Russell Parkway Extension Study

October 2010

Georgia Department of Transportation
Office of Planning

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Executive Summary

The Georgia Department of Transportation (GDOT) has prepared the Russell Parkway Extension Study to determine the transportation need for, and the alignment and ending termini of, the extension of Russell Parkway, which is an existing project in the WRATS 2030 LRTP and a programmed GDOT project (PI# 363763). The intent of this study was to identify the highest performing alignment alternative with respect to configuration, cost, and transportation benefits. The results of this study will be forwarded to the Warner Robins Metropolitan Planning Organization (MPO) and to Peach County for further consideration.

The purpose of the Russell Parkway Extension was to satisfy the transportation needs of east-west mobility, access and connectivity, and safety in the study area. Four build alternatives were developed to address these needs and consider all feasible alignments, configurations, and connections to the existing roadway network. Alternative 1 would extend Russell Parkway west from its current terminus at Housers Mill Road to tie into John E Sullivan Road, and extend John E Sullivan Road south to SR 96. Alternative 2 would extend Russell Parkway west to Lakeview Road, and then extend to the southwest before turning to the northwest to intersect with SR 49 at Lilly Creek Road. Alternative 3 would extend Russell Parkway west to Lakeview Road, and then extend southwest before turning south to intersect with SR 96 at Brock Road. Alternative 4 would extend Russell Parkway to Lakeview Road, and then utilize the existing Lakeview and Powersville Roads to provide a connection to SR 247C. These alternatives were considered in their environmental and cultural context for potential negative impacts to their surroundings.

Five evaluation criteria were established in order to compare the relative performance of each alternative. The first three criteria address the identified need and purpose of the project, and the final two consist of total project cost and benefit/cost ratio. Study alternatives, including the No-Build Alternative, were assigned a score based on how well they addressed each criterion, and then ranked by their composite score.

Alternative 2 ranked first out of the five alternatives studied. Alternative 2 was the only alternative to offer new access to collector and residential roadways, as well as principal arterials, and offered substantial mobility and safety benefits. At $18.9M, Alternative 2 is the most expensive of the alternatives, based on planning-level cost estimates, but has the second-highest benefit-cost ratio. Therefore, this study recommends that Alternative 2 be selected as the alignment for the Russell Parkway Extension as programmed in the GDOT Work Program.

Alternative 1 ranked third out of the five alternatives studied. This alternative offered minimal safety benefits and a relatively low benefit-cost ratio.

Alternative 3 ranked second out of the five alternatives studied. While this alternative provided many similar benefits to Alternative 1, it offered new access only to collector and residential roadways and minor arterials, and has a lower benefit-cost ratio.

Alternative 4 ranked fourth out of the five alternatives studied. This alternative offered minimal mobility, access and connectivity and safety benefits.

1. Introduction

In cooperation with Peach County, the Warner Robins Area Transportation Study (WRATS), and other planning partners, the Georgia Department of Transportation (GDOT) has prepared the Russell Parkway Extension Study. This study first examined the existing and future conditions within the study area in order to understand if a need and purpose for extending Russell Parkway exists. Once the need and purpose of the Russell Parkway Extension was defined, the study presented the four build condition alternatives that were developed to address the identified transportation needs along with the planning-level cost estimate of each alternative. These alternatives were then evaluated based on their impact to environmental and community resources, their transportation benefits, their benefit/cost ratio, and finally the ability of each alternative to address the need and purpose of the project.

The extension of Russell Parkway is an existing project in the WRATS 2030 LRTP and is a programmed GDOT project (PI# 363763). The purpose of this study is to determine the alignment and ending termini for the extension project. The results of this study will be forwarded to the Warner Robins Metropolitan Planning Organization (MPO) and to Peach County for further consideration.

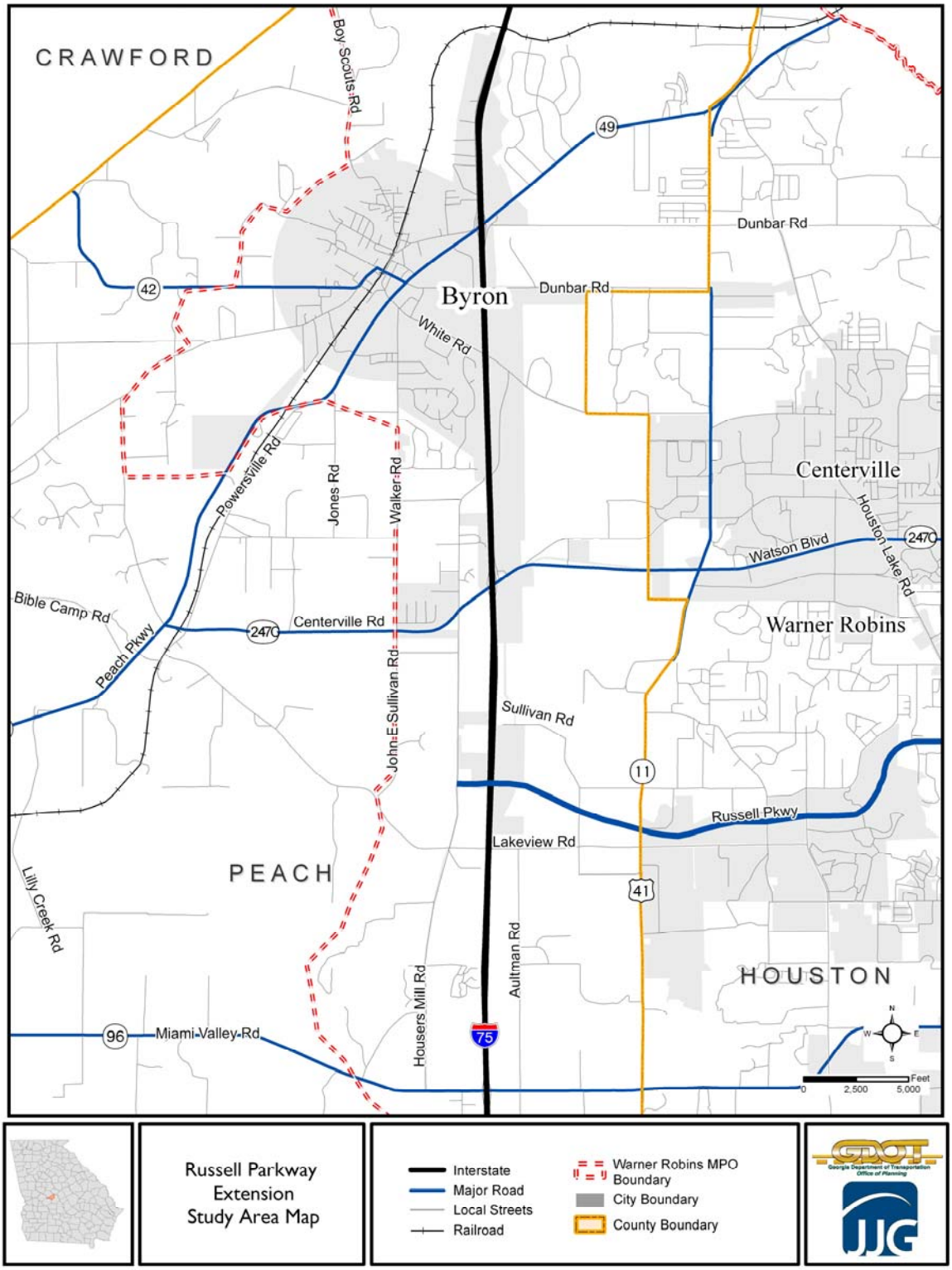
1.1 Study Area

The study area is generally defined as the northeastern portion of Peach County, including the City of Byron. The area is approximately bounded by the Peach County line to the north, SR 96 to the south, SR 49 to the west, and US 41 to the east. **Figure 1.1** on page 2 presents the study area map. While the study area consists of the extension alternatives and their immediate surroundings, the influence area of travel patterns affecting the alternatives is larger that this study area. For example, land use or development patterns north and south of the study area have the potential to influence travel patterns within the study area. Thus, for purposes of this study, much of the analysis and figures utilized in this study covers all of Peach County.

1.2 Study Process

The study was conducted in a series of phases from January 2009 to July 2010. The study began with a data-collection period, which was followed by an evaluation of existing socioeconomic and transportation conditions. A travel demand evaluation was then performed utilizing the travel demand model developed for the ongoing Southwest Georgia Multi-County Study. The travel demand model was utilized to analyze existing and future (2035) travel conditions within the study area. Input from local agencies, stakeholders, and the public regarding transportation needs and issues and development patterns was received. Utilizing the results of the existing and future conditions analysis as well as local input, the need and purpose of the Russell Parkway Extension was developed. A series of alternatives for the extension were proposed, refined, evaluated for transportation benefits, and examined for environmental impacts. Planning-level design, right-of-way, and construction cost estimates for each alternative were prepared. This final report presents the findings of this study. Throughout the study process, stakeholders and agency personnel have been involved in identifying issues and proposing solutions within the study area.

Figure 1.1: Study Area Map



2. Existing Conditions

2.1 Population

As depicted in **Table 2.1** below, between 1990 and 2000, Peach County increased population, adding almost 2,500 new residents, resulting in an annual growth rate of 1.1 percent during this period. The City of Byron in Peach County grew even more over the decade, growing by 27 percent from 2,276 residents in 1990 to 2,887 in 2000. Furthermore, Houston County, which serves as the economic engine for this area of middle Georgia, grew at almost the same rate as the City of Byron, with a 24 percent increase over the decade.

Table 2.1: Study Area Population Growth, 1990-2006

				1990 - 2000		2000 - 2006	
	1990	2000	2006	Percent Change	Annual Growth Rate	Percent Change	Annual Growth Rate
City of Byron	2,276	2,887	3,225	26.8%	2.4%	12.8%	1.9%
Peach County	21,189	23,668	24,785	11.7%	1.1%	4.7%	0.8%
Houston County	89,208	110,765	130,706	24.2%	2.2%	18.0%	2.8%
State of Georgia	6,478,216	8,186,453	9,363,941	26.4%	2.4%	14.4%	2.3%

Source: US Census, WRATS, GA DCA

These trends continued from 2000 to 2006, during which the average annual growth rates of the City of Byron (1.9 percent) and Houston County (2.8 percent) were comparable to the statewide growth trend of 2.3 percent per year. Peach County experienced growth of just below one percent per year, for a net addition of 1,117 residents.

The population density of Peach County, including the study area, is presented on **Figure 2.1** on page 4. As presented in Table 2.1 and shown in Figure 2.1, the area surrounding the possible extension of Russell Parkway has experienced steady residential growth over the past few decades. The extension would serve an area that has grown at a higher rate than the surrounding county. This residential growth is a primary cause for traffic congestion on the major roadways within the study area.

2.2 Employment

As depicted in **Table 2.2** on page 5, Peach County was home to approximately 7,900 jobs in 2006. In 2006, the City of Byron accounted for 13 percent of Peach County residents and 20 percent of its jobs. More importantly, Houston County was home to 6.8 times as many jobs as the whole of Peach County. With such a large number of jobs, Houston County represents a major destination for daily commuter traffic within middle Georgia.

Figure 2.1: Peach County Current Population Density (2006)

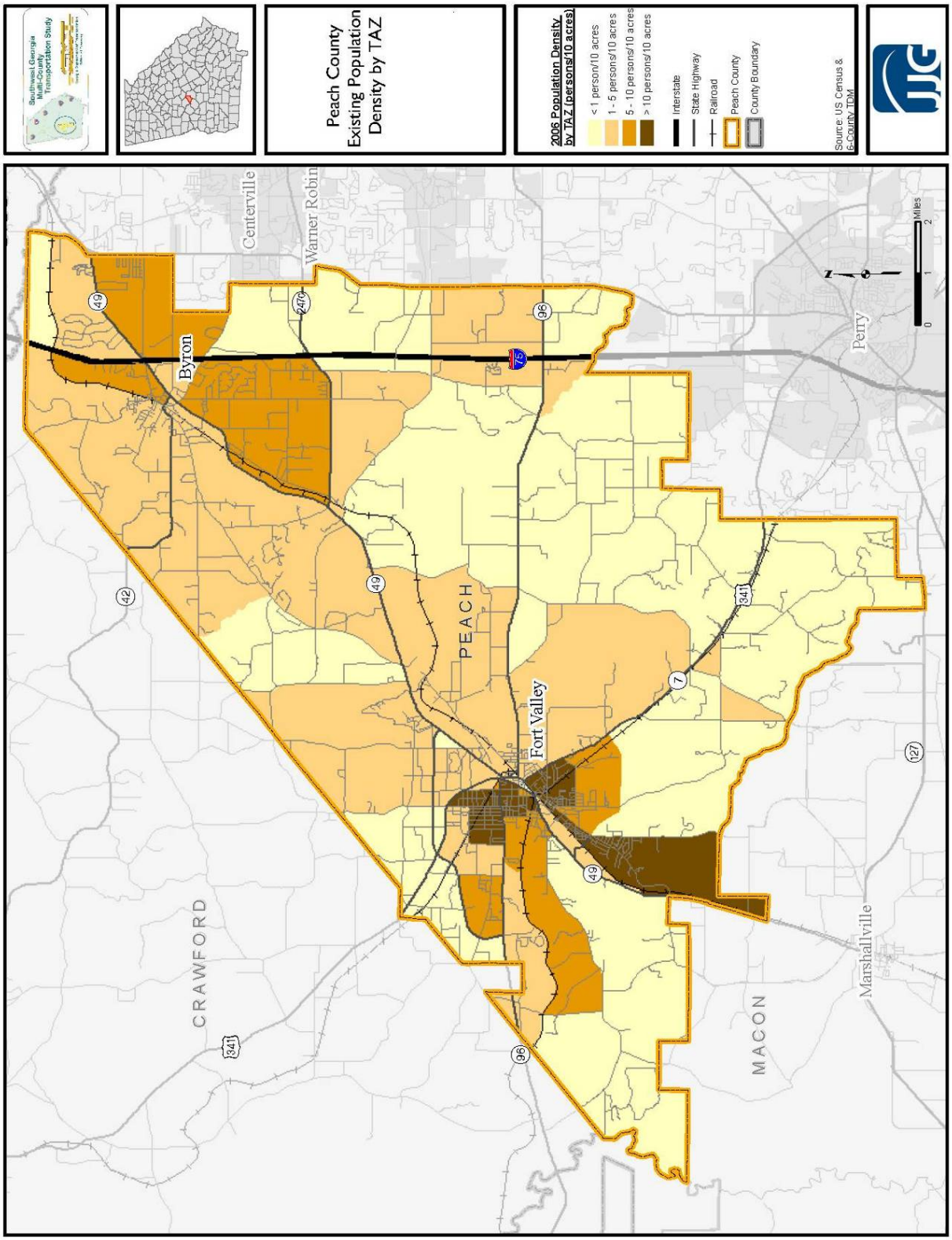


Table 2.2: Study Area Employment 2006

COUNTY	AMC	MFG	WTW	Retail	Service	TOTAL
City of Byron	79	317	48	198	880	1,563
Share of 2006 Employment	*5%*	*20%*	*3%*	*13%*	*50%*	
Peach County	727	1,861	353	1,026	3,933	7,901
Share of 2006 Employment	*9%*	*20%*	*6%*	*14%*	*51%*	
Houston County	3,309	8,124	1,276	6,135	34,477	54,149
Share of 2006 Employment	*6%*	*15%*	*2%*	*11%*	*64%*	

Note: AMC – Agricultural, Mining and Construction employment
MFG – Manufacturing employment
WTW – Wholesale, Trucking and Warehouse employment
Source: GDOL; U.S. Bureau of Labor Statistics

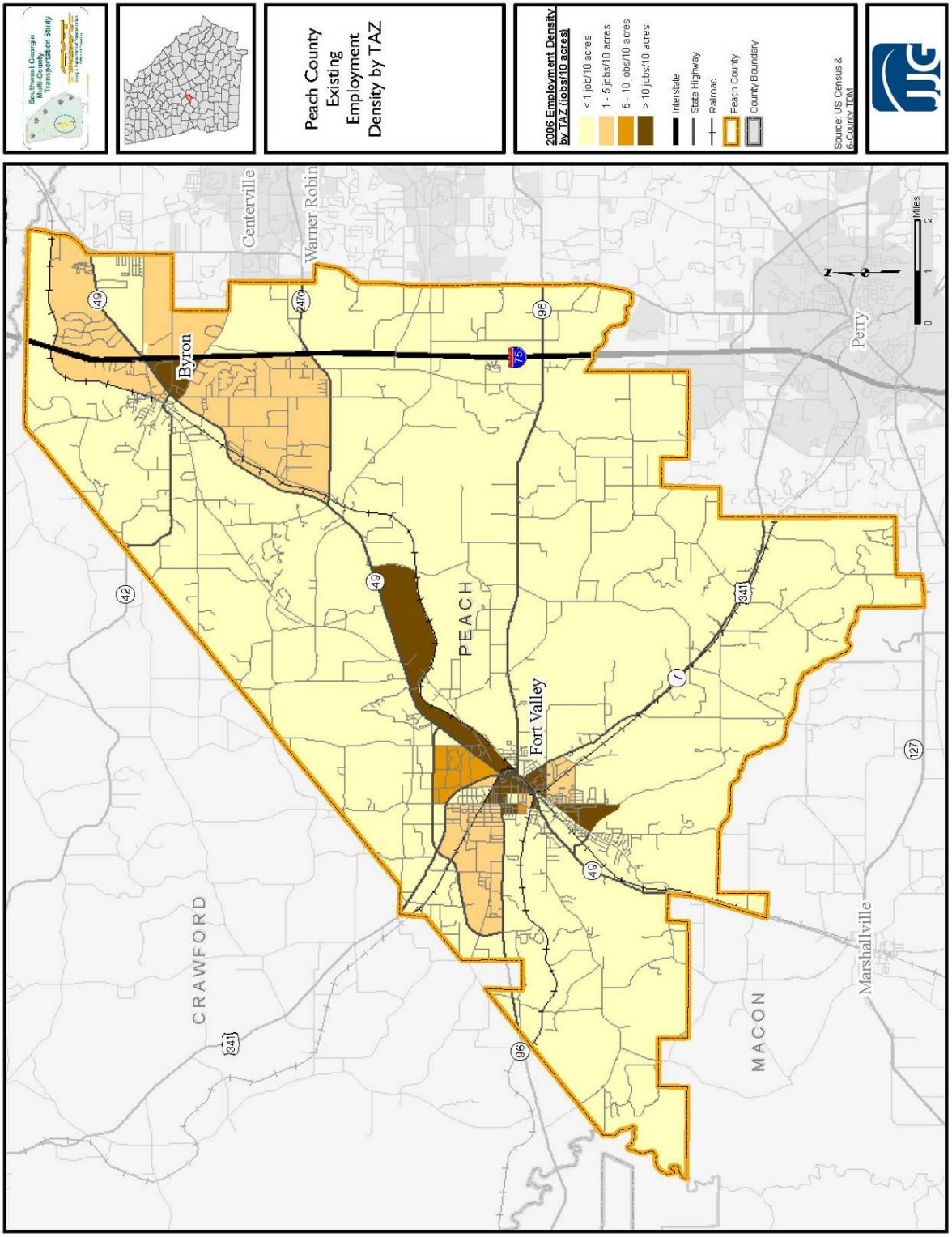
In 2006, the agriculture industry made up approximately four percent of jobs in Peach County, ranking sixth among county industries. Almost half of Peach County's employment was associated with the service-providing sector, which includes a significant share of accommodation and food services, and health care jobs. Retail trade and manufacturing industries are also significant in Peach County; together, they make up over one-third of jobs in the county. The county's top five employers are Advance Stores Co., Arriscraft International, Blue Bird Corporation, Fort Valley State University, and Fred's Stores of Tennessee.

Houston County's economy relies less on manufacturing than those of Byron and Peach County. Instead, 64 percent of Houston County's jobs are in the service sector. The Georgia Department of Labor reports that the largest employers in Houston County include Frito-Lay; Wal-Mart; Perdue Farms, Incorporated; Southeast Administrative Services; and Houston County Hospital Authority.

While 42.5 percent of Peach County residents were employed in Peach County, 20.0 percent of Peach County residents were employed in Houston County. Reciprocally, 18.3 percent of Houston County residents were employed in Peach County (GDOL Peach County 2008 Area Labor Profile.) That nearly one-fifth the employed population of Peach and Houston Counties crosses the county line for work highlights the need to maintain safe and efficient mobility between these two counties. The Russell Parkway Extension would be located in an area that would serve these trips.

As illustrated in **Figure 2.2** on page 6, the majority of jobs in Peach County can be found along state routes in Fort Valley and Byron. Approximately 2,500 acres in Peach County has an employment density of at least ten jobs per ten acres. The northern portion of the study area surrounding the City of Byron has higher employment densities than the southern portion.

Figure 2.2: Peach County Employment Density (2006)



2.3 Land Use

While much of Peach County is agricultural in nature, the study area for this report is predominantly residential and commercial. A map of existing land use in Peach County can be found in **Figure 2.3** on page 8. The land uses surrounding the potential Russell Parkway Extension correlate very closely with the population and employment data presented in the previous sections. As population and employment within and surrounding the study area has increased, so too has the land uses in the study area transitioned from agricultural to residential and commercial.

