I-16 Terminus/MLK Jr. Blvd. Flyover Analysis & Concept Development Study

Georgia Department of Transportation
Office of Planning

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Executive Summary

The purpose of the I-16 Terminus/MLK Flyover Analysis and Concept Development Study is to analyze the potential benefits and impacts associated with the removal of the I-16 eastbound flyover ramp over Martin Luther King Jr. Blvd. in downtown Savannah, Georgia. When this flyover ramp was originally constructed in the 1960's, it severed multiple downtown Savannah city blocks and streets. Three concept alternatives were developed as part of this study that would remove the I-16 eastbound flyover ramp and realign the I-16 ramps to tie into the downtown roadway network at MLK Jr. Blvd.

All three alternatives were evaluated and ranked using quantitative and qualitative evaluation criteria developed for this study. The results of this planning level analysis indicate that all three alternatives would allow these ramps and the surrounding intersections to operate at acceptable levels of service in 2030. It is believed that the reestablishment of these blocks and streets would help facilitate redevelopment and restore these blocks to their original form.

The results of this study indicate that all three alternatives would allow for the removal of the I-16 flyover ramp without a significantly detrimental effect on the operation of the I-16 ramps or the adjacent roadway network.

1 Introduction

At various times over the past several years, different local individuals and organizations have contemplated the pros and cons of removing the I-16 eastbound flyover ramp over Martin Luther King Jr. Blvd. in Savannah, Georgia. Instead of terminating I-16 at Montgomery Street, the realigned eastbound ramp would terminate at MLK Jr. Blvd. This study was undertaken to analyze the potential benefits and impacts associated with the removal of the I-16 flyover ramp.

1.1 *Background and Study Purpose*

In November 1967, Interstate 16 opened to traffic in downtown Savannah, Georgia. I-16 provides a direct Interstate link between Macon and Savannah. The I-16 westbound entrance ramp connected directly with West Broad Street (now Martin Luther King Jr. Blvd.), and the I-16 eastbound exit ramp to downtown Savannah bridged over West Broad Street and merged with Montgomery Street. In order to terminate I-16 directly into the downtown street system several historic structures and properties were demolished. Additionally, since the I-16 flyover to Montgomery Street was an elevated limited access roadway, its construction severed multiple city blocks and streets.

In the forty years since the opening of these Interstate ramps, the blocks surrounding the I-16 flyover have seen businesses close down or move away with virtually no new investment in their place. The city blocks immediately to the north and east of the study area have seen new businesses and rehabilitation of historic structures.

In recent years, citizens and business groups in Savannah have called for the removal of the I-16 flyover that bridges Martin Luther King (MLK) Jr. Blvd. Some believe that by removing the flyover and aligning the I-16 ramps with the existing roadway network, the blocks and city streets, once bisected by the ramp, could be reestablished to provide redevelopment opportunities.

The purpose of this study is to examine the operational effects of removing the I-16 flyover ramp and revising the Interstate access in order to best return this section of downtown Savannah to its original street and block pattern. While traffic travelling to or from I-16 generally travels beyond the defined study area, the operation of these roadways and intersections will determine the effectiveness of any flyover removal alternatives. This study will develop and analyze several alignment alternatives that may serve to accomplish this task while maintaining acceptable traffic operations and minimizing impact to the downtown Savannah Historic District.

1.2 *Study Area Description*

The study area was determined to be the roadways and intersections most directly affected by the potential removal of the I-16 flyover over MLK Jr. Blvd. Figures 1-1 and 1-2 (see page 1-2) present the location map with the study area and boundary for the Savannah Historic District within the study area. The study area extends to just north of Liberty Street, just south of Gaston Street, just east of Montgomery Street, and just west of MLK Jr. Blvd. This includes intersections that are directly connected to the I-16 ramps or are immediately downstream or upstream of these intersections. Figure 1-3 (see page 1-3) presents an aerial graphic of the study area including the I-16 flyover.

Within the study area, MLK Jr. Blvd is a five-lane urban principal arterial with a continuous center turn lane. Montgomery Street is an urban minor arterial with two to four lanes within the study area. W. Liberty Street is a four-lane urban minor arterial with a raised, landscaped center median east of MLK Jr. Blvd. W. Liberty Street becomes the two-lane Louisville Road to the west of MLK Jr. Blvd. Both Taylor Street and Gaston Street are one- and two-lane urban collector streets. With the exception of W. Liberty Street, there are no raised medians on any study area roadways. The I-16 ramps are urban Interstate facilities.

The study area contains a mix of commercial businesses, low-rise and townhome residential units, and a hotel. Many of the commercial and residential buildings are categorized as historic and are contributing features of the Savannah Historic District. Figure 1-2 shows the location of this district boundary within the study area. This district is listed on the National Register of Historic Places and its limits extend west through most of the study area to the center of MLK Jr. Blvd.

Figure 1.1: Location Map

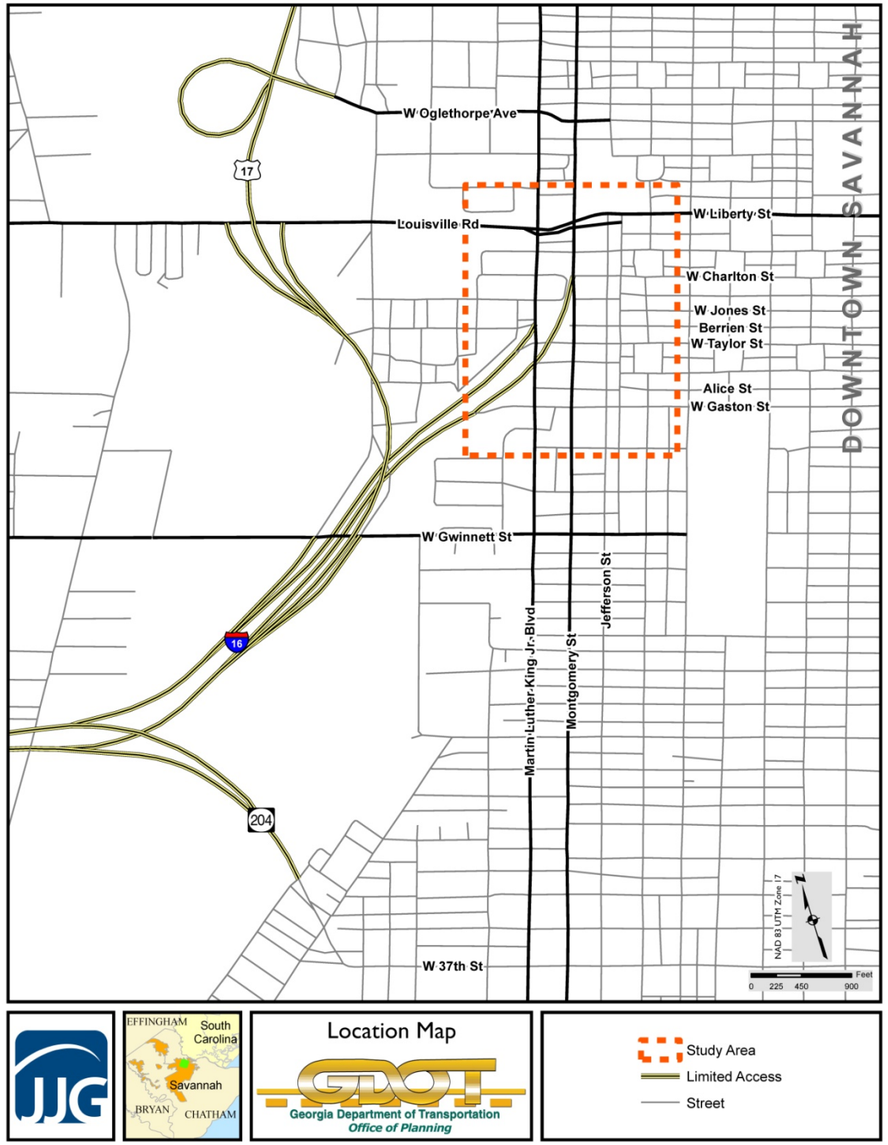
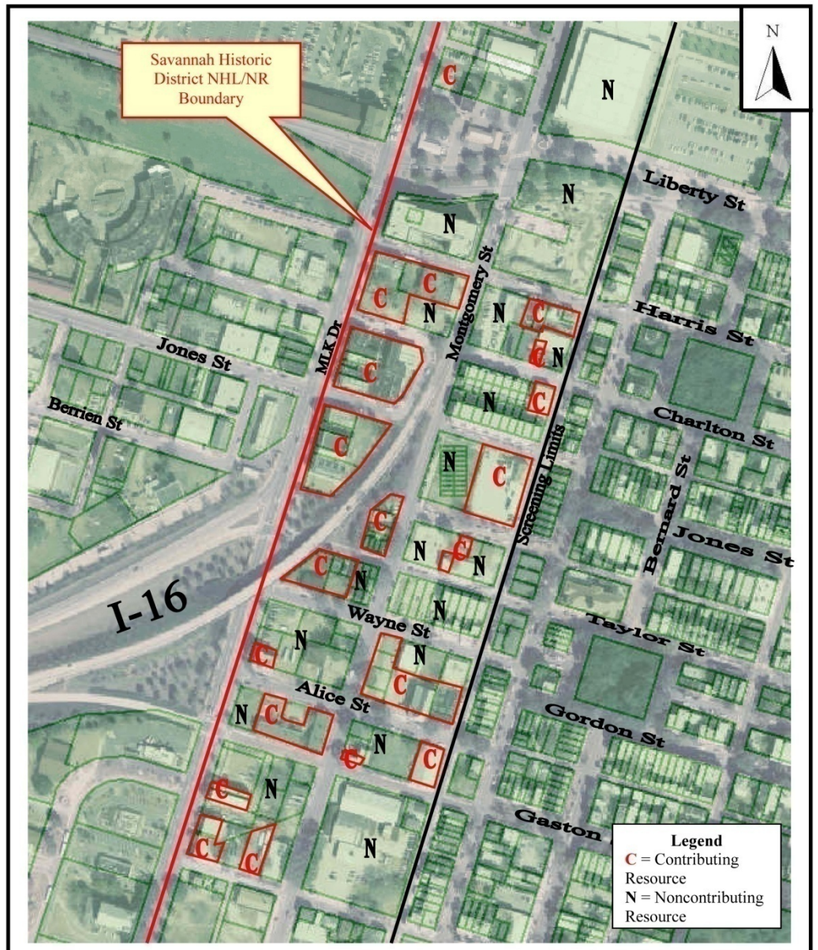


