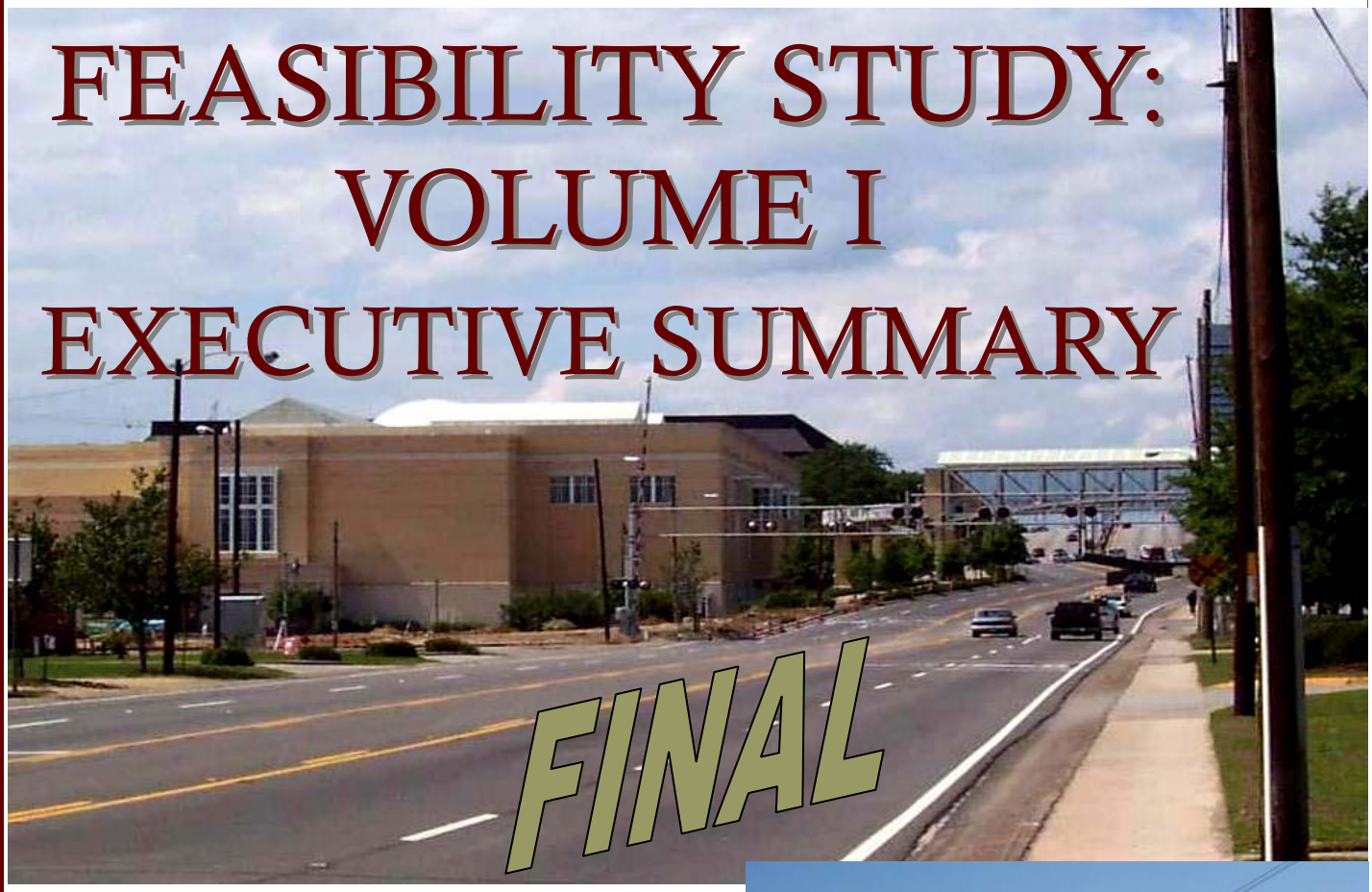
March 2009

FEASIBILITY STUDY: VOLUME I EXECUTIVE SUMMARY



ASSEMBLY STREET Railroad Corridor Consolidation Project

File No. 40.221B PIN 30434
Richland County

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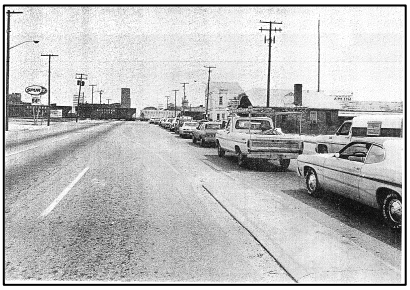
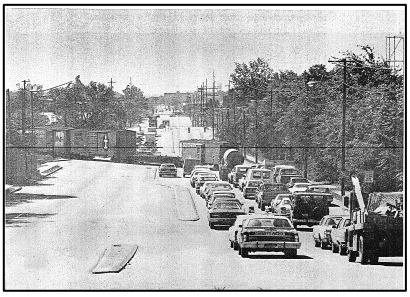
TABLE OF CONTENTS

Volume I – Executive Summary

EXECUTIVE SUMMARY

I. Project History





The Assembly Street Railroad Corridor Consolidation and Grade Crossing Elimination Project dates back to the 1970s. At that time, the City of Columbia was dealing with several issues within the downtown area, primarily growth and redevelopment, community connectivity, expansion of the University of South Carolina campus, heavily-used rail corridors that crisscrossed the area and bisected communities, and a notable increase in traffic volume. The need for railroad corridor consolidation had long been recognized as a need for reducing delays in automotive traffic, creating efficient operating speeds for railroad traffic, and eliminating barriers to redevelopment. Many alternative solutions to this growing problem were suggested and studied in an Environmental Impact Statement (EIS), completed in 1981. Among the Alternatives were:

- Evaluation of alternative corridors outside the downtown area.
- Evaluation of alternative modes, such as truck deliveries or relocating businesses.
- Grade separation without consolidating corridors.
- Evaluation of Alternative Designs.
- No Action.

Alternative corridors were not pursued because of the adverse impact of denying rail service to the many businesses in the downtown area that utilize those services. Economic implications of utilizing alternative modes of transportation indicated that the existing rail/motor carrier balance was the best method. Therefore, alternative modes were not considered reasonable. The grade separation alternative did not meet the objective of allowing an orderly redevelopment pattern. Topographic relief in the area also made this an unattractive alternative. Alternative designs were considered for area roadways and railroad corridors. Six potentially feasible alternatives were created that would consolidate railroads and improve at-grade crossings. Existing conditions would continue to deteriorate, including a decline in tax base because of the uneconomical layout and operations of the rail facilities.

From this evaluation, it becomes evident that the most feasible option would be designing alternatives within the downtown area. Thus, part of the solution developed in the 1970s became known as the "Columbia Railroad Relocation and Roadway Grade Separation Project" and was conceived as a series of four phases. The four phases, Phase 1-A (Assembly Street), Phase 1-B (Elmwood Loop), Phase 1-C (the "Ditch"), and Phase II (the Fairwold Connection), created plans for improving railroad and vehicular traffic within the

downtown area. Phase 1-B (Elmwood Loop) and 1-C (the 'Ditch") have been completed. Phase 1-A (Assembly Street) is the subject of this feasibility study.

II. Current Status

The City of Columbia is still divided by various separate railroad corridors as shown in Figure I-1. These railroad corridors include the: Norfolk Southern (NS) R-line, NS W-line, CSXT Transportation (CSXT) AKA-line-, and the CSXT S-line. The area has also seen an increase in development in recent years with a surrounding mix of residential, institutional and commercial uses with some vacant properties.

Figure I-1

Much like in the 1970s, issues associated with the various separate railroad corridors continue to abound today. In particular:

- The railroads are faced with low speed train operation over sprawling facilities;
- The traveling public is forced to wait for lengthy periods of time while trains pass, or are forced to slow down considerably at track crossings; and

- The community's inability to successfully redevelop a valuable growth center in the downtown area.

