SR 400/I-85 Connector Ramps
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Interchange Modification Report for I-85 and SR 400

Fulton County, GA

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Executive Summary

This Interchange Modification Report (IMR) documents the need to modify the interchange located along I-85 at SR 400 in Fulton County, Georgia and the impact as it pertains to its location and design.

The proposed modification consists of constructing two new connector ramps at the interchange of SR 400/I-85 that currently do not exist. The first proposed ramp would exit I-85 southbound providing direct access to SR 400 northbound. The second proposed ramp would exit SR 400 southbound, cross over the mainline of I-85, and directly merge onto I-85 northbound. These proposed ramps would provide vastly improved connectivity between the two regionally significant facilities, and would better satisfy driver expectations for connectivity between these two major corridors.

The proposed capacity improvement modification at this interchange was identified as a regional need. The proposed project is part of the Atlanta Regional Commission (ARC) Transportation Improvement Program (TIP)/ Regional Transportation Plan (RTP) and is programmed in the Georgia Department of Transportation (GDOT) Construction Work Plan (CWP) with construction scheduled in long range.

This IMR was completed to address the requirements as stated in Federal Register, Volume 74, Number 165 (pages 43743-43746), and dated August 18, 2009. The FHWA Georgia Division's *Guidance on Interstate Access Requests*, dated August 5, 2003 was also used to provide guidance on the procedures for processing requests for new or revised interstate access. Additionally, GDOT endorses these FHWA policies and has instituted a policy, titled "*Responsibility and Procedures for Interchange Justification (IJR) and Interchange Modification (IMR) Reports for Interstate and Non-Interstate Limited Access Facilities*," which complements the requirements and procedures set forth by FHWA. Both FHWA and GDOT policies 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.

The need for new access points at the I-85 interchange with SR 400 was examined in relation to the eight policy requirements of the Federal Register and included in the *Guidance on Interstate Access Requests*. The following presents an examination of the findings and how they relate to these eight criteria.

Policy 1: Existing Facilities

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

No ramps are currently provided for I-85 southbound traffic to access SR 400northbound, or for SR 400 southbound traffic to access I-85 northbound. Currently motorists must exit from I-85 and SR 400 and use surface streets (Sidney Marcus Boulevard, SR 13/Buford Highway, and Lenox Road) to transition from I-85 southbound to SR 400 northbound and from SR 400 southbound to I-85 northbound.

When the SR 400/I-85 interchange was originally planned, minimal traffic demand was forecasted for the movements from SR 400 southbound to I-85 northbound and from I-85 southbound to SR

400 northbound of the interchange. Therefore, the two ramps that would have served this traffic were omitted from the original interchange. As traffic has steadily increased since the early 1990's, the demand for the omitted ramps has grown. Over 46,000 vehicles per day currently travel on Sidney Marcus Boulevard between SR 400 and SR 13/Buford Highway. Without the omitted ramps, this volume is projected to increase to 65,700 vehicles per day by 2035. Approximately 39,400 vehicles per day in 2035 are projected to travel between SR 400 North and I-85 North, which would be over 50 percent of the traffic on Sidney Marcus Boulevard. With these anticipated traffic volumes, Sidney Marcus Boulevard could not provide an acceptable level of service for the I-85/SR 400 vehicles by 2035 even if it was widened from four to eight lanes. This inability to accommodate future 2035 traffic volumes would apply similarly to SR 13/Buford Highway. Therefore, there are no feasible improvements to the existing local streets that would accommodate the 2035 traffic volumes without the proposed interchange modifications.

The other alternative to the proposed interchange modifications would be to improve one or more of the existing interchanges in the immediate vicinity to accommodate the demand for the omitted ramps. There are no feasible interchange modifications that would connect the I-85/Lenox Road/Cheshire Bridge Road interchange directly with the SR 400/Sidney Marcus Boulevard interchange to bypass the capacity constraints of the local streets that was previously described.

Since none of the existing I-85/SR 400 interchange ramps carry the traffic that would use the omitted ramps, there are no feasible improvements of the existing interchange that would accommodate the future traffic demand except for the proposed ramps. Therefore, there are no feasible improvements to the existing interchanges in the immediate vicinity that would accommodate the 2035 traffic volumes except for the proposed interchange modifications.

Policy 2: Transportation System Management

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

Transportation system management (TSM) applications would not provide an acceptable alternative to constructing the omitted ramps. I-85 currently has HOV lanes and selective ramp metering and neither of these TSM applications accommodate the need for the omitted ramps. The local road system in the project area already has numerous bus routes and access to a transit station; however, the local road system is still at or near capacity. The future congestion on the local road system is also too severe to be remedied by retiming of the affected traffic signals. There is no evidence that any other TSM applications would serve as effectively in the Design Year as the proposed interchange modifications.

As part of the concept development, six different design options were considered:

1. Alternative 1 – SR 400 Collector Distributor Option
2. Alternative 1A – I-85 Collector Distributor Option
3. Alternative1B – I-85 Direct Merge Option
4. Alternative 2 – Lindbergh Drive Flyover Option
5. Alternative 3 – Compact Flyover Option
6. Alternative 3A – Modified Compact Flyover Option

These options were reviewed by FHWA and GDOT to ensure that the design requirement was met. The Preferred Alternative (Alternative 3 – Compact Flyover Option) was recommended for the following reasons:

- It provides no displacements and minimal right-of-way acquisition

- Provides minimal environmental and utility impacts
- Minimizes impacts to the existing ramp operations
- Would have the least impact to existing structures and roadways, thus having a lower construction cost
- Allows for a design with minimal design exceptions
- Matches user expectancy

Policy 3: Operational Analysis

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

Complete operational analyses of I-85, SR 400, and the local streets were conducted with and without the proposed connector ramps and the results reported in **Section 6**.

The No-Build traffic analysis indicated that the majority of the areas of I-85 and SR 400 currently operate at acceptable levels of service (LOS D or better) except for the areas impacted by the heavily congested merge of I-85 southbound and SR 400 southbound (LOS F). The queues on SR 400 southbound from this merge regularly back up past the upstream interchange at Sidney Marcus Boulevard. The weaving sections of I-85 between North Druid Hills Road and SR 13/Buford Highway operate at LOS D or better during the existing AM and PM peak hours. The current local street PM peak hour congestion results in intersection LOS E and F for the SR 13/Buford Highway intersections at Sidney Marcus Boulevard and Lenox Road, respectively. The No-Build analyses for 2015 and 2035 indicate that the severely congested (LOS F) areas would expand gradually over time to encompass a significant percentage of the freeways and almost all of the local streets by 2035.

The Build traffic analysis indicated that the overall operations on I-85 and SR 400 would be improved with the Preferred Alternative as illustrated by the estimated reductions in freeway travel times through the corridor. The freeway travel time on I-85 northbound would decrease by 0.5 min. from the SR 400 off-ramp to the North Druid Hills off-ramp during PM peak hour of 2035 under the Build condition. There would be some isolated sections of these freeways that would experience more congestion and lower speeds with the proposed interchange modifications. Based on the CORSIM results, traffic congestion (LOS F) in the 2035 AM peak hour would increase by 14 percent for the weave section of I-85 southbound between the North Druid Hills Road on-ramp and the Lenox Road/Cheshire Bridge Road off-ramp. The I-85 northbound level of service between the SR 400 northbound off-ramp and the SR 13/Buford Highway northbound on-ramp would drop from LOS D to LOS E in the 2035 PM peak hour with the proposed interchange modifications. However, north of the section of I-85 northbound between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills off-ramp, the level of service of this weaving area would improve from LOS F to LOS D in the 2035 PM peak hour. Traffic operations along the local streets would be

substantially improved with the proposed interchange modifications because the vehicles traveling between I-85 southbound to SR 400 northbound and between SR 400 southbound to I-85 northbound on the local streets would reroute to the proposed connector ramps in the Build condition. For the intersection of Lenox Road/Cheshire Bridge Road and I-85 northbound on-ramp, this would result in an improvement in intersection level of service from LOS F to LOS B in the 2035 PM peak hour.

Policy 4: Access Connections and Design

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

The original SR 400/I-85 interchange provided connections between two public roads; however, it did not provide for all traffic movements. The I-85 southbound to SR 400 northbound and SR 400 southbound to I-85 northbound movements were omitted from the original construction project and no physical accommodations were made to facilitate their future addition. The Preferred Alternative would upgrade the existing interchange to a "full interchange" that would provide ramps to service all possible traffic movements. The Preferred Alternative would also connect to public roads and meet current standards for Federal-aid projects on the Interstate System. The concept design for the preferred alternative can be found in **Appendix C-1**.

Policy 5: Transportation Plans

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

The Preferred Alternative is currently in GDOT's Statewide Transportation Improvement Program. Additionally, the proposed modifications to the interchange are a high priority recommendation in ARC's Long Range Transportation Plan. It is contained in Atlanta Region FY 2008-2013 TIP by reference number AT-AR-212B. The proposed interchange also demonstrates consistency with the City of Atlanta's Transportation Plan.

Policy 6: Comprehensive Interstate Network Study

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

There are no other planned interchanges on I-85 in proximity to the SR 400 at I-85 interchange that are currently included in a local or state Transportation Plan. The Preferred Alternative has independent utility as the proposed interchange modifications would provide enhanced connectivity between SR 400 and I-85 and would improve overall traffic operations in the area without any additional future improvements.

Policy 7: Coordination with Transportation System Improvements

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

The Preferred Alternative is consistent with ARC's Comprehensive Plan and Future Land Use maps. GDOT has coordinated with FHWA, GDOT, ARC, Fulton and DeKalb Counties, and community groups. The development assumptions used for this analysis are consistent with the currently submitted Developments of Regional Impact (DRI) in the Atlanta metro area. DRI's are required for large-scale developments that are likely to have regional effects beyond the local government's jurisdiction in which they are located. The intent of DRI's is to improve the communication between state, regional, and local governments, and growth plans of the counties. These nineteen DRI's, which are located in the Buckhead, Lindbergh Drive and North Druid Hills Road corridors, represent future construction of approximately 20,000 residential units and 6,000,000 square feet of commercial, retail and office space. These new developments would have varying impacts to the SR 400 at I-85 interchange.