2.4 Roadway Characteristics

Functional classification is the process by which street and highway facilities are grouped into classes according to the character of traffic service that they are intended to provide. These classifications allow the safety of facilities across the state of Georgia to be evaluated relative to other facilities of similar design, traffic volumes and purpose. Classifications also determine valid funding sources for roadway projects. **Table 2.3** below lists the functional classifications of major roadways in the Russell Parkway Extension study area. A map of the functional classifications of Peach County roadways can be found in **Figure 2.4** on page 9.

Table 2.3: Functional Classifications of Major Study Area Roadways

Functional Classification	Roadway
Rural Interstate	I-75
Rural Principal Arterial	SR 49
Urban Principal Arterial	Russell Parkway
Rural Minor Arterial	SR 247C & SR 96
Rural Major Collector	Lakeview Road & Housers Mill Road
Rural Minor Collector	Lilly Creek Road

Source: GDOT Roadway Classification data

As can be seen from **Figure 2.4**, roadways in Peach County with urban classifications, with the exception of Russell Parkway, are found in and around Peach County. In fact, the county has many more miles of rural roadway than urban, with approximately 294 miles of rural roadways and 81miles of urban roadways. **Table 2.4** on page 10 presents the mileage and vehicle miles travelled (VMT) for each functional classification in Peach County.

Figure 2.3: Peach County Land Use Map (2006)

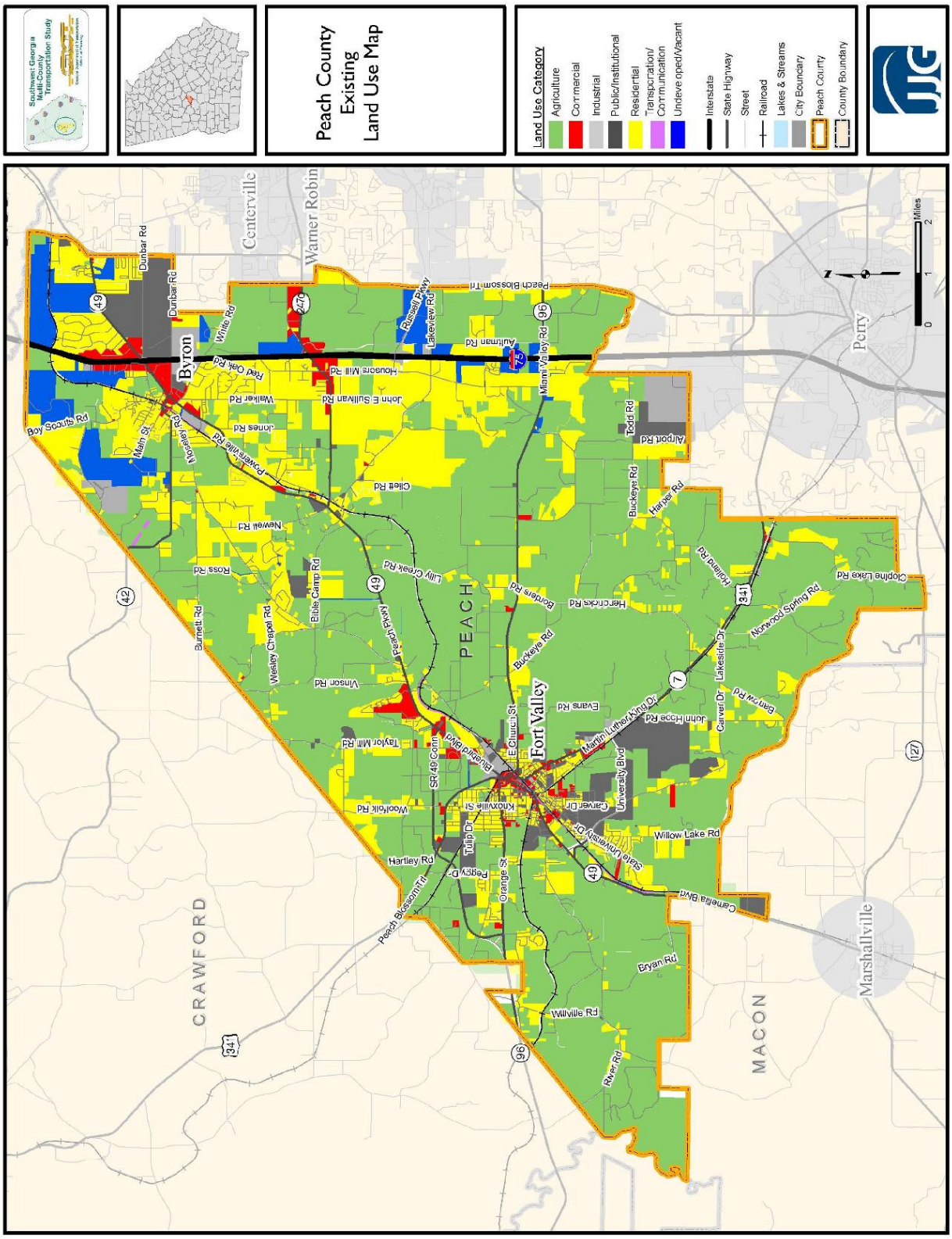


Figure 2.4: Peach County Functional Classifications

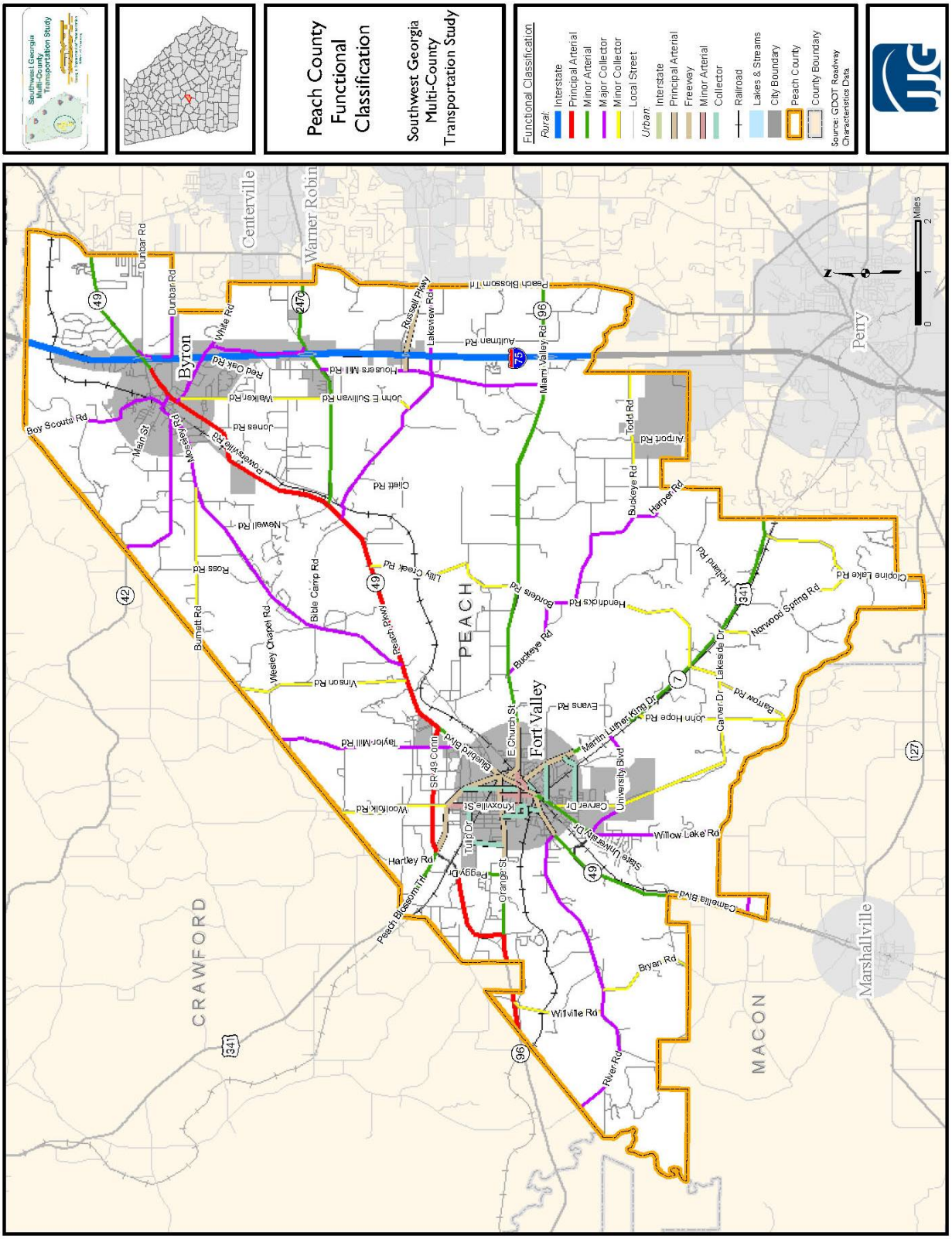


Table 2.4: Functional Classifications in Peach County

	Rural Roadways		Urban Roadways	
	Mileage	**VMT**	**Mileage**	**VMT**
Interstate	8.30	569,064	2.82	182,227
Arterial	41.53	319,309	20.77	134,564
Collector	90.19	147,588	8.56	11,469
Local	153.57	70,010	49.13	44,494
Road Total	293.59	1,105,970	81.28	372,755

Source: GDOT Roadway Classification data

2.5 Safety

Crashes occur most frequently at intersections, but can also occur along segments of a street or highway. Understanding the location and type of accidents that are occurring is useful in measuring relative need and prioritizing projects. To pursue this end, crash data were analyzed using three distinct approaches.

Between the years 2000 and 2007, Peach County averaged 2.4 accidents per day or 35.6 accidents per 1,000 people, slightly lower than the State of Georgia rate of 37.8. In 2003 and 2007, Peach County accident rates exceeded those statewide. During the same time period, Peach County averaged 868 accidents, 397 traffic related injuries and 7.1 fatalities annually.

2.5.1 Roadway Analysis

Crash rates on Peach County roads were analyzed by roadway segment. Segment termini were established by using county lines, termini of a roadway facility, or location where a facility type changed. Segments with accidents rates higher than the state rate per million vehicle miles (MVM) for their respective facility type were identified and noted. This analysis was conducted using the year 2000-2007 data, which were the most recent available when this study began.

Average accident rates on Peach County roadways were compared to statewide averages for respective functional classifications. Of the ten Peach County segments that experienced higher rates than state averages for each respective roadway type, portions of seven segments lie within the study area. These seven segments are identified in **Table 2.5** on page 11, which provides a complete list of segments for all Peach County. **Figure 2.5**, on page 12, identifies the location of each segment.

Of the seven roadways within the study area that exceeded the statewide average crash rate, SR 96, SR 49, and SR 247C represent the three main corridors providing mobility and connectivity between Peach County and Houston County. These three roadways also represent the three critical access points to I-75. As identified in the previous sections, the study area has experienced residential and population growth, along with land use changes to accommodate this growth. This growth has also put a strain on the roadway network providing mobility, connectivity, and access to the study area. As a result of this growth, the existing east-west corridors within the study area have experienced a reduction in safety with higher than average crash rates on these corridors.

Table 2.5: 2007 Peach County Crash Rate by Segment

Roadway			Crashes	Crash Rate (per 100 million vehicle-miles (MVM))		Injuries
GDOT Route No.	Functional Classification	Beg - End MP	Number	Road Segment	Statewide Ave.	Number
I-75	Rural Interstate	0 - 3.6*	47	60	50	17
I-75	Rural Interstate	5.7 - 11.3*	124	81	50	69
I-75	Rural Interstate	12.5 - 17.6*	71	270	114	21
SR 49 CO	Rural Principal Arterial	0 - 5	22	320	114	26
SR 96	Rural Minor Arterial	5.9 - 12.9*	30	237	154	16
SR 96	Rural Minor Arterial	13.0 - 15.0*	12	200	154	3
SR 7/US 341	Rural Minor Arterial	0.3 - 6.2	24	204	154	11
SR 7/US 341	Urban Principal Arterial	6.3 - 10.1	61	629	441	27
SR 247 CO	Rural Minor Arterial	0.0 - 3.0*	21	276	154	5
SR 42	Rural Major Collector	0.0 - 3.5*	18	391	158	8

*Indicates that portion of segment is in study area

Source: CARE Data 2000-2007

2.5.2 Intersection Analysis

As with roadways, the crash rates of Peach County intersections were analyzed to identify high crash locations. GDOT maintains statewide crash rates for intersections by type; however, for the purposes of this study, intersection crash rates were compared within the county. Of the ten intersections across the county identified as having more than 40 crashes during the 2000 to 2007 period, four were located within the study area. As with the high crash roadways, these high crash intersections are likely a result of increasing traffic volumes along major roadways serving this growing study area. **Table 2.6** on page 13 provides a list of high crash intersections within Peach County, and **Figure 2.5** identifies their locations.

Figure 2.5: Hotspots and High Crash Roadways in Peach County

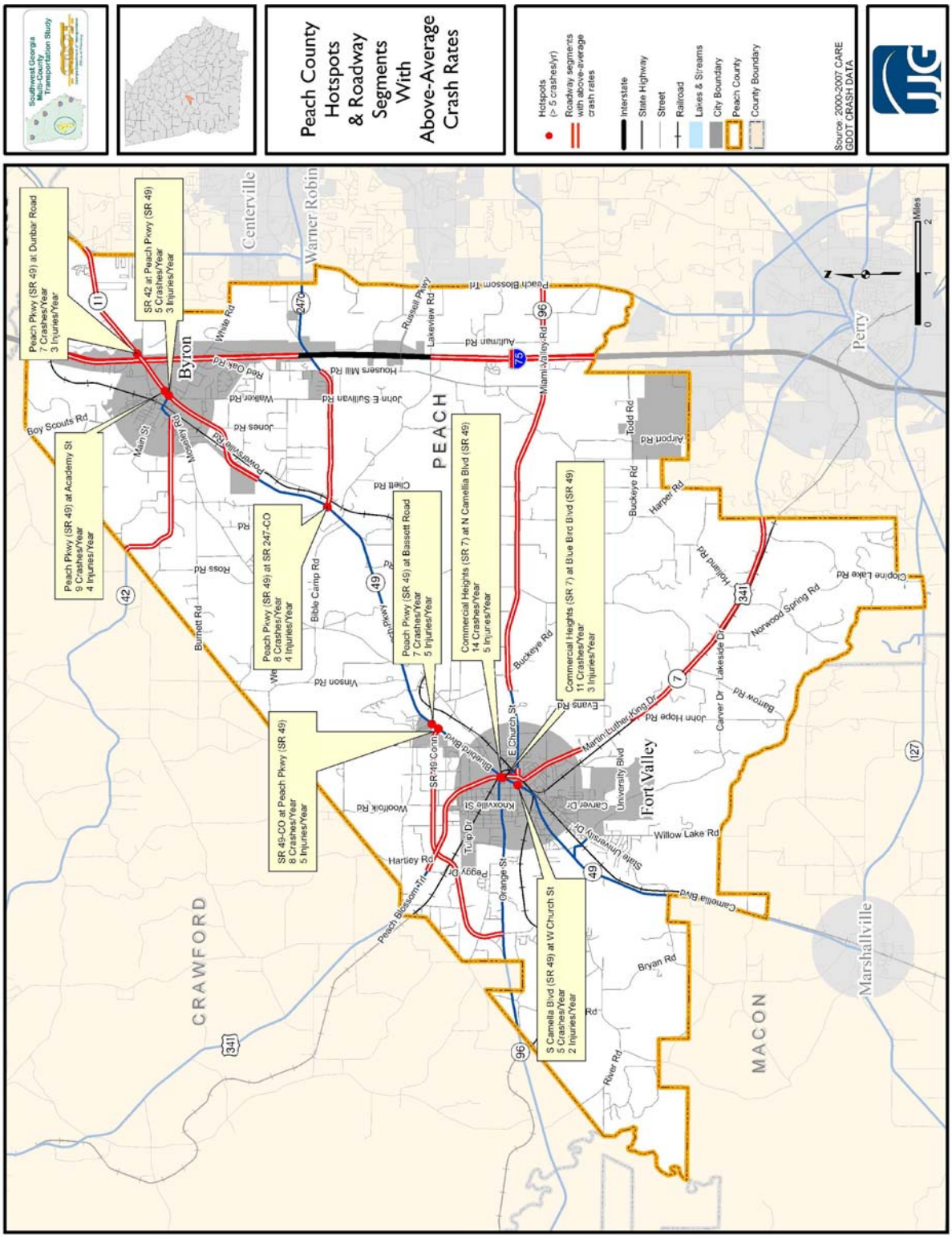


Table 2.6: Peach County High Crash Intersections (Hotspots)

Intersection Location			Total (2000-2007)			Annual Average		
Location	**MP**	**City**	**Crash**	**Injury**	**Fatality**	**Crash**	**Injury**	**Fatality**
Commercial Heights (SR 7) at N. Camellia Blvd (SR 49)	7.73	Fort Valley	115	36	0	14	5	0
Commercial Heights (SR 7) at Blue Bird Blvd (SR 49)	7.86	Fort Valley	90	25	0	11	3	0
Peach Pkwy (SR 49) at Academy St*	14.81	Byron	72	29	0	9	4	0
SR 247C at Peach Pkwy (SR 49) *	0.00	Peach Rural	65	41	2	8	5	<1
Peach Pkwy (SR 49) at SR 49-CO	10.97	Peach Rural	65	28	1	8	4	<1
Peach Pkwy (SR 49) at Dunbar Rd*	15.77	Byron	57	23	0	7	3	0
Peach Pkwy (SR 49) at Bassett Rd	5.9	Peach Rural	54	38	0	7	5	0
SR 42 at Peach Pkwy (SR 49)*	0.00	Peach Rural	42	22	1	5	3	<1
Atlanta St (SR 7) at N 1st St	9.13	Fort Valley	40	30	1	5	4	<1
South Camellia Blvd (SR 49) at W Church St	3.92	Fort Valley	40	15	0	5	2	0

*Indicates that intersection is in study area

Source: CARE Data 2000-2007

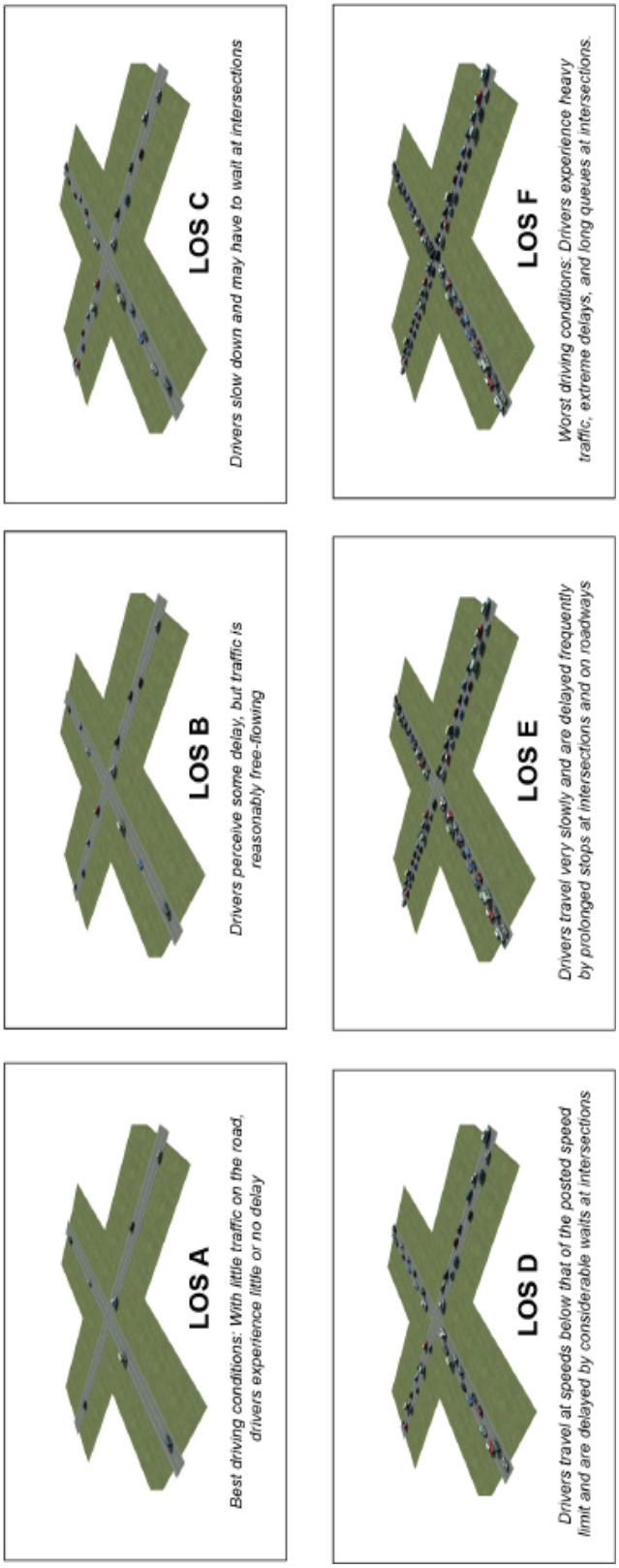
2.6 Existing Traffic Conditions

2.6.1 Travel Demand Model

In order to evaluate existing and future traffic conditions on roadways within Peach County, a travel demand model was developed based on the Southwest Georgia Interstate Study Travel Demand Model. A travel demand model is a computer model used to estimate traffic volumes and travel patterns utilizing study area information such as roadway networks, land use information, and demographic data including population and employment. The base, or existing, model year utilized was 2006 since this is the most recent year for accurate employment data from the Georgia Department of Labor. The future, or horizon, year utilized for this study was 2035.