These issues have only been exasperated with increased growth and revitalization of the city center since the 1990s. Columbia had actually experienced a population loss during the period between 1970 and 1990, similar to many American cities. However, population began to increase in the 1990s as residents returned to the city center and preservation and revitalization efforts were undertaken. The result has netted a population increase of almost 20% in Columbia since 1960, even with the population losses in the 1970-1990 periods.

One of the city's most successful revitalization efforts, the Vista, was the result of Phase 1-C (the "Ditch") which reconnected the area by opening up Gervais Street, as shown in Figure I-2. The Vista is now considered the one of the more popular districts in Columbia boasting a mixture of residential, retail, and cultural entertainment opportunities. Many buildings have been preserved and renovated and new construction is built with the historic character in mind. The Vista serves as a model for the redevelopment potential of the area that is hindered by the Assembly Street railroad crossing.

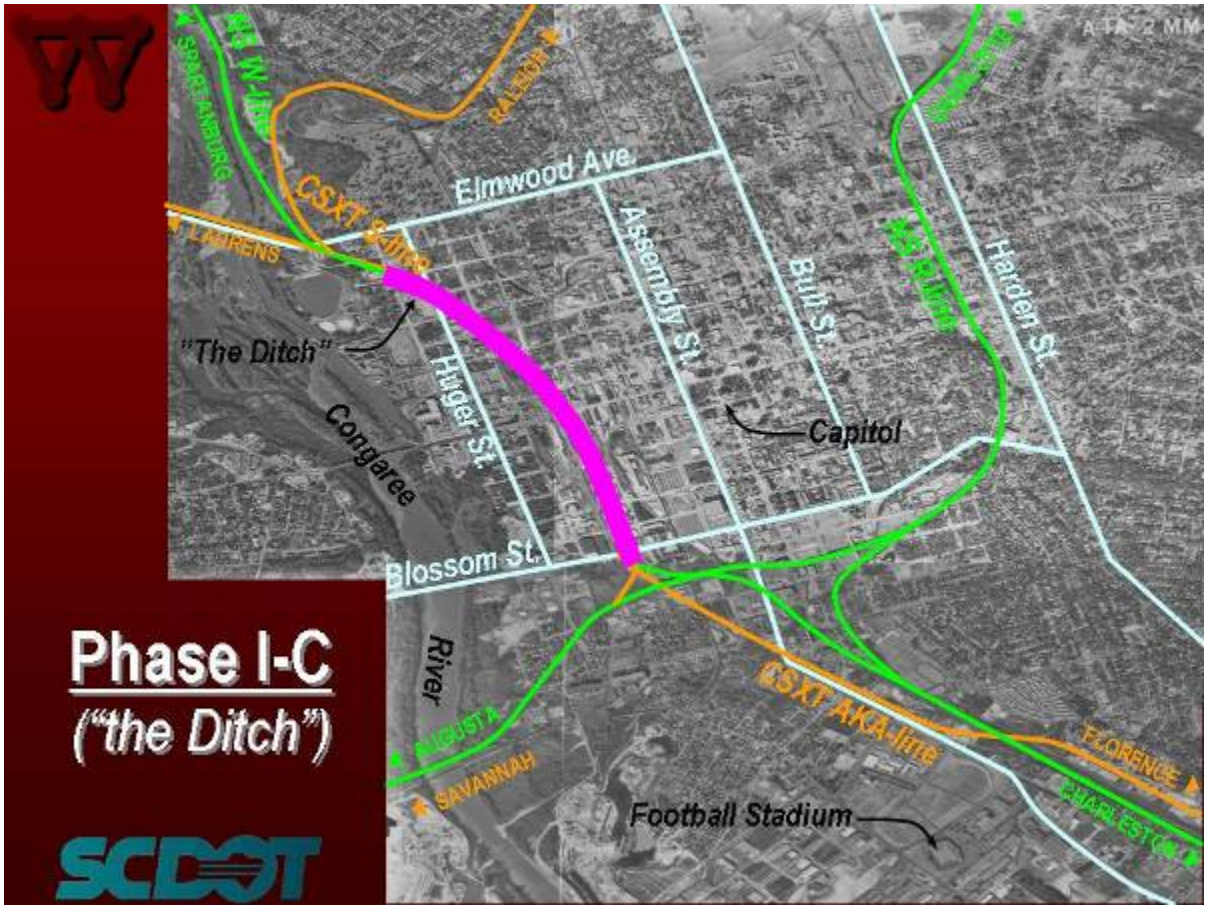


Figure I-2

III. Purpose and Need

Columbia, South Carolina, the capital city and home to the University of South Carolina (USC) and several major healthcare businesses, continues to grow. The university desires to expand and there are initiatives to re-develop the downtown, once a thriving hub for manufacturing and trade. USC has plans to develop a major scientific research park through public-private partnerships called Innovista that could bring growth to Columbia that is comparable to that from the success of similar projects in the Research Triangle in North Carolina. The Innovista campus is planned to be located to the northwest of the Assembly Street crossing. However, the Innovista campus area, much like other vital areas in downtown Columbia, is still accessed by crossing at-grade railroad tracks.

The existing CSX Transportation (CSXT) and Norfolk Southern Corporation (NS) tracks occupy the same corridor as they enter Columbia through Andrews Yard from the southeast. However, these tracks spread out and cross over Assembly Street, in several locations, and divide the University of South Carolina campus. Assembly Street is a heavily traveled arterial and the combination of increased vehicular traffic congestion and slow train traffic speeds results in unacceptable delays (both to vehicles and trains), increased air and noise pollution, and increased danger to pedestrians. Additionally, it impedes the revitalization of the downtown area along one of Columbia's primary gateways to the city.

The downtown area has already seen a resurgence of residential development returning to the city center. Downtown residential development will most likely continue to increase as many cities similar to Columbia have seen a dramatic increase in the number of people desiring to live in the downtown due to the increase in fuel prices. With an increase in residential development, other uses tend to follow including commercial/retail and other support services for the residential growth. The result of more people living in the city center will be the need to efficiently move the additional pedestrians and vehicles that come with them. Removing the Assembly Street at-grade railroad crossings will help address these needs and could play a vital role in major streetscape improvements for the Assembly Street corridor.

The EIS that was completed in 1981 proposed to consolidate the various tracks into one corridor and to replace the at-grade crossings with grade separation structures by lowering the elevation of the tracks and raising the roadway elevations. This solution would reduce delays along Assembly Street, give USC a more cohesive campus, improve pedestrian safety, prove for increased train speeds through the area, and work toward reducing both air and noise pollution. The purpose of the feasibility study is to determine if this proposed solution is still feasible in light of current conditions, changes in environmental laws and regulations, and the City's vision for the downtown area. The purpose of this report is to summarize the review of existing environmental conditions within the project study area, a .75 square mile study area (see Exhibit #1 Figure I-3) generally bounded by:

- Blossom Street to the north
- Pickens Street and Norfolk Southern (NS) R-Line to the east
- 1,200 feet south of Rosewood Drive to the south

- Huger Street/ Whaley Street/ Wayne Street/ Heyward Street/ Dreyfus Road/ Assembly Street/ CSX Transportation (CSXT) line to the west

