



# **I-16 INTERCHANGE MODIFICATION REPORT**

**P.I. No. 001744**

**Prepared for**

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# 1 Introduction

## 1.1 Purpose of the Report

This interchange modification report (IMR) documents the need to modify the interchange located at the terminus of I-16 at Martin Luther King (MLK), Jr. Boulevard and Montgomery Street in Savannah, Georgia and to determine the configuration, location and design of proposed improvements. The context for this discussion of the I-16 terminal ramps is presented in **Figure 1.1**.

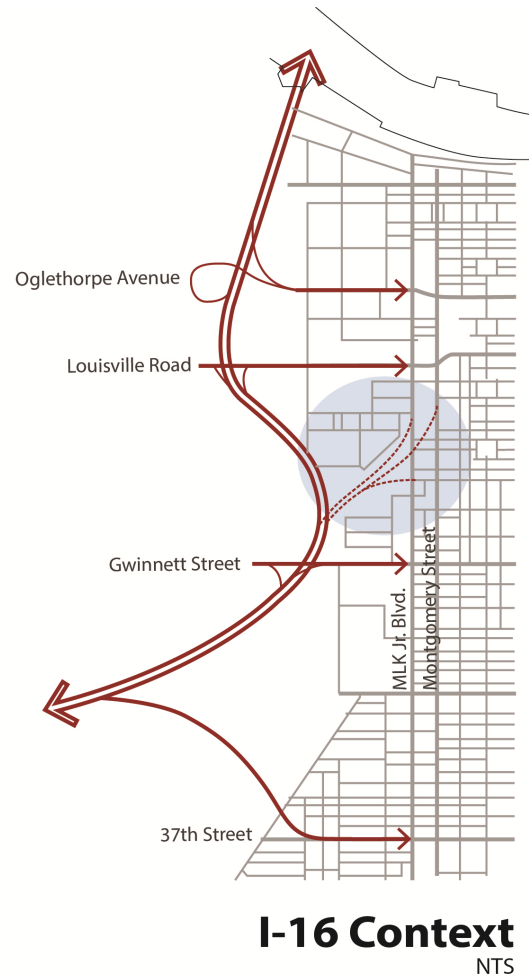
The I-16 terminal interchange was constructed in the 1960s as a partial Y-interchange with ramps connecting to MLK, Jr. Boulevard and Montgomery Street. Although the I-16 interchange was constructed as an urban renewal program, the ramps have been a barrier to development and economic recovery in the area. The current connections to I-16 are at MLK, Jr. Boulevard and Montgomery Street using Exit 167A and 167B, respectively. The existing terminal ramps begin approximately 1,600 feet south of Gwinnett Street, and extend an additional 1,500 feet to the Exit 167. The MLK, Jr. Boulevard exit ramp (167A) is approximately 700 feet long, terminating at a traffic light at the intersection of MLK, Jr. Boulevard and Gaston Street. The Montgomery Street exit ramp (167B) is approximately 1,800 feet long with a flyover bridge across MLK Jr. Boulevard. The Montgomery Street ramp directly ties into Montgomery Street on a one-way segment just south of Liberty Street.

The feasibility of the ramp removal has been determined through a series of previous planning studies, including Reclaiming Old West Broad Street (2012), studies conducted by the Savannah Development and Renewal Authority (SDRA) in 1998, 2002, 2004 and 2009; and the 2008 Georgia Department of Transportation (GDOT) I-16 Terminus/MLK Jr. Boulevard Flyover Analysis and Concept Development Study.

The purpose of an IMR is to provide the FHWA with all the necessary information to consider modifications to an existing interchange on the Interstate system. The Federal Highway Administration (FHWA) guidance for interchange modifications and justifications are targeted at increasing access or adding new access; however, this report considers removing access and modifying access within the vicinity of the I-16 terminal interchange. To support the proposed modification of the terminal ramps, this report documents:

- Existing transportation network and land use
- Forecasted future conditions
- Environmental screening
- Interchange design alternatives
- Operations, capacity and safety analysis
- Preliminary cost estimates

**Figure 1.1: I-16 Context**





## 1.2 Need for the Project

The purpose of this project is to modify the terminus of I-16 into downtown Savannah. Reconfiguring the interchange includes removal of the I-16 eastbound overpass over MLK, Jr. Boulevard to Montgomery Street and the associated adjacent ramps. When the terminal ramps were constructed, several pre-existing roads were cut-off or demolished. Roberts Street was replaced with new elevated infrastructure, and Charlton Street, Jones Street, and Berrien Street were interrupted between MLK, Jr., Boulevard and Montgomery Street. Reconfiguration would allow for restoration of the surface street network to improve connectivity and mobility, and it would return developable land to downtown Savannah.

The primary need for this project is revitalization of the area surrounding the I-16 terminal ramps. The modification or removal of the I-16 interchange ramps is intended to spur economic development, restore east-west connectivity, and improve mobility options for all users. The removal of the ramps would restore approximately eight acres of developable land to the City of Savannah. Of that land, 650 linear feet would front MLK, Jr. Boulevard, and 350 linear feet would front Montgomery Street, allowing for the restoration of these historically mixed-use corridors. The removal of the ramps would reestablish connectivity between downtown and West Savannah and allow additional connections to the proposed development to the west of I-16/US 17. The terminal ramps would be replaced by a local street network that would improve traffic flow, support redevelopment on the reclaimed land, and provide additional pedestrian and bike facilities to allow them to access additional parts of Savannah safely.

Improving safety is another identified need for the project. The crash rates on I-16 between I-516 and the terminus, and on Montgomery Street between Gwinnett Street and Bay Street, are currently higher than the statewide average. The predominant crash type was rear end collision. From 2010 to 2012, the specified segment of I-16 experienced an average of 435 crashes per 100 million vehicle miles (MVM) travelled, which is more than double the statewide average for Interstates and Freeways during that period. The segment of Montgomery Street between Gwinnett Street and Bay Street had an annual average crash rate of 1,826 per MVM from 2010 to 2012, which was over three times the average annual crash rate of 497 crashes per MVM for Minor Arterials during that period. (Crash data were incomplete for 2013).

One factor that contributes to these high crash rates is the spacing of the interchanges in this area. Interchanges along I-16 are currently spaced closely together, with five interchanges between the 37<sup>th</sup> Street connector and Oglethorpe Avenue, for an average spacing of 0.3 mile within a 1.5 mile span. That leaves minimal space for merging and diverging traffic at the access points. The direct access onto Montgomery Street also creates a weave section south of Liberty Street because vehicles currently enter on the west side of Montgomery Street and have to cross two to three lanes to make a right turn on Liberty Street. The need for the project is demonstrated by the high crash rates, suboptimal interchange spacing and effects on the local street network and disruption of community cohesion.

## 1.3 Study Area and Area of Influence

The study area is located entirely within an urban area, the City of Savannah, Georgia, in Chatham County, at the existing I-16 terminus with ramps to MLK, Jr. Boulevard and Montgomery Street. As can be seen in **Figure 1.2**, the rectangular study area extends to the north and south of the I-16, US 17 split. The study area extends from just north of the US 17 overpass over W Bay Street/SR 25 Connector to just south of the SR 204/W 37<sup>th</sup> Street intersection at MLK, Jr. Boulevard. The study area has its western extent where SR 204 splits from I-16 and its eastern extent just east of Forsyth Park. The study area extents were determined based on the inclusion of upstream and downstream interchanges in the vicinity of the existing interchange.

The project's area of influence differs slightly from the study area. The area of influence considered in an IMR is supposed to include at least the next interchange upstream and downstream from the interchange proposed for modification, as well as the first crossroad in either direction from each interchange ramp intersection. However, the area of influence for this study is slightly larger than that for two reasons.



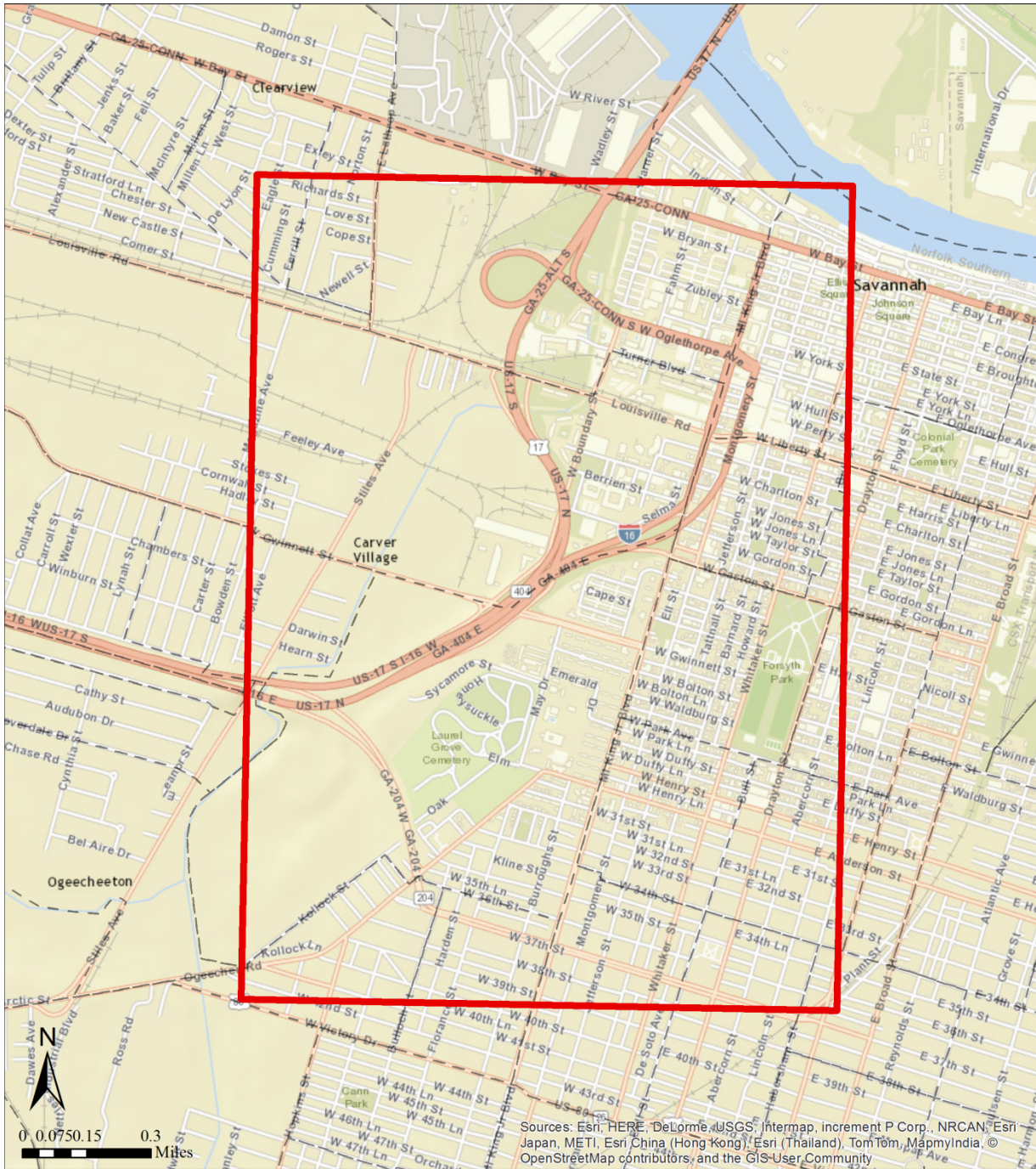


First, many interchanges in the vicinity of the study terminal ramps are do not provide full access (partial interchanges), including those immediately up- and downstream from the terminal ramps. To get a the full impact of traffic entering and exiting I-16, further interchanges were added to the area of influence to account for the movements not included at the adjacent partial interchanges. Second, because historic resources constrain improvements to Louisville Road (the next interchange upstream from the terminal ramps), improvements to Oglethorpe Avenue needed to be considered instead.

The following corridors are included in the study Area of Influence, and mapped in **Figure 1.3**:

- I-516 (Exits 164A and 164B, full interchange)
- SR 204 (37<sup>th</sup> Street) (Exit 165, access to and from south only)
- Gwinnett Street (Exit 166, access to and from south only)
- MLK, Jr. Boulevard (Exit 167A, access to and from south only)
- Montgomery Street (Exit 167B, access from south only)
- Louisville Road (US 17 via Exit 166, access to and from south only)
- Oglethorpe Avenue (US 17, access to and from north only)

Figure 1.2: Study Area Map



**I-16 IMR STUDY AREA**

Sources: American Community Survey 2010, CORE-MPO, Jacobs Engineering

Block Groups

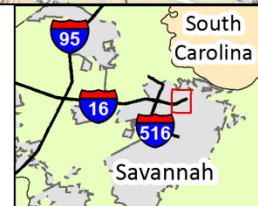
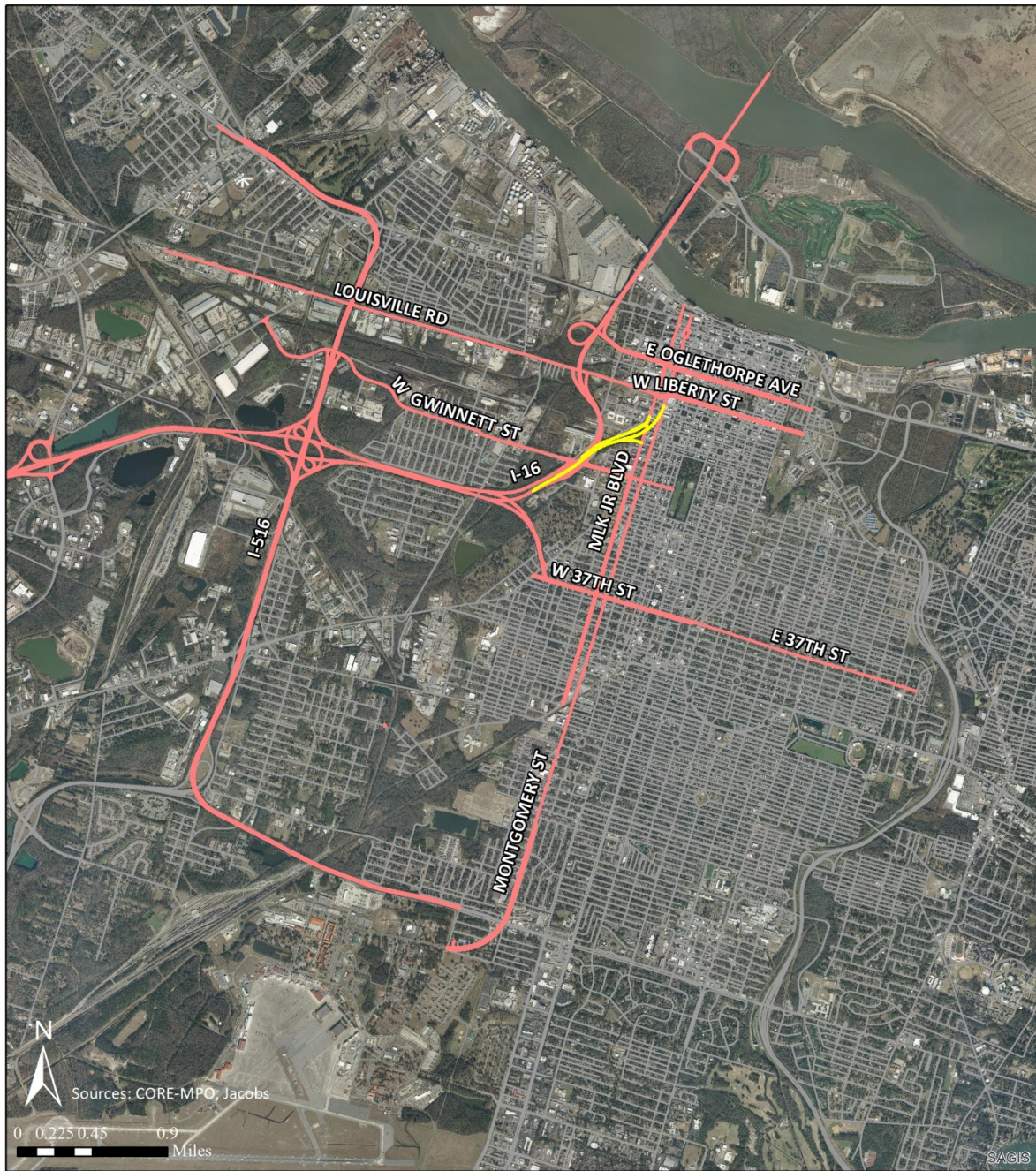
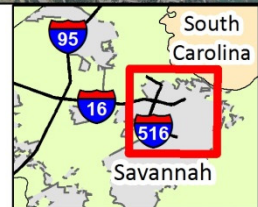


Figure 1.3: Major Corridors



I-16 MAJOR CORRIDORS

- Study Interchange
- Major Corridors
- Roads



## 2 Existing Conditions

The following sections provide a discussion of the existing conditions within the area of influence for the I-16 terminal interchange. Data were collected on:

- Existing roadways and structures
- Existing traffic
- Crash history
- Existing land use
- Existing population and employment

### 2.1 Roadway Network

The local roadway network in the study area is laid out as a dense grid system to the east of the I-16 ramps, as can be seen in **Figure 2.1**. To the west of the ramps, the density of these connections is interrupted by a series of canals, but there is a series of east-west thoroughfares that provide a framework for local roads.

I-16/US 17 is the major roadway facility in the study area, classified as an Interstate until the terminal ramps beyond which it continues as US 17, a limited access facility until after it crosses the Savannah River to the north. Bay Street, MLK, Jr. Boulevard, and the I-16 – 37<sup>th</sup> Street Connector/Ogeechee Road ramps are classified as Major Arterials by the GDOT, which denotes higher speeds and volumes of vehicular traffic. Information about the functional class, number of travel lanes, and posted speed limits is provided in **Table 2.1**.

**Table 2.1: Roadway Characteristic Inventory**

Roadway	Functional Class	Travel Lanes	Posted Speed (mph)	Hurricane Evacuation Route?
I-16	Interstate/Freeway	4	55	Yes
MLK Jr. Boulevard/SR 25	Major Arterial	4 with center turn lanes	35	Yes
Montgomery Street	Minor Arterial	2 with turn lanes	30	No
Whitaker Street	Minor Arterial	2 lanes one way	35	No
Fahm Street	Collector	2 lanes	25	No
Drayton Street	Minor Arterial	2 lanes one way	30	No
Barnard Street	Collector	2 lanes	35	No
Abercorn Street	Collector	2 lanes	30	Yes
W Bay Street	Major Arterial	4 with some center turn lanes	30 / 40	Yes
Augusta Avenue	Minor Arterial	2 lanes	35	Yes
W Broughton Street	Minor Arterial	2 lanes	30	No
W Oglethorpe Avenue	Minor Arterial	2 lanes with median	25 / 35	No
Louisville Road	Minor Arterial	2 lanes	35	Yes
W Liberty Street	Minor Arterial	4 with center turn lanes	25	Yes
W Gaston Street	Collector	2 lanes	25	No
W Gwinnett Street	Collector	4 with center turn lanes	35	No
W Henry Street	Minor Arterial	2 lanes one way	30	No
W and E Anderson Street	Minor Arterial	2 lanes one way	30	No
Taylor Street	Collector	1 lane one way	25	No
Ogeechee Road	Major Arterial	2 lanes	30	No
Stiles Avenue	Collector	2 lanes	35	No
W Boundary Street	Collector	2 lanes	25	No

Source: GDOT

**Figure 2.1: Functional Classification of Study Area Roadways**





## 2.2 Interchange Spacing

There are four existing interchanges within the study area other than the I-16 terminal interchange. All of these are partial interchanges (**Table 2.2** and **Figure 2.2**). FHWA describes partial interchanges as “either system or service interchanges that do not provide for all possible interchanging movements between intersecting routes,” in the Interstate System Access Informational Guide (August 2010). The nearest full access interchange on I-16 is at I-516 west of the study area.

**Table 2.2: Access at Interchanges**

Interchanges on I-16	Eastbound/ Northbound Access	Eastbound/ Northbound Egress	Westbound/ Southbound Access	Westbound/ Southbound Egress
I-516	X	X	X	X
I-16 at Ogeechee Rd via 37th St Connector		X	X	
I-16 at Gwinnett St		X	X	
<b>I-16 at MLK, Jr. Blvd and Montgomery St (study interchange)</b>		X	X	
US 17 at Louisville Rd		X	X	
US 17 at Oglethorpe Avenue	X			X

Based on *GDOT Policy: 3140-1- Responsibility and Procedures for Interchange Justification IJR and Interchange Modification IMR Reports*:

- Minimum spacing is calculated as the crossroad to crossroad distance between the proposed interchange and the adjacent upstream and downstream interchanges.
- Average spacing reflects the crossroad to crossroad distance between downstream and upstream interchanges beyond, but adjacent to and including those used to calculate minimum spacing.

AASHTO recommends a one-mile minimum spacing between interchanges in its *A Policy on Geometric Design of Highways and Streets* and *A Policy on Design Standards Interstate System*. GDOT uses this minimum spacing of one mile, with an overall average interchange spacing of two miles for urban areas. However, within the study area the spacing between the I-16 terminal ramps and I-16 at Gwinnett Street to the south (which is from Gwinnett Street to Louisville Road following the ramps) is 0.7 mile (**Table 2.3** and **Figure 2.3**). The spacing between the I-16 terminal ramps and I-16 at Gwinnett Street to the south is 0.7 mile, measured from Gwinnett Street to Louisville Road/Liberty Street along the ramps (See Table 2.3). The spacing from Gwinnett Street to Louisville Road via US 17 is 0.6 mile, and from Gwinnett Street to Oglethorpe Avenue is 0.90 mile. There are five interchanges from I-16 at 37<sup>th</sup> Street Connector to US 17 at Oglethorpe Avenue. The segment of I-16/US 17 measures approximately 1.5 miles between the 37<sup>th</sup> Street Connector and Oglethorpe Avenue and the average interchange spacing along this segment is approximately 0.3 mile.

This review of the interchange spacing shows that the existing I-16 terminal interchange does not meet the minimum spacing requirements or average spacing requirements for an urban area.