The travel demand model was utilized to determine traffic conditions on study area roadways for the base (2006) and horizon year (2035). Traffic conditions on study roadways are evaluated based on a Level-of-Service (LOS) analysis. LOS is a qualitative measure describing operational conditions and driver perceptions within a traffic stream. According to the 2000 Highway Capacity Manual (2000 HCM), six LOS are defined for each type of facility. Letters designate each level, from A to F, with LOS A representing free-flow conditions with minimal delay and LOS F representing severe congestion with long vehicle delays. **Figure 2.6** on page 14 presents a graphical representation of the six levels of service.

Figure 2.6: Representation of LOS



LOS for a roadway segment is based on the volume to capacity (V/C) ratio. V/C compares the traffic volumes on a roadway with the carrying capacity of that segment of road. V/C is the quantitative measure generated by the travel demand model that is utilized to determine the LOS of a roadway segment. The threshold for each LOS based on V/C is presented in **Table 2.7** below.

Table 2.7: Level of Service Thresholds

Level of Service (LOS)	Volume/Capacity Ratio
LOS A, B, C	V/C < 0.75
LOS D	0.75 <= V/C < 0.85
LOS E	0.85 <= V/C < 1.00
LOS F	V/C >= 1.00

The travel demand model was utilized to identify existing and future roadway segments with deficient LOS. For planning efforts in rural counties, GDOT considers LOS C or better to be acceptable and considers LOS D, E, or F to be deficient. When developing long range transportation plans in rural counties, GDOT strives to provide LOS C or better for all study roadways. This section presents the existing (2006) traffic conditions for Peach County and the study area.

2.7.2 Existing Travel Conditions

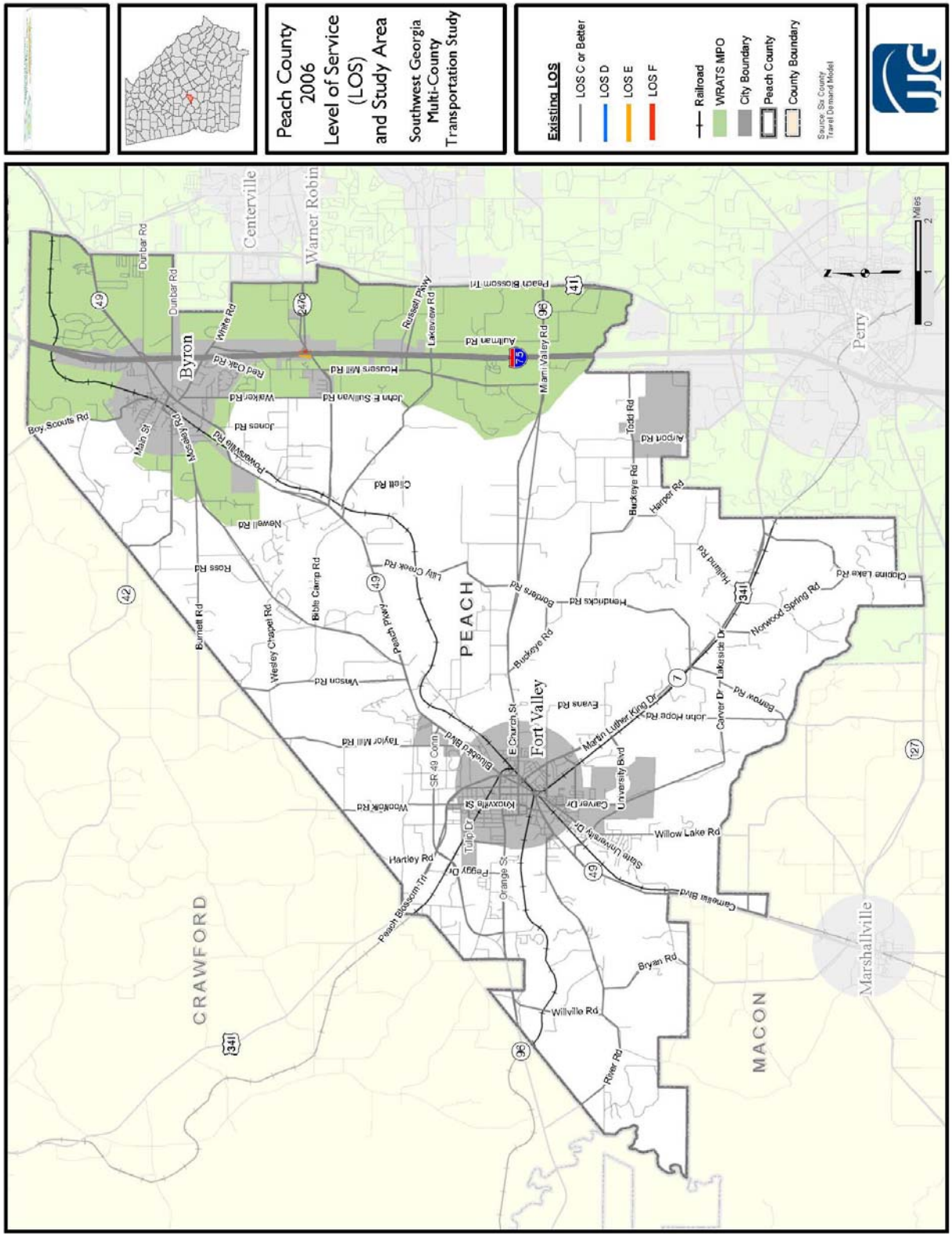
Under existing conditions, most roadways within Peach County and the study area operate at acceptable LOS (C or better). The only roadway segment that operates at unacceptable LOS (D or worse) is presented in **Table 2.8** below, and in **Figure 2.7** on page 16. The facility currently operating at unacceptable LOS is the interchange of I-75 at SR 247C, which is within the Russell Parkway Extension study area. Russell Parkway, if extended, could aid this interchange in attaining a more acceptable LOS.

Table 2.8: Existing (2006) Deficient Roadway Segments in Peach County

Roadway	From	To	LOS	Traffic Volume (AADT)
SR 247 Connector	I-75 SB Ramps	I-75 NB Ramps	F	11,990

Source: CARE Data 2000-2007

Figure 2.7: Existing LOS in Peach County and Study Area



3.0 Future Conditions

3.1 Future Population

Peach County is forecast to add 6,950 new residents expected by 2035, with a county-wide annual growth rate of 0.44 percent during this period, as shown in **Table 3.1** below. Future population was determined by using growth rates based on continuation of past trends and growth assumptions outlined in the Peach County Comprehensive Plan (2006).

Upon a review of Peach County's Comprehensive Plan (2006) and interviews with county staff and officials, it is clear that the northeast area of Peach County is expected to experience the majority of the county's population growth. As presented earlier in this report, the study area is already experiencing rapid residential growth due to its proximity to Houston County, Macon, and I-75. **Figure 3.1** on page 18 illustrates the 2035 population density in Peach County.

As presented in the existing and future population data, the study area is expected to experience continued growth. This population growth will continue to place ever greater demands on the transportation system within the study area.

Table 3.1: Study Area Population Forecast 2006-2035

Area	2006	2035	2006-2035	
			Percent Change	Annual Growth Rate
City of Byron	3,225	5,032	54.6%	1.6%
Peach County	24,785	31,735	21.9%	0.9%
Houston County	130,706	168,795	29.1%	0.9%
State of Georgia	9,363,941	12,962,006	37.4%	1.1%

Source: US Census, WRATS, GA DCA

3.2 Future Employment

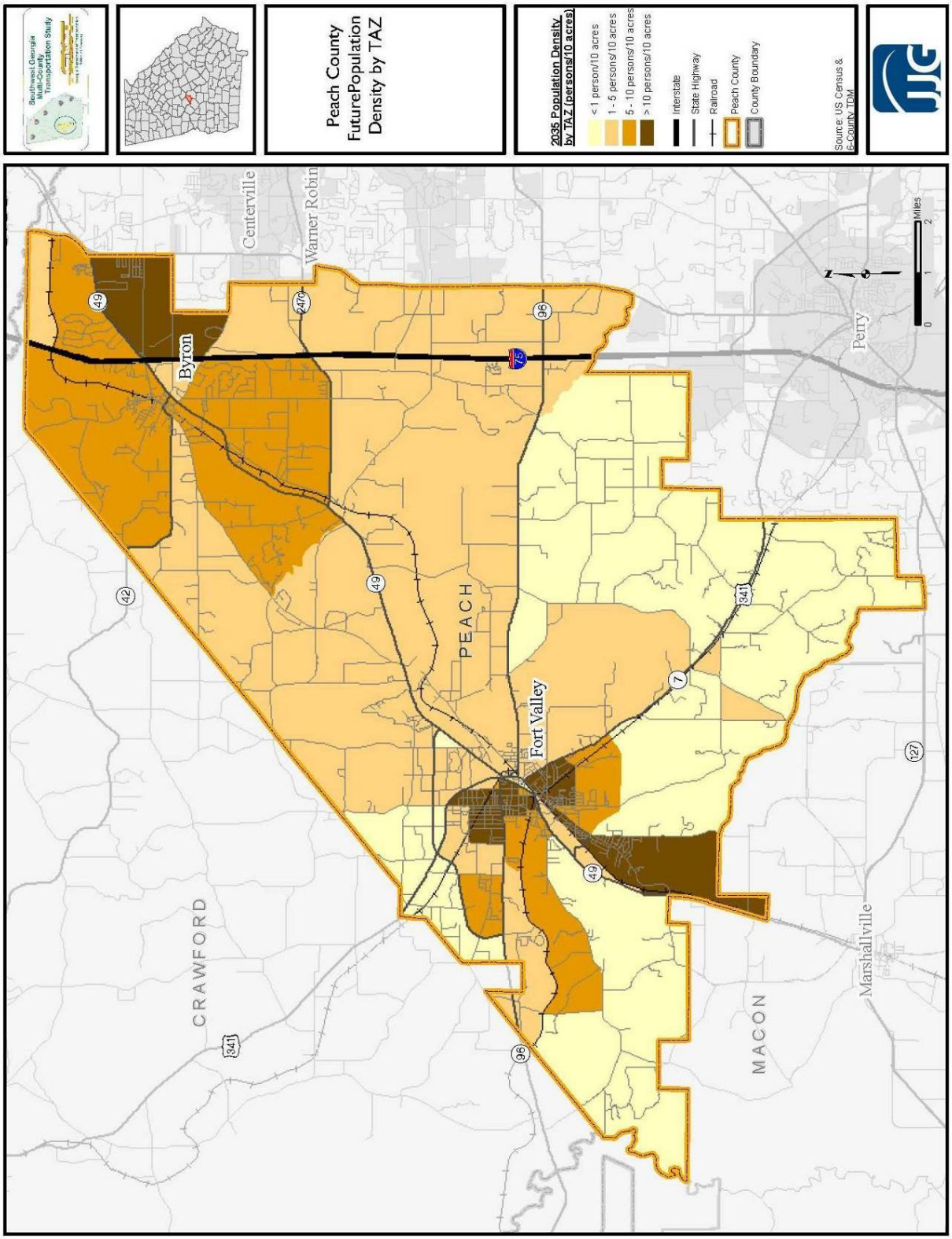
As can be seen in **Table 3.2** below, Peach County is forecast to have over 10,100 jobs in 2035, for a 28 percent increase in jobs over 2006. However, Houston County employment is projected to expand by 49 percent with the addition of 26,564 jobs. Furthermore, employment in the City of Byron is projected to increase by 65 percent with the addition of 1,011 new jobs.

Table 3.2: Future Study Area Employment Growth 2006-2035

Area	2006	2035	2006-2035	
			Percent Change	Annual Growth Rate
City of Byron	1,563	2,574	64.7	1.7%
Peach County	7,901	10,106	27.9	0.9%
Houston County	54,149	80,713	49.1	1.4%

Source: GDOL; U.S. Bureau of Labor Statistics

Figure 3.1: Peach County Future Population Density



As can be seen in **Table 3.3** below, the service sector is projected to account for half of employment in 2035, much as it did in 2006. With population growth concentrated in northeast Peach County, much of this service sector growth is expected in this area of the county. Manufacturing, as well, is expected to remain strong in Peach County, continuing to account for almost a quarter of employment.

To even a greater extent than in 2006, the Houston County economy will not rely on manufacturing employment. Instead, service employment is expected to make up 68 percent of Houston County jobs.

Table 3.3: Future Study Area Employment Constitution 2035

County	AMC	MFG	WTW	Retail	Service	Total
City of Byron	49	349	234	295	1564	2,574
Share of 2035 county employment	*2%*	*14%*	*9%*	*11%*	*61%*	
Peach County	928	2,381	451	1,312	5,028	10,106
Share of 2035 county employment	*9%*	*24%*	*4%*	*13%*	*50%*	
Houston County	4,286	7,718	5,144	7,311	54,730	80,713
Share of 2035 county employment	*10%*	*5%*	*6%*	*9%*	*68%*	

Note: AMC – Agricultural, Mining and Construction employment
MFG – Manufacturing employment
WTW – Wholesale, Trucking and Warehouse employment
Source: GDOL; U.S. Bureau of Labor Statistics

Figure 3.2 on page 20 illustrates Peach County's 2035 employment density. As with existing conditions, the northern portion of the study area is expected to support a higher density of jobs than the southern portion.

Commuter traffic in Peach and Houston Counties is projected to increase due to the more than 80,000 jobs expected in Houston County by 2035. This will likely place further burden on the already congested east-west corridors that serve traffic traveling between these two counties or accessing I-75.

3.3 Future Land Use

According to the Peach County Comprehensive Plan (2006), anticipated changes in land use in Peach County is expected due to growth in the northeast section of the county. Current trends indicate that this area of the county will continue to shift to residential uses. A map of future land use in Peach County can be found in **Figure 3.3** on page 21. The majority of the Russell Parkway Extension study area is expected to transition to residential and commercial land uses in the future. As land uses convert from agricultural to residential and commercial, the traffic volumes on area roadways are expected to grow steadily. As population and employment increase in the study area, the ability of the area transportation network to provide mobility, connectivity, and access will be strained. Without improved access to these growing areas, existing roadways will continue to experience increasing congestion.

Figure 3.2: Peach County Future Employment Density

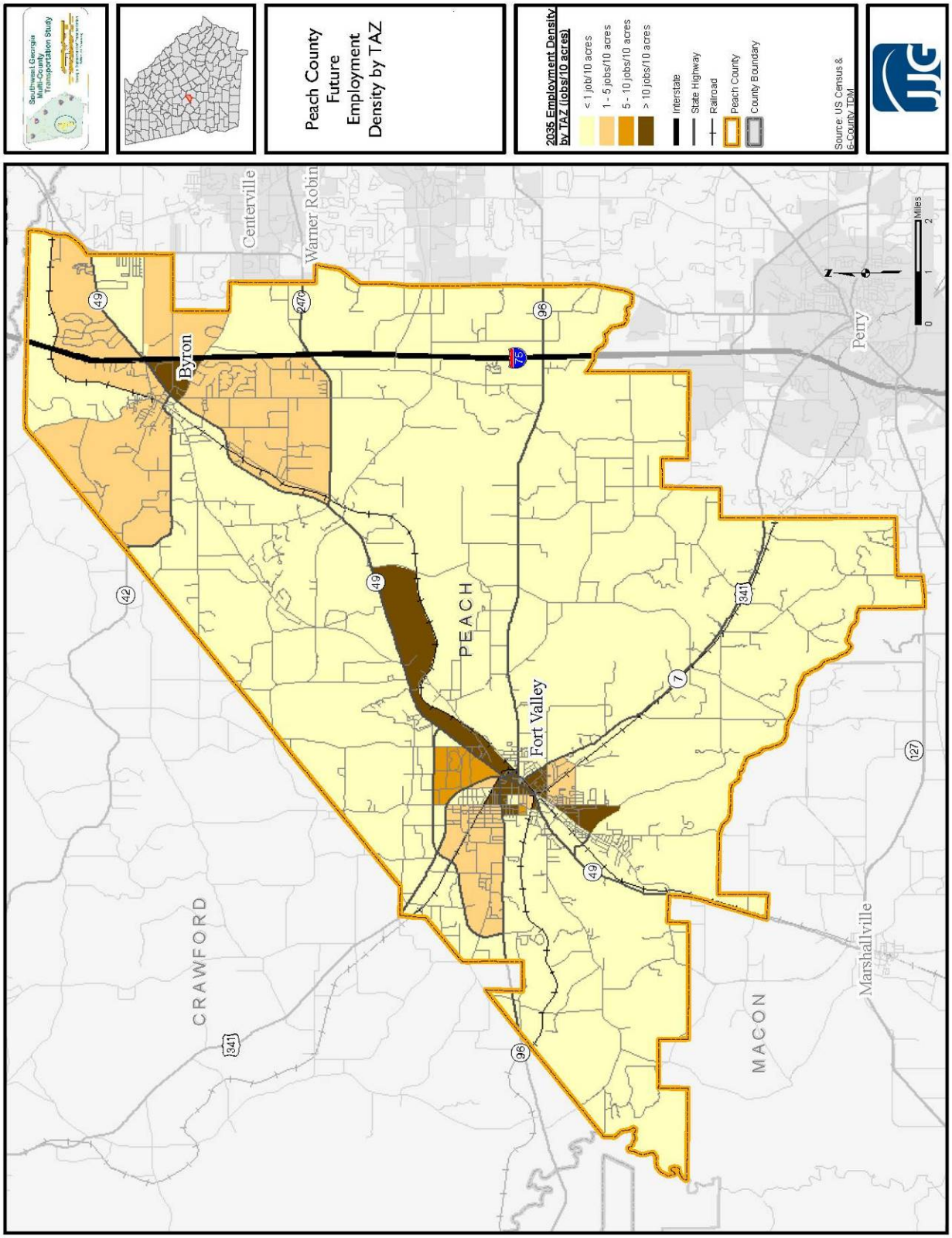
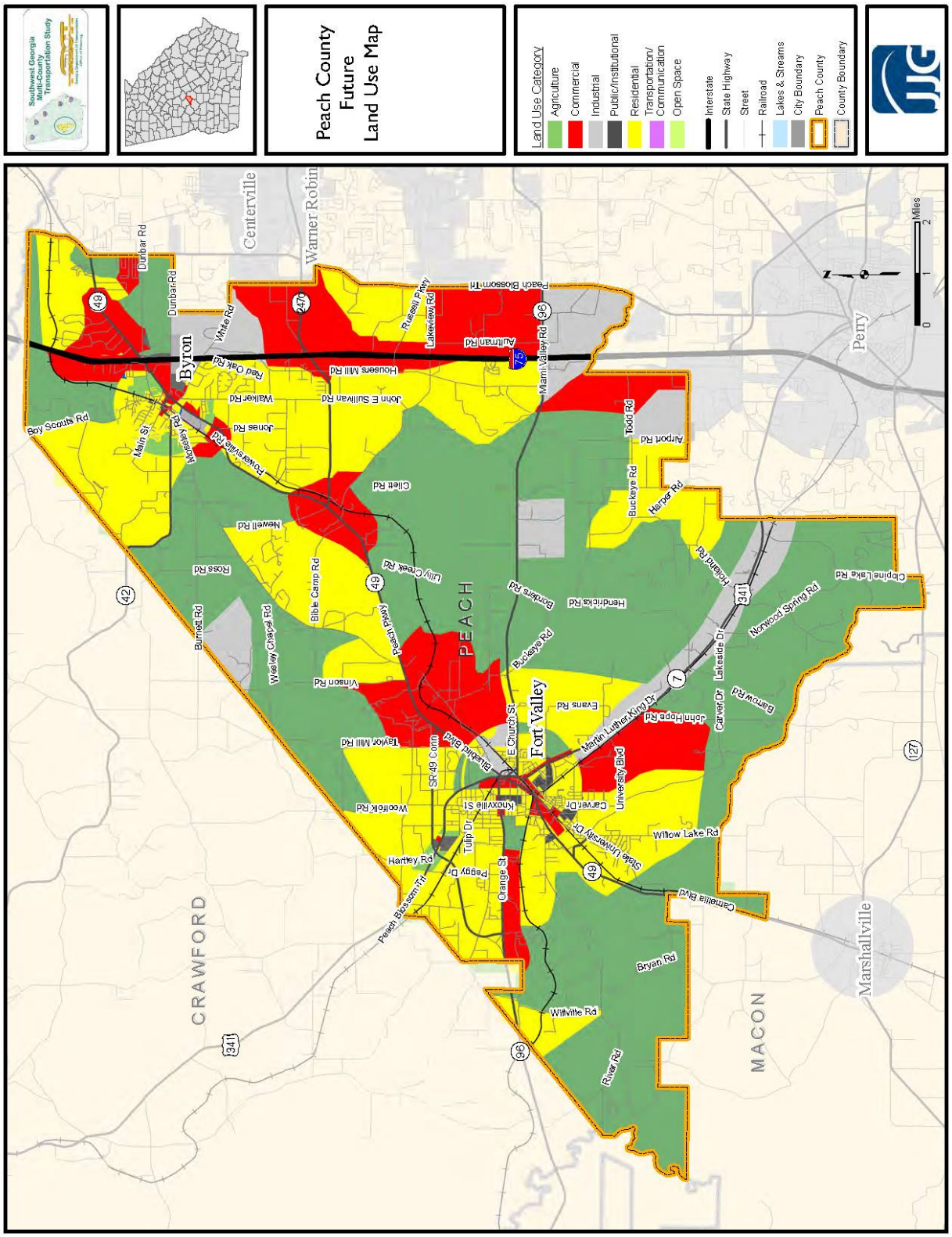


