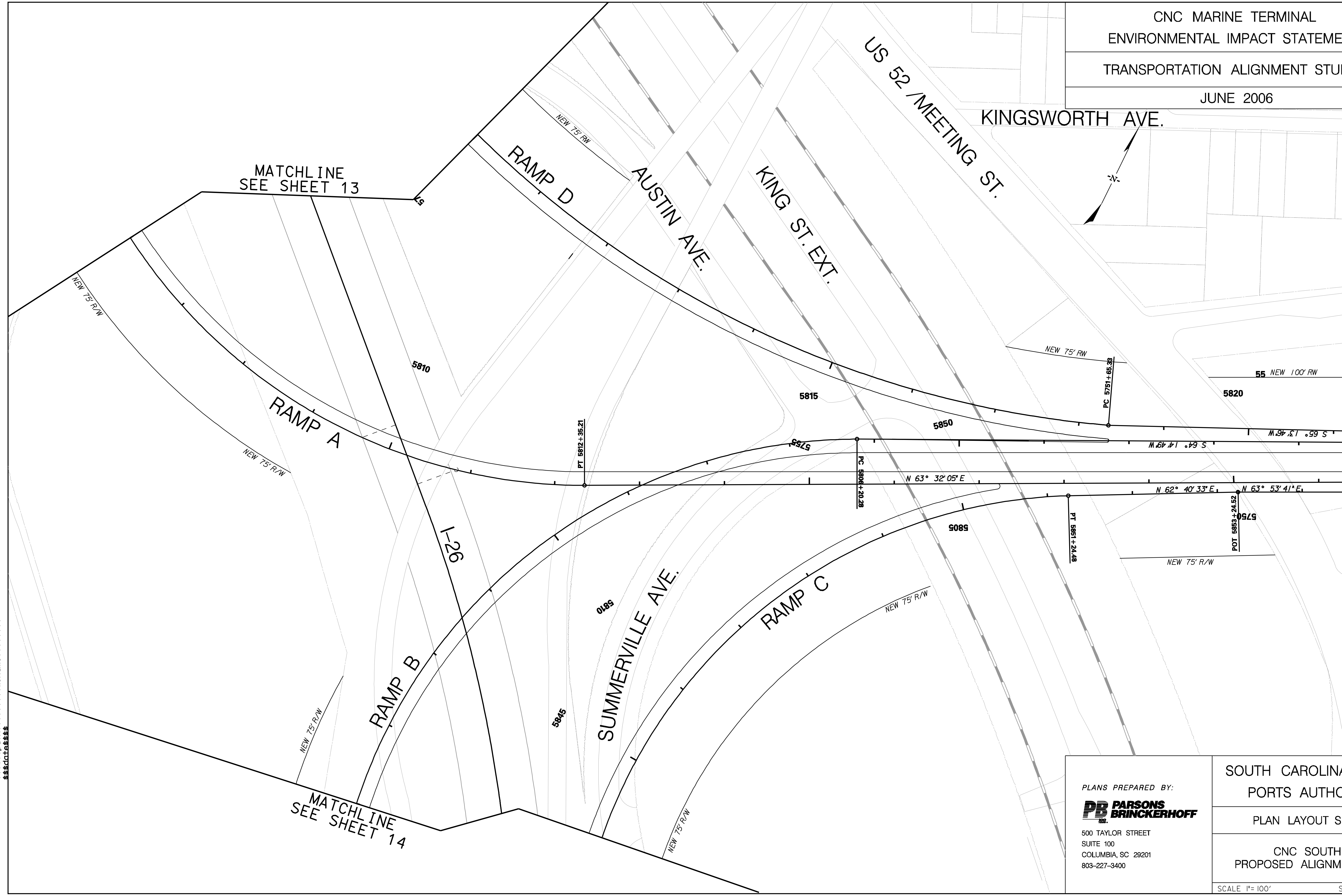

CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

SHEET NO. 6

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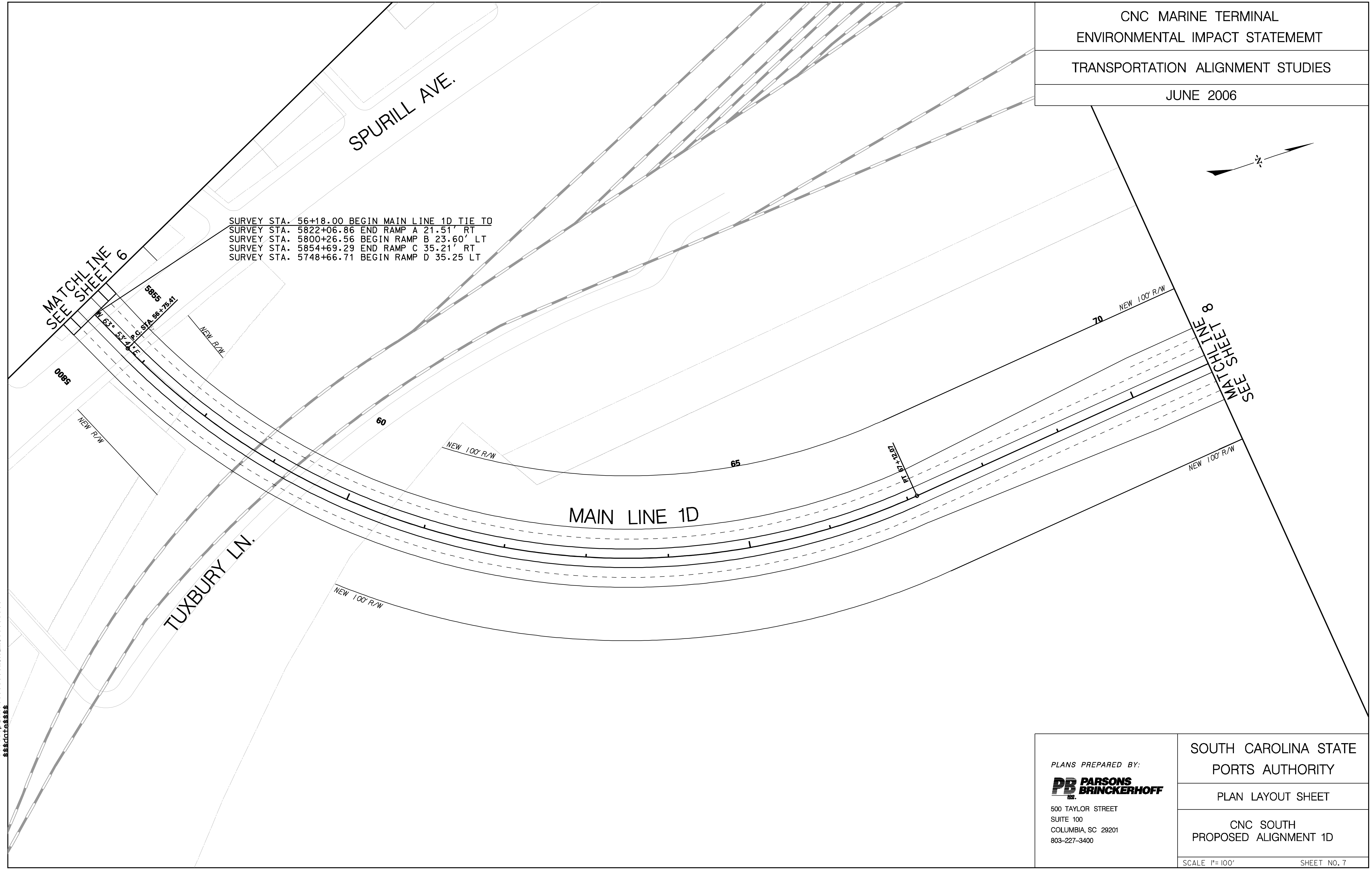

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ENVIRONMENTAL IMPACT STATEMEMT

