



TRANSPORTATION

STUDY



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# Bryan County Transportation Study Executive Summary



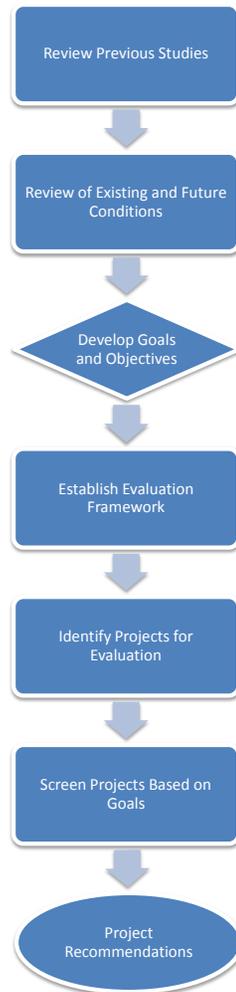
# Executive Summary

Bryan County is projected to almost double in population from 23,500 in 2000 to roughly 46,000 by 2030. The Bryan County Transportation Study has been prepared by the Georgia Department of Transportation (GDOT) in cooperation with Bryan County, the City of Pembroke, the City of Richmond Hill, Coastal Regional Commission of Georgia (CRC) and various other planning partners. The purpose of this study is to identify and recommend transportation improvements necessary to meet travel needs through the year 2035. A Bryan County Travel Demand Model was developed to assess travel trends in the county and assist in the evaluation of capacity improvements based on performance measures. In addition to sound technical analysis, public involvement also played a critical role in the development of this study. **Figure ES.1** (opposite) displays a flow chart depicting the study process. This document should be reviewed and updated periodically to ensure that the planning factors and other assumptions are still relevant and effectively address transportation needs.

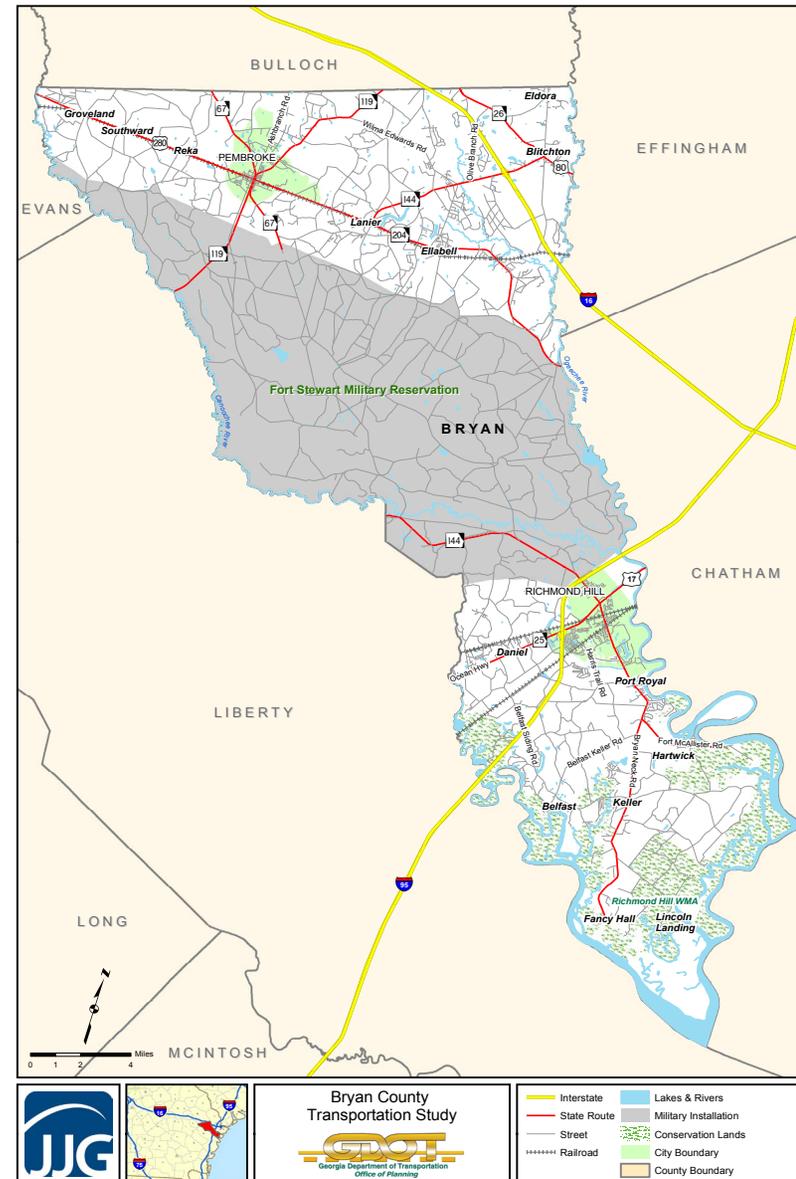
## Study Area Overview

Bryan County is located in southeast Georgia as part of a ten-county coastal region. **Figure ES.2** (opposite) provides a map of the study area. Bryan County is bordered by Effingham and Chatham Counties to the east, Liberty and Evans Counties to the west and Bulloch County to the north. Fort Stewart occupies roughly the middle third of the study area. The presence and location of Fort Stewart creates two separate subareas, with the City of Pembroke providing public services for north Bryan and the City of Richmond Hill for south Bryan. Bryan County is thus unique in that those wishing to travel from one end of the county to the other find it easier to travel outside the county

**Figure ES.1: Study Process**



**Figure ES.2: Bryan County Study Area**



# Executive Summary

to do so. I-16 traverses the northern portion of the county and includes an interchange at US 280. I-95 primarily serves the southern portion of the county and includes two interchanges at SR 144 and at Ocean Highway (US 17). These interstate connections make the county attractive for commuters to Chatham County, and for freight activities related to the nearby Port of Savannah.

## Goals and Objectives

Bryan County Transportation Study goals were built on the relevant goals developed from previous studies, and were refined based on stakeholder interviews and Advisory Committee inputs. Refer to Chapter 1 for a review of the previous studies including the locally adopted Comprehensive Plan. **Table ES.1** (opposite) presents the goals and needs statements that shaped the format and direction of this study.

## Baseline Conditions

The following baseline conditions findings were essential in creating a plan that reflects and meets the county's needs for an integrated transportation system:

- Most of Bryan County is characterized by rural, low-density land use with pockets of identified growth areas. These existing and proposed areas include the existing commercial nodes in Richmond Hill, Belfast Siding corridor, residential areas in south Bryan County, and the I-16 corridor in north Bryan County. Future transportation investments should be consistent with the county's land use plans.
- Approximately 42 percent (291,300 acres) of Bryan County is covered in wetlands and could pose significant limitations to new developments and infrastructures.
- Bryan County residents travel to Savannah more frequently for employment and shopping than to destinations within the county. There is a high disparity between Bryan County's residents and jobs with greater than 75 percent of residents commuting to other counties for work.
- Due to the anticipated growth projected for the county, coupled with the lack of planned improvements and available financing for improvements, the following travel conditions can be expected by 2035:
  - Only the areas with direct access to the interstate are projected to maintain similar commute times to current conditions.

**Table ES.1: Study Goals and Needs**

Bryan County Transportation Study Goals	Needs Statements
Encourage Multi-modal Transportation Corridors	Increase capacity along major corridors while improving pedestrian access and connectivity
Expand the Bicycle/Pedestrian Network	Expand bicycle and pedestrian network along major corridors and greenways
Coordinate Land Use and Transportation	Identify transportation improvements that are consistent with future land use plans
	Identify transportation improvements that avoid/and or mitigate impacts to the natural environment
	Identify transportation improvements that help preserve the rural-suburban character of the County
Increase Safety and Operations of Transportation Network	Improve operations to reduce the number of crashes at critical intersections and hot spots
	Reduce the number of unpaved roadways and provide lighting and sidewalks

- LOS for major roadways in the county (e.g., US 17, SR 144, Harris Trail Road, Belfast Siding Road, and US 280) is expected to deteriorate significantly.

- Currently, 30 percent of the roads in Bryan County are unpaved. The county has an aggressive roadway paving plan to improve the transportation network that reflects the growing demands on its infrastructure.

## Evaluation Framework

More than 50 potential projects were identified during the study process. The new capacity projects identified in this study were evaluated using a multiple step process which employed guidelines from GDOT's Project Prioritization Process (PrPP). Due to their nature, the traffic operations, system management, and bicycle and pedestrian projects were not subject to the PrPP evaluation criteria.

## Improvement Recommendations

The traffic operations/system management projects are recommended because they are relatively low-cost and maximize the effectiveness of the existing system. The bicycle and pedestrian improvements are recommended to enhance the quality of life and promote a multimodal transportation network. **Figures ES.3** and **ES.4** (page ES-3) illustrate the traffic operations/system management and bicycle and pedestrian improvements identified for recommendation.

# Executive Summary

Figure ES.3: Traffic Operations Projects

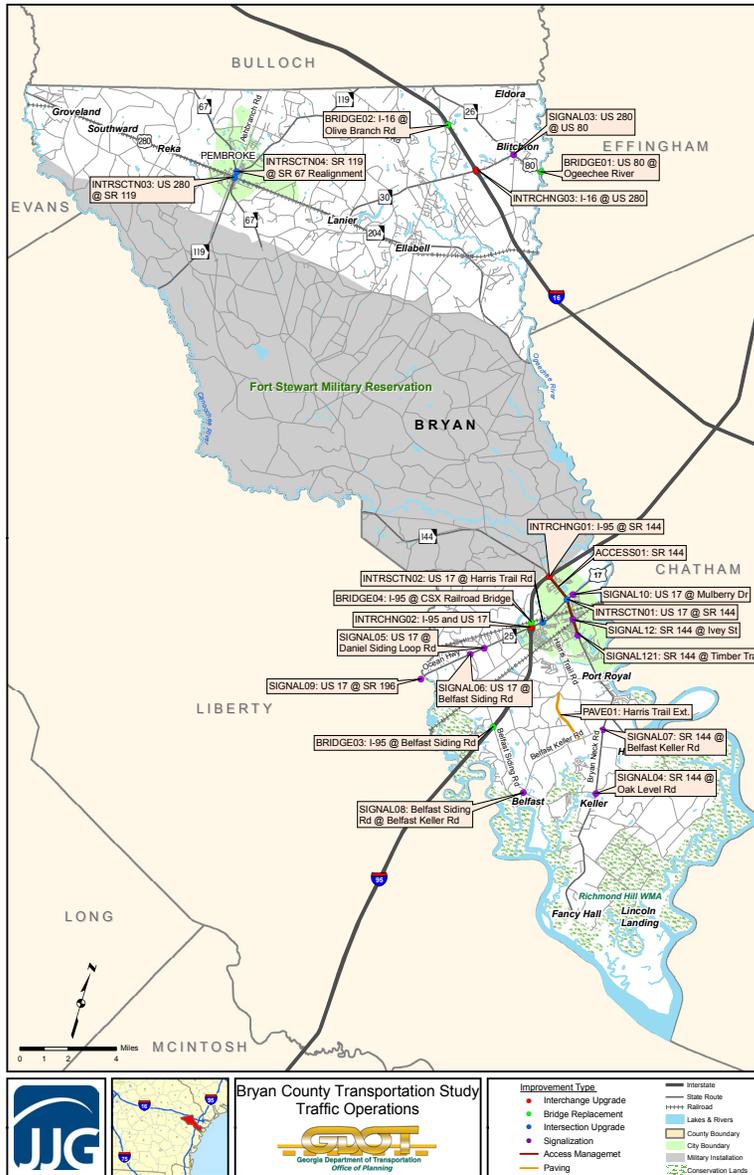
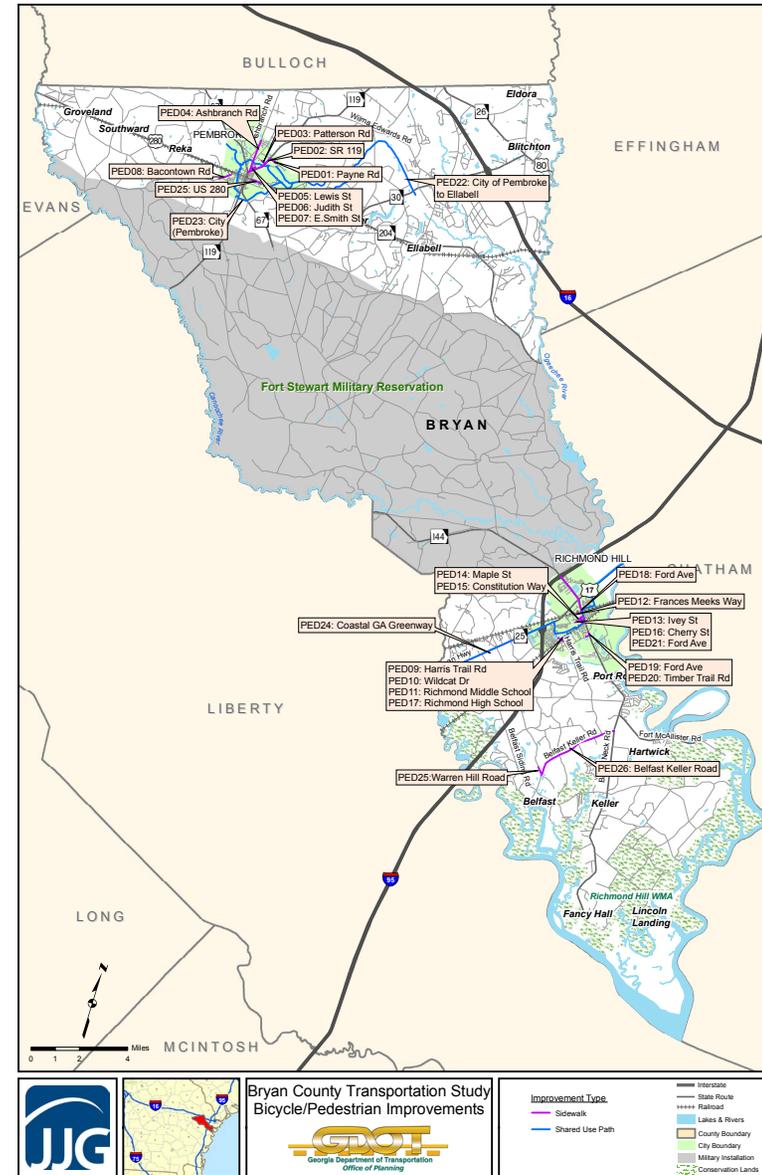


Figure ES.4: Bicycle and Pedestrian Projects



# Executive Summary

Bryan County's Travel Demand Model played a key role in identifying roadways with deficient levels of service (LOS D or below) based on existing and anticipated growth. **Figure ES.5** (opposite) illustrates the locations of new capacity recommendations. Because new capacity projects can be significant investments, they were evaluated based on performance and prioritized based on benefit-cost and local needs. **Table ES.2** (page ES-5) is a comparative list of the new capacity projects illustrating benefit-cost and local input. Project sheets for new capacity recommendations are presented at the end of this section in order of priority, as determined by the benefit-cost analysis.

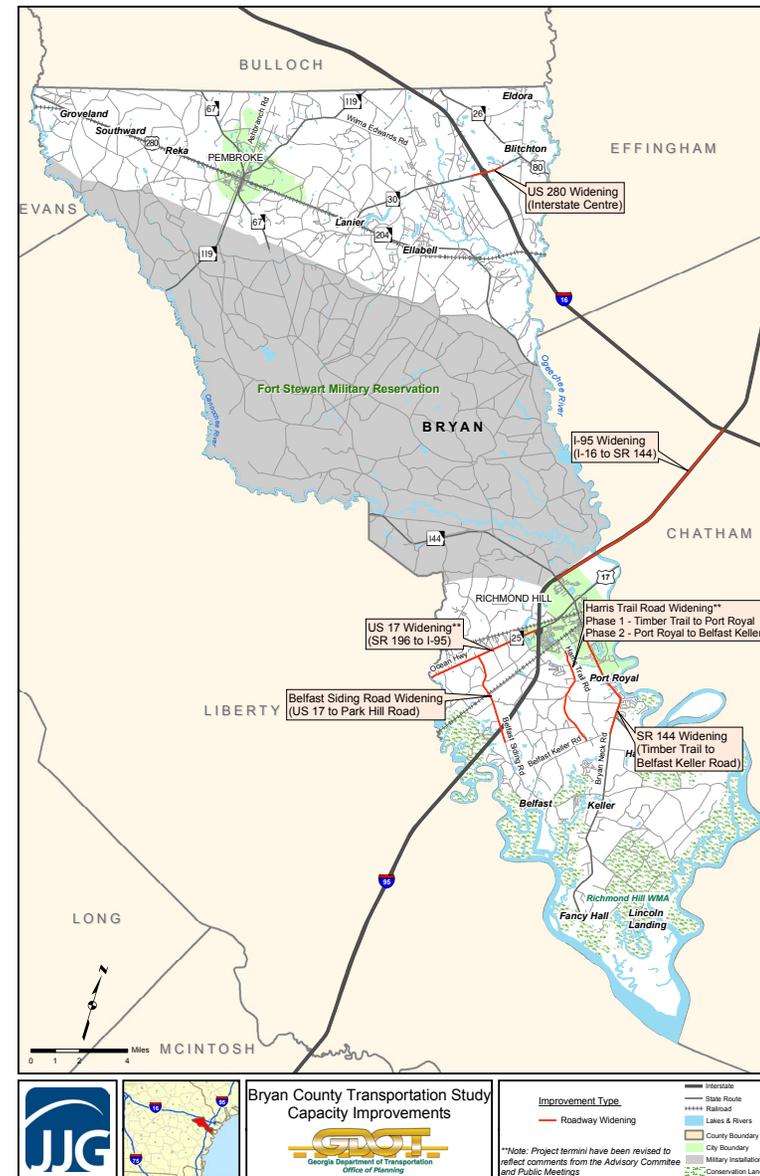
## Public Involvement and Technical Advisory Committee

Although Bryan County's north-south divide posed some logistical challenges, the project team undertook a broad dissemination of user-friendly information about the study, and provided a wide range of opportunities for all stakeholders to make their views known. The Advisory Committee met three times throughout the course of the study to provide feedback, general oversight and technical review of the study findings. One-on-one stakeholder interviews with a cross section of community leaders were conducted at the onset of the study as part of the outreach effort. Citizens were also given opportunities to participate in development of the Bryan County Transportation Study through series of public meetings held over the course of the study. These meetings were designed in an open house format and consisted of informational displays as well as interactive discussion sessions. See Chapter 6 for greater detail on the public involvement and outreach efforts made throughout the study process.

## Funding

It is unlikely that all of the projects recommended in the study can be funded over the next 25 years. Therefore, a major task in the Bryan County Transportation Study is the identification of potential funding programs for the recommended projects. A full spectrum of funding programs was identified in an effort to proactively group projects into the most applicable funding sources based on current requirements. Thus, this study provides a framework for pursuing funding for the project recommendations in the future.

**Figure ES.5: Capacity Improvements**



# Executive Summary

Table ES.2: Project Prioritization: Benefit-Cost and Local Priorities

	Benefit-Cost			Local Input	
	Project Ranking	B-C Ratio		Project Ranking	Note
1	I-95 Widening (SR 144 to I-16)	4.84	1	SR 144 Widening (Timber Trail to Belfast Keller)	Majority of stakeholders believed this project should be the county's top priority.
2	SR 144 Widening (Timber Trail to Belfast Keller)	0.39	2	US 17/SR 25 Widening (SR 196 to I-95)	This project is needed to relieve congestion and facilitate commuter traffic.
3	US 17/SR 25 Widening (SR 196 to I-95)	0.29	3	US 280/SR 30 Widening (Interstate Centre)	This project is needed to accommodate the traffic growth associated with Interstate Centre.
4	Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)	0.18	4	Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)	Some stakeholders desired Harris Trail Road to function as a viable bypass to City of Richmond Hill.
5	US 280/SR 30 Widening (Interstate Centre)	0.08	5	Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)	This project should be implemented after Phase 1 widening.
6	Belfast Siding Road Widening (US 17 to Park Hill Road)	0.07	6	I-95 Widening (SR 144 to I-16)	Some stakeholders believed that this project will be a greater benefit to non-Bryan County residents.
7	Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)	-0.12	7	Belfast Siding Road Widening (US 17 to Park Hill Road)	Some stakeholders questioned need for this project without the proposed interchange.

# Executive Summary

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## Project Sheets

*I-95 Widening - I-16 to SR 144*

*SR 144 Widening - Timber Trail to Belfast Keller*

*US 17/SR 25 Widening - SR 196 to I-95*

*Harris Trail Road Widening: Phase 2 - Port Royal Road to Belfast Keller Road*

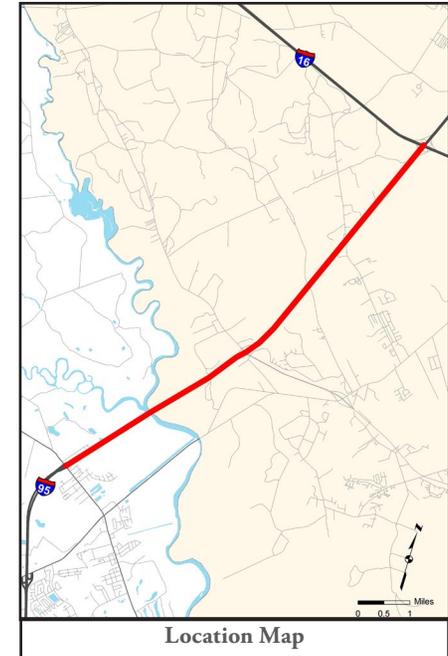
*US 280/SR 30 Widening - Interstate Centre*

*Belfast Siding Road Widening - US 17 to Park Hill 20 Road*

*Harris Trail Road Widening: Phase 1 - Timber Trail to Port Royal Road*

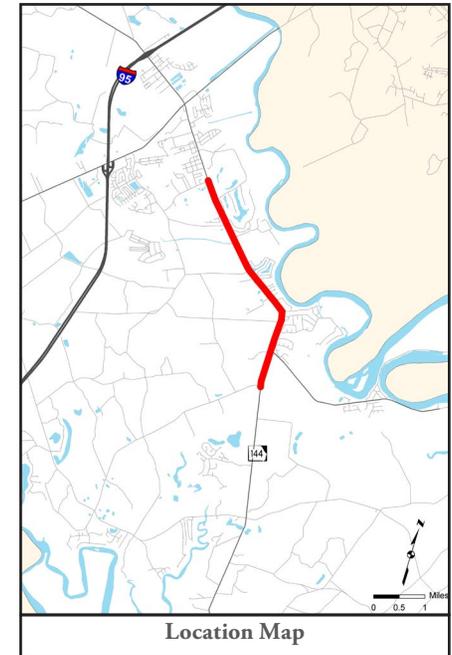
# Executive Summary

Project Name: I-95 Widening (I-16 to SR 144)						
<b>Description:</b> Widen I-95 from 6 lanes to 8 lanes with center barrier wall beginning at I-16 in Chatham County and ending at SR 144.				County	Bryan	
				P.I. No.:	511035	
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	80,500	2035:	113,000	RC/MPO:	CRC
Truck %	2006:	12.1%	2035:	14.7%	Length (miles):	2.0
No. of Lanes	Existing:	6	Recommended:	8	Route #:	405
Functional Classification:			Interstate Principal Arterial		Beginning and Ending Points:	I-16/ SR 144
<b>Project Need and Purpose:</b> This segment of I-95 currently experience extreme delays and high volume to capacity ratio during the peak hours and this condition is expected to worsen by 2035. Widening of I-95 is recommended to provide congestion relief and improve safety.						
<b>Logical Termini:</b> I-16/I-95 interchange in Chatham County was chosen as the northern terminus since a large percentage of I-95 traffic travels to and from I-16. The southern terminus is at the SR 144 interchange in Bryan County since the model projects a significant drop in the number of vehicles (30,000) south of this interchange.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$675,000	\$0	\$0	\$8,441,000	\$9,116,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



# Executive Summary

SR 144 Widening (Timber Trail to Belfast Keller)						
<b>Description:</b> Extend the existing 4-lane section of SR 144 south to Belfast Keller Road.				County	Bryan	
				P.I. No.:	532370	
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	14,000	2035:	22,100	RC/MPO:	CRC
Truck %	2006:	3.7%	2035:	5.6%	Length (miles):	4.5
No. of Lanes	Existing:	4	Recommended:	6	Route #:	144
Functional Classification:			Minor Arterial		Beginning and Ending Points:	Timber Trail to Belfast Keller
<b>Project Need and Purpose:</b> Widening of SR 144 is recommended to provide additional capacity and reduce congestion for the travelers from Richmond Hill and south Bryan to US 17 and I-95.						
<b>Logical Termini:</b> The section of SR 144 just south of Timber Trail was chosen as the northern terminus since it marks the ending of the existing 4-lane section. The southern terminus is at the intersection of Belfast Keller Road because significant percentage of traffic is expected to diverge at this intersection.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,693,000	\$4,846,000	\$4,825,000	\$21,157,000	\$32,520,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



# Executive Summary

## US 17/SR 25 Widening (SR 196 to I-95)

### Description:

Widen US 17/SR 25 from 4 lanes to 6 lanes with 20-ft raised median beginning at SR 196 in Liberty County to I-95.

				County	Bryan	
				Project #:		
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	21,900	2035:	37,300	RCD/MPO:	CRC
Truck %	2006:	9.8%	2035:	10.4%	Length (miles):	4.8
No. of Lanes	Existing:	4	Recommended:	6	Route #:	25
Functional Classification:			Principal Arterial		Beginning and Ending Points:	SR 196/I-95

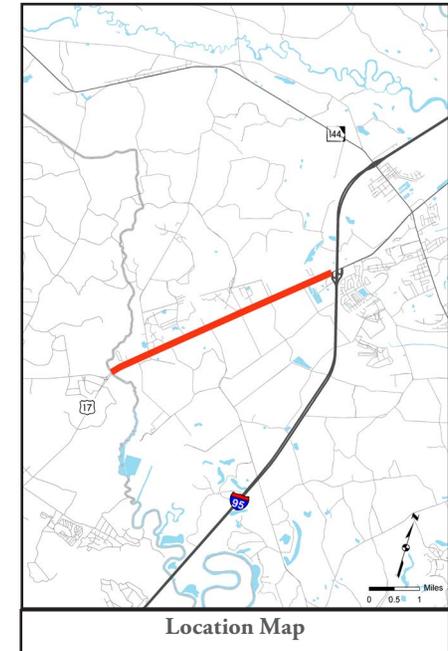
### Project Need and Purpose:

Under the existing roadway configuration, US 17 is anticipated to have significant deterioration of LOS by 2035. Widening on US 17 is needed to facilitate safe and efficient travel of commuters to and forth from the Savannah area. The capacity improvements to US 17 will also provide relief for the users of I-95 during the peak hours.

### Logical Termini:

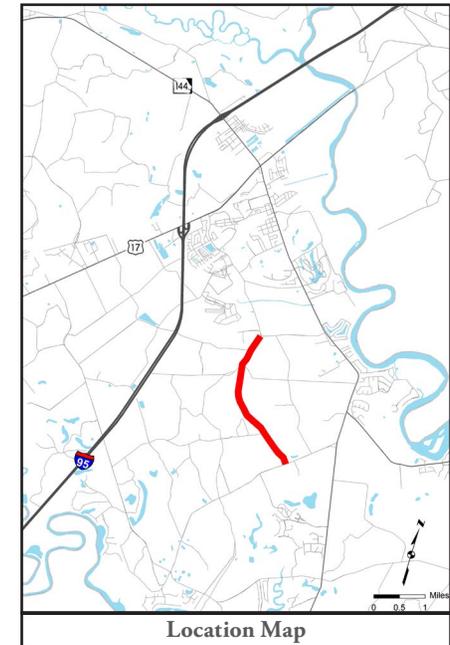
The eastern terminus is at the T-intersection at SR 196 in Liberty County. SR 196 is currently under construction to be widened to 4 lanes. The completion of this improvement is expected to attract more commuters from Liberty County onto US 17. The western terminus is at the I-95 interchange since a significant share of travelers utilizes this interchange to access Savannah and other destinations.

Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total
Cost Estimate	\$2,584,000	\$ 11,636,000	\$3,309,000	\$32,298,000	\$49,827,000
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT	



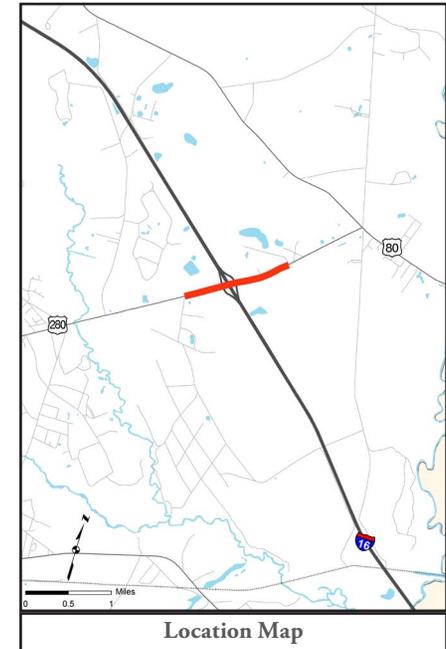
# Executive Summary

Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)						
<b>Description:</b> Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Timber Trail to Port Royal Road.			County	Bryan		
			P.I. No.:			
			GDOT District	5		
			Congressional District:	1		
Traffic Vol.:	2006:	N/A	2035:	7,200	RCD/MPO:	CRC
Truck %	2006:	N/A	2035:	6.4%	Length (miles):	2.9
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Local		Beginning and Ending Points:	Port Royal Road to Belfast Keller
<b>Project Need and Purpose:</b> With the completion of Harris Trail Extension, traffic on Harris Trail Road is expected to increase by greater than 100% from 5,600 in 2006 to 12,500 by 2030, resulting in deficient LOS. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.						
<b>Logical Termini:</b> The northern terminus is at the existing 4-lane section ending at Timber Trail. The southern terminus is at Port Royal intersection as the travel pattern indicates a significant diversion of traffic from Harris Trail to Port Royal Road.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,175,000	\$2,937,000	\$2,001,000	\$14,685,000	\$20,798,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



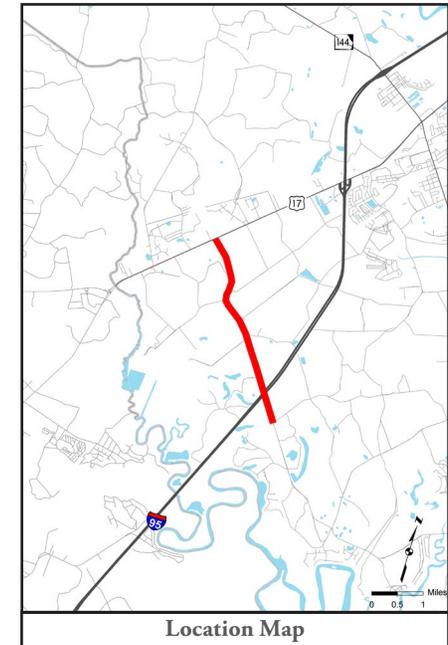
# Executive Summary

US 280/SR 30 Widening (Interstate Centre)						
<b>Description:</b> Widen US 280/SR 30 from 2 lanes to 4-lanes with 20-ft median at the proposed entrances of Interstate Centre.				County	Bryan	
				P.I. No.:	0004799	
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	4,300	2035:	16,600	RCD/MPO:	CRC
Truck %	2006:	10.0%	2035:	24.9%	Length (miles):	1.0
No. of Lanes	Existing:	2	Recommended:	4	Route #:	30
Functional Classification:			Principal Arterial		Beginning and Ending Points:	N/A
<b>Project Need and Purpose:</b> Widening of US 280/SR 30 is needed to improve safety and accommodate increasing traffic volumes as a result of the proposed Interstate Centre Industrial Park. The additional capacity improvement will facilitate large truck traffic generated from the proposed development and headed towards the Port of Savannah area via I-16.						
<b>Logical Termini:</b> The project termini are located at the anticipated eastern and western entrances of the Interstate Centre Industrial Park because significant deterioration of LOS on US 280/SR 30 is expected near the development.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$539,000	\$1,532,000	\$686,000	\$6,741,000	\$9,498,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



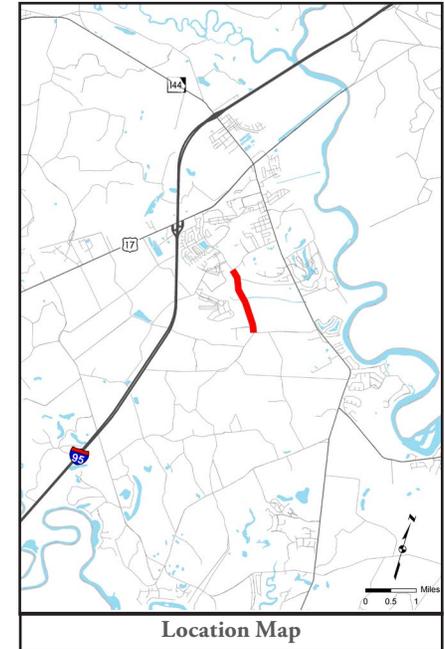
# Executive Summary

Belfast Siding Road Widening (US 17 to Park Hill 20 Road)						
<b>Description:</b> Widen Belfast Siding Road from 2 lanes to a 4-lane divided section beginning at US 17 and ending at the Park Hill 20 Road.				County	Bryan	
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	2,600	2035:	12,000	RCD/MPO:	CRC
Truck %	2006:	3.8%	2035:	10.3%	Length (miles):	5.7
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Local		Beginning and Ending Points:	US 17 to Park Hill 20 Road
<b>Project Need and Purpose:</b> Widening of Belfast Siding Road will provide relief to the congested conditions anticipated as a result of the planned development surrounding this roadway.						
<b>Logical Termini:</b> The northern terminus is at the T-intersection at US 17, which provides the most direct access to I-95. The southern terminus is at Park Hill 20 Road intersection.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,984,000	\$3,118,000	\$3,924,000	\$24,805,000	\$33,832,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



# Executive Summary

Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)						
<b>Description:</b> Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Timber Trail to Port Royal Road.				County	Bryan	
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	3,000	2035:	10,000	RC/MPO:	CRC
Truck %	2006:	8.0%	2035:	9.6%	Length (miles):	1.3
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Minor Collector		Beginning and Ending Points:	Timber Trail to Port Royal Road
<b>Project Need and Purpose:</b> With the completion of Harris Trail Extension, traffic on Harris Trail Road is expected to increase by greater than 100% from 5,600 in 2006 to 12,500 by 2030, resulting in deficient LOS. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.						
<b>Logical Termini:</b> The northern terminus is at the existing 4-lane section ending at Timber Trail. The southern terminus is at Port Royal intersection as the travel pattern indicates a significant diversion of traffic from Harris Trail to Port Royal Road.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$653,000	\$1,271,000	\$894,000	\$8,163,000	\$10,980,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



# Chapter 1

## Introduction



# Chapter 1

## 1.0 Introduction

The Bryan County Transportation Study has been prepared by the Georgia Department of Transportation (GDOT) in cooperation with Bryan County, the City of Pembroke, the City of Richmond Hill, Coastal Regional Commission of Georgia (CRC) and various other planning partners. The objective of the study is to identify and recommend transportation improvements necessary to meet existing and future transportation needs through the year 2035. To this end, a Bryan County Travel Demand Model was developed to assess travel trends in the county and assist in the evaluation of capacity improvements based on performance measures. Transportation projects considered in this study were identified based on safety analysis, relevant previous studies, the Travel Demand Model, and public and stakeholder input. An Advisory Committee made up of key local officials and planning staff was established to provide guidance on technical and policy issues. This group met several times over the course of the study.

It is unlikely that all of the projects recommended in the study can be funded over the next 25 years. Therefore, a critical task in the Bryan County Transportation Study is the identification of potential funding programs for the recommended projects. This study commenced in September of 2008 and was completed in September of 2009.

## 1.1 Study Overview

Bryan County is experiencing a significant increase in population. Its close proximity to Savannah, abundance of developable land, quality of life and quality schools have made the area attractive to retirees and young families. Projections released by the Georgia Institute of Technology's Center for Quality Growth and Regional Development (2006) indicate that the county's population is projected to increase from 23,500 in 2000 to roughly 46,000 by 2030 – an anticipated increase of 96 percent. Therefore, it is of prime importance that the Bryan County Transportation Study considers future mobility needs and impacts associated with the county's rapid growth. This information will be utilized to recommend transportation improvement strategies so that the future transportation network can adequately serve Bryan County residents.

Figure 1.1: Study Area Map



# Chapter 1

Bryan County is located in southeast Georgia and is part of Georgia's ten county coastal region. **Figure 1.1** (page 1-1) provides a map of the study area. Please note that a larger size of all the maps in this report are provided in Appendix A. Bryan County is bordered by Effingham and Chatham Counties to the east, Liberty and Evans Counties to the west and Bulloch County to the north. Given its location in the coastal region, Bryan County has a wealth of natural resources including shoreline areas, wetlands, and numerous flowing streams. The county lies between the Ogeechee River on the east and the Cancoohee River, Mt. Hope Creek, and the Jerico-Laurel View River that becomes the Midway River on the west.

Fort Stewart divides Bryan County into northern and southern portions. Fort Stewart, home of the Army's Third Infantry Division, occupies roughly the middle third of the study area. Though there are roads through Fort Stewart that can be used by the general public, none of these roads currently provide a direct connection between the northern and southern areas of the county. Bryan County is unique in that those wishing to travel from one end of the county to the other find it easier to travel outside the county first. The presence and location of Fort Stewart creates two separate subareas under one county government, with the City of Pembroke providing public services for north Bryan and the City of Richmond Hill for south Bryan.

I-16 traverses the northern portion of the county and includes an interchange at US 280. I-95 primarily serves the southern portion of the county and includes two interchanges at SR 144 and at Ocean Highway (US 17). These interstate connections make the county attractive for commuters to Chatham County, and also for freight activities related to the nearby Port of Savannah.

## 1.2 Report Organization

The remainder of this report is organized as follows:

- Chapter 2 provides an overview of the study development process, which incorporates the elements of the study goals, project evaluation framework, and Travel Demand Model development.

- Chapter 3 provides an assessment of the baseline conditions, which includes the following components:
  - Existing and future land uses;
  - Demographics and forecasts;
  - Environmental and historic features;
  - Existing and future trip-making and travel conditions;
  - Roadway characteristics, including safety analysis, freight, bicycle pedestrian facilities, and unpaved roads.
- Chapter 4 provides the results of the project evaluation analysis that has led to project recommendations.
- Chapter 5 provides a discussion on various funding options for the recommended projects.
- Chapter 6 provides an overview of the public involvement process used to gather data and solicit input from stakeholders and the general public.
- Appendix A provides a larger size of all the maps in this report.

## 1.3 Data Sources

The data presented in the Bryan County Transportation Study include a variety of sources ranging from GDOT, Bryan County, Cities of Pembroke and Richmond Hill, Coastal Georgia RC, U.S. Census Bureau, National Wetlands Inventory and other key stakeholders in the region.

Demographic and socioeconomic data were collected mostly from U.S. Census Bureau, Bryan County Board of Education, Georgia Department of Labor, Joint Comprehensive Plan for Pembroke, Richmond Hill and Unincorporated Bryan County and other various planning documents reviewed in the subsequent section.

Development of a countywide Travel Demand Model is included as part of this study. This model will be capable of integrating surrounding travel demand models, including those in Chatham, Liberty, Bulloch and Effingham Counties. The tool will be used to determine future traffic conditions, taking into account population and employment growth for both

# Chapter 1

Bryan and surrounding counties. Data output produced through the model will be utilized to anticipate future travel conditions by corridor.

GIS data analyzed in the Baseline Conditions section of the report has been collected from various sources such as the U.S. Census Bureau, GDOT Roadway Characteristics (RC) data and the Bryan County Travel Demand Model. All GIS data is available electronically. See **Table 1.1** (opposite) for a sample inventory list.

## 1.4 Review of Relevant Studies

This section is intended to provide an overview of previous studies and planning initiatives by various planning partners within the study area. These studies provide useful background information on Bryan County's land use, demographics and infrastructure systems, which were used as a basis for determining the county's transportation needs. As such, these studies are summarized with a strong emphasis on elements related to transportation issues and potential improvements.

### 1.4.1 Regional Studies

The following regional studies consider Bryan County as part of a larger study area that would likely have affects on the transportation policies and priorities of Bryan County:

- **Coastal Georgia 2030: Population Projections for the 10-County Region (2006)** - conducted by the Coastal Georgia RC; it projects future population growth for a 10-county region, which includes Bryan.
- **Coastal Georgia Regional Bicycle and Pedestrian Plan (2005)** - conducted by the Coastal Georgia RC; it provides a framework of regional priorities and standards related to the development of bicycle and pedestrian infrastructure throughout the 10-county region.
- **Statewide Truck Lanes Needs Identification Study (2008)** - an evaluation of truck traffic growth along key corridors throughout the state including portions of Bryan County that provide access the Port of Savannah.

**Table 1.1: GIS Data Inventory**

Type	Data	Geographic Unit	Source
<b>Socioeconomic &amp; Demographic</b>	Population	Transportation Analysis Zone (TAZ)	Bryan County Travel Demand Model
	Employment	TAZ	Bryan County Travel Demand Model
	Minority Population	Census Block	2000 U.S. Census
	Population below Poverty Line	Census Block	2000 U.S. Census
	Median Household Income	Census Block group	2000 U.S. Census
<b>Roadway Characteristics</b>	Functional Classification	N/A	GDOT RC Data
	Laneage	N/A	GDOT RC Data
	Annual Average Daily Traffic (AADT) Volume	N/A	Bryan County Travel Demand Model
	Traffic Signals	N/A	Bryan County Transportation Plan (2007)/ Field Survey
	Crashes (2000 - 2007)	N/A	CARE GDOT Crash Software
	Bridges	N/A	Jan. 2008 GDOT Bridge Inventory Data
<b>Environmental</b>	Water Features	N/A	National Wetlands Inventory
	Historic Structures	N/A	National Historic Register of Places

### Coastal Georgia 2030: Population Projections for the 10-County Region

In 2006, the Coastal Georgia RC contracted Georgia Tech's Center for Quality Growth and Regional Development to develop a methodology to project population growth for the ten counties that are part of the RC. The purpose of this study was to address concerns that the traditional methodologies used to project future population did not adequately capture the development and other growth related to specific activities in the Coastal Georgia region. The context-specific methodology used in this study was primarily based on increased area military training and deployment as well as growth in retirees and industrial activities surrounding the Port of Savannah.

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The following observations were made of Bryan County:

- Bryan County's population growth was concentrated in unincorporated areas until the 1980s, when significant growth occurred in the incorporated cities.
- In 2000, Bryan County had 7,000 jobs, and by 2030 this number is anticipated to increase to 13,500, with most of the growth anticipated in the service industry.
- At the time of this study, annual residential building permits and residential construction were at an all-time high in Bryan County.

The population projections in this study employed an inter-regional cohort component model, which considers population change by age and sex, using baseline population counts as well as birth, death, and migration rates. This model was adjusted based on interviews with local representatives and the most recent trends in housing construction. As such, the findings from this study indicated that by 2030, population in Bryan County is anticipated to increase by 96 percent to 45,986.

## **Coastal Georgia Regional Bicycle and Pedestrian Plan**

The Coastal Georgia Regional Bicycle and Pedestrian Plan was prepared by the Coastal Georgia RC and adopted locally in May of 2005. This plan is an assessment of the bicycling and walking conditions in the 10-county region, including a summary of local and state plans. This plan also included a suitability analysis of potential bicycle routes that considers existing land use, historic sites, community facilities and conservation lands.

Recommendations included implementation strategies to improve the regional bicycle and pedestrian network and provide a safe environment for its users. Specifically, the Coastal Georgia Greenway was ranked by the Coastal Georgia Bicycle and Pedestrian Committee as the top priority bicycle facility to be developed in the region. The Coastal Georgia Greenway called for a 152 mile long facility that predominantly follows US 17, of which, approximately 11 miles are located within Bryan County.

Other observations and recommendations related to Bryan County include:

- Bryan County's zoning ordinances and subdivision regulations contain provisions for bicycle and pedestrian facilities.
- The Coastal Georgia Regional Bicycle and Pedestrian Plan identifies approximately 30 miles of potential bike routes for Bryan County, including SR 204, US 280 East, SR 67, Ashbranch Road and SR 119.

## **Statewide Truck Lanes Needs Identification Study**

GDOT completed the Statewide Truck Lanes Needs Identification Study in April of 2008. The purpose of this study is to understand and quantify the feasibility of implementing truck-only lanes, statewide. The document placed emphasis on congestion reduction (especially during the peak periods) and benefit-cost measures to determine the feasibility of truck-only lanes.

The following list describes some of the key observations from this study:

- Trucks carry most of the freight in Georgia by tonnage (86 percent) and carry almost all of the intrastate shipment of freight tonnage (97 percent).
- Freight and transportation jobs account for close to 15 percent of jobs throughout the state.
- An efficient, world-class transportation network is one of the primary drivers of business location decisions.
- 82 percent of the nation's industrial market and 79 percent of the nation's consumption market is within two or less trucking days distance from the Port of Savannah.
- By 2035, the tonnage of freight moved in Georgia is forecast to increase by 260 percent, 3.1 percent per year, to 2.45 billion tons, worth \$4.9 trillion (in 2004 dollars).

Because of proximity to the Port of Savannah and access to I-16 and I-95, portions of Bryan County were included in the study's Savannah Subarea, which focused on truck activities associated with the Port. Recommendations from the study included the widening of I-16 and I-95 within Bryan County to accommodate the anticipated truck traffic growth in the Savannah Subarea.

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## 1.4.2 Local Studies

This section contains a review of the local studies that focus on countywide land use, transportation and economic needs as well as smaller-scale planning efforts. These studies include:

- **The Bryan County Joint Comprehensive Plan** – jointly conducted for the county and the cities and included extensive public outreach process to brainstorm community visions and needs associated with future development.
- **Economic Diversification of Bryan County** – evaluation of existing and projected employment activities and proposes methods to increase diversification of the employment in the county.
- **Bryan County Transportation Plan** - assessment of future road improvements needed to maintain acceptable Level of Service (LOS C) in Bryan County based on historic growth patterns and permitted changes in land use.
- **Bryan County Bicycle and Pedestrian Plan** – evaluation of baseline conditions of bicycle and pedestrian facilities in the county and includes specific improvement recommendations.
- **I-95 at Belfast Siding Road Interchange Analysis Report** - developed to assess the need of constructing an additional interchange within Bryan County.

### **Bryan County Joint Comprehensive Plan**

As required by the 1989 Georgia Planning Act, and as established by the Georgia Department of Community Affairs, each municipality and county in Georgia is required to prepare and adopt a local Comprehensive Plan. It is important to note that although the Bryan County Joint Comprehensive Plan represents the entire county, development of this document was pursued through three separate efforts and subareas. The subareas considered for the Plan are unincorporated Bryan County, the City of Richmond Hill and the City of Pembroke. The documents were each adopted by their respective governing bodies and then combined in an effort to consolidate various needs.

For every subarea, the comprehensive plans all include the standard eight key elements of population, housing, economic development, community facilities and services, natural and cultural resources, transportation, land use, and intergovernmental coordination.

### **Bryan County**

Projections released by Georgia Tech's Center for Quality Growth and Regional Development (2006) indicated that Bryan County should expect to grow from 23,417 residents in 2000 to 45,986 residents in 2030—an increase of 96 percent.

A vision for the county's future was conceived based on its desire to balance projected growth with quality, sustainable development. This vision was also reflected in Bryan County's Future Development Map (FDM) which incorporates designated areas such as Conservation Areas, Crossroad Community Areas and Regional Commercial Areas. To assist in realizing the County's priorities, an implementation program offered a detailed description of action items and strategies to execute the community's vision for future development.

Specific implementation measures include:

- Developing heritage and eco-tourism programs, based on natural amenities such as rivers, fishing, hiking, etc.;
- Creating innovative partnerships with local schools and continuing education programs to produce a qualified labor force;
- Providing incentives and establish requirements for affordable housing;
- Concentrating new development around commercial nodes; and
- Adopting development guidelines to protect agricultural lands from commercial encroachment, preserving rural character and quality of life.

# Chapter 1

## City of Pembroke

Through a comprehensive public involvement process, City of Pembroke established goals and priorities for future development and growth. The goals reflected the City's desire to maintain its rural, small town atmosphere while simultaneously providing quality education and opportunity for their growing community.

Georgia Tech's population projection figures indicate that City of Pembroke can expect an increase in population from 2,379 residents in 2000 to 4,672 residents in 2030—an increase of 96 percent. As such, Pembroke developed its FDM to maintain its rural character while preparing for future growth. Pembroke's FDM includes designated areas such as Traditional Neighborhood Area, Highway Commercial Areas, and Historic Pembroke to support the notion of preservation and strategic growth. Specific implementation measures identified in the Plan to encourage development that also preserves family-friendly values include:

- Implementation of a trail network along the existing canal system throughout the City;
- Creation of policies and programs to support entrepreneurial activities;
- Identification of workforce training resources to match the needs of the local workforce;
- Development of small area plans for traditional neighborhoods and the redevelopment of older neighborhoods; and
- Construction of a recreational complex for community activities.

## City of Richmond Hill

According to research conducted by Georgia Tech in 2006, the City of Richmond Hill should expect an increase in population from 6,959 residents in 2000 to 14,825 residents in 2030—a substantial increase of 113 percent. Based on this significant population projection as well as extensive public outreach as part of the Comprehensive Plan, the City of Richmond Hill developed a vision including associated goals and objectives with respect to its future growth and development. This vision encourages sustainable development through progressive leadership and a commitment to preserving

the community's rich coastal heritage. In an effort to implement development measures that reflect this vision, designated areas such as Traditional Residential Areas, Corridor/Gateway Areas and Conservation Areas have been incorporated in the City's FDM.

Also included in this document is the Richmond Hill's Implementation Program which offers a detailed description of action items and strategies to execute its vision for future development. From these efforts, Richmond Hill conceived the following implementation measures:

- Extend the natural trail at J.F. Gregory Park to the Ogeechee River for the purpose of providing nature-interpretive public access to the River;
- Evaluate current buffer standards for effectiveness with an emphasis on viewsheds as they relate to historic sites and natural vistas;
- Collaborate with the Bryan County Board of Education to continue to address the increased traffic congestion resulting from a concentration of residential developments around school locations;
- Study the feasibility of implementing a form-based code for development;
- Continue collaboration with state and national natural resource and/or land conservation programs to preserve environmentally sensitive areas; and
- Contract with the Development Authority of Bryan County to conduct a public seminar on the economic values of high-paying, high-technology industry.

## Economic Diversification of Bryan County

In 2006, a study entitled Economic Diversification of Bryan County was developed for the Bryan County Board of Commissioners. This study was sponsored by the U.S. Department of Defense and completed by Georgia Tech's Enterprise Innovation Institute with local support from Coastal Georgia RC. The purpose of this study was to assess Bryan County's existing employment diversification and propose strategies to increase and develop more balanced employment opportunities in the county.

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According to this study, nearly two thirds of Bryan County's working population is employed outside of Bryan County. Therefore, this study outlined methods to increase employment in the county that complements the county's population growth and reflects Bryan County's close proximity to the Port of Savannah. Findings from this study indicate that Bryan County has the most potential to be competitive for wholesale electronics markets, agents and brokers; warehousing and storage (i.e., distribution centers); and professional, scientific, and technical firms. The study also identified industrial park and property development and residential development as the top opportunities for economic development in Bryan County.

## **Bryan County Transportation Plan (Draft)**

In 2007, the Bryan County Transportation Plan was developed on behalf of the Bryan County Board of Commissioners to identify the transportation infrastructure needs through the year 2027. It is important to note that this Plan has not been adopted by the Bryan County Commissioners as of June 2009. Additionally, this Plan only considered those roadways in the county categorized as major or secondary arterials or primary collectors.

In order to determine the future transportation needs of the county, the Highway Capacity Manual (HCM 2000) was employed to analyze the existing and future capacity of the key corridor segments throughout the county. Future volumes were derived from historic growth in addition to the build-out assumption of the County's FDM.

Recommendations were based on the findings from the level of service (LOS) analysis, and included detailed descriptions of transportation improvements that are necessary to maintain an acceptable LOS (LOS C) through the year 2027. These projects are as following:

- US 280/SR 30 Widening, SR 204 to US 80;
- US 80/SR 26 Widening, US 280 to the Ogeechee River;
- US 280/SR 30 Widening, City of Pembroke to SR 204;
- SR 144 Widening, Belfast Keller Road to Oak Level Road;
- New Interchange, Interstate 95 at Belfast Siding Road;

- Oak Level Road Widening, SR 144 to Jake Brown Road;
- Belfast Siding Road Widening, US 17 to Belfast Keller Road;
- Jake Brown Road Paving with Improvements;
- Daniel Siding Loop Road Widening, Cartertown Road to US 17;
- Belfast Keller Road Widening, Belfast Siding Road to SR 144; and
- Belfast Siding Road Widening, Belfast Keller Road to SR 144.

Some of the capacity improvements recommended from this Plan were reviewed for inclusion in the Bryan County Transportation Study.

## **Bryan County Bicycle and Pedestrian Plan**

The Bryan County Bicycle and Pedestrian Plan was prepared by the Coastal Georgia RC in 2007 to review existing conditions and identify the needs of bicyclists and pedestrians within the county. Specifically, the Plan focused on pedestrian connections around schools and countermeasures to address safety at high accident locations, identifying roads that need shoulders as well as priority pedestrian projects in the county.

Plan recommendations included sidewalks and shared-use paths under the Safe Routes to School program, and projects that will enhance the multimodal environment within the established urban areas. This plan also identified potential funding categories such as Safe Routes to School (SR2S), Transportation Enhancement (TE), Special Purpose Local Option Sales Tax (SPLOST) and GDOT.