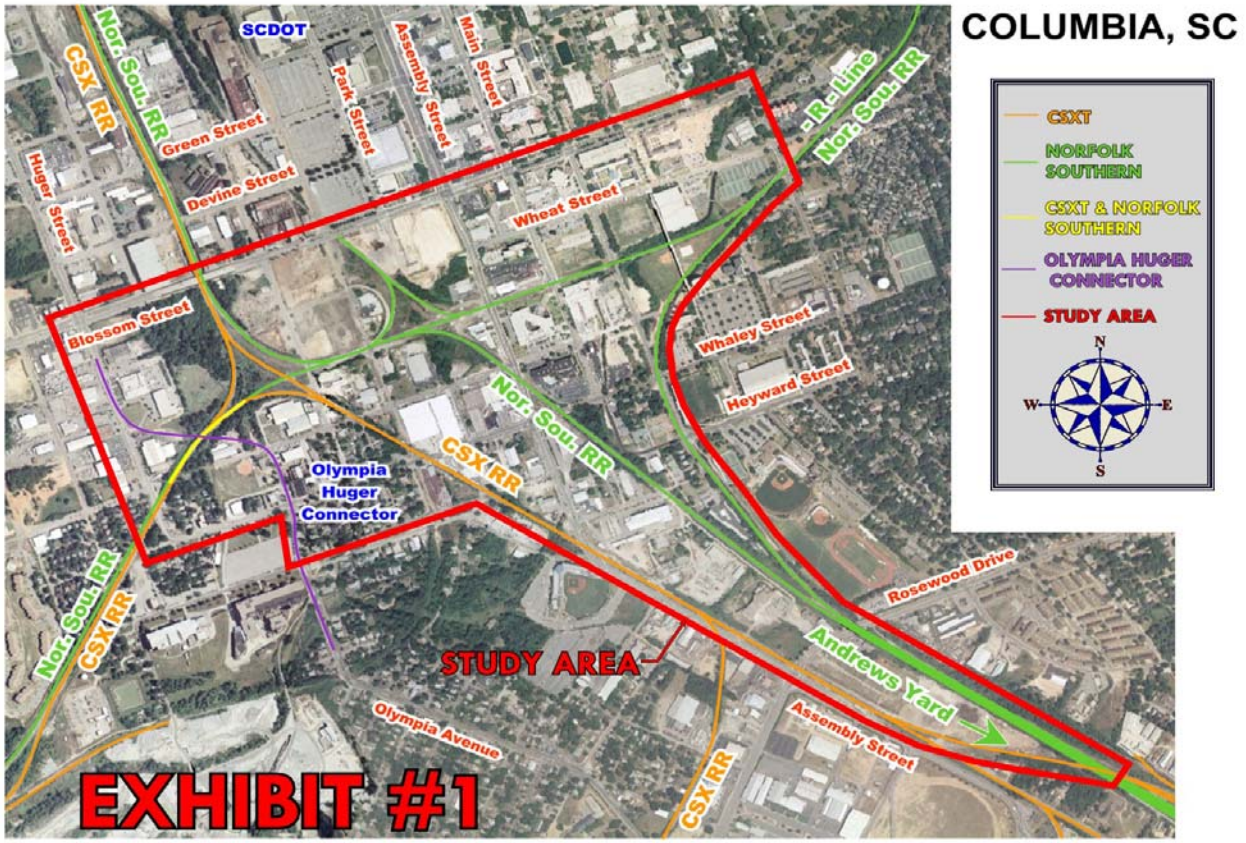


Figure I-3

The City of Columbia is still divided by various separate railroad corridors including the NS R-line, NS W-line, CSXT AKA-line-, and the CSXT S-line. The area has seen an increase in development, and with that development the issues that existed before have only been expatriated. The issues associated with the various separate railroad corridors continue to abound today. In particular:

- The railroads are faced with low speed train operation over sprawling facilities;
- The traveling public is forced to wait for lengthy periods of time while trains pass, or are forced to slow down considerably at track crossings; and
- The community is unable to successfully redevelop a valuable growth center in the downtown area.

IV. Stakeholder Involvement

To ensure that all issues and concerns of the proposed project were evaluated in the feasibility study, the project team conducted a series of stakeholder meetings over a two-year period to determine interests and expected results. Stakeholders included:

- City of Columbia
- Richland County
- University of South Carolina
- Norfolk Southern Corporation
- CSX Transportation
- SCANA Corporation
- South Columbia Development Corporation
- Central Midlands Council of Governments
- 14 Utility Companies (private and public)

An initial stakeholder group meeting took place on June 2, 2006 to discuss current operations and constraints, as well as the future plans that any of the stakeholders may have in the project area. In an effort to ascertain specific concerns relative to each agency, individual stakeholder meetings were then held throughout July and August 2006. Additional meetings were held with CSXT in January 2007 and with Norfolk Southern in July 2007. A second group stakeholder meeting took place in September of 2007.

In addition, letters were sent to the individual stakeholders in July of 2008 requesting their feedback on the proposed Alternatives, specifically Alternative 4, which was developed after the last group stakeholder meeting. Figures of all alternatives were included in the letter. Stakeholders were asked to submit any comments or concerns that they may have with the project and the proposed alternatives.

Numerous public and private utilities are located throughout the project area and these companies were engaged through group and individual meetings. The purpose was to ascertain information on existing utility operations and gain information on any proposed operations and/or plans. As-builts were obtained from each utility company and their feedback on the proposed project was encouraged.

A utility group meeting was held on August 10, 2006 and was attended by both public and private utility companies. The project history was presented as was an overview of the feasibility study. Utility companies were asked to submit any plans or mapping of utilities within the study area. They were also informed at this meeting that individual utility meetings would be held once the alternative was chosen.

V. Existing Conditions

In order to complete a rail/roadway analysis, field reviews, mapping, interviews, and correspondence with local and state officials were conducted. The available information utilized included:

- Existing census data, property information, zoning, and GIS mapping
- Aerial mapping
- Daily traffic volume estimates
- Environmental review, natural resources data, and protected species databases
- Roadway/rail crossing data (accidents/incident reports)
- Train operation information from Norfolk Southern and CSXT
- Stakeholder meetings

During the study process, an existing rail/roadway grade crossing analysis was conducted utilizing the following information:

- Existing AADT
- Accident data
- Photos of each crossing
- Traffic Volumes
- Land use classifications surrounding the crossings

VI. Rail and Roadway Analysis

1. Traffic Analysis

The project team conducted various analyses utilizing mapping, survey, field studies, and other data gathered. A traffic analysis was also conducted for the roadways within the study area as well as a detailed rail and roadway analysis. Accident rates, both rail and roadway, were investigated as well. A crossing analysis was also conducted to determine if there were any major issues relating to a crossing. An increase in the number of trains and/or automobiles at an at-grade crossing leads to a greater potential for accidents. A cost/benefit analysis was also conducted to determine if the at-grade railroad crossing should be either grade separated or closed in order to improve the railroad's level of service and reduce the potential for accidents. In addition, an exposure index was calculated; a delay analysis was performed; and an accident analysis was performed; and a cursory review of potential system enhancement options was investigated.

An exposure index can be used to determine if a grade separation structure is warranted at highway/rail grade crossings. The exposure index is calculated by multiplying the number of trains per day by the number of vehicles per day that use the crossing. As a general rule, grade separations should be considered in rural areas when the exposure index is 15,000 or more. In urban areas grade separations should be considered when the exposure index is 30,000 or more. The exposure index was calculated for each of the 39 crossings (25 CSXT crossings and 14 NS crossings) for the year 2005 traffic volumes. Ten (10) crossings

exceeded the exposure index of 30,000 for the year 2005. Detailed ratings and locations are can be found in the Volume II report. The ten crossings that exceeded the exposure index limit are as follows (in order from highest to lowest exposure exceeding 30,000):

1. Assembly Street (634647A)
2. Assembly Street (715620R)
3. Huger Street (715847J)
4. Rosewood Drive (634630W)
5. Assembly Street (716363Y)
6. Whaley Street (634654K)
7. Pickens Street (715866N)
8. Assembly Street (634632K)
9. Main Street (715621X)
10. Shop Road (715400V)

Level of Service is a measure of the operational efficiency of the highway/rail grade crossing. It is determined using procedures from the *Highway Capacity Manual* procedures. Level of service is expressed as a letter ranging from A (free flowing) to F (severely congested) and is determined using the average delay for all vehicles. The level of service (LOS) for each of the 39 crossings was determined based on these computed values and the Highway Capacity Manual procedures. The following ten highway/rail grade crossings had a LOS F (> 50 seconds of avg. delay/vehicle) based on 2005 rail and highway traffic volumes. Detailed ratings and locations are can be found in the Volume II report.

