Interchange Analysis Report

I-95 at Belfast Siding Road
Bryan County Georgia

Prepared for:

Office of Planning

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EXECUTIVE SUMMARY

The purpose of this Interchange Analysis Report (IAR) is to analyze and document the need, or lack thereof, for a new interchange at Belfast Siding Road located in Bryan County, Georgia (see pg 16 for map of study area). In accordance with Federal Highway Administration (FHWA) and Georgia Department of Transportation (GDOT) guidance on the installation of new access points, the IAR examines operations at the requested interchange location, as well as the adjacent interchanges upstream and downstream of the requested access break at Belfast Siding Road.

The study area, which is centered on the Belfast Siding Road corridor, extends from north of SR 144 to south of US 84 along I-95 and encompasses the surrounding region, as shown in Figure 3-1 (pg 16). 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.

In addition to analyzing the operations at the requested Belfast Siding Road interchange, this IAR examined conditions along I-95 as well as at other intersections within the vicinity of this requested interchange. This analysis utilized the current FHWA policies regarding breaks in access along the freeway system to determine if a new interchange is justified.

FHWA Policy Compliance

FHWA has issued a series of policies regarding the installation of new access points on the Interstate System, published in the Federal Register, Volume 63, Number 28 (pages 7045-7047), dated February 11, 1998 (Doc. 98-3460). GDOT endorses these FHWA policies and has instituted a policy, titled "*Responsibility and Procedures for Interchange Justification Reports (IJR's) and Interchange Modification Reports (IMR's) for Interstate and Non-Interstate Limited Access Facilities*," which compliments the requirements and procedures set forth by FHWA. Both FHWA and GDOT policies, detailed in Appendix B, are intended to protect the capacity and safety of travel along the Interstate System by maintaining its limited access functionality. Compliance with these policies ensures that appropriate alternatives to providing new Interstate access points are considered prior to granting an additional access point. **Although this report is not considered an IJR because of the lack of justification for the requested interchange, it adheres to the analysis requirements set forth by FHWA and GDOT, which are used when developing an IJR.**

The need for a new break in access along I-95 between US 17 and US 84 at Belfast Siding Road was examined in relation to the eight policy requirements of the Federal Register and included in the *FHWA Guidance on Interstate Access Requests*. The following presents an examination of the findings and how they relate to these eight criteria. In order for an interchange to be recommended, all eight criteria must be met.

Policy 1: Existing Facilities

"The existing interchange and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal."

- **Policy 1 is not satisfied by the requested interchange.**

Based on traffic data and analyses documented in this IAR, the adjacent existing interchanges immediately north and south of the requested interchange at Belfast Siding Road can provide the necessary access to satisfactorily accommodate the Design Year (2032) traffic demands. Adequate traffic operations can be achieved for Design Year (2032) via a combination of GDOT's currently programmed projects and newly identified transportation improvements. The implementation of the recommended improvements, described on pages 30 and 31, which could be performed in conjunction with the programmed widening of I-95 (PI # 511025), will satisfy the interstate access needs for the currently identified (as of 2007) planned development in southern Bryan County. Therefore, Policy 1 is not satisfied by the requested interchange at I-95 at Belfast Siding Road.

Policy 2: Transportation Management System

"All reasonable alternatives for design options, location, and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified."

- **Policy 2 is satisfied by the requested interchange.**

Currently, no transportation system management type improvements such as ramp metering, mass transit, and HOV facilities have been identified in the vicinity of the requested access break at Belfast-Siding Road. Since there are no system-wide plans for these improvements, they are not considered as viable options to serve the traffic intended by the requested interchange.

Policy 3: Operational Analysis

"The proposed access point does not have a significant adverse impact on the safety and operation of the interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including the first adjacent existing or proposed interchange on each side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with the new or revised access points."

- **Policy 3 is satisfied by the requested interchange.**

According to analysis of existing and future traffic, the requested interchange will not have a significant adverse impact on the safety and operations of the freeway facility and the supporting road network. Though the requested new access is anticipated to add or concentrate traffic in some areas, mitigation treatments are feasible and can reduce the potential for any safety hazards induced as a result of this proposal.

An analysis of existing peak hour traffic conditions was performed to determine the level of service (LOS) at the study intersections. LOS for an intersection is based on vehicular delay at the intersection and is a typical measure of effectiveness used to evaluate intersection operations. The Highway Capacity Manual provides ranges of delay for each LOS definition, spanning from very minimal delays (LOS A) to high delays (LOS F). LOS F is considered unacceptable for most drivers. For the purpose of this study, Level-of-service "C" (LOS C) and above is considered to be adequate peak hour traffic conditions. Levels-of-Service "D," "E," and "F" were considered to be inadequate peak hour conditions. For some cases, in which financial and environmental concerns prevent the attainment of LOS "C" or better conditions, LOS "D" can be considered adequate.

Although the existing freeway analysis indicates that the segment of I-95 north of SR 144 currently operates at LOS F and the segment of I-95 between US 17 and SR 144 operates at LOS D for both peak periods, planned improvements, such as the widening of I-95 from 6 to 8 lanes (PI # 511025), will mitigate this capacity issue for future years. Existing conditions analyses show that the section of I-95 north of SR 144 experiences poor operations during the AM (northbound) and PM (southbound) peak periods. However, with the programmed widening of I-95, the Design Year (2032) freeway analysis indicates that I-95 will provide adequate capacity to sustain the anticipated traffic flow and density.

Similarly, the merge/diverge analysis identified existing operational problems that were mitigated with the planned widening of I-95. For existing conditions, several of the merge/diverge sections surrounding the interchanges of I-95 at SR 144 and US 17 operate at LOS E or F. With planned improvements to I-95, all merge/diverge sections are anticipated to operate adequately for the Design Year (2032).

Improvements to several intersections within the study area will be necessary to serve the anticipated peak hour traffic flows and are, thereby, recommended to be programmed. Intersection modifications, described on pages 30 and 31 will improve operations at the intersections of SR 144 at I-95 NB; US 17 at I-95 NB; and US 17 at SR 196. Additional improvements (also described on pages 30 and 31), including widening of US 17 from Belfast Siding Road through the US 17 at I-95 interchange (also described on page 30 and 31) would be needed to provide adequate operations.

Policy 4: Access Connections & Design

"The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System."

- **Policy 4 is satisfied by the requested interchange.**

The requested access is a diamond interchange, which will provide for all traffic movements, thereby satisfying Policy 4. The lane configurations and traffic control requested for the new access and adjacent intersections are described on pages 30 and 31

Policy 5: Transportation Plans

"The proposal considers and is consistent with local and regional land use and transportation plans. Prior to the final approval, all requests for new or revised access must be consistent with the metropolitan and or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and transportation conformity requirements of 40 CFR parts 51 and 93."

- **Policy 5 is satisfied by the requested interchange.**

The proposal is consistent with local and regional land use and transportation plans. The requested interchange is a key item in the Bryan County transportation planning efforts and is one of the proposed recommendations of the Draft 2007 Bryan County Transportation Plan, developed by Bryan County.

Policy 6: Comprehensive Interstate Network Study

"In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan."

- **Policy 6 is satisfied by the requested interchange.**

No new future interchanges in the vicinity of the requested access have been discussed nor have they been identified through any state, regional or local planning process.

Policy 7: Coordination with Transportation System Improvements

"The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements."

- **Policy 7 is satisfied by the requested interchange.**

The need for the access, within the study area, is driven by the TerraPointe Belfast Siding Master Plan (2007), indicating development along Belfast Siding Road. This plan, which includes over 10 thousand residential units, 3 million SF of office/retail space and 3 million SF of industrial property has been considered in the analysis. In addition to the TerraPointe site, 21 other developments, covering over 7 thousand acres in southern Bryan County that were not included in the Belfast Siding Master Plan have been considered for traffic generation. The interchange is consistent with and supportive of the planned development efforts. However, as indicated in Policy number 1, existing roads and interchanges could be improved to provide and negate the need for a new interchange along I-95 at Belfast Siding Road.

Policy 8: Status of Planning and NEPA

"The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal."

- **Policy 8 is satisfied by the requested interchange.**

An initial GIS-based examination of the existing Belfast Siding Road crossing of I-95 suggests that the current roadway alignment is not impacted by wetlands. If the interchange were to be constructed, various alternatives with differing alignments would need to be considered. Each of these alternatives would need to be analyzed for potential impacts on wetlands. Additionally, a review of the National Register of Historic Places showed that no historic resources were located within the vicinity of the requested interchange. Since the interchange was not justified through the traffic analyses performed, no further study was conducted at this time.

Recommendations Based on FHWA Policies

This IAR indicates that FHWA Policy 1 is not satisfied since the adjacent interchanges can be improved to provide the access intended by the requested interchange. The requested access does not meet this essential criterion (Policy 1), which relates to upgrading the current infrastructure prior to building new infrastructure. According to FHWA policy, all criteria must be met for a requested interchange to be justified. **Therefore, the request for a new access break along I-95 at Belfast Siding Road is not recommended to be forwarded to FHWA for consideration and approval**.

Overall Study Findings & Recommendations

Through the traffic analysis performed for this study, it was determined that a new interchange at Belfast-Siding Road is not warranted. The requested new interchange would not preclude the need for improvements to the interchanges along I-95 at SR 144 and US 17. The analysis contained in this IAR establishes that improvements made to the interchanges and roadways in the vicinity of Belfast-Siding Road could accommodate anticipated traffic in the Year 2032, without the requested access break.

Though improvements are necessary to support Design Year (2032) traffic conditions, a majority of these improvements are necessary whether or not an interchange is constructed at Belfast Siding Road. According to the *Highway Capacity Software (HCS+) Version 5.21*, used to determine arterial capacity needs, the section of US 17 from west of I-95 to Belfast Siding Road will require widening to adequately serve projected traffic volumes. Additionally, various intersection improvements, described on pages 30 and 31, will be required to obtain adequate LOS throughout the study area.

In addition to the improvements recommended for the future system with or without the requested interchange, a few scenario-specific improvements are necessary. For future conditions with the requested interchange, a right turn lane is needed from US 17 northbound onto Belfast Siding Road to accommodate traffic accessing the requested interchange. Belfast Siding Road would also need to be widened to four lanes from US 17 to I-95 to provide capacity for traffic flowing to and from the requested interchange. For Design Year (2032) traffic conditions without the requested interchange, the following additional improvements are needed:

SR 144 at US 17

- Add a westbound left turn lane on SR 144;
- Add southbound left turn lane on US 17.

US 17 at I-95 Ramps

- Add one westbound left turn on US 17 the I-95 SB Ramps;

The results of the traffic analyses show that the Design Year (2032) traffic can be accommodated with improvements to the existing transportation network surrounding the requested Belfast Siding Road corridor, most of which would be required with or without the requested new access break along I-95. Therefore, it is recommended that the interchange not be built. Instead, the "Without Requested Interchange" improvements, illustrated in Figure 5-1 (page 32) and described on page 30 and 31, are recommended to accommodate future travel demand within the area and facilitate flow to and from the interstate.

1. INTERCHANGE PURPOSE, NEED, AND JUSTIFICATION

Introduction

The intent of this Interchange Analysis Report (IAR) is to analyze and document the need, or lack thereof, for a new interchange on I-95 between US 17 (Coastal Highway) and US 84 (East Oglethorpe Highway), located in Bryan County, Georgia. In accordance with Federal Highway Administration (FHWA) and Georgia Department of Transportation (GDOT) guidance, the Interchange Analysis Report examines operations at the requested interchange location, as well as adjacent interchanges upstream and downstream. Work performed through the course of study was coordinated with GDOT Office of Planning and Bryan County.

Project Description

The requested break in access analyzed along I-95 at Belfast Siding Road is located between the existing US 17 (Coastal Highway) interchange to the north and the US 84 (East Oglethorpe Highway) to the south, in Bryan County, Georgia.

Purpose, Need, & Justification

The purpose of this Interchange Analysis Report is to document the analysis of the need for or lack thereof and implications of a new interchange on I-95 between US 17 and US 84 in accordance with FHWA and GDOT guidance (detailed in Appendix A). The analysis indicates that the adjacent interchanges just north and south of the Belfast Siding Rd overpass can be improved to satisfy the need for enhanced I-95 access. Therefore, the construction of a new interchange is not justified.

The need for the improved I-95 access is driven by Bryan County's plan for development along Belfast Siding Road, which is described in chapter 2 of this IAR. This planned development has been considered in the analysis, along with other development planned in southern Bryan County. Providing access to these areas without impeding the I-95 at US 17 interchange is necessary to allow the US 17 corridor provide effective access to I-95 for those who currently rely on this road, as well as new development.

The requested interchange along I-95 at Belfast Siding Road is consistent with and supportive of the anticipated growth in southern Bryan County, including the proposed development at TerraPointe, as well as additional development not yet formally documented by a DRI request. However, as indicated in Section 5 of this report, existing roads and interchanges could be improved to provide the necessary freeway access. Further, many of these improvements will be needed with or without the requested interchange. Since the existing I-95 access points can be modified to provide the access intended by the requested Belfast Siding interchange, justification for the interchange is not provided, based on FHWA and GDOT Policy Guidance.

2. STUDY METHODOLOGY AND GROWTH PROJECTIONS

FHWA has issued a series of policies regarding the installation of new access points on the Interstate System, published in the Federal Register, Volume 63, Number 28, dated February 11, 1998 (Doc. 98-3460). This series of policies, described in Appendix A, is intended to protect the capacity and safety of travel along the Interstate System by maintaining its limited access functionality. Compliance with these policies ensures that appropriate alternatives to providing new Interstate access points are considered prior to granting an additional access point. In this manner, the additional access location must be justified to allow it to be considered for implementation. The need for a new break in access along I-95 between US 17 and US 84 was examined in relation to the eight policy requirements listed in the Federal Register and included in the FHWA Guidance on Interstate Access Requests.

This section describes the approach to estimating the future growth in the study area, as well as, southern Bryan County. It includes the calculation of development-generated traffic, assignment of traffic to the roadway network, and discusses information provided by Bryan County suggesting the inclusion of increased growth assumptions. This section also describes the traffic analysis tools and methods used to evaluate the potential interchange location, as well as the adjacent interchanges, intersections and freeway sections.

Forecast of Future Traffic Volumes

The IAR includes analysis of future year conditions to determine the need and justification for a new interchange along I-95 at Belfast Siding Road. Based on discussions with Bryan County, the potential interchange, if warranted, could potentially be constructed as soon as year 2012. Therefore, year 2012 was used as the "open to traffic year" and 2032 was designated as the "design year" for analysis. The steps used in forecasting future traffic volumes for use in the Interchange Analysis Report analysis are shown below.

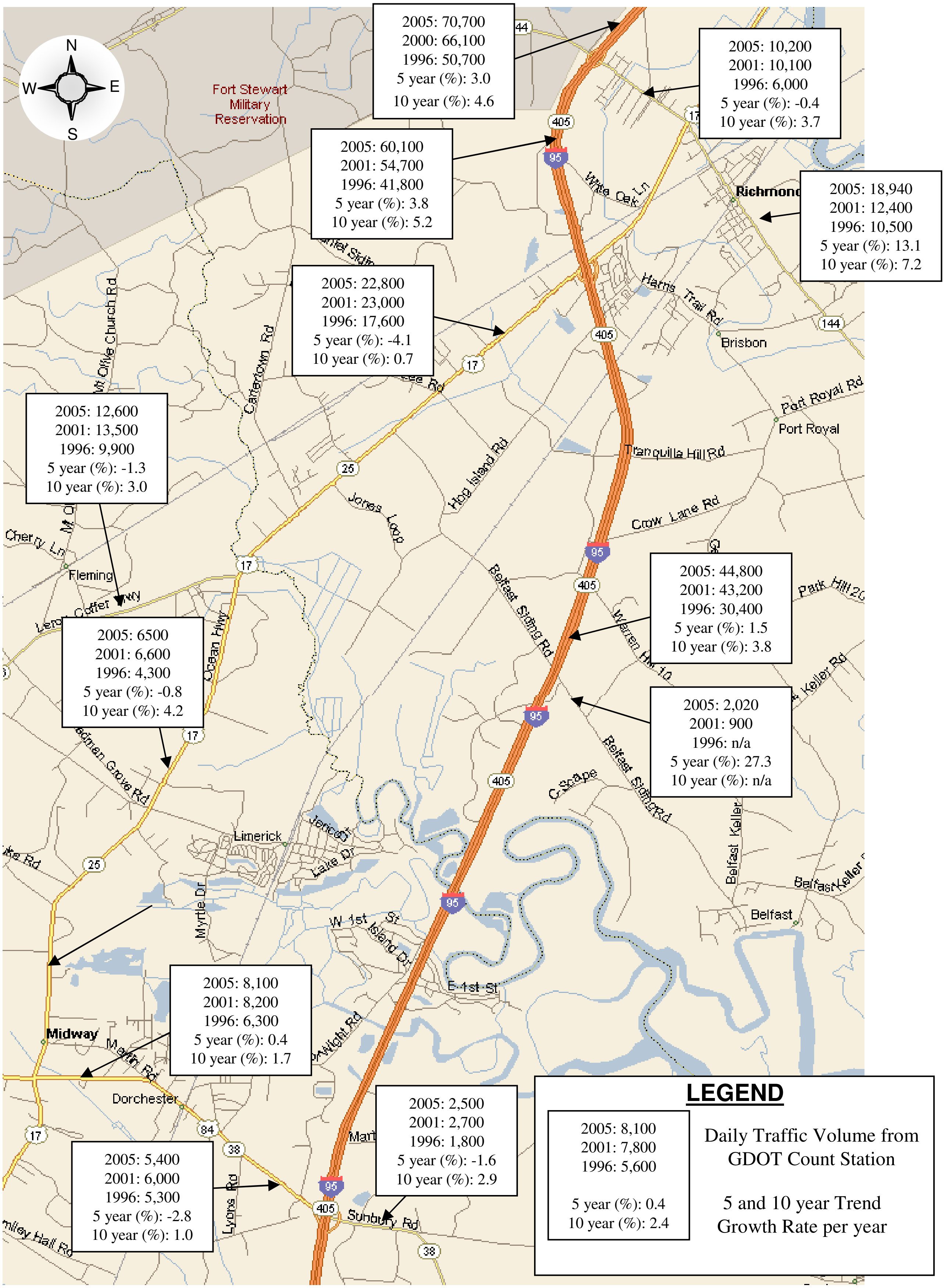
Step 1 – Examine Existing Traffic Volume and Growth Trends

The first step in developing future year traffic forecasts was to examine existing traffic volumes and trends in traffic growth. GDOT traffic count stations in southern Bryan County were examined to determine area growth trends. Figure 2-1 shows traffic volumes for year 1996, 2001, and 2005 along with five and ten year growth rates.

Step 2 – Determine Future Year Traffic Growth

The five year growth trend along I-95 (2.8% per year) was used to establish a growth rate for external to external travel along the freeway through year 2012. Following this time, the 22 planned developments will be in place, resulting in additional internal and external trips. The trips generated by these sites were explicitly accounted for in future analysis. Therefore, a reduced growth rate (1.4%) was assumed for years 2012 through 2032 to avoid double counting of this growth.

Along the non-interstate segments, the future year growth rates were estimated in a different manner. The average of the five and ten year growth rates along non-freeway roads in Bryan County was used to determine a background growth rate of 1.7% per year for application through year 2032.



JACOBS	I-95 at Belfast-Siding Road Interchange Analysis Report	GDOT Office of Planning	Figure 2-1 Historic Traffic Volumes and Growth Rates
October 2008			

The anticipated new development associated with 22 planned development sites was determined through discussions with Bryan County in Spring of 2007. The potential development areas and traffic analysis zones are shown in Figure 2-2 (page 10). This figure shows the relative size and location of the 22 planned developments along with traffic analysis zones, used for aggregating anticipated traffic for assignment to the roadway network. The trips anticipated by the planned developments were determined using Trip Generation, 7th Edition, by the Institute of Transportation Engineers (ITE), the standard resource used nationally for determining trip generation based on proposed development size and land use type.

Table 2-1, below, shows the overall trip generation for the TerraPointe Development at Belfast Siding Road, while Table 2-2 (pg 11) shows the overall trip generation for the other 21 development sites. As shown in Table 2-1, the characterization of this site as a mixed use development calls for the reduction in trips by a percentage specified by Trip Generation, 7th Edition. This reduction is due to the fact that some of the trips will occur between complementary land uses within the site, thereby not adding additional trips to the surrounding roadway network. An example would be a trip from the planned residential units to a retail establishment within the site.

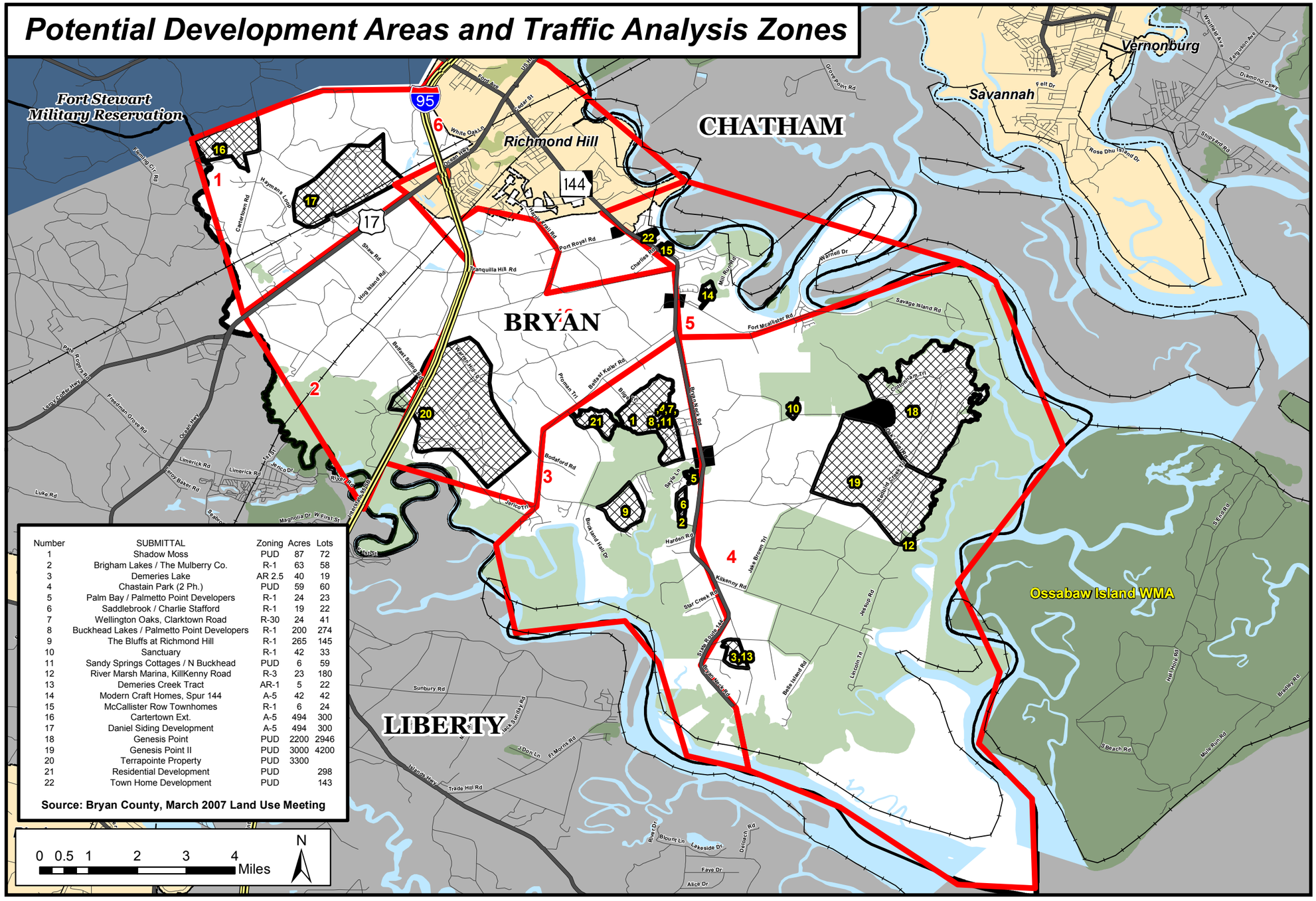
Table 2-1: Daily Traffic Generation for TerraPointe Site

Land Use	Quantity	Units	Daily Trip Rate	Total Daily Trips	Mixed Use Reduction		Net with Reduction
					Percent	Trips	
Single Family Residential	4,271	units	7.7	32,887	8%	2,586	30,301
Multifamily Residential	6,460	units	6.0	38,975	7%	2,586	36,389
School	75	acres	13.8	1,034	25%	258	775
Office	1,050	ksq. ft.	7.8	8,156	5%	436	7,720
Retail	2,100	ksq. ft.	23.4	49,134	35%	17,258	31,876
Industrial	3,721	ksq. ft.	4.8	17,708	9%	1,543	16,165
Total				**147,894**	**17%**	**24,668**	**123,226**

Step 3 – Distribute and Assign Future Year Growth to the Roadway Network

The next step was to determine how much traffic would be present in southern Bryan County in opening year 2012 and future year 2032. This includes traffic due to 22 major developments, approved by Bryan County (explicitly evaluated to determine traffic generation). This also includes traffic volumes at smaller developments, those with existing compatible zoning, and large developments to be approved in the future (reflected in the assumed 1.7% background growth rates indicated in Step 2).

Potential Development Areas and Traffic Analysis Zones



Number	SUBMITTAL	Zoning	Acres	Lots
1	Shadow Moss	PUD	87	72
2	Brigham Lakes / The Mulberry Co.	R-1	63	58
3	Demeries Lake	AR 2.5	40	19
4	Chastain Park (2 Ph.)	PUD	59	60
5	Palm Bay / Palmetto Point Developers	R-1	24	23
6	Saddlebrook / Charlie Stafford	R-1	19	22
7	Wellington Oaks, Clarktown Road	R-30	24	41
8	Buckhead Lakes / Palmetto Point Developers	R-1	200	274
9	The Bluffs at Richmond Hill	R-1	265	145
10	Sanctuary	R-1	42	33
11	Sandy Springs Cottages / N Buckhead	PUD	6	59
12	River Marsh Marina, KillKenny Road	R-3	23	180
13	Demeries Creek Tract	AR-1	5	22
14	Modern Craft Homes, Spur 144	A-5	42	42
15	McCallister Row Townhomes	R-1	6	24
16	Cartertown Ext.	A-5	494	300
17	Daniel Siding Development	A-5	494	300
18	Genesis Point	PUD	2200	2946
19	Genesis Point II	PUD	3000	4200
20	Terrapointe Property	PUD	3300	
21	Residential Development	PUD		298
22	Town Home Development	PUD		143

Source: Bryan County, March 2007 Land Use Meeting

0 0.5 1 2 3 4 Miles

N

Regional Inset

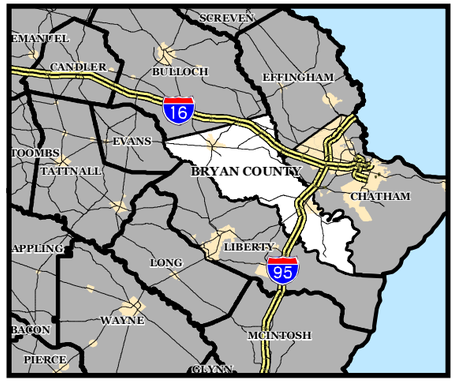


Figure 2-2

Legend

Bryan County Zoning and TAZ

- Bryan County TAZ

Road Network

- Interstate
- Ramp
- Major Road
- Other Road

Other Layers

- Potential Development Areas
- Future Commercial / Retail Nodes
- Bryan County Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Conservation Areas
- Railroads

Source: GDOT, Bryan County, and Carter & Burgess, Inc.

This map is intended for planning purposes only.

Table 2-2: Traffic Generation and Distribution of New Trips by Sub-area

No.	Submittal	Residential Lots	Trip Rate	Trips Generated		
				Gross	Mixed Use Reduction	Net with Reduction
US 17 Corridor west of I-95						
16	Cartertown Ext	300	9.5	2,857	n/a	2,857
17	Daniel Siding	300	9.5	2,857	n/a	2,857
SR 144 north of Fort McCallister Road						
14	Modern Craft	42	11.1	468	n/a	468
15	McCallister Row	24	11.7	280	n/a	280
22	Town Home	143	10.1	1,445	n/a	1,445
West of SR 144 between Belfast Keller Rd (north) and Belfast Keller Rd (south)						
1	Shadow Moss	72	10.7	769	10%	692
4	Chastain Park	60	10.8	650	10%	585
7	Wellington Oaks, Clarktown	41	11.2	458	10%	412
8	Buckhead Lakes / Palmetto Point	274	9.6	2,628	10%	2,365
11	Sandy Springs / N Buckhead	59	10.8	640	10%	576
21	Town home	298	9.5	2839	10%	2,555
SR 144 south of Oak Level Road						
2	Brigham Lakes / Mulberry Co	58	10.9	630	n/a	630
3	Demeries Lake	19	11.9	226	n/a	226
5	Palm Bay / Palmetto Point	23	11.7	269	n/a	269
6	Saddlebrook	22	11.7	258	n/a	258
9	The Bluffs	145	10.1	1,464	n/a	1,464
13	Demeries Creek	22	11.7	258	n/a	258
Oak Level Road East of SR 144						
10	Sanctuary	33	11.4	375	n/a	375
12	River Marsh Marina	180	9.9	1,786	10%	1,607
18	Genesis Point	2946	7.9	23,369	10%	21,032
19	Genesis Point 2	4200	7.7	32,384	10%	29,146

Source: Bryan County, March 2007 Land Use Meeting

Bryan County lies south of the Chatham Urban Transportation Study (CUTS) boundary and is not included in the MPO's travel demand model. Therefore, a manual assignment method was used to apply future growth to the roadway network. The traffic analysis zones indicated in Figure 2-2 (pg 10) were used to group developments within similar geographic areas. Travel time was used for the creation of travel impedance in this study. Travel time between each pair of TAZs was calculated based on the speed and distance between the pair of TAZs. The TransCAD gravity model program used the trip generation and trip impedance for trip distribution, resulting in the trip origin-destination (OD) matrix shown in Table 2-3 (pg 12). As indicated above, calculation of 2030 external trips was based on the 2007 ADT with the estimation of annual growth rate 2.8% from year 2007 to 2012 and 1.4% from year 2012 to 2030.

Table 2-3: Matrix of Trip Origins and Destinations for Proposed Developments in Southern Bryan County

TAZ	1	2	3	4	5	6	7	8	9	10	11	12
1 - Developments 16 and 17	0	253	101	17	0	540	733	13	176	221	264	539
2 - Development 20 west of I-95	253	0	270	446	12	0	0	400	0	358	358	1,115
3 - Developments 1, 2, 4, 5, 6, 7, 8, 9, 11, 13, and 21	101	270	836	6,451	189	479	279	40	183	265	607	8,942
4 - Developments 3, 10, 12, 18, and 19	17	446	6,451	2,484	38	2,075	793	665	408	740	849	16,793
5 - Developments 14, 15, and 22	0	12	189	38	0	229	126	37	40	61	90	276
6 - Richmond Hill	540	0	479	2,075	229	0	0	0	0	0	0	4,772
7 - External Zone - US 17 west of I-95	733	0	279	793	126	0	0	0	197	1,160	57	4,739
8 - External Zone - I-95 south of Belfast Siding Rd	13	400	40	665	37	0	0	0	987	44,603	120	2,325
9 - External Zone - SR 144 North of I-95	176	0	183	408	40	0	197	987	0	6,316	1,737	2,817
10 - External Zone - I-95 North of Richmond Hill	221	358	265	740	61	0	1,160	44,603	6,316	0	0	1,848
11 - External Zone - US 17 North of Richmond Hill	264	358	607	849	90	0	57	120	1,737	0	0	1,988
12 - Development 20 east of I-95	539	1,115	8,942	16,793	276	4,772	4,739	2,325	2,817	1,848	1,988	6,043
Total TerraPointe Development Traffic Productions West of I-95		*3,212*									Total TerraPointe Development Traffic Productions East of I-95	*52,209*

Total TerraPointe Development Traffic Productions (note: productions are half of overall trip generation)	**55,421**
Total TerraPointe Development Traffic Remaining in Southern Bryan County	**40,588**
Total TerraPointe Development Traffic Leaving Southern Bryan County	**14,833**

The traffic noted in Table 2-3 represents travel to/from the 22 planned development sites in southern Bryan County that were identified through coordination with Bryan County in Spring 2007. This volume was added to the roadway network on top of the assumed background growth rates, as explained on page 7. Thus, the traffic generated in the origin-destination matrix reflects new trips from the 22 developments explicitly examined. In addition, the background growth rate reflects any new trips from development not included in the 22 indicated sites. The traffic was assigned to the roadway network and is shown on the traffic flow diagrams provided in Appendix C.

Consideration of Additional Traffic Generation Proposed by Bryan County

In a coordination meeting with Bryan County in August 2007, the County indicated that the trip generation rates assumed for the development may be low. TerraPointe indicated that the site may serve as an inland port with substantially higher truck trip generation than was reflected in the traffic estimates. In addition, they indicated that additional planned developments, above and beyond the development identified in March 2007, may need to be included in the analysis. At the request of Bryan County, the study paused to allow the County and TerraPointe to provide additional data for input to the study.

In December 2007, additional information was provided by Bryan County which included 8 additional DRI locations, served by freeway access outside the study area, additional trips assumed to be generated from the 22 planned developments included in the Interchange Analysis Report, and trip generation due to assumed currently undocumented build-out of 23,000 acres of land at 1.4 units per acre. The information transmittal, shown in Appendix B, indicated that the County agreed that additional truck traffic would not need to be applied to the proposed development and that the use of ITE Land use Code 110 – Light Industrial would satisfactorily address industrial trip generation.

The growth assumed in the December 2007 growth projections provided by King Engineers on behalf of Bryan County was addressed in GDOT's February 5, 2008 letter (see Appendix B). This letter indicated GDOT's concern that the growth in traffic estimated by King Engineering was unrealistically high. The growth assumption provided by King Engineers resulted in 458,000 new daily trips due to development. The 458,000 new daily trips estimated by King Engineering would equate to 45% of the 1,015,000 daily trips assumed in all of Chatham County for year 2030, which is a larger urbanized area. Therefore, GDOT decided to use the traffic generation presented in the August 2007 meeting which reflects 286,000 new daily trips, which exceeds the documented development in order to account for potential growth beyond what is currently planned.

The background growth assumptions included in the IAR analysis represent an additional 92,000 vehicles per day in southern Bryan County (see Study Area map, page 16) along with the 194,000 vehicles per day for the 22 planned developments. Thus, the Interchange Analysis Report analysis assumes a total of 286,000 vehicles per day over current traffic volumes (this includes background growth rates equivalent to the Bryan County recommendations assuming a buildout of 29% of the unspecified development area identified by Bryan County). Therefore, development of 23,000 acres of unspecified development was included in the Interchange Analysis Report analysis in the form of assumed growth in background traffic.

Traffic Analysis Tools

Per FHWA and GDOT policy, various analysis methods were utilized to examine existing and future traffic conditions in the study area. The interstate and associated ramps were analyzed using freeway analysis and merge/diverge analysis methods. Intersection capacity analyses were performed on the arterial intersections within the study area.

The *Highway Capacity Software (HCS+) Version 5.21* was used to determine the LOS and vehicle density along the freeway sections subject to this Interchange Analysis Report. The following criteria were used:

- Base free-flow speed of 70 miles per hour (mph);
- Peak hour factor of 0.90;
- Grade set as "level" (short grades of 2% or less); and,
- Heavy vehicle percentage of 25%.

HCS+ also provided the LOS and vehicle density for merge and diverge points along I-95 in the vicinity of Belfast-Siding Road. The criteria used in the merge/diverge analyses included:

- Ramp free-flow speed of 35 mph;
- Peak hour factor of 0.90;
- Heavy vehicle percentage of 25%; and,
- "Level" freeway setting for I-95 and 3% grade for the ramps.

Intersection level performance was measured using *Synchro 7.0* analysis software. Using existing peak hour factors, lane configurations and traffic control, the software was used to determine the peak hour LOS and vehicular delay at the study intersections. For the purpose of analysis, signal timings were assumed to be optimized, and signalized intersections spaced less than approximately 1,000 feet apart were assumed to have coordinated timings.

Analysis Scenarios

The analysis scenarios performed for each type of analysis described above include the following:

- Existing Conditions;
- Year 2032 "Without Requested Interchange" Conditions; and
- Year 2032 "With Requested Interchange" Conditions.

Analyses showed that several locations require improvements to operate at adequate Levels of Service (LOS). Mitigation analyses were performed, where necessary, for each scenario, under each type of analysis, to indicate improvements necessary to provide satisfactory operations.

3. EXISTING CONDITIONS AND PLANNED IMPROVEMENTS

Before performing traffic analyses, it is important to gain an understanding of the physical and operational characteristics of the existing transportation network and the surrounding region. To provide insight on the operations and potential needs, an inventory of existing facilities was performed. To supplement this existing conditions information and provide an understanding of the future transportation network, project information was gathered on GDOT's planned transportation improvements within the study area.

Study Area Overview

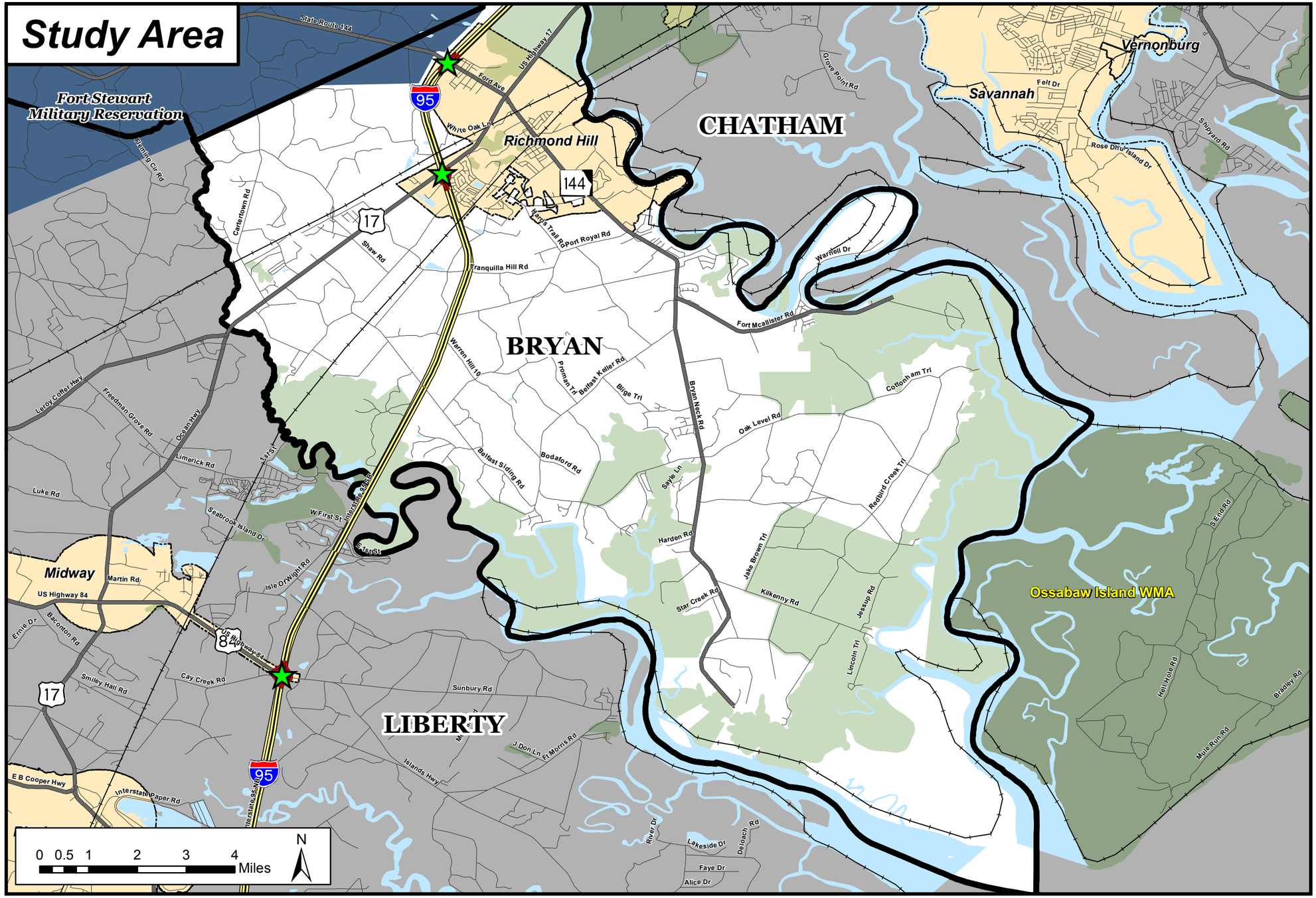
The study area, which is centered on the Belfast-Siding Road corridor, extends from north of SR 144 to south of US 84 along I-95 and encompasses the surrounding region, as shown in Figure 3-1 (page 16). The requested interchange is located approximately 4.6 miles south of the US 17 interchange and 6.4 miles north of the US 84 interchange. The minimum spacing requirements set forth in FHWA's and GDOT's policies on new or revised access points states at least two miles between interchanges in rural and suburban areas, which is met by the requested interchange (see Appendix A). Figure 3-2 (page 17) illustrates the interchange spacing within the study area.

Several large developments, including TerraPointe and Genesis Point, planned within the study area will have a significant impact on the transportation system. These planned developments as well as the potential for unplanned development has been considered in the growth analysis.

The study area includes the southern portion of Bryan County and portions of the surrounding counties where necessary for traffic analysis. In general, the borders of Bryan County served as the boundaries for the study area due to the limited access caused by the surrounding bays. These bodies of water that serve as the northeastern and southwestern boundaries of the county restrict traffic to a few limited points. Therefore, most of the traffic generated in this eastern portion of the county must travel through the intersections within the study area to access the interstate. For this reason, all of Bryan County east of I-95, as well as portions of Liberty and Chatham Counties, was included in the study area for existing and future trip generation purposes.

In order to meet current FHWA and GDOT guidelines, the study must include analysis of adjacent interchanges. For this reason, the study area extends beyond Bryan County, southwards to the interchange of I-95 at US 84 in Liberty County. The study also includes several non-interchange intersections along US 17.

In order to analyze the impacts of the requested new interchange on the existing network, the study area includes three existing interchanges at SR 144, US 17 and US 84 as well as additional key intersections within the study area. For analysis purposes, 12 intersections were identified and studied for capacity and traffic flow levels of service. The 12 intersections, detailed on page 18 and shown in Figures 3-2, 4-1, 5-1 and 5-2 (pg 19, 23, 32 and 33, respectively), include interchange and non-interchange intersections, as well as future intersections at Belfast Siding Road and I-95 requested for the "With Requested Interchange" alternative.



Regional Inset

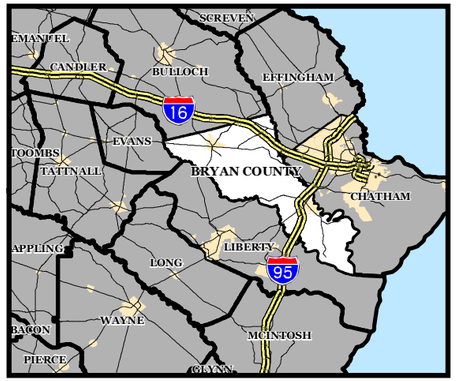


Figure 3-1

Legend

Study Interchanges

- Study Interchanges

Road Network

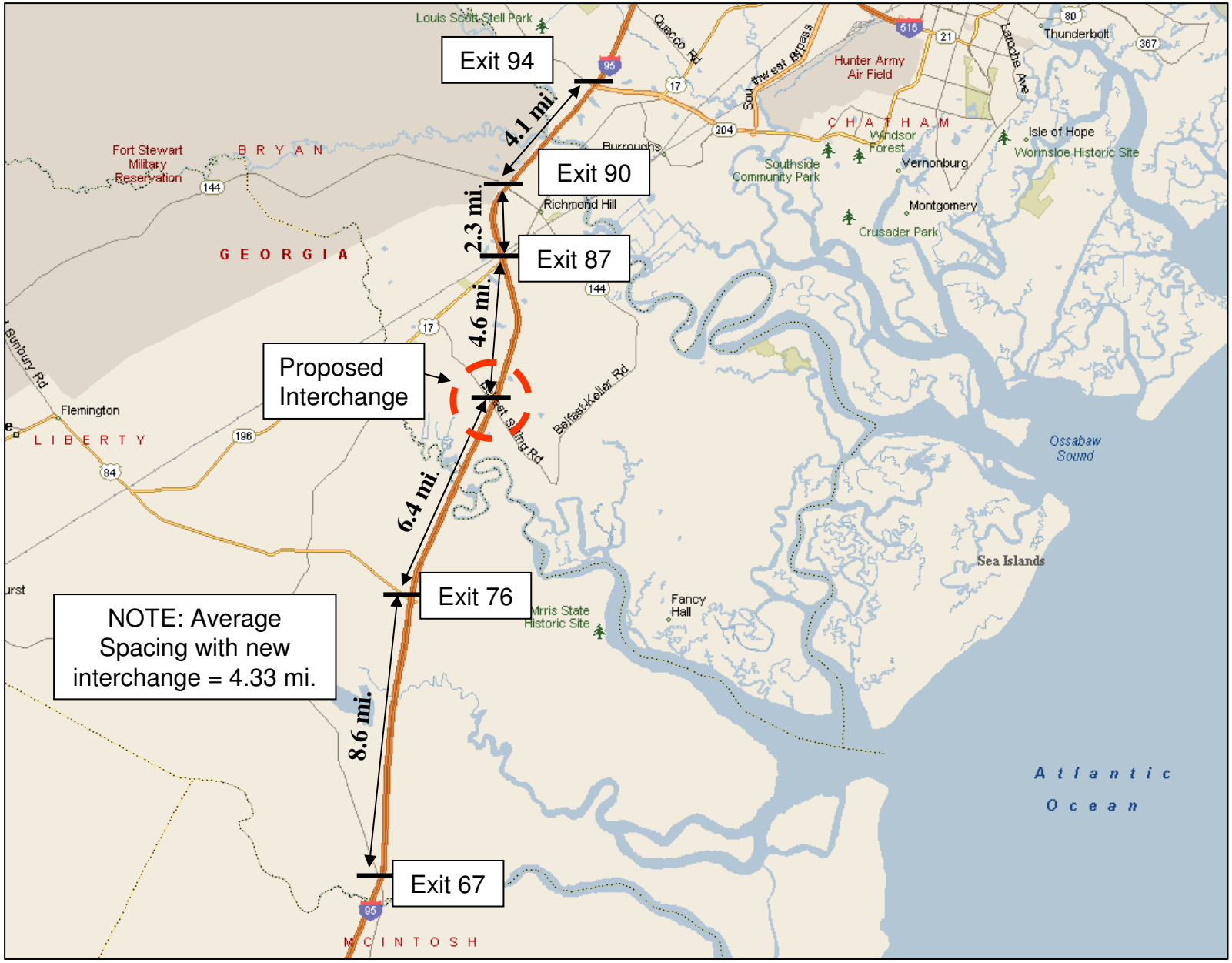
- Interstate
- Interchange Ramps
- State Route / U.S. Highway
- Other Roads

Other Layers

- Study Area Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Conservation Areas
- Railroads

Source: GDOT, and Carter & Burgess, Inc.

This map is intended for planning purposes only.


Exit 94
Exit 90
Exit 87
Exit 76
Exit 67
4.1 mi.
2.3 mi.
4.6 mi.
6.4 mi.
8.6 mi.
Proposed Interchange
NOTE: Average Spacing with new interchange = 4.33 mi.
Louis Scott Stell Park
Fort Stewart Military Reservation
B R Y A N
G E O R G I A
L I B E R T Y
M C I N T O S H
C H A T H A M
Hunter Army Air Field
Thunderbolt
Isle of Hope
Wormsloe Historic Site
Windsor Forest
Southside Community Park
Vernonburg
Montgomery
Crusader Park
Richmond Hill
Burroughs
Flemington
Belfast-Keller Rd
Belfast Siding Rd
Sunbury Rd
Quacco Rd
Southwest Bypass
Lancaster Ave
Fancy Hall
Mrris State Historic Site
Ossabaw Sound
Sea Islands
Atlantic Ocean

Interchange and Roadway Network Inventory

To determine the impacts of the requested interchange at Belfast Siding Road, the roadway network surrounding this location and the adjacent interchanges was analyzed. The following list details the intersections and interchanges that would be impacted by such an improvement. The lane configurations and traffic control for these existing intersections and interchanges within the study area are shown in Figure 3-3 (page 19).

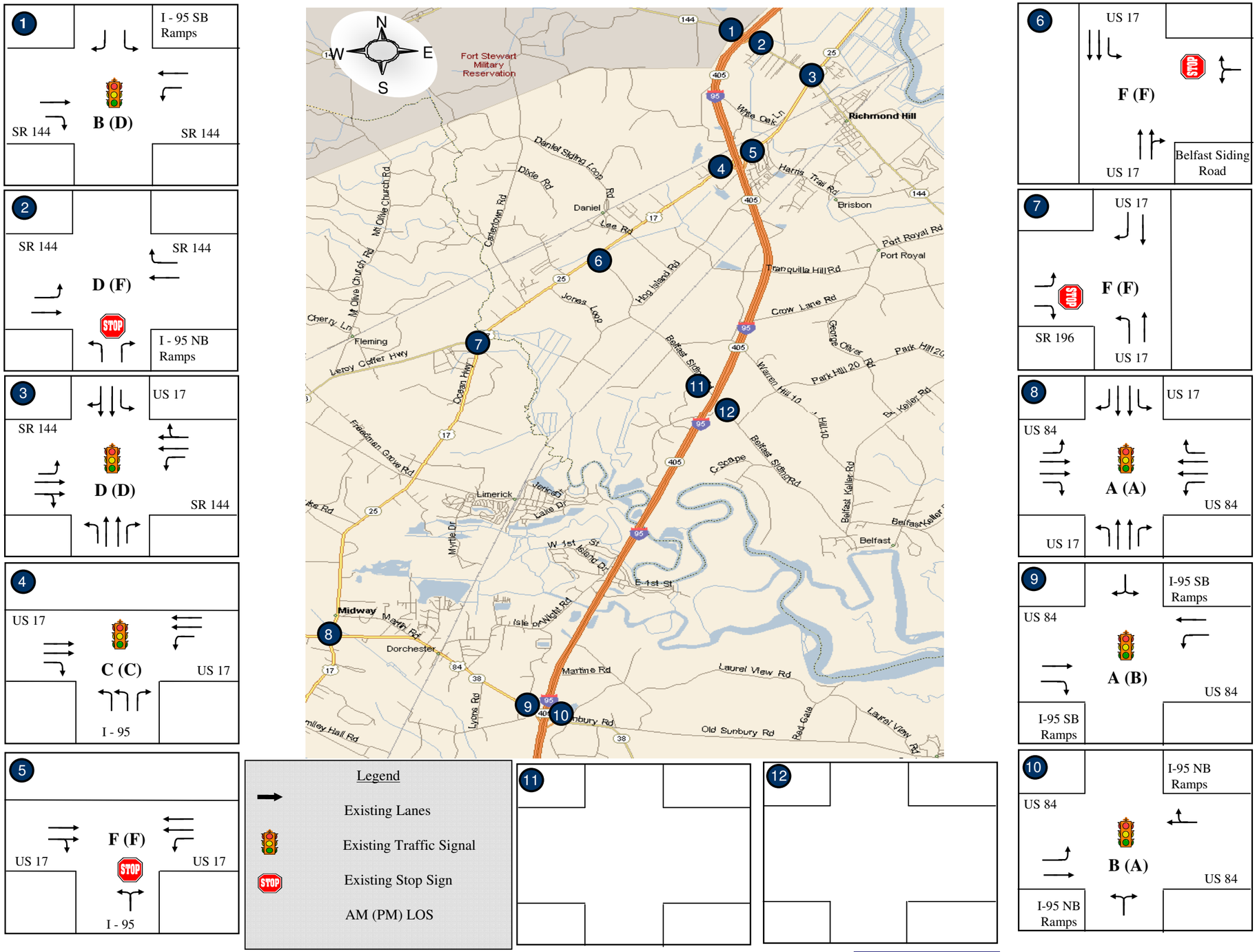
(1), SR 144 at I-95 SB ramps;
(2), SR 144 at I-95 NB ramps;
(3), SR 144 at US 17;
(4), US 17 at I-95 SB ramps;
(5), US 17 at I-95 NB ramps;
(6), US 17 at Belfast Siding Rd;
(7), US 17 at SR 196;
(8), US 17 at US 84;
(9), US 84 at I-95 SB ramps;
(10), US 84 at I-95 NB ramps;
(11) Belfast Siding Road at I-95 SB ramps (future "With Requested Interchange" analysis);
(12) Belfast Siding Road at I-95 NB ramps; (future "With Requested Interchange" analysis).

Traffic Volumes

Weekday peak period and daily traffic volumes were collected at the study intersections and along roadways within the study area in March 2007. The weekday peak hour volumes and ADT turning movement volumes at the existing study intersections are shown in Appendix C. These volumes were used to evaluate existing traffic conditions in and around the requested interchange vicinity. They were also used to develop the Design Year (Year 2032) traffic volumes.

Planned Transportation Improvements

There is one transportation improvement project programmed by GDOT in the vicinity of the study area that will have an impact on traffic operations and have implications on the overall findings and recommendations related to the requested new access break. This project is the programmed widening of I-95 (PI # 511025) through Bryan County from six to eight lanes. According to GDOT's Long Range Program (2007), preliminary engineering for this project is scheduled to begin in 2014.



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I-95 at Belfast-Siding Road

Interchange Analysis Report

GDOT Office of Planning

Figure 3-3: 2007 Existing Lane Configuration & LOS

4. EXISTING CONDITIONS ANALYSIS

Freeway, merge/diverge, and intersection capacity analyses were performed for existing conditions (based on Year 2007 data). Level-of-service "C" (LOS C) and above was considered to be adequate peak hour traffic conditions. For some cases, in which financial and environmental concerns prevent the attainment of LOS "C" or better conditions, LOS "D" is considered adequate. Generally, Levels-of-Service "D," "E" and "F" were considered to be inadequate peak hour conditions. Where necessary, transportation improvements were tested to improve traffic conditions to LOS C or better.

Freeway Analysis

An analysis of existing freeway conditions was performed on the segment of I-95 from south of US 84 to north of SR 144. The *Highway Capacity Software (HCS+) Version 5.21* was used to determine the existing LOS and vehicle density along the freeway sections. Based on field observations and engineering judgment, the following criteria were used to analyze freeway segments:

- Base free-flow speed of 70 miles per hour (mph);
- Peak hour factor of 0.90;
- Grade set as "level" (short grades of 2% or less); and,
- Heavy vehicle percentage of 25%.

The results of the freeway segment analysis are shown in Table 4-1.