Figure 3.3: Peach County Future Land Use (2035)



3.4 Future Traffic Conditions

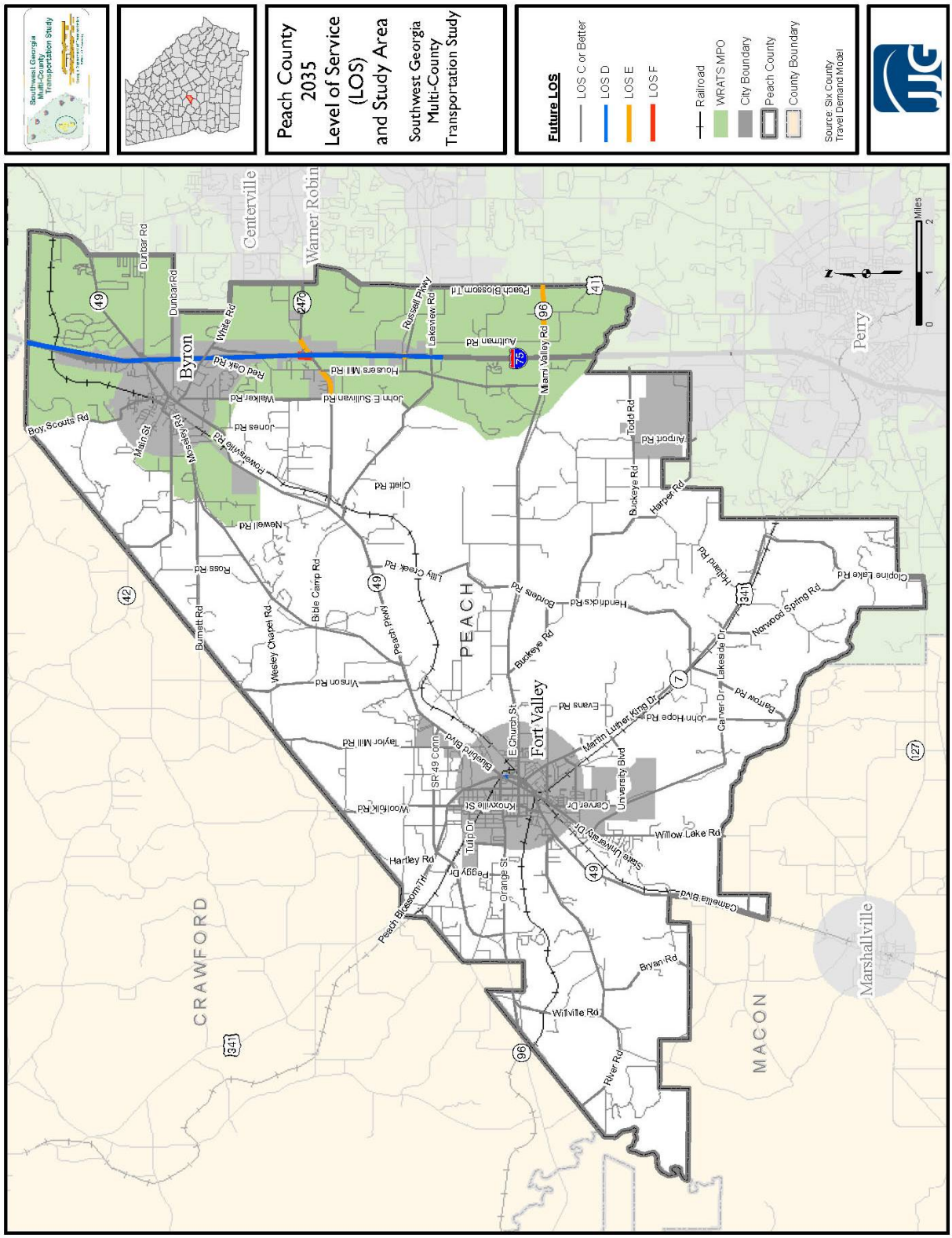
Under future conditions within the study area, many important roadways are expected to operate at an unacceptable LOS (D or worse). These roadway segments are presented in **Table 3.4** below, and in a map identifying these deficient segments in **Figure 3.4** on page 23. Given the employment and population projections for the study area presented in previous sections of this report, many roadway segments within the study area are expected to operate at unacceptable LOS by 2035. Growth in Houston County and northeast Peach County will continue to place a strain on the east-west arterials that provide mobility and connectivity between these two counties. Additionally, this growth will continue to drive demand for access to I-75. In response to the increasing travel demands on these roadways, GDOT has programmed projects to widen SR 96 east and west of I-75 and improve SR 247C to the east and west of I-75.

Table 3.4: Future (2035) Deficient Roadway Segments in Peach County

Roadway	From	To	LOS	Traffic Volume (AADT)
SR 247 Connector	I-75 SB Ramps	I-75 NB Ramps	F	17,480
SR 247 Connector	Walker Rd	Housers Mill Rd	E	13,390
SR 247 Connector	I-75 North Ramp	Gunn Road	E	26,460
SR 96	I-75	US 41	E	14,200
I-75	Lakeview Rd	Crawford County Line	D	90,020
US 341/SR 7/SR 96	RR Overpass	SR 49	D	14,230

Source: CARE Data 2000-2007

Figure 3.4: 2035 LOS in Peach County and Study Area



4.0 Public Involvement

4.1 Agency Kickoff Meeting

In an effort to better understand the need for potential transportation improvements within the study area, the project team met with representatives of agencies within the study area to discuss the proposed Russell Parkway Extension. The initial meeting with agency representatives was held at 1:30 pm on February 4, 2009, at the Peach County Fire Station No. 1 in Byron. In addition to members of the project team, meeting attendees included:

- Martha McAfee, City Administrator, City of Fort Valley
- John Stumbo, Mayor, City of Fort Valley
- Roy Lewis, County Commissioner, Peach County
- Marcia Johnson, County Administrator, Peach County
- Martin Moseley, County Commission Chairman, Peach County
- Bob Rychel, Manager of Planning Programs, Middle Georgia RDC
- Jessica Bird, Transportation Planner, Warner Robins MPO
- Melvin Walker, Jr. County Commissioner, Peach County
- Billie Segars, Peach County Public Works Director

At the meeting, Pat Smeeton, a member of the study team, gave a presentation about the purpose of the Russell Parkway Extension Study. Then the group discussed the opportunities and challenges that would accompany the project in the future. The expectations and needs of the local agency representatives would inform the study and aid the study team in selecting the preferred alternative for this project, should one be deemed necessary. At the close of the meeting, a Fact Sheet for the study was distributed, in the expectations that attendees would share the information with others in the study area.

During the discussion period, the following observations were collected from meeting attendees:

- A new fire station is planned for Peach County; the location of the potential Russell Pkwy Extension would be helpful in the placement of that station.
- The extension of Russell Parkway was reportedly studied once before and rejected. This study would utilize a more accurate traffic model and be able to better determine whether the extension is needed and which alignment would be most effective. Those who proposed alignments for the previous study should re-submit those ideas for reconsideration.
- Russell Parkway ends at an odd place and should extend to John E Sullivan Road to connect people who live in the Byron area to their place of work, typically the base in Warner Robins.

Regardless of the extension's final alignment, the first priority should be to connect it to John E Sullivan.

- A hospital is planned for the John E Sullivan Road and SR 247C intersection area and the extension would provide improved access.
- The connection to SR 49 was not the primary objective of the extension for locals, rather improving access to the Interstate and providing improved access to the study area was more important.
- Even though the Russell Parkway Extension would create a parallel route to the SR 247C, an additional route is necessary given the traffic congestion on SR 247C at peak hours and on Saturdays.
- By providing an additional access to I-75 from Peach County, the extension would ease congestion at the SR 49 and SR 247C interchanges with I-75.
- The alignment of the Russell Parkway Extension may be contingent on the alignment of the Fort Valley Bypass given the relative proximity of these two projects. It was explained that the traffic model utilized in this study will analyze the effects these two facilities may have on each other.
- Extending Russell Parkway may require an overpass over the railroad line.
- The Pilot gas station on SR 247C at the I-75 interchange experiences heavy congestion and the SR 247C bridge is a bottleneck.
- The extension of Russell Parkway to John E Sullivan Road, along with a connection to SR 96, would give relief to SR 247C and SR 49. This would foster growth and alleviate congestion.

4.2 Stakeholder Interviews

Members of the study team met with stakeholders individually to obtain additional information about the needs of Peach County. Stakeholder input is summarized in **Appendix B**. Areas that were perceived by stakeholders to be in need of transportation improvements are included in the Locally-Identified Transportation Needs Areas map at the end of this section.

4.3 Fact Sheets

The study team has produced a Fact Sheet for the Russell Parkway Extension Study to educate the public about the study. The Fact Sheet presents the purpose of the study, the study process, the study schedule, a map of the study area, and ways in which the public can remain involved in the study, as by checking the study webpage on the GDOT website. Many Fact Sheets were distributed among attendees of the agency kick-off meeting so that attendees could pass them along to others.

4.4 Locally Identified Transportation Issues and Needs in the Study Area

Input about transportation issues and needs in the study area was gathered from local agencies and Stakeholder Interviews, as well as from the Southwest Georgia Multi-County Transportation Study,

which was conducted in tandem with this study. This input was mapped to create a visual representation of locally identified transportation issues and needs within the study area. The issues and needs reported below are numbered in correspondence with the Locally Identified Transportation Issues and Needs map in **Figure 4.1** on page 27.

Roadway Issues and Needs _____

1. Russell Parkway is an emerging transportation corridor that needs appropriate planning.
2. SR 49 at I-75 interchange experiences congestion issues during certain times of the day.
3. Widen Boyscout Road as a new connector to new I-75 Interchange at Sardis Church Road.
4. SR 42 now has a lot of traffic but few passing zones because it is curvy. SR 42 out of Byron has curves at the Crawford County line and just south of its intersection with Jones Road.
5. SR 247C is at capacity. Widening it from I-75 west to four lanes may someday be needed.
6. SR 96 carries high volumes of traffic.
7. SR 49 in Byron has terrible traffic, but signal timing may help relieve the congestion.

Safety/Pedestrian and Bicycle Issues and Needs _____

8. There is a need for continuous sidewalks and bike paths to accommodate the growing number of residents in Byron.
9. Turn lanes are needed on 247 C at Housers Mill Road, and John E Sullivan Road.
10. SR 49 at White Road seems to be a dangerous intersection. SR 42 dumps into SR 49 near White Road. There is a skew at SR 42, SR 49, and White Road.

Truck and Railroad Issues and Needs _____

11. SR 96 has heavy truck traffic.
12. Byron has a large number of trucks.

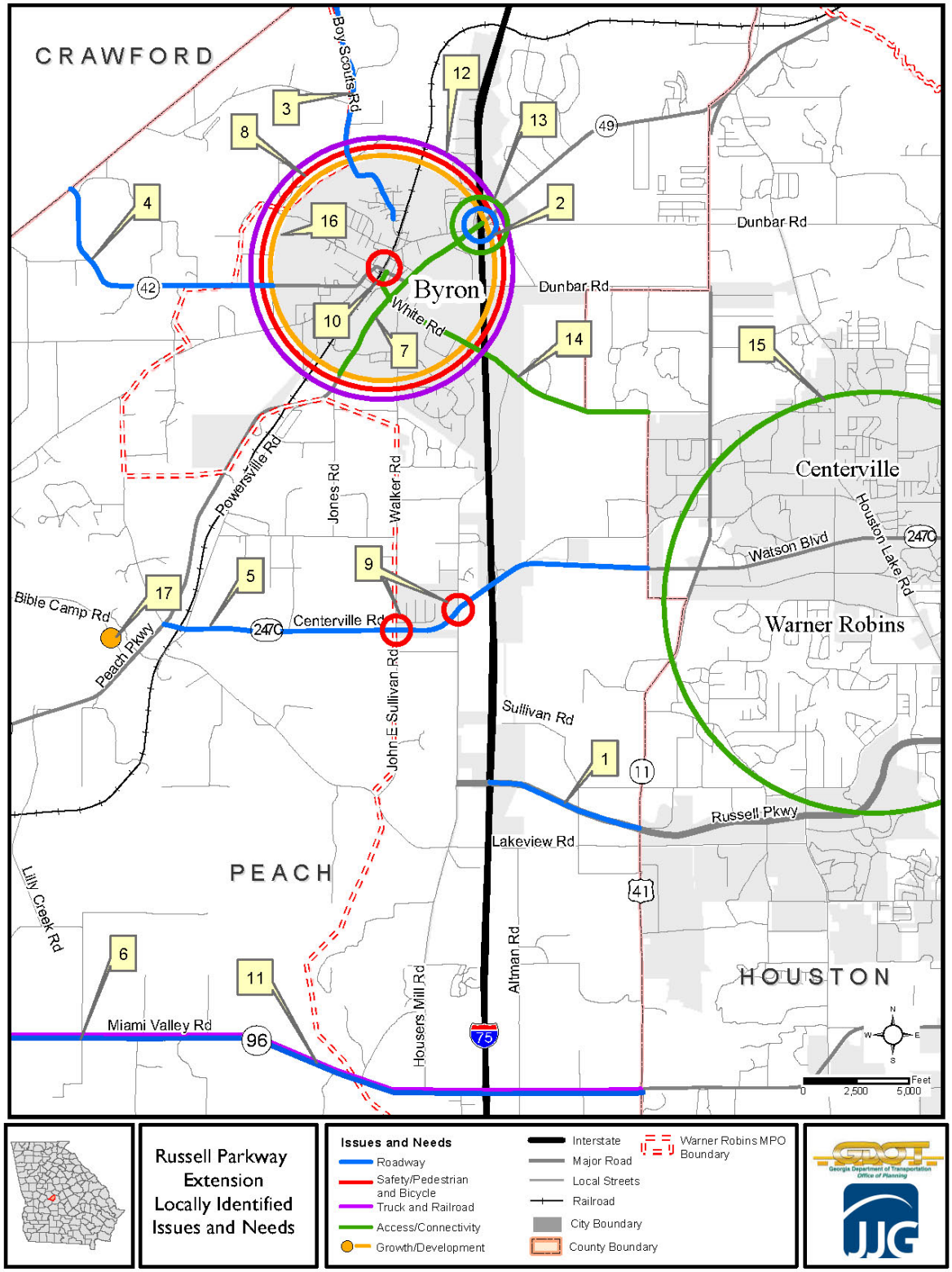
Access/Connectivity Issues and Needs _____

13. Access to Dunbar Road from SR 49 is hindered by a sharp curve and close proximity to the I-75 ramps. Dunbar Road provides access to the North Peach Industrial Park. Heavy Truck use is damaging the sidewalk and roadway, which is impacting potential economic growth in this area due to access concerns.
14. Connect SR 42 to US 41 via White Road. Widen and Pave White Road to become extension of SR 42 or a connector highway. Complete new I-75 interchange as part of this plan.
15. The potential Russell Parkway Extension would improve access to residential areas for Warner Robins AFB employees. Warner Robins AFB is the largest industrial/military facility in the state.

Growth/Development Issues and Needs _____

16. City of Byron is a bedroom community that is experiencing significant population growth.
17. A new high school is planned near Lily Creek and Bible Camp Road.

Figure 4.1: Russell Parkway Extension Study Locally Identified Issues and Needs



5.0 Project Need and Purpose

The previous sections of this report all serve to identify the purpose and need for the potential Russell Parkway Extension. Utilizing the existing and future conditions analysis and projections, along with input from local agencies and stakeholders, the following primary transportation needs within the study area were identified:

East-West Mobility

As described in earlier sections, population growth in Houston County and northeast Peach County has historically been strong and is expected to continue into the future. Employment growth in Houston County and northeast Peach County has driven a steady increase of residential development within the study area. Land use within the study area has transitioned from agricultural to residential and commercial and this trend is expected to continue. As identified by local agencies and stakeholders, SR 49, SR 247C, and SR 96 already experience traffic congestion during weekday peak hours and on Saturday. Daily commuters use these three arterials to travel to and from jobs in Houston, Peach and Bibb Counties. The Robins Air Force Base in Houston County is a major employment destination for many area commuters.

Future traffic projections on area roadways indicate congestion is expected to significantly worsen in the future. As the study area continues to experience residential and commercial growth, maintaining east-west mobility will be important for economic growth as well as quality of life for area residents. However, as traffic congestion worsens on area roadways, east-west mobility will diminish without improvements to the area transportation system.

Access and Connectivity

With more than 28,000 additional jobs expected to be added in Houston and Peach Counties over the next 25 years, maintaining adequate access to major employment centers is critical to the success of this region. SR 49, SR 247C, and SR 96 all provide important access to employment centers in Houston County. As congestion worsens on area roadways, access between residential and employment centers diminishes. Access is also important to new residential areas west of I-75. With a limited number of roadways in this transitioning area, adequate access to new residential developments must be maintained in order to serve the growing transportation needs of these residential areas.

As employment and population within this region continue to grow, access to and from I-75 becomes important to the economic success of this area of middle Georgia. SR 49, SR 247C, Russell Pkwy, and SR 96 provide critical access to I-75. As identified by local agencies and stakeholders, the SR 49 and SR 247C interchanges already experience heavy congestion during peak hours. With no currently programmed improvements to these interchanges, access to I-75 is expected to continue to worsen as traffic and congestion worsen. Access to and from I-75 is an important transportation need within the study area.

Safety

The existing conditions section of this report presents the safety analysis for the study area. As presented in this section, the study area contains several roadway segments that currently experience crash rates higher than statewide average. The study area also contains four of the ten high crash intersections within Peach County. These high crash roadway segments and intersections within the study area are most likely a result of increasing traffic volumes and congestion. As population and employment continue to grow, traffic congestion, and thus safety, will continue to worsen on these roadways and intersections. With several major roadways within the study area expected to operate at LOS D or worse, safety will continue to be a primary transportation need within the study area.

6.0 Development of Study Alternatives

Four build alternative routes were proposed for analysis in this study. The alternatives were based on alignments prepared by the Warner Robins MPO, and then refined using aerial photography, environmental resource maps, and field investigation, to minimize environmental and community impacts. The alternatives are presented in **Figures 6.1 to 6.4** on pages 31 to 34.

Alternatives 1, 2, 3, 4 were initially modeled as a two-lane and four-lane roadways, however the results of the travel demand modeling indicated that four-lane facilities were not warranted for capacity for any alternatives. For this reason, all build alternatives were evaluated as two-lane roadways. All build alternatives connect to the current terminus of Russell Parkway just west of I-75.

A No-Build Alternative was analyzed in addition to the four build alternatives. The No-Build Alternative is based on projected future conditions with no transportation improvements and provides a comparison for the Build alternatives.

6.1 Planning Level Cost Estimates for Study Alternatives

Planning level costs were estimated for all alternatives using GDOT Right-of-Way and Utility Relocation Cost Estimate Tool (RUCEST) and Trns-port Cost Estimation System Tool (CES) Software. In addition, Preliminary Engineering costs were set at eight percent of construction costs. Individual assumptions for each project can be found in **Appendix A.**

To determine right of way costs, a survey of each alternative was conducted using aerial photography and field investigation for adjacent land use types, presence of utilities and potential impacts to homes, businesses and institutions. This information was entered into RUCEST, which determined costs for right of way acquisition based on land use type and county given the additional or new right of way requirements for the project. RUCEST estimated utility relocation costs by utility type and location, and relocation and improvement costs based on market history. Contingency costs were added to right of way estimates, to cover damages (30 percent), scheduling (55 percent), and administration and court costs (60 percent, all costs cumulative). The resulting right of way and utility cost estimates were included when developing total project costs.

Construction costs were based on width, length and roadway functional classification, to which costs for additional or replacement traffic signals, turn lanes and bridges were added as needed. Turn lanes were included in cost estimates for major intersections or where intersection improvements were deemed necessary. Likewise, traffic signals were included at intersections where widening or other improvements would require their replacement or where they were deemed necessary as an intersection improvement.

In CES, costs for turn lanes were estimated using the same price per ton for asphalt and base/aggregate as the main project; these prices were estimated by CES given size and location of the project. Cost estimates for bridges were determined by CES based on materials costs and historic data. CES construction estimates were utilized in the development of total project costs, which included right of way, utility relocation, and preliminary engineering costs.