Policy 8: Status of Planning and NEPA

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

An Environmental Assessment has been undertaken for this project. Preliminary environmental screening has been conducted. The Preferred Alternative was chosen to minimize impacts to residents and property to the fullest extent possible. No residence or business will be displaced by the Preferred Alternative. The impacts of the Preferred Alternative on existing and potentially eligible cultural resources in the study area have not been determined at this time. The Preferred Alternative would not result in any direct impacts to any of the churches or institutions.

The Preferred Alternative has also been surveyed for wetlands and non-wetland waters of the United States. Four wetlands, eighteen ephemeral streams, and nine intermittent/perennial streams were observed within the project study area. A U.S. Army Corps of Engineers Section 404 Permit may not be required since there are no anticipated impacts to wetlands or streams. A stream buffer variance will be required. The project is anticipated to have no effect on any protected species.

Final approval of the IMR is contingent upon approval of NEPA. The development of final plans, right-of-way acquisition, and construction may not be performed until approval of the environmental document.

Recommendations

The Preferred Alternative is recommended. The proposed ramps would provide vastly improved connectivity between the two regionally significant facilities, and would better satisfy driver expectations for connectivity between these two major corridors. These proposed ramps would reduce freeway-related traffic on the heavily congested surface streets in the area that currently serve as the only connection from SR 400 southbound to I-85 northbound and I-85 southbound to SR 400 northbound. As a result of the proposed ramp connections, the potential for future accidents would be reduced for the vehicles using these ramps instead of the local streets.

1.0 INTRODUCTION

1.1 Purpose of the Report

The purpose of an IMR is to provide the Federal Highway Administration (FHWA) with all the necessary information to independently evaluate the request to modify an existing interchange on the interstate system. An IMR also demonstrates that all pertinent factors and alternatives have been considered. This report documents the following activities and criteria for FHWA's evaluation:

- Review of FHWA policy and guidelines
- Identification of existing transportation and land use plans
- Examination of area growth and development
- Environmental screening of potential impacts
- Development and analysis of interchange design alternatives
- Model network for forecasting future travel demand
- Traffic operations and capacity analysis for existing, no-build and build conditions
- Development of concept level interchange design
- Consideration of existing and future traffic safety operations
- Development of preliminary cost estimates

Section 7 (page 106) of this report summarizes FHWA's requirements[1] and how they specifically relate to the proposed interchange modifications at I-85 and SR 400.

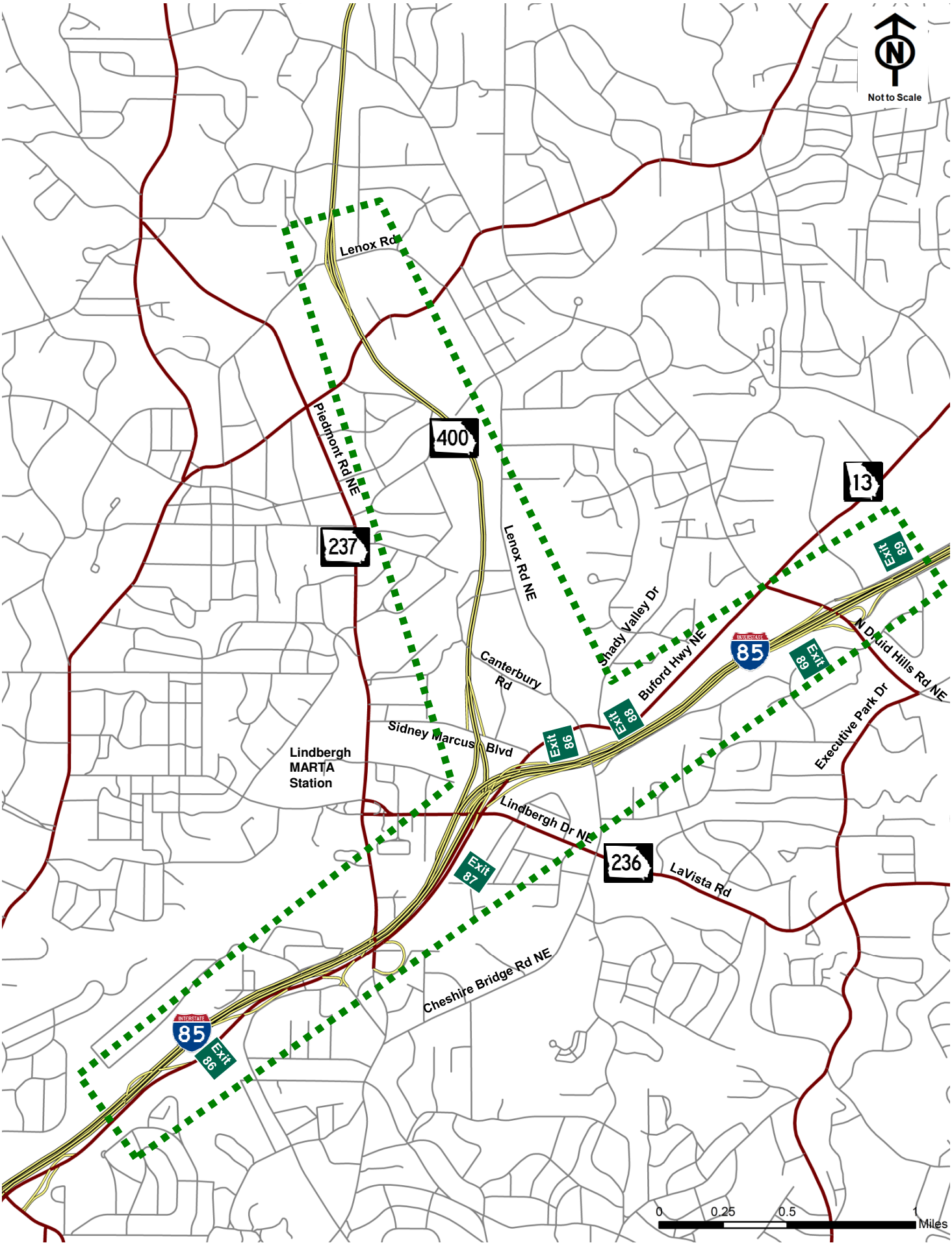
1.2 Study Area

The project is located entirely inside the City of Atlanta, in Fulton County at the interchange of SR 400 with I-85. The project area is bordered by the following interchanges: along I-85, North Druid Hills Road Interchange approximately 1.5 miles to the north, the southbound on-ramp and northbound off-ramp for SR 13/Buford Highway approximately 2.0 miles to the south, and approximately 2.3 miles to the north along SR 400 is the Buckhead Loop/Lenox Road Interchange (see **Figure 1.1**, on page 2).

The study area encompasses roadways significant to travel in the vicinity of the existing interchange and the upstream and downstream interchanges. The following corridors were included in the study area:

- I-85 from south of SR 13/Buford Highway on-ramp and off-ramp (Exit 86) to north of SR 42/ North Druid Hills Road (Exit 89);
- SR 400 from I-85 to north of Buckhead Loop/Lenox Road (Exit 2).
- Cheshire Bridge Road/Lenox Road from south of LaVista Road to north of Canterbury Road
- SR 13/Buford Highway from I-85 northbound exit to east of Lenox Road
- Sidney Marcus Blvd. from SR 13/Buford Highway to west of SR 400 southbound off-ramp; and
- North Druid Hills Road from west of SR 13/Buford Highway to east of Executive Park Drive.

[1] Source: FHWA, Georgia Division, Guidance on Interstate Access Requests, August 5, 2003



HNTB	**Study Area Map**	Figure No: 1.1	Page No: 2
	Interchange Modification Report for I-85 and SR 400		

2.0 Existing Conditions

Data was collected for the transportation facilities in the vicinity of the SR 400 at I-85 Interchange. This information documents the 2007 baseline operating conditions and forms the foundation for analyzing existing and future (2015 and 2035) conditions. This section also provides an overview of the existing characteristics in the study area, including:

- Existing Roadways and Structures
- Existing Traffic Data
- Historical Population
- Existing Employment
- Existing Land Use and Development
- Crash History

2.1 Existing Roadways and Structures

Roadway Characteristic (RC) data were identified to facilitate completion of the study. RC data were sampled along the study corridors - I-85, SR 400, Lenox Road, SR 13/Buford Highway, and Sidney Marcus Boulevard.

RC data served as the basis for analyzing existing and future travel conditions along these study corridors. Ultimately this information was used to assist in the development of recommendations. **Table 2.1**, below, presents the data collected from the Roadway Characteristic Inventory.

Table 2.1 Roadway Characteristic Inventory

Segment	Access Management	Bike/Ped Facilities	Designated Roadway Lighting	Intersection Control	Posted Speed (mph)
I-85	8-Lane Limited Access Facility plus 2 HOV Lanes	No	Yes	-	55
SR 400	6-Lane Limited Access Facility	No	Yes	-	55
Lenox Road	6-Lane Facility w/ Turn Lanes	No	Yes	Traffic Signal	35
Cheshire Bridge Road	4-Lane Facility w/ Turn Lanes	No	Yes	Traffic Signal	35
SR 13/Buford Highway	4-Lane Facility w/ Turn Lanes*	No	Yes	Traffic Signal	45
Sidney Marcus Blvd.	4-Lane Facility w/ Turn Lanes	No	Yes	Traffic Signal	40

Source: GDOT
**SR 13/Buford Highway has 5 lanes from Lenox Road to Shady Valley Drive and 6 lanes from Shady Valley Drive to North Druid Hills Road.*