**Table 2.3: Interchange Spacing on I-16/US 17 in the Study Area**

Interchanges on I-16	Existing Spacing from I-16 at MLK, Jr. Blvd and Montgomery Street
I-16 at Ogeechee Rd via 37th St Connector	0.65
I-16 at Gwinnett St	0.70
<b>I-16 at MLK, Jr. Blvd and Montgomery St (study interchange)</b>	--
US 17 at Louisville Rd	0.60
US 17 at Oglethorpe Avenue	0.90



**Figure 2.2: Access at Interchanges**

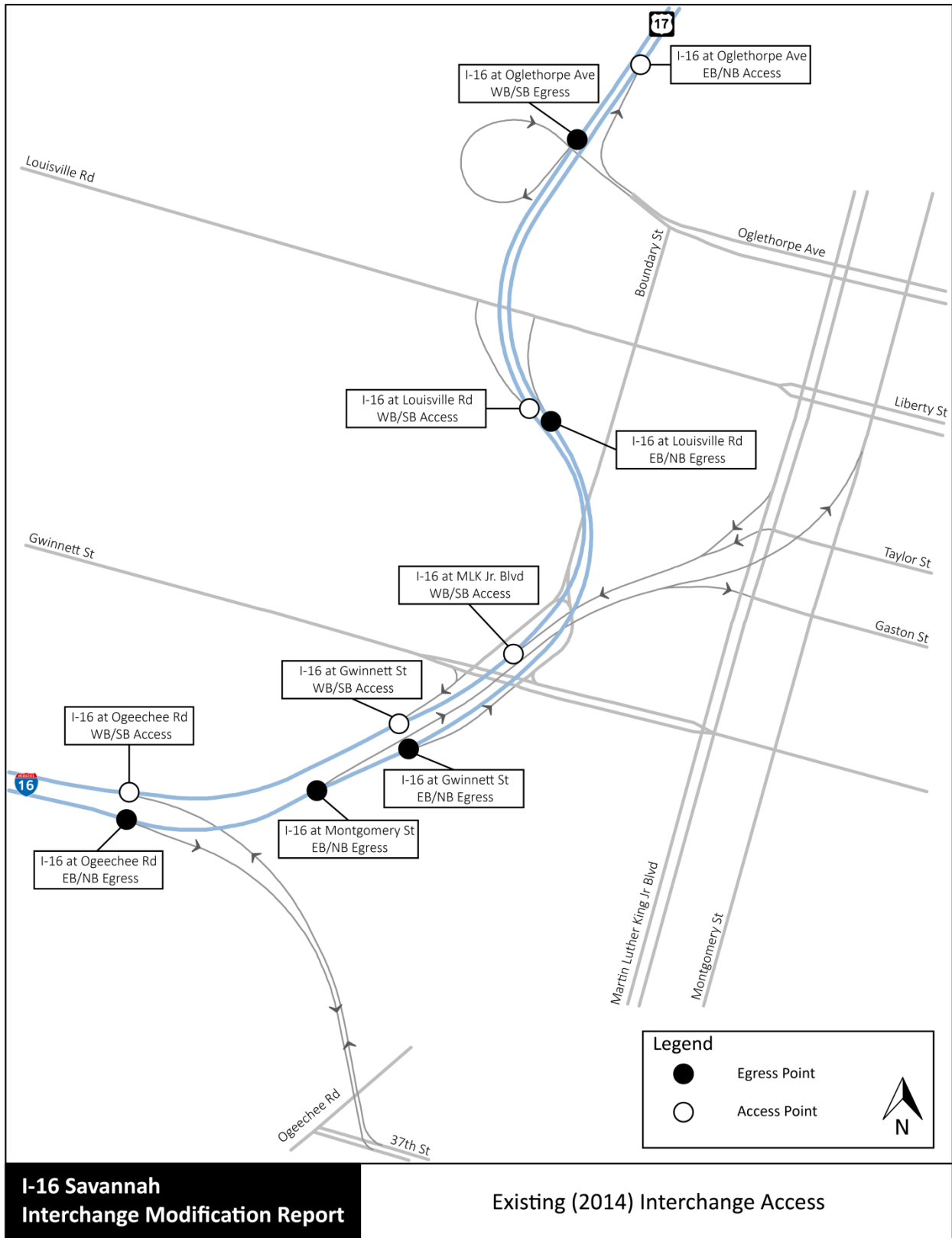
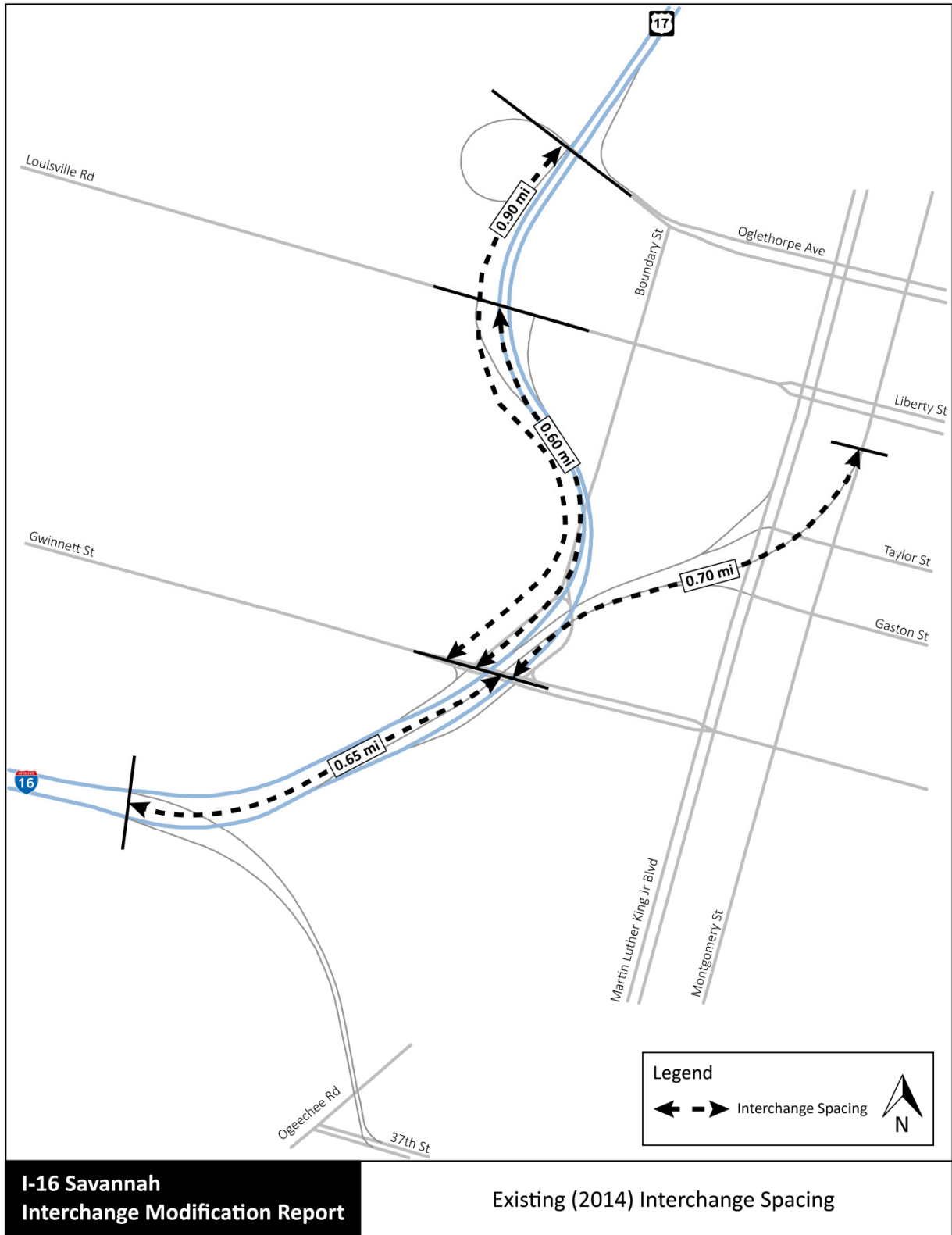




Figure 2.3: Interchange Spacing in the Area of Influence







### 2.3 Existing Structures

The bridges along the mainline of I-16 and US 17 were evaluated to determine their useful life and the potential need for improvement within the lifespan of the proposed project. Bridge sufficiency ratings are used in the identification of bridges that may be in need of improvements or replacement. In general, bridges with sufficiency ratings of 50 or below are considered for replacement, and bridges with sufficiency ratings between 50 and 80 are considered for rehabilitation. Additional criteria are used to determine bridges that are structurally deficient or functionally obsolete. A structural deficiency may require significant maintenance, rehabilitation or replacement. Functionally obsolete means that the bridge does not meet current design standards. The criteria ratings are shown in **Table 2.4**.

**Table 2.4: Criteria for Identifying Structurally Deficient or Functionally Obsolete Bridges**

Rating Type	Item	Rating
Structural Deficiency*		
Condition Ratings	Item 58 - Deck	≤4
	Item 59 - Superstructures	≤4
	Item 60 - Substructures	≤4
	Item 62 - Culvert and Retaining Walls	≤4
Appraisal Ratings	Item 67 - Structural Condition	≤2
	Item 71 - Waterway Adequacy	≤2
Functional Obsolescence		
Appraisal Ratings	Item 68 - Deck Geometry	≤3
	Item 69 - Underclearances	≤3
	Item 72 - Approach Roadway Alignment	≤3
	Item 67 - Structural Condition	3
	Item 71 - Waterway Adequacy	3

\* Bridges that are structurally deficient are excluded from the functionally obsolete category.

Source: FHWA

Analysis of the Bridge Inventory Data Listings identified six structures in the study area that are functionally obsolete, including the flyover ramp proposed for removal (**Table 2.5**):

- Bridge on SR 404/US 17 northbound over Boundary Street (051-0166-0) received a rating of 3 for item 69, Underclearance – Horizontal/Vertical.
- Bridge on SR 404/US 17 southbound over Boundary Street (051-0167-0) received a rating of 3 for item 69, Underclearance – Horizontal/Vertical.
- Bridge on SR 25 E Connector over SR 404 Spur (051-0170-0) received a rating of 2 for item 68, Deck Geometry.
- Bridge on I-16 eastbound over Boundary Street (051-0099-0) received a rating of 3 for item 69, Underclearance – Horizontal/Vertical.
- Bridge on I-16 westbound over Boundary Street (051-0100-0) received a rating of 3 for item 69, Underclearance – Horizontal/Vertical.
- Bridge on I-16 eastbound over MLK, Jr., Boulevard (051-0101-0) received a rating of 3 for item 68, Deck Geometry. This structure is the flyover ramp proposed for removal.

**Table 2.5: 2014 Data for Bridges in the I-16 IMR Study Area**

ID	Name	Sufficiency Rating	Functionally Obsolete?	Structurally Deficient?	Bridge inspection date
051-0057-0	Gwinnett St at Springfield Canal	88.20	-	-	5/11/2015
051-0078-0	SR 204 WBL at I-16 EBL	87.70	-	-	7/31/2014
051-0097-0	I-16 EBL at Gwinnett St	83.50	-	-	7/30/2014
051-0098-0	I-16 WBL at Gwinnett St	86.40	-	-	7/30/2014
051-0099-0	I-16 EBL at Boundary St	88.80	Yes	-	7/30/2014
051-0100-0	I-16 WBL at Boundary St	87.90	Yes	-	7/30/2014
<b>051-0101-0</b>	<b>I-16 EBL over MLK Jr. Blvd (study interchange)</b>	<b>71.90</b>	<b>Yes</b>	<b>-</b>	<b>8/12/2014</b>
051-0165-0	US 17 at Springfield Canal	98.00	-	-	8/12/2014
051-0166-0	US 17 (NBL) at Boundary St	86.00	Yes	-	12/4/2015
051-0167-0	US 17 (SBL) at Boundary St	75.30	Yes	-	11/17/2014
051-0168-0	SR404R - US 17 at Springfield Canal	97.20	-	-	8/12/2014
051-0170-0	SR25 E Conn. at SR404 Spur	96.00	Yes	-	12/3/2015
051-0171-0	SR25 Ramp at SR 404 Spur	94.40	-	-	11/06/2014
051-0172-0	SR25 Conn. at Springfield Canal	94.40	-	-	8/12/2014

Source: GDOT Bridge Data

## 2.4 Existing Traffic Analysis

An analysis of the existing traffic was conducted through the collection of traffic counts and review of the regional travel demand model results. Traffic flow diagrams for the project study area were developed. The methodology and assumptions used for the analysis are provided in the following sections. The mainline Average Annual Daily Traffic (AADT) is shown in **Figure 2.4**. The approved Existing Traffic Memorandum is provided in Appendix A.

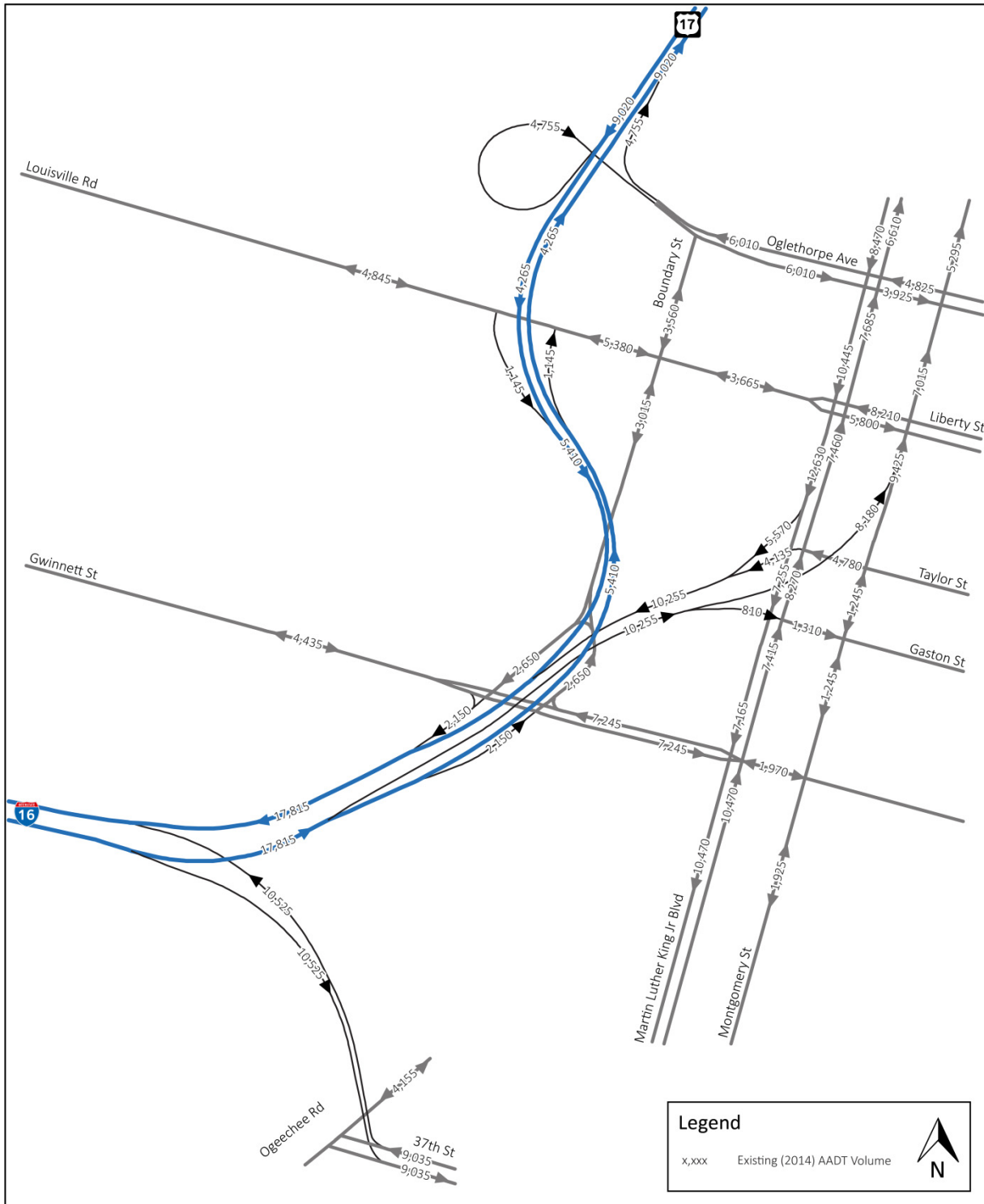
### 2.4.1 Traffic Counts

Traffic counts were taken during the week of February 25-27, 2014. These counts included 32 weekday peak hour turning movement counts at intersections, and 22 48-hour tube counts on the surrounding ramps and roadways in the study network. The location of these traffic counts was coordinated with the Chatham County-Savannah Metropolitan Planning Commission (MPC) and GDOT. As part of the traffic count process through the GDOT Office of Planning, the counts were compared to existing data such as GDOT's State Traffic and Report Statistics (now replaced by GEOCounts) and the Traffic Polling and Analysis System (TPAS) to ensure consistency and reasonableness. Traffic counts are presented in Appendix A. Figure 2.4 shows adjusted existing AADT.

### 2.4.2 Directional Distribution, Peak Hour K-Factor, and Truck Percentage

Based on the 48-hour tube classification counts, the K- and D-factors for traffic throughout the study area were calculated, as well as truck percentages for both daily and peak hour conditions. **Table 2.6** summarizes the peak hour, directional distribution, and truck percentage for each of the tube count locations. The K-factor was used to convert the peak hour turn movement volumes to daily volumes for the average daily traffic volume diagrams.

Figure 2.4: Existing AADT (2014)



I-16 Savannah Interchange Modification Report

Existing (2014) Annual Average Daily Traffic (AADT)

**Table 2.6: Existing Year (2014) Peak Hour Factors, Directional Distribution, and Truck Percentage**

Location	Description	Total Volume (vpd)	Factor		Daily Truck Percentage			Peak Hour Truck Percentage		
			K	D	Truck %	S.U. %	Comb %	Truck %	S.U. %	Comb %
A	W Bay St (between Ann St and MLK, Jr. Blvd)	18,330	8.1	55.5	10.7	3.5	7.2	9.5	3.2	6.3
B	MLK, Jr. Blvd (between Zubley St and W Oglethorpe Ave)	15,199	8.6	55.1	9.9	4.2	5.7	10.2	3	7.2
C	W Oglethorpe Ave (between Ann St and MLK, Jr. Blvd)	12,979	8	53.4	14.8	9.5	5.4	12.5	6.7	5.7
D	W Oglethorpe Ave (between MLK, Jr. Blvd and Montgomery St)	5,112	8.4	52.3	11.3	6.5	4.8	9	5.7	3.3
E	Louisville Rd (E of N Boundary St)	6,819	9.8	53.7	8.6	6.1	2.4	5.8	4.3	1.6
F	MLK Jr. Blvd (between W Harris St and W Charlton St)	21,357	7.8	69.6	10.6	4.8	5.8	8.7	3.1	5.7
G	Montgomery St (between W Harris St and W Charlton St)	8,334	8.8	100	7.8	5.4	2.4	7	5.1	2
H	I-16 On-ramp	10,139	11.2	100	6.4	3.7	2.7	4.8	2.9	1.8
I	I-16 Off-ramp to Montgomery St NB	6,134	9.1	100	8.7	6.1	2.6	7.7	5.7	2
J	I-16 Off-ramp to MLK, Jr. Blvd	2,222	11.3	100	9.1	3.7	5.4	9.4	4	5.4
K	W Gwinnett St (between Stiles Ave and W Boundary St)	8,822	9.3	51.3	8.2	4.9	3.3	5.8	2.7	3.1
L	W Gwinnett St (between May St and Allison St)	11,770	9.7	55.8	9.3	5.9	3.4	7.6	3.3	4.3
M	MLK, Jr. Blvd (between W Hall St and W Huntingdon St)	14,853	7.5	54.9	7.3	5	2.3	5.8	3.5	2.2
N	Fahm St (between Oglethorpe Ave and Bay St)	4,823	10.3	61	15	7.1	7.9	10.4	6.2	4.2
a	I-16 Mainline (between GA 204 and W Gwinnett St)	28,321	9.1	60.9	9.9	4.4	5.5	12.6	3.6	9
<b>AVERAGE</b>			<b>9.2</b>		<b>9.9</b>	<b>5.2</b>	<b>4.7</b>	<b>9.0</b>	<b>3.9</b>	<b>5.1</b>

### 2.4.3 Seasonal Adjustment

To address Savannah's high tourism and fluctuating student population, it was necessary to adjust the traffic volumes to reflect variances in the traffic throughout the year. Using GDOT TPAS data, monthly volumes were tabulated for sample days in each month of the year in order to calculate an Annual Daily Traffic (ADT) volume. Location 051-0376 was selected as the nearest permanent count station to the study area. This count station is located on I-16 just west of the Gwinnett Street interchange. The average of all the monthly ADT values results in the AADT. The AADT was then divided by each monthly ADT in order to determine the seasonal adjustment factors. Counts performed for this study were collected in the month of February. Therefore, the seasonal adjustment factor of 1.023 was applied to all volumes to adjust the traffic. This figure means that the month of February has typically lower volumes than the annual average and is therefore increased by 2.3% to reach accurate AADT traffic volumes.

### 2.4.4 Peak Hour Volumes

Weekday period traffic volumes were collected at the subject intersections for two hours in the AM Peak (7 AM to 9 AM) and two hours in the PM Peak (4 PM to 6 PM). The peak hour volumes are determined based on the four consecutive 15-minute periods for each intersection that handle the highest total volume of traffic traveling through the intersections. Peak hour volumes were mostly balanced between intersections despite the high number of access points (small roads, driveways, parking lot access) between counted intersections. In the case of intersections at adjacent ramp termini (e.g. – US 17 ramps



at Louisville Road and I-16 ramps at Gwinnett Street), volumes must be balanced to ensure no lost traffic occurs on the interchange bridges. It was also assumed that no traffic is lost or gained between intersections adjacent to each other on MLK, Jr. Boulevard and Montgomery Street. In all other cases, it was assumed that there would be sinks/sources for traffic to enter and exit the roadway prior to the next downstream intersection, as is noted on the volume diagrams. If the resulting sink/source volumes appeared to be excessively high, the traffic volume was moderated to a more reasonable value based on aerial observations and professional judgment. These traffic volumes were deemed reasonable by GDOT Office of Planning.

#### **2.4.5 Average Daily Volumes**

Average daily traffic volumes were calculated using the K-factor described above applied to the PM peak hour traffic volumes. The daily approach and departure volumes are used as control totals, along with the peak hour turning movement counts as the seed values to conduct a fratar method to determine daily turning movement volumes. For a typical intersection in the study area, the complementary movements (e.g. – NB/SB through or EB right/WB left) were balanced to indicate the same number of vehicles traveling in one direction will return on that same path within the same day. This did not apply in the case where there is a one-way street such as Montgomery Street. Therefore some complimentary movements in the study area show unbalanced volumes. As with the peak hour volumes, the daily traffic volumes were balanced between most intersections so that there is a net ‘0’ sink/source value over the course of the day. The exception to this rule is in cases where the adjacent intersections are at a far distance from each other with several cross street and access points in between. The final step in determining the AADT volumes was applying a seasonal adjustment factor as described above. These traffic volumes were deemed reasonable by GDOT Office of Planning.

### **2.5 Existing Operational Analysis**

An operational analysis of the Existing Year 2014 was performed for mainline segments, ramps and intersections within the study area. **Figure 2.5** shows the existing lane configuration of the I-16/US 17 mainline, intersecting roadways and associated intersections. The methodology for evaluating Level of Service (LOS) on the Interstate and local facilities in this IMR is based on criteria set forth in the Transportation Research Board’s Highway Capacity Manual, 2010 edition (HCM2010).

The HCM2010 “grades” traffic flow along a roadway segment from A to F, with A representing the best, free flow conditions, and F representing the worst conditions, at which a facility is at or above its capacity. A description of each LOS follows:

**LOS A** – Drivers perceive little or no delay and easily progress along a corridor.

**LOS B** – Drivers experience some delay, but generally driving conditions are favorable.

**LOS C** – Travel speeds are slightly lower than the posted speed with noticeable delay in intersection areas, but considered acceptable.

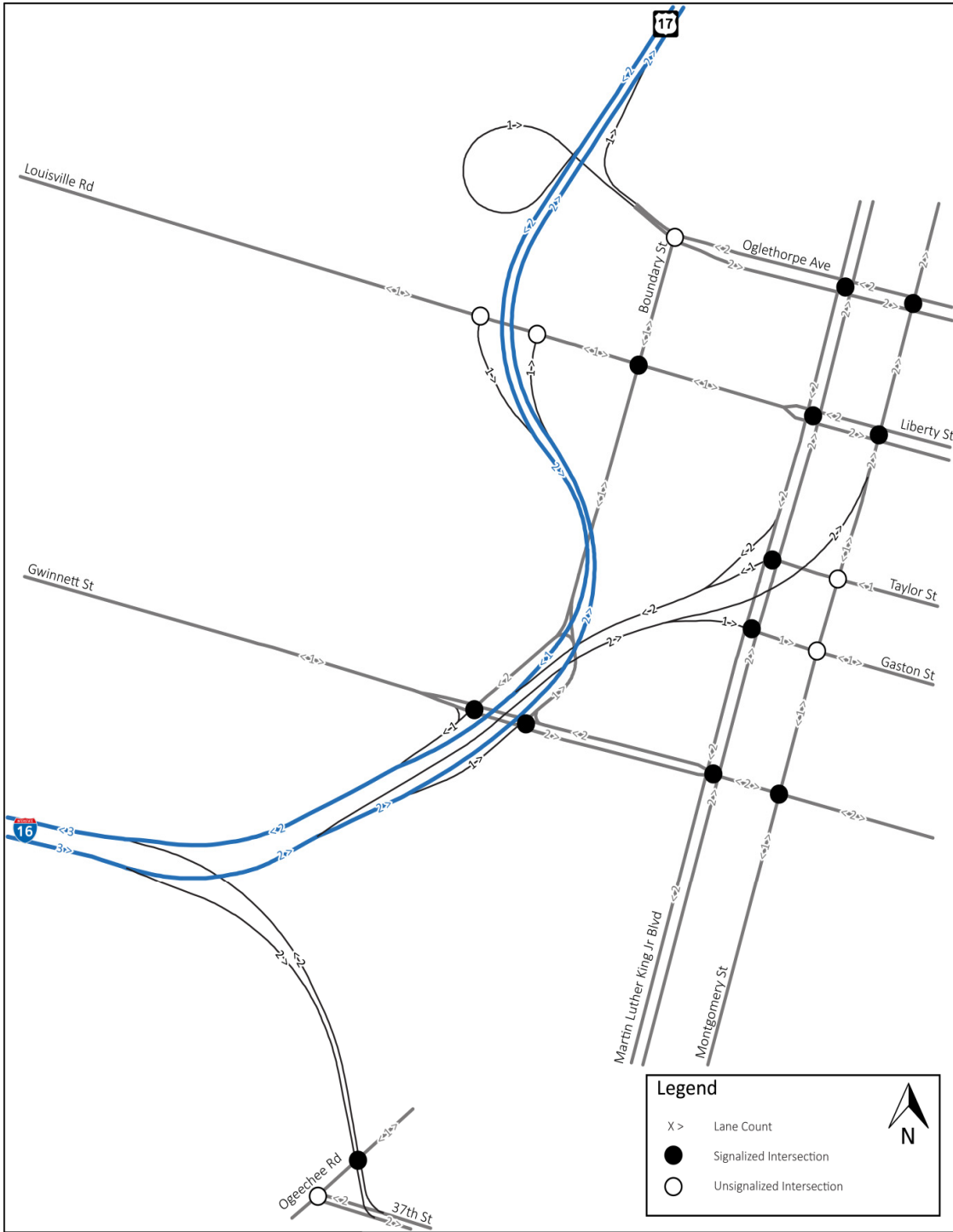
**LOS D** – Travel speeds are well below the posted speed with few opportunities to pass and considerable intersection delay, but considered acceptable.

**LOS E** – The facility is operating at capacity and there are virtually no useable gaps in the traffic.

**LOS F** – More traffic desires to use a particular facility than it is designed to handle resulting in extreme delays.

According to the design criteria in GDOT’s Design Policy Manual, Revision 4.11 (January 2016), desirable LOS on Local, Collector, and Arterial Roadways is D or better in urban areas.

Figure 2.5 Existing Lane Configuration



**Legend**

- X > Lane Count
- Signalized Intersection
- Unsignalized Intersection

**I-16 Savannah Interchange Modification Report**

Existing (2014) Lane Configuration



**2.5.1 Mainline Analysis**

The Existing Year 2014 Synchro mainline analysis results are shown in **Table 2.7**. I-16/US 17 was analyzed between Gwinnett Street to the south and Oglethorpe Avenue to the north. The results of the operational analysis show that I-16/US 17 generally operates at an acceptable LOS (LOS D or better) in the AM and PM peak hours. In the PM peak hour the ramp from Gwinnett Street to I-16 south and the mainline south operates at a LOS E.