Figure 1.2: Location of Savannah Historic District Boundary



Savannah Historic District Boundary Within Study Area

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Figure 1.3: Aerial Graphic of Existing Conditions

1.3 *Study Process*

This study will determine the feasibility of removing the I-16 eastbound exit ramp flyover and realignment of the I-16 ramps to provide an operationally effective terminus for I-16 in downtown Savannah. The process undertaken to assess this revised Interstate access consists of the following tasks.

- Data Collection
- Existing Conditions Analysis
- Future Conditions Analysis: 2030 No-Build
- Development of Alternatives
- Evaluation of Alternatives
- Conclusions

1.4 *Conclusions*

This study will demonstrate that all three concept alternatives developed for this study would allow for the removal of the I-16 flyover ramp without a significantly detrimental effect on the operation of the I-16 ramps or the adjacent roadway network. The results indicate that all three alternatives would allow these ramps and the surrounding intersections to operate at acceptable levels of service in 2030.

All alternatives, as well as the No-Build scenario, were evaluated and ranked using quantitative and qualitative evaluation criteria developed for this study. This planning level analysis reveals Alternative 3 (see page 3-7) as the highest performing alternative, based on the evaluation criteria developed as part of this study.

2 Existing and Future No-Build Conditions

2.1 *Existing Conditions Analysis*

24-hour tube counts and intersection turning movement counts were taken at all major intersections within the study area in May 2007. Figure 2-1 (page 2-2) presents the existing AM and PM intersection volumes at all study intersections. A level of service (LOS) analysis was completed for the weekday AM and PM peak hours at all study intersections using SYCHRO Professional, Version 7.0. SYNCHRO is a traffic analysis software based on the 2000 Highway Capacity Manual (HCM). SimTraffic, a component of SYNCHRO, was utilized to ensure that the analyzed traffic conditions matched actual observed operations. LOS is a qualitative measure that describes operational conditions and motorists' perceptions within a traffic stream. The 2000 HCM defines six levels of service, LOS A through LOS F, with A representing free flow conditions and F representing heavily congested conditions. Table 2-1 (below) presents the results of the Existing Conditions traffic analysis.

Table 2-1: Existing Conditions Level of Service

	2007 Existing Condition			
	AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS
MLK JR Blvd @ I-16 Exit-Ramp/W Gaston St	22.3	C	10.2	B
MLK JR Blvd @ I-16 On-Ramp/W Taylor St	6.0	A	11.8	B
MLK JR Blvd @ W Jones St	3.1	A	4.8	A
MLK JR Blvd @ W Liberty St	21.4	C	30.8	C
Montgomery St @ Liberty St	21.9	C	26.2	C
Montgomery St @ W Taylor St*	11.5	A/B	23.6	A/C
Montgomery St @ W Gaston St*	11.6	A/B	11	A/B

*unsignalized intersection (LOS given is for main street/side street, delay given for side street)

2.2 *Future (2030) No-Build Conditions Analysis*

In order to determine the future 2030 traffic conditions, the previously developed Chatham Interstates Plan Travel Demand Model (2006) was utilized. Although this travel demand model is useful for forecasting travel patterns and volumes on Interstates and major roadways, its outputs should not be directly utilized for small area traffic studies. Instead, the travel demand model should be utilized as an accurate way to calculate projected traffic growth as well as changes in travel patterns due to land use changes. This projected data from the Chatham Interstates Plan Model (2006) was applied to the existing intersection traffic volumes in order to develop anticipated 2030 traffic conditions. Figure 2-2 (page 2-3) presents the future (2030) No-Build AM and PM intersection volumes at all study intersections. The future No-Build conditions are the 2030 traffic conditions within the study area assuming no improvements or changes to the roadway facilities. Table 2-2 (below) presents the results of the Future (2030) No-Build Conditions traffic analysis.

Table 2-2: Future (2030) No-Build Conditions Intersection Level of Service

	2030 No-Build			
	AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS
MLK JR Blvd @ I-16 Exit-Ramp/W Gaston St	25.2	C	13.1	B
MLK JR Blvd @ I-16 On-Ramp/W Taylor St	6.4	A	42.5	D
MLK JR Blvd @ W Jones St	4.8	A	42.3	D
MLK JR Blvd @ W Liberty St	35.3	C	140.8	F
Montgomery St @ Liberty St	23.3	C	23.0	C
Montgomery St @ W Taylor St*	14.1	A/B	206.9	A/F
Montgomery St @ W Gaston St*	15.0	A/C	13.2	A/B