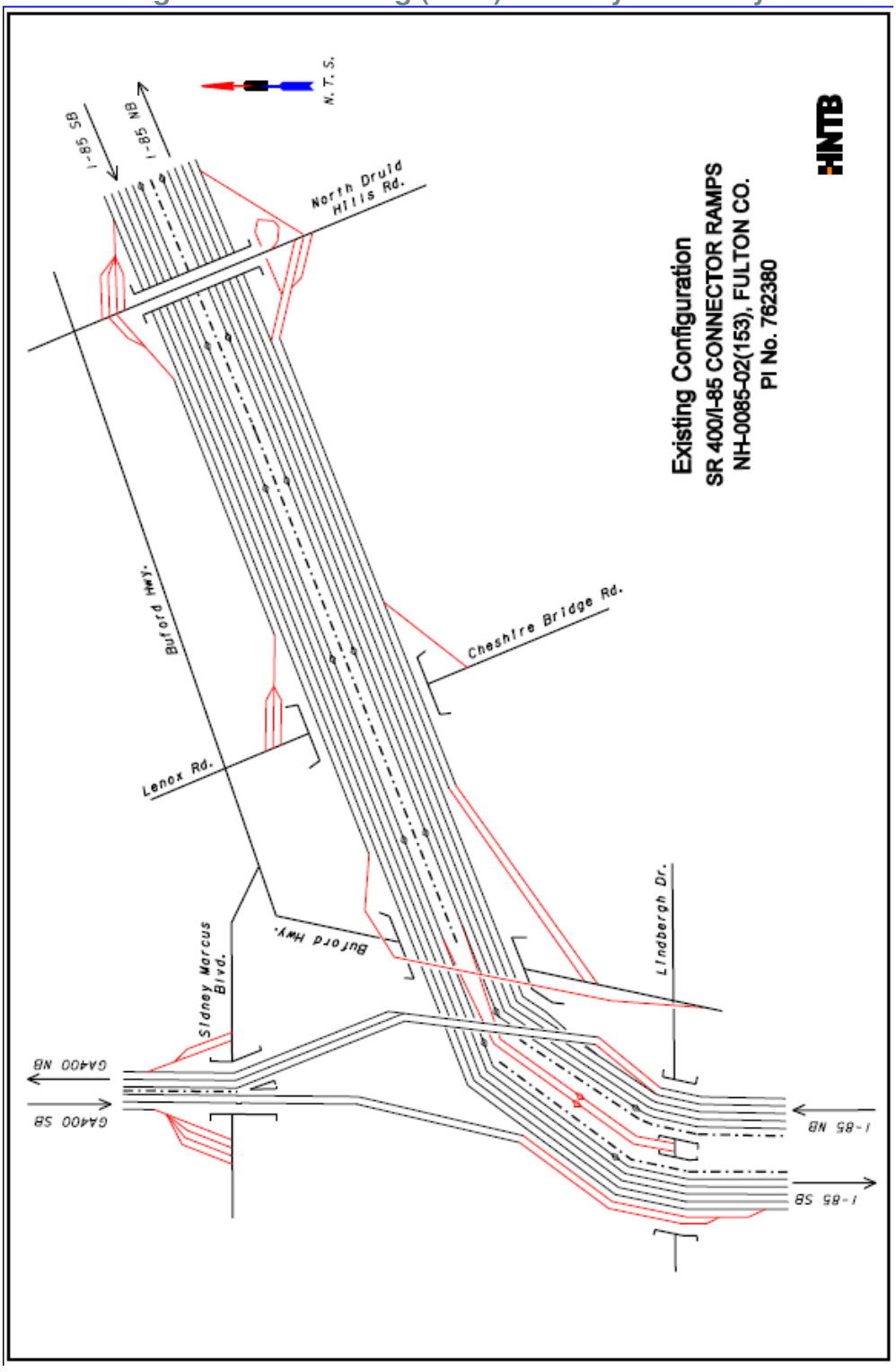
No ramps are currently provided for I-85 southbound traffic to access SR 400 northbound, or for SR 400 southbound traffic to access I-85 northbound. Currently motorists must exit from I-85 and SR 400 and use surface streets (Sidney Marcus Boulevard, SR 13/Buford Highway, and Lenox Road/Cheshire Bridge Road) to transition from I-85 south to SR 400 north and from SR 400 south to I-85 north. The posted speed limit for SR 400 and I-85 in this area is 55 mph.

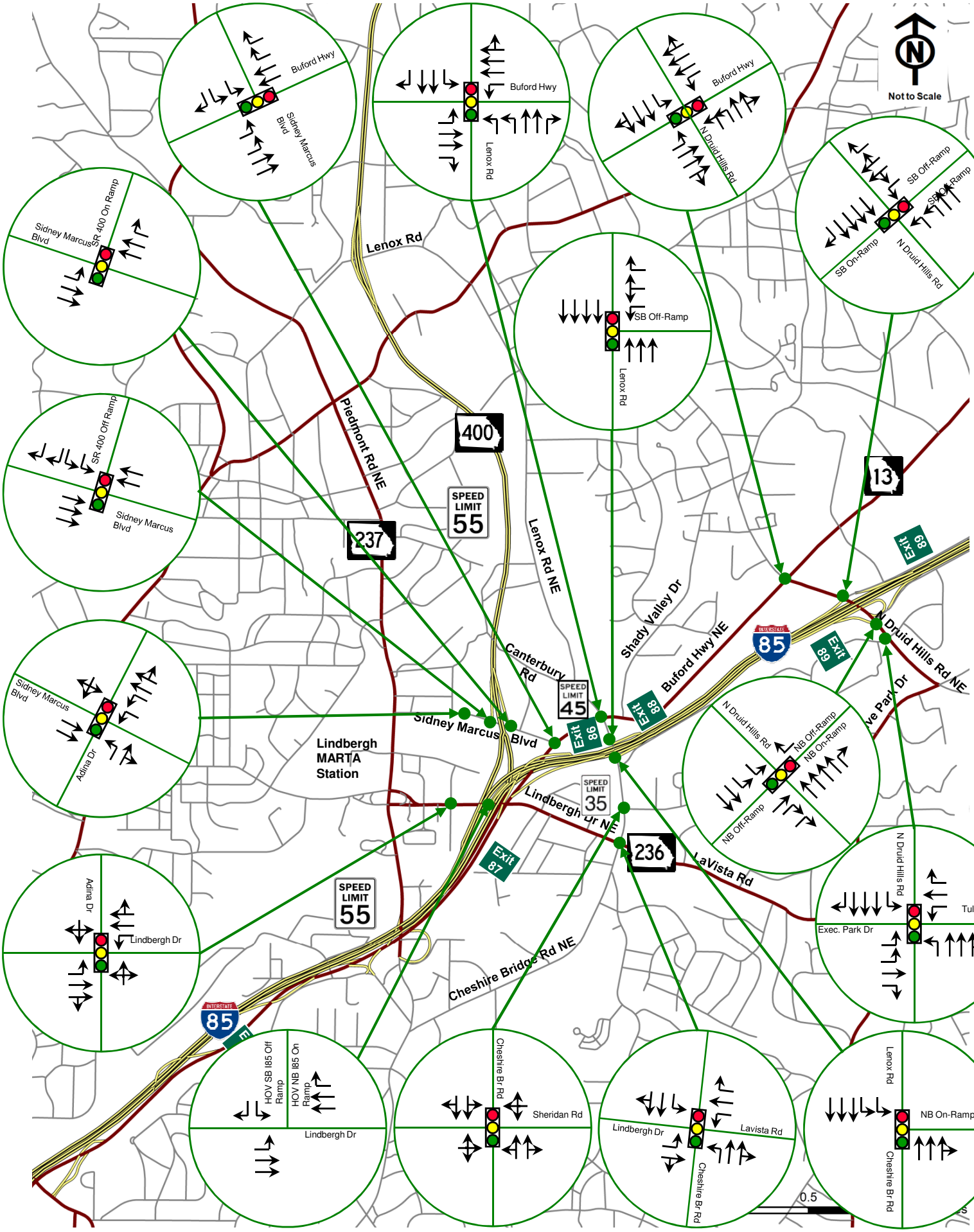
SR 400 southbound currently has a connection to I-85 southbound and I-85 northbound has a connection to SR 400 northbound. SR 400 is a 6-lane north-south facility classified as an Urban Freeway/Expressway.

Currently the North Druid Hills Road northbound and southbound on-ramps have ramp meters. The Cheshire Bridge Road northbound on-ramp has a ramp meter but there are no plans for it to be turned out due to the limited storage space and traffic volume.

Existing freeway geometry is depicted on the following page in **Figure 2.1** . Existing intersection geometry and control as well as laneage and posted speed limits are depicted in **Figure 2.2** (see page 6).

Figure 2.1 Existing (2007) Freeway Geometry





Existing (2007) Intersection Geometry

Interchange Modification Report for I-85 and SR 400

Figure No:	Page No:
2.2	6

2.1.1 Existing Structures

The bridges along I-85 and SR 400 were evaluated to determine their useful life and the potential need for improvement within the study's planning horizon. Deficient bridges pose a major obstacle to a fully functional road network due to load limits or other restrictions. To facilitate the completion of this effort, GDOT provided bridge condition reports for bridges within the study area. A general measure of the condition of each bridge is the sufficiency rating. The sufficiency rating is used to determine the need for maintenance, rehabilitation or reconstruction of a bridge structure. Typically a bridge with a sufficiency rating above 75 should maintain an acceptable rating for at least 20 years with adequate maintenance. Structures with a sufficiency rating of 75 or lower can be expected to have a useful life of less than twenty years and may require major rehabilitation or reconstruction work during the study horizon.

The existing bridges and their sufficiency rating are listed below.

Table 2.2 Existing Structure Inventory

Structure ID	Description	Sufficiency Rating
121-0559-0	I-85 NB Ramp from SR 13 (over Peachtree Creek)	81.94
121-0558-0	I-85 SB Ramp to SR 13/Buford Highway	85.00
121-0556-0	I-85 Mainline over SR 13/Buford Highway	81.00
121-0213-0	I-85 Mainline over Peachtree Creek	72.22
121-0736-0	SR 400 NB over Sidney Marcus Boulevard	64.76
121-0737-0	SR 400 SB over Sidney Marcus Boulevard	66.79

2.2 Existing Traffic Data

Traffic counts consist of vehicle volume counts, vehicle classification counts, and peak period intersection turning movement counts that were collected in 2007 in the study area. There were 72-hour bi-directional volume counts with classifications; sixteen-hour directional manual counts with classifications, AM and PM peak hour turning movement counts (TMC); and travel time and delay studies. The types of counts are summarized in **Table 2.3**.

