



SR 204 Corridor Study

Preliminary Traffic Analysis Report

Phase I Final Report

SR 204 Corridor Study
Chatham County, Georgia

Prepared For:



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Executive Summary

As part of the State Route 204 (SR 204) Corridor Study, Jacobs Engineering Group Inc. (JEG) was retained by the Metropolitan Planning Commission (MPC) and has completed a corridor study for SR 204 from Gateway Boulevard West to south of Wilshire Boulevard. The purpose of this study is to investigate the existing and future transportation needs along the SR 204 corridor and recommend improvements to the mobility, connectivity and safety of this route.

SR 204 is the primary arterial providing access to Downtown Savannah from South Chatham, Bryan, and Liberty Counties. The corridor is also a designated evacuation route for Savannah and the coastal region. SR 204 is not only a primary commuter route for outlying areas such as Georgetown and Richmond Hill, but also serves several residential communities, retail centers, office parks, as well as major destinations including Hunter Army Airfield, Armstrong University, St. Joseph's Hospital and Savannah Mall. Because there is a lack of alternate routes due to natural obstacles, traffic converges and creates heavy congestion along the corridor. In general, there is a need for improved connectivity and mobility in the area.

Increasing traffic congestion has deteriorated the ability of SR 204 to effectively serve as a commuter route and as a link between regional activity centers, and in the case of an emergency to evacuate traffic. Recently, there has been a negative growth trend in traffic volumes along the corridor; however this pattern is not anticipated to continue. The Coastal Region Metropolitan Planning Organization (CORE MPO) Travel Demand Model projects growth over the next twenty years, which creates the need to expand capacity along this corridor. Previous studies examined several alternatives for improving mobility in the corridor. These alternatives range from travel demand management strategies, widening SR 204, adding grade separated intersections, to construction of an elevated freeway to accommodate through traffic.

Most of the project corridor extends through unincorporated portions of Chatham County. However, the portion of SR 204 east of Rio Road is located within the city limits of Savannah. The project area is characterized mostly by dense commercial and residential land uses. The occurrence of commercial land uses and the density of development decreases further west of the City. Most of the undeveloped land along the east and west sides of the Little Ogeechee River, including the section of SR 204 west of Veterans Parkway to Rio Road, is comprised of wetlands. Impacts to this protected land use must be carefully considered in the development of alternatives.

Within the study area, SR 204 is functionally classified as an Urban Principal Arterial, carrying significant traffic volumes throughout the corridor. The western study segment, spanning from Gateway Boulevard to US 17, sustains average daily traffic (ADT) volumes of approximately 37,000 vehicles per day (vpd) between I-95 and US 17. Volumes drop significantly to 11,600 vpd just west of Gateway Boulevard West. The central study segment, from US 17 to Rio Road has increasing ADT volumes moving west to east until SR 204 reaches its peak of 53,000 vpd between Veterans Parkway and Rio Road. Along the eastern segment, from Rio Road to Truman

Parkway, significant reductions in ADT occur at cross streets such as Rio Road and Middleground Road. Near the eastern termini, east of Holland Drive, SR 204 has ADT volumes of 43,000 vpd.

Existing and future traffic conditions were analyzed for the corridor taking into consideration the proposed projects along SR 204 as well as the anticipated growth in the area. Major planned projects include the grade separation of the intersection of SR 204 at King George Boulevard and the construction of Truman Parkway Phase V. The anticipated growth in the area is expected to increase traffic congestion and create lengthy delays for commuter and local traffic traveling through the corridor.

Today, SR 204 can be characterized as a six-lane arterial with dense development, curb-cuts, and congestion. The number of lanes, curb-cuts, and heavy traffic volumes restrict mobility and reduces the quality of life for those who live, work, and play within the corridor. To address these issues several roadway capacity and traffic operational improvement alternatives (including the No Build scenario) were evaluated as part of the study. Based on the results of the traffic analysis performed for the study, the proposed concept would include the following:

- Convert SR 204 to a limited-access freeway with one-way access roads from I-95 to US 17
- Provide fly-over ramps from I-95 southbound to SR 204 Eastbound and from SR 204 Westbound to I-95 Southbound
- Provide access roads connecting SR 204 with Gateway Boulevard South and I-95.
- Convert SR 204 to a six-lane freeway from US 17 to Rio Road, with interchanges at US 17, Pine Grove Road/King George Boulevard (split diamond), and Veterans Parkway
- Install a continuous elevated four-lane freeway above the existing six-lane geometry from Rio Road to the Truman Parkway Extension
- The elevated freeway lanes would begin west of Rio Road and continue onto Truman Parkway
- Tie SR 204 into the existing six-lane typical section northeast of the SR 204 at Truman Parkway Intersection
- Provide a half diamond interchange east of Arts Drive
- Maintain access to all existing cross streets and driveways

The recommended project would provide additional capacity along SR 204 from I-95 to Truman Parkway to accommodate the existing and projected traffic volumes. The recommended improvement would also enhance the traffic Level of Service (LOS) operations along SR 204. The change to a limited access freeway facility from I-95 to Truman Parkway would potentially reduce crash frequency and severity along SR 204 and the existing side streets. In addition, the recommended improvements are expected to substantially reduce travel time along SR 204 from the No Build condition. The additional capacity provided by the recommended Build alignment would accommodate anticipated future growth in the project area and improve east-west connectivity throughout the region while maintaining local access and minimizing right-of-way impacts.

1 Introduction

The Savannah/Chatham County area is not only a top tourist destination but also a major business center for the region. The area has a strong business and employment base that includes manufacturing, distribution, tourism, military, education, healthcare, and port operations. SR 204 plays a vital role in serving the area. The SR 204 corridor is the key arterial connection across the southern part of Savannah and Chatham County. Upon completion of Truman Parkway Phase V, SR 204 will provide an important link between downtown Savannah and Truman Parkway to US 17 and I-95. SR 204 also acts as a primary commuter route between Richmond Hill in Bryan County, Hinesville in Liberty County and Georgetown in Southern Chatham County into Savannah. The SR 204 corridor accommodates through trips and provides access to regional activity centers such as Savannah Mall, Armstrong Atlantic State University and St. Joseph's Hospital. SR 204 also functions as the key strategic route between Fort Stewart and Hunter Army Airfield. In addition, SR 204 serves a strategic purpose as a hurricane evacuation route.

Increasing traffic congestion has deteriorated the ability of SR 204 to effectively serve as a commuter route and as a link between regional activity centers, and in the case of an emergency to evacuate traffic. Recently, there has been a negative growth trend in traffic volumes along the corridor; however this pattern is not anticipated to continue. The Coastal Region Metropolitan Planning Organization (CORE MPO) Travel Demand Model projects growth over the next twenty years, which creates the need to expand capacity along this corridor. Previous studies examined several alternatives for improving mobility in the corridor. These alternatives range from travel demand management strategies, widening SR 204, adding grade separated intersections, to construction of an elevated freeway to accommodate through traffic.

For the purpose of this study, three logical roadway segments have been defined based on roadway characteristics and previous planning efforts. The western segment spans from Gateway Boulevard West to US 17, the central segment spans from US 17 to Rio Road and the eastern segment spans from Rio Road to White Bluff Connector.

This report is part of a comprehensive study to determine necessary roadway improvements to address existing and future traffic needs for enhancing safety and improving mobility along the corridor. This comprehensive study weighs the costs and benefits of each alternative against considerations of environmental conditions, constructability, and impacts to residents and businesses. In addition, this study examines potential funding options with special focus on the at-grade commercial portion of the corridor between Wilshire Boulevard and Rio Road while utilizing both context-sensitive and complete-streets approaches to the alternatives developed. The SR 204 corridor study also assesses opportunities for redevelopment and assess impacts to land use and community resources.

JEG developed recommendations based on existing traffic conditions, operational analysis of the roadway and intersections, future traffic projections, and a review of historical crash data. The recommendations developed from this study take into consideration safety, capacity needs,

implementation feasibility, constructability, community support, right-of-way impacts, environmental impacts, connectivity, and complete streets concepts.

1.1 Study Area

SR 204 is an existing principal arterial that provides east-west connectivity between the City of Savannah and I-95 to the west. It is the primary route providing commuter access from I-95 to the southern side of Downtown Savannah. The study area focuses on a nine-mile segment of SR 204 from Gateway Boulevard West in the west to the SR 204 connection with Truman Parkway Phase V south of Wilshire Boulevard in the east. The portion of the study area east of Forest River is located with the city limits of Savannah and the portion west is in unincorporated Chatham County. Figure 1 shows the study area along SR 204.

1.2 Project History

Current congestion along SR 204 has raised concern for the future of the corridor. Traffic along the corridor is projected to increase as the city of Savannah grows and other nearby transportation projects increase regional mobility. The Truman Parkway Extension Phase V extension is anticipated to create better connectivity between downtown Savannah and SR 204, thus increasing SR 204's use as a regional commuter route.

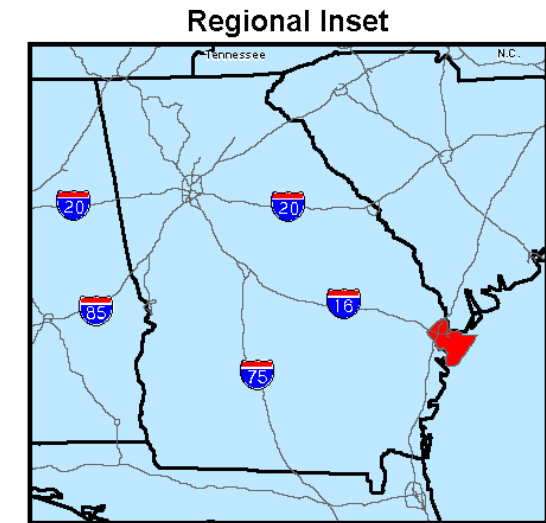
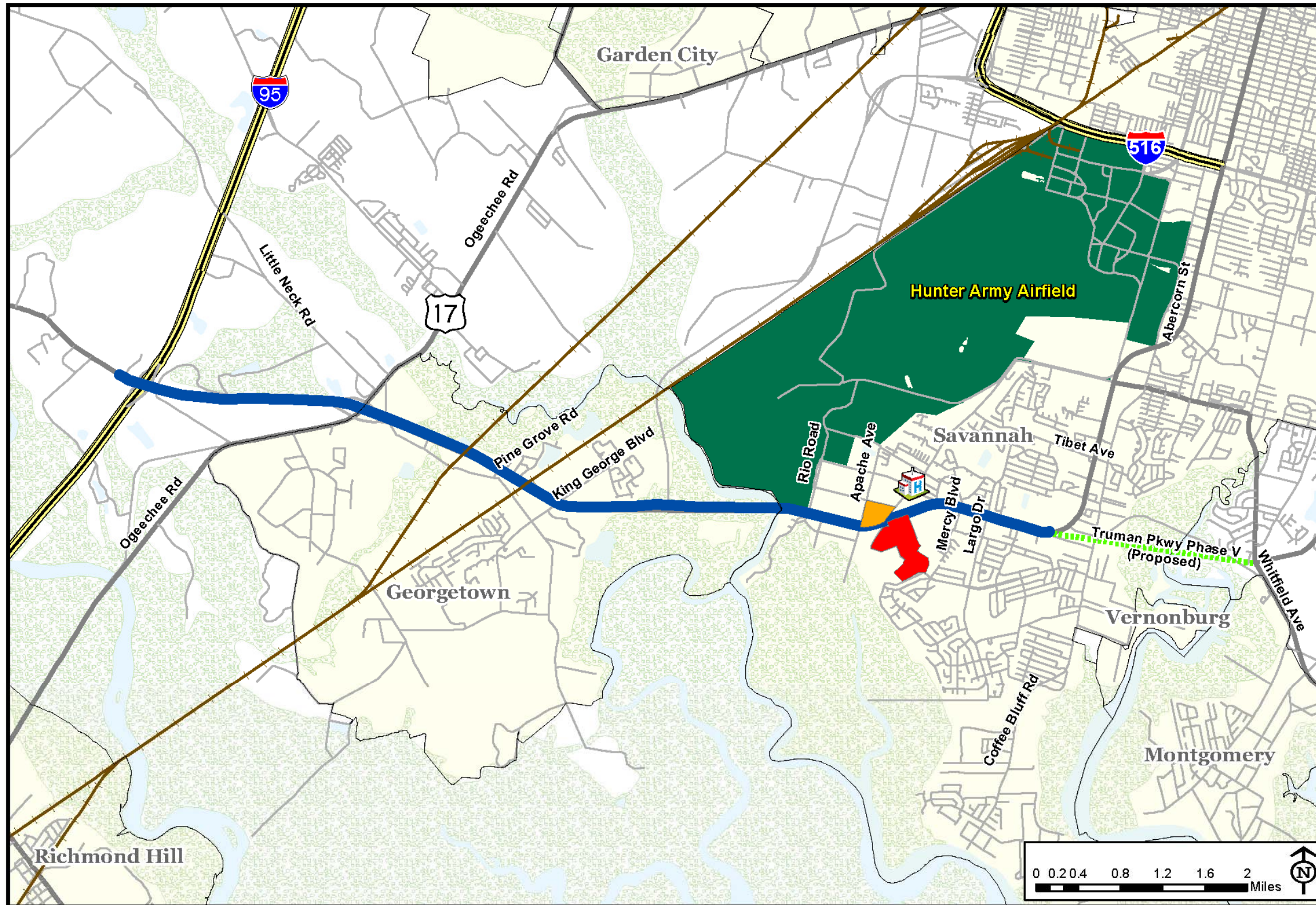
Previous studies have been performed for the SR 204 corridor. The SR 204 Improvements Technical Memorandum prepared for the Georgia Department of Transportation (GDOT) in April 2010 analyzed a planned project to convert the intersection of SR 204 at King George Boulevard into a partial cloverleaf interchange with loop ramps in the northwest and southeast quadrants to alleviate congestion during the morning and evening peak periods. The study also recommended that the improvements at King George Boulevard should be designed to accommodate the future implementation of a Pine Grove Road/King George Boulevard split diamond interchange. Another prior study, SR 204 Corridor Study prepared for GDOT in August 2009, developed a recommended alternative for the segment of SR 204 from Rio Road to the Truman Parkway extension. The study recommended converting SR 204 into a limited access freeway with two-lane one-way access roads adjacent to the corridor. U-Turn ramps with slip ramps were recommended to connect the freeway and access roads.

This corridor study is intended to expand the study limits and the alternatives considered in previous studies. Recommendations from previous studies have been re-evaluated and compared to new alternatives. A comprehensive review is included in Section 3 of this report.

1.2.1 Other Projects Planned in the Area

The development of conceptual alternatives to improve conditions along the SR 204 corridor will be addressed with consideration of other planned projects that will affect the corridor. Figure 2 shows a map of projects that are planned near the SR 204 corridor.

Figure 1: Study Area



Legend

Landmarks

- Hospital
- Armstrong State College
- Savannah Mall
- Hunter Army Airfield

Environmental

- Water
- Swamp/Marsh

Transportation

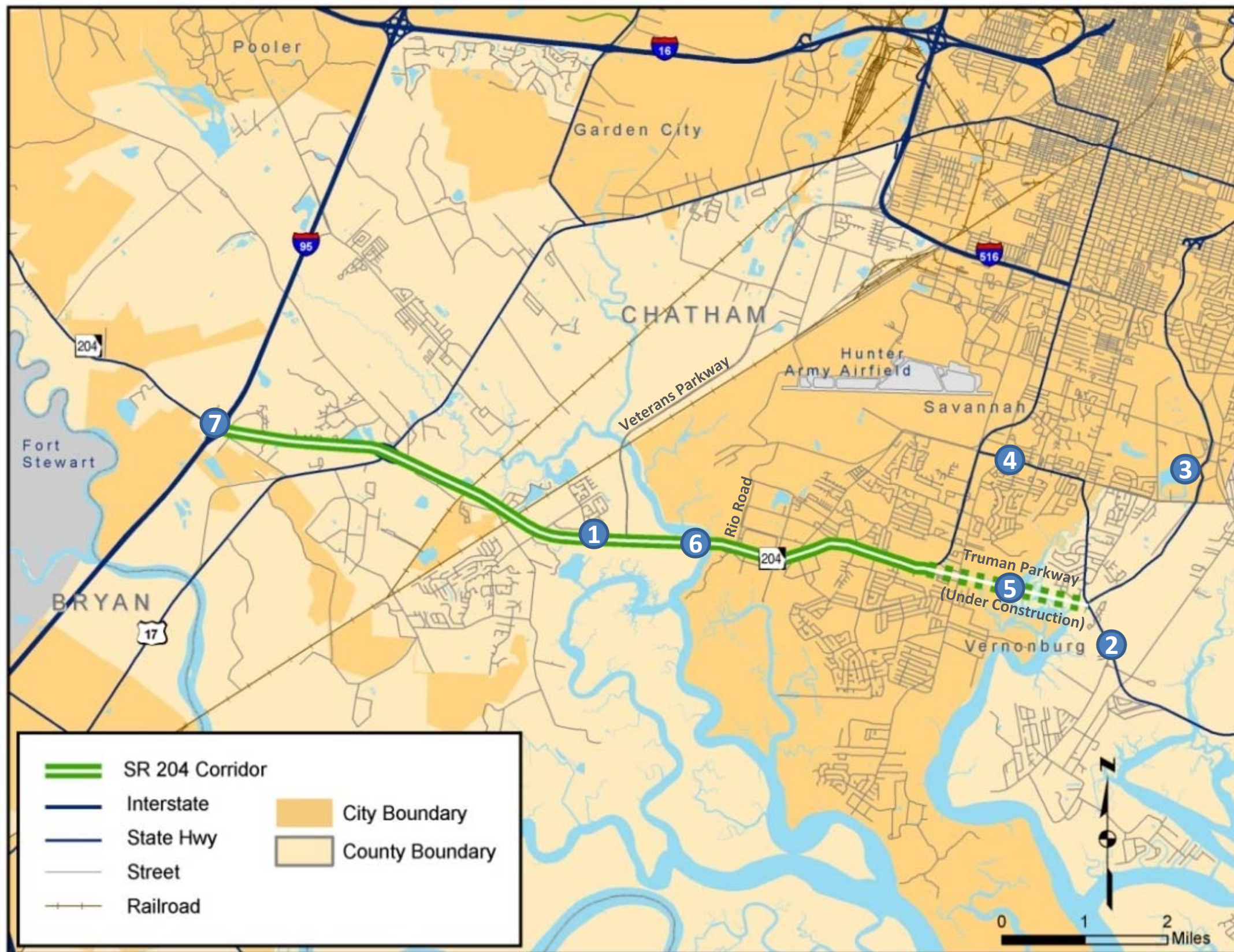
- Interstate
- Highway/Major Road
- Study Corridor
- Under Construction
- Local / Other Road
- Railroad

Other Layers

- Cities
- Unincorporated County

Source: U.S. Census (2005), ESRI, & Jacobs
This map is intended for planning purposes only.

Figure 2: Other Programmed Projects Planned in the Area



1. NH-111-1(24), Chatham Co., P.I. #:522870; SR 204/Abercorn St. Widening from Pine Grove Road to Veterans Parkway. (Project changed to interchange construction at SR204/King George Blvd pending revised concept approval)
2. STP-00MS(5), Chatham Co., P.I. # 550560; SR 204 Spur Widening from Haney's Creek to CR 767/Ferguson Ave
3. No Number, Chatham Co., P.I. # 0007631; Truman Linear Park Trail – Phase II (Nearby on Truman Pkwy)
4. VSSTP000900384, Chatham Co., P.I. # 0009384; Montgomery Cross Road Signal Interconnect
5. NHS-0002-00(921), Chatham Co., P.I. # 0002921; Truman Pkwy Phase V
6. PI 522870, Chatham Co., SR 204/Abercorn Street Extension Improvements from Veteran's Parkway to Rio Road
7. PI 0007148, I-95 at SR 204/Abercorn Street Recon/Rehab – Operational Improvement

2 Review of Previous Studies

A review of previous studies conducted along the corridor was incorporated into this study. The purpose of this review was to assess findings and recommendations developed in previous work to avoid reanalyzing what has already been done. As noted previously, recent planning studies have assessed the mobility issues of the corridor and have examined several improvement alternatives. These alternatives include transportation demand management strategies, widening SR 204 to an 8-lane cross-section, grade-separated intersections, and construction of an elevated viaduct to accommodate through traffic. To aid in the development of a preferred alternative for this corridor, the assessment of previous studies was conducted so that they could be appropriately incorporated into the development of the final preferred alternative. The following section provides summaries of the previous studies that were reviewed for their relevance to this current SR 204 Corridor Study.

2.1 Overview of Previous Studies Review

The analyses and recommendations presented in these reports were carefully considered in the further refinement of alternatives for the SR 204 corridor. In summary, the following are results and recommendations from previous studies that are relevant to the current SR 204 Corridor Study:

- *FY 2010-2013 Transportation Improvement Plan (TIP)* – Includes eight programmed projects in the study area, including widening SR 204 from King George Boulevard to Rio Road, Truman Parkway Phase V and operational improvements to I-95 at SR 204.
- *FY 2010 Unified Planning Work Program* – Includes funds for this study as well as the 2035 Long Range Transportation Plan (LRTP).
- *Coastal Region (CORE) Connections Framework Mobility Plan* – Includes King George Boulevard interchange as well as four other projects in the study area.
- *SR 204 Corridor Study (2009)* – Provides preferred alternative for US 17 to Rio Road as well as Rio Road to Truman Parkway Phase V. Three alternatives were analyzed in detail and the preferred alternative from this previous study was selected because it provided the most future capacity and provided the best Levels of Service (LOS). This alternative was then short listed and further analyzed for the purposes of this comprehensive study.
 - *SR 204 Improvements* – Provides a preferred alternative for a proposed interchange at SR 204 and King George Boulevard as well as adjacent intersections. The alternative was analyzed with updated traffic projections.
- *Chatham County Interstate Needs Analysis and Prioritization Plan* – Recommends widening SR 204 to 3 lanes in each direction and other operational improvements at the I-95 interchange.

- *Transportation Development Plan (Chatham Area Transit Authority)* – Recommends extension of Route 6 (which traverses SR 204) to Quacco Road.
- *Southwestern Chatham County Sector Plan* – Recommends widening SR 204 to six lanes west of I-95 to the proposed Belford Spine Road (near John Carter Rd). It also recommends several additional roadway connections in the study area.
- *Context Sensitive Design Manual* – Provides specific guidelines for implementing Context Sensitive Design based on road type and context, which should be applied to the alternatives developed for SR 204.
- *Chatham County-Savannah Comprehensive Plan* – Proposes minimal changes to land use compared to existing conditions along the corridor.
- *Congestion Management System Report* – Four segments on SR 204 ranked within the top 20 most congested segments in the study area. Recommendations included operational improvements at I-95, widening from King George Boulevard to Pine Grove Road and from Rio Road to Truman Parkway and operational improvements throughout the corridor.
- *Chatham County Bikeway Plan* – Recommends several bicycle improvements in and around the corridor, including paved shoulders from US 17 to Rio Road.

2.2 Previous Studies

2.2.1 FY 2010-2013 Transportation Improvement Program for the Coastal Region Metropolitan Planning Organization (CORE MPO)

Prepared by CORE MPO with Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and GDOT, adopted October 2009, Revised December 2009 and February 2010.

The CORE MPO TIP “is a detailed capital program or a list of federally-funded highway, transit and other multi-modal projects for the MPO planning area over the next four years. The TIP must be updated on an annual basis and must be consistent with the LRTP. All transportation projects must appear in an approved LRTP and TIP before they may receive federal funds for implementation. The TIP is based on a reasonable estimate of the amount of federal funds expected to be available to the MPO planning area and is required to be financially constrained by year.” TIP projects that may prove relevant to the SR 204 Corridor Study are listed in Tables 1 and 2.

Table 1: Relevant Projects from the TIP, 2010 to 2013

PI #	FUNDING IN FY 2010 - 2013	PROJECT TITLE	DESCRIPTION	FY CST
522870, 0008840	L050, LY20, LY30	SR 204/Abercorn Ext.	Widen SR 204 from King George Blvd to Rio Rd (Project changed to interchange construction at SR204/King George Blvd pending revised concept approval)	Long Range
550560	L230	SR 204 Spur / Whitefield Ave	Widen SR 204 Spur / Whitfield Ave from Haney's Creek to Ferguson Ave.	2013
M003977*	ARRA-C240	I-95	I-95 Resurface and Maintenance from US 17 in Bryan to I-16 in Chatham	2010
0002921	ARRA-TIGER	Truman Pkwy	Construct Truman Pkwy Phase V from Whitefield Ave to Abercorn St	2010

* Project has since been completed

Table 2: Relevant Lump Sum Projects from the TIP, 2010 to 2013

PI#	Project#	LOCATION & DESCRIPTION	TYPE	PE	ROW	CST
0007148	CSSTP-0007-00(148)	I-95 @ SR 204/ABERCORN ST	Recon/Rehab - Operational Improvement	Authorized		PRECST
0007190	CSSTP-0007-00(190)	SR 204 FM CR 803/FORT ARGYLE RD TO CR 770/OLD RIVER RD	Safety - Realignment	Authorized	PRECST	PRECST
0007482	CSSTP-0007-00(482)	SR 25/US 17 @ SR 307/BOURNE AVE	Recon/Rehab - Operational Improvement	Authorized	Authorized	PRECST
532780-	STP-111-1(28)	SR 204 / ABERCORN ST @ LARGO DRIVE IN SAVANNAH -	Safety - Turn Lanes	Authorized	Authorized	PRECST for UTL and CST

2.2.2 FY 2010 Unified Planning Work Program

Prepared by the CORE MPO with GDOT, adopted June 2009, revised December 2009, February 2010, amended February 2010.

The FY 2010 Unified Planning Work Program (UPWP) document describes the transportation planning activities to be performed from July 1, 2009 to June 30, 2010 with funds provided under Title 23 USC and the Federal Transit Act. Tasks include an update of the 2030 LRTP that would extend the horizon year to 2035 and the development of the annual TIP update. The UPWP specifies that ARRA funds will be used in part to fund the SR 204 Corridor Study.

2.2.3 CORE Connections Framework Mobility Plan

Prepared for the CORE MPO by RS&H, adopted September 2009

The 2035 CORE Connections Framework Mobility Plan charts the course of transportation in Chatham County through 2035 and identifies "financially feasible projects to be completed during the planning timeframe. The CORE Connections – 2035 LRTP is the five year update of the Chatham County – Savannah region's previous long range transportation plan, adopted on September 22, 2004."

Regional trends reported by this plan include population and employment growth. Chatham County 2010 population was 265,128 according to 2010 Census data. The Comprehensive Plan projected Chatham population to be 284,531 in 2035. The study states that the majority of the county population resides in the City of Savannah, which had a population of 136,286 people in 2010, and was projected to have 176,717 residents by 2035. By 2035, the area to the west of and surrounding I-95 is projected to increase in density from two to eight persons per acre, which is the highest anticipated growth in the county.

From 1980 to 2005, Chatham County employment grew by 35 percent. County employment is projected to grow by 24.6 percent (approximately one percent annually) between 2010 and 2035. In 2006, most areas of the County had one to three jobs per acre. Downtown Savannah and areas surrounding the Port of Savannah had more than three jobs per acre with areas of 11 to 138 jobs per acre. Additionally, there are plans to expand the Port of Savannah and the Georgia Ports Authority is currently studying the feasibility of increasing the depth of the Savannah River channel. By 2035 some areas in downtown Savannah are projected to grow from four to ten jobs per acre, to 11 to 35 jobs per acre. Other areas are predicted to grow from 11 to 35 jobs per acre, to 36 to 138 jobs per acre. The SR 204 corridor is projected to remain steady at primarily one to three jobs per acre with specific areas of four to ten jobs per acre.

The plan reports that 22 percent of county workers live outside the county and the majority of these live in Effingham County (8 percent of the total) to the north or in Bryan County (5 percent of the total), which borders Chatham County to the west and south. Average commute times were 20 to 27 minutes from these counties. SR 204 provides an east-west connection between Bryan County and Chatham County.

The roadway projects recommended by the plan include five projects in the SR 204 Corridor shown in Table 3. All of these projects were reported by the study to have a potential impact on natural obstacles.

Table 3: SR 204 Corridor Projects in the Framework Mobility Plan

GDOT PI No.	Name	From/at	To	Type
522870 0008841	SR 204/Abercorn St at King George Blvd Operational Improvements (Project changed to interchange construction at SR204/King George Blvd pending revised concept approval)	King George Blvd		Operational
533200	SR 204/Abercorn St Bridge Replacement	At Harmon Canal		Bridge Replacement
532780	SR 204/Abercorn St Operational Improvements	At Largo Drive		Operational
0002922	SR 204/Abercorn St Truman Parkway Extension	W. of Forest River Bridge	N of Wilshire Boulevard	New Construction
550560	SR 204 SPUR/ Whitfield Avenue Widening	Haneys Creek (south of Montgomery Crossroad)	CR 767/ Ferguson Ave	Widening
0002921	Truman Parkway (Phase V) -New	Abercorn St	Whitfield Ave	New Construction

The plan also listed projects that were not in the GDOT Work Plan as a “vision plan.” The vision plan included improvements to the interchange of SR 204 with I-95 and the widening of SR 204/Fort Argyle Road west of I-95 to John Carter Road.

2.2.4 SR 204 Corridor Study

Prepared for GDOT by McGee Partners, Inc. and Jacobs, 2009

GDOT’s 2009 SR 204 Corridor Study is the predecessor to the current study. It was prepared for GDOT in 2009 and covered the study area along SR 204 from US 17 to Truman Parkway Phase V.

The purpose of the 2009 SR 204 Corridor Study was to “to determine necessary roadway improvements to address existing and future traffic needs for enhancing safety and improving traffic operations along the corridor.” The plan presented relevant existing and future conditions along the corridor.

In regard to existing conditions, the plan states that the intersections of SR 204 at King George Boulevard and Rio Road experience operational deficiencies during one or more weekday peak hours. Crash analysis determined that from 2002-2006 crash rates along the section of SR 204 from Forest River to Wilshire Boulevard were substantially higher than the statewide average due to heavy mainline traffic volumes, the number of signalized intersections, and frequent driveway access points. In regard to future conditions, the study projected that several key intersections (King George Boulevard, Rio Road, Apache Avenue, and Middleground Drive) would experience LOS F conditions with vehicle delays greater than 100 seconds by 2035.

Several alternative concepts were considered in the 2009 SR 204 Corridor Study to improve traffic conditions and safety. The alternatives considered for the concept included constructing turn lanes and improving signal timing (transportation demand management strategies) along the

corridor, adding an extra through lane in each direction on SR 204, implementing unconventional intersection designs at key intersections (continuous flow), and constructing various freeway/access road concepts (including a viaduct-style elevated freeway extending from Rio Road to Truman Parkway). From US 17 to Rio Road, four basic alternatives were developed:

- No-Build
- Transportation Demand Management (TDM)
- Widen from four to eight lanes with signalized intersections (A1 and B1)
- Widen from four to six lanes and provide a limited access freeway along the entire length of the project by eliminating all at-grade intersections. Various concepts were developed to provide access at King George Boulevard, Pine Grove Road, and Grove Point Road (C1, C2, C3a, and C3b)

From Rio Road to Truman Parkway Phase V, five basic alternatives were developed:

- No-Build
- Transportation Demand Management (TDM)
- Widen to eight lanes with either turn lane improvements at existing at-grade intersections (J1) or continuous flow intersections at critical locations (K1)
- Provide a six-lane freeway with grade separations and two-lane one-way access roads in both directions (Freeway/Access Road Alternates L1, L2n, L2s, L3, and L4)
- Extend Truman Parkway on a bridge viaduct above the median of SR 204 to the west of Rio Road (Truman Viaduct Alternates M1 and M2)

Evaluations of the different alternatives considered from US 17 to Rio Road and the different alternatives considered from Rio Road to Truman Parkway Phase V are included in Figure 3.

The preferred alternative in the 2009 SR 204 Corridor Study was identified through a process that evaluated traffic operations; environmental, community and property impacts; construction, right-of-way, and utility impacts; and input from the public and local government agencies. The plan proposed a preferred concept alternative that would convert SR 204 to a six-lane freeway from US 17 to Rio Road with interchanges at US 17, Pine Grove Road/King George Boulevard (split diamond), and Veterans Parkway. From Rio Road to the Truman Parkway Phase V, SR 204 would be converted to a six-lane, limited-access freeway with two-lane one-way access roads and U-Turn ramps with slip ramps connecting the freeway and access road system. East of the Truman Parkway, SR 204 would transition back to the existing six-lane typical section. The study proposed freeway overpasses at Rio Road, Middleground Road (north leg), and Mercy Boulevard. All other existing cross streets and driveways would be converted to right-in, right-out access only.

However, there was never a political consensus behind supporting the proposed project because of the large right-of-way impacts to the surrounding community and the lack of local connectivity. This lack of consensus resulted in the current study to re-investigate potential alternatives with more emphasis placed on context sensitive design.

Figure 3: Previous Study Evaluation of Alternatives
Evaluation of Alternatives US 17 to Rio Road

Alternative	2035 Traffic Operations	Safety (Crash Rate)	Meet Need & Purpose?	Impacts				Relocations		Cost			
				Wetlands (acres)	Steams (lin. feet)	Environ. Justice	Historic	Residential	Commercial	Construction	Right of Way	Total	
No Build Do Nothing	Undesirable	Worse	No	NO BUILD is Always Considered as an Alternative									
TSM Transportation Systems Management, Intersection & Signal Upgrades	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
A1 Eight-Lane w/Signalized Intersections	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
B1 Eight-Lane w/Signalized Intersections, "Continuous Flow Intersection" at King George	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
C1 Split Diamond Interchange at King George and Pine Grove	Desirable/Acceptable	Better	Yes	6.1	700	Not Significant	No Adverse Affect	14	4	\$115,000,000	\$47,000,000	\$162,000,000	
C2 Diamond Interchange at King George, Pine Grove Access to King George	Desirable/Acceptable	Better	Yes	ELIMINATED – Concerned With Congestion on SR 204 Mainline Due to Short Weaving Distance Between Veterans Parkway and King George Boulevard									
C3a Partial Cloverleaf Interchange at King George, Pine Grove Access to King George	Desirable/Acceptable	Better	Yes	7.2	250	Not Significant	No Adverse Affect	14	4	\$113,000,000	\$45,000,000	\$158,000,000	
C3b Partial Cloverleaf Interchange at King George, Pine Grove Access to US 17	Desirable/Acceptable	Better	Yes	8.0	300	Not Significant	No Adverse Affect	8	5	\$113,000,000	\$49,000,000	\$162,000,000	

Evaluation of Alternatives Rio Road to Truman Parkway Phase V

Alternative	2035 Traffic Operations	Safety (Crash Rate)	Meet Need & Purpose?	Impacts				Relocations		Cost			
				Wetlands (acres)	Steams (lin. feet)	Environ. Justice	Historic	Residential	Commercial	Construction	Right of Way	Total	
No Build Do Nothing	Undesirable	Worse	No	NO BUILD is Always Considered as an Alternative									
TSM Transportation Systems Management, Intersection & Signal Upgrades	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
J1 Eight-Lane w/Signalized Intersections	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
K1 Eight-Lane w/Signalized Intersections, "Continuous Flow Intersection" at Middleground	Undesirable	Worse	No	ELIMINATED – Undesirable Operations & Increased Crash Rates									
L1 Freeway/Frontage Roads, (Bridges @ Rio, Middleground, Hospital, Largo, Truman)	Desirable/Acceptable	Better	Yes	ELIMINATED – Less Efficient than L2, Constructability Problems									
L2 North Freeway/Frontage Roads, (Bridges @ Rio, Middleground, Mercy, Truman)	Desirable/Acceptable	Better	Yes	2.1	170	Not Significant	N/A	4	42	\$120,000,000	\$252,000,000	\$372,000,000	
L2 South Freeway/Frontage Roads, (Bridges @ Rio, Middleground, Mercy, Truman)	Desirable/Acceptable	Better	Yes	6.1	840	Not Significant	N/A	26	44	\$123,000,000	\$281,000,000	\$404,000,000	
L3 Freeway/Frontage Roads, (Bridges @ Rio, Middleground, Truman)	Desirable/Acceptable	Better	Yes	ELIMINATED – Less Efficient & Less Desirable Access than L2									
L4 Freeway/Frontage Roads, (Bridges @ Rio, Middleground, Largo, Truman)	Desirable/Acceptable	Better	Yes	ELIMINATED – Less Efficient than L2 & Constructability Problems									
M1 Truman Viaduct (Rio to Truman)	Undesirable	Same	No	ELIMINATED – Undesirable Operations & High Cost				2	32	\$300,000,000	\$148,000,000	\$448,000,000	
M2 Truman Viaduct (Middleground to Truman), Freeway/Frontage Roads (Rio to Middleground)	Desirable/Acceptable	Better	Yes	ELIMINATED – Less Efficient than L2 & High Cost									

Source: SR 204 Corridor Study, McGee Partners, Inc. and Jacobs, 2009

As shown in Figure 3, the Truman Viaduct (Alternative M1) was eliminated due to undesirable operations and high cost. It is important to note that this was based on a “planning level” cost estimate and it assumed the viaduct would not be built over existing lanes, thus requiring an extensive amount of right-of-way. Also, the operations were worse because the analysis assumed no improvements to the existing at-grade intersections to achieve acceptable LOS. The current study recommends an alternative very similar to Alternative M1, but with elevated lanes over existing lanes to have less right-of-way impacts and with improvements to the at-grade intersections needed to achieve acceptable LOS.

As an additional sub-analysis, the SR 204 Improvements study was completed to further refine the concept and layout of the proposed interchange at SR 204 and King George Boulevard as well as adjacent intersections. Several alternative interchange configurations were examined including variations of a tight diamond, partial cloverleaf, single-point diamond, and diverging diamond interchange. Additionally, each alternative was examined with SR 204 as 4-lanes and 6-lanes to incorporate the proposed short-range and long-range widening projects. Based on the results of the traffic analysis, the proposed concept to convert SR 204 at King George Boulevard to a grade-separated partial cloverleaf interchange will provide the most benefit to traffic operations, reduce crash frequency and severity, and will increase mobility and minimize delay for both local and commuter vehicles traveling through the corridor.

Figure 4: 2009 SR 204 Corridor Study Preferred Alternative



2.2.5 Chatham County Interstate Needs Analysis and Prioritization Plan

Prepared for GDOT by JJG, August 2008

The Chatham County Interstate Needs Analysis and Prioritization Plan studied the existing Interstate network in the county and developed a “prioritized list of potential improvements to this system based on need.”

The plan recommended improvements to the interchange at I-95 with SR 204, as well as widening I-95 from six to eight lanes from US 17 in Bryan County to I-16. The plan describes SR 204 as “an important east-west arterial, serving as a primary access roadway for Bryan County and

Liberty County traffic traveling to and from the Savannah area. SR 204 also serves the rapidly growing southwest quadrant of Chatham County.” It describes the I-95 at SR 204 interchange as providing “the only Interstate access for southern Chatham County.”