1. Assembly Street (Crossing # 634 632K)
2. Bluff Road (Crossing # 634 635F)
3. Huger Street (Crossing # 715 847J)
4. Shop Road (Crossing # 715 400V)
5. Heyward Street (Crossing# 715 402J)
6. Assembly Street (Crossing # 715 620R)
7. Main Street (Crossing # 715 621X)
8. Tryon Street (Crossing # 715 846C)
9. Assembly Street (Crossing # 716 363Y)
10. Lincoln Street (Crossing # 716 365M)

Seventy-Five (75) accidents involving train/vehicle collisions have been reported at 22 of the 39 crossings within the past 30 years. Out of the 75 accidents, there was only 1 fatality.

Accidents are summarized in Volume II using the following classifications:

- Fatality
- Injury
- PDO – property damage only

2. Safety and Mobility

During the feasibility study, various factors were analyzed to determine the existing conditions of the road network, rail crossings and service routes within the study area. These factors are discussed in detail in Volume II of this study:

- Vehicles Queuing Across Railroad Tracks - The presence of nearby traffic signals, intersections, or parallel roadways can result in queues of stopped vehicles extending onto or across a highway/rail crossing.
- Traffic Signal Preemption - Standard practice requires that traffic signals located within 200 feet of a highway/rail at-grade crossing be coordinated with the crossing's train detection and warning system to preempt normal operations of the traffic signal.
- Humped Crossings – Occurs where the elevation of the railroad is significantly higher than the crossing roadway, causing vehicles to ascend on one side of the tracks and descend on the other.
- Grade Crossing Conditions - A poor grade crossing surface can result in a rough, uneven ride. This can increase wear and tear on vehicles, potentially create a traffic safety hazard, and may add to congestion by reducing travel speeds.
- Vehicles Driving Around Automated Gates
- Improved Signs and Markings - The effectiveness of required warning signs, markings, signals, and other devices depends heavily on proper installation and maintenance by state and municipal transportation departments and the railroads.
- Roadway Grade Separation – The ability to separate the rail and roadway crossings by either elevating the rail over the roadway or vice versa.
- Community Services – School bus routes and emergency response routes were identified to ensure they are not disturbed.

3. System Enhancement Options

Grade separations provide the most benefit to safety measures when it comes to enhancement options. Unfortunately, these are typically the most costly types of improvements.

Many factors must be considered before suggesting grade separation, including:

- Exposure Index
- Accident history
- Topography
- Adjacent land use
- Construction impacts
- Costs

The most common and cost-effective way to increase the safety at a railway crossing is to upgrade existing warning devices at the crossing. Typical warning devices include signs, gate arms, flashing lights and bells. *Passive* devices, such as advanced warning signs and crossbucks, merely warn the motorist of the existence of a railroad crossing. These devices are most suitable where train and traffic volumes and speeds are low and where sight distance is adequate. *Active* devices that warn motorists of approaching trains include flashing lights, bells, and automated gates. Such devices are usually employed at locations

exhibiting higher volumes or speeds, or greater potential for accidents. The hierarchy of standard warning treatments, from least to most protected are:

- Unmarked
- Railroad crossbucks
- Standard STOP signs (limited sight distance) and crossbucks
- Flashing signals and bells
- Flashing signals, bells and gates

Crossing Protection Device Upgrades that can be considered include: median barriers, four-quadrant gates, long gate arms, articulated gates, remote video detection, crossing consolidation and elimination, roadway improvements, and traffic signals.

VII. Environmental Review

Columbia is the capital of and largest city in the state of South Carolina. Columbia is the county seat of Richland County, but a small portion of the city extends into Lexington County. Founded in 1786 as the site of South Carolina's new capital city, it was one of the first planned cities in the United States. The area is often cited for its high quality of life offerings, with its many cultural amenities, parks, and recreational features.

Columbia benefits from an excellent interstate highway system, with three interstates, I-26, I-77, and I-20, forming an outer loop around the city. I-26 runs east and west from Kingsport, Tennessee to Charleston, South Carolina. I-77 is a major interstate in eastern U.S. running from Columbia, SC all the way to Cleveland, Ohio. I-20 is another major east-west interstate, connecting Kent, Texas to Florence, South Carolina for a total of 1,535 miles.

Since 1960 Columbia has grown almost 20%. Between 1990 and 2000 Richland County, the second largest county in South Carolina grew 12%. Overall, 52% of Columbia’s population qualifies as a minority compared to Richland County and South Carolina that contain 51% and 45% respectively. In Richland County, 40,386 people and in Columbia, 20,778 people were identified as being below the poverty level and almost 34% below poverty level could be directly affected by the proposed project. Numerous languages are spoken in the project area, including Spanish, Indo-European, Asian and Pacific Islander languages; however, the vast majority of individuals only speak English. In total there are 22,079 individuals (about 8% of the focus area) that speak other languages, and 3,282 individuals (about 1% of the focus area) that do not speak English "well" or "at all." Spanish-speakers comprise the vast majority of the non-English speaking population. Overall, 10.3% of Columbia is above age 65, while at least 16.5% is below age 16. Therefore, approximately 27% of the focus area population would fall into the category of people that may have special transportation needs or other social needs due to age.

A Phase I Environmental Site Assessment (ESA) was performed in order to identify any potential contamination issues. A total of thirty-seven sites having had leaking underground storage tanks were identified with thirty-three of those sites being designated with “no further action required” status. The four remaining sites could require additional analysis based on the potential impacts of the selected alternative.

The Environmental Review also evaluated wetland impacts, threatened and endangered species, cultural resources, and noise levels. A small enclave of late nineteenth to late twentieth century industrial, commercial, and residential buildings and a few community-related buildings remain adjacent to the project area. Two emergent herbaceous wetlands and one forested wetland were identified within the study area. There also were no threatened nor endangered species observed within the study area. Further environmental investigation will be warranted as the project proceeds and any Federal Funding will require the project to meet all requirements of the National Environmental Policy Act (NEPA) and most likely an Environmental Assessment (EA) review. At the EA level of the project, community members will be invited to provide input on the project as part of the process.

VIII. Drainage

A hydraulic/hydrologic drainage basin study was completed by the LPA Group in August 2007 to identify drainage concerns involving the Assembly Street project study area.

The proposed grade separation could require replacement of an existing bridge and box culvert within the Rocky Branch Flood Zone. The project study area is located within a Federal Emergency Management Agency (FEMA) Zone. A floodway has been established from the railroad bridge downstream to the Congaree River. A detailed hydraulic study will have to be performed to determine if a Conditional Letter of Map Revision (CLOMR) is needed in accordance with FEMA regulations.

All applicable state/government agencies were contacted in order to determine what data exists for the project area. Many of the exiting studies were completed in the past and the area has seen many changes since those studies were completed. As a result, the studies may no longer be valid.

A Rocky Branch Flood Study is currently being conducted by the City of Columbia and includes the Assembly Street project area. As the Assembly Street alternatives are developed, the results of the Rocky Branch Flood Study should be taken into consideration.

A site inspection was conducted in January of 2005 and it was noted that severe erosion problems are occurring along Rocky Branch downstream of the Assembly Street Crossing. The area of Rocky Branch located upstream of the Assembly Street crossing appears to be stable with no major erosion issues.

In addition, two structures are located in the floodway, along Dreyfus Street, just downstream of the Assembly Street Crossing. A third structure was found to be within close proximity to the floodway and could be affected if any changes were made to the Rocky Branch crossings.