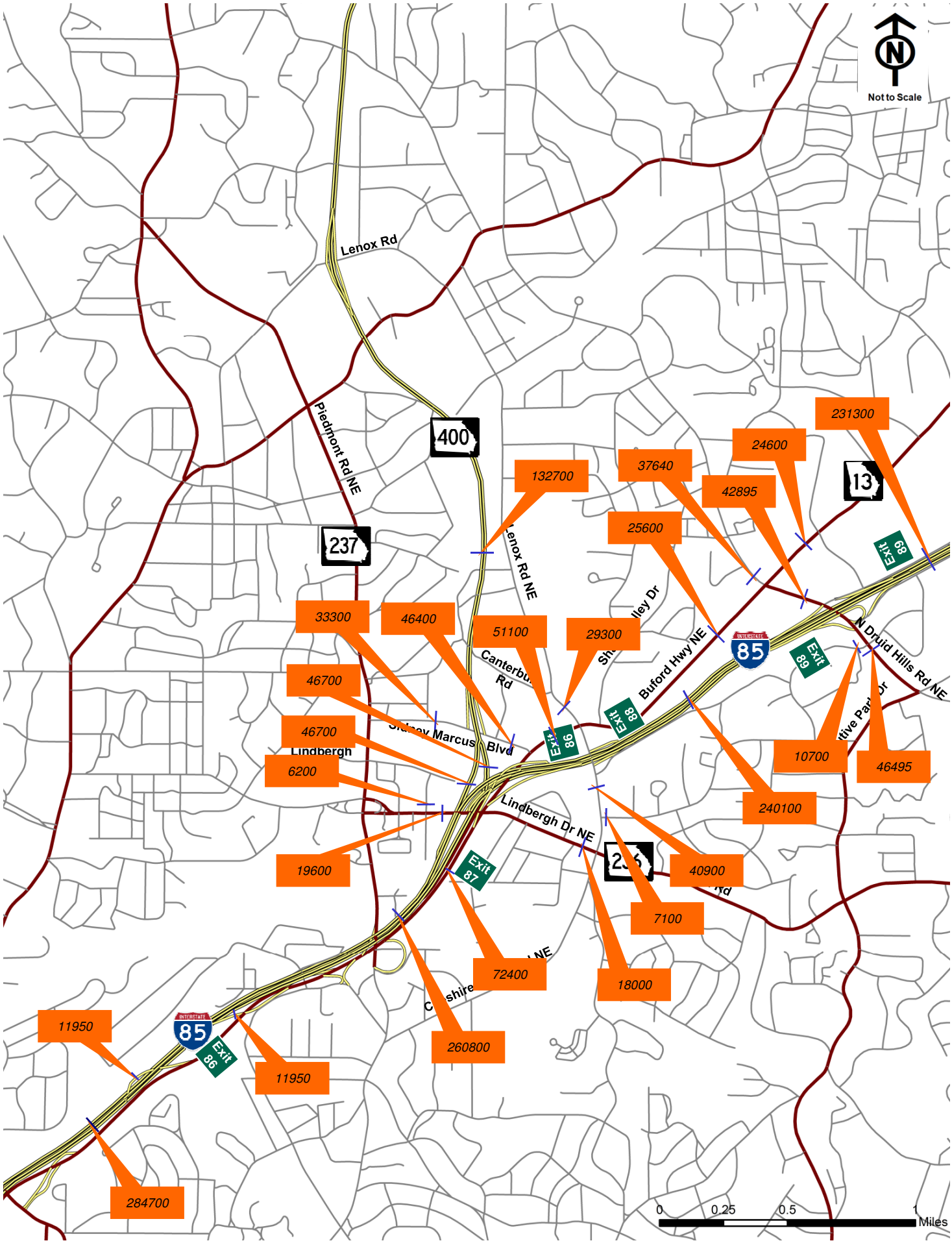
Table 2.3 Types of Traffic Counts

Type of Count	Quantity
Manual 16-hour Freeway Count (classification)	4
Automated 72-hour Freeway Ramp Count (classification)	13
Automated 72-hour Directional Roadway Count (classification)	25
16-hour Manual Intersection Turning Movement Count	16

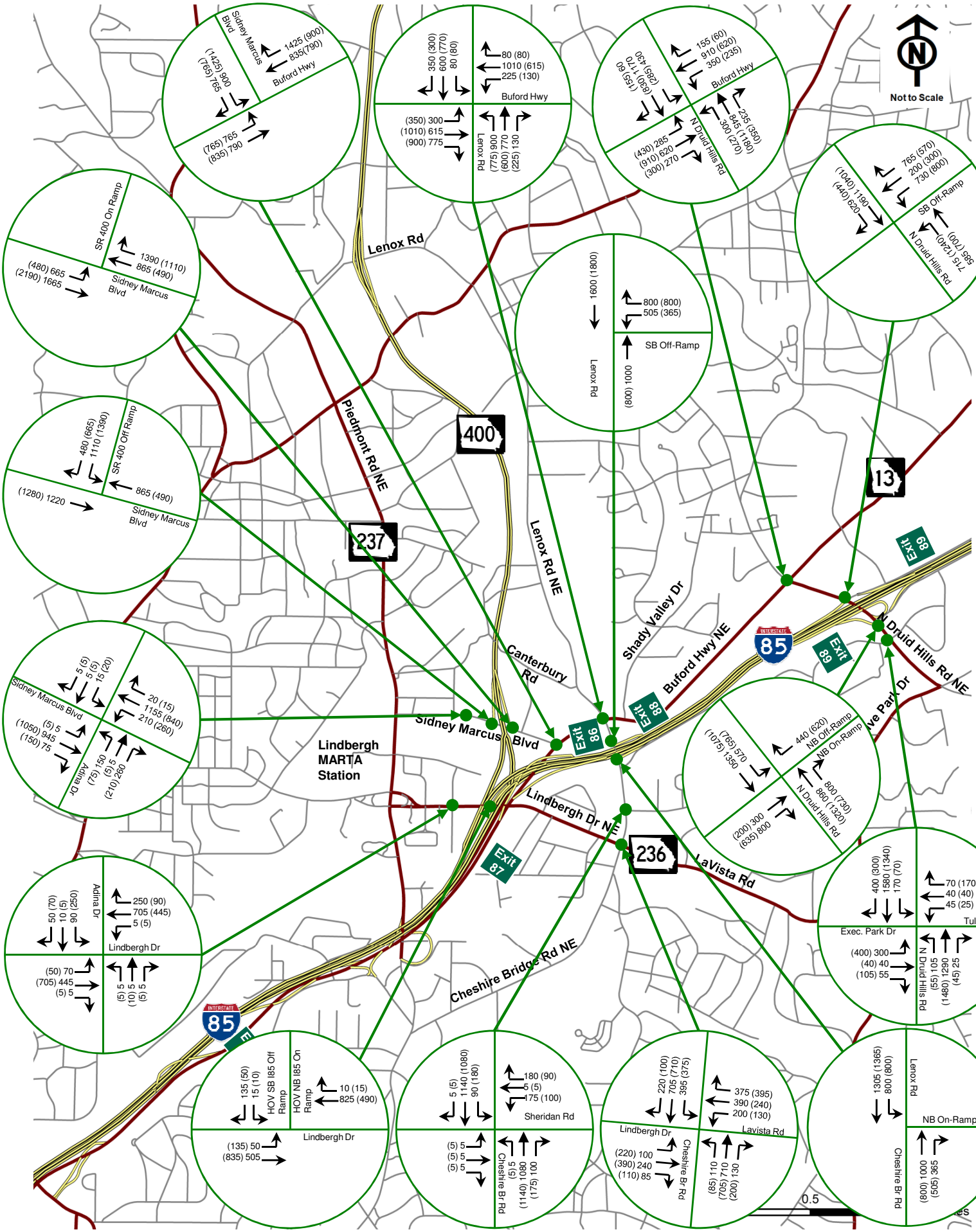
Base Year (2007) Annual Average Daily Traffic (AADT) volumes and Base Year (2007) Peak Hour Turning Movement Volumes were developed by adjusting and balancing raw traffic counts. These volumes are illustrated in **Figures 2.3** and **2.4** (on pages 9 and 10), and the traffic diagrams are available in **Appendix A**.

2.3 Existing Land Use

In the vicinity of the proposed project, SR 400 is bounded to the east and west primarily by medium density residential properties consisting of low-rise apartment and condominium complexes. A large vacant commercial parcel, which previously served as the site of a Home Depot building supply store' is located in the southwest quadrant of SR 400 and Sidney Marcus Boulevard. I-85 is bounded to the south by low density residential properties, primarily comprised of single family homes. To the north, I-85 is bounded by existing GDOT right-of-way and the SR 13/Buford Highway and Sidney Marcus Boulevard corridors. Low and medium density residential properties consisting primarily of low-rise apartment and condominium complexes are located to the north of these corridors. Transitional properties are located in the vicinity of the Lindbergh MARTA station. Based on developments that are currently underway or planned for construction and comparing the existing land use to the future land use plans, it appears that land use in the area is gradually changing. The proximity of the Lindbergh MARTA station is spurring changes to existing land use in the proposed project area.



HNTB	**Existing (2007) Average Daily Traffic** *Interchange Modification Report for I-85 and SR 400*	Figure No: 2.3	Page No: 9



HNTB	**Existing (2007)** **Peak Hour Turning Movement Volumes** *Interchange Modification Report for I-85 and SR 400*	xxx – AM Peak Hour Volumes (xxx) – PM Peak Hour Volumes	Figure No: 2.4 / Page No: 10

2.4 Crash History

The crash history along SR 400, I-85 and arterials in the study area was investigated. One measure that is used to determine potential safety deficiencies is crash rate. Crash rates (crashes per hundred million vehicle miles traveled) for a roadway segment were calculated based on the following equation:

$$\text{Crash Rate} = \frac{(\#\text{ of Crashes in 1 Year}) * 10^8}{(\text{Average ADT}) * (365\text{ Days / Year}) * (\text{Distance})}$$

Tables 2.4 through **2.10** (see pages 11 to 13) show the crash rates for the study corridors in comparison with the statewide average for similar facilities. The study corridors include:

- SR 400 from Lenox Road to I-85
- I-85 from North Druid Hills Road to Piedmont Road
- Sidney Marcus Boulevard from SR 400 to SR 13/Buford Highway
- SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road
- SR 13/Buford Highway from Lenox Road to North Druid Hills Road
- Lenox Road from SR 13/Buford Highway to Chantilly Drive
- North Druid Hills Road from SR 13/Buford Highway to Northeast Expressway (I-85 Frontage Road)

These tables provide the number of crashes, injuries, and fatalities (with respective crashes, injury, and fatality rates) per year between 2006 and 2008. In comparison, the statewide crashes and injury rates for Urban Freeway and Expressway, Urban Interstate Principal Arterial, Urban Minor Arterial, and Urban Principal Arterial roads for 2006-2008 are shown in same tables. All crashes, injury, and fatality rates are per 100 million vehicle miles.