## **I-95 at Belfast Siding Road Interchange Analysis Report**

The I-95 at Belfast Siding Road Interchange Analysis Report (IAR) was commissioned by GDOT in 2008. The purpose of the IAR was to analyze and document the need, or lack thereof, for a new interchange at Belfast Siding Road located in Bryan County. In accordance with Federal Highway Administration (FHWA) and GDOT guidance on the installation of new access points, the IAR examined operations at the requested interchange location, as well as the adjacent interchanges upstream and downstream of the requested access break at Belfast Siding Road.

# Chapter 1

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The study area centered on the Belfast Siding Road corridor, extending from north of SR 144 to south of US 84 along I-95 and encompasses the surrounding region. The requested interchange is located approximately 4.6 miles south of the US 17 interchange and 6.4 miles north of the US 84 interchange.

Although the IAR did not recommend a new interchange, improvements to several intersections within the study area were noted as necessary to serve the anticipated peak hour traffic flows and were thereby recommended by this study to be programmed. These included intersection operational improvements at SR 144 at I-95 NB; US 17 at I-95 NB; and US 17 at SR 196. In addition, widening of US 17 from Belfast Siding Road through the US 17 at I-95 interchange was also recommended.

# Chapter 1

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# Chapter 2

## Plan Development & Evaluation Framework



# Chapter 2

## 2.0 Plan Development and Evaluation Framework

This chapter describes the overall process involved in the development of the Bryan County Transportation Study. The sections herein include an overview of the following key components of the study process:

- Development of Goals – Provides an overview of how the study goals were developed and refined based on stakeholder input;
- Project Evaluation Framework – Describes how performance measures were selected and used in the evaluation of projects. Also, the details of the candidate project identification process are provided in this section;
- Travel Demand Model Development – Gives a general summary of the process involved in building the Bryan County Travel Demand Model. Refer to the appendices for a detailed technical modeling document. ]

Refer to Appendix B (provided in a separate document) for documentation on model development and users guide.

### 2.1 Goals Development

The process of developing a transportation plan must recognize that the plan does not exist in isolation. A robust and realistic plan should be prepared in concert with the goals and objectives of other related plans in the county. To this end, an inventory of previous studies described earlier, including the *Joint Comprehensive Plan for Bryan County and the Cities of Pembroke and Richmond Hill* along with other relevant studies, were reviewed to document the transportation goals of each study and to ascertain countywide transportation and land use needs.

Bryan County Transportation Study goals were built on the relevant goals developed from previous studies, and were refined based on stakeholder interviews and Advisory Committee inputs. An electronic voting exercise was used during the

first Advisory Committee meeting to present and refine four potential transportation goals of the study. Details involved in the goals development exercise conducted during the Advisory Committee meeting are described in a later chapter of this report (*Chapter 6 - Public Involvement*). **Table 2.1** (below) presents the goals and the corresponding needs statements which shaped the format and direction of this study.

### 2.2 Evaluation Framework

The transportation projects for the Bryan County Transportation Study were evaluated using a multiple step process which employed guidelines from GDOT’s Project Prioritization Process (PrPP). This section documents steps taken to identify candidate projects for evaluation, conversion of study goals into metrics and methodologies utilized to score project metrics. A complete list of projects and scoring results can be found on page 4-15 in *Chapter 4– Evaluation Results and Recommendations*.

**Table 2.1: Goals and Needs Statements**

Bryan County Transportation Study Goals	Needs Statements
Encourage Multi-modal Transportation Corridors	Increase capacity along major corridors while improving pedestrian access and connectivity
Expand the Bicycle/Pedestrian Network	Expand bicycle and pedestrian network along major corridors and greenways
Coordinate Land Use and Transportation	Identify transportation improvements that are consistent with future land use plans
	Identify transportation improvements that avoid/and or mitigate impacts to the natural environment
	Identify transportation improvements that help preserve the rural-suburban character of the County
Increase Safety and Operations of Transportation Network	Improve operations to reduce the number of crashes at critical intersections and hot spots
	Reduce the number of unpaved roadways and provide lighting and sidewalks

# Chapter 2

## 2.2.1 Project Identification

More than 50 potential projects were identified during the study process primarily from the following sources:

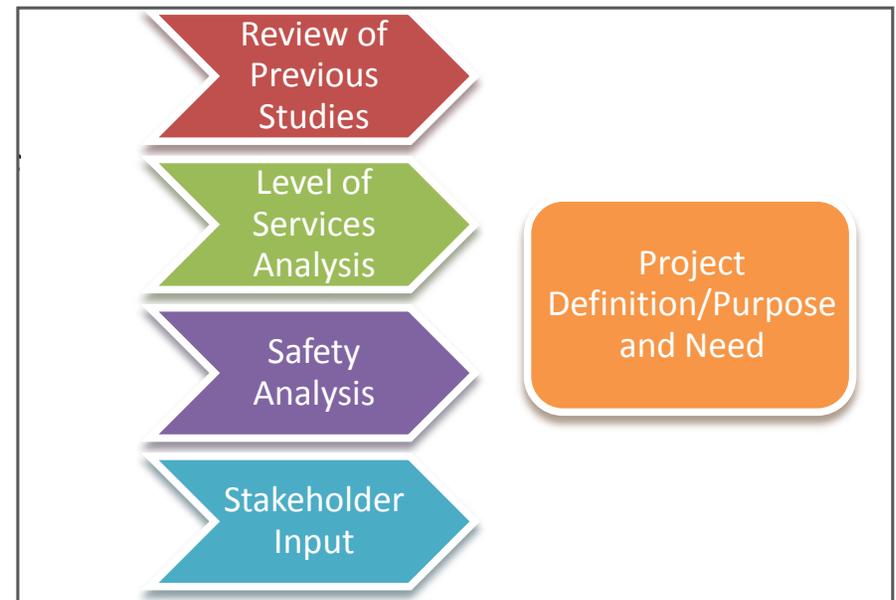
- Recommendations from previous studies;
- LOS analysis of No-Build Scenario;
- Safety data derived from Critical Analysis Reporting Environment (CARE) database; and
- Stakeholder interviews and public meetings.

For each candidate project, logical termini as well as purpose and need statements were developed and refined as the study progressed, as depicted in **Figure 2.1** (opposite). Refer to page 4-12 in Chapter 4 for the complete list of projects and purpose and need statements for each candidate project.

The candidate projects can be categorized into the following project types:

- New Capacity Projects:
  - Roadway Widening - Increase in the number of travel lanes.
- Traffic Operation/System Management Projects:
  - Access Management – Construction of 20-foot raised median;
  - Bridge Rehabilitation or Replacement – Upgrade or replacement of existing structures;
  - Paving of Dirt Road;
  - Intersection Realignment or Intersection Capacity - Correction of offset streets at key locations and/or addition of turn lanes at key intersections;
  - Intersection Signalization
- Bicycle Pedestrian Improvement:
  - Sidewalks;
  - Multi-use paths; and
  - Shoulder widening.

Figure 2.1: Project Identification Process



## 2.2.2 Performance Metrics

GDOT's PrPP is a technical tool that place emphasis on project performance to help determine statewide transportation priorities. The PrPP developed performance metrics based on the relevant goals established in the Statewide Transportation Plan (SWTP), as adopted by the State Transportation Board in January 2006. The *Transportation Study Guidelines for PrPP*, developed by GDOT, was used as a basis for project evaluation. This document details methodologies and assumptions behind each performance measure related to the SWTP goals. The Guidelines for PrPP state that when quantifiable data is used, the local needs and priorities must be also considered. As such, the following goals from the SWTP were determined to be consistent with the Bryan County Transportation Study goals:

- Safety;
- Congestion; and
- Connectivity, Access and Mobility.

# Chapter 2

**Table 2.2** (opposite) presents how the goals of the Bryan County Transportation Study were matched up with the goals of the SWTP and the associated performance metrics from the PrPP. These metrics are based on quantitative and qualitative information derived from the Travel Demand Model, previous studies, community input, and traffic analyses. As two of the performance measures require outputs from the Travel Demand Model, only the capacity improvement projects were subjected to this evaluation methodology.

The Safety goal was measured under the assumption that a widening project would likely eliminate known safety flaws such as poor sight distance and deficient geometric designs that would typically attribute to crashes. Therefore, the improvement to safety was estimated by the forecast reduction in the number of crashes on the facility as a result of the planned improvement. Future crashes under the Build Scenario were estimated by applying crash reduction factors (CRF) to the actual number of recorded accidents. As outlined in the Guidelines for PrPP, these CRFs were taken from the *Federal Highway Administration’s Desktop Reference for Crash Reduction Factors*.

The Congestion goal was measured by the forecast reduction in Vehicle Hours of Travel (VHT) on the roadways as a result of the improvement. The Travel Demand Model was utilized to calculate the change in VHT under the No-Build and the Build Scenarios. It was assumed that a widening project would lead to an overall reduction in travel time. However, it should be noted that because the projects were not modeled in isolation, special considerations were made for improvements to parallel facilities. In some incidences, planning judgment was used to manually assign VHT savings because the model could not accurately capture the effects of improving parallel routes.

The Connectivity, Access and Mobility goal was measured by travel time savings on key corridors and consistency with local plans as a result of the improvement. Similar to the previous congestion measure, the travel time savings on key corridors were calculated by the change in VHT under the No-Build and the Build Scenarios. However, this measure places emphasis on improving regionally significant corridors such as non-interstate truck routes, national highway system (NHS) connectors, and designated evacuation routes.

**Table 2.2: Performance Metrics based on Study Goals**

Bryan County Transportation Study Goals	SWTP Goals	Performance Metrics
Increase Safety and Operations of Transportation Network	Safety	Percent Reduction in Crashes
Encourage multi-modal transportation corridors	Congestion	Delay Reduction
Coordinate Land Use and Transportation	Connectivity, Access and Mobility	Travel Time Savings on Key Corridors (VHT Reduction)
Expand the Bicycle/Pedestrian Network		Consistency with Local Plans

Consistency with local plans is a qualitative measure that recognizes the importance of being consistent with the recommendations of other related plans in the county. Projects that have been included in previous studies are indicative of having endorsement from the local and regional stakeholders.

### 2.2.3 Project Scoring

Each candidate project received a score based on how it satisfied the objective of each metric. To this end, the absolute value of each project’s metric total was translated to a final score ranging from 10 to 90 based on a uniform distribution. The uniform distribution was used to ensure the full utilization of the possible range of scores and to avoid a concentration of scores around a central median value. The PrPP provides guidance for applying different weights for three different geographies in Georgia: Atlanta MPO, Non-Atlanta MPO, and Rural. Using the Rural weights proposed by the PrPP as a basis, appropriate weights were determined based on the goals and objectives of this study. The weights were applied to the normalized scores under each metric. The weighted normalized scores were then added up across each metric to determine the composite score based on performance.

Construction cost estimations were conducted using GDOT’s cost estimation software (CES) and Right-of-Way cost estimations were conducted using ROW and Utility Estimation Tool (RUCEST). These tools were developed

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to ensure that planning level cost estimates are reliable and based on the latest project information. These costs are reported in today's dollars, and were used to calculate the benefit-cost ratings for all the capacity improvement projects. Refer to Appendix C for details on the cost-estimation process.

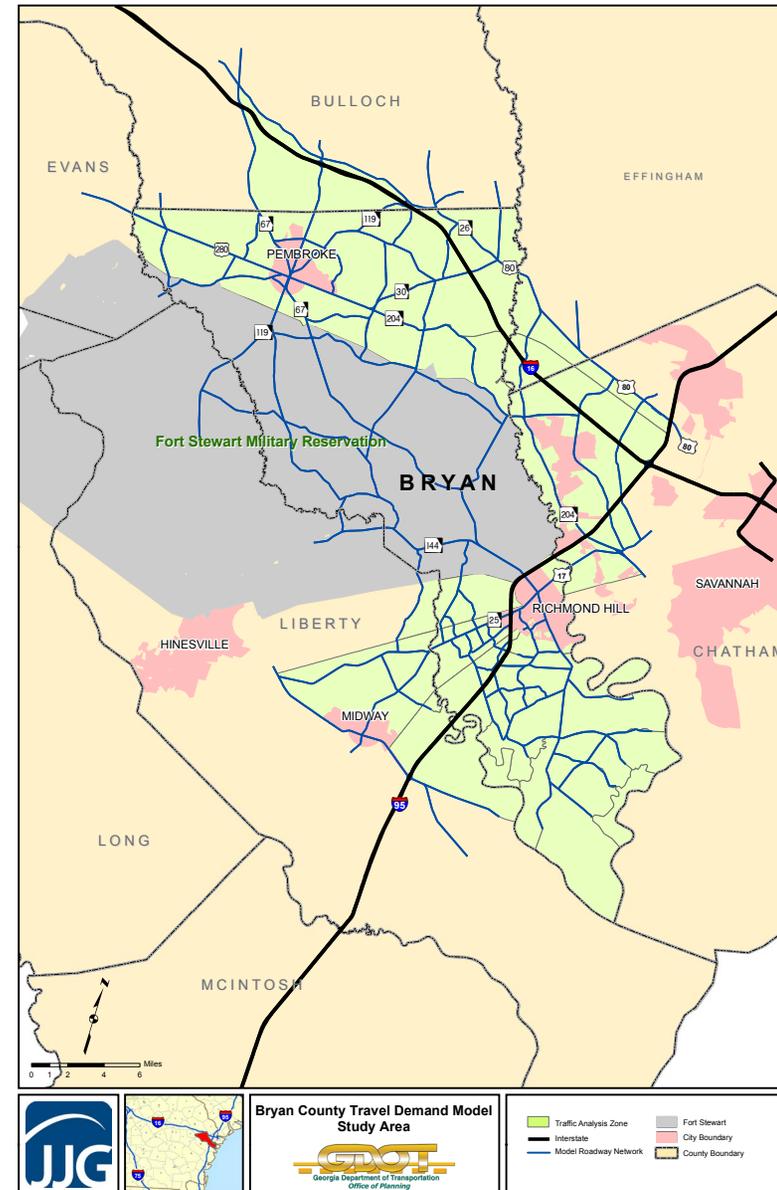
## 2.3 Travel Demand Model Development

This section provides a general overview of the Travel Demand Model (TDM) used to assess trip-makings and travel patterns in Bryan County. Specifically, this section focuses on the assumptions used in the zonal allocation of future population and employment data. As aforementioned, a detailed description of the actual modeling process, including (1) Trip Generation; (2) Trip Distribution; and (3) Daily Traffic Assignment, is provided in a standalone technical document included in Appendix B. The model refinement and validation process are also included in the appendices.

The Bryan County TDM represents the Bryan County transportation system in addition to parts of four neighboring counties (Chatham, Effingham, Bulloch and Liberty). **Figure 2.2** (opposite) highlights the model study area. Two TDM base scenarios were built as part of the model development process. The year 2006 was selected to represent the base year travel characteristics because it was the most recent year for which reasonably accurate demographic and traffic data were available. As it is customary for transportation studies to plan for needs 20-years or more out into the future, year 2035 was selected to be the horizon year for the future base year.

Overall, design of the Bryan County TDM was patterned after a typical urban area travel demand model used by GDOT. These urban area models were developed in 13 areas throughout the state to facilitate the transportation planning processes within those areas. The significant difference between the Bryan County model and the other urban area models is the external trip data files. Current year traffic data indicated that a significant share of trips in Bryan County is associated with external trips to the surrounding counties. As such, this trend was captured in the Bryan County model by increasing the external trip database to reflect a much larger share of total trip-making in comparison to GDOT's other urban area models.

Figure 2.2: Bryan County Travel Demand Model - Study Area



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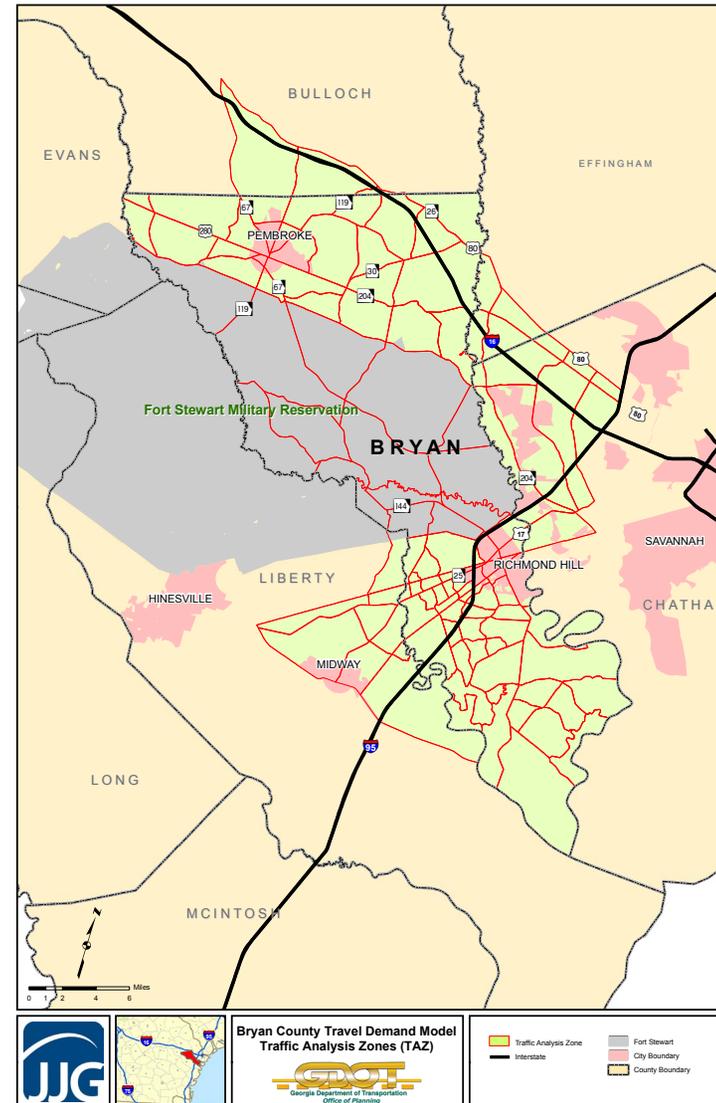
## 2.3.1 Roadway Network

The 2006 base roadway network in the Bryan County model represents more than 500 total centerline miles of roadway. As indicated in **Table 2.3** (below), approximately 60 percent of the roadway mileage lies within the county border. The rest of the model network lies within Chatham, Effingham, Bulloch and Liberty County. **Table 2.3** also provides a breakdown of the route miles by generalized functional class category used in the model. The classification of roadways in accordance with their primary function is an important step in developing a travel model and in conducting a transportation planning study. Functional classification of Bryan County roadways is discussed in greater detail in the *Chapter 4 - Baseline Conditions*.

## 2.3.2 Traffic Analysis Zone

Traffic Analysis Zones, referred to as TAZs, are relatively small units of geography used in travel demand modeling to relate different land-use patterns with trip purposes and trip end frequency. A map of TAZs that were created for the Bryan County model is illustrated in **Figure 2.3** (opposite). The map shows a total of 143 TAZs inside the model's study area. Of these, 105 TAZs or 73 percent are located within Bryan County. Although not

**Figure 2.3: Bryan County Travel Demand Model - Traffic Analysis Zones**



**Table 2.3: Bryan County Travel Demand Model - Roadway Network Mileage**

Functional Classification	Counties		Total
	Bryan	Other	
Freeway	21.4	44.5	65.9
Principal Arterial	31.1	25.9	57
Minor Arterial	36.6	68.5	105.1
Collector	70.2	51.9	122.1
Local	162.6	22.7	185.3
All Roadways	321.9	213.5	535.4

Source: Bryan County Travel Demand Model

Source: Bryan County Travel Demand Model

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always evident, the model's TAZ boundaries were methodically drawn to reflect road alignments, census geography, jurisdictional and topographic boundaries or barriers. Specific examples used in creating TAZs for Bryan County include Fort Stewart and bodies of water such as Canoochee Creek.

### 2.3.3 Zonal Socioeconomic Data

In travel demand modeling, socioeconomic data are allocated at the TAZ level, and are used as a basis to determine total area trips and travel patterns. The primary source for socioeconomic data is the 2000 U.S. Census Bureau. First, the 2000 population and employment data at the Census Block level were aggregated within each TAZ. Then, the 2000 zonal data were converted to 2006 estimates by applying a uniform growth rate from the change in county totals between 2000 and 2006 population and employment. The 2006 county-level employment estimates were provided by the Georgia Department of Labor. Once the initial 2006 base model had been developed, it was refined based on known factors such as new school locations and recent development trends.

It is important to keep in mind that the Bryan County model study area includes portions of neighboring counties. The GDOT, in cooperation with local governments, has built travel demand models for the counties of Chatham, Effingham and Bulloch as well as the Liberty County/Hinesville Area. Therefore, the zonal socioeconomic data for the TAZs outside Bryan County were derived from the four neighboring travel demand models.

Similar to the development of the 2006 base scenario, the future 2035 No-Build model also required the assignment of population and employment forecasts at the TAZ level. The 2035 population and employment growth rates were calculated based on the 2030 projections developed by the Coastal Georgia RC, and were extrapolated out to the year 2035. Once the initial 2035 No-Build model was developed, the refinement process involved the reallocation of socioeconomic data to reflect the high growth areas identified in the Bryan County's Future Development Map. Special considerations were also made for the TAZ areas that included established activity centers, approved Development of Regional Impacts (DRIs), and future school locations. **Figure 2.4** (page 2-7) illustrates the high growth areas where

**Table 2.4: Bryan County Travel Demand Model – Population Forecasts**

SUBAREA	POPULATION		
	2006	2035	% Change
South Bryan	19,937	32,665	64%
North Bryan	12,241	14,878	22%
Outside Bryan	30,711	49,341	61%
Total Area	62,889	96,884	54%

Sources: 2006 data from US Census and Ga. Dept. of Labor., 2035 data from US Census, Ga. Dept. of Labor, Bryan County Comprehensive Plan, Hinesville MPO, Chatham County MPO, Georgia DOT and Study Team.

**Table 2.5: Bryan County Travel Demand Model – Employment Forecasts**

SUBAREA	TOTAL EMPLOYMENT		
	2006	2035	% Change
South Bryan	3,844	9,052	135%
North Bryan	1,698	5,464	222%
Outside Bryan	8,677	16,628	92%
Total Area	14,219	31,144	119%

Sources: 2006 data from US Census and Ga. Dept. of Labor., 2035 data from US Census, Ga. Dept. of Labor, Bryan County Comprehensive Plan, Hinesville MPO, Chatham County MPO, Georgia DOT and Study Team.

significant share of the anticipated population and employment growth are expected. **Tables 2.4 and 2.5** (above) present the population and employment forecasts, respectively, developed as part of the Bryan County model. *Chapter 4 Baseline Conditions* describes the population and employment forecasts with a greater focus on Bryan County.

The highest population within the model study area is anticipated in the following locations:

- Southwest Chatham County, near SR 204;
- South Bryan County, near SR 144 and Belfast Keller Road;

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- South Effingham County near the I-16 at Old River Road interchange; and
- Southwest Chatham County south of I-95 between Little Neck Road and Quacco Road.

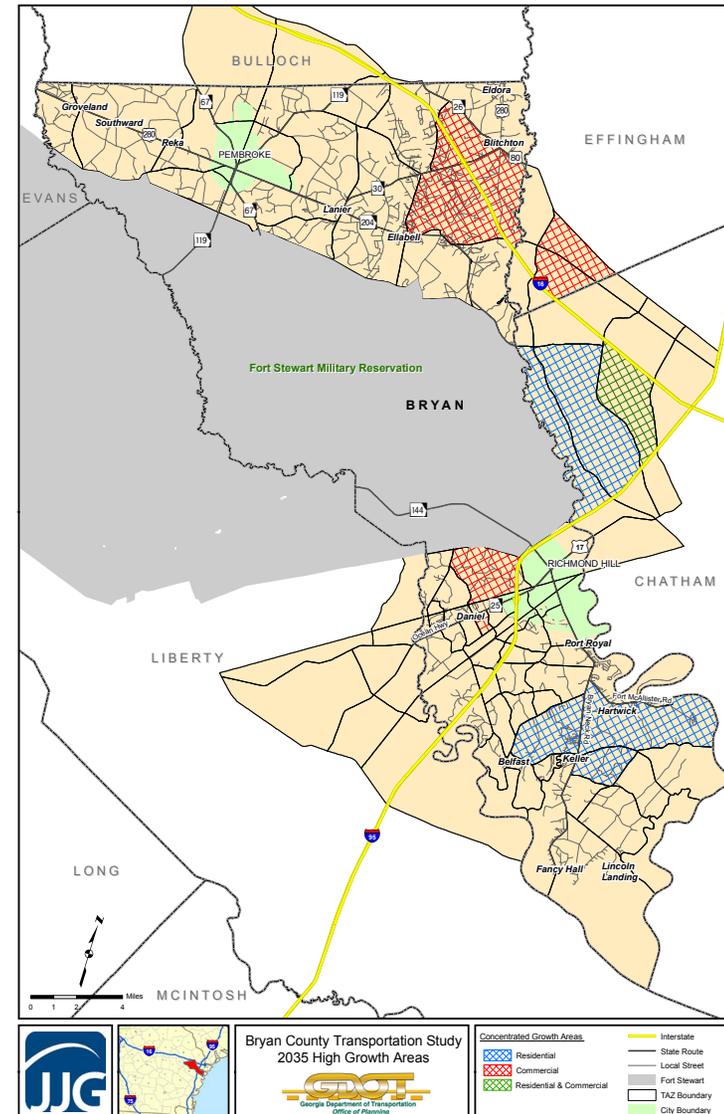
The highest employment within the model study area is anticipated in the following locations:

- Southwest Chatham County south of I-95 between Little Neck Road and Quacco Road;
- South Effingham County near the I-16 at Old River Road interchange and southwest of US 80;
- North Bryan County near the I-16 at US 280 interchange; and
- South Bryan County near the US 17 at I-95 interchange.

It should be noted the Interchange Analysis Report (IAR) for I-95 at Belfast Siding Road, completed in 2008, assumed that the areas surrounding this potential interchange area will be developed as high-intensity uses that are regionally significant. The findings from the IAR indicated the proposed interchange was not justified based on FHWA and GDOT policies. As such, the Bryan County model did not assume that the vacant properties near the proposed interchange will be developed at the level of intensity that was assumed in the IAR. It is unlikely that concentrations of jobs and residents near the junction of I-95 at Belfast Siding Road will occur at the intensity assumed in the IAR. To this end, for the areas near the junction of I-95 and Belfast Siding Road, the model assumed employment and population growth that are consistent with the surrounding land uses and existing interstate access.

The population and employment increases anticipated in the study area were translated into additional vehicle trips in accordance with the trip generation, trip distribution and auto occupancy methodologies described in the TDM technical document. *Chapter 3 Baseline Conditions* includes a detailed assessment of the trip tables and travel patterns as a result of the demographic growth in the study area.

**Figure 2.4: Bryan County Travel Demand Model – High Growth Areas**



Source: Bryan County Travel Demand Model

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## Baseline Conditions



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## 3.0 Baseline Conditions

The Baseline Conditions chapter herein includes a discussion on the land use, demographic and socioeconomic factors that impact travel demand in Bryan County. Also included in this chapter is an inventory of environmental resources that should be considered when making decisions on future transportation investments. The last section of this chapter is a comprehensive overview of the county's existing and projected transportation system including its roadway network, freight, and bicycle and pedestrian facilities. The findings from the baseline conditions are essential in creating a plan that reflects and meets the county's needs for an integrated transportation system.

### 3.1 Existing and Future Land Use and Development Patterns

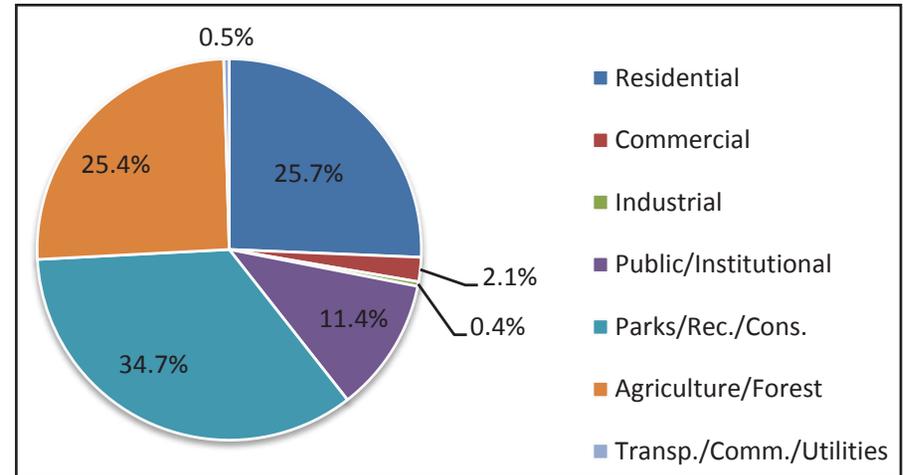
The transportation system is inherently connected to its environment, and thus, cannot be analyzed in isolation. The relationship between the transportation system and the land use it serves is critical since the intensity of transportation investment should match land development patterns. High speed highway investments facilitate travel between home and work over longer distances and interregional travel. Conversely, pedestrian infrastructure such as sidewalks provide a safer travel environment for local, compact trip-making between home and shopping areas or from home to school.

The following discussions on the existing and future land uses in Bryan County have been obtained from the *Joint Comprehensive Plan for Bryan County and the Cities of Pembroke and Richmond Hill* (2008).

#### 3.1.1 Existing Land Use

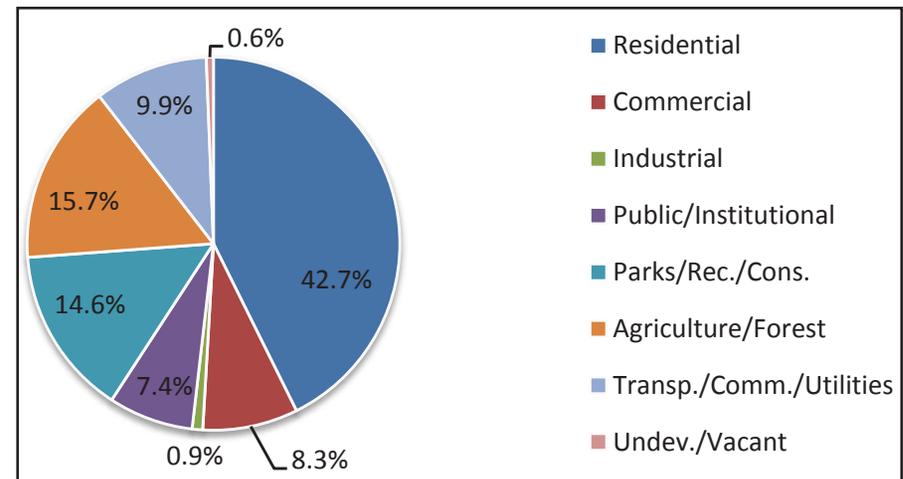
**Figure 3.1** (opposite) shows the distribution of the existing land uses in Pembroke provided by the Comprehensive Plan. Despite some growth that Pembroke is beginning to see within the city, Pembroke still retains a great deal of its rural character with over 60 percent of existing land characterized as Agriculture/Forestry or Parks/Recreation/Conservation.

**Figure 3.1: Existing Land Use City of Pembroke**



Source: *Joint Comprehensive Plan for Bryan County and the Cities of Pembroke and Richmond Hill*.

**Figure 3.2: Existing Land Use City of Richmond Hill**



Source: *Joint Comprehensive Plan for Bryan County and the Cities of Pembroke and Richmond Hill*.

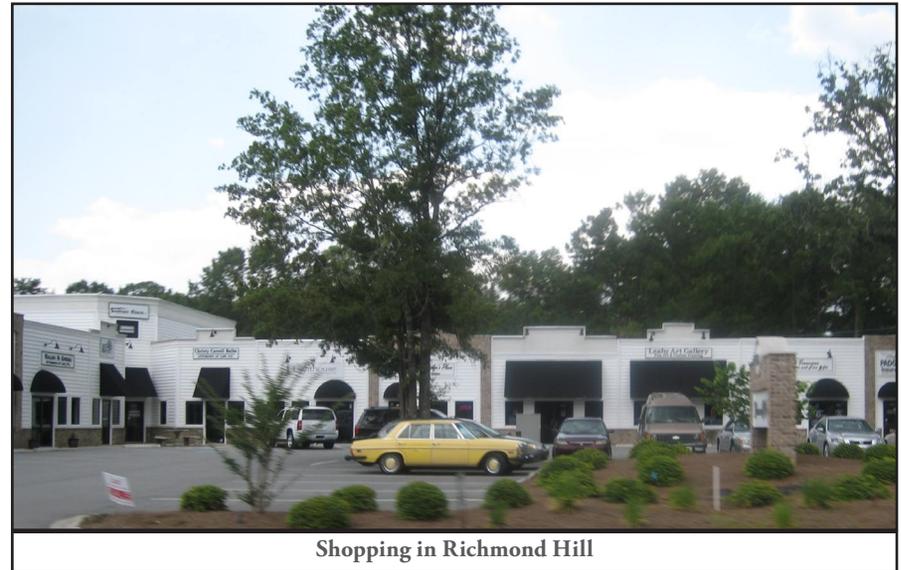
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Existing development patterns have a direct impact on determining future growth. At present, most suburban area development is taking place north and southwest of downtown Pembroke. Because of Pembroke's location relative to Savannah, the Port of Savannah and Fort Stewart, there will be continued pressure for development in certain areas of the city. The Comprehensive Plan indicated that although the amenities such as a good school system and excellent vehicular access will fuel development pressure, this growth will be moderated by a restriction on development without sanitary sewer systems and lack of water distribution systems in some areas.

**Figure 3.2** (page 3-1) illustrates the current share of land allocated for each land use in Richmond Hill. The existing land use in Richmond Hill is predominantly (43 percent) residential, which suggests that majority of the residents commute outside the city for employment. Approximately 30 percent of the city is characterized as Agriculture/Forestry or Parks/Recreation/Conservation, and majority of these uses are located in the southern portion of the city. Commercial areas (8.3 percent) including shopping centers and offices are generally clustered along SR 144 and US 17. Due to recent growth and development experienced in Richmond Hill, there is little undeveloped or vacant land available in the city (only 0.6 percent).

Recently, most of the growth in Richmond Hill has been single-family residential and commercial services near Richmond Hill Plantation and areas southwest of the city. Although portions of this subdivision will be in gated, private communities, the Planned Unit Developments designated for this area also allow for a variety of home sizes and price ranges for different income levels. As identified in the Comprehensive Plan, the existing development patterns in Richmond Hill indicate a favorable environment for strategic future growth. For example, the city already has in place provisions for smart-growth and/or neo-traditional development so that developers do not have to go through a long variance process for these types of projects.

Unincorporated Bryan County is almost entirely rural in use. However, the majority of county population and employment growth is occurring outside of the city limits. This trend is forecast to continue into the future. Large tracks of land south of Richmond Hill have been approved for various types of development, including commercial, residential and mixed use. Development



Shopping in Richmond Hill

in northern Bryan County is occurring principally in the eastern portion, in and around the US 280 Interchange with I-16. Development in these areas includes Interstate Centre, a 1,000 acre industrial park which has attracted substantial manufacturing and distribution facilities to the area.

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## 3.1.2 Planned Development

Developments of Regional Impact (DRI) are large-scale projects that are likely to have regional impacts beyond the boundaries of the local governments of their locations. Applications are reviewed by the Coastal Georgia RC, which issues a finding of whether or not the proposed project is in “the best interest of the region and therefore the state.” The local government uses this recommendation in deciding whether to allow the project to proceed. **Table 3.1** (opposite) displays the applications for DRI that have been filed with the Georgia Department of Community Affairs (DCA) for proposed projects in the county since 2001.

These DRI applications are indicative of future growth areas in Bryan County. Consistent with the county’s land use plans, several applications for additional residential, commercial and mixed-use developments have been completed for areas south of Richmond Hill and the I-16 corridor in northern Bryan County.

Notable residential and mixed use developments are currently being planned and developed for areas of south Richmond Hill. These Planned Unit Developments, with mix of retail, office and services, are located in Richmond Hill Plantation, Brisbon Hall and Turtle Landing areas. A total of 1,000 new homes are envisioned, some in gated, private communities.

Interstate Centre II is a 505-acre master-planned industrial park developed in partnership with Bryan County Development Authority. Current Interstate Centre tenants include manufacturing and distribution centers owned by Oracal, Oneida and Kawasaki. Phase 1 is a 605,000 s.f. building with cross-dock configuration, and is already under construction. There are plans to construct six other buildings ranging from 200,000 s.f. to 2,000,000 s.f. in size during later phases.

**Table 3.1: Developments of Regional Impact**

DRI ID	Project	Development Type	City	Initial Info Form Submitted	Current Status
1957	Belfast Industrial	Mixed Use	unincorporated	9/29/2008	Completed
1879	Kilkenny Tract PUD	Mixed Use	unincorporated	6/16/2008	Completed
1720	Interstate Centre South	Industrial	unincorporated	1/24/2008	Completed
1561	Belfast Siding	Mixed Use	unincorporated	8/14/2007	Completed
1541	Placid Hill	Housing	unincorporated	7/26/2007	Completed
1452	BLT Project	Mixed Use	unincorporated	5/21/2007	Completed
1446	JF Gill Tract	Housing	unincorporated	5/21/2007	Completed
1343	Interstate Centre Expansion	Industrial	Pembroke	2/20/2007	Request for Comments Made
1319	Daniel Siding Development	Mixed Use	unincorporated	1/26/2007	Additional Form Submitted
1287	Blitchton Crossing	Mixed Use	Pembroke	12/8/2006	Additional Form Submitted
1274	Interstate Centre II	Industrial	Pembroke	11/21/2006	Additional Form Submitted
1174	Buckhead Lakes	Housing	unincorporated	7/25/2006	Initial Form Submitted
1094	North Point Warehouse	Wholesale & Distribution	unincorporated	4/12/2006	Completed
1069	River Marsh Marina At Kilkenny Creek	Mixed Use	unincorporated	3/8/2006	Completed
991	South Bryan County Wastewater Treatment Plant	Wastewater Treatment Facilities	Richmond Hill	1/17/2006	Completed
916	Interstate Centre South	Industrial	unincorporated	9/16/2005	Initial Form Submitted
913	Georges Bluff Subdivision	Housing	unincorporated	9/14/2005	Completed
892	Elbow Swamp Subdivision	Housing	Richmond Hill	8/15/2005	Completed
889	Tivoli Estates	Housing	unincorporated	8/9/2005	Completed
872	Belfast Lake Subdivision	Housing	unincorporated	7/19/2005	Completed
871	Hidden Creek (Wilma Edwards Road)	Housing	unincorporated	7/19/2005	Completed
782	Orafol Plant	Industrial	unincorporated	4/22/2005	Additional Form Submitted
748	Richmond Hill Interchange Park	Commercial	Richmond Hill	2/24/2005	DRI Determination Made
737	White Oak Village	Housing	Richmond Hill	2/7/2005	Completed
725	Live Oak	Housing	Richmond Hill	1/31/2005	Additional Form Submitted
721	Love's Travel Stop	Truck Stops	Richmond Hill	1/26/2005	Completed
544	Ford Park of Commerce	Commercial	Richmond Hill	2/26/2004	Completed
483	Richmond Hill Plantation	Housing	Richmond Hill	10/16/2003	Completed
213	Bryan County Interstate Centre	Mixed Use	unincorporated	1/31/2002	Completed
67	Timber Trail Road	Housing	Richmond Hill	7/20/2001	Completed

Source: Georgia Department of Community Affairs

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## 3.1.3 Future Land Use

Addressing transportation needs involves an understanding of Bryan County's growth patterns and distributions. Identifying areas of various levels of growth helps determine the types of transportation investment needed to serve the community. Areas that are growing aggressively may need new infrastructure, whereas established areas may need maintenance or enhancement investments. **Figures 3.3 and 3.4** (pages 3-5 and 3-6) represent the future development maps for northern and southern Bryan County. These maps have been taken directly from the Comprehensive Plan (2008), in which notable future uses are identified as future development map designated (FDM) areas.

As identified in the FDM of northern Bryan County, the land parcels directly surrounding the interchange of US 280 at I-16 are designated as regional commercial areas with planned development associated with Interstate Centre. The remaining incorporated county is still anticipated to retain its rural character with pockets of suburban developments along Wilma Edwards Road, US 280 near I-16 and Black Creek Church Road. The future land use for Pembroke is still expected to be predominantly suburban residential with concentrations of commercial and mixed use development in around downtown Pembroke.

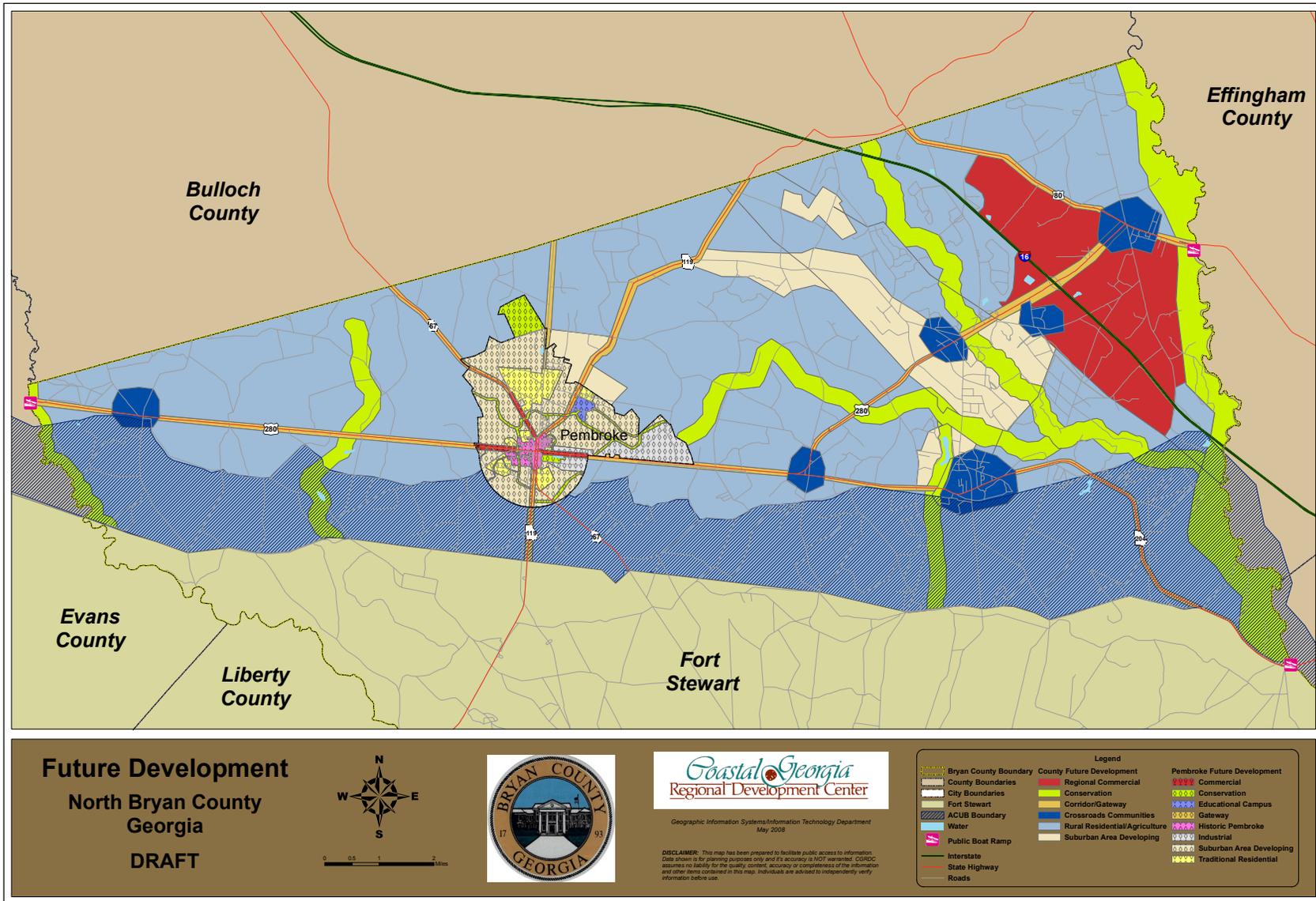
South Bryan's future development map identified most of the unincorporated county as suburban area development with pockets of regional commercial areas surrounding Belfast Siding Road between US 17 and I-95. The City of Richmond Hill has plans to develop mixed use communities in areas west of the city along the CSX rail corridor, near I-95 at US 17 interchange and along I-95 near SR 144.



Interstate Centre Development

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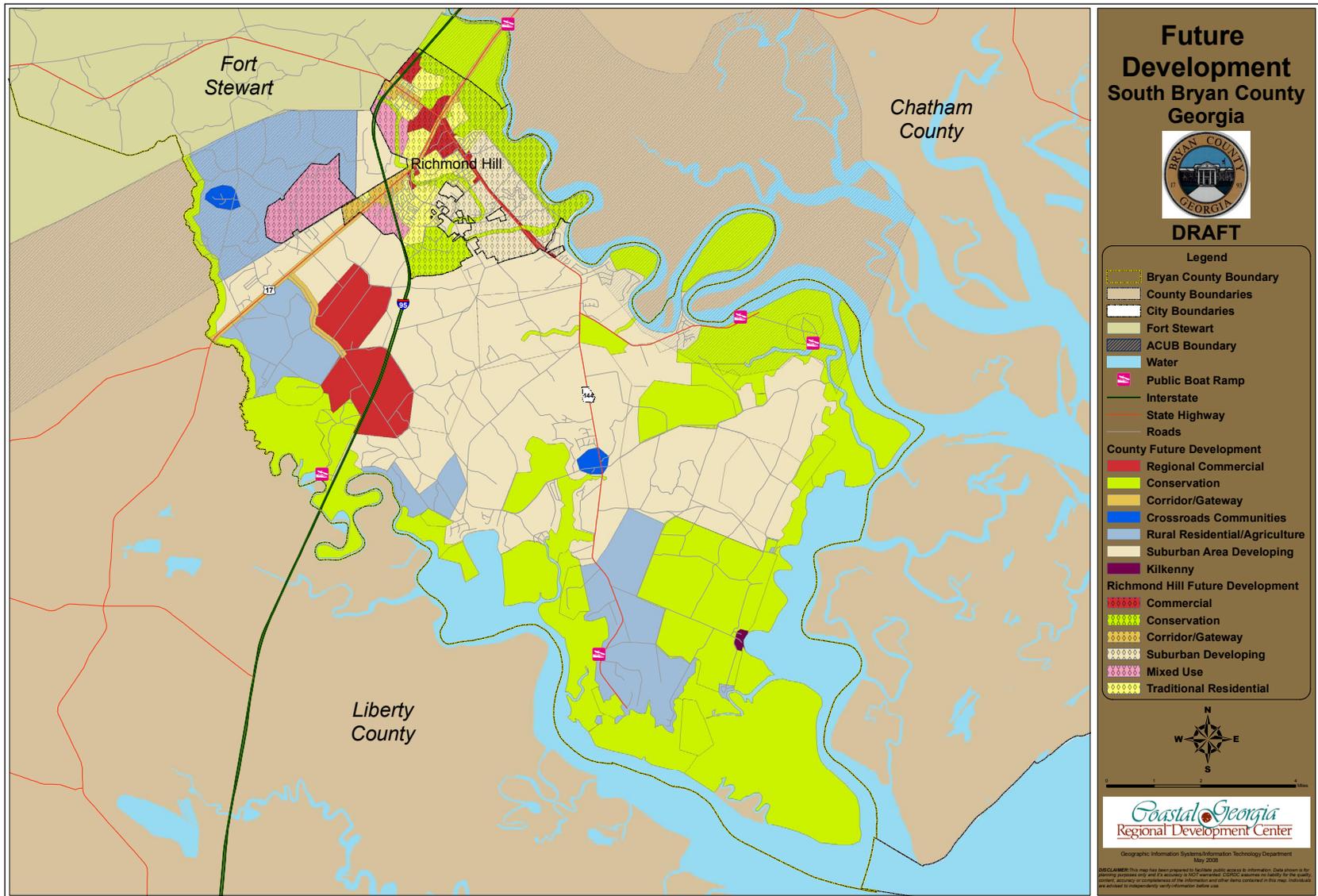
Figure 3.3: Future Development in North Bryan County



Source: Coastal Georgia RC

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Figure 3.4: Future Development in South Bryan County



Source: Coastal Georgia RC

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## 3.2 Demographic Characteristics

Understanding the demographic characteristics of an area is important because transportation investments should reflect the needs of changing demographic trends. Furthermore, this information will assist the County in determining transportation needs to support future population and employment growth. The following summary of Bryan County’s demographic characteristics has been collected from various sources such as the US Bureau of Census, US Department of Labor and demographic estimates derived from previous studies.

### 3.2.1 Population

Overall, Bryan County as a whole has experienced significant growth since the 1970s. In each of the last three decades, the county has grown in population by greater than 50 percent. However, growth trends in the cities of Pembroke and Richmond Hill have not matched the growth experienced by the unincorporated portions of the county. Pembroke’s population growth during the 1970s and 1980s was generally stagnant, not matching the county’s growth until the 1990’s. Richmond Hill did not begin to experience accelerated growth until the 1980s and 1990s.

According to the 2000 Census, Bryan County as a whole had 23,420 people, 8,090 households, and 6,510 families residing in the county. These statistics translate to a population density of 53 persons per square mile. The majority of the population is located in the southern portion of the county, while the northern portion remains sparsely populated. Approximately 40 percent of the county’s total population resides in the cities of Pembroke (2,380) and Richmond Hill (6,960). See **Figure 3.5** (page 3-8) for the distribution of existing population densities.

The county and cities are expected to continue to experience rapid growth over the next thirty years. According to *Georgia Coast 2030* (Georgia Institute of Technology, 2006), Bryan County’s population is anticipated to almost double from 23,420 in 2000 to 45,990 by 2030. As stated earlier, this growth can be attributed to the county’s proximity to the Port of Savannah, abundant developable lands, quality schools and interstate access to I-16 and I-95.

**Table 3.2: Bryan County Projected City and County Population Growth**

Area	2000	2005	2010	2015	2020	2025	2030
Pembroke	2,380	3,100	3,580	3,940	4,240	4,480	4,670
Richmond Hill	6,960	9,840	11,350	12,510	13,460	14,230	14,830
Unincorporated Bryan County	14,080	17,580	35,200	22,360	24,050	25,420	26,490
Bryan County Population	23,420	30,520	35,200	38,820	41,750	44,130	45,990

Source: Center for Quality Growth and Regional Development’s *Georgia Coast 2030*

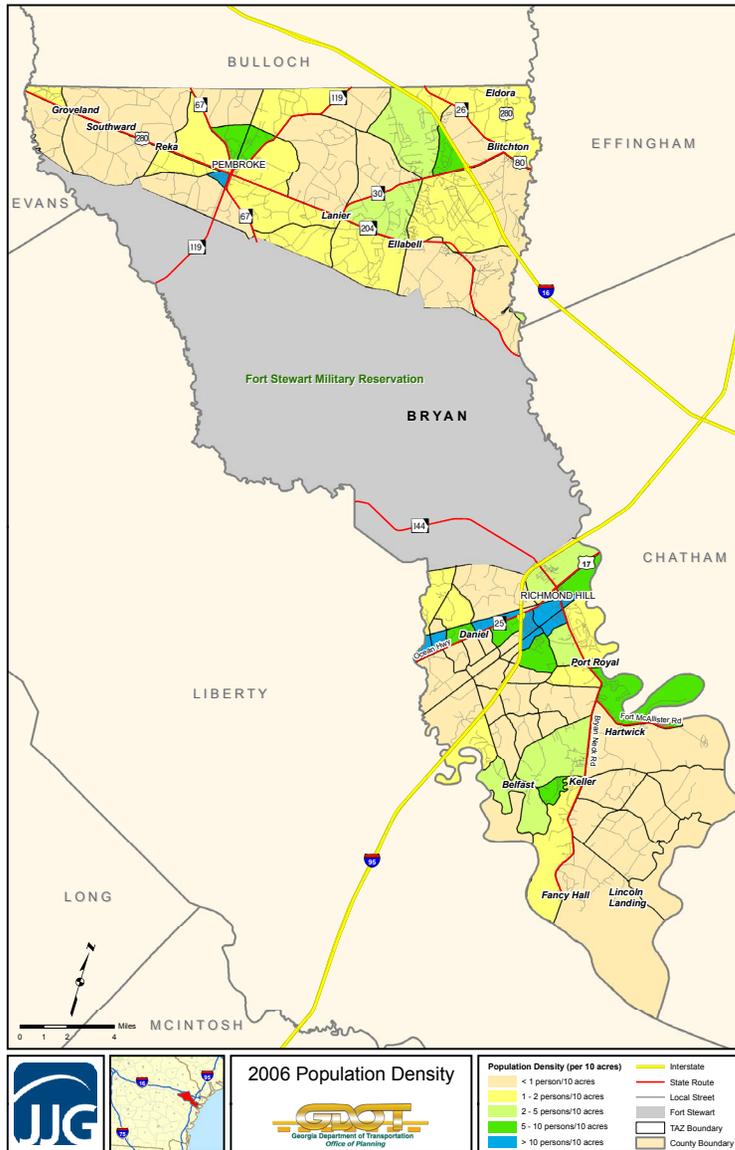
**Table 3.2** (above) shows projected growth rates for Pembroke, Richmond Hill and Bryan County.

**Figure 3.6** (page 3-8) illustrates the projected 2035 population densities that are consistent with the planned growth and development outlined in the Comprehensive Plan. These growth areas have been identified for the use in determining future trip origins and destinations as part of the development of the Travel Demand Model. (Details on the Travel Demand Model process can be found in Section 2.3 and Appendix B.) The areas with highest population density are expected to be within the established residential neighborhoods in Pembroke, near the commercial node of US 17 at SR 144 in Richmond Hill, at Belfast Siding Road near I-95, and in south Bryan County adjacent to Keller.