In conclusion, the proposed grade separations may require replacement of structures in an established Flood Zone and FEMA coordination will be necessary.

Drainage improvement recommendations include:

- Using the hardcopy Flood Insurance Rate Map or Digital Flood Insurance Rate Map in making official determinations.
- Conducting a detailed hydraulic study in order to determine if a Conditional Letter of Map Revision (CLOMR) is needed in accordance with FEMA regulations.
- Reviewing any update drainage studies within the area (specifically the pending Rocky Branch Flood Study).
- Once the proposed alternative has been selected, the most recent FEMA study should be obtained and modified to reflect the proposed design of the Assembly Street crossing.

IX. Rail and Roadway Alternatives

As a result of this study, five (5) alternatives have been developed and evaluated. The proposed alignments for each alternative can be found at the end of the report. These alternatives include:

- Alternate 1 will include grade crossing closures, eliminations, and grade-separations. This alternate will require five grade crossings to be closed while four will remain open. A section of the existing tracks will be removed which will result in the elimination of three grade crossings. Two bridges will be constructed in order to grade-separate the proposed tracks from the existing roadway on Whaley Street and Assembly Street. Additionally, Huger Street will be realigned with Olympia Avenue and a third bridge will need to be constructed to separate the realigned roadway from the existing tracks. The estimated cost of Alternative 1 is $63,100,000.

- Alternate 2B will include grade crossing closures, eliminations, and grade-separations. This alternate will require five grade crossings to be closed while three will remain open. A section of Main Street will be closed to allow a new track alignment to cross without installing an at-grade crossing. A section of the existing tracks will be removed which will result in the elimination of six grade crossings. Three bridges will be constructed in order to grade-separate the proposed tracks from the existing roadway on Whaley Street and Assembly Street. As in Alternate 1, Huger Street will be realigned with Olympia Avenue and a fourth bridge will need to be constructed to separate the realigned roadway from the existing tracks. The estimated cost of Alternative 2B is $87,100,000.

- Alternate 3 will include grade crossing closures, eliminations, and grade-separations. This alternate will require four grade crossings to be closed while two will remain open. Several sections of the existing tracks will be removed which will result in the elimination of one grade crossing. Two bridges will grade-separate the proposed tracks from Assembly Street and Whaley Street. As in Alternate 1, Huger Street will be realigned with Olympia Avenue and a fourth bridge will need to be constructed to separate the realigned roadway from the existing tracks. The estimated cost of Alternative 3 is $63,300,000.

- Alternate 4 includes changes to the existing roadway but not to the existing tracks. A section of Bluff Road will be removed and realigned to create a connection with Flora Street. This will eliminate one grade crossing on Bluff Road. The new roadway alignment will cross Assembly Street forming a four-leg intersection. A bridge will have to be constructed on this new alignment over a small creek just east of Assembly Street. Flora Street will no longer intersect Assembly Street but will instead dead end before the existing intersection. Two bridges will be constructed on Assembly Street over the existing tracks which will eliminate two grade crossings. The estimated cost of Alternative 4 is $23,000,000.

- Alternate 5 can be built in addition to any other selected alternate. This alternate will realign one of the existing CSXT tracks just north of Andrews Road and will provide a connection between the CSXT tracks and the Norfolk Southern tracks. A section of the existing CSXT tracks will be removed. The estimated cost of Alternative 5 is a reduction of $500,000.

X. Utilities

A total of fourteen (14) separate public and private utilities are located throughout the project area and these companies were engaged through group and individual meetings. A survey of major utilities within the project area was completed as well as an assessment of prior rights.

The proposed alternatives vary and include options to take the railroad over Assembly Street and well as taking the railroad under Assembly Street. If the roadway were lowered so that the railroad could cross over Assembly Street, a bigger impact would be made on the underground utilities. However, an accurate assessment on the true impact to utilities can not be ascertained until an alternative is selected and the exact grade change requirement can be calculated.

Approximate utility locations have been incorporated into the mapping and construction cost estimates will reflect conceptual impacts to the major utilities.

XI. Economic Analysis

The economic analysis portion of a feasibility study requires a benefit-cost analysis of the preferred alternative. In general, this involves the calculation of the stream of benefits and costs over the lifetime of the project. In addition to the benefit-cost analysis, non-monetary but quantifiable considerations, and non-quantifiable considerations should be evaluated to determine if a project is economically justified.

Two separate Benefit/Cost Analyzes were conducted, a Railroad Benefit/Cost Analysis and a roadway Benefit/Cost Analysis. Mainly due to the modeling programs, each mode of transportation conducts their own Benefit/Cost Analysis.

1. Railroad benefit/cost analysis

Benefit/cost ratios were determined using the Federal Railroad Administration's "GradeDec 2000 System for Grade Crossing Investment Analysis." GradeDec determines the effects rail corridor investments will have on safety, and highway delay and queuing. Improvements will result in the following economic benefits:

- Improvements in safety and reduced accident cost;
- Reduced travel time costs;
- Improves rail operations and service ability;
- Improved air quality;
- Reduced vehicle operating costs; and
- Network benefits.

The program was used to evaluate the rail lines separately and with all combined as a regional model. The benefit/cost ratio is based on a factor of 1.00 with a benefit of $1.00 for every $1.00 spent.

- Alternative 1 Average Benefit/Cost Ratio = 5.72
- Alternative 2B Average Benefit/Cost Ratio = 5.72
- Alternative 3 Average Benefit/Cost Ratio = 3.92
- Alternative 4 Average Benefit/Cost Ratio = 6.72

2. Roadway benefit/cost analysis

The methodology used for the benefit-cost analysis for the roadway portion of this project is based on the procedures outlined in AASHTO's *A Manual on User Benefit Analysis of Highway and Bus-Transit Improvements*, 1977, Office of Management and Budget (OMB) circular No. A-94, *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*; and, National Cooperative Highway research Program (NCHRP) Project 7-12, *MicroBENCOST Software and User's Manual.* For the purposes of this study, the *MicroBENCOST* program was used to compute the benefits and costs of the proposed alternatives.

Input for *MicroBENCOST* consists of:

- Descriptions of the proposed route and the existing route for each alternative (i.e. type of facility, geometric data, length, control of access);
- Traffic projections for the existing route without improvements, the existing route with improvements, and the proposed route;
- Estimated design and construction costs; and,
- Year of completion.

MicroBENCOST software contains fifty-one tables with default values that establish the pertinent economic analysis data (i.e. geometric data, fuel costs, value of time, depreciation, etc.). The default dollar values in the tables are based on 1990 costs information. In order to escalate these costs to 2007 dollars, each value was adjusted using the Consumer Price Index.

- Alternative 1 Netted Benefit/Cost Ratio = 1.16
- Alternative 2B Netted Benefit/Cost Ratio = 0.86
- Alternative 3 Netted Benefit/Cost Ratio = 1.19
- Alternative 4 Netted Benefit/Cost Ratio = 3.33

There are other benefits of the proposed Assembly Street project that cannot be translated into monetary, dollar equivalent terms. They include improved access to the University of South Carolina and the central business district of Columbia. For the Assembly Street project, the construction of the project would help the local economy through the beautification and revitalization of the area. Assembly Street would be more pedestrian friendly and would support the long-range development/revitalization plan for this area, which includes the Olympia Community.

XII. Funding Strategies

Investing in grade separation projects has long term benefits for all users (trains, auto users, transit users, pedestrians/bicyclists). As detailed in the previous section (Economic Analysis), a project of this magnitude comes with significant cost. Due to the complexity and high estimated cost of this project, it is necessary to look for several funding options and potentially a combination of methods to pay for its development and construction. It is very unlikely that one source will be able to cover the entire cost of the project. Various funds could be available at different phases of the project (planning, design, and construction). These may include local public funds, private business funds, federal appropriations or grants, and even property or sales tax revenues.