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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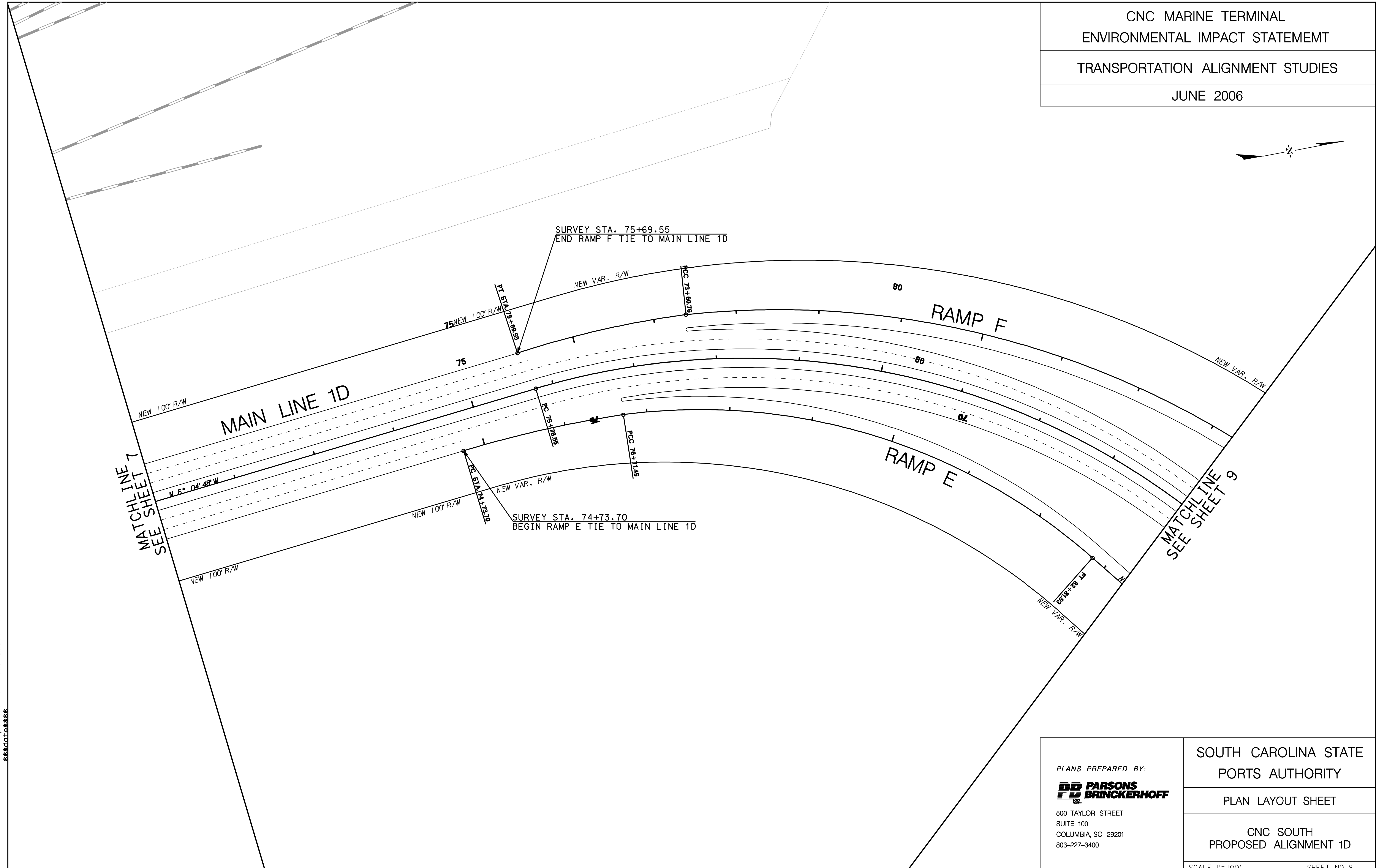
CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

JUNE 2006



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CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

SHEET NO. 8

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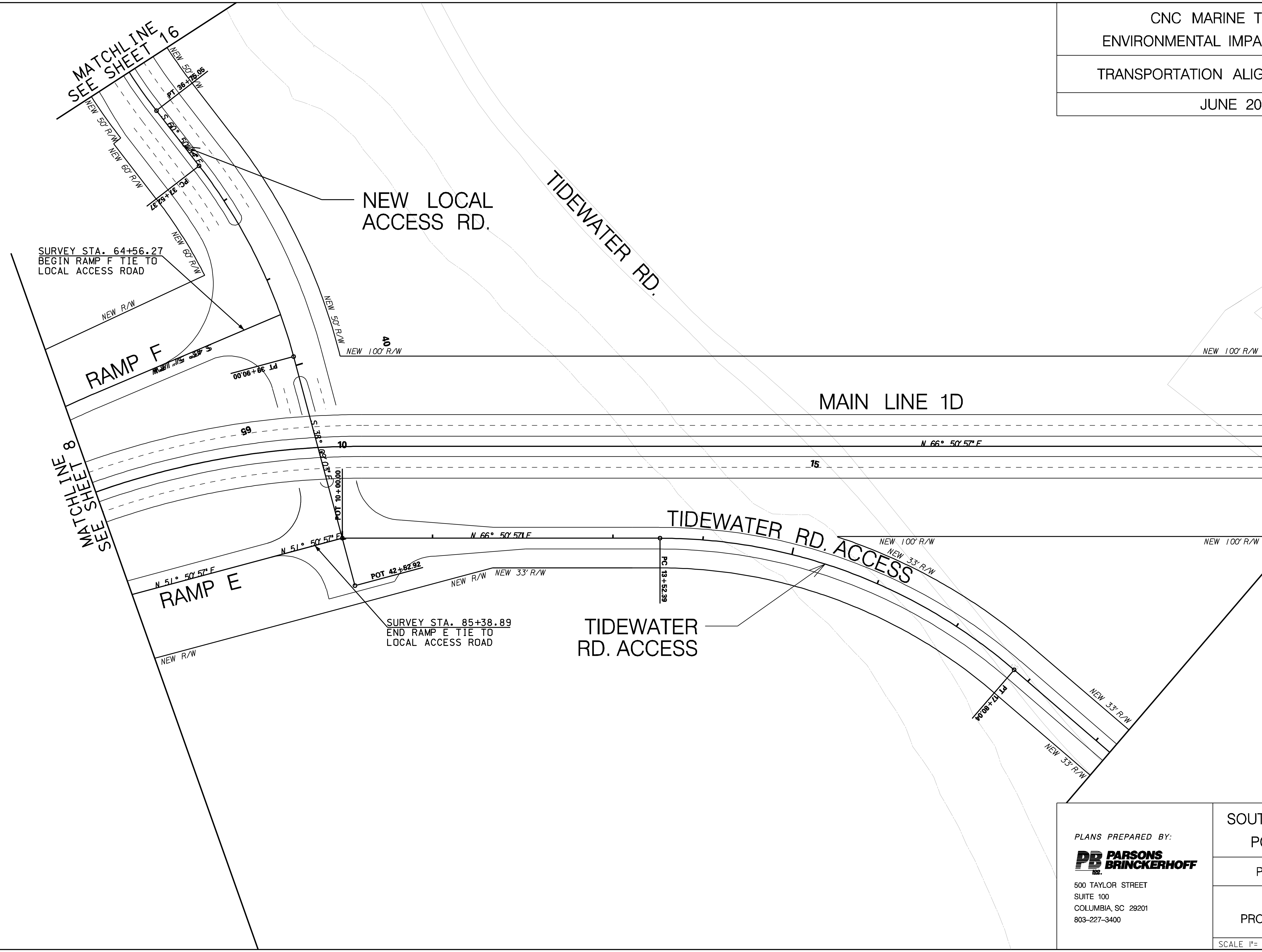
CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

JUNE 2006



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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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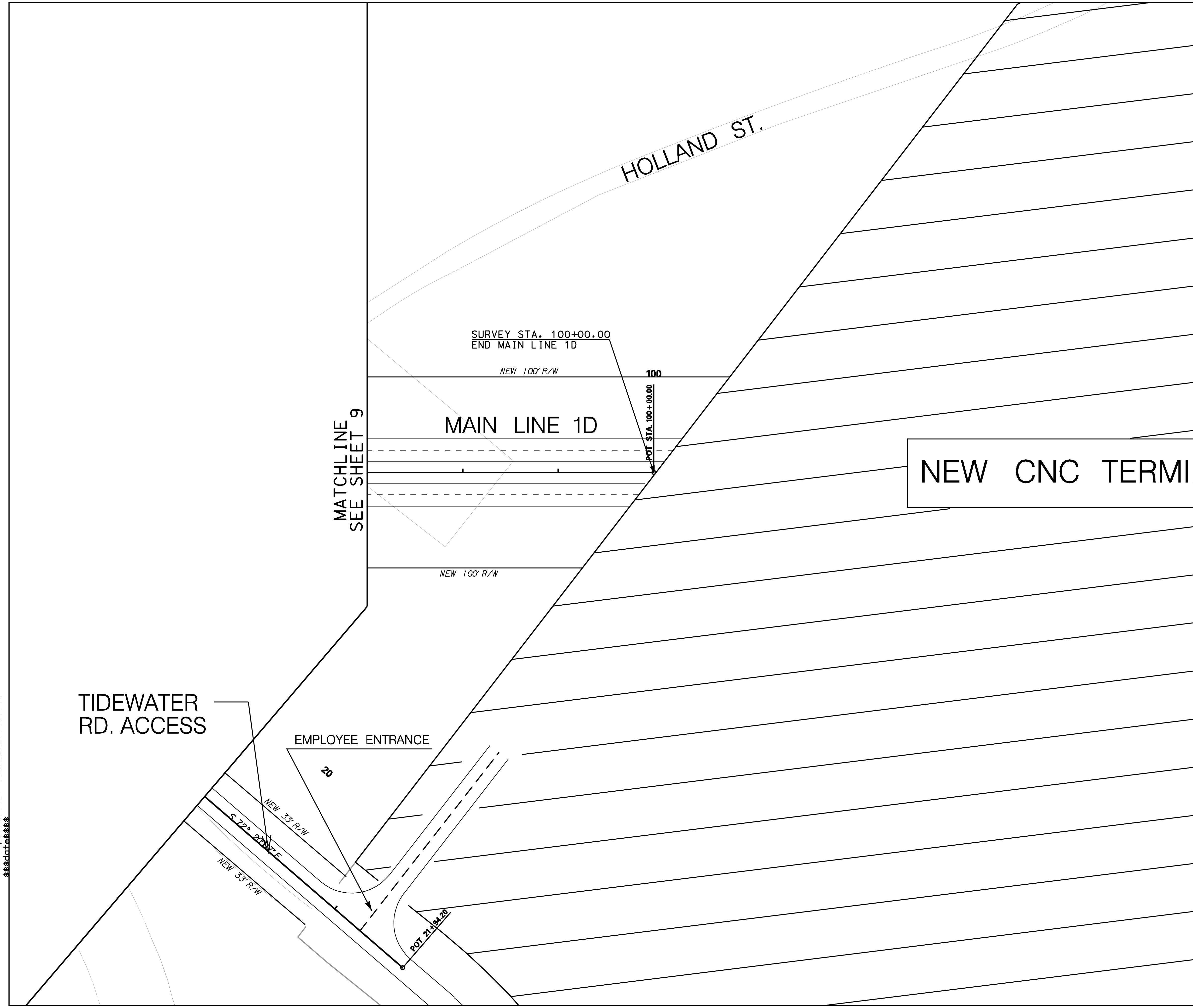