Table 4-1: Existing Freeway Conditions

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)[1]	LOS	Density (pc/mi/ln)[1]
I-95 south of US 84	NB	C	21.2	B	14.1
	SB	B	14.1	C	21.2
I-95 between US 84 and US 17	NB	C	23.5	B	15.4
	SB	B	15.4	C	23.5
I-95 between US 17 and SR 144	NB	D	32.9	C	19.8
	SB	C	19.8	D	32.9
I-95 north of SR 144	NB	F	>45	C	25.8
	SB	C	25.8	F	>45

[1]Passenger cars/mile/lane

As shown in Table 4-1 (above), most freeway sections operate with adequate LOS. However, I-95 between US 17 and SR 144 operates at LOS D and the section of I-95 north of SR 144 operates at LOS F during both peak periods (northbound in the AM peak hour and southbound in the PM peak hour).

Merge/Diverge Analysis

Highway Capacity Software (HCS+) Version 5.21 software was also used to analyze the operation of merge and diverge sections along I-95 within the study area. The existing LOS and vehicle density at these locations, described in Table 4-2 (below), were developed using the following criteria:

- Ramp free-flow speed of 35 mph;
- Peak hour factor of 0.90;
- Heavy vehicle percentage of 25%; and,
- "Level" freeway setting for I-95 and 3% grade for the ramps.

Table 4-2: Existing Merge/Diverge Conditions

Ramp[1,2]	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)[3]	LOS	Density (pc/mi/ln)[3]
I-95 NB Off Ramp @ US 84	C	25.2	B	16.7
I-95 NB On Ramp @ US 84	C	27.6	B	19.0
I-95 SB Off Ramp @ US 84	B	18.2	C	27.8
I-95 SB On Ramp @ US 84	B	17.7	C	25.4
I-95 NB Off Ramp @ US 17	C	27.8	B	18.2
I-95 NB On Ramp @ US 17	D	34.3	C	23.6
I-95 SB Off Ramp @ US 17	C	23.6	E	35.5
I-95 SB On Ramp @ US 17	B	19.0	C	27.7
I-95 NB Off Ramp @ SR 144	E	35.5	C	23.6
I-95 NB On Ramp @ SR 144	F	40.8	D	29.4
I-95 SB Off Ramp @ SR 144	D	30.1	E	36.2
I-95 SB On Ramp @ SR 144	C	23.9	D	34.7

[1]Four travel lanes on freeway have been assumed
[2]Two lanes on the ramp have been assumed
[3]Passenger cars/mile/lane

As shown in Table 4-2 (above), a majority of the existing merge/diverge sections at the studied interchanges operate with adequate LOS. During the AM peak hour, the merge and diverge sections at the NB I-95 On-Ramp at US 17; the NB I-95 Off-Ramp and On-Ramp at SR 144; and the I-95 SB Off-Ramp at SR 144 operate at LOS D or worse. For the PM peak hour, the I-95 SB Off-Ramp at US 17; the I-95 NB On-Ramp at SR 144 and both ramps at I-95 SB at SR 144 operate at LOS D or worse.

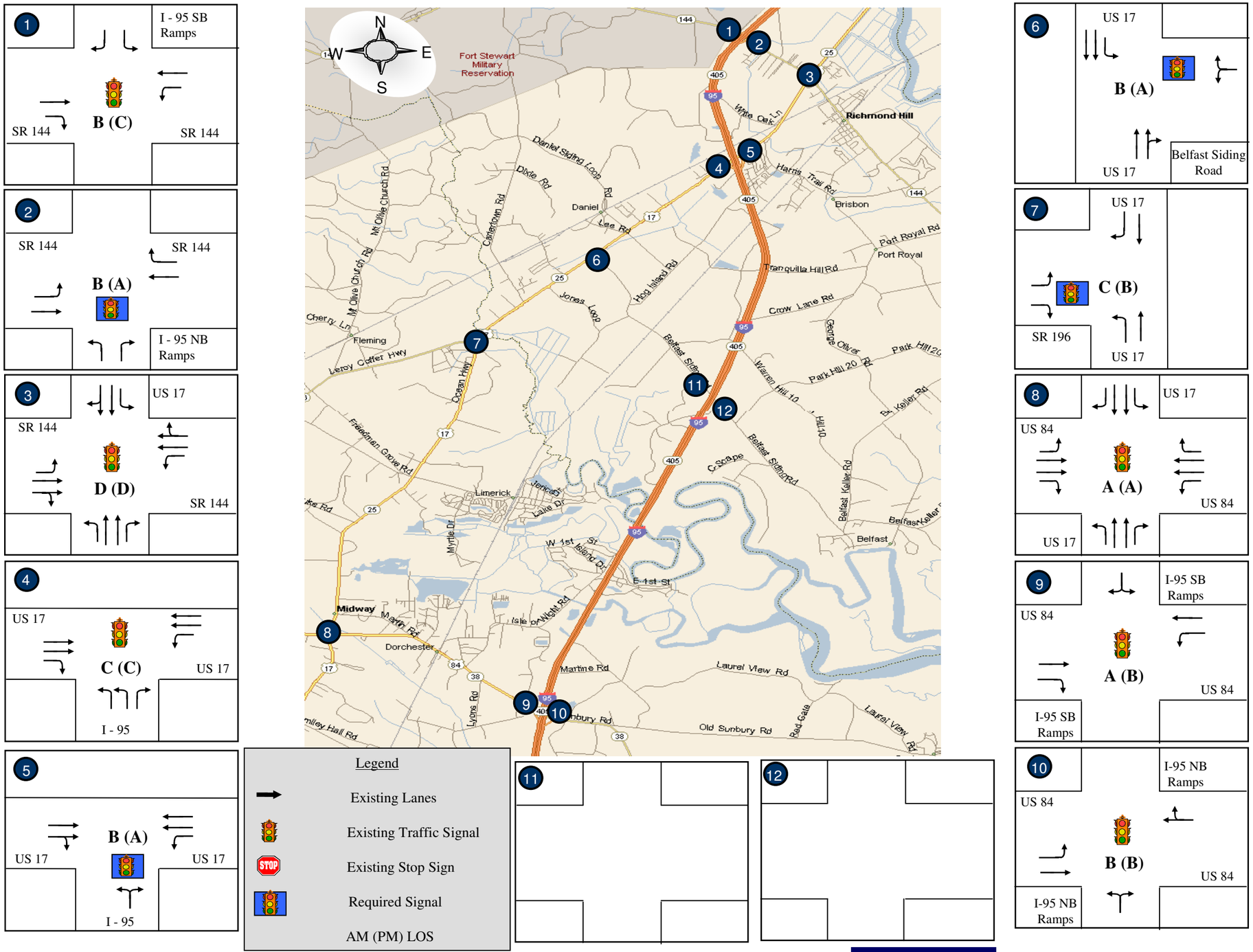
Intersection Analysis

Intersection analyses for existing conditions were performed for the intersections/interchanges identified in previous sections. *Synchro 7.0* software was used to determine the peak hour LOS and vehicular delay at the study intersections. Existing peak hour factors, lane configurations and traffic control (i.e. signals, signage) were included in the analysis. Signal timing was assumed to be optimized, and signalized intersections, spaced less than approximately 1,000 feet apart, were assumed to have coordinated timings. Although coordinated timings do not exist in the field today, the assumption was made to standardize analyses since it is likely that the intersections in the Year 2032 will be eventually optimally adjusted to reflect changes in traffic volumes and patterns.

The results of the intersection analysis are shown in Table 4-3, below. As shown this table, several intersections operate with inadequate peak hour operations. Improvements were tested, using *Synchro 7.0* software, at these intersections in addition to others that could easily be enhanced to operate more efficiently. The result of this mitigation analysis is described in Table 4-3, below. The improvements necessary to improve the existing roadway network to LOS C or better are also shown graphically on Figure 4-1 (page 23).

Table 4-3: Existing Intersection Conditions

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	B	19	D	50.4
		Signal with improvements	Overall	B	18.0	C	25.9
2	SR 144 @ I-95 NB ramps	Stop Control	NB-L	D	32.6	F	>50
			NB-R	D	32.6	F	>50
			EB-L	A	8.4	A	8.4
		Signal with improvements	Overall	B	11.8	A	6.9
3	US 17 @ SR 144	Signal	Overall	D	43.0	D	51.0
		Signal with improvements	Overall	D	45.6	D	52.9
4	US 17 @ I-95 SB ramps	Signal	Overall	C	31.4	C	21.7
		Signal with improvements	Overall	C	27.8	C	22.4
5	US 17 @ I-95 NB ramps	Stop Control	NB-LR	F	>50	F	>50
			WB-LR	B	10.5	A	8.8
		Signal with improvements	Overall	B	14.0	B	14.6
6	US 17 @ Belfast Siding Road	Stop Control	SB-L	B	13.9	B	11.3
			WB-LR	F	>50	F	>50
		Signal with improvements	Overall	B	8.3	A	8.4
7	US 17 @ SR 196	Stop Control	NB-L	A	7.9	A	8.3
			EB-L	F	>50	F	>50
			EB-R	A	10.0	B	10.7
		Signal with improvements	Overall	C	22.6	B	18.8
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	7.7	A	7.9
9	US 84 @ I-95 SB ramps	Signal	Overall	A	9.5	B	11.8
10	US 84 @ I-95 NB ramps	Signal	Overall	B	14.8	B	11.8



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I-95 at Belfast-Siding Road

Interchange Analysis Report

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Figure 4-1: 2007 Required Improvements & LOS

Crash Analysis

To identify potential safety issues within the study area, the most recent available crash data (Year 2002 through Year 2006) was analyzed. The crash data includes a variety of detailed information such as crash location, day of crash, time of crash, type of crash, and severity of crash (i.e. PDO, non-injuries, injuries, and fatalities). The following table summarizes the crash rates for roadway segments within the study area and provides a comparison between these segments and the statewide average for various roadway classifications.

Table 4-4: Crash Analysis

Route	Extents	GDOT Roadway Classification	Average crashes per year per 100 MVM	Statewide average crashes per 100 MVM[1]
US 17	South of US 84 to north of SR 144	Rural Principal Arterial	130	150
SR 144	West of I-95 to US 17	Rural Minor Arterial	230	208
US 84	From US 17 to I-95	Rural Minor Arterial	220	208
Belfast Siding Rd	Full extent	Rural Major Collector	210	221

[1] Rates are an average of statewide average crashes from Years 2002 through 2006 for each roadway classification

As shown in Table 4-4 (above), the crash rates within the study area are similar to statewide averages for roadways with similar characteristics. Therefore, no safety issues have been identified within the study area.

5. DESIGN YEAR 2032 ANALYSIS

Freeway, merge/diverge, and intersection capacity analyses were performed using *Highway Capacity Software (HCS+) Version 5.21* software for Year 2032 conditions. The same methodologies used in the existing conditions analysis were assumed in the future analysis. The volumes used for this analysis are included in Appendix C. Both "With Requested Interchange" and "Without Requested Interchange" scenarios were analyzed for the Year 2032, which includes the planned widening of I-95. The "With Requested Interchange" scenario assumed the construction of a diamond interchange at Belfast Siding Road.

Freeway Analysis

The segment of I-95 spanning from south of US 84 to north of SR 144 was analyzed for future, Year 2032, conditions using *Highway Capacity Software (HCS+) Version 5.21* software. The criteria and methodologies used for the existing conditions analysis were assumed to remain true for future conditions. The results of the freeway segment analysis are shown below in Tables 5-1 and 5-2.

Table 5-1: 2032 "Without Requested Interchange" Freeway Conditions

Freeway Section[1]	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)[2]	LOS	Density (pc/mi/ln)[2]
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and US 17	NB	C	18.1	B	12.7
	SB	B	12.7	C	18.1
I-95 between US 17 and SR 144	NB	C	22.4	B	14.9
	SB	B	14.9	C	22.4
I-95 north of SR 144	NB	D	29.4	C	19.5
	SB	C	19.5	D	29.4

[1] Four travel lanes on freeway have been assumed
[2] Passenger cars/mile/lane

Table 5-2: 2032 "With Requested Interchange" Freeway Conditions

Freeway Section[1]	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)[2]	LOS	Density (pc/mi/ln)[2]
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and Belfast Siding Road	NB	C	18.1	B	12.7
	SB	B	12.7	B	18.1
I-95 between Belfast Siding Road and US 17	NB	C	22.3	B	14.5
	SB	B	14.5	C	22.3
I-95 between US 17 and SR 144	NB	C	27.4	B	16.8
	SB	B	16.8	C	27.4
I-95 north of SR 144	NB	D	35.0	C	20.8
	SB	C	20.8	D	35.0

[1] Four travel lanes on freeway have been assumed
[2] Passenger cars/mile/lane

As shown in Tables 5-1 and 5-2 (page 25), the freeway operations for the Year 2032 "Without Requested Interchange" and "With Requested Interchange" conditions are forecast to maintain an adequate LOS for most segments. Both the freeway and merge/diverge analyses show that the section of I-95 north of SR 144 will operate at LOS D during AM (northbound) and PM (southbound) peak periods.

Merge/Diverge Analysis

The merge/diverge ramps at the interchanges of I-95 at US 84, US 17 and US 144 were analyzed for Year 2032 conditions using *Highway Capacity Software (HCS+) Version 5.21*. The methodologies and assumptions used for the existing conditions analysis were assumed to remain the same for future Year 2032. The results of the merge/diverge analysis are shown in Tables 5-3 (below) and 5-4 (page 27).

Table 5-3: 2032 "Without Requested Interchange" Merge/Diverge Conditions

Ramp[1,2]	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)[3]	LOS	Density (pc/mi/ln)[3]
I-95 NB Off Ramp @ US 84	B	17.6	B	12.7
I-95 NB On Ramp @ US 84	B	17.3	B	13.3
I-95 SB Off Ramp @ US 84	B	14.9	C	21.4
I-95 SB On Ramp @ US 84	B	12.2	B	15.9
I-95 NB Off Ramp @ US 17	C	20.9	B	16.2
I-95 NB On Ramp @ US 17	C	20.5	B	16.6
I-95 SB Off Ramp @ US 17	C	21.6	D	30.9
I-95 SB On Ramp @ US 17	B	13.8	B	17.2
I-95 NB Off Ramp @ SR 144	C	24.3	B	16.3
I-95 NB On Ramp @ SR 144	C	22.6	B	19.1
I-95 SB Off Ramp @ SR 144	B	12.3	B	19.2
I-95 SB On Ramp @ SR 144	B	14.7	C	20.3

[1]Four travel lanes on freeway have been assumed
[2]Two lanes on the ramp have been assumed
[3]Passenger cars/mile/lane

Table 5-4: 2032 "With Requested Interchange" Merge/Diverge Conditions

Ramp[1,2]	AM Peak Hour		PM Peak Hour	
	LOS	Density (pc/mi/ln)[3]	LOS	Density (pc/mi/ln)[3]
I-95 NB Off Ramp @ US 84	B	16.8	B	11.4
I-95 NB On Ramp @ US 84	B	16.8	B	12.4
I-95 SB Off Ramp @ US 84	B	13.6	C	20.7
I-95 SB On Ramp @ US 84	B	11.2	B	15.4
I-95 NB Off Ramp @ Belfast Siding Road	B	18.7	B	13.2
I-95 NB On Ramp @ Belfast Siding Road	C	20.5	B	15.0
I-95 SB Off Ramp @ Belfast Siding Road	B	17.6	D	28.5
I-95 SB On Ramp @ Belfast Siding Road	B	12.6	B	17.2
I-95 NB Off Ramp @ US 17	C	25.0	B	17.9
I-95 NB On Ramp @ US 17	C	22.1	B	17.4
I-95 SB Off Ramp @ US 17 (2)	A	9.1	B	17.3
I-95 SB On Ramp @ US 17	B	14.9	C	20.1
I-95 NB Off Ramp @ SR 144	D	28.6	B	18.2
I-95 NB On Ramp @ SR 144	C	23.9	B	19.5
I-95 SB Off Ramp @ SR 144 (2)	B	12.0	B	19.3
I-95 SB On Ramp @ SR 144	B	16.2	C	23.4

[1]Four travel lanes on freeway have been assumed
[2]Two lanes on the ramp have been assumed
[3]Passenger cars/mile/lane

As shown in Tables 5-3 (page 26) and 5-4 (above), most of the merge/diverge sections at the interchanges of I-95 at SR 144, US 17 and US 84 are forecast to operate with adequate LOS in Year 2032. For the "Without Requested Interchange" scenario, the diverge section at the SB Off-Ramp to US 17 operates at LOS D during the PM peak hour. The analysis of the "With Requested Interchange" scenario shows that the diverge section at the requested interchange of Belfast Siding at the SB Off-Ramps would experience LOS D during the PM peak hour. Additionally, the diverge section at I-95 NB at SR 144 Off-Ramp would operate at LOS D during the AM peak for the "With Requested Interchange" scenario.

Arterial Analysis

Highway Capacity Software (HCS+) Version 5.21 was used to determine arterial capacity needs throughout the study area. According to this software, improvements are needed along US 17 to adequately serve the projected future volumes with or without the requested interchange. Annual Average Daily Traffic (AADT) were used to determine the capacity needs along this corridor for Design Year (2032). With an AADT between 40,000 and 65,000 vehicles per day (with or without the requested interchange), the section of US 17 between Belfast Siding Road and I-95 (west of the interstate) would require a six-lane roadway. At the interchange and to the east of the interstate, a four-lane road could adequately serve anticipated volumes. Additionally, the arterial analysis indicated that Belfast Siding Road would also require widening for the "With Requested Interchange" scenario.

Intersection Analysis

Using *Synchro 7.0* software, intersection analyses were performed for the intersections/interchanges identified earlier in this report for future Year 2032. The methodologies and assumptions used for existing conditions analyses were assumed to remain true for 2032 analysis. Improvements were tested at the intersections operating at inadequate LOS and the results of the analysis are also shown in Tables 5-5 (below) and 5-6 (page 29). The improvements are also shown graphically on Figure 5-1(page 32) and 5-2 (page 33).

Table 5-5: 2032 "Without Requested Interchange" Intersection Conditions

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	E	62.5	F	>80
		Signal with improvements	Overall	C	29.2	C	29.8
2	SR 144 @ I-95 NB ramps	Stop Control	NB-L	F	>50	F	>50
			NB-R	F	>50	F	>50
			EB-L	A	9.3	A	9.5
		Signal with improvements	Overall	C	26.1	B	10.4
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal with improvements	Overall	D	46.8	D	54.9
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal with improvements	Overall	C	27.3	C	21.3
5	US 17 @ I-95 NB ramps	Stop Control	NB-LR	F	>50	F	>50
			WB-L	E	36.0	C	16.0
		Signal with improvements	Overall	C	26.6	C	40.0
6	US 17 @ Belfast Siding Road	Stop Control	SB-L	F	>50	F	>50
			WB-LR	F	>50	F	>50
		Signal with improvements	Overall	C	22.3	B	16.6
7	US 17 @ SR 196	Stop Control	NB-L	A	8.3	A	8.9
			EB-L	F	>50	F	>50
			EB-R	B	11.0	B	12.4
		Signal with improvements	Overall	C	26.6	C	20.8
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	8.4	A	9.4
9	US 84 @ I-95 SB ramps	Signal	Overall	B	11.0	B	14.1
10	US 84 @ I-95 NB ramps	Signal	Overall	B	11.1	B	13.6

Table 5-6: 2032 "With Requested Interchange" Intersection Conditions

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	C	34.5	F	>80
		Signal with improvements	Overall	C	22.1	C	23.8
2	SR 144 @ I-95 NB ramps	Stop Control	NB-L	F	>50	F	>50
			NB-R	F	>50	F	>50
			EB-L	A	9.3	A	9.6
		Signal with improvements	Overall	B	16.8	B	11.0
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal with improvements	Overall	D	47.6	D	38.6
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal with improvements	Overall	C	30.4	C	31.1
5	US 17 @ I-95 NB ramps	Stop Control	NB-LR	F	>50	F	>80
			WB-L	C	16.3	B	12.6
		Signal with improvements	Overall	C	30.7	B	18.0
6	US 17 @ Belfast Siding Road	Stop Control	SB-L	F	>50	F	>50
			WB-LR	F	>50	F	>50
		Signal with improvements	Overall	C	23.2	C	22.3
7	US 17 @ SR 196	Stop Control	NB-L	A	8.3	B	8.9
			EB-L	F	>50	F	>50
			EB-R	B	11.0	B	12.4
		Signal with improvements	Overall	C	26.6	C	20.8
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	8.4	A	9.4
9	US 84 @ I-95 SB ramps	Signal	Overall	B	11.0	B	13.0
10	US 84 @ I-95 NB ramps	Signal	Overall	B	7.1	B	14.8
11	Belfast Siding Road @ I-95 SB ramps	Signal	Overall	C	25.4	C	33.8
12	Belfast Siding Road @ I-95 NB ramps	Signal	Overall	B	18.9	B	12.9

Needs for All Scenarios

A majority of the improvements needed to achieve adequate LOS for Design Year (2032) were required with or without the implementation of the requested interchange at Belfast Siding Road. Analyses performed for the study identified operational and capacity projects throughout the study area. Using the *Highway Capacity Software (HCS+) Version 5.21*, multilane roadway analysis tool, an examination of roadway segment volumes verses capacity was conducted. This analysis determined that future volumes in the area, with or without the requested interchange, would justify the widening of US 17 from Belfast Siding Road to I-95. Additionally, the following intersection improvements were identified as needs for both "With Requested Interchange" and "Without Requested Interchange" scenarios:

SR 144 at I-95

- Add an additional southbound left turn lane on SB Ramp;
- Signalize intersection at NB Ramps and optimize timings;
- Add an eastbound through lane on SR 144 along with receiving lane.

SR 144 at US 17

- Add two eastbound and two westbound through lanes on SR 144 along with receiving lanes;
- Add two eastbound and westbound right turn lanes and one eastbound and two westbound left turn lanes on SR 144;
- Add two northbound and two southbound through lanes on US 17 along with receiving lanes;
- Add one northbound and two southbound left and one northbound and southbound right turn lane on US 17.

US 17 at I-95 SB Ramps

- Add one eastbound through lane on US 17;
- Add one northbound left turn lane on SB Ramp.
- Add one westbound left turn lane on US 17;
- Add one northbound right turn lane on NB Ramp;
- Signalize intersection at NB Ramps and optimize timings.

US 17 at Belfast Siding Road

- Add a westbound right and left turn lanes on Belfast Siding Road;
- Signalize intersection and optimize timings;
- Add northbound and southbound thru lanes on Belfast Siding Road.

US 17 at SR 196

- Add an eastbound left turn lane on SR 196;
- Signalize intersection and optimize timings.

As noted above, the intersection of US 17 at SR 144 will need significant improvements for either the "With Requested Interchange" or "Without Requested Interchange" scenarios. A variety of

opportunities exist that could improve operations at this busy intersection. Widening of the roadways in the vicinity of this critical intersection is a common solution which could be employed. However, widening is not the only alternative. By providing roadway connectivity in the vicinity of the intersection and, thereby, reducing demand on this busy intersection, it may be possible to delay the need for road widening. Another way to improve the intersection without widening the intersecting roadways is to implement a high-capacity intersection treatment such as a Continuous Flow Intersection (CFI), a Two-Level Signalized Intersection or a Center Turn Overpass Intersection. These innovative designs, have served as practical solutions to critical intersections within the United States and abroad, as noted in Appendix D. It should be noted that while these improvements could serve as viable solutions to the severe operational issues projected for Future Year (2032) at this intersection, they will not preclude the need for the other improvements recommended on page 30. `

Needs for "Without Requested Interchange" Scenario

In addition to the recommended improvements for all scenarios, detailed on page 30, "Without Requested Interchange" conditions for 2032 require the following additional intersection improvements;

SR 144 at US 17

- Add a westbound left turn lane on SR 144 to US 17 southbound;
- Add southbound left turn lane on US 17 to SR 144 eastbound.

US 17 at I-95 Ramps

- Add one westbound left turn on US 17 to I-95 SB on-ramps.

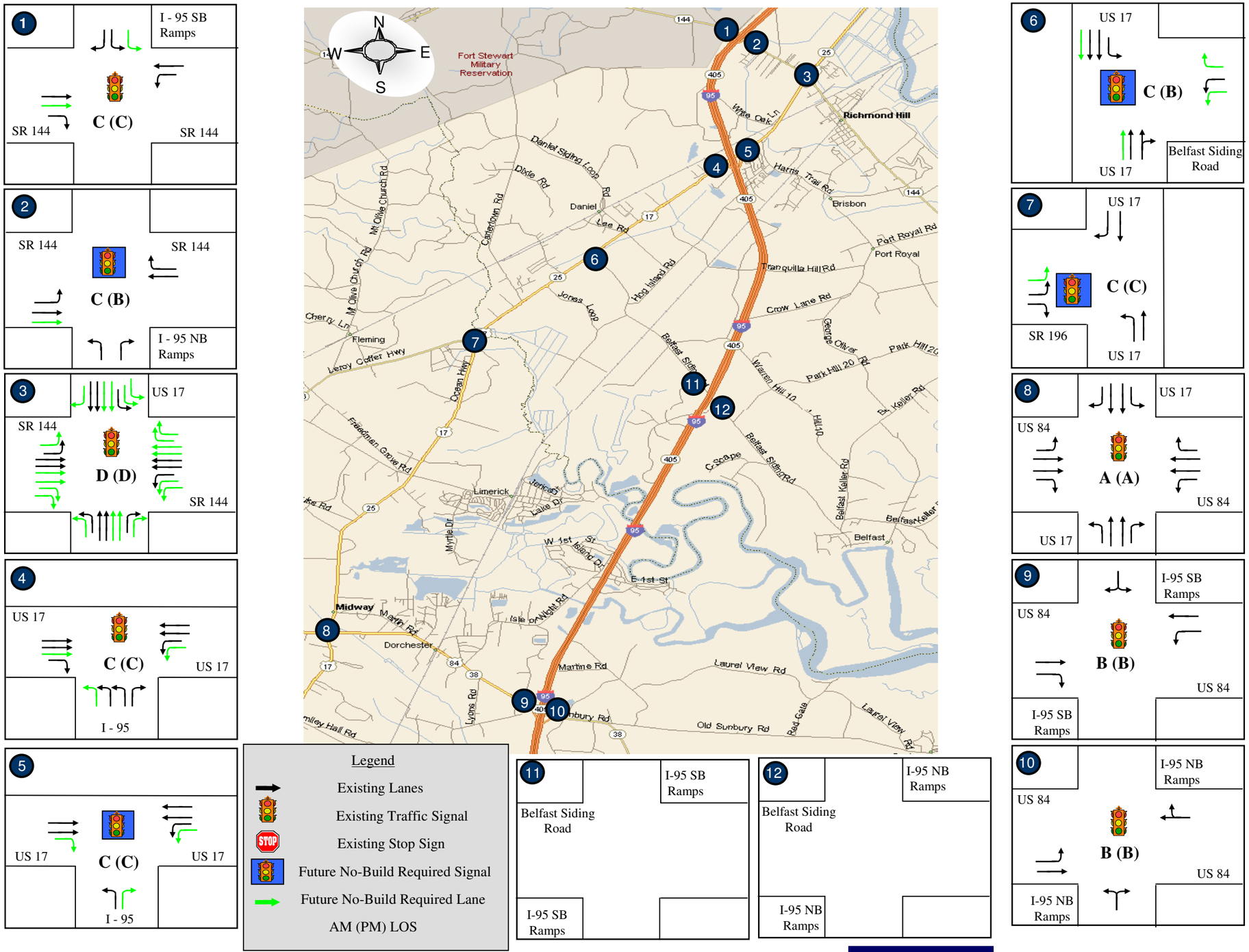
Needs for "With Requested Interchange" Scenario

In addition to the recommended improvements for all scenarios, detailed on page 30, the 2032 "With Requested Interchange" scenario requires the widening of Belfast Siding Road and the following additional intersection improvements:

US 17 at Belfast Siding Road

- Add northbound right turn lane on US 17 to Belfast Siding Road eastbound.

This improvement facilitates increased movements to the requested interchange. Figures 5-1 and 5-2 (pages 32 and 33) show the "With Requested Interchange" and "Without Requested Interchange" improvements, respectively, for the Year 2032 analyses.



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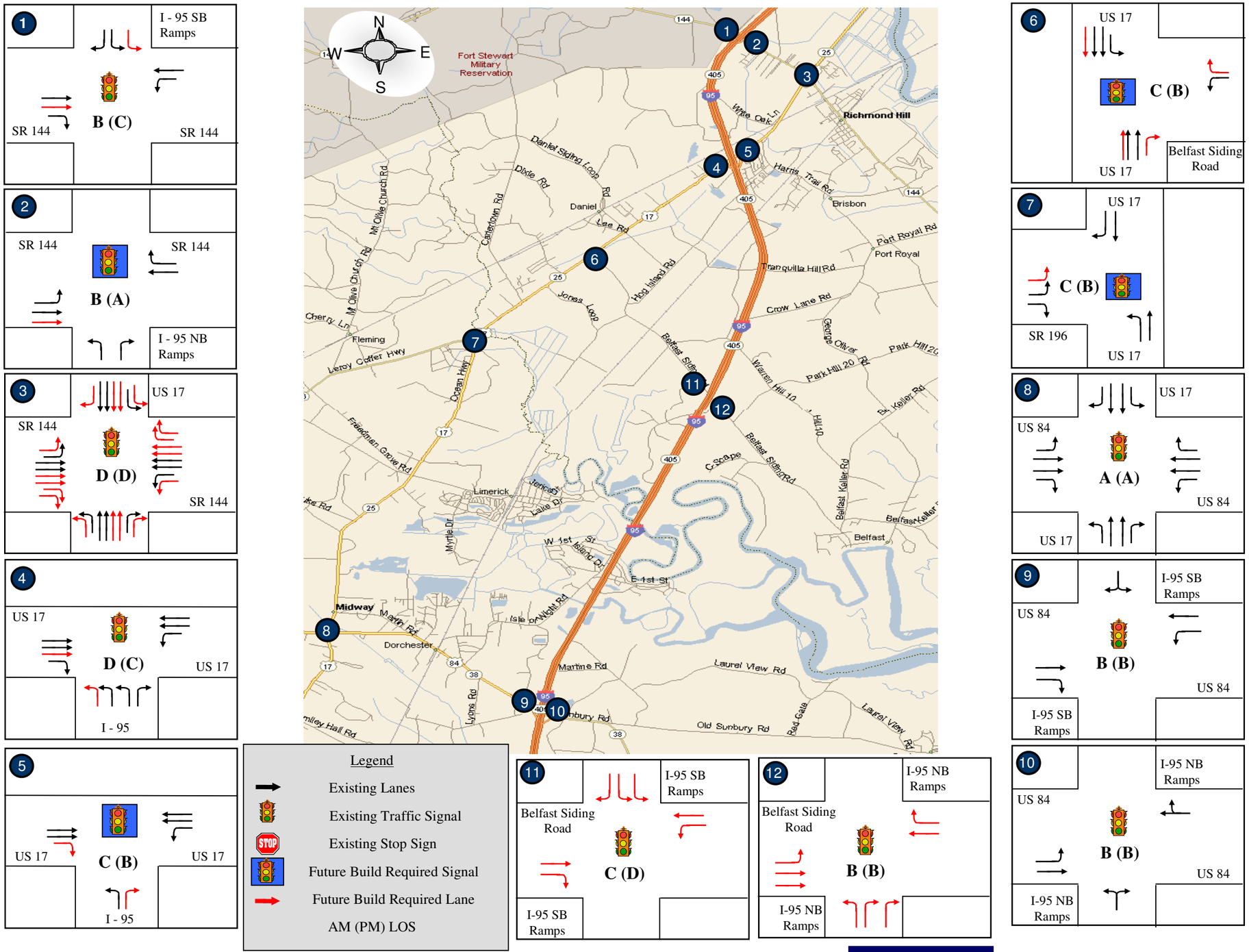
October 2008

I-95 at Belfast-Siding Road

Interchange Analysis Report

GDOT Office of Planning

Figure 5-1: 2032 "Without Requested Interchange" Required Lane Configuration & LOS



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I-95 at Belfast-Siding Road

Interchange Analysis Report

GDOT Office of Planning

Figure 5-2: 2032 "With Requested Interchange" Required Lane Configuration & LOS

6. ENVIRONMENTAL SCREENING

An environmental screening was conducted to determine the feasibility of the requested interchange at Belfast Siding Road. Several environmental factors must be considered when analyzing constructability of a transportation project. For this initial review, the location of wetlands and historic resources were identified and reviewed using GIS resources and online databases.

An initial screening of the existing Belfast Siding Road crossing of I-95 indicates that the current roadway alignment is not impacted by wetlands. If the interchange were to be constructed, various alternatives with differing alignments would need to be considered. Each of these alternatives would need to be analyzed for potential impacts on wetlands.

Another environmental feature that must be considered prior to construction is the location of historical resources. To screen for potential impacts on historical resources, aerial photography (2008) was used to identify structures surrounding the requested interchange, which might be impacted by construction. No such buildings or structures were identified. In addition to this visual review of the study area, information was obtained from the National Register of Historic Places online data center on the historical resources located in Bryan County. According to this database, 10 locations within Bryan County have been identified as historic resources, none of which are in the vicinity of the Belfast Siding Road overpass at I-95.

7. SUMMARY OF FINDINGS

As stated in previous sections, the intent of this Interchange Analysis Report is to analyze and document the need, or lack thereof, for a new interchange along I-95 between US 17 (Coastal Highway) and SR 144 (Ford Avenue), located in Bryan County, Georgia. In accordance with Federal Highway Administration (FHWA) and Georgia Department of Transportation (GDOT) guidance, this study and resulting document examined operations at the requested interchange location, as well as adjacent interchanges upstream and downstream. The study also considered the impact of the requested interchange on the surrounding transportation system, extending to non-interchange intersections within the study area.

Implications of the Requested Interchange

The requested new access along I-95 at Belfast Siding Road is not recommended**.** This IAR indicates that the requested interchange satisfies FHWA Policies 2 through 8 and meets FHWA and GDOT minimum spacing guidelines. However, the analysis also shows that the adjacent interchanges at SR 144 and US 17 can be improved to accommodate the projected traffic for Design Year (2032). Results indicate that, with improvements similar to those needed in addition to the new interchange, the transportation network surrounding the requested new access point can be improved, thus precluding the need for an additional interchange.

Improvements Needed without the Requested Interchange

The results of this study demonstrate that the existing interchanges at US 17 and at SR 144 can be improved to accommodate future demand. Recommended improvements, described on pages 30 and 31, would adequately upgrade interchange capacity and facilitate adequate traffic flow during the AM and PM peak travel hours without the requested new access break.

Conclusions & Recommendations

The requested new access break along I-95 at Belfast Siding Road is not recommended, as it fails to meet FHWA Policy 1. The adjacent interchanges to the north (SR 144 and US 17) and south (US 84) can be improved to adequately serve and facilitate Design Year (2032) traffic in the study area as intended by the proposal.

Recommendations for improvements include the programmed widening of I-95 from six to eight lanes (PI # 511025) along with additional improvements not currently programmed, which are needed with or without the requested new interchange. These improvements, not currently programmed, include the widening of US 17 to six lanes and the widening of Belfast Siding Road to four lanes in addition to various intersection improvements. With the programmed and recommended improvements identified in this study, the existing interchanges can be expected to adequately serve anticipated Year 2032 traffic demands within the study area and especially to and from I-95.

Furthermore, the requested new interchange will not eliminate the need for improvements to the interchanges of I-95 at US 17 and SR 144. The analysis of the "With Requested Interchange"

scenario indicated that widening would be necessary along both US 17 and Belfast Siding Road to serve future travel demands despite the added capacity of the requested interchange.

According to the analysis and the standards set forth by the FHWA guidelines on interstate access requests, the access break along I-95 at Belfast Siding is not justified. As an alternative to providing this new interchange, it is recommended that the intersection improvements identified in this report be implemented in addition to the programmed projects in Bryan County.

APPENDICES

Appendix A – FHWA and GDOT Policies on IMR's and IJR's

Appendix B - Meeting Notes and Correspondences

Appendix C – Traffic Flow Diagrams

Appendix D – Alternative Intersection Designs

Appendix A – FHWA and GDOT Policies on IMR's and IJR's

Additional Interchanges to the Interstate System

[Federal Register: February 11, 1998 (Volume 63, Number 28)]

[Page 7045-7047]
From the Federal Register Online via GPO Access
[DOCID:fr11fe98-120]

AGENCY: Federal Highway Administration (FHWA), DOT.
ACTION: Notice of policy statement.

SUMMARY: This document issues a revision of the FHWA policy statement regarding requests for added access to the existing Interstate system. The policy includes guidance for the justification and documentation needed for requests to add access (interchanges and ramps) to the existing Interstate System. The policy statement was originally issued in the Federal Register on October 22, 1990 (55 FR 42670).

DATES: The effective date of this policy is February 11, 1998.

FOR FURTHER INFORMATION CONTACT: Mr. Seppo I. Sillan, Federal-Aid and Design Division, Office of Engineering, (202) 366-0312, or Mr. Wilbert Baccus, Office of Chief Counsel, (202) 366-0780, Federal Highway Administration, 1200 New Jersey Avenue SE, Washington DC 20590. Office hours are from 7:45 a.m. to 4:15 p.m., e.t., Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION:

Background

Section 111 of title 23, U.S.C., provides that all agreements between the Secretary and the State highway department for the construction of projects on the Interstate System shall contain a clause providing that the State will not add any points of access to, or exit from, the project in addition to those approved by the Secretary in the plans for such project, without the prior approval of the Secretary. The Secretary has delegated the authority to administer 23 U.S.C. 111 to the Federal Highway Administrator pursuant to 49 CFR 1.48(b)(10). A formal policy statement including guidance for justifying and documenting the need for additional access to the existing sections of the Interstate System was published in the Federal Register on October 22, 1990 (55 FR 42670).

The FHWA has adopted the AASHTO publication "A Policy on Design Standards--Interstate System" as its standard for projects on the Interstate System. This publication provides that access to the Interstate System shall be fully controlled by constructing grade separations at selected public crossroads and all railroad crossings. Where interchanges with selected public crossroads are constructed, access control must extend the full length of ramps and terminals on the crossroad.

Summary of Changes

The changes in the policy statement are being made to reflect the planning requirements of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, Pub. L. 102-240) as implemented in 23 CFR part 450, to clarify coordination between the access request and environmental processes, and to update language at various locations. The following specific revisions are made to the existing policy statement:

1. An additional sentence is added to item 5 under "Policy" that ensures requests for new or revised access are consistent with 23 CFR part 450 and 40 CFR parts 51 and 93.
2. Text in item 5 pertaining to future interchange additions has been moved to item 6 because it covers a different subject.
3. Item 6 is redesignated as item 7.
4. A new item 8 is added so that those reviewing the access request have the information necessary to process the request.
5. The fifth paragraph under "Application" is revised to clarify coordination with the environmental process.

The revised policy statement also includes various editorial changes to enhance clarity and readability. The revised policy statement is as follows:

Policy

It is in the national interest to maintain the Interstate System to provide the highest level of service in terms of safety and mobility. Adequate control of access is critical to providing such service. Therefore, new or revised access points to the existing Interstate System should meet the following requirements:

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.
2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.
3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.
4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit

vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.

5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.
6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.
7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.
8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.

Application

This policy is applicable to new or revised access points to existing Interstate facilities regardless of the funding of the original construction or regardless of the funding for the new access points. This includes routes incorporated into the Interstate System under the provisions of 23 U.S.C. 139(a) or other legislation.

Routes approved as a future part of the Interstate system under 23 U.S.C. 139(b) represent a special case because they are not yet a part of the Interstate system and the policy contained herein does not apply. However, since the intention to add the route to the Interstate system has been formalized by agreement, any proposed access points, regardless of funding, must be coordinated with the FHWA Division Office. This policy is not applicable to toll roads incorporated into the Interstate System, except for segments where Federal funds have been expended, or where the toll road section has been added to the Interstate System under the provisions of 23 U.S.C. 139(a).

For the purpose of applying this policy, each entrance or exit point, including "locked gate" access, to the mainline is considered to be an access point. For example, a diamond interchange configuration has four access points.

Generally, revised access is considered to be a change in the interchange configuration even though the number of actual points of access may not change. For example, replacing one of the direct ramps of a diamond interchange with a loop, or changing a cloverleaf interchange into a fully directional interchange would be considered revised access for the purpose of applying this policy.

All requests for new or revised access points on completed Interstate highways must be closely coordinated with the planning and environmental processes. The FHWA approval constitutes a Federal action, and as such, requires that the National Environmental Policy

Act (NEPA) procedures are followed. The NEPA procedures will be accomplished as part of the normal project development process and as a condition of the access approval. This means the final approval of access cannot precede the completion of the NEPA process. To offer maximum flexibility, however, any proposed access points can be submitted in accordance with the delegation of authority for a determination of engineering and operational acceptability prior to completion of the NEPA process. In this manner, the State highway agency can determine if a proposal is acceptable for inclusion as an alternative in the environmental process. This policy in no way alters the current NEPA implementing procedures as contained in 23 CFR part 771.

Although the justification and documentation procedures described in this policy can be applied to access requests for non-Interstate freeways or other access controlled highways, they are not required. However, applicable Federal rules and regulations, including NEPA procedures, must be followed.

Implementation

The FHWA Division Office will ensure that all requests for new or revised access submitted by the State highway agency for FHWA consideration contain sufficient information to allow the FHWA to independently evaluate the request and ensure that all pertinent factors and alternatives have been appropriately considered. The extent and format of the required justification and documentation should be developed jointly by the State highway agency and the FHWA to accommodate the operations of both agencies, and should also be consistent with the complexity and expected impact of the proposals. For example, information in support of isolated rural interchanges may not need to be as extensive as for a complex or potentially controversial interchange in an urban area. No specific documentation format or content is prescribed by this policy.

Policy Statement Impact

The policy statement, first published in the Federal Register on October 22, 1990 (55 FR 42670), describes the justification and documentation needed for requests to add or revise access to the existing Interstate System. The revisions made by this publication of the policy statement reflect the planning requirements of the ISTEA as implemented in 23 CFR part 450, clarify coordination between the access request and environmental processes, and update language at various locations. The States will have to take these factors into consideration when making future requests for new or revised access points, but the overall effort necessary for developing the request will not be significantly increased.

GDOT's IMR/IJR Policy

"Responsibility and Procedures for Interchange Justification (IJR) and Interchange Modification (IMR) Reports for Interstate and Non-Interstate Limited Access Facilities"

Purpose and Goal:

This policy documents the Department's Interchange Justification Reports (IJR) and Interchange Modification Reports (IMR) policy and responsibilities associated with preparing IJRs. These guidelines address local requests for new interchanges, initial reviews to determine if minimal requirements will be met, Federal IJR/IMR guidelines and requirements, supporting data needed to accompany the IJR/IMR, and submission to FHWA for action. If the Department proposes new interchanges, the Office of Planning will assume responsibility for preparing the IJR, incorporating concept and capacity/weave analyses prepared by the Division of Preconstruction.

Modifications of existing interchanges require preparation of an Interchange Modification Report (IMR). As interchange modification is a function of design issues, the Design Office managing the project will be responsible for preparation of the IMR. Preparation of IMRs and support material should be incorporated in the Department's design/concept contracts as a deliverable. The Office of Planning will review and provide comments on draft IMRs. The Office of Planning will submit the IJRs and IMRs to FHWA for their consideration and action.

Applicability:

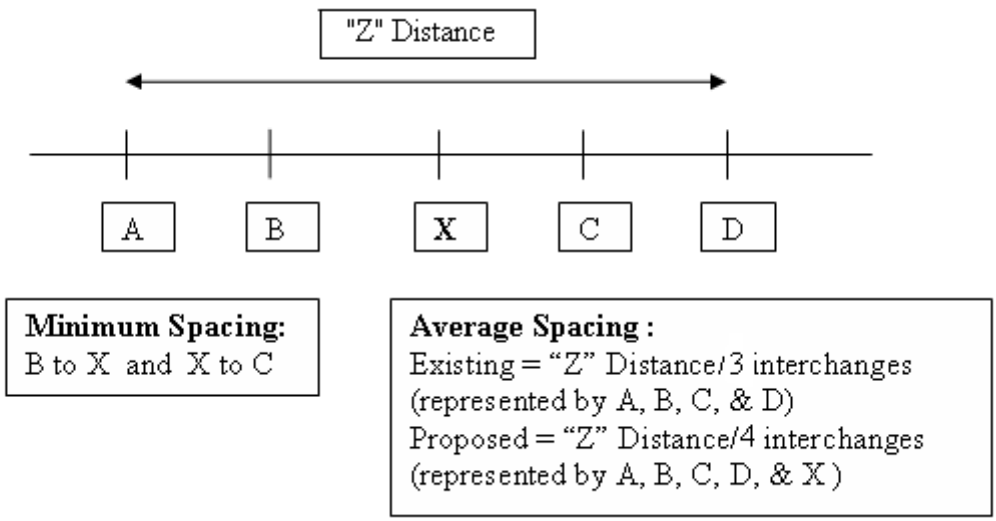
The policy and guidelines contained herein apply to new or revised access points to the Interstate System, regardless of funding source. The procedures and responsibilities outlined in this policy also apply to freeway facilities on the Appalachian Development Highway System (ADHS), non-Interstate facilities, freeways or other limited access highways. The FHWA has review and approval authority for new or revised access points to the Interstate System and non-Interstate ADHS facilities.

General Procedures:

I. Applicable Definitions:
   A. Minimum spacing is calculated as the crossroad to crossroad distance between the proposed interchange and the adjacent upstream and downstream interchanges. In urban or suburban areas with high-density development and/or complex transportation features, use of grade-separated ramps or collector-distributor roads may be considered to manage safety and

other operational difficulties associated with proposed interchanges not meeting the minimum spacing guideline.

B. Average spacing reflects the crossroad to crossroad distance between downstream and upstream interchanges beyond, but adjacent to and including those used to calculate minimum spacing. Existing interchange spacing is calculated as follows: there are four interchanges (A, B, C, and D); the distance between interchanges A and D is "Z" miles; the average spacing is therefore Z divided by 3 (interchanges A, B, C, and D). A new interchange (X) is proposed to be located between interchanges B and C; therefore the proposed average interchange spacing would be Z divided by 4 (interchanges A, B, C, D, and proposed interchange X). Using this same example, the interchange spacing, defined above under minimum spacing, would be the distances between the crossroads for interchanges B and X and between X and C. See following graphic.



C. **Urban and rural areas are as defined by the latest U.S. Census.** If a proposed interchange is located within a Census-defined urban cluster or urbanized area, it is considered either an urban or suburban area. If the proposed interchange is located outside an urban or urbanized area, the area is considered rural. As the next Census approaches, it is probable that some locations within Census-defined rural areas could exhibit suburban characteristics (see D., below).

D. Suburban areas traditionally provide an informal transition area between areas with urban or rural characteristics. "Suburban" is based on prudent judgement of such factors as land use and density of development. Use of suburban area spacing guidelines will require Sponsor's documentation of the various contributing factors. Based on information provided by the Sponsor, the Office of Planning will determine the appropriateness of "suburban" area designation. This designation is for planning purposes only and unrelated to design criteria and guidelines.

E. Metropolitan Planning Organization (MPO) is the transportation planning entity designated by the Governor to receive Federal transportation planning funds for the conduct of the "3C" metropolitan planning process. The MPO is responsible for meeting the Federal transportation planning requirements within areas designated by the Census as urbanized areas. As of the 2000 Census, Georgia has 15 distinct geographic areas associated with MPOs and participation in the metropolitan planning process.

F. "Sponsor" refers to the governmental entity having jurisdiction for the geographic area in which the proposed interchange is located (i.e. a City or County).

II. This Policy recognizes that there are two types of planning processes and areas within which Sponsors may be located: within MPO areas and those located in non-MPO areas.

For proposed interchanges located in non-MPO areas, the Sponsor of the proposed interchange addition is responsible for providing, to the Department's Office of Planning, the information required under Section II-A of this Policy, along with the request for the new interchange.

For proposed interchanges located within an MPO's geographic area of responsibility, the process is more complex. The MPO will ensure that the proposed interchange is not included in the transportation plan until the proposed interchange has been determined, by the Department, to be feasible in accordance with the criteria contained in Section II-A. Therefore, should the MPO receive a request for a new interchange, they will notify the Sponsor of the Department's Interchange Policy and requirements. The Sponsor of the proposed interchange is responsible for providing the information required under Section II-A. The request for a new interchange and the information required under Section II-A will be submitted to the Department's Office of Planning through the MPO. If a new interchange is proposed during the MPO's update of the transportation plan, the MPO will ensure the Department is provided the information required under Section II-A. The timeframe of the submittal will be such that the Department can review and determine feasibility prior to the interchange's proposed inclusion in the plan. Responsibility for preparation of Section II-A information will be addressed between the Sponsor and the MPO. If the Department proposes the new interchange, the Department will develop the information required under Section II-A.

Under either planning process (MPO or non-MPO), the Office of Planning will review the Sponsor's information and determine if the interchange addition appears to be feasible. The following describes the information required of the Sponsor (Section II-A) and Department's review procedures (Sections II-B & C).

A. As part of the feasibility review, the Sponsor must provide the Department, as appropriate per the above, with the following information:

1. A review and written analysis demonstrating that the proposed interchange will provide adequate interchange spacing. Interchange spacing guidelines are as follows:
   a. Minimum spacing of one (1) mile in urban areas with an average spacing of two (2) miles, or
   b. Minimum spacing of two (2) miles in suburban areas with an average spacing of four (4) miles, or
   c. Minimum spacing of two (2) miles in rural areas with an average spacing of eight (8) miles.
2. A written statement defining why the Sponsor considers the proposed interchange as needed:
   a. A written statement defining the need for the proposed interchange, including why access at existing interchanges are not adequate, local commitments that support the need and purpose (such as pending development, letters of interest from companies, dedicated special purpose local option sales tax, etc.).
   b. An environmental scan and documentation detailing existing infrastructure in vicinity of the proposed interchange, including water, sewerage, utilities, schools, and roads.
   c. Documentation detailing current land use & zoning, existing and pending development (ground-breaking within 5 years), future land use plan and current comprehensive plan as approved by DCA.
   d. Existing and forecast daily traffic volumes without and with the proposed interchange. Volumes shall be provided for the "mainline" facility, adjacent interchanges, parallel roadways, and the surface street network of roadways providing access to and between the subject interchanges.
   e. Other information: any other material that would illustrate need for the proposed interchange.
3. Written documentation addressing each requirement delineated in the FHWA's IJR Guidance, included below as Section III, Subsections A-H.

B. The Office of Planning will analyze data including: existing and forecasted daily (24-hour) traffic volumes, roadway conditions, existing access to the Interstate System, and the information supplied by the Sponsor.

C. The Office of Planning will develop a recommendation and notify the Sponsor, and MPO if applicable, of the determination of feasibility:
   1. If the review indicates the proposed interchange is not feasible, the Department will notify the Sponsor, and MPO if applicable, and take no further action with the proposal.

2. If the review indicates the proposed interchange may be feasible and could possibly benefit regional access, the Department will notify the Sponsor, and MPO if applicable, that the interchange may be feasible. Upon such notification, the MPO may include the proposed interchange in the transportation plan in accordance with their procedures and if the transportation plan will remain financially constrained.
3. If the interchange appears to be feasible, an Interchange Justification Report (IJR) must be prepared and submitted to the Federal Highway Administration (FHWA) in accordance with the process described below. The Sponsor will determine if the IJR should be pursued immediately or postponed until the need is less long range. Within MPO areas, an IJR will not be submitted to FHWA for approval until the interchange is a component of the adopted transportation plan.

4. Initiation of the IJR is as follows:
   a. The Sponsor is responsible for 100% of the costs associated with the Department procuring a consultant to develop the IJR and concept layout. The Office of Planning will provide the Sponsor with an estimate for the necessary consultant services and a memorandum of understanding (MOU) for execution by the local government.
   b. Upon receipt of a fully executed MOU, the Office of Planning will secure the consultant services for the IJR, the required support data and analyses, and a reproducible concept layout.
   c. The Office of Planning will manage the consultant contract. The consultant must be prequalified with the Department for the appropriate planning and design area classes. Consultant selection and review of deliverables will be a joint effort between the Office of Planning and the applicable Design Office(s).
   d. Before the Department executes the agreement with the consultant, the Sponsor's funds, covering the costs to produce the IJR and supporting information, must be on deposit with the Department.
   e. The Sponsor must appoint a person to serve as the Sponsor's "single point of contact" for the Department and the consultant.
   f. The Sponsor's "single point of contact" will be responsible for providing the Department's consultant with other appropriate points of contact, current and future zoning and land use information, and any other information that would further document the Sponsor's statement of the interchange's need and purpose and fulfillment of the IJR data requirements.

g. The IJR/IMR must address FHWA's guidance for "Additional Access Points to the Interstate System 23 CFR 630." See requirements at http://www.fhwa.dot.gov/legsregs/directives/fapg/0630csup.htm.

h. The IJR/IMR must address the guidance on Interstate Access Requests developed by the FHWA Georgia Division Office in coordination with the Department. The guidance is maintained by FHWA and located at: http://www.fhwa.dot.gov/gadiv.

III. The following extract is from the Federal Aid Policy Guide (FAPG) of June 17, 1998, and is provided for user convenience only. Please see the above website for FHWA's latest requirements.

"Policy. It is in the national interest to maintain the Interstate System to provide the highest level of service in terms of safety and mobility. Adequate control of access is critical to providing such service. Therefore, new or revised access points to the existing Interstate System should meet the following requirements:

A. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

B. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

C. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.

D. The proposed access connects to a public road only and will provide for all traffic movements. Less than 'full interchanges' for special purpose access for transit vehicles, for HOVs, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.

E. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

F. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with

recommendations that address all proposed and desired access within the context of a long-term plan.

G. *The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.*

H. *The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal."*

IV. The IJR/IMR Data Requirements are as follows:

A. Planning and Background information, including:

1. Brief description of proposed improvement with location map and diagrams,
2. Response to each of the elements listed in the FHWA policy,
3. Description of the study area and existing transportation facilities (including access/frontage roads and local roadways),
4. Need and purpose statement for proposed improvement,
5. Relationship to other transportation projects in area,
6. Relationship to regional comprehensive and/or long-range transportation plans. In MPO areas, the interchange must be a component of the adopted transportation plan prior to submittal of the IJR to the Department. In non-MPO areas, the interchange must be included in the approved comprehensive plan prior to submittal of the IJR to the Department,
7. In non-attainment areas, planning information must be consistent with the conforming transportation plan's assumptions,
8. Distance to and size of communities directly served by proposed interchange,
9. Distance to the next existing interchange in each direction and other proposed adjacent interchanges, when applicable.

B. Environmental screening of potential area of impact, including:

1. Review and consideration of resources covered under NEPA for area between existing interchanges so as not to preclude from consideration a less environmentally-intrusive location. Provide map depicting general location of applicable environmental items,
2. Review and consideration of community issues. Provide map as applicable,
3. Documentation of alternatives considered during development of the IJR,
4. Documentation as to why a particular alternate is recommended.

C. Traffic volumes for "build" alternatives and "no-build," including:

1. Traffic networks will include Interstate mainline at site of proposed interchange and include at least one interchange each direction from the proposed interchange.

