1.0 Introduction

In an effort to address the existing and future congestion and operational issues of the Interstate 526 (I-526) corridor in Charleston County, the South Carolina Department of Transportation commissioned a study to develop a long-range plan for the corridor. I-526 has been identified by SCDOT as one of the most congested corridors in State, being one of three corridors that have been designated as a “Mega Project” in the State Long-Range Interstate Plan, signifying that construction costs for corridor improvements exceeds the funding of the entire South Carolina Interstate program for multiple years. A significant portion of the I-526 study recommendations have been programmed in the State Transportation Improvement Program (STIP) with additional interstate funding approved in the 2013 legislative session for SCDOT and the State Infrastructure Bank.

The purpose of the study is to look at potential improvement strategies for the corridor in a holistic manner, and not just wholesale widening. Four categories of improvement strategies are considered, consisting of: Travel Demand Management strategies, Modal strategies including Transit and Freight improvements, Traffic Operations strategies, and Capacity Improvement strategies. This study results in a menu of short-term and long-range projects by level of investment and ease of implementation in the four improvement strategy categories. The purpose of this report is to document the results of the study, including the geometric evaluation of the corridor, traffic analyses, and development of the various projects and programs for each improvement strategy.

The goal of the study is to develop a menu of strategies that will resolve current and projected traffic congestion issues to maintain I-526 as an efficient and viable multi-modal transportation link for the future. The menu of strategies includes short-term, low-cost travel demand management, modal, and traffic operations strategies to reduce (or push back) the need for large-scale improvements such as widening. Ultimate capacity improvements were also evaluated for the corridor. In the study, care was taken to develop improvement strategies and projects that would build upon each other.

1.1 Study Description

The project study area consists of an eight-mile section of I-526 from US52/Rivers Avenue in North Charleston to US 17/Savannah Highway in West Ashley, including the system-to-system interchange of I-26 & I-526. The analyses also considered the operations of nine interchanges along the I-526 study corridor and three adjacent interchanges along I-26. The study area also extended outward along the crossing arterials to capture the area of influence for each interchange for evaluation. Exhibit 1-1 illustrates the location of the study corridor.

Exhibit 1-1: Project Study Area

To evaluate the effectiveness of proposed improvement strategies, the *VISSIM* traffic analysis program was selected to develop a comprehensive model of the I-526 corridor. *VISSIM* is a microscopic simulation software package that analyzes multi-modal traffic flows with the flexibility of modeling all types of geometries and traffic control schemes. The supporting research of the algorithms utilized by the *VISSIM* program has been tried and tested for over 20 years.

1.2 Corridor Description

The study area consists of an eight-mile section of I-526 from US52/Rivers Avenue in North Charleston to US 17/Savannah Highway in West Ashley, including the system-to-system interchange of I-26 & I-526. I-526 is a four-lane, divided Interstate serving as a circumferential freeway around the Charleston area connecting West Ashley to Mount Pleasant. The corridor is a major route for commuters traveling from suburban areas to urban Charleston and North Charleston as well as for traffic associated with various commercial and industrial operations along the route.

I-526 was approved as an Interstate facility by the American Association of State Highway and Transportation Officials (AASHTO) in 1989, extending approximately 30 miles forming a three-quarters loop around the Charleston area. From US 17/Savannah Highway to Dorchester Road, SC 31, which was completed in 1985 including the General William C. Westmoreland Bridge over the Ashley River, was re-designated as the first section of I-526. In 1990, I-526 was completed between Dorchester Road and I-26, and in 1991, I-526 was completed between Clements Ferry Road and Mount Pleasant. The final piece of I-526 was completed in 1992 with the completion of the route between I-26 and Clements Ferry Road, including the Don N. Holt Bridge which spans the Cooper River.

The I-526 corridor experiences high traffic volumes with considerable congestion during the weekday AM and PM peak periods. In addition, several large-scale developments are planned or have recently been constructed in the Charleston area and along the study corridor, putting additional pressure on I-526 to provide efficient traffic flow for area users.