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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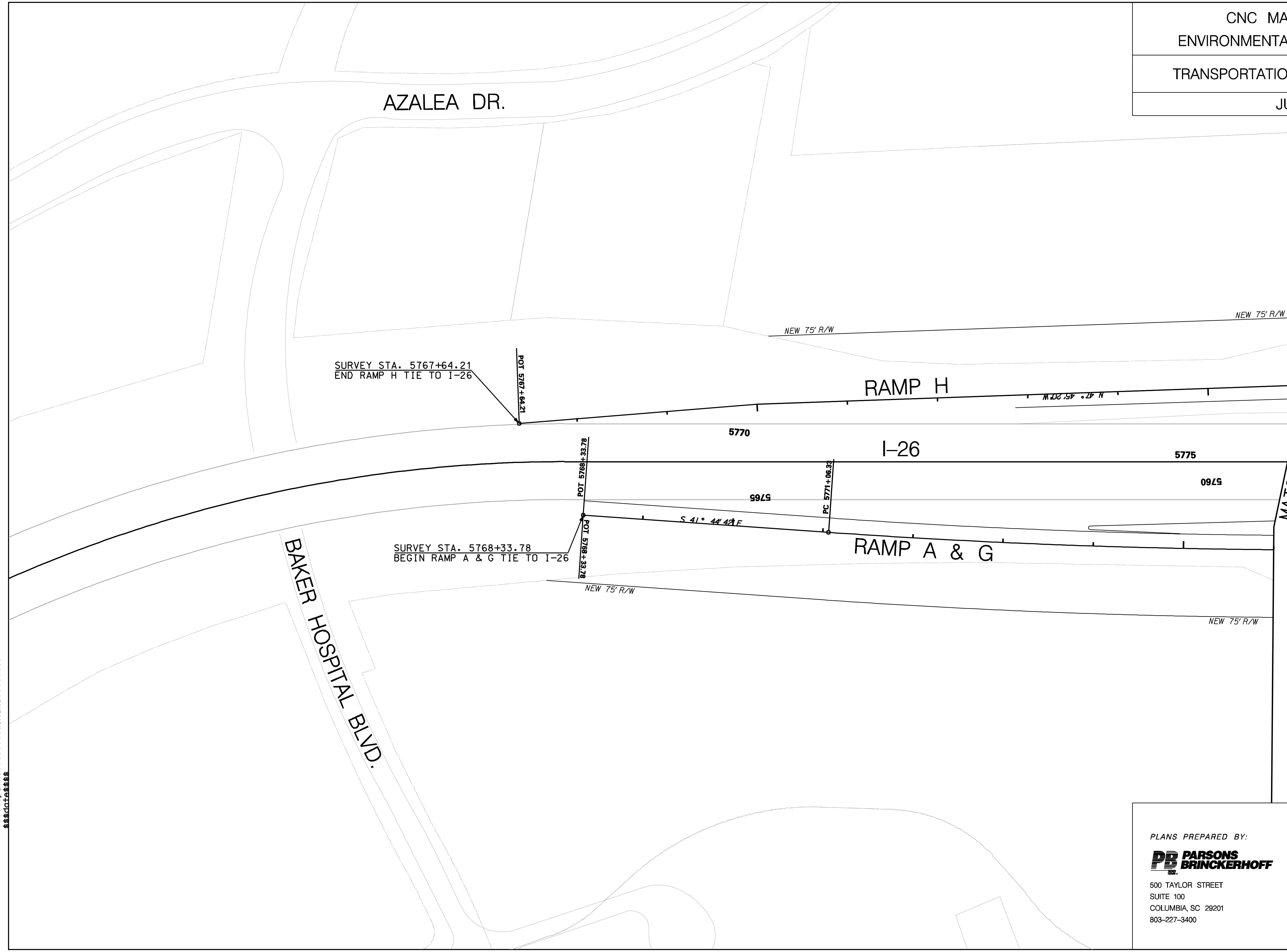

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ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

SHEET NO. 11

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ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

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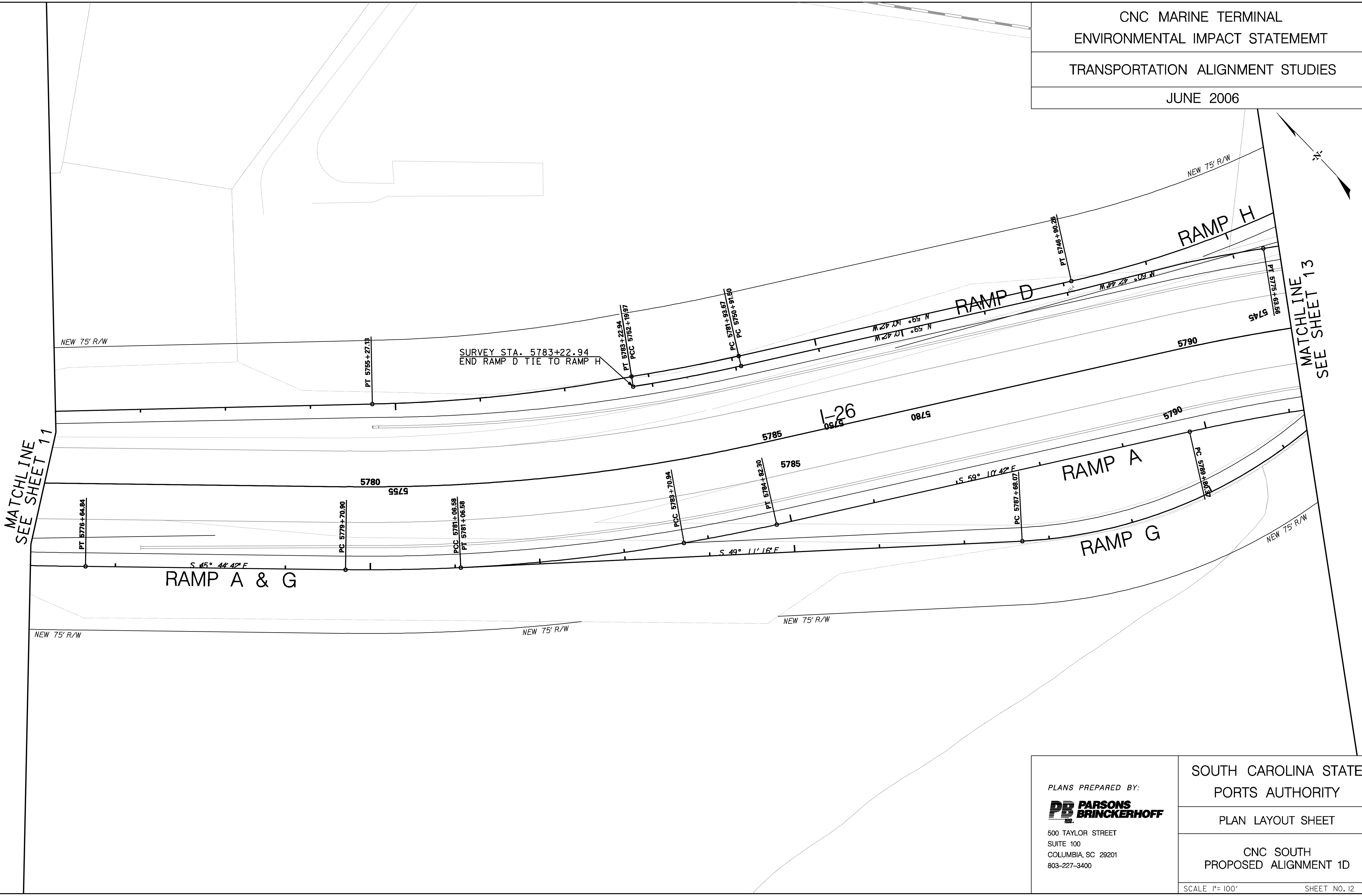