2. Networks will include traffic data for crossroads within the interchanges and their approaches to the interchanges, both existing and proposed.
3. Traffic data requirements are similar to those already required for project design traffic and as such will also consider any traffic projections available from the Office of Planning. Typical traffic data requirements:
   a. No-Build and Build Average Daily Traffic for both Base Year (planned open to traffic year) and Design Year (20 Years from proposed open to traffic year),
   b. AM/PM Peak, and Midday Peak if applicable, Hour Turning Movements for all conditions,
   c. Weaving movements on Interstate Mainline to the first adjacent existing or proposed interchange in both directions from subject proposed interchange,
   d. % 24 Hour Trucks and % Peak Hour Trucks,
   e. K-Factor and Direction Split (D),
   f. In non-attainment areas, traffic projections must be consistent with the conforming transportation plan.

D. Capacity Analyses for "existing", "build", and "no-build" conditions, including:
1. Intersection and arterial capacity analyses for crossroads (and intersections with side streets), ramp junctions within the proposed interchange area, and for the first adjacent existing or proposed interchanges in both directions from the subject proposed interchange.
2. Interstate mainline and weaving analyses reflecting the first adjacent existing or proposed interchange in both directions from subject proposed interchange.
3. Selection of analysis tools/software will depend on the complexity of the proposed interchange and its relationship to the transportation system. The degree of anticipated complexity and appropriate software will be determined and included in the consultant's workscope.

E. Design Concept, including:
1. IJR layouts on aerial imagery; IMR layouts as design plans. Both reflecting appropriate consideration of the site's terrain & environmental features,
2. Adjacent interchanges, configuration of proposed interchange, travel/auxiliary lanes, bridge structures, ramp radii, grades, proposed additions and removals, frontage/access roads and collector/distributor roads,
3. Lengths of acceleration/deceleration lanes, auxiliary lanes, tapers, ramps, and weaving areas,
4. Right-of-way and access control limits,

5. Intersection control information (signalized, STOP signs, turn lanes),
6. Schematic map (line diagram) of total analysis area depicting:
    a. Proposed and existing laneage, and
    b. All merge/diverge, weaving, intersections, roadways, etc. LOS for all movements,
7. A computer disk with all files needed to properly examine IJR/IMR options, and
8. A description of model calibration, if applicable.

F. Cost Estimates for alternatives analyzed in IJR, including:
1. Preliminary Engineering,
2. Right-of-Way,
3. Construction:
    a. Roadway, Drainage, and Paving,
    b. Bridges and other Major Structures,
    c. Utilities and
    d. Signage.

V. Federal Design Requirements:

A. Interstate and Appalachian Development Highway (ADH) System projects will be designed in accordance with the AASHTO publication, "A Policy on Design Standards--Interstate System."

B. Where interchanges with selected public crossroads are constructed, access control must extend the full length of ramps and terminals on the crossroad. Other access controls shall be adhered to for ramp and side street intersection spacing as per Department policies.

C. Concept layouts must provide all the information FHWA will need to independently review or perform capacity analyses, weave analyses, and design review.

D. The proposed interchange location reflects consideration of environmental issues and concerns.

E. FHWA approval of an Interstate break-in-access is based on a "determination of engineering and operational acceptability." Final location and approval of the proposed interchange is contingent on the results of the NEPA process.

VI. Federal Review and Approval Process:

A. The Department will review the IJR/IMR prior to its submission to FHWA.

B. If during development of the IJR, the proposed interchange's need does not warrant a break in Interstate access, the Department will notify the Sponsor.

C. If the IJR determines a break in access may be warranted and the Department determines it will support submittal of the IJR to the FHWA, the Office of Planning will forward 3 copies of the IJR, concept layout, and supporting data to the Georgia Division of the FHWA.

D. The FHWA Division (Atlanta Office) may approve:
1. New freeway-to-crossroad interchanges not located within a Transportation Management Area (TMA). TMAs are urbanized areas with a Census-recognized population exceeding 200,000.

2. Modifications of existing freeway-to-crossroad interchanges.
3. Completion of basic movements at a partial interchange.

E. FHWA Headquarters (Washington D.C. Office) may approve:
1. New or major modification to freeway to freeway interchanges.
2. New partial interchange (such as, a half-diamond interchange).
3. New freeway-to-crossroad interchanges located within TMAs.

F. FHWA will notify the Department:
1. If additional information is required before reaching a recommendation, or
2. If the requested Interstate break-in-access is denied and why, or
3. If the request is approved as being engineering and operationally feasible and if any conditions apply to the approval.

G. The Department will notify the Sponsor and Design Office of the FHWA's action and any conditions placed on that action.

H. Final FHWA approval is subject to completion of the NEPA process. In non-attainment areas, the proposed interchange must be included in the conforming transportation plan before FHWA may take the approval action.

VII. The Department's Internal IJR/IMR Review and Approval Procedures:

A. Review Procedures for Interstate, ADHS and Non-Interstate Limited Access Facilities:
1. The Office of Planning will serve as Lead Office. The Office will review the IJR/IMR documentation for satisfactory consideration and treatment of the required information, including documentation of the proposed improvement's Need and Purpose.
2. The Director of Preconstruction will designate a Design Office to perform an independent review of engineering assumptions, including concept drawings, calculations, and analyses.
3. The Office of Environment/Location will review the concept drawing(s) and IJR/IMR documentation for satisfactory consideration of Need & Purpose, environmental screening, community issues, and alternatives analyzed.
4. All review comments will be forwarded to the Office of Planning so that comments may be addressed prior to submitting the IJR/IMR for approval. Approval procedures for Interstate and ADHS facilities are addressed under Section VI., above. See remainder of this section (VII.B.) for approval procedures for non-Interstate limited access facilities.

B. Approval Procedures for Non-Interstate Limited Access Facilities:
1. The Office of Planning will prepare a recommendation for consideration by the Chief Engineer with recommendations by the Division of Preconstruction, and the Division of Transportation Planning, Data and Intermodal Development.
2. In nonattainment areas, the proposed improvement must be included in the conforming transportation plan before the Department will take an approval action.

3. The Department's approval, and the proposed interchange's final location, is subject to completion of the appropriate environmental (GEPA/NEPA) process. Until that time, the Department's approval represents an opinion that the proposed improvement is engineering and operationally feasible.
4. The Office of Planning will notify the Sponsor and the Design Office of the Department's action and any conditions placed on that action.
5. Regardless of the Department's action, the Sponsor's cost for preparing the IJR/IMR is not reimbursable by the Department.

FHWA Interstate Access Request Policies

1. **Purpose**

This guidance provides procedures for processing requests for new or revised Interstate access.

2. **Legislation and Regulations**

- 23 USC 111
- Federal Register: February 11, 1998 (Volume 63, Number 28, Page 7045-7047)
- 23 CFR 625

3. **Guidance**

- FHWA Rodney Slater memo "Action: Delegation of Authority Requests for New or Revised Access Points on Completed Interstate Highways" dated August 19, 1996.
- A Policy on Geometric Design of Highways and Streets, AASHTO, 2001
- GDOT Plan Development Process (PDP)
- A Policy on Interstate Design Standards - Interstate System, AASHTO, 1991
- MUTCD
- GDOT Policy TOPPS 3140

4. **Procedures for Interstate Access Requests**

a. **Summary of Federal Law**

Section 111 of Title 23, United States Code (23 USC 111) requires that proposed new or revised Interstate access must be approved by the FHWA before such access modifications can be made.

b. **Definitions of Interstate Access Requests**

GDOT has historically referred to Interstate Access Requests as either Interstate Justification Reports (IJR's) or Interstate Modification Reports (IMR's).

An IJR is a request for approval to add a new interchange on the Interstate System. GDOT's Office of Planning prepares IJR's and submits them to FHWA.

An IMR is a request for approval to add or modify access points to an existing Interstate interchange. GDOT's Preconstruction Division is responsible for preparing IMR's. However, as with the case of IJR's, IMR's are submitted to FHWA by GDOT's Office of Planning.

Because the terms IJR and IMR have historically been used by GDOT to describe the actual request for access as well as the supporting documentation, this document will use the term IMR/IJR to refer to the request for Interstate access.

c. **Applicability of this Policy**

This policy applies to the Interstate System and portions of the Appalachian Development Highway System that are full access-controlled.

The policy applies regardless of the funding source. Therefore, it applies to local government agencies and private developers that propose and/or finance projects for Interstate access.

All FHWA approvals for additional or modified access are conditioned upon compliance with applicable Federal rules and regulations. Applicable design standards must be used and final project designs are subject to review and approval by FHWA.

The FHWA approval of new or modified access constitutes a Federal action and requires that National Environmental Policy Act (NEPA) procedures are followed. This requirement applies even when changes to an Interstate facility are being financed completely by the State, local municipality, or private developer. NEPA approval is a condition to receiving final access approval.

d. **Determination of whether an IJR is required**

A new interchange, new partial interchange, or new ramps to-from frontage roads always requires an IJR.

e. **Determination of whether an IMR is required**

In accordance with 23 USC 111, FHWA must approve**all** new or revised Interstate access. Therefore, FHWA must approve all revised access or modifications within the limits of an existing interchange. The only exceptions are maintenance activities that do not change existing geometric or operational features of the roadway.

The limits of an interchange as applied to this policy are defined as "within the roadway and within the limited access of the interchange." The roadway is defined as "the portion of a highway, including shoulders, for vehicular use." The limited access includes the limited access on the cross street. ***Therefore, any changes to an existing Interchange, other than routine maintenance, require FHWA approval.***

FHWA approval of a proposed modification to an existing interchange does not necessarily require a separate IMR document. If there is doubt as to whether a proposed modification will require an IMR, then the appropriate FHWA Transportation Engineer shall be contacted. FHWA will determine whether or not an IMR is required.

If FHWA determines that an IMR **is not** required, then that determination by itself constitutes FHWA approval for the access.

If FHWA determines that an IMR **is** required, then FHWA approval of the IMR is the FHWA approval for the access.

The following modifications always require submittal of an IMR:

- Major modification of an existing interchange (i.e., adding new ramp(s), removing ramp(s), changing the interchange configuration, completing basic movements at a partial interchange)
- Locked gate access (i.e., Interstate access via locked gate)
- Abandonment of ramps or interchanges
- Decreasing the length of any deceleration lane or acceleration lane on any existing ramps
- Addition of an auxiliary lane between two (2) adjacent interchange ramps.

If the proposed action does not fall under one of the categories above, FHWA will determine if an IMR is required. GDOT should provide FHWA with a description of the action in enough detail to make this determination. The level of information needed can be obtained by contacting the appropriate FHWA Transportation Engineer. In some cases, FHWA may request some type of analysis to help determine if an IMR is required or not.
The keys to FHWA's determination will be (1) whether an IMR analysis would add value, (2) whether the action may have an adverse effect on operations or safety, and (3) whether there are other alternatives that should also be analyzed.

Some hypothetical examples are provided below just to illustrate the process:

- The proposed action is to shift an exit ramp and move the termini over 100 feet. GDOT provides FHWA with information showing the nearest intersection is a sufficient distance away from the new ramp terminal. FHWA determines no IMR is required and therefore, approves the access.
- The proposed action is to widen a bridge and lengthen entrance and exit ramps at an interchange. GDOT provides FHWA with information that shows traffic volumes are light and the closest adjacent interchanges are several miles away in each direction. FHWA determines no IMR is required and therefore, approves the access.
- Similar to the example above, the proposed action is to widen a bridge and lengthen entrance and exit ramps at an interchange. However, GDOT provides FHWA with information that shows traffic volumes are heavy and an adjacent exit ramp is now only 2000 feet from the new proposed entrance ramp. FHWA determines that an IMR is required because this may have an adverse effect on Interstate operations.
- The proposed action is to add new left-turn lanes on the exit ramps of an interchange, resulting in a dual left turns. However, to accommodate the left turns, an existing lane on the cross street is added by narrowing the existing lanes from 12-feet to 10-feet. Furthermore, the new left turn lane further

reduces the signal spacing of the existing tight-diamond interchange. FHWA determines that an IMR is required because this may have an effect on safety and operations of the interchange and other alternatives should be analyzed.

To reiterate, **FHWA must provide approval for <u>any</u> modification, other than maintenance activities, to an existing interchange**. This approval can be made by either (1) determining that the modification does not require an IMR or (2) approving an IMR. As explained in Section(g), a Concept Report may serve as an IMR if it contains the appropriate level of analysis.

FHWA's determination that a modification does not require an IMR must be made in writing, but does not necessarily require an official letter. In many cases, approval can be made via e-mail to the appropriate GDOT Office that initiated the request. Alternatively, GDOT may send a letter to FHWA requesting that no IMR be required, and FHWA can sign a concurrence block on the letter.

f. **FHWA Internal Delegation of Authority for approving IMR/IJR's**

This section explains what types of IMR/IJR's may be approved at the Georgia Division Office and what types have to be approved at FHWA Headquarters in Washington, D.C.
The FHWA Georgia Division Office may approve the following types of new or revised Interstate Access Requests:

- New freeway-to-crossroad interchanges not located within a Transportation Management Area (as defined in 23 USC 134).
- Modifications of freeway-to-crossroad interchanges
- Minor modifications of freeway-to-freeway interchanges
- Completion of basic movements at partial interchanges
- Locked gate access
- Abandonment of ramps or interchanges
- All other types of access not defined below

The following types of new or revised Interstate Access Requests must be approved at FHWA Headquarters, Washington, D.C., after a recommendation for approval from the Division Office.

- New freeway-to-freeway interchanges
- Major modifications of freeway-to-freeway interchanges
- New partial interchanges or ramps to/from continuous frontage roads that create a partial interchange
- New freeway-to-crossroad interchanges located within a TMA.

g. **Timing of submittal of IMR's and IJR's and their relationship to the Concept Report**

A question frequently asked of FHWA is "What point in the Plan Development Process (PDP) should GDOT obtain access approval from the FHWA Division Office?"

Early project development usually consists of concept development, NEPA, and IMR/IJR analyses taking place concurrently. Ultimately, the final products of each of these processes will need to be approved in order to advance the project. In every case, the IMR/IJR should be approved prior to starting final design. In most cases, the appropriate time to obtain access approval from FHWA is prior to, or concurrently with, or shortly after approval of the concept report.

Also, it is important to clarify that final FHWA approval of an IMR/IJR is always dependent upon NEPA approval. When FHWA approves an IMR/IJR prior to completion of NEPA, it is understood that final approval of the IMR/IJR is contingent upon NEPA approval.
In the past, routine practice has been for FHWA to approve concept reports prior to approving the IMR/IJR. In some cases, projects have progressed to substantial public involvement and final design prior to the IMR/IJR being submitted. This has caused problems when the concept had to be changed late in the process due to the operational analyses in the IMR/IJR. This is why FHWA feels that the IMR/IJR analyses should be done prior to, or concurrently with the concept report. However, in cases where a concept is submitted to FHWA without traffic analyses to support an IMR/IJR, it must be clear that FHWA's signature on a concept report does not constitute Interstate access approval for that concept. It must also be clear that the concept may have to be changed based upon the findings of the IMR/IJR.

Therefore, for projects that involve Interstate access, FHWA will be approving concept reports with one of the two comments listed below. Comment (1) will be used when an IMR/IJR has been previously approved or when the concept report contains enough information to approve the Interstate access. Comment (2) will be used when the concept report is submitted to FHWA for approval without the analyses necessary to approve Interstate access.

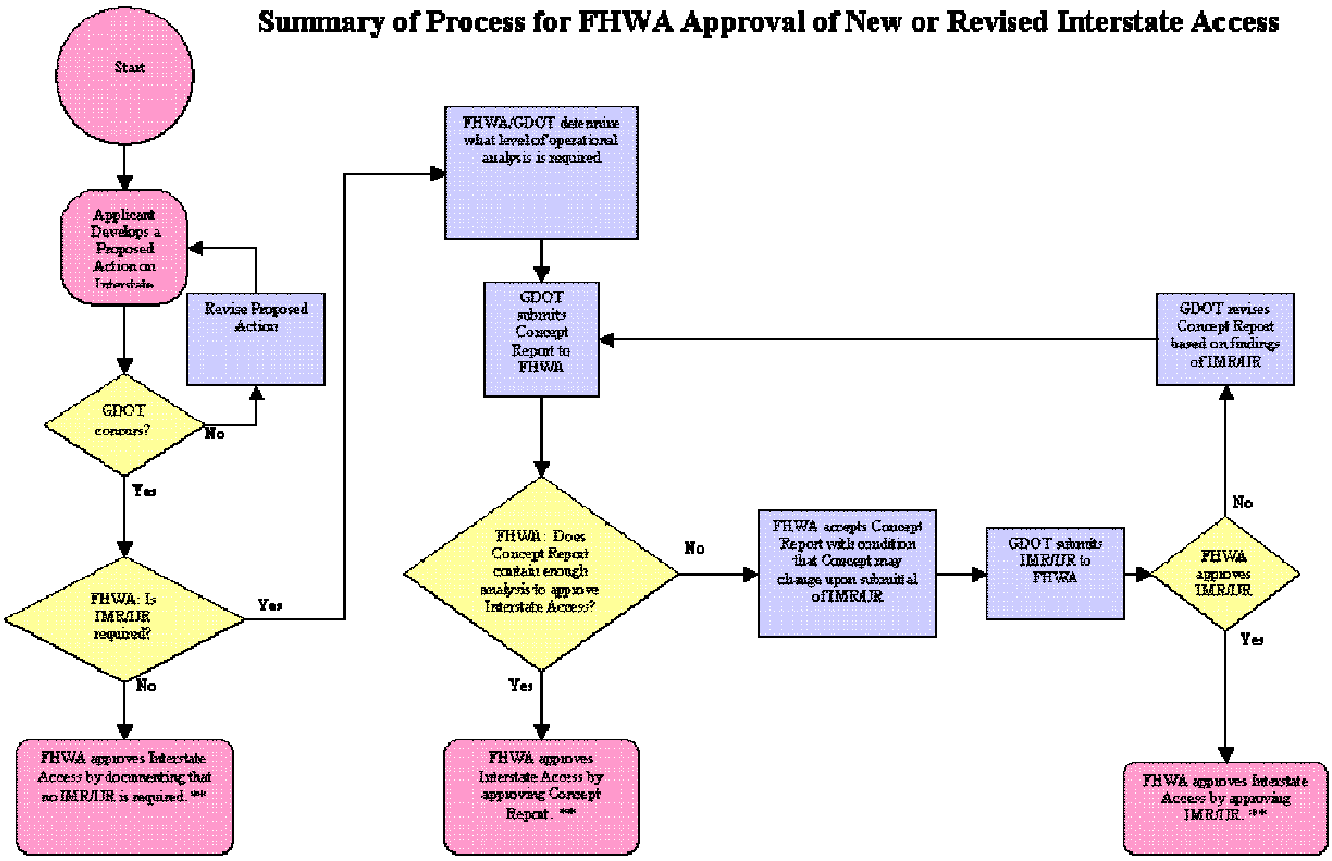
- (1) The Concept Report contains all the necessary analyses required by an IMR/IJR. This Concept Report approval constitutes the Interstate access approval and no separate IMR/IJR will be required. It is understood that the concept may need to be revised as a result of the NEPA process.
- (2) The Concept Report does not contain all the necessary analyses for FHWA to provide Interstate access approval. A separate IMR/IJR must be approved by FHWA prior to starting final design. It is understood that the concept may need to be revised as a result of (a) the operations analyses contained in the IMR/IJR or (b) the NEPA process.

Final FHWA approval of an IMR/IJR is always dependent upon NEPA approval. However, FHWA may approve an IMR/IJR for engineering and operational acceptability prior to completion of NEPA. In this case, it is understood that final approval of the IMR/IJR is contingent upon NEPA approval.

In the case where the concept is advanced prior to IMR/IJR approval, and where Federal funds are used for design, FHWA's expectation is that the IMR/IJR should be submitted prior to devoting significant design resources toward advancing the concept.

h. **Flowchart showing the FHWA approval process**

The flowchart shown below is intended to provide a brief summary of the process for obtaining Interstate access approval.



**Note: All FHWA Approval of Interstate Access is conditioned on final NEPA Approval.

IMR/IJR: Interchange Modification Report/Interchange Justification Report

i. **General information required in an IMR/IJR**

FHWA policy states that all requests for new or revised access must include sufficient supporting information to allow FHWA to independently evaluate the request and ensure that all pertinent factors and alternatives have been appropriately considered. GDOT should submit three copies of the IMR/IJR to FHWA. The following is a description of what information should typically be included in an IJR or IMR:

- A clear description of the location and type of proposed new or modified access. Maps, schematic diagrams, and functional preliminary design plans shall be included as needed to clearly describe the proposal. Drawings and plans should include (as applicable): project limits, adjacent interchanges, proposed interchange configuration, travel lanes and shoulder widths, ramps

to be added, ramps to be removed, ramp radii, ramp grades, acceleration lane lengths, deceleration lane lengths, taper lengths, auxiliary lane lengths, "taper" or "parallel" type exit ramps, truck climbing lanes, and collector/distributor roads. A large-scale layout of the project on an aerial photograph is helpful to FHWA in reviewing the request.

- Purpose and need for the new or revised access points (i.e., why it is needed, what are the intended benefits).
- Any background or supporting information that further explains the basis for the proposal (i.e., new highway proposed, planned private developments, known political support, etc.) Maps should show exact locations of all developments. If the purpose of the IMR/IJR is to support one or more proposed developments, the IMR/IJR should say so. Economic development can be a valid justification for new access.
- If the interchange is within a Transportation Management Area
- If there are any known issues of concern or controversy (i.e., environmental, public opposition, etc.).
- A description of the design alternatives considered (i.e., diamond interchange, single-point, directional ramps, alternate locations, etc.) and why the proposed alternative was selected.
- Estimated costs of the project, proposed funding sources (i.e., private development, local funds, State or Federal-aid funds), and implementation schedule.
- Relationship and distance of the interchange to adjacent interchanges and the ability to provide adequate signing.
- Any necessary design exceptions from currently adopted AASHTO Interstate design standards.
- Existing and Proposed Limits of Access
- Schematic drawings showing current and design year ADT and DHV for mainline traffic volumes, ramp volumes, cross road volumes, and intersection turning movements.
- Additional proposed traffic signalization and signing (if applicable).
- Safety issues regarding the existing conditions and proposed alternatives

j. **Policy information required in an IMR/IJR**

The IMR/IJR needs to address each of the following eight policy requirements listed in the Federal Register:

- Existing Facilities: FHWA policy states: "*The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.*"

The intent of this requirement is to demonstrate that an access point is needed for regional traffic needs and not to solve local system needs or problems. The Interstate facility should not be allowed to become part of the local circulation system but should be maintained as the main regional and interstate highway it was intended to be.

In the case of adding a new interchange or new ramp(s), the IMR/IJR needs to analyze whether existing or proposed roads parallel to the Interstate facility could be used as a connection to existing adjacent interchange ramps in lieu of adding a new interchange or ramps.

- Transportation System Management: FHWA policy states: "*All reasonable alternatives for design options, location, and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.*"

The intent is to assure that all reasonable alternatives, including improvements to the existing local roads and streets in lieu of new access, have been fully considered. The IMR/IJR needs to contain a description of the design alternatives considered, (e.g., diamond interchange, single-point, directional ramps, collector-distributor roads, alternate locations, no-build, HOV, transit, park and ride lots, signal timing modifications, etc.) as applicable, and why the proposed alternative was selected. The IMR/IJR will need to make the case that all reasonable alternatives have been considered and that the alternative being recommended is the best alternative.

- Operational Analysis: FHWA policy states: "*The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on each side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with the new or revised access points.*"

The intent of this requirement is to assure that sufficient operational analyses are made to determine the impact of the revised or new access on the Interstate operation. For consistency, it is anticipated that the current Transportation Research Board (TRB) "Highway Capacity Manual" (HCM) analysis procedures will be used. Other analysis tools may be used to supplement the HCM when appropriate. The operational impact on the mainline Interstate between the proposed new/revised access and the adjacent existing interchanges on either side is a critical item that must be analyzed. The analysis may need to extend farther along the mainline and include additional existing interchanges if necessary to establish the extent and scope of the impacts. This could be critical in urban areas with many closely spaced interchanges. The spacing between interchanges must safely accommodate weaving, diverging, merging maneuvers, and good directional signing.

- Access Connections and Design: FHWA policy states: "*The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.*"

The intent of this requirement is that, except in the most extreme circumstances, all interchanges should provide for all basic movements. Partial interchanges usually have undesirable operational characteristics. If circumstances exist where a partial interchange is considered appropriate as an interim design, then commitments should be made to providing the ultimate future design, such as purchasing necessary right-of-way, during the initial project stage. Special purpose access for HOV's, for transit vehicles, or for park and ride lots should be treated as special cases and decided on a case-by-case basis.

- Transportation Plans: FHWA policy states: " *The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR part 450 and transportation conformity requirements of 40 CFR parts 51 and 93.*"

The intent of this requirement is that the request must include a discussion as to how the current proposal fits into the transportation plan for the area and its implications to air quality conformity. Although requests for engineering and operational approval of access may be made prior to being included in transportation plans, final approval cannot be given if the project is not included in the appropriate plan (i.e. approved by MPO in the Long Range Plan). Such coordination should be made as part of the normal project development process.

- Comprehensive Interstate Network Study: FHWA policy states: " *In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.*"

The intent of this requirement is to cause sufficient review and coordination so as not to have piece-meal consideration of added access and to avoid future conflict as much as possible with other proposed access points. It is usually best to consider all proposed changes in access for an area at the same time. If a new or revised interchange is being proposed and another new or revised adjacent interchange is being planned and programmed, then both changes should be analyzed together. The expectation here is that any proposal is considered in view of currently known plans for transportation facilities and/or land use planning and is especially important when several new interchanges are anticipated.

- Coordination with Transportation System Improvements: FHWA policy states: " *The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.*"

The intent of this requirement is to assure that highway facilities are developed in an orderly and coordinated manner to serve the public. Therefore, when private development is clearly the driving force behind the need for access, it is only reasonable that the State and the developer work closely together in order to develop the access to achieve mutual benefits

with minimal adverse impact on the Interstate travelers. Stage construction should be considered where extensive private development is not expected to be completed for several years. As a condition of approval, the developer may be required to have certain parts of the local circulation system ready before ramps can be constructed or opened to traffic. Coordination and cooperation is essential where different entities (GDOT, developers, local governments, etc.) are each responsible for a portion of the proposed project.

- Status of Planning and NEPA: FHWA policy states: " *The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.*"

The intent of this requirement is to confirm and report information relative to the status of the planning and NEPA processes in regard to the access request. Final approval of an IMR/IJR is contingent upon approval of the NEPA and planning processes. Also, the development of final plans, right-of-way acquisition, and physical construction may be performed only after approval of the environmental document.

k. **Operational analysis required in an IMR/IJR**

The IMR/IJR must contain an operational analysis. The operational analysis of the proposed access must clearly demonstrate to the satisfaction of FHWA that there will be little or no impact to the safety and operation of the Interstate facility. The methodology from the current TRB Highway Capacity Manual (HCM), or current version of the Highway Capacity Software (HCS) shall be used to perform the needed engineering analyses. Other analysis tools, such as Corsim, may be used to supplement the HCS analysis and in some complex projects, may be required. The IJR/IMR submittal shall include a computer disk containing all electronic data used in all the analyses. The operational analysis should use traffic data based on a design year 20 years from the date when the project is scheduled to be complete and open to the traveling public. Alternate analysis tools for determining operational acceptability will need prior approval by FHWA.

The operational impact on the mainline Interstate between the proposed new/revised access and the adjacent existing interchanges on either side must be analyzed. The analysis should be extended as far along the mainline and include as many existing interchanges as is necessary to establish the scope of the impacts. In some cases in urban areas, the effects of a new interchange may be felt several miles downstream where a bottleneck occurs. If this is the case, then it must be addressed in the analysis. If there are multiple planned projects on a corridor, the corridor should be analyzed. The spacing between interchanges must safely accommodate weaving, diverging, and merging maneuvers, and also allow for understandable signing.

The engineering analysis shall include all of the following, as applicable, unless agreed otherwise by FHWA:

- Existing Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with existing "AM Peak Hour" and "PM Peak Hour" volumes.

- Design Year No-Build Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with the Design Year No-Build "AM Peak Hour" and "PM Peak Hour" volumes.
- Design Year Build Peak Hour Volumes: Plan view map with ramps and Interstate through lanes labeled with the Design Year Build Peak "AM Peak Hour" and "PM Peak Hour" volumes.
- Summary Of Operational Analysis: Preferably, a table listing the "Freeway LOS", "Ramp LOS", and "Weave LOS" for the corresponding Existing AM/PM, Design Year "No-Build" AM/PM, and Design Year "Build" AM/PM for the appropriate Interstate through lane sections, on-ramps, off-ramps, and weave areas.
- Existing Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Existing "AM Peak Hour Level of Service" values and " PM Peak Hour Level of Service" values.
- Design Year No-Build Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Design Year No-Build "AM Peak Hour Level of Service" values and "PM Peak Hour Level of Service" values.
- Design Year Build Peak Hour Levels of Service: Plan view map with ramps, Interstate through lanes, and crossroads labeled with calculated Design Year Build "AM Peak Hour Level of Service" values and "PM Peak Hour Level of Service" values.
- Basic Freeway Segments Analyses of Existing Conditions
- Basic Freeway Segments Analyses of the Design Year "No-Build" Conditions
- Basic Freeway Segments Analyses of the Design Year "Build" Conditions
- Ramp Junction Analyses of the Existing Conditions
- Ramp Junction Analyses (including queue analysis) of the Design Year "No-Build" Conditions
- Ramp Junction Analyses (including queue analysis) of the Design Year "Build" Conditions
- Weave Area Analyses of the Existing Conditions
- Weave Area Analyses of the Design Year "No-Build" and "Build" Conditions
- Weave Area Analyses of the Design Year "Build" Conditions
- A copy of the raw input and output data used in the traffic analyses, both in hard-copy form and electronic form.

If CORSIM is used to supplement the HCM, the following information needs to be provided with the CORSIM analysis:

- A disc with a copy of the .trf files.
- A description of the method used to calibrate the CORSIM model.
- An explanation of what default values were changed and why.
- An explanation of the number of runs and random seeds used to develop the final CORSIM results.
- A summary of the CORSIM results in graphical or tabular format.
- A summary chart showing the Level of Service results from the operational analysis.

Appendix B - Meeting Notes and Correspondences

Summary of Activities

Kickoff Meeting – January 29, 2007

- Discussed study scope, analysis procedures, and input data
- Verified available data
- Examined field conditions

Performed initial traffic projections and analyzed existing conditions – February through Mid-March, 2007

Coordination Meeting Regarding Land Use – March 14, 2007

- Confirmed planned development with Bryan County
- Verified locations in follow-up with Bryan County

Analyzed Traffic data provided by Bryan County and Terra Point Development – Mid March through April, 2007

- Prepared trip generation estimates
- Prepare future year forecast traffic volumes with and without proposed interchange

Coordination Meeting with GDOT Regarding Generated Traffic – May 2, 2007

Performed IJR Analysis – May through July 2007

- Analyzed proposed and adjacent interchanges along I-95
- Analyzed FHWA Policies

Coordination Meeting Regarding Draft IJR Results – August 2, 2007

- Adjacent US 17 interchange could be improved to provide access intended by Belfast Siding Road Interchange
- Bryan County indicated they want to revisit growth assumptions
- Terra Point indicates their development will be an inland port with much greater truck trip generation
- Bryan County requests three months for Bryan County and Terra Point to compile data

Received Data from King Engineering on Behalf of Bryan County – December 15, 2007

- Draft Bryan County Transportation Plan – July 2007
- Markup of traffic generation assumptions – Thomas & Hutton Engineering
- Bryan County Future Development Plan Map – Thomas & Hutton Engineering

Performed preliminary examination of additional data – Mid-December through Mid January 2007

- Additional development does not significantly alter assumptions (assuming only a portion of unspecified development area will develop by year 2030)
- Prepared memorandum of findings for GDOT (January 24, 2008)

GDOT provides response letter to Bryan County – February 5, 2008

Kickoff Meeting Agenda (January 29, 2007)

AGENDA

IJR Planning Study – I-95 at Belfast Siding Road
Georgia Department of Transportation – Office of Planning
Kickoff Meeting – January 29, 2007

Agenda Item

I. Introductions
- Consulting Team
- Public Agency Representatives

II. Project Purpose
- Project Background
- Inter-Jurisdictional Coordination

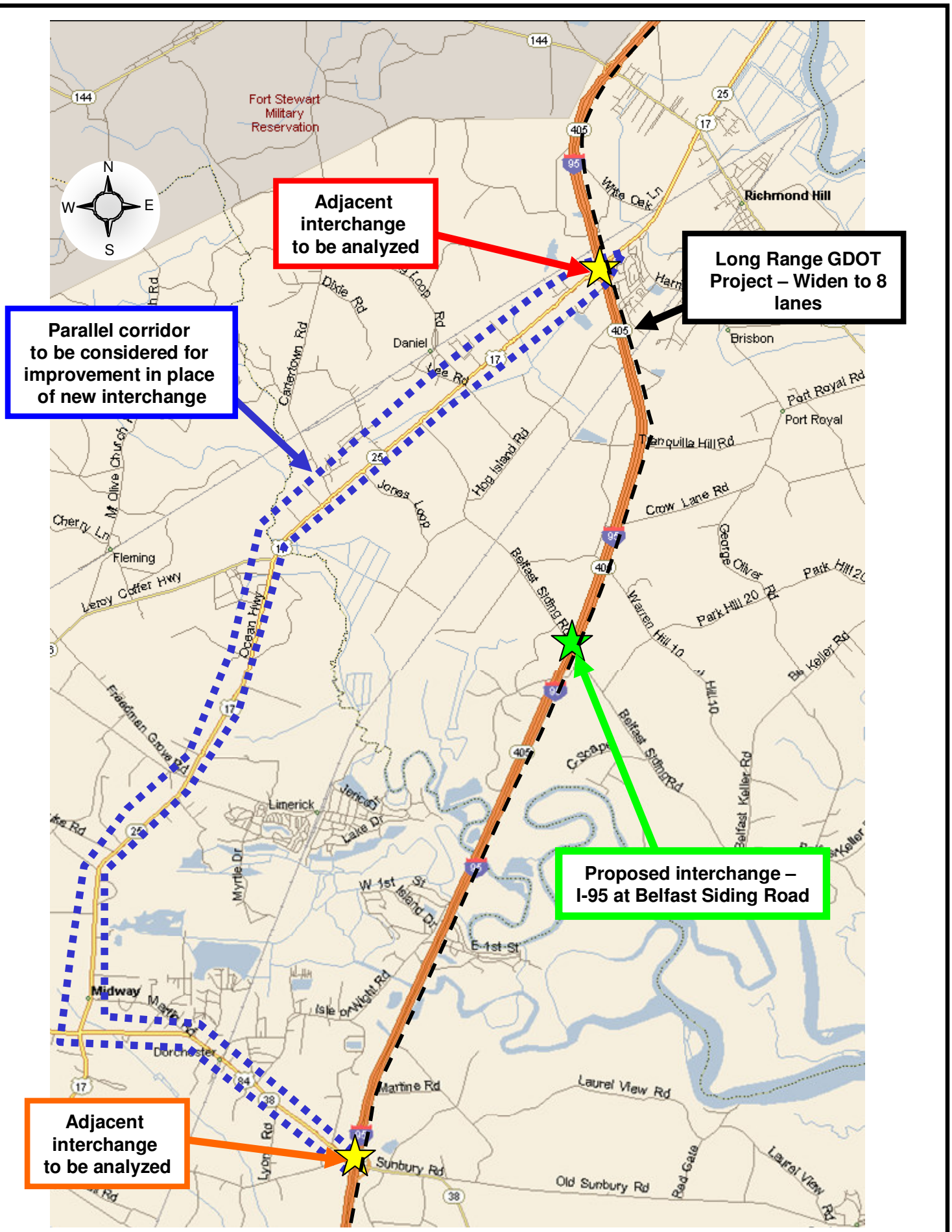
III. Project Overview
- Study Tasks
- Schedule
- Application of GDOT Technical Guidance
  - Guidance on Interstate Access Requests, by FHWA
  - GDOT Design Manual – Chapter 13, Traffic Forecasting and Analysis

IV. Data Input to IJR Study Process
- Traffic Volume Data
- Development and Growth Information
- Future Year Traffic Forecasts
- Aerial Photography
- GIS Data

V. Discussion of Preliminary IJR Issues and Improvement Concepts
- Potential Interchange Directionality and Connection to Roadway Network
- Anticipated Benefits and Operational Issues with New Interchange
- Potential Improvement of Adjacent Interchanges or Parallel Facilities

VI. Next Steps
- Examine Existing Conditions and Project Future Traffic
  - Examine Field Conditions / Collect data
  - Review Available Studies and Planned Projects
  - Identify Potential Environmental Justice Communities
  - Analyze Existing Conditions
  - Prepare Initial Future Year Traffic Volume Projections
- Analyze Key FHWA Policies
  - Interchange Spacing
  - Ability of Adjacent Interchanges to Satisfy Needs
  - Potential Impacts of New Interchange on I-95 Traffic Service

Project Contacts:
GDOT Project Manager: Michael Hatfield – (404) 651-5330 – Michael.Hatfield@dot.state.ga.us
Consulting Team Contact: Richard Fangmann, Carter & Burgess, Inc. – (404) 249-7550
Richard.Fangmann@c-b.com



Carter Burgess One Source, One Firm™ Jan 29, 2007	I-95 at Belfast-Siding Road Interchange Justification Report GDOT Georgia Department of Transportation	Figure 1 Study Area

Interchange Justification Report (IJR) Work Plan

Task 1: Data Collection

Task 1.1: Perform Field Reconnaissance
Task 1.2: Collect Traffic Volume and Turning Movement Data
Task 1.3: Review Available Studies and Identify Planned Projects

Task 2: Development of Base Year and Design Year Traffic for All Interstate Routes

Task 2.1: Determine Historic Traffic Growth Trends and Travel Demand Model Growth Forecasts
Task 2.2: Forecast Opening Year and Design Year Traffic

Task 3: Evaluation of the Existing System

Task 3.1: Perform Analysis of Arterial Segments, Intersections, and Ramp Termini (Current and Future Year with Current Network)
Task 3.2: Perform Analysis of Freeway Ramps, Merge/Diverge Areas, and Weaving Movements (Current and Future Year with Current Network)
Task 3.3: Define Interchange Need and Purpose

Task 4: Development of Potential Improvements and Conceptual Layouts for Projects in the Study Area

Task 4.1: Define Potential Build and No-Build Alternatives
Task 4.2: Perform Screening for Impact to Environmental Resources
Task 4.3: Identify Potential Environmental Justice Communities in the Study Area
Task 4.4: Perform Analysis of Arterial Segments, Intersections, and Ramp Termini (Future Year with Network Modifications)
Task 4.5: Perform Analysis of Freeway Ramps, Merge/Diverge Areas, and Weaving Movements (Future Year with Network Modifications)
Task 4.6: Prepare Preliminary Interchange Alternative Layouts and Preliminary Cost Estimates
Task 4.7: Evaluate Build and No-Build Alternatives

Task 5: Prepare Preliminary Concepts for Each Project

Task 5.1: Prepare Refined Interchange Alternative Layouts for Preferred Alternative
Task 5.2: Prepare Cost Estimate for Preferred Alternative

Task 6: Document the Implementation Plan Effort

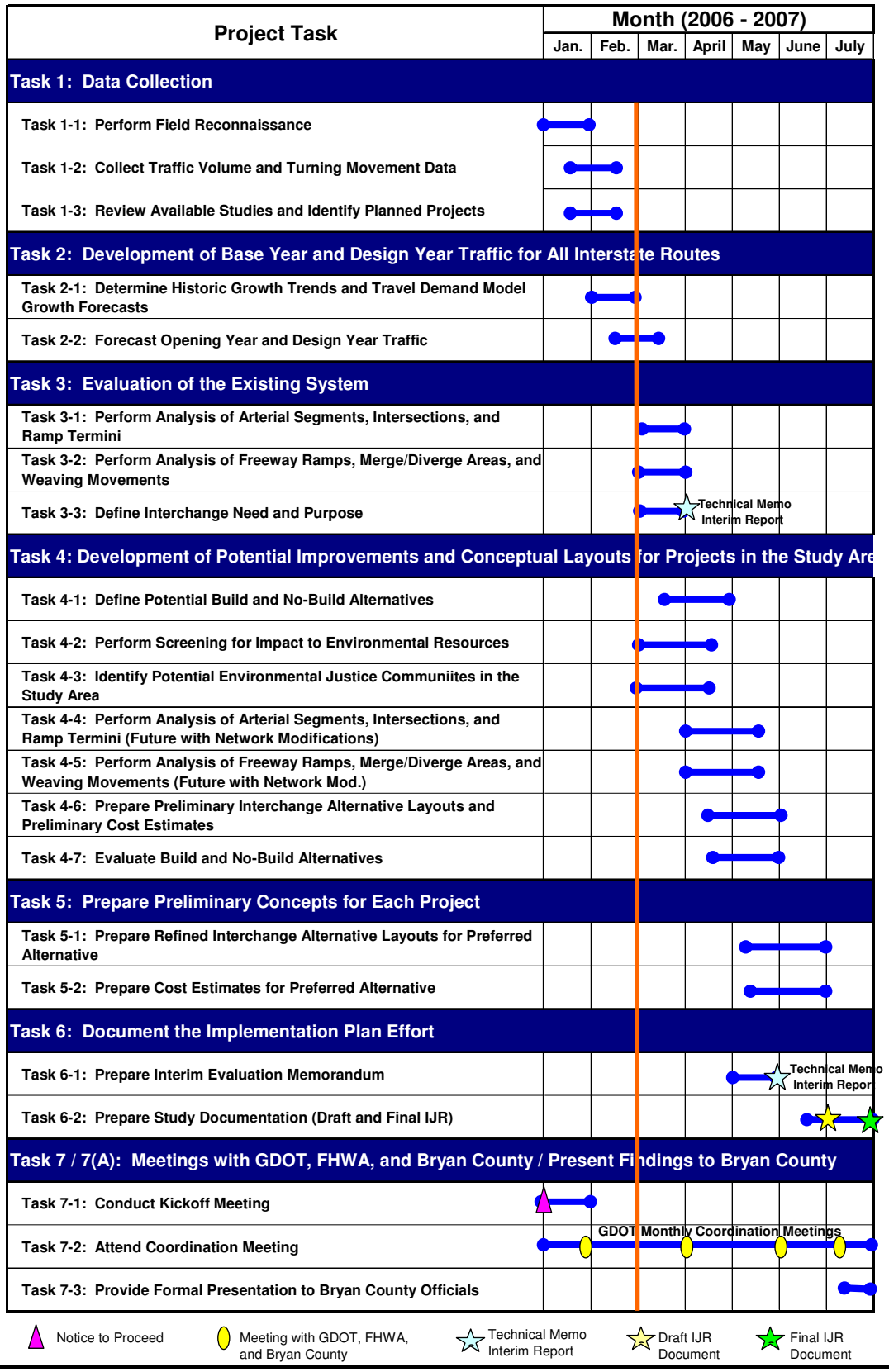
Task 6.1: Prepare Interim Evaluation Memorandum
Task 6.2: Prepare Study Documentation (Draft and Final IJR)

Task 7: Meetings with GDOT, FHWA

Task 7.1: Conduct Kickoff Meeting
Task 7.2: Attend Coordination Meetings

Task 7 A: Consultant Present Findings to Bryan County

IJR Schedule



GDOT Technical Guidance on Preparing Interchange Justification Reports (IJRs)

The need for a new break in access along I-95 at Belfast Siding Road will be examined in relation to the eight policy requirements listed in the Federal Register and included in the *FHWA Guidance on Interstate Access Requests*, as follows:

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.

4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.

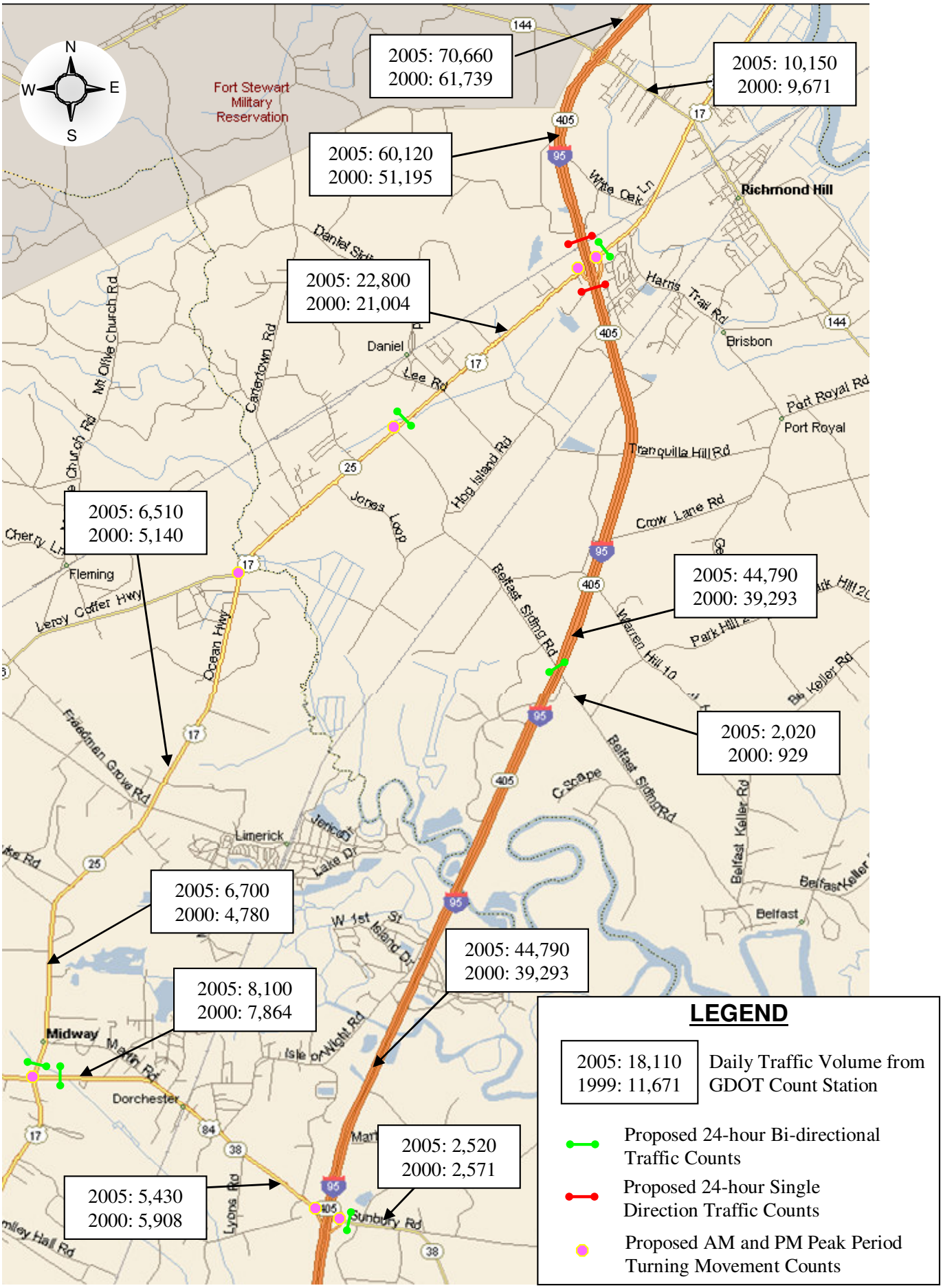
5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and /or statewide transportation plan, as appropriate, the applicable provisions of 23 CRF part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.

7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.

8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.

In accordance with FHWA and GDOT guidance, the IJR will examine operations at the proposed interchange location, as well as adjacent interchanges upstream and downstream.



LEGEND

2005: 18,110 1999: 11,671	Daily Traffic Volume from GDOT Count Station
	Proposed 24-hour Bi-directional Traffic Counts
	Proposed 24-hour Single Direction Traffic Counts
	Proposed AM and PM Peak Period Turning Movement Counts

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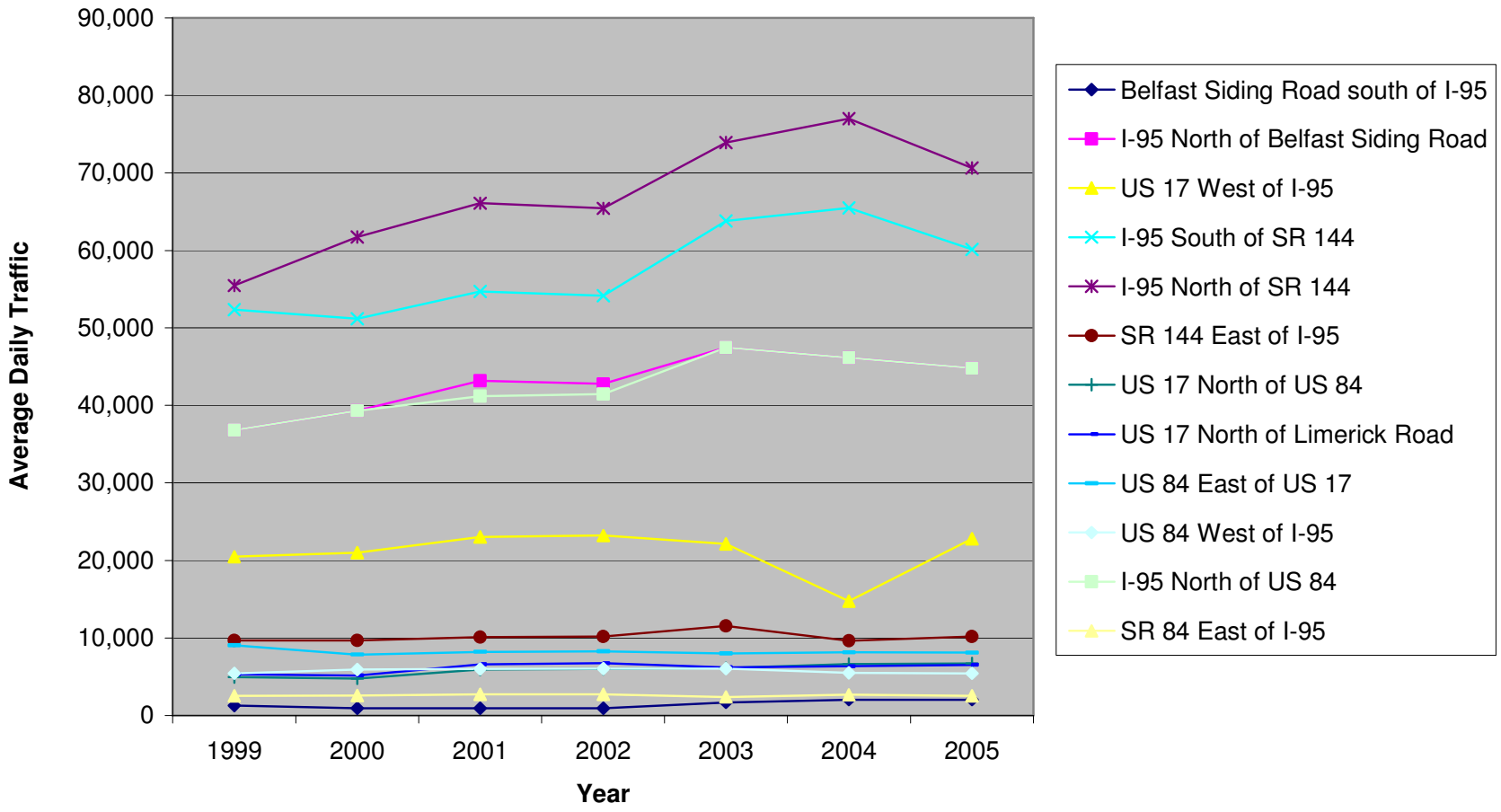
Jan 29, 2007

I-95 at Belfast-Siding Road
Interchange Justification Report

GDOT
Georgia Department of Transportation

Bryan County Interchange Justification Report
Traffic Volumes from GDOT Count Stations
1999-2005



Kickoff Meeting Minutes (prepared February 9, 2007)

SUBJECT: Georgia Department of Transportation (GDOT)
IJR Planning Study – I-95 at Belfast Siding Road
CSMSL-0006-00(941), PI N. 0006941
Kickoff Meeting

MEETING DATE: January 29, 2007

TODAY'S DATE: February 9, 2007

PREPARED BY: Richard Fangmann, Carter & Burgess

ATTENDEES: Phil Jones, Bryan County Administrator
Jimmy Burnsed, Bryan County Commission
Mike Hatfield, GDOT Office of Planning
Mathew Fowler, GDOT Office of Planning
Radney Simpson, GDOT Office of Planning
Kyle Mote, GDOT Office of Planning
Teresa Scott, GDOT District 5
Jim Collins, Thomas & Hutton Engineering Company
Jeff Ingham, Thomas & Hutton Engineering Company
Ray Pittman, Thomas & Hutton Engineering Company
Jeannie Fewell, TerraPointe
Jeff Lawrence, TerraPointe
Marta Rosen, Carter & Burgess
Richard Fangmann, Carter & Burgess

LOCATION: Bryan County

Meeting Summary

1. The meeting began at 10:00 AM with an introduction of the meeting attendees. Mathew Fowler provided a brief overview of the study purpose and background.

2. Richard Fangmann provided a summary of the project schedule and FHWA requirements for obtaining a break in access. He indicated the study would be coordinated with GDOT and FHWA to ensure it adequately addressed the eight FHWA policies included in the FHWA Guidance on Interstate Access Requests.

3. Richard Fangmann indicated that the study will initially look at three key FHWA interchange requirements to determine if the proposed interchange will satisfy these criteria based on initial traffic projections prior to performing the full traffic analysis.

   - Interchange spacing to GDOT/FHWA standards for minimum and average spacing.
   - The existing interchanges cannot provide the needed access nor be improved to provide it.
   - The proposed access point does not have a significant adverse effect on the safety and operations of the existing freeway system.

4. Phil Jones provided a summary of the recent growth trends occurring in the County and the proposed growth planned for the Belfast Siding Road area near I-95. The County is rewriting its Comprehensive Land Use plan to include recent significant growth planned in the area. The previous plan was prepared in 1990. Marta Rosen indicated Carter & Burgess would like a copy of the previous plan. The following are some major developments underway in Bryan County:

    - Genesis Point – Large residential development with commercial along Oak Level Road.
    - TerraPointe – 20,000 acres of development overall with 7,000 acres being planned now.
    - Other residential and commercial development is occurring along the SR 144 corridor.

5. Representatives of TerraPointe and Thomas & Hutton provided an overview of the TerraPointe development. They will develop 3,000 acres south of the Genesis Point Development east of I-95. They will develop 4,000 acres along Belfast Siding Road to include residential, commercial, and industrial. The industrial development will be 1,100 acres west of I-95 along Belfast Siding Road in the vicinity of the existing rail line.

6. Richard Fangmann requested TerraPointe provide information on the square footage for each of the proposed uses along Belfast Siding Road so the development could be included in the interchange analysis work. The information was requested by February 15th. TerraPointe indicated they will likely need more time to finalize these plans.