The materialization of this project will require a great deal of collaboration from all parties involved. Potential sources should include anything and anyone associated with transportation and/or economic development as well as State and Federal entities. The inception of this project will have beneficial economic impacts throughout the local region as well as the national transportation network. This includes local government (Richland County and the City of Columbia), state (SCDOT) and federal sources as well as the private railroad companies. Specifically, funds and/or grants may be available from the Federal Railroad Administration (FRA) and/or the Federal Highway Administration (FHWA).

Transportation has a direct impact on the overall quality of everyday life for the residents of this area. The overall benefits of removing the track/road intersection should offset any potential negative financial impacts. However, it can be difficult to place a dollar value on the gains of the increasing safety, improving mobility, stimulating redevelopment, and reconnecting the community. With growth and subsequent population increases, redevelopment of the downtown, and expansion of the USC campus, the number of cars on Assembly Street will only increase with time. In addition, passenger and rail freight transportation is also projected to have a significant increase over the next decade. A recent report released in January of 2008 from the United States Government Accountability Office (GAO) on Freight Transportation predicts that the amount of goods moved by freight will

increase by 88% by 2035 from 2002 levels. In addition, an increase is also expected for passenger rail service due to the increase in fuel costs. These variables will only create more delays for everyone and produces the general assumption that costs may continue to increase without providing congestion relief in the immediate future. As a result, financial decisions should be made based on the long term user cost savings, not just the initial development and construction costs. The project may result in the following economic benefits:

- Safety improvements due to the reduction of train/vehicle accidents that will reduce property damage and insurance claims
- Improving the redevelopment potential in the area.
- Improved air quality and pollution mitigation (from idling vehicles).
- Reduced travel time for automobiles (driver delay cost savings).
- Decrease spillover congestion on the rest of the local road network.
- Improved emergency vehicle response and access.
- Reduced train derailment costs.
- Decrease of wear and tear on automobiles going over uneven tracks.
- Overall network benefits for the railroad including reduced delivery time.

Potential funding sources can stem from transportation related programs and economic incentives originating from local, state, federal or private entities.

Transportation Funding Sources include:

- SAFETEA (Section 1401)
- Congressional Earmarks such as the High Priority Funds from SAFETEA-LU
- Federal Railway Programs
  - -Rail Relocation Grant (FRA)
  - -Highway/Rail Grade Crossing Program (Section 130/152)
  - -Safety-Rail/Highway Grade Crossings (FHWA)
  - -Railroad Rehabilitation and Improvement Financing Program (RRIF)
  - -Transportation Infrastructure Finance and Innovation Act (TIFIA)
  - -Infrastructure Stimulus Funding
- President Barack Obama's $787 billion economic stimulus bill
- State Infrastructure Bank (SIB)
- Capital Grants for Rail Line Relocation Projects (Section 9002 of SAFETEA-LU) – this legislation provides financial assistance for local rail line relocation and improvement projects. The project must identify a need for mitigating adverse effects of rail traffic on safety, motor vehicle traffic flow, community quality of life, including noise mitigation, or economic development, or involve a lateral or vertical relocation of any portion of the rail line, in order to reduce the number of grade crossings and/or serve to mitigate noise, visual issues, or other externality that negatively impacts a community.
- Highway Programs
  - -City Funds
  - -County Funds
  - -State Funds
- Railroad (CSXT and NS)
- Private funding (USC, surrounding development)

Economic Development Sources include:

- Community Development Block Grants (CDBG) and Loans
- Tax Increment Financing

Direct Tax Sources include:

- Property Taxes
- Sales Tax Revenue

Historically, the government has not funded railroads as they have heavily funded other modes of transportation (auto and air travel). Railroad development has primarily occurred from private market investment. Recognizing the importance of freight movement in this county, U.S. railroads have lobbied Congress to support tax-credit legislation to boost investments in rail. Unlike roads, there are no dedicated funding sources for freight rail facilities. However, with the increase in fuel costs, the government is beginning to explore increased federal investment in rail projects, both for passenger and freight rail.

The Freight Rail Infrastructure Capacity Expansion Act of 2007 (H.R. 6003) has been proposed with bipartisan support. If passed, it would provide a 25% infrastructure tax credit for projects such as new track, grade separations, transfer yards, terminals and intermodal facilities. The proposed bill is a sign that lawmakers understand the demand for rail facilities and recognize that funding rail infrastructure is a wise investment for this country. The bill is currently in discussion in the House of Representatives.

The House of Representatives also passed a $15 billion bill in June of 2008 to fund Amtrak to set up or expand passenger rail service. The Passenger Rail Investment Improvement Act of 2008 (H.R. 6003) was also a bipartisan bill that passed with a veto-proof margin of 311-104. Support from all sides for both of these bills may be a strong indication that federal funding for rail projects will increase in our country. While sufficient funds may not be readily available for projects like the Assembly Street Project, there are strong indicators that the funding could be available in the very near future.

In addition, the Richland County Transportation Study Commission (TSC) was created in 2006 by the Richland County Council and is charged with reviewing the county's current and future transportation needs (including roadway, transit, greenway, bike, and pedestrian). It has developed a 25-year plan entitled the Richland County Transportation Study and it lists short-, medium-, and long-term recommendations. It has the Assembly Street Railroad Grade Separation project listed first on its High-Priority list with a projected cost/funding of $32,100,000.

The TSC recommended that the County Council place a local sales tax referendum on the ballot for November 4, 2008 and raise the Richland County sales tax from 7% to 8%. These funds would be appropriated for roadway, transit, greenway, bike and pedestrian improvements in Richland County. The projected tax was estimated to yield approximately $394 million dollars over the next seven years and cover the majority of the costs for recommendations in the Richland County Transportation Study, including almost $40,000,000 for the Assembly Street crossing.

A similar sales tax has been approved in York County entitled Pennies for Progress. The referendum for York County narrowly passed in 1997 but 73% voted to renew it in 2003. The success of the referendum passing in York was attributed to rapid growth and residents wanting to maintain their quality of life by ensuring adequate transportation facilities would be available in their community. The phenomenon of rapid growth in the south is causing communities to take control of their infrastructure funding instead of being dependant on the State and Federal government for those responsibilities. Having adequate transportation facilities is not only seen as a quality of life issue but also as an economic development booster as it can lead to better commercial/industrial growth that can bring better and additional jobs to the area.

However, in July of 2008 the Richland County Council voted against allowing the referendum on the sales tax. The referendum was not included on the ballot in November of 2008.

With the change in our presidential seat, the newly Presidential Barack Obama has signed a $787 billion economic stimulus bill. The newly signed bill includes funding for new transportation infrastructure projects. Projects that not only repair our aging transportation network, but improve and enhance our transportation network by constructing multi-modal transportation systems. The City of Columbia has plans to investigate funding through this opportunity for the Assembly Street Project, since this is one of their top priority infrastructure projects.

In addition, the state of South Carolina has utilized the State Infrastructure Bank (SIB) as a funding source for transportation projects. The State Infrastructure Bank (SIB) was introduced in 1995 and is a “revolving” fund created by states utilizing Federal transportation dollars. These revolving funds are used as credit assistance, such as a loan, for local transportation projects and require a 25% state match. These revenue bonds are issued against annual gas taxes and registration fees. The funds are termed “revolving” because the repaid loans go back into the fund for further lending.

South Carolina has utilized the SIB in the past and provides the best example of a large, leveraged SIB. SCDOT has also developed the “27 in 7” program in which the SIB was used to compress 27 years of road and bridge projects into a 7 year accelerated schedule. The next SIB is expected to issue another $800 million in revenue bonds over the next several years. Once FHWA requests submittals, South Carolina plans on requesting bonds through the SIB once again.