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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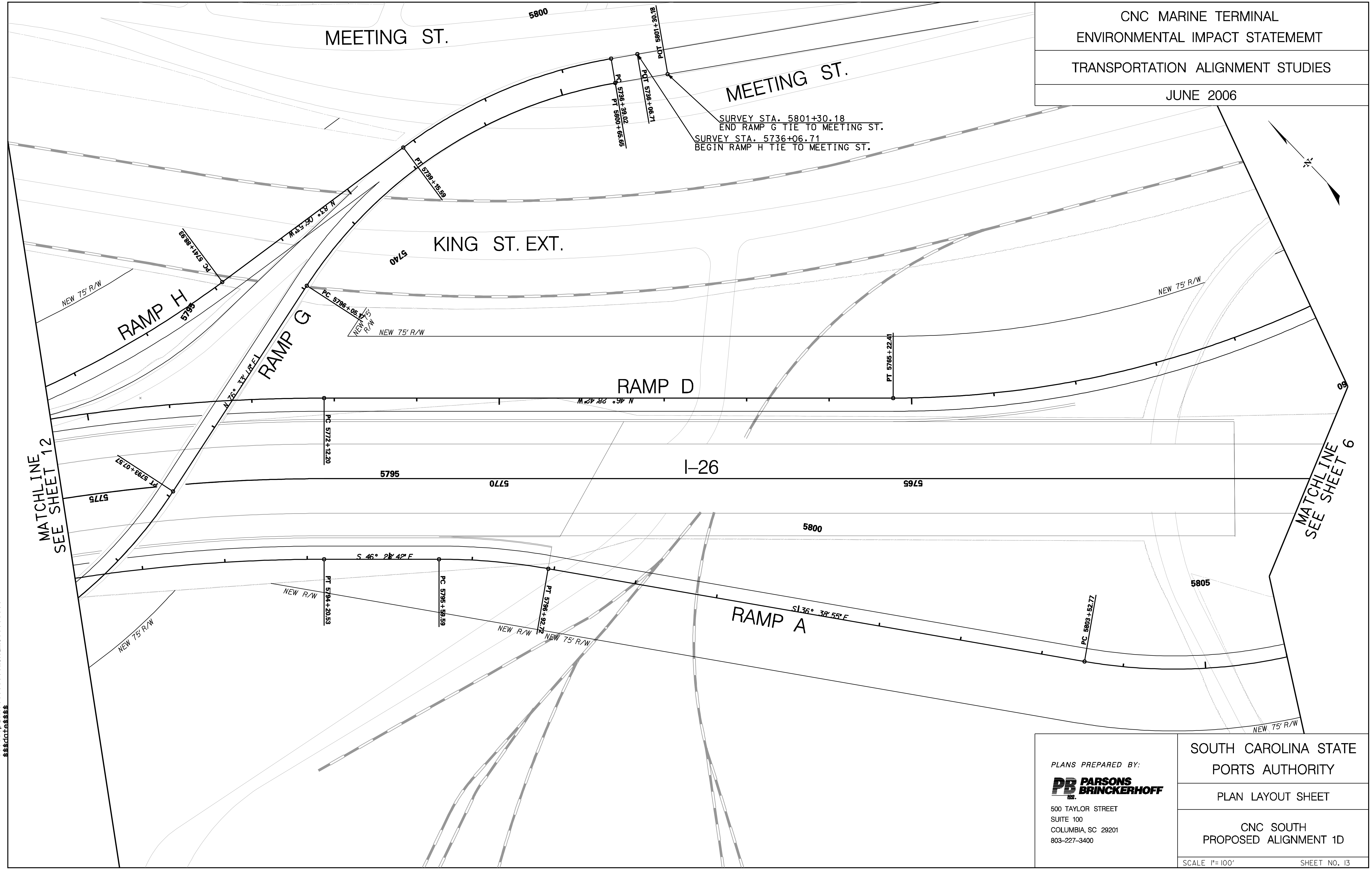

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ENVIRONMENTAL IMPACT STATEMEMT

TRANSPORTATION ALIGNMENT STUDIES

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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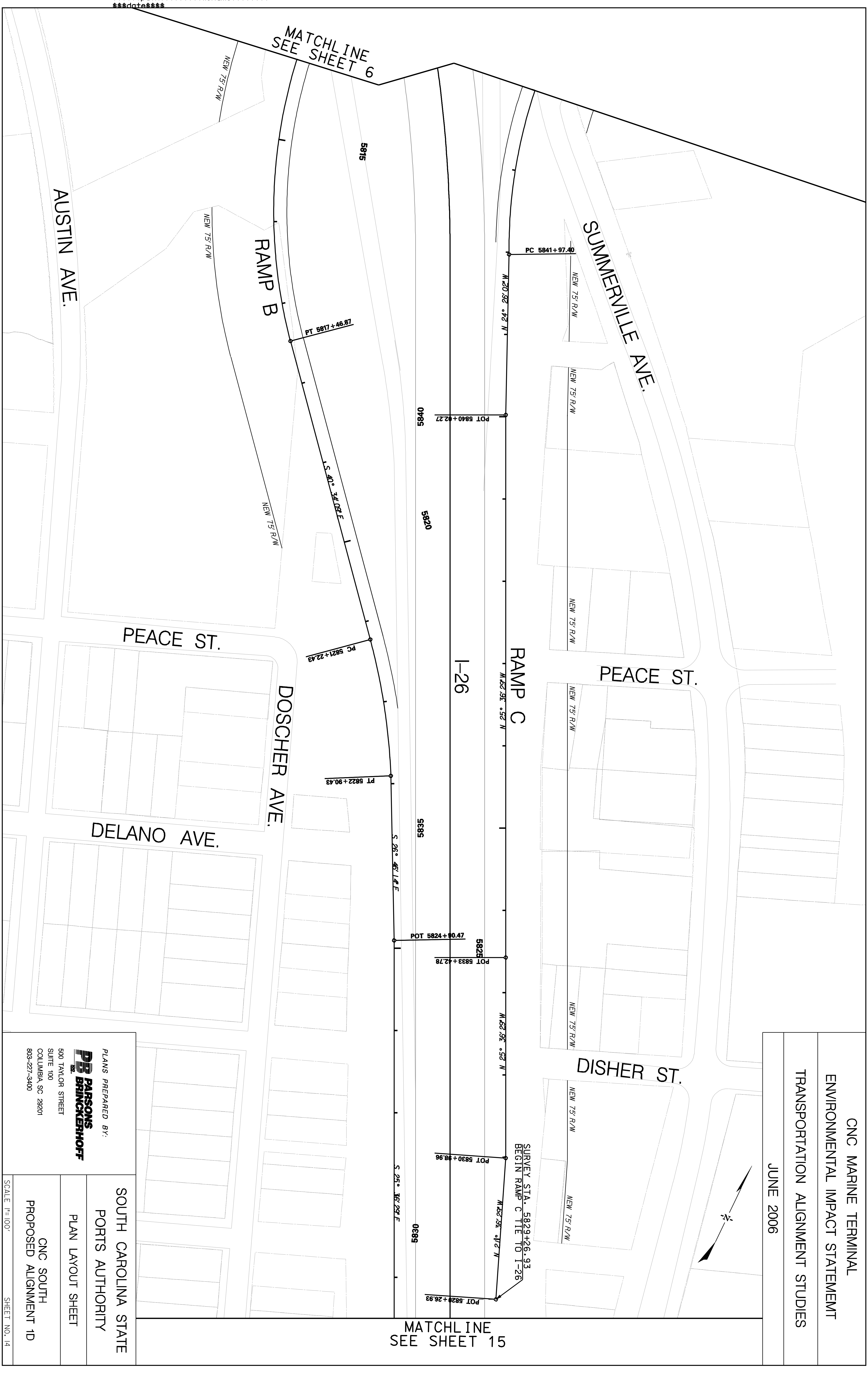

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ENVIRONMENTAL IMPACT STATEMEMT
TRANSPORTATION ALIGNMENT STUDIES

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"=100'