1.2.1 Major Employers

The I-526 Corridor is not only an important route for the region's commuters but also provides a direct link to key employment and destination centers in both the City of Charleston and the City of North Charleston. Many of these major employment centers are located in close proximity to the I-526 study corridor and are directly impacted by traffic congestion and delays, especially during the peak hours. The major employers and destination centers, with their approximate number of employees in the Charleston area, within one mile of the study corridor include the following.

- Charleston International Airport & Joint Base Charleston – 6,150 employees
- Boeing – 6,000 employees
- SPAWAR – 4,700 employees
- Bon Secours St. Francis Hospital – 3,400 employees
- Charleston County – 2,100 employees
- Mead Westvaco – 1,500 employees
- Blackbaud – 1,100 employees
- City of North Charleston – 950 employees
- Kapstone – 850 employees
- Cummins Marine/MerCruiser – 730 employees
- Tanger Outlet Mall
- Citadel Mall
- North Charleston Coliseum & Performing Arts Center

Due to the significant impact these employers and retail centers have on the local economy and their strong reliance on the I-526 corridor for transport of their products, the study team actively sought and received their input throughout all phases of the study through both survey questionnaires and attendance at the project stakeholder meetings. Of particular importance to the corridor were the potential expansion efforts of the Boeing operations and the construction of the Navy Base Container Terminal.

1.2.2 Economic Development

The Greater Charleston Area is one of the fastest growing areas in South Carolina. According to the 2010 Census, the population of the City of Charleston and City of North Charleston (the state's second and third largest cities) grew by 24% and 22% respectively since the 2000 Census. In addition to this significant population growth, numerous businesses and industries including The Boeing Company have been established in and around the I-526 corridor. According to *The Economic Impact of Boeing in South Carolina* prepared by Miley & Associates, Inc., 3,800 new full time jobs are expected at Boeing's 787 Dreamliner Assembly Plant and 11,478 permanent jobs in the greater Charleston area will be created due to indirect and induced effects. In addition to the job creation, 200 companies are expected to supply parts and services to the Boeing plant creating a total economic benefit of $6.14 billion annually for the State of

South Carolina ($5.9 billion in the Charleston and surrounding area and $186 million for areas outside the Charleston area).

To accommodate the increasing roadway capacity needs as well as to capitalize on and realize the full potential for economic development in the region, improvements to the I-526 corridor are essential. These improvements are needed not only to address existing deficiencies and congestion areas but also to help ensure there is adequate capacity for future economic development and expansion in the area. These roadway improvements and continued economic development will not only benefit the local region but, as indicated above, extend to other areas across the state.

The *2012 Comprehensive Economic Development Strategy (CEDS)* report developed by the Berkeley-Charleston-Dorchester Council of Governments (BCDCOG) provides a review of economic trends and development over the past few years and conveys future goals and objectives related to economic development within the Berkeley County, Charleston County and Dorchester County region. Area infrastructure and transportation are identified as key components in the economic development of the region.

Transportation is mentioned throughout the *CEDS* report as it impacts virtually all businesses within the region, and infrastructure and logistics are mentioned as being vital to economic development. The *CEDS* report states that “highway congestion and management will be addressed in order to successfully build a world-class logistics level of service, resulting in the region having an even more competitive advantage.” The *CEDS* goes on to identify logistics as a “target competency,” which is defined as an industry that affects a “target industry” within the region.

Finally, the Port of Charleston is identified as a far-reaching source of economic development according to the *CEDS*. It is mentioned as one of three economic goals for the *2012 CEDS*, which is to “sustain and strive to improve the Port of Charleston’s position as the 6th largest port in container volume in the nation.” Many of the objectives and strategies related to that particular goal focus on accessibility to the port and developing the transportation network within the region, including the study I-526 corridor.

1.3 Previous Studies

A number of recent engineering and planning studies involving the I-526 corridor area have been identified and reviewed as part of the I-526 study corridor analysis. These studies have been conducted by both state and local planning agencies, and cover a wide range of topics including regional planning studies, Environmental Assessment documents for various projects, and intersection-level improvement projects. The findings and recommendations of these studies have, to the extent possible, been considered in the analysis and recommendations for the Travel Demand Management, Modal, Traffic Operations, and Capacity Improvement portions of the I-526 Corridor Analysis. The past studies identified and evaluated for this report include the following.