Figure 6.1: Russell Parkway Extension Alternative 1

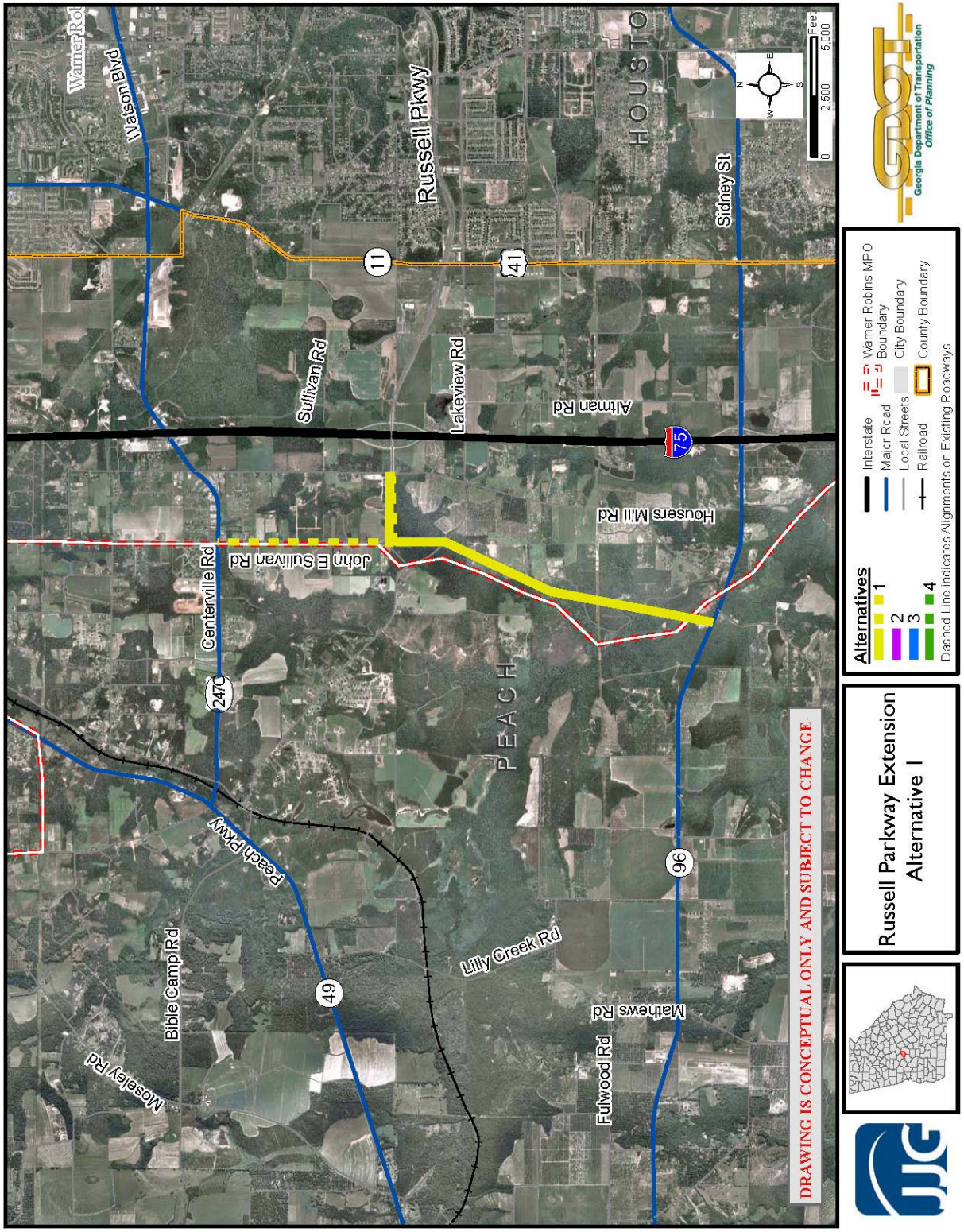


Figure 6.2: Russell Parkway Extension Alternative 2

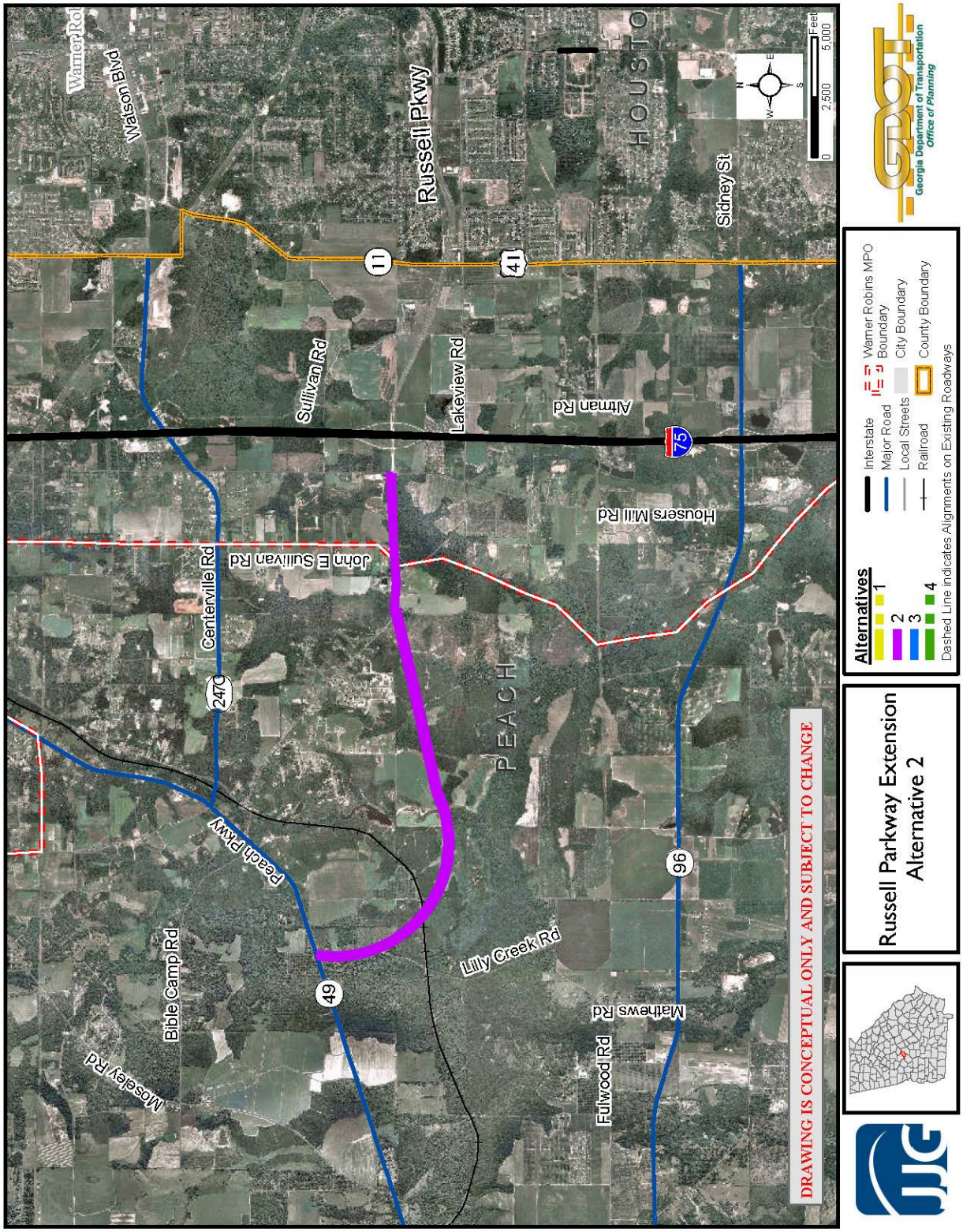


Figure 6.3: Russell Parkway Extension Alternative 3

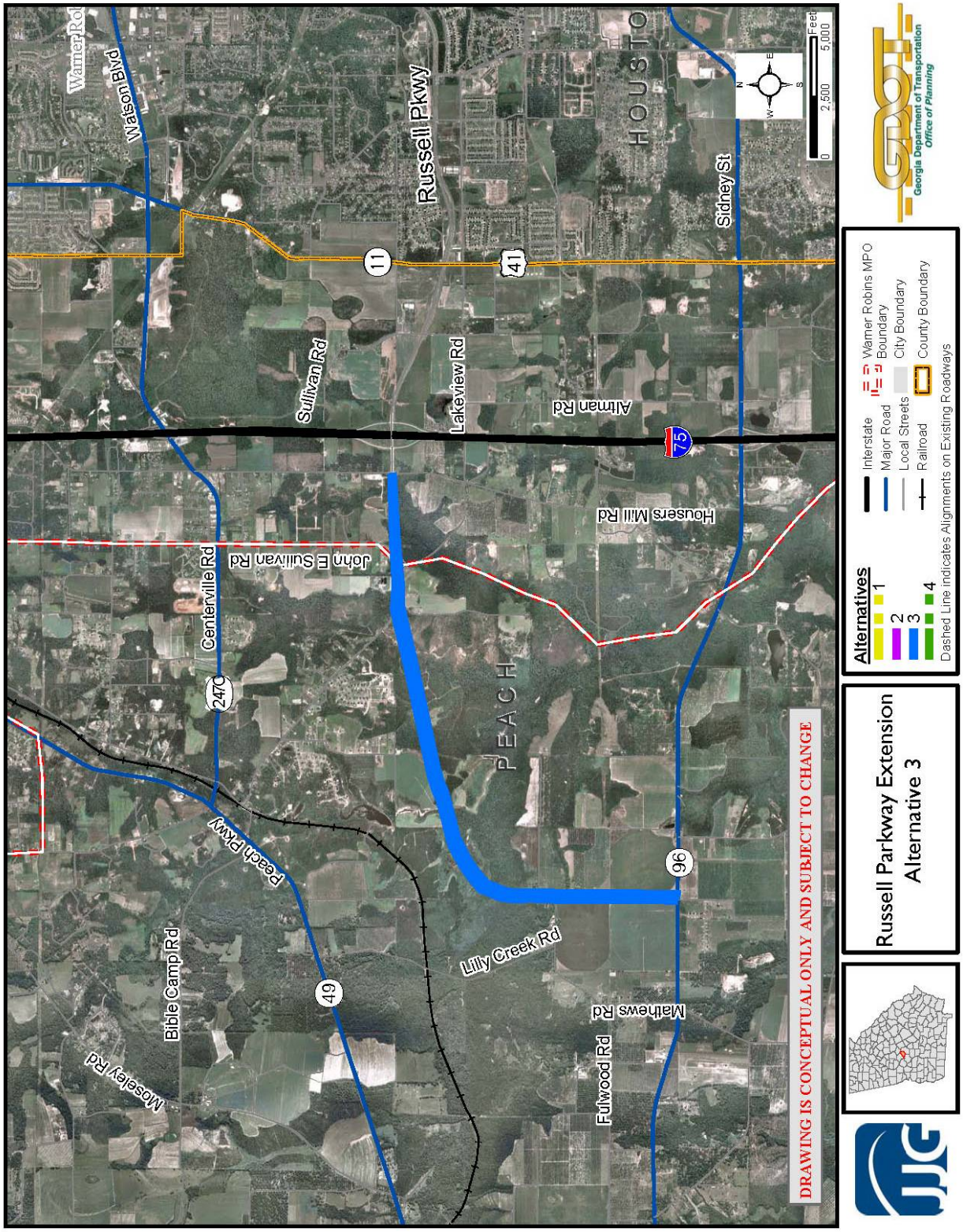
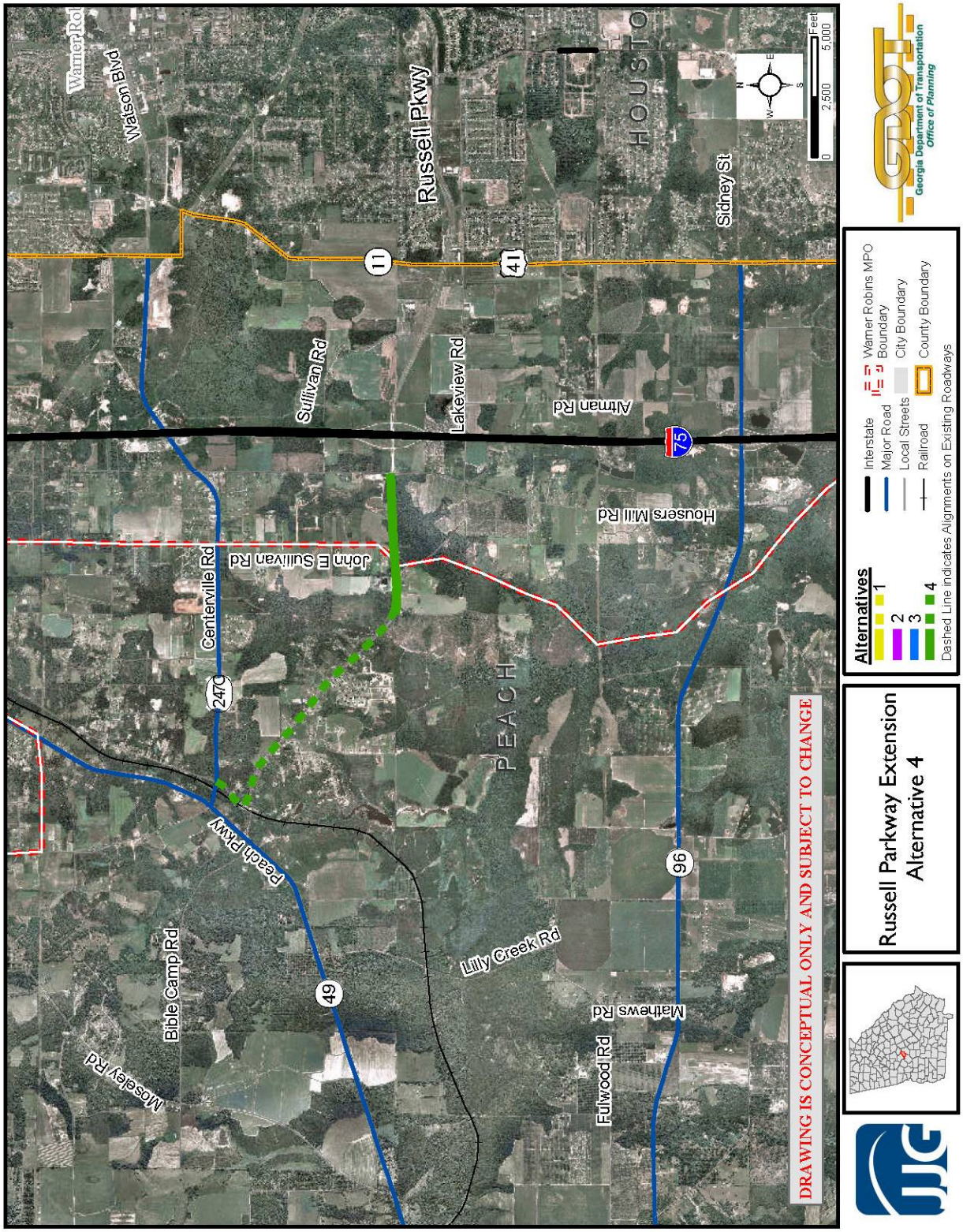


Figure 6.4: Russell Parkway Extension Alternative 4



6.2 Alternative 1

Alternative 1 would extend Russell Parkway as a two-lane roadway on new location for approximately 0.5 mile from its current terminus at Housers Mill Road west to tie into John E Sullivan Road. The two-lane John E Sullivan Road would then be extended on new location approximately 2.7 miles south to SR 96. John E Sullivan Road would then provide a north-south roadway between SR 96 and SR 247C parallel to I-75. As with Housers Mill Road, to which Russell Parkway currently connects, the existing segment of John E Sullivan Road has two 12 foot lanes with grassed shoulders and horizontal or vertical curves which appear to meet GDOT design standards, thus this existing roadway should be able to accommodate additional traffic without roadway improvements. Additional improvements associated with this alternative include turn lanes at the intersections of Russell Parkway at John E Sullivan Road, John E. Sullivan Road extension at Lakeview Road, John E Sullivan Road extension at SR 96, John E Sullivan Road at SR 247C, and signalization of the intersection of John E Sullivan Road at SR 247C.

Alternative 1 would improve north-south mobility along John E Sullivan Road and provide an east-west connection to the existing Russell Parkway. This alternative would provide improved access to a large area of Peach County expected to experience residential growth. It would also provide improved access to I-75 for the existing and future residential developments within the study area.

The planning-level preliminary engineering, right-of-way, utility relocation, and construction costs for Alternative 1 are presented in **Table 6.1** below.

Table 6.1: Planning-Level Cost Estimates for Russell Parkway Extension Alternative 1

Alternative	PE	ROW	Utility	CST	Total
Alternative 1	$824,244.90	$3,097,384.73	$0.00	$10,303,061.24	**$14,224,690.87**

6.3 Alternative 2

Alternative 2 would extend Russell Parkway as a two-lane roadway on new location for approximately 1.0 mile from its current terminus at Housers Mill Road west to Lakeview Road. An intersection would be provided with John E Sullivan Road as well as Lakeview Road. The alignment would then extend on new location approximately 2.0 miles to the southwest where it would turn northwest for 1.6 miles to intersect with SR 49 at Lilly Creek Road. This alternative would bridge over the Norfolk Southern Railroad just south of SR 49. Additional improvements include turn lanes at major intersections.

By connecting with SR 49 to the west, Alternative 2 would provide an additional east-west corridor for traffic currently utilizing SR 49 and SR 247C for travel between Peach and Houston Counties. This alternative would provide a direct route for traffic travelling on SR 49 to access I-75 and provide improved access to a large area of Peach County expected to experience residential growth.

The planning-level preliminary engineering, right-of-way, utility relocation, and construction costs for Alternative 2 are presented in **Table 6.2** below.

Table 6.2: Planning Level Cost Estimates for Russell Parkway Extension Alternative 2

Alternative	PE	ROW	Utility	CST	Total
Alternative 2	$1,152,574.14	$3,381,096.73	$0.00	$14,407,176.76	**$18,940,847.63**

6.4 Alternative 3

Alternative 3 would extend Russell Parkway as a two-lane roadway on new location for approximately 1.0 mile from its current terminus at Housers Mill Road west to Lakeview Road. An intersection would be provided with John E Sullivan Road as well as Lakeview Road. The alignment would then extend on new location approximately 2.0 miles to the southwest where it would turn south for 2.2 miles to intersect with SR 96 at Brock Road. Additional improvements include turn lanes at major intersections.

By connecting with SR 96 to the southwest, Alternative 3 would provide an additional connection to Houston County and I-75. These alternatives would provide improved access to a large area of Peach County expected to experience residential growth.

The planning-level preliminary engineering, right-of-way, utility relocation, and construction costs for Alternatives 3 are presented in **Table 6.3** below.

Table 6.3: Planning-Level Cost Estimates for Russell Parkway Extension Alternative 3

Alternative	PE	ROW	Utility	CST	Total
Alternative 3	$986,296.39	$3,486,609.45	$0.00	$12,328,704.87	**$16,801,610.71**

6.5 Alternative 4

Alternative 4 would extend Russell Parkway as a two-lane roadway on new location for approximately 1.0 mile from its current terminus at Housers Mill Road west to Lakeview Road. This alternative would then utilize the existing Lakeview and Powersville Roads to provide a connection to SR 247C. The goal of Alternative 4 was to provide a low cost extension by utilizing the existing Lakeview Road. As with Housers Mill Road, to which Russell Parkway currently connects, the existing segment of Lakeview Road has two 12 foot lanes with grassed shoulders and horizontal or vertical curves which appear to meet GDOT design standards, thus this existing roadway should be able to accommodate additional traffic without roadway improvements. Additional improvements associated with this alternative include turn lanes at the intersections of Russell Parkway at John E Sullivan Road, Russell Parkway at Lakeview Road, Russell Parkway at Housers Mill Road, Powersville Road at SR 247C, and signalization of the intersection of Powersville Road at SR 247C.

When developing Alternative 4, a bridge across the Norfolk Southern railroad was considered in order to provide a direct connection with SR 49, however, field investigation of this alignment revealed a historic district at the intersection of Lakeview Road and Powersville Road. The presence of this historic district makes it almost impossible to widen Lakeview Road or extend it over the railroad without significant impact to the historic district. Since federal law makes it very difficult to impact historic resources such

as this district, Alternative 4 is limited to utilizing the existing roadways to provide a connection to SR 247C.

Alternative 4 would provide improved access to a large area of Peach County expected to experience residential growth; however, because it does not connect directly with SR 49, this alternative would not provide an efficient east-west arterial within the study area.

The planning-level preliminary engineering, right-of-way, utility relocation, and construction costs for Alternative 4 are presented in **Table 6.4** below.

Table 6.4: Planning Level Cost Estimates for Russell Parkway Extension Alternative 4

Alternative	PE	ROW	Utility	CST	Total
Alternative 4	$440,167.77	$2,574,510.55	$0.00	$5,502,097.11	**$8,516,775.43**

7.0 Travel Demand Modeling Analysis

In order to determine the transportation benefits, if any, of each alternative, the travel demand model was utilized to analyze each alternative. Each of the seven Build alternatives and the No-Build condition were analyzed using the 2035 travel demand model developed for the concurrent Southwest Georgia Multi-County Study. The following sections present the results of this travel demand modeling analysis for all alternatives.

7.1 No-Build Scenario

The LOS and traffic volumes projected from the travel demand model for the 2035 No-Build are presented in **Figure 7.1** on page 39. As shown in **Figure 7.1** and in **Figure 3.4** on page 23, the segment of SR 247C west of I-75 is expected to operate at LOS E in 2035.