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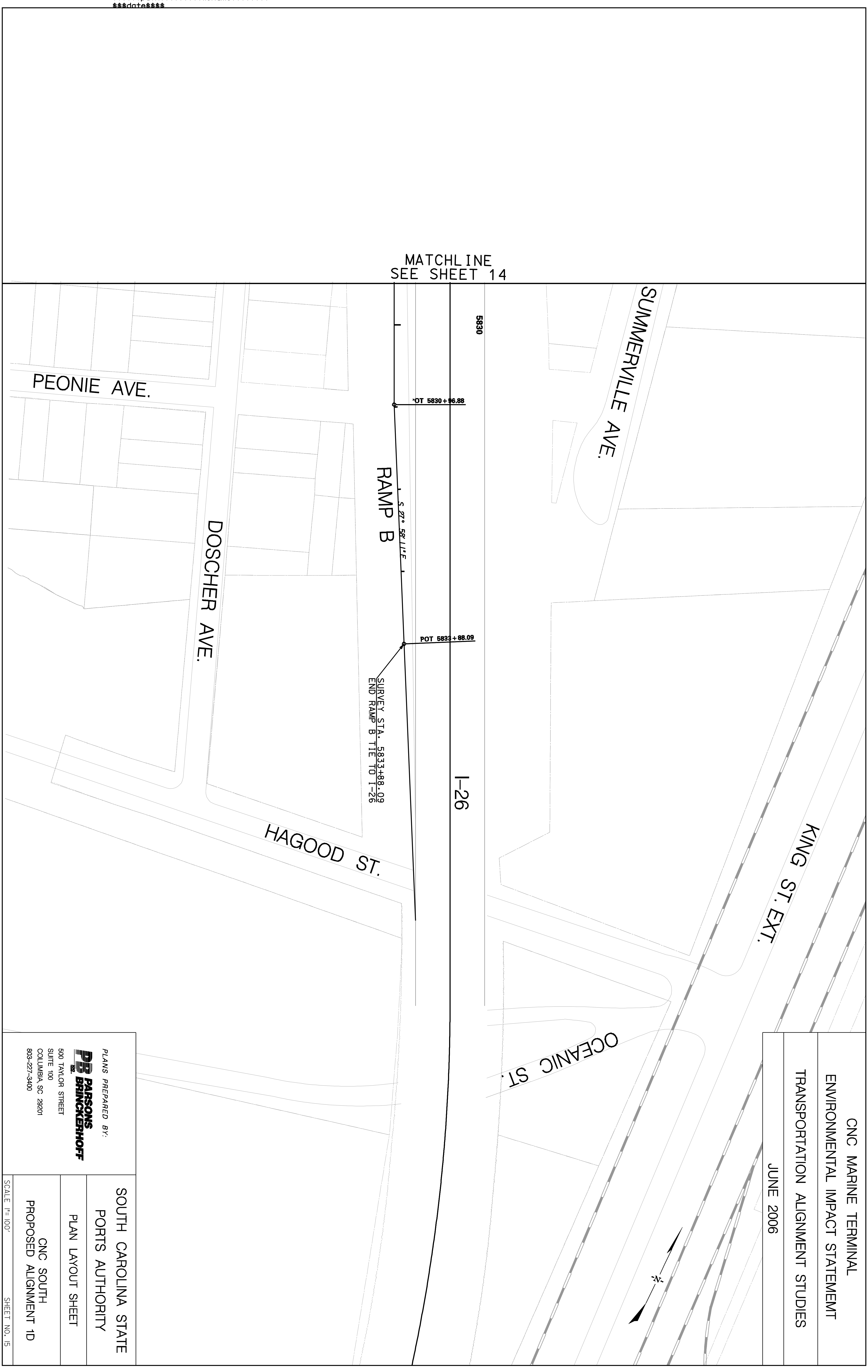