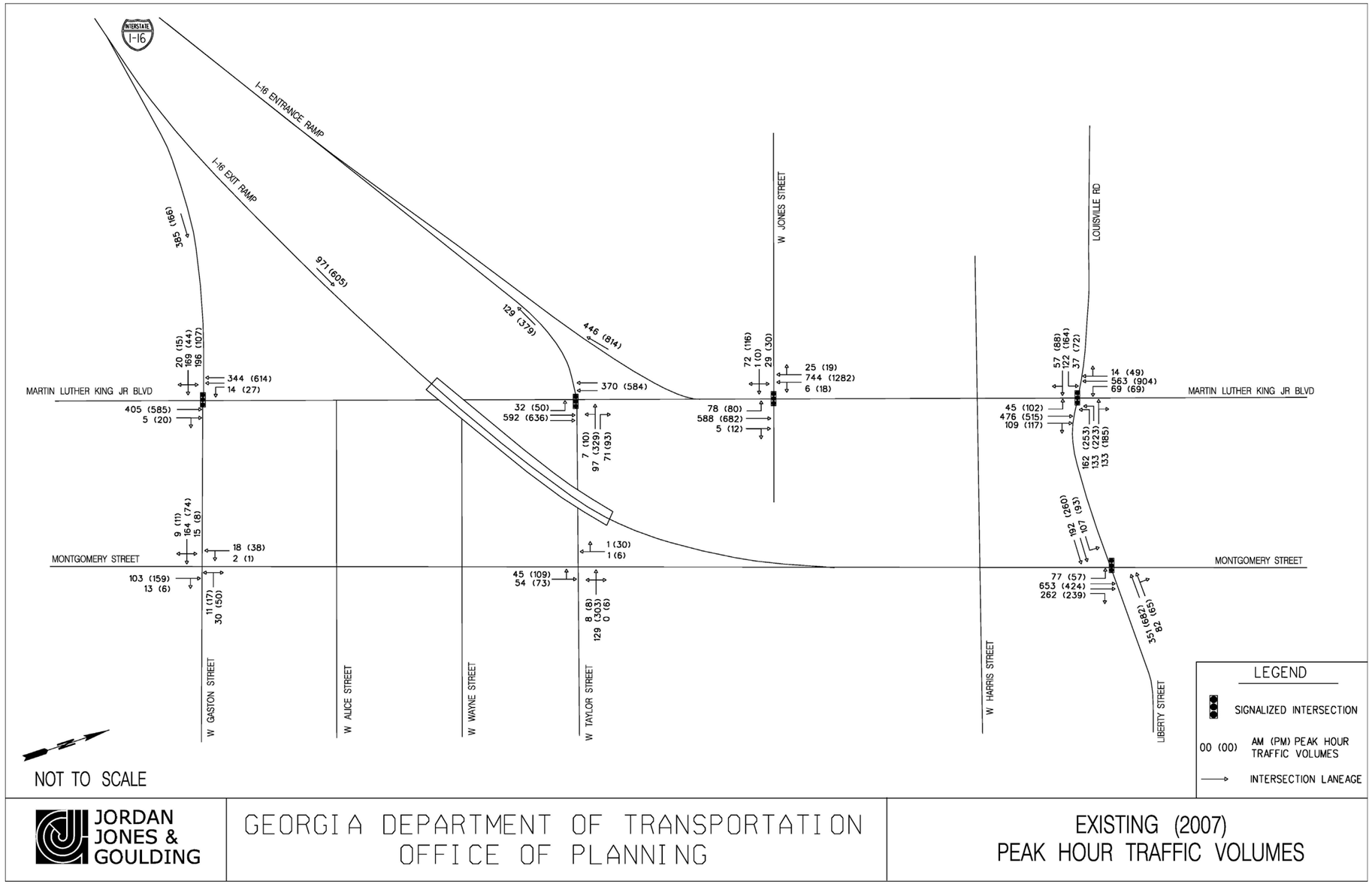
*unsignalized intersection (LOS given is for main street/side street, delay given for side street)

As presented in Table 2-2, in 2030 without any roadway improvements, all intersections operate at acceptable levels of service with the exceptions of MLK Jr. Blvd. at W. Liberty Street and the unsignalized intersection of Montgomery St. at W. Taylor Street in the PM peak hour.

With a LOS F, the intersection of MLK Jr. Blvd at W. Liberty Street fails under 2030 conditions because of heavy southbound volumes on MLK Jr. Blvd, and heavy westbound volumes on W. Liberty Street. As shown in Figure 1-1 (on page 1-2) traffic to the north and east of this intersection wishing to access I-16 in the evening must travel on either W. Liberty Street and/or MLK Jr. Blvd to access one of the three westbound freeway interchanges. Thus, this intersection is a bottleneck for much of the downtown Savannah traffic traveling west or south in the PM peak period. Any modifications to the I-16 ramps are unlikely to improve or deteriorate operational conditions at the MLK Jr. Blvd at W. Liberty Street intersection, thus the LOS of this intersection is not expected to change significantly under any of the Build alignments.

The intersection of Montgomery Street at W. Taylor Street is expected to operate at LOS F in the PM peak hour because it is an unsignalized intersection. Thus main street traffic has no traffic control while side street traffic is stop sign controlled. It is not uncommon for stop sign controlled side streets to experience LOS F conditions in peak periods due to heavy main street volumes. The intersection of Montgomery Street at W. Taylor Street was analyzed with signalization in the 2030 No Build condition and experienced LOS B conditions in the PM peak hour.

Figure 2.1: Existing Peak Hour Traffic Volumes



JORDAN JONES & GOULDING	GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE OF PLANNING	EXISTING (2007) PEAK HOUR TRAFFIC VOLUMES

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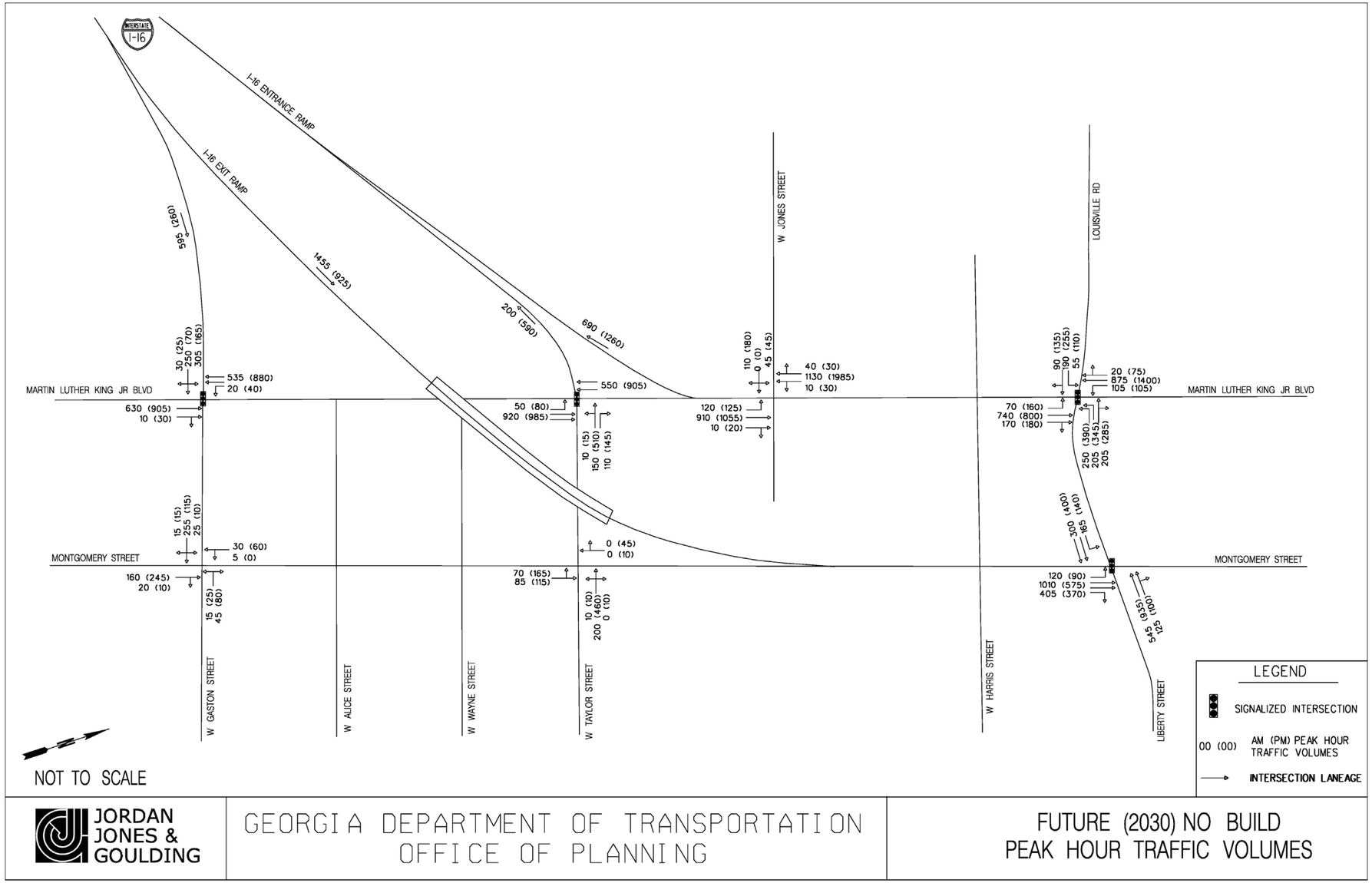
Figure 2.2: Future (2030) No-Build Peak Hour Traffic Volumes



3 Development of Alternatives

In order to successfully remove the I-16 eastbound exit flyover ramp over MLK Jr. Blvd, all alignment alternatives must maintain acceptable traffic operations for study intersections and the I-16 eastbound ramp terminus, with respect to the 2030 No-Build condition, and minimize impact to the Savannah Historic District. Utilizing these criteria, three alignment alternatives were developed to:

1. Remove the I-16 flyover ramp over MLK Jr. Boulevard
2. Realign the I-16 ramps so that they connect to the downtown street network, and
3. Reestablish the city block and roadway network that was divided when the flyover was constructed.

The Chatham County - Savannah Metropolitan Planning Commission was consulted with during the development of these alternatives. They provided invaluable direction regarding the reestablishment of city streets and extension of the downtown Savannah grid system.