7.2 Transportation Benefits of Alternative 1

Figure 7.2 on page 40 presents projected 2035 traffic conditions associated with the implementation of Alternative 1. Segments of Alternative 1 are projected to attract 2,380 to 3,700 vehicles per day and operate at an acceptable LOS. With the implementation of Alternative 1 however, the segment of Lakeview Road west of I-75 is projected to fall to LOS D due to the implementation of Alternative 1. The extension of Russell Pkwy to John E. Sullivan Road and the extension of John E. Sullivan Road to SR 96 would provide improved connectivity to and from Lakeview Road west of I-75, thus attracting more traffic onto this roadway as well as surrounding roadways. The implementation of Alternative 1 would reduce traffic congestion on SR 247C, allowing the segment of SR 247C between Housers Mill Road and I-75 to operate at LOS C or better.

7.3 Transportation Benefits of Alternative 2

Figure 7.3 on page 41 presents projected 2035 traffic conditions associated with the implementation of Alternative 2. Alternative 2 is projected to attract 6,430 vehicles per day and operate at an acceptable LOS. The implementation of Alternative 2 would reduce traffic congestion on SR 247C, allowing the segment of SR 247C between Housers Mill Road and I-75 to operate at LOS C or better.

7.4 Transportation Benefits of Alternative 3

Figure 7.4 on page 42 presents projected 2035 traffic conditions associated with the implementation of Alternative 3. Alternative 3 is projected to attract 5,140 vehicles per day and operate at an acceptable LOS. With the implementation of Alternative 3 however, the segment of Lakeview Road west of I-75 is projected to fall to LOS D. By extending Russell Pkwy to John E. Sullivan Road and then to SR 96, this alternative would provide improved connectivity to and from Lakeview Road west of I-75, thus attracting more traffic onto this roadway as well as surrounding roadways. This additional traffic is

Figure 7.1: 2035 ADT in the No Build Scenario

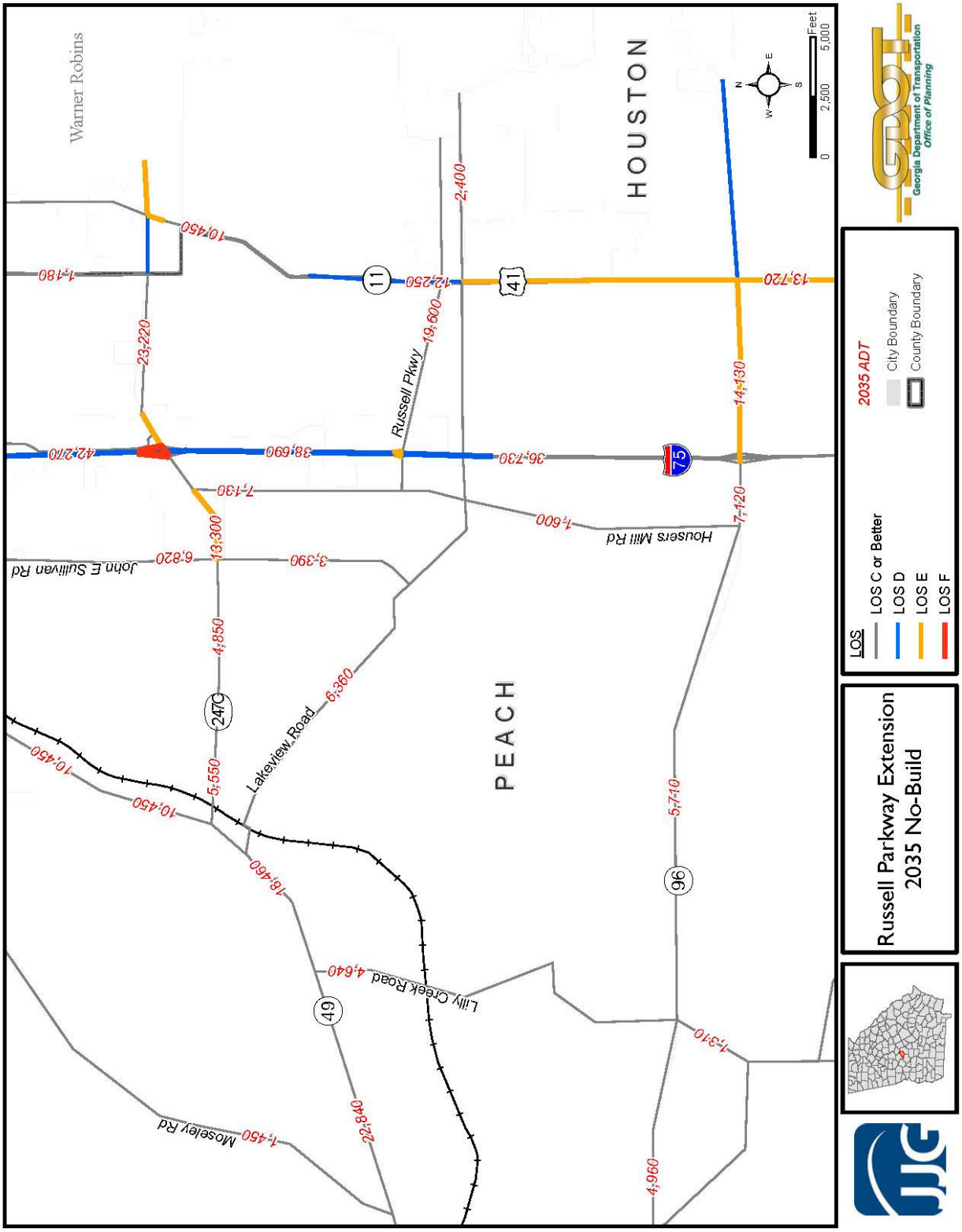


Figure 7.2: Projected Future ADT and LOS on Russell Parkway Extension Alternative 1

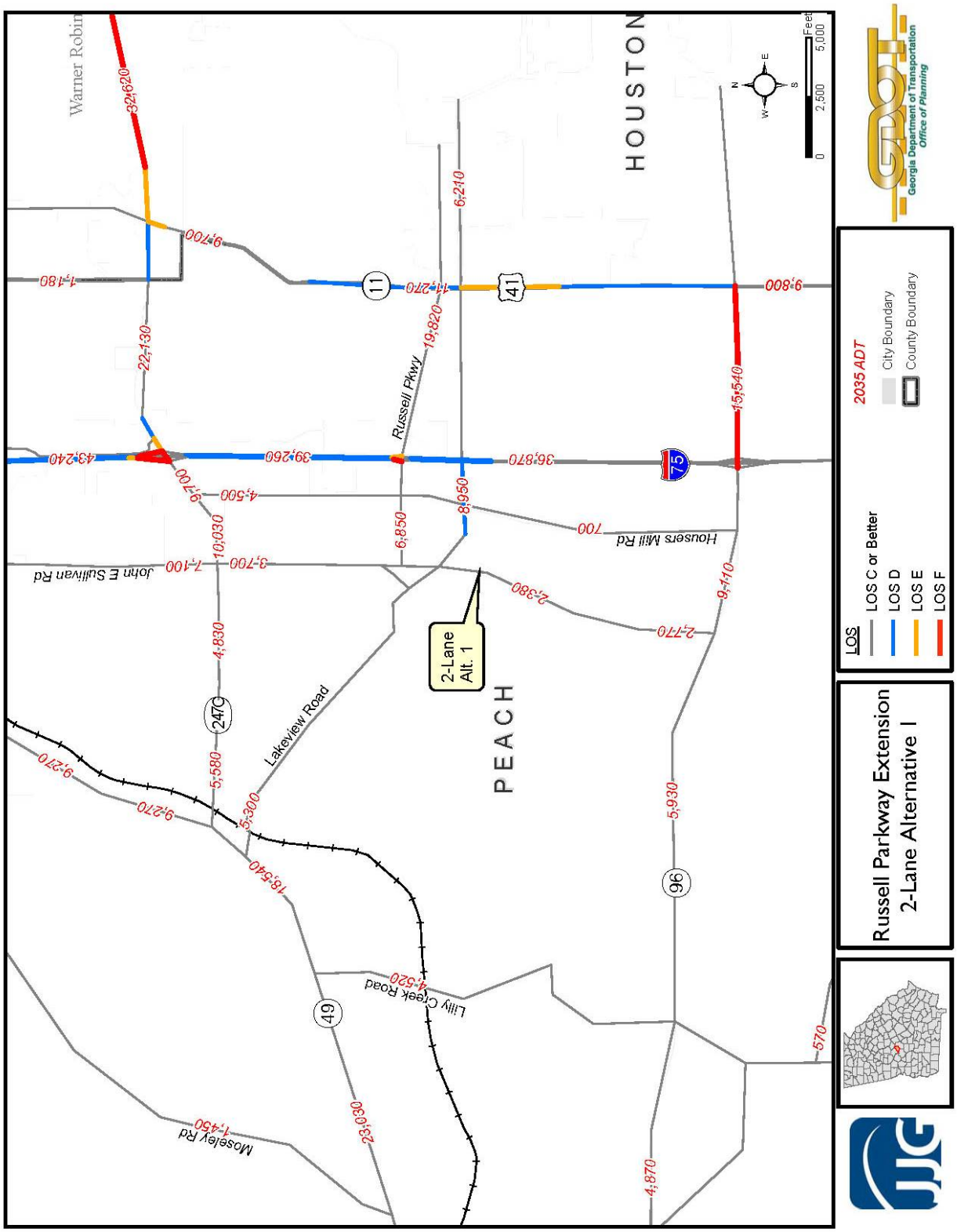


Figure 7.3: Projected Future ADT and LOS on Russell Parkway Extension Alternative 2

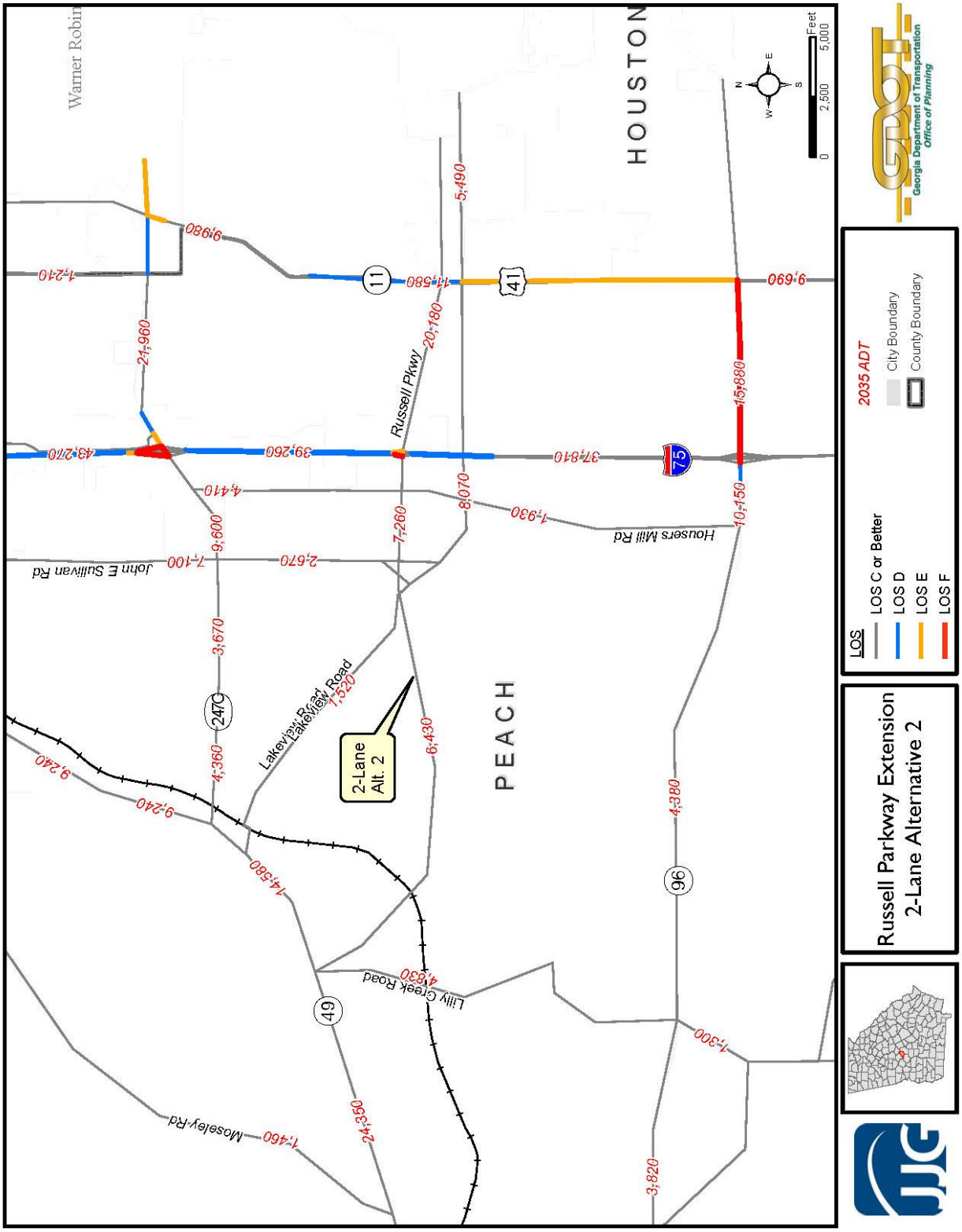
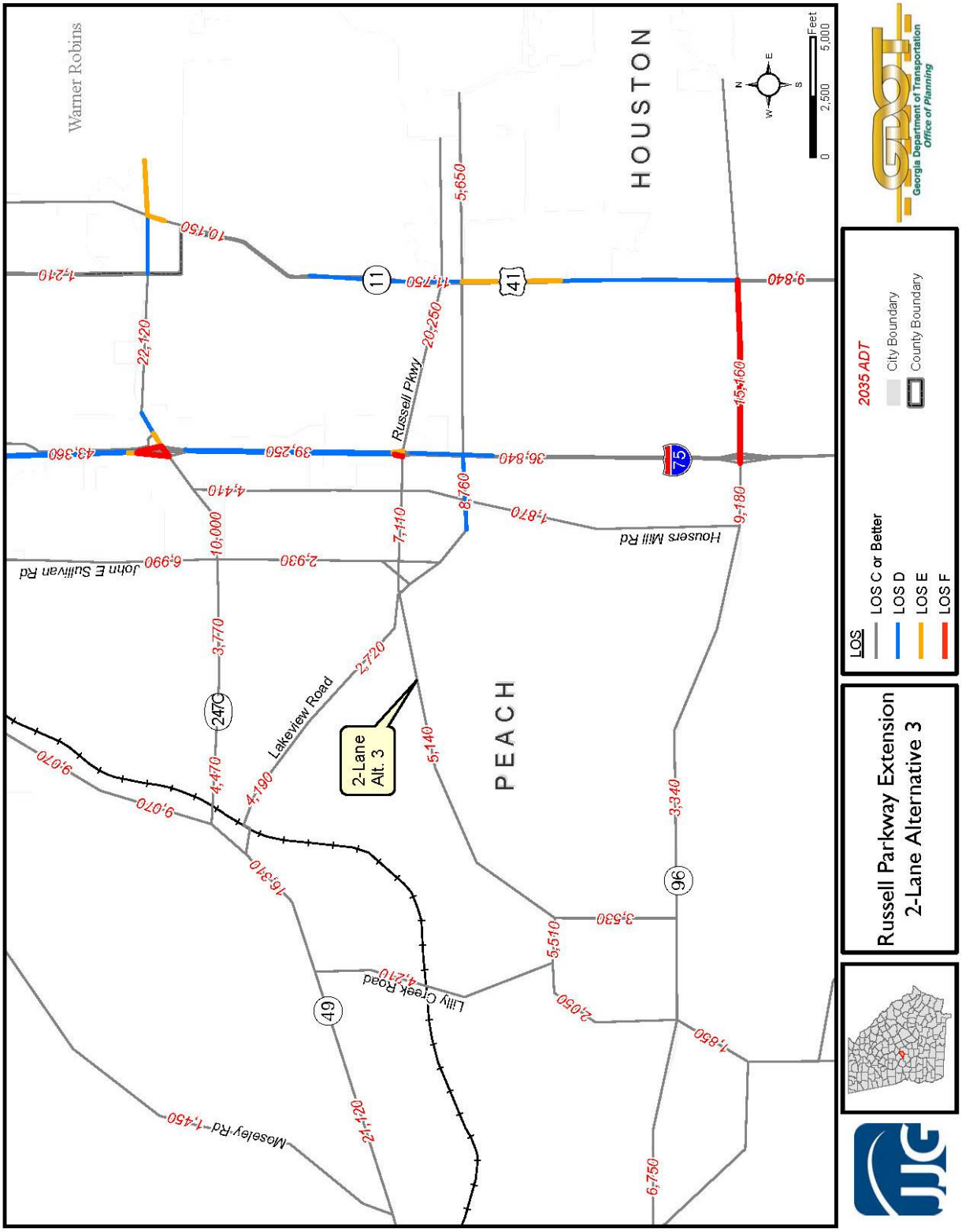


Figure 7.4: Projected Future ADT and LOS on Russell Parkway Extension Alternative 3

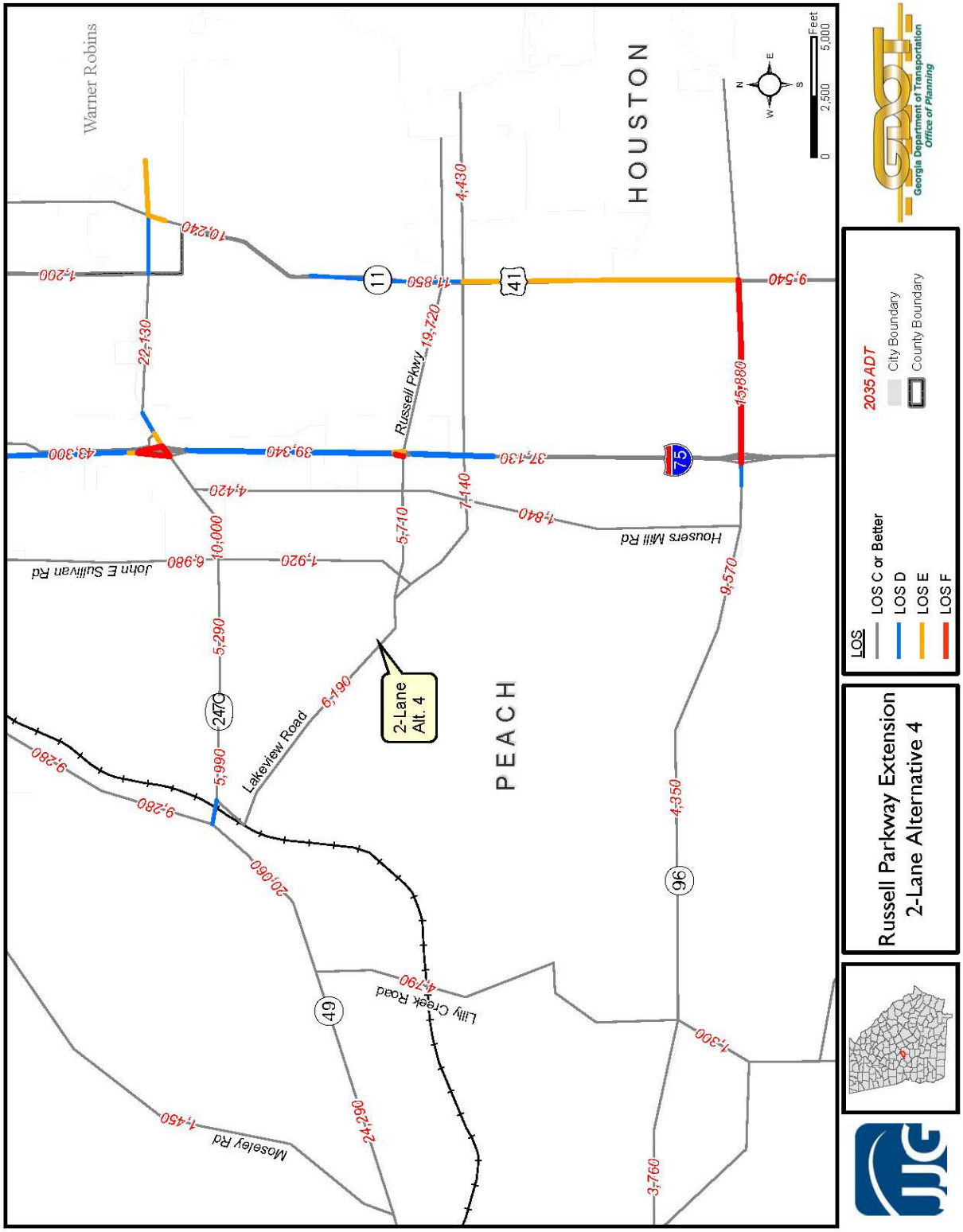


since the implementation of Alternative 3 would provide additional routes for traffic between SR 96 and SR 247C. Thus, more traffic would be expected on all roadways surrounding Alternative 3. The implementation of Alternative 3 would reduce traffic congestion on SR 247C, allowing the segment of SR 247C between Housers Mill Road and I-75 to operate at LOS C or better.

7.5 Transportation Benefits of Alternative 4

Figure 7.5 on page 44 presents projected 2035 traffic conditions associated with the implementation of Alternative 4. Alternative 4 is projected to attract 5,710 vehicles per day and operate at an acceptable LOS. The implementation of Alternative 4 would reduce traffic congestion on SR 247C, allowing the segment of SR 247C between Housers Mill Road and I-75 to operate at LOS C or better. However, since this alternative does not provide a connection with SR 49, traffic utilizing this route would have to travel on SR 247C to access SR 49. This causes the segment of SR 247C between SR 49 and Powersville Road to experience an increase in traffic and operate at LOS D. Thus any benefits provided by this project would be negated due to the reduce LOS on SR 247C.