The railroad companies (CSXT and NS) have not, at this time, dedicated any funding for this project. However, they have continued to participate in the planning phase of this project and have vested interests in its materialization. At-grade crossings can delay rail traffic and as a result slow down the delivery of passengers and commercial goods. A track that is no longer impacted by Assembly Street traffic has value to the railroads and decreases traffic delays along Assembly Street.

As noted, there are a number of funding options out there. The ability to work with and coordinate with the numerous agencies and sources for cost sharing will only enhance and expedite the ability to construct improvements along the Assembly Street corridor.

END CONSTRUCTION
NS1 STA. 116+18.50

GADSDEN STREET
GRADE CROSSING
TO BE ELIMINATED

LINCOLN STREET
GRADE CROSSING
TO REMAIN OPEN

ASSEMBLY STREET
GRADE CROSSING
TO BE ELIMINATED

GADSDEN STREET
GRADE CROSSING
TO REMAIN OPEN

GADSDEN STREET GRADE
CROSSING TO BE CLOSED

FLORA STREET
GRADE CROSSING
TO BE CLOSED

END GRADE NS1
STA. 104+00.00

END GRADE CSX1A-3
STA. 105+10.00

OLYMPIA HUGER
CONNECTOR

CATAWBA STREET
GRADE CROSSING
TO BE CLOSED

LINCOLN STREET
GRADE CROSSING
TO BE CLOSED

PROPOSED
BRIDGE

PROPOSED
BRIDGE

BLUFF ROAD GRADE
CROSSING TO BE
CLOSED

BEGIN GRADE CSX1A-3
STA. 76+98.69

ASSEMBLY STREET
GRADE CROSSING
TO REMAIN OPEN

HUGER STREET
GRADE CROSSING
TO REMAIN OPEN

MATCHLINE A-A

DEVINE STREET
BLOSSOM STREET
WHEAT STREET
GADSDEN STREET
LINCOLN STREET
ASSEMBLY STREET
MAIN STREET
SUMTER STREET
HAMPTON STREET
S EVANS STREET
CATAWBA STREET
PARK STREET
WHALEY STREET
FLORA STREET
POLASKI STREET
HUGER STREET
WILLIAMS STREET
WAYNE STREET
MULBERRY LANE
HEYWARD STREET
BLUFF ROAD
DREYFUSS ROAD
FERGUSON STREET
VIRGINIA STREET

USE: 324 MW PLANT (UNDER CONSTRUCTION)

PROPOSED APARTMENTS SITE

N

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

ASSEMBLY STREET ALTERNATE 1

SCALE: 1" = 350'

JULY 2007

ASSEMBLY STREET
ALTERNATE 1

SCALE: 1" = 350'

JULY 2007

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

FLORA STREET GRADE CROSSING TO BE CLOSED

MARION STREET

HEYWARD STREET

S. EVANS STREET

S. MARION STREET

CL LINE A-A

E. BROADWAY STREET

BEGIN GRADE NS1
STA. 67+28.74

ROSEWOOD DRIVE

SUPERIOR STREET

FULTON STREET

ROYSTER STREET

S. BRYSON AVENUE

WILEY STREET

MITCHELL STREET

ASSEMBLY STREET

FERGUSON STREET

VIRGINIA STREET

BEGIN CONSTRUCTION
NS1 STA. 43+82.98

END GRADE CSX1-2
STA. 41+62.98

GEORGE ROGERS BOULEVARD

ANDREWS ROAD

BEGIN GRADE CSX1-2
STA. 20+89.80

END GRADE NS2A
STA. 115+00.00

EXISTING GRADE CROSSING TO BE ELIMINATED

EXISTING GRADE CROSSING TO BE ELIMINATED

EXISTING GRADE CROSSING TO BE ELIMINATED

EXISTING GRADE CROSSING TO BE ELIMINATED

MAIN STREET AND SUMTER STREET GRADE CROSSING TO BE ELIMINATED

BEGIN GRADE NS2BR
STA. 65+93.88

INTERSECTION GRADE CROSSING TO REMAIN OPEN

MAIN STREET GRADE CROSSING TO BE CLOSED

GADSDEN STREET GRADE CROSSING TO BE CLOSED

PROPOSED BRIDGES

OLYMPIA HUGER CONNECTOR

CATAWBA STREET GRADE CROSSING TO BE CLOSED

END GRADE NS2BR
STA. 92+39.87

LINCOLN STREET GRADE CROSSING TO BE CLOSED

BEGIN GRADE CSX2B
STA. 91+44.63

PROPOSED BRIDGE

BLUFF ROAD GRADE CROSSING TO BE CLOSED

ASSEMBLY STREET GRADE CROSSING TO REMAIN OPEN

END GRADE CSX2B
STA. 117+82.00

HUGER STREET GRADE CROSSING TO REMAIN OPEN

END CONSTRUCTION
CSX2B STA. 124+21.11

DEVINE STREET
BLOSSOM STREET
WHEAT STREET
POTASKO STREET
HUGER STREET
GADSDEN STREET
LINCOLN STREET
ASSEMBLY STREET
MAIN STREET
SUMTER STREET
MARION STREET
CATAWBA STREET
PARK STREET
WHALEY STREET
SUMNER STREET
FLORA STREET
MATCHLINE A-A
WAYNE STREET
MULBERRY LANE
DREYFUSS ROAD
HEYWARD STREET
WILLIAMS STREET
FERGUSON STREET
VIRGINIA STREET
USC BYRNES PLANT (UNDER CONSTRUCTION)
SCE&G – DISTRIBUTION SOUTH MAIN STREET SUBSTATION
PROPOSED APARTMENTS SITE

ASSEMBLY STREET
ALTERNATE 2B

SCALE: 1" = 350'

JULY 2007

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

ASSEMBLY STREET
ALTERNATE 2B

SCALE: 1" = 350'

JULY 2007

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

FLORA STREET GRADE CROSSING TO BE CLOSED

CLINE A-A

BEGIN GRADE NS2A STA. 67+00.00

MARION STREET

HEYWARD STREET

S. MARION STREET

E. BROADWAY STREET

ROSEWOOD DRIVE

SUPERIOR STREET

FULTON STREET

ROYSTER STREET

WILEY STREET

MITCHELL STREET

ASSEMBLY STREET

FERGUSON STREET

VIRGINIA STREET

GEORGE ROGERS BOULEVARD

ANDREWS ROAD

END GRADE CSX STA. 41+62.98

BEGIN CONSTRUCTION NS2A STA. 43+66.29

BEGIN GRADE CSX1-2 STA. 20+89.80

END GRADE NS3
STA. 117+00.00

BEGIN GRADE NS3
STA. 98+44.18

BEGIN GRADE NSR3–1
STA. 88+88.75

LINCOLN STREET
GRADE CROSSING
TO BE CLOSED

CATAWBA STREET
GRADE CROSSING
TO BE CLOSED

EXISTING GRADE
CROSSING TO BE
ELIMINATED

END GRADE CSX3–1
STA. 113+26.06

END GRADE NSR3–1
STA. 97+44.18

FLORA STREET
GRADE CROSSING
TO BE CLOSED

BEGIN GRADE NSR3–3
STA. 101+16.29

GADSDEN STREET
GRADE CROSSING
TO BE CLOSED

BEGIN GRADE CSX3–3
STA. 101+90.75

PROPOSED
BRIDGES

OLYMPIA HUGER
CONNECTOR

GADSDEN STREET
GRADE CROSSING
TO REMAIN OPEN

END GRADE CSX3–3
STA. 113+75.93

END GRADE NSR3–3
STA. 118+44.96

HUGER STREET
GRADE CROSSING
TO REMAIN OPEN

DEVINE STREET
BLOSSOM STREET
LINCOLN STREET
GADSDEN STREET
WHEAT STREET
ASSEMBLY STREET
MAIN STREET
SUMTER STREET
MARION STREET
S EVANS STREET
CATAWBA STREET
PARK STREET
WHALEY STREET
PULASKI STREET
HUGER STREET
WILLIAMS STREET
WAYNE STREET
MULBERRY LANE
BLUFF ROAD
DREYFUSS ROAD
HEYWARD STREET
FLORA STREET
POE STREET
FERGUSON STREET
VIRGINIA STREET
PROPOSED APARTMENTS WITH
UNDER CONSTRUCTION