As the tables indicate, historical crash, injury and fatality rates along the surface streets in the study area substantially exceed the corresponding annual statewide averages. The close spacing of signalized intersections and the high volumes on the intersecting streets may have contributed to crash rates that are higher than statewide average rates. The proposed project would reroute traffic from these surface streets to the freeways by providing a more direct link for southbound traffic on SR 400 to access I-85 northbound and southbound traffic on I-85 to access SR 400 northbound. Since freeways typically experience much lower crash rates than surface streets, this shift in traffic would reduce the crash rates for the vehicles that reroute to the proposed ramps.

Table 2.4 Crash History of SR 400 from Lenox Road to I-85

Crash History of SR 400 from Lenox Road to I-85 (Urban Freeway and Expressway)			
Year	**Total Crashes/ Crash Rate/Statewide Average Crash Rate***	**Total Injuries/** Injury Rate/Statewide Average Injury Rate*	**Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate***
2006	233/**202**/200	70/**61**/59	2/**1.73**/0.37
2007	209/185/205	54/48/62	0/0.00/0.27
2008	154/137/207	51/45/67	0/0.00/0.87

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Freeway and Expressway that year.

Table 2.5 Crash History of I-85 from North Druid Hills Road to Piedmont Road

Crash History of I-85 from North Druid Hills Road to Piedmont Road (Urban Interstate Principal Arterial)			
Year	**Total Crashes/ Crash Rate/Statewide Average Crash Rate***	**Total Injuries/** Injury Rate/Statewide Average Injury Rate*	**Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate***
2006	574/**315**/200	200/**110**/69	0/0.00/0.73
2007	549/**298**/186	151/**82**/63	3/**1.63**/0.58
2008	500/**271**/187	143/**78**/63	0/0.00/0.62

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Interstate Principal Arterial that year.

Table 2.6 Crash History of Sidney Marcus Boulevard from SR 400 to SR 13/Buford Highway

Crash History of Sidney Marcus Boulevard from SR 400 to SR 13/Buford Highway (Urban Minor Arterial)			
Year	**Total Crashes/ Crash Rate/Statewide Average Crash Rate***	**Total Injuries/** Injury Rate/Statewide Average Injury Rate*	**Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate***
2006	93/**2,043**/548	27/**593**/208	0/0.00/1.55
2007	145/**3,999**/513	29/**800**/190	0/0.00/1.48
2008	121/**3,337**/469	25/**690**/176	0/0.00/1.47

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Minor Arterial that year.

Table 2.7 Crash History of SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road

Crash History of SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road (Urban Principal Arterial)			
Year	**Total Crashes/ Crash Rate/Statewide Average Crash Rate***	**Total Injuries/** Injury Rate/Statewide Average Injury Rate*	**Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate***
2006	174/**2,246**/787	37/**478**/291	0/0.00/1.87
2007	203/**2,621**/649	53/**684**/227	0/0.00/1.53
2008	179/**2,311**/612	52/**671**/213	0/0.00/1.33

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Principal Arterial that year.

Table 2.8 Crash History of SR 13/Buford Highway from Lenox Road to North Druid Hills Road

Crash History of SR 13/Buford Highway from Lenox Road to North Druid Hills Road (Urban Principal Arterial)			
Year	Total Crashes/ Crash Rate/Statewide Average Crash Rate*	Total Injuries/ Injury Rate/Statewide Average Injury Rate*	Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate*
2006	101/**793**/787	34/267/291	0/0.00/1.87
2007	184/**1,429**/649	39/**303**/227	2/**15.53**/1.53
2008	156/**1,212**/612	61/**474**/213	1/**7.77**/1.33

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Principal Arterial that year.

Table 2.9 Crash History of Lenox Road from SR 13/Buford Highway to Chantilly Drive

Crash History of Lenox Road from SR 13/Buford Highway to Chantilly Drive (Urban Minor Arterial)			
Year	Total Crashes/ Crash Rate/Statewide Average Crash Rate*	Total Injuries/ Injury Rate/Statewide Average Injury Rate*	Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate*
2006	177/**5,742**/548	43/**1,395**/208	0/0.00/1.55
2007	157/**5,093**/513	34/**1,103**/190	0/0.00/1.48
2008	134/**4,347**/469	34/**1,103**/176	0/0.00/1.47

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Minor Arterial that year.

Table 2.10 Crash History of North Druid Hills Road from SR 13/Buford Highway to Northeast Expressway

Crash History of North Druid Hills Road from SR 13/Buford Highway to Northeast Expressway (Urban Minor Arterial)			
Year	Total Crashes/ Crash Rate/Statewide Average Crash Rate*	Total Injuries/ Injury Rate/Statewide Average Injury Rate*	Total Fatalities/ Fatality Rate/Statewide Average Fatality Rate*
2006	107/**3,841**/548	21/**754**/208	0/0.00/1.55
2007	123/**2,891**/513	23/**541**/190	0/0.00/1.48
2008	228/**5,359**/469	41/**964**/176	0/0.00/1.47

* All crashes, injury, and fatality rates are per 100 million vehicle miles.
Bold indicates that rate exceeds statewide average for Urban Minor Arterial that year.

Section 6.7 (see page 95) discusses the safety analysis related to the preferred alternative including a review of accident types near the locations for the proposed ramp tie-ins on SR 400 and I-85.

3.0 Future Conditions and Traffic Forecasts

3.1 Future Land Use

Future land use patterns for the City of Atlanta are expected to remain similar to the existing land use patterns. Small changes are expected and many developed areas in the City of Atlanta are expected to experience either infill development on scattered vacant tracts of land, or the remodeling or redevelopment of existing facilities. The overall proportions of land use within the City of Atlanta have remained stable and are expected to reflect the City of Atlanta land use pattern through 2019, according the City of Atlanta's Comprehensive Development Plan (CDP).

Within the project area, the City of Atlanta plans to encourage high-density residential and mixed use developments in the development node around the Lindbergh heavy rail MARTA station. According to the City of Atlanta's CDP, MARTA heavy rail stations are becoming catalysts for new development, especially along the North rail line and most dramatically around Lindbergh station. A $500 million dollar development is underway around the MARTA Lindbergh station. This development is slated to include office space, a Main Street complex, apartments, retail areas, and condominiums on a 47-acre parcel of land that promotes a live-work environment utilizing the MARTA heavy rail and bus stations. Construction permits issued in this area since 1998 included Lindbergh Crossing, a 37,500 square foot shopping center; a Mainstay Suites Hotel; and the Lindbergh Station Apartments. These new developments join the upscale, multi-family housing along Sidney Marcus Boulevard; an older group of apartments along Lindbergh Road, east of Piedmont Road; and the Post and Gables apartment complexes. According to the City of Atlanta's CDP, all of this development complements BellSouth's $750 million dollar plan to relocate 13,000 employees from suburban offices to 3 new business centers located near the Lenox, Lindbergh, and North Avenue MARTA heavy rail stations.

Land use in the area is urban in nature and redevelopment in the area has already begun and is accounted for in the future land use plans for the City of Atlanta. It is not anticipated that land use along the proposed project corridor would be cumulatively impacted by this project or in conjunction with the actions of others within the region.

3.2 Planned and Programmed Improvements

GDOT's FY 2010-2013 State Transportation Improvement Program (STIP) and FY 2008-2014 Construction Work Program (CWP) were reviewed for projects impacting the study area in the City of Atlanta. Projects with a construction date of 2013 or earlier were considered committed. Based on the review, there are no planned or committed projects in the study area that would impact the project. There is one committed project and three uncommitted projects that are listed in **Table 3-1** (see page 16).

Additionally, the City of Atlanta's current Comprehensive Transportation Plan (CTP) was reviewed. The CTP was designed to evaluate needed transportation plans, identify necessary improvements, and produce a comprehensive and prioritized program of projects to meet increasing traffic demands and ensure future mobility. The study, completed in the fall of 2008, is organized into three phases and focuses primarily on transit. The study conditionally supports the proposed improvements as follows: "The City supports the construction of the interchange at Georgia 400 and I-85 provided the design is consistent with the principles of this study, avoids impacts to adjacent single family neighborhoods and that the project is funded by regional/federal and state sources rather than City of Atlanta funds or funds which would otherwise be due the City."

Table 3.1 Programmed Projects

PROJECT ID	FACILITY	LIMITS	DESCRIPTION	COMMENT
731770	SR 13/Buford Highway	Lenox Road to Shallowford Terrace	New Sidewalks-Construction Work Program	No effect on project
762630	Cheshire Bridge Road	At SR 236/ Lindbergh Drive	Reconstruction/ Rehabilitation-Long Range	Beyond area of effect

3.3 Developments of Regional Impacts (DRI)

The Georgia Regional Transportation Authority (GRTA) is responsible for the review of Developments of Regional Impact (DRI) in the Atlanta metro area. DRI's are required for large-scale developments that are likely to have regional effects beyond the local government's jurisdiction in which they are located. The intent of DRI's is to improve the communication between state, regional, and local governments. DRI's in metropolitan regions must be conducted if a proposed development exceeds certain thresholds such as 400 new lots or units in a residential development or 300,000 square feet of commercial or mixed-use space.

For this study, all of the DRI's within a 2.5-mile radius of the project location were reviewed. This was important so that consistent and balanced information would be available for input into the ARC travel demand model. The local DRI's and their descriptions are presented in **Table 3.2** (see page 17).