Figure 7.5: Projected Future ADT and LOS on Russell Parkway Extension Alternative 4



8.0 Impacts to Environmental and Social Resources

8.1 Potential Impacts to Protected Areas

Protected areas are locations which receive protection because of their environmental, cultural, community, or physical value. A large number of protected areas exist which receive varying levels of protection by state and federal laws. Examples include parks, reserves, wetlands, wildlife sanctuaries, cemeteries, and historic properties. **Figure 8.1** on page 46 presents the identified environmental resources within the study area overlaid with the alignments of the study alternatives.

When developing the study alternatives, impacts to these identified resources were avoided or minimized where possible. Environmental resources, such as historic districts, have the potential to preclude the implementation of state or federally funded transportation projects. For this reason, whenever possible, environmental screening is conducted to identify protected environmental resources.

This section discusses the potential impacts of each alternative on identified protected areas. Federal and state law requires protection of wetlands and other natural resources from adverse impacts. Where impacts are unavoidable, mitigation of these impacts must be provided. Federal and state law also requires the protection of historic properties. Where impacts are unavoidable, all possible planning to minimize harm must be made.

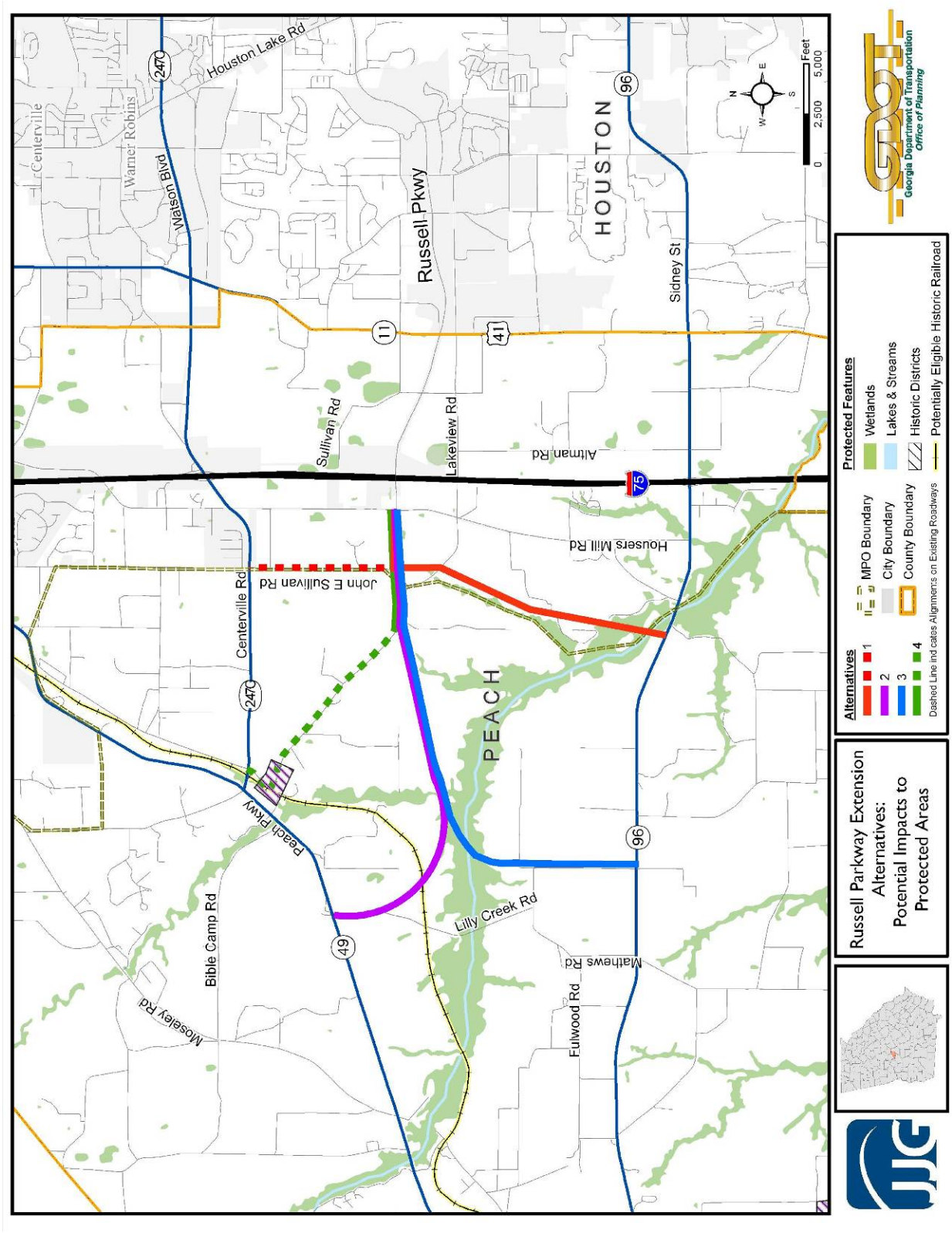
8.1.1 Potential Impacts of Alternative 1

As can be seen from **Figure 8.1**, the north-south segment of Alternative 1 abuts wetlands for much of their mutual alignment before traversing wetlands and the associated river before reaching the southern terminus. Based on upstream and downstream river crossings, this river would need to be crossed by a bridge, minimizing impacts to the river. Wetland impacts appear likely with this alignment and thus, wetland mitigation would likely be necessary. While these impacts would need to be minimized as much as possible, they would not be likely to preclude the implementation of Alternative 1.

8.1.2 Potential Impacts of Alternative 2

As can be seen in **Figure 8.1**, Alternative 2 traverses some wetland areas in the center of their mutual alignment. Wetland impacts appear likely with this alignment and thus, wetland mitigation would likely be necessary. While these impacts would need to be minimized as much as possible, they would not be likely to preclude the implementation of Alternative 2.

Figure 8.1: Potential Impacts to Protected Areas by Russell Parkway Extension Alternatives



8.1.3 Potential Impacts of Alternative 3

As can be seen in **Figure 8.1**, Alternative 3 would traverse a river and a large wetland area and thus wetland mitigation would likely be necessary. While these impacts would need to be minimized as much as possible, they would not be likely to preclude the implementation of Alternative 3. Based on upstream and downstream river crossings, this river would need to be crossed by a bridge, minimizing impacts to the river.

8.1.4 Potential Impacts of Alternative 4

As can be seen in **Figure 8.1**, Alternative 4 traverses an identified historic district. While this district is not identified in the National Register of Historic Places (NRHP), it is likely eligible for inclusion in the NRHP. Alternative 4 would utilize the existing roadway in order to avoid impact to this historic district.

8.2 Potential Impacts to Environmental Justice Communities

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. EO 12898 Federal Actions to Address Environmental Justice to Minority Populations and Low income Populations requires federal agencies to consider impacts to minority and low income populations as part of environmental analyses to ensure that these populations do not receive a disproportionately high number of adverse human health impacts as a result of a federally funded project. In 1998, FHWA issued a guidance document that established policies and procedures for complying with EO 12898 in relation to federally-funded transportation projects. This guidance defines a “disproportionately high and adverse effect” as one that is predominantly borne by, suffered by, or that is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority population and/or non-low-income population.

Minority persons are defined as those people belonging to the following groups: Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or Other Pacific Islander, and Hispanic or Latino. It is important to note that while the first five groups are defined as races, Hispanic or Latino is defined as an ethnicity by the Office of Management and Budget (OMB 1997) as well as Census 2000. As such, people of this minority group can belong to any racial group but are still considered minorities with respect to Environmental Justice. Low-income persons are defined as those whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines.

Census 2000 data from the P4 and P92 sample datasets were utilized to provide a quantitative analysis of the study area with respect to minority and ethnic populations and low-income households. Census data are grouped together by geographic area, of which blocks are the smallest and most precise form. The sensitivity of some information requires the Census Bureau to release it in the more general form of block groups. The data for this study were gathered at the most accurate level for which they were available: for race and ethnicity, at the block level; for income, at the block-group level. The Russell

Parkway Extension study area is composed of Block Groups 1 and 3 from Census Tract 401, and Block group 1 from Census Tract 402.

Across the study area, 29.1 percent of the population is minority persons, a lower share than that of the State of Georgia, which is 37.4 percent minority. For the study area as a whole, 17.2 percent of households have incomes under the poverty level, higher than the statewide average of 12.6 percent. To better gauge potential impacts of the construction of alternatives upon minority and low income neighborhoods, the minority population as a percentage of Census block group population is presented in **Figure 8.2** on page 49 and the low-income population as a percentage of Census tract population is presented in **Figure 8.3** on page 50.

8.2.1 Potential Environmental Justice Impacts of Alternative 1

As can be seen from **Figure 8.2**, the alignment of Alternative 1 abuts the western edge of a residential area that is 21 to 40 percent minority at its northern section, and then traverses an area that is 0 to 20 percent minority. As Peach County is roughly 51 percent minority, it is unlikely that Alignment 1 would cause high or adverse impacts to minorities in these areas. At its southern end, the alignment for Alternative 1 would briefly traverse an area that is 61 to 80 percent minority. However, this area has an extremely low residential density, with less than one person per ten acres. Thus, Alternative 1 is unlikely to cause undue impacts to minorities in this area.

As can be seen from **Figure 8.3**, near its southern terminus, the alignment for Alternative 1 briefly traverses an area with a population that is 31 to 50 percent low-income, while the remainder traverses an area that is 6 to 15 percent low income. However, population density along the proposed alignment is extremely low, less than one person per ten acres, making high or undue impacts to low income households from Alternative 1 unlikely.

8.2.2 Potential Environmental Justice Impacts of Alternative 2

As can be seen from **Figure 8.2**, the eastern end of the alignment for Alternative 2 traverses a neighborhood that is 21 to 40 percent minority. As Peach County is roughly 51 percent minority, it is unlikely that Alternative 2 would cause high or adverse impacts to minorities in this area. Near the proposed western terminus, Alternative 2 abuts an area that is 61-80 percent minority. However this area has an extremely low residential density, with one to five persons per ten acres. Thus, Alternative 2 is unlikely to cause undue impacts to minorities in this area.

As can be seen from **Figure 8.3**, the eastern terminus of the alignment for Alternative 2 lies within an area that is 6 to 15 percent low-income. In this area, these alternatives are unlikely to cause undue or adverse impacts to low-income households. Toward its western terminus, the alignment traverses an area that is 31 to 50 percent low income. Nevertheless, due to the low residential density of this area, Alternative 2 is unlikely to cause undue or high impacts to low income households in this area.

Figure 8.2: Potential Impacts to Minority Neighborhoods by Russell Parkway Extension Alternatives

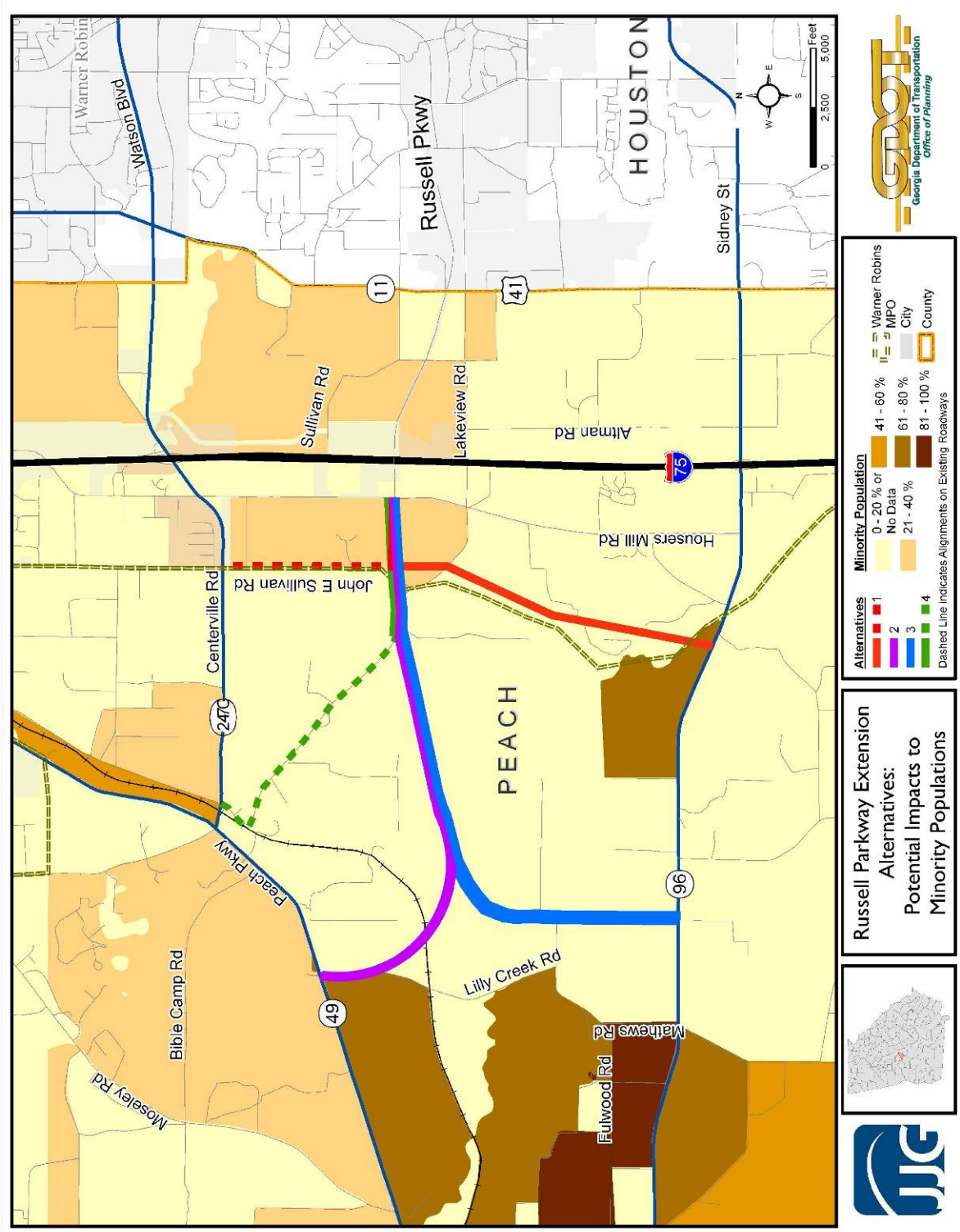
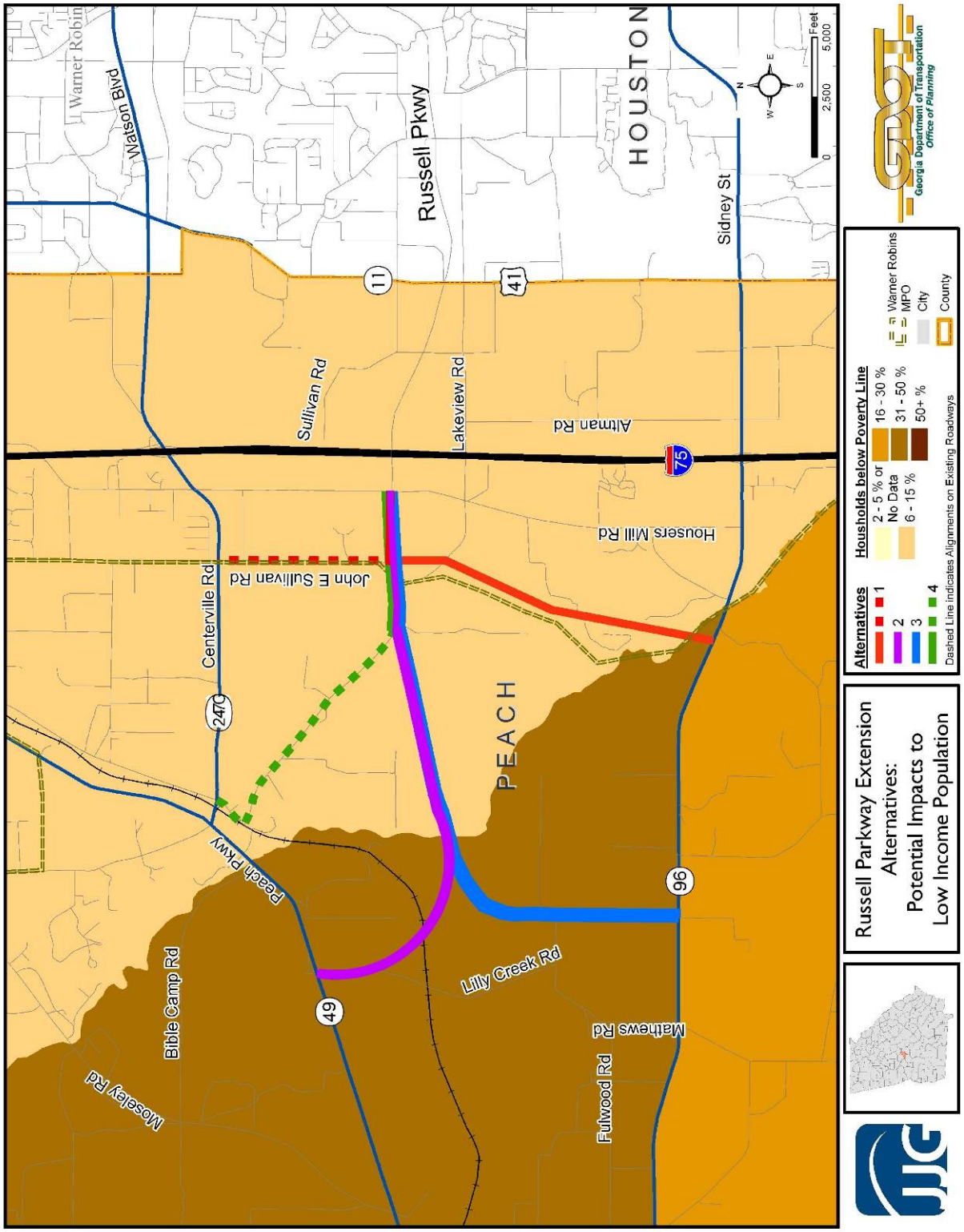


Figure 8.3: Potential Impacts of Russell Parkway Extension Alternatives to Low Income Populations



8.2.3 Potential Environmental Justice Impacts of Alternative 3

As can be seen from **Figure 8.2**, the eastern end of the alignment for Alternative 3 traverses an area that is 21 to 40 percent minority. As Peach County is roughly 51 percent minority, it is unlikely that Alignment 3 would cause high or adverse impacts to minorities in this area. The remainder of the alignment lies within an area that is no more than 20 percent minority. This alternative is therefore unlikely to create any undue impacts to minority residents.

As can be seen from **Figure 8.3**, the eastern terminus of the alignment for Alternative 3 lies within an area that is 6 to 15 percent low-income. In this area, these alternatives are unlikely to cause undue or adverse impacts to low-income households. Toward its western terminus, the alignment traverses an area that is 31 to 50 percent low income. Nevertheless, due to the low residential density of this area, Alternative 3 is unlikely to cause undue or high impacts to low income households in this area.

8.2.4 Potential Environmental Justice Impacts of Alternative 4

As can be seen from **Figure 8.2**, the eastern end of Alternative 4 traverses an area that is 21 to 40 percent minority. As Peach County is roughly 51 percent minority, it is unlikely that Alignment 4 would cause high or adverse impacts to minorities in this area. The remainder of Alterative 4 lies within an area that is no more than 20 percent minority. This alternative is therefore unlikely to create any undue impacts to minority residents.

As can be seen from **Figure 8.3**, the entirety of Alternative 4 is in an area that is 6 to 15 percent low-income, and therefore, this alternative is unlikely to cause undue or high impacts to low income households.

9.0 Evaluation of Alternatives

In order to assist Peach County, the Warner Robins MPO, and GDOT with future decisions regarding the Russell Parkway Extension, all alternatives, including the No-Build, were evaluated and ranked. This section documents the identification of evaluation criteria, results of the evaluation, and ranking of study alternatives.

9.1 Evaluation Criteria

Evaluation criteria were established in order to compare the performance, or effectiveness, of each alternative with the other alternatives. By evaluating each alternative against these criteria, an objective evaluation of each alternative with each other can be performed. Five main evaluation criteria were identified to evaluate the Russell Parkway Extension alternatives. The first three criteria – mobility, access and connectivity, and safety — evaluate each alternative's ability to address the identified need and purpose of the project. Total project cost and benefit/cost ratio were also utilized to evaluate the study alternatives against each other. For each evaluation criteria, the study alternatives were assigned a score based on how well each criterion was addressed. The composite score for each alternative across all five evaluation criteria was utilized to rank the study alternatives.

Improvement to east-west mobility was identified as a primary need within the study area. For this reason, the ability of the study alternatives to address east-west mobility was selected as an evaluation criterion. In order to evaluate this criterion, the travel demand model analysis was utilized to quantify the traffic reduction on SR 247C, which is the primary east-west travel corridor within the study area.

Access and connectivity improvements were also identified as a primary need within the study area. With the study area, and surrounding areas, expected to experience significant growth in the next 25 years, safe and efficient access to residential and employment areas is critical to the success of this region. With a limited number of roadways serving the study area, adequate access to and from new residential developments must be maintained in order to serve the growing transportation needs of this area. Alternatives were evaluated on their ability to provide improved access to the existing roadway network in the study area.