3.1 *Alternative 1*

Alternative 1 is presented in Figure 3-1 (see page 3-2). Alternative 1 removes the I-16 eastbound exit flyover ramp to Montgomery Street and replaces it with an at-grade intersection at the intersection of MLK Jr. Blvd. at W. Wayne Street. This ramp would remain a two-lane ramp, widening to three lanes at the intersection with MLK Jr. Blvd. This intersection would carry two through lanes eastbound onto W. Wayne Street, and allow one lane to turn left onto MLK Jr. Blvd. northbound. The existing one-lane exit ramp to the Intersection of MLK Jr. Blvd. at W. Gaston Street would remain in order to better distribute eastbound Interstate traffic onto the downtown Savannah grid network.

The relocated I-16 eastbound ramp would have a 35 MPH design speed at it terminus with MLK Jr. Blvd and W. Wayne Street. This ramp would meet current speed design standards for freeway ramps per the most recent (2004) available American Association of State Highway and Transportation Officials (AASHTO) “Green Book.” The I-16 westbound ramp configuration would remain unchanged under Alternative 1.

In order to facilitate traffic flow from the Interstate ramp onto the city roadway network, W. Wayne Street would be converted to one-way operation eastbound for two blocks. The intersection of W. Wayne Street at Montgomery Street would be signalized and allow two eastbound lanes to turn left onto Montgomery Street, which would also be converted to one-way northbound operation at this intersection. Montgomery Street would then have two northbound lanes which would carry traffic to the intersection at W. Liberty Street.

As shown in Figure 3-1, this alternative would allow several city street connections to be reestablished. The sections of W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd and Montgomery Street were severed by the original construction of the I-16 flyover ramp. Under Alternative 1, these roads could be reestablished, allowing for improved vehicular and pedestrian mobility and connectivity within the study area.

By tying into the existing roadway network, this alternative would provide more choices by which eastbound traffic could enter the downtown roadway system. The existing I-16 flyover ramp funnels most of this traffic to the intersection of Montgomery Street at W. Liberty Street, where commuters can either go straight, or turn right or left to enter the roadway network. Figure 3-2 (see page 3-3) presents the Alternative 1 (2030) peak hour traffic volumes.

3.2 *Alternative 2*

Alternative 2 is presented in Figure 3-3 (see page 3-4) and the Alternative 2 (2030) peak hour traffic volumes are presented in Figure 3-4 (see page 3-5). Alternative 2 removes the I-16 eastbound exit flyover ramp to Montgomery Street and replaces it with an at-grade intersection at the intersection of MLK Jr. Blvd. at W. Alice Street. The ramp would remain a two-lane ramp widening to three lanes at the intersection with MLK Jr. Blvd. Alternative 2 would carry two through lanes eastbound onto W. Alice Street, and allow one lane to turn left onto MLK Jr. Blvd. northbound. The existing one-lane exit ramp to the Intersection of MLK Jr. Blvd. at W. Gaston Street would remain in order to distribute eastbound Interstate traffic onto the downtown Savannah grid network. The I-16 westbound ramp would be relocated further south to intersect with W. Wayne Street instead of W. Taylor Street, as it does under its existing configuration.

The relocated I-16 eastbound and westbound ramps would have a 40 MPH design speed immediately west of MLK Jr. Blvd. These ramps would meet current speed design standards for freeway ramps per the most recent (2004) available American Association of State Highway and Transportation Officials (AASHTO) “Green Book.”

In order to facilitate traffic flow from the eastbound I-16 ramp onto the city roadway network, W. Alice would be converted to one-way operation eastbound for two blocks. The intersection of W. Alice Street at Montgomery Street would be signalized and allow two eastbound lanes to turn left onto Montgomery Street, which would also be converted to one-way northbound operation at the intersection. Montgomery Street would then have two northbound lanes that would carry traffic to the intersection at W. Liberty Street.

W. Wayne Street would be converted to one-way operation in the westbound direction to facilitate traffic leaving downtown wishing to access I-16. Since W. Taylor Street would no longer serve to carry traffic to the I-16 westbound entrance ramp, it would be converted back to two-way operation with a right-in right-out intersection at MLK Jr. Blvd.

As shown in Figure 3-2, Alternative 2 would also allow several city street connections to be reestablished. The sections of W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd and Montgomery Street were severed by the original construction of the I-16 flyover ramp. Alternative 2 would allow these roads to be reestablished, allowing for improved vehicular and pedestrian mobility and connectivity within the study area.

Figure 3-1: Alternative 1

Figure 3-2: Alternative 1 (2030) Peak Hour Traffic Volumes

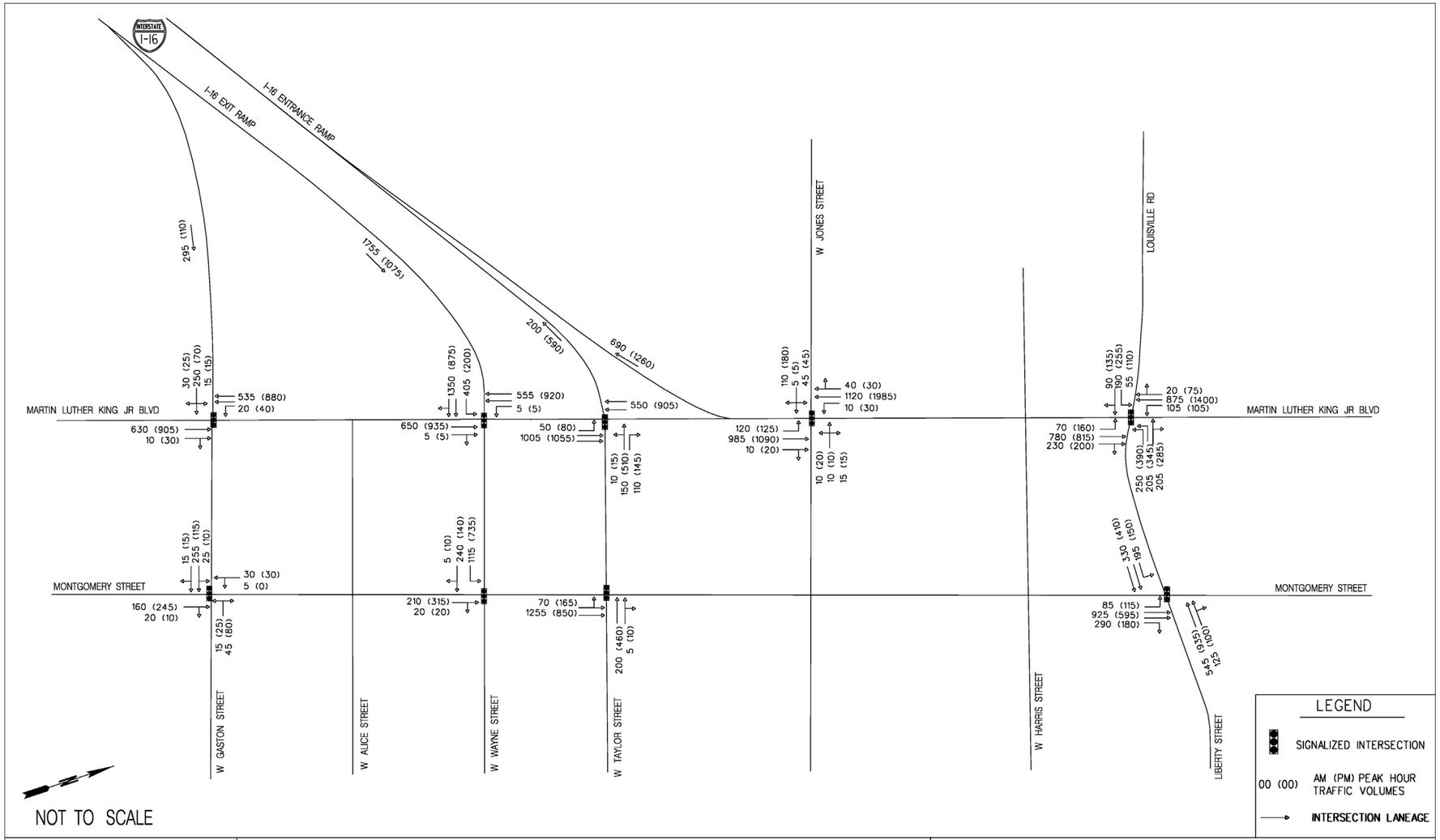
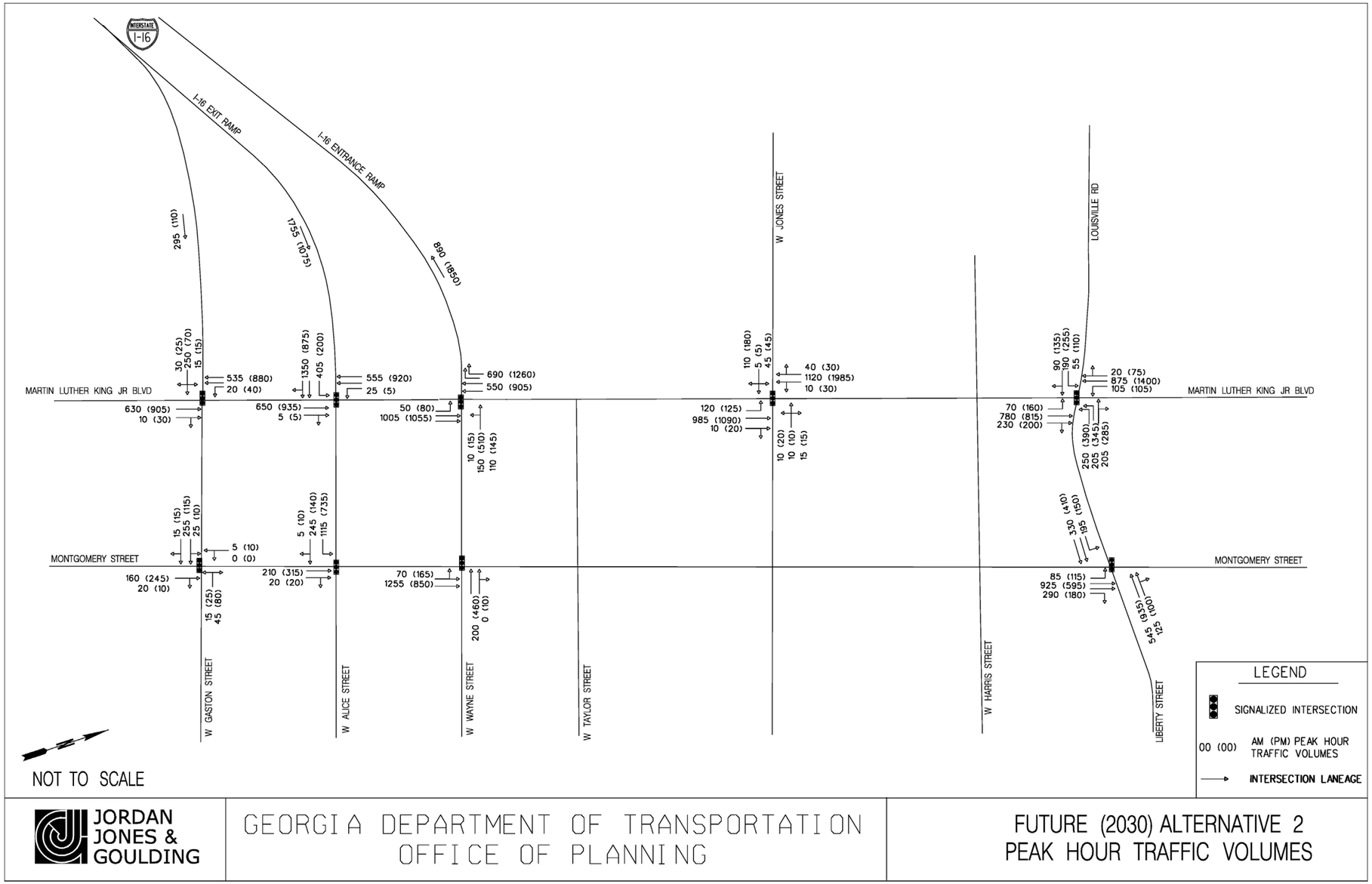