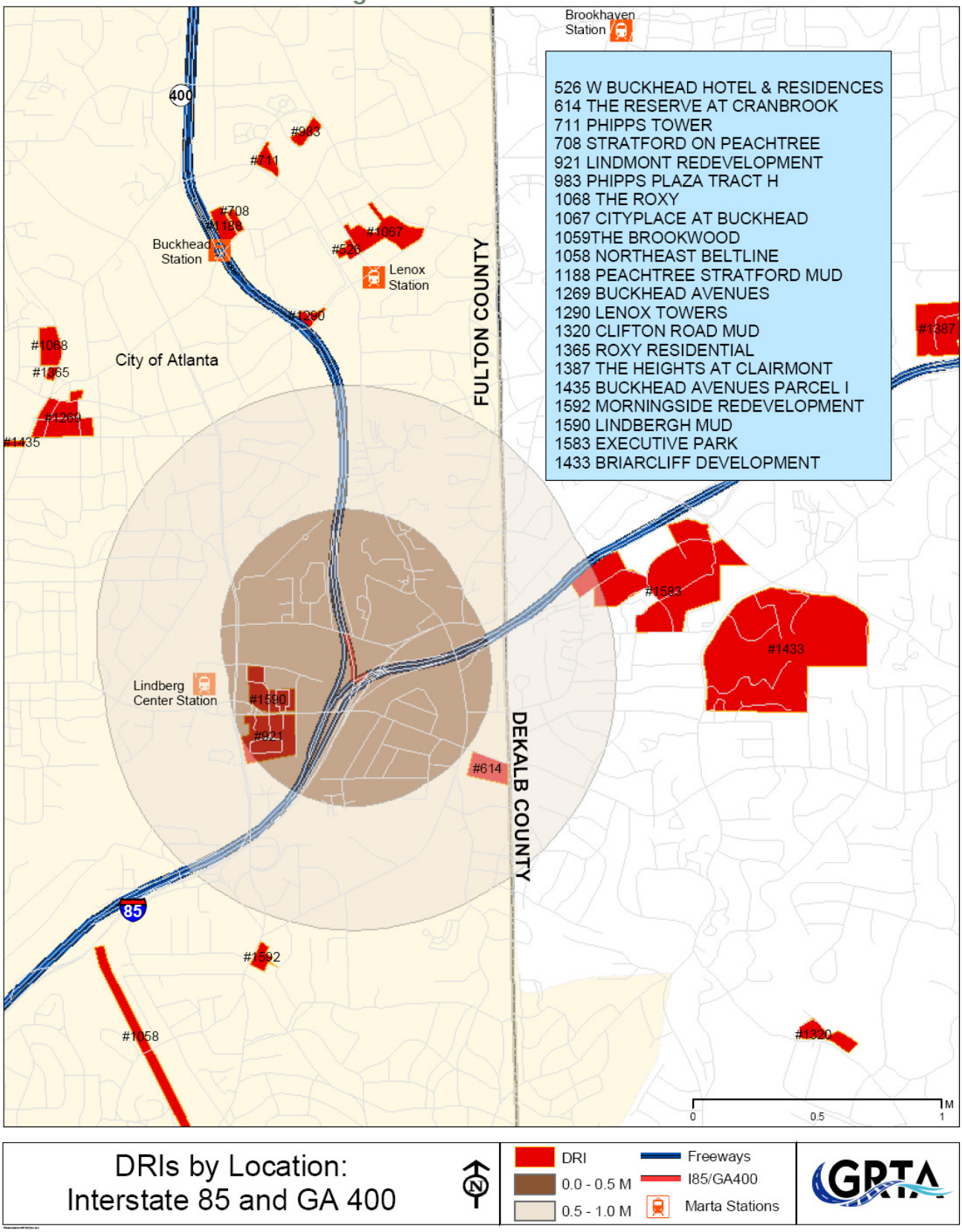
Table 3.2 Development of Regional Impact

DRI Id	Project	Development Type	Description
526	W Buckhead	Mixed Use	828,200 ft^2 of total developed space
614	Reserve @ Cranbrook	Mixed Use	480 RU's, 60,000 ft^2 retail
708	Stratford on Peachtree	Mixed Use	170,000 ft^2 hotel, 125,000 ft^2 condo space, 160 RU's
711	Phipps Tower	Commercial	500,000 ft^2 office
921	Lindmont Redevelopment	Housing	1,389 RU's
983	Phipps Plaza Tract H	Mixed Use	530 RU's / 250 rooms 50,000 ft^2 retail 8,500 ft^2 restaurant
1058	Northeast Beltline	Mixed Use	3237 RU's, 160,000 ft^2 25,000 ft^2 live/work
1059	The Brookwood	Mixed Use	285 RU's 25,000 ft^2 retail
1067	Cityplace @ Buckhead	Mixed Use	3,832 RU's 95,000 ft^2 commercial
1068	The Roxy	Mixed Use	445 RU's 55,800 ft^2 retail
1188	Peachtree Stratford	Mixed Use	498 RU's / 300 rooms 12,500 ft^2 retail
1237	Johnson Ferry East Redevelopment	Mixed Use	836 RU's 80,000 ft^2 retail
1269	The Streets of Buckhead	Mixed Use	860,475 ft^2 of total developed space
1290	Lenox Towers	Residential	700 RU's
1320	Clifton Road	Mixed Use	872 RU's / 200 rooms 121,000 ft^2 retail
1435	Buckhead Avenues Parcel 1	Mixed Use	63 RU's / 221 rooms 300,000 ft^2 office 31,868 ft^2 retail
1583	Executive Park	Mixed Use	772 RU's 1,074,000 ft^2 office 693,000 ft^2 retail 57,000 ft^2 restaurant
1590	Piedmont Rd. at Lindberg Circle	Mixed Use	96,000 ft^2 grocery 17,700 ft^2 retail
1592	Morningside Redevelopment	Mixed Use	360 RU's 50,000 ft^2 retail

Source: Georgia Regional Transportation Authority
Additional information concerning DRI requirements can be found at: http://www. grta.org/dri/home.htm

Overall, the DRI's represent the addition of approximately 20,000 new residential units, and 6,000,000 square feet of commercial, retail, and office space. The economic impact of these developments is estimated to represent $4.9 billion upon build-out with $168.3 million in annual local taxes. This demonstrates the enormous economic impact that is expected in this area over the next ten to fifteen years. Nearly all of the DRI's in Fulton and DeKalb Counties will benefit from the improved access achieved by constructing the proposed interchange ramps. The DRI locations are mapped in **Figure 3.1** (see page 19).

Figure 3.1 DRI Locations



3.4 Model Refinement

A travel demand model was used to forecast future traffic growth, as well as assess traffic assignments on local roads. The travel demand model provided an opportunity to test scenarios with and without the proposed connector ramps. It is important to review the potential impacts of the proposed interchange modification not only to the I-85/SR 400 interchange itself, but to the surrounding roadway network as well. The ARC *Envision 6* travel demand model was used to conduct runs for years 2010, 2020, and 2030 for both the build (with proposed ramps) and no-build (without proposed ramps) alternatives.

The *Envision 6* travel demand model is calibrated at a regional level, and therefore it is important to examine model output within a project's study area in order to confirm the reasonableness of the results. Since the *Envision 6* model was developed prior to the permitting of several large-scale building projects around the I-85/SR 400 interchange, it was thought that traffic volume output from the future year model could be lower than actual future year traffic. In order to determine if the model accurately reflects growth in line with these large-scale projects, growth projections in traffic analysis zones (TAZ's) immediately surrounding the I-85/SR 400 interchange were reviewed.

Socioeconomic data is a key driver of travel demand in the regional model, and larger numbers of households and jobs translate to higher levels of traffic. According to ARC's projections, the total number of households in 13 TAZ's surrounding the interchange is projected to increase by 3,000 between year 2005 and year 2020. Employment is projected to increase by 13,000 in these TAZ's over the same period. However, 18 DRI's have been approved (and 3 more are under review) in these 13 TAZ's, and these 21 projects alone will add approximately 20,000 new residential units and 6 million square feet of commercial, retail, and office space to the 13-TAZ area. This equates to nearly 17,000 new households and 22,000 new jobs. Smaller-scale developments in the area will add to these projected totals, leading to significantly higher totals than those forecasted by ARC. The following **Table 3.3** shows the comparison of ARC growth to growth expected just from DRI's in the 13 TAZ's surrounding the I-85/SR 400 interchange.

Table 3.3 Comparison of ARC and DRI Household and Employment Growth

TAZ #	2005-2020 Household Growth (ARC)	2005-2020 Household Growth (DRI Only)	2005-2020 Employment Growth (ARC)	2005-2020 Employment Growth (DRI Only)
23	212	324	150	125
29	508	2,913	483	525
153	205	239	-379	63
158	1,142	3,735	4,295	475
161	167	682	369	1,849
166	25	594	177	-
167	35	630	198	-
176	93	925	118	2,699
512	209	644	2,312	-
513	102	3,330	-507	5,250
514	81	1,017	19	9,482
567	112	785	4,020	303
1654	10	1,548	2,100	1,001
SUM	3,000	17,000	13,000	22,000

While a significant amount of development is planned in the area surrounding the interchange, there is no guarantee that everything will be built as originally envisioned. For this reason, not all of the DRI growth was added to the TAZ totals. Approximately 50% of the 17,000 DRI-related households were added to the TAZ's, and less than 50% of the DRI-related jobs were added. In total, about 8,500 households and 9,000 jobs were added to the 13 TAZ's in both the 2020 and 2030 travel demand model input files. Fewer than 2,000 households and jobs were added to the 2010 network files, because many of the DRIs are scheduled for completion after year 2010.

The input file for jobs includes a breakdown by employment type (e.g. construction, retail, service-oriented jobs, etc.). All of the 9,000 additional jobs were assigned in proportion to the existing job type splits in each TAZ. In the same way, additional households were assigned in proportion to existing distributions of income and household size. The following **Table 3.4** provides an example of the allocation of jobs to TAZ number 514. **Table 3.4** shows that the 3,880 additional jobs in this TAZ were assigned to employment types in the same proportion as the original data for the TAZ.

Table 3.4 DRI Based Job Growth

TAZ # 514 Employment Type	Year 2020 Original Totals	Year 2020 Original Jobs % of Total	Year 2020 Additional Jobs by Type	Year 2020 Additional Jobs % of Total
Construction	109	2%	79	2%
Manufacturing	147	3%	106	3%
TCU	121	2%	87	2%
Wholesale	238	4%	171	4%
Retail	563	10%	406	10%
FIRE	5	0%	4	0%
Service	2,781	52%	2,004	52%
Government	1,420	26%	1,023	26%
TOTAL	5,384	100%	3,880	100%

The regional control totals for both households and employment were retained throughout this process. In order to meet this constraint, an equal number of households and jobs were taken from all of the other TAZ's in the model networks. The values for all other TAZ's were multiplied by a factor slightly less than 1. This brought the 20-county regional sums of households and jobs back in line with the original totals.

All of the other input files remained the same for these model runs. Model runs were executed for 2010, 2020, and 2030 no-build and build scenarios. Output volumes from these runs were used to develop annual traffic growth rates.

3.5 Traffic Forecasts

The travel demand model produces average daily traffic (ADT) forecasts for each link in the roadway network. Specific locations were targeted for tracking ADT growth from 2010, 2020 and 2030. Examples of this are shown in **Table 3.5** (see page 22).