**Table 2.7: Existing Year 2014 Mainline Capacity and Ramp Analysis Summary**

	Location	Dir.	Type	AM Peak Hour			PM Peak Hour		
				Input Vol. (vph)	Density (pc/mi/l n)	LOS	Input Vol. (vph)	Density (pc/mi/l n)	LOS
EB / NB	I-16 west of Gwinnett St	EB	Segment	1,496	20.9	C	1,343	18.8	C
	I-16 Split at US 17	EB	Diverge	1,496	22.2	C	1,343	19.9	B
	US 17 between Gwinnett St and Louisville Rd	EB	Segment	436	6.1	A	432	6.5	A
	US 17 off-ramp to Louisville Rd	NB	Diverge	436	6.1	A	432	6.5	A
	US 17 between Louisville Rd and Oglethorpe Ave	NB	Segment	330	5.0	A	396	5.8	A
	US 17 on-ramp from Oglethorpe Ave	NB	Merge	703	15.4	B	956	18.5	B
	US 17 north of Oglethorpe Ave	NB	Segment	703	15.3	B	956	18.5	C
WB / SB	US 17 north of Oglethorpe Ave	SB	Segment	660	9.5	A	825	12.2	B
	US 17 off-ramp to Oglethorpe Ave	SB	Diverge	660	9.8	A	825	12.6	B
	US 17 between Oglethorpe Ave and Louisville Rd	SB	Segment	212	3.3	A	286	4.9	A
	US 17 on-ramp from Louisville Rd	SB	Merge	254	3.9	A	483	7.6	A
	I-16 from MLK, Jr. Blvd	WB	Segment	696	15.4	B	959	22.2	C
	I-16 on-ramp from Gwinnett St	WB	Merge	1,106	25.0	C	1,670	37.5	E/F
	I-16 west of Gwinnett St	WB	Segment	1,106	24.6	C	1,670	37.0	E



### 2.5.2 Intersection Analysis

The results of the Existing Year 2014 intersection analysis are shown in **Table 2.8**. The majority of the intersections operate at an acceptable LOS (LOS D or better) during the existing weekday peak hours. The intersection of Oglethorpe Avenue at MLK, Jr Boulevard operates at a LOS F in the PM peak hour.

**Table 2.8: Existing Year Intersection Analysis**

Intersection	AM Peak Hour			PM Peak Hour		
	Volume (vph)	Delay (sec/veh)	LOS	Volume (vph)	Delay (sec/veh)	LOS
W Oglethorpe Ave at W Boundary St	1082	1.2	A	1557	2.1	A
W Oglethorpe Ave at MLK Jr. Blvd	1944	20.4	C	2591	71.1	F
W Oglethorpe Ave at Montgomery St	1527	8.1	A	1723	19.5	C
Louisville Rd at US 17 SB On-ramp	872	0.4	A	1002	0.4	A
Louisville Rd at US 17 NB Off-ramp	904	0.7	A	973	0.6	A
Louisville Rd at W Boundary St	1161	11.1	B	1482	12.2	B
Louisville Rd/W Liberty St at MLK Jr. Blvd	2000	14.8	B	2484	13.1	B
W Liberty St at Montgomery St	2034	10.3	B	1925	8.2	A
MLK Jr. Blvd at W Taylor St/I-16 WB On-ramp	1703	5.4	A	2351	11.5	B
MLK Jr. Blvd at W Gaston St/I-16 EB Off-ramp	1113	8.6	A	1512	7.0	A
W Gwinnett St at W Boundary St/I-16 WB On-ramp	1040	11.4	B	1267	13.8	B
W Gwinnett St at I-16 EB Off-ramp	1374	8.0	A	1481	8.2	A
W Gwinnett St at MLK Jr. Blvd	1717	11.9	B	2308	12.8	B
W Gwinnett St at Montgomery St	500	7.5	A	661	8.8	A
GA 204 (37th St Conn) at Ogeechee Rd	2375	10.3	B	2420	13.8	B
W Gaston St at Montgomery St	404	5.3	A	430	6.1	A





## 2.6 Crash History

A crash rate analysis was performed for study area roadway segments to identify those roadway segments with crash rates higher than the statewide average over the most recent three-year period (2010-2012) for which geocoded data were available. A summary of the results of this analysis is presented in **Table 2.9**. The following four segments had higher than average crash rates for their functional classification:

- W Oglethorpe Avenue from US 17 to Montgomery Street
- I-16 from I-516 to its terminus
- MLK Jr. Boulevard from W 37<sup>th</sup>/SR 204 to W Bay Street
- Montgomery Street from W Gwinnett Street to W Bay Street

Crash frequency at locations throughout the study area is presented in **Figure 2.6**. A table of crash data associated with this figure is available in Appendix F.

**Table 2.9: Average Annual Crash Rate 2010-2012 on Major Study Area Roadways**

Roadway Segment	Total Average Annual Crashes	Roadway Crash Rate (per 100 million vehicle-miles (MVM))	Statewide Crash Rate (per 100 million vehicle-miles (MVM))	Most Frequent Collision Type
US 17 (I-16 to State Line)	5	130	156	Angle
W. Oglethorpe Ave (US 17 to Montgomery St)	39	<b>1872</b>	500	Angle
W. Gwinnett St (Stiles to Montgomery St)	16	337	497	Angle
Louisville Rd (Stiles to Montgomery St)	14	483	497	Rear End
SR 204 (I-16 to MLK Jr. Blvd.)	0	49	459	Rear End
I-16 (I-516 to Terminus)	35	<b>435</b>	187	Rear End/Sideswipe
MLK Jr. Blvd. (W. 37 <sup>th</sup> /SR 204 to W. Bay St)	201	<b>2361</b>	459	Angle
Montgomery St (W. Gwinnett St to W. Bay St)	52	<b>1826</b>	497	Angle

Source: *GDOT Crash Data*

## 2.7 Existing Land Use

The distribution of existing land uses within the study area is presented in **Figure 2.7**. The existing land use categories provided by the MPC for parcels within the study area have been combined and simplified based on general conventions for ease in mapping and display. The historic core of Savannah features a fine-grain of land uses on small, narrow blocks. This area features a mixture of office, commercial, public-institutional, and residential uses. The area also features notable park-recreation-conservation uses including the historic squares, Forsyth Park and the Savannah Civic Center.

North of Liberty Street, the land use mix is dominated by office and commercial uses and represents a portion of Savannah's Central Business District. This area includes a mixture of office buildings, hotels, retail stores, as well as numerous restaurants and entertainment venues. The City Market pedestrian promenade is found here, which includes areas for outdoor dining and entertainment. This area also contains the Chatham County Courthouse.

South of Liberty Street the historic core is more residential in nature featuring a high percentage of Single-Family and Multi-Family Residential uses. This includes single-family homes, multi-family apartment buildings, and numerous row houses. While predominately residential in nature this area also features a mixture of commercial, public-institutional, and office uses.

Figure 2.6: Crash Frequency, 2010-2013



I-16 IMR CRASH COUNTS, 2010 - 2013

Crash Counts Highway Classification		Block Groups
● 1 - 2	Interstate / Freeway	Buildings
● 3 - 8	Major Arterial	Water
● 9 - 16	Minor Arterial	
● 17 - 24	Collector	
● 25 - 812	Unclassified	

Sources: American Community Survey, CORE-MPO, Jacobs Engineering

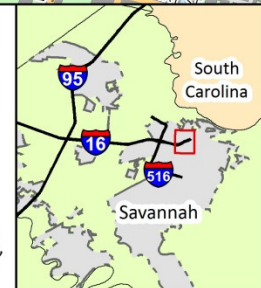
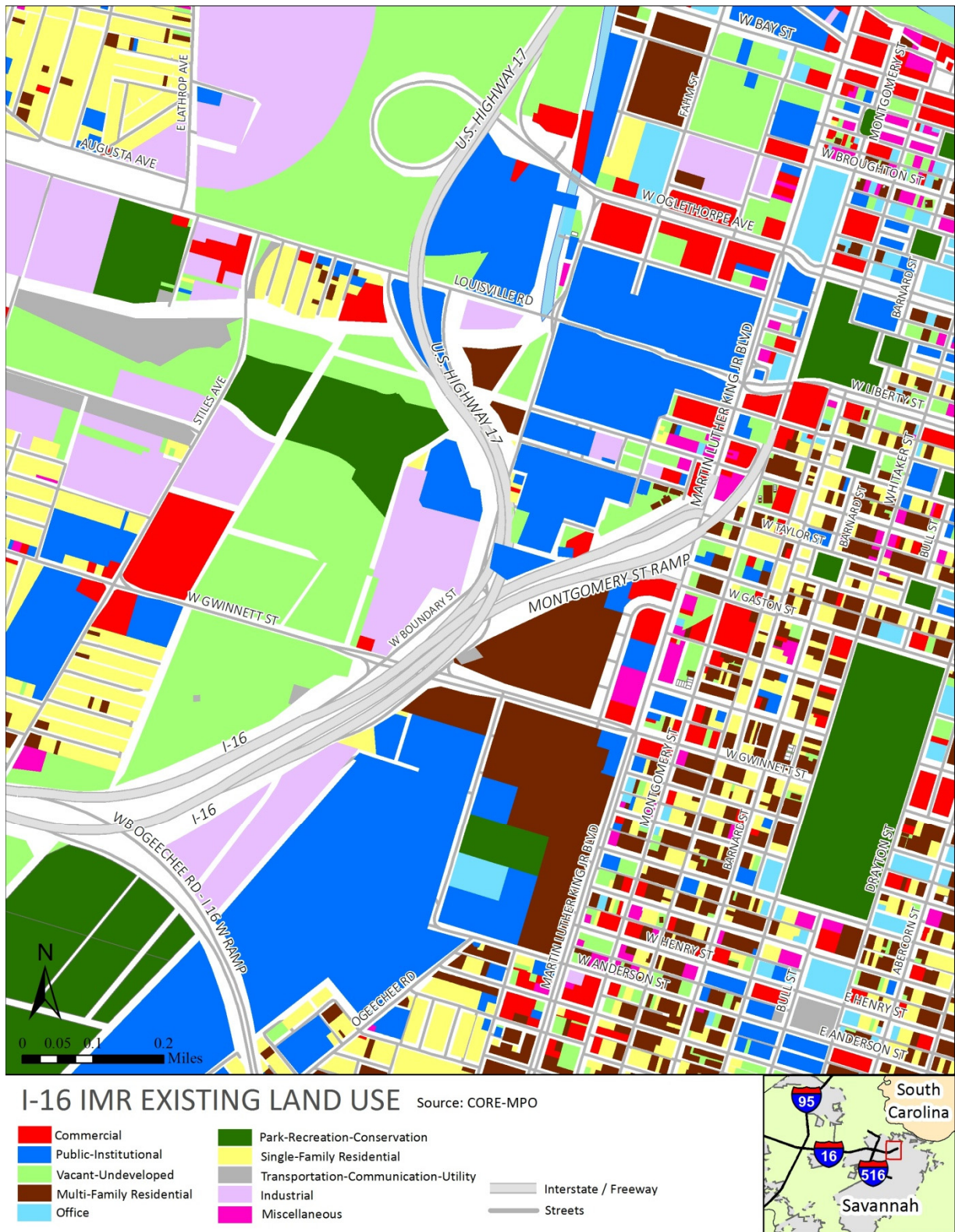


Figure 2.7: Existing Land Use in the Study Area





Three concentrations of multi-family residential uses can be found within the study area. This includes the Yamacraw Village public housing complex which is located in the northern portion of the study area directly south of Bay Street. The complex is operated by the Housing Authority of Savannah and is comprised of two-story garden style apartments.

The additional two concentrations are found in the central portion of the study area and include two large public housing complexes. Both of these developments abut Gwinnett Street between I-16 and MLK, Jr. Boulevard. This includes Herbert Kayton Homes on the north side of Gwinnett Street and Simon F. Frazier Homes on the south side of Gwinnett Street. These communities are operated by the housing authority and are predominately comprised of two-story garden style apartments.

The northeastern quadrant of the study area contains a significant amount of industrial land uses. These are found predominately west of I-16/US 17. This includes large-scale industrial operations like the Chatham Steel Corporation, located immediately west of I-16/US 17 north of Gwinnett Street and also smaller warehouse distribution uses along Lathrop Avenue.

Public-institutional uses can be found throughout the study area and include schools, religious institutions, museums, government uses, and cemeteries. Prominent land uses include Laurel Grove Cemetery, the Savannah History Museum, and the Garrison School of Visual and Performing Arts.

## 2.8 Population and Employment

*Reclaiming Old West Broad Street: The I-16 Exit Ramp Removal Study (Phase I)*, describes historically compact, vibrant neighborhoods – Frogtown and Currietown – surrounding West Broad Street in 1916. As that study reports, by the mid-1960s Savannah’s Union Station and many of the buildings in this area had been torn down to make way for urban renewal. This action was taken in the name of fighting blight and providing access to downtown Savannah (an area that already had several alternative points of access to the US 17/I-16 facility) at the expense of the community it traversed. The construction of the I-16 terminal ramps disrupted the fabric of what had been, in the 1950s, a thriving neighborhood.

### 2.8.1 Population

With 10,694 residents, the I-16 study area represents roughly eight percent of the City of Savannah’s total population of 133,421 (**Table 2.10**). Households in the study area are slightly smaller than those elsewhere in the region, with two people per household in the study area, and two and one-half people on average across the region.

**Table 2.10: Existing and Future Study Area Households and Population**

Area	Households		Population
	2010	Ave 2010 HH Size	2010
I-16 IMR Study Area	5,473	2.0	10,694
City of Savannah	58,795	2.3	133,421
Chatham County	110,971	2.3	260,170
Savannah (CORE) Region	139,801	2.5	342,653

*Source: Coastal Region Metropolitan Planning Organization (CORE MPO) Travel Demand Model (GDOT)*

A large portion (65 percent) of I-16 study area residents are minorities. The percentage of minority residents in the study area is only marginally greater than that seen across the city of Savannah (64 percent). Nearly half (47 percent) of all residents in the study area live below the poverty line. That is a far greater proportion than found in the city as a whole, where approximately 25 percent of individuals have incomes below the poverty line. At \$20,650, median household income within the study area is less than half of city-wide median income (\$42,763). The I-16 ramps connect the Interstate to a relatively high-income area through an impoverished area immediately adjacent to the ramps. There is an income



disparity between neighborhoods divided by MLK Jr. Boulevard, with lower incomes to the west and south and higher incomes to the north and east of MLK Jr. Boulevard. The area to the west of MLK Jr. Boulevard and east of I-16 is home to several public housing complexes that contribute to the high poverty rates in the area.

The I-16 study area contains some of the densest population centers in the Savannah region (**Table 2.11**). Study area population density is, on average, six persons per acre, three times the citywide average of two persons per acre. As can be seen from the map of population density in **Figure 2.8**, the I-16 ramp structures divide the population centers to the east and the less dense sectors to the west. Most of the study area population resides in the neighborhoods surrounding Forsyth Park.

**Table 2.11: Existing and Future Study Area Population Density**

Area	Area in acres	2010 Population	2010 Population Density (persons per acre)
I-16 IMR Study Area	1,713	10,694	6.2
City of Savannah	69,568	133,421	1.9
Chatham County	404,480	260,170	0.6
Savannah Metropolitan Statistical Area (MSA)	1,004,132	342,653	0.34

*Source: CORE MPO Travel Demand Model (GDOT)*

### 2.8.2 Employment

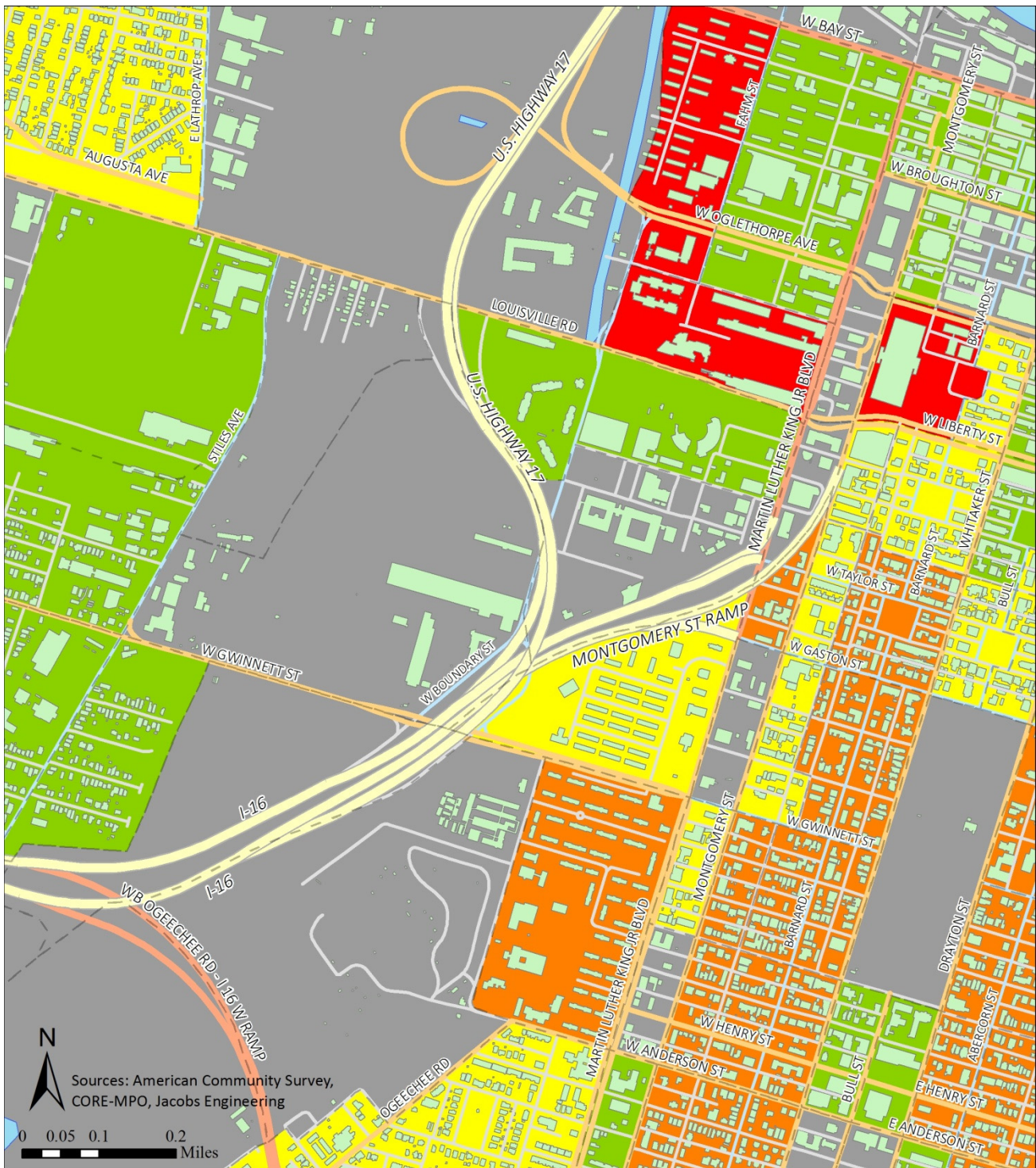
According to 2010 data presented in **Table 2.12**, the study area contains 7,656 jobs, or six percent of all jobs in the city of Savannah (123,747). The study area has an average of 4.5 jobs per acre, which is more than twice the employment density of the city (1.8) and far higher than that of the county and region (0.4 and 0.2 jobs per acre, respectively.) Employment is most highly concentrated (80 to 160 jobs per acre) in the blocks between Broughton Street and Oglethorpe Avenue within Savannah's historic district. County services and other government uses are housed in this area. This concentration is a small part of greater historic Savannah, which houses an average of 36 to 80 jobs per acre. Savannah's historic district is partially included in the study area. The I-16 roadway and terminal ramp structure divides the concentrated employment centers to the east and the largely defunct industrial and vacant zones to the west. The southern portion of the study area is largely residential without major employment hubs.

**Table 2.12: Employment Density**

Area	Size in acres	2010	
		Employment (Jobs)	Employment Density (Jobs per acre)
I-16 IMR Study Area	1,713	7,656	4.5
City of Savannah	69,568	123,747	1.8
Chatham County	404,480	175,125	0.4
Savannah Metropolitan Statistical Area (MSA)	1,004,132	200,849	0.2

*Source: CORE MPO Travel Demand Model (GDOT)*

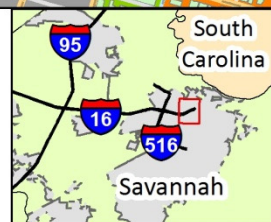
Figure 2.8: 2010 Population in the Study Area



Sources: American Community Survey, CORE-MPO, Jacobs Engineering  
 0 0.05 0.1 0.2 Miles

I-16 IMR POPULATION DENSITY

Interstate / Freeway	Collector	<b>POP10 / ACRES</b>	10 - 17	Buildings
Major Arterial	Unclassified		17 - 25	Water
Minor Arterial		4 - 10	25 - 40	TAZs





### 3 Future Conditions and Traffic Forecast

This section provides a brief overview of future conditions and traffic forecasts used in this study. For additional information about forecasting methodologies, as well as the traffic forecasts for the No Build alternative, please see Appendix B. The GDOT Office of Planning approved the methodology submitted in the Existing Traffic Memorandum and the methodology submitted in the Future Year Traffic Memorandum.

#### 3.1 Methodology

##### 3.1.1 Traffic Growth

The selected years for future traffic analysis include an Opening Year (2025) and a Design Year (2045). The Coastal Region Metropolitan Planning Organization (CORE MPO) Travel Demand Model was used as the basis for calculating traffic growth for the study area traffic diagrams. This growth was applied to the existing traffic volumes, and served as the basis for the Opening and Design Year traffic volume diagrams submitted to GDOT Office of Planning on April 6, 2015. The following discussion explains the traffic growth methodology to determine the 2025 and 2045 volumes.

The available Travel Demand Models from CORE MPO include the years 2010 and 2040. The first step in creating the Opening and Design Year models was to interpolate/extrapolate for the years 2025 and 2045. For the purposes of this methodology, straight-line interpolation was used between 2010 and 2040 to determine the input socio-economic data to be used for the 2025 model run; and straight-line extrapolation was used from the 2010 and 2040 data to determine the year 2045 socio-economic input data. The 2014 SE Data that was used in the existing year methodology was also calculated by straight-line interpolation between the 2010 and 2040 data.

Once the Opening and Design Year travel demand models were run, the resulting model volumes at select locations throughout the study area were compared in order to calculate growth from the Base Year Model (2014) volumes to the Future Year models, 2025 and 2045. It is noted that, locally, the growth of traffic slows considerably between 2025 and 2045, as compared to the growth leading up to 2025. This is due to the fact that development in the immediate study area is projected to slow down as parcels are redeveloped and in-filled over time. Straight-line interpolation was used to calculate the intermediate year socio-economic data parameters within the traffic analysis zones of the study area. Traffic generated by these zones does not necessarily result in a similar straight-line growth in model volume, because shifts in trip productions and attractions occur in the distribution phase of the model. It would be unreasonable to expect significant sustained growth over a 30+ year period, so the growth rate on local roads was slowed over time, while freeway background growth was relatively constant up to 2045.

##### 3.1.2 Directional Distribution, Peak Hour K-Factor, and Truck Percentage

The directional distribution and K factors are assumed to be consistent between the existing year and the Opening and Design No Build Alternatives. These factors were used in the calculation of the Future Year diagrams.

##### 3.1.3 Truck Percentages

The daily truck percentages for Opening and Design Year were calculated based on the volumes produced from the future year travel demand models. By comparing the percent change in truck composition in the travel demand model, the truck percentages were adjusted accordingly in the No Build volume diagrams. The majority of freight movement in the area is using I-516 with access to SR 21 and SR 25 to access the Port of Savannah.



### 3.2 Traffic Volumes

The Coastal Region MPO Travel Demand Model was run for year 2025 and 2045 to ascertain projected AADT for the No Build and Proposed Improvement scenarios. These findings are summarized in **Table 3.1**. Traffic flow diagrams for 2025 and 2045 turning movements, AM and PM peak hour traffic, and additional facilities not presented in this table can be found in Appendix B. No Build traffic volumes for 2025 are presented in **Figure 3.1** and volumes for 2045 in **Figure 3.2**.