Improving safety on study area roadways was also identified as a primary need within the study area. As presented earlier, the study area contains multiple roadway segments and intersections identified as safety concerns. These roadways experience crash rates higher than statewide average for their facility type and these intersections experience a higher than average number of crashes when compared to other intersections within the county. Since these safety concerns are most likely a result of increasing traffic volumes and congestion, the ability of the study alternatives to reduce congestion on these high crash roadway segments and at these high crash intersections was utilized as an evaluation criterion.

Additionally, project cost was utilized as an evaluation criterion since cost is a primary consideration for all agencies when considering and prioritizing transportation projects. Finally, benefit/cost ratio was utilized since it serves to equate project benefits with project costs.

As presented in the previous section of this report, no study alternatives are expected to have significant environmental or social impacts. Thus the environmental and social impacts of these alternatives were not included in the evaluation criteria. The following details the results of the evaluation of alternatives based on these established criteria.

9.2 East-West Mobility

Maintaining east-west mobility was identified as a primary transportation need within the study area. For this reason, the study alternatives were evaluated on the basis of their ability to enhance regional mobility. As one of the primary east-west corridors between the residential areas in Peach County and employment and retail centers in Houston County, the effective operation of SR 247C is critical to maintaining east-west mobility. Therefore the ability of the Russell Parkway Extension to reduce congestion on SR 247C serves as a primary evaluation criterion of the performance of each study alternative. Thus, each alternative was evaluated on the total projected reduction of ADT on the two segments of 247C that extend from SR 49 to Housers Mill Road and from Housers Mill road to I-75. A comparison of ADT reduction by alternative is provided in **Table 9.1** below. **Table 9.2** below presents the project evaluation scoring for the East-West Mobility evaluation criterion.

Table 9.1: Comparison of ADT Reduction on Study Segments by Alternative

	ADT	Reduction in ADT			
Roadway Segment	**No-Build Scenario**	**1**	**2**	**3**	**4**
247C from SR 49 to Housers Mill Road	4,850	20	1,180	1,150	-440
247C from Housers Mill Road to I-75	13,300	3,600	3,700	3,300	3,300
Combined ADT reduction	0	3,620	4,880	4,450	2,860

Table 9.2: Mobility Evaluation Criterion Scoring

ADT reduction on SR 247C from SR 49 to Housers Mill Road and from Housers Mill road to I-75	Scoring
Combined ADT reduction = < 2,500 vehicles per day	0
Combined ADT reduction = 2,501 – 3,500 vehicles per day	1
Combined ADT reduction = 3,501 – 4,500 vehicles per day	2
Combined ADT reduction = > 4,500 vehicles per day	3

9.2.1 No-Build Alternative

As shown in **Table 9.1**, the No-Build Alternative would not reduce ADT on the two segments of SR 247C.

9.2.2 Alternative 1

As shown in **Table 9.1**, Alternative 1 is projected to reduce ADT on the two segments of SR 247 by a total of 3,620.

9.2.3 Alternative 2

As shown in **Table 9.1**, Alternative 2 is projected to reduce ADT on the two segments of SR 247 by a total of 4,880. Alternative 2 is projected to result in the highest reduction in ADT of the alternatives studied.

9.2.4 Alternative 3

As shown in **Table 9.1**, Alternative 3 is projected to reduce ADT on the two segments of SR 247C by a total of 4,450.

9.2.5 Alternative 4

As shown in **Table 9.1**, Alternative 4 is projected to reduce ADT on the two segments of SR 247C by a total of 2,860. Alternative 4 was the least effective among the alternatives for reducing ADT on SR 247C.

9.3 Access and Connectivity

The project need and purpose states that adequate access to new residential developments within the study area must be maintained in order to serve the growing transportation needs of these residential areas. Access, or accessibility, refers to the ability to reach a destination or location. In roadway engineering, *access* refers to connections to adjacent properties. Access is a general term used to describe the degree to which a destination is accessible by as many people as possible. In this study, access refers to how well an existing area or roadway network can be reached by automobile. Improved access provides for a more connected roadway network, thus reducing congestion and bottlenecks at major intersections.

Connectivity refers to how well a transportation network provides multiple routes and connections that serve the same origins and destinations. As connectivity increases, travel distances and vehicle miles travelled (VMT) decrease and route options increase, allowing more direct travel between origins and destinations. A well connected area includes parallel routes and cross connections. In this study, connectivity refers to the number of, or lack of, travel routes between an origin and destination.

The alternatives were evaluated on how well they improve access and connectivity based on the number and functional classification of roadways accessed by each alternative. Therefore, a connection to a collector roadway would not improve access as much as a new connection to a four-lane principal arterial. A comparison of new access provided by the study alternatives is presented in **Table 9.3** on page 55. **Table 9.4** on page 55 presents the project evaluation scoring for the Access evaluation criterion.

Table 9.3: Comparison of New Access Provided by Alternatives

Alternative	No new access	New access to collector & residential roadways	New access to collector & residential roadways & minor arterials	New access to collector & residential roadways & principal arterials
No-Build	X			
1			X	
2				X
3			X	
4		X		

Table 9.4: Access and Connectivity Evaluation Criterion Scoring

Provision of additional access	Scoring
Provides no additional access	0
Provides additional access to collector and residential roadways	1
Provides additional access to collector and residential roadways and minor arterials	2
Provides additional access to collector and residential roadways and principal arterials	3

9.3.1 No-Build Alternative

The No-Build Alternative would not improve access to the roadway network.

9.3.2 Alternative 1

Alternative 1 would provide new access to SR 96, a two-lane, minor arterial, and to the existing John E Sullivan Road and Lakeview Road, which are collector roadways.

9.3.3 Alternative 2

Alternative 2 would provide new access to Lakeview Road and John E Sullivan Road, both collector roadways, and SR 49, a four-lane, divided, principal arterial.

9.3.4 Alternative 3

Alternative 3 would provide new access to Lakeview Road and John E Sullivan Road, both collector roadways, and SR 96, a two-lane, minor arterial.

9.3.5 Alternative 4

Alternative 4 would provide access to two existing collector roadways, Lakeview Road and John E Sullivan Road.

9.4 Safety

The project need and purpose states that improved safety is a primary transportation need within the study area. As presented earlier, the study area contains multiple roadway segments and intersections identified as safety concerns. These roadways experience crash rates higher than statewide average and these intersections experience a higher than average number of crashes when compared to similar intersections within the county. Since these safety concerns are most likely a result of increasing traffic volumes and congestion, the ability of the study alternatives to reduce congestion on these high crash roadway segments and intersections was utilized as an evaluation criterion.

According to *The Benefits of Reducing Congestion* (NCHRP Project 8-36, Task 22, Demonstrating Positive Benefits of Transportation Investment), prepared for the National Cooperative Highway Research Program, Transportation Research Board, and the National Research Council by Cambridge Systematics, Inc, January 2002, "Traffic congestion contributes to highway crashes." As motorists fight for position at intersections and access from feeder roadways, the potential for crashes increases. Higher speeds are associated with traffic fatalities, but bottlenecks contribute to the number of all types of crashes, albeit often at slower speeds. In turn, crashes on roadways increase congestion on those same roadways.

Reduction of ADT on SR 247C would contribute to improving Level of Service on that facility. The reduction in congestion on that segment, then, as measured in a reduction in ADT, would indicate a potential increase in safety on that segment. While geometric issues do contribute to crash rates on certain roadways and intersections, this segment of SR 247C and its intersection with SR 49 do not contain any substandard vertical or horizontal alignments and the sight distance at the intersection appears more than adequate. Therefore, reduction in congestion would likely lead to an improvement in safety.

The high crash roadways and intersections within the study area, presented in **Figure 2.5** on page 11, are SR 96, SR 247C, SR 49, and the intersection of SR 49 at SR 247C. Study alternatives were evaluated on their ability to reduce traffic volumes on these high crash roadway segments and on the major roadways that comprise the intersection of SR 49 at SR 247C. Each alternative was evaluated on the basis of the combined reduction in ADT on these roadway segments projected to result from its implementation. **Table 9.5** on page 57 presents a comparison of the ADT reduction by alternative. Project evaluation scoring for the Safety evaluation criterion is presented in **Table 9.6** on page 57.

Table 9.5: Comparison of ADT Reduction on Study Segments by Alternative for Safety Criterion

	High Crash Rate Roadway Segments			High Crash Intersection			Combined ADT Reduction for Study Segments
	SR 96 (Matthews/ Borders Rd to Housers Mill Rd)	SR 247C (Housers Mill Rd to John E Sullivan Rd)	SR 49 (N of Menagerie Manor)	SR 49 (S of 247C)	SR 49 (N of 247C)	SR 247C at SR 49	
No-Build	5710	13,300	10450	18460	10450	5550	**-**
reduction	*0*	*0*	*0*	*0*	*0*	*0*	***0***
1	5930	10030	9270	18540	9270	5580	
reduction	*-220*	*3,270*	*1,180*	*-80*	*1,180*	*-30*	***5,300***
2	4380	9600	9240	14580	9240	4360	
reduction	*1330*	*3,700*	*1,210*	*3,880*	*1,210*	*1,190*	***12,520***
3	3340	10000	9070	16310	9070	4470	
reduction	*2370*	*3,300*	*1,380*	*2,150*	*1,380*	*1,080*	***11,660***
4	4350	10000	9280	20060	9280	5990	
reduction	*1360*	*3,300*	*1,170*	*-1,600*	*1,170*	*-440*	***4,960***

Table 9.6: Safety Evaluation Criterion Scoring

Characteristic: **Improved Safety through Combined Reduction of ADT on SR 49, SR 247C and SR 96**	**Score**
Total ADT reduction <5000 vehicles per day	0
Total ADT reduction = 5000-10,000 vehicles per day	1
Total ADT reduction = 10,000 – 15,000 vehicles per day	2
Total ADT reduction > 15,000 vehicles per day	3

9.4.1 No-Build Alternative

The No-Build Alternative would not reduce ADT on the selected segments.

9.4.2 Alternative 1

Alternative 1 is projected to reduce ADT on the selected segments by a total of 5,300.

9.4.3 Alternative 2

Alternative 2 is projected to reduce ADT on the selected segments by a total of 12,520, the highest reduction projected for any of the alternatives.

9.4.4 Alternative 3

Alternative 3 is projected to reduce ADT on the selected segments by a total of 11,660.

9.4.5 Alternative 4

Alternative 4 is projected to reduce ADT on the selected segments by a total of 4,960. Alternative 4 is projected to provide the least reduction in ADT on the roadway network of all build alternatives.

9.5 Total Planning-Level Estimated Project Cost

As presented earlier in this report, the planning-level cost estimates for the study alternatives vary significantly based on alignment and configuration differences. Given the fiscal constraints facing federal, state, and local agencies, project cost becomes an increasingly important consideration when preparing and prioritizing transportation plans and programs. For this reason, project cost was included as an evaluation criterion. **Table 9.7** below presents the total planning-level project cost for each alternative, including construction, preliminary engineering, right of way and utility costs. **Table 9.8** below presents the project evaluation scoring for the project cost evaluation criterion.

Table 9.7: Comparison of Project Cost by Alternative

Alternative	PE	ROW	Utility	CST	Total
1	$824,244.90	$3,097,384.73	$0.00	$10,303,061.24	$14,224,690.87
2	$1,152,574.14	$3,381,096.73	$0.00	$14,407,176.76	$18,940,847.63
3	$986,296.39	$3,486,609.45	$0.00	$12,328,704.87	$16,801,610.71
4	$440,167.77	$2,574,510.55	$0.00	$5,502,097.11	$8,516,775.43

Source: RUCEST and CES

Table 9.8: Project Cost Evaluation Criterion Scoring

Characteristic: **Cost of project including preliminary engineering, right-of-way, utility, and construction costs**	**Score**
Total project cost > $20 million	0
Total project cost = $15 - 20 million	1
Total project cost = $10 - 15 million	2
Total project cost < $10 million	3

9.5.1 No-Build Alternative

The No-Build Alternative would not incur any costs.

9.5.2 Alternative 1

Alternative 1 is projected to cost approximately $10.3 million.

9.5.3 Alternative 2

Alternative 2 is projected to cost approximately $14.4 million, the highest estimated cost of all alternatives.

9.5.4 Alternative 3

Alternative 3 is projected to cost approximately $12.3 million.

9.5.5 Alternative 4

Alternative 4 is projected to cost approximately $5.5 million. Of the alternatives, Alternative 4 has the lowest estimated total cost, mainly due to its use of the existing Lakeview Road facility.

9.6 Benefit-Cost Ratio

Although the cost of a project is an important factor when evaluating transportation projects, it is also important to weight projects costs with project benefits. Projects with a benefit-cost ratio greater than 1 have greater benefits than costs as well as positive net benefits. The higher the benefit-cost ratio, the greater the benefits are relative to the costs. Thus, the high cost of a project may be validated by the additional benefits its implementation would provide users. The benefit-cost ratio is useful in determining whether the costs associated with that project justify its construction. This ratio can also provide insight as to whether the extra expense of an alternative is justified by the additional benefits it is projected to provide. Benefit-cost ratios help agencies prioritize projects and make better transportation investment decisions.

In a benefit-cost analysis, each alternative is compared to the no-build scenario. The user benefits projected to result from each alternative—shorter trip times and reduced fuel costs--are divided by the alternative's annualized construction cost. The travel demand model was utilized to calculate the benefits of each alternative relative to the No-Build condition, based on the following assumptions:

- Truck percentage of five percent on Alternative 1, and 7.4 percent on Alternatives 2, 3 and 4, based on 2009 GDOT averages by facility type.
- Fuel cost per mile of $0.1786 based on fuel cost of $3.22 and an average MPG of 18.03.
- Annual average use is 250 days per year.
- Driver's time value is $13.75 and truck driver's time value is $72.65.
- Project lifetime of 25 years.

Table 9.9 on page 60 presents the benefit-cost ratio calculations for each alternative. **Table 9.10** on page 60 presents the project evaluation scoring for the benefit-cost ratio criterion.

Table 9.9: Benefit-Cost Ratio by Project Alternative

	Benefit - Delay Savings				Benefit - Fuel Savings					
Alter-native	Car Time Savings	Truck Time Savings	Total Daily Savings	Annual Savings	VMT Change	Daily Change	Annual Benefit/ Loss	Total Project Cost	Annual Project Cost	B/C Ratio
NB	0	0	0	0	0	0	0	0	0	**0**
1	$4,258	$1,184	$5,443	$1,360,643	306	54.65	$13,663	$10,303,061	$591,683	**2.32**
2	$6,545	$2,763	$9,308	$2,326,955	2,201	393.10	$98,275	$14,407,177	$827,373	**2.93**
3	$5,437	$2,296	$7,732	$1,933,093	-947	-169.13	($42,284)	$12,328,705	$708,011	**2.67**
4	$3,845	$1,624	$5,469	$1,367,199	-5,345	-954.62	($238,654)	$5,502,097	$315,974	**3.57**

Table 9.10: Project Benefit-Cost Ratio Evaluation Criterion Scoring

Characteristic: **Ratio of time savings and cost savings benefits to project cost**	**Score**
Benefit-Cost Ratio < 1	0
Benefit-Cost Ratio 1 – 2	1
Benefit-Cost Ratio 2 – 3	2
Benefit-Cost Ratio > 3	3

9.6.1 Benefit-Cost Ratio of No-Build Alternative

As can be seen from **Table 9.9**, the benefit cost of the No-Build Alternative is 0. This alternative offers no time or fuel savings, but also does not incur any costs.

9.6.2 Benefit-Cost Ratio of Alternative 1

As can be seen from **Table 9.9**, the benefit cost of Alternative 1 is 2.32. This benefit-cost ratio is generally recognized as sufficient to justify construction. This alternative offers both time and fuel savings.

9.6.3 Benefit-Cost Ratio of Alternative 2

As can be seen from **Table 9.9**, the benefit cost of Alternative 2 is 2.93. This benefit-cost ratio is generally recognized as sufficient to justify construction. This alternative offers both time and fuel savings.

9.6.4 Benefit-Cost Ratio of Alternative 3

As can be seen from **Table 9.9**, the benefit cost of Alternative 3 is 2.67. This benefit-cost ratio is generally recognized as sufficient to justify construction. This alternative offers time savings but would result in slightly higher overall vehicle miles travelled (VMT), which would increase fuel costs for users.

9.6.5 Benefit-Cost Ratio of Alternative 4

As can be seen from **Table 9.9**, the benefit cost of Alternative 4 is 3.57, which is generally recognized as sufficient to justify construction. This alternative has the highest benefit-cost ratio of the alternatives, primarily because it makes use of an existing roadway and therefore has the lowest cost of construction. However, this alternative would incur the greatest increase in fuel costs of the alternatives as well.

9.7 Alternatives Evaluation Matrix

The scores of each alternative for each evaluation criteria were compiled into a single evaluation matrix, presented in **Table 9.11** below. These scores have been totaled to produce a ranking of alternatives.

Table 9.11: Project Evaluation Matrix

	Need and Purpose Measures			Costs			
Alternative	Mobility	Access and Connectivity	Safety	Total Cost	Benefit-Cost Ratio	Total Score	Ranking
No-Build	0	0	0	3	0	3	5
1	2	2	1	2	2	9	3
2	3	3	2	1	2	11	1
3	3	2	2	1	2	10	2
4	1	1	0	3	3	8	4

9.7.1 Evaluation of No-Build Alternative

As can be seen from **Table 9.11**, the No-Build alternative ranked last out of the alternatives. This alternative only received any score in the cost category because it would incur no cost.

9.7.2 Evaluation of Alternative 1

As can be seen from **Table 9.11**, Alternative 1 is ranked third out of the five alternatives.

9.7.3 Evaluation of Alternative 2

As can be seen from **Table 9.11**, Alternative 2 ranked first out of five alternatives. This alternative offers the most mobility, access and connectivity, and safety advantages of the alternatives in this study's evaluation.

9.7.4 Evaluation of Alternative 3

As can be seen from **Table 9.11**, Alternative 3 ranked second out of five alternatives.

9.7.5 Evaluation of Alternative 4

As can be seen from **Table 9.11**, Alternative 4 ranked fourth out of five alternatives Even though this alternative had the highest benefit-cost ratio, and lowest total cost, it did not address the need and purpose of the project as well as other alternatives.

10.0 Conclusions

As the Russell Parkway Extension is already included in the GDOT Work Program and the WRATS 2030 LRTP, the intent of this study was to identify the highest performing alignment alternative with respect to configuration, cost, and transportation benefits.

Based on analysis of existing and future conditions, as well as from input from local agencies, stakeholders, and the general public, this study established that the purpose of the extension of Russell Parkway was to satisfy the identified transportation needs for increased mobility, access and connectivity, and safety within the study area. Four build alternatives were developed to consider all feasible alignments, configurations, and connections to the existing roadway network.

These alternatives and the No-Build conditions were then evaluated against identified criteria. These evaluation criteria were established in order to compare the performance, or effectiveness, of each alternative with the other alternatives. By evaluating each alternative against these criteria, an objective comparative evaluation of each alternative could be performed. Five main evaluation criteria were identified to evaluate the Russell Parkway Extension alternatives. The first three criteria evaluate each alternative's ability to address the identified need and purpose of the project. Total project cost and benefit/cost ratio were also utilized to compare study alternatives. For each evaluation criterion, the study alternatives were assigned a score based on how well each criterion was addressed. The composite score for each alternative across all five evaluation criteria was utilized to rank the study alternatives. **Table 9.11** on page 61 presents the results of this evaluation and the resultant ranking of all project alternatives.

The following recommendations were based on the analysis and ranking of the study alternatives presented in this report:

- **Alternative 1** ranked third out of the five alternatives studied. This alternative offers new access to collector and residential roadways, as well as minor arterials, and some reduction in ADT on existing roadways. However, Alternative 1 offered minimal safety benefits and a relatively low benefit-cost ratio. Therefore, this alternative was not selected by this study.
- **Alternative 2** ranked first out of the five alternatives studied. As the only alternative to offer new access to collector and residential roadways, as well as principal arterials, this alternative most effectively addressed the need for access and connectivity within the study area. It also offered substantial mobility and safety benefits within the study area. At $18.9M, Alternative 2 is the most expensive of the alternatives, based on planning-level cost estimates, but has the second-highest benefit-cost ratio. Therefore, this study recommends that Alternative 2 be selected as the alignment for the Russell Parkway Extension as programmed in the GDOT Work Program.
- **Alternative 3** ranked second out of the five alternatives studied. This alternative offered many of the same benefits as Alternative 2. However, this alternative offers new access to collector and residential roadways, as well as minor arterials, and therefore has slightly less access and

connectivity benefits than Alternative 2, as well as a lower benefit-cost ratio. Therefore, this alternative was not selected by this study.

- **Alternative 4** ranked fourth out of the five alternatives studied. This alternative has a high benefit-cost ratio of 3.57, and a low estimated project cost of $8.5M. However, Alternative 4 offered minimal mobility, access and connectivity and safety benefits. In fact, Alternative 4 would increase traffic on SR 247C, causing this segment to operate at LOS D. By forcing improvements to be made beyond its terminus, this project would not be deemed to have logical termini. Thus without improvements to SR 247C, which would include a new bridge over the railroad, Alternative 4 could not receive federal funding. For these reasons, this alternative was not selected by this study.