The interchange improvements would “widen SR 204 to three lanes in each direction to the east of I-95 as well as add turn lanes at all intersections in order to accommodate anticipated traffic growth. The I-95 northbound and southbound ramp intersections would be improved to provide additional left turn lanes for vehicles exiting and entering the Interstate. Due to the currently close proximity of the Gateway Boulevard intersection to the I-95 northbound ramp, the intersection of SR 204 at Gateway Boulevard would be converted to a right-in right-out driveway and the full access intersection would be relocated approximately one-half mile to the east. The plan states that the “purpose of these interchange improvements is to accommodate growing traffic volumes, provide improved Interstate access, and maintain acceptable interchange operation.”

2.2.6 Transportation Development Plan

Prepared for the Chatham Area Transit Authority by Urbitran Associates, Inc, February 2008

The Transportation Development Plan (TDP) “provides a comprehensive review of the Chatham Area Transit Authority’s (CAT’s) operations and the demographics and attitudes of its users to analyze system strengths and opportunities for improvement in the next five years [and recommends] short and medium term improvements based on operating efficiencies, public interest, and market patterns.”

The plan reports that the Route 6 Crosstown bus operates along the SR 204 corridor from Montgomery Cross Road to US 17, and provides service to “areas adjacent to the Highway 204 corridor, including numerous shopping areas and Oglethorpe and Savannah Malls,” but does not provide service to downtown Savannah. The route “operates seven days a week, with 60 minute service on weekdays and Saturdays, and service every two hours on Sundays.”

In its evaluation, Route 6 ranked “in the bottom three on weekdays and Saturdays and in the bottom two on Sundays” in part because its productivity is “compromised by the lengthy segment on Route 204 west of Savannah Mall where no development exists.” Except for Wal-Mart on Montgomery Cross Road, there is minimal activity east of Hodgson Memorial Drive. Savannah Mall generates more activity on Route 6 than the Oglethorpe Mall.

The plan recommends the extension of Route 6 to Quacco Road to “provide residents with a new connection to Savannah’s south side, in particular to the Oglethorpe Mall area, without requiring a long trip to downtown and a transfer to routes to the south side.”

The Route 17 Silk Hope/Savannah Festival Center “provides service along the US 17/Ogeechee Road corridor.” This route operates daily with service once an hour on weekdays and Saturdays, and every two hours on Sundays.

In its evaluation, Route 17 was a “mid-level performer on weekdays and Saturdays, and ranked third highest on Sundays.” On weekdays, “the most used bus stops are located at Wal-Mart, inside the downtown loop, and at the Highland Woods Trailer Park on Quacco Road.”

The plan notes that Route 17 is a “productive route; however, it is also a long route. As such, any diversions off the route’s mainline add time to an already long trip for certain passengers.” Since “ridership to the detention center is limited,” the plan recommends that Route 17 “no longer serve the detention center, shifting this location to an extension of the 25 MLK Boulevard/West Lake Apartments service.”

2.2.7 Southwestern Chatham County Sector Plan

Prepared by the CORE MPO, November 2007

The Southwest Sector plan is intended as a “strategic template for decision-makers for high growth areas” that “focuses on sustainable growth and development integrated with an efficient and effective transportation system and supporting infrastructure.” The plan addresses land use and transportation needs in the area surrounding SR 204 north of I-95 in Chatham County.

In its crash analysis, the plan states that “For the intersections identified within the sector, the SR 204/Fort Argyle Road & CR 803/Old Highway 204 intersection is the most severe with an index of 30, placing this intersection as one of the 100 most severe in the County.” Of the eleven intersections with one or more crashes over the 2000-2004 period, six involved Ft. Argyle Road/SR 204. These were at Fort Argyle Road (10 crashes, including 1 fatality and 6 injuries), Middle Landing Road (7, 0, 4), Cape Fear Drive (3, 0, 2), Canvasback Drive (2, 0, 1), Bush Road (2, 0, 1), and Arkwright Lane (1, 0, 0).

The plan recommended widening SR 204 west of I-95 from two lanes to four lanes from Belford Spine Road north to John Carter Road, and to six lanes from Belford Spine Road to I-95.

It also recommended the construction of the following new facilities:

- Highgate Boulevard - from SR 204 to New Hampstead Parkway (4 lanes)
- New Hampstead Parkway - from SR 204 to Little Neck Road (4 lanes)
- Little Neck Road/Fort Argyle Road Connector – from SR 204 to Little Neck Road at Quacco Road connector (4 lanes)
- Belford Spine – from SR 204 to a potential new roadway (2 lanes)

2.2.8 Context Sensitive Design Manual

Prepared for the CORE MPO by Glattig Jackson, July 2007

The Context Sensitive Design Manual provides guidelines for the CORE MPO, which seeks to preserve trees (especially canopy trees), within Chatham County; to design and construct streets that include provisions for automobiles, bicycles, pedestrians and landscaping; and to implement a planning and design process that considers and provides for all of these uses.

The manual's design guidelines are based on road type and context. Within the corridor, SR 204 is considered an arterial in a suburban or rural context. The guidelines for these types of roadway are in Table 4. SR 204 already exceeds lane limit guidelines; however, other context sensitive guidelines can still enhance the design of the roadway.

Table 4: Context-Based Design Guidelines for SR 204

	Suburban Context	Rural Context
Lane Limits (No. of through lanes)	4	4
Right Turn Lane	No: Unless very heavy turning volume	
Median (width, raised / flushed)	Yes: raised medians/with trees. Left turn lane flush where applicable @ intersection. 20' maximum	No: for 2-lane section. Yes: Grass median 14' wide for 4-lane section
Lane Width (max)	11'	12'
Design Speed	45 mph	50 mph
Shoulder / Curb & Gutter	Curb & Gutter or shoulder where development does not face up on the street/road	Shoulder 5' to 6' paved (to be used as a bike lane)
Bike Lanes	5'	5' - 6' or paved shoulder.
On-street Parking	No	
Sidewalks	6' (where curb & gutter condition) No sidewalk in shoulder condition	No sidewalk. Off road trail: min 10' wide where appropriate
Intersection Spacing (Full intersection)	800'	
Trees	Where shoulder/bike lane: informal tree planting Where curb & gutter: street trees	Replace natural tree patterns
Mid-Block Crossing	Yes: At pedestrian and trail crossing location	
Traffic Calming Elements	Vertical and horizontal deflection in roadway alignment	
Block Size / Intersection	1200' max block size	N/A
Building Placement		N/A
Planting Strip / Amenity Zone	4' planting strip	N/A

2.2.9 Chatham County-Savannah Comprehensive Plan

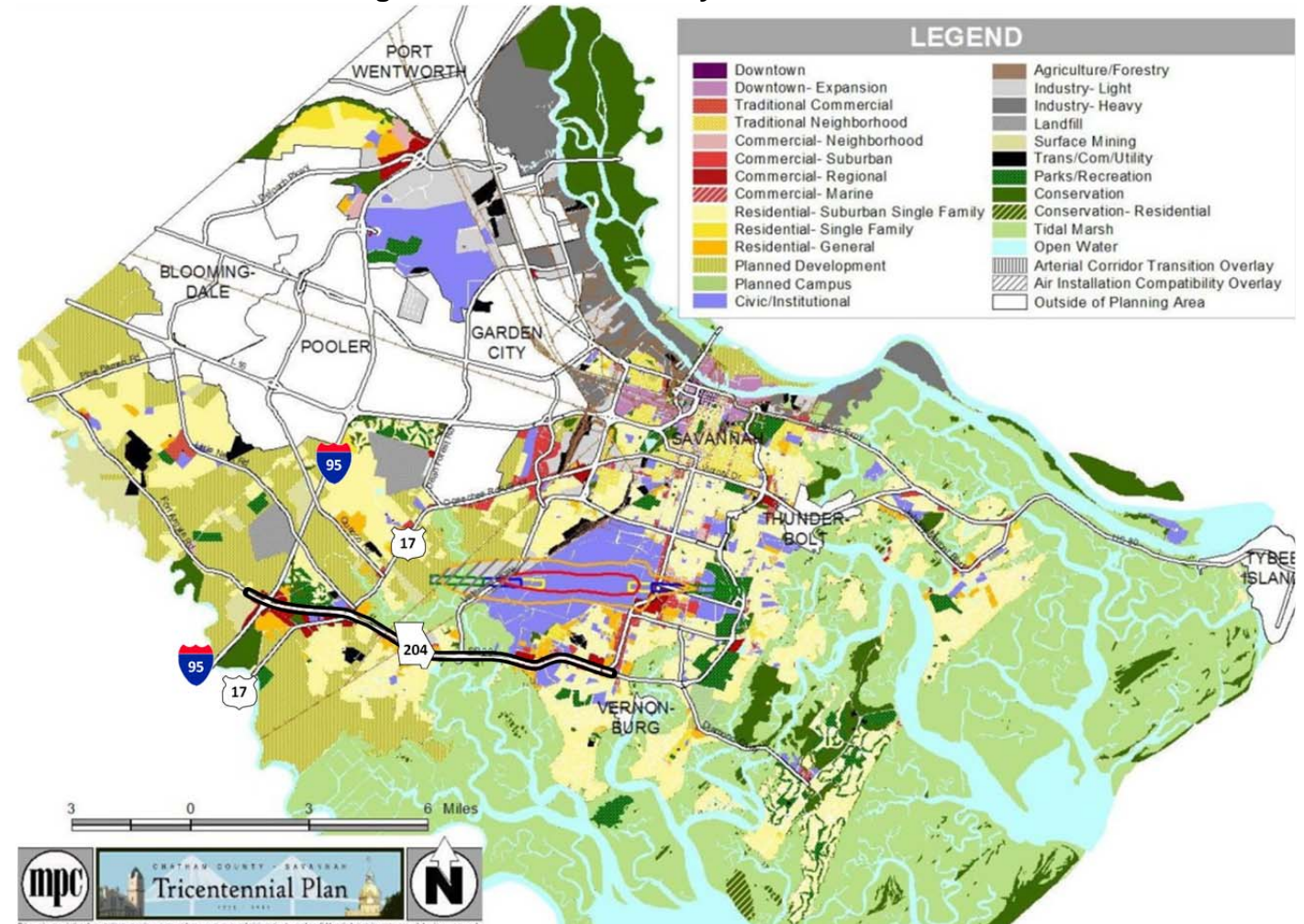
Prepared by the CORE MPO, Adopted November 2006

The Comprehensive Plan "is a policy document that has been designed to provide guidance for future development within the City of Savannah and unincorporated Chatham County."

The plan designates surrounding future land uses along SR 204 from I-95 to US 17 as primarily regional commercial, parks and conservation, and civic and institutional. From US 17 to Veterans Parkway, future land uses shift to single family, suburban to general residential, with continued commercial uses and some tidal marsh/open water. From Veterans Parkway to Rio Road, the land is occupied by tidal marsh and open water, but from Rio Road to the point at which SR 204 turns northward, land uses are primarily regional commercial and general residential, with some

civic and institutional uses (Armstrong Atlantic State University, St. Joseph's Hospital, etc.), and single family residential further offset from the roadway. These land uses can be seen in Figure 5.

Figure 5: Chatham County Future Land Uses



2.2.10 Congestion Management System Report

Prepared for the CORE MPO by Carter Burgess, January 2005

The purpose of the CORE MPO 2004 Congestion Management System Report was to "evaluate the conditions of the existing roadway network, prepare recommendations for congestion mitigation measures, and project the future conditions of the primary roads within Chatham County."

The study found several segments of SR 204/Abercorn Street were congested during peak hours. Four segments of SR 204 ranked in the top 20 most congested roadway segments in the study:

- The southbound segment from Veterans Parkway to King George Avenue ranked eighth with LOS D at midday and LOS F during the PM peak hour.
- The westbound segment from Apache Road to Rio Road ranked 13th with PM peak LOS F.
- The northbound segment from Private Drive to DeRenne Avenue ranked 18th with AM and PM LOS F and Midday LOS D.
- The segment of SR 204 from Pine Grove to King George Boulevard ranked 20th with AM and Midday LOS F and PM LOS E.

The study recommended the following improvements to SR 204, some of which have since been implemented and completed:

- I-95 to Gateway: Priority II - Operational at I-95, Coordinate signals between I-95 South ramp and Gateway
- Pine Grove Road to King George Boulevard: Priority II - Widen from four to six lanes from US 17 to King George Boulevard, add acceleration lane for eastbound rights, and widen King George Boulevard approach
- City Limit to Rio Road Priority IC - Widen from four to six lanes from Rio Road to Truman Parkway, Optimize from Rio Road to King George Boulevard (Complete)
- Rio Road to Apache Avenue: Priority IB – Operational improvements, Priority IC - Widen from Rio Road to Truman Parkway, Coordinate between Rio Road and King George Boulevard
- Apache Avenue to Science Drive: Priority IB - Operational, Priority IC - Widen from Rio Road to Truman Parkway, Coordinate between Rio Road and King George Boulevard
- Mercy Boulevard to Largo Drive Priority IB - Operational, Priority IC - Widen from four to six lanes from Rio Road to Truman Parkway (Complete)
- Television Circle to Montgomery Cross: Consider NB and SB right turn lanes and optimize signal, planned Truman extension may relieve some volume

2.2.11 Chatham County Bikeway Plan

Prepared by the CORE MPO, September 2000.

The Chatham County Bikeway Plan “updates the 1992 Bikeway Plan with several changes to the on-road bikeway system and incorporates select multiuse greenway corridors that may be suitable as bikeways.”

Currently, the Habersham Bikeway reported in the Bikeway inventory is the only existing bikeway that is near or relevant to SR 204 (crosses SR 204 at Largo Drive). In the Bikeway Corridor Ratings, existing bicycle travel conditions along the “Abercorn Extension Corridor” on SR 204 from Middleground Road to US 17 was determined to be among the “least suitable routes for comfortable bicycling in the County.” The “Quacco Road/Fort Argyle Corridor” on SR 204 from US

17 to Bush Road among the “suitable” options. The Chatham County Bikeway Plan has taken into consideration the need for bikeway improvements along the SR 204 corridor and developed some recommendations.

The Bikeway Plan proposes the following improvements along the study corridor:

- Improvements to State Route 204 and Quacco Road/Fort Argyle Corridor, which include paved shoulder sections along Quacco Road from Pine Barren Road to Bush Road/Canal Road (2.8 mile), Bush Road/Canal Road from Pine Barren Road to S&O Canal Right-of-way (0.5 mile), and S&O Canal Right-of-way (undeveloped) from Quacco Road to Bush Road (0.7 mile). These improvements would require re-routing due to the removal of the Quacco Road overpass at I-16. There is a corresponding roadway project in the LRTP for these improvements.
- Additional improvements to the Quacco Road / Fort Argyle Bikeway Corridor are recommended that are not covered in planned road projects and that do not have a corresponding roadway project in the LRTP. These improvements consist of the following designated bikeways: 4.9 miles of paved shoulder on Bush Road and Fort Argyle Road and 7 miles of paved shoulder on Bush Road, Fort Argyle Road and SR 204 between I-95 and US-17.
- Improvements to SR 204 Abercorn Extension, which includes the 4.4-mile paved shoulder section of the Abercorn Extension Bikeway from US 17 to Rio Road, and the 2.1-mile paved shoulder section of the Quacco Road/Fort Argyle Bikeway from I-95 to US 17. The Bikeway Plan acknowledges that alternatives to the paved shoulder design must be considered since part of this corridor is being planned as a freeway concept. There is a corresponding roadway project in the LRTP for these improvements.

3 Project Justification

The following section describes the need and project justification for the SR 204 improvements recommended in this study. This section includes a sub-set of information obtained in the SR 204 Corridor Study – Justification Report and Definition of Logical Termini document dated January 2013.

SR 204 is the primary arterial providing access to Downtown Savannah from south Chatham, Bryan, and Liberty Counties. The corridor is also a designated evacuation route for Savannah and the coastal region. SR 204 is not only a primary commuter route for outlying areas such as Georgetown and Richmond Hill, but also serves several residential communities, retail centers, office parks, as well as major destinations including Hunter Army Airfield, Armstrong University, St. Joseph’s Hospital and Savannah Mall. Because there is a lack of alternate routes due to wetlands and Hunter Army Airfield, traffic converges and creates heavy congestion along the corridor. In general, there is a need for improved connectivity and mobility in the area.

The proposed project would improve the capacity, operational and safety characteristics of SR 204, which serves as a connection between I-95 in western Chatham County to Downtown Savannah and to the islands located in eastern Chatham County. By providing limited access to downtown Savannah and the islands, the proposed project would increase capacity along SR 204 between Gateway Boulevard West and the eastern terminus of Wilshire Boulevard. The study segment of SR 204 experiences unacceptable levels of service (LOS E or F) at nine intersections under the existing conditions. It is anticipated that much of the corridor will operate at LOS F in future year 2035 if no improvements are implemented. The No-Build Option in the 2035 design year is expected to have thirteen intersections with unacceptable LOS and will experience excessive delays at currently-failing intersections.

Analysis of the existing and future No Build conditions shows that conditions are expected to worsen over time as traffic volume is predicted to grow. The anticipated growth in the project area will increase traffic congestion and create lengthy delays for commuter and local traffic traveling through the corridor. Existing congestion along SR 204 creates excessive delays to commuters during both the AM and PM peak hours. The central and eastern segments of the SR 204 study area have crash rates, injury rates and fatality rates that are above statewide averages. This demonstrates the need to reduce travel time along SR 204, reduce crash frequency, and improve connectivity in this region. Failure to address these needs will result in a decline in mobility and access along the corridor. In addition, it is important to maintain travel time reliability for users of the corridor, especially if tolling alternatives are considered for future improvements. The logical termini for the proposed project are at Gateway Boulevard West (western, west of I-95) and Truman Parkway Phase V (eastern). These points have been defined based on connections to planned improvements, significant changes in roadway characteristics and changes in surrounding land uses.

SR 204 is classified as an Urban Principal Arterial and has the following characteristics:

- A four-lane cross section at the western end and a six-lane cross section at the eastern end
- Low levels of pedestrian and bicycle activity along the corridor
- Some sidewalk facilities on the eastern end of the corridor
- Four current bus routes within the study area
- Traffic volumes from 11,700 vehicles per day (vpd) at the western terminus to 42,900 vpd at the eastern terminus
- High point traffic volume of 53,000 vpd between Veterans Parkway and Rio Road

The historic five-year, ten-year, and fifteen-year growth rates from GDOT count stations in the study area are all negative. The weighted historic average shows a 0.45% decline in traffic in recent years within the study area. This is typical across the country as traffic growth has slowed due to economic recession. However, this trend is not expected to continue and comparing CORE MPO E+C network 2035 travel demand model (existing plus committed) with the 2010 base year model indicates positive growth rates are expected for the SR 204 corridor in the future.

Relevant committed projects that were included in the 2035 model include a split diamond interchange at King George Boulevard/Pine Grove Road, improvements to the Middleground Road at SR 204 intersection, and the Truman Phase V Extension. As designed, the Truman Phase V Extension is configured to intersect SR 204 with a signalized intersection near Holland Drive. However, this configuration may create latent demand by being less desirable to some drivers who would avoid the corridor altogether and take a different route to their destination.

Due to the different characteristics along the corridor, two growth rates were calculated along SR 204, one east of Veterans Parkway and one west of Veterans Parkway. A growth rate of 1.67% was calculated west of Veterans Parkway along SR 204. East of Veterans Parkway had a much lower growth rate of 0.33% because of the existing configuration’s capacity constraints.

Because a decline in traffic is not expected to continue in the future, the growth rates obtained from the model were used in the future analysis. For the alternatives considered, the CORE MPO 2035 travel demand model was modified to reflect the proposed roadway improvements. This modification allows the model to predict changes in travel patterns that occur as a result of the improvement. The addition of each build alternative to the CORE MPO 2035 travel demand model resulted in an increase of through traffic using SR 204. This is caused by latent demand that is drawn to the corridor by the increased desirability of the improvements. Existing, Future Build and No Build volumes were submitted to GDOT Office of Planning and approved on August 16, 2011.

Crash rates and injury rates for the segment of SR 204 between Gateway Boulevard West and US 17 have typically been close to the statewide average for similar type roadways in 2007 and 2008, with slightly higher rates in 2006. Crash rates along two of the three study segments are higher than statewide averages:

- A significant percentage of collisions along SR 204 from US 17 to Rio Road are rear ends, which are typically associated with congestion. Reduced congestion as a result of the proposed project is expected to improve safety along this segment.
- The combination of high traffic volumes and numerous at-grade intersections and driveways along SR 204 east of Rio Road causes crash rates to remain significantly above the statewide average for similar roadway types. Safety along SR 204 would be improved by the proposed replacement of at-grade intersections with grade separated interchanges. In addition, reducing the curb-cuts would further increase safety and operational characteristics along SR 204.

The study segment of SR 204 experiences unacceptable levels of service (LOS E or F) at nine intersections under the existing (2010) conditions. It is anticipated that much of the corridor will operate at LOS F in future year 2035 if no improvements are implemented. The No-Build Option in the 2035 design year is expected to have thirteen intersections with unacceptable LOS and will experience excessive delays at currently failing intersections.

The greater Chatham County region is projected to experience stronger future employment growth than population growth, which indicates that the area will retain its role as the economic center of its region. SR 204 currently serves commuter traffic from Richmond Hill, Liberty County, and western Chatham County, which flows into and back out of job centers in the county, as well as local traffic, which seeks access to the corridor's many businesses, and the Hunter Army Air Field. All alternatives should consider this dual role of the corridor, just as they should consider the potential impacts they may have on the Environmental Justice populations who reside along the corridor.

The SR 204 corridor has large amounts of commercial development adjacent to the roadway, areas containing tidal marsh and open water, and nearby residential zones. All of these factors contribute to a high level of sensitivity regarding future development. Any changes made to the corridor can have both positive and negative impacts on the surrounding business, residents, and environment. Specific areas of high sensitivity include the dense commercial development along the eastern segment and the tidal marsh/open water along the central segment. All alternatives considered should take close consideration as to what kind of impacts it would have on the surrounding land uses.

Transit service is currently provided on the corridor by bus service operated by Chatham Area Transit (CAT). Currently four bus routes serve SR 204 within the project area. Bus Route 6 (Crosstown) has stops along SR 204 between King George Boulevard and Middleground Road, including Savannah Mall. Bus Route 17 (Silk Hope) serves bus stops on US 17 within the study area. Bus Route 14 (Abercorn) has stops along SR 204 between Savannah Mall and historic downtown Savannah. Bus Route 114 (Abercorn Express) serves bus stops at Oglethorpe Mall and Savannah Mall. The same safety concerns noted for pedestrians along the corridor apply to transit users. Additionally, because the only transit along SR 204 is bus service, it is important to provide reliable travel times for the buses. As congestion increases along SR 204 the reliability of the bus service will have an associated decline during peak periods. By providing a more reliable

travel time, the transit service contributes to providing an efficient transportation system that emphasizes moving people rather than vehicles.

3.1 Logical Termini

The FHWA defines logical termini for project development as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. The termini of a proposed project will be of sufficient length to address the problems of congestion and safety along the corridor of SR 204 from Gateway Boulevard West to south of Wilshire Drive.

3.1.1 Proposed Termini

This SR 204 project corridor begins at Gateway Boulevard West and ends south of Wilshire Drive and has logical termini. The proposed project begins at Gateway Boulevard West which is a north/south two lane road that provides access to multiple businesses. The proposed project then ends just south of Wilshire Drive, where it will tie into the Truman Parkway Phase V Project. Within the proposed termini there is a GDOT preferred alternative in the central segment from US 17 to Rio Road. West of the GDOT preferred alternative (Gateway Boulevard West to US 17) SR 204 provides a connection to I-95 as well as local developments. East of the GDOT preferred alternative (Rio Road to Truman Parkway) there is dense commercial development and many nearby residential uses. Traffic is already heavy within this region and is expected to get worse with the completion of Truman Parkway Phase V.

From Gateway Boulevard West to US 17 surrounding the interchange at I-95 (a 0.3-mile segment), SR 204 is a four-lane median-divided facility with typical rural shoulders between Gateway Boulevard West and Gateway Boulevard South. From Gateway Boulevard South to US 17 (a 1.9-mile segment), SR 204 is a partially limited-access facility providing four travel lanes divided by a concrete median barrier. Commercial land uses surround the interchange at I-95, while land use near US 17 is typically residential.

From US 17 to Rio Road (a 4.4-mile segment), SR 204 continues the characteristics of the western segment, with four travel lanes, a concrete median and paved shoulders. Land uses along this segment include large single-family subdivisions, multi-family residences and undevelopable tidal marsh. Significant focus has been placed on this segment due to the existing traffic congestion surrounding the intersection of SR 204 and King George Boulevard. The GDOT has approved an alternative for improving this section of SR 204.

Rio Road is another logical breakpoint because the surrounding land uses along the corridor transition from generally lower density west of the intersection to higher density east of the intersection. The current characteristics of the roadway also change at this intersection, with partially limited access to the west and driveway access allowed on SR 204 to the east. From Rio Road to the planned Truman Parkway extension (approximately 2.4 miles), SR 204 provides six travel lanes divided by an 18-foot raised median, curb and gutter, and intermittent sidewalks.

Driveway access is allowed by permit between Rio Road and Holland Drive. Truman Parkway Phase V is planned to tie into SR 204 just south of Wilshire Boulevard.

The proposed termini will mean that the proposed project includes the access points to major traffic generators such as I-95, US 17, King George Boulevard, Veterans Parkway, Middleground Road, Largo Drive and Truman Parkway. The project is intended to improve connectivity between all of the different land uses and provide enhanced mobility for the different trip types that are on the SR 204 corridor. The proposed logical termini were selected because they encompass the length of SR 204 in need for improved connectivity, mobility, and access between these identified major generators and along SR 204. Additionally, mobility along SR 204 has special significance because SR 204 is a major commuter route, has a hospital, university, and military base along the corridor, and is a designated hurricane evacuation route.

Western Terminus:

The western terminus of the proposed project will be located at the intersection of SR 204 and Gateway Boulevard West, approximately 0.13 miles west of the southbound ramps for I-95. Traffic volumes drop significantly on SR 204 west of I-95 (from 25,600 vpd to 12,600 vpd). The proposed terminus location also marks the point at which the road classification changes from an Urban Principal Arterial to a Rural Major Collector. East of the terminus intersection, SR 204 is a divided four-lane arterial. SR 204 reduces to two lanes with no median immediately west of Gateway Drive West

Minimal development exists along SR 204 west of I-95. Traffic generators in the vicinity of the intersection primarily include hotels, gas stations, and restaurants. However, the 1,500 home New Hampstead community and other developments are in planning stages. Residents of these developments would likely use SR 204 as a commuter route.

I-95 is located just east of this terminus point, within the study area. I-95 serves as a major traffic destination for the corridor, and SR 204 serves as a connection between this key route and downtown Savannah.

Eastern Terminus:

The eastern terminus at the proposed Truman Parkway Phase V (south of Wilshire Blvd. near Holland Drive) is appropriate because the proposed project would then connect to a freeway-type facility with four lanes. The proposed project would connect to Truman Parkway Phase V with a continuously elevated four-lane freeway above the existing geometry from Rio Road to the Truman Parkway Extension. From Truman Parkway, traffic operations would be improved as vehicles could continue on the freeway (still two lanes in each direction at this point) rather than meeting SR 204 at an at-grade intersection. Additionally, the direct freeway connection would attract some of the trips that would otherwise use SR 204 to points north/east of the study area. Traffic volumes are expected to drop along SR 204 northeast of the Truman Parkway connection once the Truman Parkway project is completed. The connection with Truman Parkway is expected to provide connectivity and improved mobility by allowing commuter trips to bypass the at-grade intersections while still providing access to local trips. The project achieves the balance

of mobility and access without causing major impacts to existing developments. The project would also aid in the functionality of the corridor serving as a hurricane evacuation route and also servicing St. Joseph's Hospital.

3.1.2 Independent Utility

The proposed project has independent utility because it provides needed capacity and safety improvements within the existing corridor. The existing traffic volumes along the study corridor contribute to heavy levels of congestion and crash rates that exceed statewide averages in several locations. Congestion on the central and eastern segments have adverse impacts on all modes (vehicles, pedestrians, bikes, etc.) and affect residents, commuters and business owners that depend on the corridor. Improvements are needed along this corridor to reduce travel times and enhance safety for local travel as well as for through-trips.

Crash, injury, and fatality rates are above the statewide averages for the segment of the study corridor east of Gateway Boulevard East. The segment west of Gateway Boulevard East is currently below statewide averages but growing traffic volumes increase from projected growth raise concerns about future conditions. The proposed project will evaluate different alternatives that would add capacity and provide safety improvements for all modes in this section of the SR 204 corridor.

Based on existing traffic volumes, the SR 204 corridor already experiences significant delay during the weekday peak hours. These delays are expected to worsen based on future projected traffic volumes. Currently, the SR 204 corridor has multiple intersections operating at a LOS F. The proposed project alternative would be focused on minimizing the corridor delays along the SR 204 corridor thus improving LOS and promoting and providing for future growth.

3.1.3 Consideration of Other Reasonably Foreseeable Improvements

The proposed project would be coordinated with all other proposed improvements in the project area. The proposed project would not preclude any alternatives for other reasonable foreseeable improvements, nor cause the need for additional improvements in the proposed project area. There will be close coordination with the project NHS-0002-00(921), P.I. # 0002921 to provide connection to Truman Parkway Phase V. Also, project NH-111-1(24), P.I. #:522870, 0008840 to widen SR 204 from Rio Road to King George Boulevard will be incorporated into the proposed project. It is possible for logical termini to change based on other improvements.

4 Public Involvement

Public involvement has been an essential component of the SR 204 Corridor Study and occurred throughout the process. Public participation within the study sought to promote public awareness of the study and provide forums at which the public could participate actively with the study. The public involvement goals of the SR 204 Corridor Study were to:

- Inform the public and associated agencies of the purpose and progress of the SR 204 Corridor Study;
- Provide a forum for the public and partnering agencies to communicate their perceptions, opinions and ideas throughout the entire course of the planning process; and,
- Promote communication and integration of public input into the study, which is critical to building consensus for the conclusions and recommendations of the study.

4.1 Communications

At the onset of the study, a project logo was created by the consultant and approved by the MPC in order to provide an identity for the 204 Corridor Study to resonate with the public. This logo, shown below, was used consistently on all presentations, documents, fact sheets, and other published project information.



A project website was developed at the beginning of the project and has been maintained throughout the project completion. The website provided updates on the status of the project, gave avenues for feedback from the public, and housed documents and plans related to the study.

In order to inform the public and relevant agencies of the purpose and progress of the SR 204 Corridor Study, project Fact Sheets were developed and maintained throughout the study. These Fact Sheets presented the project purpose, schedule and goals, as well as updates and findings. The most recent Fact Sheet is included in Appendix A.

4.2 Meetings

Over the life of the study, the MPO staff and consultant team met with the community, stakeholders, elected officials, and other interested parties on a regular basis as a primary means of public involvement and awareness. In addition to the regularly scheduled meetings determined

at the beginning of the study – such as regular Stakeholder Committee meetings and Public Meetings – others were added on an as-needed basis.

A summary of the meetings held during the course of the study is shown below in Table 5. This table includes meetings with GDOT and other state or federal agencies.

Table 5: Summary of Meetings

	Public	Stakeholder Committee	Stakeholder - Individual/Small Group Meetings							Elected & Appointed Officials			GDOT	SRTA	
			Business Focus Group	AASU	St. Joseph's Hospital	Savannah Mall	Hunter Army Airfield	Neighborhoods	Concerned Citizens	City Council/County Commission	MPO Board	State Elected Officials			Federal Elected Officials
Initiating the Study															
2010	August														✓
	September	✓	✓	✓	✓		✓	✓	✓						
	November			✓				✓	✓		✓				
Identification of Three Alternatives															
2011	February										✓				
	June				✓							✓	✓		
	August				✓									✓	
	September	✓	✓							✓					
	October			✓	✓	✓				✓					
December											✓	✓			
Preferred Alternative															
2012	April					✓									
	June														
	October				✓	✓	✓			✓	✓	✓		✓	✓
	November	✓	✓		✓										

Outreach was continual throughout the process but was emphasized at three main points in the study:

- *Initiating the study* – To share the study goals and obtain initial input from the local community regarding traffic/transportation issues along the corridor.
- *Identification of three alternatives* – To share a minimum of three alternatives for improving conditions along the corridor that satisfy the need and purpose for the project for public comment.
- *Preferred alternative*– To present a preferred alternative for community support and refinement.

For each of these three key milestones, meetings were held with the Stakeholder Committee, the public and key stakeholders.

- All public meetings were held at the Armstrong Center, which is a well-known meeting facility located on SR 204 within the study area. All public meetings were advertised in the Savannah Morning News and posted on the project website. In addition, roadside signs were placed in multiple locations throughout the corridor at least two weeks prior to public meeting dates.
- Stakeholder Committee meetings were held at various locations, including the Metropolitan Planning Commission, the Armstrong Center, and businesses in the corridor. The Stakeholder Committee included over 60 individuals, including representatives of the following:
 - Local Businesses: Savannah Tire, Grainger, Keller’s Holdings, Savannah Mall, JC Lewis, Carey Hilliard’s Restaurants, Jiffy Management, Parker’s Convenience Stores
 - Neighborhood Associations: Windsor Forest, Wilshire, Grove Point, Henderson, Holland Drive, Georgetown
 - Armstrong Atlantic State University (AASU)
 - Chatham County
 - City of Savannah
 - Georgia Department of Transportation (GDOT)
 - Hunter Army Airfield
 - Live Oak Library
 - Memorial Health
 - Savannah Bicycle Campaign
 - Savannah Chamber of Commerce
 - Savannah Chatham County Public School System
 - St. Joseph’s / Candler Health System

- Key stakeholder meetings were held at various locations, including the Metropolitan Planning Commission, the Armstrong Center, Armstrong Atlantic State University campus, St. Joseph’s Hospital, and businesses in the corridor.

Because the input from these meetings was treated as cumulative and informed the process along the way, the following narrative is primarily structured chronologically, rather than by meeting type.

Initiating the Study

The initial stakeholder and public meetings were held to obtain input from the local community regarding traffic/transportation issues along the corridor. Held on September 2, 2010, both meetings provided an overview of the study need, goals, and process. The public meeting was attended by 44 people. Meeting participants were then asked to provide feedback regarding their top issues and concerns. This was achieved through small group breakout sessions during the public meeting. Stakeholders and the public were also invited to complete comment cards. The detailed meeting summaries are located in Appendix A; highlights of the comments are shown below.

- Truman should have been realigned to Veterans Parkway, but it’s too late for that.
- We have limited access on Truman. This project is kind of an extension of the Truman. I think you can limit access to the corridor also. Between end of Truman and Veterans Hwy, maybe four exits including St. Joseph’s and AASW. Between Veterans and I-95, maybe limit to Rte 17 and one other.
- The SR 204 corridor is the main access from Fort Stewart and Bryan County commuters. For commuters, as well as those accessing commercial and residential uses, Forest River is a choke point. There is no other way into town from the west unless you drive up to SR 21 or I-16. The through trips don’t need access, but the local trips need lots of access. This makes developing the concepts for the corridor more challenging.
- The removal of “encumbrances” would have a negative effect on neighboring businesses. The roadway should respect its residential and commercial surroundings, as well as commuter needs.
- The roadway should provide for forms of transportation other than the automobile. The roadway should then include sidewalks, bicycle facilities, and other considerations of the safety and mobility of people using other modes of travel.
- This corridor is also a candidate for Bus Rapid Transit (BRT) service, although there are safety and transportation issues that would be involved in implementing BRT in this corridor
- The issue needs some of the best creative thinking – not just more lanes of pavement.

Identification of Three Alternatives

As the study progressed, many alternatives were developed and analyzed. During the second round of public outreach, emphasis was placed on sharing the top three alternatives with the public for feedback and comment. The stakeholder and public meetings were held on September 12, 2011. The public meeting was attended by 53 people. A comment form was developed to assess the community's response to each of these alternatives. In addition to asking about the preference for the alternatives presented, the comment form also asked questions regarding elements of context-sensitive design, and provided substantial opportunity for written comments. The detailed summary of the surveys can be found in Appendix A, but the highlights of the survey are shown below in Figures 6a, 6b, and 6c.

Note: The central section of the SR 204 corridor included in the study does not require substantial modification from current or programmed improvements. Therefore, preference for the central section alternatives was not included in the survey.