**Table 3.1: Average Annual No Build Daily Traffic for 2025 and 2045**

Roadway Segment	2025	2045
	No Build	No Build
US 17 north of Oglethorpe Avenue	10,890	15,060
US 17 from Louisville Road to Oglethorpe Avenue (Proposed SB ramp/US 17 SB)	NA/5,470	8,860
US 17 from Gwinnett Street to Louisville Road	6,780	10,360
I-16 south of Gwinnett Street	20,940	26,560
Oglethorpe Avenue Ramps west of US 17	5,420	6,200
Louisville Road Ramps (SB Entrance/NB Exit)	1,310/1,310	1,500/1,500
Louisville Road west of US 17	5,530	6,310
Louisville Road east of US 17	6,140	7,010
I-16 Terminal Ramps	11,710	13,400
MLK Jr., Boulevard south of Gaston Street/I-16 off-ramp (SB/NB)	8,170/8,460	9,360/9,680
MLK Jr., Boulevard from Gaston Street/I-16 EB off-ramp to Taylor Street/I-16 WB on-ramp	8,280/9,440	9,490/10,800
MLK Jr., Boulevard from I-16 WB on-ramp to Jones Street	14,500/9,400	16,610/10,750
Gwinnett Street Ramps	2,450	2,800
Gwinnett Street west of US 17	5,060	5,790
Gwinnett Street east of US 17	8,270	9,460
37 <sup>th</sup> Street Connector/SR 204 west of Ogeechee Road	12,010	13,750
Ogeechee Road north of 37 <sup>th</sup> Street	4,740	5,420
Ogeechee Road south of 37 <sup>th</sup> Street	3,900	4,460

Source: Future Year Traffic Analysis Note: AADT is shown for one way except for otherwise indicated



Figure 3.1: No Build AADT Traffic Volumes for 2025

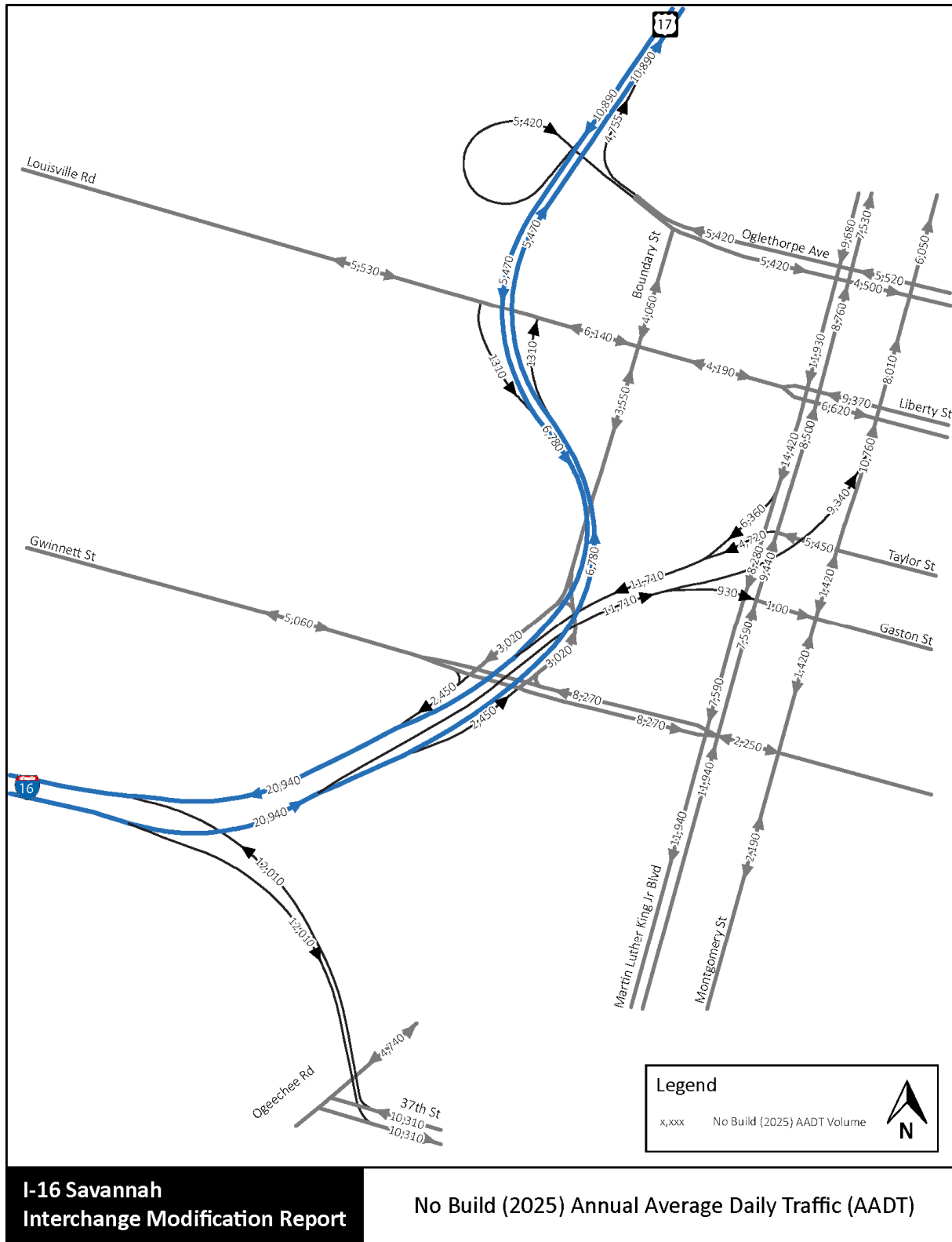
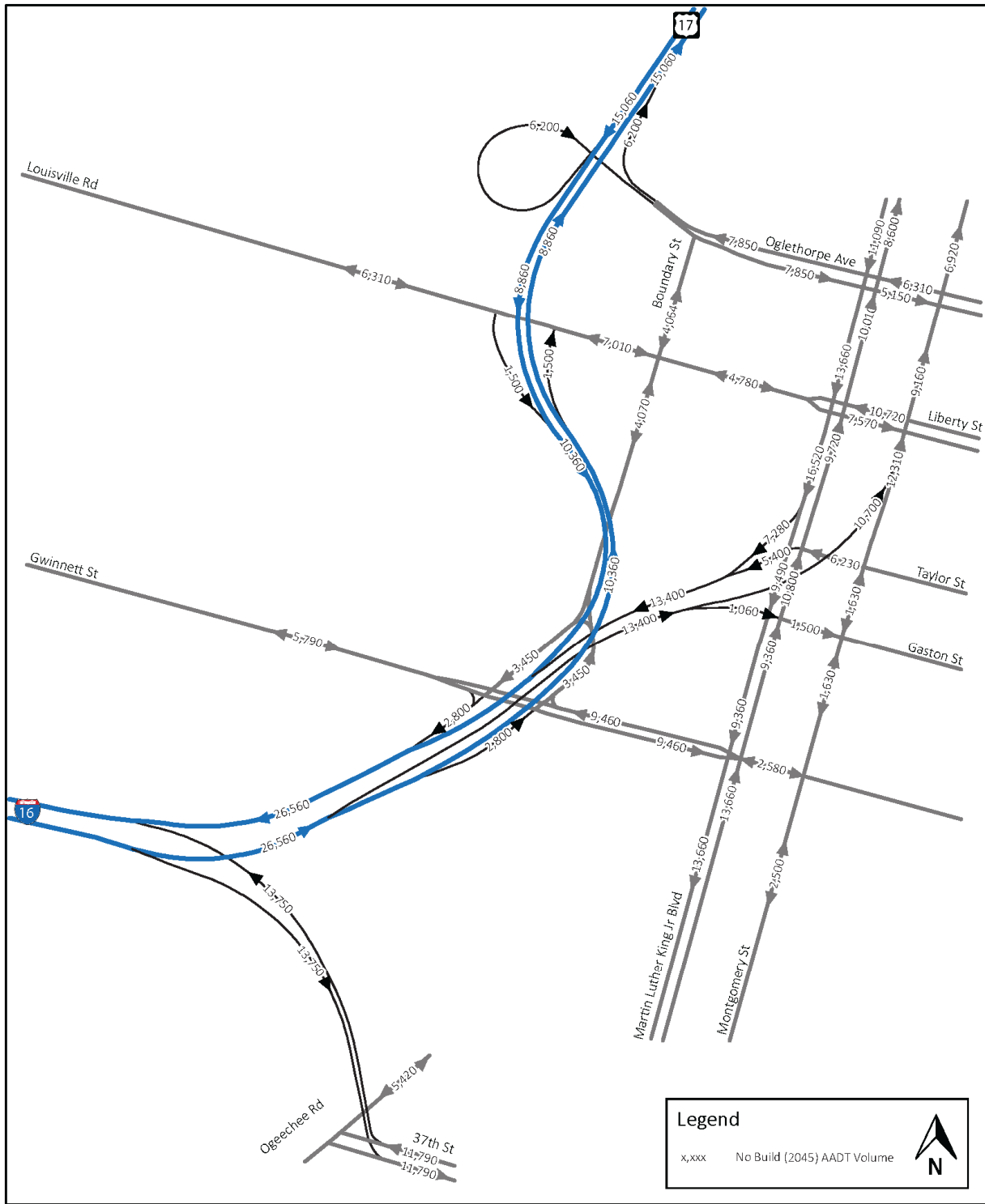


Figure 3.2: No Build AADT Traffic Volumes for 2045



I-16 Savannah Interchange Modification Report

No Build (2045) Annual Average Daily Traffic (AADT)



### 3.3 Future Land Use

To assess planned land uses within the study area an analysis of Savannah's Future Development Map was conducted. This map is a component of the Chatham County-Savannah Tricentennial Plan, as amended in 2012. Figure 3.3 depicts the future development categories within the study area. The Future Development Map is in compliance with Department of Community Affairs's regulations. The Future Development Map designates character areas which have corresponding appropriate future land uses identified within the plan, and also serves as the Future Land Use Map.

The historic commercial core of the city is shown under the Downtown category. This category is defined as Savannah's Central Business District, including retail, office, entertainment, institutional, civic, and residential uses that are integrated into the urban fabric. A large component of the study area west of the Downtown designation is shown as Downtown Expansion. This category is defined as areas in close proximity to the Central Business District where similar growth is desired. This area is seen as being contiguous and interconnected with the Downtown area and appropriate for future retail, office, entertainment, institutional, civic, and residential uses. The proposed redevelopment of the abandoned right-of-way is consistent with this future land use category. According to FHWA<sup>1</sup> the existing right-of-way is owned by the state. After the ramp removal the property would need to be sold or transferred by the state prior to any redevelopment of the area.

The Parks/Recreation category includes Forsyth Park and the squares in the historic core of the city. It also includes Bowles C. Ford Park adjacent to I-16. The area surrounding Springfield Canal is also shown as a Parks/Recreation use. This land use category is defined as land dedicated to open space that is accessible to the public or land that is dedicated to sports, exercise, or other types of leisure activities. The study area includes two major land uses designated under the Conservation category. This includes Laurel Grove Cemetery and undeveloped land immediately west of US 17, north of Louisville Road. Conservation uses are defined as publicly or privately held and designated for preservation in a natural state or for use as passive recreation (e.g., fishing, hiking, camping).

The Traditional Commercial category is found in various locations in the city's historic core. Concentrations are found fronting Montgomery Street, Bull Street, Abercorn Street, and Whitaker Street. This category is defined as business areas in close proximity to historically settled areas having development patterns characteristic of the Planned Town, Streetcar, and the Early Automobile eras. These development patterns typically feature small-scale compact commercial development fronting the street with parking in the rear of buildings and/or on-street parking. In addition to commercial uses this category is also deemed as appropriate for residential uses that are compatible with the character of adjacent neighborhoods.

The historic core of the city south of Liberty Street is primarily designated under the Traditional Neighborhood category. These areas are defined as residential areas in close proximity to downtown or in outlying historically settled areas having development patterns characteristic of the Planned Town, Streetcar, and Early Automobile eras. This includes a mixture of multi-family residential, mixed-use with ground level retail and residential above, townhomes, and compact single-family residential on narrow lots. Commercial developments are permitted in these areas as long as they are compatible with the residential character of the surrounding neighborhoods.

The existing industrial area on Lathrop Avenue is designated under the Commercial-Suburban category on the Future Development Map. This category is defined as business areas of moderate scale consisting of shopping centers and typical commercial corridor uses.

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<sup>1</sup> "Who owns it?" *Highway History: Interstate Frequently Asked Questions*. Federal Highway Administration. 29 Feb. 2016. <<http://www.fhwa.dot.gov/interstate/faq.cfm#question5>>



Several neighborhoods are designated under the Residential-Single Family category. This includes Carver Heights and the West Savannah neighborhoods. These neighborhoods are comprised of small modest homes on small lots. These areas are defined as single-family detached residential areas with gross densities ranging from five to ten units per acre.

Two locations are identified within the study area within the Residential – General category. This includes mixed residential areas on Louisville Road and Ogeechee Road. These areas include a mix of single-family residential, duplex, and multi-family residential. This category is defined as areas appropriate for a wide variety of residential uses including multi-family dwellings, attached dwellings, small lot single-family dwellings, and mixed-use development.

A small area designated Light Industrial is located in the northern portion of the study area and includes a large warehousing use. This area is seen as appropriate for the continuation of industrial uses, which do not produce noise, odor, dust, or waterborne contaminants. Warehouse, wholesale facilities, lumberyards, and storage yards are seen as appropriate for this area.

### 3.3.1 Pending Development

There are several major projects planned in and around the study area, as mapped in **Figure 3.4**. These projects will work in tandem with the ramp removal to support redevelopment of the study area and its wider area of influence. These projects include:

- The planned **Cultural Arts Center** would replace the city’s existing arts exhibition and performance space on Henry Street with a facility more than twice the size. It would be located in the southeast quadrant of MLK, Jr. Boulevard and Oglethorpe Avenue and is anticipated to be a pedestrian-friendly park and venue for community led theater productions, craft workshops, art-house cinema and showcase for local artists. The building has been designed, and is scheduled to go out to bid for construction by the end of 2015. Construction is expected to take at least 18 months.<sup>2</sup>
- The **Arena** would hold more than 10,000 seats and be built in west Savannah north of W Gwinnett Street along the Springfield Canal. It would replace the city’s existing Martin Luther King, Jr. Arena, which was built in 1967, and is not in compliance with the Americans with Disabilities Act and not technologically advanced enough to host modern shows.<sup>3</sup> The site was approved by City Council in October 2013.
- The **Canal District** would create a new urban environment west of I-16 to act as a catalyst to new development in that area. It would offer a mix of uses, including residential, office, and entertainment and retail. It takes its name from the proposed greenways that would connect the area to scenic, historic canals from the Savannah River.
- The **Savannah Development and Renewal Authority (SDRA) Priority Corridor Street** initiative has included a series of investments in this corridor, particularly pedestrian improvements to make the corridor a more welcoming and attractive gateway. SDRA work in this corridor is summarized in the Previous Studies portion of this report. These include the **SDRA Broad Street** projects.

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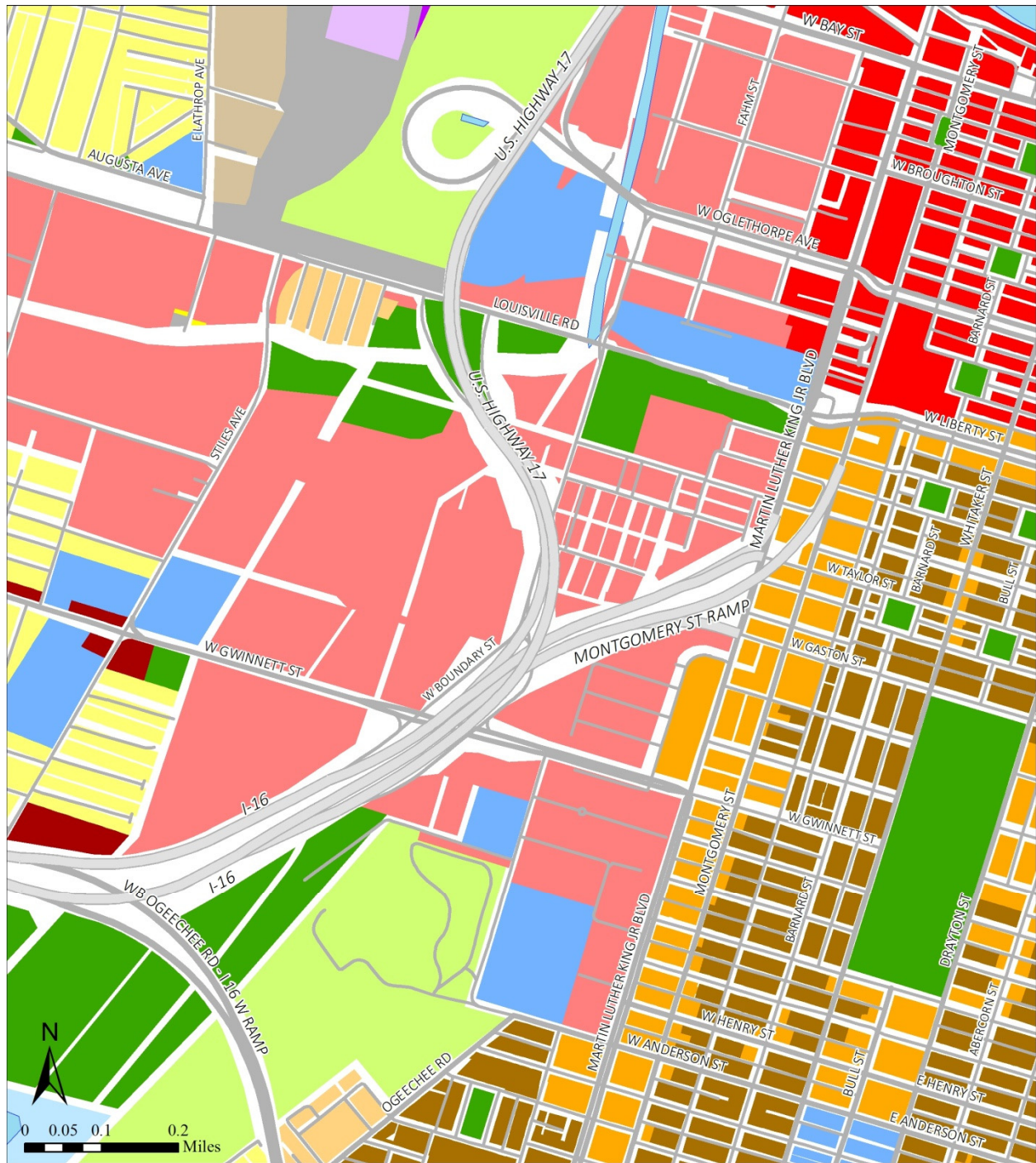
<sup>2</sup>Curl, Eric. “Cultural Arts Center Design Unveiled.” Savannah Now. 1 April 2014.

<http://savannahnow.com/news/2014-04-01/cultural-arts-center-design-unveiled#.U9FrqPldWQE>

<sup>3</sup> City of Savannah Website. “Why do we need a new arena?” <http://www.savannahga.gov/index.aspx?NID=1369>



Figure 3.3: Future Development Map in the Study Area



I-16 IMR FUTURE DEVELOPMENT MAP

Source: CORE-MPO

- |                          |                            |  |
|--------------------------|----------------------------|--|
| Commercial- Neighborhood | Industry- Light            | Civic/Institutional                    |
| Commercial- Suburban     | Industry- Heavy            | Traditional Commercial                 |
| Conservation             | Parks/Recreation           | Traditional Neighborhood               |
| Downtown                 | Residential- General       | Transportation/Communication/Utilities |
| Downtown- Expansion      | Residential- Single Family | Water                                  |

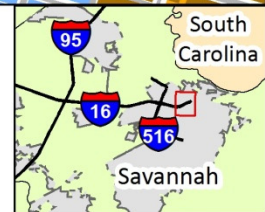
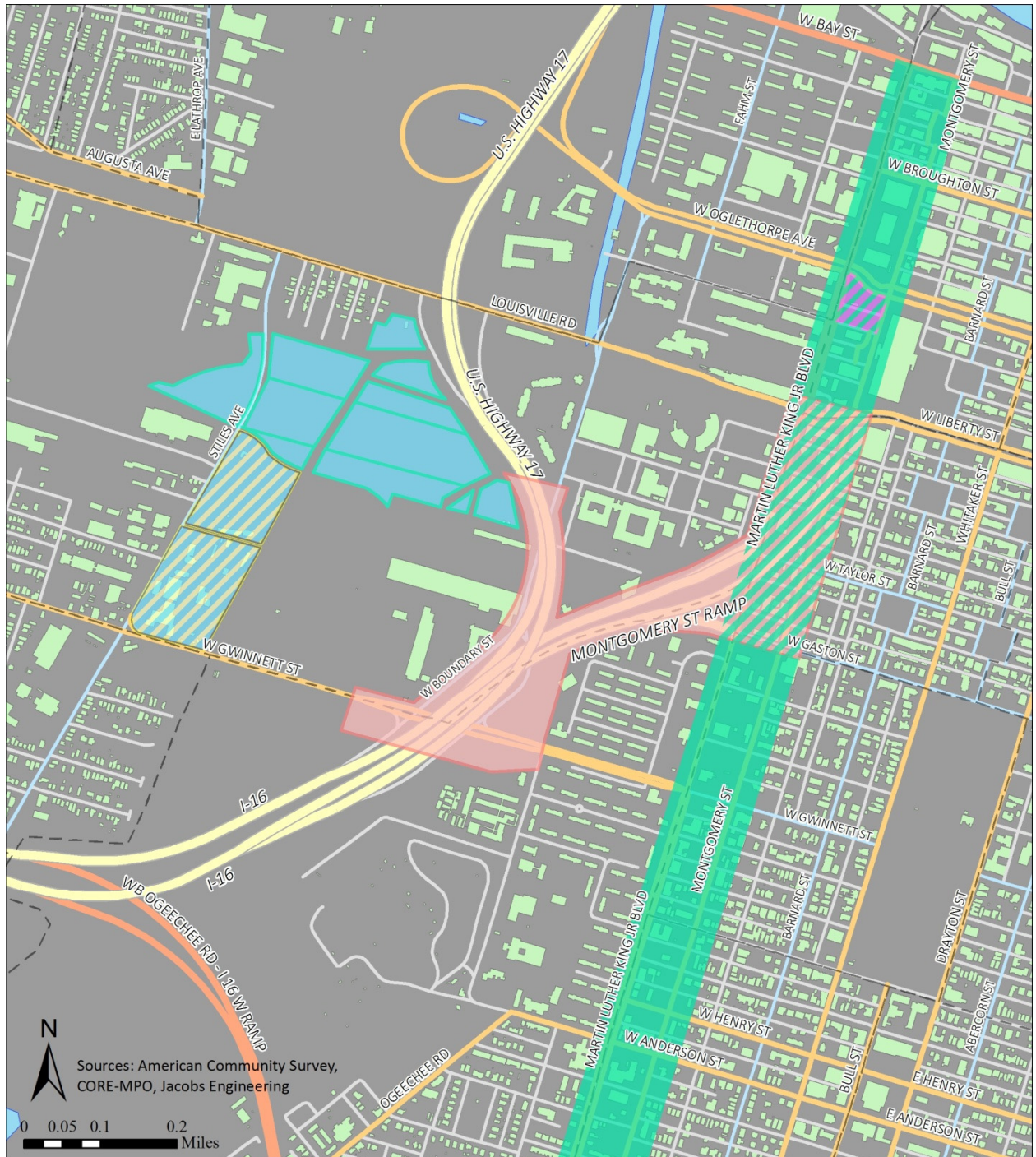
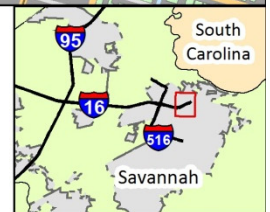


Figure 3.4: Planned and Programmed Projects in the Study Area



**I-16 IMR PLANNED AND PROGRAMMED PROJECTS**

- |                      |              |                      |                           |
|----------------------|--------------|----------------------|---------------------------|
| Interstate / Freeway | Buildings    | <b>Project Areas</b> | Canal District            |
| Major Arterial       | Water        | Cultural Arts Center | SDRA / Broad Street       |
| Minor Arterial       | Block Groups | Arena                | SDRA Priority Corridor    |
| Collector            |              |                      | Reclaiming Old West Broad |
| Unclassified         |              |                      |                           |





## 4 Description of Alternatives

Several alternatives were considered within the context of the previously completed *Reclaiming Old West Broad Street* Civic Master Plan. (This Civic Master Plan was a part of the ROWBS study as adopted by the City of Savannah in 2012.) The publicly supported Civic Master Plan was refined based on further analysis in support of this IMR and two build options were developed. Concept schematics can be found in Appendix E.

### 4.1 No Build Alternative

For the purposes of comparison, the No Build Alternative represents the future scenario if no action is taken to remove the I-16 terminal interchange. It assumes that the terminal ramps, as well as access at the points to the north and south, will remain as-is. This alternative is not recommended because it does not meet the need of the project in restoring community cohesion, economic development, or improving safety.

### 4.2 Build Alternatives

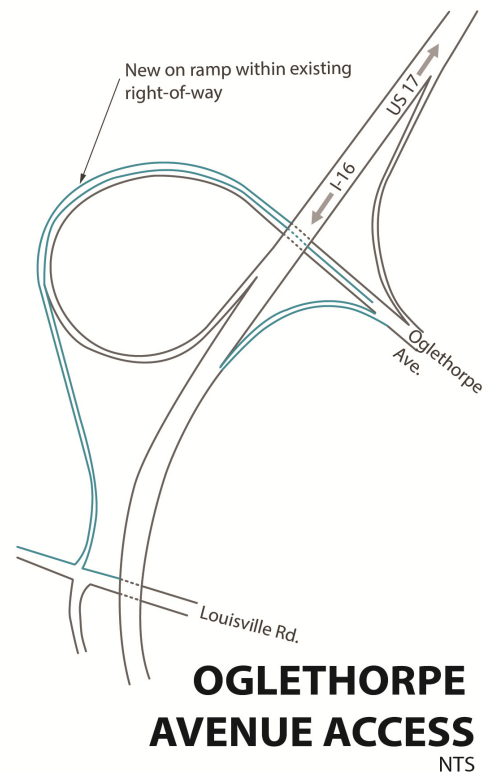
Two Build Options were considered. Under Build Option 1, modified access to the interstate was retained. Under Build Option 2, access to the interstate was removed. Both Build Options include improvements at the Oglethorpe Avenue interchange.

#### 4.2.1 Oglethorpe Avenue Interchange Build Alternative Improvements

Both Build Option 1 and 2 include additional access to the US 17/I-16 facility at Oglethorpe Avenue. The interchange at this location currently allows northbound traffic to enter and southbound traffic to exit at Oglethorpe Avenue. Under the Build Alternatives, northbound traffic would be allowed to exit via a new ramp to Oglethorpe Avenue, and southbound traffic would be aided in accessing the existing ramp at Louisville Road via a new one-way, one-lane ramp facility that would curve around the existing interchange to the west. Proposed improvements are presented in **Figure 4.1**.