*Bryan County’s population is anticipated to almost double from 23,420 in 2000 to 45,990 in 2030.*

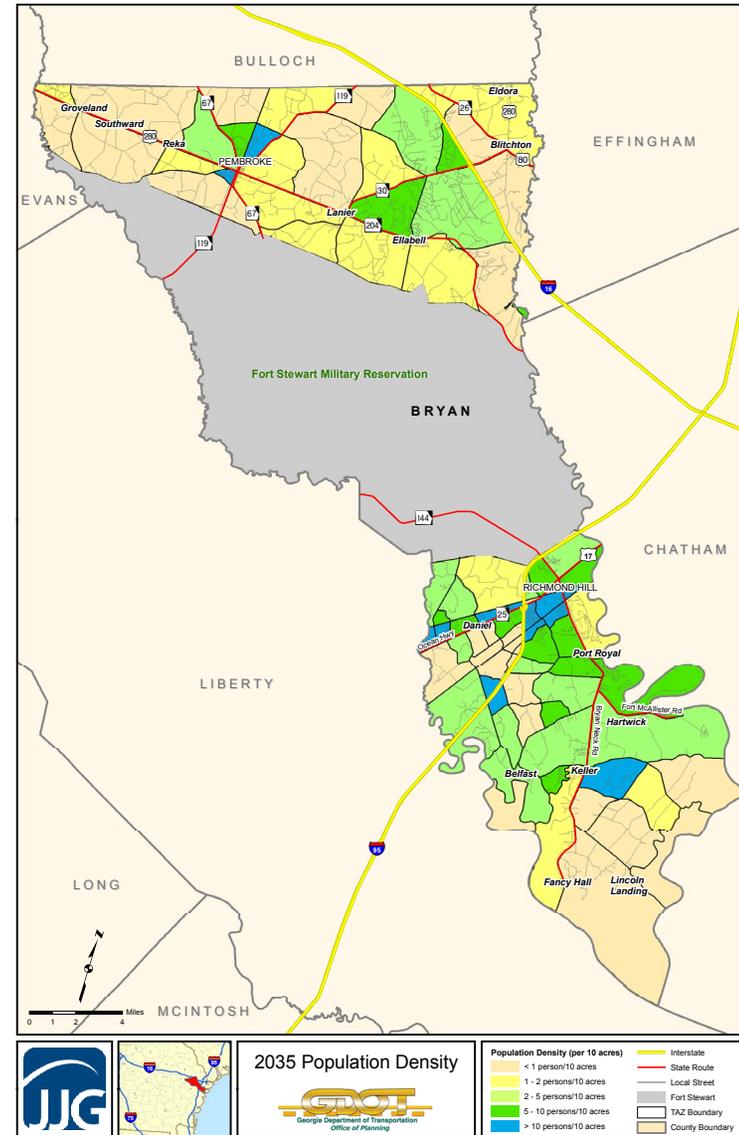
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Figure 3.5: 2006 Population Density



Source: Bryan County Travel Demand Model

Figure 3.6: 2035 Population Density



Source: Bryan County Travel Demand Model

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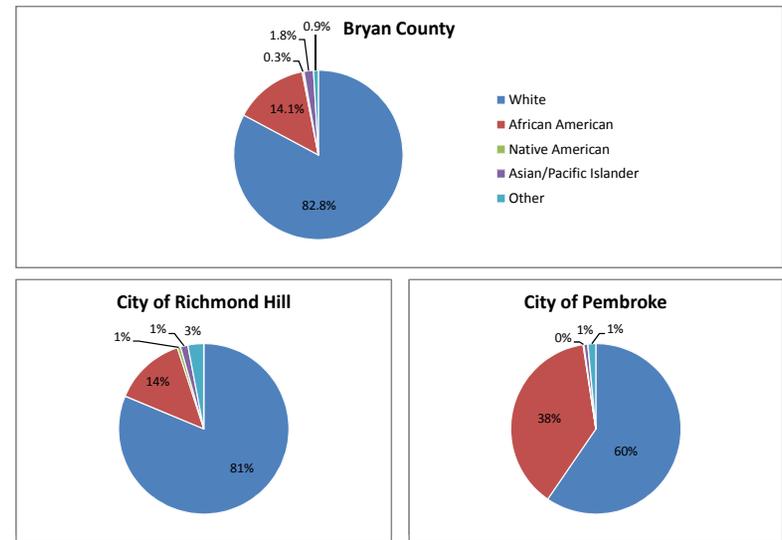
## 3.2.2 Race

Most of the minority population in Bryan County reside in the northern portion of the county in and around Pembroke. **Figure 3.7** (opposite) is a comparison of racial composition within the county and the cities. Bryan County is similar to Richmond Hill in that the white population makes up a significant majority of greater than 80 percent, followed by roughly 14 percent African American population. Although Pembroke’s racial makeup is still largely white with (60 percent), its share of African American population (38 percent) is much higher than rest of the county.

## 3.2.3 Age Distribution

Details related to age distribution were available at the county level. **Table 3.3** (opposite) presents the growth in the share of age cohorts between 1990 and 2000. In general, due to the significant population increase in Bryan County as a whole, the overall trends for all the age groups show a positive growth even if the share of some of the cohorts may have decreased in 2000. Significant increase in the number of county residents can be seen in the 10-19 and 40-40 age cohorts, while relatively little growth has occurred for the under 9 and the 20-29 age groups. Other noteworthy observations include the increase in the county’s median age from 27 in 1980 to 33 in 2000, and the significant 20 percent increase in school enrollment between 1995 and 2005. These statistics indicate that Bryan County is experiencing growth in the number of families with school-age children.

**Figure 3.7: Racial Composition**



Source: US Bureau of Census

**Table 3.3: Bryan County Age Cohort Distribution**

Age Group	1990	1990 Share of Population	2000	2000 Share of Population
0-9	2,760	18%	3,760	16%
10-19	2,700	17%	4,180	18%
20-29	2,260	15%	2,680	12%
30-39	2,850	18%	3,860	17%
40-49	2,090	14%	4,010	17%
50-59	1,150	7%	2,520	11%
60-69	960	6%	1,250	5%
70-79	500	3%	790	3%
80+	180	1%	200	1%
<b>Total</b>	<b>15,440</b>	<b>100%</b>	<b>23,240</b>	<b>100%</b>

Source: US Bureau of Census

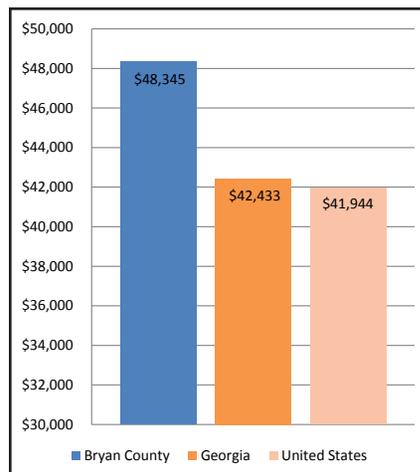
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## 3.2.4 Household Income

As discussed in the previous sections, northern and southern portions of the county are vastly different from one another, with the northern end possessing more rural characteristics and the southern end traditionally serving as a bedroom community to Savannah. Even the level of economic prosperity greatly differs, with Pembroke designated as Tier 1 by the State of Georgia for job tax credit purposes and Richmond Hill designated as Tier 4, with Tier 4 being among the most prosperous communities in the state.

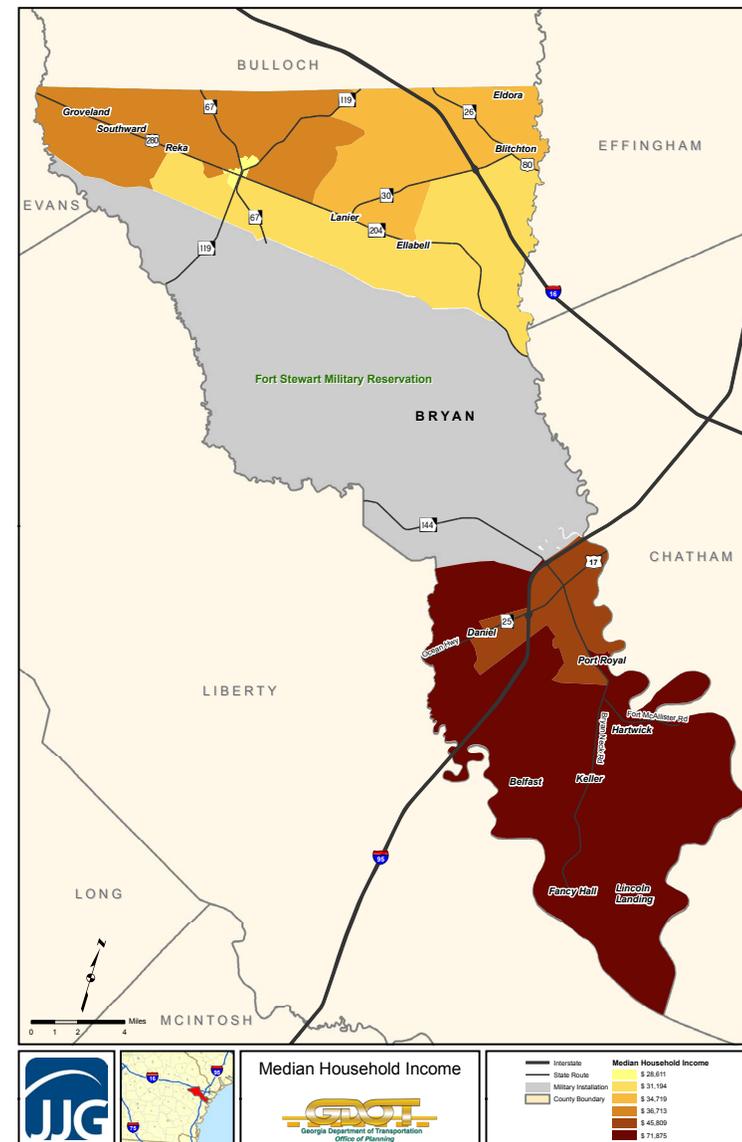
**Figure 3.8** (below) shows a much higher year 2000 Bryan County median household income (\$48,345) than the average in the state of Georgia (\$42,433) and the United States (\$41,944). However, as illustrated in **Figure 3.9** (opposite), there is a significant disparity in household income between the northern and southern areas of the county. This map shows that the areas with the highest household incomes (\$71,875) are concentrated in the southern portion of the county, especially surrounding Richmond Hill. Conversely, the areas with the lowest household income are generally concentrated in northern Bryan County, especially inside the city limits of Pembroke (\$28,611).

**Figure 3.8: 2000 Median Household Income Comparison**



Source: US Census Bureau

**Figure 3.9: 2000 Median Household Income**



Source: US Census Bureau

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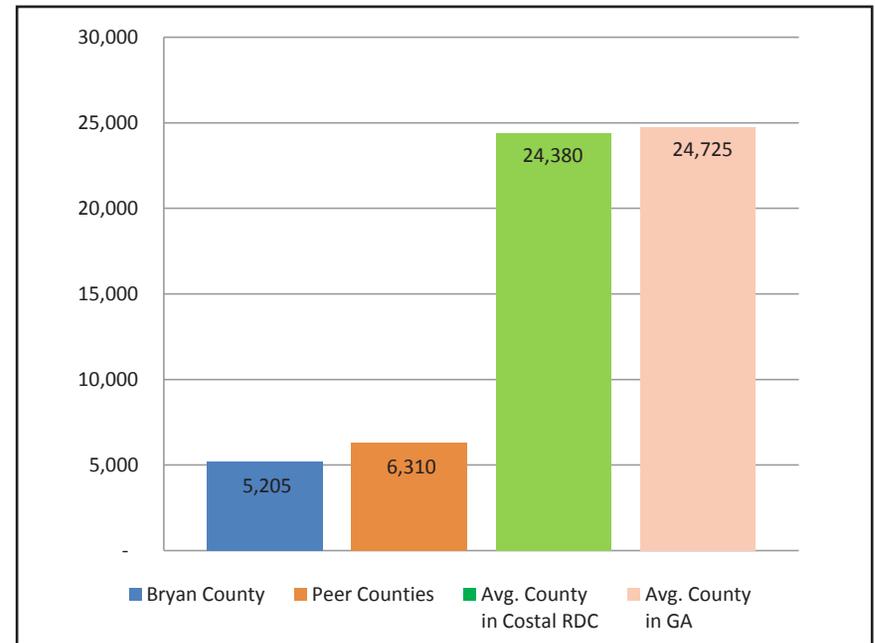
## 3.2.5 Bryan County Employment

According to the study conducted by the Georgia Institute of Technology, *Support for Business and Industry Assessment for Bryan County*, the county's economic base is relatively small when compared with other counties in the Coastal Georgia region and the state. As shown in **Figure 3.10** (opposite), in 2005, Bryan County was home to 5,205 total jobs compared to an average 6,310 for its peer counties, 24,380 for its regional counterparts, and 24,725 for an average county in Georgia.

Statistics from the Georgia Department of Labor indicates that Bryan County's service producing industries accounted for the largest share (52.1 percent) of employment in 2005 (**Figure 3.11**, opposite). Accommodations/food services and retail trade make up the largest share of the county's service producing industries. According to *Support for Business and Industry Assessment for Bryan County*, given its strengths in accessibility and location, Bryan County has the most potential to be competitive for wholesale electronics markets, agents and brokers; warehousing and storage (i.e., distribution centers); and professional, scientific, and technical firms. The study also identified industrial park or property development and residential development as the top opportunities for economic development in Bryan County.

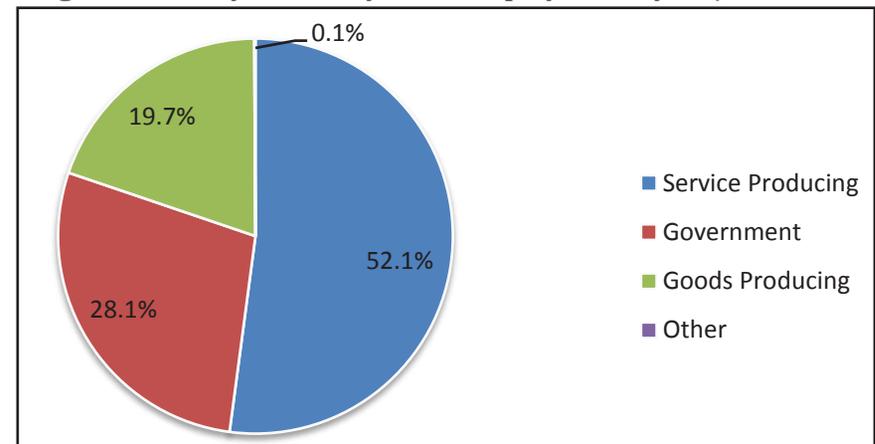
**Figure 3.12** (page 3-12) illustrates the distribution of existing employment densities in the county. Currently, except for the small established activity centers within the cities, the Bryan County is characterized by extremely low density employment. By 2035, Bryan County is expected to have employment densities of five to ten jobs per acre in the areas near Interstate Centre, existing commercial nodes in Richmond Hill, and along Belfast Siding Road between US 17 and I-95 (**Figure 3.13**, page 3-12). As with the population projections, the areas of high employment growth are consistent with the county's future development plans, and were identified to be used in the trip forecasts by the 2035 Travel Demand Model.

**Figure 3.10: Bryan County 2005 Employment**



Source: Georgia Department of Labor

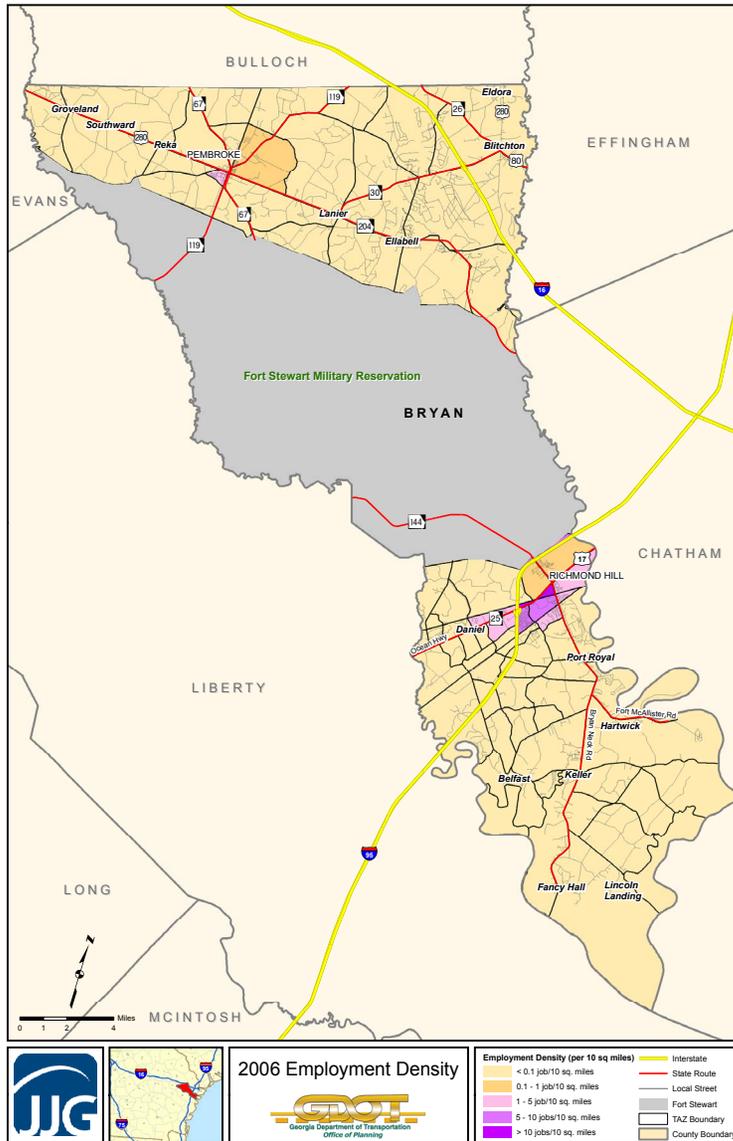
**Figure 3.11: Bryan County 2005 Employment by Major Sector**



Source: Georgia Department of Labor

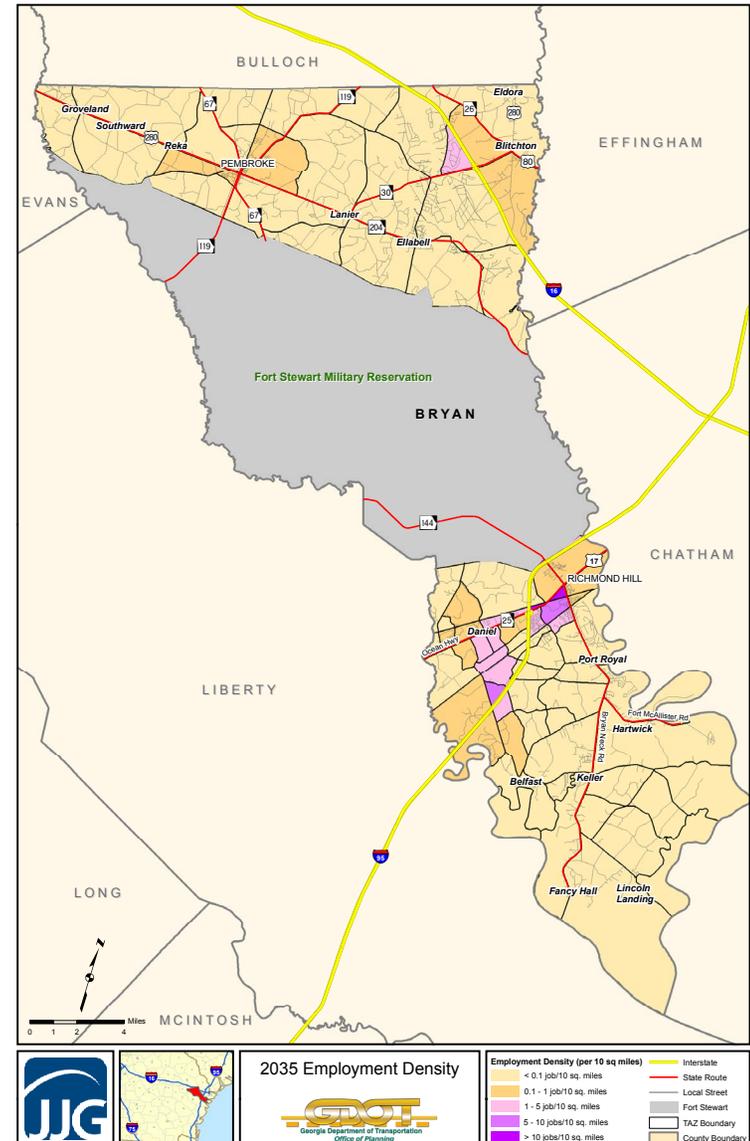
# Chapter 3

Figure 3.12: 2006 Employment Density



Source: Bryan County Travel Demand Model

Figure 3.13: 2035 Employment Density



Source: Bryan County Travel Demand Model

# Chapter 3

## 3.2.6 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. In 1998, FHWA issued a guidance document that established policies and procedures for addressing Environmental Justice 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 sets 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.

## 3.2.7 Minority Population

Bryan County is comprised of 19 percent minority population, which is significantly lower than Georgia’s statewide 37 percent minority population. **Figure 3.14** (page 3-14) illustrates the distribution of minority populations at a Census block level. According to the 2000 Census, the highest concentrations of minority populations are located in and around Pembroke along US 280, SR 119 and SR 67. Pockets of minority areas are also located along SR 30 and SR 204 in northern Bryan. In south Bryan, there are areas of minority concentrations along the Harris Trail Extension and along the CSX rail corridor.

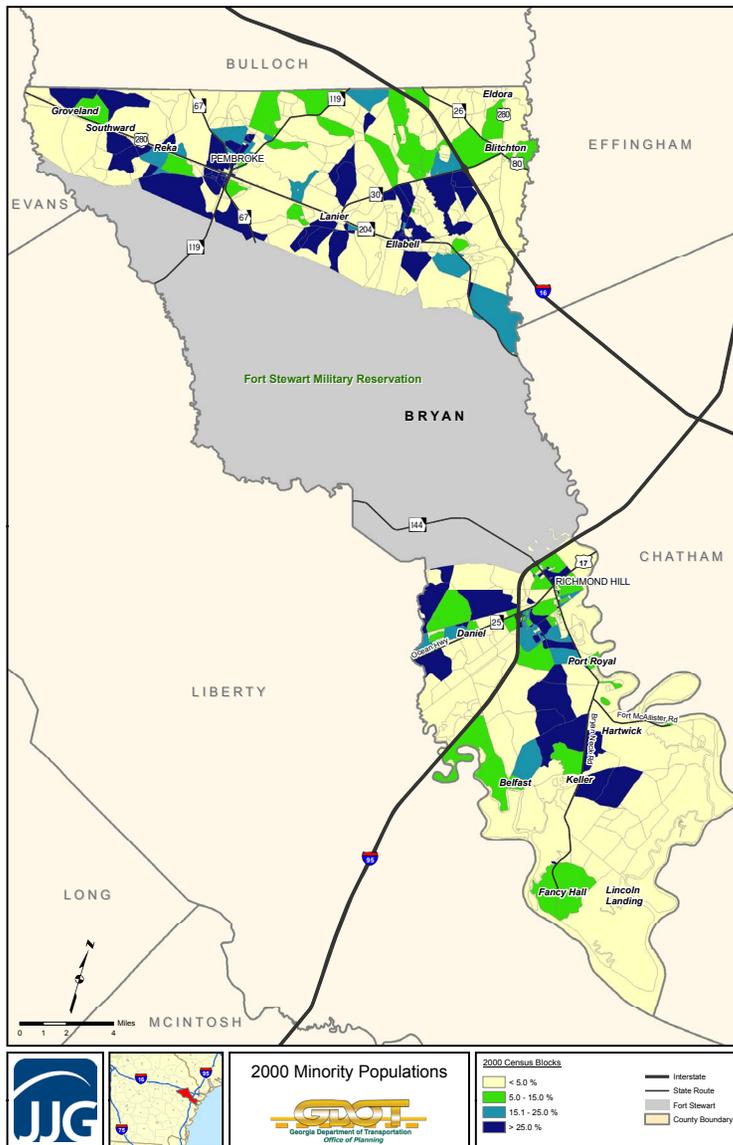
## 3.2.8 Low Income Population

In 2000, the population living in poverty in Bryan County was approximately 7.1 percent compared to 11.1 percent of those across the State of Georgia and 9.8 percent in the United States. **Figure 3.15** (page 3-14) shows that although Bryan County’s poverty rate is lower than the state and national averages, the geographic disparity in the poverty levels between the north and south is quite apparent. In particular, the City of Pembroke is home to the highest poverty level at 24 percent.

The Bryan County Transportation Study addressed Environmental Justice by reaching out to the leaders of minority and low income communities as part of the study’s public involvement efforts. As discussed in greater detail in Chapter 6, the Environmental Justice communities were able to participate in the study as part of the Advisory Committee and/or through stakeholder interviews.

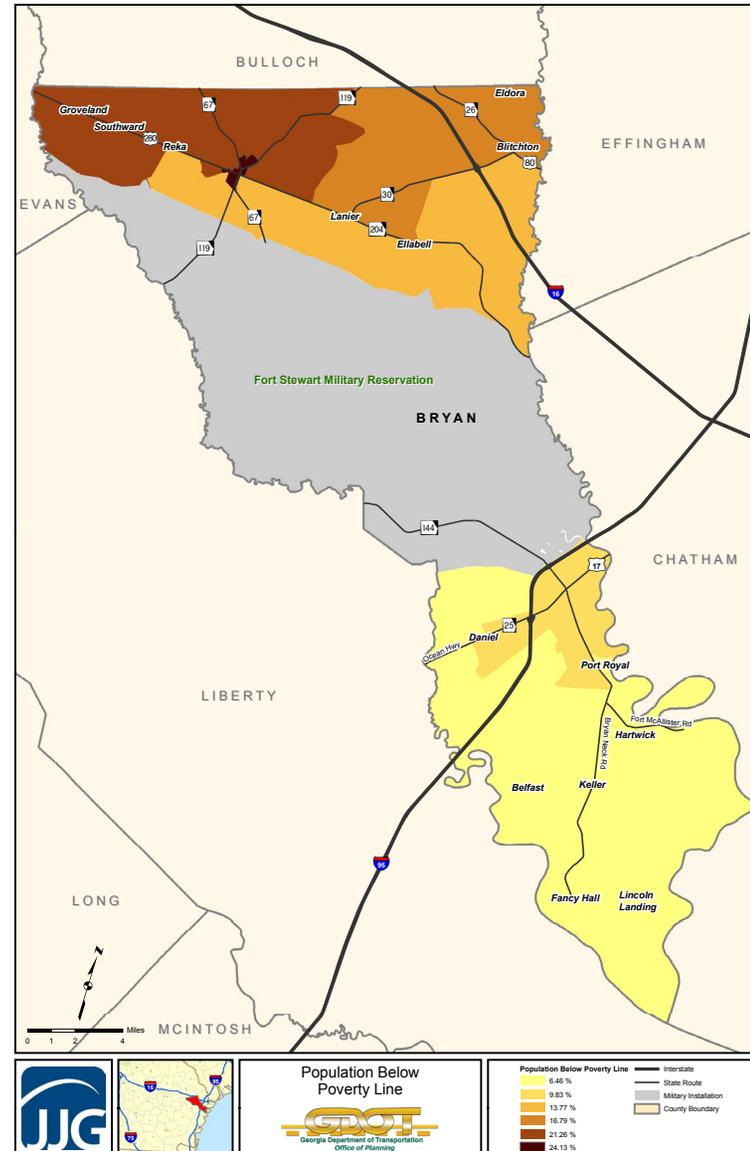
# Chapter 3

Figure 3.14: Minority Populations



Source: US Census Bureaus

Figure 3.15: Low Income Populations



Source: US Census Bureau

# Chapter 3

## 3.3 Built and Natural Environment

This section highlights the abundance of natural and historic resources in Bryan County. The county’s future development map should be used as a guide for developments to avoid potential encroachment on the county’s natural and historic resources. Similarly, potential impacts to these resources must be analyzed and accounted for when considering transportation improvements. This section provides an overview of environmental factors.

### 3.3.1 Wetlands

Given its location in the coastal region, Bryan County has a wealth of natural resources including sensitive shoreline areas, wetlands, and numerous flowing streams. The county lies between the Ogeechee River on the east and the Cancoochee River, Mt. Hope Creek, and the Jerico-Laurel View River that becomes the Midway River on the west. **Figure 3.16** (page 3-16) depicts the geographic distribution of wetland and water body features in Bryan County.

Federal law and the Georgia Planning Act require protection of wetlands and other natural resources from adverse impact. As such, the Georgia Department of Natural Resources maintains a database that defines, identifies, and maps the categories of freshwater wetlands and aquatic habitats. Wetland areas help recharge the water supply, provide flood control, natural habitat for fish, wildlife and endangered species and recreational areas. Because of these impacts, wetlands receive special protections from local, state and federal agencies. These protections can affect land use development patterns, location of roads, transportation improvement, project capital costs and the use of state and federal funding. Approximately 42 percent (291,300 acres) of Bryan County is covered in wetlands, and thus, could pose significant limitations

*Approximately 42% of Bryan County is covered in wetlands, which could pose limitations to new development and infrastructure.*

to new developments and infrastructures. Potential impacts to wetlands have been taken into consideration during development of recommendations.

**Table 3.4: National Register Locations in Bryan County**

Resource Name	Location	City
Bryan County Courthouse	College St.	Pembroke
Bryan Neck Presbyterian Church	Belfast Keller Rd.	Keller
Fort McAllister	10 mi. E of Richmond Hill via GA 67	Richmond Hill
Glen Echo	2 mi. (3.2 km) E of Ellabelle on GA 204	Ellabelle
Kilkenny	E of Richmond Hill on Kilkenny Rd.	Richmond Hill
Old Fort Argyle Site	Address Restricted	Savannah
Pembroke Historic District	Centered on US 280 and Main St.	Pembroke
Richmond Hill Plantation	E of Richmond Hill on Ford Neck Rd.	Richmond Hill
Seven Mile Bend	Address Restricted	Richmond Hill
Strathy Hall	SE of Richmond Hill	Richmond Hill

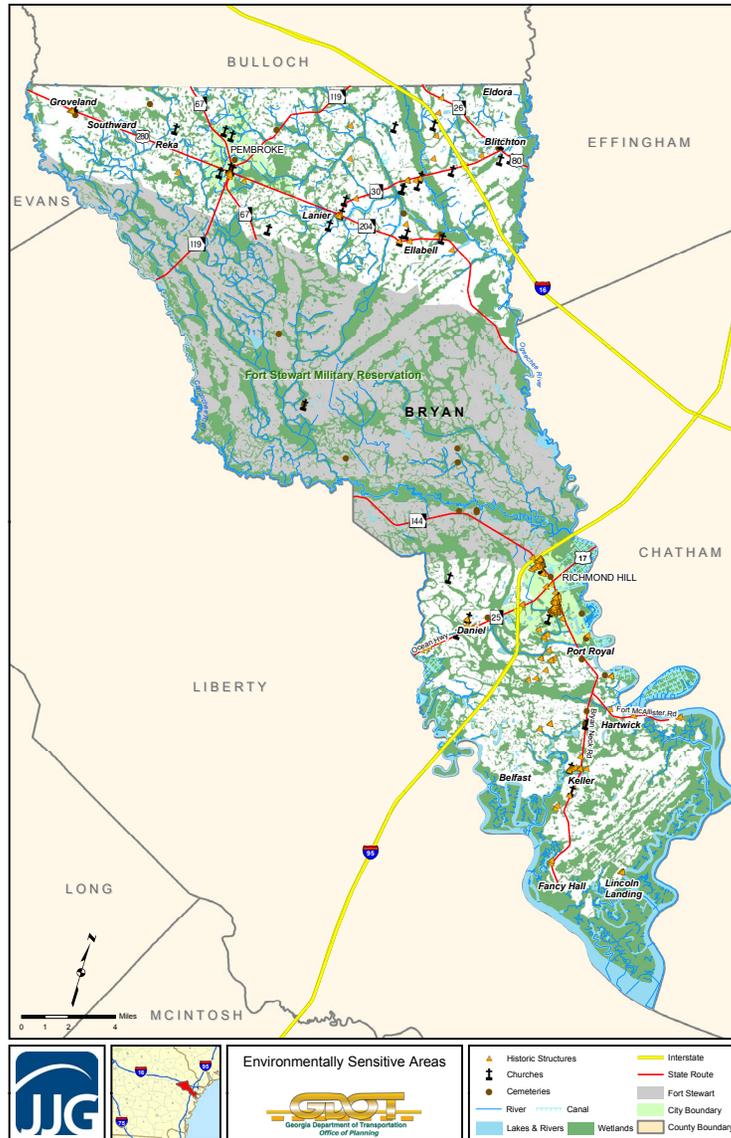
*Source: National Register of Historic Places*

### 3.3.2 Historic Structures

Preservation of an area’s historic features helps to maintain a community sense of character and identity. According to the National Historic Register of Places, Bryan County is home to approximately 120 structures noted as historic places, most of which are located within the City of Richmond Hill. **Table 3.4** (above) provides the most notable locations within Bryan County. Historic structures in an area are often provided a higher level of protections by local state and federal agencies, and thus, must be accounted for when developing project recommendations. Therefore, historic structures that may potentially be affected by project improvements will be documented as part of the project evaluation process. **Figure 3.17** (page 3-16) illustrates the locations of historic properties in Bryan County.

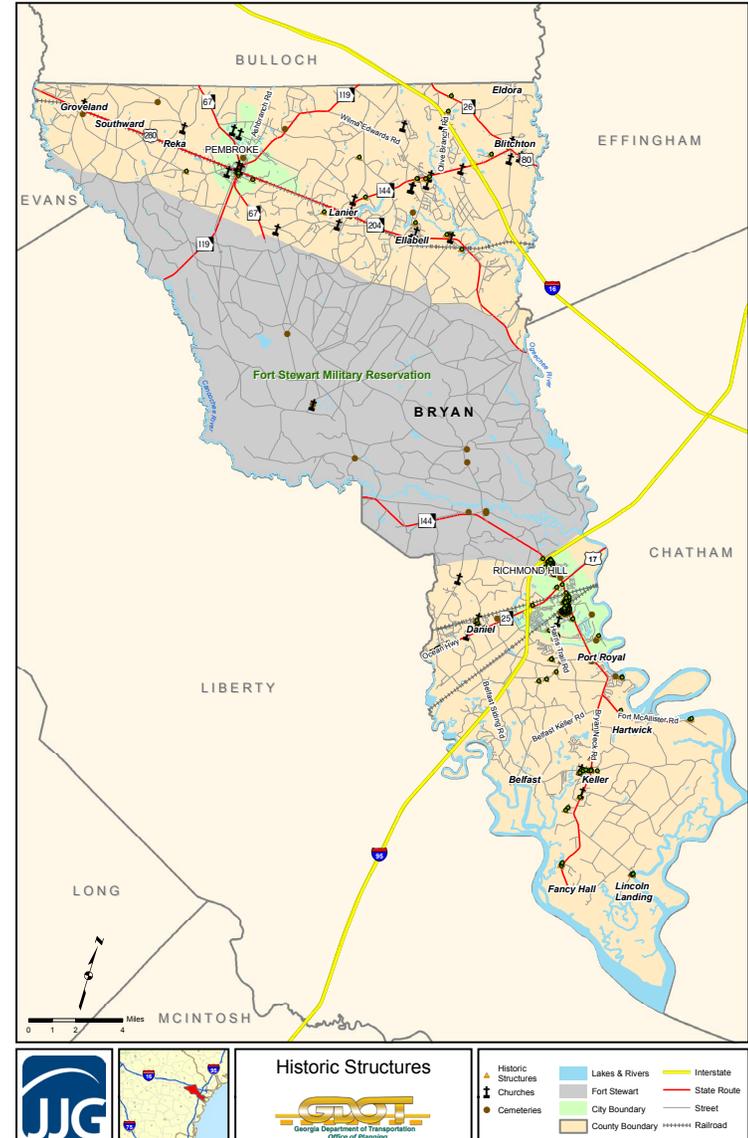
# Chapter 3

Figure 3.16: Water Resources



Source: National Wetlands Inventory

Figure 3.17: Historic Structures



Source: National Register of Historic Places

# Chapter 3

## 3.4 Transportation System

This section provides an inventory of existing and future conditions of Bryan County's transportation system, which includes the following:

- Travel trends;
- Roadway characteristics;
- Safety and crash analysis;
- Level of Service (LOS);
- Freight;
- Bridge Conditions;
- Bicycle and pedestrian facilities;
- Transit;
- Road Surface; and
- Evacuation and deployment routes.

Findings from this section will form the basis for determining the county's transportation needs and identifying future improvements.

### 3.4.1 Travel Trends

As aforementioned, Bryan County is challenged by the presence of Fort Stewart which divides the northern and southern portions of the county. Those wishing to travel from one end of the county to the other must travel outside the county first. Georgia Department of Labor reported that greater than three-quarters of Bryan County's residents (or 8,000 of the 11,000 employed) commute outside of Bryan County for work. In 1990, 28.8 percent of Bryan County's workforce worked in Bryan County, and approximately 25.2 percent did so in 2000. Leading destinations have traditionally been Chatham, Liberty, Effingham, and Bulloch counties.

As described in *Section 2.3 Travel Demand Model Development*, a Bryan County model was developed to study the existing and projected trip patterns based on the county's growth and development plans. The 2006 base model was

calibrated to reflect the travel patterns of the north and south Bryan County residents who tend to travel to Savannah more frequently for employment and shopping than to each other's communities. It is important to note that higher numbers of workers commuting outside of the county implies a higher disparity or disconnection between residents and jobs.

**Tables 3.5 and 3.6** (page 3-18) present the 2006 and 2030 trip attractions and productions for the districts within the Bryan County TDM. The total estimated trips from the model include all trip types such as Home-Based Work trips, Home-Based Other trips and Non-Home-Based trips. According to the model, approximately 44,800 vehicle trips travel to and from south Bryan County on a daily basis, and by 2030, these trips are expected to increase by greater than 100 percent to almost 100,000 trips. Although more than half of the trips are associated with Richmond Hill, the highest growth in trips is expected to occur in the unincorporated areas of south Bryan. The results from the model indicated that about a third of the trips originating from south Bryan County head to Chatham County for shopping, work, and other activities, and this trend is expected to remain unchanged by 2030. Almost 60 percent of south Bryan County trips occur internally, and this share is projected to increase to 65 percent by 2030. This trend is indicative of the amount of future development planned for the south Bryan County area.

The number of vehicle trips to and from north Bryan County is expected to grow by greater than 100 percent from 22,450 in 2005 to 47,200 in 2030. Consistent with the future land use and development plans, the number of trips associated with the unincorporated area surrounding Interstate Centre is projected to experience a tremendous increase from 10,500 in 2006 to 31,700 in 2030. Currently, approximately 64 percent of the trips in north Bryan County are internal trips, and this share is expected to decrease slightly to 60 percent. This decrease in internal trips is likely attributed to the build-out of Interstate Centre that will generate a significant amount of trips to the surrounding counties. Although vehicle trips for both north and south Bryan County are expected to grow significantly, trips made between north and south Bryan County will likely continue to be very minimal.

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**Table 3.5: 2006 Trip Attractions and Productions**

Production District		Attraction District											
		1	2	3	4	5	6	7	8	9	10	11	12
Richmond Hill	1	16,957	2,201	1,053	6	20	2,335	4,934	23	81	4,310	1,387	2,665
So. Bryan (SE of I95)	2	2,228	2,325	94	1	2	344	510	7	152	408	178	176
So. Bryan (NW of I95)	3	1,061	92	226	0	1	513	261	2	4	89	101	57
No. Bryan (Pembroke)	4	10	1	1	7,144	1,324	1	77	51	3,037	69	2	111
No. Bryan (Blitchton-Ellabell)	5	31	3	2	1,332	4,409	10	901	737	2,611	309	22	258
Liberty Co.	6	2,353	345	517	1	10	3,845	373	83	224	8,925	1,576	1,164
SW Chatham Co.	7	4,958	503	261	69	872	364	35,653	1,862	381	12,100	360	7,749
S Effingham Co.	8	30	7	2	50	727	83	1,889	1,624	1,024	3,140	160	1,778
S Bulloch Co.	9	82	152	4	3,037	2,611	224	382	1,025	3,319	4,191	2,269	1,924
Savannah	10	4,310	408	89	69	309	8,925	12,100	3,140	4,191	9,550	9,350	14,578
So. I-95	11	1,387	178	101	2	22	1,576	360	160	2,269	9,350	92	8,814
No. I-95	12	2,665	176	57	111	258	1,164	7,749	1,778	1,924	14,578	8,814	44

Source: Bryan County Travel Demand Model

**Table 3.6: 2030 Trip Attractions and Productions**

Production District		Attraction District											
		1	2	3	4	5	6	7	8	9	10	11	12
Richmond Hill	1	23,124	5,471	2,704	9	44	2,635	5,859	71	97	7,490	1,868	3,622
So. Bryan (SE of I95)	2	5,541	15,153	1,930	3	27	2,144	1,332	61	724	1,504	989	512
So. Bryan (NW of I95)	3	2,778	1,908	4,248	3	18	3,019	470	16	36	957	1,091	513
No. Bryan (Pembroke)	4	12	3	4	9,312	1,929	1	83	78	3,647	168	3	156
No. Bryan (Blitchton-Ellabell)	5	50	23	18	1,910	15,454	38	1,890	2,017	7,172	1,659	201	1,300
Liberty Co.	6	2,669	2,147	3,047	2	43	7,252	469	162	405	12,832	3,526	1,958
SW Chatham Co.	7	5,847	1,295	454	73	1,869	442	63,242	5,209	433	21,993	906	10,036
S Effingham Co.	8	73	56	15	75	2,013	158	5,208	8,281	1,406	7,126	424	4,286
S Bulloch Co.	9	97	724	36	3,645	7,174	405	435	1,406	4,783	8,132	4,346	3,245
Savannah	10	7,490	1,504	957	168	1,659	12,832	21,993	7,126	8,132	13,162	13,266	18,849
So. I-95	11	1,868	989	1,091	3	201	3,526	906	424	4,346	13,266	186	12,298
No. I-95	12	3,622	512	513	156	1,300	1,958	10,036	4,286	3,245	18,849	12,298	46

Source: Bryan County Travel Demand Model

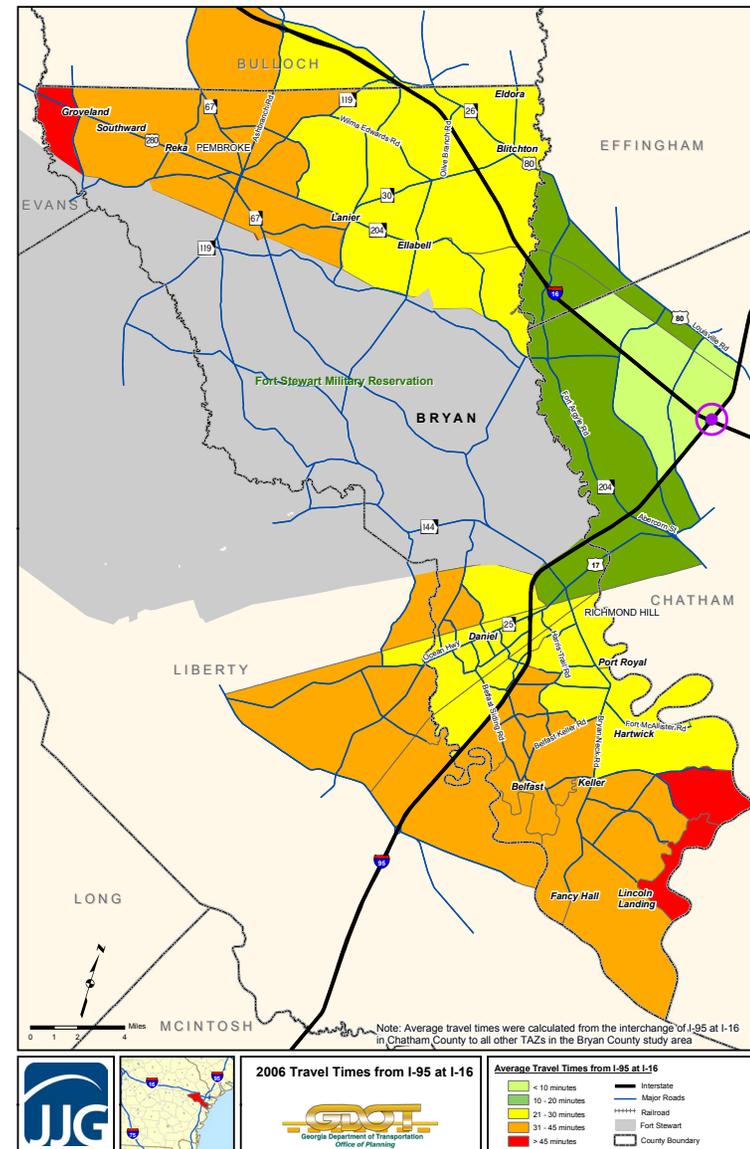
# Chapter 3

Travel time contours are an estimate of travel time from a point radiating out through the transportation network. In this case, average daily travel times were derived from the 2006 base model to compare against the 2035 No-Build model. To reflect the current funding shortage and in order to perform an unbiased evaluation of projects, none of the currently programmed projects were assumed in the future No-Build scenario. **Figures 3.18** (opposite) and **3.19** (page 3-20) illustrate the 2006 and 2035 travel time contours for the interchange at I-16 and I-95 in Chatham County to reflect Bryan County's commute trips to Savannah.

According to the 2006 base model, an average trip from the Richmond Hill area to the I-16 at I-95 interchange currently takes 21 to 30 minutes. The base model also determined that an average trip from Pembroke to the interchange currently takes 31 to 45 minutes. By 2035, the average travel times are projected to worsen significantly, if no capacity improvements are made. Only the areas with direct access to I-95 in Richmond Hill area are still projected to maintain comparable travel times to current conditions. The residential areas of south Bryan County including Keller, Fancy Hall and Lincoln Landing are forecast to have travel times greater than 45 minutes. Similarly, the travel times in north Bryan County are projected to worsen considerably to greater than 45 minutes for the towns located near the western county limits, such as Groveland, Southward and Reka. Findings from the travel time contours indicate the need to provide capacity improvements and/or viable alternates to major commute routes to Savannah.

*Average travel times are projected to worsen significantly without capacity improvements.*

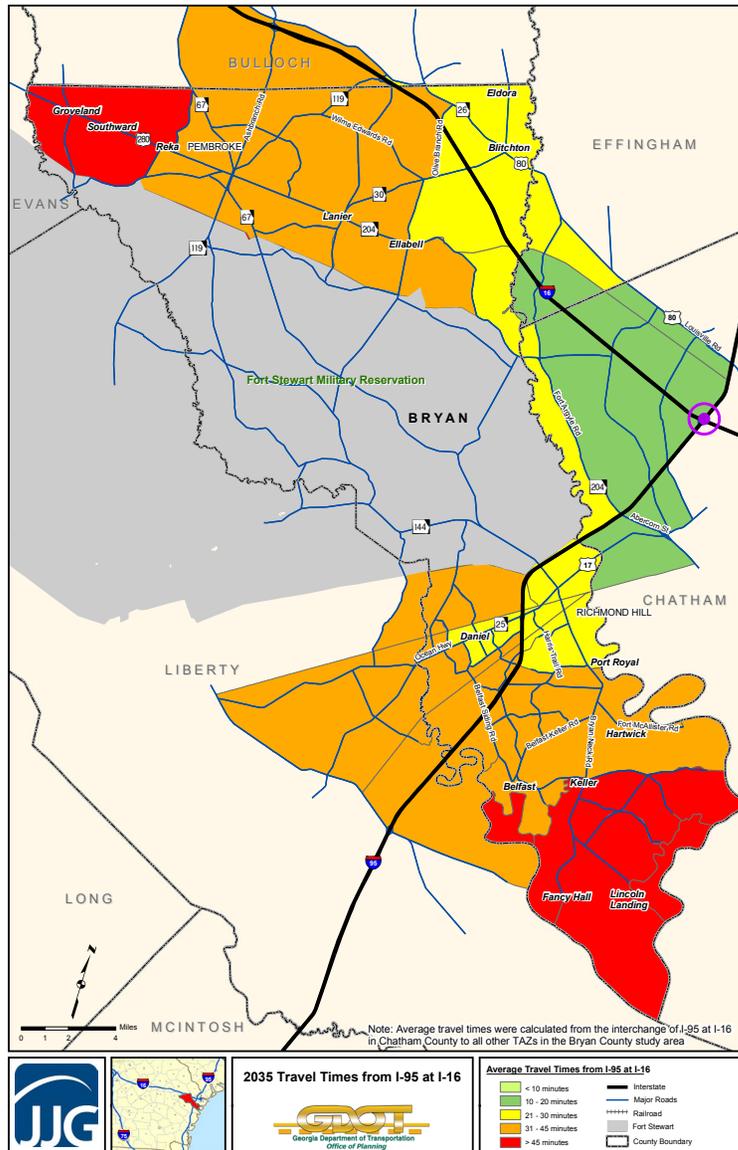
**Figure 3.18: 2006 Travel Trends**



Source: Bryan County Travel Demand Model

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Figure 3.19: 2035 Travel Trends



## 3.4.2 Roadway Characteristics

This section details major roadway characteristics such as functional classification, lane configuration, and signal locations that are relevant to roadway design and operations. There are three main functional classifications as defined by the Federal Highway Administration (FHWA): arterial, collector, and local. Functional classification is determined largely by the use, speed and location (urban or rural) of the roadway and can change over time as improvements are made to the facility or as the surrounding area urbanizes. To be eligible for federal money for improvements, rural roadways must be designated major collectors or above, and urban roadways must be collectors or above. With the exception of the roadways within Richmond Hill, all roadways in Bryan County are currently classified as rural. **Table 3.7** (page 3-21) displays roadway characteristics in terms of mileage and vehicle mileage traveled (VMT). According to GDOT's Roadway Classification (RC) database, there are 446 miles of roadway in Bryan County, with approximately two-thirds designated as local street. The remaining Bryan County roadways include 21 miles of interstates, 67 miles of arterials, and 74 miles of collectors. The accompanying **Figure 3.20** (page 3-22) illustrates the current roadway functional classifications as designated in GDOT's RC database.

Bryan County is primarily served by two interstates and two principal arterials that traverse the county. The northern portion is served by I-16 and US 280, while the southern portion is served by I-95 and Ocean Highway (US 17). As shown in **Figure 3.21** (page 3-22), there are currently only four multilane facilities and five signalized intersections in the entire county, with most of which are located in the southern portion. The following discussion includes a detailed inventory of the major roadway facilities in north and south Bryan County.

### North Bryan County

Northern Bryan County is generally served by US 280 (SR 30), a two-lane rural principal arterial that connects Pembroke to Evans County to the west and to I-16, Blitchton and US 80 (SR 26) to the east.

Source: Bryan County Travel Demand Model

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As illustrated in **Figure 3.20**, all the major roads including I-16, US 80, SR 119, SR 67 and SR 204 in northern Bryan County are accessible via US 280 (SR 30). Although US 280 is one of the corridors included in the Georgia Department of Transportation’s Governor’s Road Improvement Program (GRIP), no portions of the corridor are currently under design or construction in Bryan County.

I-16 is a four-lane section through north Bryan County and provides the most direct access to Savannah. Interstate Centre industrial development is strategically located near the interchange at US 280 and I-16 to take advantage of its accessibility to Port of Savannah. US 80 (SR 26) is a rural two-lane arterial that parallels I-16 into Chatham County. SR 204 is a two-lane connector and functions as another alternative route to Savannah as well as to south Bryan County via its connection to I-95 and Ocean Highway (US 17). SR 204 connects north Bryan County directly to rapidly developing portions of western Chatham County.

Other roadways of interest in north Bryan County include SR 67 and SR 119, which both intersect SR 280 (SR 30) within the city limits of Pembroke. The intersection of US 280 (SR 30) and Main Street (SR 119) is the only intersection controlled by a traffic signal in north Bryan. SR 119 provides a north-south connection for travelers from I-16 in Bulloch County to access not only Pembroke and north Bryan County but it also traverses through Fort Stewart to connect with Hinesville in Liberty County. SR 67 is another north-south route through Pembroke. Historically, SR 67 provided a direct connection between the cities of Pembroke and Richmond Hill through Fort Stewart, but it now terminates on the northern side of Fort Stewart.