Figure 6a: Survey Summary Results

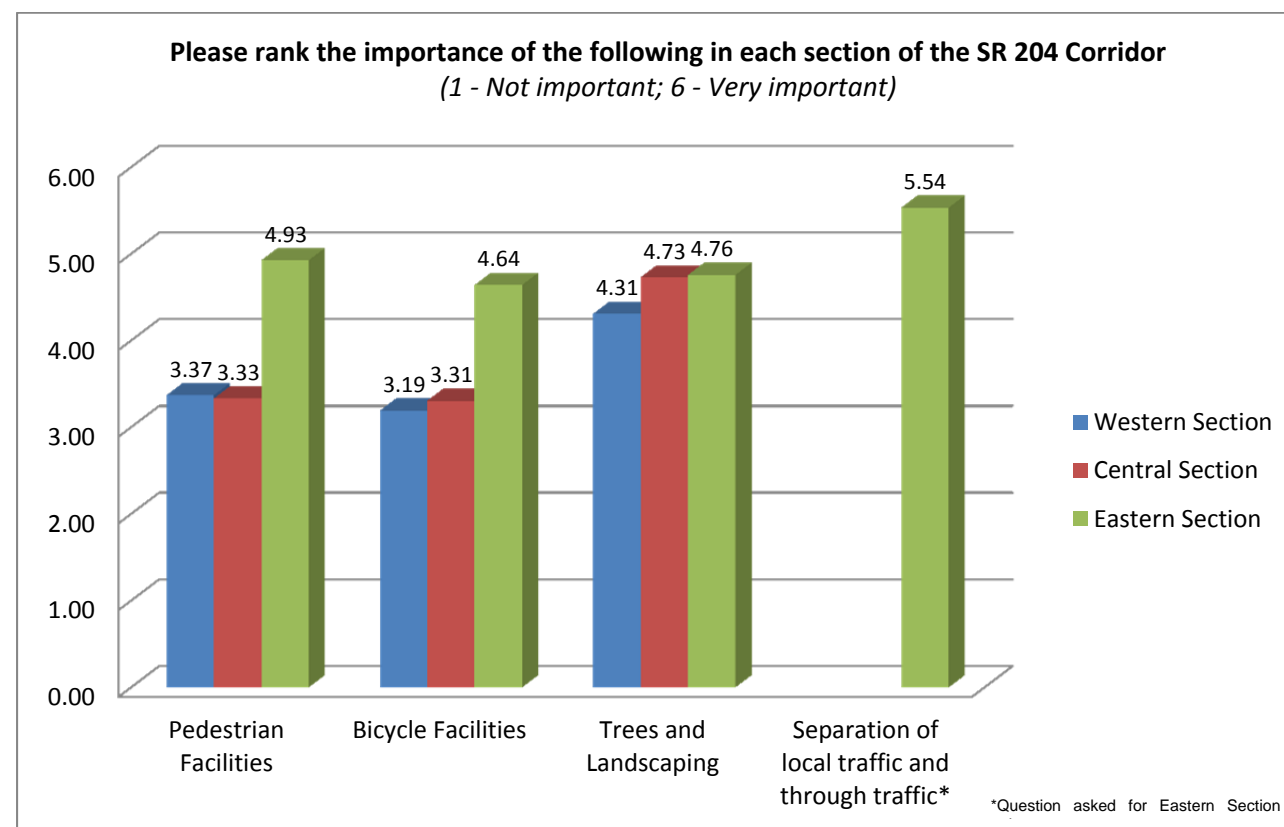


Figure 6b: Survey Summary Results

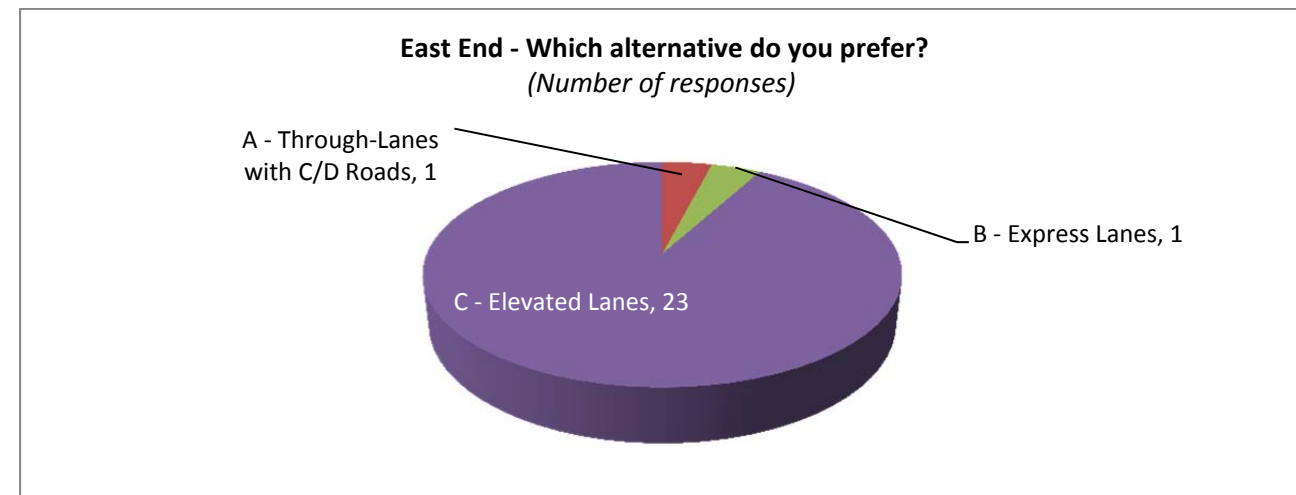
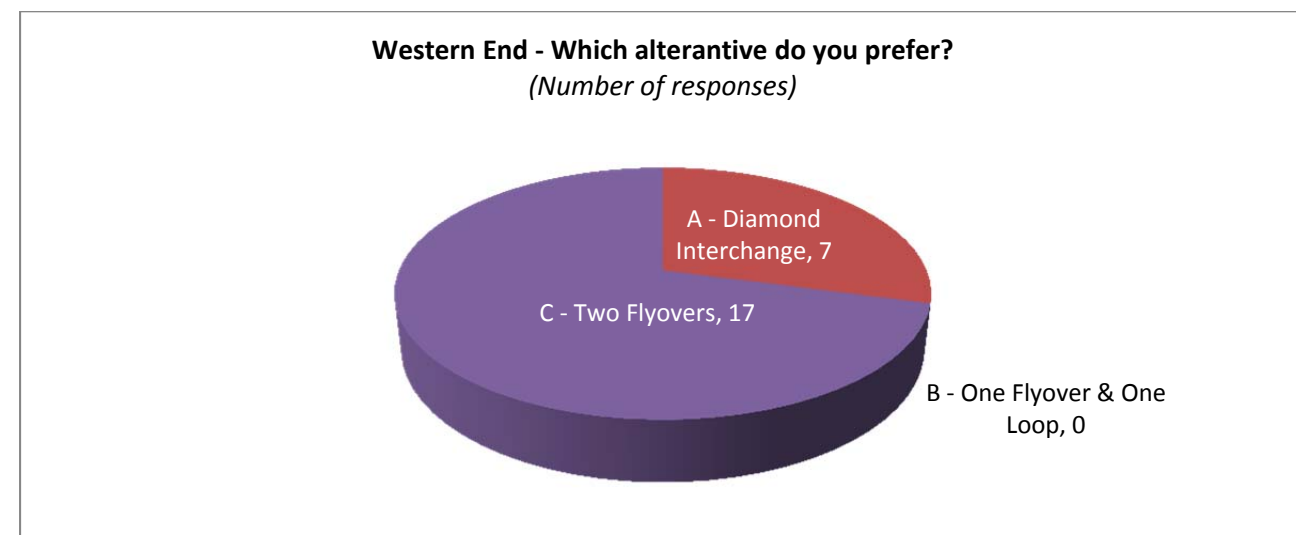


Figure 6c: Survey Summary Results



Preferred Alternative

Based on technical analysis of the top three alternatives and input from the community, the elevated lanes have been identified as the preferred alternative in the eastern section of the corridor. Two flyovers at Interstate 95 were identified as part of the preferred alternative for the western end of the corridor.

Due to the unique nature of the elevated lanes and the lack of familiarity with this concept in the Savannah area, a public outreach video was developed to share the study process as well as information about the elevated lanes. This video, which is approximately 14 minutes in length, addresses the project need, goals of the study, alternative selection process, and details about the elevated lanes, including the construction process. This video was a key component of the final

round of public and stakeholder meetings. During both meetings, the participants were encouraged to first view the video, then meet with representatives of the MPO and the consultant team for more detailed discussion and to ask any additional questions. The video was very well-received and the project team heard many people who viewed the video comment that the elevated lanes were not what they had envisioned. The video also aired on the public information channels for the City of Savannah and Chatham County.

The final stakeholder and public meeting were held on November 1, 2012. The public meeting was attended by 63 people. As with the other stakeholder and public meetings, attendees were invited to provide written comments. While only six written comment forms were received (see Appendix A), the overall feedback about the preferred alternative was very favorable. The project team also shared that the next phase of the study would include refinement of the alternative, an economic impact analysis, financing strategy, and a corridor vision plan to address the land use/transportation relationship. Many participants also favored the idea of looking at these considerations in more detail as the project progresses.

4.3 Major Stakeholders

The project team sought to include all businesses, residents, and institutions in the corridor during the corridor study. However, there are two institutions – Armstrong Atlantic State University (AASU) and St. Joseph’s Hospital – that have different issues, concerns, and needs regarding the corridor study. Due to the unique needs of these institutions and their importance in the Savannah community, the MPO staff and/or the project team had individual meetings with both institutions throughout the study, as shown below. These meetings were in addition to the Stakeholder Meetings, of which both institutions were also participants.

- AASU Meetings: 2010 – September; 2011 – June, August, October; 2012 – October
- St. Joseph’s Meetings: 2010 – September; 2011 – October; 2012 – April, October

Throughout the stakeholder process, both St. Joseph’s Hospital and AASU expressed concerns about the project and questioned if it was even needed.

Another major stakeholder in the corridor is Savannah Mall. The general manager participated in the early portion of the study. Due to changes in personnel, the new general manager was unaware of the study and therefore met individually with the MPO staff and project team towards the conclusion of the study.

4.4 GDOT/FHWA and MPO Coordination Meetings

The study team recognized that regular communication with agencies at the state and federal level was in the best interest of the project. Therefore, the study team, including the MPC Project Manager, attended coordination meetings in Atlanta with GDOT and Federal Highway

Administration (FHWA) staff to discuss the project. These meetings supported the progress of the study by providing a venue for guidance and comment by GDOT and FHWA.

Coordination with the sponsoring agency and its relevant committee members was also at the forefront of the SR 204 Corridor Study. Updates on the study were provided on a regular basis. At the conclusion of the study, the MPO Policy Committee adopted a resolution in support of the preferred alternative.

5 Existing Conditions

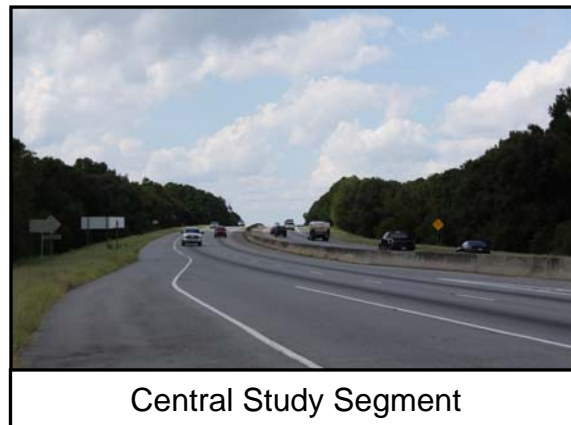
The corridor study area has been broken into three logical roadway segments based on roadway characteristics and previous planning efforts.

The western segment spans from Gateway Boulevard West to US 17. Surrounding the interchange at I-95 (a 0.3-mile segment), SR 204 is a four lane median-divided facility with typical rural shoulders between Gateway Boulevard West and Gateway Boulevard South. From Gateway Boulevard South to US 17 (a 1.9-mile segment), SR 204 is a partially limited access facility providing four travel lanes divided by a concrete median barrier. Commercial land uses surround the interchange at I-95, while land use near US 17 is typically residential.



Western Study Segment

The central study segment spans from US 17 to Rio Road. This 4.4-mile has four travel lanes, a concrete median and paved shoulders. Land uses along this segment include large single-family subdivisions, multi-family residences and undevelopable tidal marsh. There are also small pockets of commercial and industrial land uses at the Pine Grove Road and King George Boulevard intersections. Significant focus has been placed on this segment due to the existing traffic congestion surrounding the intersection of SR 204 and King George Boulevard. GDOT has approved an alternative for improving the central study segment, which will be discussed in further detail in later sections.



Central Study Segment

Rio Road is another logical breakpoint because the surrounding land uses along the corridor transition from generally lower density west of the intersection to higher density east of the intersection. The current characteristics of the roadway also change at this intersection, with partially limited access to the west and driveway access allowed on SR 204 to the east.



Eastern Study Segment

The eastern segment from Rio Road to Holland Drive (approximately 2.4 miles), SR 204 provides six travel lanes divided by an 18-foot wide raised median, outside

curb and gutter, and intermittent sidewalks. Driveway access is allowed by permit between Rio Road and Holland Drive. Truman Parkway Phase V is planned to tie into SR 204 just south of Wilshire Boulevard.

The study corridor spans portions of unincorporated Chatham County as well as the City of Savannah east of the Little Ogeechee River. As discussed in the individual segments, the overall project area is characterized by a mix of commercial and residential land uses. East of Rio Road, the land use transitions to dense office, institutional, commercial development, and multi-family residences. Commercial land uses and the density of development decreases further west of Savannah, where large single family subdivisions are prevalent between US 17 and Rio Road. Noteworthy destinations along SR 204 include Savannah Mall, Armstrong Atlantic State University, St. Joseph's Hospital, and Hunter Army Air Field. The majority of the remaining undeveloped land along the east and west sides of the Little Ogeechee River is comprised of undevelopable tidal marsh.

SR 204 is classified as a Rural Major Collector west of Gateway Boulevard South and classified as Urban Principal Arterial east of Gateway Boulevard South. It provides east/west connectivity for a large amount of traffic volume because no nearby parallel facilities exist. Based on approved traffic flow diagrams, the average annual daily traffic (AADT) volumes range from a low of approximately 11,700 vehicles per day (vpd) west of I-95 to a high of approximately 53,000 vpd east of Veterans Parkway. The east/west connectivity provided by the route produces a considerable amount of through traffic volume within the study limits.

A portion of SR 204 east and west of the Little Ogeechee River (Forest River) is designated as a "scenic vista" and protection of this designation was taken into account in the alternative development process. SR 204 is also one of four designated hurricane evacuation routes in Chatham County. Despite the residential and commercial/retail land uses along SR 204, the facility does not include a continuous network of sidewalks and therefore limits pedestrian, transit and ADA accessibility.

The following roadways have intersections with SR 204 and comprise the study intersections for each of the three study segments:

Gateway Blvd West to US 17 (Western Segment)

- Gateway Boulevard West
- I-95 SB Ramps (signalized)
- I-95 NB Ramps (signalized)
- Gateway Boulevard South (signalized)

US 17 to Rio Road (Central Segment)

- US 17 EB Ramps (signalized)
- US 17 WB Ramps (signalized)
- Grove Point Road
- Pine Grove Road (signalized)

- King George Boulevard (signalized)
- Veterans Parkway

Rio Road to Tibet Avenue (Eastern Segment)

- Rio Road (signalized)
- West Mall Driveway
- Central Mall Driveway
- East Mall Driveway
- Apache Avenue (signalized)
- Middleground Road (signalized)
- Arts Drive (signalized)
- Mohawk Street
- Mercy Boulevard (signalized)
- Largo Drive (signalized)
- Idlewood Drive
- Deerfield Road (signalized)
- Holland Drive (signalized)
- Truman Parkway (signalized - Future only)
- White Bluff Connector (signalized - Future only)

The study segments and study intersections are shown in Figure 7 for the western segment, in Figure 8 for the central segment, and Figure 9 for the eastern segment.

5.1 Field Observations

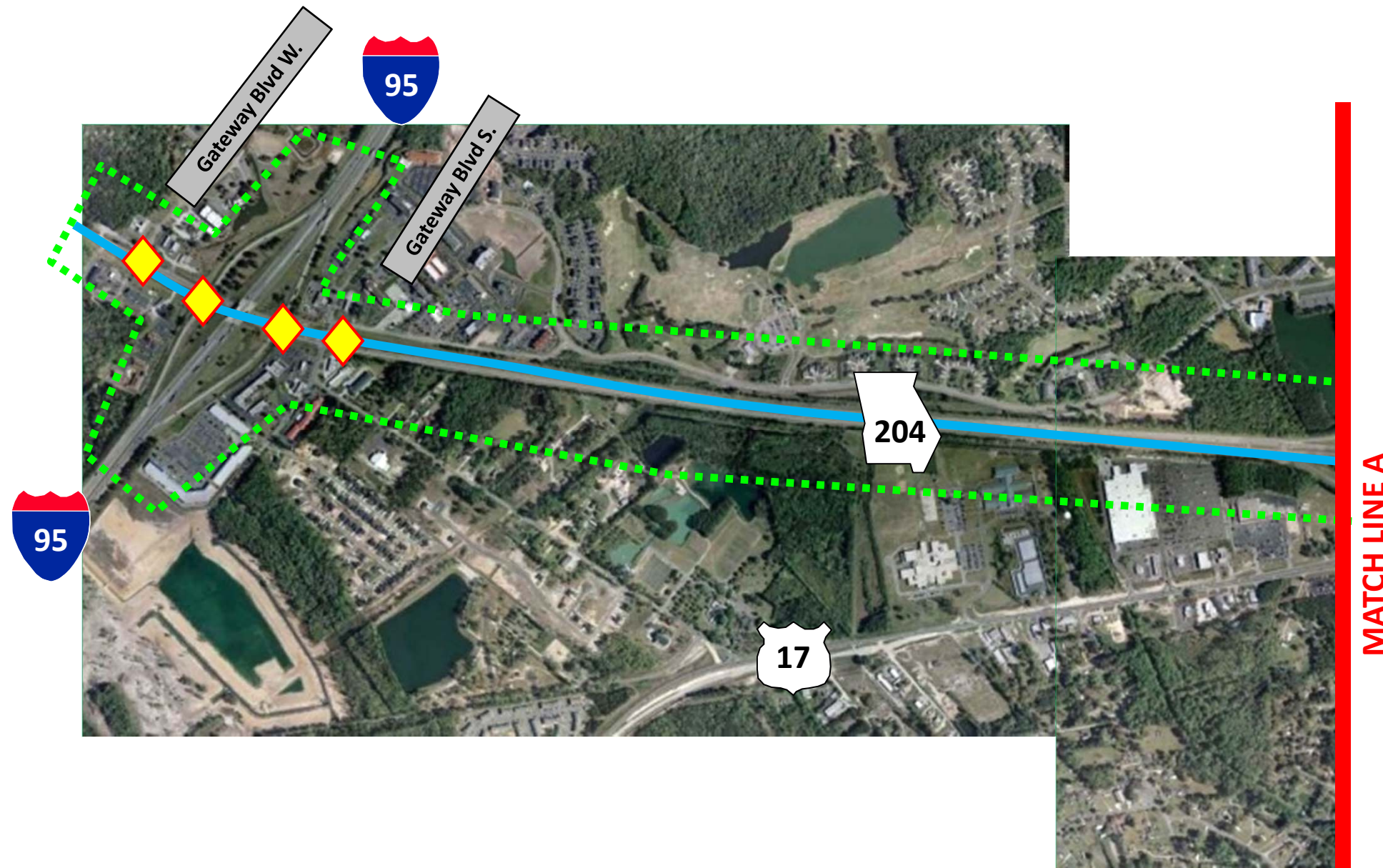
Based on field observations from August 2010, traffic congestion exists along the SR 204 corridor during the weekday peak hours. During the weekday morning peak hour, significant queuing was observed on eastbound SR 204 at Rio Road as well as minor queuing at King George Boulevard. Similarly, extremely long westbound SR 204 queues were observed at King George Boulevard during the weekday PM peak hour, at times backing through the interchange at Veterans Parkway. Additional queuing was also noted for westbound traffic at Rio Road in the PM peak hour due to a westbound lane reduction from six-lanes to four-lanes at this intersection. Though some congestion occurs through the eastern segment, efficient signal operations kept queues from forming along this section. Over the observation period, the PM peak hour was more severe than that of the AM peak period.

Travel time runs were performed from Gateway Boulevard West to Holland Drive during AM, midday and PM peak periods. During the AM peak period, travel times for the peak direction (eastbound) averaged almost 18 minutes, with an average travel speed of 30 mph. For the PM peak period, peak direction (westbound) trips took, on average, almost 20 minutes to complete at an average travel speed of 27 mph. Midday travel times were similar in both directions, averaging about 12.5 minutes, with traffic traveling an average speed of 37 mph.

Looking specifically at the most congested segments, the average westbound travel speeds between Veterans Parkway and Pine Grove Road in the PM peak period averaged 21 mph, as compared to the posted speed limit of 55 mph. This congestion is due to queues extending from King George Boulevard, the severity of which causes vehicles to sit through several signal cycles. The segment extending west of Rio Road to Veterans Parkway experienced the worst congestion in the AM peak, with average eastbound travel speeds of 31 mph. During the same period, the segment west of King George Boulevard experienced average eastbound travel speeds of 37 mph.

Non-motorized transportation was also assessed during field observations. Minimal pedestrian or bicycle traffic was observed along the corridor during any part of the day. The segment of the corridor surrounding the hospital, commercial areas and Armstrong Atlantic State University had some pedestrian activity. The existing roadway character of SR 204 does not lend itself to pedestrian or bicycle activity. However, this segment of the study corridor is characterized by a few disjointed sidewalk segments with limited connectivity and no bike lanes or pedestrian paths. Crosswalks are present at most intersections on this segment. The high traffic volumes and lack of adequate pedestrian facilities, especially for safely crossing the busy SR 204 corridor, likely contributes to the minimal pedestrian activity.

Figure 7: Study Area from Gateway Boulevard West to US 17 (Western Segment)



Legend

- SR 204
- Study Limits
- Study Intersections

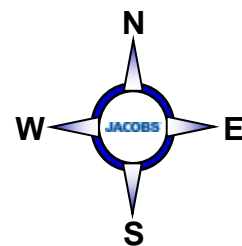
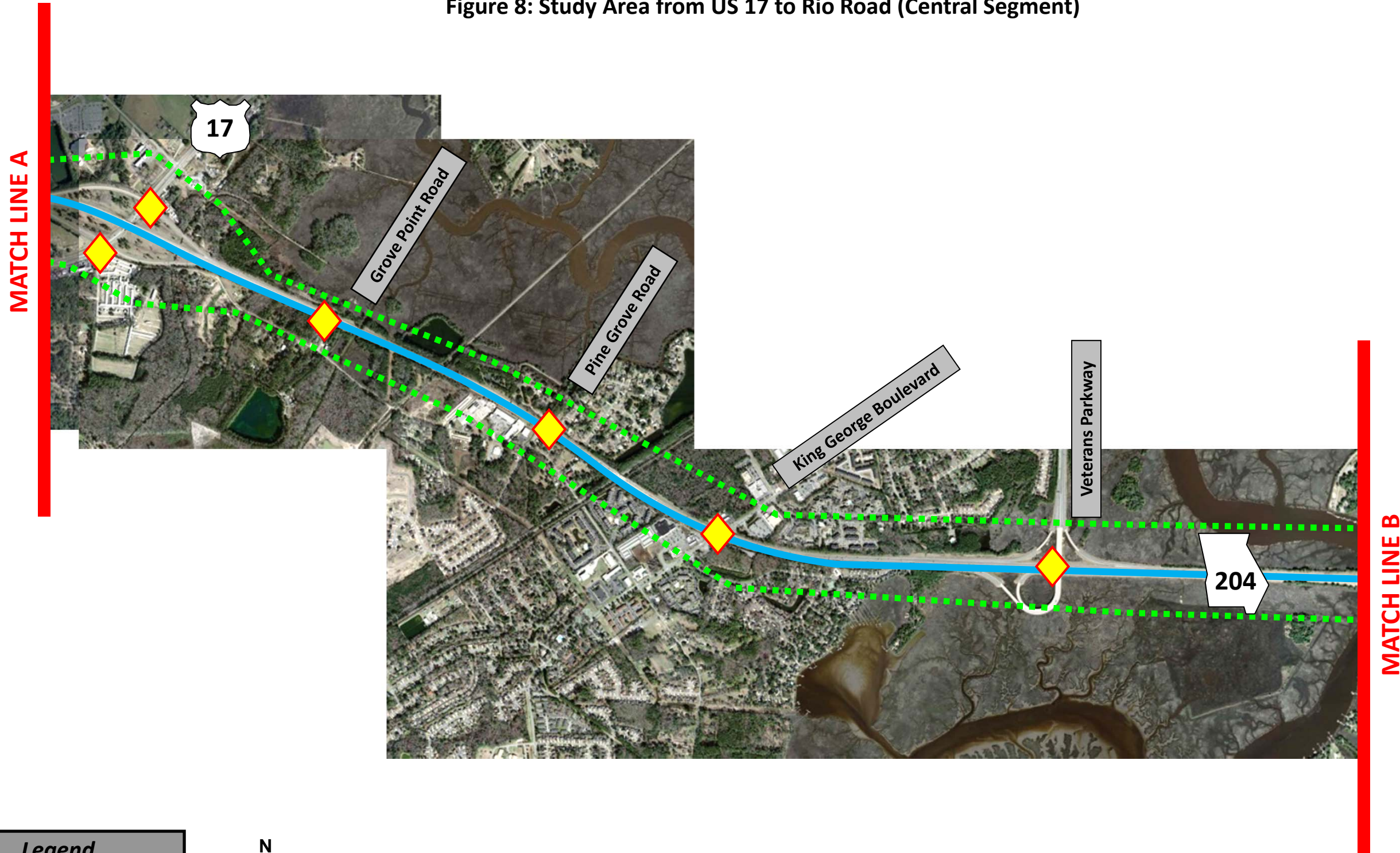


Figure 8: Study Area from US 17 to Rio Road (Central Segment)



Legend

- SR 204
- - - Study Limits
- ◆ Study Intersections

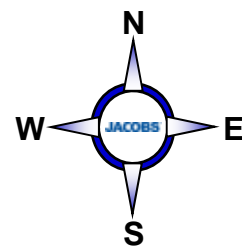
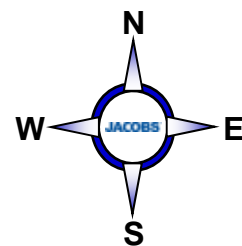


Figure 9: Study Area from Rio Road to White Bluff Connector(Eastern Segment)



Legend

- SR 204
- - - Study Limits
- - - Future Roads
- ◆ Study Intersections



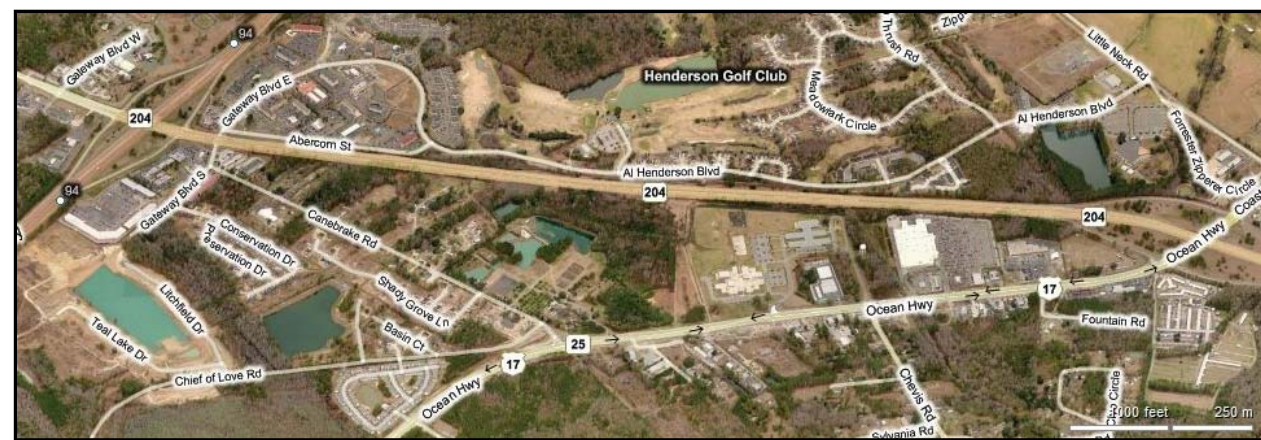
5.2 Land Use

The SR 204 corridor study area includes three major areas, each with different land use patterns and demands, thus reflecting the difference in alternative approaches for each segment. The following analysis is therefore provided for each segment. Each alternative will be defined in more detail in Section 7 of this report.

5.2.1 Western Segment

This section of the study area is located between I-95 and U.S. Highway 17. At the intersection of SR 204 and I-95, there is significant commercial development commonly associated with an interstate interchange, such as restaurants, hotels, and an outlet mall, catering largely to the travelling public along I-95. Moving eastward, the adjacent land uses are primarily buffer areas between SR 204 and residential development. Importantly, the developed areas adjacent to SR 204 in this segment are not accessed directly from SR 204. Henderson Golf Course and the associated residential development are located to the north of SR 204. The area to the south of SR 204 includes a mix of residential developments as well as two schools and local businesses. (Appendix B - *Existing Land Use Maps 1 & 2*). The development in this area is accessed primarily from U.S. 17. Canebrake Road also provides access between U.S. 17 and SR 204 via Gateway Blvd S. Essentially, development adjacent to SR 204 in the western segment ‘turns its back’ on the roadway.

Future land use in this segment remains primarily the same (Appendix B - *Future Land Use Maps 1 & 2*), with the exception of the southeast quadrant of SR 204 and I-95, discussed in more detail below.



Western Study Segment

The primary congestion concerns in this area are around the interchange and the signals at Gateway Boulevard. Significant developments are planned in southwest Chatham County, such as Belford and New Hampstead. Belford is a 735 acre planned unit development (PUD) located

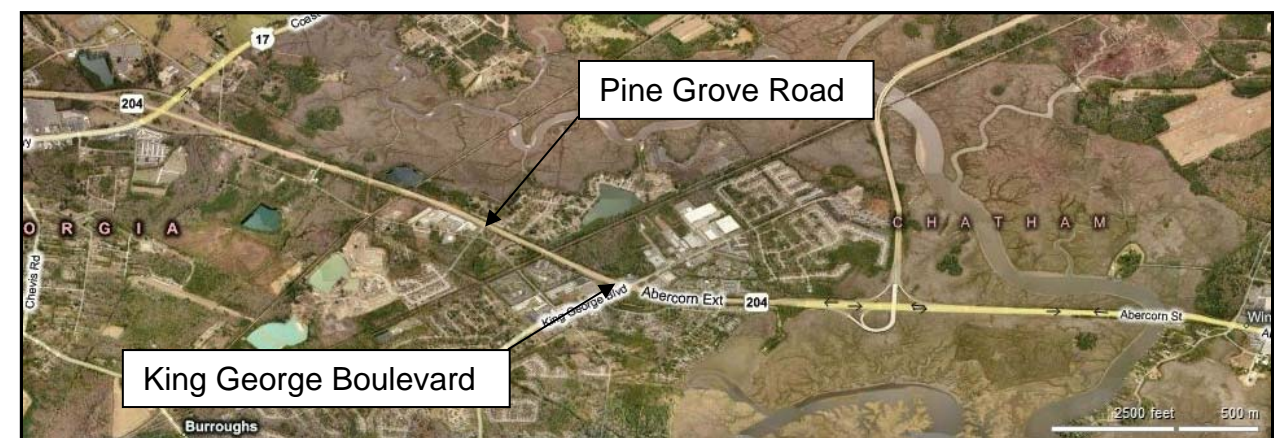
on SR 204 west of I-95. New Hampstead is an over 4,000 acre PUD located on SR 204 south of I-16. Both the Belford and New Hampstead developments are expected to add a significant amount of traffic onto SR 204 and have the potential to compound existing congestion and introduce a higher mix of local and regional traffic. Therefore, expediting movements safely on and off of I-95 is important for the preferred alternative.

From a land use and community perspective, improvements to this segment can also present opportunities to connect areas to the north of SR 204 with areas to the south of SR 204. This concern is particularly significant because there is a large residential development (Henderson), plus other residential areas, to the north of SR 204 and two public schools (Southwest Elementary and Southwest Middle) to the south of SR 204. Currently, no facilities allow children to walk or ride a bike to school. Additional connectivity could also increase multi-modal access between residences and businesses on both sides of SR 204.

An off-road, multi-purpose path should be considered for the majority of this segment, which is consistent with the corridor’s designation as a Bikeway Plan Network in 2000. Additional bike/pedestrian facilities, especially sidewalks, should also be considered in the commercial development at the I-95 interchange.

5.2.2 Central Segment

The central segment of the study area is located between U.S. Highway 17 and the Forest River. The southwest quadrant of the SR 204/Highway 17 interchange supports commercial development, but the other quadrants of this intersection are primarily residential. Moving eastward, the area is still predominately undeveloped, with some single-family residential and small-scale commercial. As shown in the aerial image below, development to the north of SR 204 is largely limited due to the marsh. There is a pocket of single family residential development accessed from Pine Grove Road, situated between the marsh and the rail line.



Central Study Segment

In contrast, King George Boulevard supports significant development, an area known as Georgetown. Georgetown is primarily residential, with some commercial development, primarily at the SR 204/King George Boulevard intersection. Moving beyond Georgetown to the east, SR 204 crosses the Forest River and adjacent marshlands. (Appendix B - *Existing Land Use Maps 3 – 6*).

The proposed future land use forecasts additional commercial development along the corridor, particularly between Grove Point Road and SR 204 as well as the interchange area of SR 204 and King George Boulevard. Areas of existing residential development are primarily forecasted to remain and expand on the south side of SR 204. (Appendix B - *Future Land Use Maps 3 – 6*).

There are two major intersections with SR 204 in this segment – U.S. Highway 17 and King George Boulevard, the former of which is already a diamond interchange. Slated improvements by GDOT at King George Boulevard will alleviate the major choke point in this segment of SR 204 by allowing free-flow movements for through traffic through a proposed interchange.

5.2.3 Eastern Segment

The eastern segment of SR 204 is the most heavily developed area in the corridor. Unlike the land uses in the central and western segments, land uses adjacent to SR 204 are primarily accessed from the main roadway, although some areas do have access roads. The two-mile area of the eastern segment includes primarily commercial and retail uses, including large regional retailers such as Savannah Mall and big box retailers such as Home Depot, Lowe’s, and Wal-Mart. In addition, there are two major institutional uses – Armstrong Atlantic State University (AASU) and St. Joseph’s Hospital. One of the primary gates to Hunter Army Airfield is accessed from Rio Road, which intersects SR 204 just east of the Forest River.



Eastern Study Segment

With the high number of retailers in this corridor, SR 204 supports many local as well as regional trips. In addition, there are more signalized intersections in this area (seven signalized between

the Forest River and the Truman Parkway) and numerous curb-cuts, so turning movements are frequent.

Although retail and commercial uses dominate the area directly adjacent to SR 204, the corridor also supports significant residential uses. Established neighborhoods (such as Wilshire, Windsor Forest, and Largo) are also major land uses in this area. Other smaller residential areas have developed, especially along the marsh. In addition to these single-family neighborhoods, there are also several areas of multi-family development. (Appendix B - *Existing Land Use Maps 6 – 8*). The future land use for the eastern segment of the corridor illustrates continuation of primarily regional commercial development directly along the corridor, with additional residential development behind the commercial areas (Appendix B - *Future Land Use Maps 6 – 8*).

The development patterns in this area are predominately suburban in character. Buildings are setback from the street with large parking lots between retailers and the road. Sidewalks are present in some areas, but a continuous sidewalk network does not exist. Worn footpaths along the side of the road demonstrate the need for sidewalks in many places where they do not currently exist. Bicycle facilities do not currently exist along the corridor.

Especially in light of the mix of land uses in this area, significant opportunities exist to improve the facilities for cyclists and pedestrians. While an off-road multi-use path is recommended for the central and western segments, the highly developed land uses in the eastern segment support the need for separate bike and pedestrian facilities. Sidewalks and an on-road bike lane are more in keeping with the character of this area. In addition, the real estate values in this area would make the additional right-of-way and buffers needed for an off-road multi-use path significantly more expensive.

The addition of bike and pedestrian facilities would also enhance transit opportunities. Transit relies not only on transit stops, but also the ability for people to safely and efficiently get to and from those transit locations.

5.2.4 Local and Regional Planning

Growth in western Chatham County has grown at a substantially higher rate than has other parts of the county. According to the Chatham County-Savannah Comprehensive Plan, the population in West Chatham is projected to increase by 73 percent by the year 2030. West Chatham is expected to experience much higher growth than other portions of the county that are at or near build-out already (East Chatham and the Savannah Area). Continued growth in the western portion of the county is expected to degrade the level of service provided by the existing transportation network.

In addition, the Chatham County-Savannah Comprehensive Plan states that commuting activity from adjacent counties (Bryan and Effingham) is one of the primary regional transportation issues facing Chatham County. Chatham County is a major regional economic and employment hub. Nearly all Chatham County residents work within the county limits, while a significant majority of

Bryan and Effingham residents commute to Chatham County for employment. The large commuter population poses capacity challenges for the regional roadway system, including interstates, US highways, and other major roads.

The CORE MPO conducted a 2030 needs assessment which modeled the travel demand for the entire metropolitan area as a system rather than on individual projects or corridors. Under a No-Build scenario, the model predicted that several roads would experience severe congestion in 2030, including portions of SR 204/Abercorn Extension. As a result of the 2030 needs assessment, CORE MPO developed a constrained long-range plan to address major deficiencies in the regional transportation system and identify funding sources to implement the various recommended projects. The long-range plan establishes priorities for roadway projects based on the current funding status of all projects included in the plan. Projects which have received at least partial funding commitments were identified as short-range and given Priority I status. Projects without a funding commitment were assigned either Priority II (mid-term) projects or Priority III (long-term) projects. The CORE MPO 2030 Long Range Transportation Plan (LRTP) identifies capacity improvement for both the SR 204 project as Priority II project. However, in its recently adopted FY 2010-2013 TIP, CORE MPO has identified the SR 204 project as a “Second Priority Project.”

5.2.5 Pedestrian, Bicycle, and Transit Facilities

Pedestrian signals are located at all of the study intersections east of Rio Road. Sidewalks are present along some segments of SR 204, however many segments lack sidewalks on either side of the roadway. Field observations were documented on several occasions of pedestrians attempting to negotiate crossings of and conveyance along segments of SR 204 without sidewalks. These observations raise concerns over pedestrian safety.

According to the Chatham County Bikeway Plan discussed previously in Section 2.2.11 the Habersham Bikeway reported in the Bikeway inventory is the only existing bikeway that is near or relevant to SR 204 (crosses SR 204 at Largo Drive). In the Bikeway Corridor Ratings, bicycle travel along the “Abercorn Extension Corridor” on SR 204 from Middleground Rd to US 17 was determined to be among the “least suitable” options for the County. The Bikeway Plan proposes improvements to SR 204 Abercorn Extension, which includes the 4.4 mile Paved Shoulder section of the Abercorn Extension Bikeway from US 17 to Rio Road, and the 2.1 mile paved shoulder section of the Quacco Road/Fort Argyle Bikeway from I-95 to US 17. The Bikeway Plan acknowledges that, since part of this corridor is being planned as a freeway concept, alternatives to the Paved Shoulder design must be considered.

Currently four bus routes serve SR 204 within the project area. Bus Route 6 (Crosstown) serves bus stops along SR 204 between King George Boulevard and Middleground Road, including Savannah Mall. Bus Route 17 (Silk Hope) serves bus stops on US 17 within the study area. Bus Route 14 (Abercorn) serves bus stops along SR 204 between Savannah Mall and historic downtown Savannah. Bus Route 114 (Abercorn Express) serves bus stops at Oglethorpe Mall

and Savannah Mall. The same safety concerns noted for pedestrians along the corridor apply to transit users.

5.3 Existing Traffic Conditions

An analysis of existing peak hour traffic conditions was performed to determine the operational LOS at the major intersections within the study area. LOS for an intersection is based on vehicular delay at the intersection and is a typical measure of effectiveness used to evaluate intersection operations. The Highway Capacity Manual (HCM) provides ranges of delay for each LOS definition, spanning from very minimal delays (LOS A) to long delays (LOS F). LOS E or worse is considered unacceptable for most drivers.

The analysis was performed for the morning and evening peak hours on a typical weekday. The results of the capacity analysis for the intersections during existing conditions are summarized in Tables 6, 7 and 8.