Build Option improvements to the Oglethorpe Avenue Interchange were arrived at through the comparison of future traffic under various ramp-removal scenarios. Under these scenarios, additional access to US-17/I-16 within the study area was needed to avoid overburdening Louisville Road, which is the location to the north for northbound traffic to exit from I-16. Louisville Road is currently a two-lane facility and is insufficient to carry the projected traffic volumes that would likely result from ramp removal without other improvements. This facility cannot be widened to meet potential future Build travel demand, because it is heavily constrained by the presence of historic resources. Therefore, it was determined that additional access at Oglethorpe Avenue would be more appropriate to the need and purpose of the I-16 terminal ramp removal. In addition, the improvements at Oglethorpe Avenue ensure that there is adequate access to US 17/I-16 within the study area for both automobile and truck traffic.

**Figure 4.1: Proposed Build Oglethorpe Avenue Interchange Improvements**





#### **4.2.2 Build Option 1**

In addition to the improved access to the US 17/I-16 facility at Oglethorpe Avenue described above, Build Option 1 includes:

- Removal of the I-16 terminal ramps
- Modified access to I-16 in the vicinity of the existing terminal ramps
- A new local street network (**Figure 4.2**)

Lane configurations proposed under Build Option 1 are presented in **Figure 4.3**.

#### **I-16 Access in the Vicinity of Existing Terminal Ramps**

Build Option 1 would remove the existing terminal ramps to MLK, Jr. Boulevard and Montgomery Street. This option would, however, retain access to I-16 in the vicinity of the existing ramps with access to and from I-16 at Cohen Street. The new ramps would be approximately 0.28 miles from the Gwinnett Street ramps, and 0.35 miles from the Louisville Road ramps.

#### **Gwinnett Street Access**

Build Option 1 would alter the existing I-16 exit at Gwinnett Street, which is the interchange immediately south of the terminal ramps. Under its current configuration, the northbound approach (exiting from I-16 to Gwinnett Street) has an exclusive left turn lane and a through lane at this exit. The through lane places traffic northbound on East Boundary Street. Under Build Option 1, East Boundary Street would be reconstructed to the east of its existing location, and the exit would be reconstructed as one left turn lane and two right turn lanes. To the east, the median on the Gwinnett Street eastbound approach at the MLK, Jr. Boulevard at Gwinnett Street intersection would be removed and the eastbound approach (from Gwinnett Street to MLK, Jr. Boulevard reconstructed with two exclusive left turn lanes and one shared through/right turn lane.

#### **Local Street Network**

Build Option 1 includes the construction of a local street network in the current location of the I-16 terminal ramps. This local street network would extend from West Boundary Street to Montgomery Street and from Gaston Street to Charlton Street. Montgomery Street would be reconfigured as a two-way facility. East Boundary Street would be reconstructed in a new alignment to the east of its existing location, where it would connect to May Street at Gwinnett Street to the south.

The following new roadways would be constructed from Montgomery Street to MLK, Jr. Boulevard:

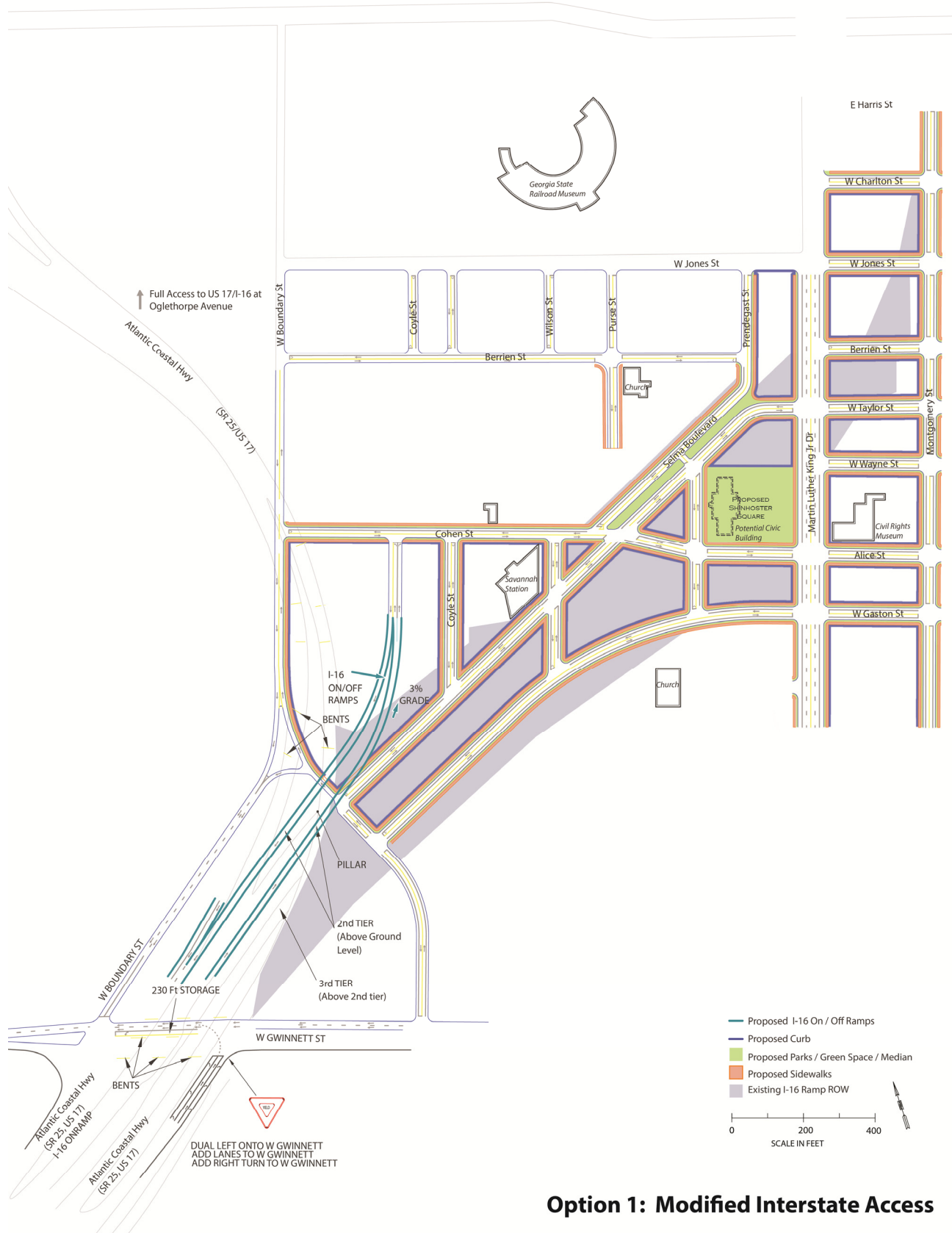
- Charlton Street
- Jones Street
- Berrien Street

The following roads would be extended west from MLK Jr. Boulevard:

- Taylor Street would be extended to the west to just south of Predegast Street/Selma Street. At that point, it would be extended southwest (parallel to Selma Street) to the proposed relocation of Boundary Street.
- Gaston Street would be extended in a curve southwest to the proposed relocation of Boundary Street.
- Alice Street would extend to connect to the existing Cohen Street at the proposed extension of Taylor Street.

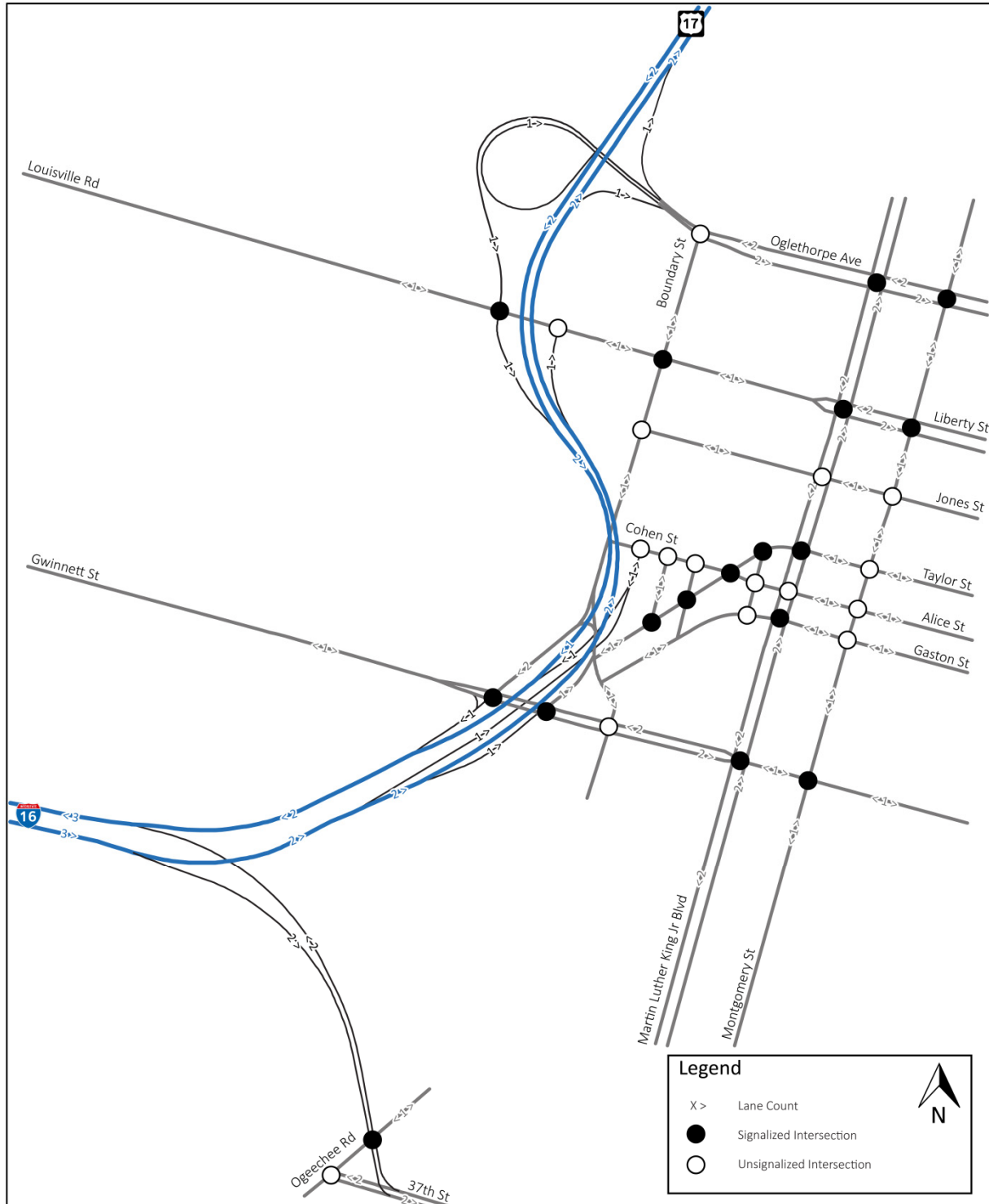


Figure 4.2: Build Option 1



Option 1: Modified Interstate Access

Figure 4.3: Proposed Lane Configurations for Build Option 1



I-16 Savannah Interchange Modification Report Build Option 1 (2025) Lane Configuration



The following north-south roads would be constructed with their northern terminus at Cohen Street, parallel to the proposed I-16 ramps:

- Coyle Street from Taylor Street to Cohen Street
- Unnamed facility from Gaston Street to Cohen Street
- Unnamed facility from Gaston Street to Taylor Street

Roadways would be reconstructed to GDOT standards as required.

#### **4.2.3 Build Option 2**

Build Option 2 would not offer access to I-16 in the vicinity of the existing terminal ramps. In addition to the improvements to the Oglethorpe Avenue interchange described above, Build Option 2 includes:

- Removal of the I-16 terminal ramps
- A new local street network (**Figure 4.4**)

Lane configurations proposed under Build Option 2 are presented in **Figure 4.5**.

#### **Gwinnett Street Access**

Build Option 2 would slightly alter the existing access to I-16 at Gwinnett Street, south of the terminal ramps. Under its current configuration, there is a left turn lane and a through lane at this exit. Under Build Option 2, the exit would be reconstructed as one exclusive left turn lane, one through/right turn lane and one new exclusive right turn lane. The median on the Gwinnett Street eastbound approach at MLK, Jr. Boulevard would be removed and the eastbound approach at this intersection (from Gwinnett Street to MLK, Jr Boulevard) reconstructed with two exclusive left turn lanes and one straight/right turn lane.

#### **Local Street Network**

Build Option 2 includes the construction of a local street network in the absence of the I-16 terminal ramps. This local street network would extend from West Boundary Street to Montgomery Street and from Gwinnett Street to Charlton Street.

Montgomery Street would be reconfigured as a two-way facility. East Boundary Street would retain its original location; in addition, a new extension of East Boundary Street would be constructed in a new alignment to the east of its existing location, where it would connect to May Street at Gwinnett Street in the south.

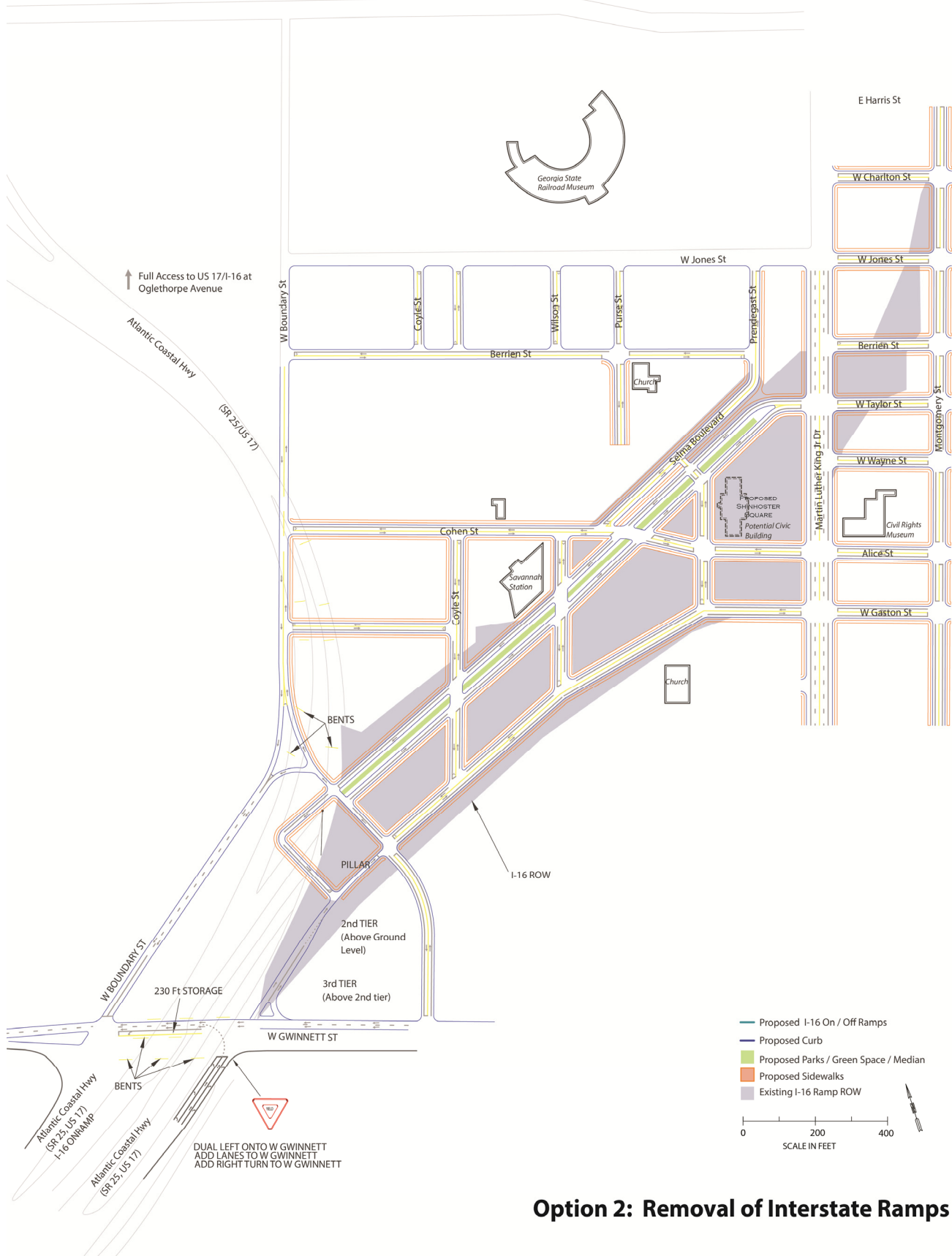
The following new roadways would be constructed from Montgomery Street to MLK, Jr. Boulevard:

- Charleton Street
- Jones Street
- Berrien Street

The following roads would be extended west from MLK, Jr. Boulevard:

- Taylor Street would be extended west to just south of Prendegast Street/Selma Street. At that point, it would be extended southwest (parallel to Selma Boulevard) to meet Gaston Street in a square south of East Boundary Street.
- Gaston Street would be extended in southwest past the new extension of East Boundary Street to the existing alignment of East Boundary Street, which it would follow to Gwinnett Street.
- Alice Street would extend to connect to the existing Cohen Street at the proposed extension of Taylor Street.

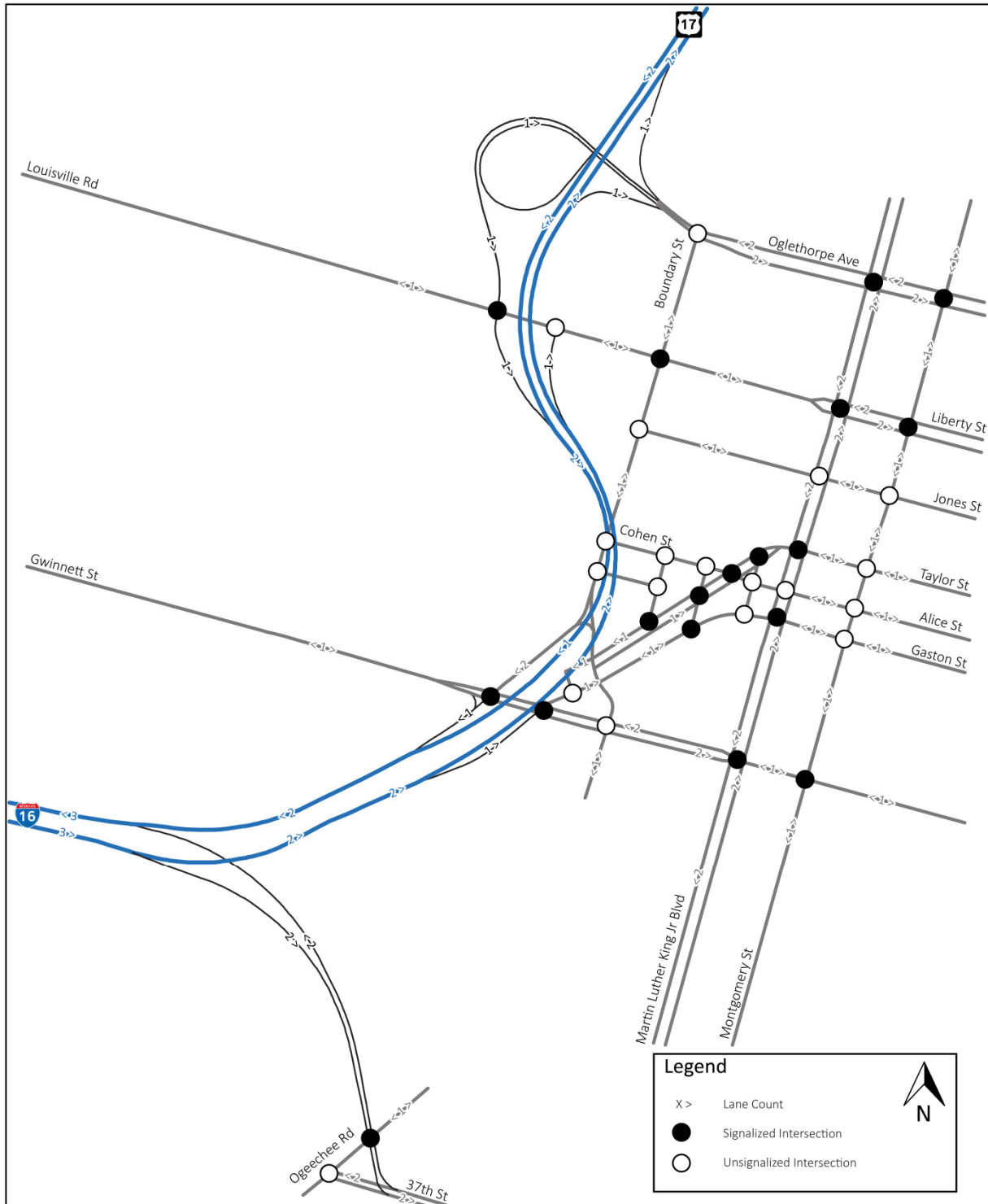
Figure 4.4: Build Option 2



Option 2: Removal of Interstate Ramps



Figure 4.5: Proposed Lane Configurations for Build Option 2



I-16 Savannah Interchange Modification Report

Build Option 2 (2025) Annual Average Daily Traffic (AADT)



## I-16 Interchange Modification Report

The following north-south roads would be constructed with their northern terminus at Cohen Street, parallel to the proposed I-16 ramps:

- Coyle Street from Taylor Street to Cohen Street
- Unnamed facility from Gaston Street to Cohen Street
- Unnamed facility from Gaston Street to Taylor Street

Roadways would be reconstructed to GDOT standard as required.

### 4.3 Cost Estimates

Planning-level cost estimates were prepared for the Build Alternatives in coordination with GDOT (Table 4.1).

**Table 4.1: Preliminary Cost Estimates**

Costs	No Build	Build Option 1	Build Option 2
Ramp Removal and Local Street Network	---	\$44.7m	\$41.7m
Oglethorpe Avenue Interchange	---	\$24.6m	\$24.6m
US 17 at Gwinnett Street	--	\$1m	\$1m
Total	N/A	\$70.3	\$67.3m

*Source: Jacobs and GDOT*

#### No Build Alternative

The No Build Alternative has no constructed components and does not have an estimated cost for construction.

#### Build Option 1

Build Option 1 is projected to cost approximately \$70.3 million in 2015 dollars. This cost includes \$44.7 million for ramp removal and construction of a local street network, \$24.6 million for improvements to the Oglethorpe Avenue interchange, and \$1 million for improvements to the Gwinnett Street interchange. The slightly higher cost estimated for Build Option 1 than Build Option 2 results from the construction of the ramps to Cohen Street.

#### Build Option 2

Build Option 2 is projected to cost approximately \$67.3 million in 2015 dollars. This cost includes \$41.7 million for ramp removal and construction of a local street network, \$24.6 million for improvements to the Oglethorpe Avenue interchange, and \$1 million for improvements to the Gwinnett Street interchange.



## 5 Environmental Screening

An environmental screening was conducted within the project study area. The screening is an initial review of environmental resources to identify areas of potential concern leading into the next phase of project development which would be a National Environmental Policy Act (NEPA) document. The study area was used as the screening boundary and the screening was conducted by desktop using readily available data. This environmental screening does not fulfill the requirements for final approval by FHWA. Final approval of this IMR will be completed after completion of the NEPA process. The following sections summarize the findings and a separate *Environmental Screening Technical Memorandum* is provided in Appendix D.

### 5.1 Cultural Resources (Historic and Archeological)

A desktop analysis for cultural resources, which includes historic resources and archeological sites, was conducted using data from the Site Files of the State Historic Preservation Office (SHPO). Known historic resources and archeological sites identified in previous studies recorded with the SHPO exist within the study area. Few of these sites are in the immediate vicinity of the project. During the next phase of study, a detailed analysis of cultural resources would be conducted during the environmental review. Historic resources are mapped in **Figure 5.1**, and the results of the environmental screening are in Appendix D.

### 5.2 Wetlands and Streams

The identification of wetlands is completed using methodologies outlined in the 1987 US Corps of Engineers Wetlands Delineation Manual and the Regional Supplement Delineation Manual: Atlantic and Gulf Coastal Plain Region. Evaluation of a habitat to determine if it meets the criteria defining a jurisdictional wetland takes into account the presence of hydrophytic vegetation, hydric soils, and wetland hydrology.