ASSEMBLY STREET
ALTERNATE 3
SCALE: 1" = 350'
JULY 2007

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

ASSEMBLY STREET
ALTERNATE 3

SCALE: 1" = 350'

JULY 2007

LEGEND	
	PROPOSED CSX TRACKS
	EXISTING CSX TRACKS
	PROPOSED NORFOLK SOUTHERN TRACKS
	FUTURE NORFOLK SOUTHERN TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED

FLORA STREET GRADE CROSSING TO BE CLOSED

END GRADE NSR3-4 STA. 63+00.00

BEGIN GRADE CSX3-1 STA. 66+35.00

BEGIN GRADE NSR3-4 STA. 52+40.84

END GRADE CSX3-2 STA. 40+93.72

BEGIN CONSTRUCTION CSX3-1 STA. 43+13.72

BEGIN GRADE CSX3-2 STA. 20+20.54

MATCHLINE A-A'

N

MARION STREET

HEYWARD STREET

S EVANS STREET

S MARION STREET

FULTON STREET

S EDISTO AVENUE

WILEY STREET

MITCHELL STREET

ROYSTER STREET

SUPERIOR STREET

ROSEWOOD DRIVE

E BROADWAY STREET

POE STREET

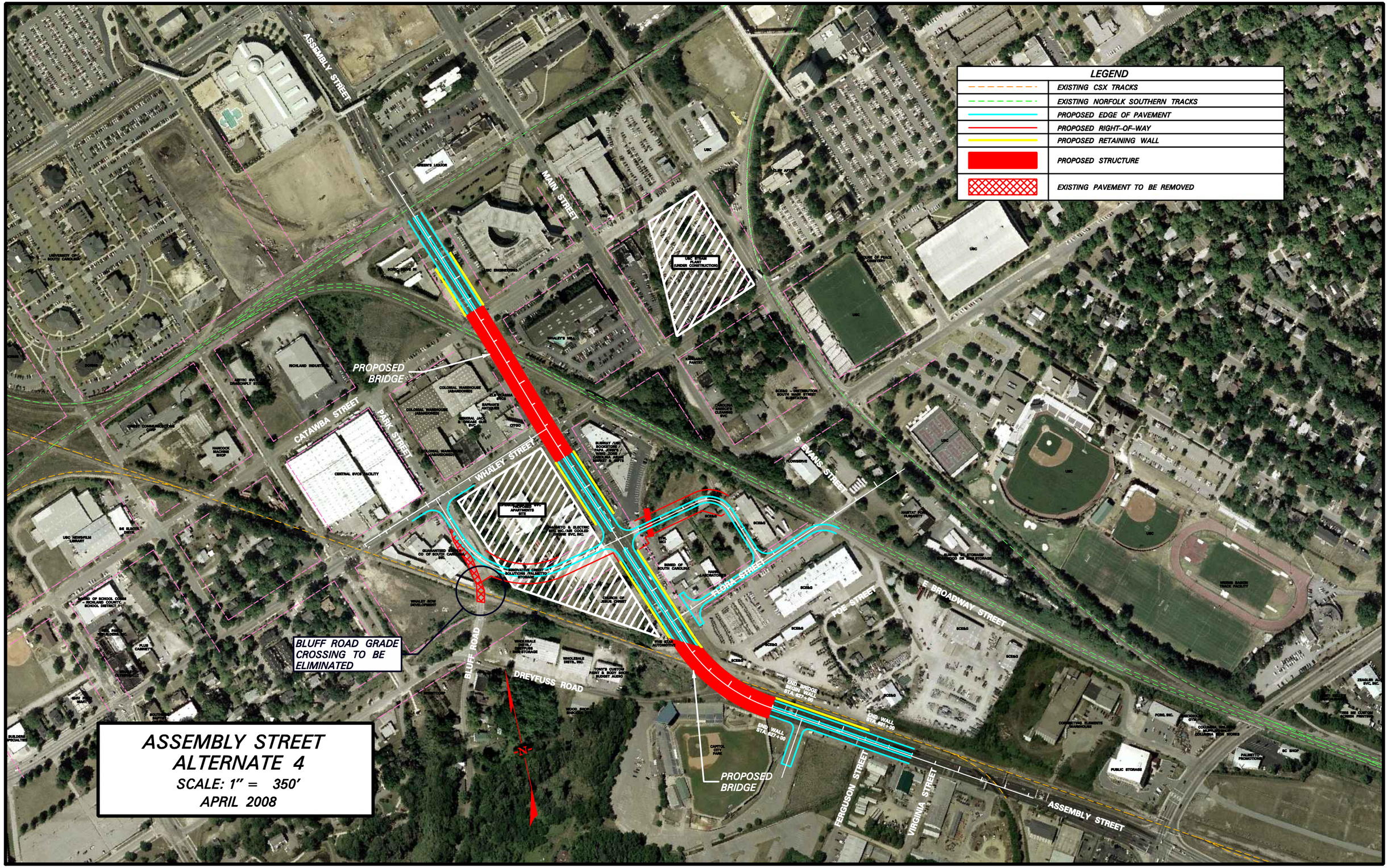
FERGUSON STREET

VIRGINIA STREET

ASSEMBLY STREET

GEORGE ROGERS BOULEVARD

ANDREWS ROAD


LEGEND
EXISTING CSX TRACKS
EXISTING NORFOLK SOUTHERN TRACKS
PROPOSED EDGE OF PAVEMENT
PROPOSED RIGHT-OF-WAY
PROPOSED RETAINING WALL
PROPOSED STRUCTURE
EXISTING PAVEMENT TO BE REMOVED
ASSEMBLY STREET
MAIN STREET
CATAWBA STREET
PARK STREET
WHALEY STREET
BLUFF ROAD
DREYFUSS ROAD
HAMPTON STREET
HENDRIX STREET
S. EVANS STREET
FOE STREET
E. BROADWAY STREET
FERGUSON STREET
VIRGINIA STREET
ASSEMBLY STREET
PROPOSED BRIDGE
PROPOSED BRIDGE
BLUFF ROAD GRADE CROSSING TO BE ELIMINATED
USC STEAM PLANT (UNDER CONSTRUCTION)
PROPOSED APARTMENTS SITE
END BRIDGE BEGIN WALL STA. 827+00
END WALL STA. 827+00
END WALL STA. 831+00
CAPITOL CITY PARK
-N-
ASSEMBLY STREET
ALTERNATE 4
SCALE: 1" = 350'
APRIL 2008

ASSEMBLY STREET ALTERNATE 5

SCALE: 1" = 350'
JULY 2007

S MARION STREET
E BROADWAY STREET
ROSEWOOD DRIVE
SUPERIOR STREET
HOYSTER STREET
WILEY STREET
MITCHELL STREET
GEORGE ROGERS BOULEVARD
ANDREWS ROAD

END GRADE CSX5
STA. 44+27.39

BEGIN GRADE CSX6
STA. 35+94.12

END GRADE CSX6
STA. 50+01.15

BEGIN GRADE CSX5
STA. 23+62.11

A
B

LEGEND	
	EXISTING CSX TRACKS
	EXISTING NORFOLK SOUTHERN TRACKS
	PROPOSED NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING NORFOLK SOUTHERN AND CSX JOINT USE TRACKS
	EXISTING TRACKS TO BE REMOVED