Table 6: Existing 2010 Traffic Operations from Gateway Boulevard West to US 17 (Western Segment)

Intersection	Traffic Operations			
	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 @ Gateway Boulevard West (u)				
Northbound Approach	B	14	B	11
Southbound Approach	C	19	C	22
SR 204 @ I-95 Southbound Ramps (s)	F	160	F	130
SR 204 @ I-95 Northbound Ramps (u)				
Northbound Approach	F	248	F	246
SR 204 @ Gateway Boulevard South (s)	E	71	E	71

(s) = signalized, (u) = unsignalized

Table 7: Existing 2010 Traffic Operations from US 17 to Rio Road (Central Segment)

Intersection	Traffic Operations			
	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 EB Ramp @ US 17 (s)	C	29	B	20
SR 204 WB Ramp @ US 17 (s)	B	17	D	44
SR 204 @ Grove Point Road (u)				
Northbound Approach	E	40	D	30
Southbound Approach	A	min	A	min
SR 204 @ Pine Grove Road (s)	E	78	B	16
SR 204 @ King George Boulevard (s)	E	73	F	126

(s) = signalized, (u) = unsignalized

Table 8: Existing 2010 Traffic Operations from Rio Road to South of Wilshire Boulevard (Eastern Segment)

Intersection	Traffic Operations			
	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 @ Rio Road (s)	D	48	F	250
SR 204 @ West Mall Driveway (u)				
Southbound Approach	B	12	C	16
SR 204 @ Central Mall Driveway (u)				
Southbound Approach	B	12	B	14
SR 204 @ Easy Mall Driveway (u)				
Southbound Approach	A	9	B	11
SR 204 @ Apache Avenue (s)	D	43	C	34
SR 204 @ Middleground Road (s)	D	49	E	57
SR 204 @ Arts Drive (s)	B	17	B	11
SR 204 @ Mohawk Street (u)				
Eastbound Left	B	12	B	13
Westbound Left	C	17	B	16
Northbound Approach	F	60	F	51
Southbound Left/Thru	E	43	F	55
SR 204 @ Mercy Boulevard (s)	B	15	C	23
SR 204 @ Largo Drive (s)	C	31	C	32
SR 204 @ Idlewood (u)				
Northbound Approach	B	11	B	10
Southbound Approach	A	9	A	10
SR 204 @ Deerfield Road (s)	C	24	C	32
SR 204 @ Holland Drive (u)				
Westbound Left	C	18	C	16
Northbound Left	F	95	E	38
Southbound Approach	B	12	B	15

(s) = signalized, (u) = unsignalized

As noted, the operational characteristics of SR 204 vary across the corridor. These characteristics have an impact on the LOS along the corridor. The segment of SR 204 around I-95 has both signalized and unsignalized major intersections. Under current conditions the signalized I-95 southbound ramps are at failing LOS in both the AM and PM peaks with delays of 160 seconds and 130 seconds respectively. The intersection at the I-95 northbound ramps was unsignalized when the analysis was performed and is at LOS F in the AM and PM peaks with delays of 248 seconds and 246 seconds, respectively; however a signal has recently been installed, which will mitigate this unsignalized intersection. While the implementation of a new

signal may bring the existing conditions to an acceptable LOS, projected growth is still expected to cause this area to experience delays.

At the SR 204 intersections with US 17 and Veterans Parkway, there are interchanges with free-flowing traffic along the mainline (SR 204). Major cross streets along this section are controlled by signalized intersections. These include signals at Pine Grove Road, King George Boulevard, and Rio Road. This results in a disruption of flow that affects the mobility of through trips using the corridor. The major traffic volumes generated by US 17 and Veterans Parkway, combined with high volumes on SR 204 and adjacent signalized intersections, create transition areas that result in large queues and heavy delays. Under existing conditions, these signalized intersections are currently operating at unacceptable LOS (LOS E or worse) with the exception of Pine Grove Road. However it should be noted that during the PM peak, westbound traffic is metered at the King George Boulevard intersection, which limits traffic entering the Pine Grove Road intersection.

Intersections from Rio Road to South of Wilshire Boulevard operate at acceptable LOS under existing conditions with the exception of Rio Road, Middleground Road, Mohawk Street, and Holland Drive, which have unacceptable LOS during at least one peak period. Commuter trips and local trips use this densely-developed SR 204 segment because there is not another nearby route that would serve their trip. The mixture of these two travel patterns creates a unique need to both serve through trips and maintain local access. These locations all justify improvement based on existing 2010 conditions and are expected to worsen with anticipated growth.

5.4 Crash History

The most up-to-date geo-coded crash data was obtained from the GDOT Office of Traffic Safety and Design for the years 2006 through 2008 as presented below. Due to the length of the corridor and the change in character and functional classification of the existing SR 204 facility, the corridor was divided into four segments for the crash analysis. The following tables show the number of crashes and the corresponding crash rates for the SR 204 corridor for the years 2006 through 2008. Crash analysis is used to identify high accident locations and existing safety deficiencies. In the study area, 871 crashes occurred along the corridor in 2006, 838 crashes in 2007 and 699 crashes in 2008. Along the SR 204 corridor, three fatalities occurred in 2006, two fatalities occurred in 2007 and four fatalities occurred in 2008. The historical crash data along the corridor is summarized in Tables 9, 10, 11 and 12. All crash rates shown are per 100 million vehicle miles traveled.

Table 9: Crash History – Gateway Boulevard West to Gateway Boulevard South

Mile log 8.22 to 8.55						
Roadway Classification: Rural Major Collector						
Year	Crashes	Crash Rate	Injuries	Injury Rate	Fatalities	Fatality Rate
2006	46	1470 (203)	10	320 (110)	0	0 (3.56)
2007	45	1247 (203)	10	277 (109)	0	0 (3.55)
2008	34	905 (194)	6	160 (100)	0	0 (3.39)

Note: Bolded entries in parenthesis represent the statewide average for Rural Major Collector

As shown in Table 9, the segment of SR 204 between Gateway Boulevard West and Gateway Boulevard South has crash rates and injury rates that exceed the statewide average for 2006 through 2008. For this portion of SR 204, no fatalities were recorded for 2006 through 2008.

Table 10: Crash History – Gateway Boulevard South to King George Boulevard

Mile log 8.55 to 12.57						
Roadway Classification: Urban Principal Arterial						
Year	Crashes	Crash Rate	Injuries	Injury Rate	Fatalities	Fatality Rate
2006	322	560 (545)	80	136 (207)	0	0 (1.69)
2007	323	519 (549)	68	111 (201)	0	0 (1.51)
2008	247	387 (524)	44	66 (191)	1	1.28 (1.33)

Note: Bolded entries in parenthesis represent the statewide average for Urban Principal Arterial (Non-Freeway)

Table 10 shows that the segment of SR 204 between Gateway Boulevard South and King George Boulevard exceeds the statewide average for crash rates in 2006 with the injury rate lower than the statewide average in all three years. For this portion of SR 204, one fatality was recorded in 2008.

Table 11: Crash History – King George Boulevard to Rio Road

Mile log 12.57 to 14.96 Roadway Classification: Urban Principal Arterial						
Year	Crashes	Crash Rate	Injuries	Injury Rate	Fatalities	Fatality Rate
2006	200	485 (545)	51	124 (207)	1	2.42 (1.69)
2007	169	425 (549)	39	97 (201)	1	2.31 (1.51)
2008	162	405 (524)	28	70 (191)	0	0.00 (1.33)

Note: Bolded entries in parenthesis represent the statewide average for Urban Principal Arterial (Non-Freeway)

Table 11 shows that the segment of SR 204 between King George Boulevard and Rio Road has crash rates and injury rates lower than the statewide average for 2006 through 2008. Although this segment is compared to the statewide average for a non-freeway, it has characteristics of a freeway. When compared with the statewide average for an Urban Principal Arterial (Freeway), the crash rates exceed the statewide average in 2006 through 2008. For this portion of SR 204, one fatality was recorded in 2006 and one fatality was recorded in 2007, with the statewide average fatality rate for similar type facilities exceeded in both years.

Table 12: Crash History – Rio Road to Holland Drive

Mile log 14.96 to 17.30 Roadway Classification: Urban Principal Arterial						
Year	Crashes	Crash Rate	Injuries	Injury Rate	Fatalities	Fatality Rate
2006	303	837 (545)	78	217 (207)	2	5.45 (1.69)
2007	301	858 (549)	74	212 (201)	1	2.66 (1.51)
2008	256	735 (524)	57	162 (191)	3	8.81 (1.33)

Note: Bolded entries in parenthesis represent the statewide average for Urban Principal Arterial (Non-Freeway)

Table 12 shows that the segment of SR 204 between Rio Road and Holland Drive has crash rates and injury rates that exceed the statewide average for 2006 through 2008. For this portion of SR 204, two fatalities were recorded in 2006, one fatality was recorded in 2007, and 3 fatalities were recorded in 2008, with the statewide average fatality rate for similar type facilities exceeded in all three years.

With the exception of the segment of SR 204 from King George Boulevard to Rio Road, the crash and injury rates along the study corridor have exceeded the statewide average in at least one of the past three years. Although the segment of SR 204 from King George Boulevard to Rio Road as compared to the statewide average for a non-freeway because of its GDOT functional classification, this segment has the roadway design characteristics representative of a freeway facility, which typically have lower crash rates than arterial facilities. The crash rates for SR 204 between King George Boulevard and Rio Road exceed the statewide average for Urban Principal Arterial (Freeway). Additionally, the crash rates along SR 204 from Rio Road to Holland Drive are significantly above the statewide average for similar roadway types. The combination of high traffic volumes and several at-grade intersections contribute to the above average crash rates along this segment.

Considerations for safety improvements along these sections were made during the alternative development process. To reduce crash frequency along the segment of SR 204 between Gateway Boulevard West and Rio Road, the key strategy is to reduce congestion by adding capacity and improving operations along this segment. Several methods can be employed to mitigate crashes along heavily developed corridors, such as the segment east of Rio Road. One of the most successful measures is to grade-separate intersections. The minimization of conflict points offered by implementing grade-separated intersections would likely reduce crash frequency and severity. The potential decrease in collisions is supported by the fact that statewide crash rates for Non-Freeway Urban Principal Arterials are 2.5 times greater than the rates for Freeway Urban Principal Arterials.

5.5 Conclusions

Along the heavily developed eastern segment, traffic is comprised of commuter trips and local trips because there is not another nearby route that would serve their trip purpose. The mixture of these two travel patterns creates a unique need to both serve through trips and maintain local access. In addition, free-flowing interchanges combined with adjacent signalized intersections results in a disruption of flow that affects the mobility of through trips using the corridor.

Analysis of the existing conditions shows that conditions are currently unacceptable at several locations along the study corridor. The anticipated growth in the project area will increase traffic congestion and create lengthy delays for commuter and local traffic traveling through the corridor. Existing congestion along SR 204 creates excessive delays to commuters during both the AM and PM peak hours. Study segments of the SR 204 study area have crash rates, injury rates and fatality rates that are above statewide averages. This demonstrates the need to reduce travel time along SR 204, reduce crash frequency, and improve connectivity in this region.

In addition, the eastern segment of SR 204 is characterized by a few disjointed sidewalk segments with limited connectivity and no bike lanes or pedestrian paths. The high traffic volumes and lack of adequate pedestrian facilities, especially for safely crossing the busy SR 204 corridor, likely contributes to the minimal pedestrian activity. Improving pedestrian facilities on the eastern segment of SR 204 would benefit surrounding land uses.

6 Definition of Alternative

The SR 204 corridor is a major commuter route in the Savannah region, serves dense commercial development along the corridor, and also provides access to residential neighborhoods. Future Build alternatives were examined in regards to how well they serve through traffic while also maintaining access to local commercial, residential, and institutional land uses along the corridor. Because of existing and planned land uses, effectively serving both of these functions is critical to ensure the continued success of the corridor.

The alternative selection process considered a 'Complete Streets' model, in which pedestrians, bicyclists, and transit riders are all supported. The potential beneficial and adverse impacts to the environment and community were also taken into account as part of the study process.

6.1 Alternatives Description

The Build Concepts for the eastern study segment are defined as follows:

- Concept A – Provide a six-lane freeway with grade separations and two-lane one-way access roads in both directions. Freeway access points will be provided from the access roads via slip ramps. The freeway will be grade separated over Rio Road, Middleground Road, Mercy Boulevard, and at the transition to Truman Parkway Phase V.
- Concept B – Provide four continuous travel lanes on an elevated structure along the center median extending from Forest River to Truman Parkway Phase V. The support for the structure is in the median of the at-grade roadway. The existing lane configuration will be maintained with minimal right-of-way impacts. A half-diamond interchange was included at Arts Drive to provide a freeway access point mid-way through the eastern study segment.
- Concept C – Provide two barrier-separated managed express lanes in each direction with grade separation at Rio Road, Apache Avenue, Middleground Road, Arts Drive, Mercy Boulevard, Largo Drive, Deerfield Road, and at the transition to Truman Parkway Phase V. A half-diamond interchange was analyzed at Arts Drive to provide a freeway access point mid-way through the eastern study segment.



Each of the concepts A, B, and C propose to have continuous bike lanes and sidewalks along SR 204 from Rio Road to Truman Parkway. A concept plan of each Build Concept for the eastern study segment is included in Appendix C.

Both geometry and traffic volume projections for Concepts A, B, and C all differ across the eastern study segment of the corridor, Rio Road to Truman Parkway; however they all tie into the same cross section near Forest River (west of Rio Road). All concepts have the same geometric configurations for the central and western study segments; however they have different traffic volume projections. This is because Concepts A, B, and C each provide different capacities on the eastern segment and thus provide different traffic demand downstream.

For the central study segment (from US 17 to Rio Road) GDOT has already determined a preferred alternative, based on the *SR 204 Corridor Study* prepared for GDOT by McGee Partners, Inc. and Jacobs in 2009. This preferred alternative with long-range recommendations has been evaluated with the traffic projections of each of the Build Concepts for the eastern study segment. The preferred concept proposes to convert the intersection of SR 204 and King George Boulevard into a partial cloverleaf interchange with loop ramps in the northwest and southeast quadrants. Long-range recommendations are to widen SR 204 to a six-lane freeway from US 17 to Rio Road with interchanges at US 17, Pine Grove Road/King George Boulevard (split diamond), and Veterans Parkway. The improvements to King George Boulevard should be designed so the implementation of a Pine Grove Road/King George Boulevard split diamond interchange requires minimum reconstruction. More information on the preferred concept and long range recommendations for this segment can be found in the *SR 204 Improvements Technical Memorandum* prepared for GDOT in April 2010 (NH-111-1(24), P.I. 522870).

Upon further analysis, additional improvements are also needed at the US 17 interchange in order to accommodate the increased traffic demand drawn by the Build Concepts for the eastern study segment and achieve acceptable future conditions. These include projects that are not currently programmed, such as converting US 17 to a six-lane cross section with turning lane improvements. The concept plans for the central study segment are included in Appendix C.

The western study segment (from Gateway Boulevard West to US 17) is currently a partially limited access facility with an interchange at I-95. GDOT has not identified a preferred concept for this study segment. Due to the additional traffic demand drawn by the Build Concepts for the central and eastern study segments, three different alternatives were developed for the western study segment to accommodate the additional traffic. These alternatives were further defined in concept plans and investigated as the Build Alternatives in this study. Each of the western alternatives was evaluated in combination with each of the eastern Build Concepts in order to determine which alternative best accommodates expected traffic demand. The Build Concepts for the western study segment are described as follows:

- Alternative 1 – Remove signal and convert Gateway Boulevard South to a right in/right out intersection and provide a new signalized intersection further east, as well as provide turning lane improvements at the I-95 interchange.

- Alternative 2 – Remove intersection at Gateway Boulevard South and provide access roads along SR 204. Construct loop ramp in southwest quadrant from I-95 southbound to SR 204 eastbound and flyover ramp from SR 204 westbound access road to I-95 southbound.
- Alternative 3 – Remove intersection at Gateway Boulevard South and provide access roads along SR 204. Construct dual flyover ramps from I-95 southbound to SR 204 eastbound access road and from SR 204 westbound access road to I-95 southbound.

A concept plan for each of the western alternatives is included in Appendix C.

6.2 Public Involvement in Refining Alternatives

Public involvement was a large part of the alternative selection process. As detailed in Section 5, three public information open house meetings and three stakeholders meetings were held throughout the study process. The original eight alternatives, including the No Build, were presented at the first round of meetings on September 10th, 2010. This meeting played a large part in the fatal flaw analysis. Attendees had an opportunity to comment and ask questions about each of the alternatives.

The second round of meetings took place on September 12th, 2011 and presented more detailed information about the alternatives that were not eliminated due to the fatal flaw analysis, as well as the preferred alternative at King George Boulevard and three alternatives for the SR 204 and I-95 interchange. Multiple representatives were there to answer questions. Attendees were strongly encouraged to fill out questionnaire forms. The questionnaire form allowed attendees to comment on each alternative as well as to rank the ones they preferred. Questionnaire forms and comments were taken into consideration during the selection of a preferred alternative.

Based on the questionnaire results performed during the second meeting the most popular alternative for the western segment was Alternative 3 (Dual Fly-Over). For both the western and central segments trees and landscaping was considered an important issue while pedestrian and bike facilities was only considered moderately important. For the eastern segment Concept C was the most popular. The public considered the separation of local and through traffic to be very important issues. Pedestrian facilities, bicycle facilities, and trees and landscaping were also considered important issues, primarily in the eastern segment.

Four additional meetings were held with major stakeholders AASU and St. Joseph's Hospital representatives to discuss the possibility of an interchange located at Arts Drive. Due to the unique needs of these institutions and their importance in the Savannah community, the MPO staff and/or the project team had individual meetings with both institutions to gain their feedback regarding the potential interchange. These meetings took place in June 2011, August 2011, October 2011 and October 2012.

A third public meeting was held on November 1, 2012 to present a recommended alternative.

6.3 Fatal Flaw Analysis

During the concept development phase, several alternatives along SR 204 were evaluated to address how well they satisfied the needed improvements. The first round of public outreach meeting took place to present these materials. The following is a description of each alternative considered initially during the concept development phase:

- No Build
- Widen to eight lanes with either turn lane improvements at existing at-grade intersections or continuous flow intersections at critical locations
- Maintain existing travel lanes while implementing continuous flow intersections at major at-grade intersections along the corridor
- Transportation System Management
- Parallel Facility
- Provide a six-lane freeway with grade separations and two-lane one-way access roads in both directions
- Provide two barrier-separated managed express lanes in each direction in the median of SR 204 with existing general purpose lanes
- Provide four continuous express travel lanes on an elevated structure in the median of SR 204 with existing general-purpose lanes below

Through an initial feasibility assessment of these alternatives, the weighing of costs and benefits, and public input, the options were narrowed down to the top three alternatives. The evaluation criteria used to identify fatal flaws are as follows:

- Roadway Capacity
- Safety Improvements
- Regional Through Trips
- Local Access Trips
- Right-of-Way Impacts
- Hurricane Evacuation Route
- Level of Service
- Community Impacts
- Context-Sensitive Design/Complete Streets Principles
- Impacts to Natural Obstacles
- Construction & ROW Costs
- Impacts to Businesses

After investigating all of the initial alternatives using the evaluation criteria, the three Build alternatives that advanced for further study were:

- Provide a six-lane freeway with grade separations and two-lane one-way access roads in both directions
- Provide four continuous express travel lanes on an elevated structure in the median of SR 204 with existing general-purpose lanes at ground level
- Provide two barrier-separated managed express lanes in each direction in the median of SR 204 with existing general purpose lanes

6.4 Lane Requirement Analysis

For the eastern segment, Concept C was originally analyzed with one barrier-separated managed lane in each direction. Upon further analysis, this version of Concept C was eliminated because it was not expected to have sufficient capacity to serve projected traffic demand adequately. This finding is supported by both the HCM methodology to determine LOS and the Georgia Regional Transportation Authority (GRTA) generalized LOS tables. This analysis is detailed below.

The HCM methodology was used to determine LOS for the high point volume on the at-grade lanes and express lanes of Concept C based on the following input data:

- Geometric data
- Free-flow speed
- Volumes

The analysis was performed for two Build conditions (two and four express lanes) in order to determine if added capacity was necessary to improve LOS. In order to perform this planning-level analysis using design (2035) peak hour volumes, the high point 2035 volume was used to calculate an adjusted 15-minute flow rate based on the peak hour factor (PHF), number of lanes (N), heavy vehicle factor (fHV), and population factor (fp). This adjusted 15-minute flow rate was compared to the maximum service flow rates reported in the HCM 2000 for multilane and freeway facilities to determine expected LOS.

The results of the analysis are summarized in Table 13 (At-Grade Lanes) and Table 14 (Express Lanes).

Table 13: At-Grade Lanes HCM Multilane Highway LOS (2035)

Build Condition	At-Grade Lanes				
	Peak Hour	Direction	High Point Volume (vph)	Adjusted 15-min flow rate (pc/h/ln)	*LOS
Two Express Lanes	AM	EB	2,778	1,122	C
Four Express Lanes	AM	EB	2,703	1,092	C

**Based on LOS thresholds from Exhibit 21-2 in HCM 2000*

Table 14: Express Lanes HCM Basic Freeway Segment LOS (2035)

Build Condition	Express Lanes				
	Peak Hour	Direction	High Point Volume (vph)	Adjusted 15-min flow rate (pc/h/ln)	*LOS
Two Express Lanes	AM	EB	1,602	1,942	E
Four Express Lanes	PM	WB	2,307	1,356	C

**Based on LOS thresholds from Exhibit 23-2 in HCM 2000*

As shown in Table 13, the at-grade lanes are expected to have acceptable LOS (LOS C or better) at the high point volume location with both two and four express lanes. Using this methodology, the express lanes are expected to have unacceptable LOS (LOS E) at the high point volume location with two express lanes, as shown in Table 14. However, the Build condition with four express lanes is expected to have acceptable LOS (LOS C) according to the analysis.

Some caution should be used with these planning-level results, particularly for the two-lane (one travel lane in each direction) freeway segment analysis. The HCM 2000 freeway methodology was researched using facilities with a minimum of two travel lanes in each direction. With one travel lane in each direction, traffic will have no opportunity to move around slower traffic. Decreased maneuverability tends to reduce the average speed of vehicles, so the actual LOS experienced on a two-lane freeway section may be worse than that reported in Table 14.

Additionally, it is important to consider how the traffic volumes were derived. Peak hour and average daily traffic (ADT) volumes were forecasted from growth rates obtained from base year and design year travel demand models. Additionally, the volume split between express lanes and at-grade lanes was determined from the model volume outputs. Because the modeling software considers travel time when determining routes, traffic is assigned to a route based on available capacity. For this reason, traffic in the model will no longer be assigned to the express lanes if capacity is reached and travel times begin to decrease. Therefore, because the volume forecasted to utilize the express lanes is constrained by capacity in the model and does not include latent demand, the actual LOS may be worse than predicted by the model volumes.

An additional analysis was performed using the forecasted ADT volumes and comparing them against generalized LOS tables prepared by the GRTA for use in reviewing Developments of Regional Impact (DRI). These tables are used by GRTA to perform a generalized assessment of traffic conditions based on ADT volumes on roadway segments adjacent to proposed developments. Similar to the HCM analysis, the high point 2035 volumes were used to determine expected roadway LOS along the SR 204 facility for the two Build conditions (two and four express lanes). Because the volume thresholds for two freeway lanes were not provided in the tables, they were estimated from the thresholds provided using a linear trend matching known data points, and the least squares method. The results of the express lane and at-grade lane analysis are summarized in Table 15.

Table 15: Generalized Roadway LOS for Express Lanes and At-Grade Lanes

Build Condition	Express Lanes		At-Grade Lanes	
	High Point Volume (vpd)	*LOS	High Point Volume (vpd)	**LOS
Two Express Lanes	33,927	***E	48,500	D
Four Express Lanes	46,741	C	43,886	D

**Based on LOS thresholds for Group II Freeway*

***Based on LOS thresholds for Class II Arterial*

****Extrapolated from data for Group II Freeway and Class II Arterial*

As shown in Table 15, the express lanes are expected to experience unacceptable LOS (LOS E) with two express lanes based on forecasted ADT volumes and an extrapolated volume threshold for a two-lane freeway facility. With four express lanes, the LOS is expected to be acceptable (LOS C). For both two and four express lanes, the at-grade lanes are expected to have acceptable segment LOS (LOS D) based on forecasted ADT volumes. This finding is in agreement with the HCM analysis.

In addition to the traffic volume analysis, other potential issues associated with a two-lane express lane section include the absence of a passing lane and the difficulty of future widening. Because a two-lane section would not permit passing in either direction, traffic issues could arise from slow vehicles, breakdowns, or wrecks. Also, since the two-lane section in Build Concept C requires shifting and reconstructing the existing lanes along SR 204 to the outside, any future widening of the express lanes would also require shifting the newly-constructed SR 204 lanes. One potential way to avoid these issues would be to install reversible lanes. However, reversible lanes were not included in the scope of this study.

These findings have been further summarized in the “SR 204 Corridor Study - Evaluation of Lane Requirements for Express Lanes Alternative” Memorandum attached in Appendix D. As part of this study a modified version of Concept C was analyzed that provides two barrier-separated managed express lanes in each direction instead of one. All of the analysis in this report is based on the modified version of Concept C that provides two barrier-separated managed express lanes in each direction.

6.5 Alternative Comparison

An evaluation of the different alternatives considered for the western, central, and eastern study segments is included in Figure 10. As shown in the figure, the acres of impacts, number of relocations, and costs were evaluated for each alternative. Several alternatives were eliminated due to Fatal Flaws identified previously. Three alternatives on the western segment and three alternatives on the eastern segment were studied further (including a comparison with and without the interchange at Arts Drive). The Central segment already has a GDOT preferred alternative that is currently under design.

Figure 10: Evaluation of Alternatives

Evaluation of Alternatives Western Segment

Alternative		2035 Traffic Operations	Meet Need and Purpose?	Impacts		Relocations		Cost	
				Wetlands (Acres)	Environmental Justice (Acres)	Residential	Commercial	Construction	Right-Of-Way
No Build	Do Nothing	Undesirable	No	NO BUILD is Always Considered as an Alternative					
-	Transportation System Management	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Widen to Eight Lanes	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Continuous Flow Intersections	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Parrallel Facility	Undesirable	No	ELIMINATED - Undesirable Operations, Cost and Environmental Impacts					
Alternative 1	Intersection Relocation	Undesirable	No	0.0	1.7	3	0	\$ 7,500,000	\$ 12,600,000
Alternative 2	Access Roads with Loop and Fly-over Ramps	Desirable/Acceptable	Yes	0.6	18.0	10	3	\$ 28,800,000	\$ 76,900,000
Alternative 3	Access Roads with Dual Fly-over Ramps	Desirable/Acceptable	Yes	0.9	20.1	8	4	\$ 37,500,000	\$ 63,600,000

Evaluation of Alternatives Central Segment

Alternative		2035 Traffic Operations	Meet Need and Purpose?	Impacts		Relocations		Cost	
				Wetlands (Acres)	Environmental Justice (Acres)	Residential	Commercial	Construction	Right-Of-Way
No Build	Do Nothing	Undesirable	No	NO BUILD is Always Considered as an Alternative					
-	Transportation System Management	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Widen to Eight Lanes	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Continuous Flow Intersections	Undesirable	No	ELIMINATED - Undesirable Operations					
-	Parrallel Facility	Undesirable	No	ELIMINATED - Undesirable Operations, Cost and Environment Impacts					
GDOT Preferred	Grade Separated with Split Diamond Interchange	Desirable/Acceptable	Yes	5.0	0.7	6	1	\$ 26,800,000	\$ 98,700,000

Evaluation of Alternatives Eastern Segment

Alternative		2035 Traffic Operations	Meet Need and Purpose?	Complete Streets	Impacts			Relocations		Cost	
					Visual Obstruction	Wetlands (Acres)	Environmental Justice (Acres)	Residential	Commercial	Construction	Right-Of-Way
No Build	Do Nothing	Undesirable	No	NO BUILD is Always Considered as an Alternative							
-	Transportation System Management	Undesirable	No	ELIMINATED - Undesirable Operations							
-	Widen to Eight Lanes	Undesirable	No	ELIMINATED - Undesirable Operations							
-	Continuous Flow Intersections	Undesirable	No	ELIMINATED - Undesirable Operations							
-	Parrallel Facility	Undesirable	No	ELIMINATED - Cost, Environmental and Right-Of-Way Impacts							
Concept A	Six-lane Freeway with One-way Access Roads	Undesirable	Yes	Low	High	6.2	32.0	4	24	\$ 138,100,000	\$ 198,000,000
Concept B-1	Four-lane Continuous Elevated Structure (With Arts Drive Interchange)	Desirable/Acceptable	Yes	High	Low	0.1	3.2	3	3	\$ 179,700,000	\$ 31,900,000
Concept B-2	Four-lane Continuous Elevated Structure (Without Arts Drive Interchange)	Desirable/Acceptable	Yes	High	Low	0.1	3.2	3	3	\$ 169,500,000	\$ 21,500,000
Concept C	Four Barrier-Separated Managed Express Lanes	Desirable/Acceptable	Yes	Low	Moderate	1.2	11.6	3	9	\$ 118,300,000	\$ 154,400,000

7 Alternative Analysis

7.1 Future Traffic Volume Projections

Future traffic volumes were developed for the years 2015 (Opening Year) and 2035 (Design Year) in order to evaluate future operating characteristics along the study corridor. These projections were used to determine expected future traffic operations and evaluate transportation improvement alternatives that will be required to support future traffic demand. The traffic forecasting methodology was summarized in a memorandum submitted to GDOT Office of Planning on June 21, 2011 and traffic volumes used in this study were approved on August 16, 2011. The approved traffic flow diagrams are included in Appendix E. The methodology below describes the process taken to develop the future volumes.

7.1.1 Traffic Forecasting Methodology

Daily and peak hour traffic projections were prepared for opening year (2015) and design year (2035) for the No Build alternative and the proposed Build concepts that passed the initial feasibility screening shown in Figure 3. To estimate future traffic conditions, the existing traffic volumes were factored up to account for future increases in background traffic and growth along the corridor.

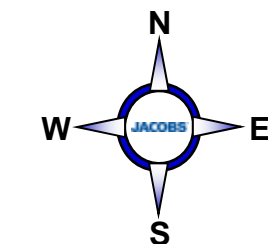
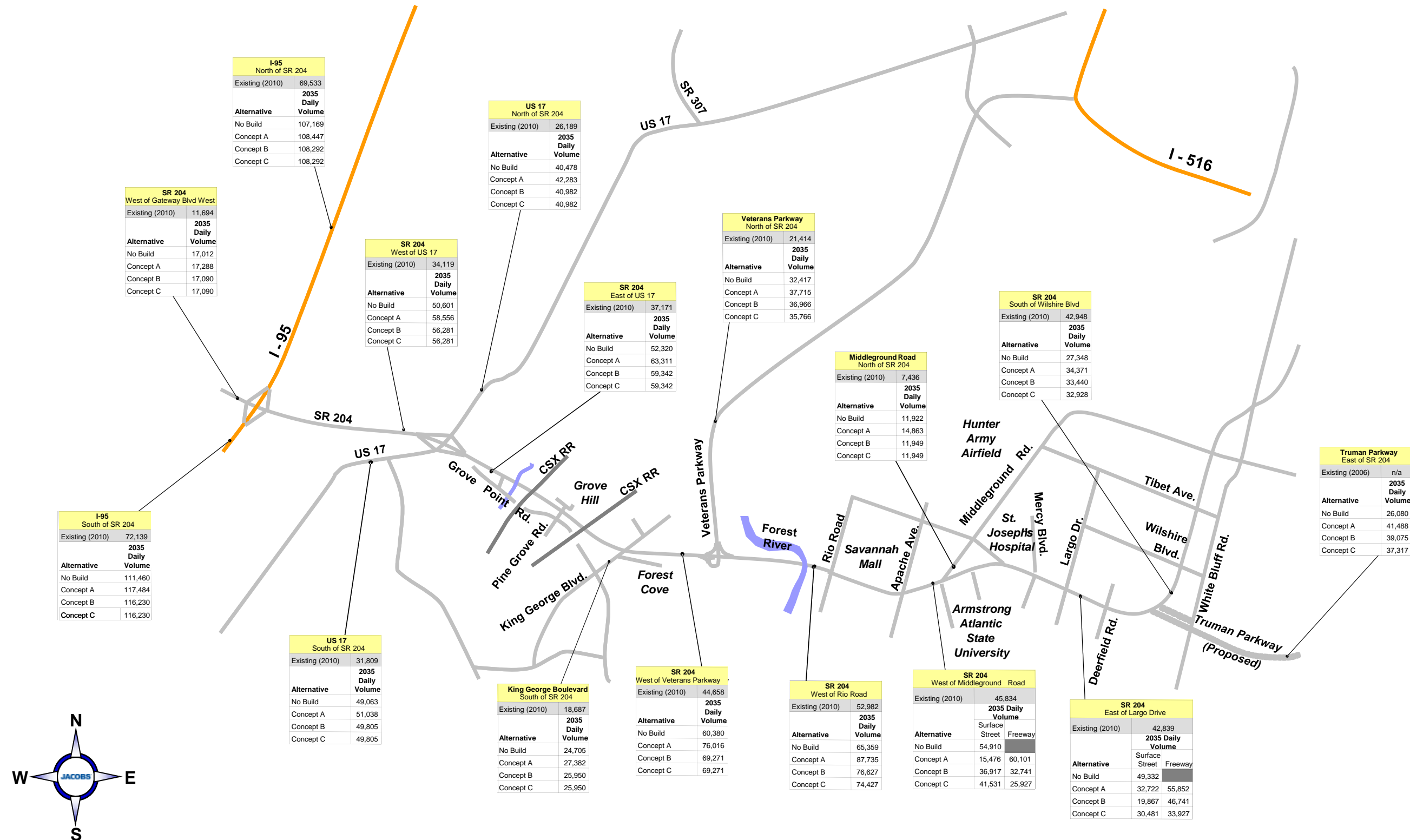
The future traffic projections were determined based on the CORE MPO 2035 travel demand model (E+C network) and the 2006 base year model, historic growth trends, and existing traffic volumes and travel patterns. The future traffic projections took into consideration prior studies on SR 204 as well as the approved Truman Parkway Phase V extension, which will extend Truman Parkway westward from its existing terminus at Whitfield Avenue to a new terminus at SR 204. For the alternatives considered, the CORE MPO 2035 travel demand model was modified to reflect the proposed roadway improvements. This modification allowed the model to predict changes in travel patterns that occurred as a result of the improvement. A comparison of the weekday ADT volumes projected for the year 2035 is summarized in Figure 11 for the alternatives considered.

Under the No Build condition, the daily traffic volume estimated for Truman Parkway Phase V is approximately 26,000 vpd for the year 2035. Traffic on SR 204 in southwestern Chatham County will increase the SR 204 daily traffic volumes to approximately 51,000 vpd from I-95 to US 17, 65,000 vpd from US 17 to Rio Road, and 55,000 vpd from Rio Road to Truman Parkway by 2035. These daily traffic volumes represent the approximate capacity of the existing roadway configuration. Based on review of the model, actual vehicle demand is greater but the demand is constrained by the network laneage and the model assigns trips to different routes. The model has increased volume on the roadway to maximum capacity which creates congested conditions throughout the corridor.

The different Build concepts are expected to generate an increase in traffic volumes over the No Build condition since the proposed network would have less of a capacity constraint. Each Build concept generates different traffic projections based on the capacity for that concept. Concept A has the highest capacity and 2035 traffic volumes are expected to increase to approximately 59,000 vpd from I-95 to US 17, 88,000 vpd from US 17 to Rio Road, and 89,000 vpd from Rio Road to Truman Parkway. The 2035 traffic volume projections for Concept B are approximately 56,000 vpd from I-95 to US 17, 77,000 vpd from US 17 to Rio Road, and 70,000 vpd from Rio Road to Truman Parkway. The original concept C (one express lane in each direction) has the lowest capacity of the Build concepts and is projected to carry approximately 56,000 vpd from I-95 to US 17, 74,000 vpd from US 17 to Rio Road, and 67,000 vpd from Rio Road to Truman Parkway. The modified concept C (two express lanes in each direction) had the same demand as Concept B and used the Concept B traffic volumes for analysis.

The projected daily traffic volume west of Gateway Boulevard West is approximately 17,000 vpd for each Build concept. These projections retain the significant drop from the volumes east of I-95 as seen in the existing and No Build conditions. This drop in volume supports the proposed logical termini at the intersection of SR 204 and Gateway Boulevard West.

Figure 11: Traffic Volumes for Concept Alternatives



7.1 Future Capacity Analysis

The SR 204 corridor was analyzed using future traffic projections developed for years 2015 and 2035. For No Build conditions the analysis was based on the existing lane geometry and traffic control. Programmed improvements were included in both No Build and Build future scenarios. These programmed improvements included Truman Parkway Phase V extension and SR 204 intersection improvements at both I-95 ramps. In addition, Build condition analysis was performed for Concepts A, B and a modified Concept C using projected future traffic volumes and proposed geometry. Synchro and CORSIM software were used to determine the expected operating characteristics along the corridor for each alternative. The results of the future capacity analysis are summarized in the following sections.

7.1.1 Design Year (2035) Synchro Analysis

An analysis of peak hour traffic conditions was performed to determine the LOS at the major intersections within the study area. Synchro was used to estimate the LOS under existing and future conditions based on the HCM methodology.

For the signalized intersections, Synchro traffic analysis software was used to determine the LOS, based on the following input data:

- Intersection geometry
- Lane configuration
- Turning movement volumes
- Existing signal phasing
- Existing signal timings

For unsignalized intersections where side streets or minor streets are controlled by a stop sign, the criterion for evaluating traffic operations is the LOS for the controlled movements at the intersection. The methodology from the HCM to determine the delay and LOS for these turning movements is based on the following input data:

- Intersection geometry
- Lane configuration
- Turning movement volumes

The analysis was performed for the morning and evening peak hours on a typical weekday. The results of the capacity analysis for the intersections are summarized in the following tables. Table 16 summarizes the existing and No Build intersection LOS.

Table 16: Intersection LOS for No Build Condition

Intersection	2010 Existing				2015 No Build				2035 No Build				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	B	14	B	11	B	15	B	11	C	21	B	14	
Southbound Approach	C	19	C	22	C	24	D	29	E	47	F	117	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	9	A	8	A	9	A	8	A	10	A	9	
SR 204 @ I-95 Southbound Ramps (s)	F	160	F	130	D	52	D	45	F	170	F	147	
SR 204 @ I-95 Northbound Ramps (u/s)*					C	28	C	29	D	40	E	65	
Northbound Approach	F	248	F	246									
Eastbound Left	A	8	A	9									
SR 204 @ Gateway Boulevard South (s)	E	71	E	71	F	93	F	122	F	212	F	267	
SR 204 EB Ramp @ US 17 (s)	C	29	B	20	D	37	C	27	F	149	E	76	
SR 204 WB Ramp @ US 17 (s)	B	17	D	44	B	19	E	68	F	93	F	221	
SR 204 @ Grove Point Road (u)													
Northbound Approach	E	40	D	30	F	55	D	34	F	163	F	88	
Southbound Approach	A	min	A	min	A	min	A	min	A	min	A	min	
Eastbound Left	A	min	A	min	A	min	A	min	A	min	A	min	
Westbound Left	C	17	B	13	C	19	B	14	D	28	C	20	
SR 204 @ Pine Grove Road (s)	E	78	B	16	F	123	B	17	F	221	C	29	
SR 204 @ King George Boulevard (s)	E	73	F	126	F	100	F	148	F	169	F	253	
SR 204 @ Rio Road (s)	D	48	F	250	E	63	F	274	F	117	F	358	
SR 204 @ West Mall Driveway (u)													
Southbound Approach	B	12	C	16	B	12	C	17	B	13	C	19	
SR 204 @ Central Mall Driveway (u)													
Southbound Approach	B	12	B	14	B	12	B	14	B	13	C	15	
SR 204 @ Easy Mall Driveway (u)													
Southbound Approach	A	9	B	11	A	9	B	11	A	10	B	12	
SR 204 @ Apache Avenue (s)	D	43	C	34	D	48	D	36	F	93	E	60	
SR 204 @ Middleground Road (s)	D	49	E	57	E	56	E	67	F	105	F	142	
SR 204 @ Arts Drive (s)	B	17	B	11	B	17	B	11	B	20	B	13	
SR 204 @ Mohawk Street (u)													
Eastbound Left	B	12	B	13	B	12	B	14	B	13	B	14	
Westbound Left	C	17	C	16	C	17	C	16	C	20	C	20	
Northbound Approach	F	60	F	51	F	69	F	58	F	114	F	97	
Southbound Left/Thru	E	43	F	55	E	46	F	60	F	70	F	78	
SR 204 @ Mercy Boulevard (s)	B	15	C	23	B	15	C	24	B	19	C	31	
SR 204 @ Largo Drive (s)	C	31	C	32	C	31	C	35	D	40	D	50	
SR 204 @ Idlewood Drive (u)													
Northbound Approach	B	11	B	10	B	11	B	10	B	13	B	11	
Southbound Approach	A	9	A	10	A	9	A	10	A	9	B	10	
SR 204 @ Deerfield Road (s)	C	24	C	32	C	21	C	27	C	24	C	33	
SR 204 @ Holland Drive (u)													
Westbound Left	C	18	C	16									
Northbound Left	F	95	E	38									
Southbound Approach	B	12	B	15									
SR 204 @ Truman Parkway (s)					B	16	C	20	B	17	C	20	
SR 204 @ White Bluff Connector (s)					A	10	B	10	B	10	A	10	

(s) = signalized, (u) = unsignalized, * Signalized in 2015 and 2035 scenarios

As depicted in Table 16, several key intersections throughout the corridor are expected to operate at unacceptable LOS (LOS E or worse) conditions during at least one peak period in 2035 under the No Build conditions. These failing intersections include:

- SR 204 at Gateway Boulevard West
- SR 204 at I-95 Southbound Ramps
- SR 204 at I-95 Northbound Ramps
- SR 204 at Gateway Boulevard South
- SR 204 Eastbound Ramp at US 17
- SR 204 Westbound Ramp at US 17
- SR 204 at Grove Point Road
- SR 204 at Pine Grove Road
- SR 204 at King George Boulevard
- SR 204 at Rio Road
- SR 204 at Apache Avenue
- SR 204 at Middleground Road
- SR 204 at Mohawk Street

These intersections experience excessive delays based on the 2035 projected volumes. SR 204 at I-95 Northbound Ramps and SR 204 at I-95 Southbound Ramps do have LOS improvements from Existing 2010 conditions to No Build 2015 due to programmed intersection improvements that are expected to be completed prior to 2015.