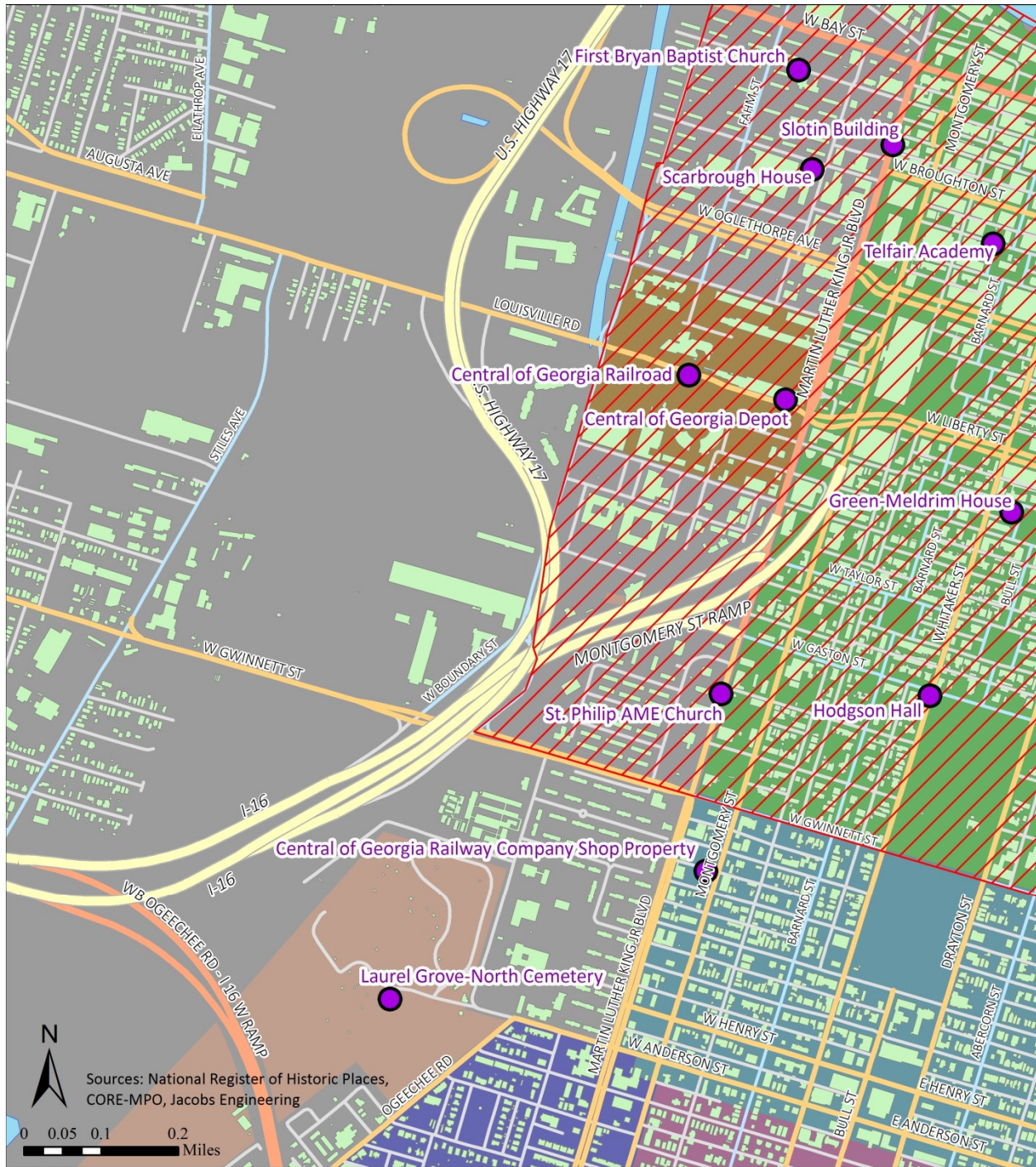
According to data retrieved from the US Fish and Wildlife (USFWS) National Wetland Inventory (NWI) and a preliminary field investigation, wetlands are present in the study area from the I-16 Oglethorpe Avenue ramps to the I-16 Ogeechee Road split, primarily to the west of the transportation facility. Wetlands have not been identified in the immediate vicinity of the I-16 Montgomery Street ramps. A summary of the wetland systems present within the study area is presented in **Table 5.1**.

**Table 5.1: Wetland Systems Present in Study Area**

Wetland System	Cowardin Classifications	Total Acres
Estuarine Subtidal	E1UBL	6.85
Palustrine Emergent	PEM1B	2.59
	PEM1F	1.63
Palustrine Scrub Shrub	PSS1Ad	4.34
	PSS1C	3.99
Palustrine Forested	PFO1Ad	19.57
	PFO1C	7.03
	PFO1A	14.33
	PFO1/4A	25.02
	PFO1/4C	4.05
Open Water	PUBHx	2.37

Source: National Wetland Inventory 2015

Figure 5.1: Historic Resources



I-16 IMR HISTORIC RESOURCES

- |                      |                                 |   |
|----------------------|---------------------------------|---|
| Interstate / Freeway | Buildings                       | Central of Georgia Savannah Landmark District |
| Major Arterial       | Water                           | Cuyler-Brownville                             |
| Minor Arterial       | Historic Cemeteries             | Savannah National Historic Landmark District' |
| Collector            | Downtown Savannah Historic Area | Savannah Victorian District                   |
| Unclassified         | Historic Places                 | Thomas Square-Trolley Historic District       |







Prior to construction, a survey of the project area would be required and all wetlands shall be delineated with a GPS device that is capable of sub-meter accuracy. Surveys may identify additional jurisdictional features that are not accounted for in the USFWS NWI. Section 404 permitting with the USACE will be required if wetlands or other jurisdictional waters are impacted as a result of fill, culverting, or dredging activities.

### 5.3 Protected Species

Under the terms of Section 7 of the Endangered Species Act of 1973 (ESA), federal agencies shall “ensure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary to be critical...” Furthermore, the USACE requires protected species surveys for project sites that require a permit under Section 404 of the Clean Water Act.

An office review of available resources was performed to develop a list of federal and state listed species that are known to occur in Chatham County, Georgia. A tentative list of protected species was compiled by review of the USFWS Information, Planning, and Conservation (IPaC) database, and a review of the Georgia Department of Natural Resources-Nongame Conservation Section (GDNR) Element Occurrence by County website database for Chatham County.

Per the review of available databases, 17 federally listed species are known to occur in Chatham County, Georgia. Please refer to **Table 5.2** for a summary of protected species for Chatham County, Georgia. A brief discussion of the natural history for each species is included at the end of this section and was researched using the NatureServe Explorer database and GDNR rare species profiles.

**Table 5.2: Threatened and Endangered Species of Potential Occurrence within the Study Area**

Common Name	Scientific Name	Federal Status	State Status
<i>Amphibians</i>			
Frosted flatwoods salamander	<i>Ambystoma cingulatum</i>	T	T
Striped newt	<i>Notophthalmus perstriatus</i>	C	T
<i>Birds</i>			
Piping plover	<i>Charadrius melodus</i>	T	T
Red knot	<i>Calidris cantus rufa</i>	T	R
Red-cockaded woodpecker	<i>Picooides borealis</i>	E	E
Wood stork	<i>Mycteria Americana</i>	T	E
<i>Fish</i>			
Atlantic sturgeon	<i>Acipenser oxyrinchus oxyrinchus</i>	E	E
Shortnose sturgeon	<i>Acipenser brevirostrum</i>	E	E
<i>Plants</i>			
Pondberry	<i>Lindera melissifolia</i>	E	E
<i>Mammals</i>			
North Atlantic right whale	<i>Eubalaena glacialis</i>	E	E
West Indian manatee	<i>Trichechus manatus</i>	E	E
<i>Reptiles</i>			
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Gopher tortoise	<i>Gopherus polyphemus</i>	C	T
Green sea turtle	<i>Chelonia mydas</i>	T	T
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	E
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E
Loggerhead sea turtle	<i>Caretta caretta</i>	T	E

Protection status is as follows: E – Endangered; T – Threatened; C – Federal Candidate; R – Rare.

Source: USFWS IPaC database, GDNR Element Occurrence by County website database

A survey of the project area for protected species and their suitable habitat would be required prior to the construction of the I-16 Interchange Modification. If federally protected species or their suitable habitat is identified during field surveys, Section 7 coordination with the USFWS would be required.



## 5.4 Hazardous Materials Facilities

In the study area, six sites have been identified at which hazardous materials are present. At one of these locations, there are fuel storage tanks, and the other five are brownfields at which hazardous materials from previous or ongoing uses are believed to be present. These areas must be taken into consideration in the development of improvements to the street network, as there may be limitations to the degree to which these sites may be disturbed. Hazardous materials facilities in the study area are presented in **Table 5.3**. A search of the US Environmental Protection Agency records revealed that there are no superfund sites (CERCLA) in the study area.

**Table 5.3: Hazardous Materials Facilities in the Study Area**

ID	Facility	Address	ZIP	Type
1	Greyhound Lines, Inc. #410861	610 Oglethorpe Avenue	31401	Hazardous Materials Site
2	Savannah (Bull Street)	1315 Bull Street	31402	Hazardous Materials Site
3	FreshPoint - Southern Georgia	313 Stiles Avenue	31415	Hazardous Materials Site
4	BellSouth - R2233	1300 Bull Street	31401	Hazardous Materials Site
5	Chatham Steel Corp	501 W Boundary Street	31401	Hazardous Materials Site
6	Savannah City Lot	110 W Gwinnett Street	31415	Fuel Storage

*Source: US Environmental Protection Agency*

## 5.5 Community Impacts

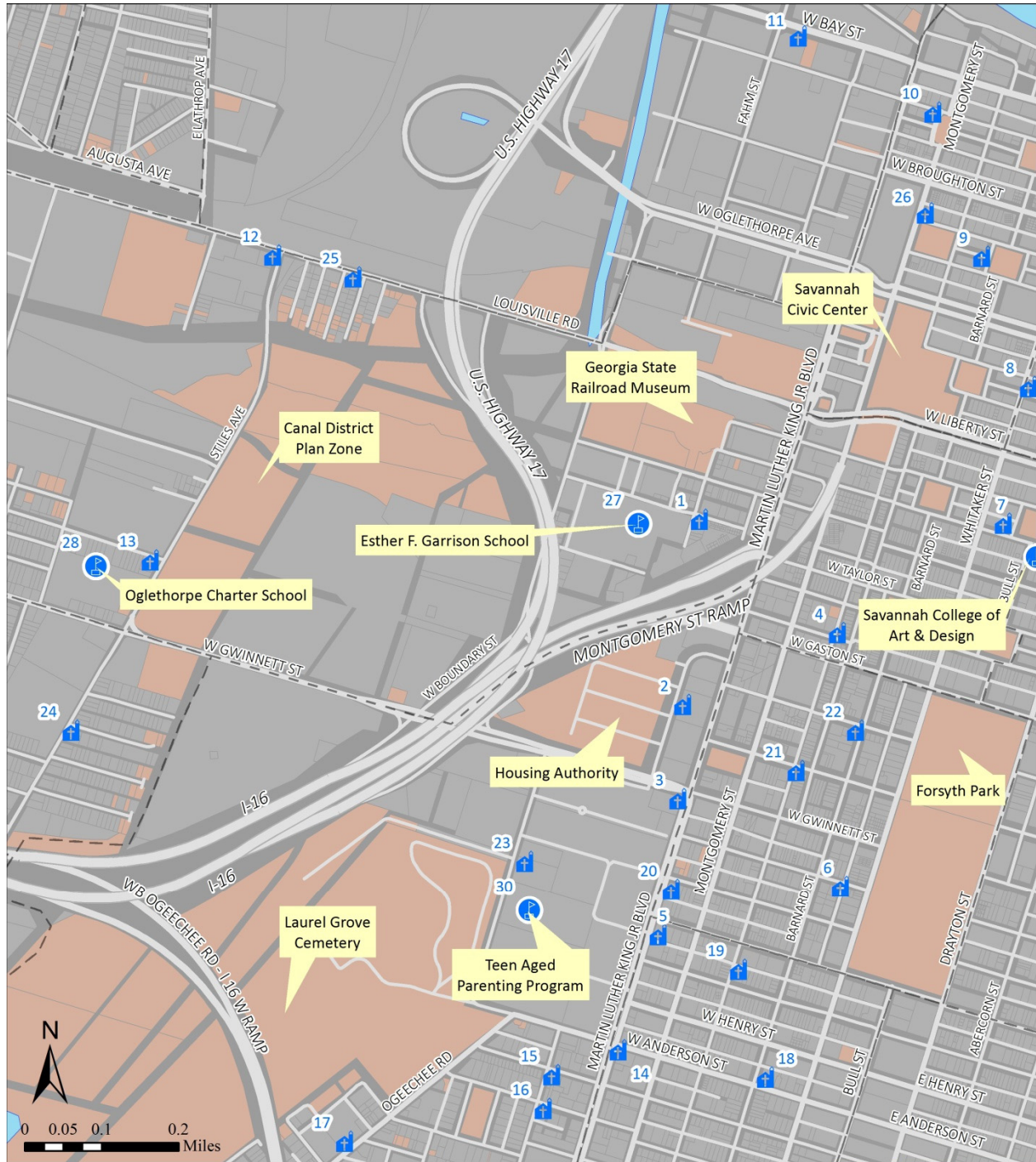
An assessment of community facilities was conducted and 26 churches and 4 schools were identified within the study area. The proposed project would restore neighborhoods that were divided by the Interstate ramps. Access to community facilities is anticipated to improve with the modifications to the interchange. It is not anticipated that the proposed improvements would adversely affect any of the community facilities. Community facilities are mapped in **Figure 5.2**.

## 5.6 Environmental Justice

As described in Section 2.5.1, the study area is an Environmental Justice community and residents are predominantly minority and largely low income. However, this project is intended to benefit the community and restore connectivity and business opportunities. The area is historically an African American community and is served by the Savannah Housing Authority with public housing located along Gwinnett Street to the south of the existing terminal ramps. The construction of the ramps in the 1960s had an adverse impact on a thriving African American community, and has limited redevelopment and growth in the area. The ramps' removal, therefore, is intended to restore community cohesion and provide opportunities for redevelopment and improved connectivity within the community and to downtown. At the time of the construction of the terminal ramps, protective legislation such as the National Environmental Policy Act of 1969 and the Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994) were not in place and therefore these adverse effects were not considered.

This study has regularly and diligently coordinated with the Savannah Housing Authority, which is a major stakeholder and property-owner in the study area. Furthermore, public outreach has confirmed the support of the community. The City of Savannah is establishing a Community Opportunity Zone, a designation that provides for employment incentives intended to spur revitalization, to support redevelopment in the study area in the event of the ramp's removal.

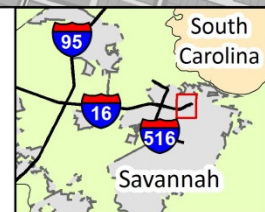
Figure 5.2: Community Facilities



I-16 IMR COMMUNITY FACILITIES

Sources: SAGIS, CORE-MPO, Jacobs Engineering

- Places of Worship
- Schools
- Civic Properties
- Water





## **5.7 Potential for Effect**

### **5.7.1 Build Option 1**

Build Option 1 is projected to result in minimal environmental impacts. Under Build Option 1, there is the potential for impacts to species habitat located in the floodplains that lie to the west of I-16 in the study area. Build Option 1, however, would also restore neighborhoods that were divided by the Interstate ramps and improve access to community facilities.

### **5.7.2 Build Option 2**

Build Option 2 is projected to result in minimal environmental impacts. Under Build Option 2, there is the potential for impacts to species habitat located in the floodplains that lie to the west of I-16 in the study area. Build Option 1, however, would also restore neighborhoods that were divided by the Interstate ramps and improve access to community facilities.

### **5.7.3 No Build Alternative**

No direct environmental impacts are anticipated to result from the No Build alternative. However, the Build Alternative would not restore neighborhoods that were divided by the Interstate ramps, nor would it improve access to community facilities in its vicinity.

## **5.8 Environmental Next Steps**

As the proposed project moves from the planning into the environmental phase, several next steps should occur. The proposed project will be subject to the NEPA due to the likely use of federal funds and because the modification would occur on an Interstate facility which is within FHWA oversight. An Environmental Assessment (EA) would likely be required if the entire project moves forward. The EA would determine whether or not the proposed action was resulting in significant impacts on its surrounding natural, cultural, and social environments. If the project can be phased into smaller projects with independent utility (standalone projects that need no other project to be successful or does not force future improvements), those smaller projects may be eligible to utilize a Categorical Exclusion, smaller level of NEPA documentation, or may be able to be approved through a series of smaller EAs. Consideration to the appropriate level of NEPA documentation should be discussed with GDOT's Office of Environmental Services and FHWA prior to programming the project into the Transportation Improvement Program (TIP).

The environmental process needs to be completed for final approval of this Interchange Modification Report by FHWA.



## 6 Traffic Operations Analysis

A traffic operations analysis was completed for the proposed improvements as compared to the No Build scenario. The analysis was completed for an opening year of 2025 and a design year of 2045. Details related to the technical outputs from the operations analysis are in Appendix C.

### 6.1 Build Traffic Analysis

Operational analysis was performed for the No Build and Build alternatives using the projected traffic volumes deemed reasonable as reviewed by GDOT. This analysis was used to assess the function of the build alternatives for the Interstate and the major local roads as influenced by the proposed modifications. Future development in the area was considered based on the type of development identified in the Civic Master Plan, and the impact to the local street network is contained within the analysis. The intensity and type of development assumed was based on the Economic Analysis of the Civic Master Plan in Section 6 of the *I-16 Ramp Removal Project: Reclaiming Old West Broad Street* (2012). The City of Savannah requires traffic studies for new developments, and impacts to traffic will be further refined and mitigated as new development emerges.

#### 6.1.1 Build Volumes

Projected daily 2025 traffic volumes (AADT) for Build Option 1 are presented in **Figure 6.1** and for Build Option 2 in **Figure 6.2**. Projected daily 2045 volumes for Build Option 1 (AADT) are presented in **Figure 6.3** and for Build Option 2 in **Figure 6.4**. Peak hour traffic flow diagrams are included in for both Build options in Appendix C.

#### 6.1.2 Segment LOS

The freeway basic segments within the study area were analyzed using the approved peak hour traffic projections. Basic freeway segments can be defined as a portion of an uninterrupted flow facility that is experiencing stable flow without any influence due to ramp merge or diverge operations. Traffic conditions for the basic uninterrupted flow segments on I-16 and US 17 were analyzed for current and future operations using the VISSIM microsimulation software, and the methodology outlined in the 2010 Highway Capacity Manual. The VISSIM model simulates traffic operations based on driver characteristics, vehicle characteristics, roadway geometry, and traffic control systems. Individual vehicles are simulated traveling through the network responding to the actions of other vehicles, the operating characteristics of the vehicle, the individual driver characteristics, the traffic control devices encountered along the routes, and the interactions with transit vehicles.

This model measures the detailed operational aspects of the existing and future proposed roadway networks. An analysis of existing and projected peak hour traffic conditions was performed to determine the LOS for each major freeway segment in the study area. As described in Section 2.5, LOS is expressed as letter grades from “A” to “F” with “A” being the best and “F” being the worst. Criteria are defined in the 2010 Highway Capacity Manual based on vehicular densities on the freeway segments (expressed in passenger cars per lane per mile). LOS F is generally considered unacceptable for most drivers. Level of Service for the No Build and Build alternatives for 2025 and 2045 AM peak hour is presented in **Table 6.1**, and for PM peak hour in **Table 6.2**.