Table 3.5 ADT Growth Rate

Locations	2010 ADT	2020 ADT	2030 ADT	Growth Rate 2010 to 2030
No-Build Alternative				
I-85 NB before SR 400 off-ramp	98,230	102,622	106,438	0.40%
I-85 SB before SR 400 off-ramp	100,652	102,939	111,330	0.51%
SR 400 NB on ramp from Sidney Marcus Blvd.	17,685	19,033	20,386	0.71%
SR 400 SB off ramp to Sidney Marcus Blvd.	15,310	16,607	18,079	0.83%
Lenox Rd. north of SR 13/Buford Highway	8,065	8,555	9,103	0.61%
Lenox Rd. between I-85 SB off ramp and SR 13/Buford Hwy.	43,355	49,169	51,085	0.82%
Build Alternative				
I-85 NB before SR 400 off-ramp	94,132	101,620	108,460	0.71%
I-85 SB before SR 400 off-ramp	94,967	97,535	108,356	0.66%
SR 400 NB on ramp from Sidney Marcus Blvd.	12,924	12,457	12,963	0.02%
SR 400 SB off ramp to Sidney Marcus Blvd.	10,788	12,096	12,145	0.59%
Lenox Rd. north of SR 13/Buford Highway	8,210	7,987	8,604	0.23%
Lenox Rd. between I-85 SB off ramp and SR 13/Buford Hwy.	34,919	38,762	40,812	0.78%

The model indicates that the addition of the interchange ramps in the Build alternative provides traffic relief to many of the existing roads in the area, as expected. Evidence for this can be seen in the widespread ADT reduction between the No-Build and Build alternatives in the table above. Also included in the table is the average annual growth rate over the 20 year period, 2010-2030. With data available at three separate points in time, growth rates could also be calculated for the 10-year periods 2010-2020 and 2020-2030 in order to get more precise forecasts for intermediate years.

Further refinements were made to the growth rate based on GDOT historical traffic counts. The annual growth rate from the existing year, 2007 to the opening year, 2015 was based upon a more aggressive growth rate shown from the GDOT historical counts. The 2015 to 2030 growth was based more upon the slower growth rate predicted by the refined ARC model. These growth rates were then applied to recent traffic count data in order to establish the input volumes for different years used in the subsequent traffic operation analysis.

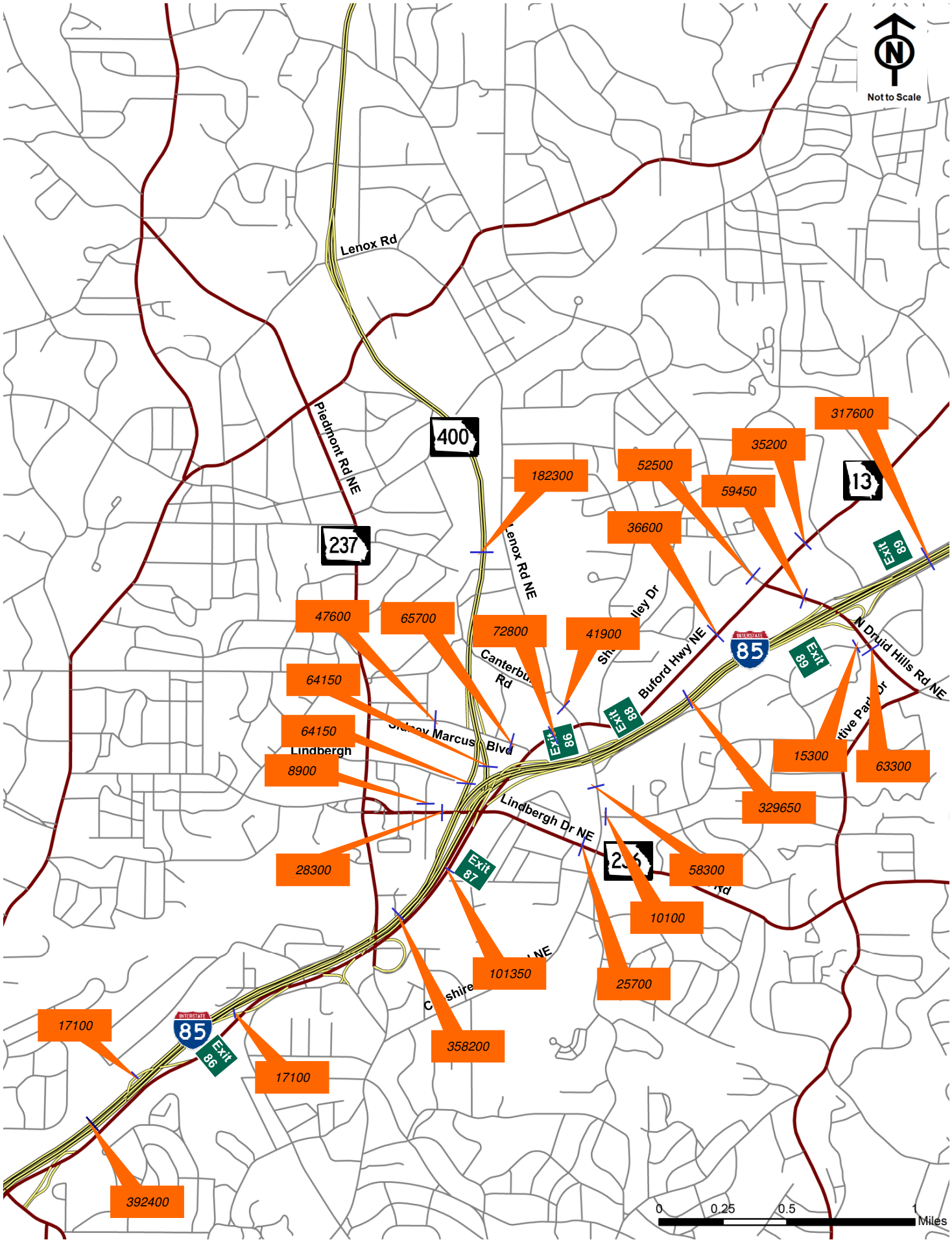
The final growth rates were applied to existing traffic volumes to estimate the No-Build future traffic volumes for 2015 and 2035. The Build future traffic volumes were calculated using the No-Build traffic volumes as a basis. The Build traffic volumes were calculated by estimating the traffic from I-85 and SR 400 that would be diverted from the existing travel paths along Sidney Marcus Boulevard, SR 13/Buford Highway and Lenox Road to the proposed ramps and the new traffic attracted by the proposed ramps. The ARC models results indicated that new I-85 and SR 400 traffic would be attracted to these routes by providing an alternative connection between I-85 and SR 400 to the existing poor connection via surface streets.

Since the absolute values of the refined ARC model daily traffic volumes do not match exactly real world daily traffic volumes on I-85 and SR 400, the percentage change in future traffic volumes from the ARC model were used to estimate changes in future traffic volumes instead of changes in absolute values from the model.

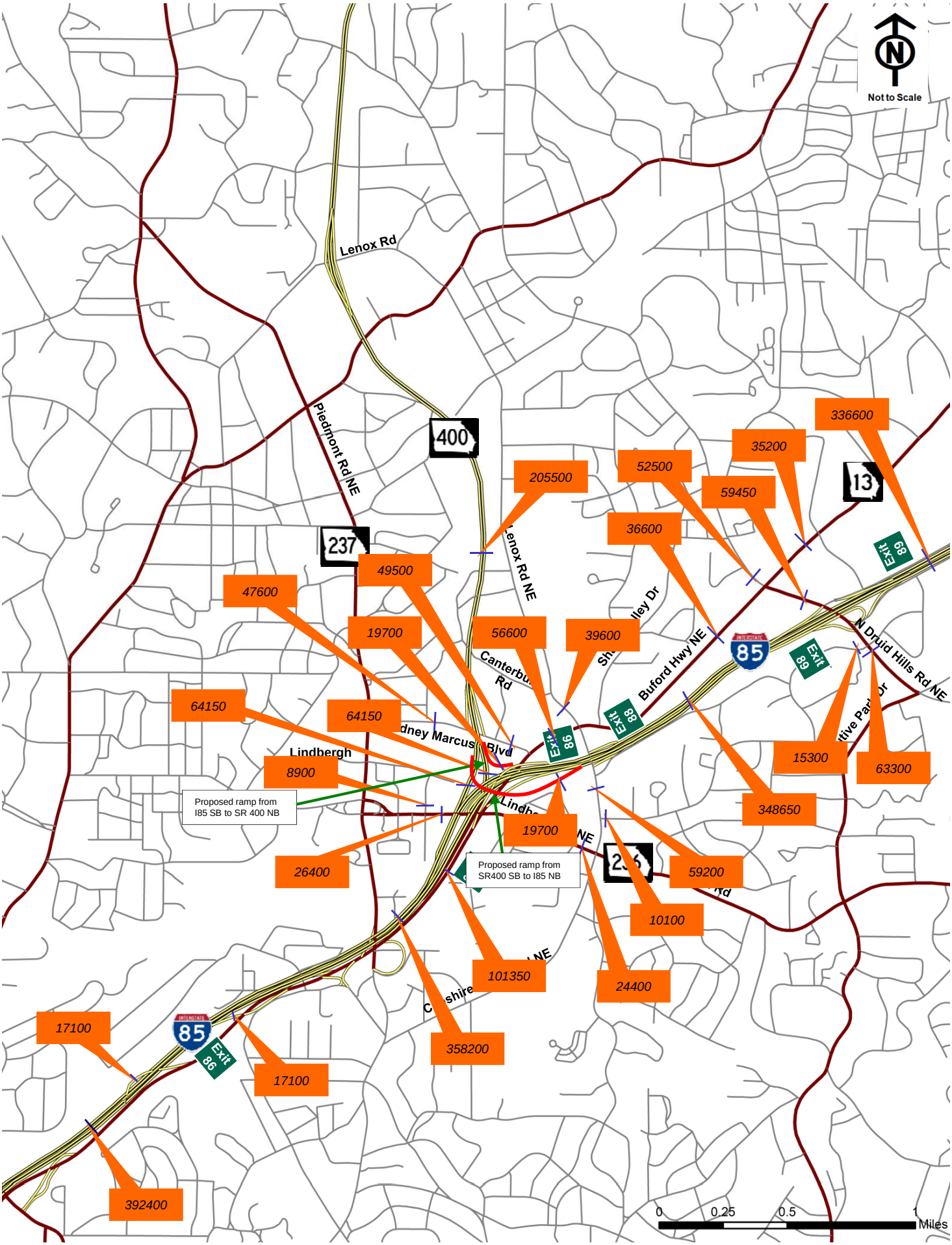
The increases in total future traffic (I-85 southbound to SR 400 northbound and SR 400 southbound to I-85 northbound) were estimated by taking the percentage increases in these respective volumes in the ARC models and applying these percentage increases to the future No-Build traffic volumes.