A summary of all existing and No Build Synchro analysis reports is included in Appendix F.

Western Study Segment Concept Alternatives

For the western study segment, a separate analysis was done for each Build Alternative. Each western segment alternative was investigated for the three eastern segment alternatives (Concepts A, B and C). Tables 17, 18, and 19 compare 2035 LOS results for western segment Alternatives 1, 2, and 3 respectively. Concepts B and C only differ for the eastern study segment and have the same demand for both the western and central segments. Therefore they were analyzed together as shown in the following tables.

Table 17: 2035 Intersection LOS Western Segment Alternative 1

Intersection	2035 No Build				2035 Concept A				2035 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	C	21	B	14	D	30	D	26	C	23	B	15	
Southbound Approach	E	47	F	117	F	71	F	387	F	55	F	250	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	10	A	9	B	10	A	9	B	10	A	9	
SR 204 @ I-95 Southbound Ramps (s)	F	170	F	147	F	140	F	165	F	90	F	113	
SR 204 @ I-95 Northbound Ramps (s)	D	40	E	65	F	159	F	245	F	130	F	183	
SR 204 @ Gateway Boulevard South (u/s)*	F	212	F	267									
Northbound Approach					B	12	A	10	B	12	B	10	
Southbound Approach					D	25	D	33	C	23	D	31	
SR 204 @ New Intersection (s)					D	46	E	71	D	43	E	63	

(s) = signalized, (u) = unsignalized
* Signalized in No Build Condition

Table 18: 2035 Intersection LOS Western Segment Alternative 2

Intersection	2035 No Build				2035 Concept A				2035 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	C	21	B	14	D	31	D	27	C	23	C	15	
Southbound Approach	E	47	F	117	F	76	F	418	F	60	F	307	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	10	A	9	B	10	A	9	B	10	A	9	
SR 204 @ I-95 Southbound Ramps (s)	F	170	F	147	A	7	A	7	A	6	A	7	
SR 204 @ I-95 Northbound Ramps (s)	D	40	E	65	A	4	A	7	A	4	A	8	

(s) = signalized, (u) = unsignalized
Note: Gateway Boulevard South traffic rerouted to access roads

Table 19: 2035 Intersection LOS Western Segment Alternative 3

Intersection	2035 No Build				2035 Concept A				2035 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	C	21	B	14	D	31	D	30	C	23	C	16	
Southbound Approach	E	47	F	117	F	80	F	587	F	60	F	448	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	10	A	9	B	10	A	9	B	10	A	9	
SR 204 @ I-95 Southbound Ramps (u/s)*	F	170	F	147									
Southbound Approach					B	10	B	11	B	10	B	11	
SR 204 @ I-95 Northbound Ramps (s)	D	40	E	65	A	6	A	10	A	7	B	10	

(s) = signalized, (u) = unsignalized
*Signalized in No Build Condition
Note: Gateway Boulevard South traffic rerouted to access roads

As shown in Table 17, Alternative 1 is expected to have unacceptable LOS (LOS E or worse) in 2035 at several locations including SR 204 at Gateway Boulevard West, SR 204 at I-95 Southbound Ramps, SR 204 at I-95 Northbound Ramps, and SR 204 at New Intersection. Because there is increased demand along the Western segment for each of the Build conditions, some locations experience increased delay from the No Build condition so signalization is considered a possibility. As shown in Tables 18 and 19, Alternatives 2 and 3 are both expected to have acceptable LOS (LOS D or better) with the exception of SR 204 at Gateway Boulevard West. The Gateway Boulevard West intersection is expected to have LOS F on the southbound unsignalized approach. Signalizing this intersection would likely improve the intersection to acceptable LOS, though signalization of the intersection would require a formal traffic signal warrant study to be performed and satisfied. However, the southbound approach does meet the 4 vehicle-hours of delay requirement stipulated in the Manual on Uniform Traffic Control Devices (MUTCD) in Warrant 3, Peak Hour.

The unsignalized Gateway Boulevard West approaches experience less delay in Alternative 2 than in Alternative 3 in part because the proximity of the signalized intersection of SR 204 at the southbound I-95 ramps provides more frequent gaps in traffic. Alternative 2 also has lower traffic volumes on the eastbound access road than Alternative 3. This variation in traffic volumes is due to the I-95 southbound ramp alignment. In Alternative 3 the ramp from I-95 southbound to SR 204 eastbound connects to the access road that merges with SR 204. In Alternative 2, the ramp from I-95 southbound connects directly to SR 204 via a loop ramp.

Central Study Segment Concept Alternatives

For the central study segment, a separate analysis was done for each Build Alternative. The central segment was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 20 compares 2035 LOS results for the central segment.

Table 20: 2035 Intersection LOS Central Segment

Intersection	2035 No Build				2035 Concept A				2035 Concept B&C			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 EB Ramp @ US 17 (s)	F	149	E	76	C	26	B	18	C	25	B	18
SR 204 WB Ramp @ US 17 (s)	F	93	F	221	B	19	D	41	B	17	D	37
SR 204 @ Grove Point Road (u)												
Northbound Approach	F	163	F	88								
Southbound Approach	A	min	A	min	-	-	-	-	-	-	-	-
Eastbound Left	A	min	A	min								
Westbound Left	D	28	C	20								
SR 204 EB Ramp @ Pine Grove Road (s)**	F	221	C	29	B	16	A	6	B	16	A	6
SR 204 WB Ramp @ Pine Grove Road (s)					C	23	B	13	C	23	B	12
SR 204 EB Ramp @ King George Blvd (s)**	F	169	F	253	E	67	B	18	D	50	B	14
SR 204 WB Ramp @ King George Blvd (s)					B	12	B	14	A	10	B	12

(s) = signalized, (u) = unsignalized
 **Single Signalized Intersection in No Build Condition
 Note: Grove Point Road closed in Concepts A, B, and C

As shown in Table 20, the intersections of the SR 204 ramps with US 17, SR 204 with Grove Point Road, and the SR 204 ramps with King George Boulevard are expected to reach unacceptable LOS (LOS E or worse) by 2035 under No Build conditions. Under both Build conditions, these intersections are expected to have acceptable (LOS D or better) operations even with increased volume demand. For Concept A, the intersection of SR 204 Eastbound Ramp at King George Boulevard is expected to have unacceptable LOS (LOS E) during the AM peak. Because Concept B has slightly lower traffic volumes, peak hour operations are expected to remain acceptable during both AM and PM peak periods.

Eastern Study Segment Concept Alternatives

For the eastern study segment, a separate analysis was done for each Build Alternative (Concepts A, B and C). Table 21 compares LOS results for the eastern segment in 2035.

Table 21: 2035 Intersection LOS Eastern Segment

Intersection	2035 No Build				2035 Concept A				2035 Concept B				2035 Concept C			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 EB @ Rio Road (s)**	F	117	F	358	B	12	B	19	D	40	F	128	D	41	E	80
SR 204 WB @ Rio Road (s)					C	26	E	67					D	53	D	54
SR 204 WB @ West Mall Driveway (u)																
Southbound Approach	B	13	C	19	B	13	C	18	B	12	B	14	B	12	B	14
SR 204 @ Central Mall Driveway (u)																
Southbound Approach	B	13	C	15	-	-	-	-	B	11	B	12	B	11	B	12
SR 204 WB @ Easy Mall Driveway (u)																
Southbound Approach	A	10	B	12	B	12	B	14	A	9	A	10	A	9	A	10
SR 204 EB @ Apache Avenue (u/s)**													B	20	C	32
Northbound Approach	F	93	E	60	D	34	C	24	D	39	C	30	C	26	C	25
SR 204 WB @ Apache Avenue (u/s)																
Southbound Approach					C	19	D	33								
SR 204 EB @ Middleground Road (s)**					C	22	B	16					D	39	E	65
SR 204 WB @ Middleground Road (s)					C	25	B	17	D	51	E	75	D	50	E	64
SR 204 EB @ Arts Drive (u/s)*													B	12	B	19
Northbound Approach	B	20	B	13	B	15	C	16	A	10	B	10	B	18	C	21
SR 204 EB @ Mohawk Street (u)																
Northbound Approach	F	114	F	97	B	12	B	12	C	17	C	18	B	11	B	11
SR 204 WB @ Mohawk Street (u)																
Southbound Approach	F	70	F	78	B	12	B	12	C	23	C	21	B	11	A	9
SR 204 EB @ Mercy Boulevard (s)**					B	17	B	15					C	24	C	34
SR 204 WB @ Mercy Boulevard (s)					B	19	B	19	C	31	C	29	C	29	C	28
SR 204 EB @ Largo Drive (u/s)*													D	46	C	31
Northbound Approach	D	40	D	50	F	207	F	173	C	33	D	40	C	26	C	28
SR 204 WB @ Largo Drive (u/s)																
Southbound Approach					C	18	F	228								
SR 204 EB @ Idlewood Drive (u)																
Northbound Approach	B	13	B	11	-	-	-	-	B	12	B	11	A	9	A	9
SR 204 WB @ Idlewood Drive (u)																
Southbound Approach	A	9	B	10	B	10	B	14	A	9	A	9	A	9	A	9
SR 204 EB @ Deerfield Road (u/s)**													C	30	D	39
Northbound Approach	C	24	C	33	-	-	-	-	C	33	D	38				
SR 204 WB @ Deerfield Road (u/s)													D	40	D	45
Southbound Approach					C	17	F	83								
SR 204 @ Truman Parkway (s)					B	15	B	15	B	19	C	20	B	15	B	17
SR 204 @ White Bluff Connector (s)					B	11	A	10	B	11	B	13	A	9	B	11

(s) = signalized, (u) = unsignalized

*Signalized in No Build Condition and Concept B

** Single Signalized Intersection in No Build Condition and Concept B

Note: Central Mall Driveway closed in Concept A

Note: Idlewood Drive and Deerfield Road northbound approaches have a free flowing right-turn lane in Concept A

As shown in Table 21, Concept A is expected to have unacceptable LOS (LOS E or worse) at several locations including SR 204 Westbound at Rio Road, SR 204 Eastbound at Largo Drive, SR 204 Westbound at Largo Drive, and SR 204 Westbound at Deerfield Road. Concepts B and C are expected to have unacceptable LOS (LOS E or worse) at SR 204 at Rio Road and SR 204 at Middleground Road.

Concepts B and C are more desirable than Concept A because fewer intersections in the eastern study segment are expected to have unacceptable LOS and the delays at those intersections are

lower than in Concept A. However, Concept B is preferable over Concept C because it has lower overall costs, less relocations, and less impact to the surrounding environment. By year 2035, all intersections will be at acceptable overall LOS in Concept B, but some minor movements may be worse. Additional improvements are required to achieve LOS D or better for all movements. However, Concept B was designed to minimize impacts to surrounding property owners so additional improvements to this alternative may not be desirable. LOS E conditions are not uncommon during peak hours in congested urban environments.

A summary of all the 2035 Build Synchro analysis reports is included in Appendix F.

The figures located at the end of Section 7 of this report summarize the 2035 intersection LOS for all the study intersections for No Build (Figures 12-14), Build Concept A (Figures 15-20), Build Concepts B&C western and central segments (Figures 21-24), Build Concept B eastern segment (Figure 25), and Build Concept C (Figures 26-27).

7.1.2 Opening Year (2015) Synchro Analysis

Similar to the 2035 analysis of the western study segment, a separate analysis was done for each Build Alternative based on opening year (2015) traffic volumes. The results of the 2015 analysis are summarized in this section.

Western Study Segment Concept Alternatives

Each western segment alternative was investigated for the three eastern segment alternatives (Concepts A, B and C). Tables 22, 23, and 24 compare 2015 LOS results for western segment Alternatives 1, 2, and 3 respectively.

Table 22: 2015 Intersection LOS Western Segment Alternative 1

Intersection	2015 No Build				2015 Concept A				2015 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	B	15	B	11	C	19	C	18	C	16	B	13	
Southbound Approach	C	24	D	29	D	29	F	59	D	26	E	48	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	9	A	8	A	9	A	9	A	9	A	9	
SR 204 @ I-95 Southbound Ramps (s)	D	52	D	45	C	34	D	43	D	37	C	32	
SR 204 @ I-95 Northbound Ramps (s)	C	28	C	29	D	50	E	72	D	41	D	44	
SR 204 @ Gateway Boulevard South (u/s)*	F	93	F	122									
Northbound Approach					C	18	B	11	C	18	B	11	
Southbound Approach					C	17	C	20	C	16	C	18	
SR 204 @ New Intersection (s)					C	28	C	31	C	27	C	30	

(s) = signalized, (u) = unsignalized
* Signalized in No Build Condition

Table 23: 2015 Intersection LOS Western Segment Alternative 2

Intersection	2015 No Build				2015 Concept A				2015 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	B	15	B	11	C	19	C	19	C	16	B	14	
Southbound Approach	C	24	D	29	D	29	F	67	D	26	F	52	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	9	A	8	A	9	A	9	A	9	A	9	
SR 204 @ I-95 Southbound Ramps (s)	D	52	D	45	A	4	A	5	A	4	A	5	
SR 204 @ I-95 Northbound Ramps (s)	C	28	C	29	A	4	A	6	A	4	A	6	

(s) = signalized, (u) = unsignalized
Note: Gateway Boulevard South traffic rerouted to access roads

Table 24: 2015 Intersection LOS Western Segment Alternative 3

Intersection	2015 No Build				2015 Concept A				2015 Concept B&C				
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	
SR 204 @ Gateway Boulevard West (u)													
Northbound Approach	B	15	B	11	C	19	C	20	C	16	B	14	
Southbound Approach	C	24	D	29	D	29	F	89	D	26	F	67	
Eastbound Left	A	1	A	1	A	1	A	1	A	1	A	1	
Westbound Left	A	9	A	8	A	9	A	9	A	9	A	9	
SR 204 @ I-95 Southbound Ramps (u/s)*	D	52	D	45									
Southbound Approach					A	10	B	11	A	10	B	11	
SR 204 @ I-95 Northbound Ramps (s)	C	28	C	29	A	6	A	8	A	6	A	8	

(s) = signalized, (u) = unsignalized
*Signalized in No Build Condition
Note: Gateway Boulevard South traffic rerouted to access roads

As shown in Tables 22, 23, and 24, Alternatives 1, 2, and 3 are all expected to have unacceptable LOS (LOS E or worse) in 2015 at the intersection of SR 204 and Gateway Boulevard West. Signalizing this intersection is expected to improve the intersection to acceptable LOS. As mentioned in the 2035 analysis section, the volumes at this intersection should be monitored and signalization should be considered when signal warrants are met. SR 204 at I-95 Northbound Ramps is expected to experience LOS E for Alternative 1 Concept A during the PM Peak. Alternative 1 actually has worse LOS for the northbound approach at Gateway Boulevard South in 2015 than 2035. This situation is due to the signal timing at the adjacent intersection creating more gaps in 2035 for the northbound rights at Gateway Boulevard South.

Central Study Segment Concept Alternatives

A separate analysis was also done for each eastern Build Alternative based on 2015 traffic volumes. The central segment was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 25 compares the 2015 intersection LOS results for the central study segment.

Table 25: 2015 Intersection LOS Central Segment

Intersection	2015 No Build				2015 Concept A				2015 Concept B&C			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 EB Ramp @ US 17 (s)	D	37	C	27	B	17	B	12	B	17	B	12
SR 204 WB Ramp @ US 17 (s)	B	19	E	68	B	12	B	18	B	12	B	18
SR 204 @ Grove Point Road (u)												
Northbound Approach	F	55	D	34								
Southbound Approach	A	min	A	min	-	-	-	-	-	-	-	-
Eastbound Left	A	min	A	min								
Westbound Left	C	19	B	14								
SR 204 EB Ramp @ Pine Grove Road (s)*	F	123	B	17	A	9	A	8	B	16	A	8
SR 204 WB Ramp @ Pine Grove Road (s)					B	13	C	23	C	25	C	23
SR 204 EB Ramp @ King George Blvd (s)*	F	100	F	148	B	16	B	17	B	13	B	13
SR 204 WB Ramp @ King George Blvd (s)					A	9	B	10	A	9	A	9

(s) = signalized, (u) = unsignalized
**Single Signalized Intersection in No Build Condition
Note: Grove Point Road closed in Concepts A, B, and C

As shown in Table 25, all the study intersections are expected to experience acceptable LOS (LOS D or better) for Concepts A, B and C in the year 2015. All central segment locations in Concepts A, B and C also experience a reduction in delay from the No Build Condition.

Eastern Study Segment Concept Alternatives

Similar to the 2035 analysis of the eastern study segment, a separate analysis was done for each Build Alternative (Concepts A, B and C) based on 2015 traffic volumes. Table 26 shows the 2015 Intersection LOS for the eastern segment.

Table 26: 2015 Intersection LOS Eastern Segment

Intersection	2015 No Build				2015 Concept A				2015 Concept B				2015 Concept C			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
SR 204 EB @ Rio Road (s)**	E	63	F	274	B	12	B	18	C	22	C	32	C	30	D	45
SR 204 WB @ Rio Road (s)					C	22	C	29					C	28	C	30
SR 204 WB @ West Mall Driveway (u)																
Southbound Approach	B	12	C	17	B	12	B	13	B	11	B	12	B	11	B	12
SR 204 @ Central Mall Driveway (u)																
Southbound Approach	B	12	B	14	-	-	-	-	B	11	B	11	B	11	B	11
SR 204 WB @ Easy Mall Driveway (u)																
Southbound Approach	A	9	B	11	B	11	B	12	A	9	A	9	A	9	A	9
SR 204 EB @ Apache Avenue (u/s)**																
Northbound Approach	D	48	D	36	C	17	B	15	D	37	C	31	B	19	B	19
SR 204 WB @ Apache Avenue (u/s)																
Southbound Approach					B	13	C	16					C	24	C	26
SR 204 EB @ Middleground Road (s)**	E	56	E	67	B	16	B	14	D	37	D	42	C	22	C	23
SR 204 WB @ Middleground Road (s)					C	23	C	23					C	33	C	30
SR 204 EB @ Arts Drive (u/s)*																
Northbound Approach	B	17	B	11	B	10	B	13	A	10	A	10	B	11	C	21
SR 204 EB @ Mohawk Street (u)																
Northbound Approach	F	69	F	58	B	10	B	11	B	13	B	13	A	10	B	10
SR 204 WB @ Mohawk Street (u)																
Southbound Approach	E	46	F	60	B	11	B	11	C	16	B	15	B	10	A	10
SR 204 EB @ Mercy Boulevard (s)**	B	15	C	24	B	15	B	14	C	27	C	27	C	22	C	22
SR 204 WB @ Mercy Boulevard (s)					B	19	B	20					C	24	C	24
SR 204 EB @ Largo Drive (u/s)*																
Northbound Approach	C	31	C	35	C	20	C	24	C	33	D	41	D	42	C	25
SR 204 WB @ Largo Drive (u/s)																
Southbound Approach					B	14	E	47					B	16	C	23
SR 204 EB @ Idlewood Drive (u)																
Northbound Approach	B	11	B	10	n/a	n/a	n/a	n/a	B	10	A	10	B	10	A	10
SR 204 WB @ Idlewood Drive (u)																
Southbound Approach	A	9	A	10	B	10	B	11	A	9	A	10	A	9	A	9
SR 204 EB @ Deerfield Road (u/s)**																
Northbound Approach	C	21	C	27	n/a	n/a	n/a	n/a	C	32	C	35	C	34	C	28
SR 204 WB @ Deerfield Road (u/s)																
Southbound Approach					B	13	C	21					D	36	C	34
SR 204 @ Truman Parkway (s)	B	16	C	20	B	13	B	14	B	15	C	20	B	13	B	16
SR 204 @ White Bluff Connector (s)	A	10	B	10	A	9	A	9	B	10	B	14	B	10	B	13

(s) = signalized, (u) = unsignalized

*Signalized in No Build Condition and Concept B

** Single Signalized Intersection in No Build Condition and Concept B

Note: Central Mall Driveway closed in Concept A

Note: Idlewood Drive and Deerfield Road northbound approaches have a free flowing right-turn lane in Concept A

As shown in Table 26, Concept A is expected to experience unacceptable LOS (LOS E) at SR 204 Westbound at Largo Drive. All other locations for Concepts A, B, and C are expected to have acceptable LOS (LOS D or better) in 2015.

A summary of all the 2015 Build Synchro analysis reports is included in Appendix F.

7.1.3 Design Year (2035) CORSIM Analysis

The SR 204 corridor was analyzed using CORSIM software for the years 2015 and 2035. CORSIM was selected to evaluate the proposed improvements because it generates a wide range of operational and environmental measures of effectiveness (MOEs) to quantify the performance and capacity of the system-wide network. MOEs used for this analysis include average travel time, average speed, and average delay per vehicle along SR 204. The CORSIM analysis was performed for each of the following three study segments: western (Gateway Boulevard West to US 17), central (US 17 to Rio Road), and eastern (Rio Road to Truman Parkway). The results are presented for the peak direction (eastbound during the AM peak and westbound during the PM peak) to determine the alternative with the greatest benefit.

Western Study Segment Concept Alternatives

For the western study segment, a separate analysis was done for each Build Alternative. Each western segment alternative was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 27 shows the 2035 CORSIM analysis results for each of the three alternatives for the western study segment.

Table 27: 2035 CORSIM MOEs Western Segment

Measure of Effectiveness		2010 Existing		2035 No Build		2035 Concept A		2035 Concept B&C	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Alternative 1	Travel Time (min/veh)	3.7	3.6	7.1	9.3	4.4	10.6	4.4	7.3
	Speed (MPH)	35	32	30	19	31	17	31	22
	Delay (min/veh)	1.3	1.5	4.6	7.0	2.0	8.6	2.0	5.3
Alternative 2	Travel Time (min/veh)	3.7	3.6	7.1	9.3	3.2	3.1	3.2	3.1
	Speed (MPH)	35	32	30	19	42	36	42	36
	Delay (min/veh)	1.3	1.5	4.6	7.0	0.4	0.6	0.4	0.5
Alternative 3	Travel Time (min/veh)	3.7	3.6	7.1	9.3	3.0	3.0	3.0	3.0
	Speed (MPH)	35	32	30	19	46	37	46	38
	Delay (min/veh)	1.3	1.5	4.6	7.0	0.2	0.5	0.2	0.5

As shown in Table 27, Alternative 1 with Concept A is actually worse during the PM peak than the No Build scenario. This increased delay is due to gridlock created by the additional traffic causing the system to exceed capacity. The lower traffic volume demand in Alternative 1 with Concepts B and C does not quite reach this breakdown point. Alternatives 2 and 3 show improvement over the No Build scenario in all three concepts.

Alternative 2 has approximately a 3.9 minute per vehicle (55%) travel time reduction over No Build in the AM peak and a 6.2 minute per vehicle (67%) reduction during the PM peak for Concepts A, B and C. There is also a 12 mph (41%) increase in average speed over No Build during the AM peak and a 17 mph (89%) increase during the PM peak for Alternative 2 with Concepts A, B and C.

Alternative 3 has approximately a 4.1 minute per vehicle (58%) travel time reduction over No Build in the AM peak and a 6.3 minute per vehicle (68%) reduction during the PM peak for Concepts A, B and C. There is also a 16 mph (53%) increase in average speed over No Build during the AM peak and at least 18 mph (95%) increase during the PM peak for Concepts A, B and C.

Alternative 2 shows slightly worse performance when compared to Alternative 3 due to the signal at the loop ramp from I-95 southbound to SR 204 that is not present in Alternative 3. Alternative 2 also has more eastbound traffic on SR 204 at the intersection of I-95 northbound than Alternative 3. This is due to how the ramp from I-95 southbound connects to SR 204. In Alternative 3, the ramp connects to the access road that bypasses the I-95 northbound intersection and eventually combines with SR 204. In Alternative 2, I-95 connects directly to SR 204 via a loop ramp so traffic immediately enters the intersection with I-95 northbound.

Central Study Segment Concept Alternatives

For the central study segment, a separate analysis was done for each Build Alternative. The central segment alternative was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 28 shows the 2035 CORSIM analysis results for the central study segment.

Table 28: 2035 CORSIM MOEs Central Segment

Measure of Effectiveness	2010 Existing		2035 No Build		2035 Concept A		2035 Concept B&C	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Travel Time (min/veh)	7.3	19.4	7.4	23.2	6.4	5.8	6.1	5.8
Speed (MPH)	46	29	43	26	52	54	52	54
Delay (min/veh)	1.1	13.4	1.6	17.5	0.2	0.2	0.2	0.2

Concepts A, B and C have the same Build geometry for the central study segment from US 17 to Rio Road. As shown in Table 28 above the central study segment is expected to see an increase in speed and a reduction in both travel time and delay for all the Build concepts as compared to No Build. This segment of SR 204 is operating at a near free-flow condition with the only delay coming from traffic merging onto SR 204.

Concept A has approximately a 1.0 minute per vehicle (14%) travel time reduction over No Build in the AM peak and a 17.4 minute per vehicle (75%) reduction during the PM peak. There is also a 9 mph (21%) increase in average speed over No Build during the AM peak and 28 mph (108%) increase during the PM peak for all three concepts.

Concepts B and C have approximately a 1.3 minute per vehicle (18%) travel time reduction over No Build and a 17.4 minute per vehicle (75%) reduction during the PM peak.

Eastern Study Segment Concept Alternatives

For the eastern study segment, a separate analysis was done for each Build Alternative (Concepts A, B and C). Table 29 shows the 2035 CORSIM analysis results for the eastern study segment.

Table 29: 2035 CORSIM MOEs Eastern Segment

Measure of Effectiveness		2010 Existing		2035 No Build		2035 Concept A		2035 Concept B		2036 Concept C	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Surface Lanes	Travel Time (min/veh)	6.0	9.9	10.8	17.6	6.7	11.1	6.4	9.5	7.4	8.5
	Speed (MPH)	35	29	24	20	35	32	34	30	29	26
	Delay (min/veh)	2.6	6.4	7.9	14.3	2.5	5.9	3.1	6.5	4.4	5.4
Freeway Lanes	Travel Time (min/veh)					3.4	3.6	3.4	3.5	3.3	3.4
	Speed (MPH)					54	53	54	54	54	53
	Delay (min/veh)					0.1	0.2	0.1	0.1	0.1	0.1

As shown in Table 29, Concepts A, B and C have increases in speed and reductions in both travel time and delay as compared to No Build. Overall, the 2035 travel time, speed and delay on the Surface Lanes of Concepts A, B and C are comparable to the Existing 2010 conditions. However, all the Build concepts carry additional traffic on the Freeway Lanes. The Freeway Lanes are expected to operate at near free-flow conditions with the only delay coming from merging traffic.

Concept A has approximately a 4.1 minute per vehicle (38%) travel time reduction over No Build in the AM peak and a 6.5 minute per vehicle (37%) reduction on the surface lanes during the PM peak. There is also an 11 mph (46%) increase in average speed over No Build during the AM peak and a 12 mph (60%) increase during the PM peak. The Concept A freeway lanes compared to the 2035 No Build surface lanes see approximately a 7.4 minute per vehicle (69%) travel time reduction in the AM peak and a 14.0 minute per vehicle (80%) reduction during the PM peak. There is also a 30 mph (125%) increase in average speed over No Build during the AM peak and a 33 mph (165%) increase during the PM peak.

Concept B has approximately a 4.4 minute per vehicle (41%) travel time reduction over No Build in the AM peak and an 8.1 minute per vehicle (46%) reduction on the surface lanes during the PM peak. There is also a 10 mph (42%) increase in average speed over No Build during the AM peak and a 10 mph (50%) increase during the PM peak. The Concept B freeway lanes compared to the 2035 No Build surface lanes see approximately a 7.4 minute per vehicle (69%) travel time reduction over No Build in the AM peak and a 14.1 minute per vehicle (80%) reduction during the PM peak. There is also a 30 mph (125%) increase in average speed over No Build during the AM peak and a 34 mph (170%) increase during the PM peak.

Concept C has approximately a 3.4 minute per vehicle (31%) travel time reduction over No Build in the AM peak and a 9.1 minute per vehicle (52%) reduction on the surface lanes during the PM peak. There is also a 5 mph (21%) increase in average speed over No Build during the AM peak and a 6 mph (30%) increase during the PM peak. The Concept C freeway lanes compared to the

2035 No Build surface lanes see approximately a 7.5 minute per vehicle (69%) travel time reduction over No Build in the AM peak and a 14.2 minute per vehicle (81%) reduction during the PM peak. There is also a 30 mph (125%) increase in average speed over No Build during the AM peak and a 33 mph (165%) increase during the PM peak.

Figures 28 through 31, located at the end of Section 7 of this report, summarize the CORSIM 2035 results of the No Build and Build alternatives for Average Speed during the AM Peak (Figure 28), Travel Times during the AM Peak (Figure 29), Average Speed during the PM Peak (Figure 30), and Travel Time during the PM Peak (Figure 31).

7.1.4 Opening Year (2015) CORSIM Analysis

Similar to the 2035 analysis of the western study segment, a separate analysis was done for each Build Alternative based on opening year (2015) traffic volumes. The results of the 2015 analysis are summarized in this section.

Western Study Segment Concept Alternatives

Each western segment alternative was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 30 shows the 2015 CORSIM analysis results for each of the three alternatives for the western study segment.

Table 30: 2015 CORSIM MOEs Western Segment

Measure of Effectiveness		2010 Existing		2015 No Build		2015 Concept A		2015 Concept B&C	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Alternative 1	Travel Time (min/veh)	3.7	3.6	5.5	4.0	3.7	3.3	3.6	3.2
	Speed (MPH)	35	32	31	32	33	32	33	33
	Delay (min/veh)	1.3	1.5	3.1	1.6	1.3	1.3	1.3	1.2
Alternative 2	Travel Time (min/veh)	3.7	3.6	5.5	4.0	3.1	2.9	3.1	2.9
	Speed (MPH)	35	32	31	32	44	39	43	39
	Delay (min/veh)	1.3	1.5	3.1	1.6	0.3	0.4	0.3	0.4
Alternative 3	Travel Time (min/veh)	3.7	3.6	5.5	4.0	3.0	2.9	3.0	2.9
	Speed (MPH)	35	32	31	32	47	39	47	40
	Delay (min/veh)	1.3	1.5	3.1	1.6	0.2	0.4	0.2	0.4

As shown in Table 30 each of the Build alternatives have improvements from the No Build condition. Alternative 1 does operate at acceptable conditions for 2015, however as shown in Table 27 Alternative 1 exceeds the No Build delay by 2035.

Central Study Segment Concept Alternatives

A separate analysis was also done for each Build Alternative based on 2015 traffic volumes. The central segment was investigated for the three eastern segment alternatives (Concepts A, B and C). Table 31 shows the 2015 CORSIM analysis results for the central study segment.

Table 31: 2015 CORSIM MOEs Central Segment

Measure of Effectiveness	2010 Existing		2015 No Build		2015 Concept A		2015 Concept B&C	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Travel Time (min/veh)	7.3	19.4	7.4	21.3	6.2	5.7	6.0	5.6
Speed (MPH)	46	29	46	29	53	55	53	55
Delay (min/veh)	1.1	13.4	1.3	15.5	0.1	0.1	0.1	0.1

As shown in Table 31, there are improvements in travel time, speed, and delay for all 2015 Build scenarios. Concepts A, B and C have similar traffic operations.

Eastern Study Segment Concept Alternatives

Similar to the 2035 analysis of the eastern study segment, a separate analysis was done for the Build alternatives based on 2015 traffic volumes. Table 32 shows the 2015 CORSIM analysis results for the eastern study segment.

Table 32: 2015 CORSIM MOEs Eastern Segment

Measure of Effectiveness		2010 Existing		2015 No Build		2015 Concept A		2015 Concept B		2015 Concept C	
		AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Surface Lanes	Travel Time (min/veh)	6.0	9.9	6.5	11.8	5.0	6.0	6.0	6.5	7.2	7.4
	Speed (MPH)	35	29	32	24	37	35	36	33	30	27
	Delay (min/veh)	2.6	6.4	3.2	8.6	1.8	1.8	2.7	3.5	4.1	4.4
Freeway Lanes	Travel Time (min/veh)					3.4	3.4	3.4	3.4	3.3	3.3
	Speed (MPH)					55	55	54	55	54	54
	Delay (min/veh)					0.0	0.0	0.1	0.1	0.1	0.1

Concepts A, B and C are expected to see improvements in travel time, speed, and delay for in 2015, with large savings are seen specifically in the PM Peak. The exception is the AM Peak Travel Time for Concept C. For Concept C to operate acceptably unique signal phasing is required for the two paired intersections at each major cross street. Because these intersections have to operate together the progression along SR 204 suffers. However by 2035 the No Build condition experiences such high delays that the effect of the unique signal phasing required in Concept C does not cause higher delays for the comparison.

7.2 Summary of Future Traffic Conditions

Based on the existing lane geometry, several key intersections are expected to experience LOS F conditions with vehicle delays greater than 90 seconds in 2035. These include four locations along the western segment (SR 204 at Gateway Boulevard West, SR 204 at I-95 southbound ramps, SR 204 at I-95 northbound ramps, and SR 204 at Gateway Boulevard South), four intersections along the central segment (US 17 at SR 204 eastbound ramps, US 17 at SR 204 westbound ramps, SR 204 at Grove Point Road, and SR 204 at King George Boulevard), and four intersections along the eastern segment (SR 204 at Rio Road, SR 204 at Apache Avenue, SR 204 at Middleground

Road, and SR 204 at Mohawk Street). Without future improvements, operating conditions at the major intersections along the corridor will continue to degrade as traffic volumes increase. In the future No Build condition, average speed is expected to decrease and total delay time is expected to increase. The No Build future traffic analysis indicates additional improvements are necessary to maintain acceptable corridor operations in the year 2035.

7.2.1 Western Alternatives

According to analysis of the western segment, Alternatives 2 and 3 are more advantageous than Alternative 1 because fewer intersections are expected to have unacceptable LOS. Overall costs and impacts are comparable for Alternatives 2 and 3. However, Alternative 3 is more desirable than Alternative 2 because the reductions in travel time and increases in speed are greater. According to the analysis however, the Gateway Boulevard West intersection is expected to have LOS F on the southbound unsignalized approach for Alternative 3. Signalizing this intersection is expected to improve the intersection to acceptable LOS, though this improvement should not be implemented before the intersection meets traffic signal warrants. Although a formal traffic signal warrant study was not performed for this intersection, the southbound approach does meet the 4 vehicle-hours of delay requirement, which is stipulated in the MUTCD in Warrant 3, Peak Hour. The volumes at this intersection should be monitored and signalization should be considered when warranted.

7.2.2 Eastern Alternatives

According to the analysis, Concepts B and C are more desirable than Concept A because fewer intersections in the eastern study segment are expected to have unacceptable LOS under these concepts. However, Concept B is more desirable than Concept C because it has lower overall costs and less relocations and impact to the surrounding environment. Concept B was designed to minimize impacts to surrounding property owners so additional improvements to this alternative may not be desirable. However, in order to achieve acceptable LOS (LOS D or better) for all movements at the study intersections in Concept B, the following improvements are needed:

SR 204 at Rio Road

- Install a third westbound through lane

SR 204 at Apache Avenue

- Convert the existing southbound dual left-turn lane into a single left-turn lane and install protected/permitted left-turn phasing on both the northbound and southbound approaches

SR 204 at Middleground Road

- Install a dual left-turn lane on the southbound approach and install protected only left-turn phasing

- Install a dedicated northbound right-turn lane
SR 204 at Mercy Boulevard

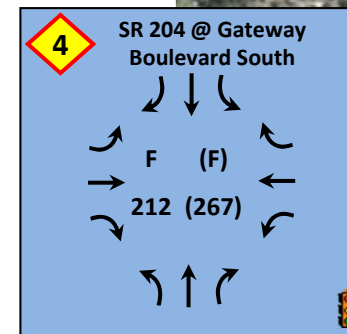
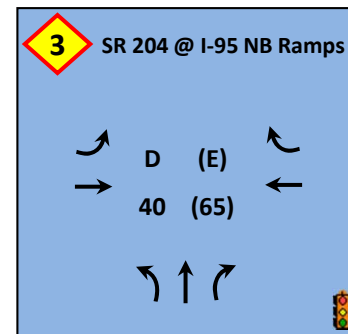
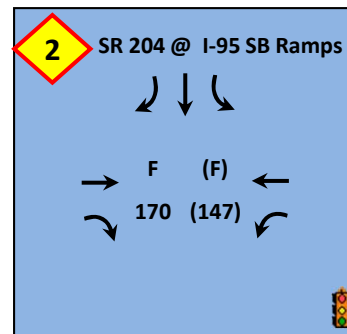
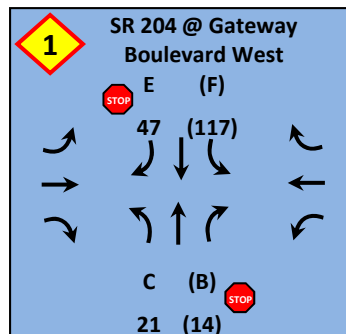
- Install protected/permitted left-turn phasing on both the northbound and southbound approaches

SR 204 at Deerfield Road

- Install a dual left-turn lane on the eastbound approach

With these improvements, all movements at the study intersections in Concept B are expected to have acceptable LOS (LOS D or better).