## South Bryan County

South Bryan County is mostly served by a few key north-south and east-west connectors. I-95 has six lanes and traverses generally in the north-south

**Table 3.7: Bryan County Summary of Roadway Characteristics**

Functional Classification	STATE ROUTE		COUNTY ROAD		CITY STREET		TOTALS	
	Mileage	VMT	Mileage	VMT	Mileage	VMT	Mileage	VMT
RURAL INTERSTATE	16.18	599,534.63	-	-	-	-	16.18	599,534.63
RURAL PRINCIPAL ARTERIAL	24.40	196,060.19	-	-	-	-	24.40	196,060.19
RURAL MINOR ARTERIAL	32.65	109,282.01	-	-	-	-	32.65	109,282.01
RURAL MAJOR COLLECTOR	28.41	102,923.11	26.17	45,501.20	0.61	612.00	55.19	149,036.31
RURAL MINOR COLLECTOR	-	-	16.41	22,485.30	-	-	16.41	22,485.30
RURAL LOCAL	-	-	212.66	76,391.30	28.57	14,271.80	241.23	90,663.10
<b>RURAL TOTAL</b>	<b>101.64</b>	<b>1,007,799.93</b>	<b>255.24</b>	<b>144,377.80</b>	<b>29.18</b>	<b>14,883.80</b>	<b>386.06</b>	<b>1,167,061.53</b>
URBAN INTERSTATE	4.49	267,841.69	-	-	-	-	4.49	267,841.69
URBAN PRINCIPAL ARTERIAL	4.98	999,982.50	-	-	-	-	4.98	999,982.50
URBAN MINOR ARTERIAL	5.05	72,552.50	-	-	-	-	5.05	72,552.50
URBAN COLLECTOR	-	-	2.50	9,564.60	-	-	2.50	9,564.60
URBAN LOCAL	-	-	17.14	11,369.80	25.96	15,270.20	43.10	26,640.00
<b>URBAN TOTAL</b>	<b>14.52</b>	<b>440,376.69</b>	<b>19.64</b>	<b>20,934.40</b>	<b>25.96</b>	<b>15,270.00</b>	<b>60.12</b>	<b>476,581.09</b>
<b>TOTALS</b>	<b>116.16</b>	<b>1,448,176.62</b>	<b>274.88</b>	<b>165,312.20</b>	<b>55.14</b>	<b>30,153.80</b>	<b>446.18</b>	<b>1,643,642.62</b>

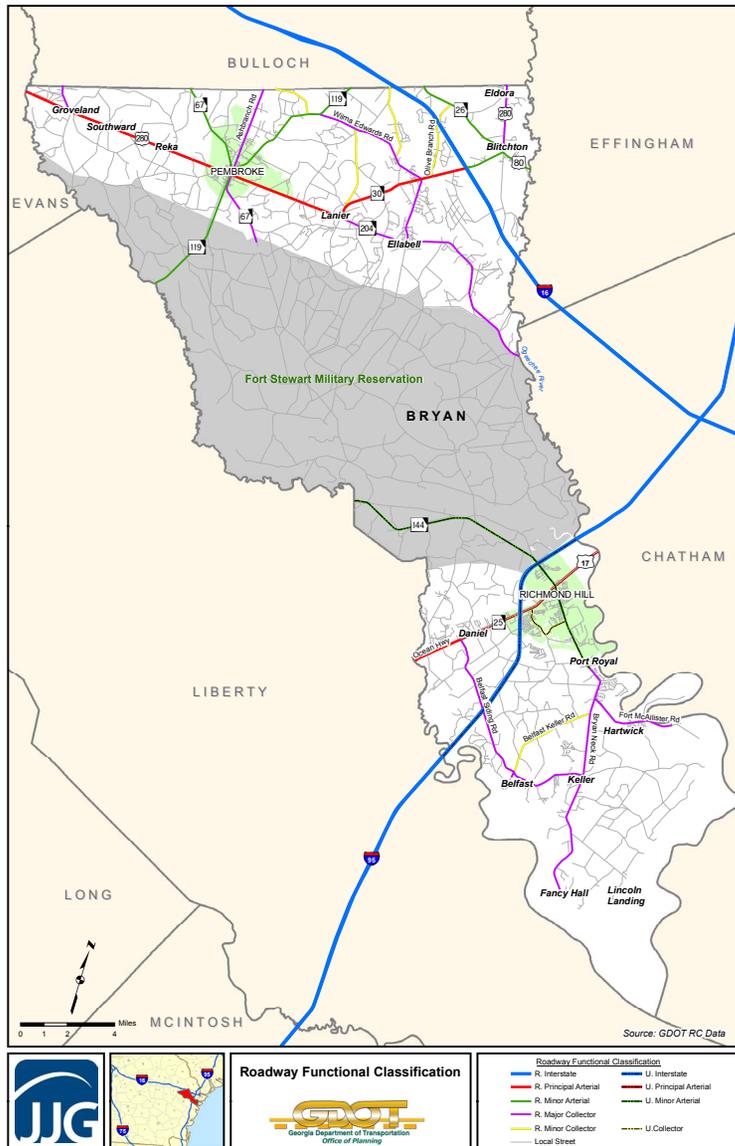
Source: GDOT Road Characteristics Database

direction through southern portion of the county and Richmond Hill. Currently, the two I-95 interchanges at Ocean Highway (US 17) and SR 144 provide access for the residents of Bryan County as well as commuters from Liberty County. Ocean Highway (US 17) is a rural principal arterial which serves as the central east-west corridor, connecting Richmond Hill and the rest of the region to Savannah and Chatham County to the east and Hinesville to the west.

SR 144 is a major north-south arterial through downtown Richmond Hill and provides access to the newly developed residential areas in south Bryan. Traveling southbound from the I-95 interchange, the urbanized section of SR 144 has four lanes separated by a raised median near Timber Trail before it becomes a rural two-lane collector. Another four-lane facility in Richmond Hill is Harris Trail Road between US 17 and Timber Trail. Harris Trail Road becomes a two-lane rural roadway south of Timber Trail that eventually transitions to unpaved section just south of Adam Johnson Road. Currently, there are plans to pave the dirt road section that extends Harris Trail Road to Belfast Keller Road, providing a viable alternative to SR 144.

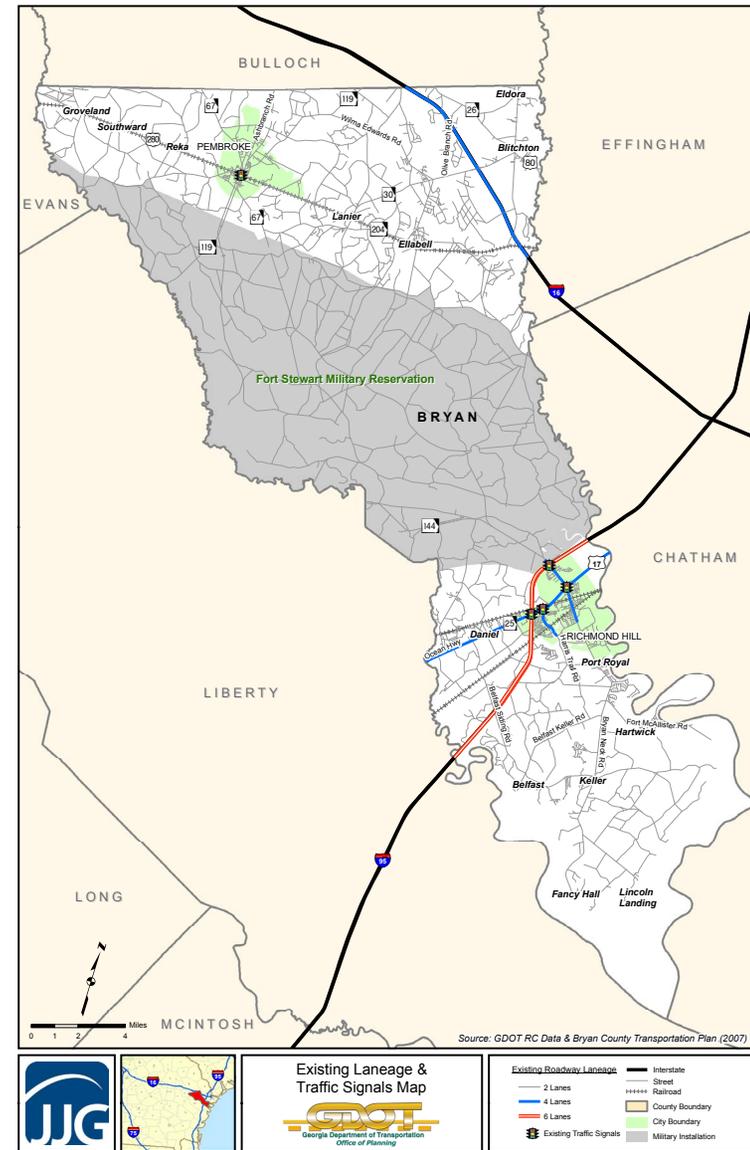
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Figure 3.20: Functional Classifications



Source: GDOT Road Classification data

Figure 3.21: Lanes and Signals



Source: GDOT Road Classification data/Bryan County Transportation Plan (2007)

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Other roadways of interest in south Bryan County include Belfast Siding Road, Fort McAllister Road and Belfast Keller Road. Belfast Siding Road is a two-lane rural collector that connects US 17 to the residential areas along SR 144 via Belfast Keller Loop. Fort McAllister Road (SR 144 Spur) is also a two-lane rural collector that provides connections from residential properties and Fort McAllister State Park to SR 144. Belfast Keller Road, which currently serves as a two-lane minor collector in central south Bryan County, provides access to the largely undeveloped portions of the county.

### 3.4.3 Safety Analysis

Assessing safety through the use of statistics is useful in identifying intersections and corridors that merit further study for safety improvements. Roadway safety was studied through a review of the county's historic crash data collected by GDOT between the years of 2000 and 2007. The Critical Analysis Reporting Environment (CARE) software was used to obtain valuable statistics and analyze crash data. The following crash analyses were performed to measure the relative safety of roadways and intersections in Bryan County:

- Countywide comparison to statewide averages;
- Intersections with the highest crash frequencies in the county; and
- Roadways that experience higher than statewide crash rates for similar facility type.

**Table 3.8** (opposite) shows the countywide crash statistics of Bryan County compare to state of Georgia. In general, Bryan County has experienced a significantly lower crash rate per 1,000 persons than the state as a whole. The historic trends are consistent with the overall growth in population during

**Table 3.8: Bryan County Crash Rate Comparison to State of Georgia per Capita**

Year	Number of Crashes	Number of Vehicles Involved	Number of Injuries	Number of Fatalities	County Population	County Crash Rate per 1000 Population	GA Number of Crashes	GA Population	GA Crash Rate per 1000 Population
2000	671	1133	318	7	23,417	28.7	310,122	8,186,453	37.9
2001	683	1136	271	12	24,220	28.2	317,851	8,345,134	38.1
2002	792	1299	327	7	25,050	31.6	327,710	8,506,891	38.5
2003	850	1399	499	6	25,909	32.8	332,321	8,671,784	38.3
2004	798	1400	578	8	26,797	29.8	342,932	8,839,872	38.8
2005	812	1358	481	7	27,715	29.3	347,652	9,011,219	38.6
2006	808	1363	443	11	29,648	27.3	344,769	9,363,941	36.8
2007	763	1315	482	6	30,132	25.3	341,352	9,544,750	35.8

**Table 3.9: Intersections with the Highest Crash Frequencies in Bryan County**

Location	Milepost	City	Total (2000-2007)			Annual Average		
			Crash	Injury	Fatality	Crash	Injury	Fatality
Ocean Highway (US 17/SR 25) at Ford Avenue (SR 144)	6.77	Richmond Hill	221	72	0	28	9	0
Ocean Highway (US 17/SR 25) at Harris Trail	5.35	Richmond Hill	181	56	1	23	7	< 1
Bacon Street (US 280) at N. Main (SR 119)	9.37	Pembroke	59	12	0	7	2	0
Ocean Highway (US 17/SR 25) at Mulberry Rd	7.08	Richmond Hill	52	16	0	7	2	0
Ford Avenue (SR 144) at Timber Trail	11.38	Richmond Hill	44	14	0	6	2	0
US 280/SR 30 at Morgan Bridge Rd (SR 204)	14.19	Bryan Rural	43	9	1	5	1	< 1
US 280/SR 30 at SR 26	4.5	Bryan Rural	41	18	1	5	2	< 1

Source: for Tables 3.8 and 3.9: CARE GDOT Crash Data & GDOT STARS Data

the recent years as reflected in the decrease in the number of crashes per 1,000 persons.

The second crash analysis involves identifying intersections with the highest number of crashes. **Table 3.9** (above) reports six intersections in the county that experience at least five crashes per year. As illustrated in **Figure 3.22** (page 3-25), the majority of high crash intersections are located within the Cities of Richmond Hill and Pembroke. Ocean Highway (US 17) in southern Bryan County is associated with three of the six critical intersections in terms

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of both crashes and injuries. The remaining intersections with high crash frequencies are located along US 280 in northern Bryan County.

**Table 3.10** (below) depicts the crash rates of some of the major roadway segments in the county. The segment limits were determined based on the roadway’s functional classifications and the locations of GDOT traffic count stations. These crash, injury and fatality rates have been normalized per 100 million vehicle miles traveled (100 MVM), and are compared against their respective statewide averages for similar facilities as indicated in the table.

In general, when compared to the statewide averages, the roadways in Bryan County exhibited much lower crash rates. Most of the roadways in the county with higher crash rates than statewide averages have relatively low volumes of vehicles. The urban section of I-95 incurred much higher crash numbers compared to its rural counterparts; however, none of the interstate segments experienced crash rates greater than their statewide averages. A

total of 121 crashes, 32 injuries and no fatalities occurred along US 17 within the urbanized city limits of Richmond Hill. These raw numbers equate to approximately 499 crashes and 132 injuries per 100 MVM, which are just above statewide averages for an urban principal arterial. Not surprisingly, the rural section of US 17 experienced significantly less number of crashes, consequently resulting in lower crash and injury rates.

Interestingly, although the section of US 280 within the city of Pembroke experienced relatively small number of crashes (17) and injuries (7), the crash rates are actually much higher than US 17. This is because the average daily traffic volume along US 280 (6,250) is considerably less than the volume along US 17 (20,000). Furthermore, the crash and injury rates US 280 are approximately five times greater than the statewide averages for a rural principal arterial.

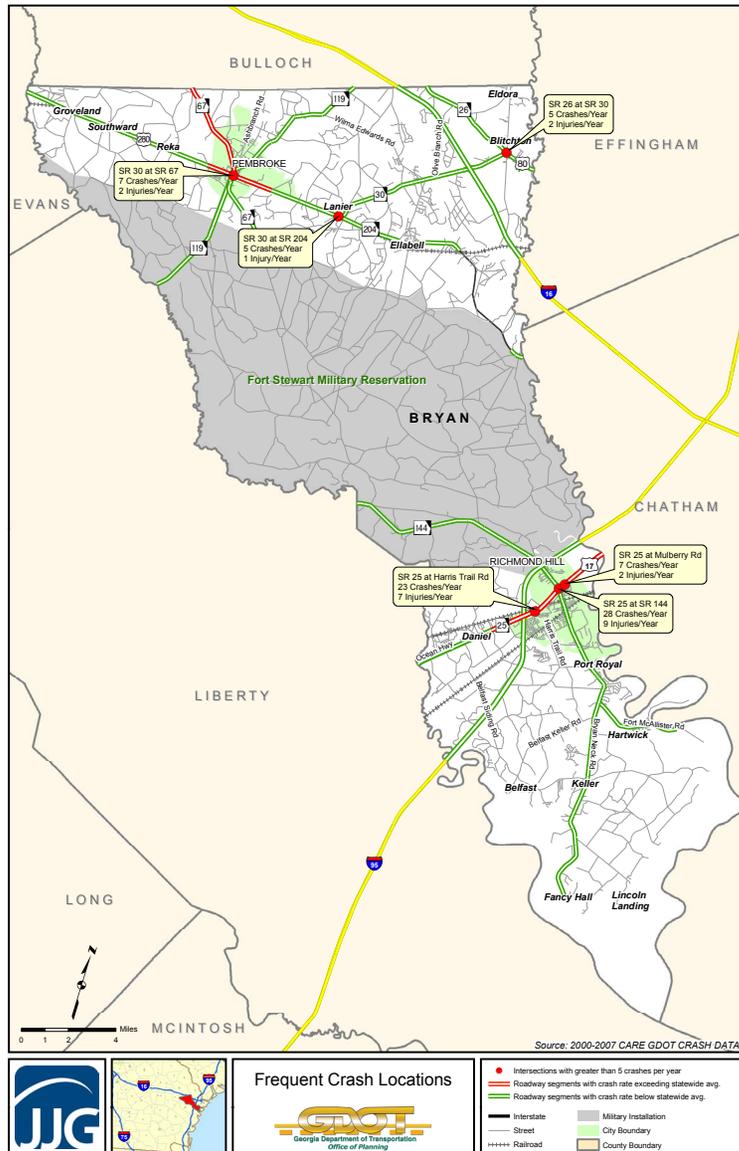
**Table 3.10: Crash Rates Compared to Statewide Averages per MVMT**

	functional classification	Beg MP - End Mp	Crashes	Crash Rate (per 100 million vehicle)		Injuries	Injury Rate (per 100 million vehicle)		Fatalities	Fatality Rate (per 100 million vehicle)	
				Road Segment	Statewide Average		Road Segment	Statewide Average		Road Segment	Statewide Average
I-95	R. Interstate	0.6 - 6.1	13	14	58	4	4	29	0	0	1.09
	U. Interstate	6.2 - 11	90	92	186	28	29	63	0	0	0.58
I-16	R. Interstate	0 - 9.3	40	45	58	34	38	29	1	1.13	1.09
US 17/ SR 25	R. Principal Art.	0.6 - 4.1	20	81	145	12	48	79	1	1.00	2.21
	U. Principal Art.	4.2 - 7.4	121	499	495	32	132	179	0	0.00	1.33
US 280/ SR 30		8.9 - 10.3	17	544	145	7	224	79	0	0.00	1.09
	R. Principal Art.	10.4 - 21.1	30	122	145	18	73	79	0	0.00	1.09
US 80/ SR 26	R. Minor Art.	0.2 - 6.0	15	119	187	6	48	100	0	0.00	2.58
SR 67	R. Minor Art.	3.2 - 7.0	11	324	187	5	147	100	0	0.00	2.58
SR 144	U. Minor Art.	8.5 - 13.6	64	177	514	32	92	190	0	0.00	1.47

Source: CARE GDOT Crash Data & GDOT STARS Data

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Figure 3.22: Bryan County Accident Locations

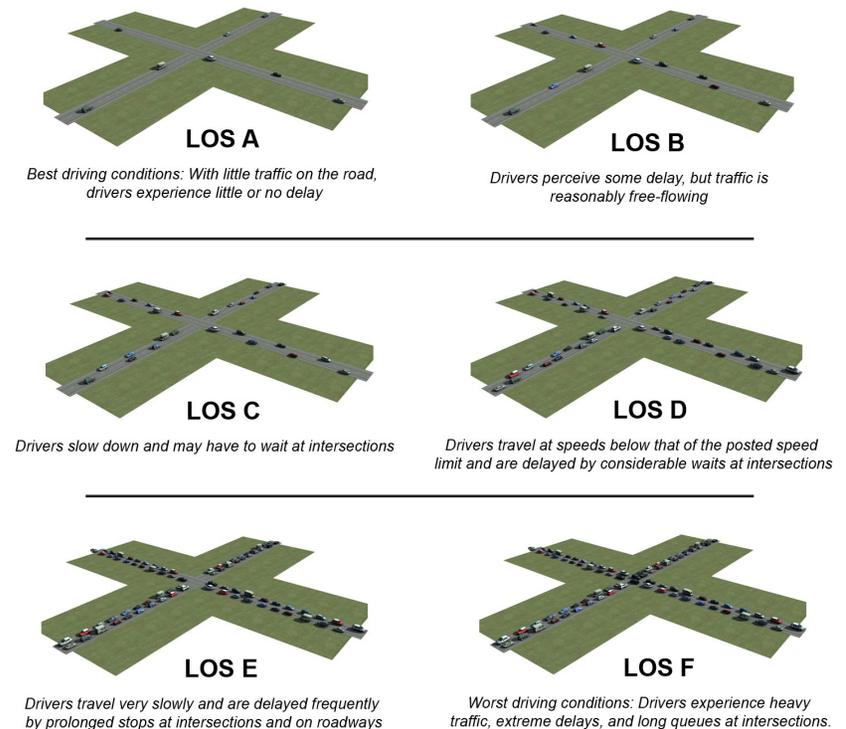


Source: CARE crash data (2000-2007)

## 3.4.4 Level of Service

Level of service (LOS) is a qualitative measure of traffic flow describing operating conditions. Six levels of service are defined by FHWA in the Highway Capacity Manual for use in evaluating roadway operating conditions. They are given letter designations from A to F, with LOS A representing the best operating conditions and F the worst. A facility may operate at a range of levels of service depending upon time of day, day of week or period of the year. A qualitative description of the different levels of service is provided in Figure 3.23 (below).

Figure 3.23: Level of Service (LOS)



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The recommended approach to determine deficient segments in Bryan County is to analyze the volume of traffic on the roadway segments compared to the capacity of those segments, also known as the V/C ratio. For daily operating conditions, any segment identified as LOS D or worse was considered deficient. The following thresholds were used to assign a level of service to the V/C ratios for roadways in Bryan County.

- $V/C < 0.825$  = LOS C or better;
- $0.825 > V/C < 0.925$  = LOS D;
- $0.925 > V/C < 1.00$  = LOS E; and,
- $V/C > 1.00$  = LOS F.

## Existing Level of Service

**Figure 3.24** (page 3-27) shows the 2006 daily LOS and corresponding Average Annual Daily Traffic (AADT) derived from the Bryan County TDM. According to the model, majority of the roadways in the county currently operate at an acceptable LOS (LOS C or better). Spots of deficient LOS can be found on ramp sections of SR 144 at I-95 and US 17 at I-95 and the two-lane section of SR 144 north of Adam Johnson Road.

## Future 2035 No-Build Level of Service

As aforementioned, the future 2035 No-Build TDM was developed based on the future land use and growth plans of the county. **Figure 3.25** (page 3-27) depicts the future daily LOS and volumes derived from the Bryan County 2035 TDM network. Due to the anticipated growth projected for the county, coupled lack of capacity improvements, the general LOS in the county is expected to deteriorate by 2035, particularly in the following locations:

- I-95 east of SR 144 interchange;
- Entire US 17 segment;
- SR 144 from US 17 to Belfast Keller Road;
- Belfast Siding Road from US 17 to Park Hill 20;
- Daniel Siding Loop Road;

- Interchange ramps at I-95 at SR 144;
- Interchange ramps at I-95 at US 17;
- US 280 at Interstate Centre; and
- Interchange ramps at I-16 at US 280.

The findings from the LOS analysis indicate that south Bryan County is anticipated to experience significant deterioration in LOS along all of the major roadways by 2035, especially those that serve the commuter traffic into Chatham County. Therefore, alleviating congestion is a top priority in consideration of potential improvements.

## 3.4.5 Freight Traffic

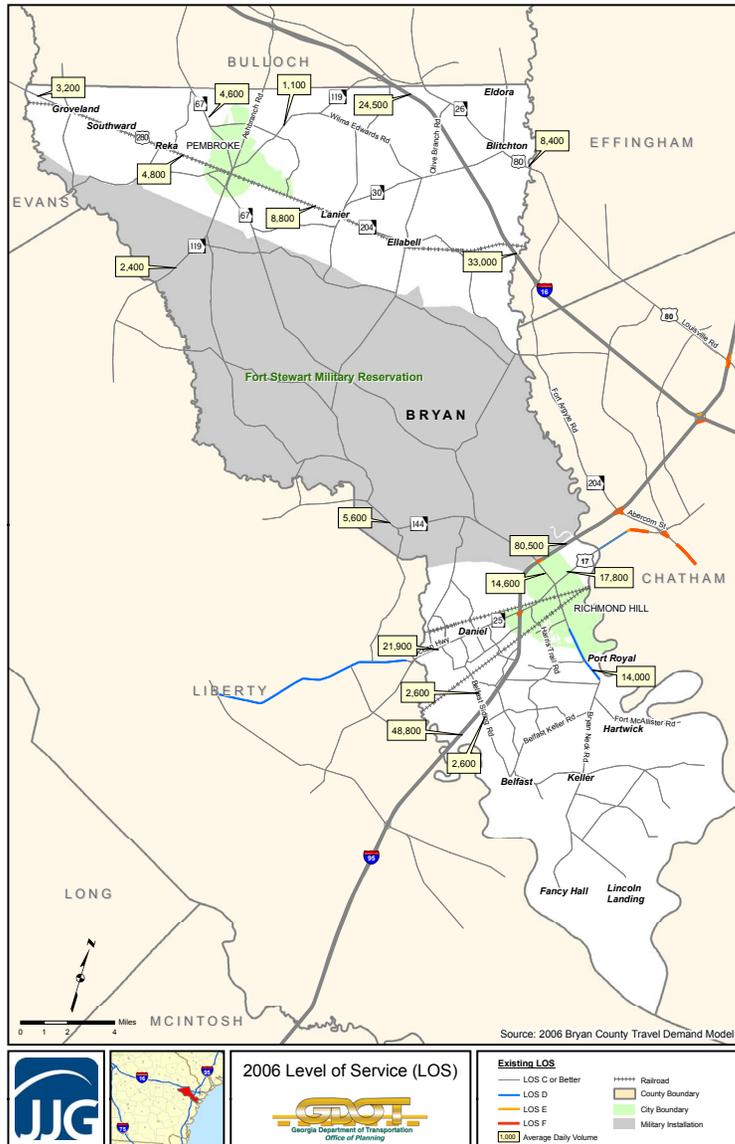
Based on tonnage, freight is primarily transported by truck (86 percent) and rail (11 percent) in Georgia. Water and air modes account for an additional three percent of freight tonnage. According to GDOT's *Statewide Truck Lanes Needs Identification Study*, all forms of travel involving transportation of freight are increasing throughout the state at a level that is almost 50 percent faster than general traffic growth rates. The proximity to Port of Savannah is anticipated to result in truck traffic growth in Bryan County in excess of statewide averages. This anticipated growth will affect future conditions and LOS for the affected portions of the transportation network.

*South Bryan is anticipated to experience significant deterioration in LOS on all major roadways, especially those that serve commuter traffic into Chatham County.*



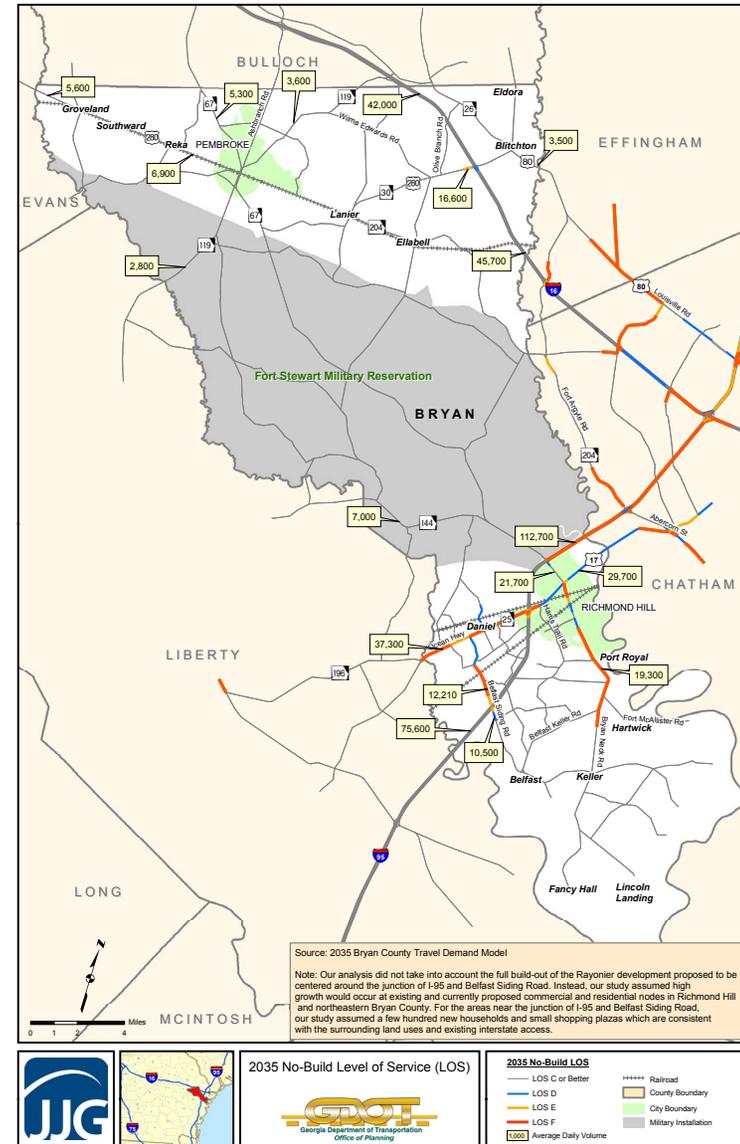
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Figure 3.24: 2006 LOS



Source: Bryan County Travel Demand Model

Figure 3.25: 2035 LOS



Source: Bryan County Travel Demand Model

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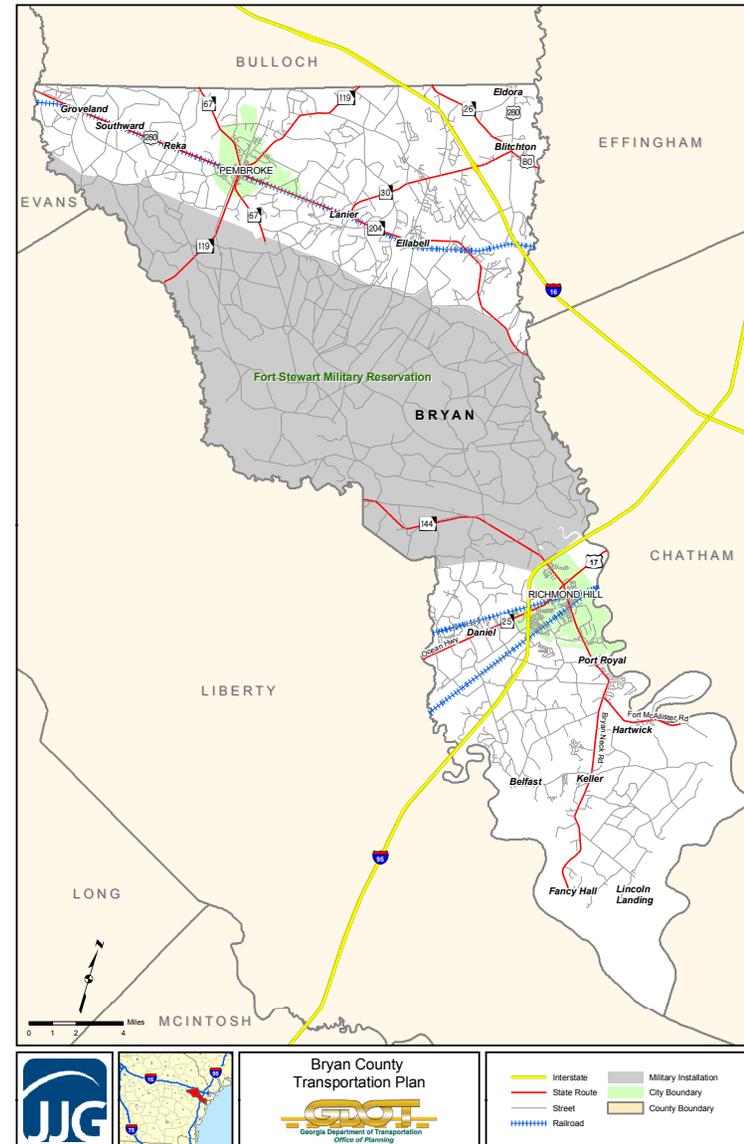
Specific routes for oversized trucks are designated by the Surface Transportation Assistance Act of 1982 (STAA), a federal highway program administered by GDOT. This act states that all interstates, United States and Georgia State highways are to be considered truck routes. As shown in **Figure 3.26** (opposite) Bryan County's truck route network includes:

- I-16;
- I-95;
- SR-67;
- SR 119;
- SR 204;
- US 280 (SR 30);
- US 80 (SR 26);
- US 17 (SR 25); and
- SR 144.

A large portion of freight traffic traveling through Bryan County can be attributed to the Port of Savannah, the nation's fastest growing and fourth busiest container port in the United States. According to the February 2008 U.S. Ports Ranking Report, the Port of Savannah handles on average 180,000 intermodal containers per month. These containers arrive and leave the port largely by truck and rail.

The Port of Savannah is located less than twenty miles from Bryan County. Trucks destined for or leaving the Port of Savannah typically utilize I-95 or I-16. According to the TDM, approximately 7,000 trucks travel daily on I-95 through Richmond Hill in 2006, and by 2035, this number is expected to almost double to 13,000 trucks. Daily truck traffic on I-16 south of the US 280 interchange was recorded at roughly 4,000 in 2006, and projected to increase significantly to almost 12,000 by 2030. This growth in truck volume is largely attributed to the expected build-out of the Interstate Centre industrial park.

**Figure 3.26: Truck and Rail Lines**



Source: GDOT Freight Map

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The southern portion of the county, including Richmond Hill, is traversed by a CSX rail mainline. This line connects the Port of Savannah to the CSX Waycross hump yard. CSX uses the Waycross Yard to build trains destined throughout North America. According to GDOT's Office of Intermodal Programs, the rail line through Richmond Hill carries more than 44 million tons of freight annually, making it one of Georgia's heaviest used rail lines in terms of tonnage. The northern portion of the study area, including the City of Pembroke, is traversed by Georgia Central Railroad, a short line with limited freight operations (approximately once a day) between Savannah and Vidalia, Georgia. This railway generally parallels SR 204 and US 280 through Pembroke.

## 3.4.6 Bridges Inventory and Conditions Assessment

There are 75 bridges in the study area including 11 that are maintained by Bryan County, 44 by GDOT and 20 by the US Army which are located inside the boundaries of Fort Stewart. Although some of these bridges provide access to the general public, the US Army utilizes a separate maintenance and replacement process outside of the Federal Highway Administration (FHWA) for military base bridges, therefore, this study will only examine conditions for county and state maintained bridges.

Maintaining bridges in good condition is important for safety and to avoid delays due to road closures and weight limits. The sufficiency rating formula is a method of collectively evaluating factors which indicate a bridge's ability to remain in service. The result of the formula is a percentage in which 100 percent represents an entirely sufficient bridge and zero percent represents an entirely insufficient or deficient bridge. States annually submit to the FHWA all of the required information that determines sufficiency ratings for each bridge. Key factors which make up a sufficiency rating include the number of lanes relative to the roadway it carries, Average Daily Traffic (ADT), structural condition and deck condition.

Note that sufficiency ratings do not necessarily indicate a bridge's ability to safely carry traffic loads. Sufficiency ratings include metrics not related to the structural integrity. Some of these factors include under clearances, if a bridge is on the national highway system and bridge approaches.

**Table 3.11: Bridges that Meet Minimum Requirements for Replacement Funding**

Bridge Facility and Location	Bridge ID Number	Sufficiency Rating
I-95 at CSX Railroad	029-0041-0	42.18
Belfast Siding Road at I-95	029-0015-0	45.54
US 80 (Jencks Bridge) over Ogeechee River	029-0006-0	47.44
Olive Branch Road at I-16	029-0002-0	50

Source: National Bridge Inventory 2008

**Table 3.12: Bridges that Meet Minimum Requirements for Rehabilitation Funding**

Bridge Facility and Location	Bridge ID Number	Sufficiency Rating
US 280 East Bound at I-16	029-0013-0	58.86
US 280 West Bound at I-16	029-0014-0	58.86
Black Creek Church Road at Mill Creek	029-0049-0	65.46
Harris Trail at Sterling Creek	029-5010-0	66.53
J.O. Bacon Highway at Ogeechee River	029-0024-0	67.46
Bacontown Road at Otter Hole Branch	029-5008-0	72
I-95 at SR 144	029-0043-0	73
Grover Hill Road at I-16	029-0001-0	73.66
Route 38 (Toni Branch Road) @ Cyprus Creek	029-5003-0	73.68
I-95 South Bound at Ogeechee River	029-0048-0	75.84
I-95 South at SR 25 (US 17)	029-0039-0	75.86
SR 144 (Bryan Neck Road) at Sweet Hill Creek	029-0051-0	77
I-95 North Bound at Ogeechee River	029-0047-0	77.51
US 17 (Harvey Granger Bridge) at Ogeechee River	029-0005-0	77.74
Route 143 (Stubbs Road) at Mill Creek	029-5012-0	77.92
I-95 North Bound at Elbow Swamp	029-0035-0	79.69
I-95 South Bound at Elbow Swamp	029-0036-0	79.69

Source: National Bridge Inventory 2008

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Sufficiency ratings are used primarily to prioritize bridges in need repair or replacement. The Federal Highway Administration uses bridge sufficiency ratings to determine eligibility for federal funding for maintenance, rehabilitation, or replacement activities. For bridges to qualify for federal replacement funds, they must have a rating of 50 or below. **Table 3.11** (page 3-29) provides a list of bridges that meet the minimum requirement for replacement funding through the FHWA. In order to qualify for FHWA federal rehabilitation funding, a bridge must have a sufficiency rating of 80 or below. **Table 3.12** (page 3-29) identifies bridges in Bryan County which currently meet the minimum requirements for rehabilitation funding.

## 3.4.7 Bicycle and Pedestrian Inventory

In general, existing bicycle and pedestrian facilities are concentrated along major state roads and infrastructure that serve the urban areas in Bryan County. In the City of Pembroke, sidewalks are present along US 280 though the downtown area and along a number of local streets serving the older neighborhoods. However, there is a lack of contiguous pedestrian connections between the sidewalks that serve the schools and the surrounding neighborhoods. In Richmond Hill, sidewalks are generally present along the urbanized sections of SR 144, Harris Trail Road and some local roads that serve the schools.

The *Bryan County Bicycle and Pedestrian Plan* was commissioned by the Coastal Georgia RC to examine existing bike and pedestrian facilities, identify network conditions and make recommendations to improve or create facilities for safer pedestrian and bicycle activities throughout the county. Emphasis was placed on key community gateways and schools through GDOT's Safe Routes to Schools program. The plan emphasizes connecting to existing and surrounding pedestrian and bicycle network to increase connectivity throughout the county. Recommendations included 25 miles of new sidewalk and shared use paths and 81 miles of widened shoulders and bike lanes throughout the county. The recommendations from this plan will be included in the list of bicycle and pedestrian improvements to be considered in the Bryan County Transportation Study.



Sidewalks in downtown Pembroke

## 3.4.8 Transit

Very limited transit services are available for those who are traditionally transit dependent in the county. Bryan County Transit provides three fixed routes for the elderly, the mentally ill, and those referred through Department of Family and Children Services. Transit services are provided Monday through Friday with times subject to customer requests. Bryan County Transit has a variety of wheel chair and handicap accessible vehicles in addition to one 15-passenger van and one 20-passenger mini bus. Fares are based on distance.

Bryan County Transit is currently working with other regional transit agencies through the Coastal Georgia Regional Commission ([coastalgeorgiarc.org](http://coastalgeorgiarc.org)) to develop and implement a Regional Transit System. These improvements are designed to provide new access to regional dialysis centers and regional hospitals in Statesboro and Savannah.

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## 3.4.9 Road Surface

Bryan County is home to a sizeable network of unimproved or unpaved roadways that serve many of the rural and transitional parts of the county. This is indicative of the county’s historically rural nature. **Table 3.13** (below) shows the breakdown of road types in the county as compared to the state in 2007. As indicated in the table, approximately 30 percent of the roads in Bryan County are unpaved, compared to 25 percent of roads statewide.

Recent decades have increased the urbanization of the county through population and employment growth. While unpaved roads provide necessary linkages to the more remote areas of the county, these facilities are often characterized as narrow with steep ditches, requiring slower operating speeds. Bryan County has an aggressive roadway paving plan to improve the transportation network that reflects the growing demands on its infrastructure. With the passing of Special Local Option Sales Tax (SPLOST V) in 2005, the county is able to levy a one percent sales tax over 6 years which committed \$3,000,0000 to roads and bridges. Most of this funding has been allocated to paving unpaved roads throughout the county.

Projects selected for paving are chosen from a prioritized list of paving projects from each council district. Each year, a road is chosen for paving based on a rotation amongst the four council districts. The number of roads

**Table 3.13: Bryan County Road Mileage by Surface Type**

Road Type	Bryan County			State Average		
	Mileage	Unpaved	Percent Unpaved	Mileage	Unpaved	Percent Unpaved
State Routes	116	-	0.00%	18,096	-	0.00%
County Roads	275	126	45.70%	84,558	27,986	33.10%
City Streets	55	6	10.30%	14,584	486	3.30%
<b>Total Roads</b>	<b>446</b>	<b>131</b>	<b>29.40%</b>	<b>117,238</b>	<b>28,473</b>	<b>24.30%</b>

Source: GDOT 2007

**Table 3.14: Bryan County SPLOST Paving Projects**

District	Project Name
1	Wildwood Church Road
	Lake Drive
	George Edwards Road
	Pete Bacon Road
	Hughes Road
	Hendrix Road
	Pembroke Connector Road
	Warnell Cemetary Road
	Fountain Road
	Benton Road
2	Bell Road
	Mill Creek Church Road
	Frank Hendry Road
	Power Circle Road
	Emaline Road
	Martin Road
Roberts Road	
3	Seascape Road
	Blige Road
	Griffin Road
	Dunham Swamp Road
	Bodaford Road
4	Harris Trail Extension to Belfast Loop
	Jake Brown Road
	Fancy Court
	Oak Level Road
	Fancy Hall Drive
	Carver School Road
5	Harden Road
	Smith Road
	Hughes Road/Cartertown Road
	Tranquilla Lane
	Jackson Road

Source: Bryan County as of 2009

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needing paving, as identified by the SPLOST, currently exceeds the number of proposed paving projects. **Table 3.14** (page 3-31) documents the list of paving projects identified in SPLOST V. Notable pavement projects include the Harris Trail Extension and the realignment of Belfast Siding Road at Belfast Keller Road. Both of these projects have completed the preliminary engineering and design phases, and thus, ready for construction.

## 3.4.10 Deployment and Evacuation Routes

Fort Stewart is ideally situated and resourced to support the training and deployability requirements of the 3rd Infantry Division (Mechanized). There are plans for Fort Stewart to add nearly 20,000 soldiers and 30,000 family members. The reservation's 280,000 acres serve as a training facility for tank operations and anti-aircraft equipment. Though the majority of the fort is located in neighboring Liberty County, the fort uses two routes for trucks leaving Fort Stewart. Both routes utilize the Bryan County transportation network to reach the Port of Savannah. The northern deployment route uses SR 119, US 280 and I-16 while the southern route employs SR 119 to SR 144 and I-95. These routes facilitate movement of troops and equipment in times of emergency.

SR 144, US 280 and I-16 are also part of Coastal Georgia's Atlantic Coast Hurricane Evacuation Routes. In times of emergency, these routes also assist evacuation from Chatham County in the attempt to reach higher ground. In times of evacuation, I-16 is designed to convert eastbound traffic lanes for use in westbound direction.



Evacuation Route Signage on US 17

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## 3.5 Major Findings

The following comprise the highlights from the baseline conditions in Bryan County. These findings warrant consideration in identifying potential improvements that address the transportation needs of the county.

- Although most of Bryan County is characterized by rural and low-density land use, the Future Development Map from the Bryan County Joint Comprehensive Plan (2008) has identified growth areas near existing and proposed activity centers. These areas include the existing commercial nodes in Richmond Hill, Belfast Siding corridor, residential areas in south Bryan County, and the I-16 corridor in north Bryan County. To this end, future transportation investments should be consistent with the county's land use plans.
- Significant population growth is anticipated for Bryan County from 23,400 in 2000 to 46,000 by 2030, which is an increase of almost 100 percent. Major capacity improvements may be necessary to adequately serve the transportation needs of the future population.
- Approximately 42 percent (291,300 acres) of Bryan County is covered in wetlands, and thus, could pose significant limitations to new developments and infrastructures.
- The presence of Fort Stewart makes travel between north and south Bryan County difficult, as those wishing to do so must travel outside the county first. To this end, county residents travel to Savannah more frequently for employment and shopping than to destinations within the county. There is a high disparity between Bryan County's residents and jobs with greater than 75 percent of residents commuting to other counties for work.
- There are only four multi-lane roadways (US 17, SR 144, Harris Trail Road, and US 280) and five signalized intersections (US 17/SR 144, US 17/Harris Trail Road, US 17/I-95 SB ramp, SR 144/I-95 WB ramp, and US 280/SR 119) in the county. The majority of the multi-lane facilities and signalized intersection are located in south Bryan. In addition to major capacity improvements, system management projects are also needed to facilitate heavy traffic flow with the use of new traffic signals, optimization, and access management.
- Due to the anticipated growth projected for the county, coupled with the lack of planned improvements and available financing options, the following travel conditions can be expected by 2035:
  - Only the areas with direct access to the interstate are still projected to maintain similar commute times to current conditions. As such, there is a strong need to provide capacity improvements and/or viable alternates to major commute routes to Savannah.
  - LOS for major roadways in the county, especially those in the southern Bryan County, is expected to deteriorate significantly, resulting in congestion and delay. These roadways include US 17, SR 144, Harris Trail Road, Belfast Siding Road, and US 280.
- In general, most of the existing bicycle and pedestrian facilities are concentrated along major state roads and infrastructure that serve the urban areas in Bryan County. However, there is a lack of contiguous pedestrian connections between the sidewalks that serve schools and the surrounding neighborhoods.
- Currently, 30 percent of the roads in Bryan County are unpaved and the County has an aggressive roadway paving plan to improve the transportation network that reflects the growing demands on its infrastructure. Some of the major paving projects include the Harris Trail Extension, Dunham Swamp Road, Pembroke Connector Road, and Oak Level Road.

# Chapter 4

## Recommended Improvements & Policies



# Chapter 4

## 4.0 Project Evaluation and Recommendations

This chapter presents a list of recommended projects based on the evaluation methodologies documented in *Chapter 2 – Goals Development and Evaluation Framework*. The baseline conditions, relevant studies, and stakeholder input provided a basis for the identification of potential projects considered for evaluation. In addition to the project list, a number of associated policies have been developed in order to foster an environment that will support the project recommendations from this study.

As indicated in Chapter 2, only the new capacity improvements were evaluated and prioritized using the performance metrics. Due to their nature, the traffic operations and bicycle and pedestrian projects were considered outside of the GDOT Project Prioritization Process (PrPP)'s evaluation, and recommended based on their qualitative benefit to the Bryan County transportation system. The following sections provide an overview of the projects identified under the categories of traffic operations, bicycle and pedestrian facilities, and new capacity improvements.

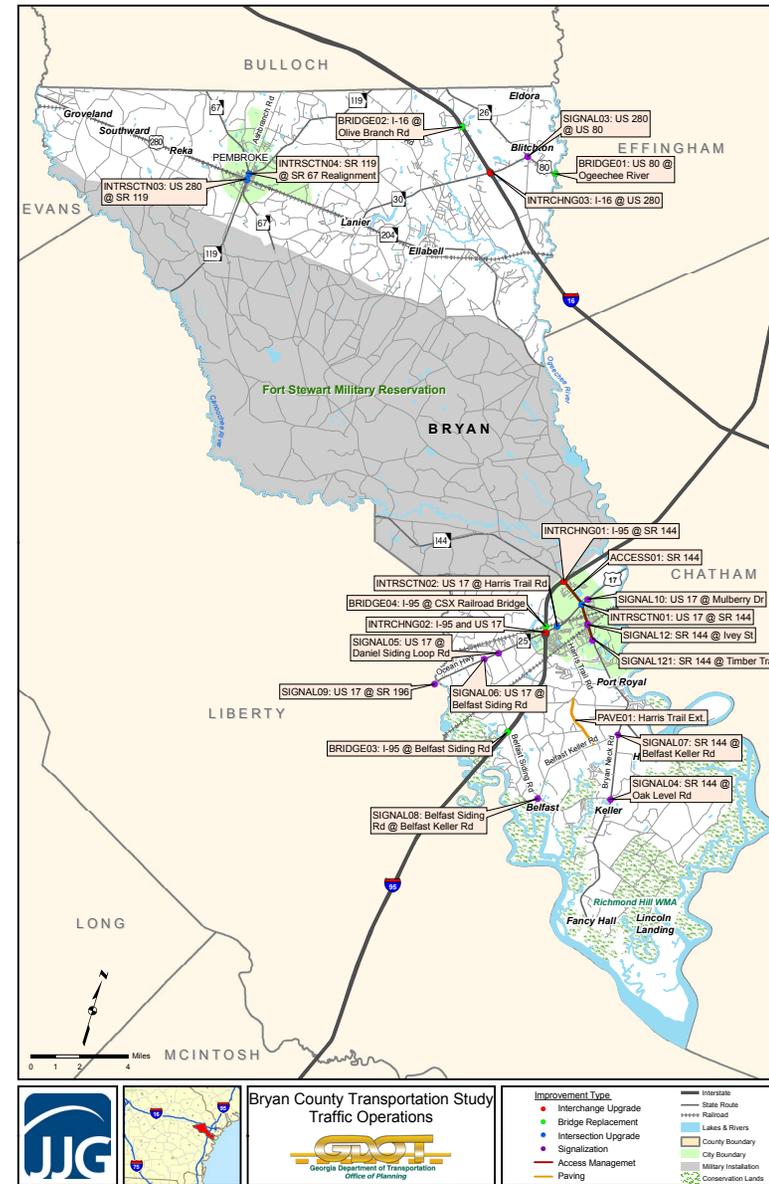
### 4.1 Traffic Operations/System Management Improvements

Improvements in traffic operations are designed to allow more effective management of the supply and use of existing roadway facilities. These improvements can increase the capacity by optimizing traffic operations, especially in recurring congestion conditions. As discussed later in this section, many of the improvements involve the installation of a new traffic signal to improve the intersection traffic flow. It is important to note that the actual need for a signal can only be determined by a signal warrants analysis.

**Figure 4.1** (opposite) illustrates the traffic operation/system management improvements identified throughout the study process. The accompanying **Table 4.1** (pages 4-2 - 4-4) provides details of each improvement, including project description, purpose and need, and

*All identified traffic operations/system management projects are recommended for consideration because they offer a relatively low-cost means to maximize the effectiveness of the existing system.*

Figure 4.1: Traffic Operations Improvements



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**Table 4.1: Traffic Operations/System Management Improvements**

Project ID	Project Name	Project Description	Purpose and Need	Construction Cost Estimate
INTRCHNG01	Interchange Improvements at I-95 and SR 144	Upgrade interchange by adding turn lanes on all approaches at both ramp intersections. Signalize eastbound off-ramp intersection and optimize timing.	The SR 144 interchange is heavily accessed by not only commuters to and from the Savannah area but also the travelers between north and south Bryan. Model results indicate that the eastbound on-ramp and westbound off-ramp are expected to incur heavy delays and potential spillbacks onto I-95. Additional capacity and signalization may be needed at the ramp intersections to improve LOS, and prevent potential spillbacks onto I-95.	\$2,470,000
INTRCHNG02	Interchange Improvements at I-95 and US 17	Upgrade interchange by providing additional storage space for turning movements onto and off the ramps. Add eastbound through lane on US 17 between the ramp intersections. Signalize northbound ramp intersection and optimize timings.	US 17 is one of two principal arterials in the County that is projected to carry up to 40,000 vehicles by 2035. It is a parallel facility to I-95 and connects all the counties in the coastal region. Model results indicate that both northbound on and off ramps and southbound on-ramp are expected to incur heavy delays and potential spillbacks onto I-95. Additional turn lanes and signalization may be needed at the ramp intersections to operate under acceptable conditions.	\$3,323,000
INTRCHNG03	Interchange Improvements at I-16 and US 280	Upgrade interchange by adding turn lanes on all approaches at both ramp intersections. Signalize both ramp intersections. (Will interface with PI No. 0004779)	The interchange of I-16 at US 280 is the only interchange in northern Bryan County. Significant truck traffic headed to the Port of Savannah area via this interchange is anticipated as a result of Interstate Centre. Additional turn lanes are needed at the ramp intersections to operate efficiently and safely with a high number of heavy multiple axle trucks. Installation of traffic signals at both ramp intersections may be needed to reduce conflicts between vehicle and truck movements.	\$767,000
INTRSCTN01	US 17 at SR 144	Safety and operational improvements - additional right and left turn lanes on all approaches	US 17 at SR 144 is a critical intersection that carries the highest traffic volume along with the highest number of crashes in the County. Drivers currently experience extreme intersection delay and queuing during the peak hours. Model projections indicate severe congestion along all the approach roadways by 2035. Capacity and operational improvements may be necessary to facilitate safe and efficient movements through this intersection.	\$1,588,000
INTRSCTN02	US 17 at Harris Trail Road	Safety and operational improvements - add turn lanes and optimize timing	Harris Trail is expected to have a traffic volume increase of over 100% by 2035. The intersection at US 17 at Harris Trail ranks number two in highest number of crashes in the County. Capacity and operational improvements may be necessary to facilitate safe and efficient movements through this intersection.	\$829,000
INTRSCTN03	Bacon Street (US 280) at N. Main (SR 119)	Safety and operational improvements - add turn lanes and optimize timing	Intersection of US 280 at SR 119 has one of the highest number of crashes in the County. Capacity and operational improvements may be necessary to facilitate safe and efficient movements through this intersection.	\$197,000
INTRSCTN04	College Street/ Camella Drive (SR 119) at N Main St (SR 67) Signalization/ Realignment	Realignment of SR 119 and SR 67 with signalization	Realignment of SR 119 to SR 67 is needed to facilitate safer turning movement and improve general traffic flow at this intersection. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$1,115,000

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**Table 4.1: Traffic Operations/System Management Improvements, Continued**

Project ID	Project Name	Project Description	Purpose and Need	Construction Cost Estimate
SIGNAL03	US 280 at US 80	Safety and operational improvements - add turn lanes and signalize intersection	The intersection of US 280 at US 80 provides an alternate access to the Port of Savannah area for the trucks from Interstate Centre. A Signal Warrants Analysis may be necessary at US 280 and US 80 intersection to examine the need for a signal with associated operational improvements.	\$199,000
SIGNAL04	SR 144 at Oak Level Road/Belfast Keller Road	Safety and operational improvements - add turn lanes and signalize intersection	The anticipated growth in south Bryan will likely increase the traffic utilizing the intersection of SR 144 at Oak Level Road/Belfast Keller Road. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$1,214,000
SIGNAL05	US 17 at Daniel Siding Loop Road	Safety and operational improvements - add turn lanes at all approaches and signalize intersection	The intersection of US 17 at Daniel Siding Loop Road is anticipated to operate under deficient LOS due to delays and queueing on the minor street approach. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$704,000
SIGNAL06	US 17 at Belfast Siding Road	Safety and operational improvements - add turn lanes at all approaches and signalize intersection	High traffic volumes are anticipated at the intersection of US 17 at Belfast Siding Road due to the planned growth in the surrounding area. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$704,000
SIGNAL07	SR 144 at Belfast Keller Road	Safety and operational improvements - add turn lanes and signalize intersection	The intersection of SR 144 at Belfast Keller Road is anticipated to be heavily utilized as a result of high growth planned for south Bryan. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$738,000
SIGNAL08	Belfast Siding Road at Belfast Keller Road	Safety and operational improvements - add turn lanes and signalize intersection	The intersection of Belfast Siding Road at Belfast Keller Road was recently aligned as a true intersection ready for pavement. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$199,000
SIGNAL09	US 17 at SR 196	Safety and operational improvements - add an eastbound left turn lane on SR 196 and signalize intersection	The widening of SR 196 currently under construction will attract more commuters from Liberty County to Savannah to this intersection. A Signal Warrants Analysis may be necessary to examine the need for a signal with associated operational improvements at this intersection.	\$925,000
SIGNAL10	US 17 at Mulberry Street	Safety and operational improvements - signalize intersection	Intersection of US 17 at Mulberry Street has one of the highest number of crashes in the County. A Signal Warrants Analysis may be necessary to examine the need for a signal at this intersection.	\$125,000
SIGNAL11	SR 144 at Timber Trail	Safety and operational improvements - add turn lanes and signalize intersection	Timber Trail provides connections between SR 144 and Harris Trail Road. School traffic from Richmond Hill middle school and high school creates long queues and delays at the minor street approach at this intersection. A Signal Warrants Analysis may be necessary to examine the need for a signal at this intersection.	\$738,000

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**Table 4.1: Traffic Operations/System Management Improvements, Continued**

Project ID	Project Name	Project Description	Purpose and Need	Construction Cost Estimate
SIGNAL12	SR 144 at Ivey Street	Safety and operational improvements - add turn lanes and signalize intersection	Coastal GA Greenway follows a section of Ivey Street that connects to SR 144. A signal at this location would provide a safer environment for pedestrians and bicyclists to cross SR 144 to follow the Greenway. A Signal Warrants Analysis may be necessary to examine the need for a signal at this intersection.	\$738,000
BRIDGE01	US 80 at Ogeechee River: Bridge Replacement	Bridge Replacement over Ogeechee River	Bridge on US 80 over Ogeechee River was identified as one of the deficient bridges in the county in need of replacement (sufficiency rating of 47.4).	\$4,756,000
BRIDGE02	Olive Branch Road at I-16	Bridge Replacement on Olive Branch Road over I-16	Bridge on I-16 over Olive Branch Road was identified as one of the deficient bridges in the county in need of replacement (sufficiency rating of 50.0)	\$4,756,000
BRIDGE03	Belfast Siding Road at I-95	Bridge Replacement on Belfast Siding Road over I-95	Bridge on I-95 at Belfast Siding Road was identified as one of the deficient bridges in the county in need of replacement (sufficiency rating of 45.5)	\$5,422,000
BRIDGE04	I-95 at CSX RR Bridge	Bridge Replacement on I-95 over CSX Rail Road	Bridge on I-95 over CSX Railroad was identified as one of the deficient bridges in the county in need of replacement (sufficiency rating of 42.2)	\$5,472,000
PAVE01	Harris Trail Extension to Belfast Loop	Paving of Harris Trail Extension from Crow Lane Road/George Oliver Road diverge to Belfast Loop. (Note: Paving projects are not eligible for federal funding)	Model projections indicate that traffic volumes on Harris Trail will increase by over 100% by 2035. Paving of Harris Trail Extension is needed to provide a safe and viable alternative to SR 144 for the residents of Richmond Hill and south Bryan.	\$1,843,000
ACCESS01	SR 144 Access Management	Apply 20-ft raised median treatment along SR 144 from I-95 interchange to Timber Trail.	The purpose of the raised median treatments along the commercial district of SR 144 is to improve safety, and improve the general mobility of the corridor.	\$2,781,000

# Chapter 4

construction cost estimates. Total construction cost of \$41.6 million for these improvements was determined using GDOT's Cost Estimation Software (CES) tool. **Table 4.1** also includes planning level strategies to improve each recommendation. The main key to success for each recommendation is to conduct traffic engineering and concept development studies that would identify specific strategies and solutions appropriate for these projects. For each project category, the following include project highlights and potential strategies.