Figure 6.1: Projected 2025 AADT for Build Option 1

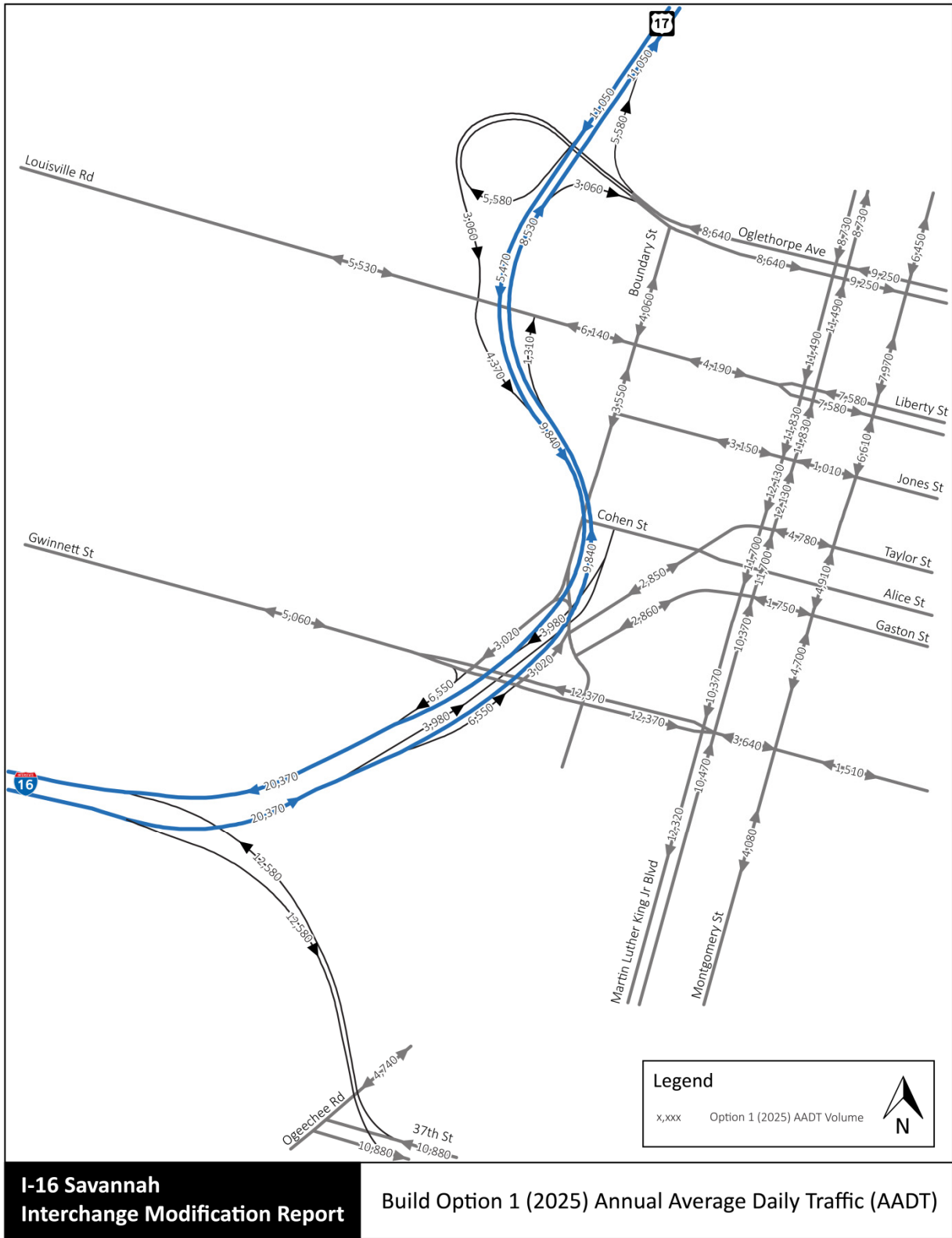




Figure 6.2: Projected 2025 AADT for Build Option 2

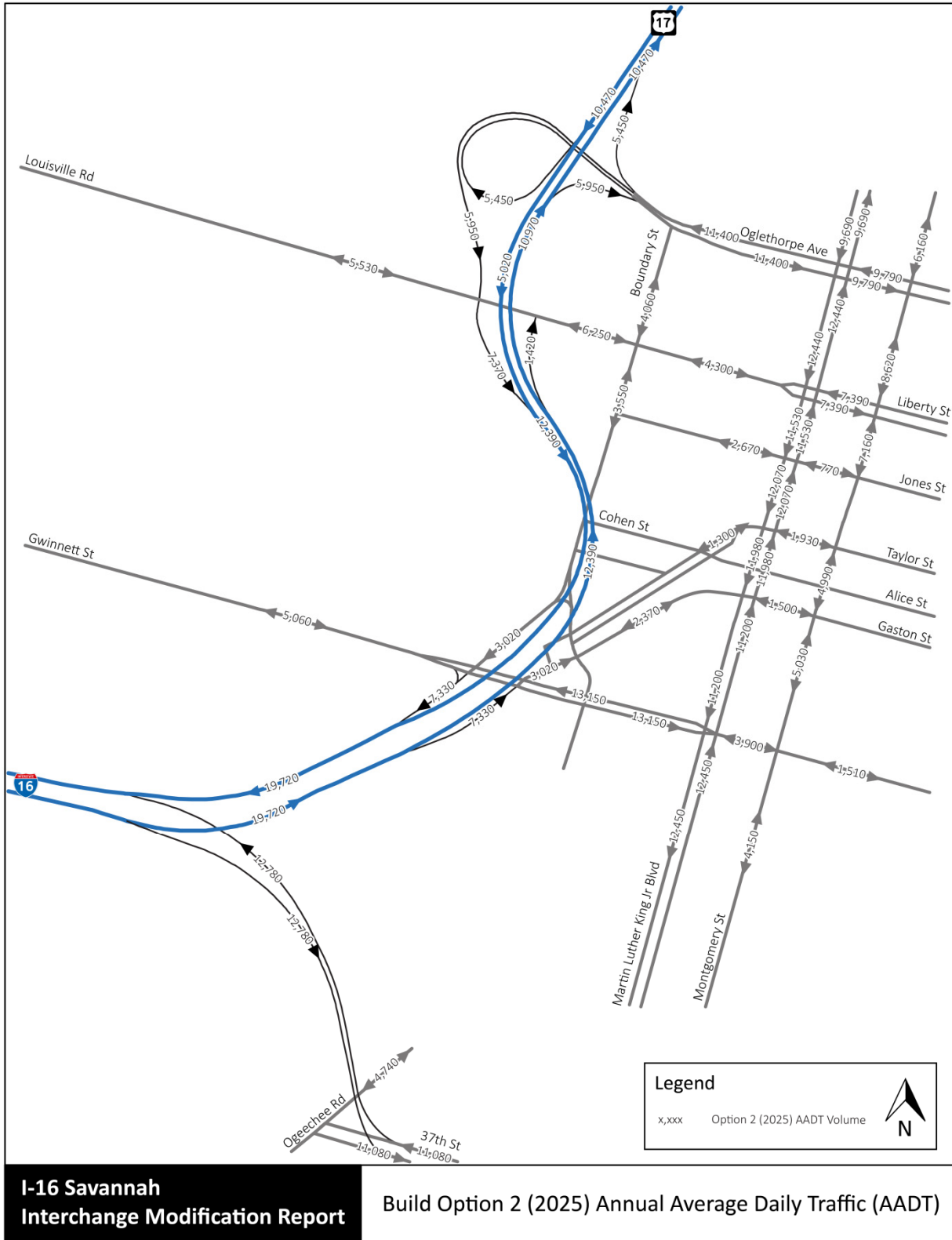


Figure 6.3: Projected 2045 AADT for Build Option 1

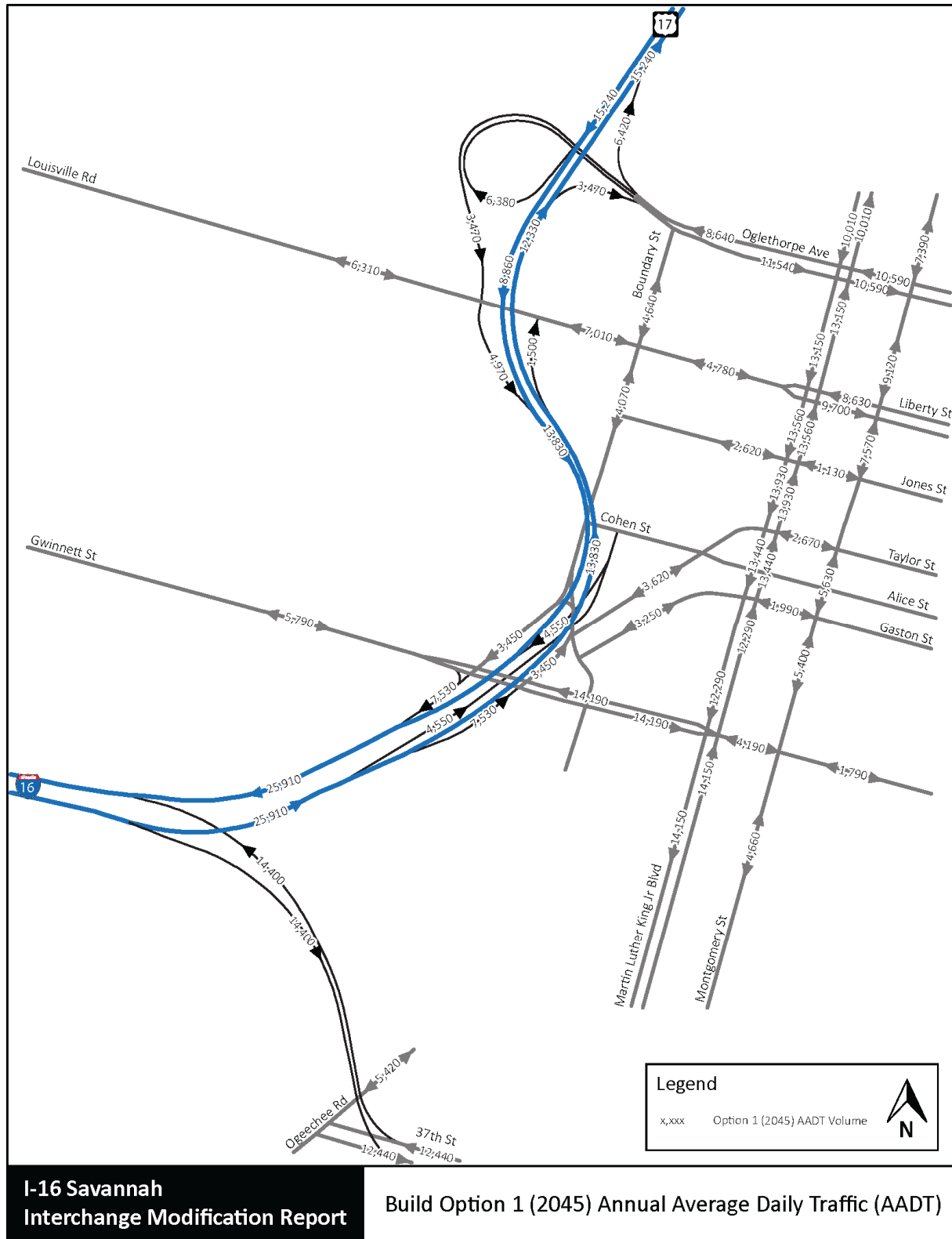
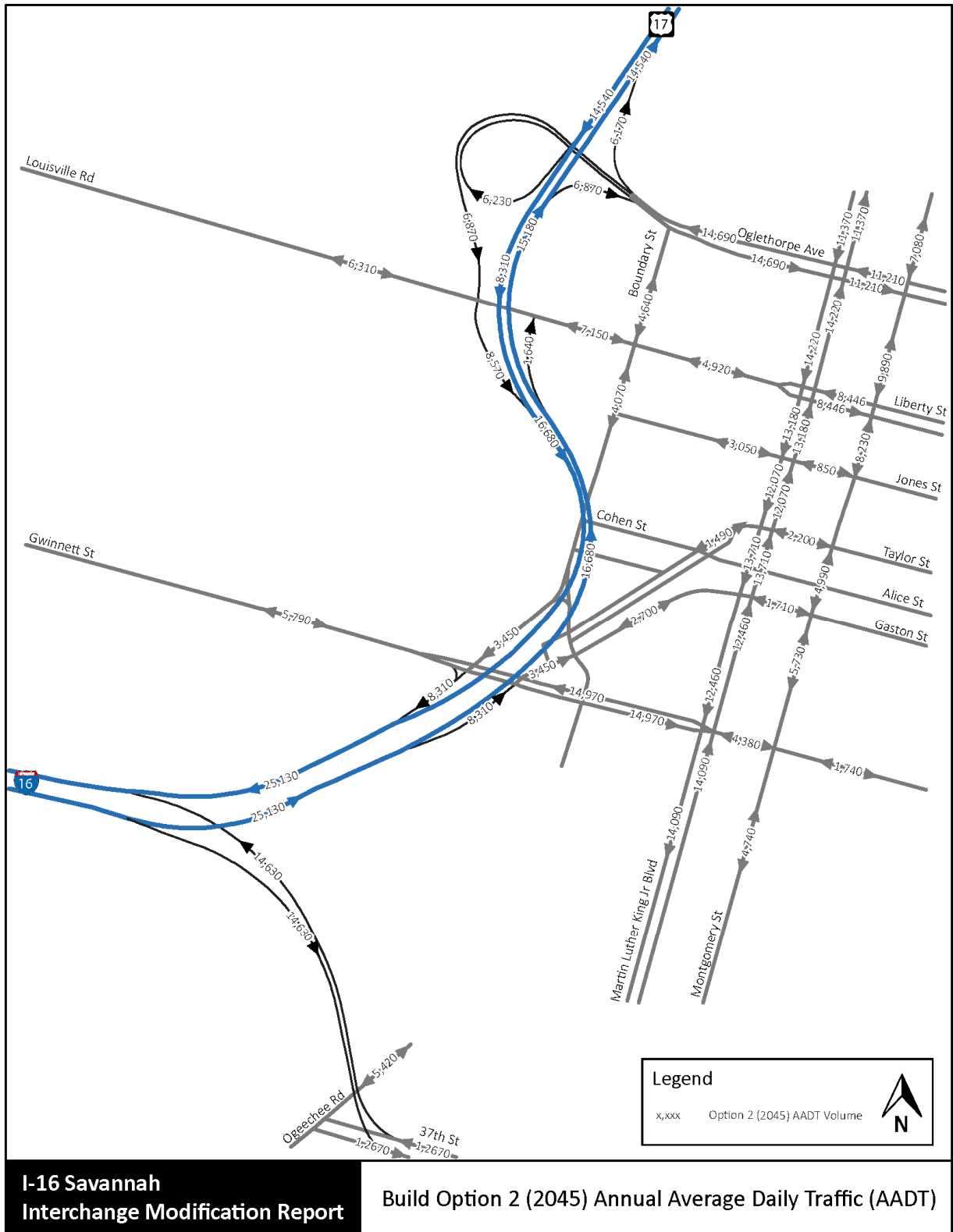




Figure 6.4: Projected 2045 AADT for Build Option 2





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**Table 6.1: AM Peak Hour Segment LOS for No Build and Proposed Improvement in 2025 and 2045**

		No Build			Build Option 1			Build Option 2		
<b>2025</b>										
Location	Dir.	Vol.	Density	LOS	Vol.	Density	LOS	Vol.	Density	LOS
I-16 to Montgomery St	EB	900	13.2	B	-	-	-	-	-	-
I-16 to Cohen St	EB	-	-	-	305	5.2	A	-	-	-
I-16 west of Gwinnett St	EB	1,760	34.6	D	1,710	33.6	D	1,655	32.5	D
US 17 between Gwinnett St and Louisville Rd	EB	550	8.2	A	760	11.4	B	935	14.0	B
US 17 between Louisville Rd and Oglethorpe Ave	NB	425	6.3	A	635	9.4	A	805	11.9	B
US 17 north of Oglethorpe Ave	NB	850	16.6	B	780	15.2	B	665	13.0	B
US 17 north of Oglethorpe Ave	SB	800	11.7	B	790	11.6	B	715	10.5	A
US 17 between Oglethorpe Ave and Louisville Rd	SB	290	4.4	A	265	4.0	A	200	3.0	A
I-16 from MLK, Jr. Blvd	WB	795	19.1	C	-	-	-	-	-	-
I-16 west of Gwinnett St	WB	1,305	19.6	C	1,270	19.1	C	1,230	18.5	C
<b>2045</b>										
I-16 to Montgomery St	EB	1030	15.0	B	-	-	-	-	-	-
I-16 to Cohen St	EB	-	-	-	350	5.3	A	-	-	-
I-16 west of Gwinnett St	EB	1,760	34.6	D	1,710	33.6	D	1,655	32.5	D
US 17 between Gwinnett St and Louisville Rd	EB	550	8.2	A	760	11.4	B	935	14.0	B
US 17 between Louisville Rd and Oglethorpe Ave	NB	425	6.3	A	635	9.4	A	805	11.9	B
US 17 north of Oglethorpe Ave	NB	850	16.6	B	780	15.2	B	665	13.0	B
US 17 north of Oglethorpe Ave	SB	800	11.7	B	790	11.6	B	715	10.5	A
US 17 between Oglethorpe Ave and Louisville Rd	SB	290	4.4	A	265	4.0	A	200	3.0	A
I-16 from MLK, Jr. Blvd	WB	795	19.1	C	-	-	-	-	-	-
I-16 west of Gwinnett St	WB	1,305	19.6	C	1,270	19.1	C	1,230	18.5	C



**Table 6.2: PM Peak Hour Segment LOS for No Build and Proposed Improvement in 2025 and 2045**

		No Build			Build Option 1			Build Option 2		
2025										
Location	Dir.	Vol.	Density	LOS	Vol.	Density	LOS	Vol.	Density	LOS
I-16 to Montgomery St	EB	815	11.9	B	-	-	-	-	-	-
I-16 to Cohen St	EB	-	-	-	275	4.7	A	-	-	-
I-16 west of Gwinnett St	EB	1,590	22.5	C	1,545	21.8	C	1,495	21.1	C
US 17 between Gwinnett St and Louisville Rd	EB	550	8.2	A	725	10.8	A	875	13.0	B
US 17 between Louisville Rd and Oglethorpe Ave	NB	510	7.6	A	685	10.3	A	830	12.4	B
US 17 north of Oglethorpe Ave	NB	1,150	23.4	C	980	20.0	C	770	15.7	B
US 17 north of Oglethorpe Ave	SB	1,000	14.6	B	930	13.6	B	765	11.2	B
US 17 between Oglethorpe Ave and Louisville Rd	SB	385	5.9	A	295	4.5	A	145	2.2	A
I-16 from MLK, Jr. Blvd	WB	1,095	18.4	C	-	-	-	-	-	-
I-16 west of Gwinnett St	WB	1,965	29.4	D	1,910	28.6	D	1,850	27.7	D
2045										
I-16 to Montgomery St	EB	930	13.4	B	-	-	-	-	-	-
I-16 to Cohen Street	EB	-	-	-	315	4.6	A	-	-	-
I-16 west of Gwinnett St	EB	2,100	29.9	D	2,050	29.2	D	1,985	28.3	D
US 17 between Gwinnett St and Louisville Rd	EB	910	13.7	B	1,110	16.7	B	1,280	19.2	C
US 17 between Louisville Rd and Oglethorpe Ave	NB	865	12.8	B	1,065	15.8	B	1,230	18.2	C
US 17 north of Oglethorpe Ave	NB	1,600	31.9	D	1,410	28.1	D	1,150	22.9	C
US 17 north of Oglethorpe Ave	SB	1,380	20.3	C	1,290	19.0	C	1,100	16.2	B
US 17 between Oglethorpe Ave and Louisville Rd	SB	675	10.2	A	560	8.4	A	400	6.0	A
I-16 from MLK, Jr. Blvd	WB	1,250	26.6	D	-	-	-	-	-	-
I-16 west of Gwinnett St	WB	2,475	37.1	E	2,415	36.2	E	2,340	35.0	E



### **6.1.3 Merge/Diverge LOS**

The freeway merge/diverge segments within the study area were analyzed using the approved peak hour traffic projections. Freeway merge and diverge segments can be defined as segments in which two or more traffic streams combine to form a single traffic stream (merge) or divide to form two or more traffic streams (diverge). As per the 2010 Highway Capacity Manual for ramps and ramp junction methodology, average volumes and speeds of lane 1 and lane 2 of the freeway are used to determine the density of the merge or diverge junction. For the merge junction, density is calculated using lanes 1 and 2 immediately downstream from the merge influence area and, for the diverge junction, lanes 1 and 2 immediately upstream of the diverge influence area. The maneuvers in traffic caused by lane changes as vehicles change lanes to merge or diverge in the traffic stream causes increased vehicular delay that can be expressed in terms of LOS. LOS for ramp merge and diverge segments is also expressing in terms of density. Traffic conditions for the merge and diverge segments on I-16 and US 17 were analyzed for current and future operations using the VISSIM microsimulation software, and the methodology outlined in the 2010 Highway Capacity Manual.

An analysis of existing and projected peak hour traffic conditions was performed to determine the LOS at the study merge and diverge locations. Merging and diverging segments are denoted in **Table 6.3** and **Table 6.4**.

### **6.1.4 Ramp LOS**

Traffic conditions for ramp terminal intersections in the area of influence were analyzed for current and future operations using Synchro 8.0 traffic simulation software. Synchro analyzes the traffic operations in regards to level of LOS, vehicle delay and queuing at these intersections. An analysis of existing and projected peak hour traffic conditions was performed to determine the LOS at the ramp terminal intersections.

The most widely used measure of effectiveness is the intersection LOS, which is based on the amount of average delay (seconds per vehicle) experienced by drivers as they travel through an intersection or along a roadway segment. The levels of service range from LOS A to LOS F. LOS “A” represents free-flow traffic conditions and LOS “F” represents extreme delays with stopped traffic conditions.

Peak hour ramp terminal intersection AM peak hour LOS in 2025 and 2045 is presented in **Table 6.5**. PM peak hour LOS is presented in **Table 6.6**. LOS for the flyover ramp from I-16 to Montgomery are shown under segment LOS.

### **6.1.5 Intersection LOS**

As with ramp terminal intersections, traffic conditions for the intersections on I-16 and US 17 were analyzed for current and future operations using Synchro 8.0 traffic simulation software. Synchro analyzes the traffic operations in regards to level of LOS, vehicle delay and queuing at the signalized and unsignalized intersections included in the study area.

Traffic on Louisville Road was restrained in the Synchro model. This was done to approximate driver choice under future scenarios that would reward the selection of other, improved routes in lieu of Louisville Road, which is prevented from widening or other improvements by proximate historic resources. Intersections on Louisville Road may operate at better LOS than expected for 2025 and 2045 as a result.

Intersection LOS for No Build and Build Alternative Options during AM peak hour for 2025 and 2045 is presented in **Table 6.7**, and PM peak hour LOS is presented in **Table 6.8**.



**Table 6.3: AM Peak Hour Merge/Diverge LOS for No Build and Proposed Improvement in 2025 and 2045**

	No Build				Build Option 1			Build Option 2		
<b>2025</b>										
Location	Dir.	Vol.	Density	LOS	Vol.	Density	LOS	Vol.	Density	LOS
I-16 Split at US 17	EB	1,760	37.3	E/F	1,710	36.2	E/F	1,655	35.0	E/F
US 17 off-ramp to Louisville Rd	NB	550	8.2	A	760	11.3	B	935	13.9	B
US 17 off-ramp to Oglethorpe Ave	NB	-	-	-	635	9.9	A	805	12.3	B
US 17 on-ramp from Oglethorpe Ave	NB	850	16.6	B	780	15.2	B	665	13.0	B
US 17 off-ramp to Oglethorpe Ave	SB	800	12.1	B	790	11.9	B	715	10.8	B
US 17 on-ramp from Louisville Rd	SB	335	5.0	A	555	8.3	A	735	10.9	B
I-16 on-ramp from Gwinnett St	WB	1,305	22.1	C	1,270	21.5	C	1,230	20.8	C
<b>2045</b>										
I-16 Split at US 17	EB	2,195	40.1	E/F	2,140	39.1	E/F	2,075	37.9	E/F
US 17 off-ramp to Louisville Rd	NB	815	12.4	B	1,050	15.9	B	1,260	19.1	B
US 17 off-ramp to Oglethorpe Ave	NB	-	-	-	905	13.5	B	1,110	16.5	B
US 17 on-ramp from Oglethorpe Ave	NB	1,170	22.2	C	1,085	20.6	C	945	17.9	B
US 17 off-ramp to Oglethorpe Ave	SB	1,100	16.6	B	1,095	16.5	B	1,005	15.1	B
US 17 on-ramp from Louisville Rd	SB	565	8.5	A	815	12.3	B	1,025	15.4	B
I-16 on-ramp from Gwinnett St	WB	1,675	27.1	C	1,635	26.4	C	1,585	25.6	C



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**Table 6.4: PM Peak Hour Merge/Diverge LOS for No Build and Proposed Improvement in 2025 and 2045**

	No Build				Build Option 1			Build Option 2		
<b>2025</b>										
Location	Dir.	Vol.	Density	LOS	Vol.	Density	LOS	Vol.	Density	LOS
I-16 Split at US 17	EB	1,590	24.0	C	1,545	23.3	C	1,495	22.6	C
US 17 off-ramp to Louisville Rd	NB	550	8.2	A	725	10.8	B	875	13.1	B
US 17 off-ramp to Oglethorpe Ave	NB	-	-	-	685	11.5	B	830	12.8	B
US 17 on-ramp from Oglethorpe Ave	NB	1,150	23.4	C	980	19.9	B	770	15.6	B
US 17 off-ramp to Oglethorpe Ave	SB	1,000	15.2	B	930	14.1	B	765	11.6	B
US 17 on-ramp from Louisville Rd	SB	610	9.5	A	900	14.0	B	1,135	17.6	B
I-16 on-ramp from Gwinnett St	WB	1,965	34.5	D	1,910	33.5	D	1,850	32.4	D
<b>2045</b>										
I-16 Split at US 17	EB	2,100	32.9	D	2,140	39.1	E/F	1,985	31.1	D
US 17 off-ramp to Louisville Rd	NB	910	13.6	B	1,050	15.9	B	1,280	19.1	B
US 17 off-ramp to Oglethorpe Ave	NB	-	-	-	905	13.5	B	1,230	19.1	B
US 17 on-ramp from Oglethorpe Ave	NB	1,600	31.5	D	1,085	20.6	C	1,150	22.6	C
US 17 off-ramp to Oglethorpe Ave	SB	1,380	21.2	C	1,095	16.5	B	1,100	16.9	B
US 17 on-ramp from Louisville Rd	SB	935	14.7	B	815	12.3	B	1,530	24.1	C
I-16 on-ramp from Gwinnett St	WB	2,475	43.2	E/F	1,635	26.4	C	2,340	40.8	E/F



**Table 6.5: AM Peak Hour Ramp Terminal Intersection LOS for No Build and Proposed Improvement in 2025 and 2045**

Intersection	Approach	No Build			Build Option 1			Build Option 2		
		Vol.	Delay (s/veh)	LOS	Vol.	Delay (s/veh)	LOS	Vol.	Delay (s/veh)	LOS
<b>2025</b>										
Louisville Rd at US 17 SB On-ramp (Signalized)	SB	-	-	-	245	10.1	B	485	26.6	C
	EB	495	0.2	A	495	16.6	B	495	20.8	C
	WB	500	0.4	A	500	15.9	B	505	17.9	B
	Total	995	0.3	A	1,240	15.0	B	1,485	21.7	C
Louisville Rd at US 17 NB Off-ramp (Unsignalized)	NB	125	4.5	A	125	4.5	A	130	4.5	A
	EB	480	0.4	A	480	0.4	A	480	0.4	A
	WB	430	0.3	A	430	0.3	A	440	0.3	A
	Total	1,035	0.8	A	1,035	0.8	A	1,050	0.8	A
W Gwinnett St at I-16 WB On-ramp (Signalized)	SB	325	14.9	B	325	33.4	C	325	34.3	C
	EB	450	16.0	B	450	40.7	D	450	35.3	D
	WB	410	4.1	A	680	3.5	A	730	3.7	A
	Total	1,185	11.6	B	1,455	21.7	C	1,505	19.8	B
W Gwinnett St at I-16 EB Off-ramp (Signalized)	NB	310	18.7	B	645	23.1	C	720	27.8	C
	EB	655	5.2	A	655	8.8	A	655	8.9	A
	WB	605	6.5	A	875	13.7	B	925	16.4	B
	Total	1,570	8.4	A	2,175	15.0	B	2,300	17.8	B
<b>2045</b>										
Louisville Rd at US 17 SB On-ramp (Signalized)	SB	-	-	-	280	13.4	B	550	19.7	B
	EB	565	0.2	A	565	13.4	B	565	19.3	B
	WB	570	0.5	A	570	13.0	B	585	19.0	B
	Total	1,135	0.4	A	1,415	13.3	B	1,700	19.3	B
Louisville Rd at US 17 NB Off-ramp (Unsignalized)	NB	135	5.0	A	145	5.0	A	150	5.0	A
	EB	545	0.4	A	550	0.4	A	550	0.4	A
	WB	495	0.3	A	490	0.3	A	505	0.3	A
	Total	1,175	0.9	A	1,185	0.9	A	1,205	0.9	A
W Gwinnett St at I-16 WB On-ramp (Signalized)	SB	375	15.0	B	370	35.8	D	370	36.8	D
	EB	510	16.3	B	515	36.0	D	515	38.6	D
	WB	475	4.1	A	785	3.9	A	835	3.9	A
	Total	1,360	11.7	B	1,670	20.9	C	1,720	21.4	C
W Gwinnett St at I-16 EB Off-ramp (Signalized)	NB	350	16.7	B	740	32.2	C	815	40.3	D
	EB	750	5.0	A	750	8.9	A	750	11.6	B
	WB	695	6.7	A	1,005	21.9	C	1,055	30.8	C
	Total	1,795	7.9	A	2,495	21.1	C	2,620	28.3	C



**Table 6.6: PM Peak Hour Ramp Terminal Intersection LOS for No Build and Proposed Improvement in 2025 and 2045**

Intersection	Approach	No Build			Build Option 1			Build Option 2		
		Vol.	Delay (s/veh)	LOS	Vol.	Delay (s/veh)	LOS	Vol.	Delay (s/veh)	LOS
<b>2025</b>										
Louisville Rd at US 17 SB On-ramp (Signalized)	SB	-	-	-	380	32.3	C	745	45.9	D
	EB	560	0.5	A	560	8.2	A	560	13.8	B
	WB	590	0.2	A	590	19.5	B	610	37.9	D
	Total	1,150	0.3	A	1,530	18.6	B	1,915	34.0	C
Louisville Rd at US 17 NB Off-ramp (Unsignalized)	NB	40	4.4	A	40	4.4	A	45	4.4	A
	EB	495	0.5	A	495	0.5	A	495	0.5	A
	WB	580	0.2	A	580	0.2	A	590	0.2	A
	Total	1,115	0.5	A	1,115	0.5	A	1,130	0.5	A
W Gwinnett St at I-16 WB On-ramp (Signalized)	SB	410	17.9	B	410	36.9	D	410	41.9	D
	EB	460	22.1	C	460	42.6	D	460	47.5	D
	WB	580	6.3	A	960	6.4	A	1,035	4.8	A
	Total	1,450	14.6	B	1,830	22.3	C	1,905	23.1	C
W Gwinnett St at I-16 EB Off-ramp (Signalized)	NB	225	29.4	C	545	30.9	C	620	39.8	D
	EB	710	5.7	A	710	8.2	A	710	5.1	A
	WB	755	5.5	A	1,135	15.7	B	1,210	23.0	C
	Total	1,690	8.8	A	2,390	16.9	B	2,540	22.1	C
<b>2045</b>										
Louisville Rd at US 17 SB On-ramp (Signalized)	SB	-	-	-	430	26.1	C	860	65.1	E
	EB	635	0.5	A	640	16.5	B	640	67.9	E
	WB	670	0.3	A	670	16.4	B	685	39.8	D
	Total	1,305	0.4	A	1,740	18.8	B	2,185	58.0	E
Louisville Rd at US 17 NB Off-ramp (Unsignalized)	NB	45	5.1	A	45	5.1	A	50	5.1	A
	EB	560	0.6	A	565	0.6	A	565	0.6	A
	WB	660	0.3	A	660	0.3	A	675	0.3	A
	Total	1,265	0.6	A	1,270	0.6	A	1,290	0.6	A
W Gwinnett St at I-16 WB On-ramp (Signalized)	SB	465	17.2	B	465	42.1	D	465	44.2	D
	EB	525	22.4	C	525	49.7	D	525	57.1	E
	WB	655	6.5	A	1,115	6.0	A	1,180	40.2	D
	Total	1,645	14.6	B	2,105	24.9	C	2,170	45.1	D
W Gwinnett St at I-16 EB Off-ramp (Signalized)	NB	260	30.1	C	625	57.5	E	705	27.3	C
	EB	815	7.9	A	810	7.4	A	810	3.3	A
	WB	860	5.7	A	1,315	27.4	C	1,380	27.9	C
	Total	1,935	9.9	A	2,750	28.4	C	2,895	20.9	C