- Transit Alternatives Analysis (ongoing) – BCDCOG
- Transit Consolidation Study (ongoing) – BCDCOG
- Neck Area Master Plan (2012) – BCDCOG
- Our Region Our Plan (2011) – BCDCOG
- Commuter Rail Feasibility Study (2006/2011) – BCDCOG
- Mark Clark Expressway Draft Environmental Impact Statement (2010) – SCDOT
- HOV/HOT Lane Feasibility Study (2010) – SCDOT
- I-526 & US 17 on-ramp re-marking plans (2010) – Charleston County
- CHATS Long Range Transportation Plan (2008) – BCDCOG
- SCDOT Multimodal Transportation Plan (2008) – SCDOT
- Interstate Corridor Plan (2008) – SCDOT
- State Rail Plan Update (2008) – SC Public Railways
- I-26 Widening Environmental Assessment (2007) – SCDOT
- I-526 & Glenn McConnell Parkway Transportation Planning Study (2007) – SCDOT
- Container Movement and Mitigation Measures (2002) – SC Department of Commerce
- North Charleston Regional Intermodal Transportation Center EA (2001) – CARTA

The relationship of this analysis of I-526 with two studies, the Long Range Transportation Plan and the Mark Clark Expressway Draft Environmental Impact Statement, are detailed in the following sections.

In addition to the studies above, several other studies and documents regarding transit ridership and freight movements associated with the proposed Navy Base Container Terminal were evaluated and incorporated into the analysis and are detailed in subsequent chapters of this report.

1.3.1 CHATS Long Range Transportation Plan

The BCDCOG Charleston Area Transportation Study (CHATS) 2035 Long Range Transportation Plan (LRTP) sets priorities for transportation projects in the region. One of the key purposes for the LRTP is to provide a ranking of future projects based upon "mobility, constructability, environmental justice impacts, cultural/economic impacts, and environmental and natural feature impacts." Several of the transportation projects identified in the LRTP include facilities that are located within or near the I-526 study corridor, including improvements to the I-26 & I-526 system-to-system interchange, the 2nd ranked project of the LRTP. Table 1-1 identifies several projects and their respective rankings in the LRTP that are located within or near the I-526 corridor study area that were considered in this analysis.

Table 1-1: LRTP Projects

LRTP Rank	Facility	Description
2	I-26 & I-526 Interchange	Interchange Improvement
9	Aviation Connector to Ashley Phosphate Road	South Aviation Avenue to Ashley Phosphate Road
12	Michaux Parkway	Dorchester Road to International Boulevard
15	Mark Clark Expressway Extension	US 17 to SC 30
19	South Aviation Avenue	Spartan Boulevard to International Boulevard
22	Combined Project – Aviation Connector & South Aviation Avenue	Ashley Phosphate Road to International Boulevard
35	International Boulevard	Michaux Parkway to I-526
36	Montague Avenue	International Boulevard to I-26
42	Dorchester Road Connector	Michaux Parkway to West Montague Avenue
51	I-526 Interchange Improvements (Exit 16)	International Boulevard at I-526

1.3.2 Mark Clark Expressway Draft Environmental Impact Statement

SCDOT has undertaken an Environmental Impact Statement (EIS) to complete the I-526/Mark Clark Expressway (MCE) from West Ashley through Johns Island to James Island. The project is proposed to extend I-526 from US 17/Savannah Highway (at the southern end of the I-526 corridor study area) for seven miles as a multi-lane, controlled-access roadway, connecting to the James Island Expressway at Folly Road. The Draft EIS was signed in 2010.

Due to the potential impact the proposed completion of I-526 could have on the project future-year volumes for the I-526 corridor study area, a review was conducted to determine the impacts of the MCE No Build scenario versus the MCE Build scenario, currently known "Alternate G". It was determined that the projected traffic volumes of the study I-526 segments overall are expected to increase with consideration of the MCE Alternate G Build scenario. Therefore, the study team agreed that to provide for a conservative, worst-case estimate of projected future growth for the study analyses, the future traffic volumes projections would include the MCE Alternate G Build scenario.