7. Richard Fangmann provided a discussion of the data collection to be performed as a part of the study. Phil Jones indicated that the analysis boundaries should include the intersection of US 17 at SR 144, as well as analysis along the SR 144 corridor, as it provides access to the growing area served by the proposed Belfast-Siding interchange.

8. Jimmy Burnsed inquired as to whether Hurricane evacuation will be considered as a part of the analysis of interchange needs. Cater & Burgess indicated that it would be considered, although not to the degree of detailed evacuation route planning. Hurricane evacuation is not explicitly indicated in the eight FHWA policies included in the FHWA Guidance on Interstate Access Requests.

9. Phil Jones indicated Bryan County has aerial photography performed in April of 2006 that could be provided to the Carter & Burgess Team. He indicated the County has parcel level data on properties and information on environmental conditions available in the County GIS. He agreed to coordinate with the GIS department regarding the use of this data by the Carter & Burgess Team.

10. The group discussed the next steps. Receipt of information on the proposed development in the vicinity of the proposed Belfast Siding Road is a key component to performing future traffic volumes to/from that area. The following is a summary of next steps to be performed.

    - Carter & Burgess to perform peak hour traffic observations
    - Carter & Burgess to perform traffic counts
    - Bryan County to provide copy of previous comprehensive plan
    - Bryan County to provide GIS database for use by Carter & Burgess. The following data is requested (if available):
        - Aerial Photography
        - Zoning (parcel data)
        - Land Use
        - Streets
        - Local Functional Classification
        - Contour Lines / LIDAR
        - Transit Routes and Stops
        - Sidewalks / Multiuse Trails
        - Traffic Signals
        - Wetlands
        - Socioeconomic data (population and employment by Traffic Analysis Zone or Census Tract)
        - Environmental Justice data - if any is available that is more recent than 2000 census data
    - TerraPointe to provide information on proposed development along Belfast Siding Road.
    - Carter & Burgess to discuss land use growth assumptions for analysis in a meeting with Phil Jones
    - Carter & Burgess to prepare initial future year traffic forecasts and analysis of roadway operations.
    - Carter & Burgess to perform initial evaluation of interchange needs based on application of primary FHWA policies.

    Richard Fangmann requested the data be provided by February 15th. TerraPointe indicated that it is not likely to have its site plan sufficiently set by that time. They indicated it would likely be the end of February before the information is available.

11. Following the kickoff meeting, Phil Jones provided an automobile tour of the portion of the County affected by the proposed interchange.

These meeting minutes reflect the understanding of Richard Fangmann, attendee at the above referenced meeting. Please indicate any changes and return these meeting minutes via email to Richard.Fangmann@c-b.com If no changes are requested, these meeting minutes will be considered final in seven calendar days. As always, please call or email me if you have any questions or comments regarding the meeting summary.

Letter From Bryan County Describing Terrapointe Development (March 2, 2007)

Bryan County Board of Commissioners

P.O. Box 430
Pembroke, Georgia 31321-0430
(912) 653-3839
(912) 653-3819
Fax (912) 653-4091

Jimmy Burnsed
Chairman

Ed Bacon
Blondean Newman
Glen Willard
Toby Roberts
Rick Gardner

W. Phillip Jones
County Administrator

Donna M. Waters
County Clerk

March 2, 2007

Carter & Burgess
ATTN: Richard Fangmann
1718 Peachtree Street N.W.
Suite 400
Atlanta, GA 30309

RE: Belfasting Siding/I-95 IJR

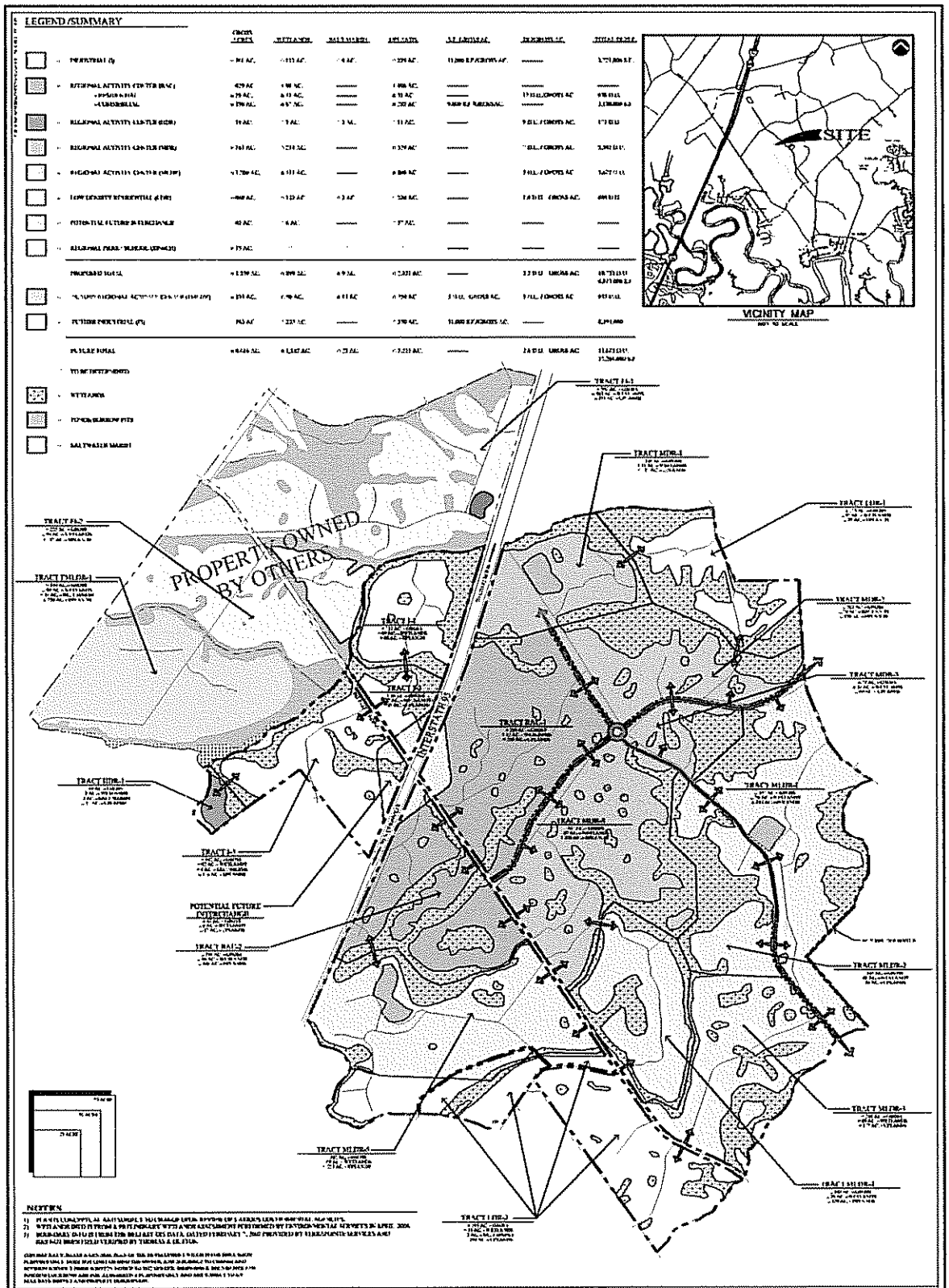
Dear Richard:

Enclosed is a copy of the master plan layout for the Belfast Siding and Interstate 95 intersection. I discussed this project with you during the last visit. The Chairman of the County Commission (Jimmy Burnsed) and I met with TerraPoint last week and they presented the finalized version of the master plan (see attachment).

Terra Point will be moving forward with the DRI process and upon completion start the rezoning proceedings. This tract should be considered in the development of the IJR. Please accept this letter as official notification.

Sincerely,

WAVERLY P. JONES
County Administrator



TERRAPOINTE

BELFAST SIDING PROPERTY
CONCEPTUAL LANDUSE MASTER PLAN

BRYAN COUNTY, GEORGIA

PREPARED FOR:

TERRAPOINTE SERVICES, INC

PREPARED BY:

THOMAS & HUTTON ENGINEERING CO.

MARCH 28, 2007

N
W E
S

PROJECT NO.
19541.416

1000 0 500 1000 2000

SCALE: 1" = 1000'

Land Use Assumptions Meeting Agenda (March 14, 2007)

Agenda Item

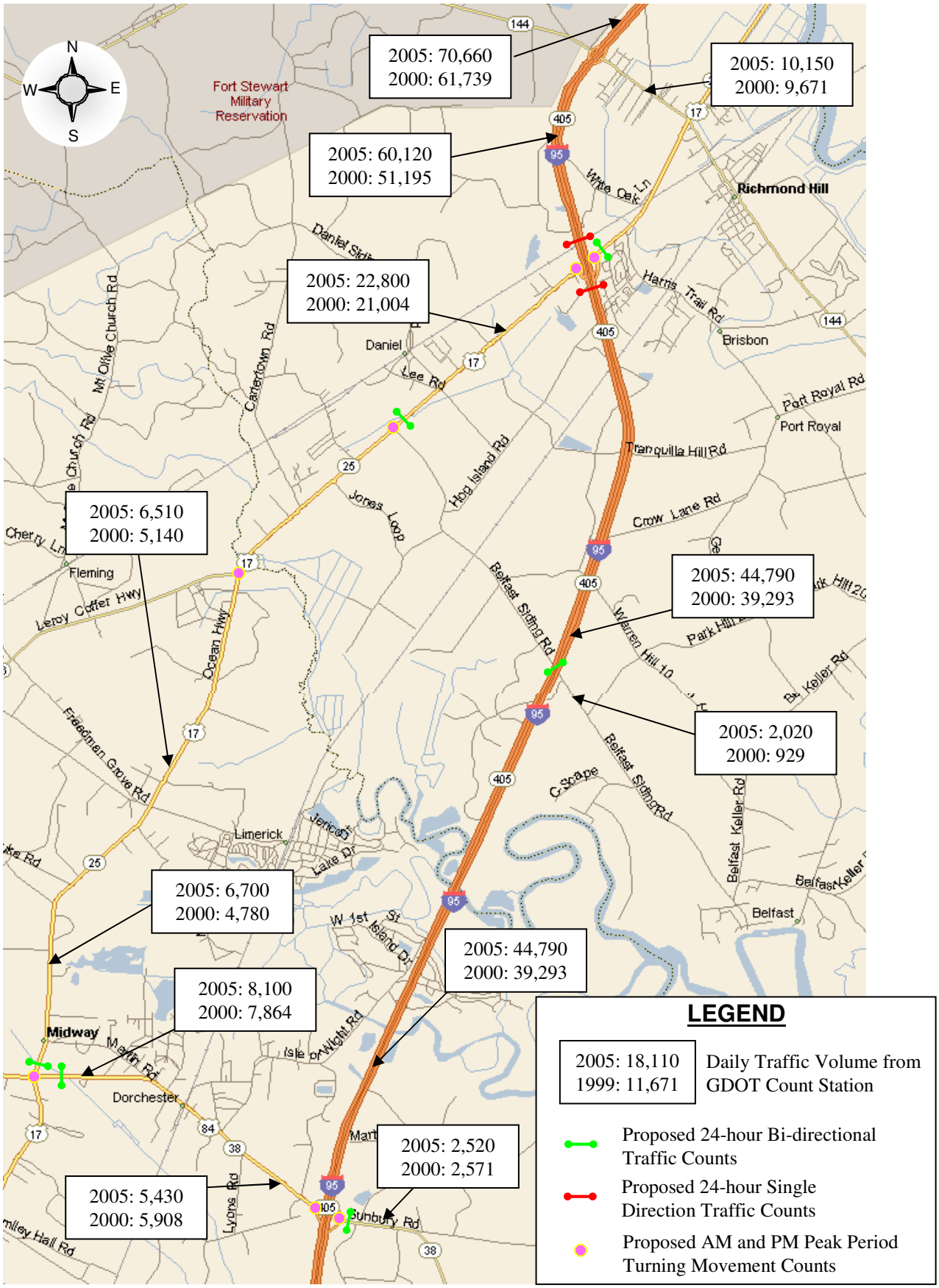
I. Introductions
- Consultant and Public Agency Representatives
- Meeting Purpose

II. Update on Data Input to IJR Study Process
- Aerial Photography
- GIS Data
- Traffic Volume Data
- Development and Growth Information
- Future Year Traffic Forecasts

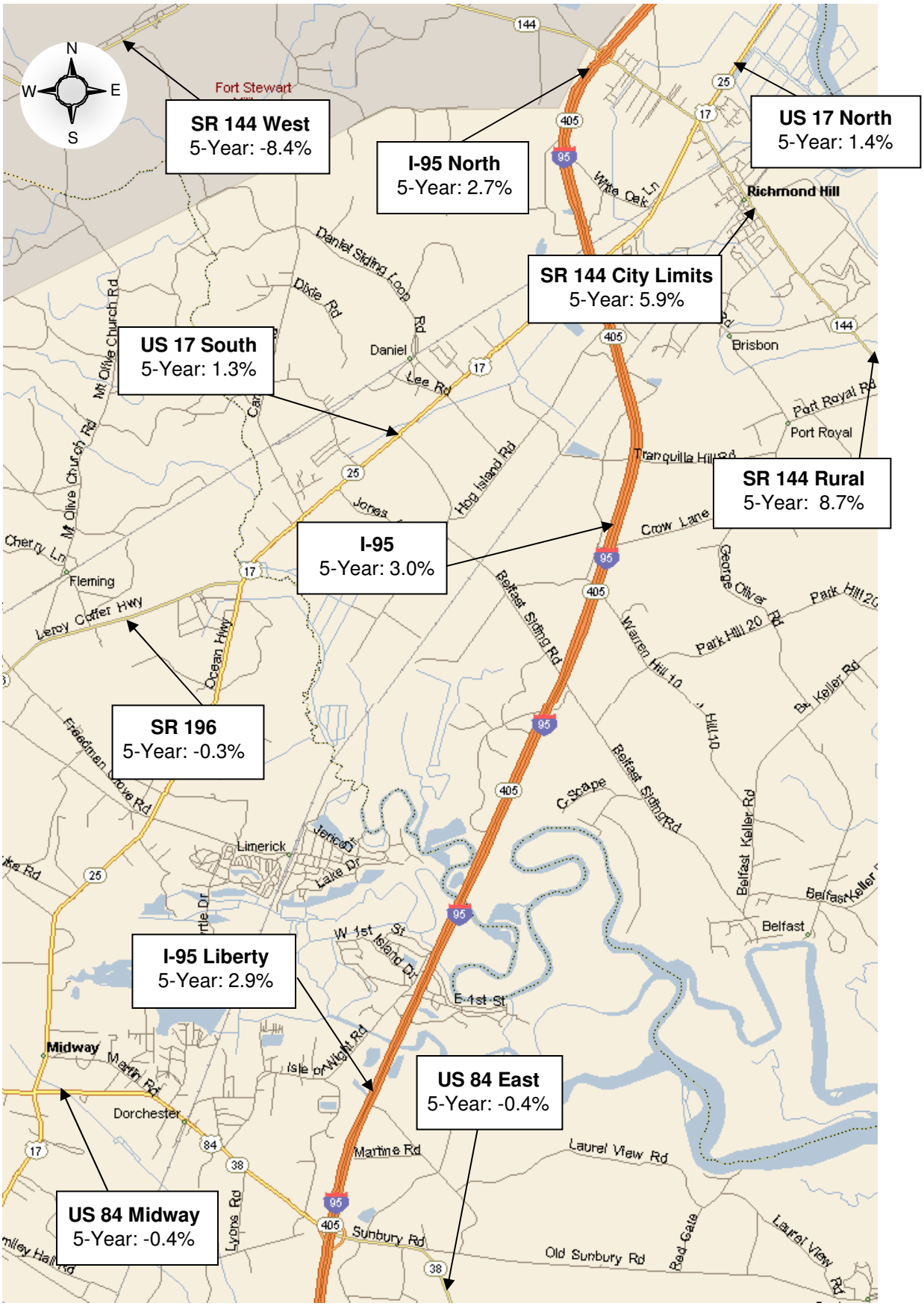
III. Discussion of Land Use Assumptions Based on Development Information
- Approved development - location and size of development by land use
- Proposed but not yet approved development (identified in master plans or other active planning efforts) - location and size of development by land use
- Proposed development not included in identified plans - (areas where growth is anticipated or developers are planning work that is not yet in a master plan or active planning effort)
- Information on Terra Point development at Belfast Siding Road - Area of proposed development and development plans

IV. Next Steps
- Project future traffic growth based on historic growth and planned development
- Conduct traffic counts
- Analyzed existing conditions
- Perform initial environmental screening to identify wetlands
- Prepare future year forecast traffic volumes with and without proposed interchange
- Analyze Key FHWA Policies
    - Interchange Spacing
    - Ability of Adjacent Interchanges to Satisfy Needs
    - Potential Impacts of New Interchange on I-95 Traffic Service

Project Contacts:
GDOT Project Manager: Michael Hatfield – (404) 651-5330 – Michael.Hatfield@dot.state.ga.us
Consulting Team Contact: Richard Fangmann, Carter & Burgess, Inc. – (404) 249-7550
Richard.Fangmann@c-b.com



Carter Burgess One Source, One Firm March 2007	**I-95 at Belfast-Siding Road Interchange Justification Report** GDOT Georgia Department of Transportation	**Figure 1** **Traffic Volume**



Carter Burgess
One Source, One Firm™

March 2007

I-95 at Belfast-Siding Road Interchange Justification Report

Georgia Department of Transportation

Figure 2 Annual Growth Rates

Email Correspondence - Questions about TerraPointe Development (April 19, 2007)

From: Fangmann, Richard B.
Sent: Thursday, April 19, 2007 1:38 PM
To: 'Phil Jones'
Cc: 'Simpson, Radney'; 'Mote, Kyle'; Rosen, Marta V.
Subject: I-95 at Belfast Siding Road IJR

Phil,

We received the information on the master plan for the TerraPoint development along Belfast Siding Road (copy attached). We appreciate you forwarding this information to us. We are beginning to look at what development scenarios may be feasible for the site in the timeframe of the proposed interchange analysis (opening 2015 with design year 2035. The following are a few questions:

- Has Terra Point let you know any more specific plans as to the type or phasing of development, particularly within the 2015 to 2035 timeframe?
- Would you please forward a scanned or electronic version of the Master Plan, we cannot read the smaller text that provides details on the tracts and summary data?
- Do they have a document that describes their Master Plan that goes along with the map? If so, could you forward that, as well?

Thank you for getting this information to us.

We have also prepared a graphic that indicates the developed areas discussed in our last meeting. Please review this graphic and let us know if we have missed anything. We would like to receive your concurrence with this information, as we plan to use it to define future development for purposes of projecting future traffic for evaluation of the need for an interchange at I-95 and Belfast Siding Road.

Thanks again for the information.

Richard Fangmann, P.E., PTOE
Carter & Burgess, Inc.
1718 Peachtree Street NW
Suite 461
Atlanta, GA 30309
404-249-7550 Main
404-478-3913 Direct
404-249-7705 Fax

Project Status Meeting Agenda (May 2, 2007)

Agenda Item
Discussion Item

I. Introductions / Meeting Purpose

II. Comparison of TerraPointe Master Plan to Previous Conceptual Work

- Status of TerraPointe Work
- Comparison to previous concept submitted to Bryan County

III. Preliminary Traffic Generation and Distribution

- Traffic Generated by TerraPointe Development
- Preliminary Residential and External Commercial Traffic Generation and Distribution for Additional Development in Southern Bryan County

IV. Schedule and Next Steps

- Review of Schedule and Next Meeting Date
- Next Steps:
  - Prepare future year forecast traffic volumes with and without proposed interchange
  - Perform initial environmental screening to identify wetlands
  - Analyze Key FHWA Policies
    - Interchange Spacing
    - Ability of Adjacent Interchanges to Satisfy Needs
    - Potential Impacts of New Interchange on I-95 Traffic Service
  - Meet with GDOT and Bryan County to discuss preliminary results

COMPARISON OF TERRAPOINTE MASTER PLAN TO PREVIOUS CONCEPTUAL WORK

Status of TerraPointe Development

- TerraPointe Submitted Master Plan to Bryan County for Belfast Siding Property at I-95 (3,300 acres)
- Thomas & Hutton Engineering, Inc. is currently preparing DRI for property (traffic study not available at this time)

Table 1
Comparison of Development Intensity for TerraPointe Development at Belfast Siding Road

Land Use Type	Development Intensity				Reduced Intensity		
	Previous Concept		Submitted Master Plan				
	size	unit	size	unit	size	unit	Percent
Industrial	17,290,700	sq. ft.	3,721,000	sq. ft.	13,569,700	sq. ft.	80%
Regional Activity Center Commercial	7,636,640	sq. ft.	3,150,000	sq. ft.	4,486,640	sq. ft.	45%
Multifamily Residential	3,063	Dwellings	6,460	Dwellings	-3,397	Dwellings	-164%
Single Family Residential	4,928	Dwellings	4,271	Dwellings	657	Dwellings	7%

Net Difference: Reduction of 18,056,340 sq. ft. industrial/commercial (72%)
Increase of 2,740 dwelling units (34%)

Note: Future development of 942 dwelling units and 8,393,000 square feet of industrial development on property west of I-95 owned by others was not considered in the table above.

Result: Submitted development master plan has lower intensity than previous concept.

PRELIMINARY TRAFFIC GENERATION AND DISTRIBUTION

Table 2
Preliminary Daily Traffic Generation for TerraPointe Site
IJR for I-20 at Belfast Siding Road

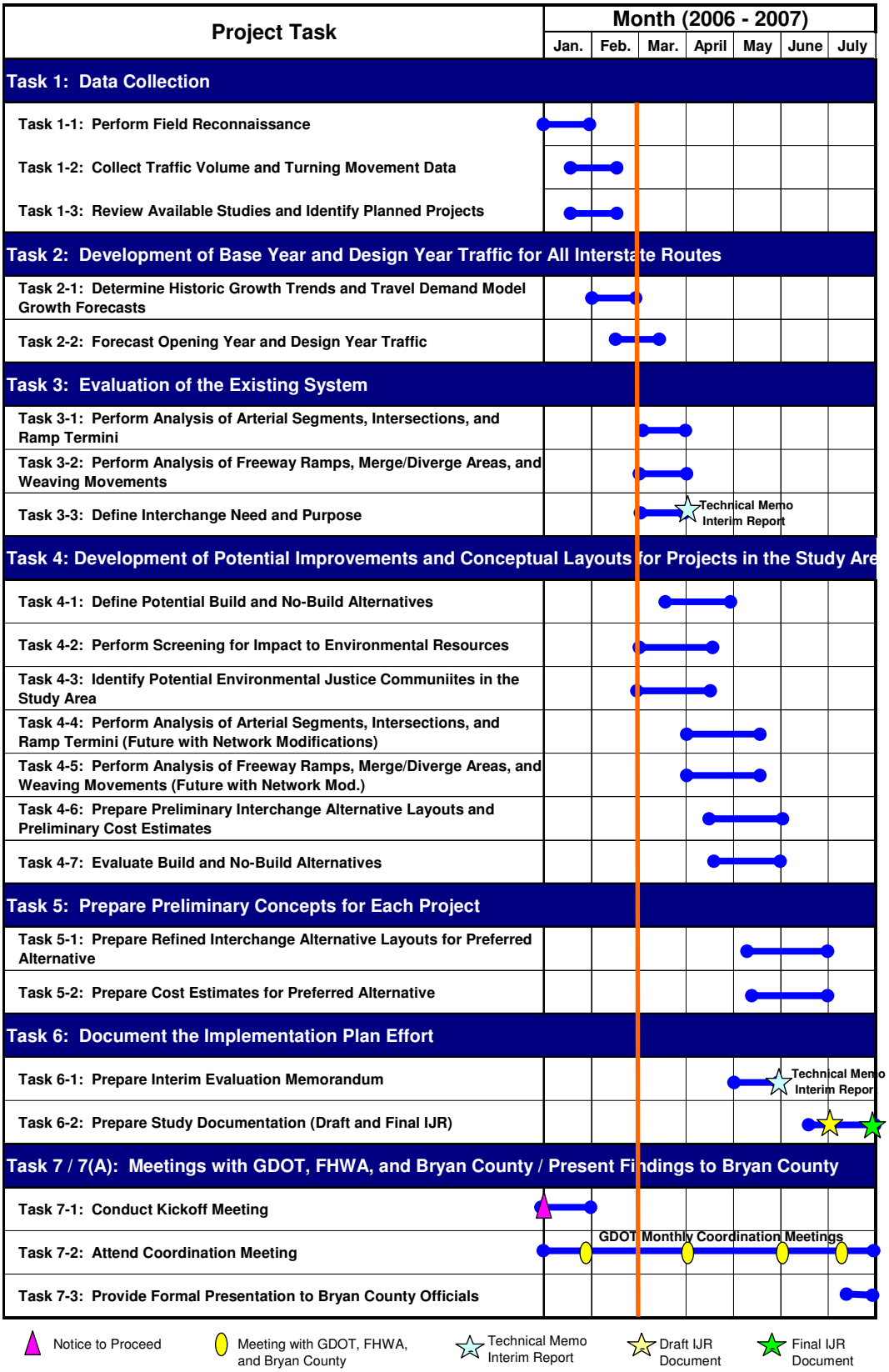
Land Use	Quantity	Units	Daily Trip Rate	Total Daily Trips	Mixed Use Reduction		Net with Reduction
					Percent	Trips	
Single Family Residential	4,271	units	7.7	32,887	8%	2,586	30,301
Multifamily Residential	6,460	units	6.0	38,975	7%	2,586	36,389
School	75	acres	13.8	1,034	25%	258	775
Office	1,050	ksq. ft.	7.8	8,156	5%	436	7,720
Retail	2,100	ksq. ft.	23.4	49,134	35%	17,258	31,876
Industrial	3,721	ksq. ft.	4.8	17,708	9%	1,543	16,165
Total				**147,894**	**17%**	**24,668**	**123,226**

Table 3
Preliminary Traffic Generation and Distribution of New Trips by Subarea
IJR for I-20 at Belfast Siding Road

No.	Submittal	Residential Lots	Trip Rate	Trips Generated		
				Gross	Mixed Use Reduction	Net with Reduction
US 17 Corridor west of I-95						
16		300	9.5	2,857	n/a	2,857
17		300	9.5	2,857	n/a	2,857
SR 144 north of Fort McCallister Road						
15		24	11.7	280	n/a	280
22		143	10.1	1,445	n/a	1,445
West of SR 144 between Belfast Keller Rd (north) and Belfast Keller Rd (south)						
1		72	10.7	769	10%	692
4		60	10.8	650	10%	585
7		41	11.2	458	10%	412
8		274	9.6	2,628	10%	2,365
11		59	10.8	640	10%	576
SR 144 south of Oak Level Road						
2		58	10.9	630	n/a	630
3		19	11.9	226	n/a	226
5		23	11.7	269	n/a	269
6		22	11.7	258	n/a	258
9		145	10.1	1,464	n/a	1,464
13		22	11.7	258	n/a	258
Oak Level Road East of SR 144						
10		33	11.4	375	n/a	375
12		180	9.9	1,786	10%	1,607
18		2946	7.9	23,369	10%	21,032
19		4200	7.7	32,384	10%	29,146
Belfast Siding Road near I-95						
20	TerraPointe	10,731	6.7	71,862	5,172	66,690

14		42	11.1	468	n/a	468
21		298	9.5	2,839	10%	2,555

IJR Schedule



Preliminary Results Meeting Agenda (August 2, 2007)

Discussion Item

I. Introductions
- Introductions
- Study Status

II. Summary and Implication of Study Findings
- Summary of Study Findings
- Application of FHWA Policy Requirements

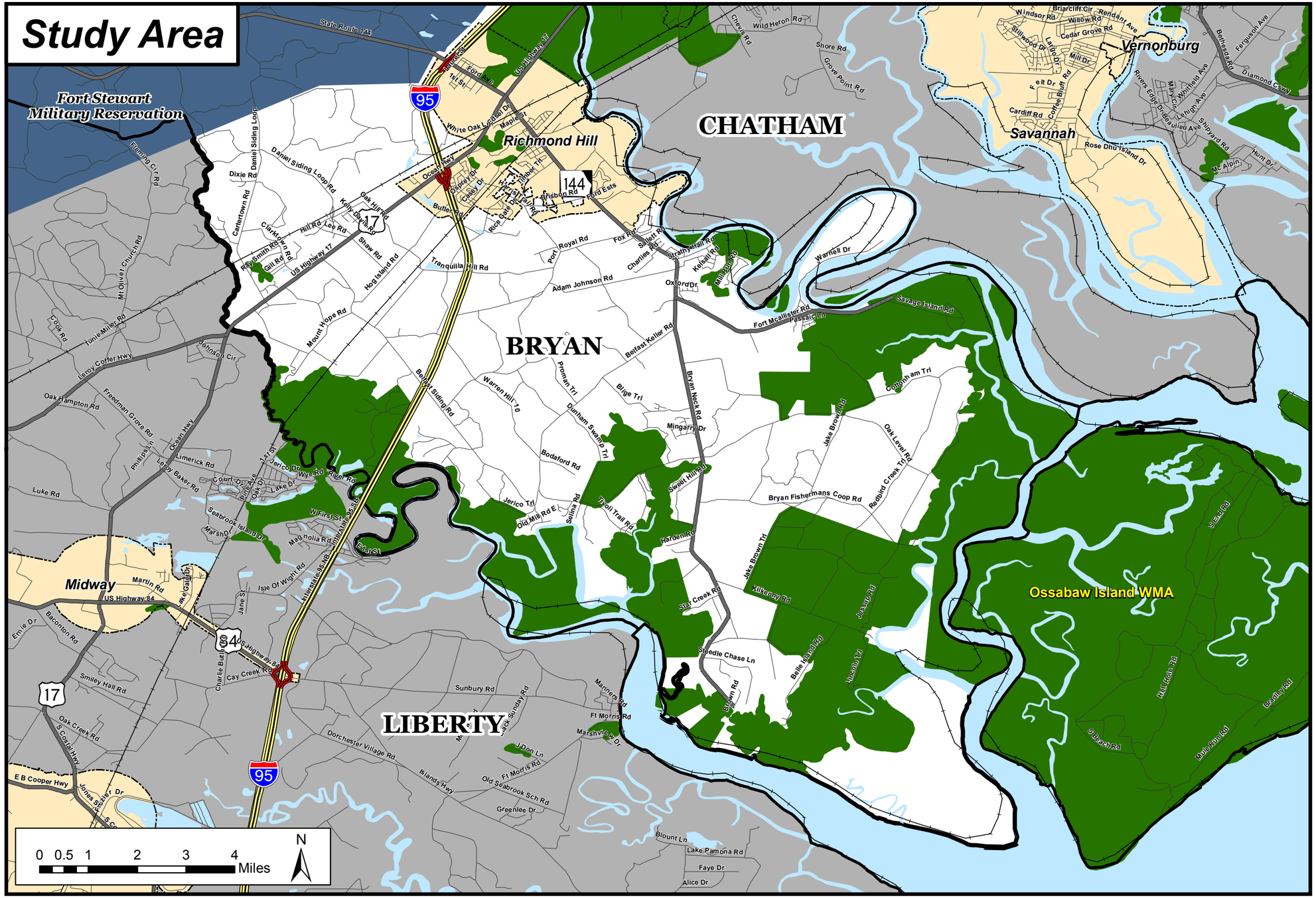
III. Future Year Traffic Projections
- Growth Trends
- Traffic Generated by Terra Point Development
- Traffic Generated by Other Approved Development
- Methodology for Assigning Future Traffic
- Future Traffic Volumes

IV. Traffic Analysis Results
- Intersection Operations
- Improvement Needs with and Without Interchange

V. Next Steps
- Prepare documentation of study findings

GDOT
Keeping Georgia on the Move
Office of Planning

Bryan County Interchange Justification Report



Regional Inset

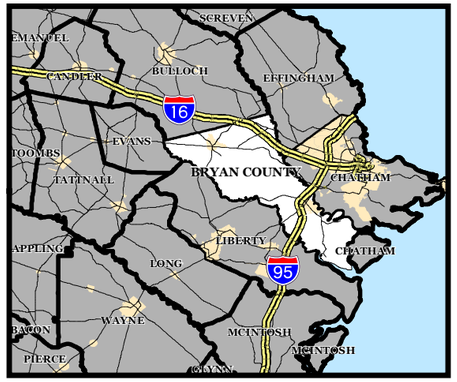


Figure 1

Legend

Road Network

- Interstate
- Interchange Ramps
- State Route / U.S. Highway
- Other Roads

Other Layers

- Bryan County Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Conservation Areas
- Railroads

Source: GDOT, and Carter & Burgess, Inc.

This map is intended for planning purposes only.

August 2, 2007

DRAFT

Carter Burgess
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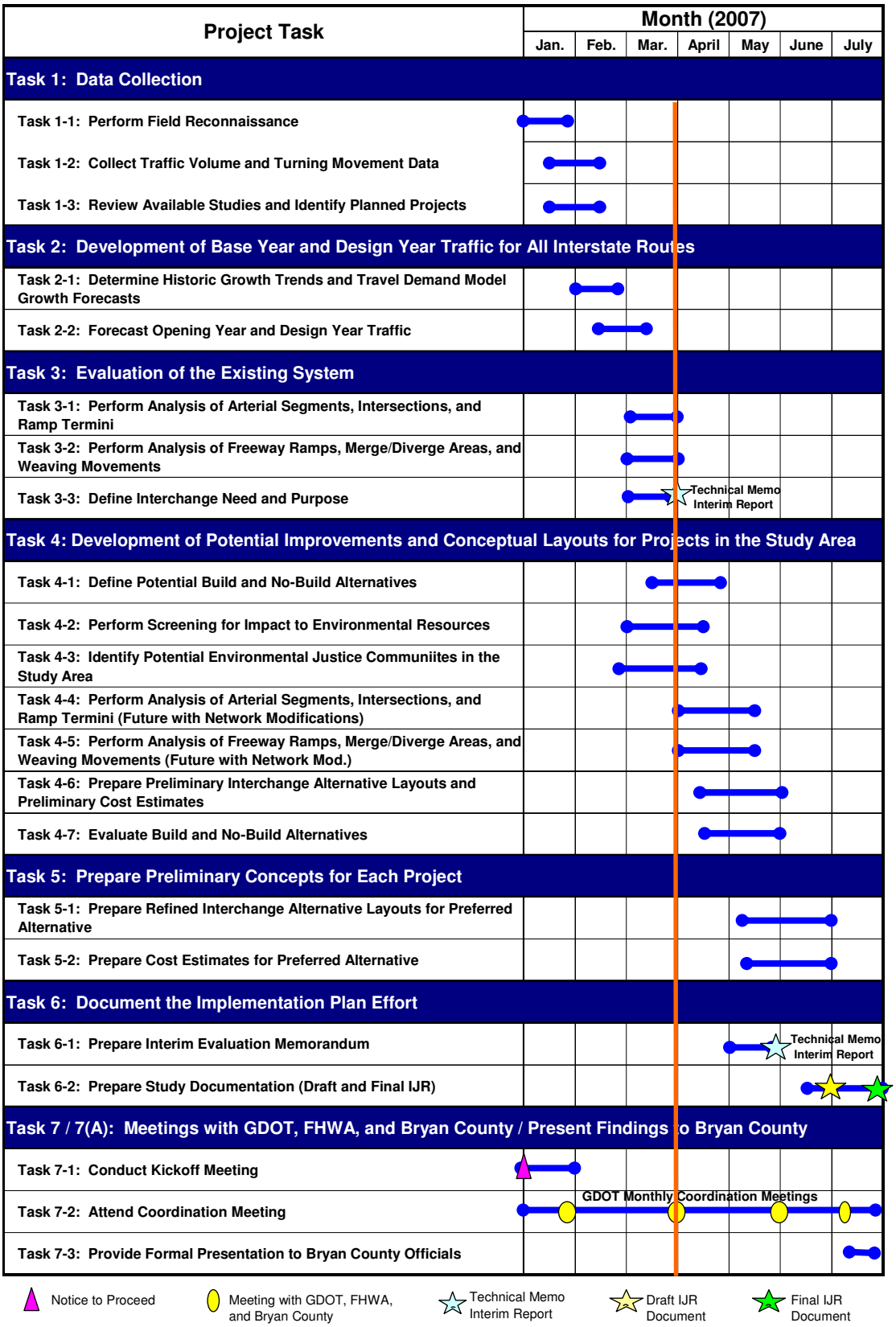
Figure 2 - IJR Schedule



Summary of Study Findings

- The proposed interchange was evaluated versus the eight FHWA Policies to determine if construction of an interchange is justified. Since the nearby interchanges can be improved to provide access to I-95 with acceptable LOS (LOS D or better), the FHWA Policy Guidance (Policy #1) is not satisfied and therefore, installation of an interchange is not recommended.

  FHWA Policy #1: "The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal. "

- The proposed Terra Point Development will generate significant traffic when built out (123,000 external trips per day).
- Many of the Terra Point development trips (approximately 70%) will satisfy travel needs within Southern Bryan County without the need for interstate access (both trip ends within southern Bryan County).
- Proposed improvements to the I-95 interchanges at SR 144 and US 17 (see improvement needs below) which could be performed in conjunction with the planned widening of I-95, will satisfy the interstate access needs for planned development in southern Bryan County.

Improvements Needed with or without New Interchange

<u>I-95 @ SR 144 interchange</u>

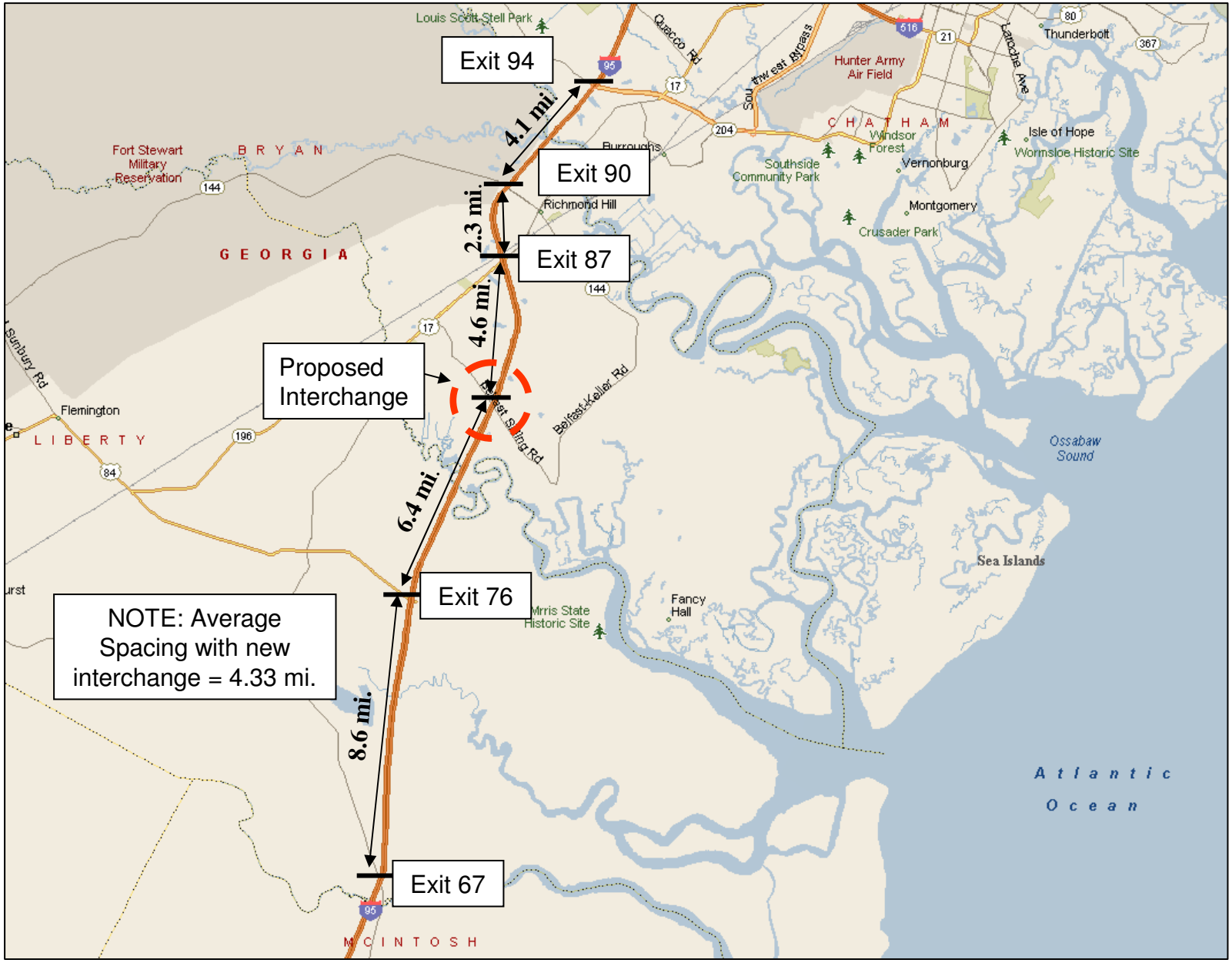
- Southbound ramp intersection
  - Add second southbound left-turn lane on the off-ramp
  - Add second eastbound through lane on SR 144
- Northbound ramp intersection
  - Add traffic signal
  - Add second eastbound through lane on SR 144

<u>I-95 @ US 17 interchange</u>

- Southbound ramp intersection
  - Add second southbound left-turn lane on the off-ramp
  - Add third eastbound through lane on US 17
  - Add second westbound left-turn lane on US 17
- Northbound ramp intersection
  - Add traffic signal
  - Add northbound right-turn lane on the off-ramp
  - Add second westbound left-turn lane on US 17
  - Add eastbound right-turn lane on US 17

<u>I-95 @ US 84 interchange</u>

- Southbound ramp intersection - No improvements required
- Northbound ramp intersection - No improvements required



JACOBS

August 2, 2007

I-95 at Belfast-Siding Road

Interchange Justification Report

GDOT Office of Planning

Figure 3: Interchange Spacing

Evaluation of Eight FHWA Policies included in the *FHWA Guidance on Interstate Access Requests*:

The need for a new break in access will be examined in relation to the eight policy requirements listed in the Federal Register and included in the *FHWA Guidance on Interstate Access Requests*, as follows:

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.
   [Policy Not Satisfied]
2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified. **[Policy Satisfied]**
3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.
   [Policy Satisfied]
4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System. **[Policy Satisfied]**
5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and /or statewide transportation plan, as appropriate, the applicable provisions of 23 CRF part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93. **[Policy Satisfied]**
6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan. **[Policy Satisfied]**
7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements. **[Policy Satisfied]**
8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.
   [Policy Could be Satisfied – Information Not Yet Provided]

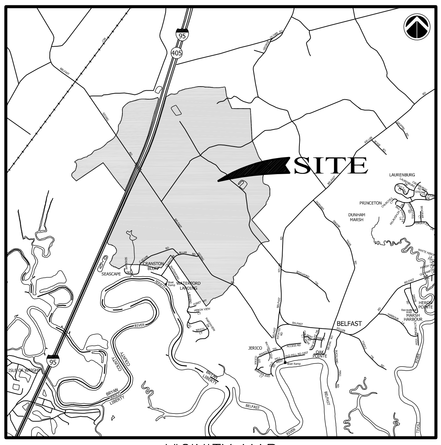
In accordance with FHWA and GDOT guidance, the IJR will examine operations at the proposed interchange location, as well as adjacent interchanges upstream and downstream.

LEGEND /SUMMARY

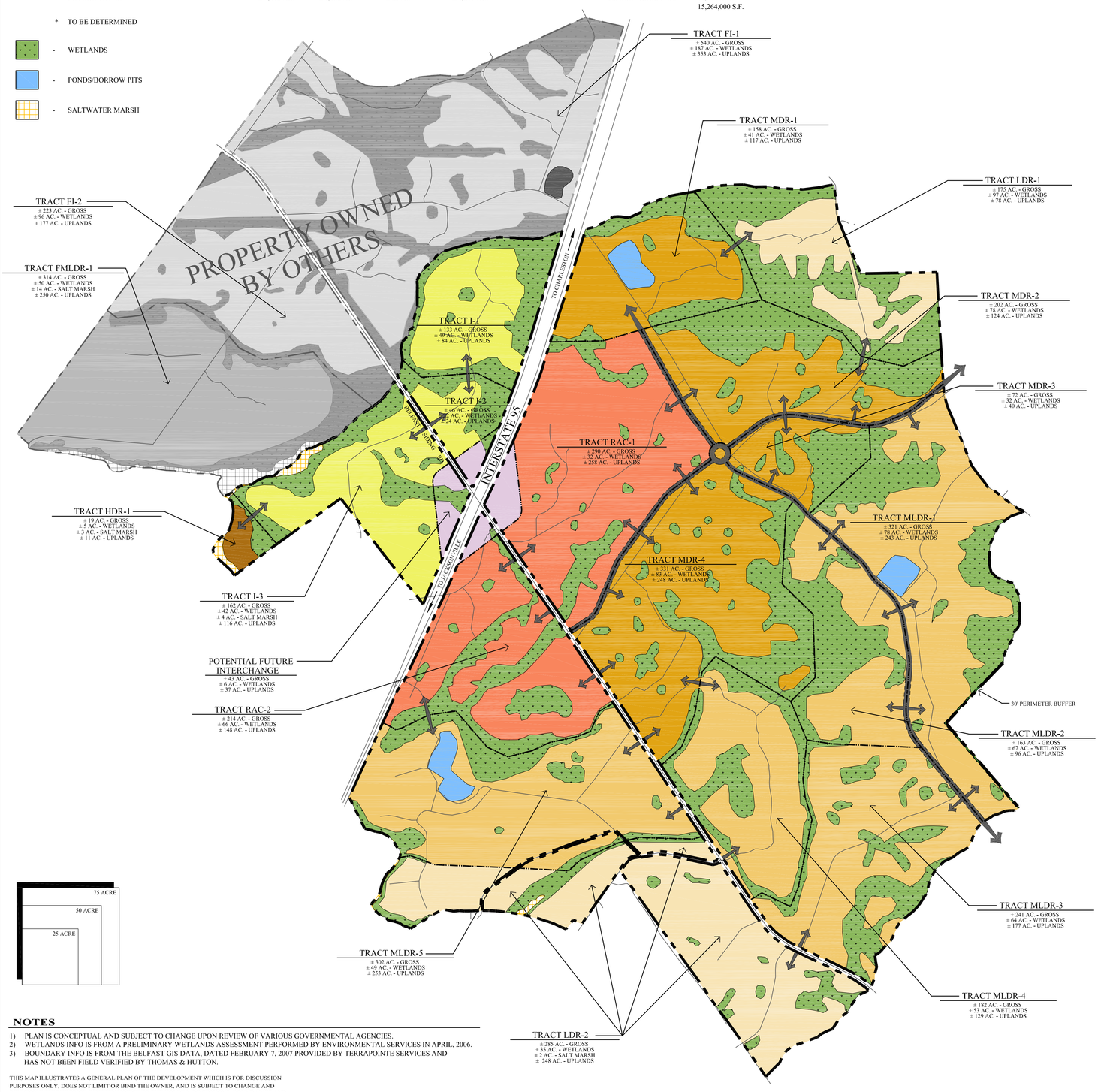
	GROSS ACRES	WETLANDS	SALT MARSH	UPLANDS	S.F./GROSS AC	DU/GROSS AC	TOTAL DU/S.F.
- INDUSTRIAL (I)	± 341 AC.	± 113 AC.	± 4 AC.	± 224 AC.	11,000 S.F./GROSS AC.	----------	3,721,000 S.F.
- REGIONAL ACTIVITY CENTER (RAC)	± 429 AC.	± 98 AC.	----------	± 331 AC.	----------	----------	----------
- RESIDENTIAL	± 79 AC.	± 31 AC.	----------	± 48 AC.	----------	12 D.U./GROSS AC.	948 D.U.
- COMMERCIAL	± 350 AC.	± 67 AC.	----------	± 283 AC.	9,000 S.F./GROSSAC.	----------	3,150,000 S.F.
- REGIONAL ACTIVITY CENTER (HDR)	± 19 AC.	± 5 AC.	± 3 AC.	± 11 AC.	----------	9 D.U. / GROSS AC.	171 D.U.
- REGIONAL ACTIVITY CENTER (MDR)	± 763 AC.	± 234 AC.	----------	± 529 AC.	----------	7 D.U. / GROSS AC.	5,341 D.U.
- REGIONAL ACTIVITY CENTER (MLDR)	± 1,209 AC.	± 311 AC.	----------	± 898 AC.	----------	3 D.U. / GROSS AC.	3,627 D.U.
- LOW DENSITY RESIDENTIAL (LDR)	± 460 AC.	± 132 AC.	± 2 AC.	± 326 AC.	----------	1.4 D.U. / GROSS AC.	644 D.U.
- POTENTIAL FUTURE INTERCHANGE	± 43 AC.	± 6 AC.	----------	± 37 AC.	----------	----------	----------
- REGIONAL PARK / SCHOOL (RP-SCH)	± 75 AC.	*	*	±75AC.	----------	----------	----------
PROPOSED TOTAL	± 3,339 AC.	± 899 AC.	± 9 AC.	± 2,431 AC.	----------	3.2 D.U. / GROSS AC.	10,731 D.U./ 6,871,000 S.F.
- FUTURE REGIONAL ACTIVITY CENTER (FMLDR)	± 314 AC.	± 50 AC.	± 14 AC.	± 250 AC.	3 D.U. / GROSS AC.	3 D.U. / GROSS AC.	942 D.U.
- FUTURE INDUSTRIAL (FI)	± 763 AC.	± 233 AC.	----------	± 530 AC.	11,000 S.F./GROSS AC.	----------	8,393,000
FUTURE TOTAL	± 4,416 AC.	± 1,182 AC.	± 23 AC.	± 3,211 AC.	----------	2.6 D.U. / GROSS AC.	11,673 D.U./ 15,264,000 S.F.

* TO BE DETERMINED

- WETLANDS
- PONDS/BORROW PITS
- SALTWATER MARSH



VICINITY MAP
NOT TO SCALE



NOTES

1) PLAN IS CONCEPTUAL AND SUBJECT TO CHANGE UPON REVIEW OF VARIOUS GOVERNMENTAL AGENCIES.
2) WETLANDS INFO IS FROM A PRELIMINARY WETLANDS ASSESSMENT PERFORMED BY ENVIRONMENTAL SERVICES IN APRIL, 2006.
3) BOUNDARY INFO IS FROM THE BELFAST GIS DATA, DATED FEBRUARY 7, 2007 PROVIDED BY TERRAPOINTE SERVICES AND HAS NOT BEEN FIELD VERIFIED BY THOMAS & HUTTON.

THIS MAP ILLUSTRATES A GENERAL PLAN OF THE DEVELOPMENT WHICH IS FOR DISCUSSION PURPOSES ONLY, DOES NOT LIMIT OR BIND THE OWNER, AND IS SUBJECT TO CHANGE AND REVISION WITHOUT PRIOR WRITTEN NOTICE. TO THE HOLDER. DIMENSIONS, BOUNDARIES AND POSITION LOCATIONS ARE FOR ILLUSTRATIVE PURPOSES ONLY AND ARE SUBJECT TO AN ACCURATE SURVEY AND PROPERTY DESCRIPTION.

TERRAPOINTE

BELFAST SIDING PROPERTY
CONCEPTUAL LANDUSE MASTER PLAN

BRYAN COUNTY, GEORGIA

PREPARED FOR:

TERRAPOINTE SERVICES, INC.

PREPARED BY:

THOMAS & HUTTON ENGINEERING CO.

MARCH 28, 2007

N W E S

PROJECT NO.
19541.416

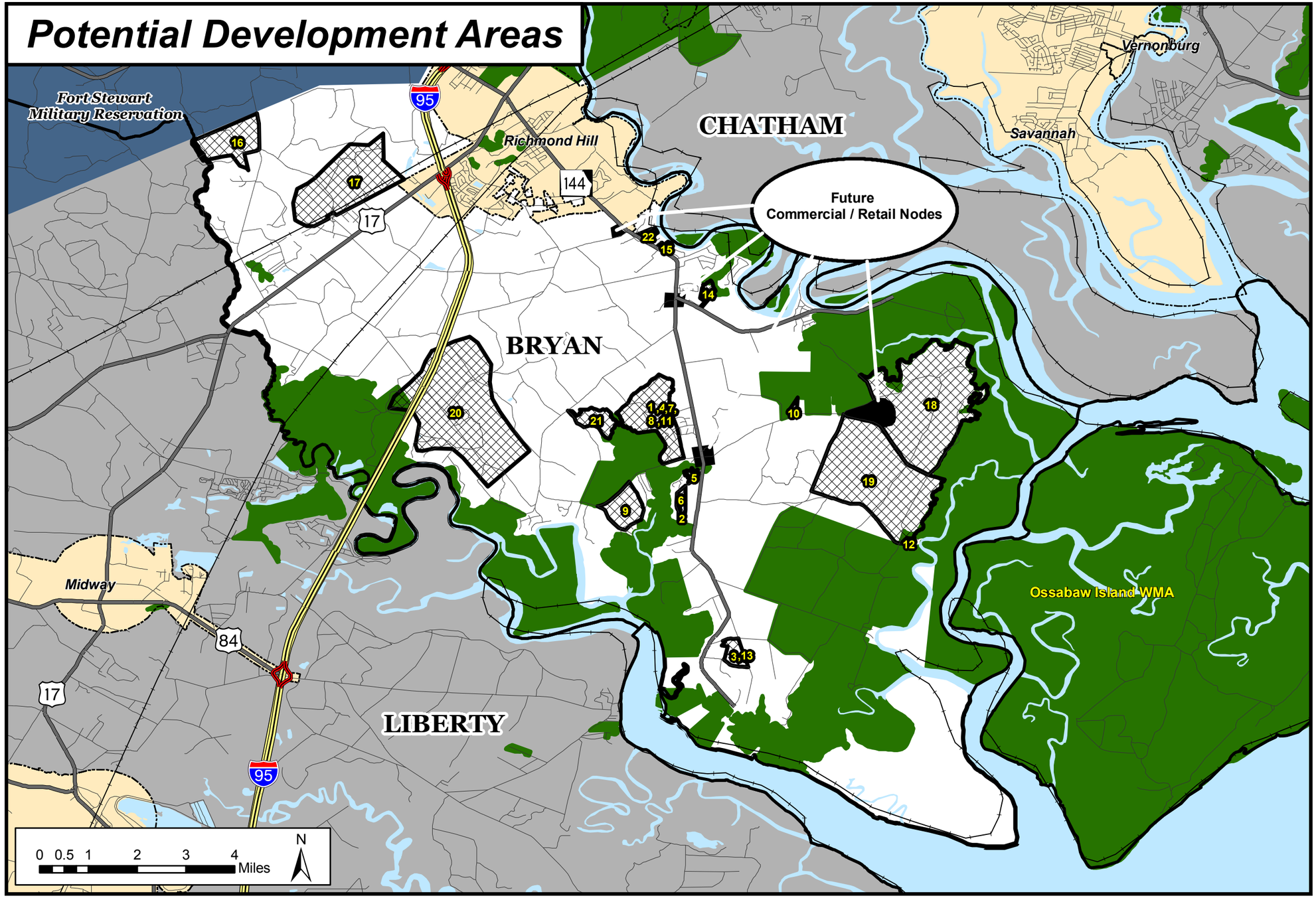
1000 0 500 1000 2,000

SCALE: 1" = 1000'

Georgia Department of Transportation

Bryan County Interchange Justification Report

Potential Development Areas



Regional Inset

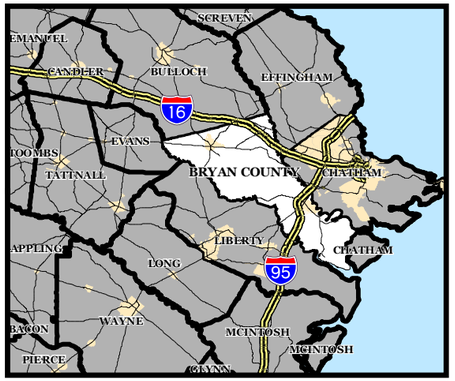


Figure 4

Legend

Road Network

- Interstate
- Interchange Ramps
- State Route / U.S. Highway
- Other Roads

Other Layers

- Potential Development Areas
- Future Commercial / Retail Nodes
- Bryan County Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Railroads

Source: GDOT, Bryan County, and Carter & Burgess, Inc.