Figure 3-3: Alternative 2

Figure 3-4: Alternative 2 (2030) Peak Hour Traffic Volumes



By tying into the existing roadway network, this alternative would provide more choices by which eastbound traffic could enter the downtown roadway system. The existing I-16 flyover ramp funnels most of this traffic to the intersection of Montgomery Street at W. Liberty Street, where commuters can either go straight, or turn right or left to enter the roadway network. Figure 3-4 (see page 3-5) presents the Alternative 2 (2030) peak hour traffic volumes.

3.3 *Alternative 3*

Alternative 3 is presented in Figure 3-5 (see page 3-7). Alternative 3 is noticeably different from Alternatives 1 and 2. Alternative 3 also removes the I-16 eastbound exit flyover ramp to Montgomery Street but utilizes the existing W. Gaston Street ramp as the only access point to the downtown roadway network. This ramp would remain a two-lane ramp widening to four lanes at the intersection with MLK Jr. Blvd. This intersection would carry two through lanes eastbound onto W. Alice Street, and provide left and right turn lanes onto MLK Jr. Blvd. The I-16 westbound ramp would be relocated further south to intersect with W. Alice Street.

The relocated I-16 eastbound and westbound ramps would have 55 MPH design speeds immediately west of MLK Jr. Blvd. These ramps would meet current speed design standards for freeway ramps per the most recent (2004) available American Association of State Highway and Transportation Officials (AASHTO) “Green Book.”

Since W. Gaston Street is already a one-way eastbound roadway, it would simply need to be striped for two lanes eastbound instead of one. This could be accomplished without widening the existing roadway. The intersection of W. Gaston Street at Montgomery Street would be signalized and allow two eastbound lanes to turn left onto Montgomery Street, which would also be converted to one-way northbound operation at this intersection. Montgomery Street would then have two northbound lanes that would carry traffic to the intersection at W. Liberty Street.

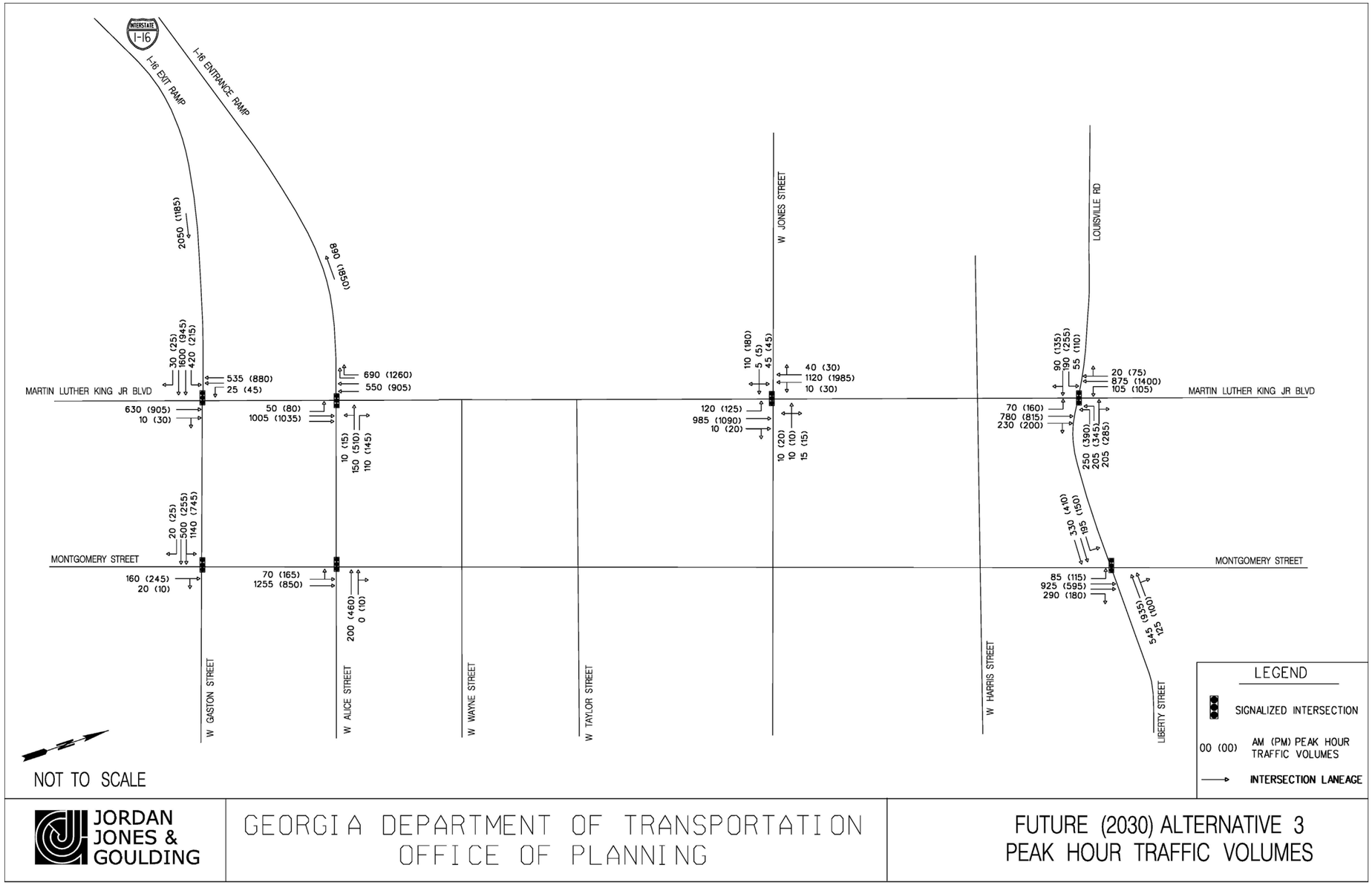
W. Alice Street would be converted to one-way operation in the westbound direction to facilitate traffic leaving downtown wishing to access I-16. Since W. Taylor Street would no longer serve to carry traffic to the I-16 westbound entrance ramp, it would be converted back to two-way operation with a right-in right-out intersection at MLK Jr. Blvd.