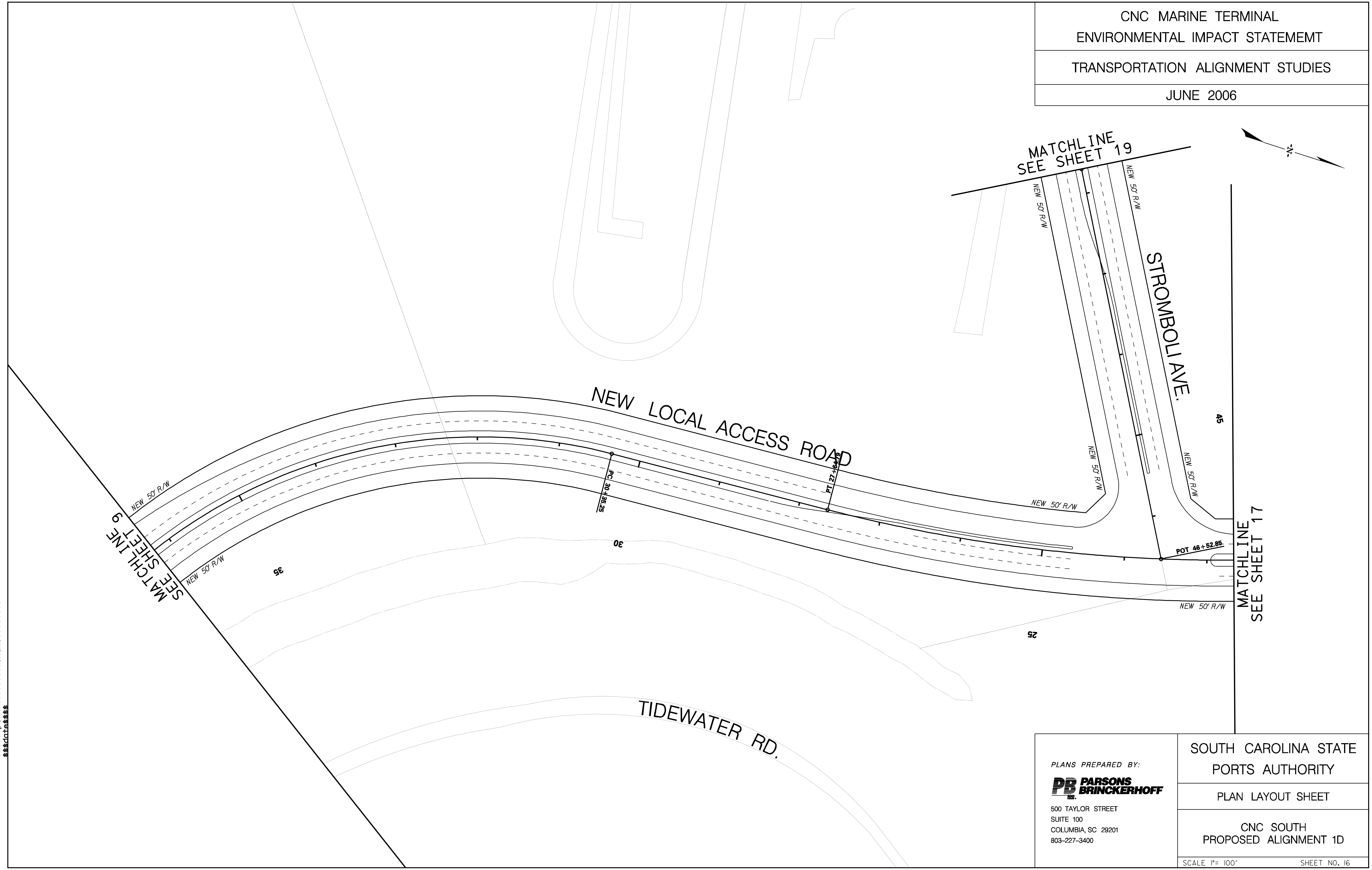

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100' SHEET NO. 16

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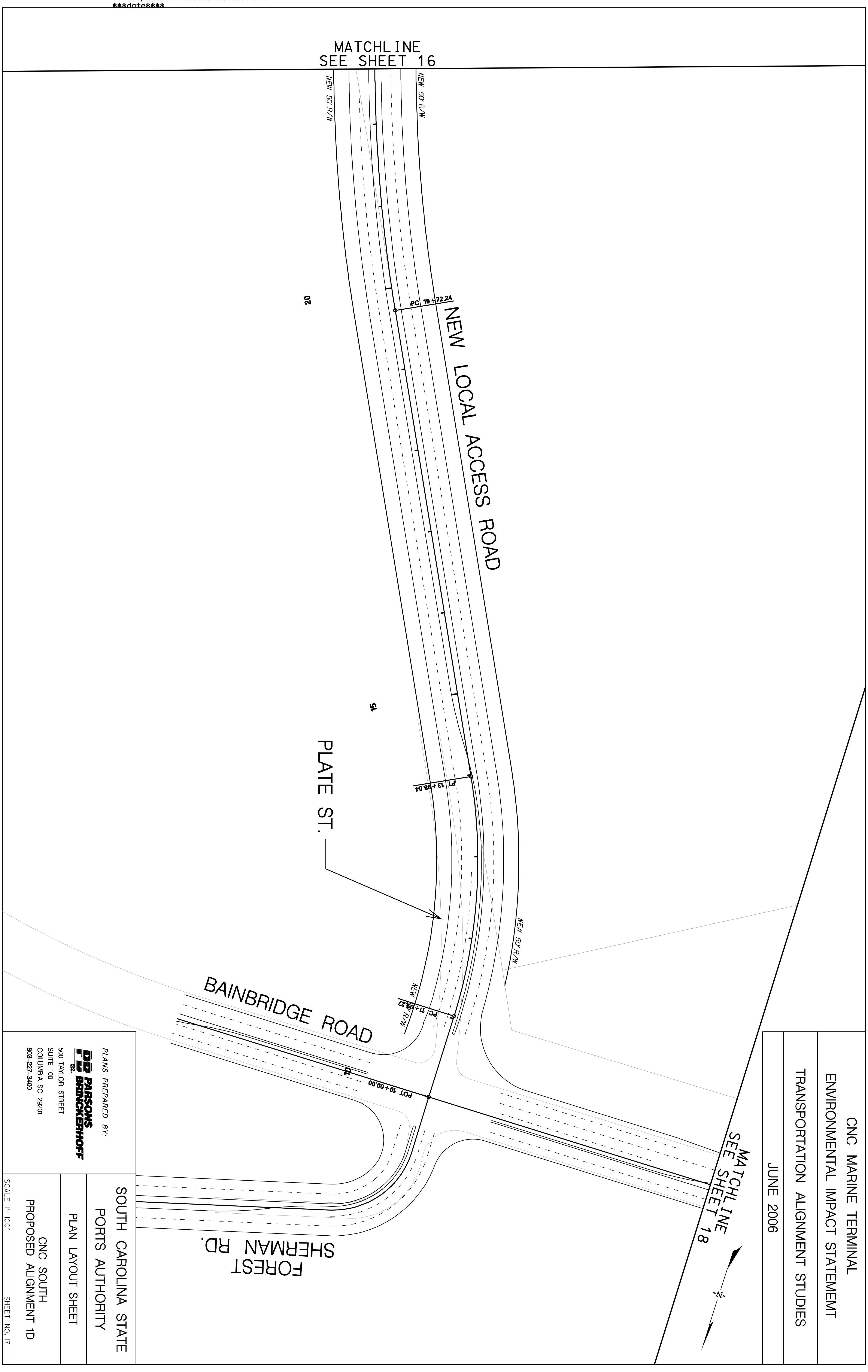

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MATCHLINE
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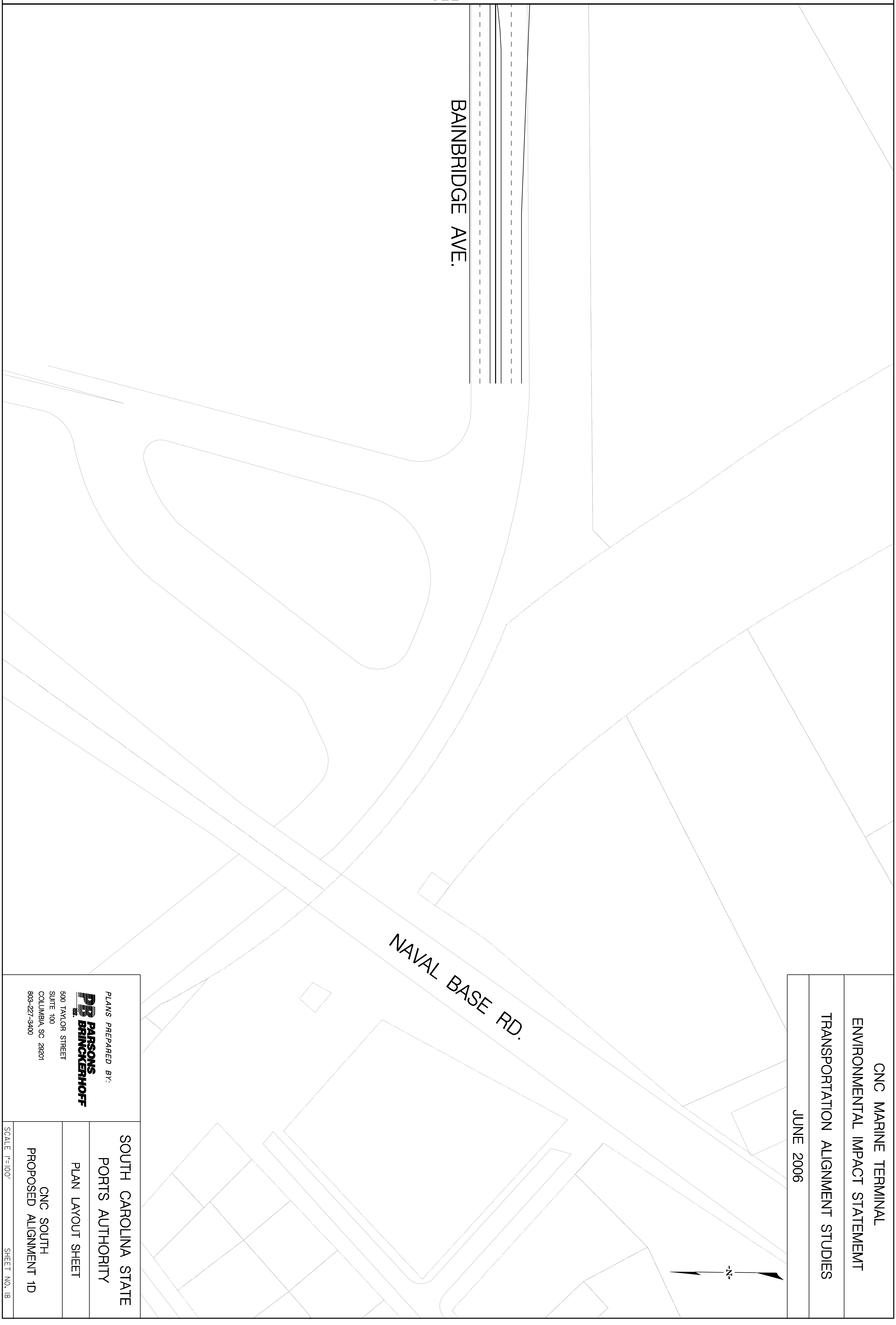

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TRANSPORTATION ALIGNMENT STUDIES

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CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"=100'

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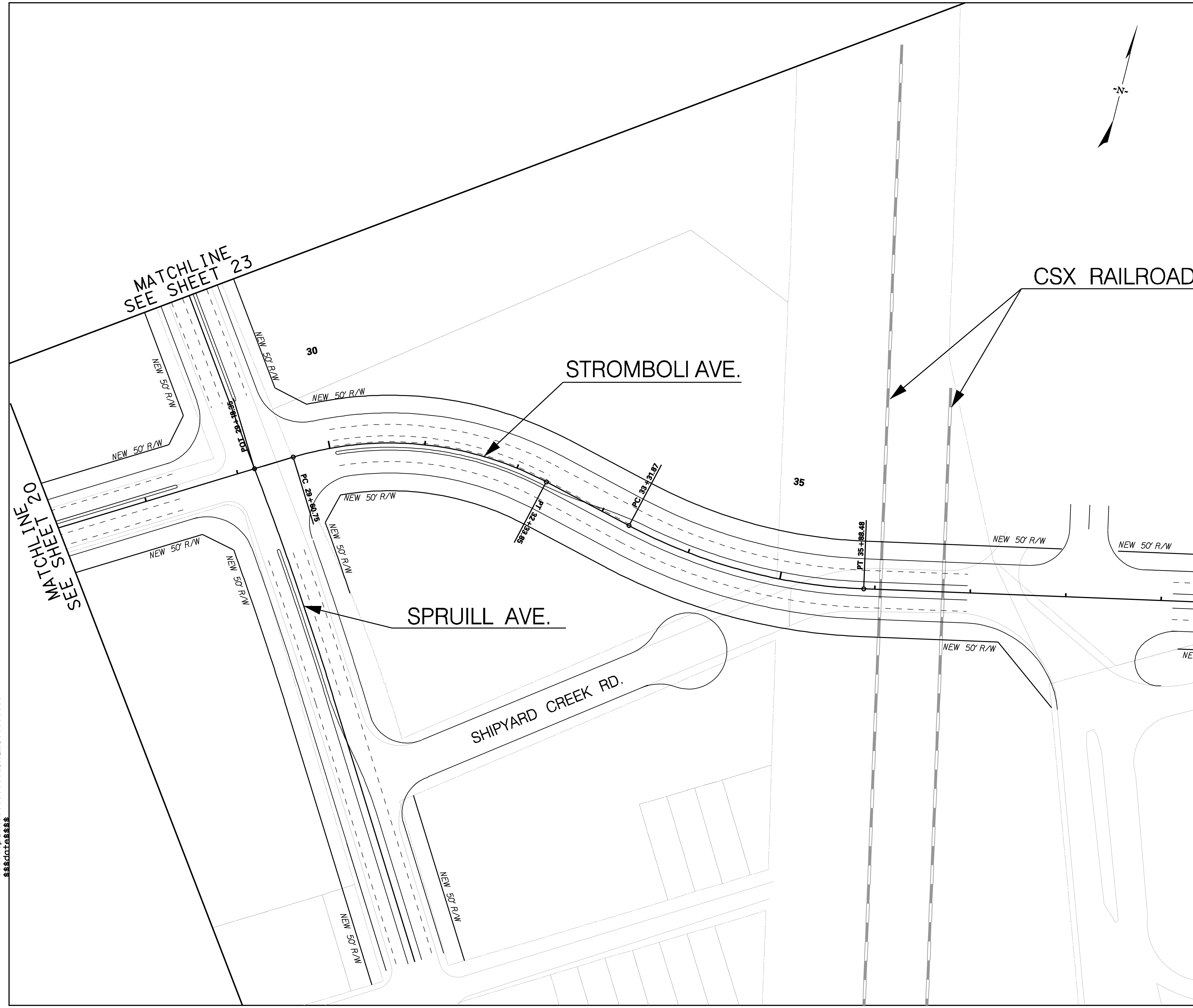