Figure 12: 2035 No Build LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

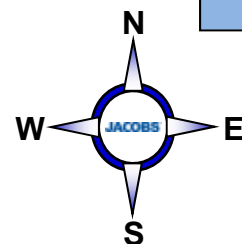
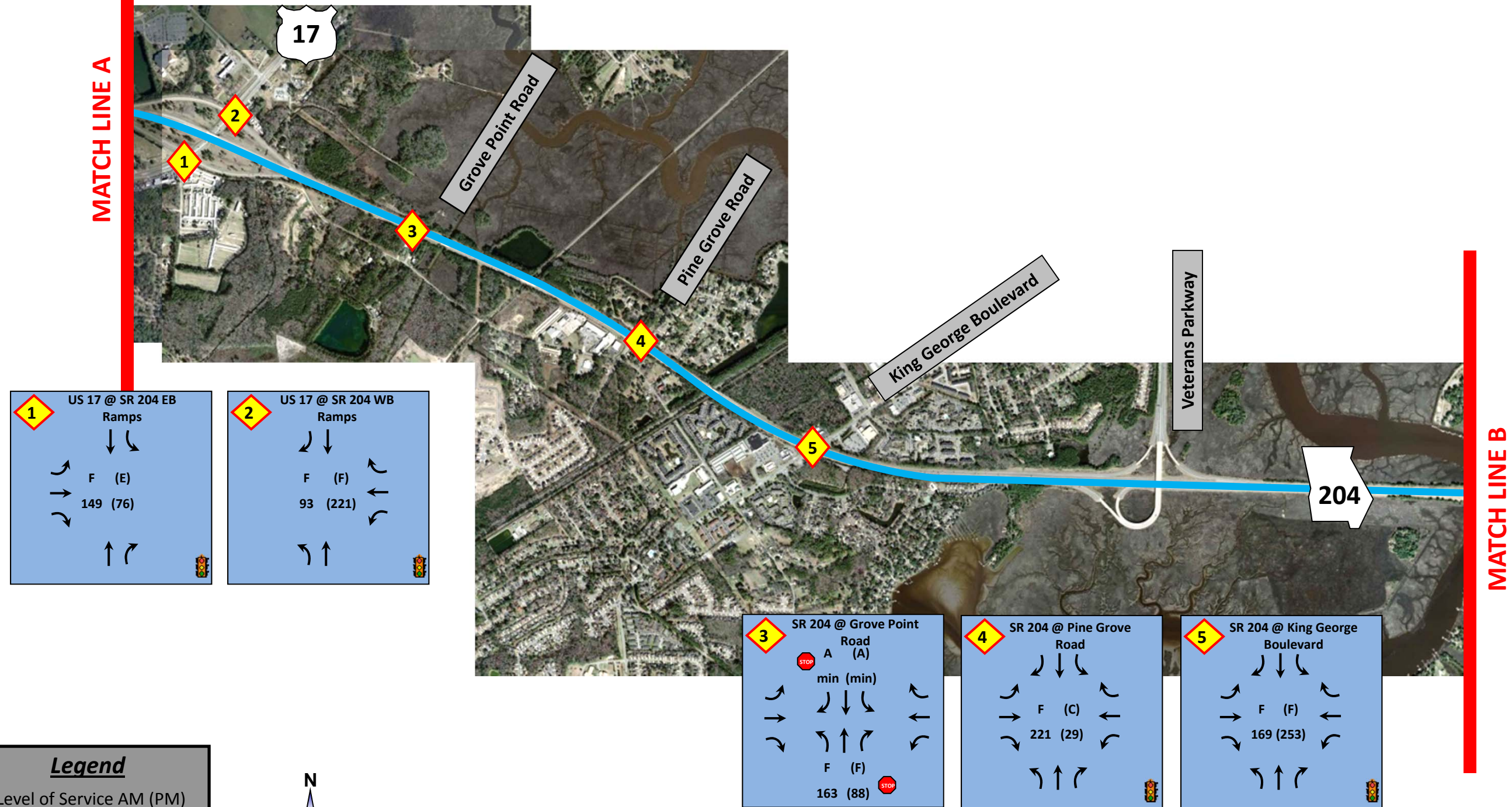


Figure 13: 2035 No Build LOS Central Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

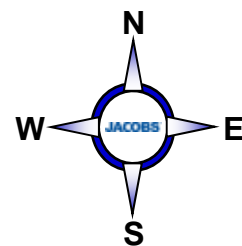
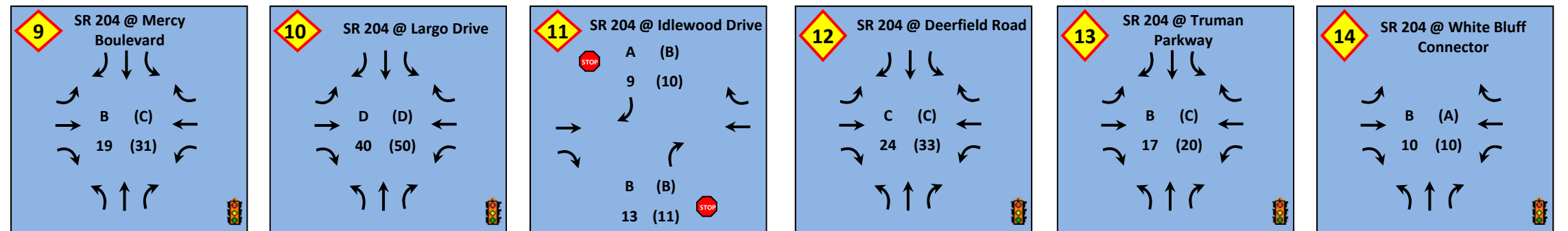
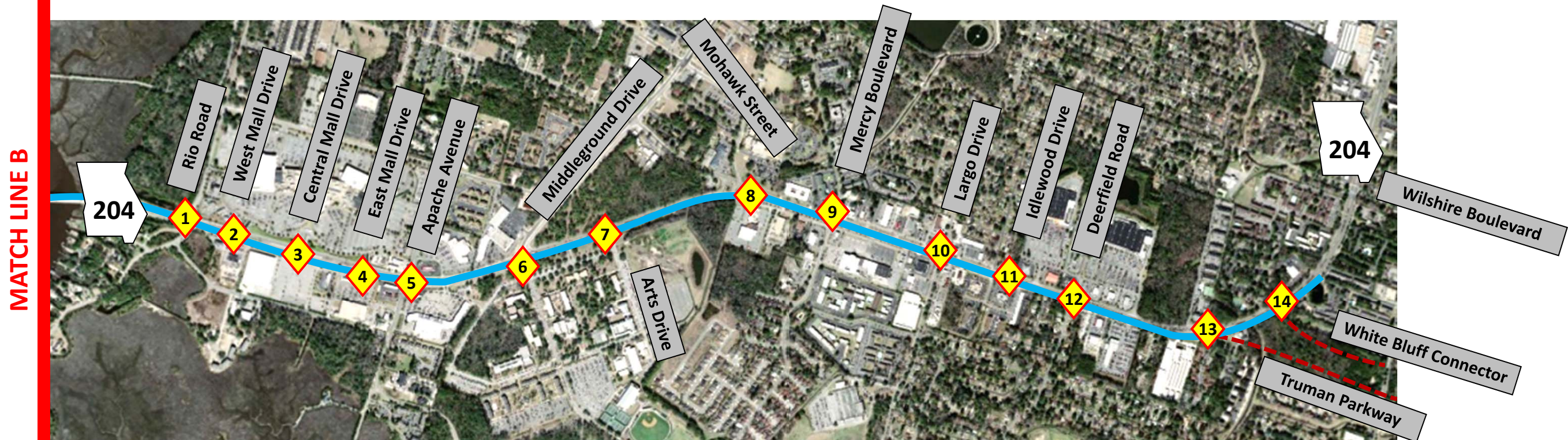
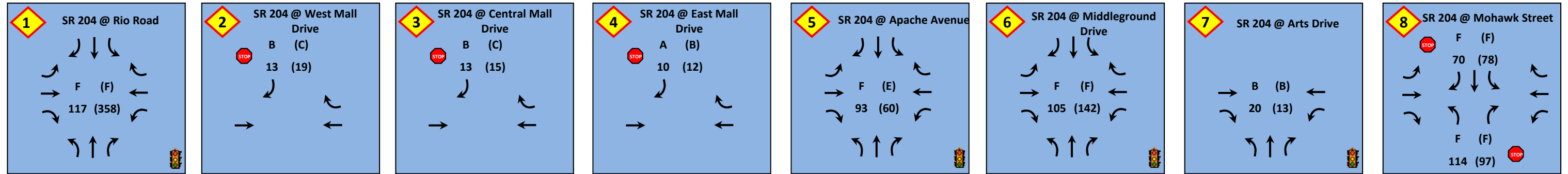


Figure 14: 2035 No Build LOS Eastern Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

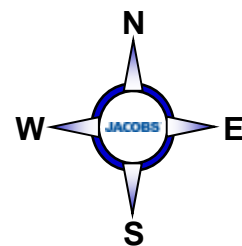
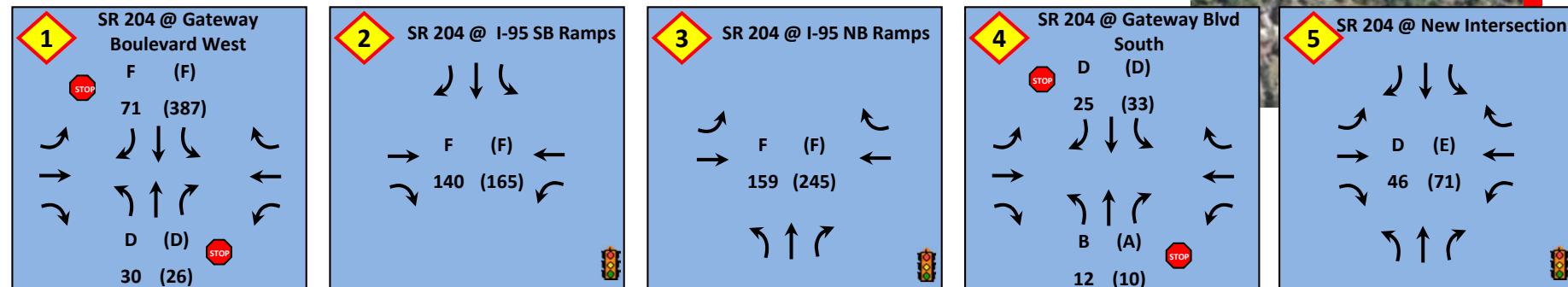
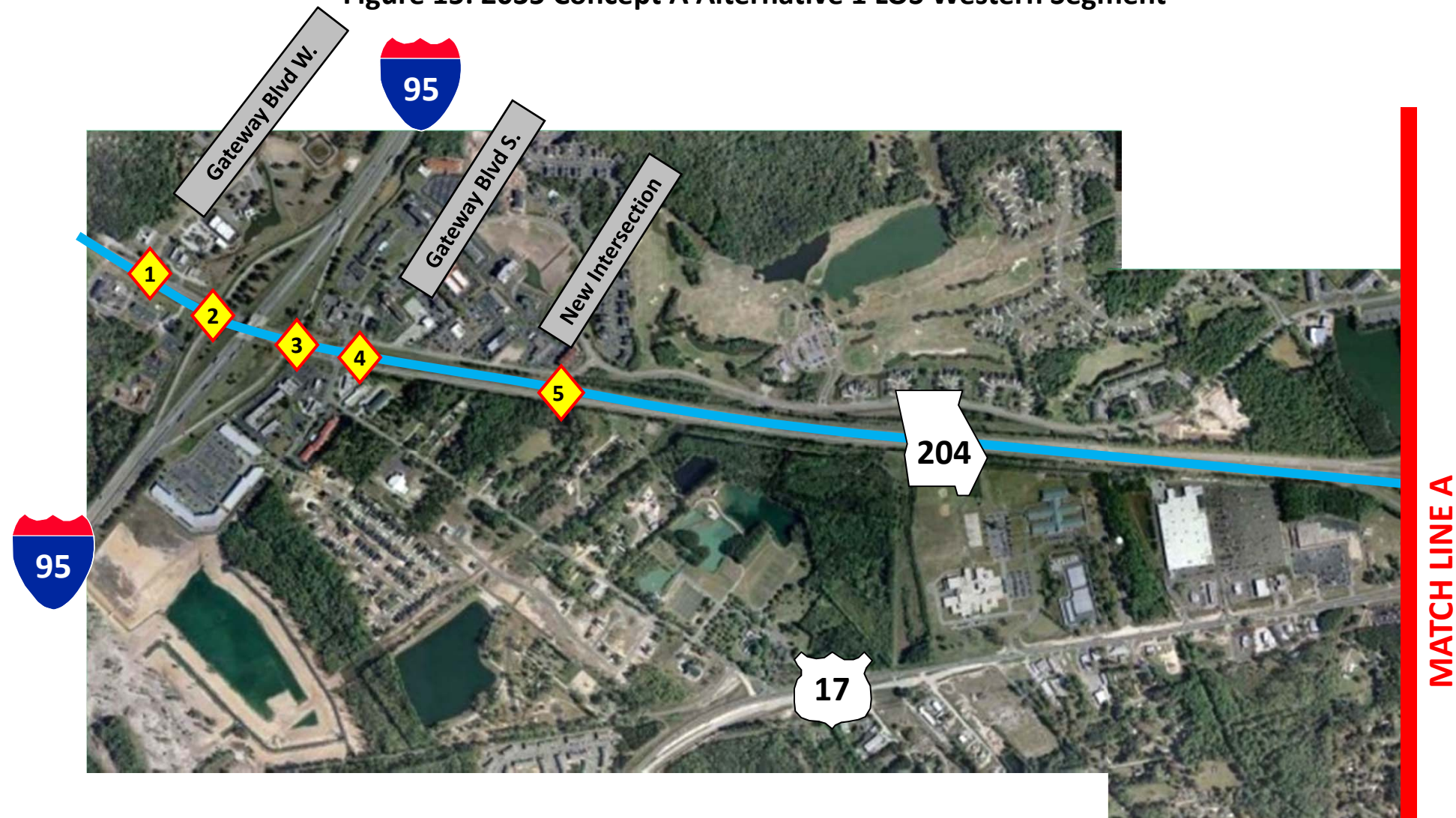


Figure 15: 2035 Concept A Alternative 1 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

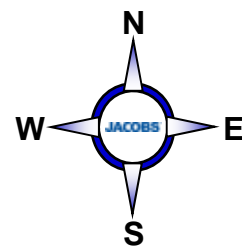
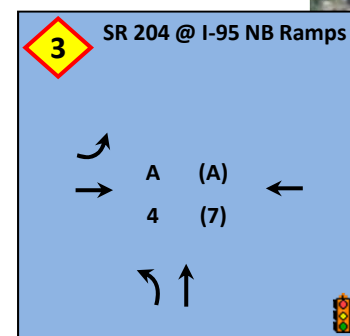
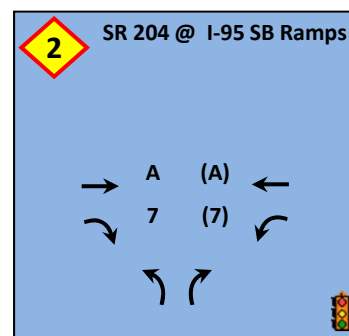
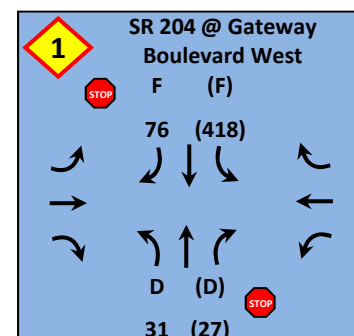


Figure 16: 2035 Concept A Alternative 2 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

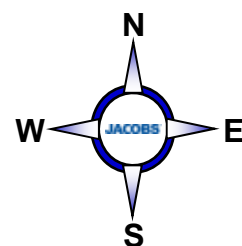
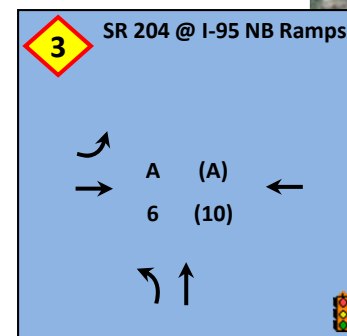
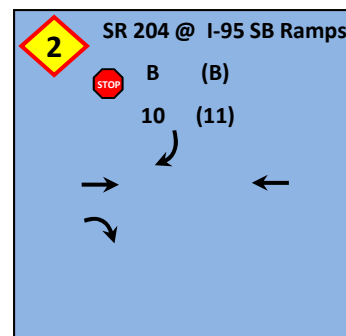
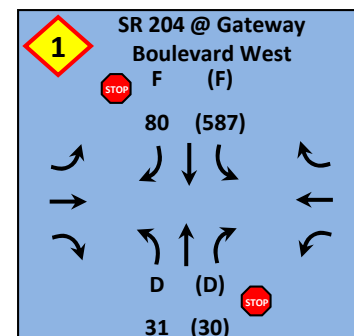


Figure 17: 2035 Concept A Alternative 3 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

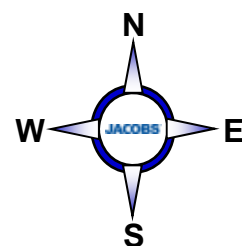


Figure 18: 2035 Concept A LOS Central Segment

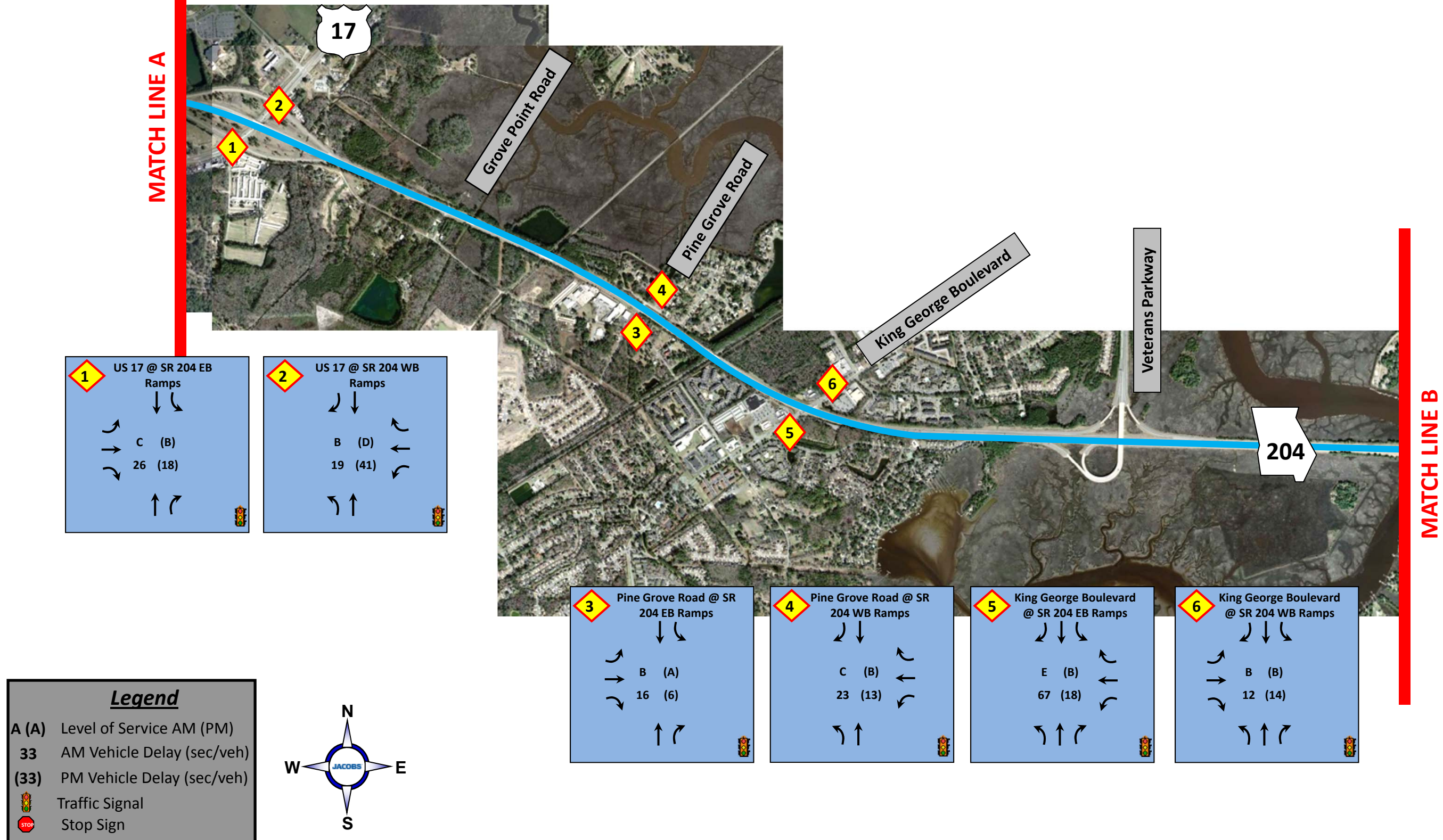
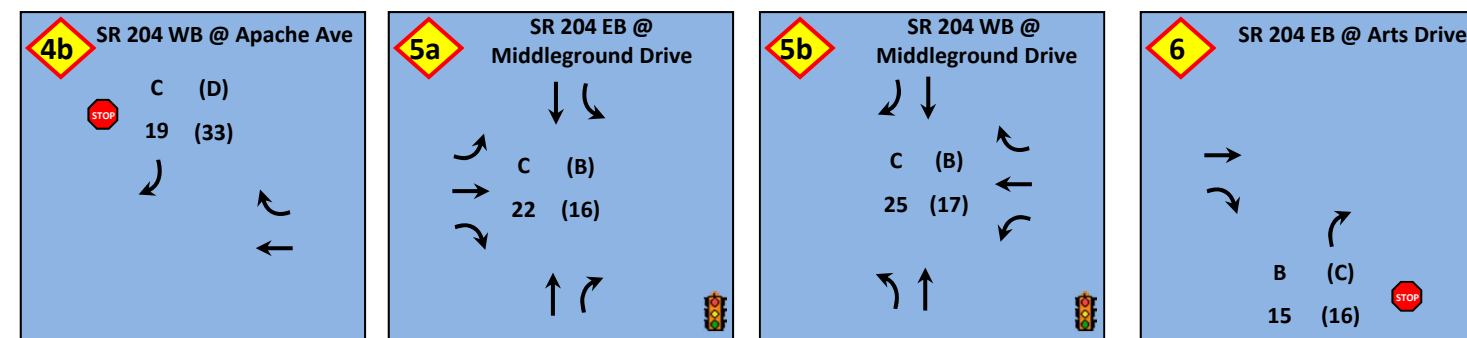
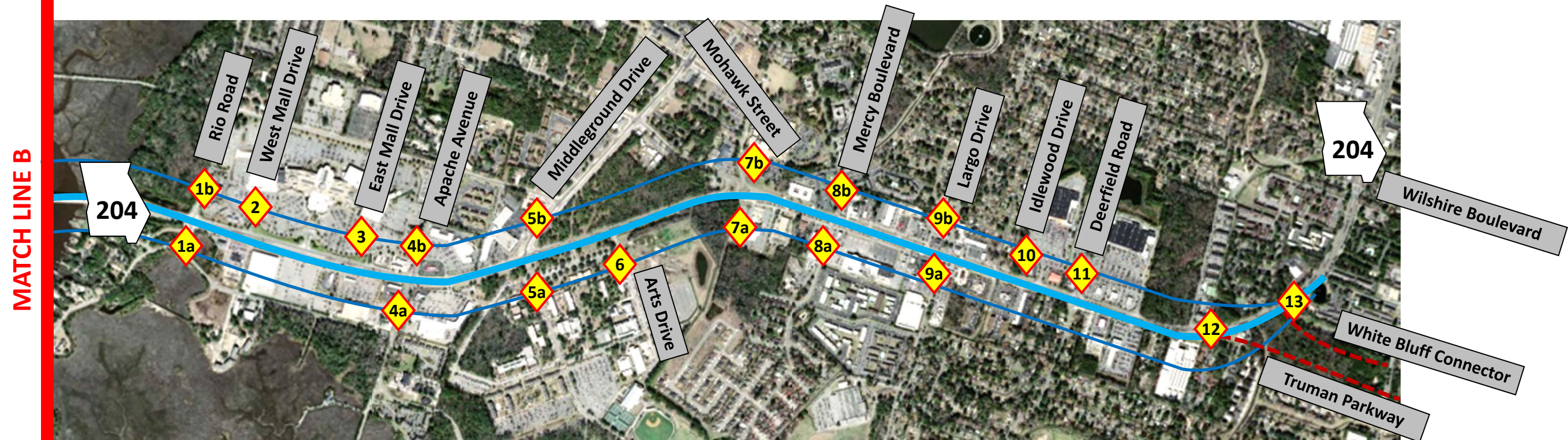
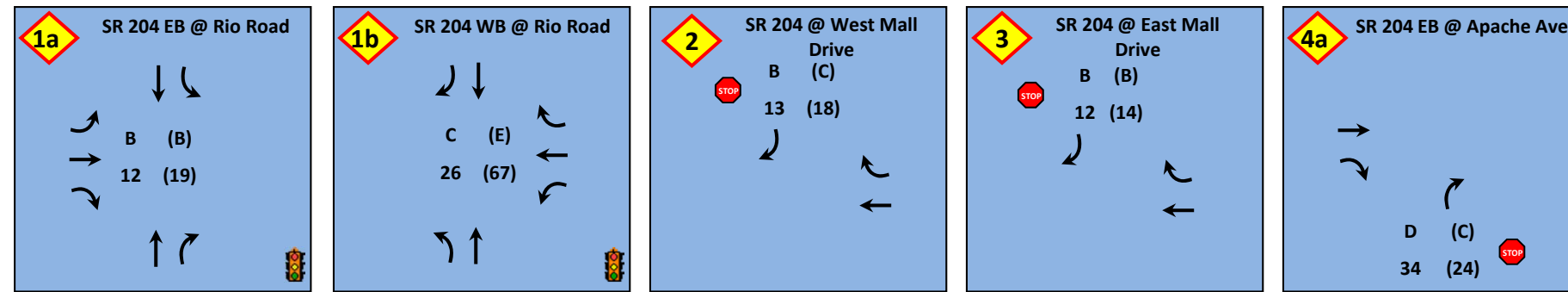


Figure 19: 2035 Concept A LOS Eastern Segment (1 of 2)



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

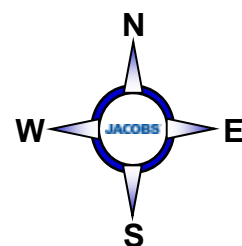
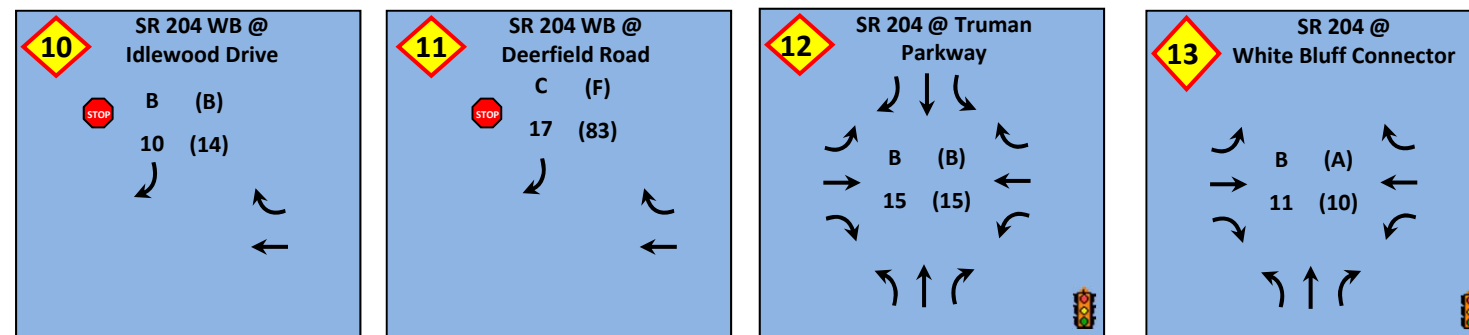
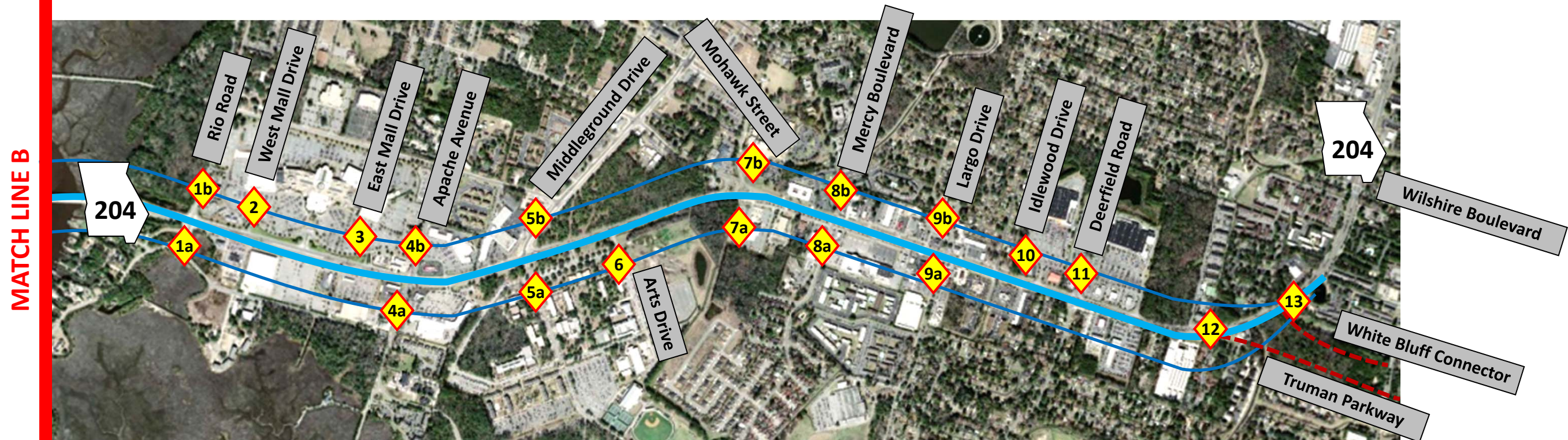
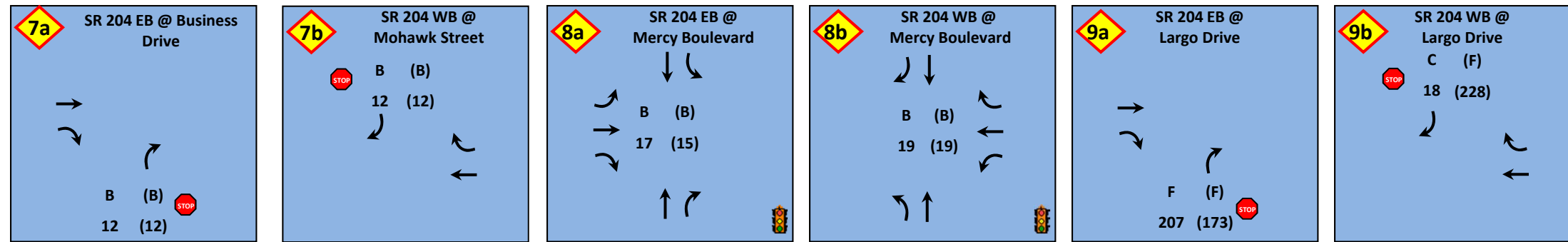


Figure 20: 2035 Concept A LOS Eastern Segment (2 of 2)



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

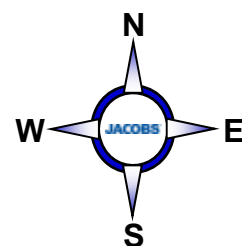
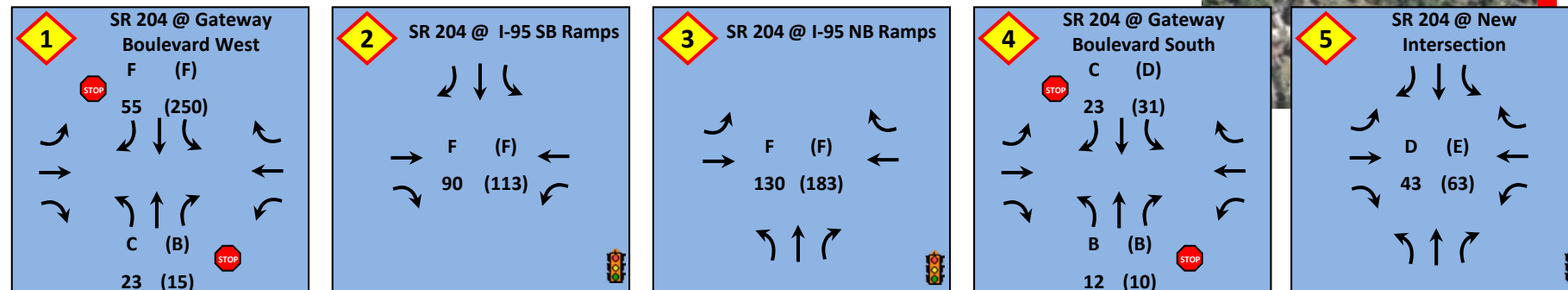
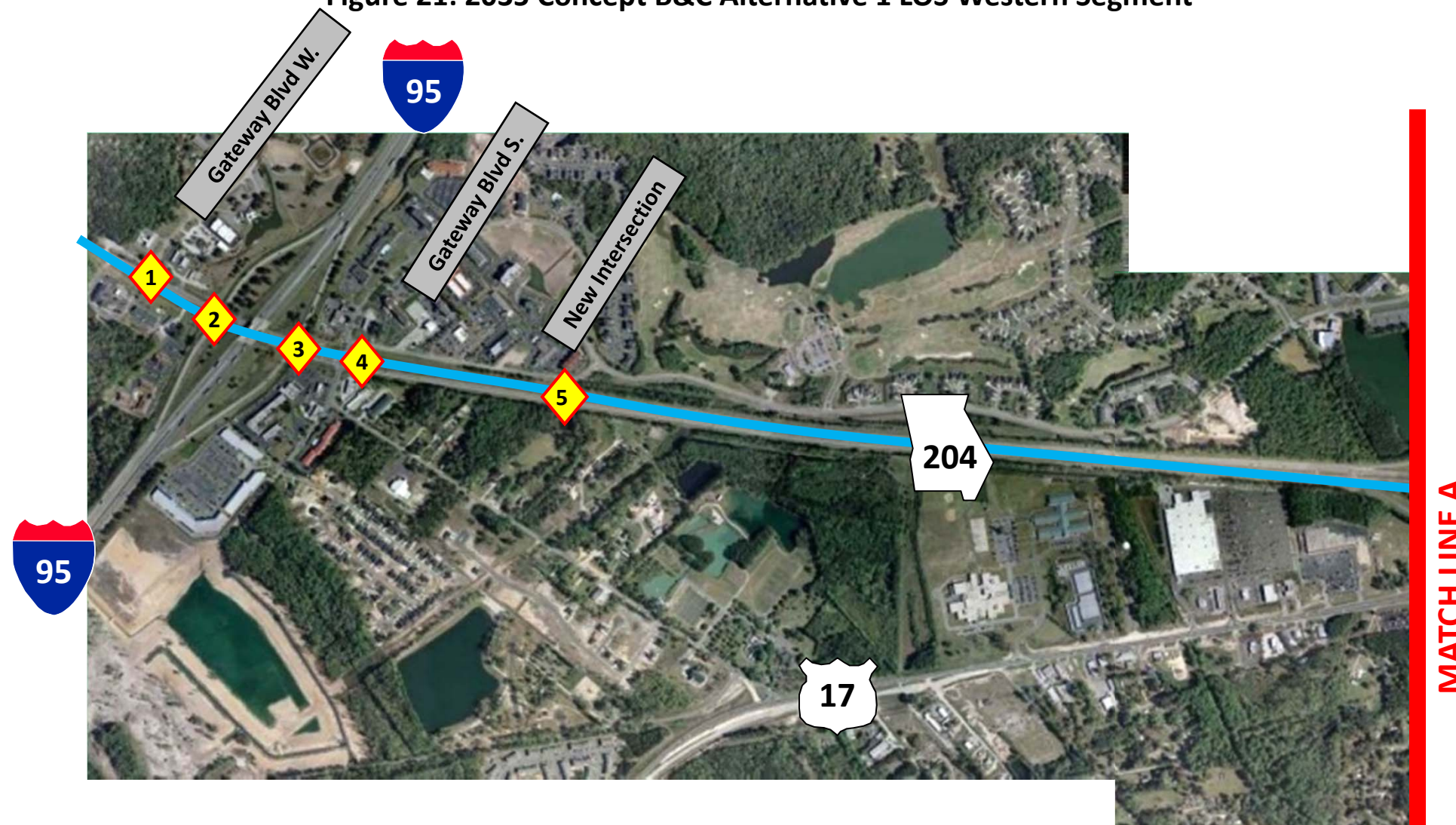


Figure 21: 2035 Concept B&C Alternative 1 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

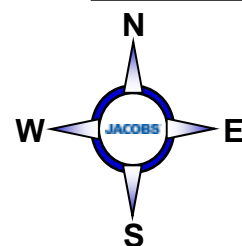
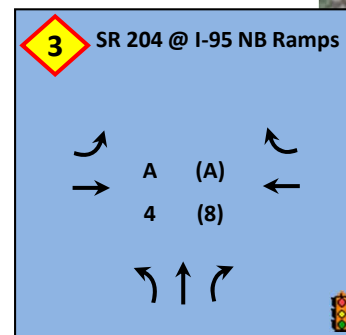
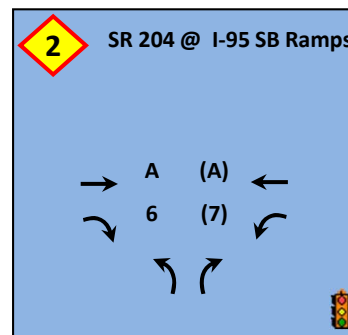
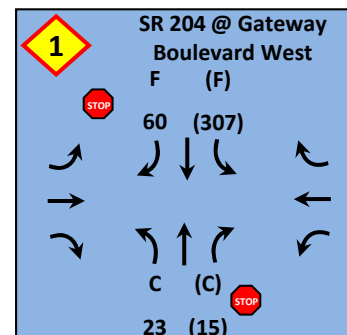


Figure 22: 2035 Concept B&C Alternative 2 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