## **Interchange Upgrades:**

Various operations and capacity improvements are recommended for all three interchanges (I-95/US 17, I-95/SR 144, and I-16/US 280) in Bryan County. These improvements focus on additional turn lanes on off-ramps to prevent potential queuing onto the interstates. Additionally, new traffic signals are recommended at the ramp intersections to help facilitate traffic getting on and off the interstate. Microsimulation modeling and/or detailed traffic studies are recommended to better ascertain the appropriate improvements at the interchanges.

As a first step in the identification of the appropriate strategies, conceptual layouts were prepared for the interchange improvements recommended at I-95 /US 17 (**Figure 4.2** on page 4-6) and I-95/SR 144 (**Figure 4.3** on page 4-7). The most recent aerial photography was employed as a guide to identify potential environmental challenges and right-of-way constraints. As such, these conceptual layouts can also assist in the development of realistic cost estimates.

## **Intersection Improvements:**

Operational improvements are recommended for heavily traveled intersections (e.g., SR 144 at US 17) in need of additional turn lanes, restriping, and/or channelization. Geometric improvements, such as intersection realignment, are recommended to facilitate safer turning movement at SR 67 and SR 119 in Pembroke. A conceptual sketch of the intersection realignment at SR 67/SR

119 is illustrated in Figure 4.4 (page 4-8). Note that this sketch is consistent with the preliminary layout completed by GDOT District 5 in 2005.

## **New Traffic Signals:**

New traffic signals, including optimizations of signal timing and phasing are recommended at ten intersections throughout the county, where the minor street approach currently experience excessive delay and queuing during the peak hours. A signal warrants analysis may be necessary to further examine the need for a signal with associated operational improvements at these intersections.

## **Bridges:**

Four bridges are recommended for continued monitoring by GDOT for potential upgrade and/or replacement. These bridges all have a sufficiency rating of 50 or below, and thus, eligible for FHWA funding for bridge replacement. As noted previously in Chapter 3, the sufficiency rating does not necessarily imply structural deficiency, as GDOT inspects bridges on a regular basis to ensure safety.

## **Access Management:**

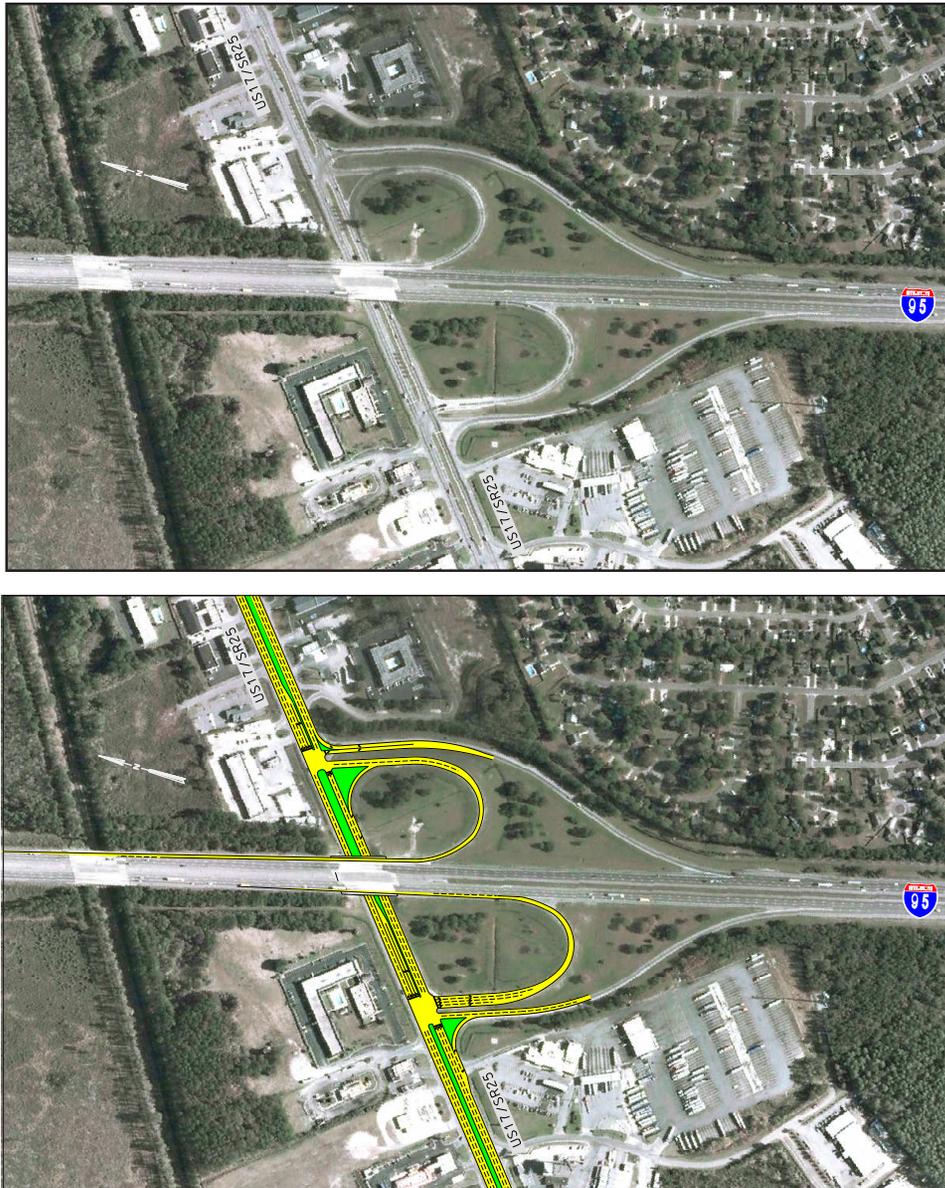
Access management is recommended for the commercial section of SR 144 from I-95 to Timber Trail to improve the mobility along this corridor. A raised median with breaks at strategic locations will channelize traffic and prevent vehicles from turning left into and out of the multiple commercial driveways along this segment of SR 144.

## **Paving:**

As mentioned in the baseline assessment of this study, Bryan County already has an aggressive paving plan in place, with the Harris Trail Extension as one of the top priorities. Because the widening projects along Harris Trail Road assumes the completion of the Harris Trail Extension, this is the only paving project included in the recommendations.

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Figure 4.2: I-95 at US 17 Interchange Improvement (Top: Existing, Bottom: Proposed)

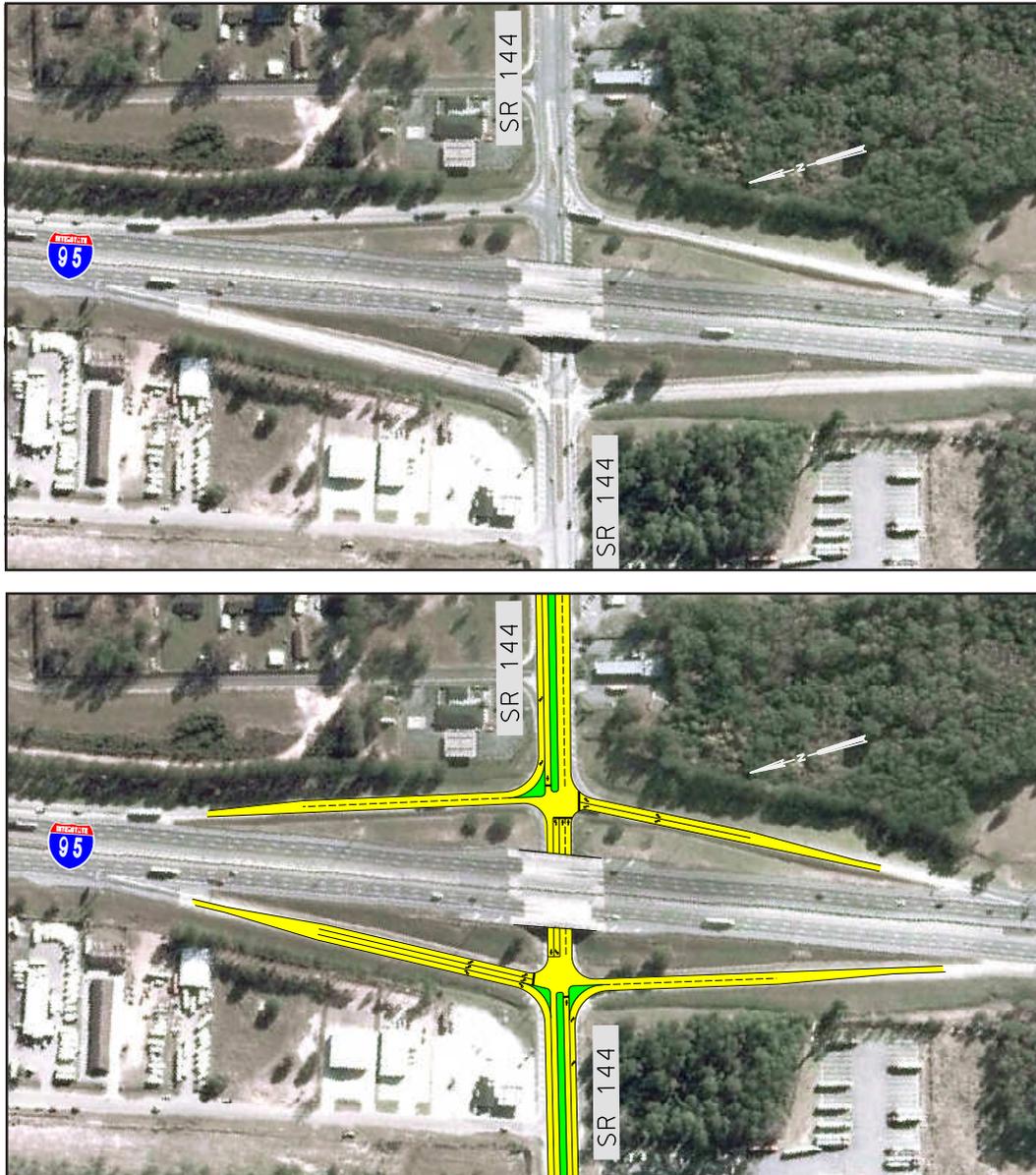


## Recommended Improvements:

- Add eastbound thru lane on US 17 between the ramp intersections;
- Add triple left-turn lanes on I-95 southbound off-ramp;
- Add double left-turn lanes on US 17 westbound onto I-95 southbound on-ramp;
- Add an exclusive right-turn lane on US 17 eastbound onto I-95 northbound on-ramp;
- Add double left-turn lanes on US 17 westbound onto I-95 northbound on-ramp;
- Add an exclusive right-turn lane on I-95 northbound off-ramp; and
- Signalize I-95 northbound ramp intersection and optimize timings.

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Figure 4.3: I-95 at SR 144 Interchange Improvement (Top: Existing, Bottom: Proposed)



## Recommended Improvements:

- Add southbound thru lane on SR 144 between the ramp intersections;
- Add double left-turn lanes on I-95 eastbound off-ramp; and
- Signalize I-95 westbound ramp intersection and optimize timings.

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Figure 4.4: SR 119 at SR 67 Intersection Realignment (Left: Existing, Right: Proposed)



## Recommended Improvements:

- Realign SR 119 along Smith Street;
- Channelized right-turn lanes on SR 119 southbound, Smith Street eastbound, Main Street northbound, and Main Street southbound;
- Signalize the realigned SR 67/SR 119 intersection; and
- Remove State Route designation on North College Street to direct traffic to N. Main Street.

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## 4.2 Bicycle and Pedestrian Improvements

In accordance with the goals and objectives of this study, bicycle and pedestrian improvements have been identified to enhance mobility and connectivity for all users of the transportation network. **Figure 4.5** (opposite) and associated **Table 4.2** (page 4-10) present the sidewalk and shared-use path projects recommended by this study.

Total construction cost for bicycle and pedestrian improvements is \$19.7 million. The following order-of-magnitude (OM) construction cost estimation factors were used to calculate the project cost:

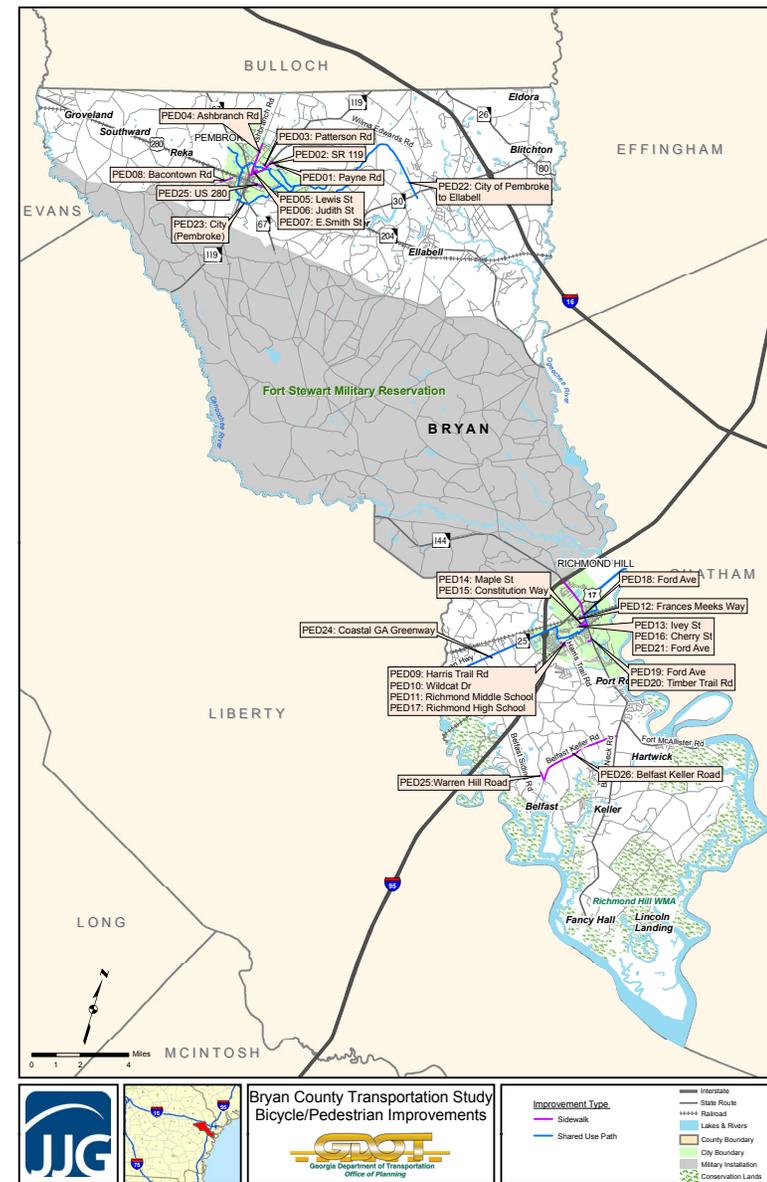
- \$650,000 per mile for two 6' sidewalks (one on each side of roadway) – based on historic GDOT cost estimates, and
- \$422,000 per mile for 10' shared use path – based on CES cost estimated adjusted for Bryan County.

In general, the proposed sidewalks place emphasis on safe connections to schools and existing activity centers. As such, many of the sidewalk projects serve established areas within the incorporated cities. Examples include SR 119 and Ash Branch Road in Pembroke, and Ford Avenue and Timber Trail in Richmond Hill. Shared-use paths are recommended along existing canal system right-of-way and trails that tie into a regional system, such as the Coastal Georgia Greenway. It is important to note that many of the improvements are consistent with the recommendations from the adopted

*Bryan County Bicycle Pedestrian Plan* (2007). Other improvements were identified through direct input from stakeholders.

*The bicycle and pedestrian improvements are recommended to enhance the quality of life and promote a multimodal transportation network.*

**Figure 4.5: Bicycle and Pedestrian Improvements**



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**Table 4.2: Bicycle and Pedestrian Improvements**

Project ID	Project Name	Project Type	Project Description	General Location	Length (miles)	Construction Cost Estimate
PED01	Payne Road	Sidewalk	SR 119 to the end of the Board of Education Property	Pembroke	0.32	\$208,000
PED02	SR 119	Sidewalk	Camella Drive to Lake View Drive	Pembroke	1.05	\$682,500
PED03	Patterson Road	Sidewalk	SR 119 to Miles Lane	Pembroke	0.2	\$130,000
PED04	Ash Branch Road	Sidewalk	Camella Drive to Owens Road	Pembroke	1.39	\$903,500
PED05	Lewis Street	Sidewalk	SR 119 to Ash Branch Road	Pembroke	0.17	\$110,500
PED06	Judith Street	Sidewalk	Lewis Street to Circle Drive	Pembroke	0.14	\$91,000
PED07	E. Smith Street	Sidewalk	E. Main Street to SR 119	Pembroke	0.06	\$39,000
PED08	Bacontown Road	Sidewalk	Pre K-Center to City limit	Pembroke	0.53	\$344,500
PED09	Harris Trail Road	Sidewalk	Brisbon Hall Drive to Wildcat Drive	Pembroke	0.13	\$84,500
PED10	Wildcat Drive	Sidewalk	Harris Trail Road to Richmond Hill High School Sidewalk	Richmond Hill	0.16	\$104,000
PED11	Richmond Hill Middle School	Sidewalk	Harris Trail Road to the school sidewalk	Richmond Hill	0.02	\$13,000
PED12	Frances Meeks Way	Sidewalk	Ford Avenue to Maple Street (multiple segments)	Richmond Hill	0.29	\$188,500
PED13	Ivey Street	Sidewalk	Ford Avenue to Laurel Hill Circle	Richmond Hill	0.4	\$260,000
PED14	Maple Street	Sidewalk	Constitution Way to the Pre-K Center walkway	Richmond Hill	0.09	\$58,500
PED15	Constitution Way	Sidewalk	Cherry Street to Ford Avenue (multiple segments)	Richmond Hill	0.35	\$227,500
PED16	Cherry Street	Sidewalk	Ford Avenue to Constitution Way	Richmond Hill	0.13	\$84,500
PED17	Richmond High School	Shared Use Path	County recreation center to the high school	Richmond Hill	0.09	\$38,000
PED18	Ford Avenue	Sidewalk	Railroad tracks to I-95 (multiple segments)	Richmond Hill	1.7	\$1,105,000
PED19	Ford Avenue	Sidewalk	Ford Avenue to Timber Trail Road	Richmond Hill	0.12	\$78,000
PED20	Timber Trail Road	Sidewalk	Ford Avenue to development	Richmond Hill	0.16	\$104,000
PED22	City of Pembroke to Ellabell	Shared Use Path	Pembroke City line to SR 280	County	8.2	\$3,462,300
PED23	City (Pembroke)	Shared Use Path	Circular canal system around city. Note that further study is needed and other alternative routes should also be explored.	Pembroke	9.2	\$3,884,500
PED24	Coastal Georgia Greenway	Shared Use Path	Generally follows US 17 and goes off path along Harris Trail to connect with the schools in Richmond Hill before tying back to US 17 near the eastern city limits of Richmond Hill	County	10.95	\$4,623,400
PED25	US 280	Sidewalk	Warnell Street to S. Industrial Blvd	Pembroke	0.39	\$253,500
PED26	Belfast Keller Road	Sidewalk	Warren Hill Road to SR 144	County	0.34	\$221,000
PED27	Warren Hill Road	Sidewalk	New Middle School entrance to Belfast Keller Road	County	3.67	\$2,385,500

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## 4.3 New Capacity Improvements

Bryan County's TDM played a key role in identifying roadways with deficient levels of service (LOS D or below) based on existing and anticipated growth. Refer to Appendix B for the detailed documentation related to the Bryan County TDM process. The results of the No-Build TDM analysis indicated a need for increased capacity in the form of additional travel lanes for the segments of I-95, US 17, SR 144, US 280, Belfast Siding Road and Harris Trail Road.

**Figure 4.6** (opposite) illustrates the locations of these proposed projects, and the accompanying **Table 4.3** (page 4-12) provides details of each improvement, including project description, purpose and need, and logical termini. Also, included in Table 4.3 are the right-of-way and construction cost estimates for each new capacity project, based on GDOT's cost estimation tools. Note that the costs associated with the I-95 widening are relatively low because when this segment of I-95 was widened from four lanes to six lanes, all I-95 bridges were reconstructed with enough width to accommodate a future additional lane in each direction. Refer to the

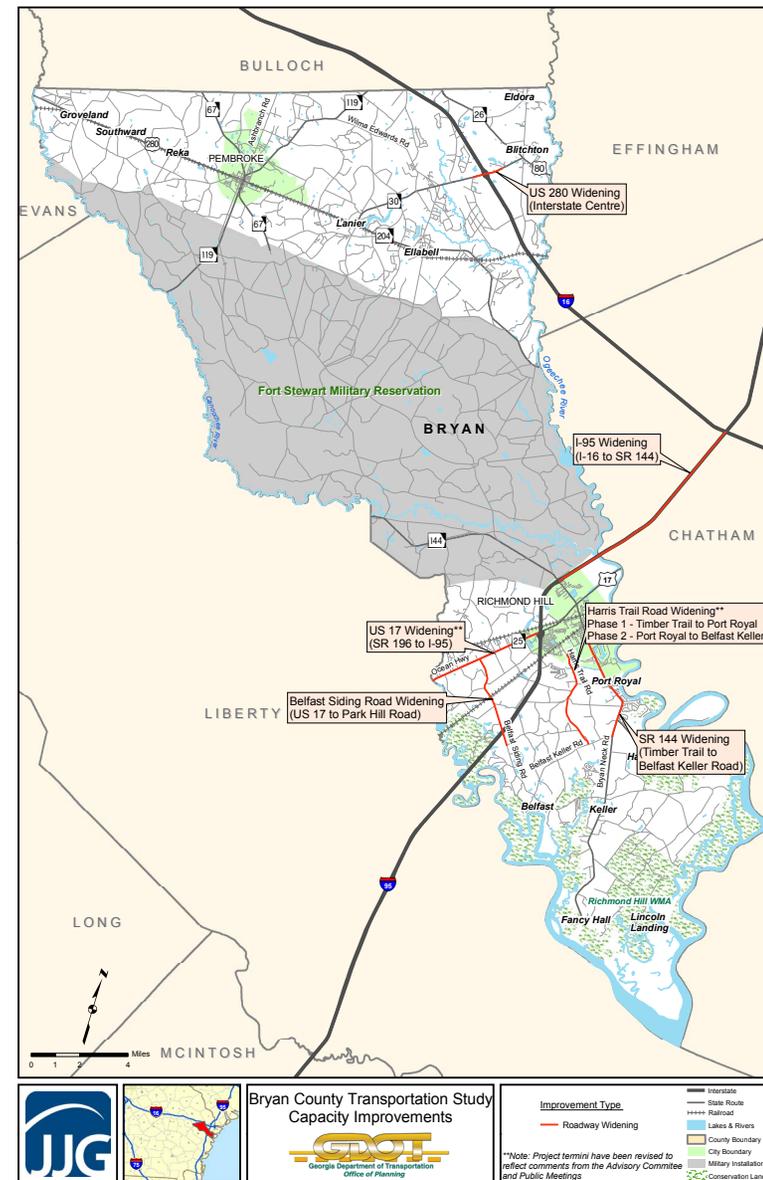
*Because they can represent a significant investment, new capacity projects are prioritized by performance, benefit-cost and local needs.*

Appendix C for all the assumptions used to calculate the costs for each new capacity project. The evaluation results, followed by the prioritization of the new capacity improvements, are presented in the subsequent sections.

**Table 4.3** also documents those improvements considered initially, but later removed based on traffic demand, local input, and overall relevance to the Bryan County Transportation System. **The following bullets highlight the details on the removed projects:**

- SR 144 widening from four lanes to six lanes from US 17 to Timber Trail – This project was identified based on forecast congested conditions along the commercial section of SR 144. The Advisory Committee recommended its removal due to the City of Richmond Hill's desire to preserve its downtown and to promote a pedestrian-friendly environment in its commercial district. As such, access management is recommended for this segment of SR 144 in order to balance having efficient through-movement with preserving the character of the downtown.

Figure 4.6: Capacity Improvements



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**Table 4.3: New Capacity Improvements**

Project Name	Project Description	Logical Termini	Purpose and Need	Construction Cost Estimate	ROW Cost Estimate	Total Cost Estimate (Construction + ROW + PE)
I-95 Widening	Widen I-95 from 6 lanes to 8 lanes with center barrier wall beginning at I-16 in Chatham County and ending at SR 144. (Currently being addressed by PI No. 511035)	I-16/I-19 interchange in Chatham County was chosen as the northern terminus since a large percentage of I-95 traffic travels to and from I-16. The southern terminus is at the SR 144 interchange in Bryan County since the model projects a significant drop in the number of vehicles (30,000) south of this interchange.	This segment of I-95 currently experience extreme delays and high volume to capacity ratio during the peak hours and this condition is expected to worsen by 2035. Widening of I-95 is recommended to provide congestion relief and improve safety.	\$8,441,000 (2-mile segment in Bryan County)	No new ROW needed	\$9,116,000
US 17/SR 25 Widening	Widen US 17/SR 25 from 4 lanes to 6 lanes with 20-ft raised median beginning at SR 196 in Liberty County to I-95.	The eastern terminus is at the T-intersection at SR 196 in Liberty County. SR 196 is currently under construction to be widened to 4 lanes. The completion of this improvement is expected to attract more commuters from Liberty County onto US 17. The western terminus is at the I-95 interchange since a significant share of travelers utilizes this interchange to access Savannah and other destinations.	Under the existing roadway configuration, US 17 is anticipated to have significant deterioration of LOS by 2035. Widening on US 17 is needed to facilitate safe and efficient travel of commuters to and forth from the Savannah area. The capacity improvements to US 17 will also provide relief for the users of I-95 during the peak hours.	\$ 32,298,000	\$ 14,945,000	\$49,827,000
SR 144 Widening (Timber Trail to Belfast Keller)	Extend the existing 4-lane section of SR 144 south to Belfast Keller Road. (Currently being addressed by PI No. 532370)	The section of SR 144 just south of Timber Trail was chosen as the northern terminus since it marks the ending of the existing 4-lane section. The southern terminus is at the intersection of Belfast Keller Road because significant percentage of traffic is expected to diverge at this intersection.	Widening of SR 144 is recommended to provide additional capacity and reduce congestion for the travelers from Richmond Hill and south Bryan to US 17 and I-95.	\$ 21,157,000	\$ 9,670,000	\$32,520,000
US 280/SR 30 Widening	Widen US 280/SR 30 from 2 lanes to 4-lanes with 20-ft median at the proposed entrances of Interstate Centre. (Currently being addressed by PI No. 0004799)	The project termini are located at the anticipated eastern and western entrances of the Interstate Centre Industrial Park because significant deterioration of LOS on US 280 is expected near the development.	Widening of US 280 is needed to improve safety and accommodate increasing traffic volumes as a result of the proposed Interstate Centre Industrial Park. The additional capacity improvement will facilitate large truck traffic generated from the proposed development and headed towards the Port of Savannah area via I-16.	\$ 6,741,000	\$ 2,218,000	\$9,498,000
Belfast Siding Road Widening	Widen Belfast Siding Road from 2 lanes to a 4-lane divided section beginning at US 17 and ending at the Park Hill 20 Road.	The northern terminus is at the T-intersection at US 17, which provides the most direct access to I-95. The southern terminus is at Park Hill 20 Road intersection.	Widening of Belfast Siding Road will provide relief to the congested conditions anticipated as a result of the planned development surrounding this roadway.	\$ 24,805,000	\$ 7,043,000	\$33,832,000

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**Table 4.3: New Capacity Improvements, Continued**

Project Name	Project Description	Logical Termini	Purpose and Need	Construction Cost Estimate	ROW Cost Estimate	Total Cost Estimate (Construction + ROW + PE)
Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)	Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Timber Trail to Port Royal Road. (To occur after the paving of Harris Trail Ext. Note that paving projects are not eligible for federal funding)	The northern terminus is at the existing 4-lane section ending at Timber Trail. The southern terminus is at Port Royal intersection as the travel pattern indicates a significant diversion of traffic from Harris Trail to Port Royal Road. (Project termini originally from US 17 to Timber Trail. Has been revised per Advisory Committee input)	With the completion of Harris Trail Extension, traffic on Harris Trail Road is expected to increase by greater than 100% from 5,600 in 2006 to 12,500 by 2030, resulting in deficient LOS. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.	\$ 8,163,000	\$ 2,164,000	\$10,980,000
Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)	Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Port Royal Road to Belfast Keller Road. (To occur after the paving of Harris Trail Ext. Note that paving projects are not eligible for federal funding)	The northern terminus is at Port Royal Road where most of the southbound traffic on Harris Trail Road currently diverts to access the residential areas along SR 144 and south Bryan. The southern terminus is at the Belfast Keller Road corresponding to the southern terminus of Harris Trail Extension. (Project termini originally from US 17 to Timber Trail. Has been revised per Advisory Committee input)	This project calls for the widening of Harris Trail Extension. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.	\$ 14,685,000	\$ 4,938,000	\$20,798,000
Harris Trail Road Widening (Phase 3 - US 17 to Belfast Keller Road)	Widen Harris Trail Road from 4 lanes to 6 lanes with 20-ft raised median from US 17 to Belfast Keller Road.	N/A	N/A	N/A	N/A	N/A
SR 144 Widening (US 17 to Timber Trail)	Widen SR 144 to 6-lane divided section from US 17 to Timber Trail intersection. (Project removed based on Advisory Committee input)	N/A	N/A	N/A	N/A	N/A
Fort Stewart Bypass	New roadway connecting SR 196, SR 119, and SR 144 to bypass Fort Stewart in Liberty County. (Project removed based on the lack of impact to Bryan County travel conditions, but currently included in the Hinesville MPO LRTP)	N/A	N/A	N/A	N/A	N/A

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- Harris Trail Road widening from four lanes to six lanes from US 17 to Timber Trail – This project was identified as a need based on the forecast traffic volumes on Harris Trail that would result from the Harris Trail Extension. The Advisory Committee recommended its removal since it makes more sense from a mobility perspective to widen the remaining segments of Harris Trail Road to four lanes before considering six lanes.
- US 17 widening from four lanes to six lanes from SR 196 to SR 144 – This project was identified as a need based on its deficient forecast LOS. The Advisory Committee recommended truncating the eastern terminus at the I-95 interchange to direct commuter traffic from Liberty County to I-95 to avoid having to go through the busy commercial district in Richmond Hill.
- Fort Stewart Bypass – This project was identified due to the perceived need to provide an alternative route to bypass Fort Stewart and provide better connectivity between north and south Bryan County. However, upon closer examination, it was determined that the construction of this bypass would provide minimal benefit for the transportation network of Bryan County, and thus removed from the recommendations. This project is included in the Hinesville Long Range Transportation Plan (LRTP).

## 4.3.1 Project Evaluation

**Table 4.4** (page 4-15) presents the evaluation results of the new capacity projects. The projects are listed in descending order based on the composite scores, which were determined by an aggregate of the weighted normalized scores under each performance metric. As noted in Chapter 2, normalized scores were calculated based on a uniform distribution of the absolute values under each metric. The weights used in the project scoring were derived from the GDOT PrPP's designations for rural counties.

Overall, the widening projects on US 17, I-95, and SR 144 have the highest composite scores. These roadways are regionally significant, and carry the highest traffic volumes in the county. Conversely, the widening projects along minor and local collectors with lower traffic volumes (e.g., Harris Trail Road and Belfast Siding Road) ranked the lowest in overall performance.

It was assumed that any general safety flaws in geometric design would likely be eliminated with a widening project. As noted previously, the top

performing projects in terms of safety are the widening projects of US 17 and SR 144. Roadways with higher crash rates scored higher because of the greater potential for crash reduction. As such, it is no surprise that improving the capacity along two of the most heavily traveled roadways would have the highest crash reduction potential. Conversely, the widening projects of US 280 and Belfast Siding Road received the lowest scores since these roadways currently experience relatively low number of crashes.

Congestion-related performance metrics (e.g., delay savings and travel time savings on key corridors) were calculated using the 2035 TDM. Delay reduction was calculated as a forecast change in the Vehicle Hours Traveled (VHT) between the 2035 No Build and Build Scenarios. The I-95 widening project rated the highest in terms of delay reduction, followed by the widening projects of US 17 and SR 144. The lowest performing projects were the widening projects of US 280 and Belfast Siding Road. Additional points were assigned to improvements along key corridors to capture the travel time savings on non-interstate truck routes, national highway system (NHS) connectors, and designated evacuation routes. Benefits could be understated for travel time savings on parallel facilities such as SR 144 and Harris Trail, and some of the VHT savings were manually redistributed among these facilities to account for unrealistic model output.

With respect to consistency with local plans, those projects that are included in their entirety in a local or regional plan, and/or are included in multiple plans received the highest scores. The widening projects of I-95, SR 144 and US 280 received the highest scores. I-95 and SR 144 widening projects are programmed in the Chatham County LRTP (PI No. 511035) and the STIP (PI No. 532370), respectively. US 280 widening is included as a recommendation in two plans: the Bryan County Transportation Plan (2007); and as part of the Governor's Road Improvement Program (GRIP), which supports a network of economic development highways.

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**Table 4.4: Project Performance Matrix**

	Goals	Safety			Congestion			Connectivity, Access and Mobility						Composite Score (Sum of Weighted Scores)
	Performance Metrics	Reduction in Crashes (No. Crashes)	Normalized Score	Weighted Normalized Score	Delay Reduction (Change in VMT)	Normalized Score	Weighted Normalized Score	Travel Time Savings on Key Corridors (% Reduction in VMT)	Normalized Score	Weighted Normalized Score	Consistency with Local Plans	Normalized Score	Weighted Normalized Score	
Project Name	Weight	30%			30%			20%			20%			
US 17/SR 25 Widening (SR 196 to I-95)		33.0	90.0	27.0	166.9	70.0	21.0	7.0%	80.0	16.0	IAR Study 2008 (modified project limits)	50.0	10.0	<b>74.0</b>
I-95 Widening (SR 144 to I-16)		7.0	50.0	15.0	421.1	90.0	27.0	5.0%	70.0	14.0	Chatham LRTP - PI No. 511035	90.0	18.0	<b>74.0</b>
SR 144 Widening (Timber Trail to Belfast Keller)		8.0	60.0	18.0	132.1	60.0	18.0	15.0%	90.0	18.0	STIP PI No. 532370/ Bryan County Transportation Plan 2007	90.0	18.0	<b>72.0</b>
US 280/SR 30 Widening (Interstate Centre)		1.0	20.0	6.0	9.4	10.0	3.0	2.6%	40.0	8.0	GRIP PI No. 0004799/ Bryan County Transportation Plan 2007 (modified project limits)	90.0	18.0	<b>35.0</b>
Belfast Siding Road Widening (US 17 to Park Hill Road)		1.0	20.0	6.0	36.6	20.0	6.0	0.0%	10.0	2.0	Bryan County Transportation Plan 2007 (modified project limits)	50.0	10.0	<b>24.0</b>
Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)		0.8	10.0	3.0	92.2	40.0	12.0	0.0%	10.0	2.0	None	10.0	2.0	<b>19.0</b>
Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)		1.0	20.0	6.0	39.3	20.0	6.0	0.0%	10.0	2.0	None	10.0	2.0	<b>16.0</b>

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## 4.3.2 Systemwide Performance

As noted in the previous section, the project evaluation process involves the development of a Build TDM to assess the performance of a capacity improvement. To accompany the project-level analysis, a systemwide comparison was also made to capture the difference in the performance between the No-Build and the Build Scenarios. As presented in **Table 4.5** (opposite), performance results from the Build network were compared against the No-Build network with respect to the systemwide improvements in VMT, VHT, average speed and deficient capacity.

In general, the Build network shows improvement over the No-Build in nearly all categories shown in the systemwide performance table. In accordance with the notion that the addition of new capacity will create more demand, the Build network is expected to incur slightly higher daily VMT than the No-Build network. By the same token, the additional capacity along key corridors is expected to lower the daily VHT, and increase the average speed in the overall Bryan County transportation network. The most significant change can be seen when comparing the capacity deficient route miles between the No-Build (30.6 miles) and the Build (3.3 miles) networks.

Comparisons were also made between the two model networks in terms of LOS improvements on specific roadways as well as the reduction in travel time from Richmond Hill and Pembroke to the I-16/I-95 interchange in Chatham County. **Figures 4.7** and **4.8** (page 4-17) illustrate the anticipated travel time contours under the No-Build and the Build conditions, respectively. Results of the future TDM analysis indicated that the additional roadway capacity improved the average travel time from Bryan County to the I-16/I-95 interchange by 10 -15 minutes. The greatest travel time savings can be seen

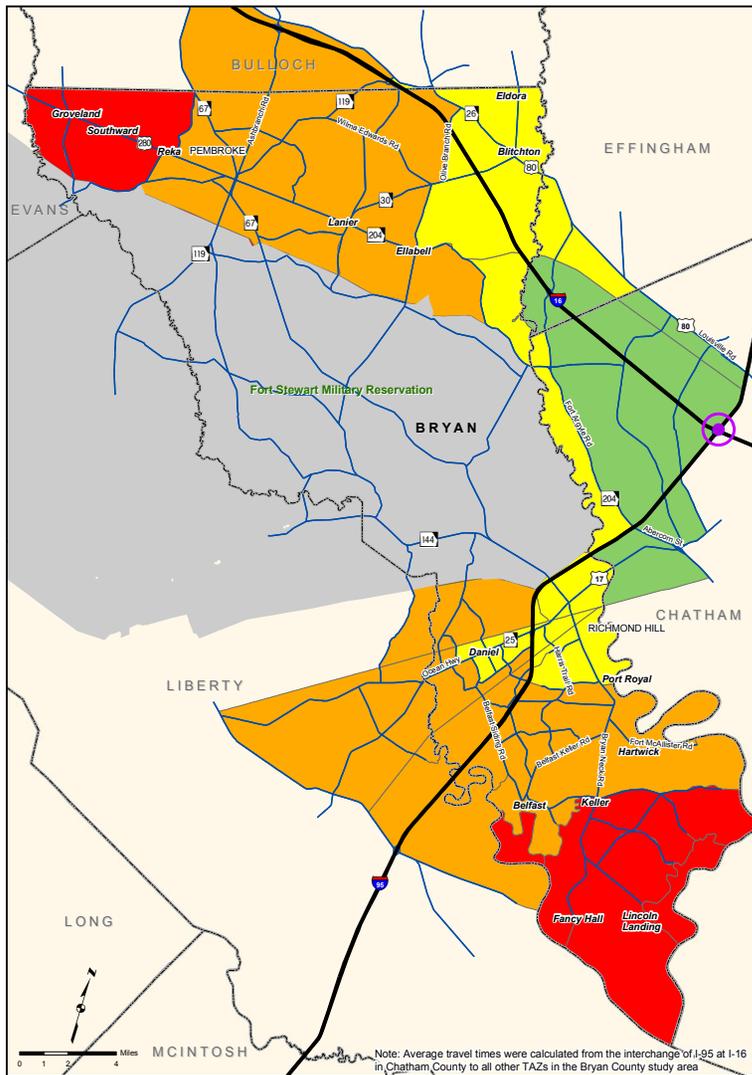
**Table 4.5: Build and No-Build Network Performance in 2035**

Evaluation Measure	Road Class	E+C/NO BUILD NETWORK			BUILD NETWORK		
		South	North	Total	South	North	Total
Centerline Route Miles	Freeway	12.0	9.1	21.1	12.0	9.1	21.1
	Arterial	14.0	40.4	54.4	15.5	40.4	55.9
	Collector	32.7	38.5	71.2	35.1	38.5	73.6
	Systemwide	58.7	88.0	146.7	62.6	88.0	150.6
Daily Vehicle Miles of Travel (DVMT)	Freeway	997,835	391,960	1,389,795	1,010,263	404,504	1,414,767
	Arterial	417,590	192,324	609,914	370,791	195,864	566,655
	Collector	208,261	79,450	287,711	265,971	64,409	330,380
	Systemwide	1,623,686	663,734	2,287,420	1,647,025	664,777	2,311,802
Daily Vehicle Hours of Travel (DVHT)	Freeway	17,862.3	6,341.4	24,203.7	17,691.4	6,560.6	24,252.0
	Arterial	12,420.7	4,353.2	16,773.9	10,460.2	4,397.5	14,857.7
	Collector	6,727.0	2,050.8	8,777.8	7,989.9	1,644.8	9,634.7
	Systemwide	37,010.0	12,745.4	49,755.4	36,141.5	12,602.9	48,744.4
Average Daily Travel Speed (MPH)	Freeway	55.9	61.8	58.9	57.1	61.7	59.4
	Arterial	33.8	44.3	39.1	35.9	44.6	40.3
	Collector	30.8	37.8	34.3	33.4	38.2	35.8
	Systemwide	40.2	48.0	44.1	42.1	48.2	45.2
Capacity Deficient Route Miles (LOS D or Below)	Freeway	1.9	0.0	1.9	0.0	0.0	0.0
	Arterial	12.7	0.7	13.4	1.7	0.0	1.7
	Collector	7.3	0.2	15.3	1.6	0.0	1.6
	Systemwide	21.9	0.9	30.6	3.3	0.0	3.3

for the more remote areas of Bryan County currently without direct access to the interstate. By 2035, the areas south of Keller and east of Pembroke are expected to have an average travel time of greater than 45 minutes to get to the I-95/I-16 interchange. By improving key roadways that provide connections to these areas, the Build network is expected to dramatically improve the travel times for these areas. According to the Bryan County TDM, significant improvements to the overall transportation system can be seen by enhancing key roadways in Bryan County.

# Chapter 4

Figure 4.7: 2035 No-Build Travel Times from I-95 at I-16







**2035 Travel Times from I-95 at I-16**

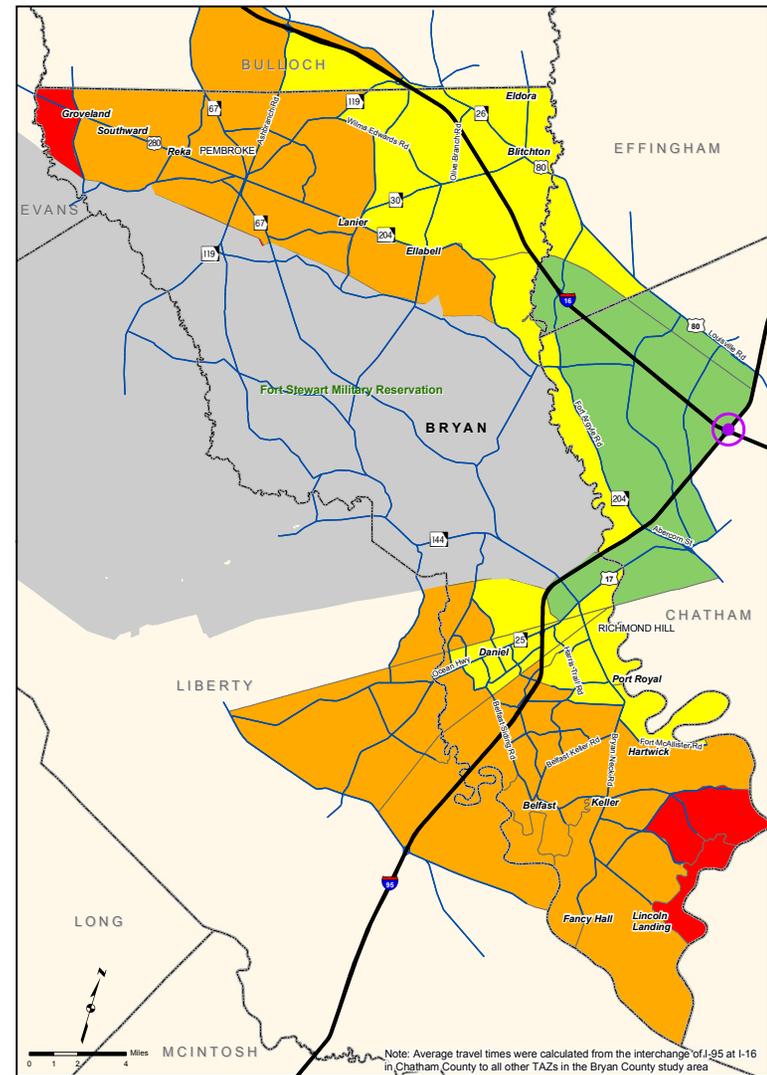


Georgia Department of Transportation  
Office of Planning

**Average Travel Times from I-95 at I-16**

	< 10 minutes		Interstate
	10 - 20 minutes		Major Roads
	21 - 30 minutes		Railroad
	31 - 45 minutes		Fort Stewart
	> 45 minutes		County Boundary

Figure 4.8: 2035 Build Travel Times from I-95 at I-16







**Bryan County Transportation Study  
2035 Build Alternative  
Travel Times from I-95 at I-16**



Georgia Department of Transportation  
Office of Planning

**Average Travel Times from I-95 at I-16**

	< 10 minutes		Interstate
	10 - 20 minutes		Major Roads
	21 - 30 minutes		Railroad
	31 - 45 minutes		Fort Stewart
	> 45 minutes		County Boundary

# Chapter 4

Figures 4.9 and 4.10 (page 4-19) display the differences in the roadway LOS between the No-Build and the Build conditions, respectively. As noted previously, with the additional capacity, the roadway LOS improved significantly on all key corridors. Pockets of deficient LOS can be expected along US 17 near the I-95 interchange, SR 144 near the I-95 interchange, and the existing four-lane segment of SR 144. Many of these deficient segments are results of conscious decisions made by the study team and the Advisory Committee to preserve the character of Richmond Hill.

### 4.3.3 Project Prioritization

In 2008, GDOT began implementing benefit-cost practices statewide. As such, project prioritization using benefit-cost has now become a standard practice in many in transportation studies conducted by GDOT. The benefit of an improvement was calculated by the sum of the savings associated with delay cost and fuel cost.

The project cost must be annualized based on a design life of 25 years with an interest rate of three percent. In addition to using benefit-cost, this study documented an alternative project ranking solely based on local priorities. **Table 4.6** (opposite) is a comparative list of the new capacity projects based on benefit-cost versus local input. Project sheets for new capacity recommendations are presented at the end of this section in order of priority, as determined by the benefit-cost analysis.

Highlights from the comparative rankings include the following:

- The I-95 widening project received an extremely high benefit-cost ratio of 4.84 from having an exceptionally low project cost. However, some stakeholders considered the relief of congestion on the interstate system to be a regional issue, and such projects not suitable for competition with others that would serve local needs first.

**Table 4.6: Project Prioritization: Benefit-Cost and Local Priorities**

Benefit-Cost			Local Input		
	Project Ranking	B-C Ratio		Project Ranking	Note
1	I-95 Widening (SR 144 to I-16)	4.84	1	SR 144 Widening (Timber Trail to Belfast Keller)	Majority of stakeholders believed this project should be the county's top priority.
2	SR 144 Widening (Timber Trail to Belfast Keller)	0.39	2	US 17/SR 25 Widening (SR 196 to I-95)	This project is needed to relieve congestion and facilitate commuter traffic.
3	US 17/SR 25 Widening (SR 196 to I-95)	0.29	3	US 280/SR 30 Widening (Interstate Centre)	This project is needed to accommodate the traffic growth associated with Interstate Centre
4	Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)	0.18	4	Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)	Some stakeholders desired Harris Trail Road to function as a viable bypass to City of Richmond Hill.
5	US 280/SR 30 Widening (Interstate Centre)	0.08	5	Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)	This project should be implemented after Phase 1 widening.
6	Belfast Siding Road Widening (US 17 to Park Hill Road)	0.07	6	I-95 Widening (SR 144 to I-16)	Some stakeholders believed that this project will be a greater benefit to non-Bryan County residents.
7	Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)	-0.12	7	Belfast Siding Road Widening (US 17 to Park Hill Road)	Some stakeholders questioned need for this project without the proposed interchange.

- The widening of SR 144, followed by US 17, ranked high in both categories. The stakeholders considered the SR 144 project to be the most important to alleviate traffic congestion in Bryan County.
- The US 280 widening project ranked higher based on local priorities than on benefit-cost analysis. Bryan County stakeholders believed this project is necessary for the accommodation of growth associated with Interstate Centre.
- The Harris Trail Road widening (Phase 1 - Timber Trail to Port Royal Road) ranked the lowest in terms of benefit-cost. As noted previously, this is likely due to the Travel Demand Model's underestimation of the 'benefits' associated with a parallel route. Although Harris Trail Road widening (Phase 2 - Port Royal Road to Belfast Keller Road) ranked higher in benefits-cost, it makes sense from a mobility perspective to implement Phase 1 first to connect with the existing four lane section of Harris Trail Road.