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ENVIRONMENTAL IMPACT STATEMEMT

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"=100'

SHEET NO. 19

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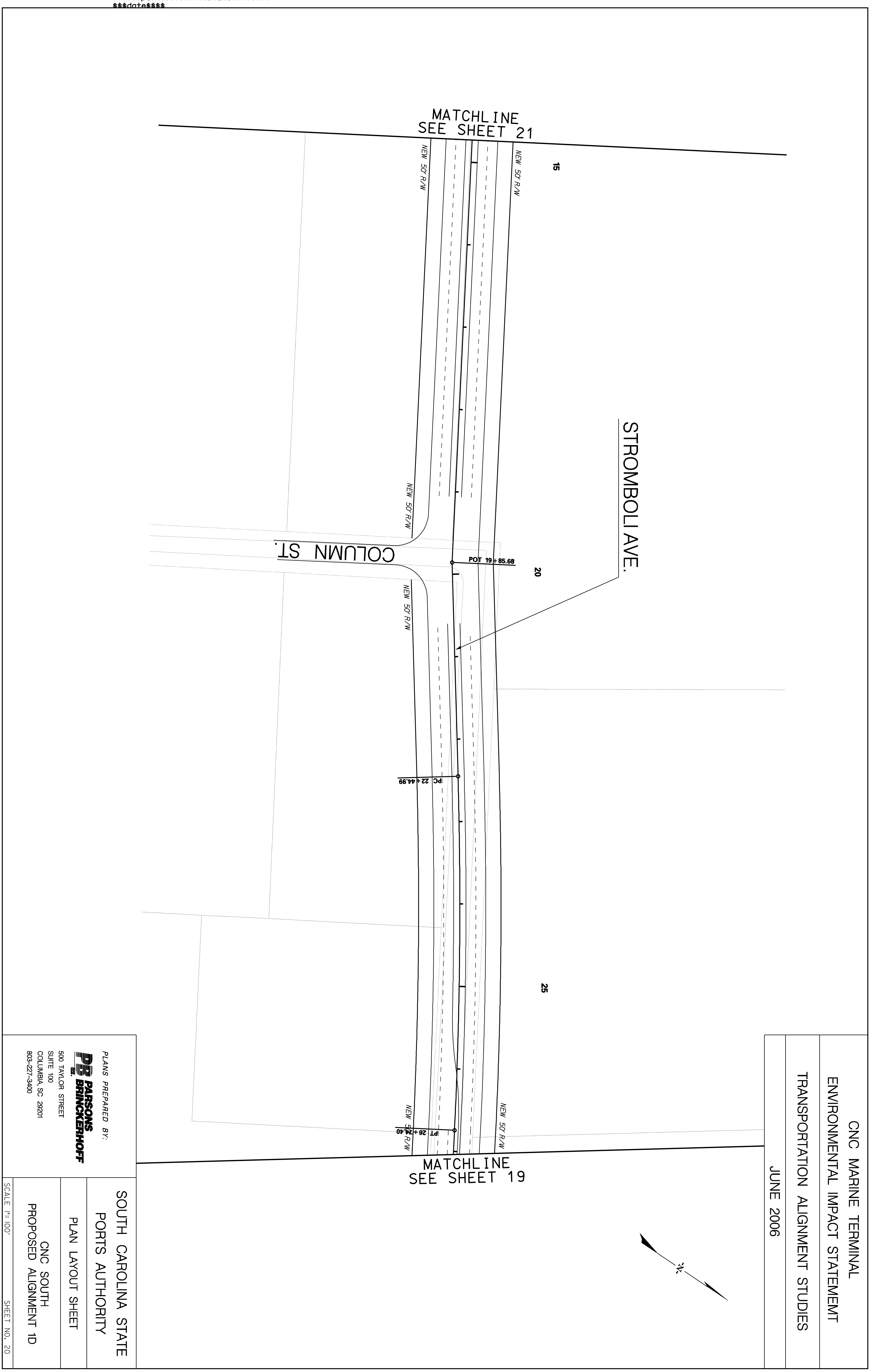

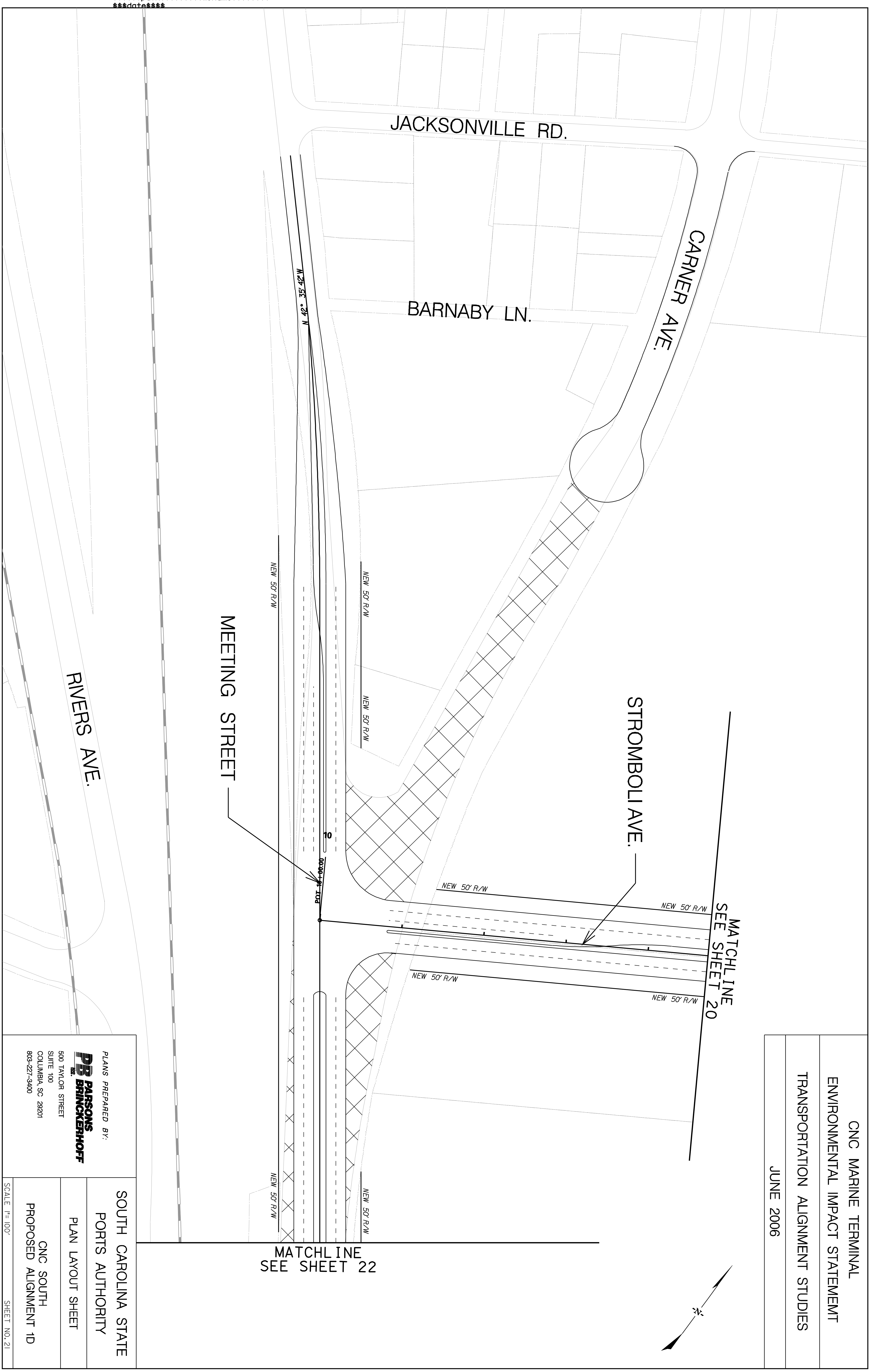
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RIVERS AVE.
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500 TAYLOR STREET
SUITE 100
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PLAN LAYOUT SHEET
CNC SOUTH PROPOSED ALIGNMENT 1D
SCALE 1"=100'
SHEET NO. 21
CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT
TRANSPORTATION ALIGNMENT STUDIES
JUNE 2006