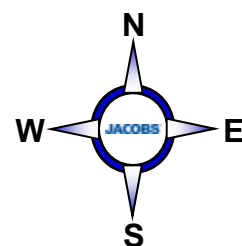
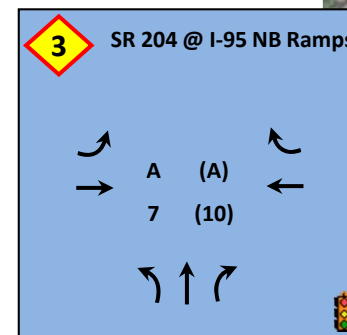
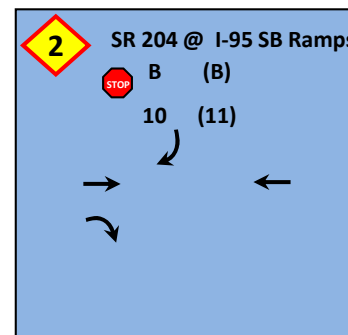
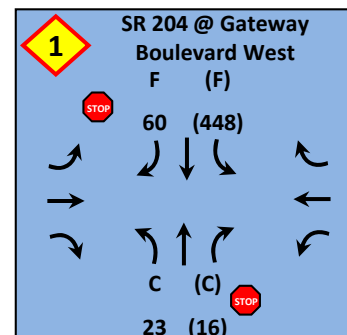


Figure 23: 2035 Concept B&C Alternative 3 LOS Western Segment



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

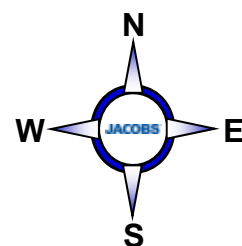


Figure 24: 2035 Concept B&C LOS Central Segment

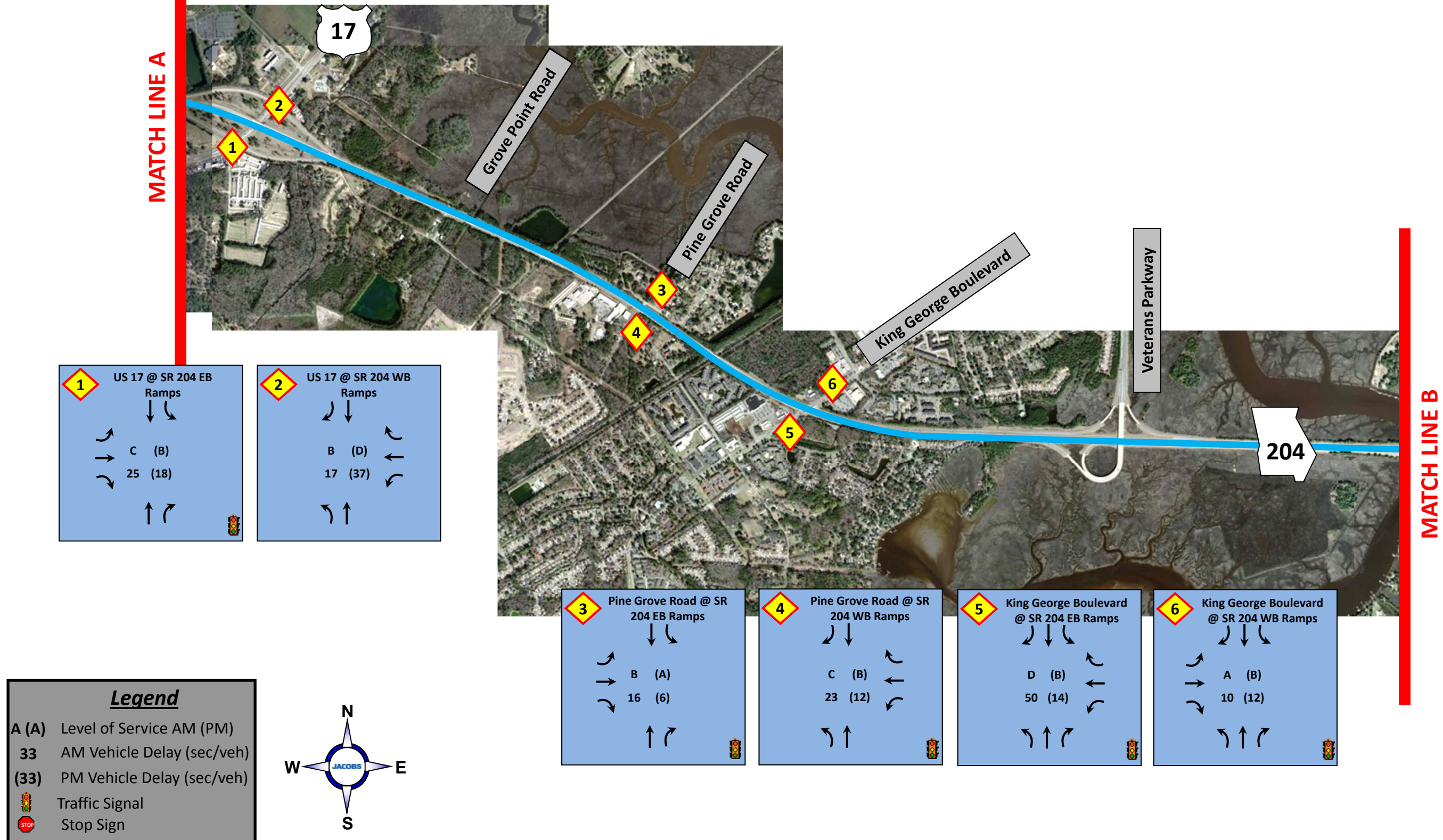
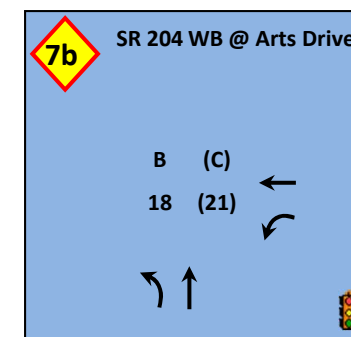
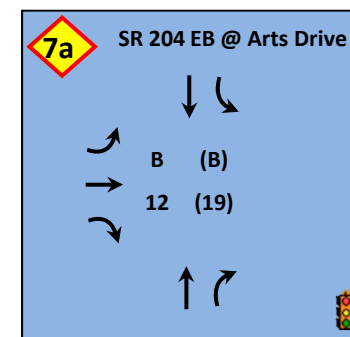
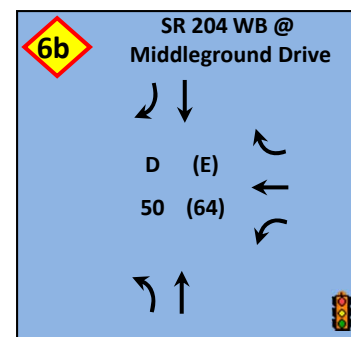
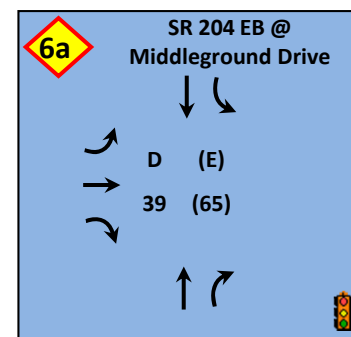
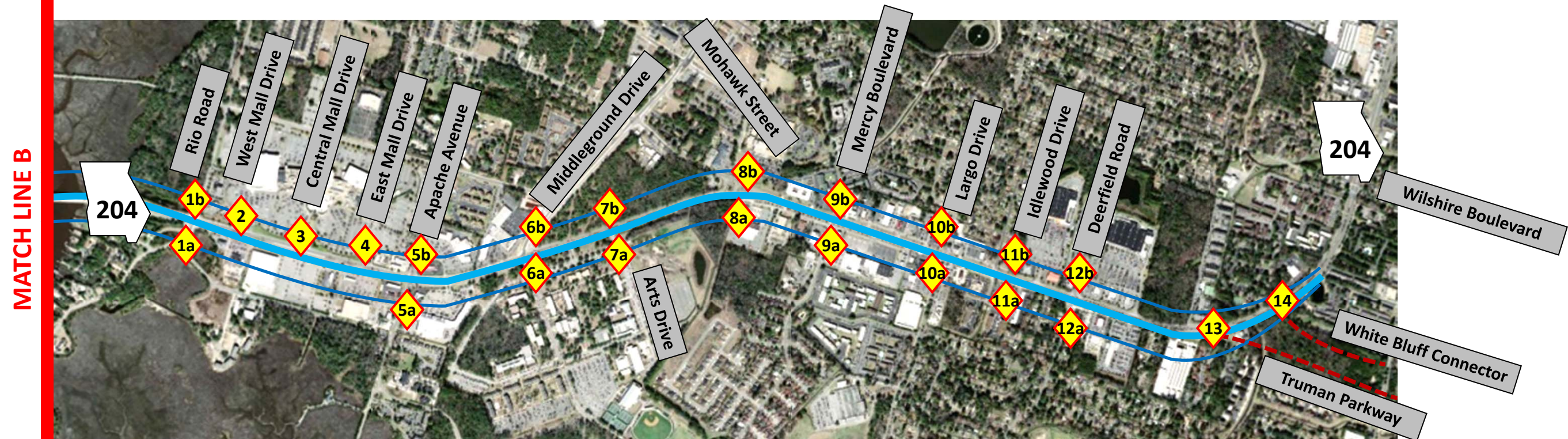
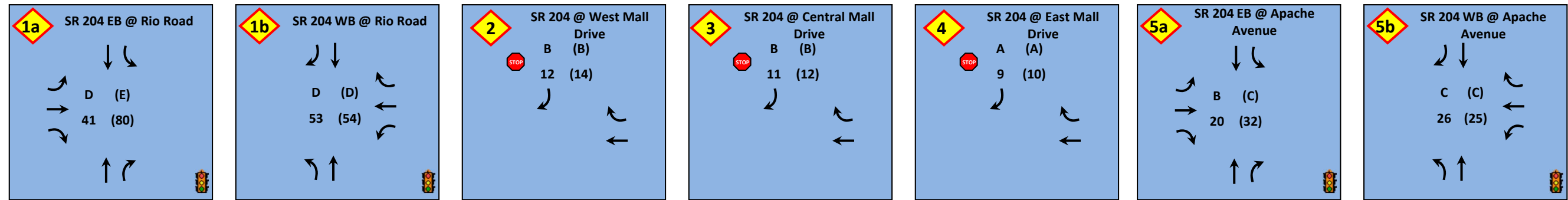


Figure 25: 2035 Concept B LOS Eastern Segment



Figure 26: 2035 Concept C LOS Eastern Segment (1 of 2)



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

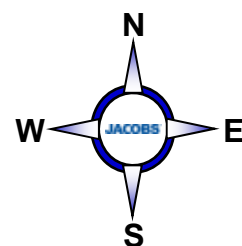
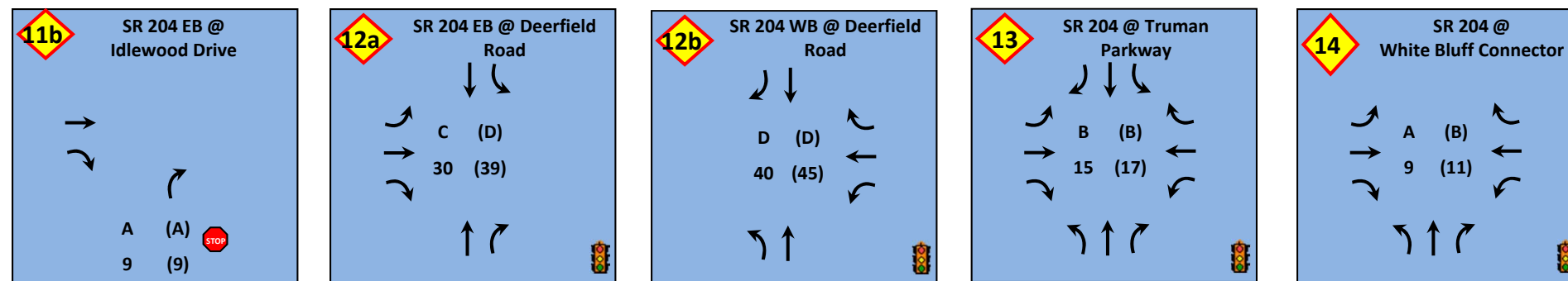
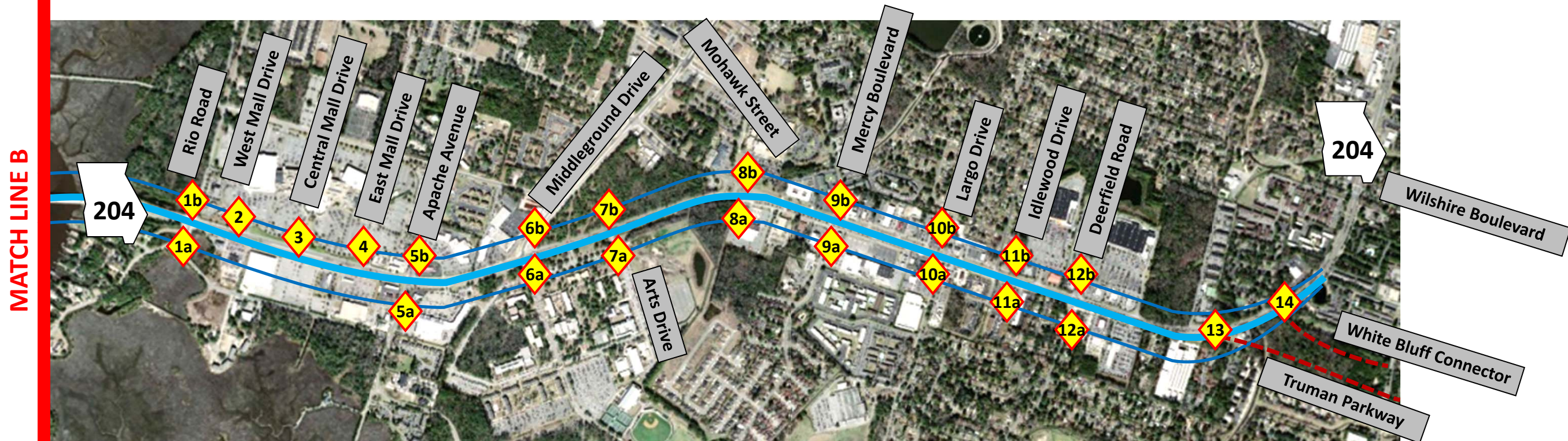
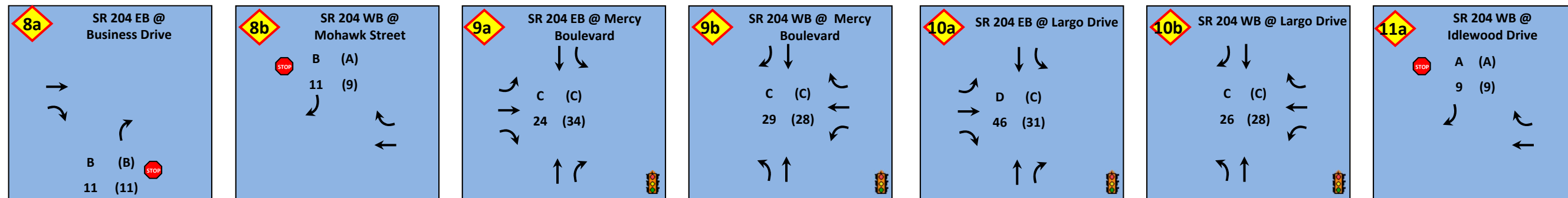


Figure 27: 2035 Concept C LOS Eastern Segment (2 of 2)



Legend

A (A)	Level of Service AM (PM)
33	AM Vehicle Delay (sec/veh)
(33)	PM Vehicle Delay (sec/veh)
	Traffic Signal
	Stop Sign

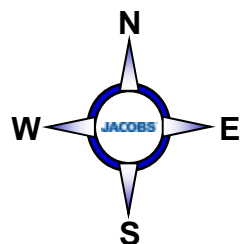


Figure 28: CORSIM Results 2035 Average Speed AM Peak

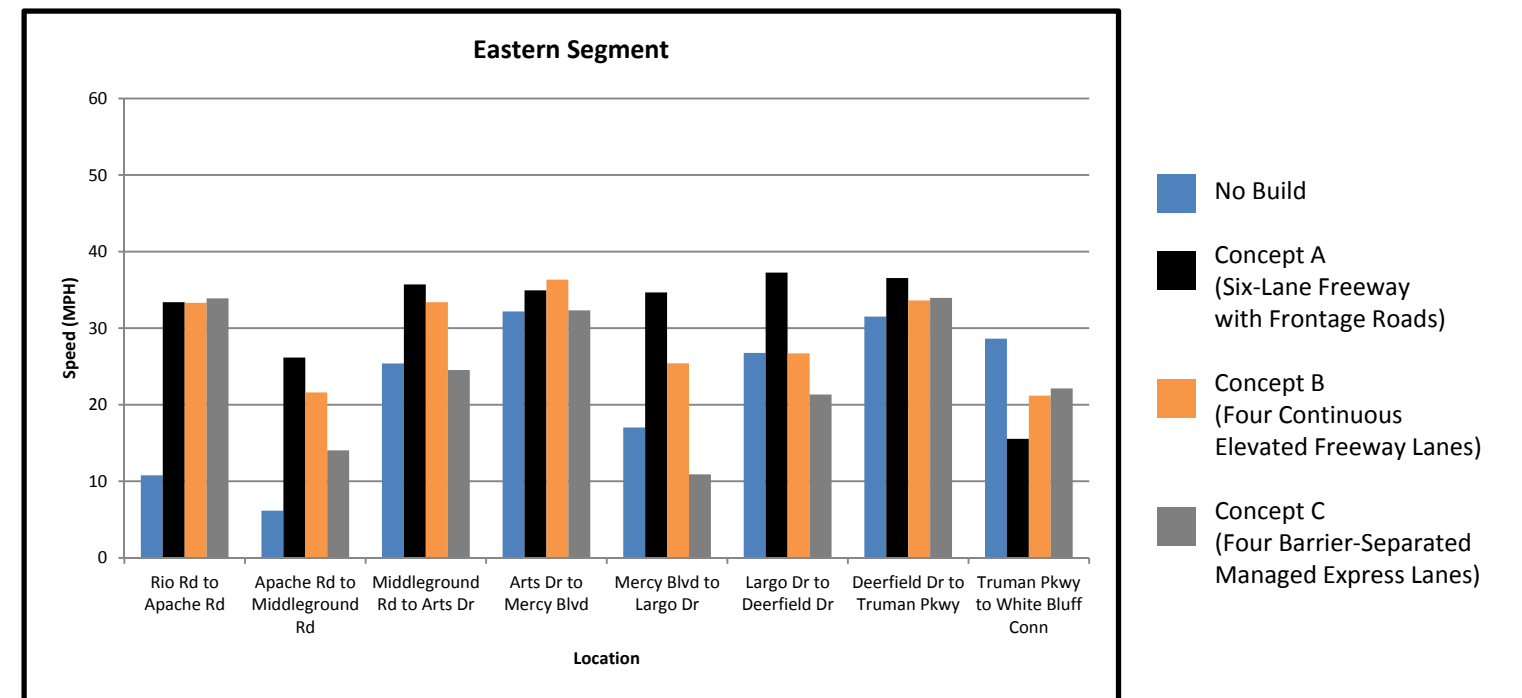
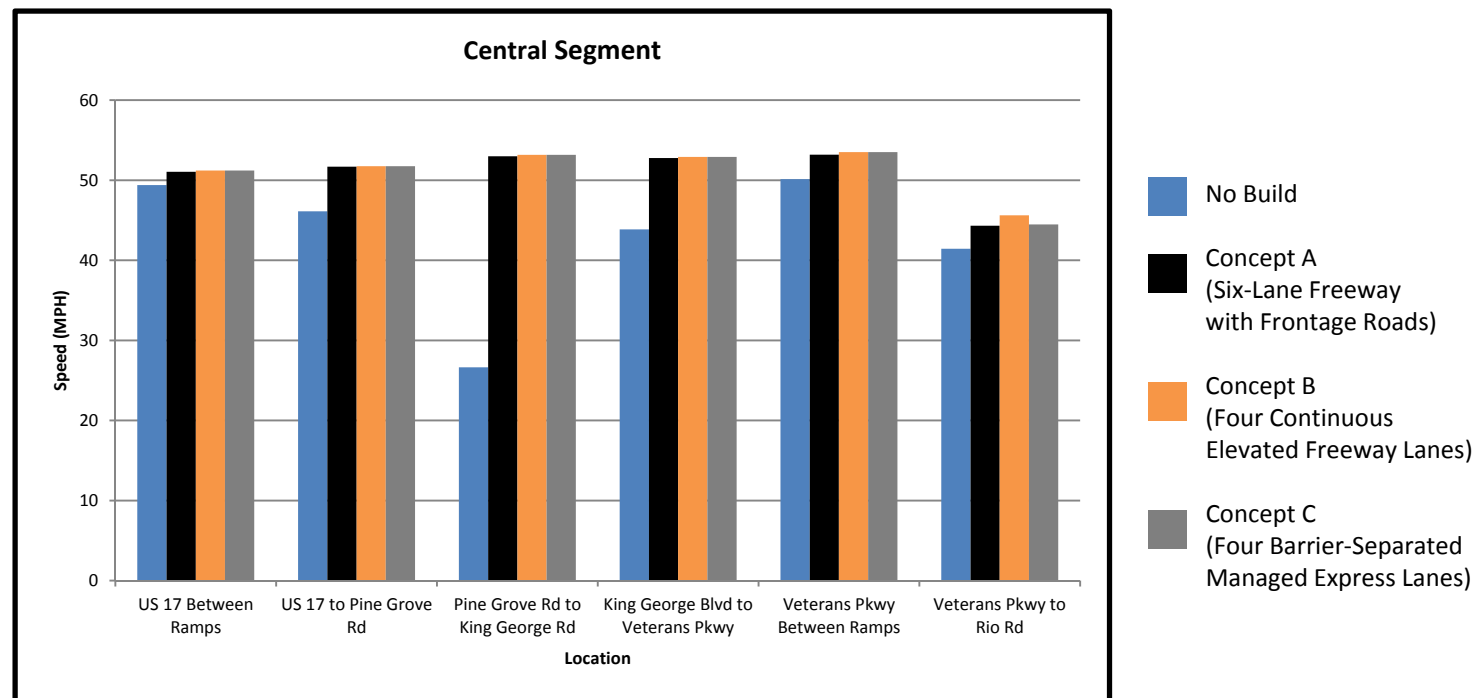
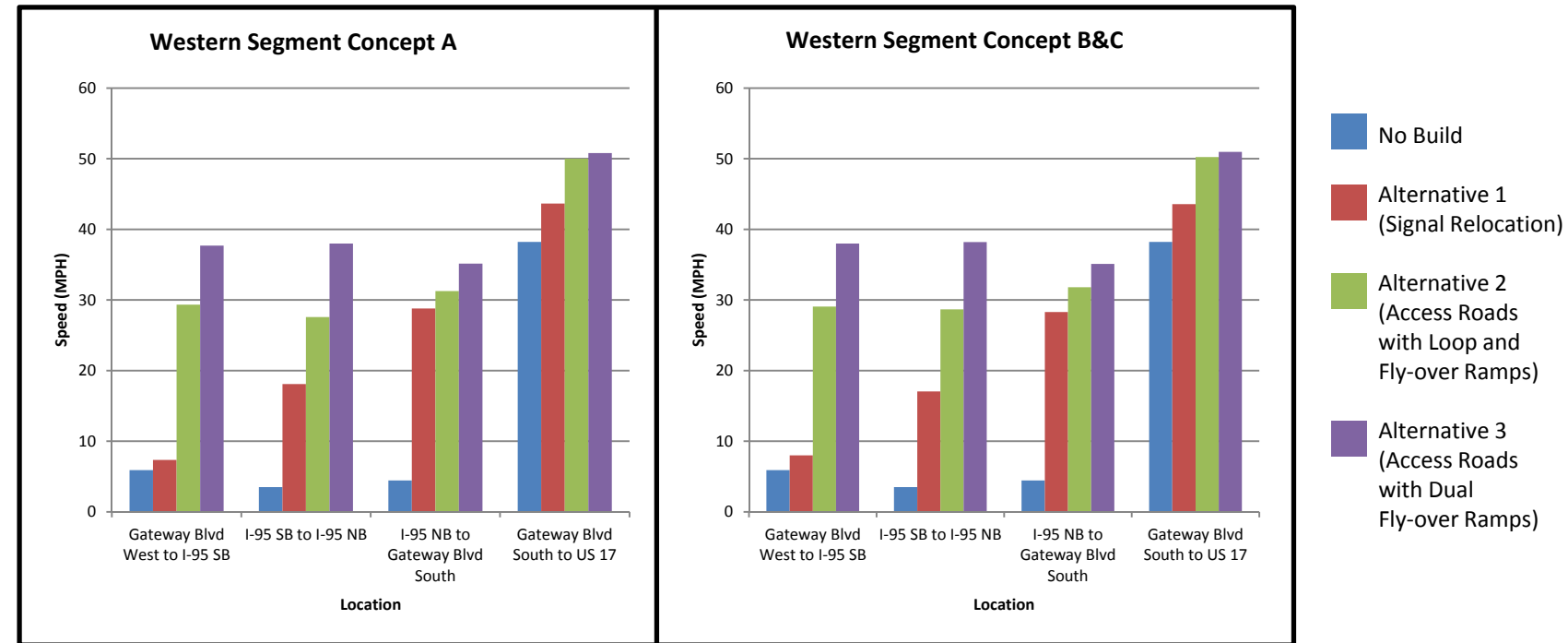


Figure 29: CORSIM Results 2035 Travel Times AM Peak

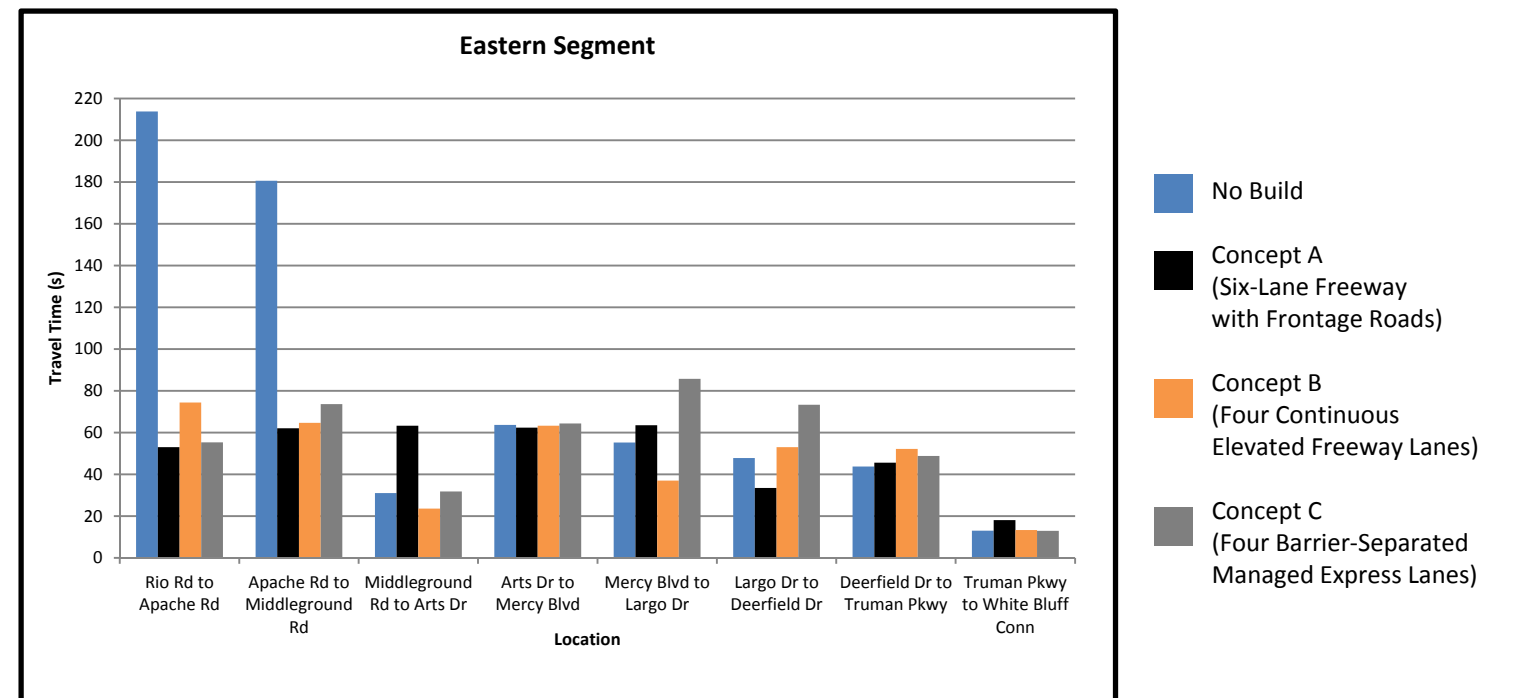
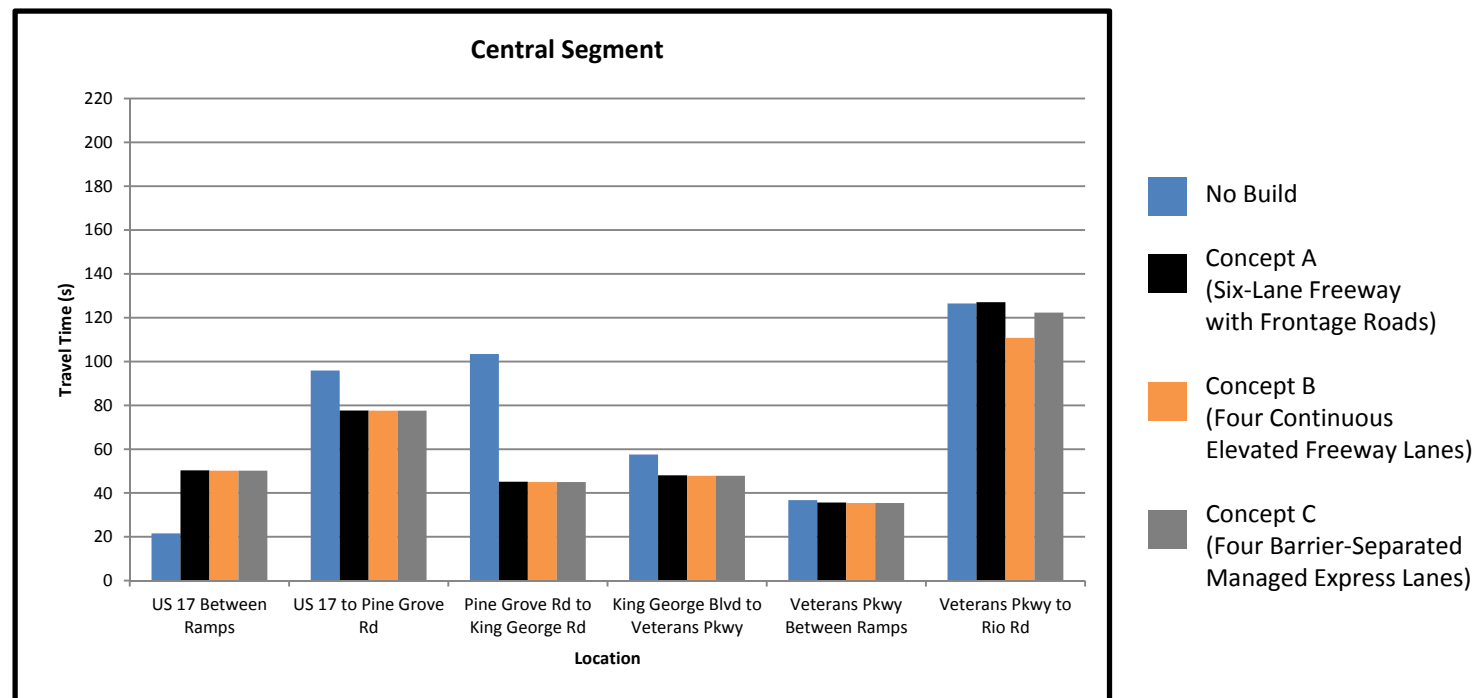
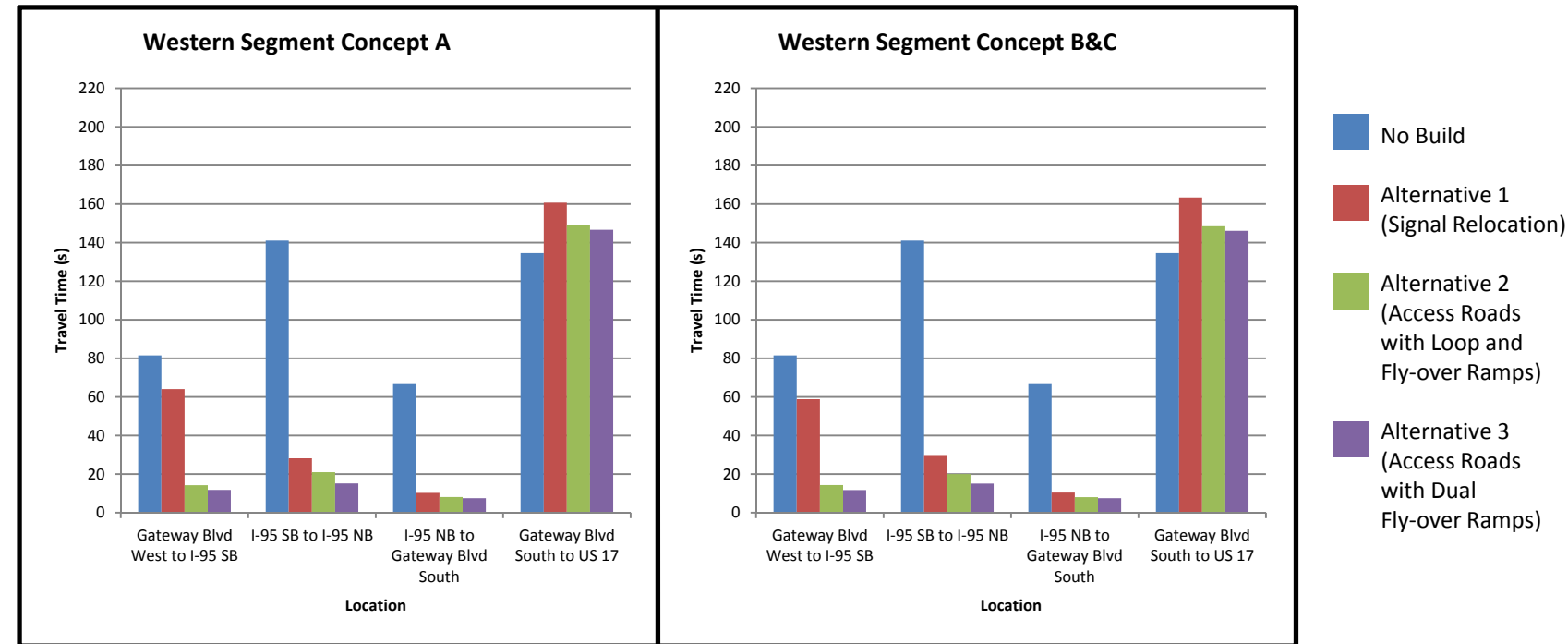