This map is intended for planning purposes only.

Table 1
Daily Traffic Generation for TerraPointe Site
IJR for I-20 at Belfast Siding Road

Land Use	Quantity	Units	Daily Trip Rate	Total Daily Trips	Mixed Use Reduction		Net with Reduction
					Percent	Trips	
Single Family Residential	4,271	units	7.7	32,887	8%	2,586	30,301
Multifamily Residential	6,460	units	6.0	38,975	7%	2,586	36,389
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Retail	2,100	ksq. ft.	23.4	49,134	35%	17,258	31,876
Industrial	3,721	ksq. ft.	4.8	17,708	9%	1,543	16,165
Total				**147,894**	**17%**	**24,668**	**123,226**

Methodology for Estimating Traffic Volumes

Trip Generation

Purpose of trip generation is to predict the number of trips that are generated by and attracted to each TAZ in the study area

Trip generation in Bryan County was based on the following data:

- Daily trip rate from the Trip Generation 7th Edition, published by the Institute of Transportation Engineers (ITE)
- Dwelling (units), acreage of land use for school, office, retail and industrial (square feet) for the potential development areas

Procedure:

- Twelve TAZs were created that included twenty-two future commercial/retail potential developments in TAZ 1,2,3,4,5 and 12
- TAZs 7 to 11 were treated as external zones
- Proposed new interchange along Belfast Siding Road is located in TAZ 2 and 12 along I-95
- Adjacent interchanges on I-95 at US 84, US 17, and SR 144 were examined
- Intersection of SR 144 at US 17 was investigated due to the capacity constraints
- Production and Attraction (PA) Trip table was created
- Once the PA table was created, the next step was to create an impedance factor
    - Measurement of impedance based on travel time (minutes)

Trip Distribution

Purpose of trip distribution is to predict the trips between origin and destination zones

Procedure:

- Gravity model was applied for HBW trips and HBO trips
- An Origin-Destination (OD) trip table was produced
- External-External trips were added to the OD trip table
    - Calculation of external-external trips was based on the existing ADT with the estimation of annual growth rate: 2.7% from year 2007 to 2012 and 1.35% from year 2012 to 2030

Trip Assignment

Purpose of trip assignment is to predict traffic volumes on roadway network in the study area

Procedure

- Based on the paths between TAZs daily trips and peak hour traffic volumes were assigned to the roadway network for year 2030 at the proposed interchange on I-95 at Belfast Siding Road and existing interchanges of I-95 at SR 144, US 17 and US 84 and the intersection of SR 144 at US 17

Table 2
Matrix of Trip Origins and Destinations
for Proposed Developments in Southern Bryan County

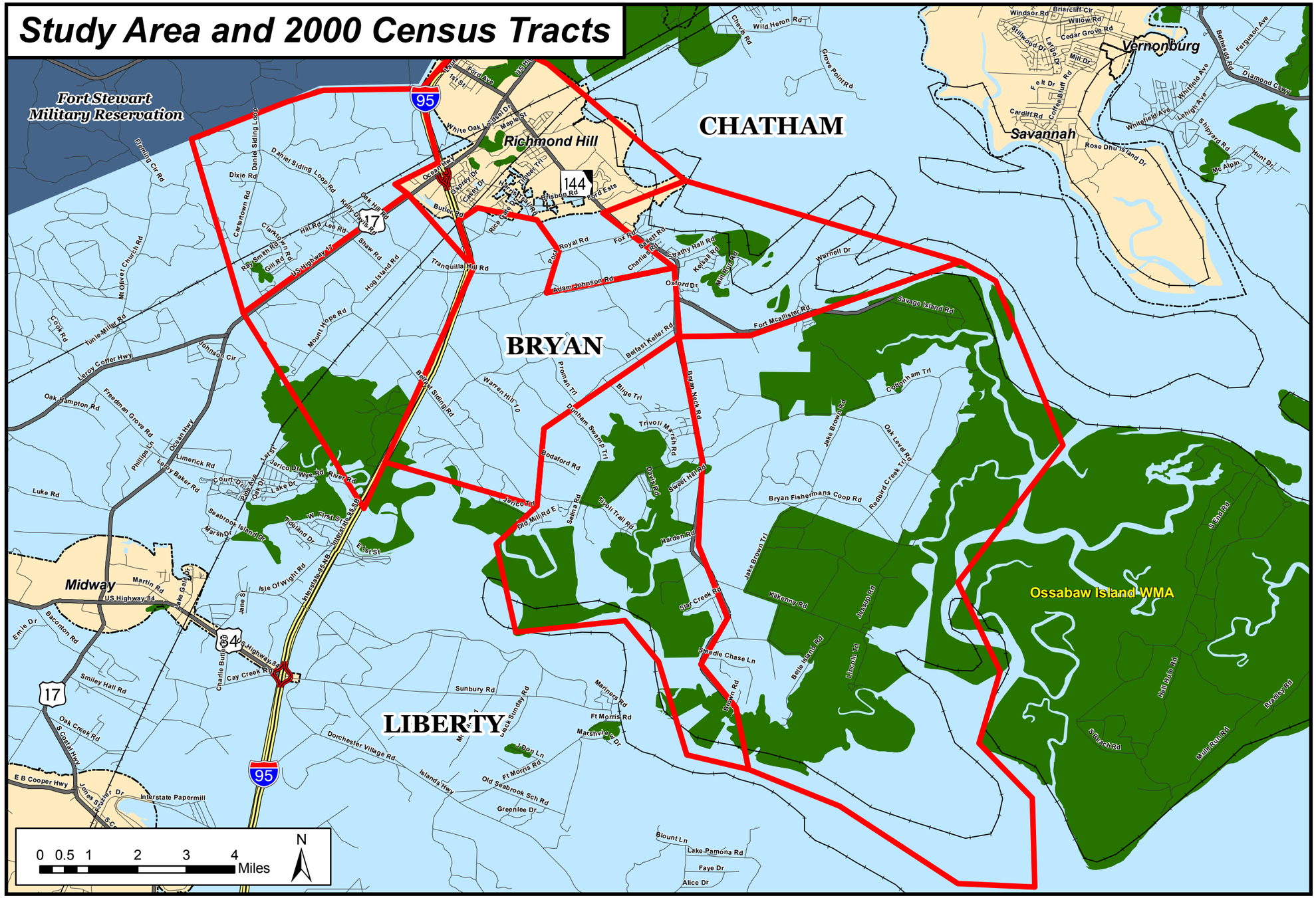
TAZ	1	2	3	4	5	6	7	8	9	10	11	12
1 - Developments 16 and 17	0	253	101	17	0	540	733	13	176	221	264	539
2 - Development 20 west of I-95	253	0	270	446	12	0	0	400	0	358	358	1,115
3 - Developments 1, 2, 4, 5, 6, 7, 8, 9, 11, 13, and 21	101	270	836	6,451	189	479	279	40	183	265	607	8,942
4 - Developments 3, 10, 12, 18, and 19	17	446	6,451	2,484	38	2,075	793	665	408	740	849	16,793
5 - Developments 14, 15, and 22	0	12	189	38	0	229	126	37	40	61	90	276
6 - Richmond Hill	540	0	479	2,075	229	0	0	0	0	0	0	4,772
7 - External Zone - US 17 west of I-95	733	0	279	793	126	0	0	0	197	1,160	57	4,739
8 - External Zone - I-95 south of Belfast Siding Road	13	400	40	665	37	0	0	0	987	44,603	120	2,325
9 - External Zone - SR 144 North of I-95	176	0	183	408	40	0	197	987	0	6,316	1,737	2,817
10 - External Zone - I-95 North of Richmond Hill	221	358	265	740	61	0	1,160	44,603	6,316	0	0	1,848
11 - External Zone - US 17 North of Richmond Hill	264	358	607	849	90	0	57	120	1,737	0	0	1,988
12 - Development 20 east of I-95	539	1,115	8,942	16,793	276	4,772	4,739	2,325	2,817	1,848	1,988	6,043
Total Terra Point Development Traffic Productions West of I-95		3,212										Total Terra Point Development Traffic Productions East of I-95 52,209

Total Terra Point Development Traffic Productions (note: productions are half of overall trip generation)	55,421
Total Terra Point Development Traffic Remaining in Southern Bryan County	14,833
Total Terra Point Development Traffic Leaving Southern Bryan County	40,588

Georgia Department of Transportation

Bryan County Interchange Justification Report

Study Area and 2000 Census Tracts



Regional Inset

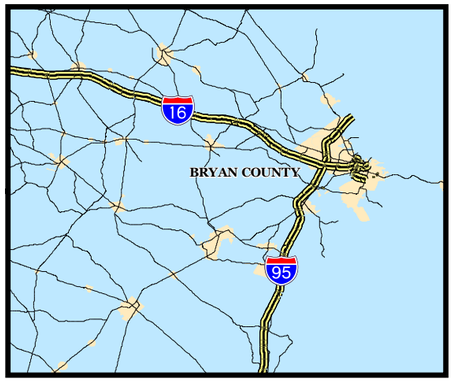


Figure 5

Legend

Traffic Analysis Zones (Bryan County Area)

- Bryan County TAZ Zones

Road Network

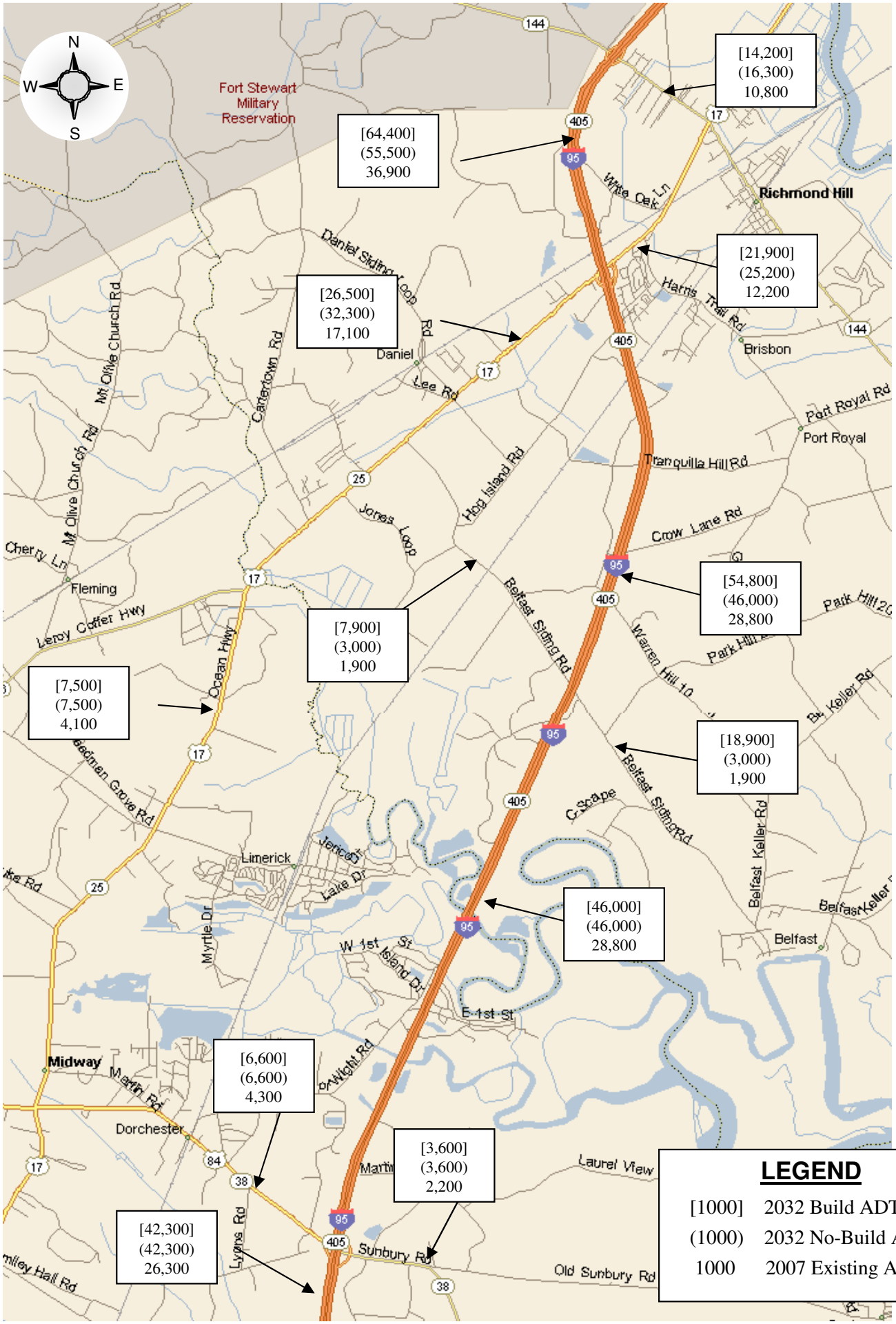
- Interstate 95
- Interchange Ramps
- State Route / U.S. Highway
- Other Roads

Other Layers

- Bryan County Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Conservation Areas
- Railroads

Source: U.S. Census (2000), GDOT, and Carter & Burgess, Inc.

This map is intended for planning purposes only.



Carter Burgess
One Source, One Firm

August 2, 2007

I-95 at Belfast-Siding Road Interchange Justification Report

Georgia Department of Transportation

Figure 6
Existing and Future ADT Traffic Volumes

Carter Burgess One Source, One Firm™ August 2, 2007	I-95 at Belfast-Siding Road Interchange Justification Report	GDOT Georgia Department of Transportation
		Figure 7 Interchange Spacing

Table 3a
Year 2007 Intersection Operations Analysis - Existing Conditions

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	B	19	D	50.4
		Signal w/imp	Overall	C	20.0	D	38.5
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	D	32.6	F	>50
			nb-r	D	32.6	F	>50
			eb-l	A	8.4	A	8.4
		Signal w/imp	Overall	A	8.8	A	6.9
3	US 17 @ SR 144	Signal	Overall	D	43.0	D	51.0
		Signal w/imp	Overall	D	42.9	D	51.1
4	US 17 @ I-95 SB ramps	Signal	Overall	C	31.4	C	21.7
		Signal w/imp	Overall	C	28.3	C	22.4
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>50
			wb-l	B	10.5	A	8.8
		Signal w/imp	Overall	B	13.5	B	11.1
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	B	13.9	B	11.3
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	B	10.9	A	6.8
7	US 17 @ SR 196	Stop Control	nb-l	A	7.9	A	8.3
			eb-l	F	>50	F	>50
			eb-r	A	10.0	B	10.7
		Signal w/imp	Overall	C	24.4	B	14.5
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	7.6	A	8.6
9	US 84 @ I-95 SB ramps	Signal	Overall	A	9.7	A	9.4
10	US 84 @ I-95 NB ramps	Signal	Overall	B	10.9	A	9.9

Table 3b
Year 2032 Intersection Operations Analysis - No-Build Conditions
(Without new interchange)

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	E	62.5	F	>80
		Signal w/imp	Overall	C	26.3	C	29.1
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	F	>50	F	>50
			nb-r	F	>50	F	>50
			eb-l	A	9.3	A	9.5
		Signal w/imp	Overall	B	19.5	A	9.3
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	47.4	D	54.9
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	C	34.8	C	28.9
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>50
			wb-l	E	36.0	C	16.0
		Signal w/imp	Overall	C	33.3	C	31.3
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	D	29.7	C	17.7
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	C	25.2	B	13.7
7	US 17 @ SR 196	Stop Control	nb-l	A	8.3	A	8.9
			eb-l	F	>50	F	>50
			eb-r	B	11.0	B	12.4
		Signal w/imp	Overall	C	23.2	B	18.4
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	B	10.5	B	10.6
9	US 84 @ I-95 SB ramps	Signal	Overall	B	12.5	B	12.5
10	US 84 @ I-95 NB ramps	Signal	Overall	B	12.4	B	12.4

Table 3c
Year 2032 Intersection Operations Analysis - Build Conditions
(With new interchange)

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	C	34.5	F	>80
		Signal w/imp	Overall	B	20.1	C	23.4
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	F	>50	F	>50
			nb-r	F	>50	F	>50
			eb-l	A	9.3	A	9.6
		Signal w/imp	Overall	B	13.1	A	9.2
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	48.6	D	52.0
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	51.1	D	36.8
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>80
			wb-l	C	16.3	B	12.6
		Signal w/imp	Overall	C	26.3	B	16.5
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	F	>50	F	>50
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	C	22.6	B	17.5
7	US 17 @ SR 196	Stop Control	nb-l	A	8.3	B	8.9
			eb-l	F	>50	F	>50
			eb-r	B	11.0	B	12.4
		Signal w/imp	Overall	C	23.2	B	18.4
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	8.6	B	10.6
9	US 84 @ I-95 SB ramps	Signal	Overall	B	12.5	B	12.5
10	US 84 @ I-95 NB ramps	Signal	Overall	B	12.4	B	12.4
11	Belfast Siding Road @ I-95 SB ramps	Signal	Overall	C	25.1	D	40.4
12	Belfast Siding Road @ I-95 NB ramps	Signal	Overall	B	14.5	B	11.2

Table 4a
Year 2007 Freeway Analysis - Existing Conditions

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	C	21.2	B	14.1
	SB	B	14.1	C	21.2
I-95 between US 84 and US 17	NB	C	23.5	B	15.4
	SB	B	15.4	C	23.5
I-95 between US 17 and SR 144	NB	D	32.9	C	19.8
	SB	C	19.8	D	32.9
I-95 north of SR 144	NB	F	>45	C	25.8
	SB	C	25.8	F	>45

Table 4b
Year 2032 Freeway Analysis - No-Build Conditions
(Without New Interchange)

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and US 17	NB	C	18.1	B	12.7
	SB	B	12.7	C	18.1
I-95 between US 17 and SR 144	NB	C	22.4	B	14.9
	SB	B	14.9	C	22.4
I-95 north of SR 144	NB	D	29.4	C	19.5
	SB	C	19.5	D	29.4

- Analysis includes I-95 widening project to eight lanes

Table 4c
Year 2032 Freeway Analysis - Build Conditions
(With New Interchange)

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and Belfast Siding Rd	NB	C	18.1	B	12.7
	SB	B	12.7	B	18.1
I-95 between Belfast Siding Rd and US 17	NB	C	22.3	B	14.5
	SB	B	14.5	C	22.3
I-95 between US 17 and SR 144	NB	C	27.4	B	16.8
	SB	B	16.8	C	27.4
I-95 north of SR 144	NB	D	35.0	C	20.8
	SB	C	20.8	D	35.0

- Analysis includes I-95 widening project to eight lanes

Table 5a
Year 2007 Merge and Diverge Analysis - Existing Conditions

Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	C	25.2	B	16.7
	On	C	27.6	B	19.0
I-95 SB Ramps @ US 84	Off	B	18.2	C	27.8
	On	B	17.7	C	25.4
I-95 NB Ramps @ US 17	Off	C	27.8	B	18.2
	On	D	34.3	C	23.6
I-95 SB Ramps @ US 17	Off	C	23.6	E	35.5
	On	B	19.0	C	27.7
I-95 NB Ramps @ SR 144	Off	E	35.5	C	23.6
	On	F	40.8	D	29.4
I-95 SB Ramps @ SR 144	Off	D	30.1	E	36.2
	On	C	23.9	D	34.7

Table 5b
Year 2032 Merge and Diverge Analysis - No-Build Conditions
(Without New Interchange)

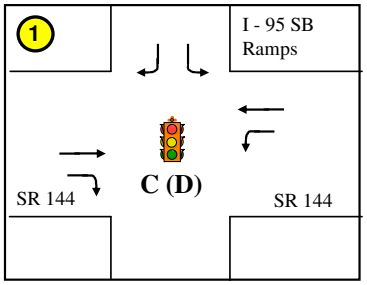
Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	B	17.6	B	12.7
	On	B	17.3	B	13.3
I-95 SB Ramps @ US 84	Off	B	14.9	C	21.4
	On	B	12.2	B	15.9
I-95 NB Ramps @ US 17	Off	C	20.9	B	16.2
	On	C	20.5	B	16.6
I-95 SB Ramps @ US 17	Off	C	21.6	D	30.9
	On	B	13.8	B	17.2
I-95 NB Ramps @ SR 144	Off	C	24.3	B	16.3
	On	C	22.6	B	19.1
I-95 SB Ramps @ SR 144	Off	C	27.3	E	37.3
	Off w/2 lanes	B	12.3	B	19.2
	On	B	14.7	C	20.3

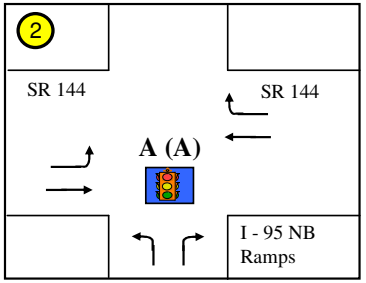
- Analysis includes I-95 widening project to eight lanes
- Analysis assumes one lane on ramp

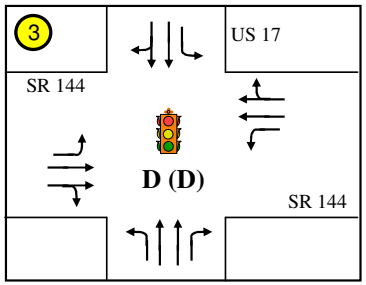
Table 5c
Year 2032 Merge and Diverge Analysis - Build Conditions
(With New Interchange)

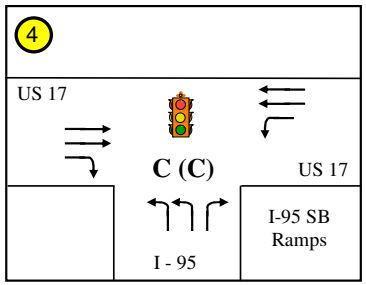
Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	B	16.8	B	11.4
	On	B	16.8	B	12.4
I-95 SB Ramps @ US 84	Off	B	13.6	C	20.7
	On	B	11.2	B	15.4
I-95 NB Ramp @ Belfast Siding Rd	Off	B	18.7	B	13.2
	On	C	20.5	B	15.0
I-95 SB Ramps @ Belfast Siding Rd	Off	B	17.6	D	28.5
	On	B	12.6	B	17.2
I-95 NB Ramps @ US 17	Off	C	25.0	B	17.9
	On	C	22.1	B	17.4
I-95 SB Ramps @ US 17	Off	C	23.4	E	35.0
	Off w/ 2 lanes	A	9.1	B	17.3
	On	B	14.9	C	20.1
I-95 NB Ramps @ SR 144	Off	D	28.6	B	18.2
	On	C	23.9	B	19.5
I-95 SB Ramps @ SR 144	Off	C	25.5	F	38.0
	Off w/ 2 lanes	B	12.0	B	19.3
	On	B	16.2	C	23.4

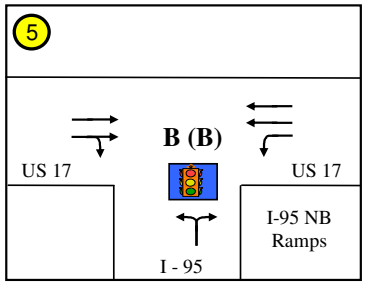
- Analysis includes I-95 widening project to eight lanes
- Analysis assumes one lane on ramp

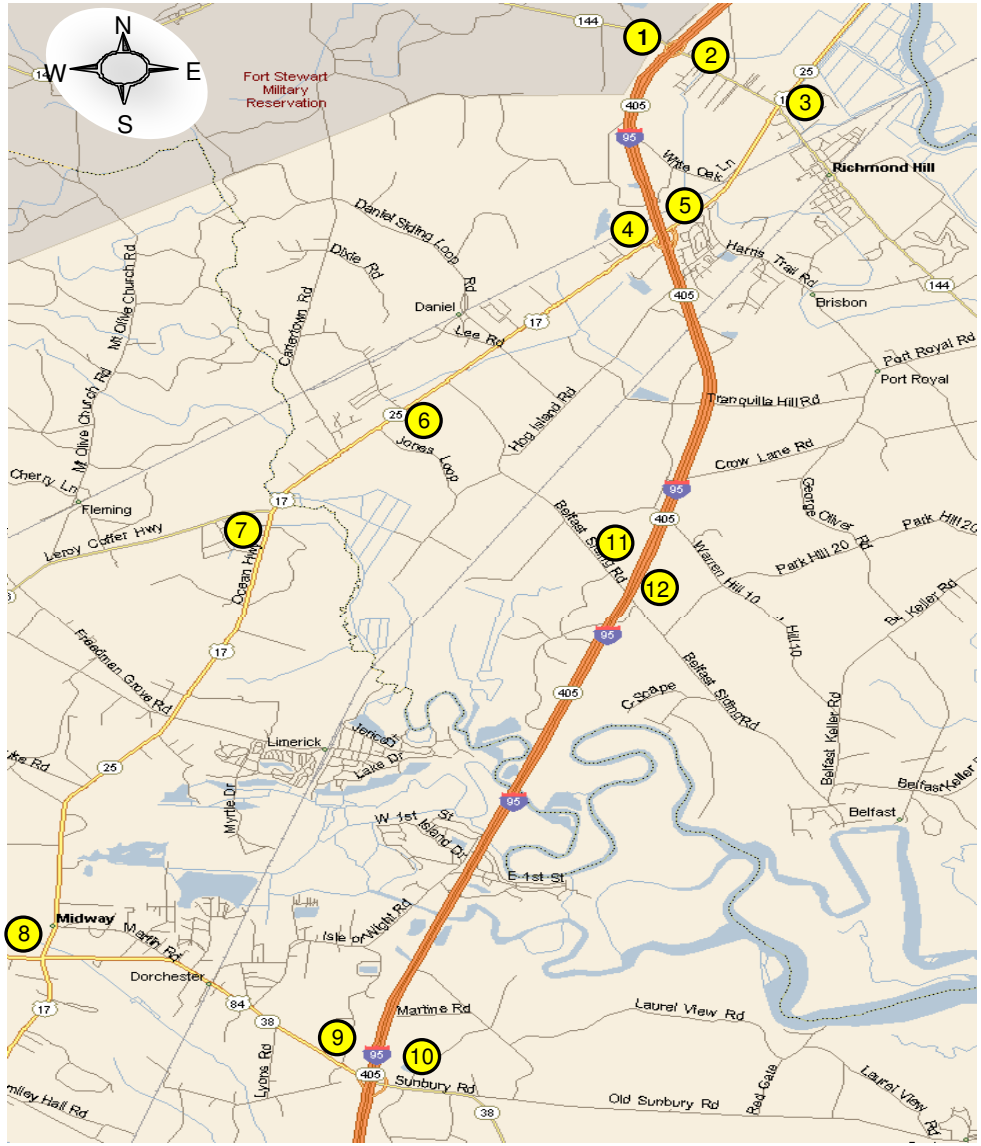


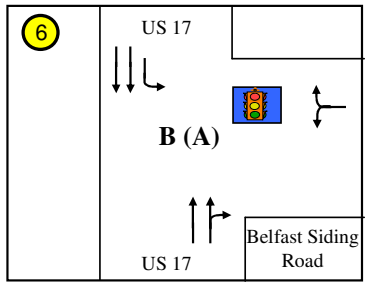


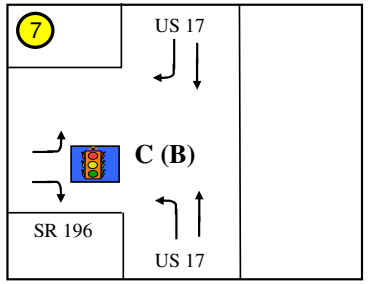


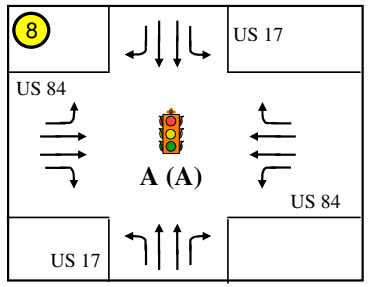


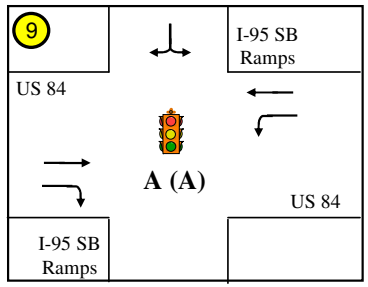


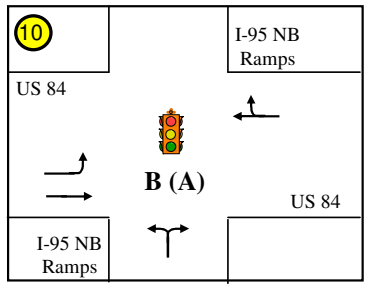












Legend

- Existing Lanes
- Existing Traffic Signal
- Existing Stop Sign
- Existing Required Signal
- C (C) — AM (PM) LOS

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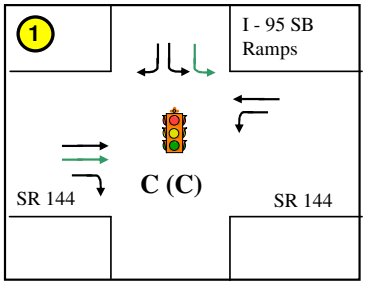
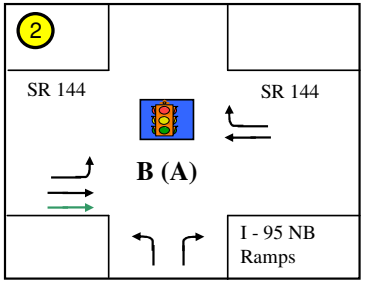
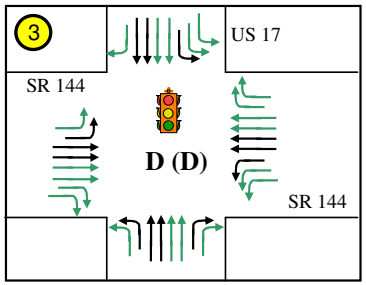
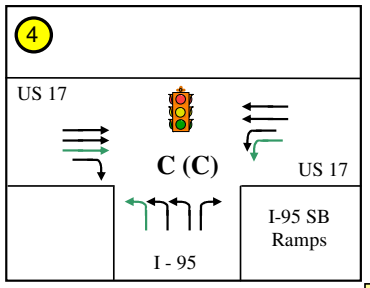
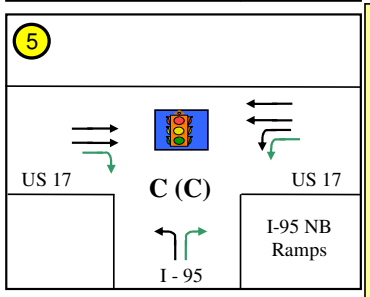
Figure 8
2007 Existing with Improvements & LOS

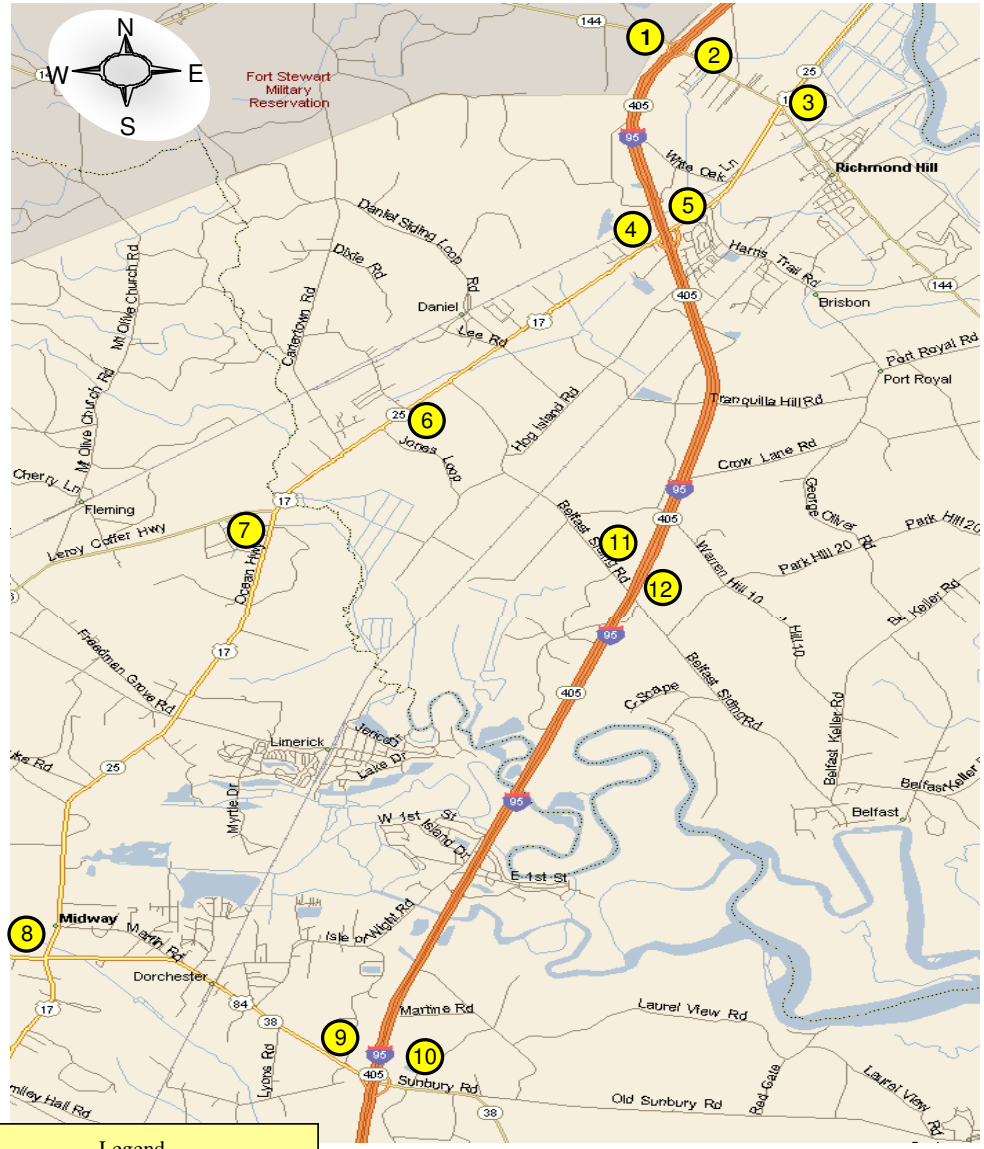


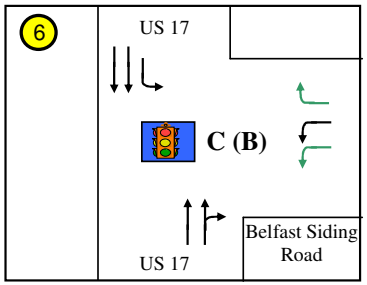


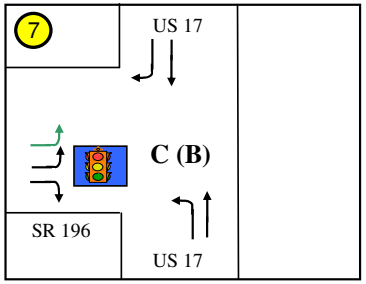


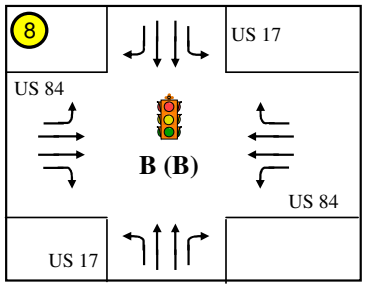


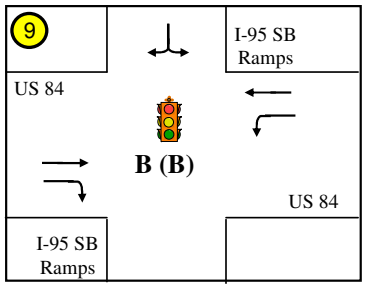


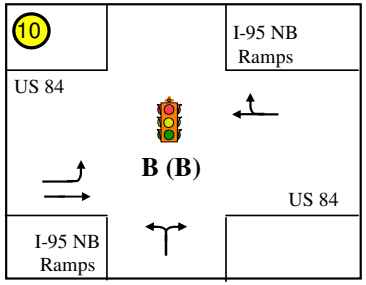












Legend

- Existing Lanes
- Existing Traffic Signal
- Existing Stop Sign
- Existing Required Signal
- Future Build Required Lane
- C (C) — AM (PM) LOS

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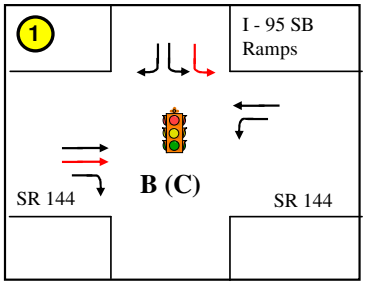
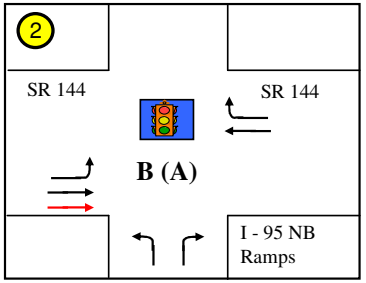
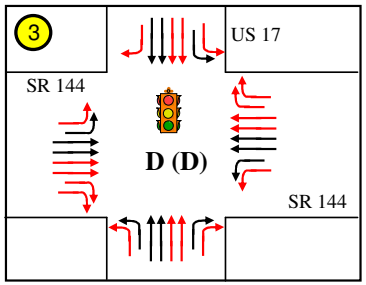
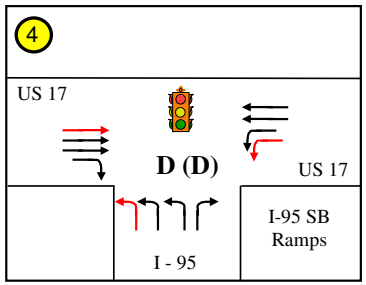
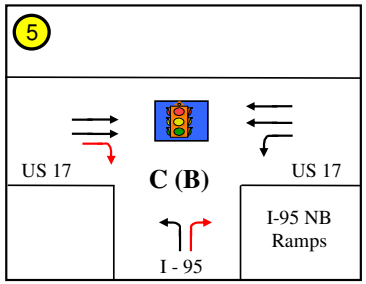
Figure 9
2032 No-Build with Improvements & LOS

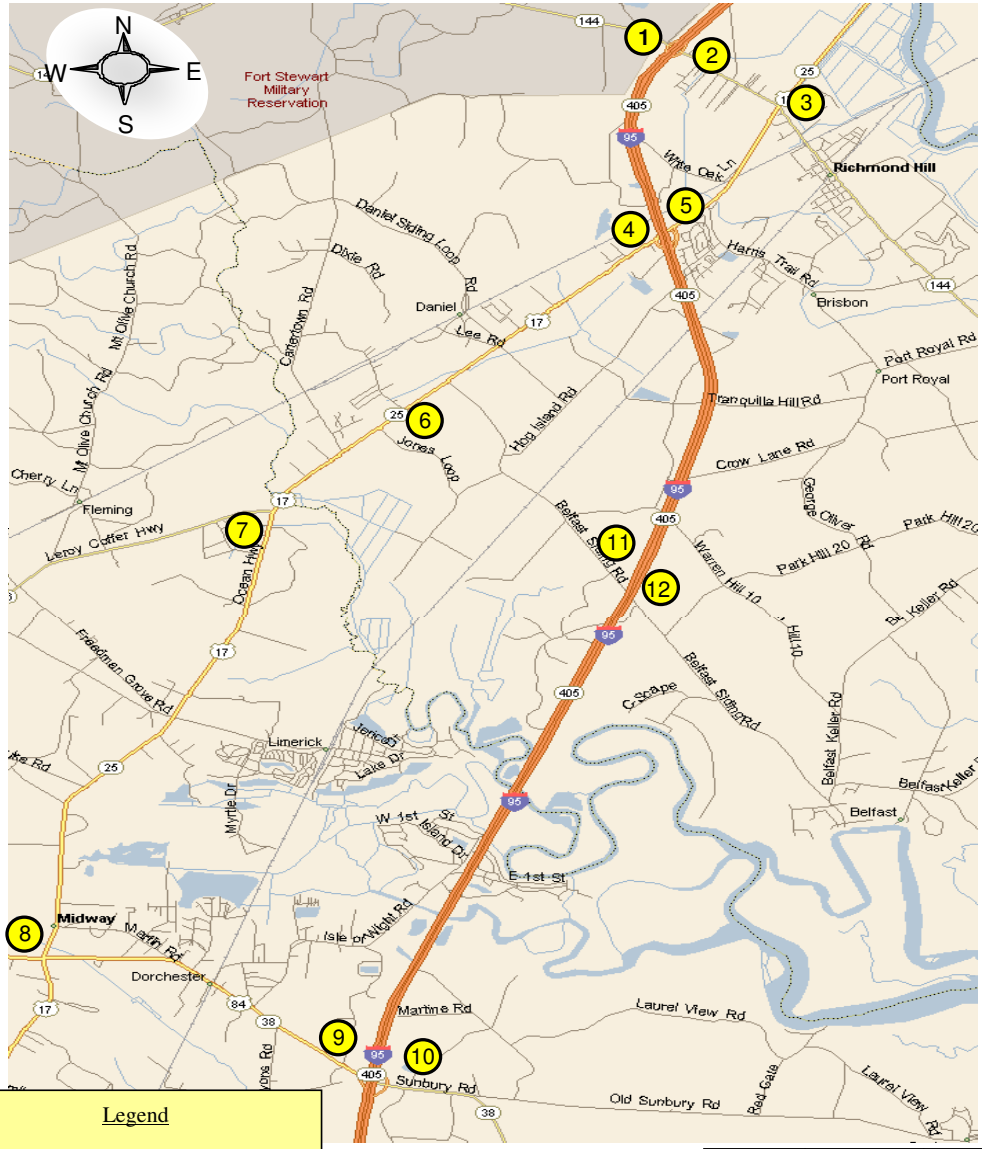


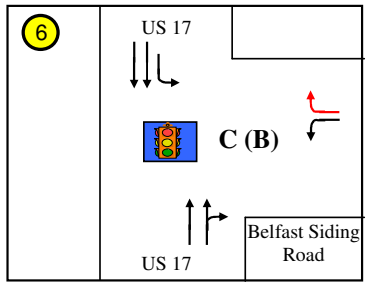


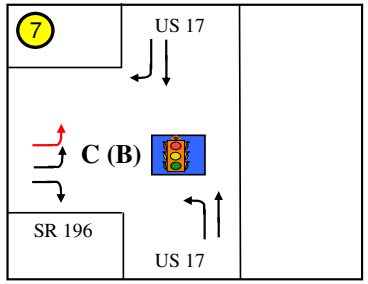


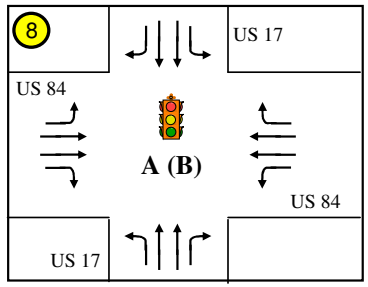


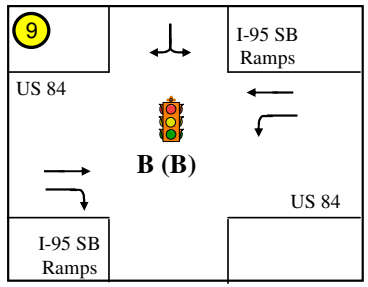


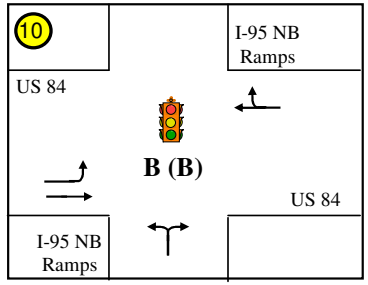


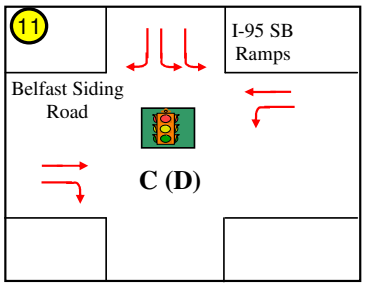


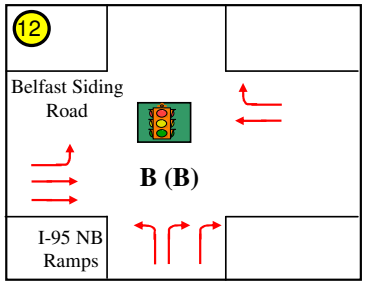












Legend

- Existing Lanes
- Existing Traffic Signal
- Existing Stop Sign
- Existing Required Signal
- Future Build Required Signal
- Future Build Required Lane
- C (C) AM (PM) LOS

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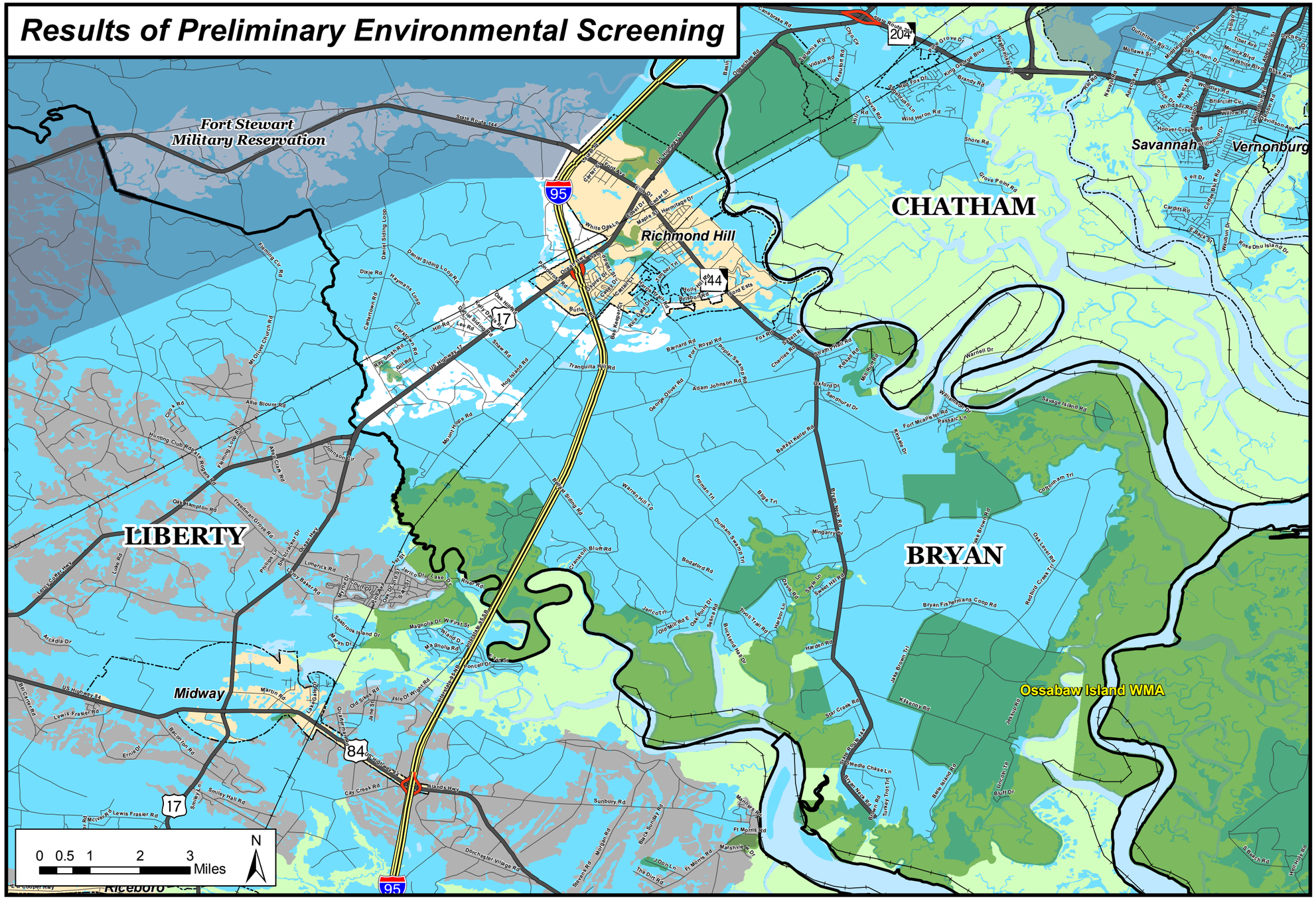
Figure 10
2032 Build with Improvements & LOS

Bryan County Interchange Justification Report

Results of Preliminary Environmental Screening



Regional Inset

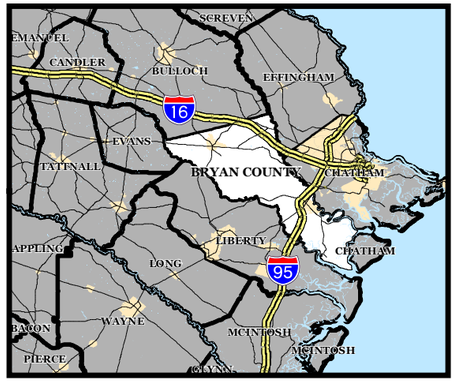


Figure 11

Legend

Environmental Screening Criteria

- Wetlands
- Marshlands
- Wetlands / Conservation Areas
- Marshlands / Conservation Areas
- Conservation Areas

Road Network

- Interstate
- Ramp
- Major Road
- Other Road

Other Layers

- Bryan County Boundary
- City Limits
- Fort Stewart Military Reservation
- Railroads

Source: National Wetlands Inventory (2004), GDOT, and Carter & Burgess, Inc.

This map is intended for planning purposes only.

Preliminary Results Meeting Minutes (prepared August 10)

SUBJECT: Georgia Department of Transportation (GDOT)
IJR Planning Study – I-95 at Belfast Siding Road
CSMSL-0006-00(941), PI N. 0006941
Kickoff Meeting

MEETING DATE: August 2, 2007

TODAY'S DATE: August 14, 2007

PREPARED BY: Richard Fangmann, Carter & Burgess

ATTENDEES: Phil Jones, Bryan County Administrator
Jimmy Burnsed, Bryan County Commission
Mathew Fowler, GDOT Office of Planning
Radney Simpson, GDOT Office of Planning
Kyle Mote, GDOT Office of Planning
Teresa Scott, GDOT District 5
Jeff Ingham, Thomas & Hutton Engineering Company
Jeannie Fewell, Terra Pointe
Rod Wilburn, Carter & Burgess
Richard Fangmann, Carter & Burgess
Shawn Pope, Carter & Burgess, Inc.

LOCATION: Bryan County

Meeting Summary

1. The meeting began at 10:00 AM with an introduction of the meeting attendees. Mathew Fowler provided a brief overview of the study purpose and work to date.

2. Richard Fangmann provided a summary of the project schedule and extents of the area being studied.

3. Richard Fangmann provided a summary of study findings which included the finding that the future traffic conditions do not satisfy FHWA Policy Guidance #1 since the nearby interchanges can be improved to provide access to I-95 with acceptable LOS (LOS D or better).

4. Richard Fangmann reviewed the FHWA requirements for obtaining a break in access based on the eight FHWA policies included in the FHWA Guidance on Interstate Access Requests. He also indicated that the strong interaction between the proposed development and existing and planned residential elsewhere in southern Bryan County suggested that most of the new trips from the Terra Pointe development would not access the interstate system as they would satisfy needs within Bryan County.

5. Phil Jones of Bryan County expressed concern that the proposed development will generate considerable traffic with access needs that are a great as other locations that have had new interchanges elsewhere along the coast, notable in Camden

County. Mr. Jones indicated that it is the County's intension that the industrial area served by the proposed interchange be considered as an inland port.

6. Jeannie Fewell indicated the nature of the industrial development planned by Terra Pointe in the vicinity of Belfast Siding Road would facilitate a large number of truck movements per day as it serves movements directly to and from the ports of Savannah and Brunswick. Ms. Fewell indicated the assumed trip generation for industrial property in the ITE trip generation manual is lower than has been experienced with similar properties developed recently. A property and interchange in the Jacksonville area was specifically mentioned. Rod Wilburn indicated that Carter & Burgess will consider additional data if specific examples can be provided by Terra Pointe to show a higher truck generation rate.

7. Phil Jones also indicated there have been other developments approved and more planned that are not included in the future traffic estimates. Mr. Wilburn indicated that Carter & Burgess will consider these developments if the County provides additional details on their location and size.

8. Radney Simpson of GDOT agreed that this additional data could be considered in the study prior to preparing a report. Phil Jones inquired as to whether the final report will be sent to FHWA. Mr. Simpson indicated that the report would be sent to FHWA if an interchange were justified and approval of FHWA was sought. Otherwise it would be a GDOT staff report.

9. The following is a summary of next steps to be provided as a part of the study:

   - Carter & Burgess will provide a .pdf copy of the study area map showing the assumed developments to Bryan County for their use in identifying the location and size of other approved and/or planned development.

   - Phil Jones of Bryan County will provide information on additional development to be assumed as a part of the IJR.

   - Terra Pointe will provide additional information on trip generation for the proposed industrial development. This information is to include counted traffic volumes from similar study areas with the corresponding development square footage and details on the uses present at the development. The type of land use and relationship to the ports should be indicated for the example development and compared to that for the proposed development along Belfast Siding Road. Terra Pointe is requested to provide an estimated timeframe to GDOT indicating when they anticipate having the supplemental data available so that Carter & Burgess and GDOT can adjust the overall schedule to allow incorporation of new information.

These meeting minutes reflect the understanding of Richard Fangmann, attendee at the above referenced meeting. Please indicate any changes and return these meeting minutes via email to Richard.Fangmann@c-b.com If no changes are requested, these meeting minutes will be considered final in seven calendar days. As always, please call or email me if you have any questions or comments regarding the meeting summary.