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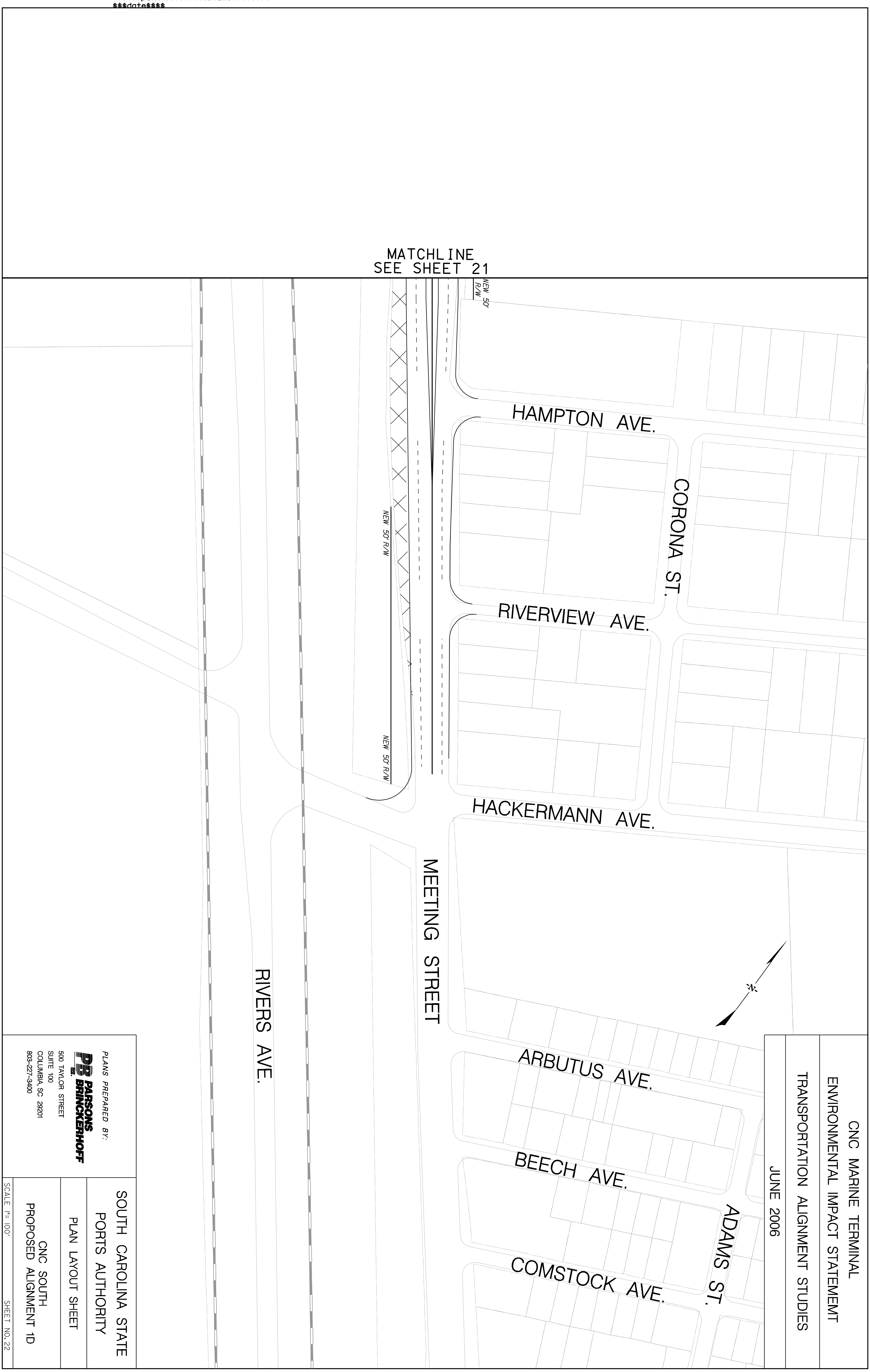

CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT
TRANSPORTATION ALIGNMENT STUDIES

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"= 100'

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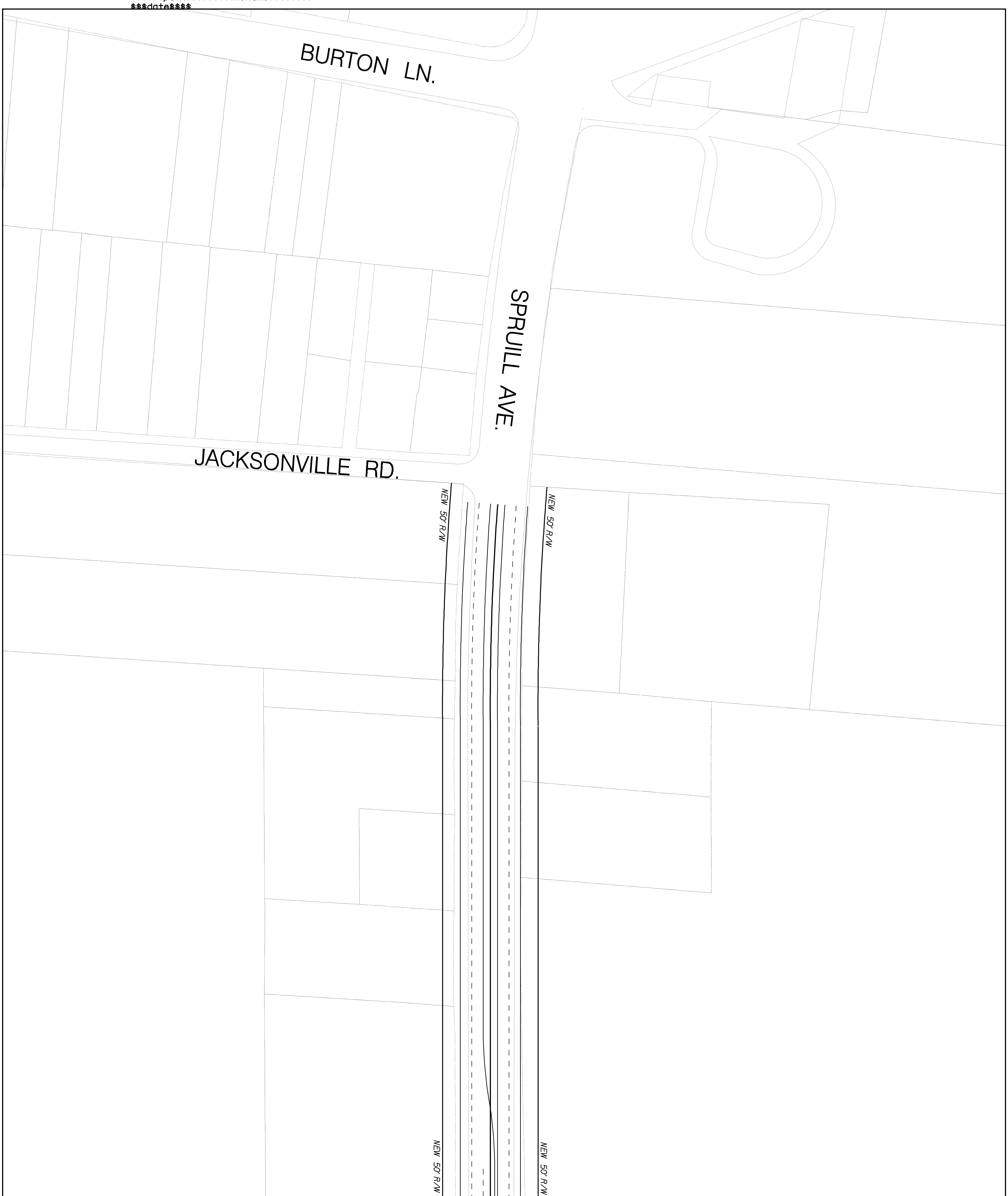

MATCHLINE
SEE SHEET 19

CNC MARINE TERMINAL
ENVIRONMENTAL IMPACT STATEMEMT
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JUNE 2006

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PLAN LAYOUT SHEET

CNC SOUTH
PROPOSED ALIGNMENT 1D

SCALE 1"=100'

SHEET NO. 23