In addition, due to the potential impact on future geometry at the I-526 & US 17/Sam Rittenberg Boulevard interchange with the MCE No Build and MCE Alternate G Build scenarios, both scenarios were considered for improvement strategies at the interchange. Furthermore, the I-526 freeway segment between US 17 and Paul Cantrell Boulevard was also analyzed for both the potential MCE project scenarios.

1.4 Funding

I-526 has been identified as one of the most congested corridors in South Carolina, and potential capacity improvements for the corridor have been identified as one of three "Mega Projects" in the Statewide Interstate Plan. The large-scale improvements required to improve I-526 are so great that it is not feasible to schedule construction funding within the confines of the current interstate program.

A significant portion of the I-526 study recommendations have been programmed in the State Transportation Improvement Program (STIP) with additional interstate funding approved in the 2013 legislative session for SCDOT and the State Infrastructure Bank. In addition, this study will be a part of the South Carolina Multimodal Transportation Plan.

1.5 Improvement Strategy Review

The study analyses resulted in recommendations of short-term and long-range strategies by level of investment and ease of implementation in four improvement categories, which are summarized herein.

Travel Demand Management (TDM) seeks to maximize the efficiency of existing transportation facilities by reducing overall (and peak) traffic demands or by moving peak travel to other times of the day, and considers both person-trips and freight-trips. TDM strategies considered for the study include enhanced carpooling and alternative work schedules. The traffic reduction results of the potential TDM strategies

considered for the I-526 study corridor, and Charleston area in general, are provided in Chapter 5 of this report.

Modal improvement strategies include consideration of mass transit and truck mobility improvements intended to help reduce the overall congestion along the I-526 corridor by encouraging the increased use of transit services and shifting truck travel away from the peak commute times. Modal strategies considered for the study include additional and modified transit routes and new truck routes. The traffic reduction results of the potential Modal strategies considered for the I-526 study corridor are provided in Chapter 6 of this report.

Traffic Operations strategies are lower-cost and focused improvements that address specific issues to relieve congestion, operational or safety concerns. Traffic Operations strategies considered for the study include the addition of turn lanes, signal retiming efforts, and updated signing along the corridor. As part of the traffic operations strategies review, a managed lane (HOV, HOT, etc.) analysis was also considered. The results of the potential Traffic Operations strategies considered for the I-526 study corridor are provided in Chapter 7 of this report.

Capacity Improvement strategies consist of large-scale projects to address traffic congestion and operational issues. Potential capacity improvement strategies include interstate widening, interchange reconfiguration improvements, and parallel route improvements. The results of the potential Capacity Improvement strategies considered for the I-526 study corridor are provided in Chapter 8 of this report. The results of the I-26 & I-526 system-to-system interchange analyses are provided in Chapter 9 of this report.

1.6 Study Team

The SCDOT Office of Planning and Environmental provided management and oversight for the study. Staff from SCDOT Regional Production Group 1 - Lowcountry and Engineering District 6 was also involved throughout the course of the study.

The project Steering Committee met six times throughout the study and was comprised of those agencies that are currently addressing local transportation issues and are responsible for implementation of local transportation improvements. Representatives, including engineers and planners, from Berkeley Charleston Dorchester Council of Governments (BCDCOG), Charleston Area Regional Transportation Authority (CARTA), Charleston County, the City of Charleston, the City of North Charleston, Federal Highway Administration (FHWA), the State Ports Authority, SCDOT, and Tri-County Link made up the Steering Committee.

The project Stakeholder Committee met three times throughout the study and was comprised of numerous organizations and employers that heavily rely on the I-526 corridor. The Stakeholder Committee also included local elected officials along the corridor and numerous homeowners and neighborhood associations. In addition to the three meetings, numerous additional meetings were held with specific stakeholders as needed throughout the duration of the study.

Further discussion of the public involvement process for the study is provided in Chapter 2 of this report.

The study project consultant team consists of Stantec Consulting Services, Inc., Florence & Hutcheson, Inc., Civil Engineering Consulting Services, Inc., Davis & Floyd, Inc., Civic Communications, Inc., and S^2 Engineering, Inc.