Email Correspondence – Request for Development Information

From: Fangmann, Richard B.
Sent: Friday, November 09, 2007 8:10 AM
To: 'Simpson, Radney'
Subject: FW: IJR Belfast Siding/I-95

Radney,

As this previous email and attachments show, we have previously provided Bryan County with information on the origin-destination matrix and our methodology for projecting traffic.

Richard Fangmann, P.E.
Carter & Burgess
Project Manager, Sr | Trans Prgm, Atlanta
404.478.3913
404.249.7705 fax
richard.fangmann@c-b.com
www.c-b.com

From: Fangmann, Richard B.
Sent: Tuesday, September 25, 2007 8:16 AM
To: 'Phil Jones'
Cc: Jaffar, Naveed; Wilburn, Rod; 'Simpson, Radney'; 'Mote, Kyle'
Subject: RE: IJR Belfast Siding/I-95

Phil,

I apologize for the delay, but I was out of the office last week and not able to respond to your email. As I understood the outcome of the last meeting, we were awaiting additional information on input data regarding additional development and trip generation to feed into the the analysis process. The items below were the next steps included in the meeting minutes:

- Carter & Burgess will provide a .pdf copy of the study area map showing the assumed developments to Bryan County for their use in identifying the location and size of other approved and/or planned development.
- Phil Jones of Bryan County will provide information on additional development to be assumed as a part of the IJR.
- Terra Pointe will provide additional information on trip generation for the proposed industrial development. This information is to include counted traffic volumes from similar study areas with the corresponding development square footage and details on the uses present at the development. The type of land use and relationship to the ports should be indicated for the example development and compared to that for the proposed development along Belfast Siding Road. Terra Pointe is requested to provide an estimated timeframe to GDOT indicating when they anticipate having the supplemental data available so that Carter & Burgess and GDOT can adjust the overall schedule to allow incorporation of new information.

We would like to receive your input on the items above to allow us to include this information in the analysis prior to preparing a detailed write-up of data inputs and output, methodology, and procedures, which would be included in the study report.

I have included the previous email (below) and attachments that were a follow up to our meeting, providing the information in bullet 1. I have also attached the following materials that

were part of the information provided in the August 2, 2007 meeting:

- Table 1 - Trip Generation assumed for the Terra Point Development
- Table 2 - Matrix of trip Origins and Destinations by traffic analysis zone (TAZ) - see attached graphic for TAZs and associated assumptions of new development in each.
- Methodology for Estimating Traffic Volumes - This is a summary sheet of the methodology used to determine the future traffic volumes.

We are interested in receiving any additional information regarding the action items described above to allow us to move forward with further analysis.

Richard Fangmann
Carter & Burgess
Project Manager, Sr | Trans Prgm, Atlanta
404.478.3913
404.249.7705 fax
richard.fangmann@c-b.com
www.c-b.com

From: Phil Jones [mailto:pjones@bryan-county.org]
Sent: Tuesday, September 18, 2007 7:48 AM
To: Fangmann, Richard B.
Subject: IJR Belfast Siding/I-95

Richard: We are having a group review the data initially presented for the IJR that you've based your numbers from. Last week I requested that you provide all data consider in that review and the procedural process that your followed and the methodology for calculating traffic counts. I have not heard from your and am wondering if you received my e-mail?.

From: Fangmann, Richard B.
Sent: Friday, August 17, 2007 7:08 AM
To: 'Phil Jones'; Jeannie. Fewell
Cc: 'Scott, Teresa'; 'Mote, Kyle'; 'Simpson, Radney'; 'matthew.fowler@dot.state.ga.us'; Wilburn, Rod
Subject: I-95 at Belfast Siding Road IJR

Phil and Jeannie,

We appreciate the opportunity to meet with you and GDOT regarding the proposed I-95 at Belfast Siding interchange and the IJR report being prepared for the location. As was discussed in the meeting, the anticipated traffic in year 2030 did not provide enough demand for additional freeway access to satisfy FHWA guidance Policy 1, as the adjacent interchanges could be improved to provide access intended by the new interchange (see attached meeting minutes).

In the meeting, you indicated that additional developments were approved and planned since we met with you last Spring. We have attached a figure indicating the developments assumed in the analysis work to date. Please mark-up this drawing and return via email or fax to indicate the location of any additional development to be considered. Please attach information including the development name,

size, and land uses.

In addition, you mentioned that the Belfast Siding development area is planned to function as an inland port and should include trip generation rates higher than that of standard industrial property. Terra Point indicated they will provide additional information regarding the proposed land use and will include examples from other locations that indicate the square footage and corresponding traffic demand. We would be interested in examining this data and considering it for application in the I-95 at Belfast Siding Road IJR. For any example data, we would be interested in the following:

- Location
- Type of Freeway Access
- Size of development
- Land uses within development
- Agreements related to port utilization / relationship to port
- Generated trips (AM peak hour, PM peak hour, and daily) and resulting trip generation rates.

Please let us know the timeframe you anticipate providing this data to GDOT and Carter & Burgess for further analysis.

Richard Fangmann, P.E., PTOE
Carter & Burgess, Inc.
1718 Peachtree Street NW
Suite 461
Atlanta, GA 30309
Phone: 404-249-7550
Fax: 404-249-7705

Letter to King Engineering (November 15, 2007)

HAROLD E. LINNENKOHL
COMMISSIONER
(404) 656-5206

GERALD M. ROSS, P.E.
CHIEF ENGINEER
(404) 656-5277

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

BUDDY GRATTON, P.E.
DEPUTY COMMISSIONER
(404) 656-5212

EARL L. MAHFUZ
TREASURER
(404) 656-5224

November 15, 2007

Mr. James M. Robinson, P.E.
Sr. Vice President
King Engineering Associates, Inc.
6500 Bowden Road, Suite 290
Jacksonville, FL 32216

Subject: Interchange Study for I-95 at Belfast Siding Road in Bryan County

Dear Mr. Robinson:

We received your e-mail request directed to Mr. Richard Fangmann of Carter and Burgess, the firm hired to complete the I-95 at Belfast-Siding Road Interchange Justification Report (IJR). The request was for information regarding the data and travel demand projections along the I-95 corridor in Bryan County used in consideration of the potential need for a new interchange at Belfast Siding Road. At this time, the data we have developed for analysis of the potential interchange need was based on information regarding proposed future development provided by Bryan County and Terra Point. In our August 2, 2007 meeting, both Terra Point and Bryan County indicated that they would like to provide additional information to modify the input data for the study.

Terra Point indicated that the Belfast Siding development area is planned to function as an "inland port" and should include trip generation rates higher than that of standard industrial property. Terra Point indicated they would provide additional information regarding the proposed land use as well as examples from other locations that show similar square footage and the corresponding traffic demand. Terra Point indicated that they have specific knowledge of developments elsewhere in the southeastern United States that are similar to the proposed development that have truck traffic generation and use by time of day that differs from the input data used in the study. The study data is based on trip generation rates provided in Trip Generation, 7th Edition, by the Institute of Transportation Engineers. In addition, Bryan County indicated that they have additional information on new growth planned in the County that will increase the planned level of development over that provided to us by the County in spring of 2007.

GDOT wants to move forward to complete the study based upon the best information available. As a result, the decision was made among all parties attending the August 2, 2007 IJR status meeting to delay the study while waiting to receive the additional information from Bryan County and Terra Point. Bryan County and Terra Point representatives indicated at that time that it may take three months to compile the information. Attached is a letter to Bryan County documenting the decisions made at the August 2, 2007 meeting.

To date neither the Department nor Carter and Burgess have received any additional information from Bryan County or Terra Point. It is likely that the current data results and model will change once Carter and Burgess receives the additional information discussed above. In light of this, the Department recommends that we provide the requested detailed trip generation, trip distribution, trip assignment and capacity analysis procedures and results to you, once the additional information discussed at the August 2, 2007 meeting has been received and incorporated into the current analysis. This will assure that we are all working from the most current and up to date information available. A future meeting will be scheduled in order to clarify what information is needed from all parties. We hope that you are agreeable to this course of action, but if you have further questions or concerns, please feel free to contact myself or Mr. Radney Simpson at 404-656-5411.

Sincerely,

Angela T. Alexander
State Transportation Planning Administrator

ATA:MF

Attachments

cc: Phil Jones, Bryan County
Mike Bell, Rayonier, Inc.

Email Correspondence – Status Update for Bryan County (November 26, 2007)

From: Fangmann, Richard B.
Sent: Monday, November 26, 2007 2:50 PM
To: 'Phil Jones'
Cc: Simpson, Radney; 'Mote, Kyle'; 'jrobinson@kingengineering.com'
Subject: IJR at Belfast Siding Rd.

Phil,

As requested by GDOT, below is a recap of the information provided to Bryan County regarding the I-95 at Belfast Siding Road IJR.

Planned Development In Bryan County

Carter & Burgess coordinated with Bryan County in Spring of 2007 to develop a map of planned developments in Bryan County. This included developments which had approved development plans or master plans for development. The attached Fig 4 Development Areas and Traffic Analysis Zones shows these anticipated developments. The number of trips generated by each development was determined based on Trip Generation, 7th Edition, by the Institute of Transportation Engineers. The Terra Point development trip generation is shown in Table 1, while trip generation for the other developments is show in Table 2.

Methods for Determining Growth within Bryan County

A travel demand model does not exist for Bryan County. Therefore, the future distribution and assignment of traffic was performed using an origin-destination matrix prepared using TRANSCAD travel demand software. This allow the new development trips to be assigned to the roadway network based on the "gravity model" methods. The modeling work performed does not provide a calibrated travel demand model based on existing socioeconomic data that is projected into the future. It does provide a logical means for distribution and assignment of traffic anticipated from the planned developments in Bryan County. A brief summary of the traffic projection methodology is attached.

Growth in background traffic volumes (through development not yet planned and external traffic growth) was estimated based on historic traffic growth trends. The current traffic volumes were grown by 2.7% per year from years 2007 to 2012 and by 1.35% per year from years 2012 through 2030. The initial growth rate is consistent with traffic volume growth over the past ten years in Bryan County. The reduced background growth rate in years 2012 through 2030 reflects the assumption that the planned developments will account for half the future growth during that time period.

Distribution of Future Traffic

As described above, the traffic generated by the planned development in Bryan County was distributed to the roadway network based on a TRANSCAD origin-destination matrix. Table 3 shows the resulting origin and destination patterns based on the development location and related traffic analysis zones(TAZs) (refer to Figure 4). Please note, developments 4, 7, 8, and 11 are also in TAZ 3 and development 13 is in TAZ 4. As this table shows, the majority of the Terra Point development traffic is anticipated to have a origin or destination within Bryan County. The traffic from Terra Point and the other developments that are destined for points other than southern Bryan County were assigned to the I-95 interchanges.

Interchange Needs and Traffic Analysis

Subsequent analysis of the I-95 interchanges indicates they can be improved to accommodate the anticipated traffic growth due to the planned development (plus assumed background growth) through year 2032. At the assumed future background growth rate of 1.35% per year,the US 17 interchange fails even with four through lanes in each direction with 25 years of additional growth (year 2057).

Information We are Awaiting for Use in Analysis

In our August 2, 2007 meeting, both Terra Point and Bryan County indicated they would like to provide

information to modify the input data for the study. Terra Point indicated that the Belfast Siding development area is planned to function as an inland port and should include trip generation rates higher than that of standard industrial property. Terra Point indicated they will provide additional information regarding the proposed land use and will include examples from other locations that indicate the square footage and corresponding traffic demand. Terra Point indicated they have specific knowledge of developments elsewhere in the southeastern United States that are similar to the proposed development that have truck traffic generation and use by time of day that differs from the input data used in the study, which is based on trip generation rates provided in Trip Generation, 7th Edition, by the Institute of Transportation Engineers. In addition, Bryan County indicated that they have additional information on new growth planned in the County that will increase the planned level of development over that provided to us by the County in spring of 2007.

During the August 2, 2007 meeting, the Georgia Department of Transportation indicated that, while they want to move forward to complete the study, they want to base it upon the best information available and will delay the study while waiting to receive additional information from Bryan County and Terra Point. Bryan County and Terra Point Indicated at that time that it may take three months to compile the information.

We have just received a copy of the updated data regarding future planned development in Bryan County, but have not received additional information regarding the Terra Point truck generation characteristics, referenced in previous discussions.

We look forward to discussing the above information further with you and GDOT, as indicated in the email below.

Richard Fangmann, P.E.
Jacobs Carter Burgess
Project Manager, Sr | Trans Prgm, Atlanta
404.478.3913
404.249.7705 fax
richard.fangmann@c-b.com

www.c-b.com
-----Original Message-----
From: Simpson, Radney [mailto:Radney.Simpson@dot.state.ga.us]
Sent: Tuesday, November 20, 2007 10:41 AM
To: Phil Jones
Cc: Mote, Kyle; Fangmann, Richard B.
Subject: RE: IJR at Belfast Siding Rd.

Phil,

Enjoyed speaking with you today.

I understand that you are going to provide some potential dates for a meeting. I would think that a conference call would be adequate, but if you / King Engineering would prefer to meet in Atlanta, that can be arranged as well.

In an effort to aid our upcoming conversation, I have instructed the consultant firm to provide you & King Engineering an email recapping what effort has been done to date on the subject study.

Radney Simpson
Central Georgia Planning Branch Chief
Office of Planning
Georgia Department of Transportation
404-657-6689

King Engineering Letter to GDOT (December 10, 2007)

King
ENGINEERING ASSOCIATES, INC.

Civil Engineering
Environmental Engineering
Transportation Planning & Engineering
Pavement Management
Land Planning
Ecological Services
Surveying & Mapping
Construction Management
GIS Mapping
Landscape Architecture #LC26000183

R[illegible]D

DEC 11 2007

December 10, 2007

Ms. Angela Alexander
State Transportation Planning Administrator
Georgia Department of Transportation
#2 Capitol Square, S.W.
Atlanta, GA 30334-1002

RE: I-95/Belfast Siding Road IJR – Bryan County, Georgia

Dear Ms. Alexander:

On behalf of Bryan County and TerraPointe Services, King Engineering Associates, Inc. (King) has reviewed file materials associated with the referenced study. In particular, our review has been for the purpose of determining whether various input variables to the future travel demand determinations have been reflective of best available information. It appears that additional information has come to light following your presentation of preliminary IJR findings in August of this year.

While some material may be redundant, we have erred on the side of caution to assemble a set of attachments that we believe more completely represents future development conditions and possibilities than those originally considered. Much of this material is the work of others, as noted, however we believe it prudent to accumulate this important data into one collection. A listing of this material is as follows:

1. Bryan County Transportation Plan (Draft); Hussey, Gay, Bell & DeYoung, Inc.; dated June 2007
2. Bryan County Potential Development Areas & Traffic Analysis Zones Map; Thomas & Hutton Engineering Co.
3. Bryan County Potential Development Areas & Traffic Analysis Zones Memo and Table; Thomas & Hutton Engineering Co.
4. Collection of Requests for Comment re: various DRI developments in Liberty, Bryan, and Chatham Counties and the City of Savannah.
5. Redlined version of Table 1, Daily Traffic Generation for TerraPointe Site

Items 1-4 relate to a depiction of future land use in the region, perhaps beyond that accounted for in the original preliminary IJR. This not only

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relates to development in Bryan County, but also lists large developments in adjacent counties that would have a bearing on analysis to determine the justification of another interchange on I-95 in this area.

Item 5 raises a question regarding two of the trip generation calculations used in the preliminary IJR. We request you reconsider the calculations for school and industrial traffic for the TerraPointe property.

We would also like to report that no further information will be forthcoming related to studies of other industrial sites. Upon further review and consideration of the range of development potential within the industrial category, we are satisfied that the ITE Land Use Code 110 – Light Industrial will satisfactorily represent the TerraPointe industrial property.

We appreciate your consideration of this new information and look forward to working with you as revisions are made to your preliminary IJR. Please feel free to contact me should questions arise out of this submittal. We look forward to being of professional service in this matter.

Sincerely,

KING ENGINEERING ASSOCIATES, INC.

James M. Robinson, P.E.
Sr. Vice President

Enclosures

Cc: Phil Jones, Bryan County (w/o enclosures)
Jeff Lawrence, TerraPointe Services (w/o enclosures)

Memo - Review of Additional Data Provided by King Engineers on Behalf of Bryan County (January 24, 2008)

JACOBS Carter Burgess

Memorandum

To: Kyle Mote, Georgia Department of Transportation

From: Richard Fangmann, Jacobs Carter Burgess

Date: January 24, 2008

Subject: I-95 at Belfast Siding Road IJR – Review of Additional Data provided by King Engineers on Behalf of Bryan County

cc: Radney Simpson, Georgia Department of Transportation
Matthew Fowler, Georgia Department of Transportation
Rod Wilburn, Jacobs Carter Burgess

As requested, Carter & Burgess, Inc. examined the data for the I-95 at Belfast Siding Road IJR provided by King Engineering on behalf of Bryan County. As this information and suggested next steps indicates, the proposed data differs significantly from that used in the previous analysis. Therefore, we will need to recreate future year traffic projections and redo previous analysis, resulting in work steps not anticipated in the current scope and budget. The paragraphs below compare the data previously used in the IJR with that provided by King Engineering and suggest next steps for further discussion.

<u>Comparisons of Data Used in IJR Study, Bryan County Draft Transportation Master Plan, and Thomas & Hutton Plan</u>

The **IJR Study** included 22 approved developments. These developments were estimated to generate approximately 194,000 daily trips. For the 22 developments, the total acreage amounts to approximately 10,700 acres.

The **Bryan County Draft Transportation Master Plan (BCTP)**, dated June 2007, identified approximately 30,300 acres of potential development, for a total daily trip generation of 52,300. The developments identified in the IJR study were accounted for in the BCTP as either potential developments or existing. 18 additional areas of potential development were identified beyond the 22 developments previously identified in the IJR study. These additional 18 areas of potential development account for approximately 20,800 acres of land. Although Bryan County' Draft Transportation Master Plan includes 20,800 acres of land, the trip generation in the IJR study significantly exceeds the trip generation shown in the BCTP by approximately 142,000 daily trips. ***It appears that the trip generation shown in the BCTP map may be underestimated.***

The **Thomas & Hutton Plan (THP)**, dated December 10 2007, included the 22 developments identified in the IJR study, and assumed an additional 11,000 daily trips to the IJR study trip generation of 194,000 - for a total of 205,000 daily trips. ***Beyond the identified developments in the IJR study, the THP included developments from BCTP and estimated a higher trip generation for those developments***. THP also included 8 Development of Regional Impact sites (DRI's). In total, the THP assumes approximately 525,200 daily trips and 37,400 acres of potential land development. However, 6 of the 8 DRI sites are remote relative to the proposed new interchange and will appear to have their infrastructure needs served by other interchanges and roadways. Therefore, ***excluding the 6 remote DRI's, the THP assumes approximately 34,000 acres and 458,000 daily trips.***

In summary, the following are some main points:

- The IJR study assumed only approved developments, totaling 22 sites. The remaining growth was accommodated by a background growth rate applied to all roads.

- The BCTP assumed the approved developments (22 sites) and an additional 18 sites for potential development. However, the trip generation estimates shown in the BCTP appear to be underestimated. BCTP includes 20,800 acres of additional development but 142,000 fewer daily trips when compared to the IJR study.

- The THP assumes the 22 sites from the IJR study, the additional BCTP areas for development, and 8 DRI's sites. The THP assumes 11,000 additional daily trips for the IJR study sites. The THP revised the trip generation analysis for additional areas of developments shown in the BCTP, thereby substantially increasing the expected daily trips for those areas. THP introduced 8 DRI sites for consideration, however, 6 of the 8 DRI sites are remote relative to the proposed new interchange and will appear to have their infrastructure needs served by other interchanges and roadways. Therefore, excluding the 6 remote DRI's, the THP assumes approximately 34,000 acres and 458,000 daily trips (representing the 22 approved sites in the IJR study, the additional areas of potential development in the BCTP, and 2 applicable DRI sites).

- Given the additional development shown in the BCTP, the revised trip generation for the BCTP sites in the THP, and the 2 additional (and applicable) DRI's identified in the THP, and an additional 264,000 daily trips and 23,400 acres are assumed on top, or in addition to, the daily trips estimates and acreage in the IJR study.

Future Land Development Plans	Total Daily Trips	Total Development Acreage	Notes
IJR Study	193,583	10,699	THP assumes additional 11,000 daily trips
Bryan Co. Draft TP June 2007 (BCTP)	52,300	30,317	BCTP has low trip generation
Thomas & Hutton Plan December 2007 (THP)	458,217	34,163	a) Increasing IJR study trip generation by 11,000 daily trips b) Substantially increasing BCTP trip generation c) Excluding 6 remote DRI's provided for consideration
In Addition to IJR Study	**264,634**	**23,464**	**THP trips and acreage minus IJR study trips and acreage**

Note: The numbers shown in this table are estimates and approximations.

Suggested Steps for Incorporation of Additional Data

If GDOT is in agreement with the proposed additional data provided by Bryan County, the following next steps would be needed to incorporate the additional data provided by King Engineering, assuming confirmation of data with Bryan County:

- Confirm the Thomas & Hutton data projections reflect the desires of Bryan County and will be included in the County's future transportation and land use planning.
- Revise trip generation to incorporate new land use. The proposed information results in future land use at a location that will effect the adjacent interchanges ability to be improved to provide access intended by the proposed new interchange. Therefore, incorporation of this data into the traffic forecasting methodology, rather than applying a background growth rate, is preferred.
- Rerun travel demand forecasting methodology to produce future year volumes reflecting revised land use.
- Reassign traffic volumes to interchange movements
- Perform future year analysis of interchanges with and without proposed interchange
- Examine potential improvements to current interchanges to see if they can be improved to provide the access intended by the proposed interchange.

We anticipate one month will be needed to complete this work effort to provide revised IJR results for review with GDOT.

GDOT Letter to Bryan County (February 5, 2008)

GENA L. ABRAHAM, Ph.D.
COMMISSIONER
(404) 656-5206

GERALD M. ROSS, P.E.
CHIEF ENGINEER
(404) 656-5277

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
Atlanta, Georgia 30334-1002

BUDDY GRATTON, P.E.
DEPUTY COMMISSIONER
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EARL L. MAHFUZ
TREASURER
(404) 656-5224

February 5, 2008

Mr. Phillip Jones, County Administrator
Bryan County
816 Mill Hill Landing Road
Richmond Hill, Georgia 31324

Subject: Interchange Study for I-95 at Belfast Siding Road in Bryan County

Dear Mr. Jones:

As you are aware, in August 2007 my staff met with you and representatives from Terra Point and Thomas and Hutton Engineers to discuss the preliminary findings of the draft I-95 at Belfast-Siding Road IJR. At that point, the IJR assumed that the area around the interchange would generate an additional 194,000 vehicle trips by the IJR's horizon year of 2032, over present levels. This was based on the County's land use assumptions as found in the County's Land Use Plan; available Developments of Regional Impact (DRIs); and additional unspecified potential development build-outs which could occur in the area around the proposed interchange by 2032. This is in contrast to the County's Draft Transportation Plan, dated June 2007 and not available prior to August 2007, which projects the area around the interchange will generate an additional 52,300 vehicle trips per day by the year 2027 over present levels.

In response to your concerns with the findings of the IJR related to the number of vehicle trips projected to occur by 2032, King Engineering, on behalf of Bryan County/Terra Point, provided additional traffic generation information. This additional information indicates that the area around the proposed interchange would generate an additional 458,000 vehicle trips per day in an unknown future year, presumably beyond the year 2032, above present levels. After reviewing the information provided, we feel that 458,000 additional vehicle trips per day is unrealistically high. For comparison, all of Chatham County presently generates approximately 716,000 vehicle trips per day and in the year 2030 is projected to generate 1,015,000 vehicle trips per day. However, in an effort to respond to the county's perceptions of the IJR under-estimating total vehicle trips by the year 2032, we have incorporated some of the unspecified traffic growth as provided by King Engineering; thus increasing the total number of vehicle trips per day for the area around the proposed interchange from our initial estimate of 194,000 to 286,000 vehicle trips per day.

Based on the generation of an additional 286,000 vehicle trips per day by the horizon year of 2032, a new interchange is not warranted at I-95 and Belfast-Siding Road. In addition, federal law requires consideration of improving adjacent interchanges and connecting roadways before a new interchange can be approved. It appears that improvements can be made at the adjacent interchanges and connecting roadways to accommodate future traffic growth in this area.

We understand the County is experiencing and planning for additional significant growth. Therefore, the Department will consider performing a Countywide Transportation study to examine long range transportation needs using a comprehensive, holistic approach for all travel needs. If you have any questions or comments, please feel free to contact Kyle Mote at 404-656-6016.

Sincerely,

Angela T. Alexander
State Transportation Planning Administrator

ATA: kbm

cc: Mike Thomas, Director of Planning, Data and Intermodal Development
Matthew Fowler, Assistant State Transportation Planning Administrator
Radney Simpson, Central Georgia Planning Branch Chief
Richard Fangmann, JC&B Project Manager
Teresa Scott, District Planning and Programming Engineer
Mike Bell, Rayonier Inc.
Jim Robinson, King Engineering
Read File

Bryan County Letter to GDOT (March 4, 2008)

Mathew
Please pull requested data + prepare response.

Bryan County Board of Commissioners

P.O. Box 430
Pembroke, Georgia 31321-0430
(912) 653-3839
(912) 653-3819
Fax (912) 653-4691

Jimmy Burnsed
Chairman

Ed Bacon
Blondean Newman
Glen Willard
Toby Roberts
Rick Gardner

RECEIVED
MAR 06 2008
OFFICE OF PLANNING

W. Phillip Jones
County Administrator

Donna M. Waters
County Clerk

March 4th, 2008

Ms. Angela T. Alexander
Georgia Department of Transportation
State Transportation Planning Administration
#2 Capitol Square, S.W.
Atlanta, GA 30334-1002

Subject: Interchange Study for I-95 at Belfast Siding Road

Dear Ms. Alexander:

I have shared you letter of February 5, 2008, in which you stated a new interchange is not warranted at I-95 and Belfast Siding Road, with our Board of Commissioners. As much as we appreciate you department's quick turnaround of the projected trip generation data supplied, we are deeply concerned about the conclusions reached.

Bryan County is one of the fastest growing counties in the State and our region. We consider this project vital for the safe evacuation, during natural disasters, of over 60 percent of our county's population who reside in the area. In addition, the subject interchange is essential to commercial and industrial economic development projects in locations just west of I-95 along existing rail infrastructure and in close proximity to the growing ports in Savannah and Brunswick. Finally, this interchange will make it possible for our county to plan for, and guide its future growth in a responsible manner.

In order to more full understand the position of GDOT related to the lack of interchange justification, we would appreciate the opportunity to review your data and analysis created in reaching that position. The following elements are requested for this purpose:

1. Trip generation calculations
2. Trip distribution analysis including details of underlying gravity model
3. Trip assignment on roadway network
4. Capacity analysis of adjacent interchanges and connectiong roadways/interchanges both with and without the proposed interchange
5. Recommended road/intersection improvements with and without the proposed interchange

Thank you for your attention to this matter.

Sincerely,

Waverly P. Jones
County Administrator

Cc: Mr. Bridges Sinyard, Legislative Assistant, U.S> Senator Saxby Chambliss
Mr. Michael Quiello, Senior Legislative Assistant, U.S. Senator Johnny Isakson
Ms. Norah Bel, Legislative Assistant, U.S. Representative Jack Kingston
Georgia Senator Eric Johnson
Georgia Senator Tommie Williams
Georgia Representative: Bob Lane
Georgia Representative: Ron Stevens
Mr. Roy Herrington, District 1 Representative, State Transportation Board
Mr. Raybon Anderson, District 12 Representative, State Transportation Board

GDOT Response to Bryan County Letter (April 2, 2008)

GENA L. ABRAHAM, Ph.D.
COMMISSIONER
(404) 656-5206

GERALD M. ROSS, P.E.
CHIEF ENGINEER
(404) 656-5277

Department of Transportation

State of Georgia
#2 Capitol Square, S.W.
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BUDDY GRATTON, P.E.
DEPUTY COMMISSIONER
(404) 656-5212

EARL L. MAHFUZ
TREASURER
(404) 656-5224

April 2, 2008

Mr. Waverly P. Jones, Administrator
Bryan County
Post Office Box 430
Pembroke, Georgia 31321

Subject: Interchange Study for I-95 at Belfast Siding Road in Bryan County

Dear Mr. Jones:

This correspondence is in response to the March 4, 2008 letter regarding the subject study. The letter requested more detailed information regarding several elements of the analysis work performed. Attached is the requested information related to these elements. It is important to note that the Department is basing the decision to not recommend a new interchange, at this location, on the anticipated growth in Bryan County, not on the trip generation assumptions.

As previously discussed, the trips projected, based on the Draft Bryan County Comprehensive Plan Transportation Chapter, hereinafter referred to as the "Draft Transportation Plan", as provided to GDOT in summer 2007, total approximately 52,300 additional vehicle trips per day in the year 2027 in the study area, this projection is based on known and anticipated future growth as documented in the County's Draft Transportation Plan. The Department developed an Interchange Justification Report (IJR) , I-95 at Belfast-Siding Road, projects approximately 286,000 additional vehicle trips per day by the year 2032 in the study area based on known and anticipated future growth identified in conjunction with Bryan County during Summer 2007, which is over five times greater than the rate developed from the County's Draft Transportation Plan. On behalf of Bryan County, Thomas and Hutton developed future projections that result in approximately 458,000 additional vehicle trips per day by an unspecified year, presumably beyond 2032 in the study area; which is over eight times greater than the vehicle trips per day rate developed from the County's Draft Transportation Plan.

In reviewing the Thomas and Hutton prepared growth rates, which were provided to the Department in the Fall of 2007, it appears that 458,000 additional vehicle trips per day for the study area is unrealistically high. For comparison, presently Chatham County generates approximately 716,000 vehicle trips per day and by 2030 Chatham County is forecasted to generate approximately 1,015,000 vehicle trips per day. Based on this reasoning, the Department supports using the 286,000 additional vehicle trips per day rate, which is over 5 times greater than the vehicle trip per day rate calculated based on the County's Draft Transportation Plan.

Again, while the Department does not support pursuing a new interchange at this time at I-95 and Belfast-Siding Road, we do recognize the growth that is occurring in Bryan County and, with the County's concurrence, the Department is willing to fund a full county-wide transportation plan which will further explore and refine anticipated growth rates, trip generation rates, transportation needs and opportunities in Bryan County. If you have additional questions, please feel free to contact Mr. Kyle Mote at 404-656-5411.

Sincerely,

Angela T. Alexander
State Transportation Planning Administrator

ATA: MF

Attachments: A – Trip Generation, Distribution, and Assignment
B – Capacity Analysis Results and Recommended Road and Intersection Improvements
C – Analysis of Additional Growth Proposed by Bryan County

cc: Mike Thomas, Director of Planning, Data and Intermodal Development
Matthew Fowler, Office of Planning
Radney Simpson, Office of Planning
File

Attachment A
Trip Generation, Distribution, and Assignment

Attachment A
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Summary of Trip Generation, Distribution, and Assignment

Methodology for Estimating Traffic Volumes – (August 2, 2007 Meeting)

The Methodology indicated below was discussed in the August 2, 2007 meeting. There is no travel demand model in place for Bryan County. Therefore, manual methods were used to assign new traffic to the roadways to reflect future year conditions. The number of new trips was calculated based on Trip Generation, 7th Edition, published by the Institute of Transportation Engineers. TransCAD software was used to distribute traffic from identified developments based on assumed origin and destination patterns and assign them to the roadway network. In addition to this traffic due to new development with plans specified by Bryan County, additional growth was assumed by providing a background growth rate to existing traffic volumes.

Trip Generation

Purpose of trip generation is to predict the number of trips that are generated by and attracted to each TAZ in the study area

Trip generation in Bryan County was based on the following data:

- Daily trip rate from the Trip Generation 7th Edition, published by the Institute of Transportation Engineers (ITE)
- Dwelling (units), acreage of land use for school, office, retail and industrial (square feet) for the potential development areas

Procedure:

- Twelve TAZs were created that included twenty-two future commercial/retail potential developments in TAZ 1,2,3,4,5 and 12
- TAZs 7 to 11 were treated as external zones
- Proposed new interchange along Belfast Siding Road is located in TAZ 2 and 12 along I-95
- Adjacent interchanges on I-95 at US 84, US 17, and SR 144 were examined
- Intersection of SR 144 at US 17 was investigated due to the capacity constraints
- Production and Attraction (PA) Trip table was created
- Once the PA table was created, the next step was to create an impedance factor
    - Measurement of impedance based on travel time (minutes)

Trip Distribution

Purpose of trip distribution is to predict the trips between origin and destination zones

Procedure:

- Gravity model was applied for trips based on new development. The TransCAD software was used to produce an OD table.
- An Origin-Destination (OD) trip table was produced
- External-External trips were added to the OD trip table
    - Calculation of external-external trips was based on the existing ADT with the estimation of annual growth rate: 2.7% from year 2007 to 2012 and 1.35% from year 2012 to 2030

Attachment A
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Summary of Trip Generation, Distribution, and Assignment

Trip Assignment

Purpose of trip assignment is to predict traffic volumes on roadway network in the study area

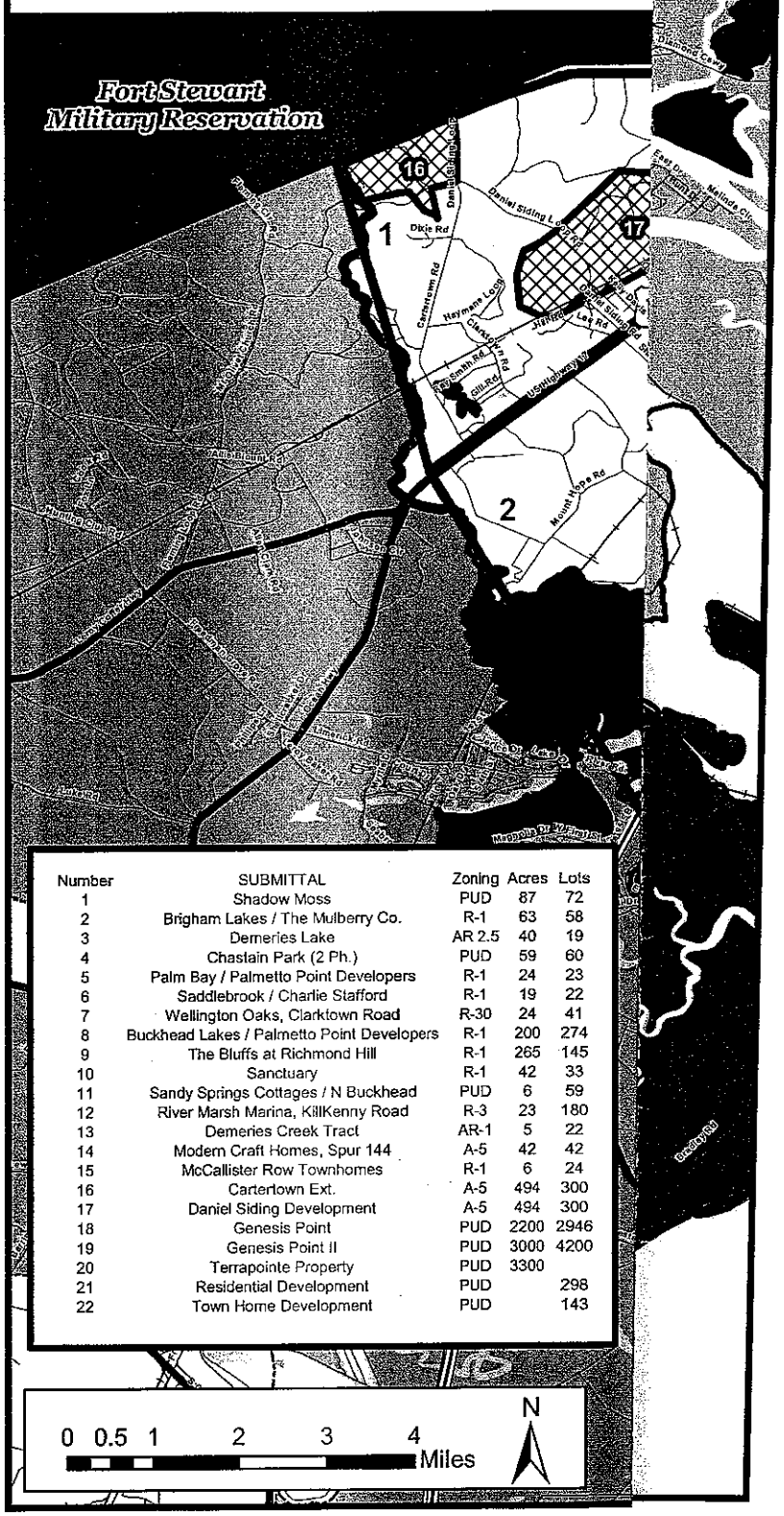
Procedure

- Based on the paths between TAZs daily trips and peak hour traffic volumes were assigned to the roadway network for year 2030 at the proposed interchange on I-95 at Belfast Siding Road and existing interchanges of I-95 at SR 144, US 17 and US 84 and the intersection of SR 144 at US 17.
- The TransCAD software was used to produce the assignment of new traffic based on the OD table.

Keeping Georgia on the Move
Office of Planning

Justification Report

Potential Development A



Number	SUBMITTAL	Zoning	Acres	Lots
1	Shadow Moss	PUD	87	72
2	Brigham Lakes / The Mulberry Co.	R-1	63	58
3	Demeries Lake	AR 2.5	40	19
4	Chastain Park (2 Ph.)	PUD	59	60
5	Palm Bay / Palmetto Point Developers	R-1	24	23
6	Saddlebrook / Charlie Stafford	R-1	19	22
7	Wellington Oaks, Clarktown Road	R-30	24	41
8	Buckhead Lakes / Palmetto Point Developers	R-1	200	274
9	The Bluffs at Richmond Hill	R-1	265	145
10	Sanctuary	R-1	42	33
11	Sandy Springs Cottages / N Buckhead	PUD	6	59
12	River Marsh Marina, KillKenny Road	R-3	23	180
13	Demeries Creek Tract	AR-1	5	22
14	Modern Craft Homes, Spur 144	A-5	42	42
15	McCallister Row Townhomes	R-1	6	24
16	Cartertown Ext.	A-5	494	300
17	Daniel Siding Development	A-5	494	300
18	Genesis Point	PUD	2200	2946
19	Genesis Point II	PUD	3000	4200
20	Terrapointe Property	PUD	3300	
21	Residential Development	PUD		298
22	Town Home Development	PUD		143

Regional Inset

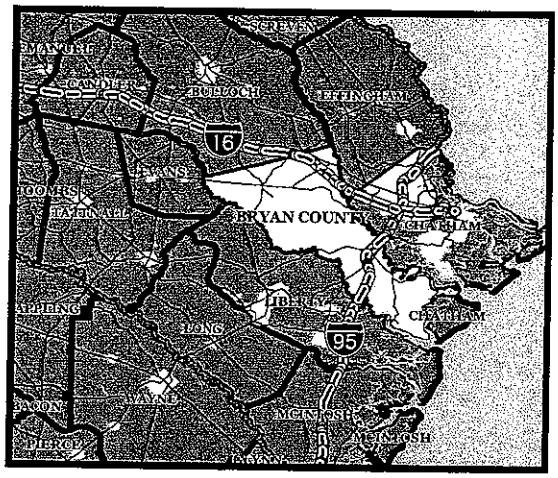


Figure 4

Legend

Traffic Analysis Zones (Bryan County Area)

- Bryan County TAZ Boundary

Road Network

- Interstate
- Ramp
- Major Road
- Other Road

Other Layers

- Potential Development Areas
- Future Commercial / Retail Nodes
- Bryan County Boundary
- City Limits
- Water
- Fort Stewart Military Reservation
- Conservation Areas
- Railroads

Source: U.S. Census (2000), GDOT, and Carter & Burgess, Inc.

This map is intended for planning purposes only.

August 2, 2007

Carter:Burgess
One Source, One Firm™

Attachment A
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Summary of Trip Generation, Distribution, and Assignment

Trip Generation and Distribution Data – From August 2, 2007 Meeting

Table 1
Daily Traffic Generation for TerraPointe Site
IJR for I-20 at Belfast Siding Road

Land Use	Quantity	Units	Daily Trip Rate	Total Daily Trips	Mixed Use Reduction		Net with Reduction
					Percent	Trips	
Single Family Residential	4,271	units	7.7	32,887	8%	2,586	30,301
Multifamily Residential	6,460	units	6.0	38,975	7%	2,586	36,389
School	75	acres	13.8	1,034	25%	258	775
Office	1,050	ksq. ft.	7.8	8,156	5%	436	7,720
Retail	2,100	ksq. ft.	23.4	49,134	35%	17,258	31,876
Industrial	3,721	ksq. ft.	4.8	17,708	9%	1,543	16,165
Total				**147,894**	**17%**	**24,668**	**123,226**

Table 2
Preliminary Traffic Generation and Distribution of New Trips by Subarea
IJR for I-20 at Belfast Siding Road

No.	Submittal	Residential Lots	Trip Rate	Trips Generated		
				Gross	Mixed Use Reduction	Net with Reduction
US 17 Corridor west of I-95						
16	Cartertown Ext	300	9.5	2,857	n/a	2,857
17	Daniel Siding	300	9.5	2,857	n/a	2,857
SR 144 north of Fort McCallister Road						
14	Modern Craft	42	11.1	468	n/a	468
15	McCallister Row	24	11.7	280	n/a	280
22	Town Home	143	10.1	1,445	n/a	1,445
West of SR 144 between Belfast Keller Rd (north) and Belfast Keller Rd (south)						
1	Shadow Moss	72	10.7	769	10%	692
4	Chastain Park	60	10.8	650	10%	585
7	Wellington Oaks, Clarktown	41	11.2	458	10%	412
8	Buckhead Lakes / Palmetto Point	274	9.6	2,628	10%	2,365
11	Sandy Springs / N Buckhead	59	10.8	640	10%	576
21	Town home	298	9.5	2839	10%	2,555
SR 144 south of Oak Level Road						
2	Brigham Lakes / Mulberry Co	58	10.9	630	n/a	630
3	Demeries Lake	19	11.9	226	n/a	226
5	Palm Bay / Palmetto Point	23	11.7	269	n/a	269
6	Saddlebrook	22	11.7	258	n/a	258
9	The Bluffs	145	10.1	1,464	n/a	1,464
13	Demeries Creek	22	11.7	258	n/a	258
Oak Level Road East of SR 144						
10	Sanctuary	33	11.4	375	n/a	375
12	River Marsh Marina	180	9.9	1,786	10%	1,607
18	Genesis Point	2946	7.9	23,369	10%	21,032
19	Genesis Point 2	4200	7.7	32,384	10%	29,146
Belfast Siding Road near I-95						
20	TerraPointe	10731	6.7	71,862	5,172	66,690

Table 3
Matrix of Trip Origins and Destinations
for Proposed Developments in Southern Bryan County

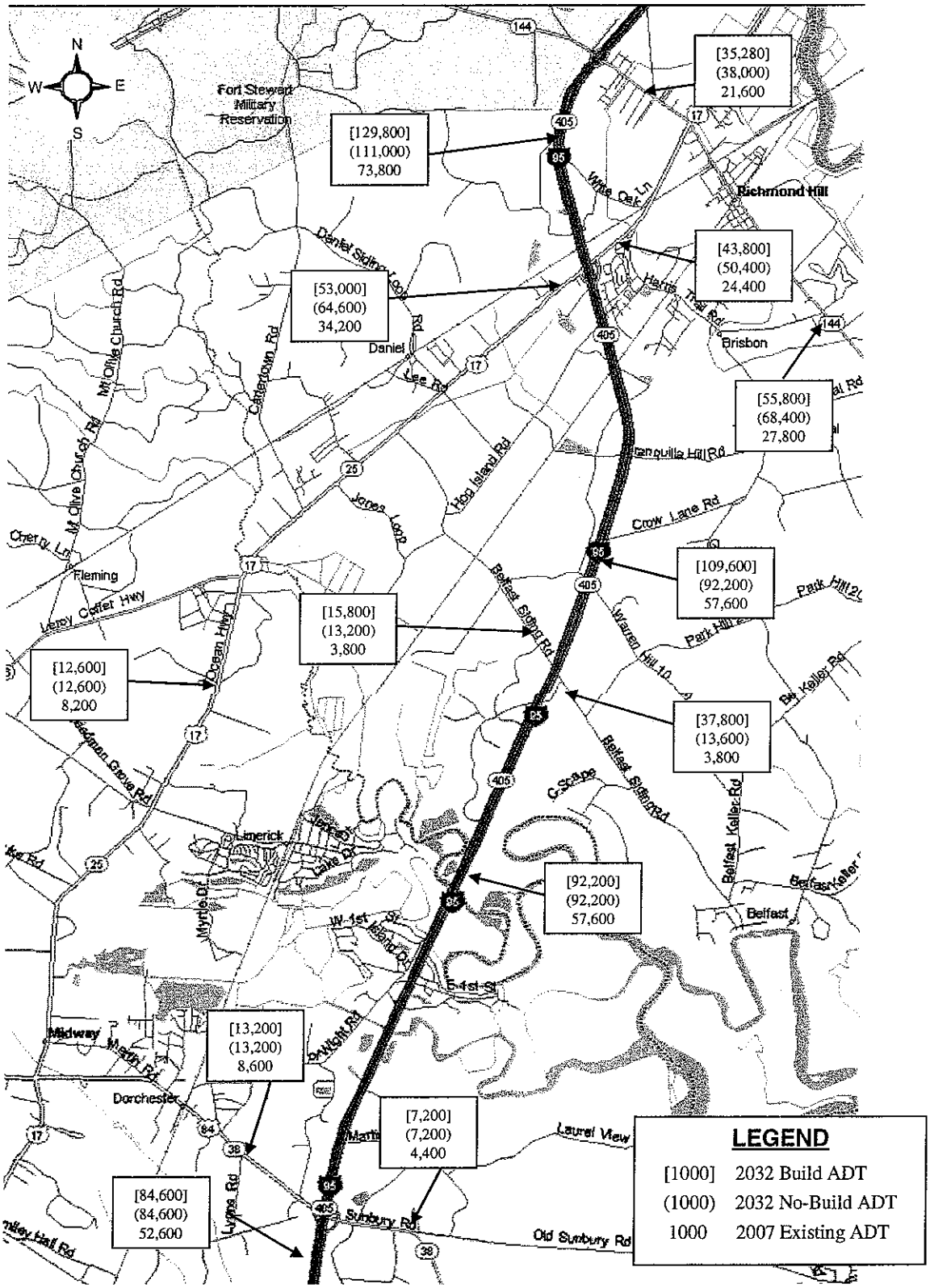
TAZ	1	2	3	4	5	6	7	8	9	10	11	12
1 - Developments 16 and 17	0	253	101	17	0	540	733	13	176	221	264	539
2 - Development 20 west of I-95	253	0	270	446	12	0	0	400	0	358	358	1,115
3 - Developments 1, 2, 4, 5, 6, 7, 8, 9, 11, 13, and 21	101	270	836	6,451	189	479	279	40	183	265	607	8,942
4 - Developments 3, 10, 12, 18, and 19	17	446	6,451	2,484	38	2,075	793	665	408	740	849	16,793
5 - Developments 14, 15, and 22	0	12	189	38	0	229	126	37	40	61	90	276
6 - Richmond Hill	540	0	479	2,075	229	0	0	0	0	0	0	4,772
7 - External Zone - US 17 west of I-95	733	0	279	793	126	0	0	0	197	1,160	57	4,739
8 - External Zone - I-95 south of Belfast Siding Road	13	400	40	665	37	0	0	0	987	44,603	120	2,325
9 - External Zone - SR 144 North of I-95	176	0	183	408	40	0	197	987	0	6,316	1,737	2,817
10 - External Zone - I-95 North of Richmond Hill	221	358	265	740	61	0	1,160	44,603	6,316	0	0	1,848
11 - External Zone - US 17 North of Richmond Hill	264	358	607	849	90	0	57	120	1,737	0	0	1,988
12 - Development 20 east of I-95	539	1,115	8,942	16,793	276	4,772	4,739	2,325	2,817	1,848	1,988	6,043

Total Terra Point Development Traffic Productions West of I-95: 3,212

Total Terra Point Development Traffic Productions East of I-95: 52,209

Total Terra Point Development Traffic Productions (note: productions are half of overall trip generation) 55,421
Total Terra Point Development Traffic Remaining in Southern Bryan County 40,588
Total Terra Point Development Traffic Leaving Southern Bryan County 14,833

Attachment A
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Summary of Trip Generation, Distribution, and Assignment



Carter::Burgess One Source, One Firm August 2, 2007	I-95 at Belfast-Siding Road Interchange Justification Report	Office of Planning	Figure 6 Existing and Future ADT Traffic Volumes

Attachment B
Capacity Analysis Results and Recommended Road and Intersection Improvements

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Summary of Study Findings – (August 2, 2007 Meeting)

- The proposed interchange was evaluated versus the eight FHWA Policies to determine if construction of an interchange is justified. Since the nearby interchanges can be improved to provide access to I-95 with acceptable LOS (LOS D or better), the FHWA Policy Guidance (Policy #1) is not satisfied and therefore, installation of an interchange is not recommended.

  FHWA Policy #1: "The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal. "

- The proposed Terra Point Development will generate significant traffic when built out (123,000 external trips per day).
- Many of the Terra Point development trips (approximately 70%) will satisfy travel needs within Southern Bryan County without the need for interstate access (both trip ends within southern Bryan County).
- Proposed improvements to the I-95 interchanges at SR 144 and US 17 (see improvement needs below) which could be performed in conjunction with the planned widening of I-95, will satisfy the interstate access needs for planned development in southern Bryan County.