**Table 6.7: AM Peak Hour Intersection LOS for No Build and Proposed Improvement in 2025 and 2045**

Intersection	No Build			Build Option 1			Build Option 2				
	Input Volume (vph)	Delay (sec/veh)	LOS	Input Volume (vph)	Delay (sec/veh)	LOS	Input Volume (vph)	Delay (sec/veh)	LOS		
<b>2025</b>											
W Oglethorpe Ave at W Boundary St	1170	1.3	A	1740	1.3	A	2225	1.3	A		
W Oglethorpe Ave at MLK Jr. Blvd	2165	21.2	C	3010	36.8	D	3385	46.9	D		
W Oglethorpe Ave at Montgomery St	1695	9.4	A	2630	40.2	D	2720	41.6	D		
Louisville Rd/W Liberty St at MLK Jr. Blvd	2380	14.4	B	2440	29.9	C	2485	28.8	C		
W Liberty St at Montgomery St	2325	10.5	B	2360	18.2	B	2515	19.0	B		
MLK Jr. Blvd at W Jones St	1860	7.3	A	2040	9.6	A	2015	8.4	A		
W Gwinnett St at Stiles Ave	1110	15.9	B	1110	14.9	B	1110	17.0	B		
W Gwinnett St at May Dr	1620	13.3	B	2214	17.2	B	2339	17.7	B		
W Gwinnett St at MLK Jr. Blvd	1960	12.2	B	2670	24.9	C	2790	25.8	C		
GA 204 (37th St Conn) at Ogeechee Rd	2700	11.5	B	2806	11.6	B	2841	11.7	B		
W 37th St at Bulloch St	2270	0.1	A	2371	0.1	A	2411	0.1	A		
<b>2045</b>											
W Oglethorpe Ave at W Boundary St	1350	1.3	A	1990	1.3	A	2550	1.3	A		
W Oglethorpe Ave at MLK Jr. Blvd	2470	23.3	C	3440	43.8	D	3870	51.0	D		
W Oglethorpe Ave at Montgomery St	1930	10.1	B	3010	43.3	D	3115	45.8	D		
Louisville Rd/W Liberty St at MLK Jr. Blvd	2605	16.5	B	2790	32.5	C	2830	31.7	C		
W Liberty St at Montgomery St	2655	11.4	B	2690	20.0	C	2875	21.2	C		
MLK Jr. Blvd at W Jones St	2130	7.4	A	2350	9.5	A	2310	7.8	A		
W Gwinnett St at Stiles Ave	1265	17.3	B	1275	17.7	B	1275	17.6	B		
W Gwinnett St at May St	1850	14.4	B	2539	24.8	C	2664	27.7	C		
W Gwinnett St at MLK Jr. Blvd	2240	13.8	B	3080	27.1	C	3195	28.8	C		
GA 204 (37th St Conn) at Ogeechee Rd	3100	12.1	B	3211	12.2	B	3251	12.3	B		
W 37th St at Bulloch St	2585	0.2	A	2701	0.2	A	2751	0.2	A		



**Table 6.8: PM Peak Hour Intersection LOS for No Build and Proposed Improvement in 2025 and 2045**

Intersection	No Build			Build Option 1			Build Option 2			
	Input Volume (vph)	Delay (sec/ veh)	LOS	Input Volume (vph)	Delay (sec/ veh)	LOS	Input Volume (vph)	Delay (sec/ veh)	LOS	
<b>2025</b>										
W Oglethorpe Ave at W Boundary St	1665	1.6	A	2450	1.6	A	3125	1.6	A	
W Oglethorpe Ave at MLK Jr. Blvd	2835	26.8	C	4050	63.4	E	4530	86.5	F	
W Oglethorpe Ave at Montgomery St	1845	9.3	A	3205	46.6	D	3375	50.5	D	
Louisville Rd/W Liberty St at MLK Jr. Blvd	2835	16.2	B	3015	36.7	D	3095	39.4	D	
W Liberty St at Montgomery St	2195	8.3	A	2490	22.2	C	2925	25.3	C	
MLK Jr. Blvd at W Jones St	2330	5.2	A	2580	16.2	B	2535	13.6	B	
W Gwinnett St at Stiles Ave	1375	22.4	C	1375	19.3	B	1375	21.9	C	
W Gwinnett St at May Dr	1710	13.9	B	2406	12.0	B	2556	17.0	B	
W Gwinnett St at MLK Jr. Blvd	2635	20.3	C	3500	53.1	D	3750	65.1	E	
GA 204 (37th St Conn) at Ogeechee Rd	2755	14.1	B	2856	14.5	B	2891	14.6	B	
W 37th St at Bulloch St	2235	0.4	A	2336	0.4	A	2371	0.4	A	
<b>2045</b>										
W Oglethorpe Ave at W Boundary St	1900	1.8	A	2805	1.8	A	3570	1.7	A	
W Oglethorpe Ave at MLK Jr. Blvd	3265	34.6	C	4640	89.2	F	5175	123.0	F	
W Oglethorpe Ave at Montgomery St	2120	11.0	B	3670	56.4	E	3985	53.2	D	
Louisville Rd/W Liberty St at MLK Jr. Blvd	3250	18.9	B	3445	45.6	D	3545	52.2	D	
W Liberty St at Montgomery St	2510	8.1	A	2835	24.9	C	3365	34.4	C	
MLK Jr. Blvd at W Jones St	2665	5.4	A	2955	21.5	C	2900	16.3	B	
W Gwinnett St at Stiles Ave	1560	26.7	C	1570	20.8	C	1570	20.7	C	
W Gwinnett St at May St	1950	17.6	B	2766	14.1	B	2911	11.5	B	
W Gwinnett St at MLK Jr. Blvd	3020	32.6	C	4020	67.1	E	4285	83.4	F	
GA 204 (37th St Conn) at Ogeechee Rd	3160	15.7	B	3280	16.2	B	3315	16.3	B	
W 37th St at Bulloch St	2560	0.5	A	2661	0.5	A	2706	0.5	A	



### 6.1.6 Roundabout Analysis

The improvements at Oglethorpe Avenue included in both Build Options would prompt the need for a new signal on Louisville Road. This signal would be located at the intersection of Louisville Road with the ramps connecting the new improvement from Oglethorpe Avenue to the southbound on-ramps at US 17. Because the intersections requiring signalization is at an Interstate ramp terminus, a roundabout was considered in lieu of a new signal at this location.

Based on results from the GDOT Roundabout Analysis Tool, the performance of the roundabout is projected to be similar to the performance of the signalized intersection. The dominant movement is from the new Oglethorpe Avenue ramp connection on the north and the traffic traveling west on Louisville and turning left onto the southbound US 17 ramps. A roundabout analysis for the intersection of Louisville at the I-16 on-ramp is presented in **Table 6.9**.

**Table 6.9: Roundabout Analysis - US 17 on-ramp at Louisville Rd**

2025								
Approach	Build Option 1				Build Option 2			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EB	11.0	B	69.0	F	17.0	C	103.0	F
WB	7.0	A	11.0	B	7.0	A	9.0	A
SB	8.0	A	26.0	D	16.0	C	96.0	F
TOTAL	8.8	A	36.0	E	13.3	B	70.3	F
2045								
Approach	Build Option 1				Build Option 2			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
EB	14.0	B	49.0	E	28.0	D	234.0	F
WB	8.0	A	10.0	A	8.0	A	10.0	A
SB	10.0	A	19.0	C	26.0	D	203.0	F
TOTAL	10.8	B	26.6	D	20.5	C	151.6	F

Source: GDOT Roundabout Analysis Tool (v2.1)

## 6.2 Traffic Analysis Results

The results of the analysis presented above for each of the Build and No Build alternatives are presented below.

### 6.2.1 Segment LOS

In all of the scenarios, the proposed Build alternatives do not create a worse condition on the basic segments for automobile or truck traffic. I-16 west of Gwinnett Street westbound (exiting the study area) operates at a LOS E in the 2045 PM peak. I-16 west of Gwinnett Street eastbound operates at a LOS E in 2045 in the AM peak hour for the No Build and Build Option 1, but improves to a LOS D for Build Option 2.

#### 6.2.1.1 Build Option 1

According to the approved traffic diagrams, the US 17 and I-16 facility through the study area is projected to operate at LOS D or above through 2045 under Build Option 1 with the following exception:

- In the PM peak hour, the roadway segment of I-16 west of Gwinnett Street operates at LOS E in the westbound direction under the No Build and Build Option 1 scenarios; however, the vehicle delay decreases slightly under Build Option 1.

### **6.2.1.2 Build Option 2**

According to the approved traffic diagrams, the US 17 and I-16 facility through the study area is projected to operate at LOS D or above through 2045 under Build Option 2 with the following exception:

- In the PM peak hour, the roadway segment of I-16 west of Gwinnett Street operates at LOS E in the westbound direction under the No Build and Build Option 2 scenarios; however, the vehicle delay decreases slightly under Build Option 2.

### **6.2.1.3 No Build Alternative**

According to the approved traffic diagrams, the US 17 and I-16 facility through the study area is projected to operate at LOS D or above through 2045 under the No Build Alternative with the following exception:

- In the PM peak hour, the roadway segment of I-16 west of Gwinnett Street operates at LOS E in the westbound direction under the No Build scenario.

## **6.2.2 Merge/Diverge LOS**

In all of the scenarios, the proposed Build alternatives do not create a worse condition on the merging and diverging movements. Two weave sections, the I-16 diverge at US 17 and the I-16 on-ramp from Gwinnett Street, are projected to operate at a poor LOS in future year scenarios, under both Build and No Build alternatives (Table 6.3 and Table 6.4).

### **6.2.2.1 Build Option 1**

Two merging or diverging movements are projected to operate at LOS E or worse in 2025 or 2045 under Build Option 1:

- The roadway segment of I-16 at the split from US 17 approaches failing (LOS E/F) during the weekday AM peak hour for eastbound traffic in 2025 or 2045 under Build Option 1. However, density on this segment in each year is slightly improved under Build Option 1 when compared to the No Build scenario.
- During the weekday PM peak hour, the I-16 on-ramp from Gwinnett Street is projected to approach failing (LOS E/F) for westbound traffic in 2045 for the No Build scenario and build improvements. Again, traffic volume densities are projected to be slightly lower under the Build Option 1 than under the No Build scenario.

### **6.2.2.2 Build Option 2**

Two merging or diverging movements are projected to operate at LOS E or worse in 2025 or 2045 under Build Option 2:

- The roadway segment of I-16 at the split from US 17 approaches failing (LOS E/F) during the weekday AM peak hour for eastbound traffic in 2025 or 2045 under Build Option 2. However, density on this segment in each year is slightly improved under Build Option 2 when compared to the No Build scenario.
- During the weekday PM peak hour, the I-16 on-ramp from Gwinnett Street is projected to approach failing (LOS E/F) for westbound traffic in 2045 for the No Build scenario and build improvements. Again, traffic volume densities are projected to be slightly lower under the Build Option 2 than under the No Build scenario.

### **6.2.2.3 No Build Alternative**

Two merging or diverging movements are projected to operate at LOS E or worse in 2025 or 2045 under the No Build scenario:

- The roadway segment of I-16 at the split from US 17 approaches failing (LOS E/F) during the weekday AM peak hour for eastbound traffic in 2025 or 2045 under the No Build scenario.
- During the weekday PM peak hour, the I-16 on-ramp from Gwinnett Street is projected to approach failing (LOS E/F) for westbound traffic in 2045 for the No Build scenario.

### **6.2.3 Ramp LOS**

Some ramp terminus intersection movements would function at a worse LOS under the Build Options than under the No Build alternative, but no ramp terminus intersection movements are projected to operate at LOS F in 2025 or 2045 under any scenario (Table 6.5 and Table 6.6).

#### **6.2.3.1 Build Option 1**

One ramp terminal intersection movement is projected to operate at LOS E or worse during PM peak hour in 2045. The northbound movement at the intersection of the I-16 eastbound off-ramp at Gwinnett Street is projected to operate at LOS E in 2045. The reconfiguration of the I-16 terminal ramps to terminate onto Cohen Street would not adequately serve truck traffic. The reconfigured ramps are intended to serve lower traffic volumes, and the trucks may have difficulty with turning movements onto a narrow roadway. Truck traffic would need to use alternate exit ramps.

#### **6.2.3.2 Build Option 2**

The removal of the I-16 terminal ramps would change the truck movements by moving the majority of movements to alternate access points at I-516, 37<sup>th</sup> Street Connector, Gwinnett Street or the improved interchange at Oglethorpe Avenue. The following ramp terminal intersection movements are projected to operate at LOS E or worse during PM peak hour in 2045:

- Southbound and eastbound movements at the US 17 southbound on-ramp at Louisville Road are projected to operate at LOS E in 2045.
- Eastbound movement at I-16 westbound on-ramp at Gwinnett Street is projected to operate at LOS E in 2045.

#### **6.2.3.3 No Build Alternative**

All ramp terminal intersection movements in the area of influence are projected to operate at LOS D or better during AM and PM peak hours in 2025 and 2045.

### **6.2.4 Intersection LOS**

The levels of service for the associated intersections are generally acceptable throughout the study area. The intersections that operate under an unacceptable LOS during the PM peak hour are:

- Oglethorpe Avenue at MLK, Jr. Boulevard
- Oglethorpe Avenue at Montgomery Street
- Louisville Road at the US 17 southbound on-ramp
- Gwinnett Street at MLK, Jr. Boulevard.

Option 2 performs slightly better at Oglethorpe Avenue and Montgomery Street and Option 1 performs slightly better at Gwinnett Street and MLK, Jr. Boulevard. Intersection LOS for AM and PM peaks in 2025 and 2045 are presented in Table 6.7 and Table 6.8.

#### **6.2.4.1 Build Option 1**

In general, intersections in the immediate vicinity of the Proposed Improvement are projected to operate at LOS D or above in 2025 and 2045 under Build Option 1, with the following exceptions:



- Under Build Option 1, the intersection of Oglethorpe Avenue at MLK, Jr. Boulevard is projected to operate at LOS E during PM peak hour in 2025 and LOS F in 2045. To address the deficiencies at this intersection, a second left turn lane at the eastbound and northbound approaches and a right turn lane on the eastbound approach are recommended.
- Under Build Option 1, the intersections of Oglethorpe Avenue at Montgomery Street and Gwinnett Street at MLK, Jr. Boulevard, are projected to operate at LOS E in 2045.

#### **6.2.4.2 Build Option 2**

In general, intersections in the immediate vicinity of the Proposed Improvement are projected to operate at LOS D or above in 2025 and 2045 under Build Option 2, with the following exceptions:

- Under Build Option 2, the intersection of Gwinnett Street at MLK, Jr. Boulevard is projected to operate at LOS E during PM peak hours in 2025, and LOS F during PM peak hour in 2045. To address this deficiency, an eastbound right turn lane is recommended.
- Under Build Option 2, the intersection of Oglethorpe Avenue at MLK, Jr. Boulevard is projected to operate at LOS F during PM peak hours in 2025 and 2045. To address the deficiencies at this intersection, a second left turn lane at the eastbound and northbound approaches and a right turn lane on the eastbound approach are recommended.
- Under Build Option 2, the on ramp to US 17 at Louisville Road is projected to operate at LOS E during PM peak in 2045. To address this deficiency, it is recommended that a roundabout be constructed at this location. As can be seen from the roundabout analysis presented in **Table 6.9**, LOS is not projected to improve under Build Option 2 even if the intersection were reconfigured as a roundabout.

#### **6.2.4.3 No Build Alternative**

In general, intersections in the immediate vicinity of the Proposed Improvement are projected to operate at LOS D or better in 2025 and 2045 under the No Build Alternative.



## 7 Justification of Interstate Modification

The proposed modifications to the I-16 terminal interchange, Oglethorpe Avenue interchange and improvements to Gwinnett Street would revitalize the area surrounding the I-16 terminal ramps, provide for the expansion of downtown Savannah to the west, improve safety, and allow for restoration of the surface street network to improve connectivity and mobility. With the proposed modifications, the Interstate will operate at an acceptable LOS through the design year 2045. This section of the IMR explains how the request for modification of access satisfies each of the FHWA's eight policy requirements. Analysis presented under each policy requirement will draw upon the data presented in previous sections to illustrate how that requirement is met. This project is atypical because the modification being proposed is about removing access rather than adding access.

### 7.1 Recommendations

Based on the comparison of build options presented in this document, Build Option 2 has been selected as the recommended Build Alternative for the I-16 Interchange Modification Report. Build Option 2 better serves the intent of the project need and purpose. It also better supports operations on I-16 because the removal of an access location will improve mainline performance and reduce merge/diverge movements along the corridor. This is the option that most closely follows the publicly accepted *Reclaiming Old West Broad Street* Civic Master Plan and was favored during the public outreach associated with this study.

### 7.2 Existing Facilities

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

The need and purpose for this project, as presented in Section 1.2, cannot be addressed through any means other than the removal of the I-16 terminal ramps and modification of access to the I-16/US 17 facility. The existing terminal ramps carry the majority of traffic accessing downtown from I-16, while the adjacent interchanges have unused capacity. Traffic demands can be met through the redistribution of traffic onto other streets and interchanges within the area of influence, allowing for the right-of-way to be restored as developable land to support plans for expanding the downtown footprint.

As described in Section 2.2, more than enough Interstate access is available within this corridor. Within 1.5 miles there are five access points along I-16/US 17, which means that existing adjacent interchanges can adequately satisfy access needs with the removal of the terminal ramps. The spacing between the interchanges within the study area is less than FHWA's current minimum standard of one mile between interchanges in urban areas.

The proposed modifications will not impede regional movement on the Interstate facility. A full interchange is recommended at the Oglethorpe Avenue interchange with US 17 to provide complete access at this location and to replace the access removed with the demolition of the existing terminal ramps. The modified interchange at Oglethorpe Avenue is less than one mile north of the I-16 terminal interchange (Table 2.3). In real terms, this is a very minor shift in access points that should not influence the share of regional to local trips that this facility serves.

Among the interchanges present in the area of influence, Oglethorpe Avenue is recommended for modification to a full interchange due to its direct connection to downtown. The Louisville Road interchange was considered, but dropped because historic resources immediately adjacent to the corridor make improvements to that facility infeasible. The proposed southbound entrance ramp around the

existing Oglethorpe Avenue interchange would allow regional traffic to enter via the existing southbound ramps at Louisville Road without an additional merge location along US 17.

### 7.3 Evaluation of Reasonable Alternatives to New Access

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

The need that would be satisfied by the removal of the terminal ramps is not an issue of traffic throughput but of social justice, economic development, and restoration of surface connectivity. Because these issues are not fundamentally traffic operations, they cannot be met through other means, including the use of Transportation System Management (TSM) strategies, or by addressing deficiencies in geometric design of this facility or other nearby interchanges.

Alternative access is considered in the alternatives, which propose the modification of the access point from the I-16 terminal interchange and which disperse traffic to Gwinnett Street and the modified Oglethorpe Avenue interchanges. Modifications to the existing interchanges maximize operations at those locations while removing the redundancy of access within a short distance. These improvements will not preclude any TSM improvements in the future, nor will they be constructed in lieu of planned TSM improvements.

### 7.4 No Significant Impacts to Interstate Safety and Operations

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

The IMR study analyzed I-16/US 17 operations for the opening and design year scenarios to explore the full range of likely transportation impacts that could result from traffic dispersion associated with the removal of the I-16 terminal interchange ramps. The analysis utilized HCS2010 methodology and microsimulation to understand travel conditions within the corridor and the local street network. The results of the traffic operations analysis are provided in Section 6 of this report.

Analysis of the Build Alternative illustrates that the project would not have any significant negative impact on the safety and the operation on the overall facilities within the project area. The I-16/US 17 mainline operation would predominantly maintain LOS D or better. In instances where the LOS



deteriorates, there is not a change in the LOS between the No Build and Build Alternatives. The proposed improvements do not contribute to a worse safety or operations condition.

The removal of the I-16 terminal interchange also does away with ramp-associated merge/diverge areas along I-16 mainline. The terminal ramps function as a left hand exit from I-16 northbound, which creates a merging conflict between those exiting to Montgomery Street and those wishing to remain on the mainline as it transitions to US 17. The entrance ramps to I-16 southbound from MLK, Jr. Boulevard connect to the mainline from the left, which creates a merge area along the mainline that has a higher crash rate than the statewide average. Removal of these ramps eliminates the unexpected merge condition and improves safety on the mainline and overall traffic flow.

The project combines the new Oglethorpe Avenue interchange southbound ramps with the existing Louisville Road southbound ramps, thereby avoiding the creation of a new merge or diverge area that would result in additional weaving maneuvers.

At Gwinnett Street, the addition of a right turn lane on the northbound exit ramp reduces conflicts at the intersection.

### **7.5 Proposed Improvement Provides for All Traffic Movements and Connects to Public Roads Only**

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

The proposed improvements would reduce the number of partial interchanges in this area with the removal of the I-16 terminal interchange ramps and the expansion of the Oglethorpe Avenue interchange to full access. The existing conditions are unusual because of the frequency of the partial interchanges within a short distance. Further, each is a partial interchange, and so existing area interchanges do not provide for all traffic movements. According to the FHWA policies, less than “full interchanges” are considered on a case-by-case basis.

The recommended Build Alternative includes improvements to the Oglethorpe Avenue Interchange that would allow that interchange to provide for four traffic movements; whereas the existing configuration supports northbound entrances and southbound exits on US 17, the proposed configuration would allow for northbound exits and southbound entrances as well. The proposed modifications are designed to meet current design standards for Interstate systems.

### **7.6 Compatible with Local and Regional Long-Range Transportation Plans**

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

The recommended alternative considers and is consistent with local and regional land use and transportation plans. The project, titled *I-16 at Montgomery Street and at MLK, Jr. Blvd – Ramp and Overpass (I-16 Exit Ramp Removal)*, is currently identified as item “Y” in the 2040 Total Mobility Plan, the long range transportation plan for the Chatham County-Savannah region, as a Cost Feasible Project. The GDOT project identification number is 001744.



Consideration of modifying the I-16 terminal interchange has been explored through a series of previous planning activities. Options for the modification or reconfiguration of the interchange were previously documented in the *I-16 Exit Ramp Removal Project: Reclaiming Old West Broad Street* (2012) conducted by the CORE MPO.

Prior to that, the ramp removal was the subject of a series of studies conducted by the Savannah Development and Renewal Authority (SDRA) in 1998, 2002, 2004 and 2009; and GDOT's I-16 Terminus/MLK Jr. Boulevard Flyover Analysis and Concept Development Study (2008).

Based on the analysis from this document demonstrating the need for them, the Oglethorpe Avenue and Gwinnett Street improvements included as part of the recommended Build Alternative will need to be added to the TIP.

The study that resulted in this IMR considered local street network configurations for eventual construction in the restored right-of-way of the existing I-16 terminal interchange ramps. The local street network improvements are not necessary to meet the purpose and need of the modification of access to I-16/US 17.

### 7.7 Coordinated with Other Planned and Programmed Transportation Projects in the Study Area

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

The modification of the I-16 terminal interchange (PI# 0011744) is the only project in the study area among the Chatham County-Savannah MPO's 2015-2018 TIP. There are no other transportation projects planned for the study area. The proposed revisions to I-16 access removes a partial interchange and are not due to a new, expanded, or substantial change in current or planned future development or land use, nor is there the potential for multiple new interchanges in this corridor.

### 7.8 Coordination with Proposed Development

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

The recommended alternative for removing the I-16 terminal interchange is intended to provide for more developable area to expand the downtown and transform the community. Adequate access is possible from adjacent interchanges to the developable sites that will become available as a result of the removal of the existing terminal ramps. The current right-of-way will be repurposed as developable land once later stages of the project restore the local street network. Given the number of access points already present in the study area, any new development in the study area is not projected to require additional Interstate access.

In addition, the removal of the I-16 terminal ramps may have the effect of allowing for improved east-west connectivity through the area currently occupied by the ramps' right-of-way. The local street network proposed for later stages of this project will promote small blocks and an interconnected grid street network, like the pattern found east of Montgomery Street, and would support east-west connectivity through the study area. In so doing, the expanded local roadway network would provide



better access to the planned development west of I-16, such as the Canal District and the planned arena, described in Section 2.1.3. As those projects move forward, the street network design will be revisited.

### **7.9 Project is in Compliance with Environmental Process**

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

It is expected that the recommended alternative will be a federal-aid project, requiring environmental evaluation, review and processing under NEPA. An environmental screening has been completed for the study area, as described in Section 5. Once the FHWA has reached a determination of engineering and operational acceptability for this IMR, the project will enter into the environmental process. Once the NEPA process is complete, the project will seek final approval of this IMR and move into the preliminary engineering, final design right-of-way acquisition, and construction.



## Appendix A: Existing Traffic



## **Appendix B: Future No Build Traffic**



## Appendix C: Build Traffic



## Appendix D: Environmental Screening Report



## **Appendix E: Design Plans and Other Information for the Proposed Improvement**





## Appendix F: Study Area Crash Data 2010 - 2013