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Figure 4.9: 2035 No-Build Level of Service

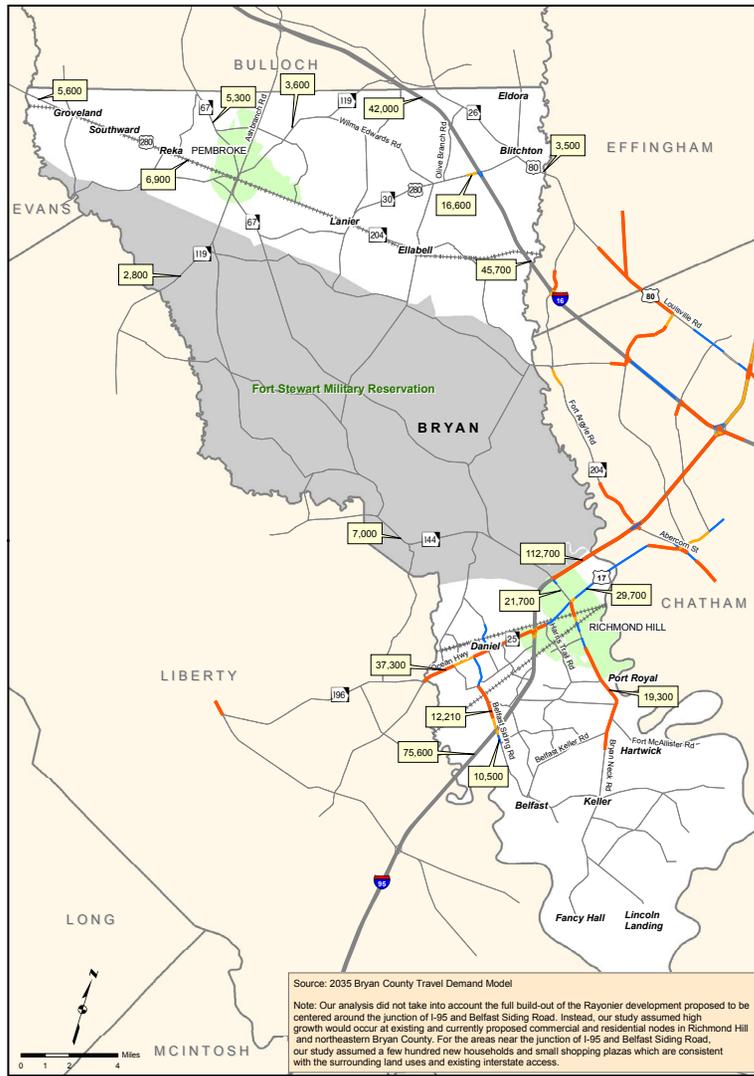
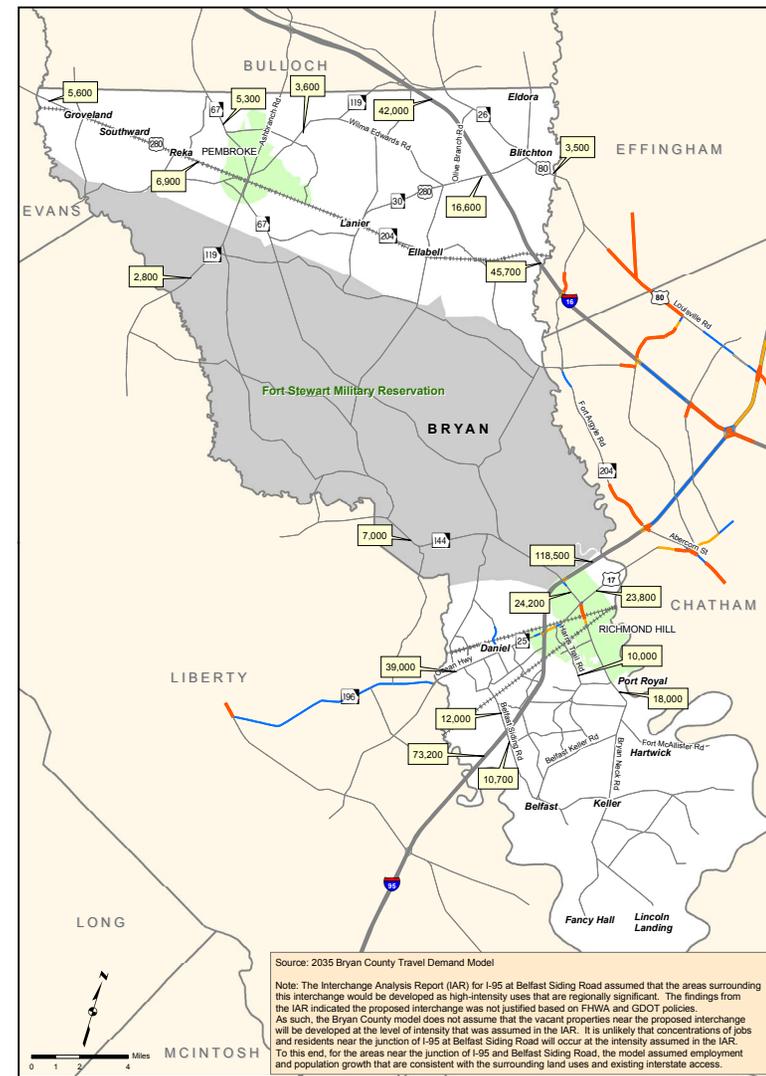


Figure 4.10: 2035 Build Level of Service



**2035 No-Build Level of Service (LOS)**

LOS C or Better	Railroad
LOS D	County Boundary
LOS E	City Boundary
LOS F	Military Installation
LOS F	Military Installation

1,000 Average Daily Volume

**Bryan County Transportation Study  
2035 Build Level of Service (LOS)**

LOS C or Better	Railroad
LOS D	County Boundary
LOS E	City Boundary
LOS F	Military Installation
LOS F	Military Installation

1,000 Average Daily Volume

# Chapter 4

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- The widening of Belfast Siding Road ranked in the bottom in both categories. Some of the stakeholders did not perceive that widening this road would have utility unless it had access to I-95.

Chapter 5 provides an overview of the potential funding programs available for these projects. It is important to note that in order to secure state and federal funding, further study, including the development of a detailed concept and the initiation of a formal environmental investigation will be necessary for each project. For the projects involving the widening of sections of state and federal routes, early coordination with the GDOT and the FHWA will be necessary.

## 4.4 Policy Recommendations

In addition to the project recommendations, the following policies are also intended to support the goals and objectives of this study. Many of these policies are consistent with the Bryan County Joint Comprehensive Plan.

### Encourage Multimodal Corridors and Expansion of Bicycle/Pedestrian Network:

- Bryan County should encourage transportation corridors that support multiple modes of transportation and aesthetics. Local bicycle/pedestrian trails and sidewalks on SR 144 should continue to expand and connect to other network (consistent with Comprehensive Plan).
- Developing a network for bicycles and pedestrians is more cost effective when done in conjunction with other projects such as a road widening. Therefore, future roadway and land development project should incorporate a bicycle and pedestrian component as appropriate.

### Land Use and Transportation Coordination

- Proposed development should be located in areas that are adequately served by public facilities. The county's Future Development Plan should be used as a guide to match infrastructure investments with the appropriate development needs (consistent with Comprehensive Plan).
- Natural resources should be protected and conserved by controlling the location and density of proposed development through the use of the Future Development Map and zoning ordinance (consistent with Comprehensive Plan).

### Increase Safety and Operations of Transportation Network

- Access management plan should be prepared for primary transportation corridors such as SR 144, US 17 and US 280 to manage curb cuts as development continue to occur along these corridors. In addition to developing overall guidelines for access management, these plans should also be corridor-specific to address individual needs of the corridors.
- Traffic signals in close proximity should be interconnected and coordinated. For instance, the new traffic signals recommended along SR 144 at Ivey Street and at Timber Trail should be coordinated with the existing traffic signal of SR 144 at US 17 to increase the effective capacity along SR 144.

# Chapter 4

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## Project Sheets

*I-95 Widening - I-16 to SR 144*

*SR 144 Widening - Timber Trail to Belfast Keller*

*US 17/SR 25 Widening - SR 196 to I-95*

*Harris Trail Road Widening: Phase 2 - Port Royal Road to Belfast Keller Road*

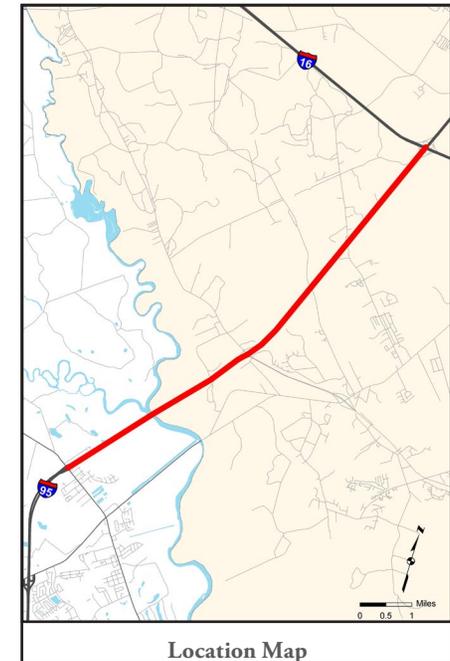
*US 280/SR 30 Widening - Interstate Centre*

*Belfast Siding Road Widening - US 17 to Park Hill 20 Road*

*Harris Trail Road Widening: Phase 1 - Timber Trail to Port Royal Road*

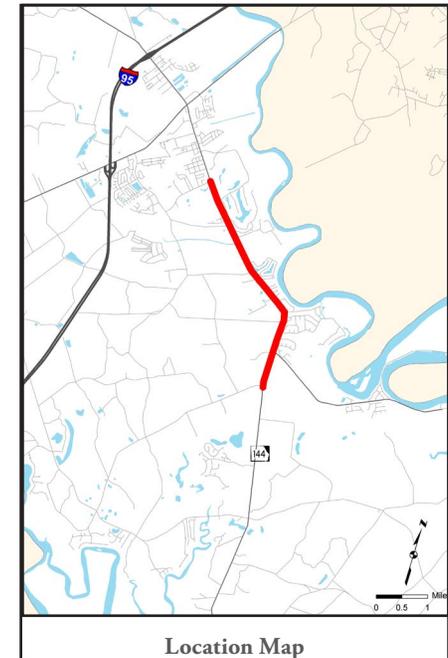
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Project Name: I-95 Widening (I-16 to SR 144)							
<b>Description:</b> Widen I-95 from 6 lanes to 8 lanes with center barrier wall beginning at I-16 in Chatham County and ending at SR 144.				County	Bryan		
				P.I. No.:	511035		
				GDOT District	5		
				Congressional District:	1		
Traffic Vol.:	2006:	80,500	2035:	113,000	RC/MPO:	CRC	
Truck %	2006:	12.1%	2035:	14.7%	Length (miles):	2.0	
No. of Lanes	Existing:	6	Recommended:	8	Route #:	405	
Functional Classification:				Interstate Principal Arterial		Beginning and Ending Points:	I-16/ SR 144
<b>Project Need and Purpose:</b> This segment of I-95 currently experience extreme delays and high volume to capacity ratio during the peak hours and this condition is expected to worsen by 2035. Widening of I-95 is recommended to provide congestion relief and improve safety.							
<b>Logical Termini:</b> I-16/I-95 interchange in Chatham County was chosen as the northern terminus since a large percentage of I-95 traffic travels to and from I-16. The southern terminus is at the SR 144 interchange in Bryan County since the model projects a significant drop in the number of vehicles (30,000) south of this interchange.							
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total		
Cost Estimate	\$675,000	\$0	\$0	\$8,441,000	\$9,116,000		
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT			



# Chapter 4

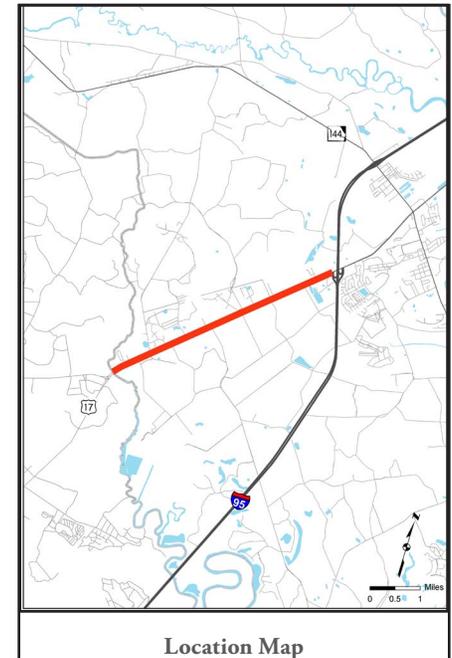
SR 144 Widening (Timber Trail to Belfast Keller)						
<b>Description:</b> Extend the existing 4-lane section of SR 144 south to Belfast Keller Road.				County	Bryan	
				P.I. No.:	532370	
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	14,000	2035:	22,100	RC/MPO:	CRC
Truck %	2006:	3.7%	2035:	5.6%	Length (miles):	4.5
No. of Lanes	Existing:	4	Recommended:	6	Route #:	144
Functional Classification:			Minor Arterial		Beginning and Ending Points:	Timber Trail to Belfast Keller
<b>Project Need and Purpose:</b> Widening of SR 144 is recommended to provide additional capacity and reduce congestion for the travelers from Richmond Hill and south Bryan to US 17 and I-95.						
<b>Logical Termini:</b> The section of SR 144 just south of Timber Trail was chosen as the northern terminus since it marks the ending of the existing 4-lane section. The southern terminus is at the intersection of Belfast Keller Road because significant percentage of traffic is expected to diverge at this intersection.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,693,000	\$4,846,000	\$4,825,000	\$21,157,000	\$32,520,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



# Chapter 4

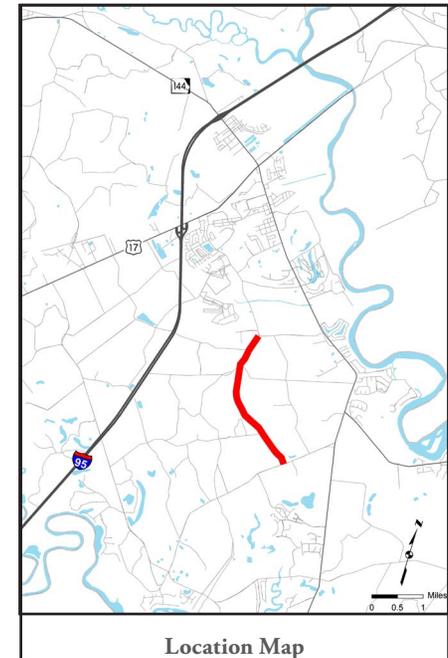
## US 17/SR 25 Widening (SR 196 to I-95)

<b>Description:</b> Widen US 17/SR 25 from 4 lanes to 6 lanes with 20-ft raised median beginning at SR 196 in Liberty County to I-95.				County	Bryan	
				Project #:		
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	21,900	2035:	37,300	RCD/MPO:	CRC
Truck %	2006:	9.8%	2035:	10.4%	Length (miles):	4.8
No. of Lanes	Existing:	4	Recommended:	6	Route #:	25
Functional Classification:			Principal Arterial		Beginning and Ending Points:	SR 196/ I-95
<b>Project Need and Purpose:</b> Under the existing roadway configuration, US 17 is anticipated to have significant deterioration of LOS by 2035. Widening on US 17 is needed to facilitate safe and efficient travel of commuters to and forth from the Savannah area. The capacity improvements to US 17 will also provide relief for the users of I-95 during the peak hours.						
<b>Logical Termini:</b> The eastern terminus is at the T-intersection at SR 196 in Liberty County. SR 196 is currently under construction to be widened to 4 lanes. The completion of this improvement is expected to attract more commuters from Liberty County onto US 17. The western terminus is at the I-95 interchange since a significant share of travelers utilizes this interchange to access Savannah and other destinations.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$2,584,000	\$ 11,636,000	\$3,309,000	\$32,298,000	\$49,827,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



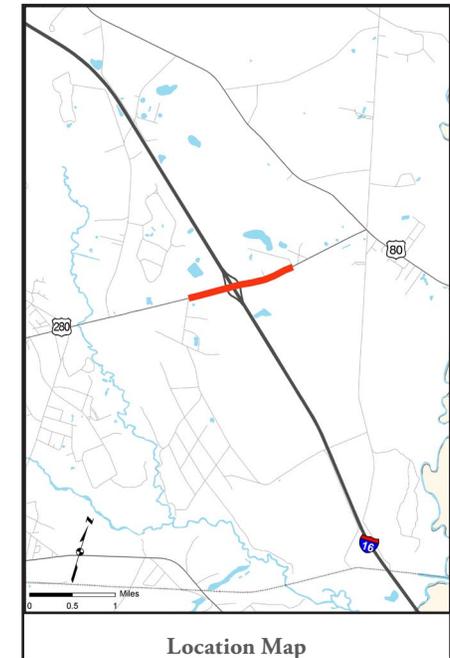
# Chapter 4

Harris Trail Road Widening (Phase 2 - Port Royal Road to Belfast Keller Road)						
<b>Description:</b> Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Timber Trail to Port Royal Road.				County	Bryan	
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	N/A	2035:	7,200	RCD/MPO:	CRC
Truck %	2006:	N/A	2035:	6.4%	Length (miles):	2.9
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Local		Beginning and Ending Points:	Port Royal Road to Belfast Keller
<b>Project Need and Purpose:</b> With the completion of Harris Trail Extension, traffic on Harris Trail Road is expected to increase by greater than 100% from 5,600 in 2006 to 12,500 by 2030, resulting in deficient LOS. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.						
<b>Logical Termini:</b> The northern terminus is at the existing 4-lane section ending at Timber Trail. The southern terminus is at Port Royal intersection as the travel pattern indicates a significant diversion of traffic from Harris Trail to Port Royal Road.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,175,000	\$ 2,937,000	\$2,001,000	\$14,685,000	\$20,798,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



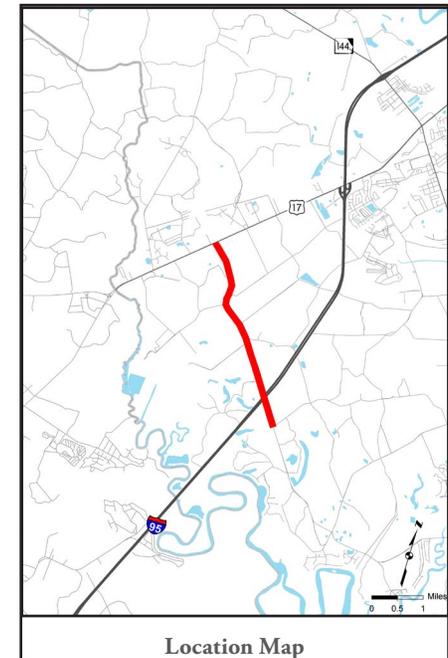
# Chapter 4

US 280/SR 30 Widening (Interstate Centre)						
<b>Description:</b> Widen US 280/SR 30 from 2 lanes to 4-lanes with 20-ft median at the proposed entrances of Interstate Centre.				County	Bryan	
				P.I. No.:	0004799	
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	4,300	2035:	16,600	RCD/MPO:	CRC
Truck %	2006:	10.0%	2035:	24.9%	Length (miles):	1.0
No. of Lanes	Existing:	2	Recommended:	4	Route #:	30
Functional Classification:			Principal Arterial		Beginning and Ending Points:	N/A
<b>Project Need and Purpose:</b> Widening of US 280/SR 30 is needed to improve safety and accommodate increasing traffic volumes as a result of the proposed Interstate Centre Industrial Park. The additional capacity improvement will facilitate large truck traffic generated from the proposed development and headed towards the Port of Savannah area via I-16.						
<b>Logical Termini:</b> The project termini are located at the anticipated eastern and western entrances of the Interstate Centre Industrial Park because significant deterioration of LOS on US 280/SR 30 is expected near the development.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$539,000	\$1,532,000	\$686,000	\$6,741,000	\$9,498,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



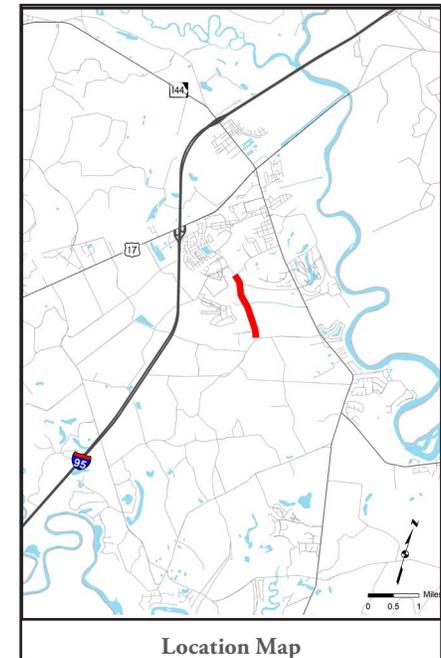
# Chapter 4

Belfast Siding Road Widening (US 17 to Park Hill 20 Road)						
<b>Description:</b> Widen Belfast Siding Road from 2 lanes to a 4-lane divided section beginning at US 17 and ending at the Park Hill 20 Road.			County		Bryan	
			P.I. No.:			
			GDOT District		5	
			Congressional District:		1	
Traffic Vol.:	2006:	2,600	2035:	12,000	RCD/MPO:	CRC
Truck %	2006:	3.8%	2035:	10.3%	Length (miles):	5.7
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Local		Beginning and Ending Points:	US 17 to Park Hill 20 Road
<b>Project Need and Purpose:</b> Widening of Belfast Siding Road will provide relief to the congested conditions anticipated as a result of the planned development surrounding this roadway.						
<b>Logical Termini:</b> The northern terminus is at the T-intersection at US 17, which provides the most direct access to I-95. The southern terminus is at Park Hill 20 Road intersection.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$1,984,000	\$3,118,000	\$3,924,000	\$24,805,000	\$33,832,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):		GDOT	



# Chapter 4

Harris Trail Road Widening (Phase 1 - Timber Trail to Port Royal Road)						
<b>Description:</b> Widen Harris Trail Road from 2 lanes to 4 lanes with 20-ft raised median from Timber Trail to Port Royal Road.				County	Bryan	
				P.I. No.:		
				GDOT District	5	
				Congressional District:	1	
Traffic Vol.:	2006:	3,000	2035:	10,000	RC/MPO:	CRC
Truck %	2006:	8.0%	2035:	9.6%	Length (miles):	1.3
No. of Lanes	Existing:	2	Recommended:	4	Route #:	
Functional Classification:			Minor Collector		Beginning and Ending Points:	Timber Trail to Port Royal Road
<b>Project Need and Purpose:</b> With the completion of Harris Trail Extension, traffic on Harris Trail Road is expected to increase by greater than 100% from 5,600 in 2006 to 12,500 by 2030, resulting in deficient LOS. Harris Trail Road provides the much needed bypass for downtown Richmond Hill and an alternative route for the residents in south Bryan to access US 17 and I-95. As such, additional capacity is needed to accommodate the new demand for this route.						
<b>Logical Termini:</b> The northern terminus is at the existing 4-lane section ending at Timber Trail. The southern terminus is at Port Royal intersection as the travel pattern indicates a significant diversion of traffic from Harris Trail to Port Royal Road.						
Project Phase	Preliminary Engineering	Right-of-Way	Utility Relocation	Construction	Total	
Cost Estimate	\$653,000	\$1,271,000	\$894,000	\$8,163,000	\$10,980,000	
Note: All costs are in 2008 dollars			Project Type (Local/GDOT):	GDOT		



# Chapter 4

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# Chapter 5

## Financial Resources



# Chapter 5

## 5.0 Funding

The Bryan County Transportation Study has been developed to address Bryan County's transportation needs through 2035. To support implementation of this plan, the following sections provide a general overview of funding programs potentially available to help advance project recommendations. The funding programs were identified in an effort to proactively group projects into the most applicable funding sources based on current requirements. Furthermore, compliance with the GDOT's Plan Development Process (PDP) is recommended, as the PDP is required for state and federal project funding eligibility.

It should be noted that federal legislative changes are pending. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) will expire in September 2009. Efforts are underway in congress and USDOT to develop the next act. However, it is likely that an 18-month extension SAFETEA-LU will occur. Additionally, discussions concerning state transportation funding have recently occurred as part of the 2009 state legislative session.

### 5.1 Federal Funding Sources

Federal funding programs typically dedicate 80 percent of the project cost if the project is eligible for federal funding. The remaining 20 percent is obtained through the state or local jurisdictions sponsoring the projects and generally used for completing the planning and design of the projects. Federal and state funds are programmed by GDOT for preliminary engineering (PE), right-of-way and construction costs.

Title 23 U.S.C does not recognize local governments as direct recipients of federal funds. GDOT assumes the responsibilities of determining the subrecipients of federal funds. As such, Bryan County may apply for federal funding for an eligible project by first submitting the plans to the GDOT District 5 Office for review. Upon completion of the review, the District 5 Office will then make recommendations to the GDOT Office of Planning for consideration in the State Transportation Improvement Program (STIP). The STIP is a multi-year capital improvement program which contains

information on all programmed projects receiving federal funds in the state of Georgia.

The following federal funding programs are potentially applicable to the recommendations in the Bryan County Transportation Study:

- Federal funding for the majority of highway system improvements (excluding interstate highways) planned in Bryan County is expected to come from the Surface Transportation Program. The distribution of STP funds includes 62.5 percent for use in urban areas (greater than 50,000 population) of the state based on population. Another 27.5 percent can be used in any area of the state at the direction of the State Transportation Board. The remaining ten percent is used for Transportation Enhancement (TE) projects.
- TE funds are available for non-traditional improvements such as aesthetic enhancements, bicycle and pedestrian facilities, historic preservations, and others. Local jurisdictions must compete for TE funds by submitting an application to be reviewed by the State Transportation Board. Richmond Hill has been awarded TE funds to enhance SR 144 and create a downtown area around the City Hall complex. Most recently, Bryan County was selected to receive TE funding for the redevelopment initiative for downtown Pembroke.
- The National Highway System (NHS) funding is available for improvements to the interstate system and the NHS routes. The widening projects of I-95 and US 280 would be eligible for the NHS funds.
- Highway Bridge Replacement and Rehabilitation Program provides funding for any public bridge replacement or rehabilitation. Included in the study recommendations are four bridges that meet the federal requirements (sufficiency rating of 50 or below) for potential replacement or rehabilitation.
- Safe Routes to School (SRTS) funds are available for pedestrian and bicycle projects within two miles of a school. These funds are distributed through GDOT and are available for grades kindergarten through eight. Given that the recommended bicycle and pedestrian projects have an emphasis in providing safe connections to schools, the SRTS program has been identified as an appropriate federal funding source for these projects. Specific recommendations eligible for the SRTS funds include sidewalks on Payne Road, SR 119, Ash Branch Road, Ivey Street, Maple Street, and Constitution Way.

# Chapter 5

- Recreational Trails Program (RTP) provides grants to fund recreational trail projects. Projects typically selected by the RTP for funding must meet the general criteria set forth in the Statewide Comprehensive Outdoor Recreation Plan. A recreation plan is required to demonstrate that the trail project will enhance outdoor recreation and natural resource conservation. The shared-use path recommendations, including shared-use paths along canal systems and the Coastal Georgia Greenway, could be applicable for the RTP funds.

## 5.1.1 Georgia Transportation Stimulus Package

The American Recovery and Reinvestment Act (ARRA) of 2009 has allocated \$932 million for highway transportation and \$144 million for public transit to Georgia's transportation stimulus package. For any federal highway purpose under the STP program, 67 percent was allocated directly to GDOT, 30 percent went to MPOs and areas with population less than 5,000, and three percent was set aside for TE projects. To be eligible to receive funding from the stimulus package, projects have to meet the following "shovel-ready," requirements, meaning all standard federal eligibility requirements:

- Projects have gone through environmental clearances in accordance with the National Environmental Protection Act;
- Projects have right-of-way acquisition and certification;
- Projects must be included or amended into STIP/TIPs.

At this time, none of the projects recommended in the Bryan County Transportation Study meet the requirements to receive funding from the federal stimulus package. Most of the roadway projects eligible for stimulus funding include maintenance and resurfacing projects, traffic safety improvements (signal upgrades, turn lanes, etc.) and to a lesser degree, roadway widening projects. Currently, Phase I stimulus projects in Bryan County include resurface and maintenance projects along sections of I-95, US 17/SR 25 and US 280/SR 30.

## 5.2 State Funding Sources

As aforementioned, funding for most transportation projects in Bryan County comes in part through GDOT. A substantial portion of GDOT funding

comes from the federal government through Federal Title I Apportionments. State highway funds are available from several sources including motor fuel taxes, special fuel taxes (diesel), state bonds and three percent state sales tax on gasoline. Federal Title I Apportionments and State motor fuels taxes account for almost 98 percent of the budget for GDOT funding. State Aid and Local Technical Assistance Program (LTAP) are funded by motor fuel taxes. Note that Georgia currently has one of the nation's lowest state motor fuels taxes, excluding sales taxes. Even when including the additional four percent sales tax (three percent for transportation use, and one percent for the State General Fund), Georgia's motor fuel taxes are the third lowest in the U.S.

In addition to motor fuel taxes, the State of Georgia also has in place the Fast Forward Bond Program to help fund transportation infrastructure projects. The Fast Forward program is a \$15.5 billion state transportation program announced by Governor Sonny Perdue in 2004. The \$15.57 billion investment includes:

- \$11 billion in funding through the regular GDOT program;
- \$1.5 billion in General Obligation (GO) and General Revenue (GR) bonds to fund arterial road improvements and the Governor's Road Improvement Program (GRIP); and
- \$3 billion in federally funded Grant Anticipation Revenue Vehicles (GARVEE) bonds. GARVEE bonds are a new funding mechanism for Georgia and an additional revenue stream that will primarily fund congestion relief projects.

Fast Forward program allows the construction of priority projects in the next six years that which would otherwise take 18 years. This program is intended to implement projects that provide congestion relief and economic development. Short-term congestion relief projects include traffic operational/system management improvements such as Intelligent Transportation Systems, signal timing and synchronization upgrades. Long-term congestion relief includes high-occupancy vehicle (HOV) lanes and new transit corridors. Economic development improvements include interstate capacity improvements.

As noted above, the funding for the GRIP program comes from bond sales. The GRIP program was started in 1989 through action by the Georgia

# Chapter 5

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Legislature, and viewed as a priority funding program for GDOT. The program's goal is to connect 95 percent of the state's cities with a population of 2,500 or more to the interstate system. US 280, also known as the Power Alley that connects Columbus to Savannah, is part of the GRIP corridor system. Currently, only a small section of US 280 has active engineering, and there are no immediate plans to improve the section of US 280 in Bryan County.

## 5.3 Local Funding Sources

Local governments receive revenues from a number of sources to support the public facilities and services they provide to citizens. These sources include federal and state funds, "own source" funds, such as property tax revenues and other monies, and discretionary grant funds from federal and/or state agencies.

As such that state funding often lags behind the need, Bryan County should consider placing a focus on generating greater local revenues through Special Local Option Sales Tax (SPLOST) and other potential mechanisms. As noted in the baseline assessment section of this report, Bryan County has had in place a SPLOST for the past 12 years, with the majority of the funds being earmarked for paving projects. The current six-year SPLOST (SPLOST V) cycle is scheduled to run through March 2012.

# Chapter 6

## Public Involvement & Technical Advisory Committee



# Chapter 6

## 6.0 Public Involvement

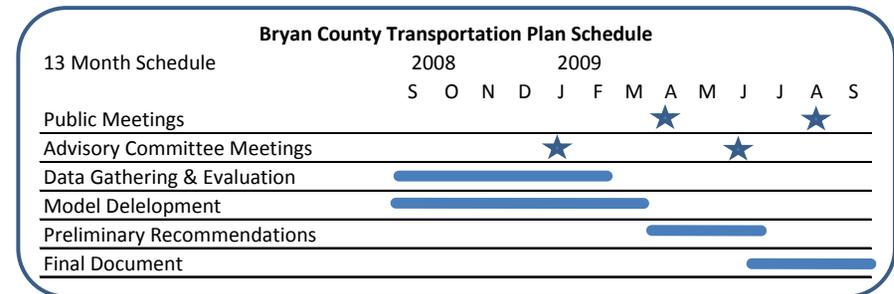
It was determined early in the planning process that a major public outreach effort would be launched to target all segments of the population. The process of public involvement was outlined in the Public Involvement Plan (PIP). The PIP outlined how the input from stakeholders – public and private, elected and appointed officials, representatives of business, faith-based and community-based groups, representatives of minority populations, and the public at large—would be incorporated to establish a successful plan. A copy of the PIP and other public involvement materials are included in the appendices.

Although Bryan County’s north-south divide posed some logistical challenges, the project team undertook a broad dissemination of user-friendly information about the study throughout the planning process, and to provide a wide range of opportunities for all stakeholders to make their views known. The following sections detail the major components of the public outreach efforts employed as part of the Bryan County Transportation Study process.

### 6.1 Advisory Committee

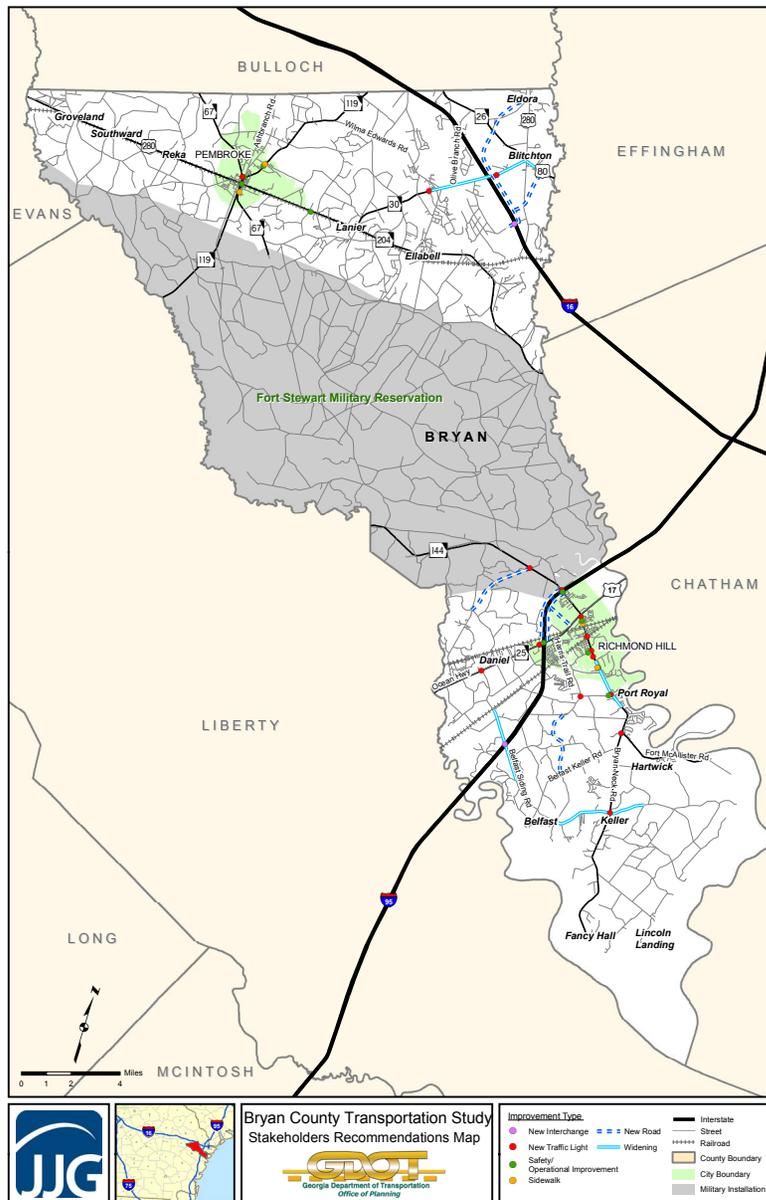
The PIP called for the formation of an Advisory Committee which provided oversight on technical and policy issues through a series of meetings. The Advisory Committee consisted of over twenty members from Bryan County, Cities of Richmond Hill and Pembroke, GDOT’s Transportation Planner, District Planning and Programming Engineer, RC staff, and other agency partners. Meeting minutes including the sign-in sheets are included in the appendices. The Advisory Committee met three times throughout the course of the study to provide feedback, general oversight and technical review of the study findings. This committee also identified critical areas within the transportation network, reviewed potential alternatives, and assisted in the outreach effort. **Figure 6.1** (opposite) illustrates the study schedule that highlights the Advisory Committee and public meeting dates at project milestones.

Figure 6.1: Project Schedule



# Chapter 6

Figure 6.2: Potential Improvements from Map Exercise



The first Advisory Committee meeting was held on November 18, 2008, as the official Local Agency Kick-off Meeting for the Bryan County Transportation Study. The purpose of this meeting was to introduce the study to local officials and receive input on key issues affecting the Bryan County transportation system. The group engaged in a map exercise to assist the study team in identifying transportation issues to be considered in the study. **Figure 6.2** (opposite) illustrates the potential improvements to be considered as a result of the map exercise. It is important to note that many of the improvements identified in the kick-off meeting were incorporated into the final recommendations.

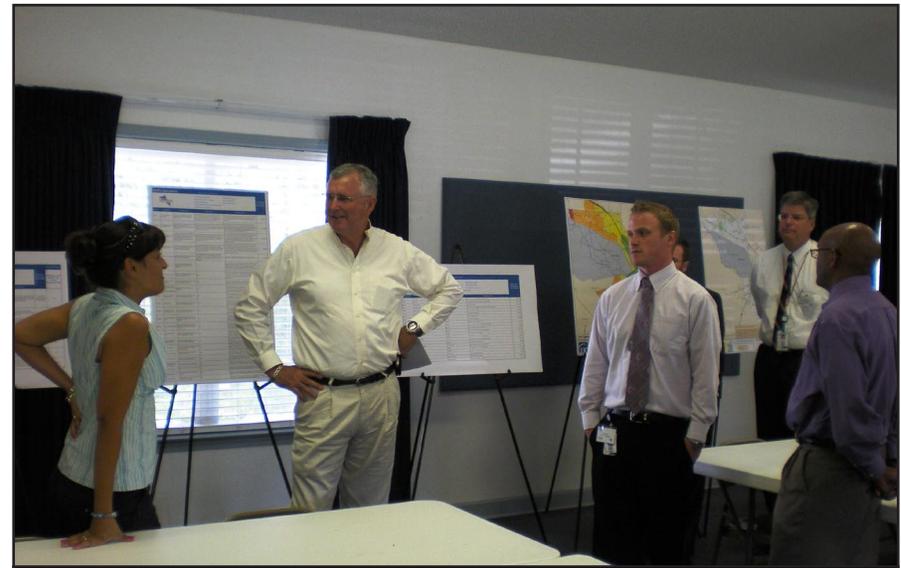
The second Advisory Committee meeting took place on February 11, 2009, at the Bryan County Courthouse Annex in Richmond Hill. Topics discussed included a progress update on study activities, review of travel demand model assumptions, and an exercise that refined transportation related goals from previous studies to shape the format and direction of the Bryan County Transportation Study. An electronic voting system was employed to gather committee input on potential study goals. The voting exercise was based on four potential goals that were drafted by consolidating goal statements

# Chapter 6

presented in previous Bryan County planning efforts (e.g., Bryan County City of Pembroke and City of Richmond Hill Comprehensive Plans and Bryan County Bicycle Pedestrian Study). **Figure 6.3** (page 6-4) displays the local priorities reflected in the results from the voting exercise. Refer to *Chapter 2 – Goals Development and Evaluation Framework*, for the study goals and the corresponding needs statements which shaped the format and direction of this study.

The final Advisory Committee meeting was held on June 24, 2009 at the John W. Stevens Wetlands Education Center in Richmond Hill. The purpose of this meeting was to present the preliminary project recommendations and receive input from the committee to finalize these recommendations. The committee conducted group discussions regarding potential project termini as well as the need for other projects. The following bullets highlight the Advisory Committee comments, many of which came from city staff of Richmond Hill, that have been reflected in the final list of improvements:

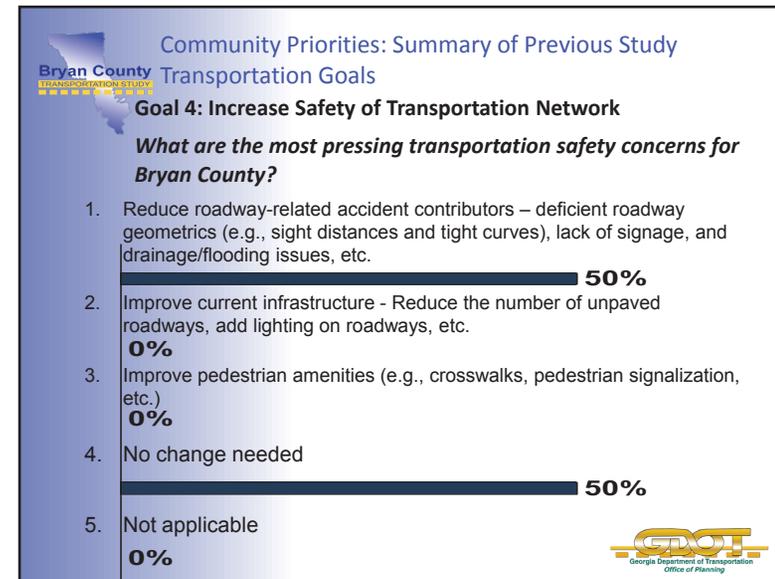
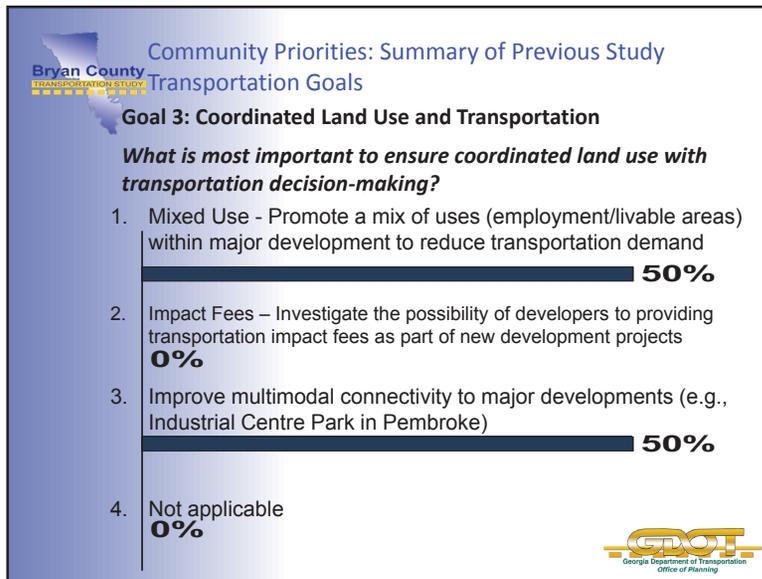
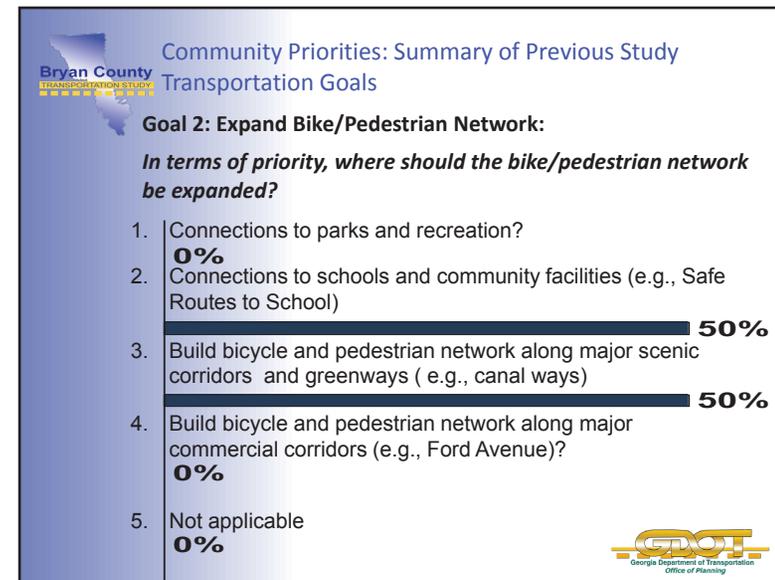
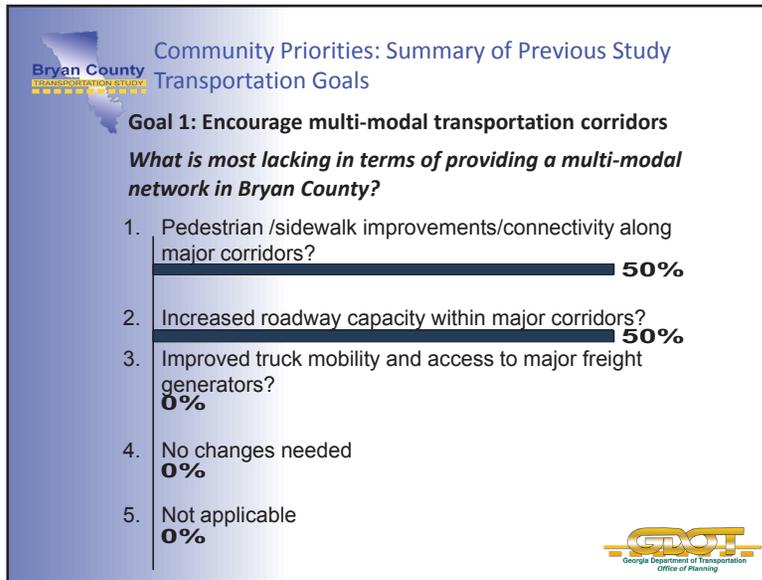
- The widening of US 17 from SR 196 to SR 144 should terminate west of the I-95 interchange to direct commuter traffic from Liberty County to I-95 without having to go through the commercial district in Richmond Hill;
- The widening of SR 144 to four lanes between Timber Trail and Belfast Keller Road should be a top priority;
- The widening of SR 144 to six lanes between US 17 and Timber Trail is not consistent with Richmond Hill's plans to promote a pedestrian-friendly environment and preserve its downtown; and
- Harris Trail Road functions as the most logical bypass to the city. Improving this road will deflect traffic from SR 144 and preserve the character of downtown Richmond Hill.



Advisory Committee Meeting, June 2009

# Chapter 6

Figure 6.3: Local Priorities from Voting Exercise



# Chapter 6

## 6.2 Stakeholder Interviews

Stakeholder interviews and one-on-one briefings with a cross section of community leaders in the study area were conducted at the onset of the study as part of the outreach effort. These interviews allowed the project team to identify key issues and consensus-building opportunities, obtain specific ideas and suggestions regarding desired quality of life, population growth, land use preferences, transportation priorities, and assist in the outreach effort.

Initially, the study team identified 39 elected and appointed officials, civic leaders, and representatives from faith and community-based organization, for the one-on-one interviews. As presented in **Table 6.1** (opposite), the study team was able to interview 17 of the identified stakeholders. A list of all the identified stakeholders as well as a summary of the interviews are included in the appendices. The following bullets highlight some of the major findings and common themes derived from the interviews:

- SR 144 widening and Harris Trail Extension are priority projects for the county and Richmond Hill;
- US 17 faces capacity issues during the peak hours of travel;
- Interchange at US 17 and I-95 needs to be upgraded to accommodate current and forecast traffic;
- Sidewalks along urban sections of major thoroughfares are needed to provide a safer environment for pedestrians;
- School traffic causes congestion because many are located in close proximity within Richmond Hill;
- The proposed interchange at I-95 and Belfast Siding Road should be considered in the long-term; and
- Growing truck traffic on US 280 at Interstate Centre necessitates the widening of the roadway.

**Table 6.1: Stakeholder Interviews**

Name	Organization	Title
Jimmy Burnsed	Bryan County Planning Commission	Chairman
Phil Jones	Bryan County	County Administrator
Billy Albritton	City of Richmond Hill Planning Commission	Chairman
Richard Davis	City of Richmond Hill	Mayor
Michael Melton	City of Richmond Hill	City Manager
Steve Scholar	City of Richmond Hill	Planning Director
Judy Cook	City of Pembroke	Mayor
Betty Hill	City of Pembroke	City Clerk
Wynn Carney	City of Pembroke	City Planner
Jean Bacon	Bryan County Development Authority	Executive Director
Jo Hickson	Coastal Georgia Greenway	Executive Director
Nevin Patton	1st Bank of Coastal Georgia	Senior VP
Sallie Brewer	Bryan County Schools	Superintendent
Nevin Brown	Main Street Homeowners Association and NAACP	
Johnny Murphy	Buckhead Lakes	Developer
Carlton Cooper	Bethel Baptist Church	Pastor
Sonny Timmerman	Hinesville MPO	Executive Director

# Chapter 6

## 6.3 Public Meetings

Citizens were given opportunities to participate in development of the Bryan County Transportation Study through series of public meetings held over the course of the study. These meetings were designed in an open house format and consisted of informational displays as well as interactive discussion sessions. The community was encouraged to share their ideas on the direction of transportation planning for Bryan County.

Due to the divided nature of the study area, meeting locations were selected in both northern and southern Bryan County to ensure maximum accessibility to participate in the process. The same information was presented at both locations. Newspaper advertisements were purchased to promote the public meetings. The meeting notices were published in the Bryan County Newspaper as well as on the Bryan County Now website. The internet advertisement ran on the main page for two weeks prior to the meeting date. With over 17,000 visits or impressions on a weekly basis, the web advertisement was viewed as a cost-effective tool to reach out to the general public. **Table 6.2** (page 6-7) presents a summary of the outreach methods employed to promote the public meetings. Subsequent section provides an overview of various other communication tools utilized to promote public meetings and disseminate study updates.



Public Meeting, April 2009 (Courtesy Bryan County Now)



Public Meeting, August 2009

# Chapter 6

## 6.4 Communication Tools

Several communication tools were utilized to assist in the outreach process. Examples of outreach materials include a project website, fact sheets, flyers, press releases and internet advertisements announcing upcoming meetings. Each of these tools served a valuable role in informing and updating the public and the community on the progress of the study. Three fact sheets were developed over the course of the study, and were distributed to city and county facilities, as well as key stakeholders. These fact sheets provided progress updates on the study and reported the major findings to date. Meeting flyers and notices were distributed through email and U.S. mail to key stakeholders. Copies of the fact sheets, newspaper advertisements and press releases are included in the appendices.