Improvements Needed with or without New Interchange– (August 2, 2007 Meeting)

<u>I-95 @ SR 144 interchange</u>

- Southbound ramp intersection
  - Add second southbound left-turn lane on the off-ramp
  - Add second eastbound through lane on SR 144
- Northbound ramp intersection
  - Add traffic signal
  - Add second eastbound through lane on SR 144

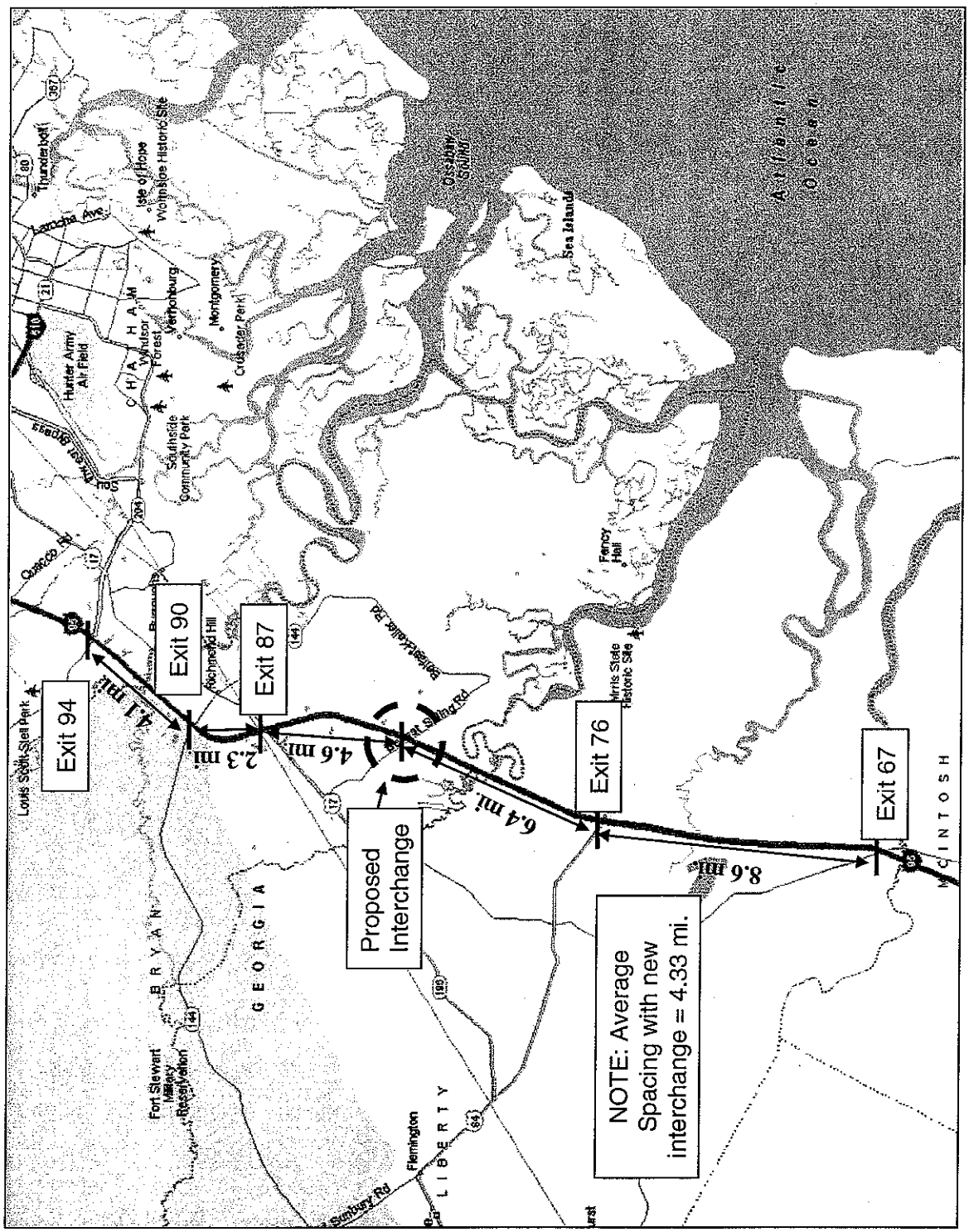
<u>I-95 @ US 17 interchange</u>

- Southbound ramp intersection
  - Add second southbound left-turn lane on the off-ramp
  - Add third eastbound through lane on US 17
  - Add second westbound left-turn lane on US 17
- Northbound ramp intersection
  - Add traffic signal
  - Add northbound right-turn lane on the off-ramp
  - Add second westbound left-turn lane on US 17
  - Add eastbound right-turn lane on US 17

<u>I-95 @ US 84 interchange</u>

- Southbound ramp intersection - No improvements required
- Northbound ramp intersection - No improvements required

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results



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One Source, One Firm™
August 2, 2007

I-95 at Belfast-Siding Road
Interchange Justification Report

Office of Planning

Figure 3
Interchange Spacing

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

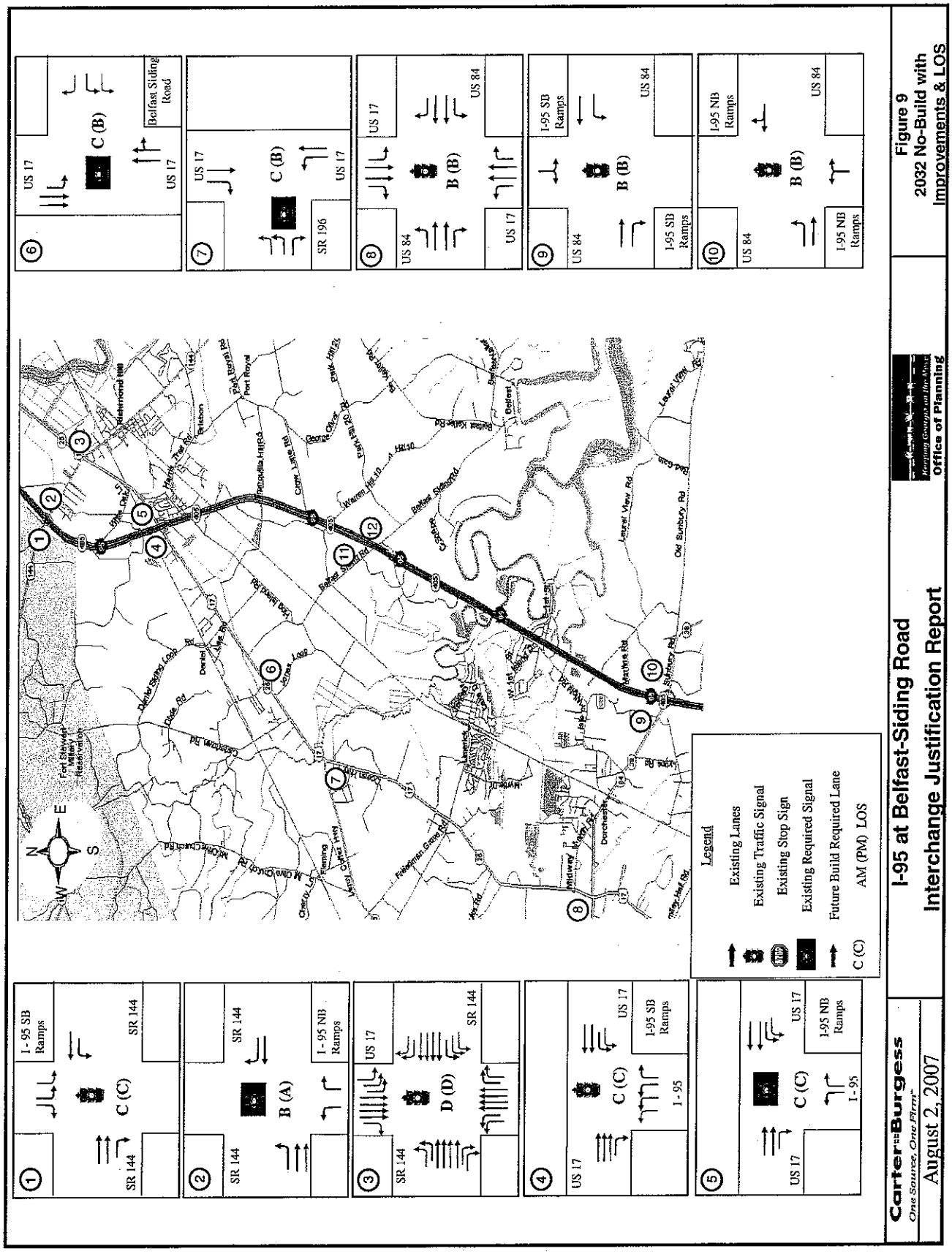
Evaluation of Eight FHWA Policies included in the *FHWA Guidance on Interstate Access Requests*: (August 2, 2007 Meeting)

The need for a new break in access will be examined in relation to the eight policy requirements listed in the Federal Register and included in the *FHWA Guidance on Interstate Access Requests*, as follows:

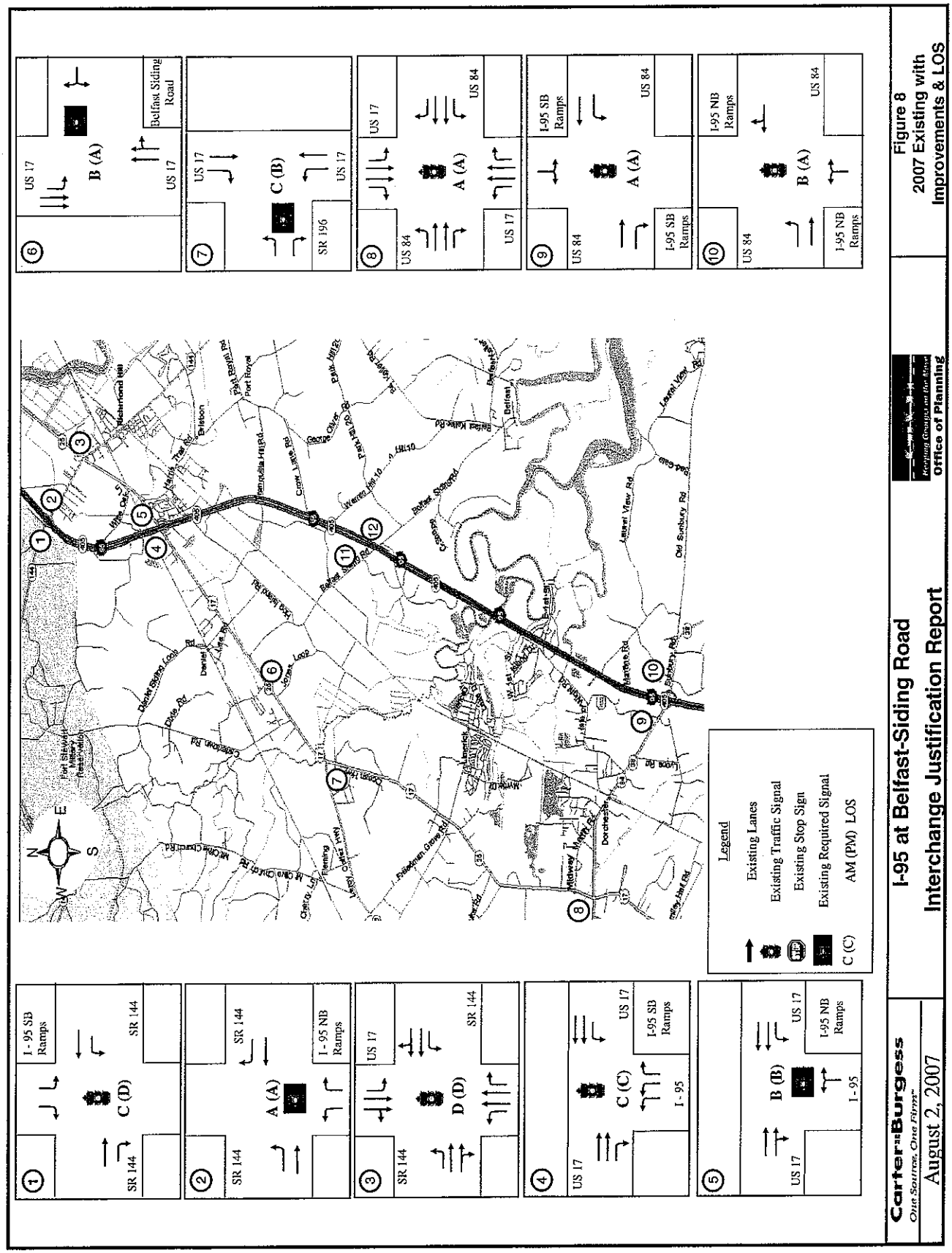
1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.
   [Policy Not Satisfied]
2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified. **[Policy Satisfied]**
3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.
   [Policy Satisfied]
4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System. **[Policy Satisfied]**
5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and /or statewide transportation plan, as appropriate, the applicable provisions of 23 CRF part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93. **[Policy Satisfied]**
6. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan. **[Policy Satisfied]**
7. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements. **[Policy Satisfied]**
8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.
   [Policy Could be Satisfied – Information Not Yet Provided]

In accordance with FHWA and GDOT guidance, the IJR will examine operations at the proposed interchange location, as well as adjacent interchanges upstream and downstream.

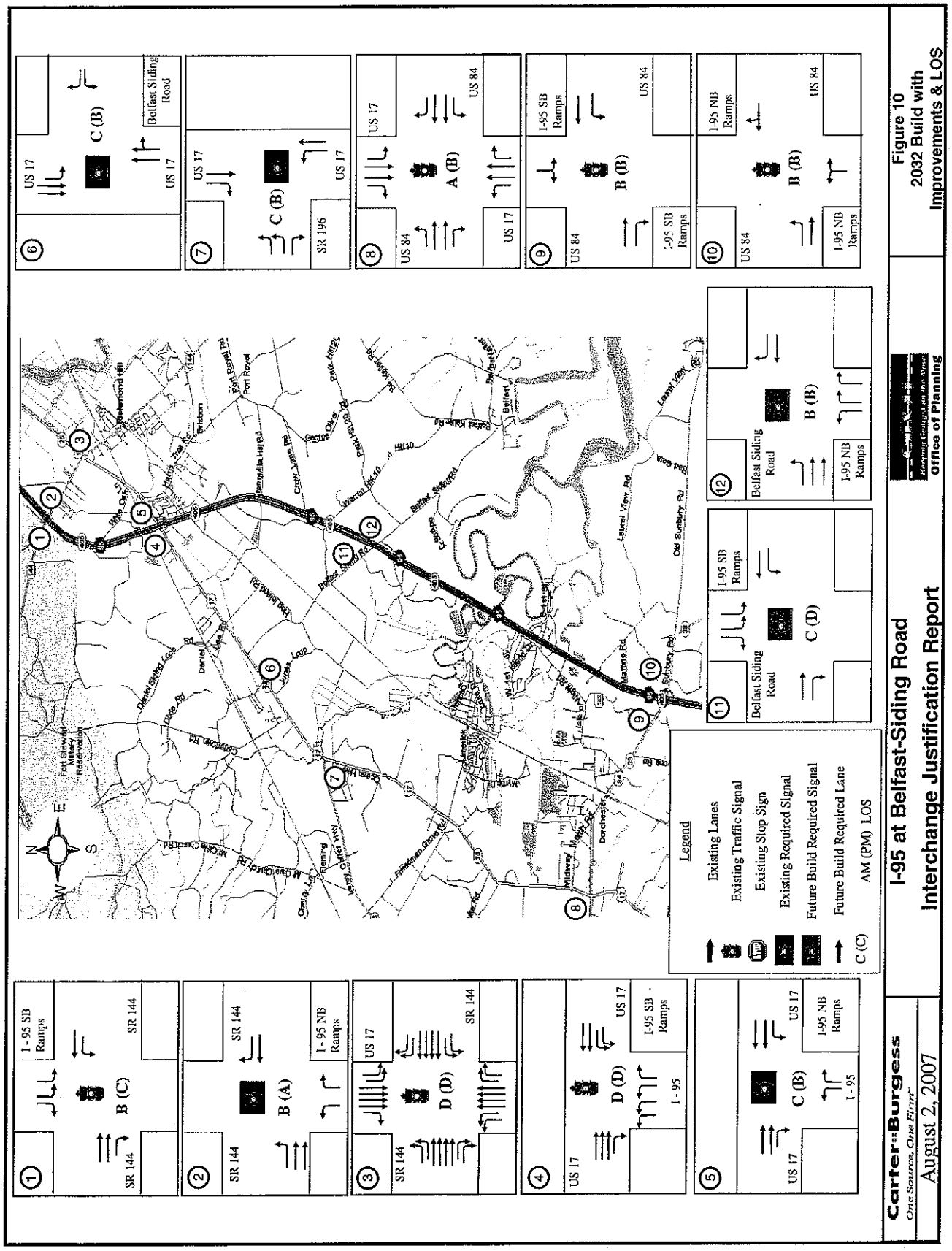
Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements



Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements



Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements



Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Table 4a
Year 2007 Intersection Operations Analysis - Existing Conditions

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	B	19	D	50.4
		Signal w/imp	Overall	C	20.0	D	38.5
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	D	32.6	F	>50
			nb-r	D	32.6	F	>50
			eb-l	A	8.4	A	8.4
		Signal w/imp	Overall	A	8.8	A	6.9
3	US 17 @ SR 144	Signal	Overall	D	43.0	D	51.0
		Signal w/imp	Overall	D	42.9	D	51.1
4	US 17 @ I-95 SB ramps	Signal	Overall	C	31.4	C	21.7
		Signal w/imp	Overall	C	28.3	C	22.4
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>50
			wb-l	B	10.5	A	8.8
		Signal w/imp	Overall	B	13.5	B	11.1
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	B	13.9	B	11.3
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	B	10.9	A	6.8
7	US 17 @ SR 196	Stop Control	nb-l	A	7.9	A	8.3
			eb-l	F	>50	F	>50
			eb-r	A	10.0	B	10.7
		Signal w/imp	Overall	C	24.4	B	14.5
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	7.6	A	8.6
9	US 84 @ I-95 SB ramps	Signal	Overall	A	9.7	A	9.4
10	US 84 @ I-95 NB ramps	Signal	Overall	B	10.9	A	9.9

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Table 4b
Year 2032 Intersection Operations Analysis - No-Build Conditions
(Without new interchange)

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	E	62.5	F	>80
		Signal w/imp	Overall	C	26.3	C	29.1
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	F	>50	F	>50
			nb-r	F	>50	F	>50
			eb-l	A	9.3	A	9.5
		Signal w/imp	Overall	B	19.5	A	9.3
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	47.4	D	54.9
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	C	34.8	C	28.9
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>50
			wb-l	E	36.0	C	16.0
		Signal w/imp	Overall	C	33.3	C	31.3
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	D	29.7	C	17.7
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	C	25.2	B	13.7
7	US 17 @ SR 196	Stop Control	nb-l	A	8.3	A	8.9
			eb-l	F	>50	F	>50
			eb-r	B	11.0	B	12.4
		Signal w/imp	Overall	C	23.2	B	18.4
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	B	10.5	B	10.6
9	US 84 @ I-95 SB ramps	Signal	Overall	B	12.5	B	12.5
10	US 84 @ I-95 NB ramps	Signal	Overall	B	12.4	B	12.4

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Table 4c
Year 2032 Intersection Operations Analysis - Build Conditions
(With new interchange)

Int No.	Intersection	Control	Movement	AM Peak Hour		PM Peak Hour	
				LOS	Delay (sec)	LOS	Delay (sec)
1	SR 144 @ I-95 SB ramps	Signal	Overall	C	34.5	F	>80
		Signal w/imp	Overall	B	20.1	C	23.4
2	SR 144 @ I-95 NB ramps	Stop Control	nb-l	F	>50	F	>50
			nb-r	F	>50	F	>50
			eb-l	A	9.3	A	9.6
		Signal w/imp	Overall	B	13.1	A	9.2
3	US 17 @ SR 144	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	48.6	D	52.0
4	US 17 @ I-95 SB ramps	Signal	Overall	F	>80	F	>80
		Signal w/imp	Overall	D	51.1	D	36.8
5	US 17 @ I-95 NB ramps	Stop Control	nb-lr	F	>50	F	>80
			wb-l	C	16.3	B	12.6
		Signal w/imp	Overall	C	26.3	B	16.5
6	US 17 @ Belfast Siding Road	Stop Control	sb-l	F	>50	F	>50
			wb-lr	F	>50	F	>50
		Signal w/imp	Overall	C	22.6	B	17.5
7	US 17 @ SR 196	Stop Control	nb-l	A	8.3	B	8.9
			eb-l	F	>50	F	>50
			eb-r	B	11.0	B	12.4
		Signal w/imp	Overall	C	23.2	B	18.4
8	US 17 @ US 84 (Sunbury Road)	Signal	Overall	A	8.6	B	10.6
9	US 84 @ I-95 SB ramps	Signal	Overall	B	12.5	B	12.5
10	US 84 @ I-95 NB ramps	Signal	Overall	B	12.4	B	12.4
11	Belfast Siding Road @ I-95 SB ramps	Signal	Overall	C	25.1	D	40.4
12	Belfast Siding Road @ I-95 NB ramps	Signal	Overall	B	14.5	B	11.2

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Table 5a
Year 2007 Freeway Analysis - Existing Conditions

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	C	21.2	B	14.1
	SB	B	14.1	C	21.2
I-95 between US 84 and US 17	NB	C	23.5	B	15.4
	SB	B	15.4	C	23.5
I-95 between US 17 and SR 144	NB	D	32.9	C	19.8
	SB	C	19.8	D	32.9
I-95 north of SR 144	NB	F	>45	C	25.8
	SB	C	25.8	F	>45

Table 5b
Year 2032 Freeway Analysis - No-Build Conditions
(Without New Interchange)

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and US 17	NB	C	18.1	B	12.7
	SB	B	12.7	C	18.1
I-95 between US 17 and SR 144	NB	C	22.4	B	14.9
	SB	B	14.9	C	22.4
I-95 north of SR 144	NB	D	29.4	C	19.5
	SB	C	19.5	D	29.4

- Analysis includes I-95 widening project to eight lanes

Table 5c
Year 2032 Freeway Analysis - Build Conditions
(With New Interchange)

Freeway Section	Direction	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 south of US 84	NB	B	16.5	B	11.8
	SB	B	11.8	B	16.5
I-95 between US 84 and Belfast Siding Rd	NB	C	18.1	B	12.7
	SB	B	12.7	B	18.1
I-95 between Belfast Siding Rd and US 17	NB	C	22.3	B	14.5
	SB	B	14.5	C	22.3
I-95 between US 17 and SR 144	NB	C	27.4	B	16.8
	SB	B	16.8	C	27.4
I-95 north of SR 144	NB	D	35.0	C	20.8
	SB	C	20.8	D	35.0

- Analysis includes I-95 widening project to eight lanes

Attachment B
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Capacity Analysis Results
and Recommended Road and Intersection Improvements

Table 6a
Year 2007 Merge and Diverge Analysis - Existing Conditions

Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	C	25.2	B	16.7
	On	C	27.6	B	19.0
I-95 SB Ramps @ US 84	Off	B	18.2	C	27.8
	On	B	17.7	C	25.4
I-95 NB Ramps @ US 17	Off	C	27.8	B	18.2
	On	D	34.3	C	23.6
I-95 SB Ramps @ US 17	Off	C	23.6	E	35.5
	On	B	19.0	C	27.7
I-95 NB Ramps @ SR 144	Off	E	35.5	C	23.6
	On	F	40.8	D	29.4
I-95 SB Ramps @ SR 144	Off	D	30.1	E	36.2
	On	C	23.9	D	34.7

Table 6b
Year 2032 Merge and Diverge Analysis - No-Build Conditions
(Without New Interchange)

Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	B	17.6	B	12.7
	On	B	17.3	B	13.3
I-95 SB Ramps @ US 84	Off	B	14.9	C	21.4
	On	B	12.2	B	15.9
I-95 NB Ramps @ US 17	Off	C	20.9	B	16.2
	On	C	20.5	B	16.6
I-95 SB Ramps @ US 17	Off	C	21.6	D	30.9
	On	B	13.8	B	17.2
I-95 NB Ramps @ SR 144	Off	C	24.3	B	16.3
	On	C	22.6	B	19.1
I-95 SB Ramps @ SR 144	Off	C	27.3	E	37.3
	Off w/2 lanes	B	12.3	B	19.2
	On	B	14.7	C	20.3

- Analysis includes I-95 widening project to eight lanes
- Analysis assumes one lane on ramp

Table 6c
Year 2032 Merge and Diverge Analysis - Build Conditions
(With New Interchange)

Ramp	On/Off	AM Peak Hour		PM Peak Hour	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
I-95 NB Ramps @ US 84	Off	B	16.8	B	11.4
	On	B	16.8	B	12.4
I-95 SB Ramps @ US 84	Off	B	13.6	C	20.7
	On	B	11.2	B	15.4
I-95 NB Ramp @ Belfast Siding Rd	Off	B	18.7	B	13.2
	On	C	20.5	B	15.0
I-95 SB Ramps @ Belfast Siding Rd	Off	B	17.6	D	28.5
	On	B	12.6	B	17.2
I-95 NB Ramps @ US 17	Off	C	25.0	B	17.9
	On	C	22.1	B	17.4
I-95 SB Ramps @ US 17	Off	C	23.4	E	35.0
	Off w/ 2 lanes	A	9.1	B	17.3
	On	B	14.9	C	20.1
I-95 NB Ramps @ SR 144	Off	D	28.6	B	18.2
	On	C	23.9	B	19.5
I-95 SB Ramps @ SR 144	Off	C	25.5	F	38.0
	Off w/ 2 lanes	B	12.0	B	19.3
	On	B	16.2	C	23.4

- Analysis includes I-95 widening project to eight lanes
- Analysis assumes one lane on ramp

Attachment C
Analysis of Additional Growth Proposed by Bryan County

Attachment C
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Analysis of Additional Growth Proposed By Bryan County

As requested, the Department's consultant, Jacobs Carter Burgess, examined supplemental data for the I-95 at Belfast Siding Road IJR provided by King Engineering in December 2007 on behalf of Bryan County. This new information was considered to determine if the future development intensity in southern Bryan County will warrant additional analysis related to the Interchange Justification Report (IJR).

The data provided by King Engineering included traffic generation information from two data sources:

- The first data source is the draft Bryan County Transportation Plan, which indicates a total trip generation of 52,000 vehicles per day due to new development through 2027.
- The second data source is the Thomas & Hutton Information (as depicted on a map of Southern Bryan County), which includes 458,000 vehicles per day at "buildout" due to new development (excluding six DRIs that are not close enough to effect interchange operations). This assumes 23,000 acres of unspecified, undeveloped land generating 241,000 daily trips. These areas are anticipated by to develop by Bryan County, but may not fully develop by year 2032. Without this unspecified "buildout" development, 217,000 new trips were forecast in the Thomas & Hutton Plan.

The Jacobs Carter Burgess analysis indicated 194,000 trips due to development, plus additional background traffic growth of 2.7% per year from 2007 through 2012 and 1.35% per year from 2013 through 2032. This background traffic growth represents growth not anticipated in the specified development plans, as well as growth in external through trips. The background traffic growth, calculated based on the percentages above will result in an additional 92,000 vehicles per day in 2032 for travel along US 17, SR 141, and I-95. This total increase of 286,000 vehicles per day is due to specific developments and background growth already included in the IJR analysis. The analysis performed to date for the IJR indicated the I-95 at US 17 interchange could accommodate the assumed growth through year 2046. Table 1 compares the information from the Bryan County Transportation Plan (BCTP), Thomas & Hutton information (THP), and Jacobs Carter Burgess Analysis.

In order to determine the impacts of the additional development identified in the BCTP and THP, additional analyses have been performed. The previous analysis had assumed generation of 286,000 total trips due to specified and unspecified development in the area (corresponding to a 30 percent buildout of the unspecified development from the THP). If all land is developed to the proposed density by 2032, the THP projected a total of 458,000 trips to occur per day. To account for the difference between these projections, new 2032 volumes were developed and used to analyze future traffic conditions for the I-95 at US 17 interchange. This interchange was examined to determine if it could be improved to accommodate the future traffic without a new interchange.

Attachment C
Interchange Study for I-95 at Belfast Siding Road in Bryan County
Analysis of Additional Growth Proposed By Bryan County

Table 1
Comparison of Assumed Trip Generation

Source	Daily Trips Due to Specified Development	Daily Trips due to unspecified development	Horizon Year for Unspecified Development	Total Trips
Draft Bryan County Transportation Plan	52,300 (both specified /approved sites and unspecified developable land)		2,027	52,300
Thomas & Hutton Information	217,000	241,000	Buildout[1]	458,000
Jacobs Carter Burgess Analysis	194,000	92,000	2,032	286,000

[1] The Thomas & Hutton Information assumes buildout of 23,000 acres not currently having development plans. The Jacobs Carter Burgess analysis assumes an equivalent trip generation to a 30% buildout of this area by year 2032.

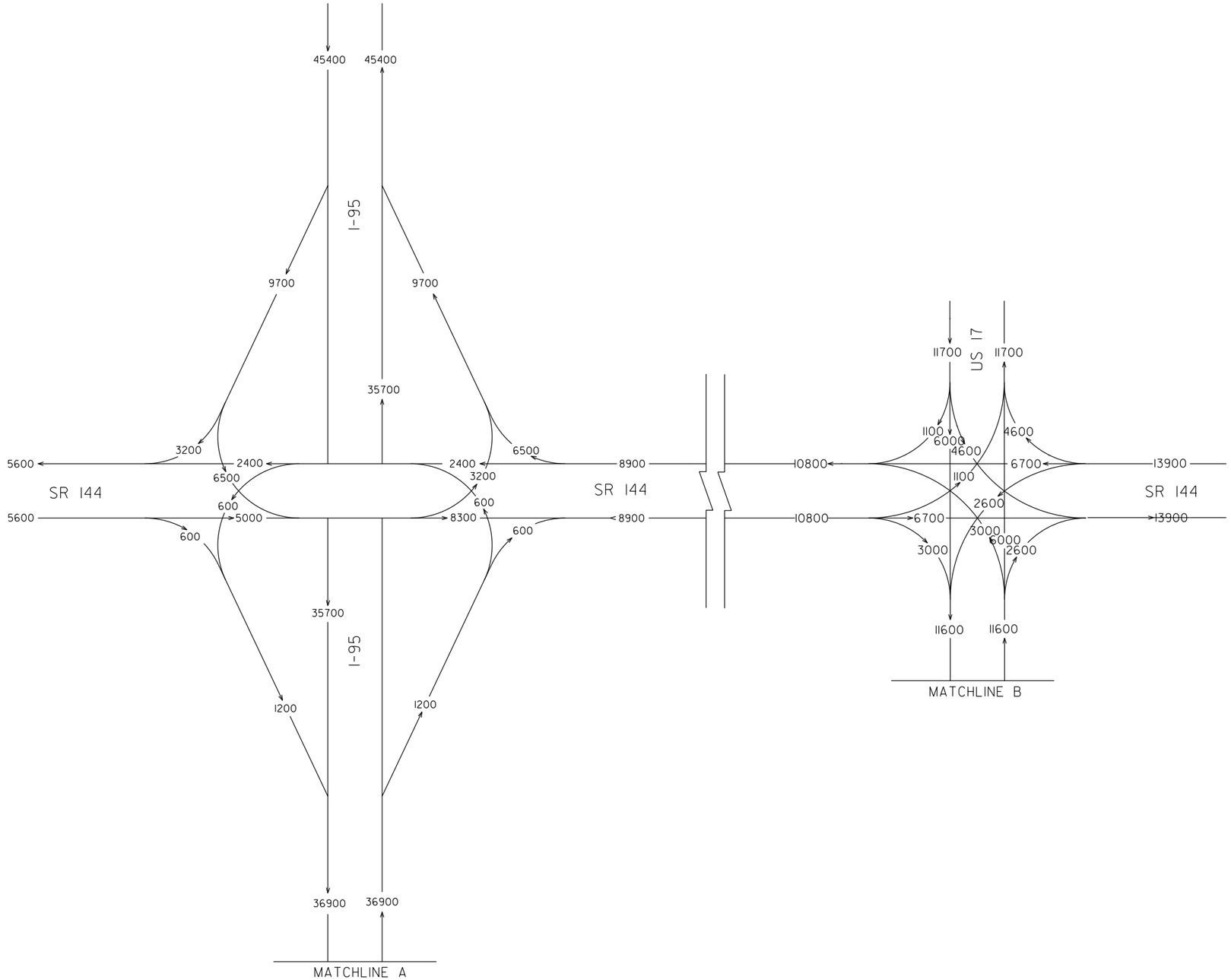
The existing and future year (2032) volumes from the IJR study were used to develop new volumes, which account for the additional development. An adjustment factor was applied to the previously calculated growth, in order to account for the difference between the 30 percent buildout scenario assumed in the IJR study and the complete buildout assumed in the THP. The difference between the existing and future year (2032) volumes from the IJR analysis was multiplied by a factor of 1.6 (calculated as 458,000 / 286,000), to adjust this growth to match what is proposed in the THP.

With the new 2032 volumes, traffic analyses were performed to determine the impact of the additional development. According to the Synchro analysis, the interchange of I-95 at US 17 would be able to handle 85 percent of the development projected by the THP for horizon year 2032 with three through lanes in each direction. Although the interchange is expected to sustain the traffic associated with 85 percent of complete buildout, nearby intersections may not. Locations, such as the intersection of US 17 and SR 144 will fail before this horizon year if additional improvements are not made to the transportation network.

If improved to four through lanes in each direction, the I-95 at US 17 interchange could sustain the traffic generated by complete buildout of the area through the horizon year 2032. However with the full buildout indicated in the THP, the configuration with four though lanes in each direction will break down by year 2035.