Figure 30: CORSIM Results 2035 Average Speed PM Peak

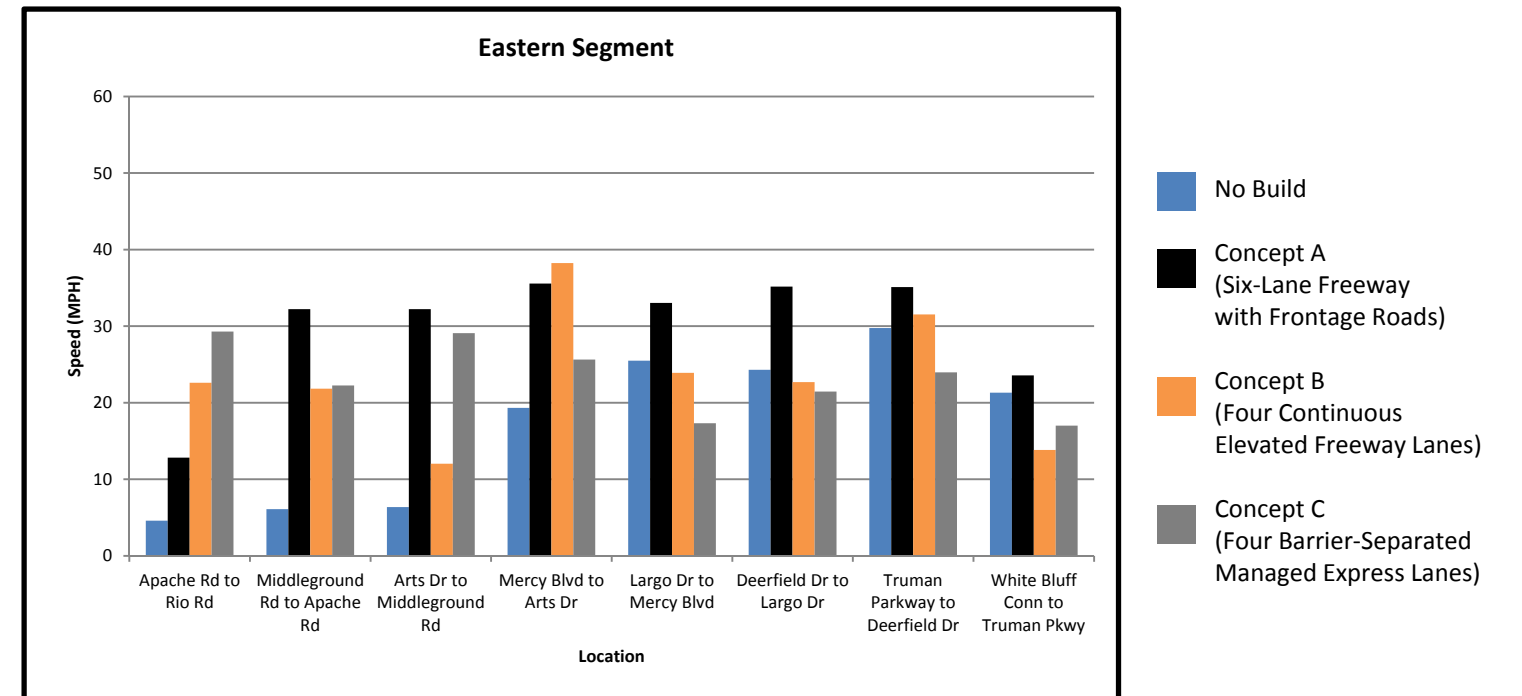
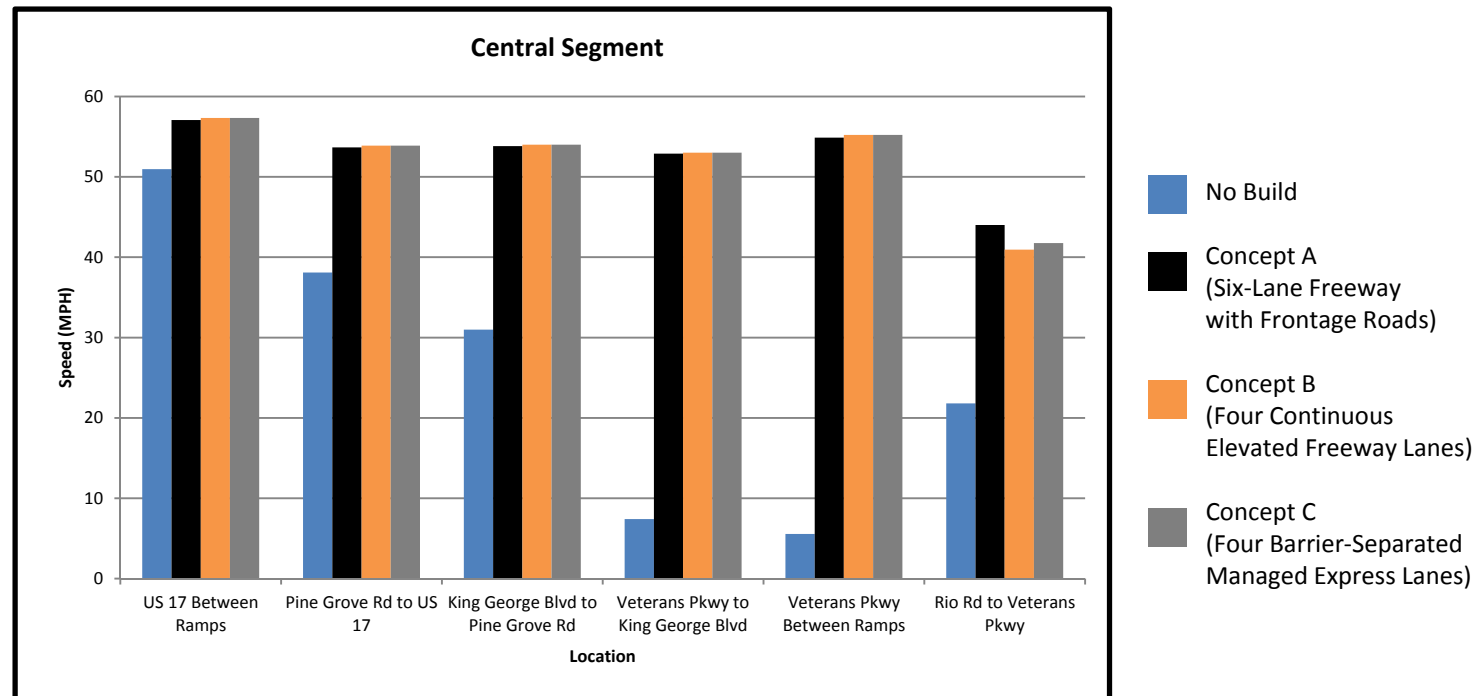
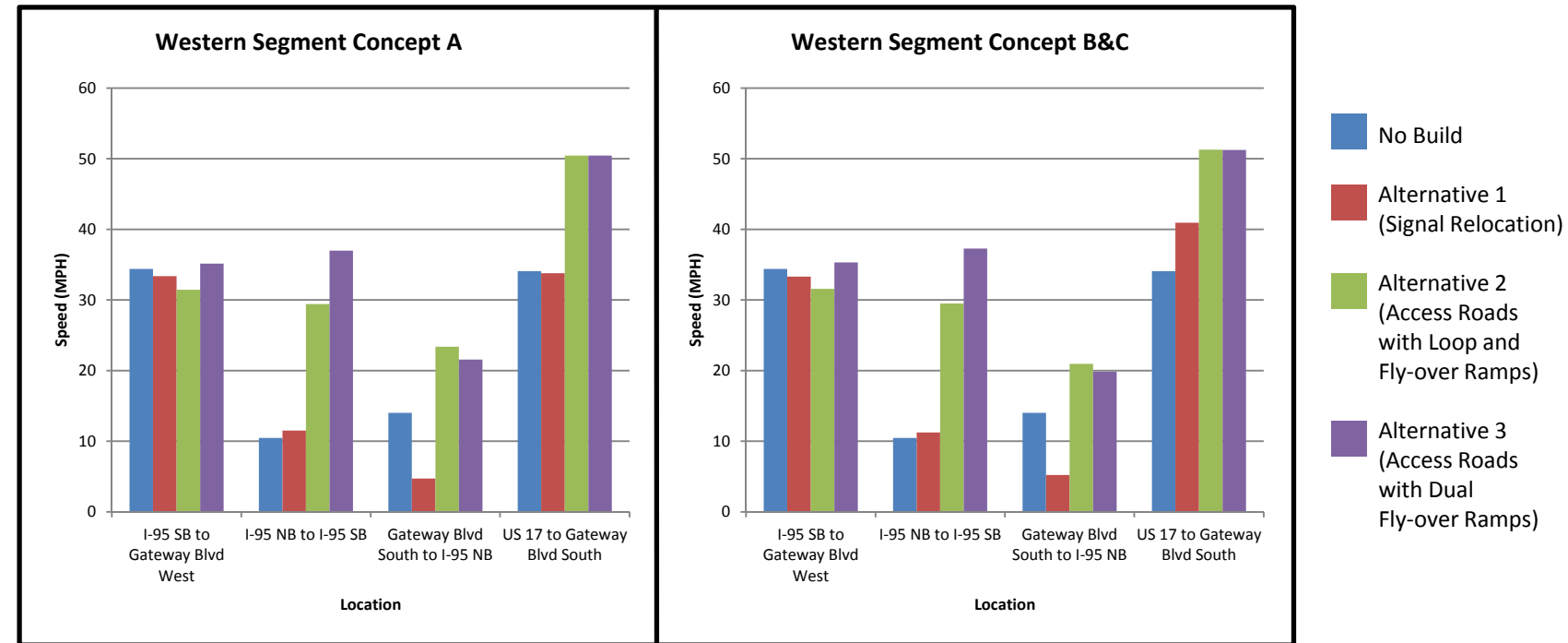
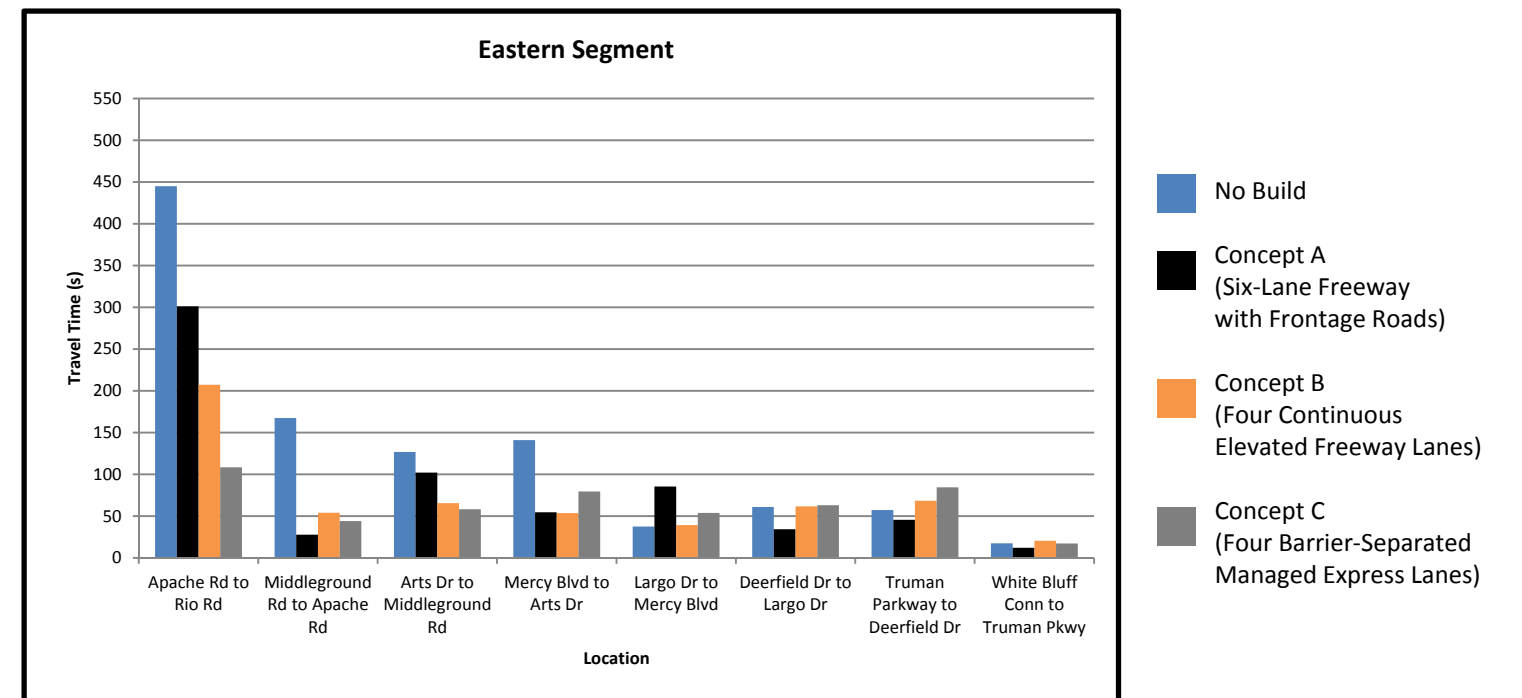
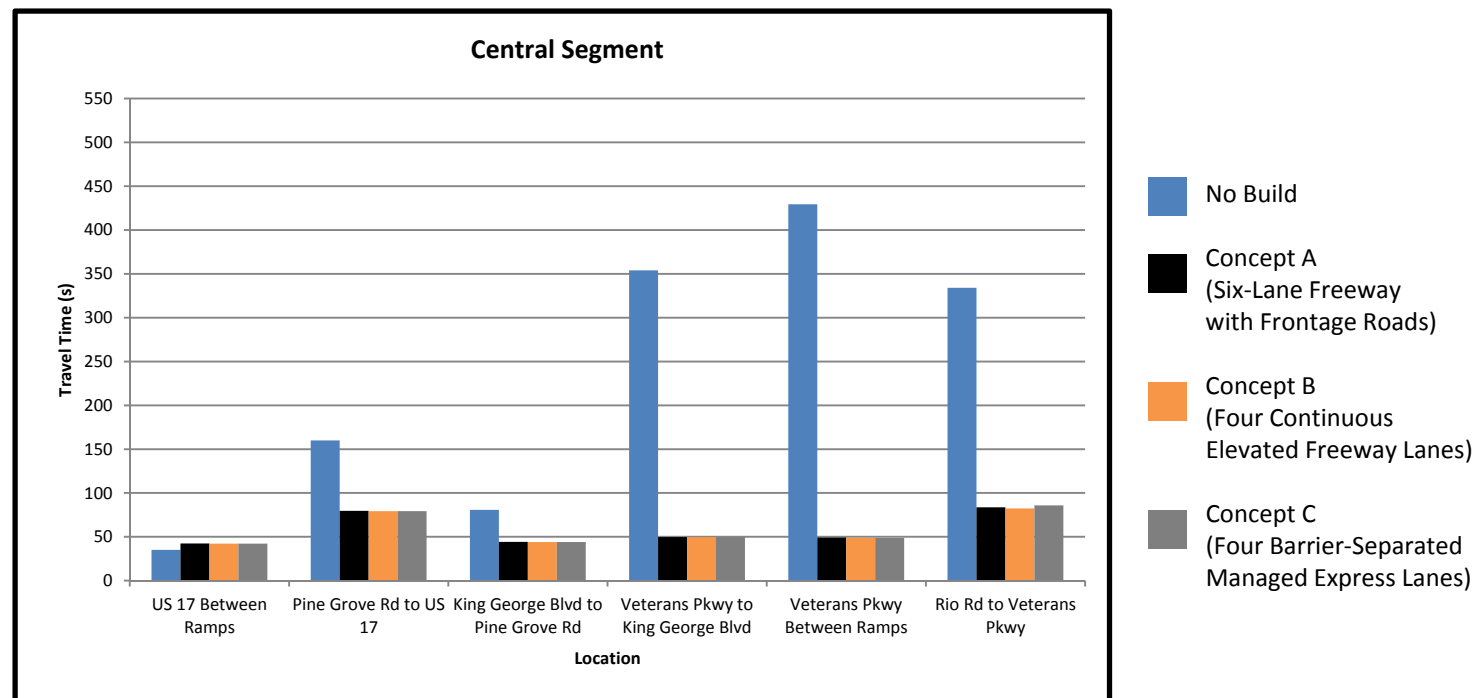
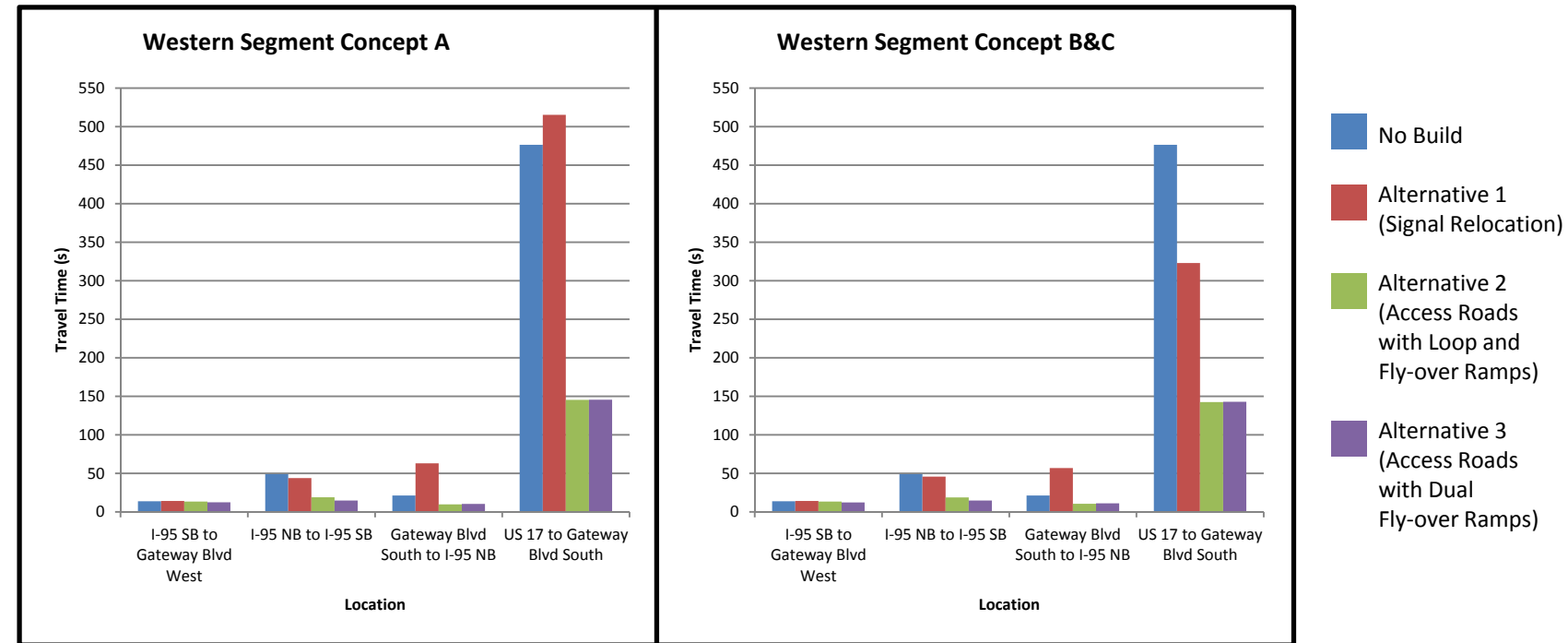


Figure 31: CORSIM Results 2035 Travel Times PM Peak



7.3 Interchange at Arts Drive

A midpoint interchange for the eastern end of SR 204 has been considered as part of the Build Alternative Concept B. The most logical location for this interchange is between the intersections of SR 204 at Middleground Road and SR 204 at Arts Drive. The benefits of this location include the lack of development and its placement approximately halfway between adjacent interchanges. Being located at a halfway point is expected to provide the greatest demand for use. Based on discussion with the MPC, a half-diamond interchange was analyzed instead of a full-diamond primarily to minimize the right-of-way impacts. The half-diamond interchange was designed to service Arts Drive. The following two different configurations were analyzed for this interchange at Arts Drive.

- Alternative A – A half-diamond interchange with eastbound on ramp starting from the outside at-grade lane and bridging over SR 204 eastbound to merge with the viaduct. The westbound off ramp splits with one lane combining with the inside at-grade through lane and one lane combining with the at-grade left-turn lane to form a dual-left turn movement onto Arts Drive.
- Alternative B – A half-diamond interchange with eastbound on ramp starting from the outside at-grade lane and bridging over SR 204 eastbound to merge with the viaduct. The Elevated Express Lanes westbound off ramp bridges over SR 204 westbound and merges with the outside at-grade through lane prior to the intersection with Arts Drive. The existing access to Mohawk Street/Hospital is closed because of the westbound off ramp. A new connector is provided on North leg of Arts Drive intersection to maintain access to Mohawk Street/Hospital.

Both alternatives were design to provide access to Mohawk Street and St. Joseph’s Hospital. Alternative A maintains existing access and Alternative B creates a new road to provide access. The new road would be located on Armstrong Atlantic State University property, which would reduce the opportunity for future development. Because of this road Alternative B is expected to require more right-of-way than Alternative A. Alternative A is also expected to have less of a visual obstruction than Alternative B because the retaining walls for the ramps in Alternative A are adjacent to each other. Alternative B’s retaining walls are offset thus reducing visibility across of SR 204. Alternative A has a greater expected capacity than Alternative B because the westbound off-ramp has a lane addition onto SR 204.

Interchange Alternative A is therefore recommended at Arts Drive. This recommendation is due to its greater capacity, maintaining existing access, requiring less right-of-way, and having less visual impact than Alternative B. Installation of a half-diamond interchange at this location is recommended to reduce the traffic volumes on the at-grade lanes along SR 204 east of the interchange.

7.4 Potential At-Grade Lane Reductions

Concept B retains existing lane geometry with added bike lanes and sidewalks on the at-grade portion of the corridor and proposes two express lanes in each direction on an elevated structure located in the median. A traffic analysis was performed in order to see if the number of at-grade lanes could be reduced to accommodate the additional bike lanes and sidewalks without expanding the existing footprint.

Lane reduction measures or “road diets” can provide benefits to both vehicles and pedestrians. By reducing the number of travel lanes, lane changes would be reduced which could potentially reduce the number of sideswipe crashes along the corridor. Also, the additional space can be used for pedestrian facilities within the existing footprint.

In order to determine lane requirements, an analysis was performed to determine generalized segment LOS along the corridor for design year 2035. The ADT volumes for each segment between Rio Road and Truman Parkway were compared to generalized LOS tables prepared by the GRTA for use in reviewing DRI. These tables are used by GRTA to perform generalized assessment of traffic conditions based on ADT volumes on roadway segments adjacent to proposed developments. To be most conservative, it was assumed that no traffic would divert away from the at-grade lanes if a road diet was implemented.

Based on the analysis using the GRTA generalized LOS tables SR 204 is expected to operate at acceptable LOS with a six-lane section either with or without the Arts Drive Interchange. If SR 204 had a four-lane section and no interchange at Arts Drive, most segments would have an unacceptable LOS. If SR 204 has a four-lane section and has an interchange at Arts Drive then all of the segments east of Middleground Drive are expected to be acceptable.

An analysis of peak hour traffic conditions was performed using Synchro software to determine expected intersection LOS for the four-lane and six-lane scenarios.

With a four-lane section and an interchange at Arts Drive, the intersections of SR 204 at Rio Road, SR 204 at Apache Avenue, and SR 204 at Middleground Road are expected to experience unacceptable LOS (LOS E or worse). The remaining intersections to the east from Middleground Road to White Bluff Connector are expected to operate with acceptable LOS (LOS D or better) with a four-lane section and Arts Drive interchange. All intersections are expected to have acceptable LOS with a six-lane section.

With a four-lane section and no interchange at Arts Drive, the intersections of SR 204 at Rio Road, SR 204 at Apache Avenue, SR 204 at Middleground Road, SR 204 at Arts Drive, SR 204 at Mohawk Street, SR 204 at Mercy Boulevard, SR 204 at Largo Drive, and SR 204 at Deerfield Road are expected to experience unacceptable LOS (LOS E or worse) on at least one approach during a peak period. The remaining intersections to the east from Truman Parkway to White Bluff Connector are expected to operate with acceptable LOS (LOS D or better) with a four-lane

section and no interchange at Arts Drive. All intersections are expected to have acceptable LOS with a six-lane section and no interchange at Arts Drive with the exception of the southbound approaches of Mohawk Street, Mercy Boulevard, and Deerfield Road.

From the results of the analysis, a minimum of six at-grade lanes is required for acceptable traffic operations between Rio Road and Middleground Road, regardless of whether or not an interchange is included at Arts Drive. From Arts Drive to White Bluff Connector, a lane reduction from six to four at-grade lanes is not expected to have unacceptable traffic operations as long as the Arts Drive interchange is included. However, if the interchange at Arts Drive is not included, the lane reduction is expected to result in several segments and intersections with unacceptable traffic operations (LOS E or worse) from Arts Drive to White Bluff Connector. A reduction in the number of lanes should be considered at logical locations and the effects of lane continuity and driver expectation should be considered before being implemented.

The SR 204 Corridor Study – Evaluation of Lane Reduction Measures for the Elevated Express Lanes Alternative Memorandum is included in Appendix G.

8 Recommended Alternative

Section 9 summarizes the recommended improvements along the corridor. The recommendations are necessary to address existing and future traffic needs for enhancing safety and improving traffic operations along the corridor.

JEG developed the recommendations based on field observations of existing traffic conditions, operational analysis of the roadway and intersections, and a review of future traffic projections and historical crash data. The recommendations developed from this study take into consideration safety, capacity needs, and implementation feasibility as well as input from public involvement.

8.1 Recommended Improvements

SR 204 is currently experiencing poor operating conditions at several locations along the corridor. The intersections of SR 204 at I-95 northbound and southbound ramps, SR 204 at King George Boulevard, and SR 204 at Rio Road experience significant congestion during the morning and evening peak periods. These intersections require improvements to meet the existing traffic demand. Average speeds are low and total delay is high along the segment between King George Boulevard and Rio Road. Additionally, speeds decrease and total delay increases along the corridor as drivers get closer to Downtown Savannah.

As a result of the traffic analysis, community feedback, and discussions with the MPC, the preferred alternative is Concept B (elevated lanes) of the eastern segment combined with Alternative 3 (dual flyovers) of the western segment. The concept plan for each alternative is included in Appendix C. This preferred alternative is recommended in order to enhance mobility, connectivity, and safety along the corridor while providing for both commuter and local trips.

The recommended improvements will do the following:

Western Segment

- Convert SR 204 to a limited-access freeway with one-way access roads from I-95 to US 17
- Provide fly-over ramps from I-95 southbound to SR 204 Eastbound and from SR 204 Westbound to I-95 Southbound (Alternative 3)
- Provide access roads connecting SR 204 with Gateway Boulevard South and I-95

Central Segment

- Convert SR 204 to a six-lane freeway from US 17 to Rio Road, with interchanges at US 17, Pine Grove Road/King George Boulevard (split diamond), and Veterans Parkway

Eastern Segment

- Install a continuous elevated four-lane freeway above the existing six-lane geometry from Rio Road to the Truman Parkway Extension (Concept B). The elevated freeway lanes would begin west of Rio Road and continue onto Truman Parkway
- Tie SR 204 into the existing six-lane typical section northeast of the SR 204 at Truman Parkway Intersection
- Provide a half diamond interchange east of Arts Drive
- Maintain access to all existing cross streets and driveways

Intersection lane configuration and ramp locations were refined throughout the process to provide acceptable traffic operations, local connectivity, and increased safety while weighing costs and constructability issues. The recommended improvements are shown in Appendix C.

The recommended project would provide additional capacity along SR 204 from I-95 to Truman Parkway to accommodate the existing and projected traffic volumes. The recommended improvement would also enhance the traffic LOS operations along SR 204. The limited access freeway facility from I-95 to Truman Parkway would potentially reduce crash frequency and severity along SR 204 and the existing side streets. In addition, the recommended improvements are expected to substantially reduce travel time along SR 204 from the No Build condition. The additional capacity provided by the recommended Build alignment would accommodate anticipated future growth in the project area and improve east-west connectivity throughout the region while maintaining local access and minimizing right-of-way impacts.

8.1.1 Potential At-Grade Lane Reductions

From the results of the analysis, a minimum of six at-grade lanes is required for acceptable traffic operations Rio Road to Middleground Road, regardless of whether or not an interchange is included at Arts Drive. From Arts Drive to White Bluff Connector, a lane reduction from six to four at-grade lanes is not expected to have unacceptable traffic operations with the inclusion of the Arts Drive interchange. However if the interchange at Arts Drive is not included, several segments and intersections are expected to have unacceptable traffic operations from Arts Drive to White Bluff Connector. A reduction in the number of lanes should be considered at logical locations and the effects of lane continuity and driver expectation should be evaluated before lane reductions are implemented.

8.1.2 Potential for Tolling

A preliminary Toll Traffic and Revenue Study was performed along SR 204 from Rio Road to Truman Parkway Phase V and is included in Appendix H. To maximize the tolling potential more alternatives should be examined. These additional alternatives primarily include extending limits of the study possibly as far as from I-95 to Downtown Savannah.

8.1.3 Public Involvement

Public involvement played a large part in the alternative selection process. There were three public information open house meetings as well as stakeholder meetings and CORE MPO coordination meetings, GDOT/FHWA coordination meetings, and meetings with Armstrong Atlantic State University. A website was also developed and maintained during the course of the project. Comments and feedback from these meetings were considered during the alternative development process as well as the alternative selection process.

During the second public information open house questionnaire forms were given to all attendees. Attendees were asked to select which alternative they preferred for both the western segment and the eastern segment. The results of the questionnaire support the recommended alternative.

8.1.4 Construction Methods and Staging of Recommended Alternative

The Eastern Segment of the project includes a 2.9 mile section of elevated lanes from the Forest River to the SR 204 connection with the Truman Parkway Extension. The elevated lanes will primarily be constructed in the median of SR 204. The current median width varies from about 12' to 18' wide. The future median will be slightly larger at 20' wide. The existing at grade lanes will be shifted outward to create this wider permanent median resulting in an overall Right-of-Way (ROW) width of 145'. As a comparison, the Express Lanes Alternative required 255' of ROW (or 155' of new ROW). This Elevated Express Lanes alternative requires 45' of new ROW primarily to accommodate proposed pedestrian upgrades. Currently, SR 204 does not have a bike lane or continuous sidewalk through the Eastern Segment. The proposed alternative includes the addition of a 4' bike lane, 6' grass strip, and 5' sidewalk.

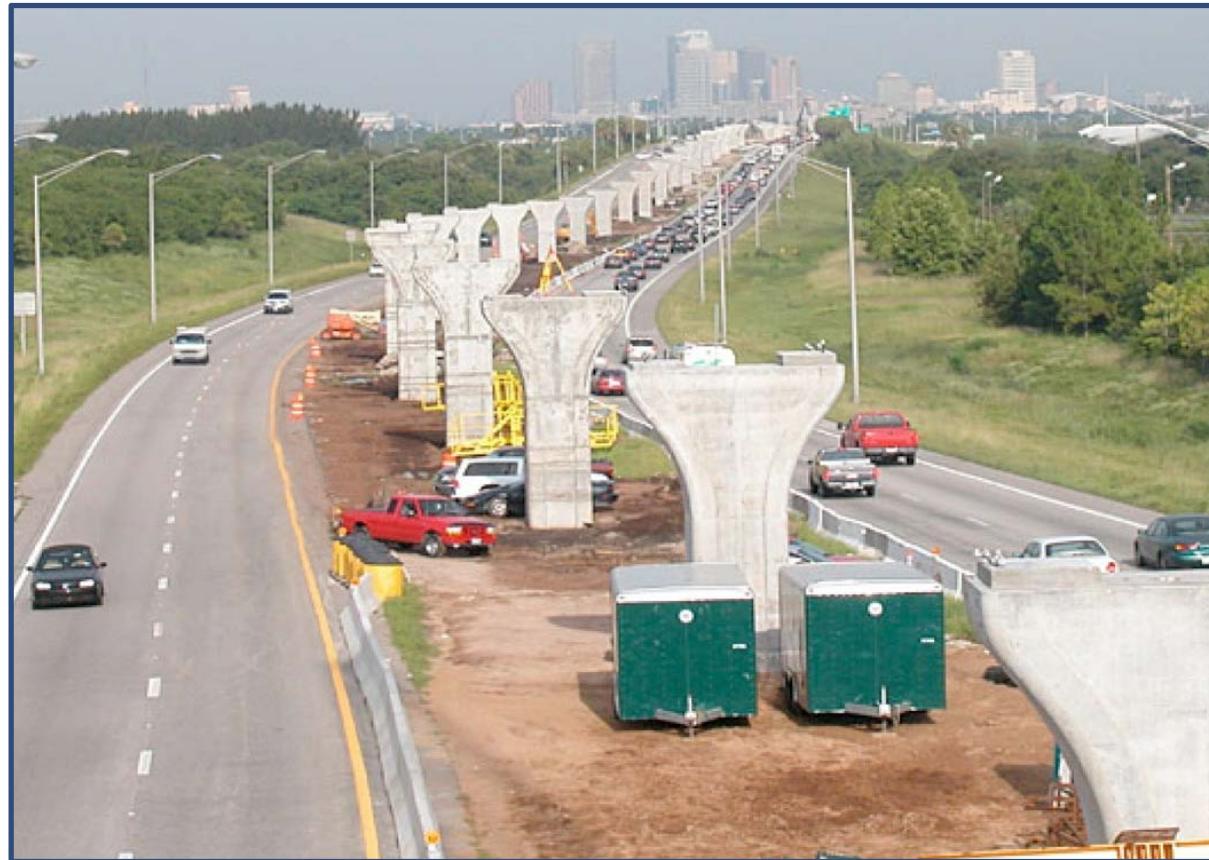
During construction a temporary work zone in the median area of 35' to 40' wide will be needed for cranes and other construction equipment. Because the construction will be segmented, the temporary work zone will be at isolated spots along the corridor and work will be performed primarily during off peak and overnight hours to avoid disrupting traffic. The drilled shaft foundations and piers for the elevated roadway will be constructed in the temporary work zone first while precast box girder segments for the bridge superstructure are cast in a casting yard off-site. Once pier construction has progressed, precast box girder segments will be erected along the median of SR 204 using a temporary erection truss and the span by span method of segmental construction. This method is very efficient and economical – normally 2 spans per week (or about 300') of bridge can be completed each week. It is estimated that it will take about 12 months for erection of the elevated lanes for this 2.9 mile section. It is anticipated that 2 or more lanes in each direction will be maintained throughout construction, with limited single lane closures occurring during off peak and overnight hours. This will result in minimal delays to the traveling public during construction, and will be less than the disruption expected from the other alternatives considered. The ROW impacts and other impacts to businesses in the corridor during

construction will also be reduced both by the smaller ROW footprint and reduced construction time for the Elevated Lanes Alternative as compared to the Express Lanes Alternative.

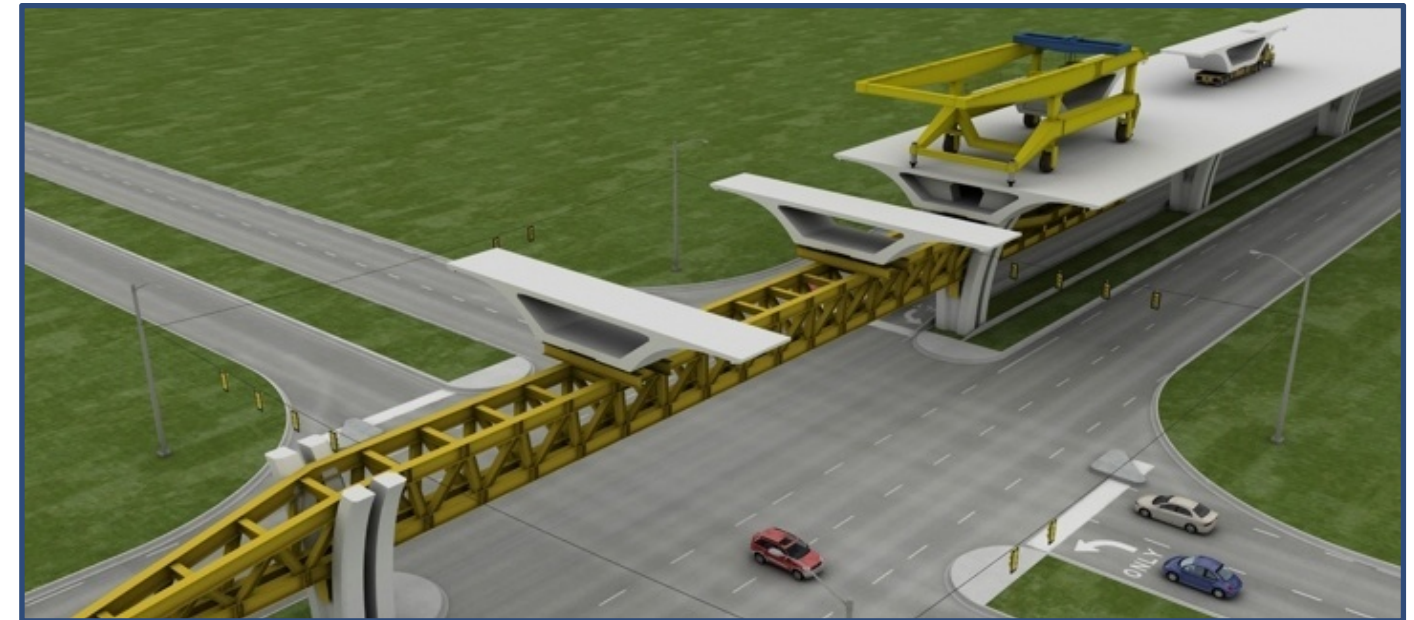
A very simplified animation of the construction sequence was prepared for use in a project video at the Public Information Open House (PIOH) for the project held on November 1, 2012. This construction animation and project video was intended to illustrate the construction sequence and staging to the public. The construction sequence and detailed Maintenance of Traffic (MOT) plans will be prepared during future design phases to provide further details on the erection sequence and MOT required for construction of the project.

The foundations for the elevated lanes will also be explored further in the future design phases for the project. Site specific geotechnical information will be obtained including deep borings for the foundations to determine the size and depth of drilled shaft foundations needed for the elevated lanes section. It is currently estimated that a single 10' to 12' diameter drilled shaft will be needed to support each pier. It is also estimated that the drilled shafts will be in the range of 80' to 120' deep. These current estimates will be refined in future design phases. The current construction cost estimates for the project are based on these conservative drilled shaft sizes and lengths.

The techniques used in the construction of the elevated lanes offer significant advantages over the other alternatives considered for the eastern section of the corridor. In particular, precast segmental construction methods allows greater physical separation of construction activity from the travel-way as well as substantial efficiencies realized from simultaneous construction operations.



Upon completion of superstructure erection, barriers are installed and the deck is milled to provide a smooth riding surface. Final at-grade improvements are conducted simultaneously with the construction of the elevated lanes.



Span-by-span superstructure erection

At-grade improvements, including modest median widening as necessary, are performed first and staged to limit the effects on traffic. Meanwhile, precast concrete segments are built off-site in factory-like conditions using local labor and materials.

As initial at-grade improvements are completed and superstructure pre-casting operations continue, the foundations and cast-in-place concrete piers are constructed within the roadway median. The confinement of substructure operations to the median combined with the pre-casting of superstructure segments at an off-site location separates a large portion of the construction activity from the travel-way, minimizing impacts on traffic and the community.

Once a sufficient number of piers are completed, superstructure erection begins using the span-by-span erection method with a temporary erection truss. Precast segments are delivered over the completed portion of the structure to limit construction traffic on the local roads.

Superstructure erection speeds for this structure are estimated at two spans per week.

9 Conclusion

Analysis of the existing and future No Build conditions shows that conditions are expected to worsen over time as traffic volumes grow. The anticipated traffic growth in the project area will increase traffic congestion and create lengthy delays for commuter and local traffic traveling along the corridor. Existing congestion along SR 204 already creates excessive delays to commuters during both the weekday AM and PM peak hours. The central and eastern segments of the SR 204 study area also have crash rates, injury rates and fatality rates that are above statewide averages. These elements demonstrate the need to reduce travel time along SR 204, reduce crash frequency, and improve connectivity in this region. Failure to address these needs will result in a decline in mobility and access along the corridor. In addition, travel time reliability is important for users of the corridor, especially if tolling alternatives are considered for future improvements.

Existing and future traffic conditions were analyzed for the corridor. These analyses took into consideration the proposed projects along SR 204 as well as the anticipated growth in the area. Major planned projects include the grade separation of the intersection of SR 204 at King George Boulevard and the construction of Truman Parkway Phase V. The anticipated growth in the area is expected to increase traffic congestion and create lengthy delays for commuter and local traffic traveling through the corridor. Today, traffic traveling through the corridor experiences significant delay and congestion during the AM and PM peak periods in the peak direction.

To address these issues several roadway capacity and traffic operational improvement alternatives (including the No Build scenario) were evaluated as part of the study. Based on the results of the traffic analysis performed for the study, the proposed concept would include the following:

Western Segment

- Convert SR 204 to a six-lane, limited-access freeway with one-way access roads from I-95 to US 17
- Provide fly-over ramps from I-95 southbound to SR 204 Eastbound and from SR 204 Westbound to I-95 Southbound (Alternative 3)
- Provide access roads connecting SR 204 with Gateway Boulevard South and I-95

Central Segment

- Convert SR 204 to a six-lane freeway from US 17 to Rio Road, with interchanges at US 17 (existing), Pine Grove Road/King George Boulevard (split diamond), and Veterans Parkway (existing)

Eastern Segment

- Install a continuous elevated four-lane freeway above the existing six-lane geometry from Rio Road to the Truman Parkway Extension (Concept B). The elevated freeway lanes would begin west of Rio Road and continue onto Truman Parkway
- Tie SR 204 into the existing six-lane typical section northeast of the SR 204 at Truman Parkway Intersection
- Provide a half diamond interchange east of Arts Drive
- Maintain signalized access to all existing cross streets and driveways

The recommended project would provide additional capacity along SR 204 from I-95 to Truman Parkway and essentially make the entire corridor limited access while still providing the local connectivity for the surrounding communities. The recommended improvement would also enhance the traffic LOS operations along SR 204. The limited access freeway facility from I-95 to Truman Parkway would potentially reduce crash frequency and severity along SR 204 and the existing side streets. In addition, the recommended improvements are expected to substantially reduce travel time along SR 204 from the No Build condition. The additional capacity provided by the recommended Build alignment would accommodate anticipated future growth in the project area and improve east-west connectivity throughout the region while maintaining local access, viability as an evacuation route and still minimizing right-of-way impacts to the community.

9.1.1 Next Steps

The following paragraph includes recommendations made in order to achieve the most efficient project timeline and future corridor operations. Completion of the SR 204 Corridor Study should be followed by a stakeholder driven vision for the repositioning of the Southside of Savannah. With the presence of major Savannah institutions and employment, including St. Joseph's Hospital and AASU, the Southside residential, retail and institutional base together have the potential to form a critical mass for further evolution. A corridor vision plan should be created to document the feasibility of the project as well as investigate potential land use development and layout a community plan to coincide with the upgraded corridor. The community and stakeholders should be actively involved in design charrettes to shape the future of the corridor. Coordination with the proper agencies will be crucial to complete the project in a timely manner. GDOT, the State Road and Tollway Authority (SRTA), FHWA, the City of Savannah and Chatham County should be involved in further development of this project.

One possible funding source for this project is tolling. An initial tolling and revenue study was performed; however a broader scope should be considered to achieve more comprehensive results. A financing and implementation plan should be laid out to move the project forward.