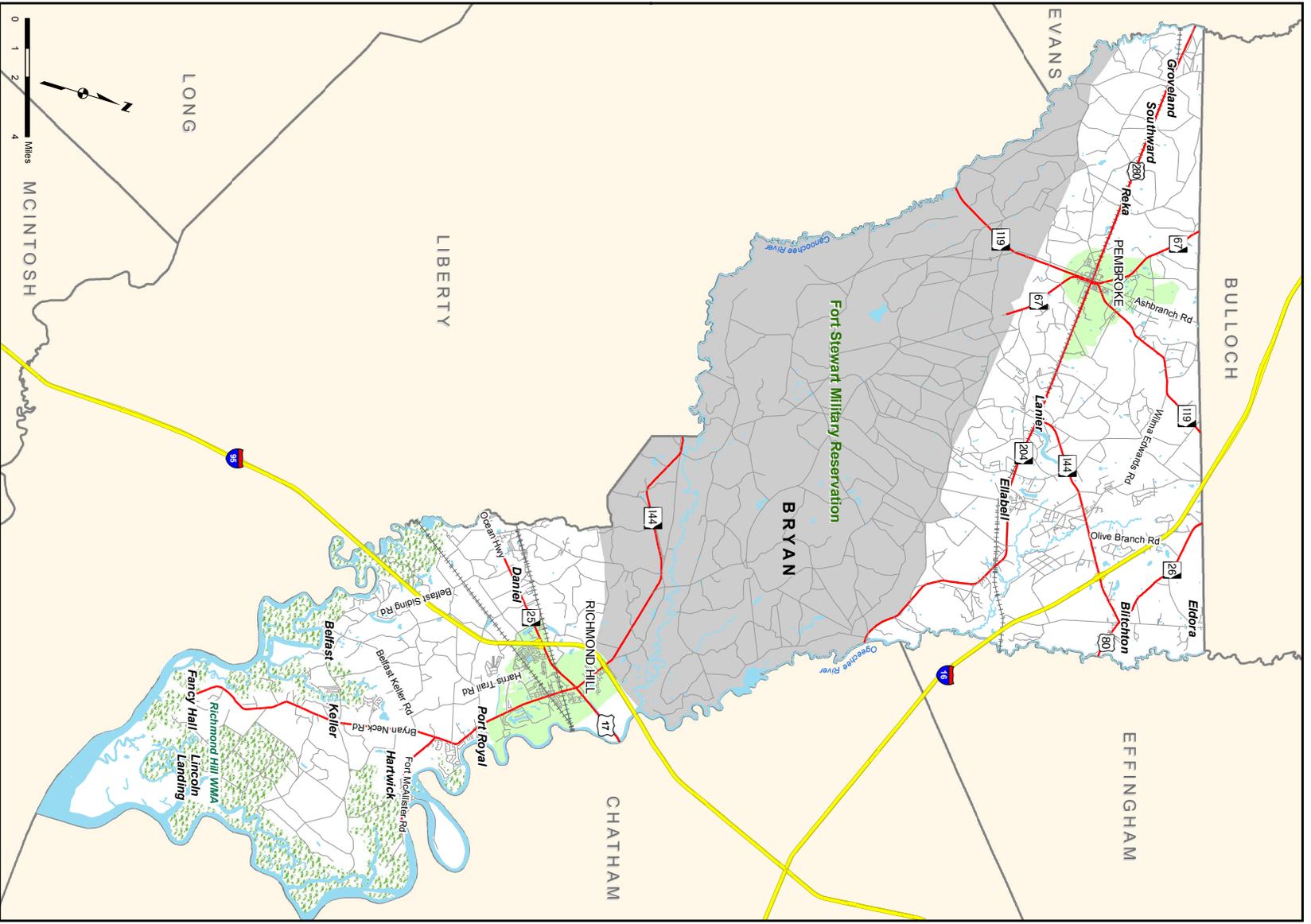
**Table 6.2: Public Meeting Notifications**

Date	Location/ Time	Advertisement	Invitation
April 21, 2009	County Commissioner’s Meeting Room in Pembroke at 2:00pm	Bryan County News - Canned Story published on April 15th; Public meeting announcement published on April 18th;	Email invitations sent out to stakeholders and Advisory Committee members
	John W. Stevens Wetlands Education Center in Richmond Hill at 6:00pm		
August 6, 2009	At Bethel Baptist Church Fellowship Hall in Richmond Hill at 2:00pm	Bryan County News - Internet Advertising for the public meetings ran from July 24th to August 6th on <a href="http://www.bryancountynews.net">www.bryancountynews.net</a> ; Public meeting announcement published on August 1st;	In addition to email invitations, public meeting notices were also sent via U.S. mail to key stakeholders and Advisory Committee members.
	J. Dixie Harn Community Center in Pembroke at 6:00pm		

# Appendix A

## Maps

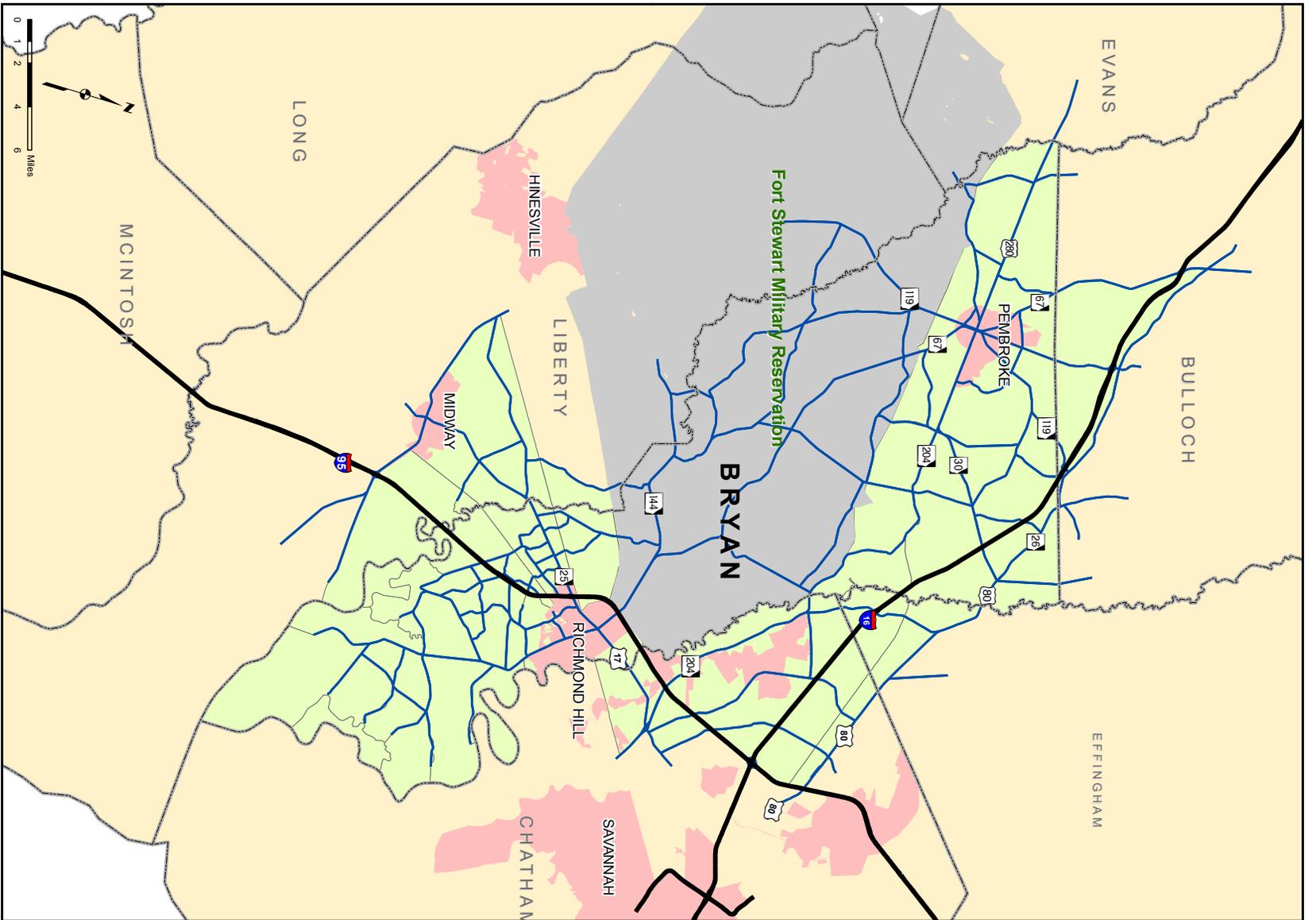




**Bryan County  
Transportation Study**

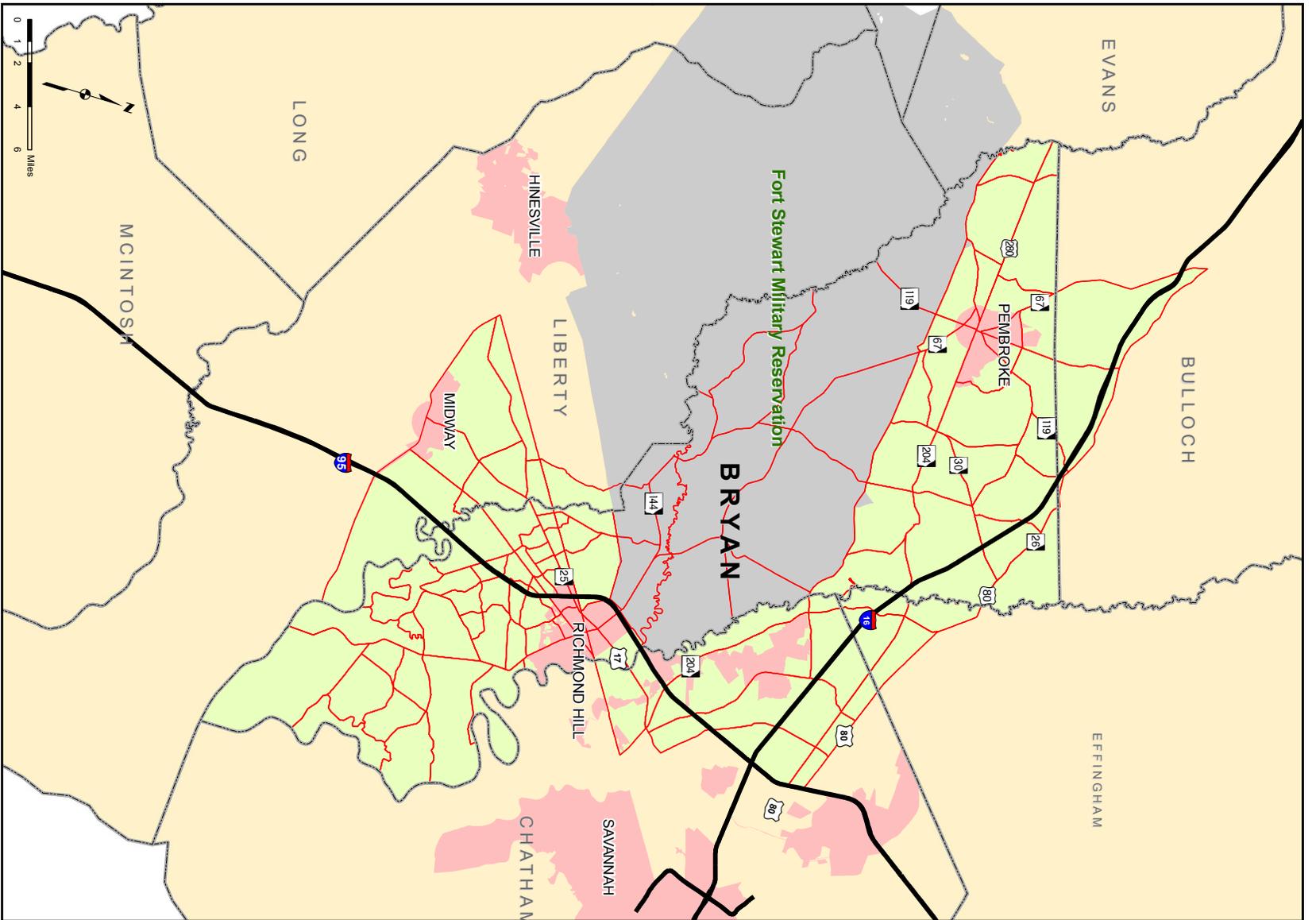
Georgia Department of Transportation  
**GDOT**  
Office of Planning

- Interstate
- State Route
- Street
- Railroad
- Lakes & Rivers
- Military Installation
- Conservation Lands
- City Boundary
- County Boundary



**Bryan County Travel Demand Model Study Area**  
 Georgia Department of Transportation  
 Office of Planning

- Traffic Analysis Zone
- Interstate
- Model Roadway Network
- City Boundary
- County Boundary



**Bryan County Travel Demand Model  
Traffic Analysis Zones (TAZ)**



Georgia Department of Transportation  
Office of Planning

	Traffic Analysis Zone		Fort Stewart
	Interstate		City Boundary
			County Boundary



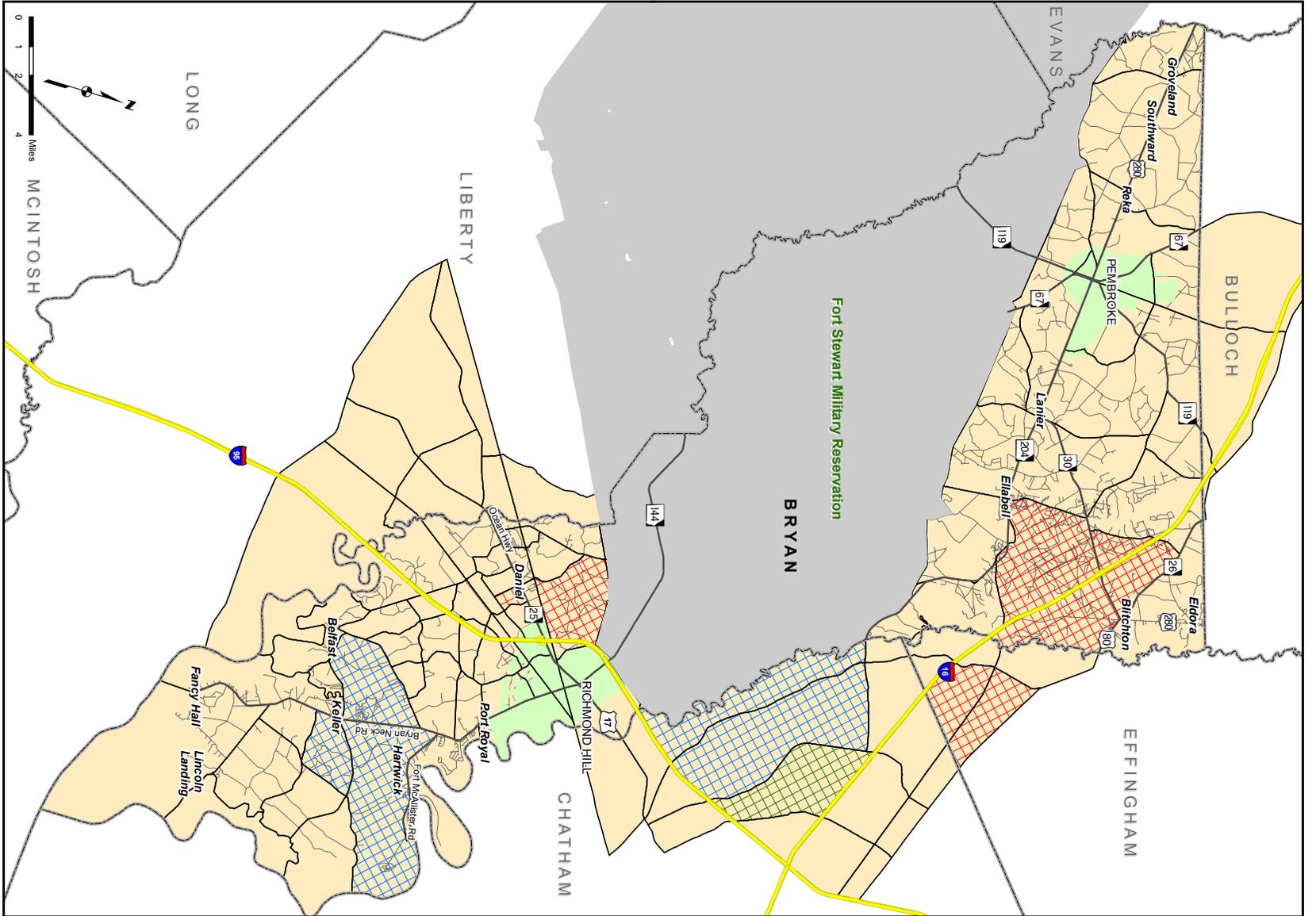
**Bryan County Transportation Study  
2035 High Growth Areas**

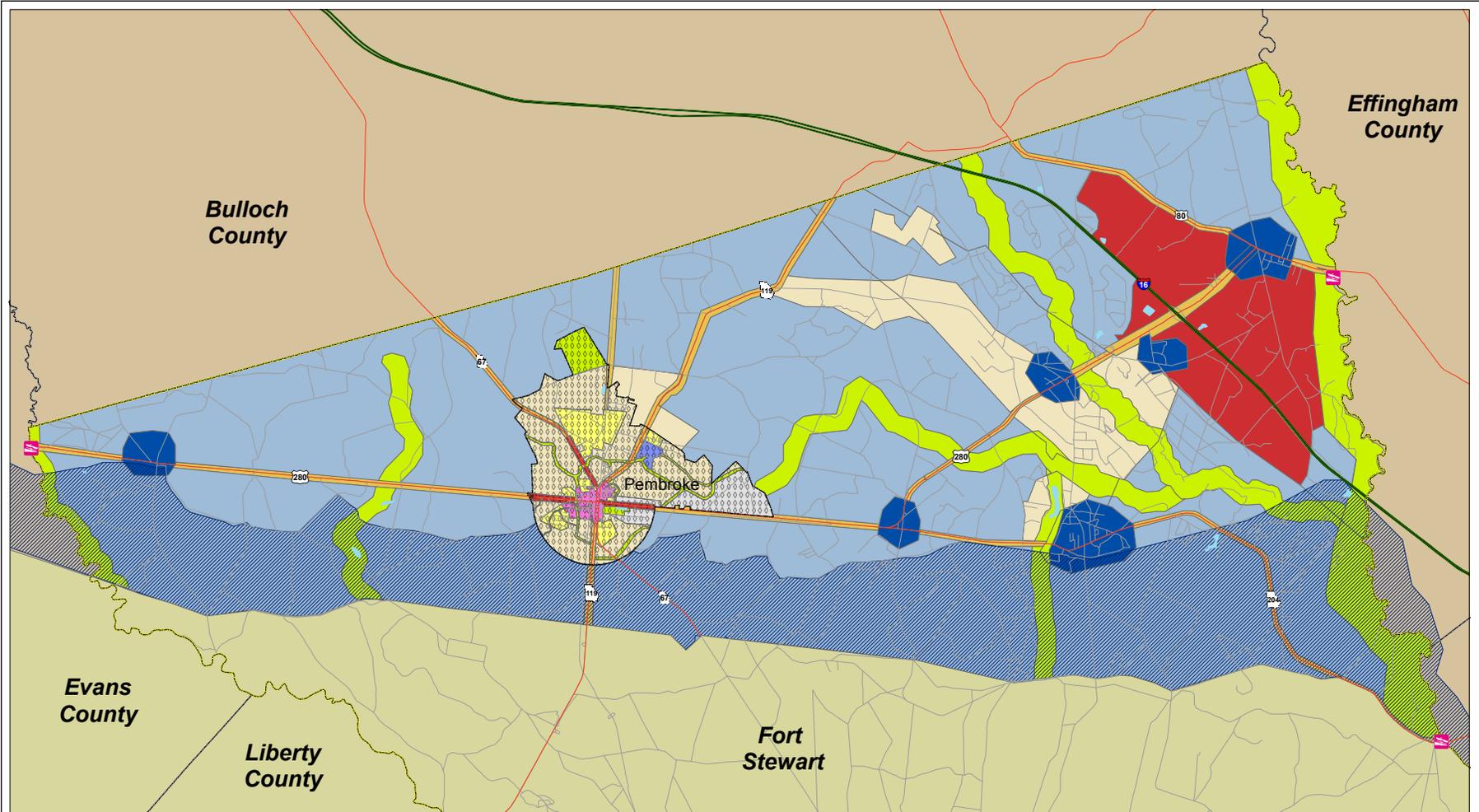
**Concentrated Growth Areas**

- Residential (Blue grid pattern)
- Commercial (Red grid pattern)
- Residential & Commercial (Green grid pattern)

**Other Features**

- Interstate (Yellow line)
- State Route (Black line)
- Local Street (Grey line)
- Fort Stewart (Grey area)
- City Boundary (Black outline)



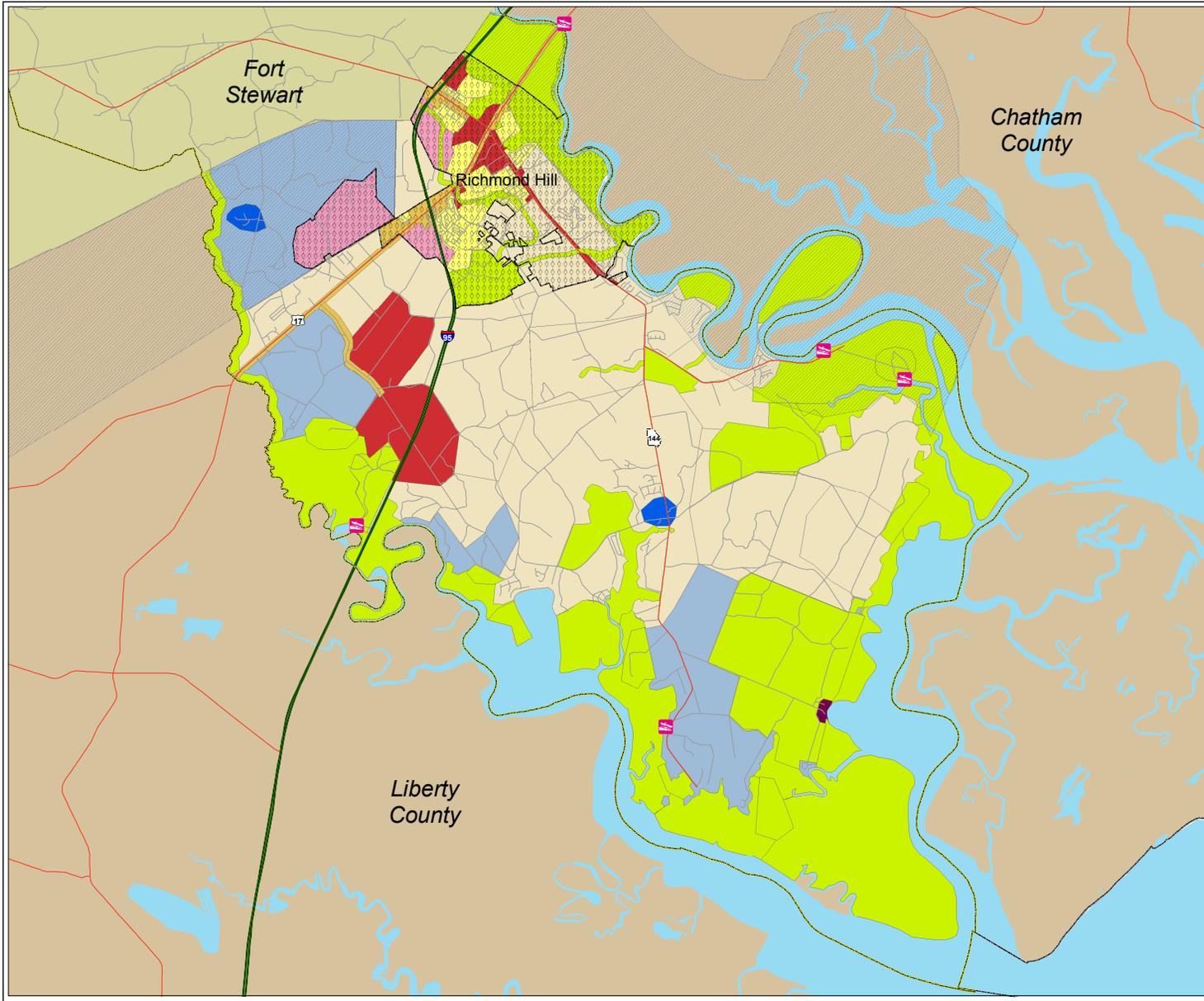


**Future Development**  
**North Bryan County**  
**Georgia**  
**DRAFT**



DISCLAIMER: This map has been prepared to facilitate public access to information. Data shown is for planning purposes only and its accuracy is NOT warranted. CGRDC assumes no liability for the quality, content, accuracy or completeness of the information and other items contained in this map. Individuals are advised to independently verify information before use.

Legend		
Bryan County Boundary	County Future Development Regional Commercial	Pembroke Future Development Commercial
County Boundaries	Conservation	Conservation
City Boundaries	Corridor/Gateway	Educational Campus
Fort Stewart	Crossroads Communities	Gateway
ACUB Boundary	Rural Residential/Agriculture	Historic Pembroke
Water	Suburban Area Developing	Industrial
Public Boat Ramp	Suburban Area Developing	Suburban Area Developing
Interstate	Traditional Residential	Traditional Residential
State Highway		
Roads		



## Future Development South Bryan County Georgia



**DRAFT**

**Legend**

-  Bryan County Boundary
-  County Boundaries
-  City Boundaries
-  Fort Stewart
-  ACUB Boundary
-  Water
-  Public Boat Ramp
-  Interstate
-  State Highway
-  Roads

**County Future Development**

-  Regional Commercial
-  Conservation
-  Corridor/Gateway
-  Crossroads Communities
-  Rural Residential/Agriculture
-  Suburban Area Developing
-  Kilkeny

**Richmond Hill Future Development**

-  Commercial
-  Conservation
-  Corridor/Gateway
-  Suburban Developing
-  Mixed Use
-  Traditional Residential



0 1 2 Miles



Geographic Information Systems/Information Technology Department  
May 2008

DISCLAIMER: This map has been prepared to facilitate public access to information. Data shown is for planning purposes only and it's accuracy is NOT guaranteed. GDOTC assumes no liability for the quality, content, accuracy or completeness of the information and other items contained in this map. Individuals are advised to independently verify information before use.



**2006 Population Density**

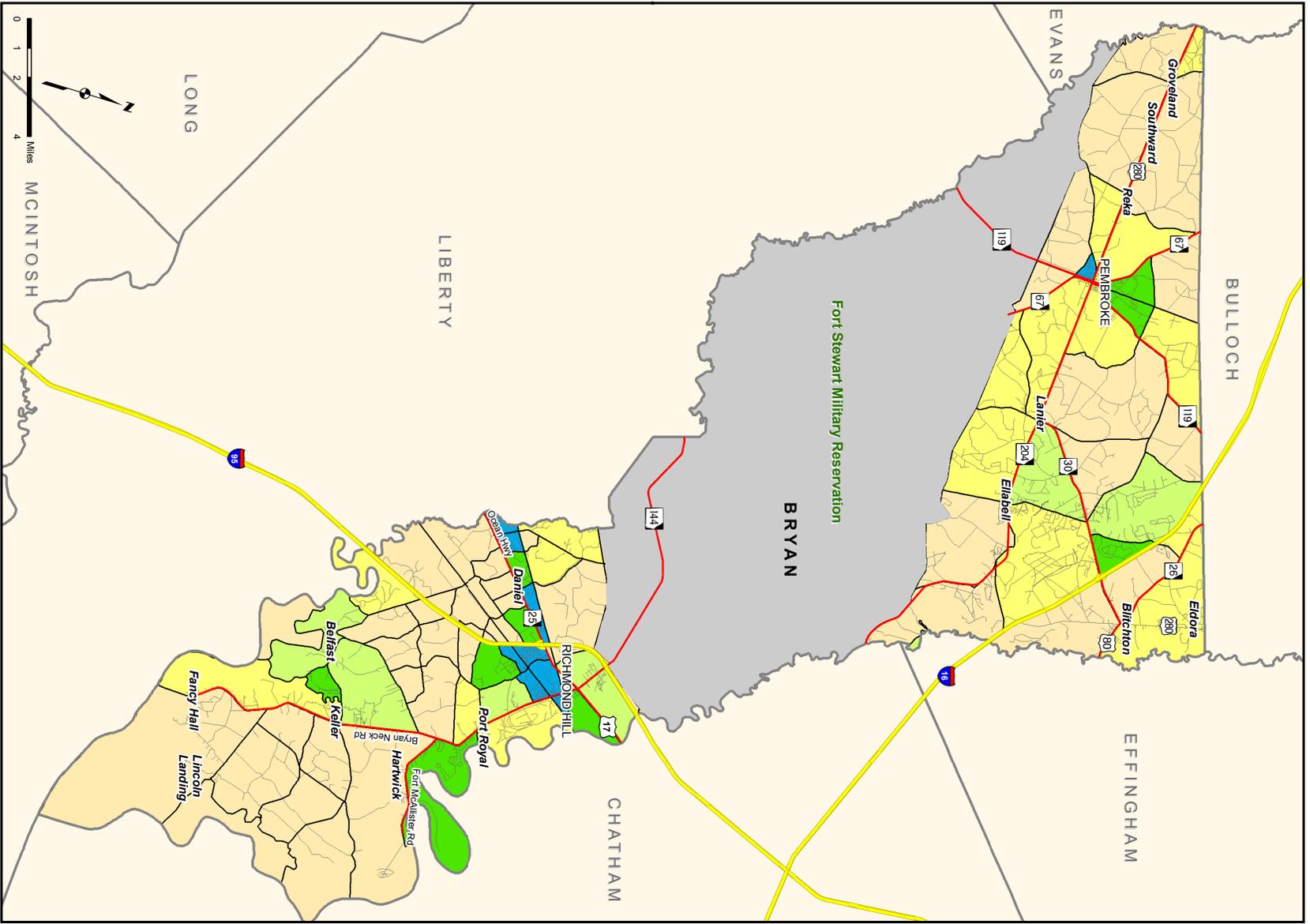
Georgia Department of Transportation  
Office of Planning

**Population Density (per 10 acres)**

- < 1 persons/10 acres
- 1 - 2 persons/10 acres
- 2 - 5 persons/10 acres
- 5 - 10 persons/10 acres
- > 10 persons/10 acres

**Legend:**

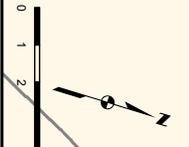
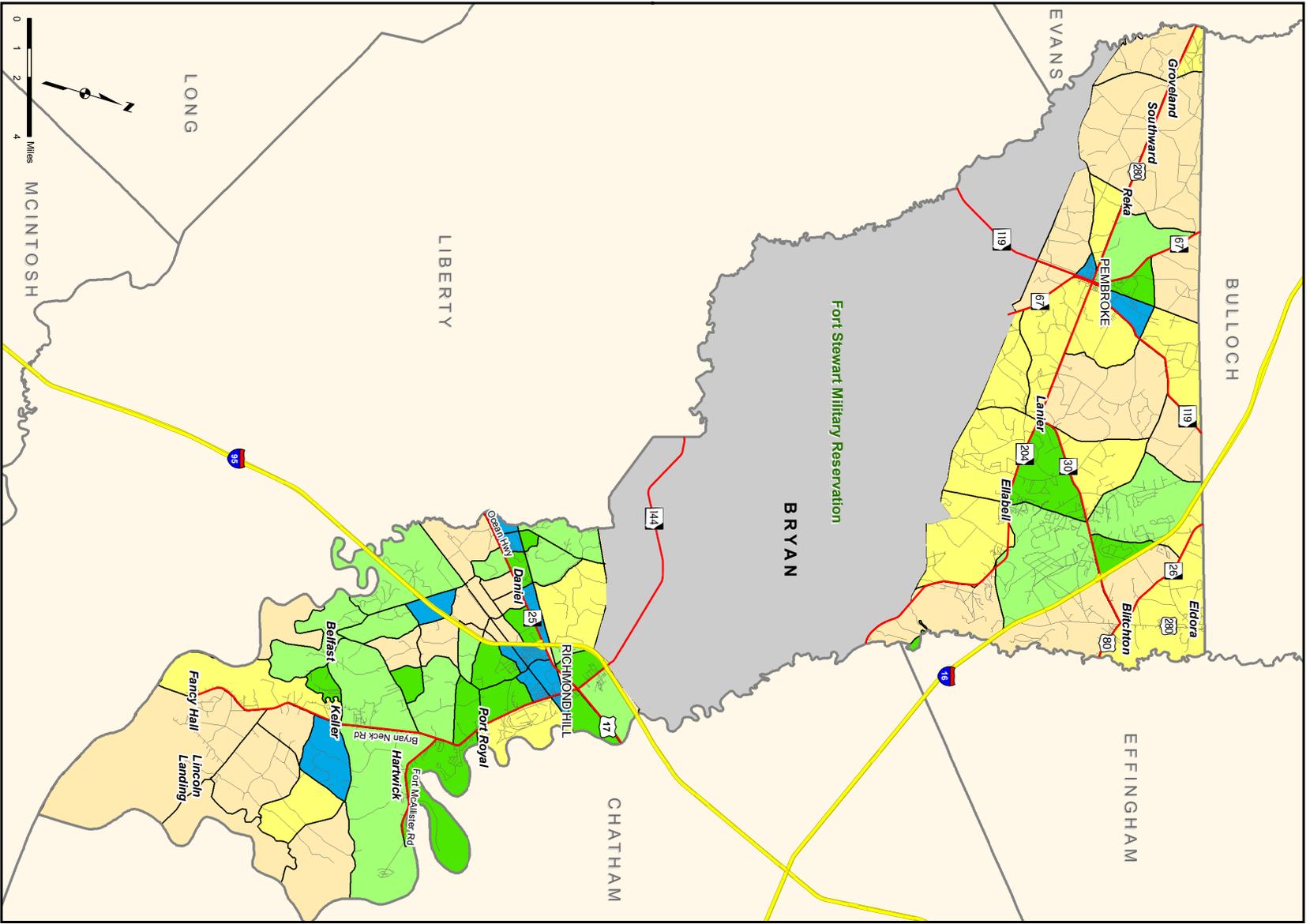
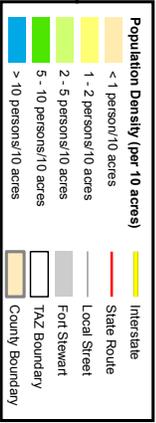
- Interstate
- State Route
- Local Street
- Fort Stewart
- TAZ Boundary
- County Boundary

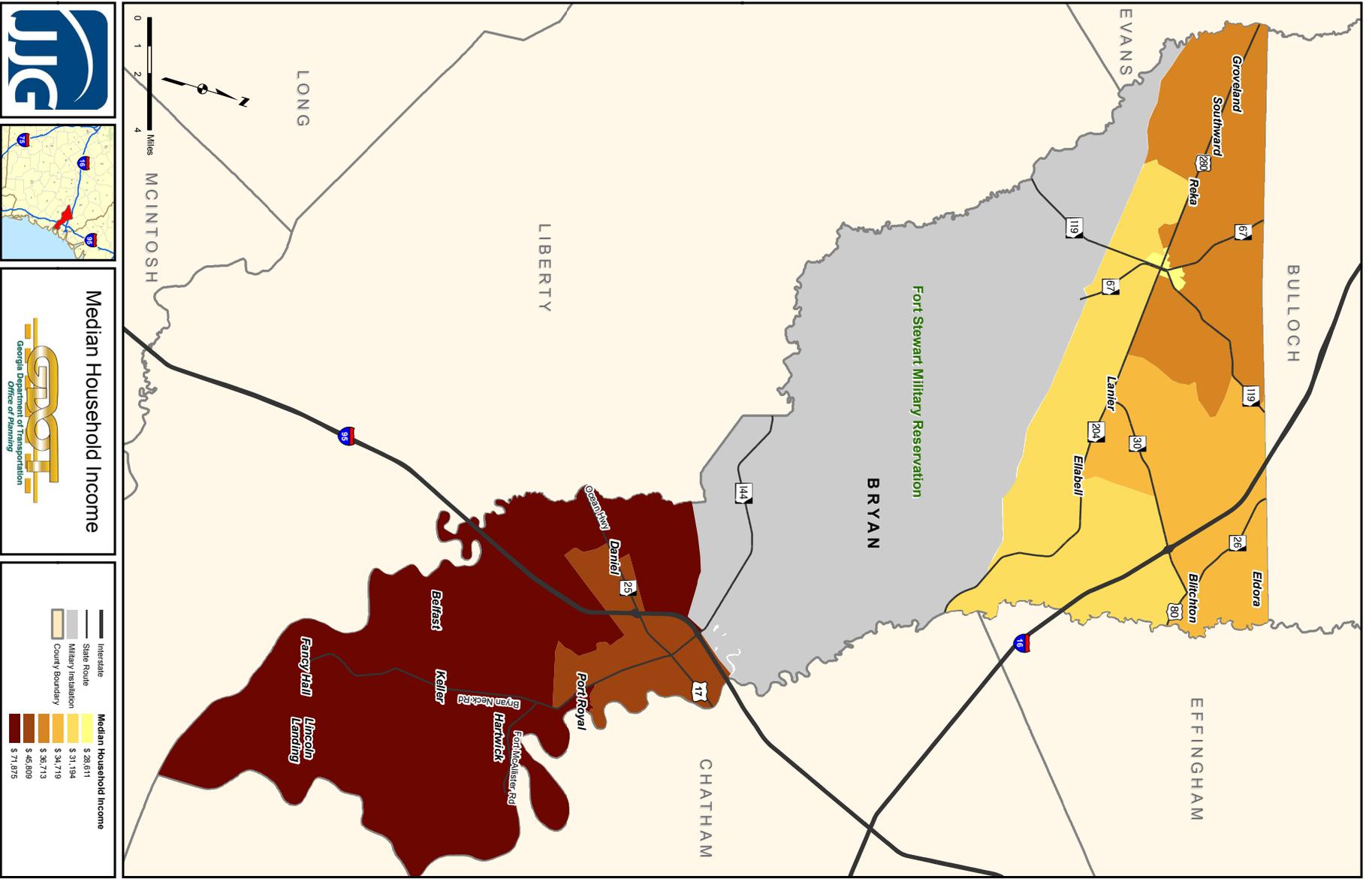


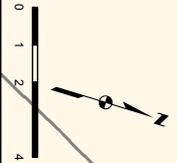
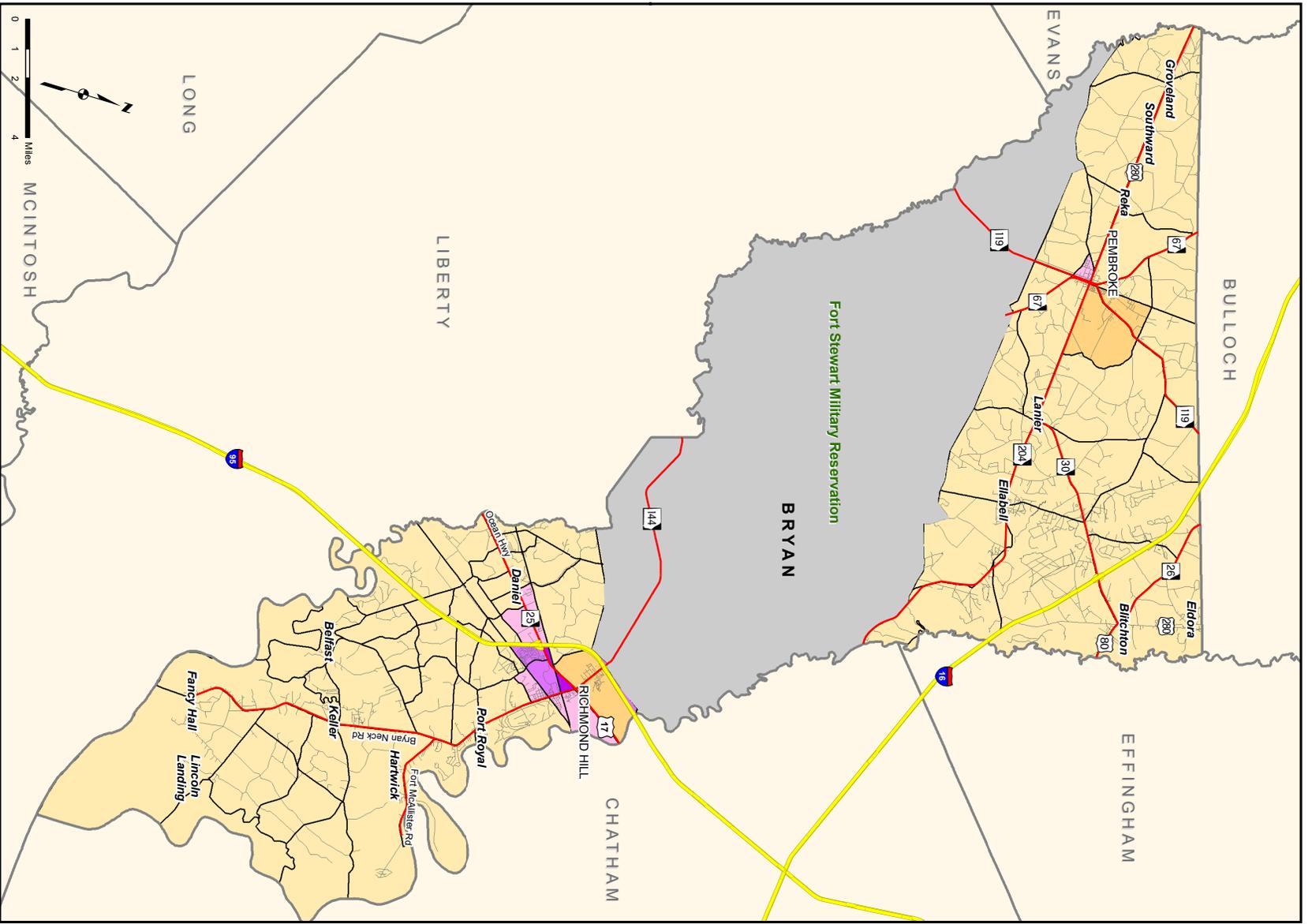


### 2035 Population Density

Georgia Department of Transportation  
Office of Planning







**2006 Employment Density**

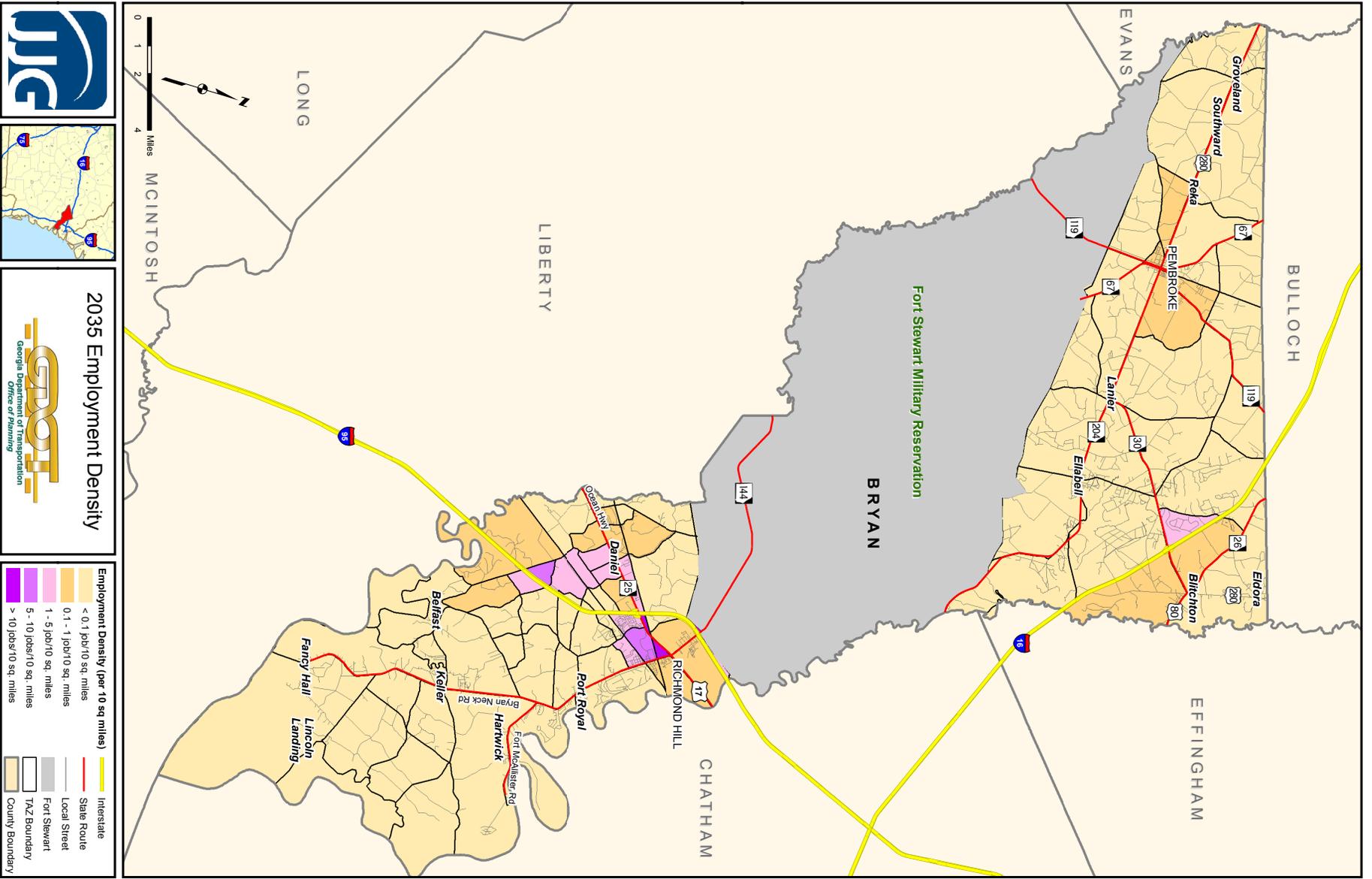
Georgia Department of Transportation  
Office of Planning

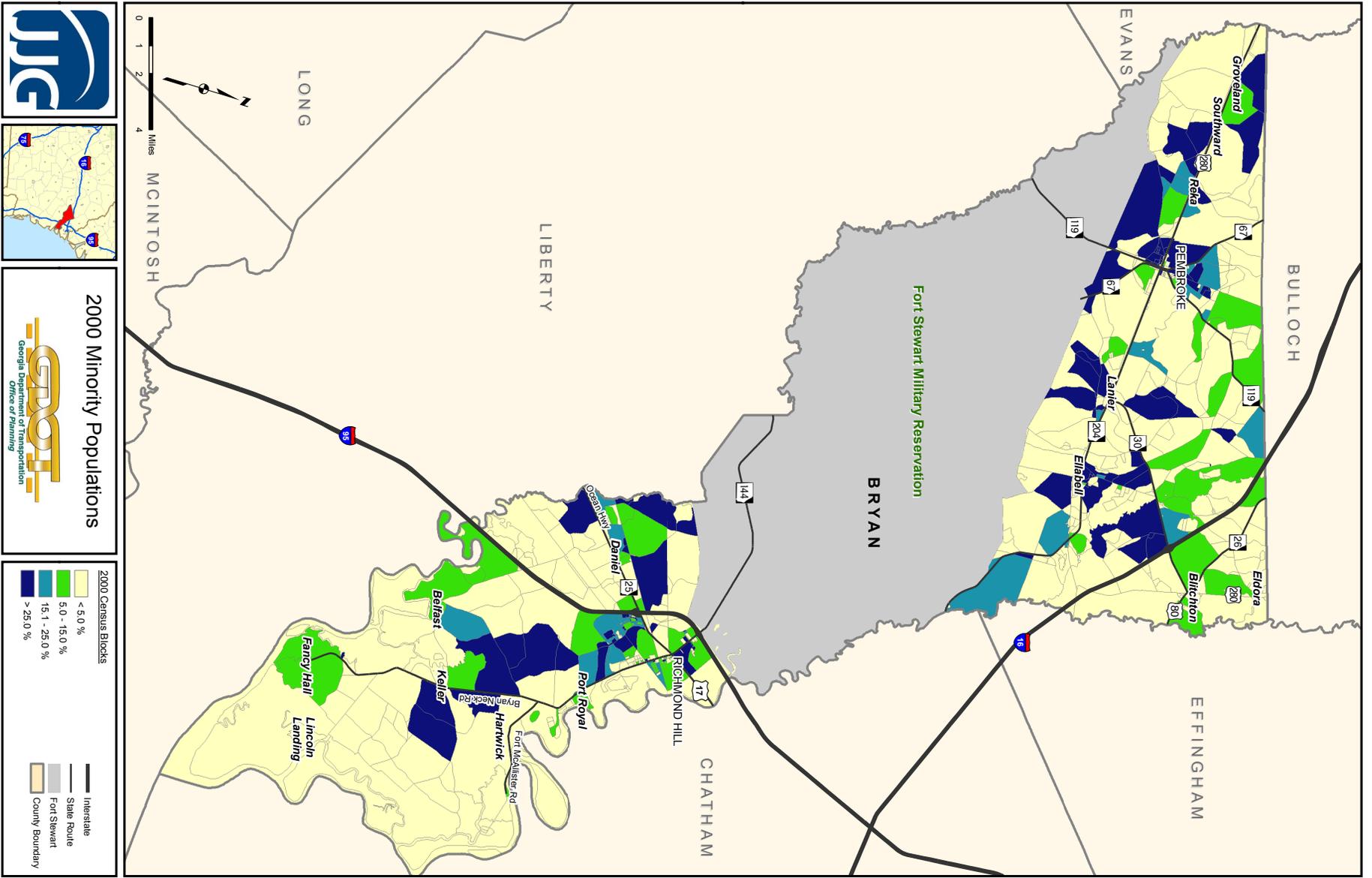
**Employment Density (per 10 sq. miles)**

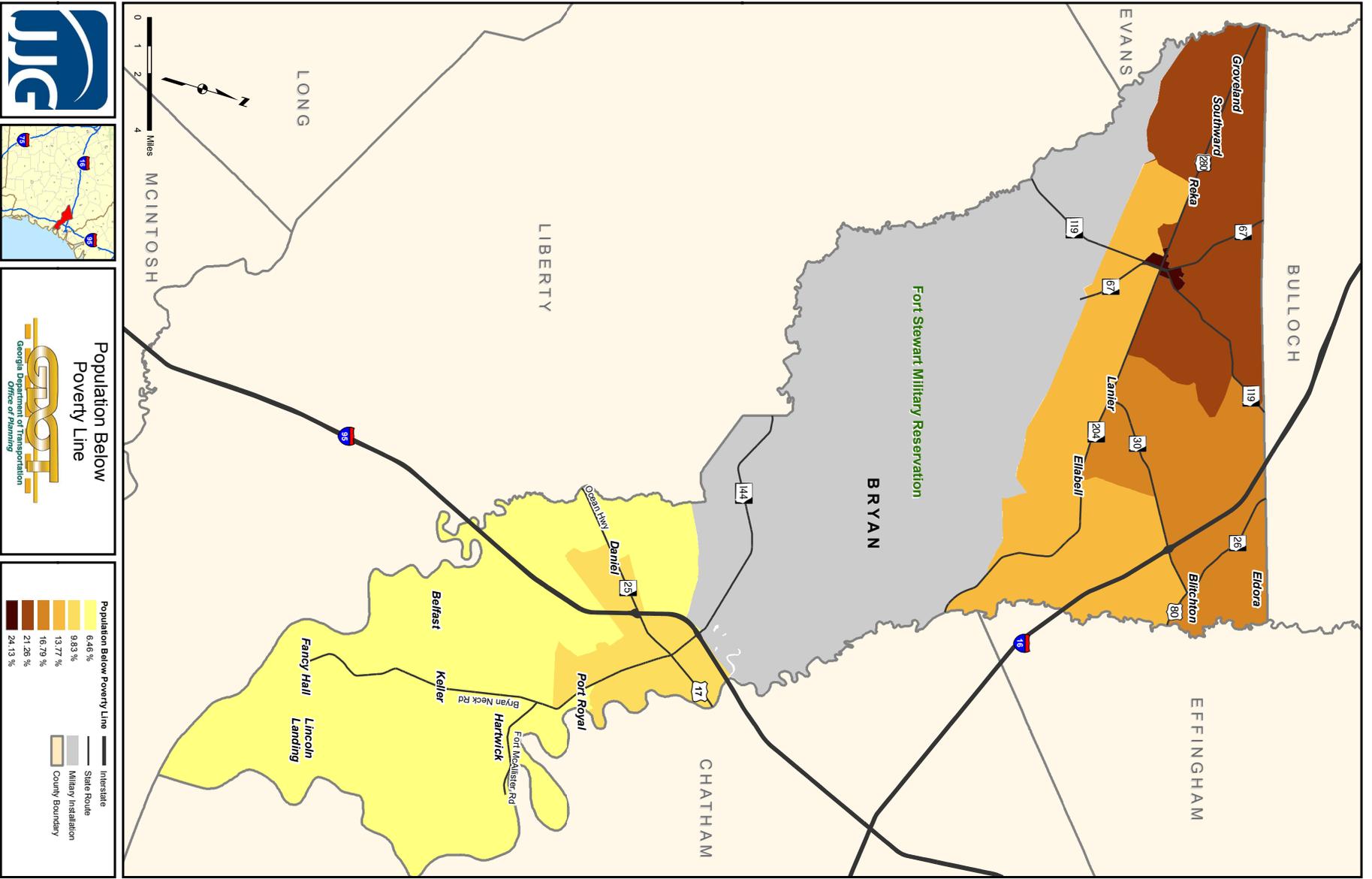
- < 0.1 jobs/10 sq. miles
- 0.1 - 1 jobs/10 sq. miles
- 1 - 5 jobs/10 sq. miles
- > 10 jobs/10 sq. miles

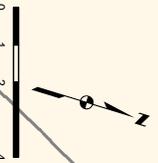
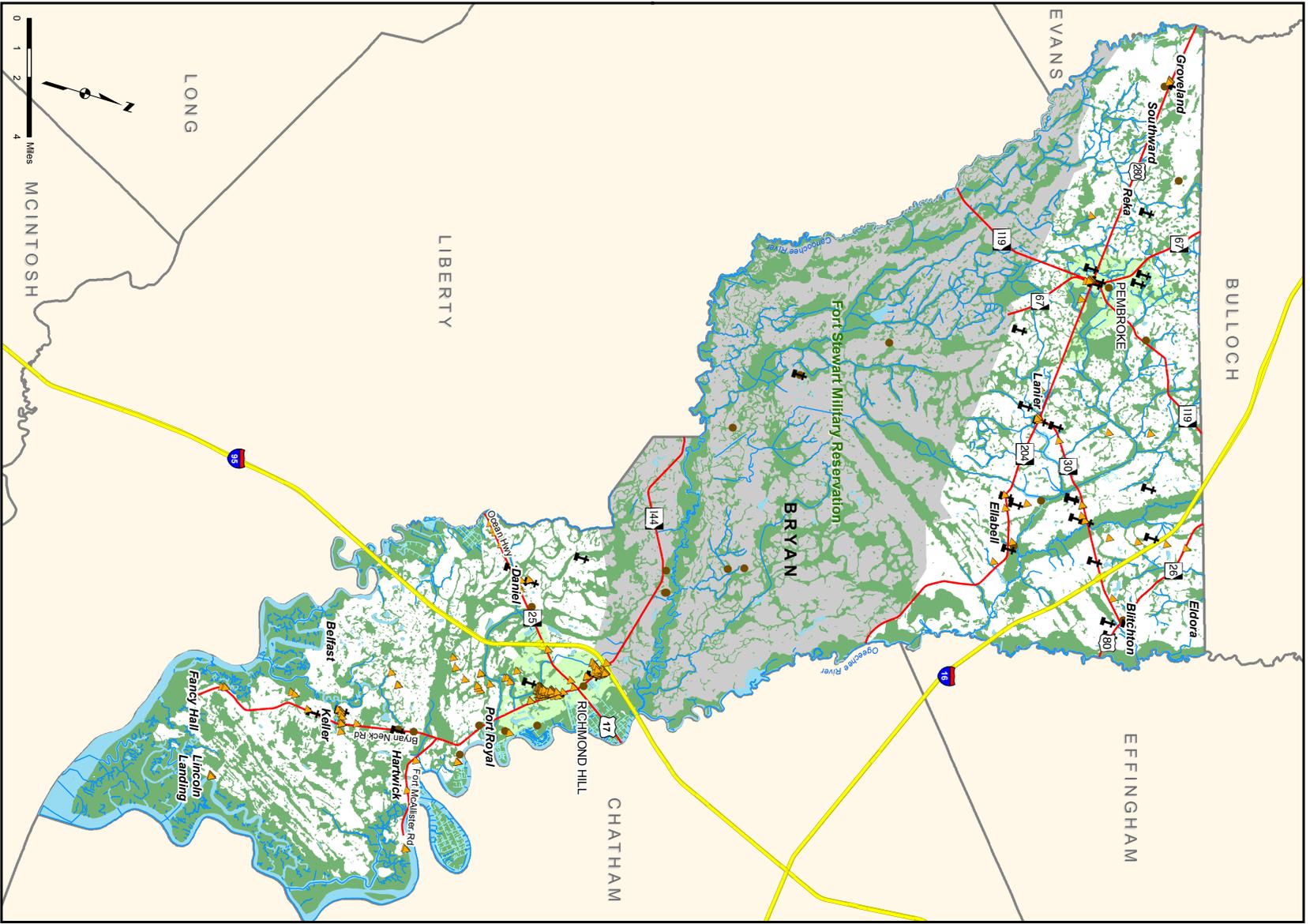
**Legend:**

- Interstate
- State Route
- Local Street
- Fort Stewart
- TAZ Boundary
- County Boundary





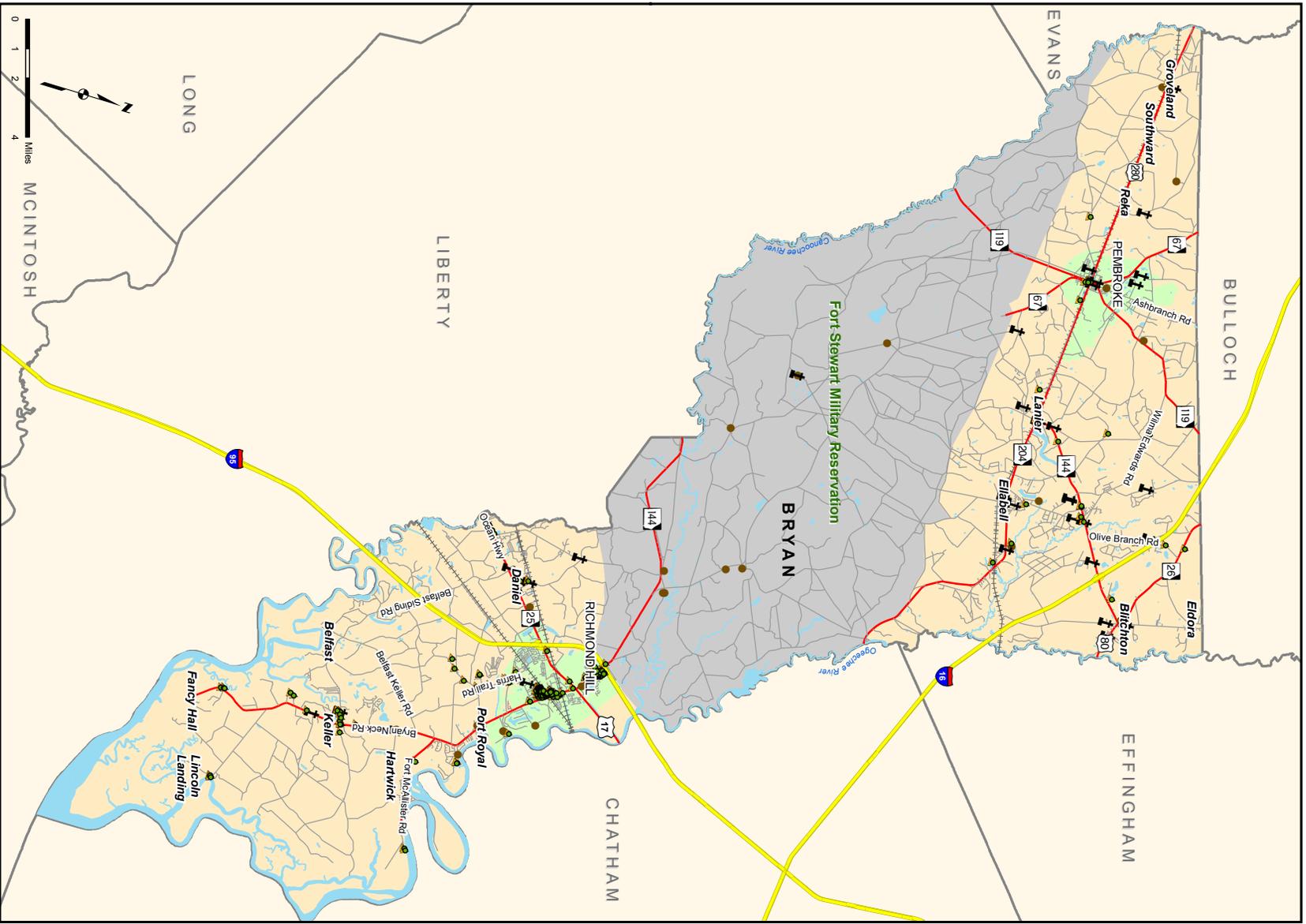




**Environmentally Sensitive Areas**

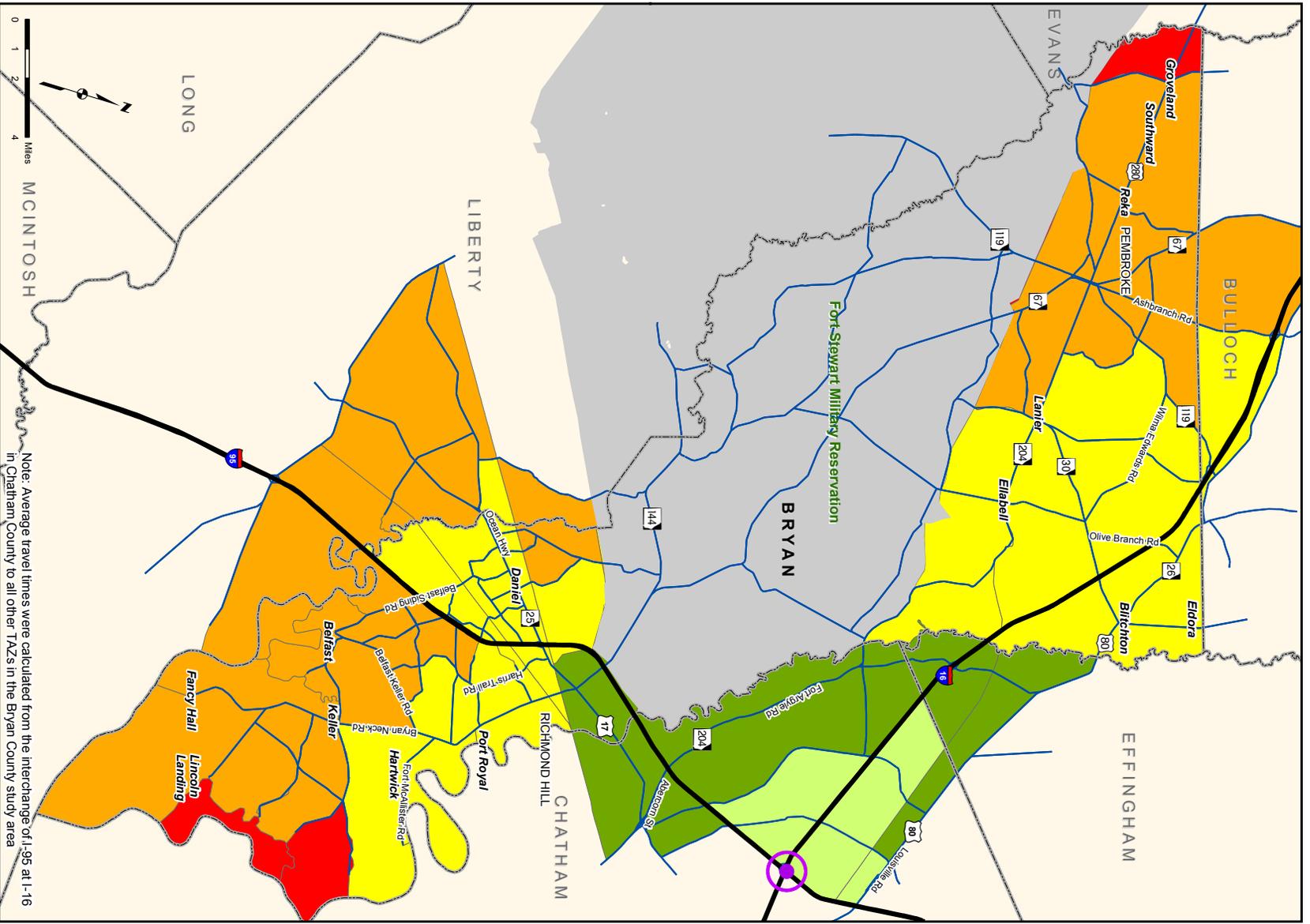
Georgia Department of Transportation  
Office of Planning

- Historic Structures
- Churches
- Cemeteries
- River
- Canal
- Lakes & Rivers
- Wetlands
- Interstate
- State Route
- Fort Stewart
- City Boundary
- County Boundary

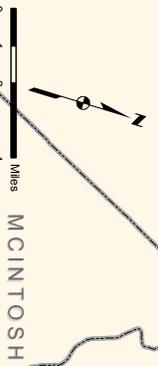


**Historic Structures**

	Historic Structures
	Churches
	Cemeteries
	Lakes & Rivers
	Fort Stewart
	City Boundary
	County Boundary
	Interstate
	State Route
	Street
	Railroad



Note: Average travel times were calculated from the interchange of I-95 at I-16 in Chatham County to all other TAZs in the Bryan County study area.