Appendix C – Traffic Flow Diagrams

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	3



BRYAN COUNTY IJR

2007 EXISTING ADT = 000

T = 15%

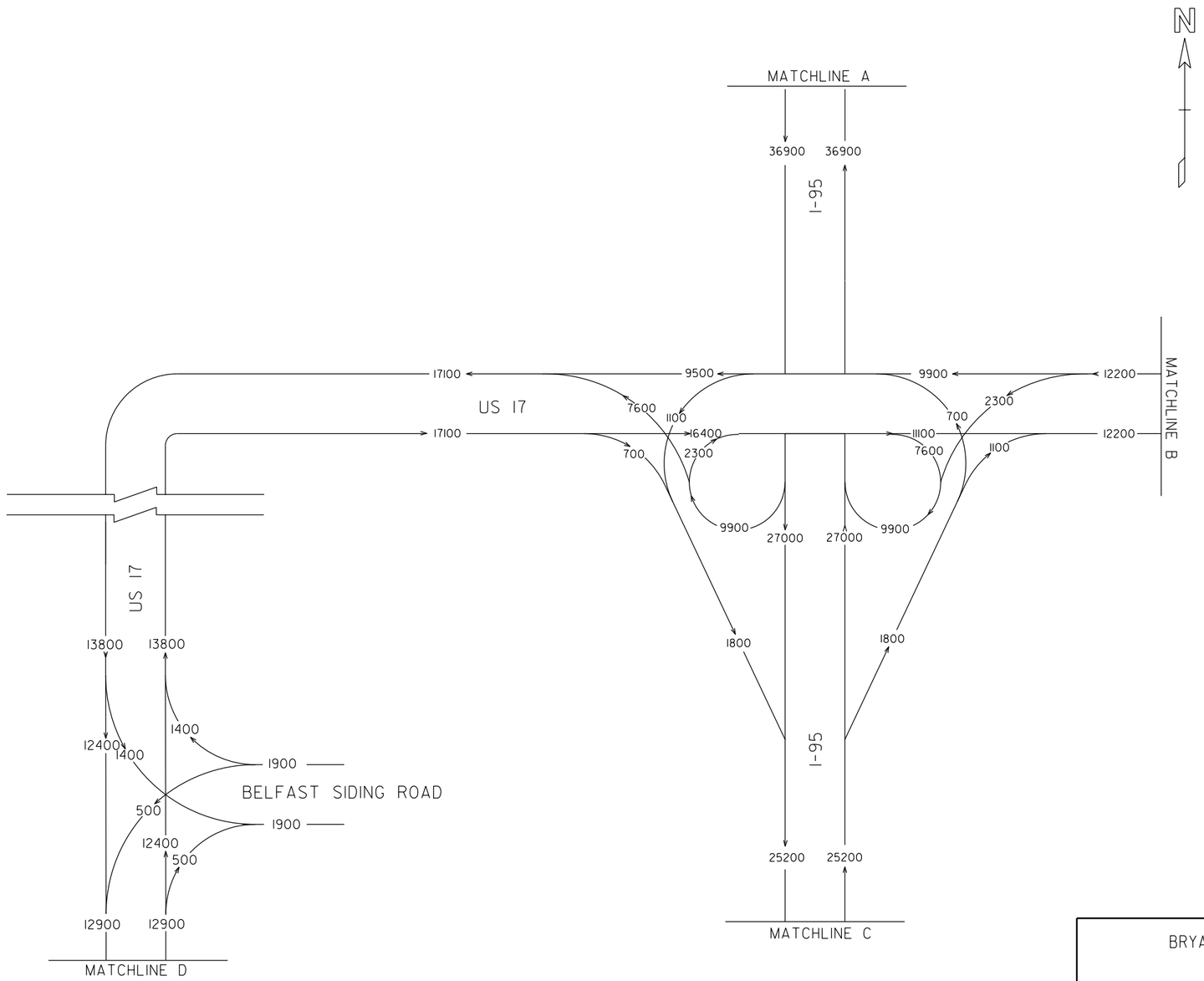
JACOBS

FIGURE C-1-1

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	3



BRYAN COUNTY IJR

2007 EXISTING ADT = 000

T = 15%

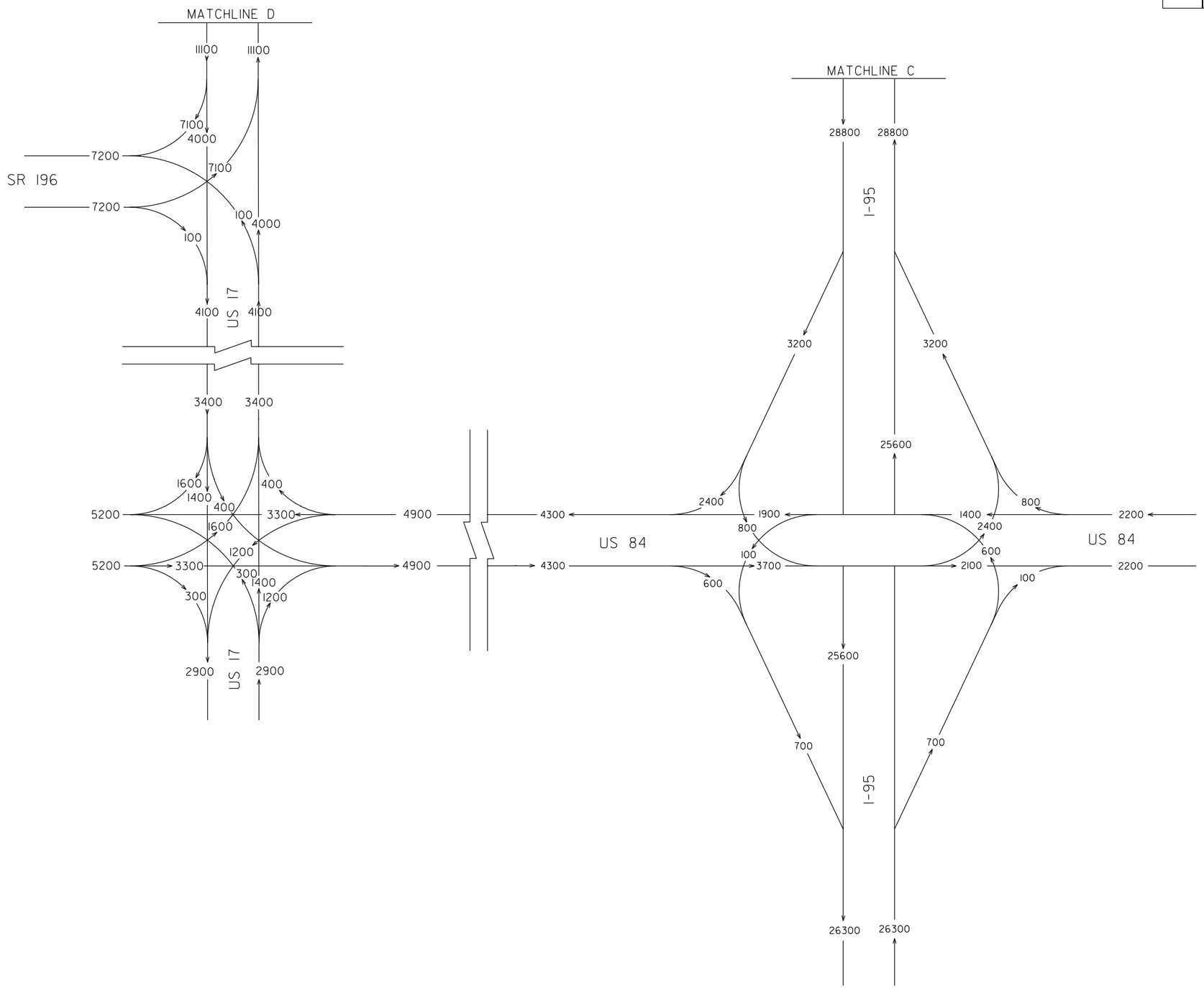
JACOBS

FIGURE C-I-2

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		3	3



BRYAN COUNTY IJR

2007 EXISTING ADT = 000

T = 15%

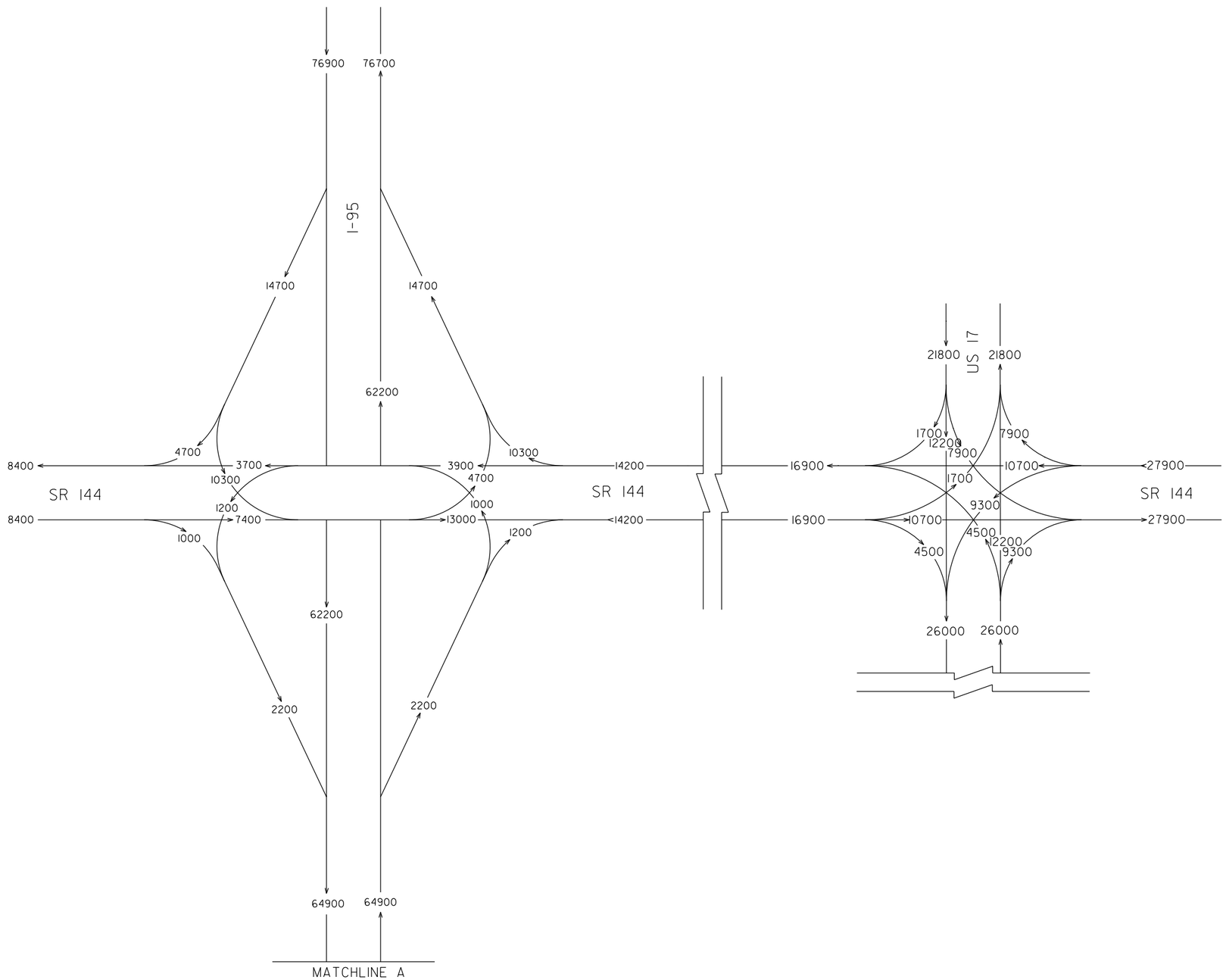
JACOBS

FIGURE C-I-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	4



BRYAN COUNTY IJR

2032 BUILD BALANCED ADT = 000

T = 15%

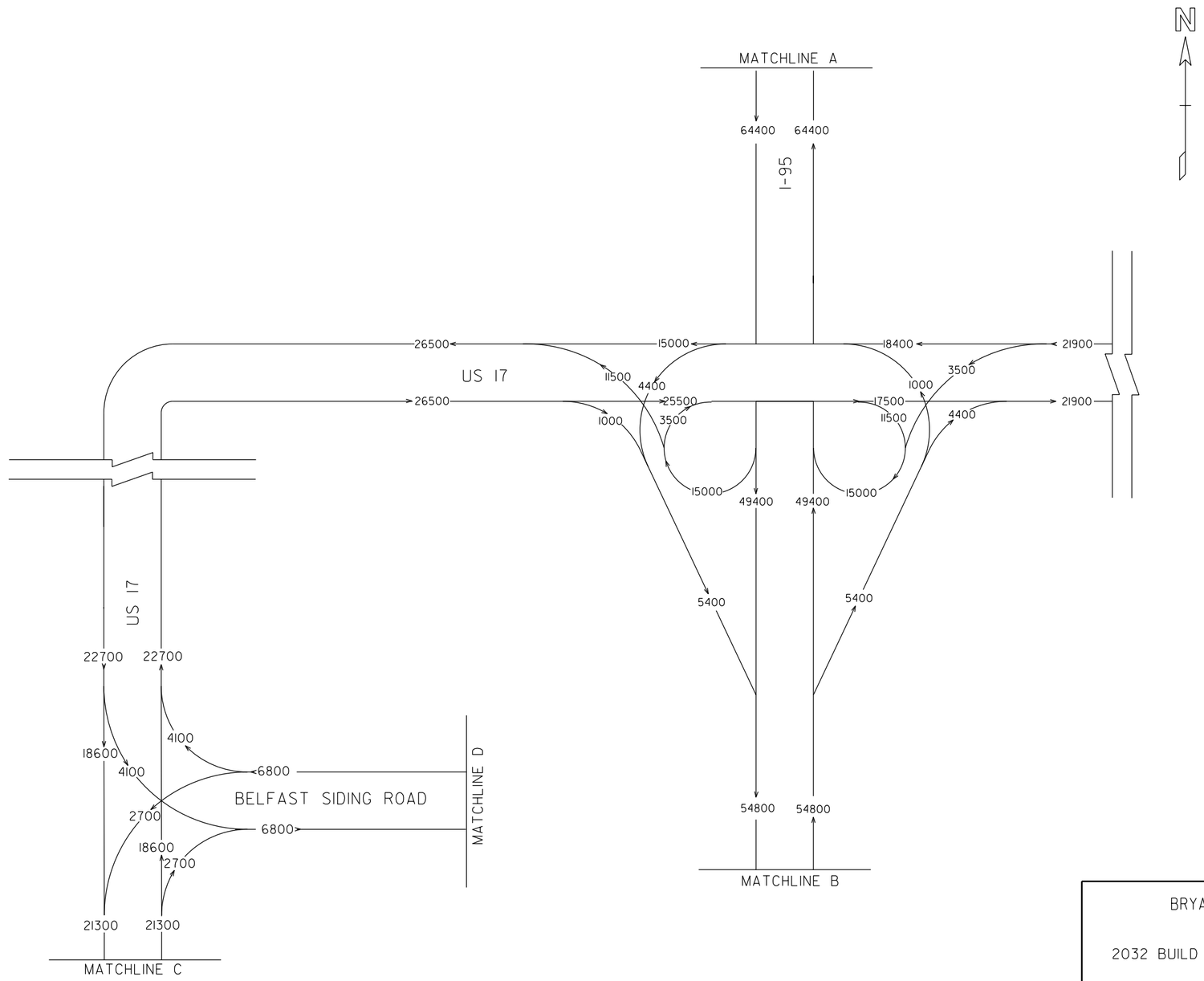
JACOBS

FIGURE C-2-1

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	4



BRYAN COUNTY IJR

2032 BUILD BALANCED ADT = 000

T = 15%

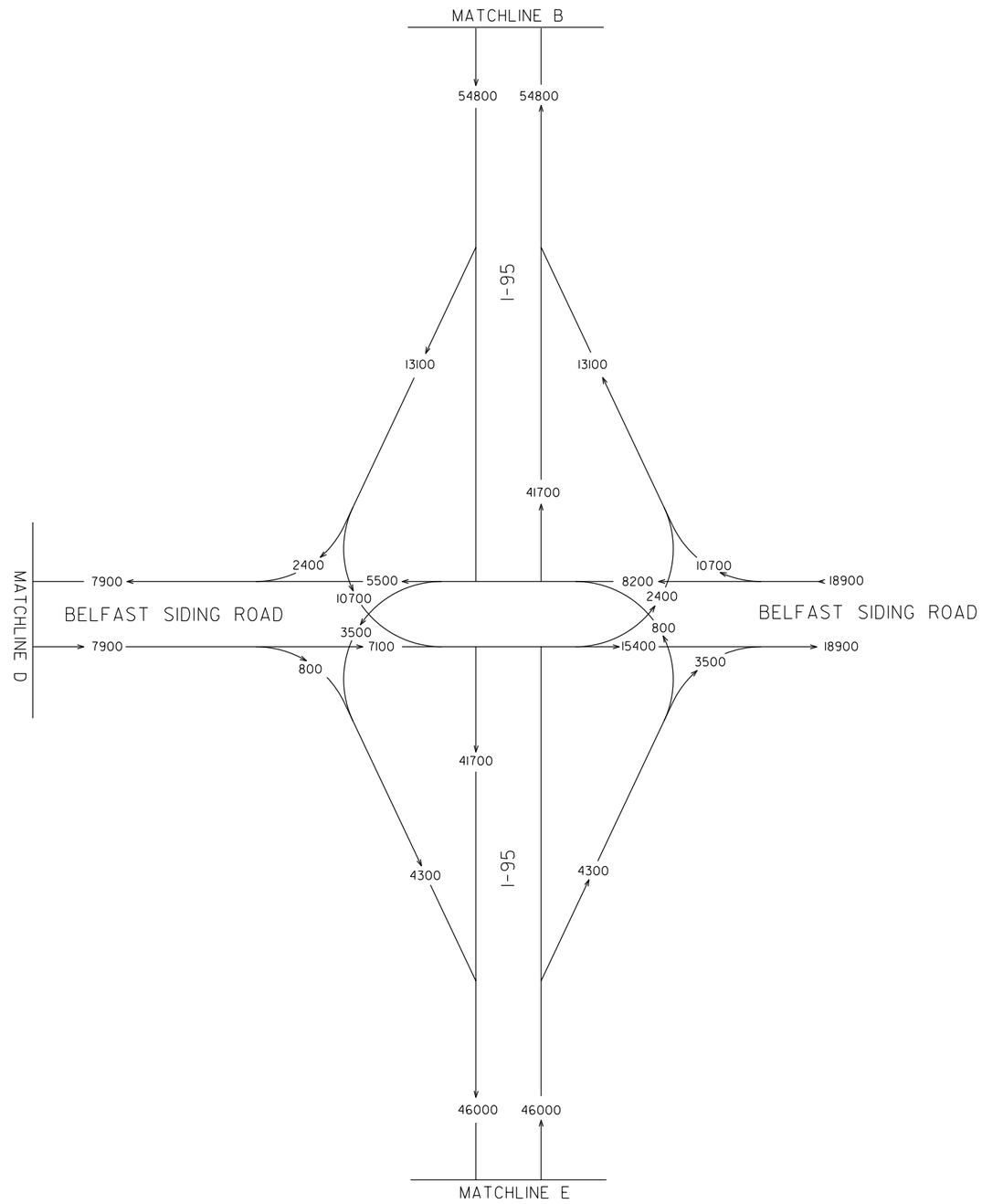
JACOBS

FIGURE C-2-2

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.		3	4



N

BRYAN COUNTY IJR

2032 BUILD BALANCED ADT = 000

T = 15%

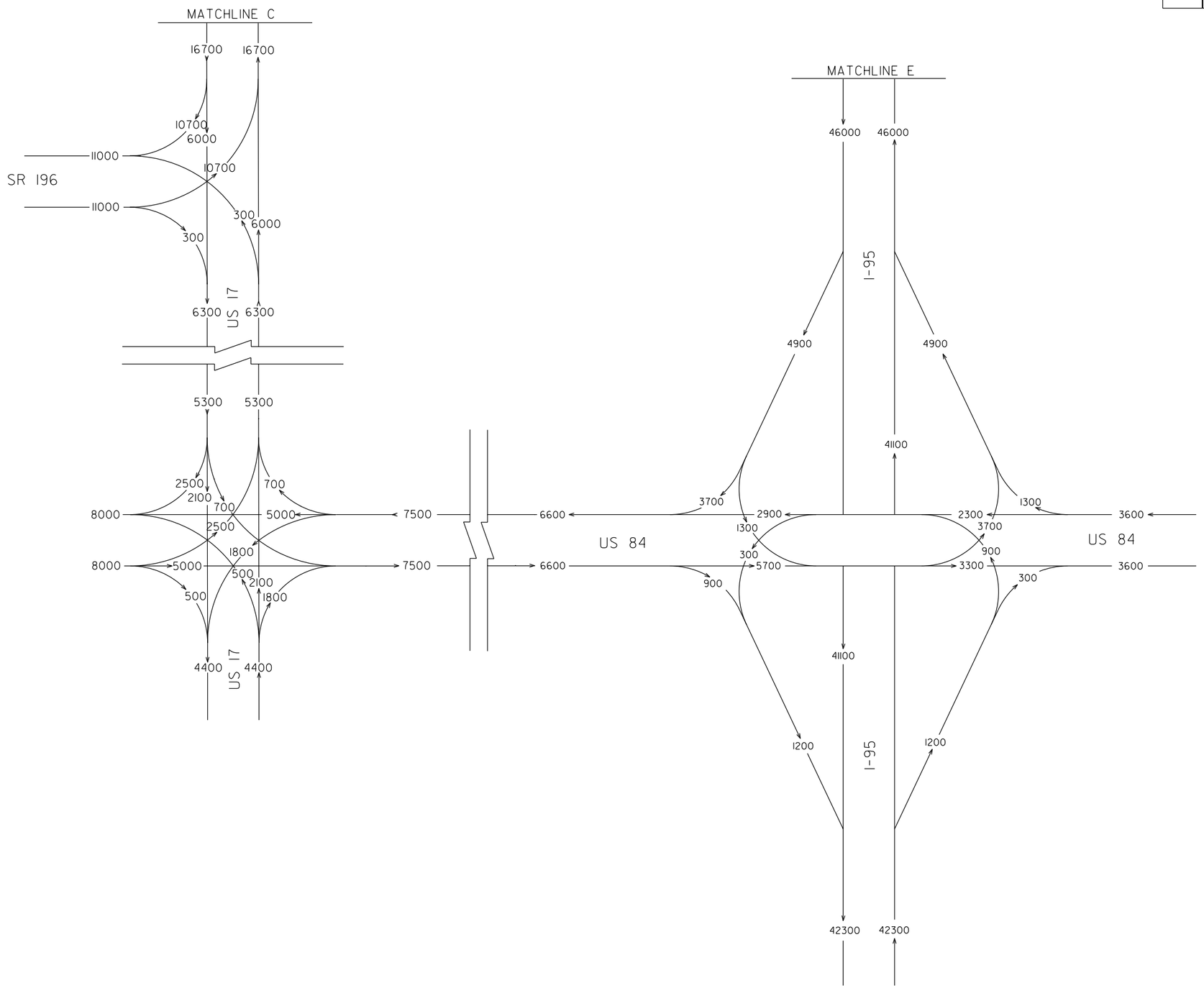
JACOBS

FIGURE C-2-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		4	4



BRYAN COUNTY IJR

2032 BUILD BALANCED ADT = 000

T = 15%

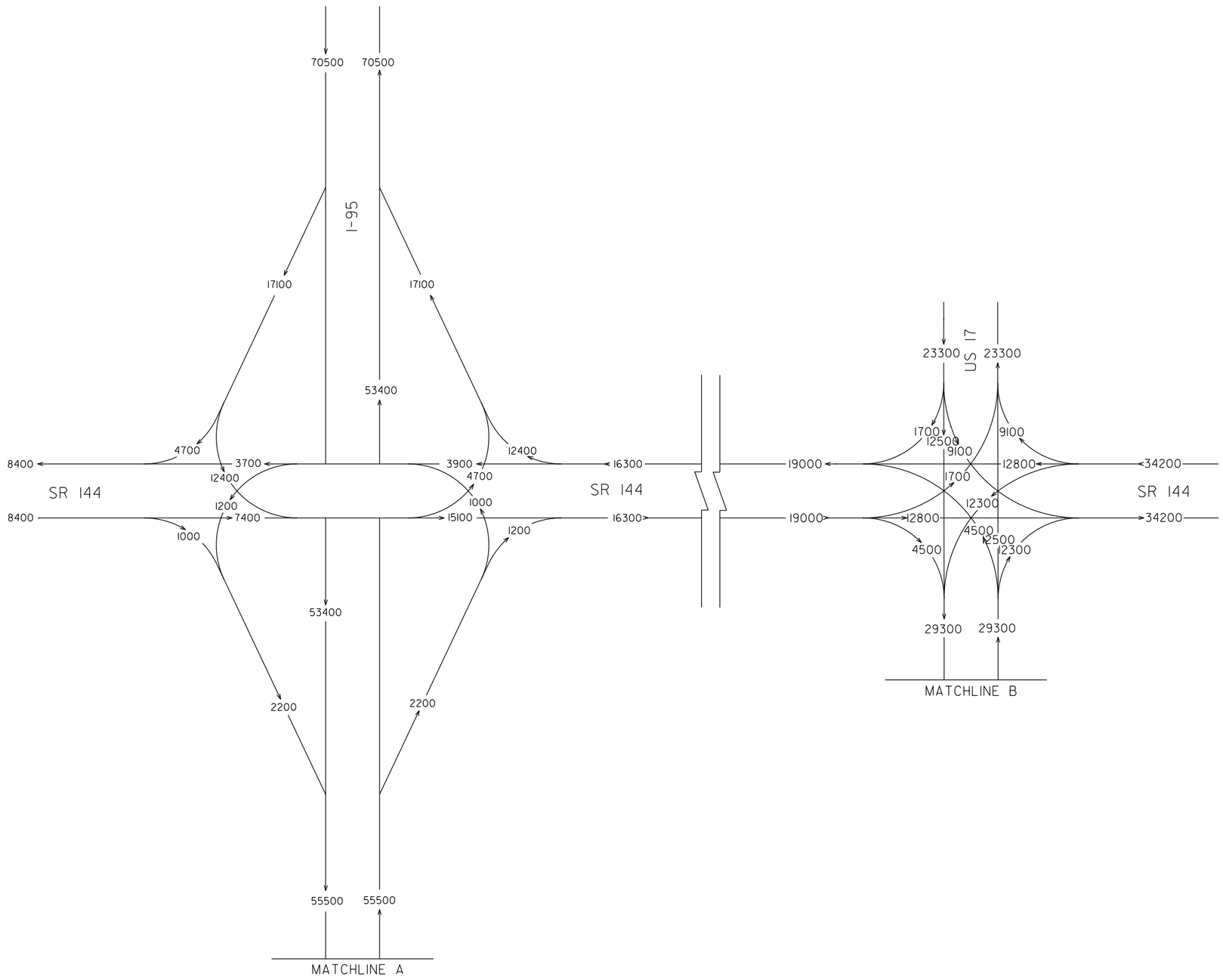
JACOBS

FIGURE C-2-4

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	3



BRYAN COUNTY IJR

2032 NO BUILD BALANCED ADT = 000

T = 15%

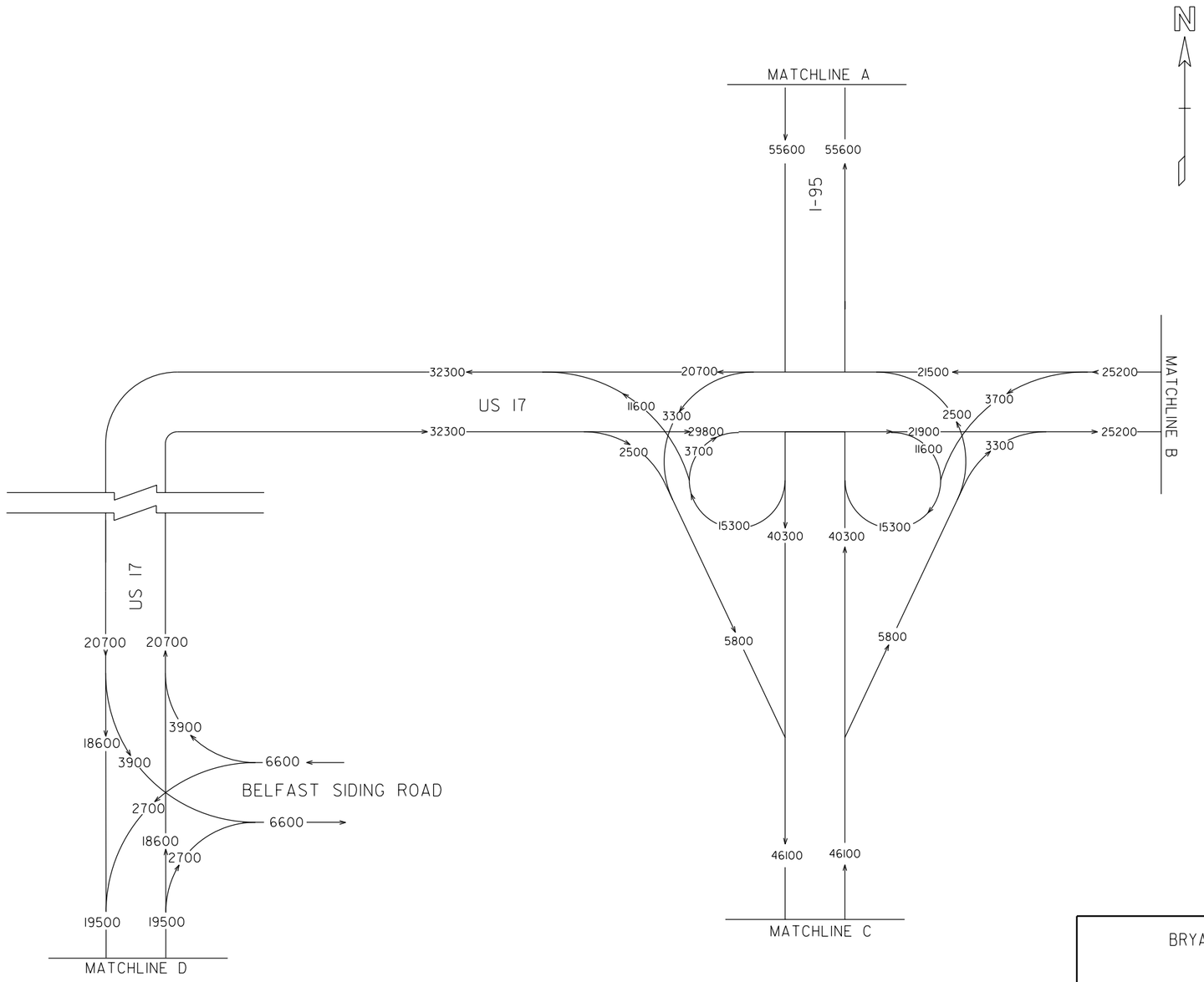
JACOBS

FIGURE C-3-1

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	3



BRYAN COUNTY IJR

2032 NO BUILD BALANCED ADT = 000

T = 15%

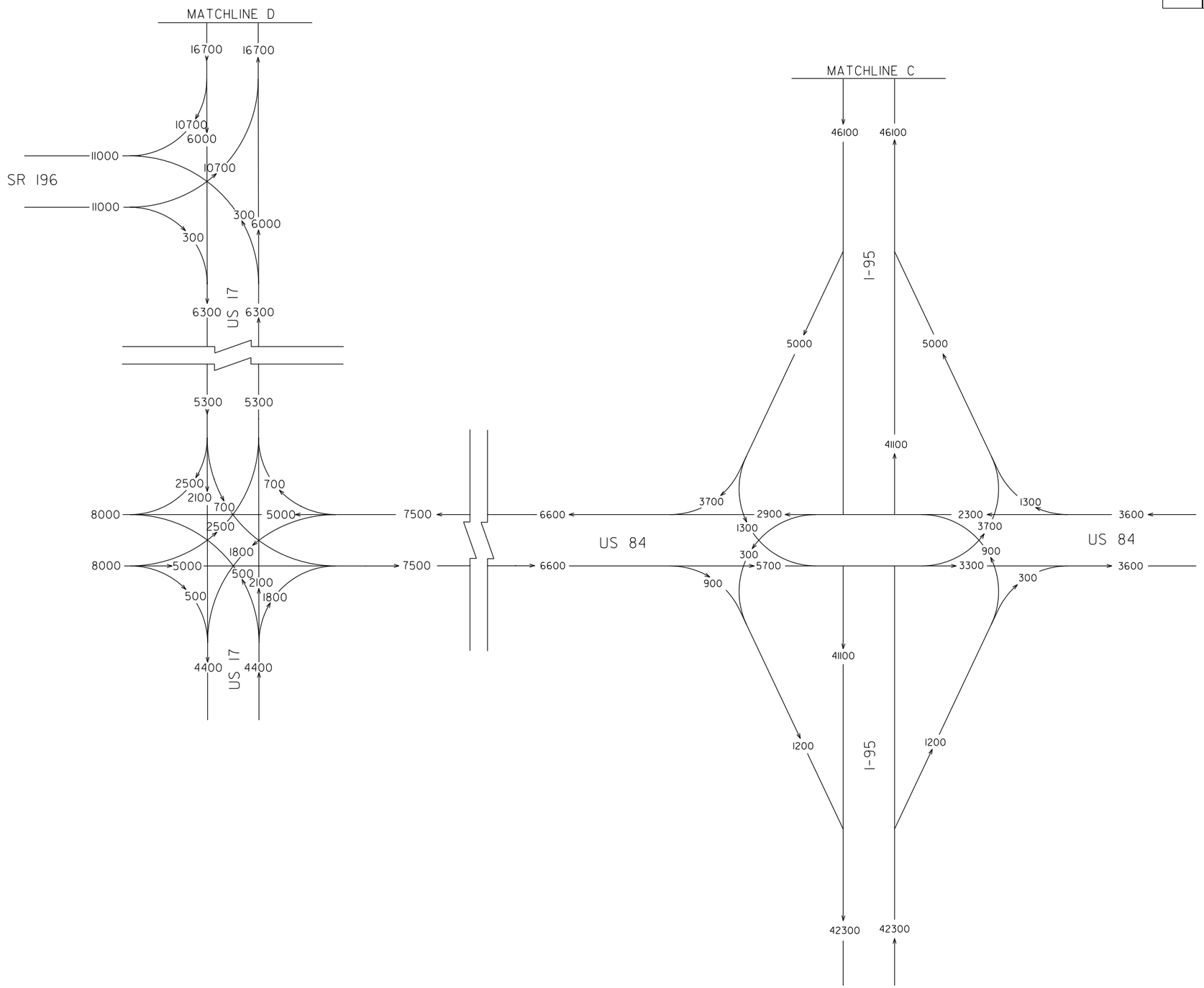
JACOBS

FIGURE C-3-2

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		3	3



BRYAN COUNTY IJR

2032 NO BUILD BALANCED ADT = 000

T = 15%

JACOBS

FIGURE C-3-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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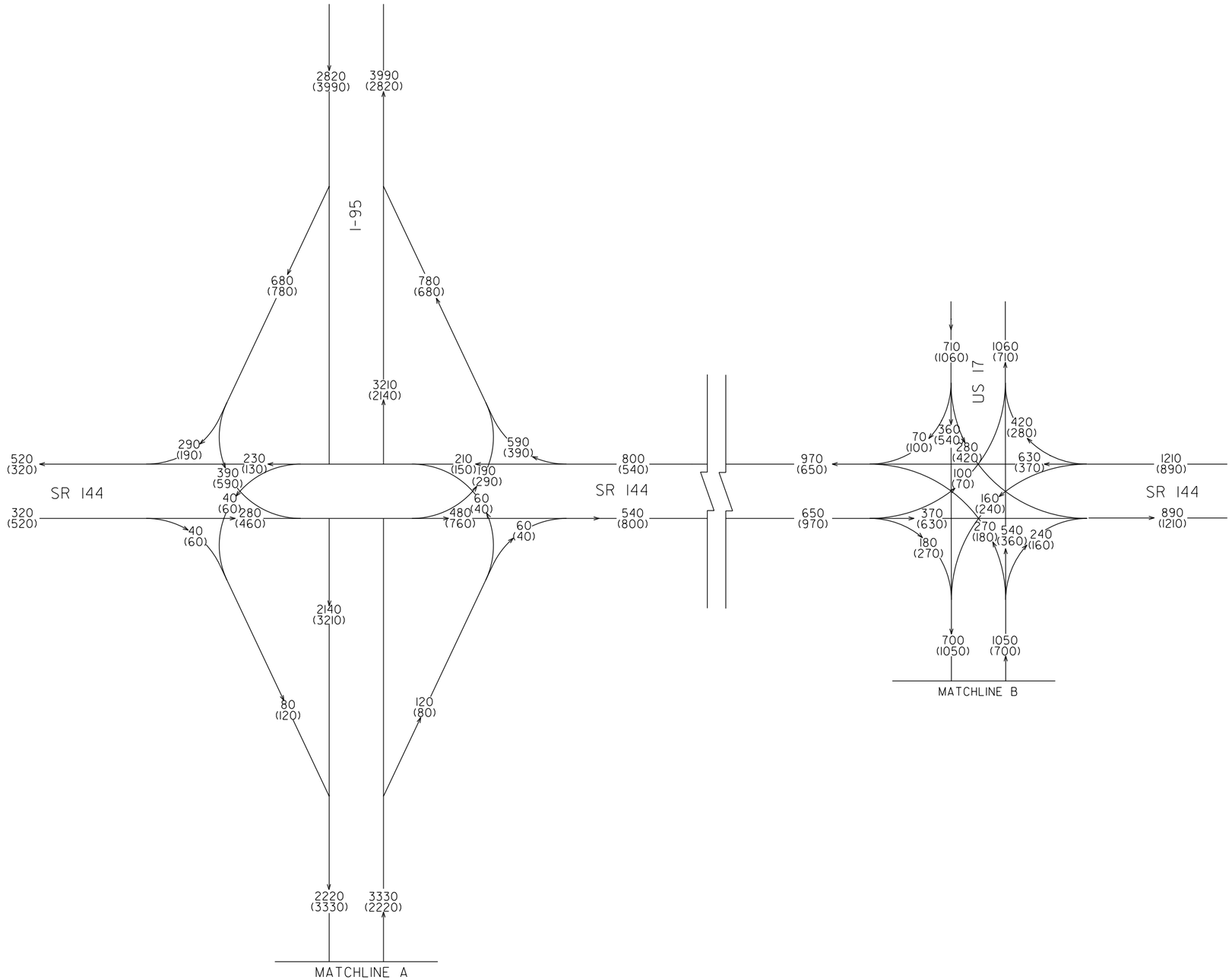


BRYAN COUNTY IJR

2007 PEAK HOUR AM(PM) = 000(000)

T = 15%

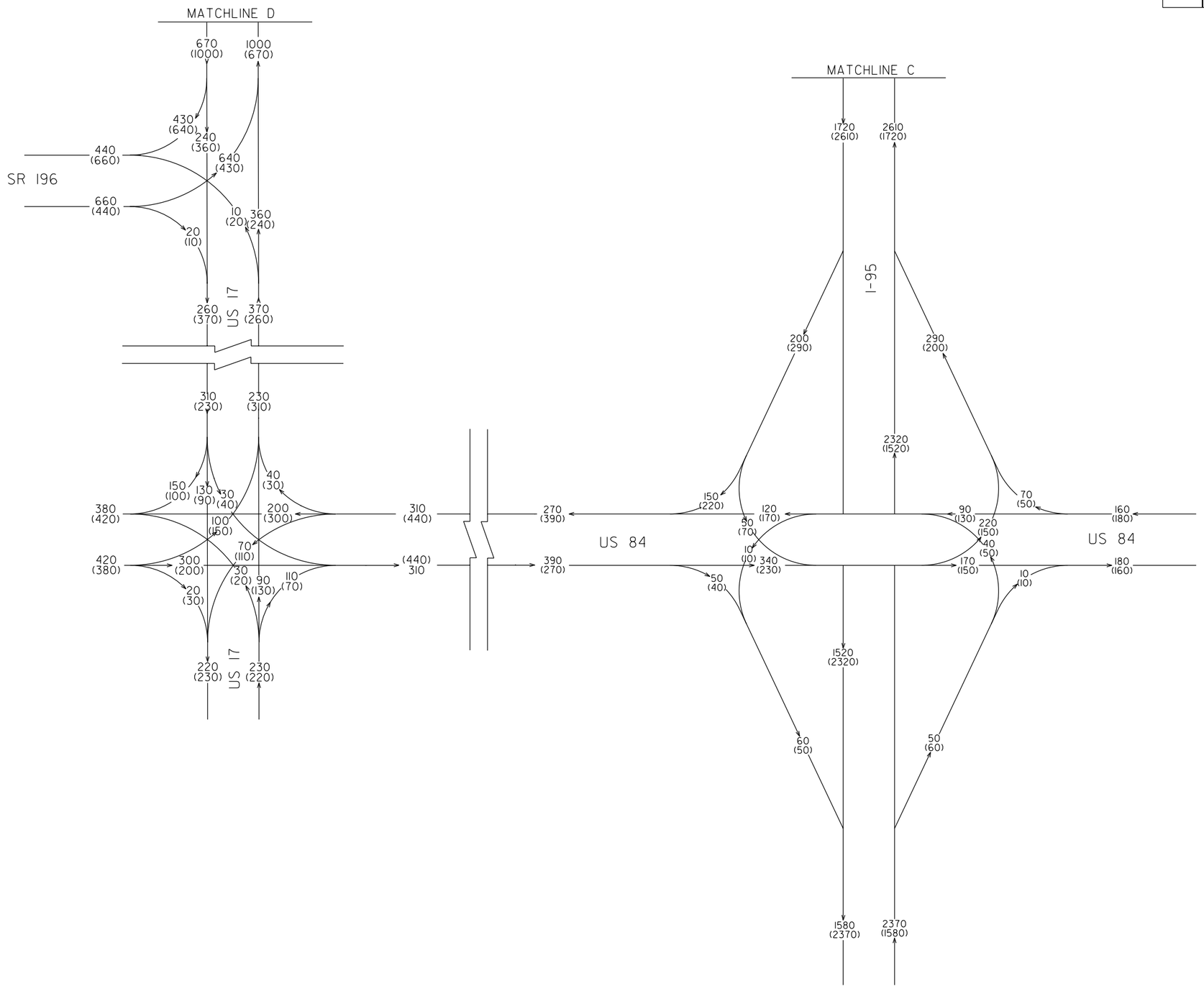
JACOBS

FIGURE C-4-1

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	3



BRYAN COUNTY IJR

2007 PEAK HOUR AM(PM) = 000(000)

T = 15%

JACOBS

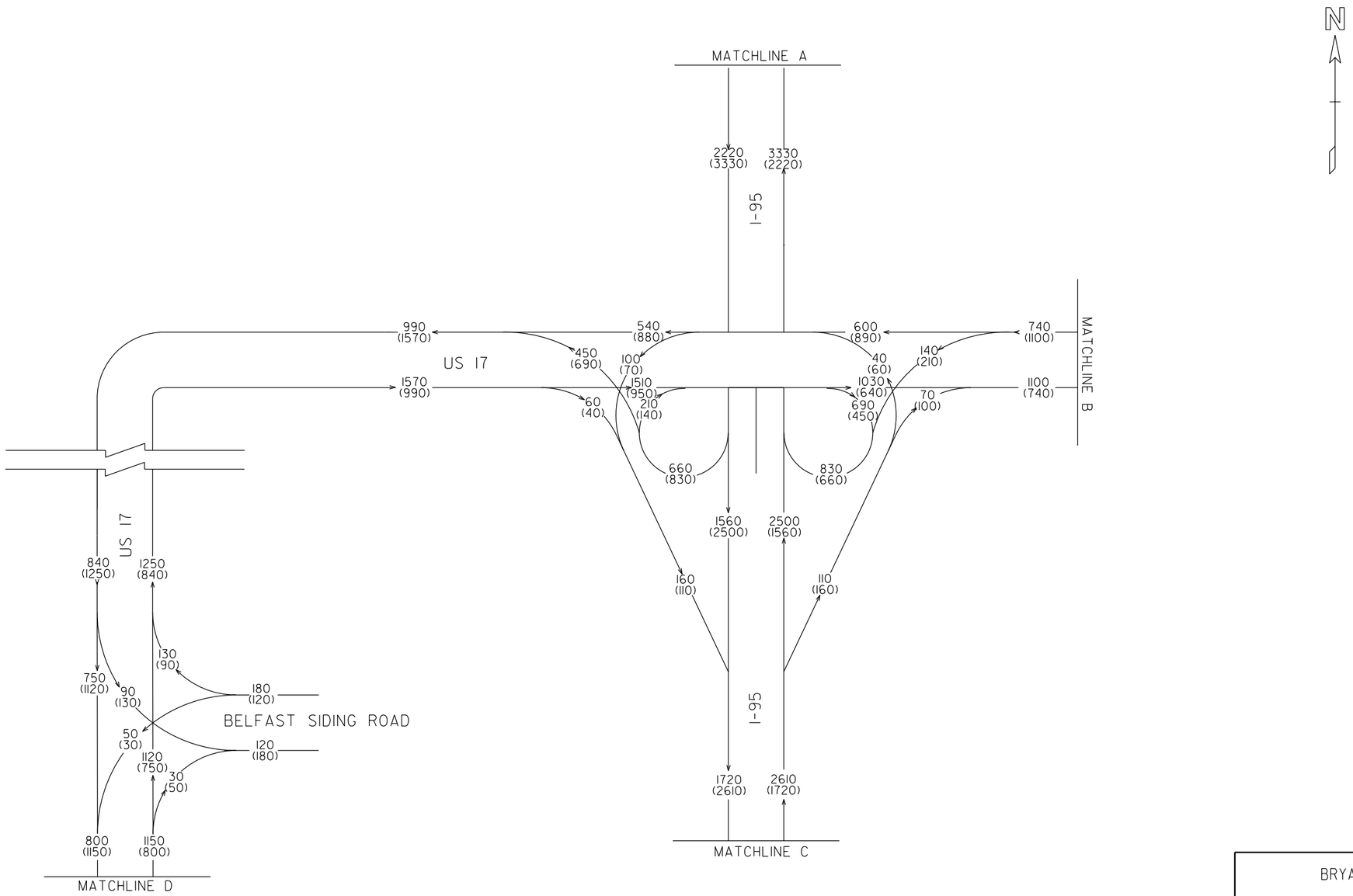
FIGURE C-4-2

SCALE: N.T.S.

OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		3	3



BRYAN COUNTY IJR

2007 PEAK HOUR AM(PM) = 000(000)

T = 15%

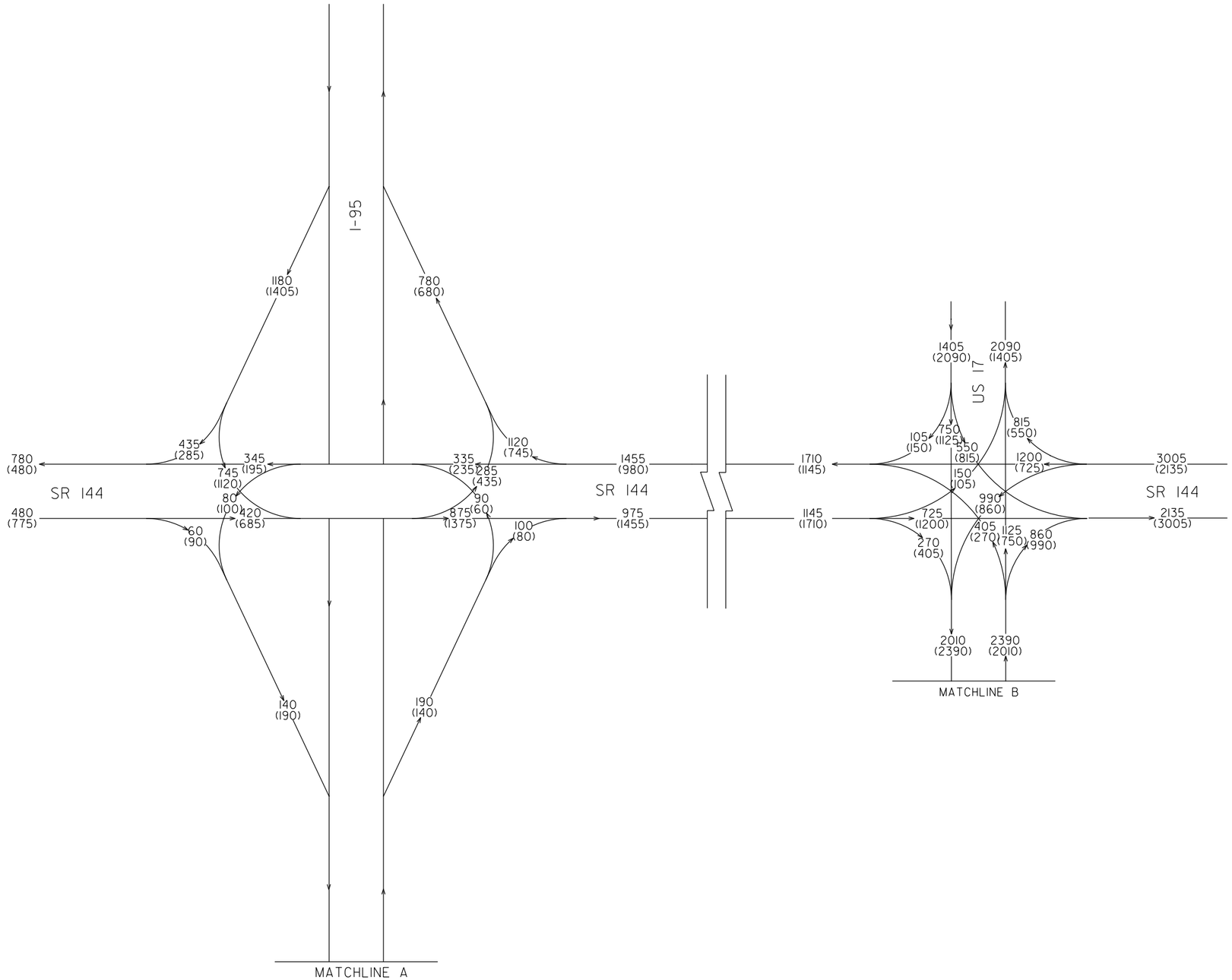
JACOBS

FIGURE C-4-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	3



BRYAN COUNTY IJR

2032 NO-BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

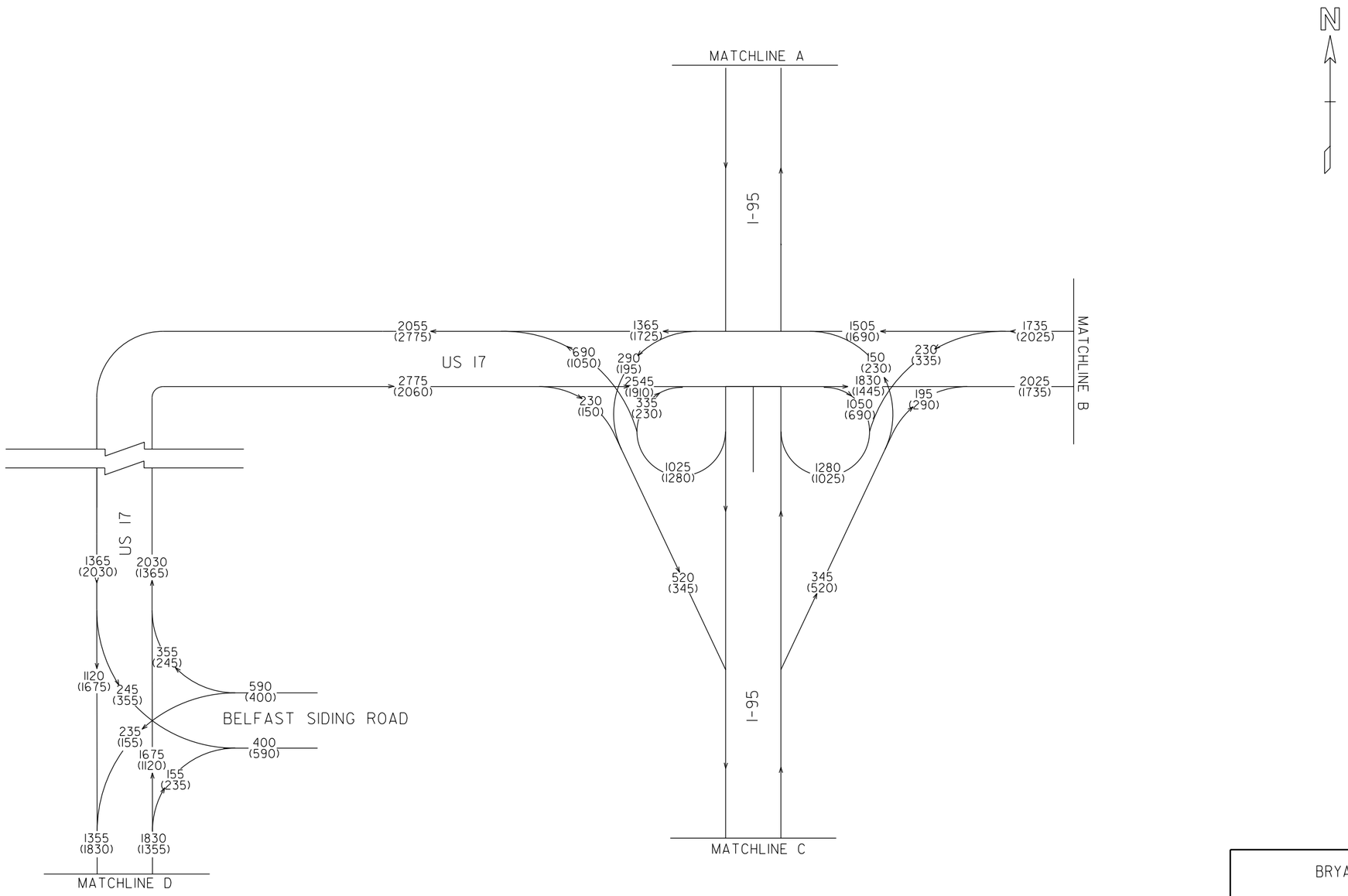
JACOBS

FIGURE C-5-1

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	3



BRYAN COUNTY IJR

2032 NO-BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

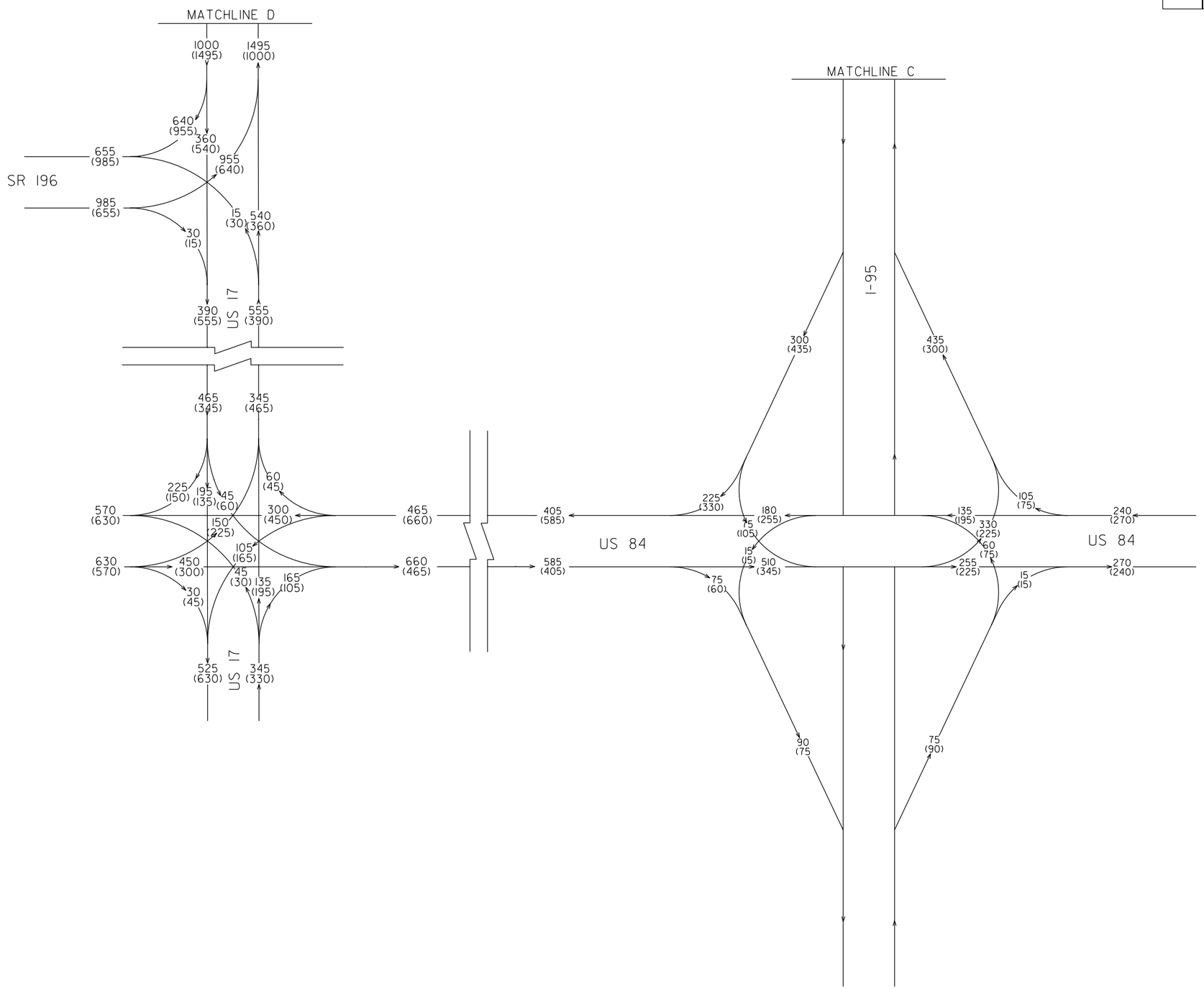
JACOBS

FIGURE C-5-2

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		3	3



BRYAN COUNTY IJR

2032 NO-BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

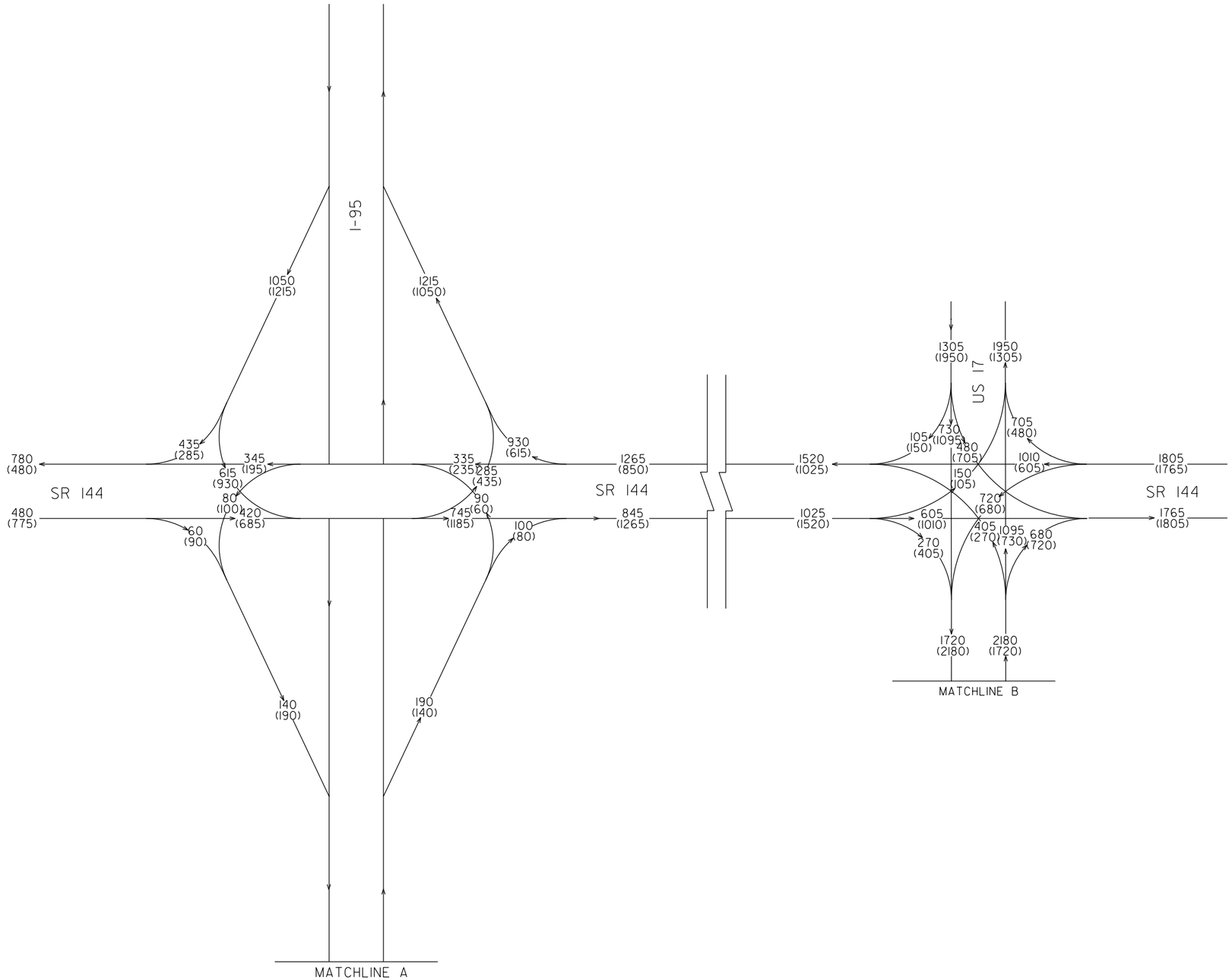
JACOBS

FIGURE C-5-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	4



BRYAN COUNTY IJR

2032 BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

JACOBS

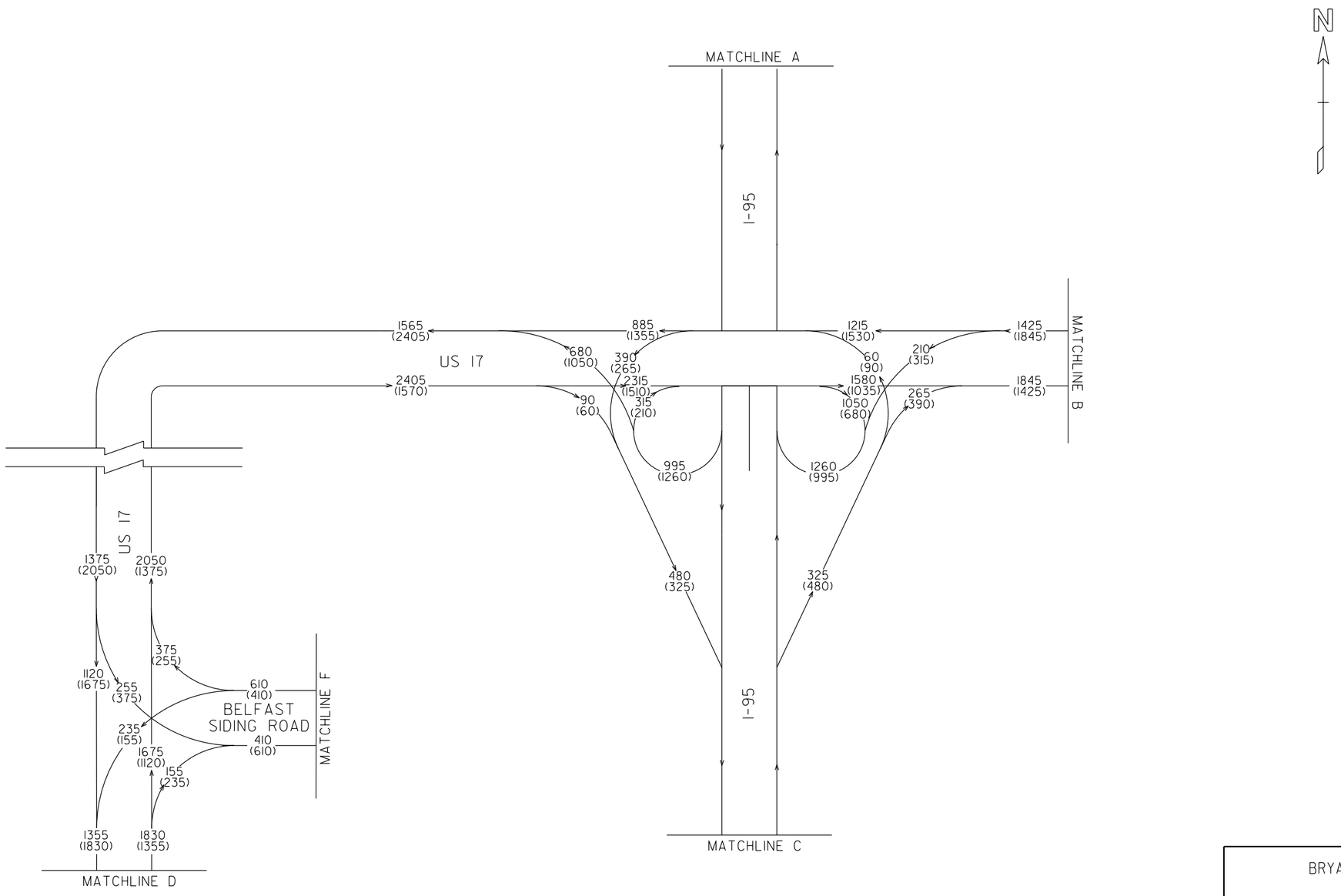
FIGURE C-6-1

SCALE: N.T.S.

OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		2	4



BRYAN COUNTY IJR

2032 BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

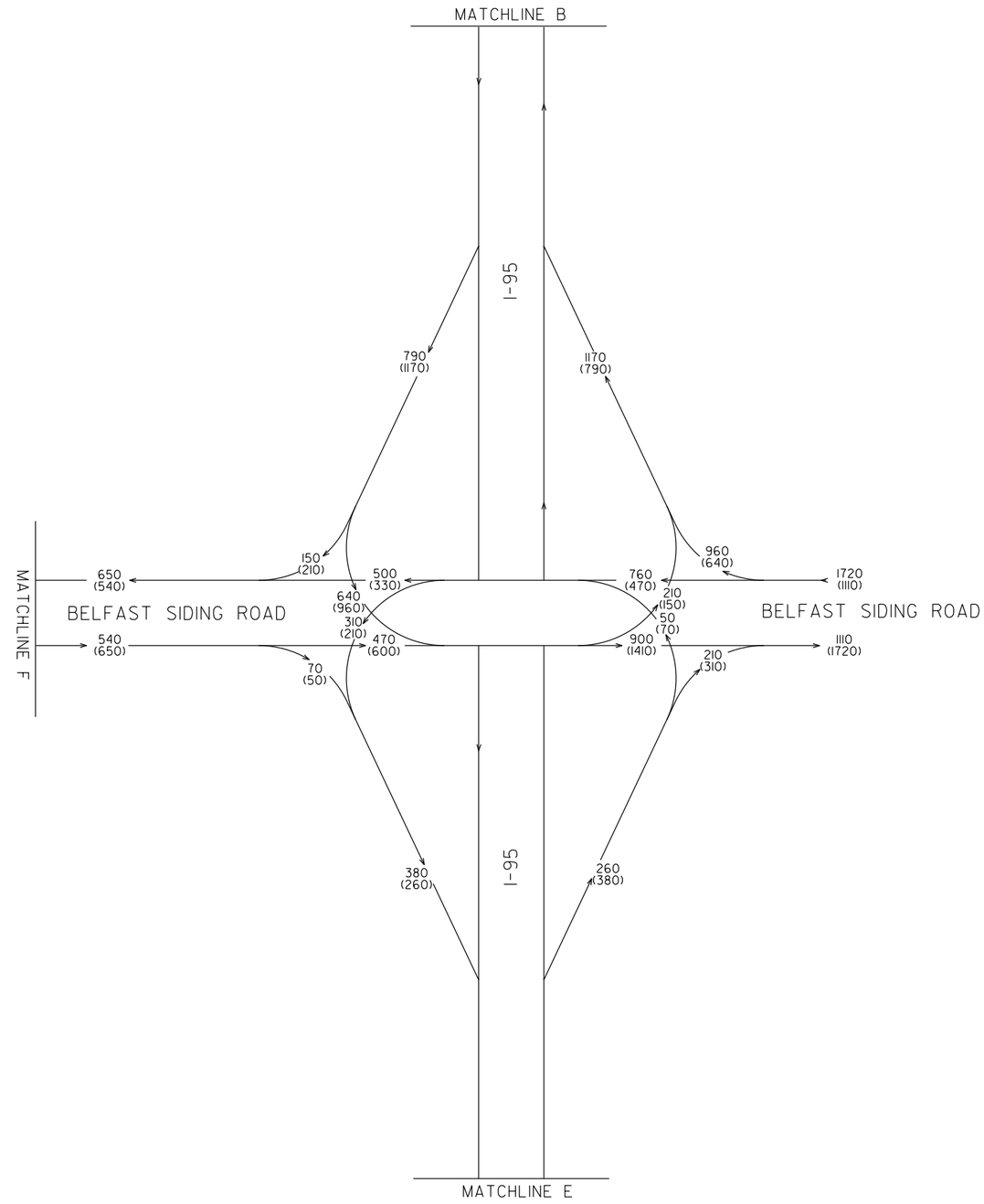
JACOBS

FIGURE C-6-2

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA.		3	4



BRYAN COUNTY IJR

2032 BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

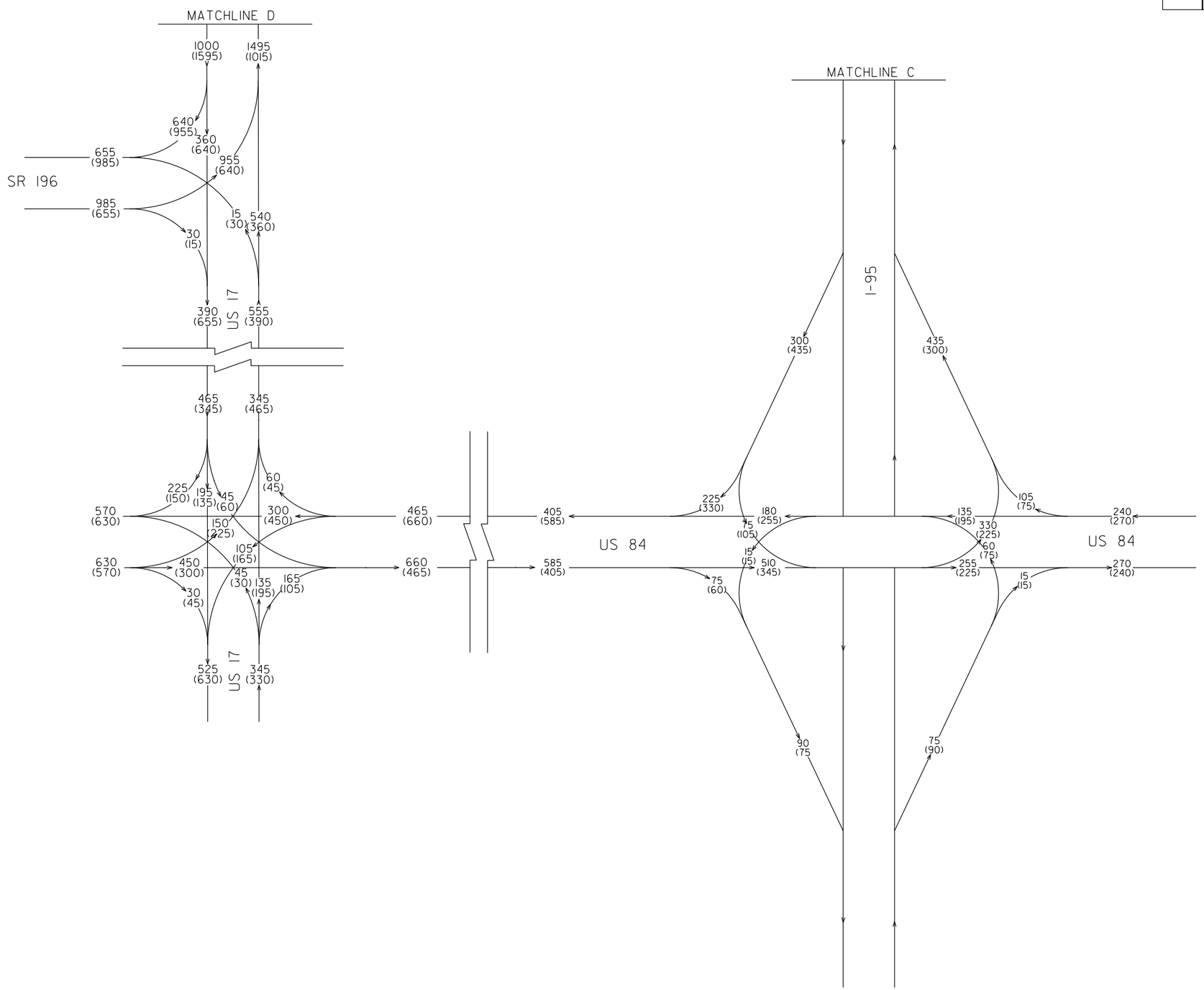
JACOBS

FIGURE C-6-3

SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		4	4



BRYAN COUNTY IJR

2032 BUILD PEAK HOUR
AM(PM) = 000(000)
T = 15%

JACOBS

FIGURE C-6-4

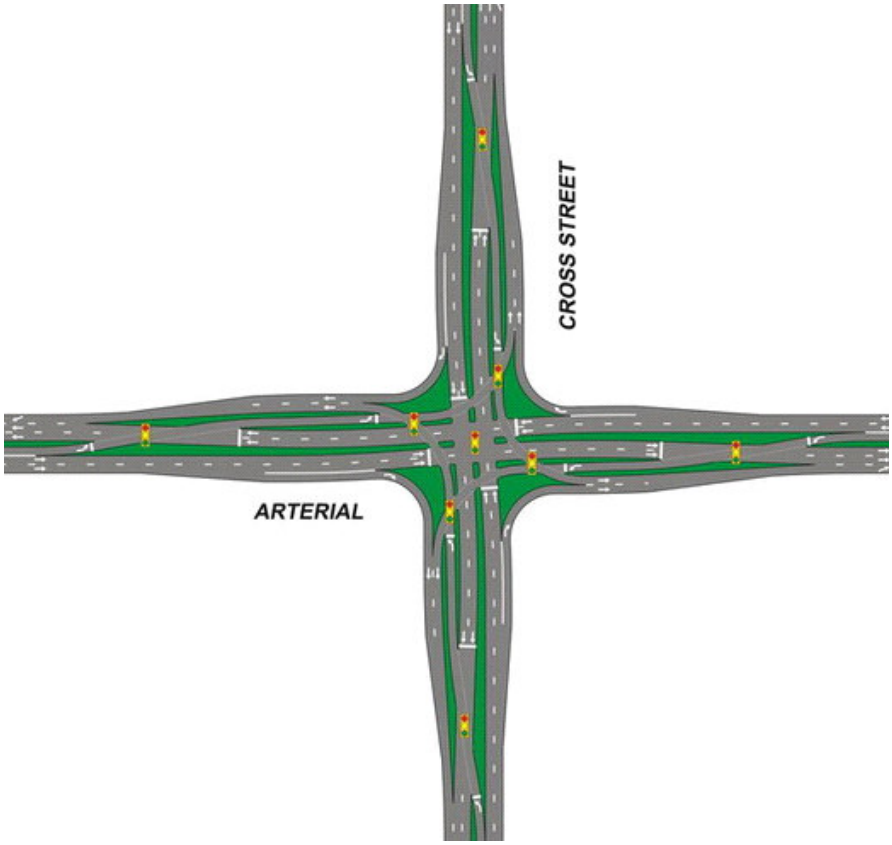
SCALE: N.T.S. OCT 2008

$DATE$ $TIME$ $USER$ $FILE$

Appendix D – Alternative Intersection Designs

Continuous Flow Intersection

Main Advantage: Left and right turns are removed from the main intersection and run concurrently with the corresponding through movement. This results in a two-phase signal operation, increasing intersection efficiency.



Implications: This intersection can support significantly more traffic than at a standard, at-grade intersection. Accommodating the contraflow left turn lanes and dedicated right turn lanes requires additional width and access control extending several hundred feet from the intersection.

Where it has been applied:

- Baton Rouge, LA
- Prince George County, Maryland
- Mexico.

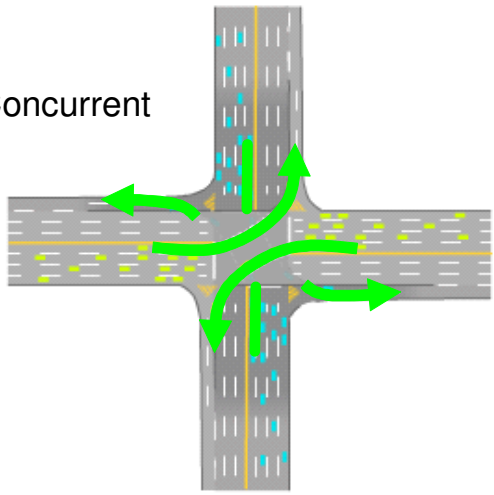
Two-Level Signalized Intersection

Main Advantage: Under this design, 4 phases can operate concurrently

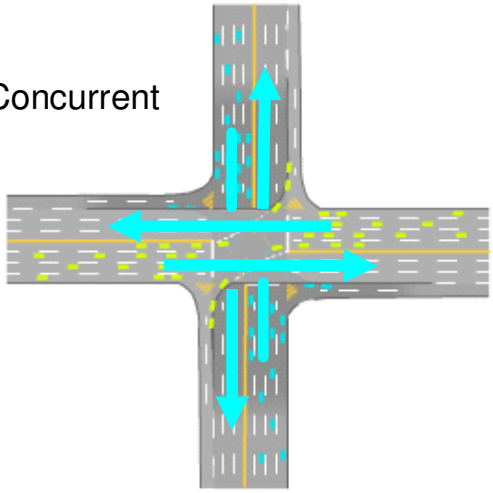
Implications: Intersection capacity during peak hours of traffic can support more than twice the amount of traffic as at-grade intersections.

Where it has been applied: Seoul, Korea

4 Phases Concurrent



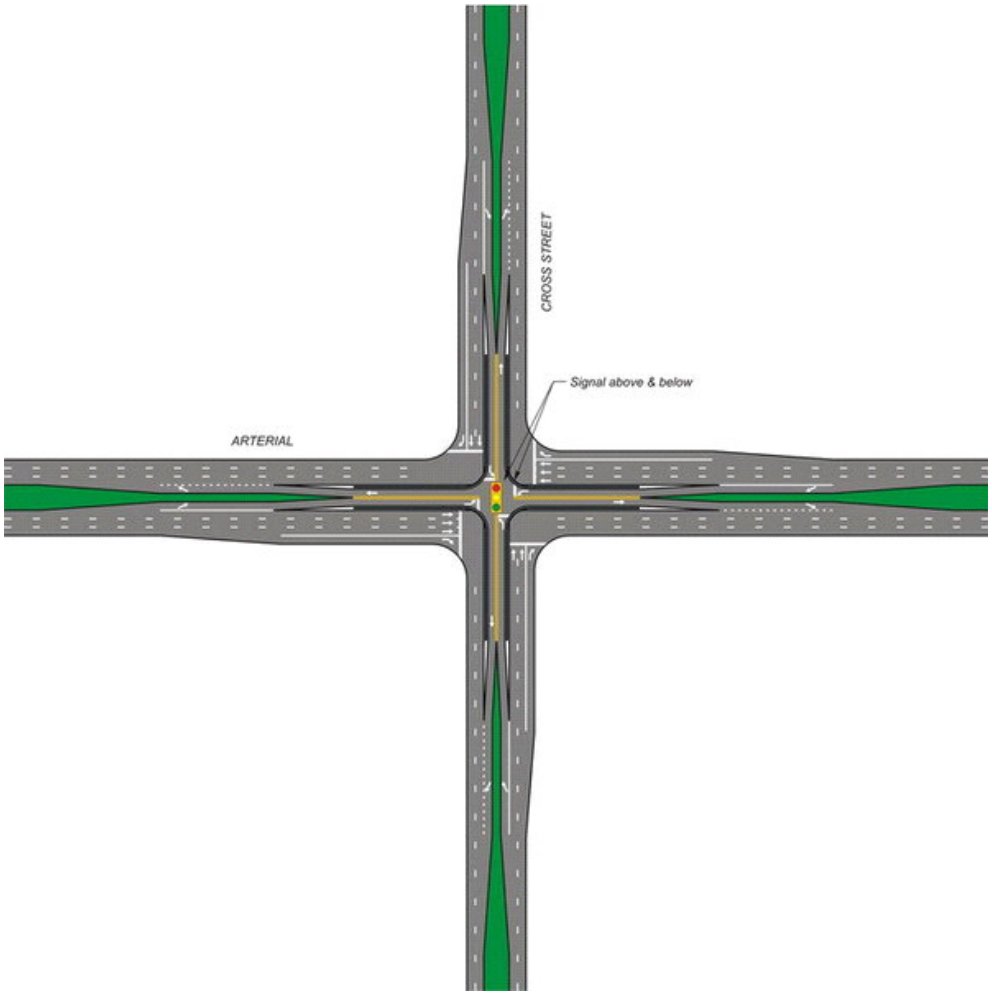
4 Phases Concurrent



Center Turn Overpass

Main Advantage: Removes left turns from the signal, allowing 2-phase signal operation

Implications: Prevents left turning traffic from impacting signal operations. Requires grade separation with elevate sections along both streets.



Where it has been applied:

Texas