As shown in Figure 3-5 (see page 3-7), this alternative would also allow several city street connections to be reestablished. The sections of W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd and Montgomery Street were severed by the original construction of the I-16 flyover ramp. Alternative 3 would allow these roads to be reestablished, allowing for improved vehicular and pedestrian mobility and connectivity within the study area.

By tying into the existing roadway network, this alternative would provide more choices for eastbound traffic to enter the downtown roadway system. The existing I-16 flyover ramp funnels most of this traffic to the intersection of Montgomery Street at W. Liberty Street, where commuters can either go straight, turn right or left to enter the roadway network. Figure 3-6 (see page 3-8) presents the Alternative 3 (2030) peak hour traffic volumes.

Figure 3-5: Alternative 3

Figure 3-6: Alternative 3 (2030) Peak Hour Traffic Volumes



4 Evaluation of Alternatives

4.1 *Evaluation Criteria*

In order to evaluate the relative performance of each alternative with respect to each other as well as the No-Build scenario, several evaluation criteria were selected. These include quantitative and qualitative factors that highlight the differences between each alternative. These criteria are as follows:

- **Intersection Level of Service and Delay:** Synchro 7 was utilized to determine the average intersection delay and LOS for each alternative in 2030. The alternatives were evaluated by their relative performance against each other as well as the No-Build scenario.
- **Queuing at I-16 Eastbound Exit Ramp Terminus.** Synchro 7 and SimTraffic were utilized to determine the average (50th percentile) queues that would occur on this ramp for each alternative in 2030. The alternatives were evaluated by their relative performance against each other as well as the No-Build scenario.
- **Impact to Historic Resources:** Each alternative was studied to determine if it would cause an adverse effect to the Savannah Historic District.
- **Ability to Reestablish City Block and Street System:** A primary purpose of this project would be to reestablish the downtown city blocks and streets that were severed by the I-16 flyover. How well each alternative accomplishes this was evaluated.
- **Provision for Redevelopment:** This project would remove the I-16 flyover, which is viewed as an impediment to redevelopment. How well each alternative provides developable land was evaluated.
- **Cost:** Detailed construction cost estimates were prepared for each alternative. Construction of each alternative is expected to occur within existing right of way. Preliminary engineering costs were estimated at 10% of construction costs. A 20% contingency was added to account for unforeseen fluctuations in construction costs and utility relocation costs. All costs presented are in 2008 dollars.

4.2 *Evaluation of Alternative 1*

Alternative 1: Intersection Level of Service and Delay

The level of service and average intersection delay results for Alternative 1 are presented on this page in Table 4-1. This table shows that all intersections operate at acceptable LOS with the exception of the intersection of MLK Jr. Blvd. at W Liberty Street in the PM peak hour. As in the 2030 No-Build scenario, this intersection is unable to accommodate the 2030 traffic volumes without significant delay. Since the alignment of the I-16 eastbound ramp has little influence on this intersection, the failing conditions in the PM peak hour cannot be attributed to the alignment of Alternative 1. Although this intersection will need improvements in the future, they are not part of the scope or purpose of this project.

Table 4-1: Alternative 1 (2030) LOS and Delay

	2030 Build Alternative 1				2030 No-Build			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
MLK JR Blvd @ I-16 Exit-Ramp/W Gaston St	17.1	B	6.9	A	25.2	C	13.1	B
MLK JR Blvd @ I-16 Exit-Ramp/W Wayne St	26.9	C	27.4	C				
MLK JR Blvd @ I-16 On-Ramp/W Taylor St	8.5	A	20.2	C	6.4	A	42.5	D
MLK JR Blvd @ W Jones St	7.3	A	26.3	C	4.8	A	42.3	D
MLK JR Blvd @ W Liberty St	39.6	D	138.5	F	35.3	C	140.8	F
Montgomery St @ W Liberty St	23.8	C	22.8	C	23.3	C	23.0	C
Montgomery St @ W Taylor St	23.8	C	25.5	C	14.1	A/B*	206.9	A/F*
Montgomery St @ W Wayne St	42.5	D	28.6	C				
Montgomery St @ W Gaston St*	12.1	A/B*	11.6	A/B*	15.0	A/C*	13.2	A/B*

*unsignalized intersection (LOS given is for main street/side street, delay given for side street)

Alternative 1: Queuing at I-16 Eastbound Exit Ramp Terminus

Table 4-2 (below) presents the results of the queuing analysis for the I-16 eastbound terminus at the intersection of MLK Jr. Blvd and W. Wayne Street. As this table shows, the average (50th percentile) queues for Alternative 1 are longer than for the No-Build Condition.

Table 4-2: Alternative 1 (2030) I-16 EB Exit Ramp Queue Analysis

	2030 Build Alternative 1		2030 No-Build	
	AM Peak	PM Peak	AM Peak	PM Peak
	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)
I-16 Eastbound Exit Ramp Terminus	530	415	445	320

Alternative 1: Impact to Historic Resources

Alternative 1 is not expected to adversely affect the Savannah Historic District. Since the I-16 flyover is not a contributing feature of the historic district, its removal would not be deemed an adverse effect. All construction of the reconfigured I-16 ramps would take place with the existing right of way and outside the historic district. Work within the existing street network would include milling, overlaying, restriping, and the installation of traffic signals. This work would likely take place within the existing roadway right of way. It was the opinion of several historians on the consulting staff, who are prequalified with GDOT, that this action would not be considered an adverse effect to the historic district.

Alternative 1: Ability to Reestablish City Block and Street System

As shown in Figure 3-1 (see page 3-2), the removal of the I-16 flyover ramp under Alternative 1 would remove this limited access, elevated roadway facility from four city blocks. The removal of this physical and visual barrier would return these blocks to their original form. In addition to the reestablishment of four city blocks, W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd. and Montgomery Street could be reconnected, allowing for improved vehicular and pedestrian access and mobility within the study area. Since the intersection of Berrien Street at MLK Jr. Blvd. would be so close to the I-16 entrance ramp, this intersection would be limited to right-in right-out access on Berrien Street.

Alternative 1: Provision for Redevelopment

As mentioned in the preceding paragraph, Alternative 1 would reestablish four city blocks by removing the I-16 flyover ramp. In addition to utilizing much of the available land, the I-16 flyover ramp bisected these blocks, disrupting the historic and urban composition of this section of downtown Savannah. It is believed that the removal of this physical and visual barrier would help facilitate redevelopment and restore these four blocks to their original form.

Alternative 1: Cost

Alternative 1 is the least expensive alternative since it proposes to leave the I-16 westbound ramp in its existing location. The construction cost includes the removal and relocation of the I-16 flyover ramp, the repaving and restriping of affected roadways, as well as the costs associated with reestablishing the roadway connections that were severed by the original construction of the I-16 flyover ramp.

Preliminary Engineering:	$ 500,000
Right-of-Way:	$ 0
Construction Cost:	$6,000,000
Contingency (20%):	$1,250,000
Alternative 1 Total:	**$7,750,000**

4.3 *Evaluation of Alternative 2*

Alternative 2: Intersection Level of Service and Delay

The level of service and average intersection delay results for Alternative 2 are presented below in Table 4-3. This table shows that all intersections operate at acceptable LOS with the exception of the intersection of MLK Jr. Blvd. at W. Liberty Street in the PM peak hour. As in Alternative 1 and the 2030 No-Build scenario, this intersection is unable to accommodate the 2030 traffic volumes without significant delay. Since the alignment of the I-16 eastbound ramp has little influence on this intersection, the failing conditions in the PM peak hour cannot be attributed to the alignment of Alternative 2.