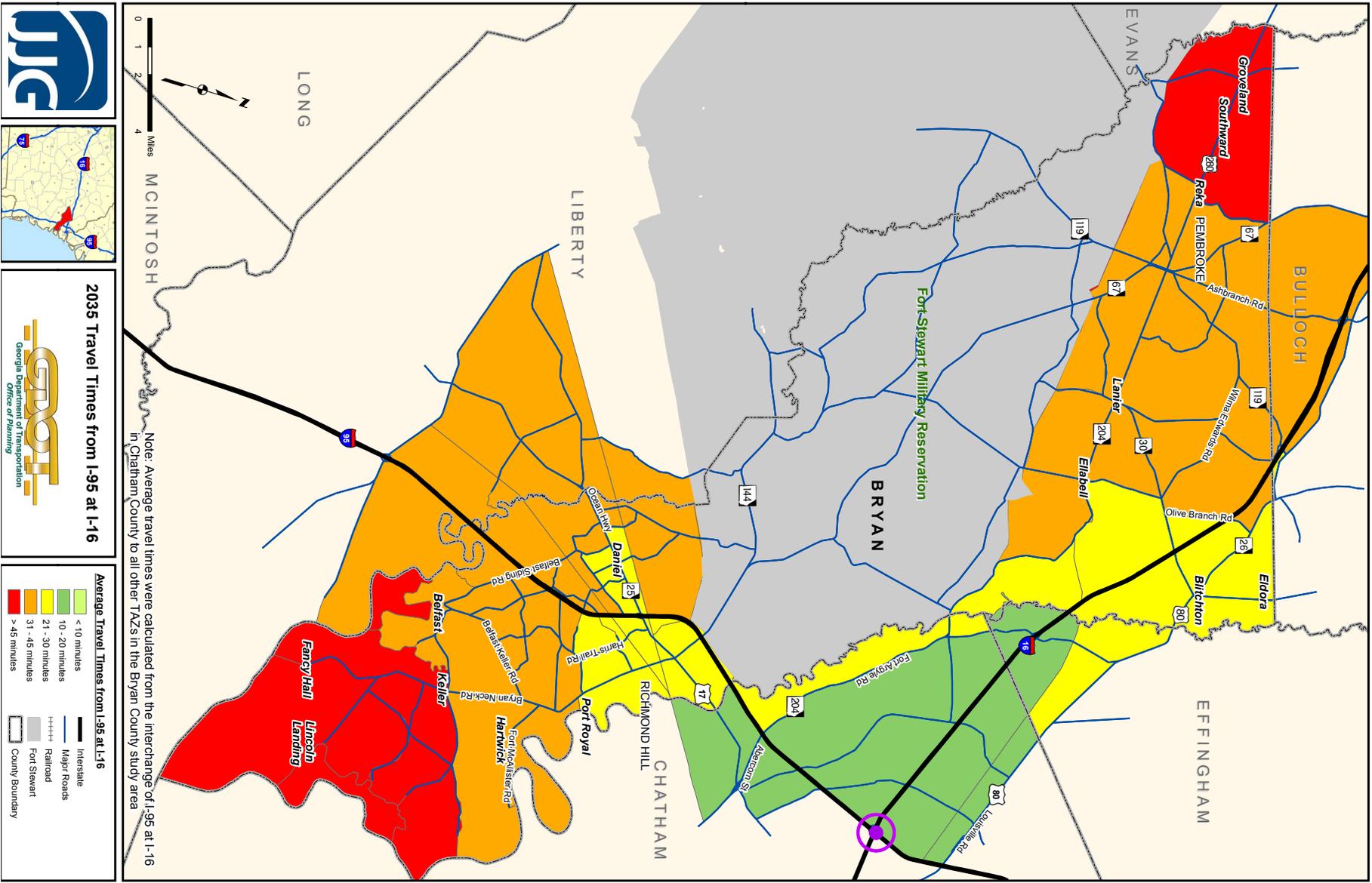
**2006 Travel Times from I-95 at I-16**

Georgia Department of Transportation  
Office of Planning

**Average Travel Times from I-95 at I-16**

- < 10 minutes
- 10 - 20 minutes
- 21 - 30 minutes
- 31 - 45 minutes
- > 45 minutes

- Interstate
- Major Roads
- Railroad
- Fort Stewart
- County Boundary



**2035 Travel Times from I-95 at I-16**

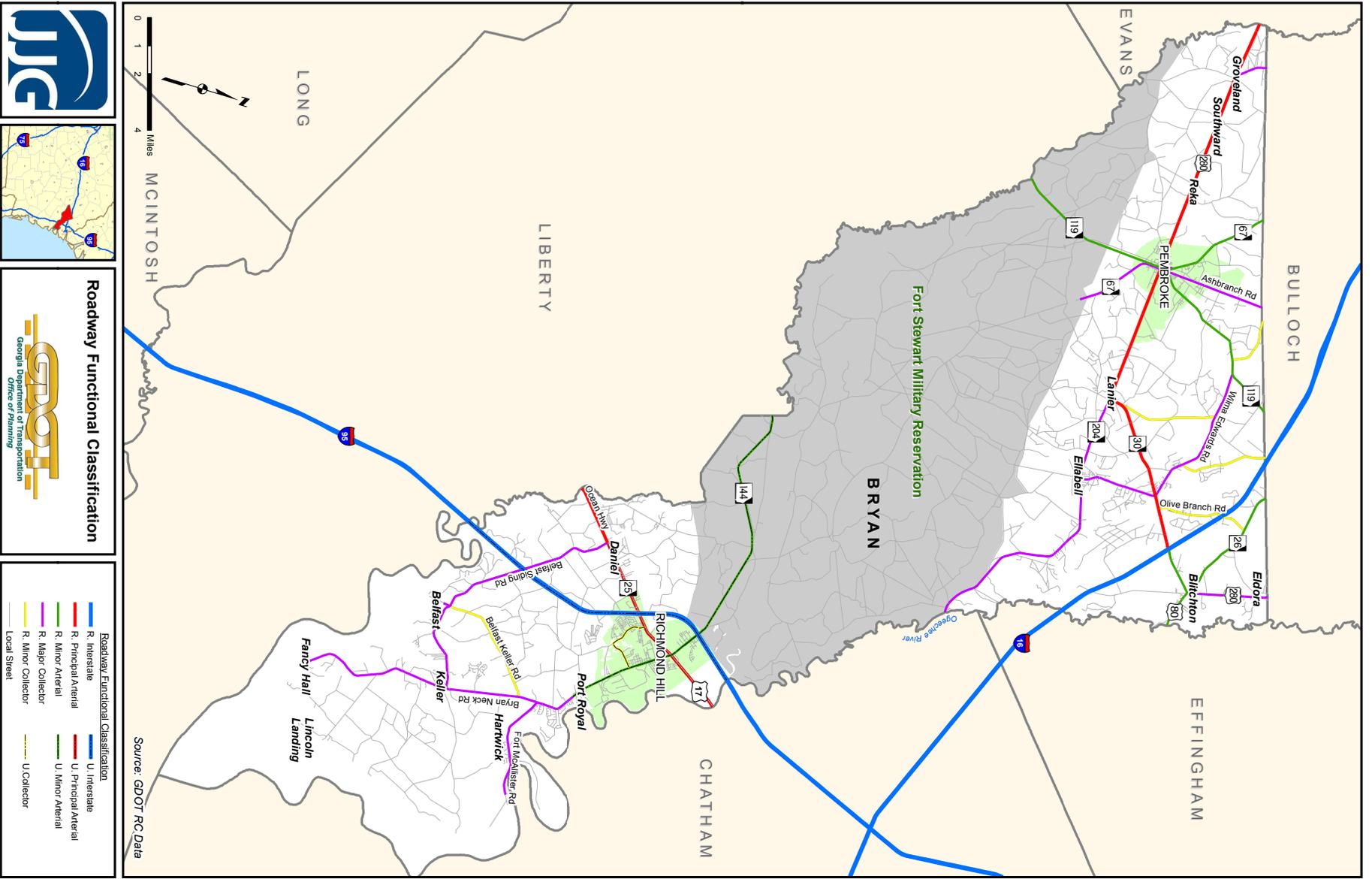
Note: Average travel times were calculated from the interchange of I-95 at I-16 in Chatham County to all other TAZs in the Bryan County study area.

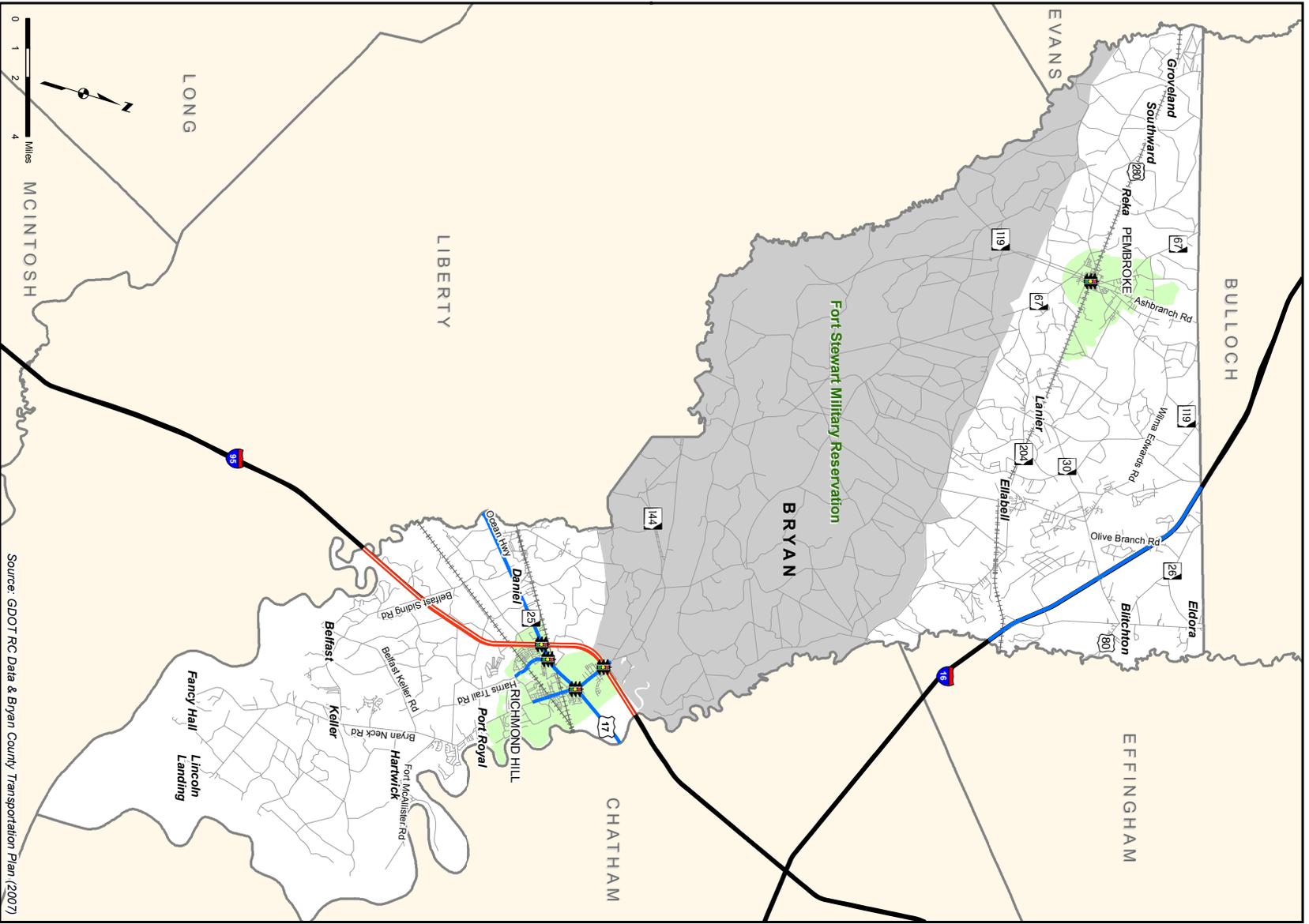
**Average Travel Times from I-95 at I-16**

- < 10 minutes
- 10 - 20 minutes
- 21 - 30 minutes
- 31 - 45 minutes
- > 45 minutes

**Legend:**

- Interstate
- Major Roads
- Railroad
- Fort Stewart
- County Boundary

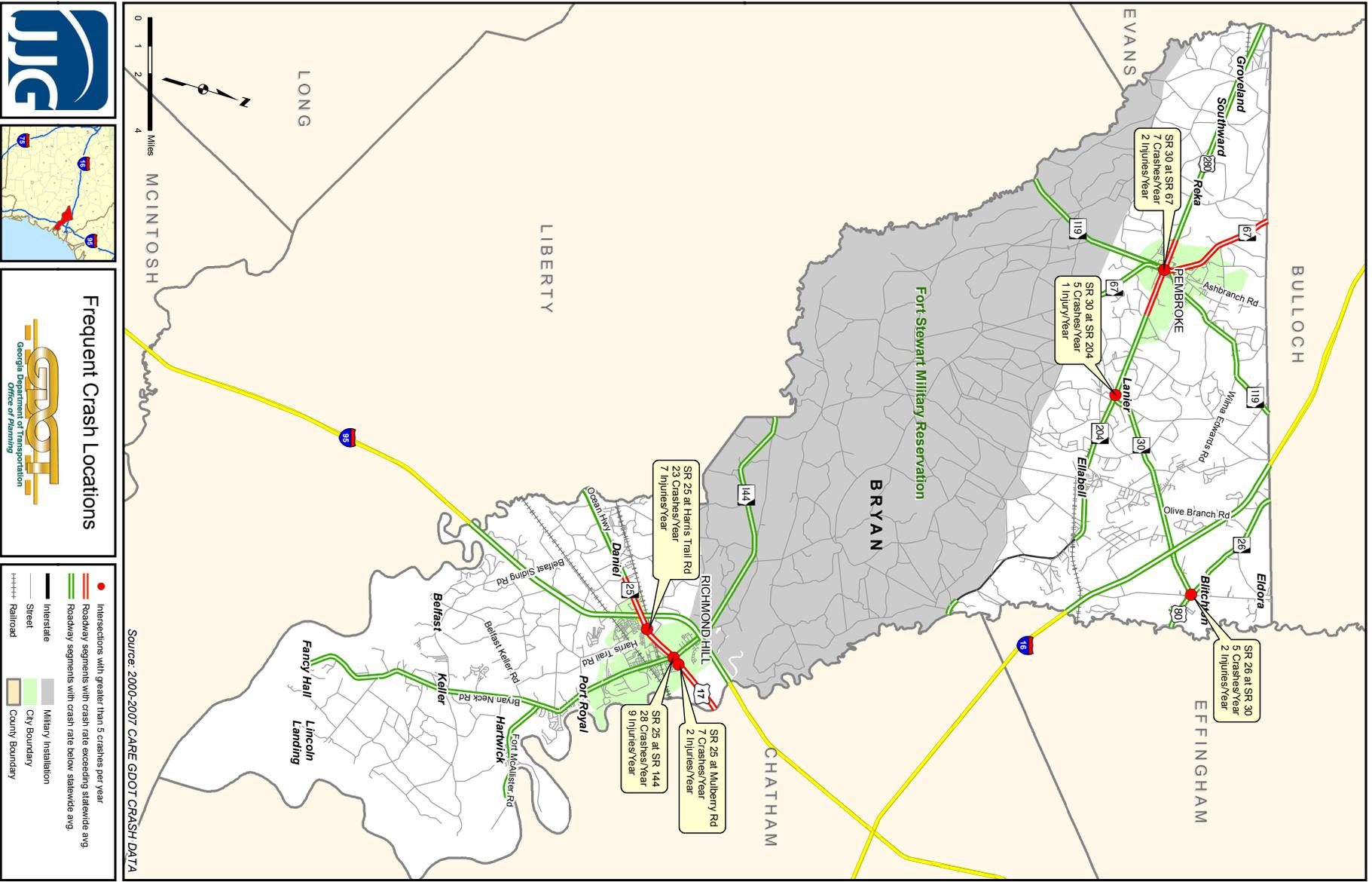




Source: GDOT RC Data & Bryan County Transportation Plan (2007)

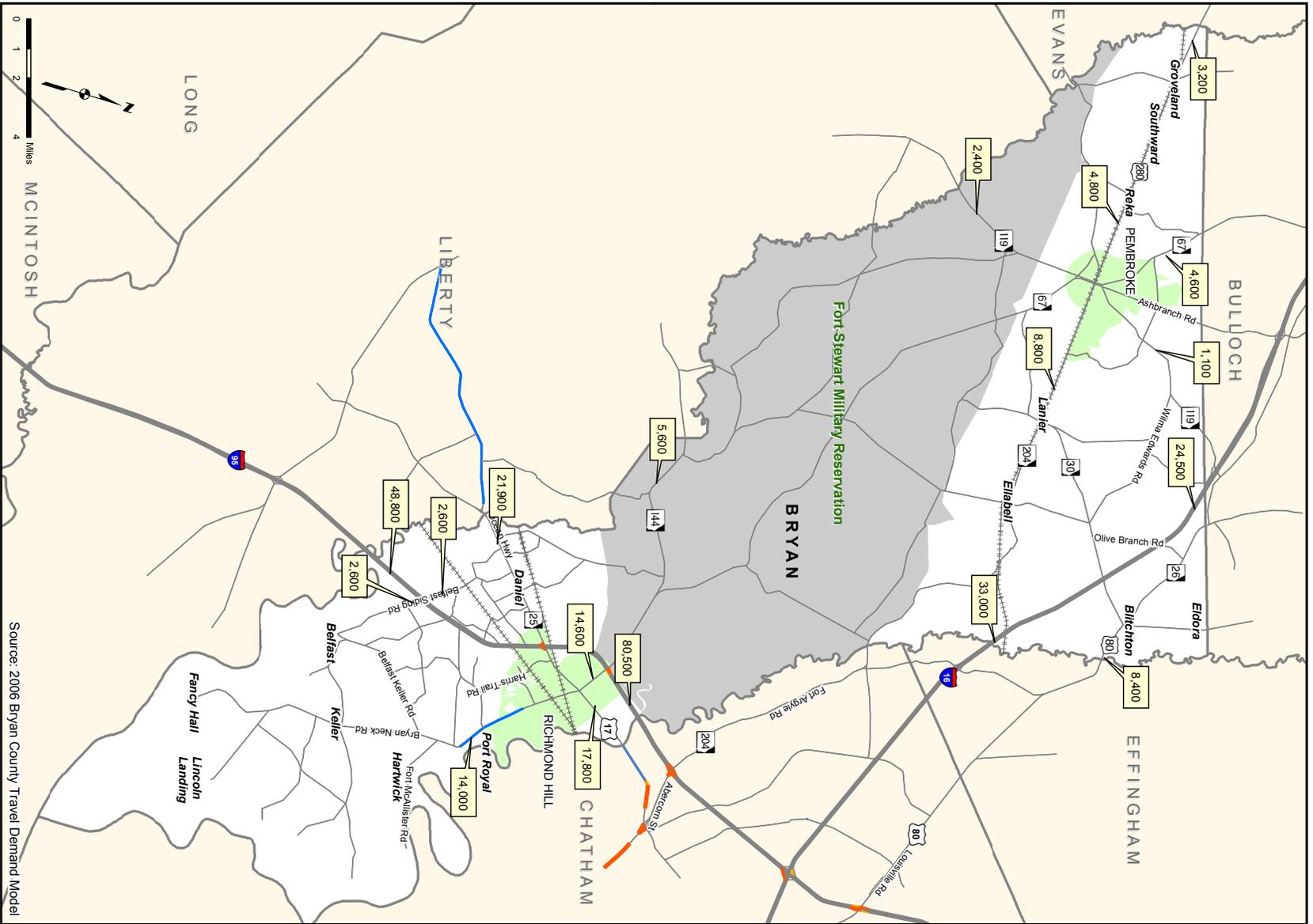


	Existing Roadway Laneage		Interstate
	Existing Roadway Laneage		Street
	Existing Roadway Laneage		Railroad
	Existing Traffic Signals		County Boundary
			City Boundary
			Military Installation



**Frequent Crash Locations**

- Intersections with greater than 5 crashes per year
- Roadway segments with crash rate exceeding statewide avg
- Roadway segments with crash rate below statewide avg
- Interstate
- Street
- Military Installation
- City Boundary
- County Boundary
- Railroad



Source: 2006 Bryan County Travel Demand Model



**Existing LOS**

- LOS C or Better
- LOS D
- LOS E
- LOS F

**Average Daily Volume**

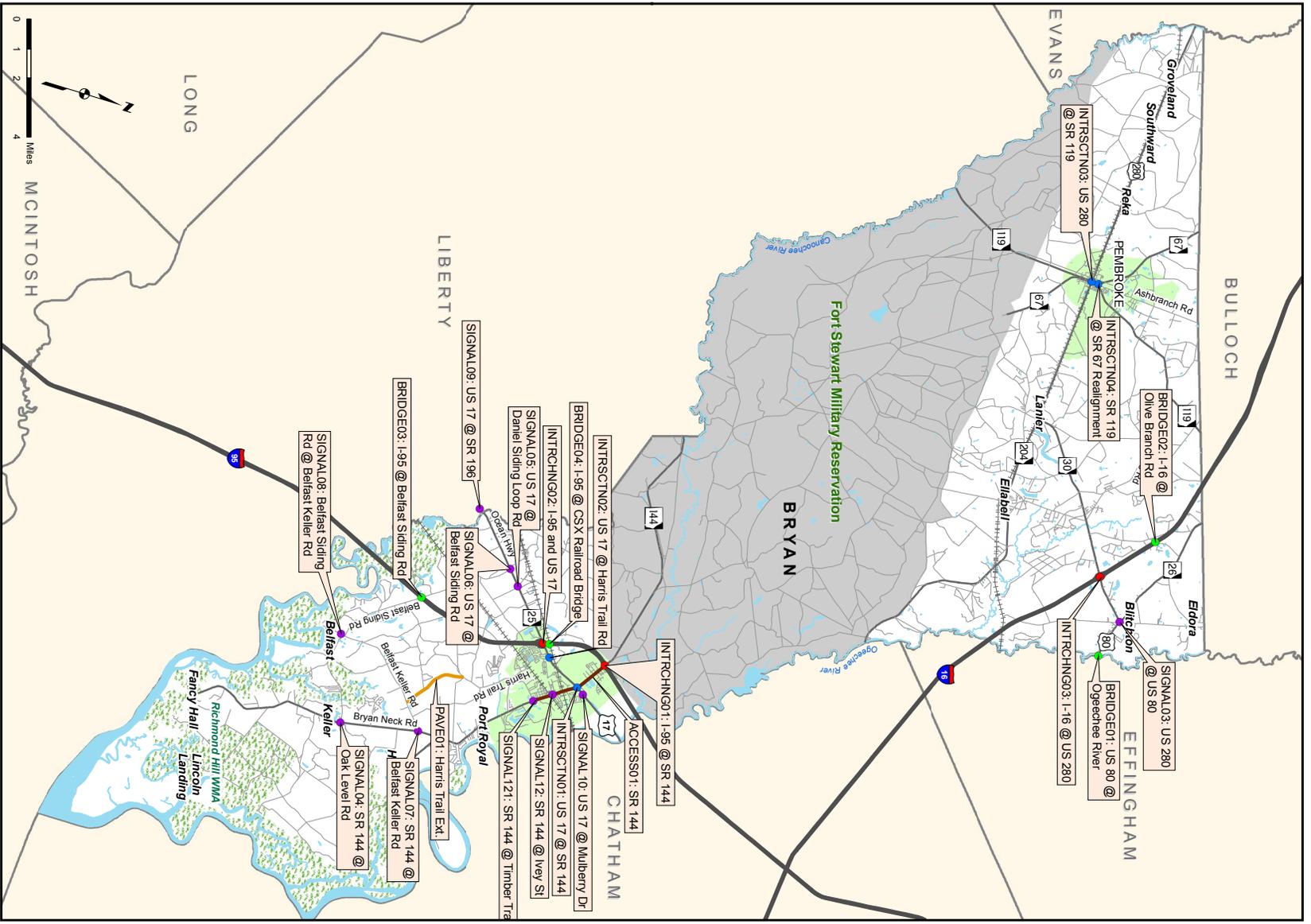
- 10,000
- 20,000
- 30,000
- 40,000
- 50,000
- 60,000
- 70,000
- 80,000
- 90,000
- 100,000

**Legend:**

- Railroad
- County Boundary
- City Boundary
- Military Installation





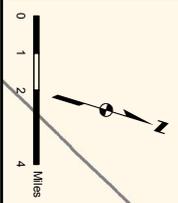
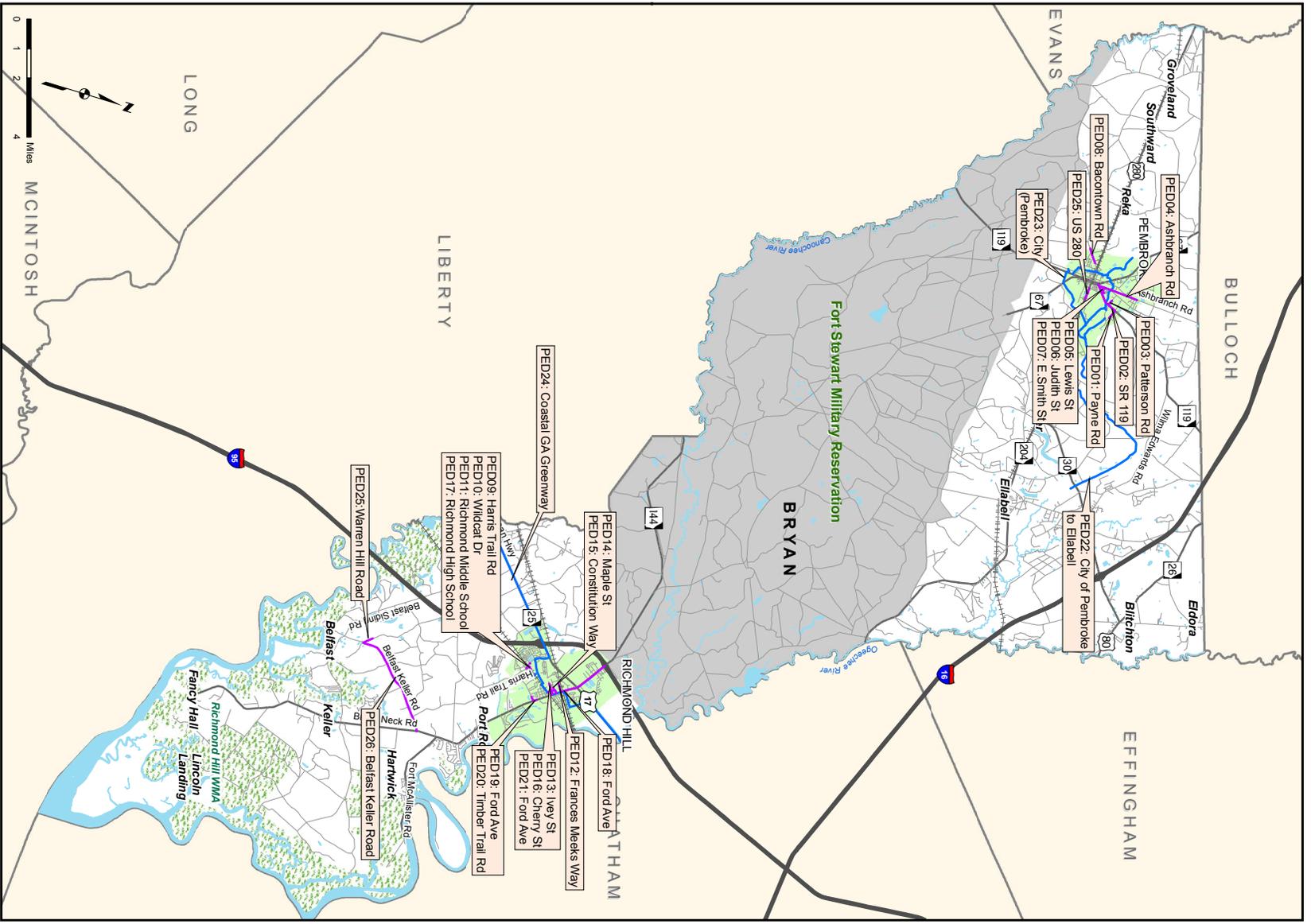


**Bryan County Transportation Study**  
**Traffic Operations**  
 Georgia Department of Transportation  
 Office of Planning

Improvement Type	
	Interchange Upgrade
	Bridge Replacement
	Intersection Upgrade
	Signalization
	Access Management
	Paving

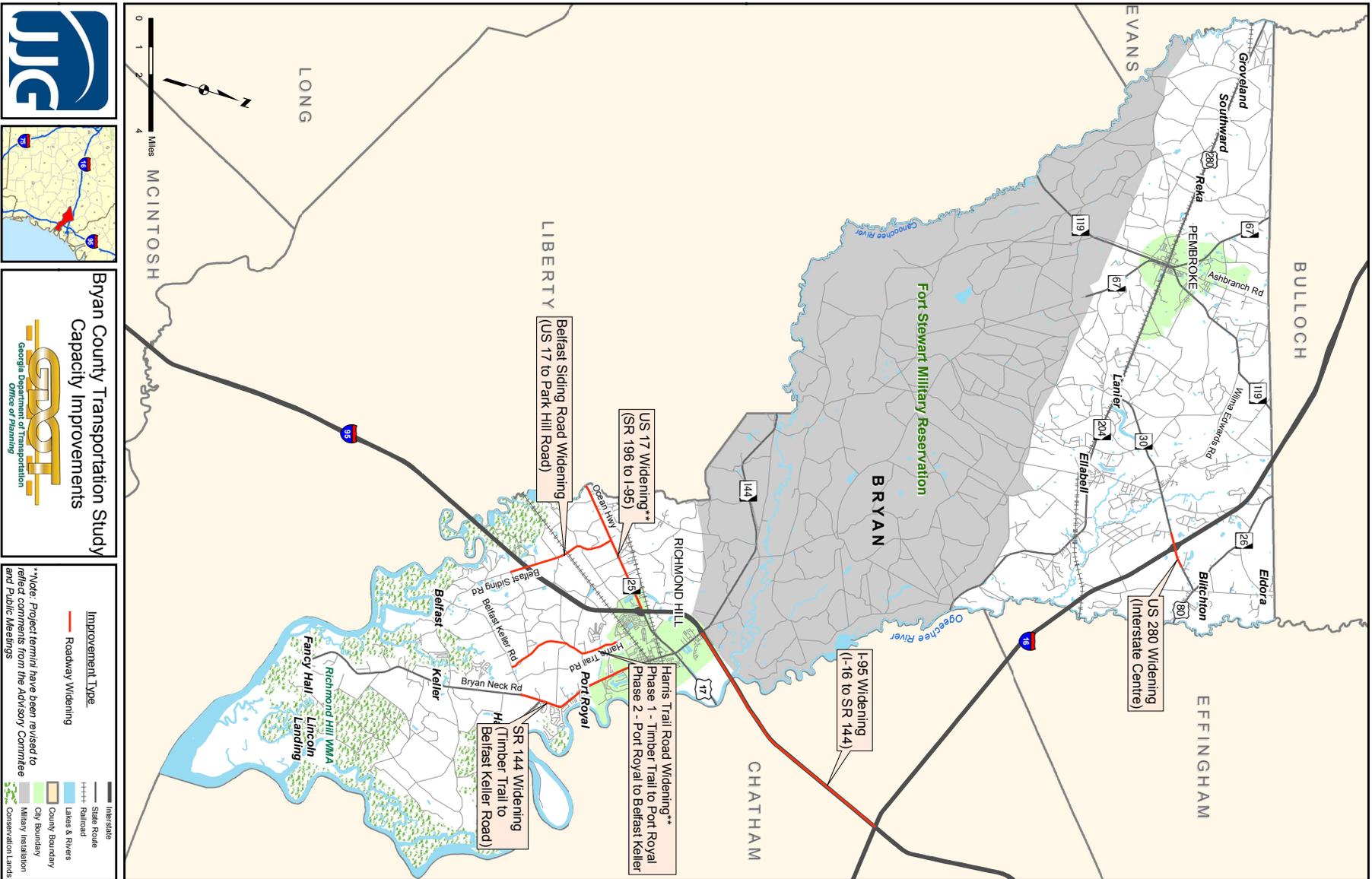
	Interstate
	State Route
	Railroad
	Lakes & Rivers
	County Boundary
	City Boundary
	Military Installation
	Conservation Lands



**Bryan County Transportation Study  
Bicyclist/Pedestrian Improvements**

Georgia Department of Transportation  
Office of Planning

Improvement Type	
	Sidewalk
	Shared Use Path
Other Features	
	Interstate
	State Road
	Roaded
	Lakes & Rivers
	County Boundary
	City Boundary
	Military Installation
	Conservation Lands

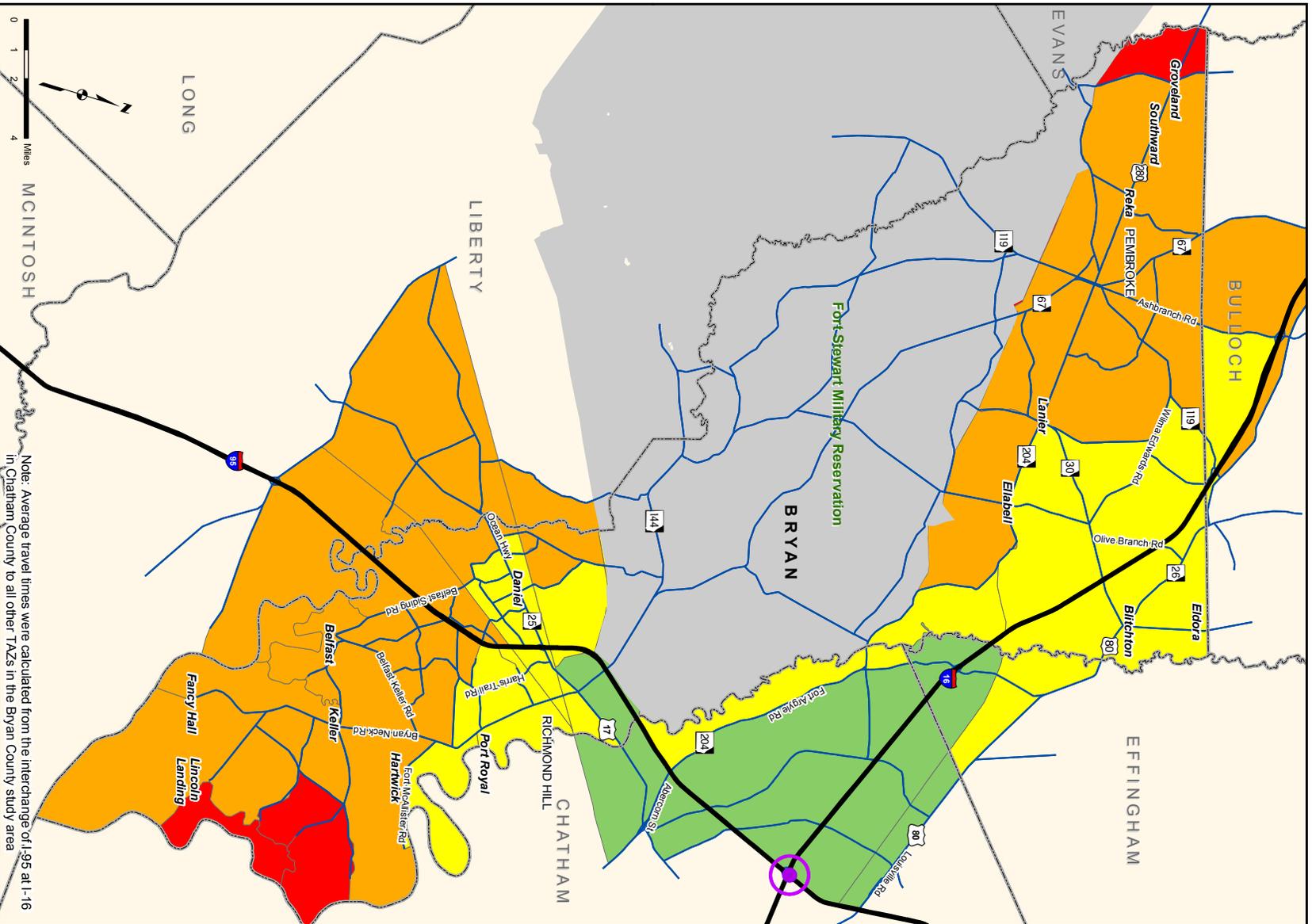


**Bryan County Transportation Study**  
**Capacity Improvements**  
 Georgia Department of Transportation  
 Office of Planning

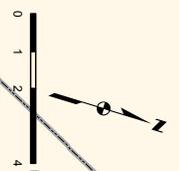
**Improvement Type**  
 Interstate  
 State Road  
 Railroad  
 Roadway Widening

**County Boundary**  
**City Boundary**  
**Military Installation**  
**Conservation Lands**  
**Lakes & Rivers**

**\*\*Note: Project termini have been revised to reflect comments from the Advisory Committee and Public Meetings.**



Note: Average travel times were calculated from the interchange of I-95 at I-16 in Chatham County to all other TAZs in the Bryan County study area



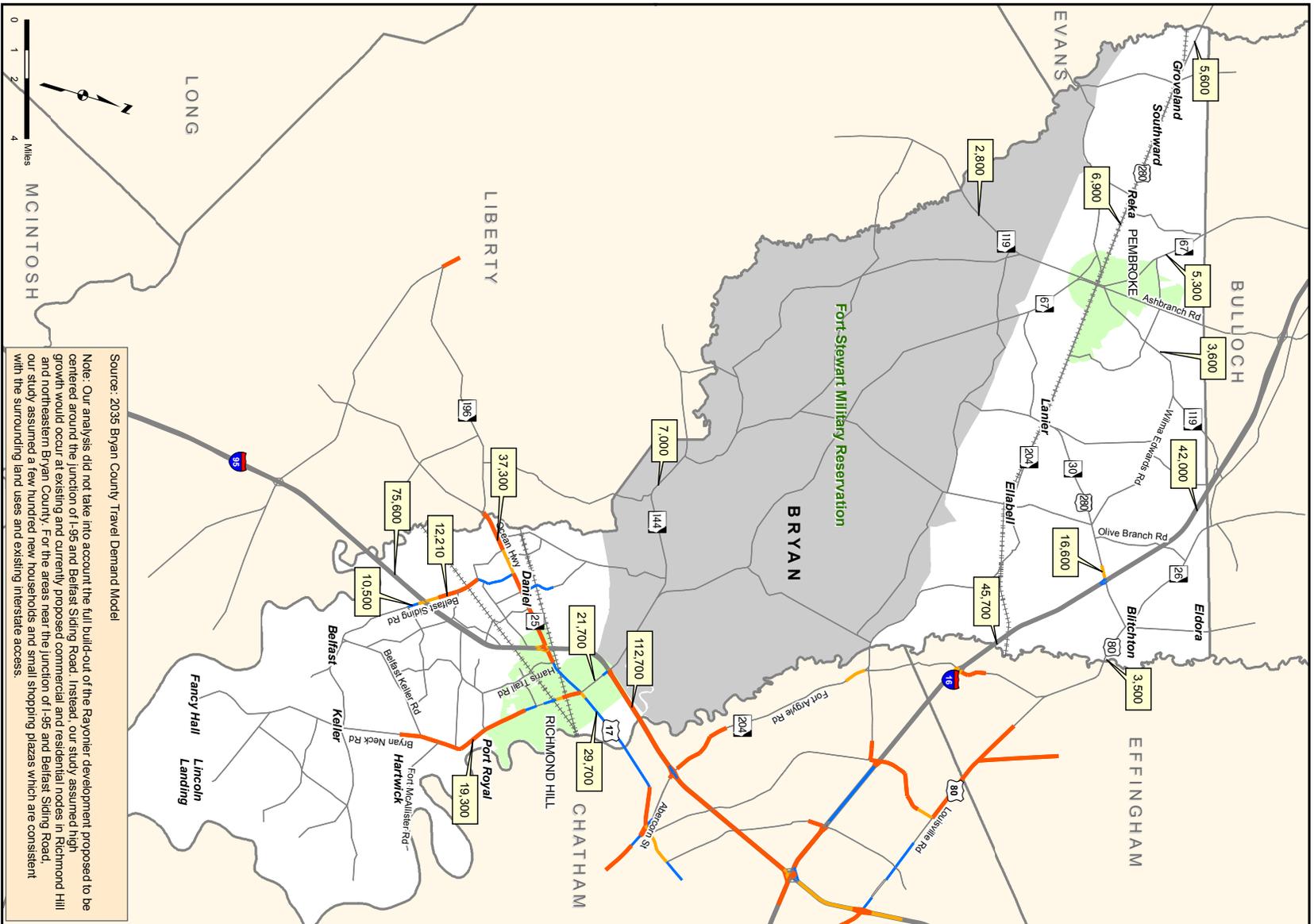
**Bryan County Transportation Study**  
 2035 Build Alternative  
 Travel Times from I-95 at I-16



**Average Travel Times from I-95 at I-16**

- < 10 minutes
- 10 - 20 minutes
- 21 - 30 minutes
- 31 - 45 minutes
- > 45 minutes

- Interstate
- Major Roads
- Railroad
- Fort Stewart
- County Boundary



Source: 2035 Bryan County Travel Demand Model

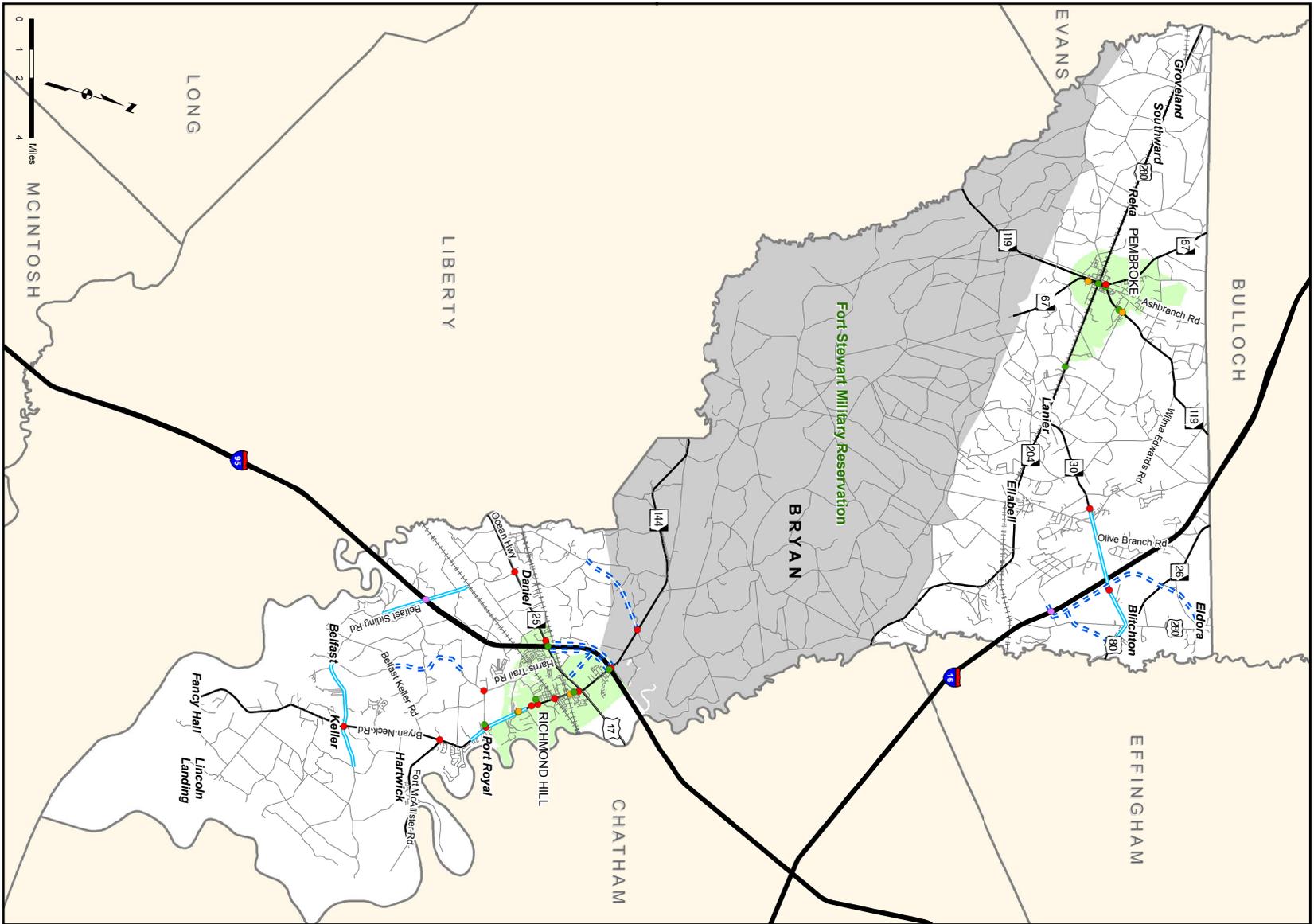
Note: Our analysis did not take into account the full build-out of the Raponier development proposed to be centered around the junction of I-95 and Belfast Sliding Road. Instead, our study assumed high growth would occur at existing and currently proposed commercial and residential nodes in Richmond Hill and northeastern Bryan County. For the areas near the junction of I-95 and Belfast Sliding Road, our study assumed a few hundred new households and small shopping plazas which are consistent with the surrounding land uses and existing interstate access.

**2035 No-Build Level of Service (LOS)**

2035 No-Build LOS	
LOS C or Better	Blue line
LOS D	Light blue line
LOS E	Orange line
LOS F	Red line
Average Daily Volume	Yellow callout
+++++ Railroad	Grey dashed line
County Boundary	Thin grey line
City Boundary	Thick grey line
Military Installation	Grey shaded area







**Bryan County Transportation Study  
Stakeholders Recommendations Map**



- |  |                                |
|--|--------------------------------|
|  | Improvement Type               |
|  | New Interchange                |
|  | New Road                       |
|  | Widening                       |
|  | Safety/Operational Improvement |
|  | Stewark                        |
|  | Interstate                     |
|  | Street                         |
|  | Railroad                       |
|  | County Boundary                |
|  | City Boundary                  |
|  | Military Installation          |