Table 4-3: Alternative 2 (2030) LOS and Delay

	2030 Build Alternative 2				2030 No-Build			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
MLK JR Blvd @ I-16 Exit-Ramp/W Gaston St	17.2	B	6.3	A	25.2	C	13.1	B
MLK JR Blvd @ I-16 Exit-Ramp/W Alice St	26.7	C	26.1	C				
MLK JR Blvd @ I-16 On-Ramp/W Wayne St	7.5	A	30.2	C				
MLK JR Blvd @ W Jones St	7.0	A	36.4	D	4.8	A	42.3	D
MLK JR Blvd @ W Liberty St	39.5	D	144.4	F	35.3	C	140.8	F
Montgomery St @ Liberty St	24.3	C	23.0	C	23.3	C	23.0	C
Montgomery St @ W Wayne St	15.3	B	30.6	C				
Montgomery St @ W Alice St	41.7	D	34.3	C				
Montgomery St @ W Gaston St*	11.6	A/B*	11.4	A/B*	15.0	A/C*	13.2	A/B*

*unsignalized intersection (LOS given is for main street/side street, delay given for side street)

Alternative 2: Queuing at I-16 Eastbound Exit Ramp Terminus

Table 4-4 (see page 4-3) presents the results of the queuing analysis for the I-16 eastbound terminus at the intersection of MLK Jr. Blvd and W. Wayne Street. As this table shows, the average (50th percentile) queues for Alternative 2 are longer than for the No-Build Condition and almost identical to Alternative 1.

Table 4-4: Alternative 2 (2030) I-16 EB Exit Ramp Queue Analysis

	2030 Build Alternative 2		2030 No-Build	
	AM Peak	PM Peak	AM Peak	PM Peak
	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)
I-16 Eastbound Exit Ramp Terminus	525	410	445	320

Alternative 2: Impact to Historic Resources

Alternative 2 is not expected to adversely affect the Savannah Historic District. Since the I-16 flyover is not a contributing feature of the historic district, its removal would not be deemed an adverse effect. In fact, its removal would likely be viewed as benefit to the historic district by the Georgia State Historic Preservation Officer as well as historic groups in Savannah. All construction of the reconfigured I-16 ramps would take place with the existing right of way and outside the historic district. Work within the existing street network would include milling, overlaying, restriping, and the installation of traffic signals. This work would likely take place within the existing roadway right of way. It was the opinion of several historians on the consulting staff, who are prequalified with GDOT, that this action would not be considered an adverse effect to the historic district.

Alternative 2: Ability to Reestablish City Block and Street System

As shown in Figure 3-3 (see page 3-4), the removal of the I-16 flyover ramp under Alternative 2 would remove this limited access, elevated roadway facility from four city blocks. The removal of this physical and visual barrier would return these blocks to their original form. By relocating the I-16 westbound entrance ramp to the south, this alternative could also reestablish an additional whole city block on the west side of MLK Jr. Blvd. between the relocated ramp and Berrien Street. In addition to the reestablishment of these five city blocks, W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd. and Montgomery Street could be reconnected, allowing for improved vehicular and pedestrian access and mobility within the study area. With the I-16 westbound ramp relocated further south, the intersection of MLK Jr. at Berrien Street would be a full access intersection under Alternative 2.

Alternative 2: Provision for Redevelopment

As mentioned in the preceding paragraph, Alternative 2 would reestablish five city blocks by removing the I-16 flyover ramp and relocating the I-16 westbound ramp further south. In addition to utilizing much of the available land, the I-16 flyover ramp bisected these blocks, disrupting the historic and urban composition of this section of downtown Savannah. It is believed that the removal of this physical and visual barrier, as well as the relocation of the I-16 westbound ramp, would help facilitate redevelopment and restore these five blocks to their original form.

Alternative 2: Construction Cost

Unlike Alternative 1, Alternative 2 includes the relocation of the I-16 westbound ramp further south of its existing location. This ramp relocation makes this alternative more expensive than Alternative 1. The construction cost includes the removal and relocation of the I-16 flyover ramp, the repaving and restriping of affected roadways, as well as the costs associated with reestablishing the roadway connections that were severed by the original construction of the I-16 flyover ramp.

Preliminary Engineering:	$ 750,000
Right-of-Way:	$ 0
Construction Cost:	$7,500,000
Contingency (20%):	$1,500,000
Alternative 2 Total:	**$9,750,000**

4.4 *Evaluation of Alternative 3*

Alternative 3: Intersection Level of Service and Delay

The level of service and average intersection delay results for Alternative 2 are presented in Table 4-5 (see page 4-4). This table shows that all intersections operate at acceptable LOS with the exception of the intersection of MLK Jr. Blvd. at W. Liberty Street in the PM peak hour. As with the 2030 No-Build scenario, this intersection is unable to accommodate the 2030 traffic volumes without significant delay. Since the alignment of the I-16 eastbound ramp has little influence on this intersection, the failing conditions in the PM peak hour cannot be attributed to the alignment of Alternative 3. The LOS results for the I-16 eastbound exit ramp intersection differ from the other alternatives because Alternative 3 utilizes only one exit ramp to MLK Jr. Blvd., whereas Alternatives 1 and 2 utilize the existing ramp at MLK Jr. Blvd. and W. Gaston Street, as well as the relocated flyover ramp at W. Wayne Street and W. Alice Street respectively. Since all I-16 eastbound traffic would exit to W. Gaston Street, this intersection would experience LOS D conditions. Although this is worse than the other two alternatives, LOS D is still acceptable for an urban intersection such as this.

Alternative 3: Queuing at I-16 Eastbound Exit Ramp Terminus

Table 4-6 (see page 4-4) presents the results of the queuing analysis for the I-16 eastbound terminus at the intersection of MLK Jr. Blvd and W. Wayne Street. As this table shows, the average (50th percentile) queues for Alternative 3 are longer than for the No-Build Condition and slightly longer than Alternative 1 or 2.

Table 4-5: Alternative 3 (2030) LOS and Delay

	2030 Build Alternative 3				2030 No-Build			
	AM Peak		PM Peak		AM Peak		PM Peak	
	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
MLK JR Blvd @ I-16 Off-Ramp/W Gaston St	33.9	D	26.9	C	25.2	C	13.1	B
MLK JR Blvd @ I-16 On-Ramp/W Alice St	6.5	A	32.9	D				
MLK JR Blvd @ W Jones St	7.6	A	36.0	D	4.8	A	42.3	D
MLK JR Blvd @ W Liberty St	34.1	D	144.5	F	4.8	A	42.3	D
Montgomery St @ Liberty St	29.6	C	24.8	C	35.3	C	140.8	F
Montgomery St @ W Alice St	20.9	B	31.6	D				
Montgomery St @ W Gaston St	22.7	B	27.1	B	15.0	A/C*	13.2	A/B*

*unsignalized intersection (LOS given is for main street/side street, delay given for side street)

Table 4-6: Alternative 2 (2030) I-16 EB Exit Ramp Queue Analysis

	2030 Build Alternative 3		2030 No-Build	
	AM Peak	PM Peak	AM Peak	PM Peak
	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)	50th Percentile Queue(ft)
I-16 Eastbound Exit Ramp Terminus	585	440	445	320

Alternative 3: Impact to Historic Resources

Alternative 3 is the only Alternative that has the potential to adversely affect the Savannah Historic District. By relocating all I-16 eastbound traffic to the MLK Jr. Blvd. and W. Gaston Street intersection, this alternative would direct heavy traffic volumes onto W. Gaston Street, which currently has exposed historic brick paving. In order to safely accommodate the heavy traffic volumes, the brick pavement would need to be milled and overlaid with a modern pavement surface. Since this brick pavement is considered historic and a contributing feature of the Savannah Historic District, it was the opinion of several historians on the consulting staff, who are prequalified with GDOT, that this milling and overlaying with standard asphalt would likely be considered an adverse effect to the Historic District.

Several options exist to mitigate this potential historic impact: First, the pavement could be replaced with a stamped concrete that resembles the original appearance of the pavement. This option may mitigate the impact sufficiently so as to avoid an adverse effect determination. A second option would be to employ photographic mitigation. This photo-mitigation would preserve images of the historic roadway. If these mitigation measures fail to avoid an adverse effect determination, a Section 4(f) analysis would be required by FHWA. A Section 4(f) analysis would need to demonstrate that there are no feasible and prudent alternatives to the construction of Alternative 3. While a Section 4(f) analysis would not preclude Alternative 3, it would make its implementation more difficult. Since this is a planning level document, further design and environmental studies would be necessary to make a final determination regarding impacts to historic resources.

Alternative 3: Ability to Reestablish City Block and Street System

As shown in Figure 3-5 (see page 3-7), the removal of the I-16 flyover ramp under Alternative 3 would remove this limited access, elevated roadway facility from four city blocks. The removal of this physical and visual barrier would return these blocks to their original form. By relocating the I-16 westbound entrance ramp to the south, this alternative could also reestablish approximately three entire city blocks on the west side of MLK Jr. Blvd. between the relocated ramp and Berrien Street. In addition to the reestablishment of these six city blocks, W. Charlton Street, W. Jones Street, and Berrien Street between MLK Jr. Blvd. and Montgomery Street could be reconnected, allowing for improved vehicular and pedestrian access and mobility within the study area. With the I-16 westbound ramp relocated further south the intersection of MLK Jr. at Berrien Street would be a full access intersection under Alternative 3.

Alternative 3: Provision for Redevelopment

As mentioned in the preceding paragraph, Alternative 3 would reestablish six city blocks by removing the I-16 flyover ramp and relocating the I-16 westbound ramp further south. In addition to utilizing much of the available land, the I-16 flyover ramp bisected these blocks, disrupting the historic and urban composition of this section of downtown Savannah. It is believed that the removal of this physical and visual barrier, as well as the relocation of the I-16 westbound ramp would help facilitate redevelopment and restore these six blocks to their original form.

Alternative 3: Construction Cost

Alternative 3 utilizes the alignment of the existing I-16 eastbound ramp to MLK Jr. Blvd. This allows Alternative 3 to have a lower cost than Alternative 2, but the relocation of the I-16 westbound ramp still makes this alternative more expensive than Alternative 1.

Preliminary Engineering:	$ 750,000
Right-of-Way:	$ 0
Construction Cost:	$6,750,000
Contingency (20%):	$1,250,000
Alternative 3 Total:	**$8,750,000**

4.5 *Alternatives Evaluation Summary*

In order to provide an effective evaluation, the alternatives were compared with one another, and more importantly, with the No Build scenario, which provided a baseline by which the effectiveness of each alternative could be evaluated. The alternatives and the No-Build scenario were evaluated using the six criteria presented in Section 4-1. Tables 4-7 through 4-12 on this page, present these criteria and the associated scoring system used to evaluate each alternative. The criteria are scored numerically, with 5 representing the best attainable score. Table 4-13 (see page 4-6) presents the results and ranking of the alternatives evaluation.

Table 4-7: 2030 Intersection LOS and Delay Criteria & Scoring

Intersections LOS and Delay	Scoring
0 Intersections at LOS E or F	5
1 Intersections at LOS E or F	4
2 Intersections at LOS E or F	3
3 Intersections at LOS E or F	2
4 Intersections at LOS E or F	1

Table 4-8: 2030 Interstate Ramp Queuing Criteria & Scoring

Average Queuing on I-16 Eastbound Ramp Terminus	Scoring
0-300	5
300-400	4
400-500	3
500-600	2
600-700	1

Table 4-9: Impact to Historic Resources Criteria & Scoring

Impact to Historic Resources	Scoring
No Impact	5
Potential Impact	4
Likely Impact	3
Minor Impact	2
Significant Impact	1

Table 4-10: Potential to Reestablish City Block and Street System Criteria & Scoring

Potential to Reestablish City Block and Street System	Scoring
7 Blocks, 5 Streets	5
6 Blocks, 4 Streets	4
5 Blocks, 3 Streets	3
4 Blocks, 3 Streets	2
1-3 Blocks, 1-3 Streets	1
0 Blocks, 0 Streets	0

Table 4-11: Provision for Redevelopment Criteria & Scoring

Provision for Redevelopment	Scoring
7 Blocks	5
6 Blocks	4
5 Blocks	3
4 Blocks	2
3 Blocks	1
None	0

Table 4-12: Project Cost (in 2008 dollars) Criteria & Scoring

Cost	Scoring
$0 - $2M	5
$2m - $4M	4
$4M - $6M	3
$6M - $8M	2
$8M -$10M	1

Table 4-13: Alternatives Evaluation Comparison

	2030 Intersection LOS and Delay	2030 Average Queuing of I-16 Eastbound Ramp Terminus	Impact to Historic Resources	Potential to Reestablish City Block and Street System	Provision for Redevelopment	Project Cost (in 2008 dollars)	Overall Score	Project Ranking
Alternative 1	All LOS D or better, with exception of MLK @ Liberty	AM - 530' PM - 415'	None Anticipated	4 City Blocks 3 Reconnected Streets	4 Existing Blocks	$7,750,000	**17**	**3**
	4	**2**	**5**	**2**	**2**	**2**		
Alternative 2	All LOS D or better, with exception of MLK @ Liberty	AM - 525' PM - 410'	None Anticipated	5 City Blocks 3 Reconnected Streets	4 Existing Blocks 1 New Block	$9,750,000	**18**	**2**
	4	**2**	**5**	**3**	**3**	**1**		
Alternative 3	All LOS D or better, with exception of MLK @ Liberty	AM - 585' PM - 440'	Likely Impact	7 City Blocks 5 Reconnected Streets	4 Existing Blocks 3 New Blocks	$8,750,000	**20**	**1**
	4	**2**	**3**	**5**	**5**	**1**		
No-Build	All LOS D or better, with exception of MLK @ Liberty and Montgomery @ W. Taylor	AM - 445' PM - 320'	None	None	None	$0	**16**	**N/A**
	3	**3**	**5**	**0**	**0**	**5**		

5 Conclusions

The I-16 Terminus/MLK Flyover Analysis and Concept Development Study was undertaken to analyze the potential benefits and impacts associated with the removal of the I-16 eastbound flyover ramp over MLK Jr. Blvd. When this flyover ramp was originally constructed, it severed multiple downtown Savannah city blocks and streets. At various times over the past several years, different local individuals and organizations have contemplated the pros and cons of removing this ramp. Some believe that by removing the flyover, the blocks and city streets, once bisected by the ramp, could be reestablished to provide redevelopment opportunities.

Three concept alternatives were developed to remove the I-16 eastbound flyover ramp and realign the I-16 ramps to tie into the downtown roadway network at MLK Jr. Boulevard. The results of this study indicate that all three alternatives would allow these ramps and the surrounding intersections to operate at acceptable levels of service in 2030. Furthermore, the I-16 eastbound ramp would only experience slightly longer queuing at its terminus than it would under its existing configuration.

All three alternatives would provide significant benefit to the city blocks that the I-16 flyover ramp currently bisects. By removing this physical and visual barrier, all alternatives would reestablish these city blocks as well as their streets. The reestablishment of these streets would improve vehicular and pedestrian mobility and connectivity within the study area. It is also believed that the reestablishment of these blocks and streets would help facilitate redevelopment and restore these blocks to their original form.

All alternatives, as well as the No-Build scenario, were evaluated and compared using several quantitative and qualitative criteria. As presented in Table 4-13 (see page 4-6), all alternatives ranked higher than the No-Build scenario. The highest ranked alternative was Alternative 3 (see page 3-7). This alternative garnered the highest overall score, due mainly to the number of blocks and streets it would reestablish and reconnect. However, Alternative 3 was the only alternative that would likely adversely affect the Savannah Historic District. While this possible historical impact could serve to preclude the construction of this alternative, detailed environmental and historical studies would need to be completed as part of the NEPA phase to determine if the alternative could be implemented.

Despite this potential historical impact, Alternative 3 was the highest performing alternative because it would reestablish approximately seven city blocks and reconnect five city streets. By reestablishing these blocks and streets, this alternative would also have the highest potential to attract redevelopment.

This study identified and analyzed three viable alternatives that would allow for the removal of the I-16 eastbound flyover ramp over MLK Jr. Blvd. While Alternative 3 was the highest performing alternative in this study, the selection of a Preferred Alternative would occur during the NEPA process of the preliminary engineering (PE) phase of this potential project. This study demonstrated that all three alternatives would allow for the removal of the I-16 flyover ramp without a significantly detrimental effect on the operation of the I-16 ramps or the adjacent roadway network.

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