These future traffic volumes were then distributed between the proposed connector ramps and the surface street connections via the existing ramps based on traffic volumes from the ARC model.

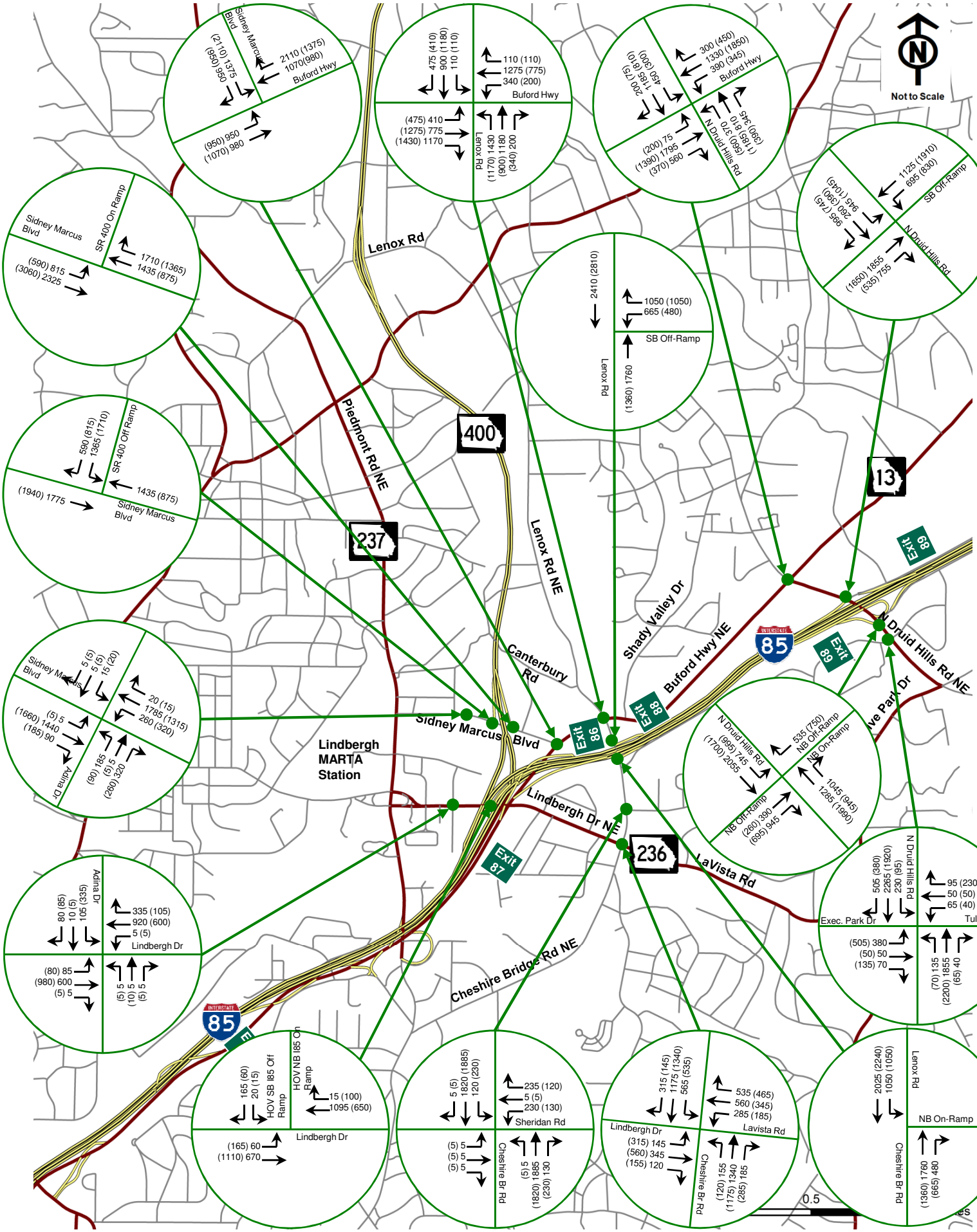
Figure 3.2 (see page 24) shows the daily volumes for the no-build alternative in the design year (2035). **Figure 3.3** (see page 25) shows the daily volumes for the preferred Build alternative in the design year (2035). **Figure 3.3** shows the estimate changes in traffic patterns and volumes resulting from building the two proposed connector ramps. **Figure 3.4** (see page 26) shows the peak hour turning movement volumes for the no-build alternative in the design year (2035). **Figure 3.5** (see page 27) shows the peak hour turning movement volumes for the preferred Build alternative in the design year (2035). Traffic diagrams are included in **Appendix A**.



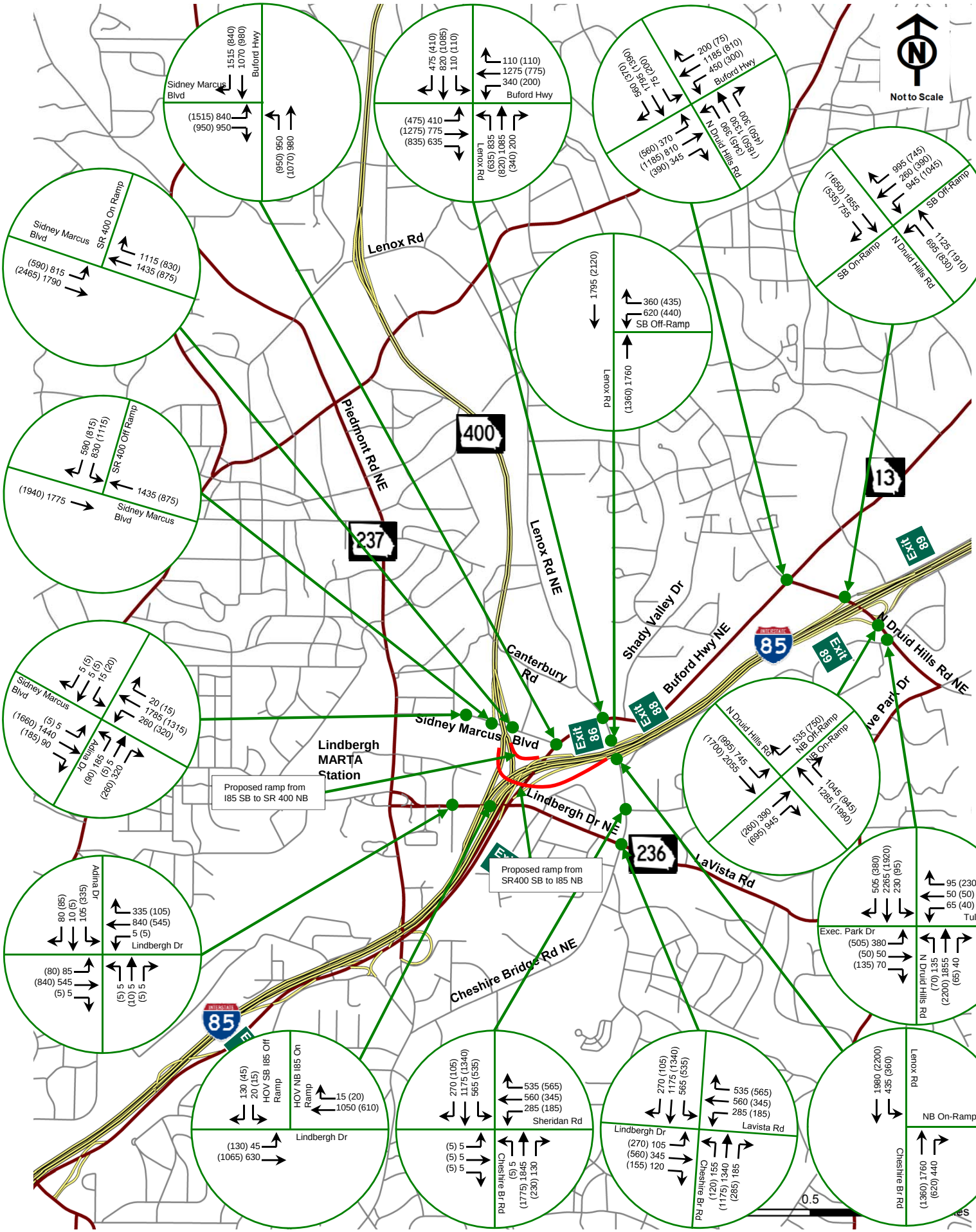
HNTB	**2035 No-Build Average Daily Traffic** *Interchange Modification Report for I-85 and SR 400*	Figure No: 3.2	Page No: 24



HNTB	2035 Preferred Alternative Average Daily Traffic *Interchange Modification Report for I-85 and SR 400*	Figure No: 3.3	Page No: 25



HNTB	**2035 No Build** **Peak Hour Turning Movement Volumes** *Interchange Modification Report for I-85 and SR 400*	xxx – AM Peak Hour Volumes (xxx) – PM Peak Hour Volumes	Figure No: 3.4 Page No: 26



xxx – AM Peak Hour Volumes
(xxx) – PM Peak Hour Volumes

2035 Preferred Alternative
Peak Hour Turning Movement Volumes

Interchange Modification Report for I-85 and SR 400

Figure No:	Page No:
3.5	27

4.0 Environmental Screening and Early Coordination

An environmental screening was conducted in the vicinity of the proposed interchange. The screening was a preliminary step in addressing the 1969 National Environmental Policy Act (NEPA), as amended, process designed to identify resources or issues of concern through background research and visual survey of the study area. This section only documents those issues or resources which are readily apparent at the preliminary screening level and therefore should not be considered exhaustive. This environmental screening does not fulfill FHWA's requirements for final approval of the proposed interchange modification at SR 400. Approval through NEPA will be required.

The area of potential effect (APE) consisted of a buffer around the proposed interchange. The survey area boundaries encompass a total of approximately 414.31 acres. Approximately 197.84 acres are in existing transportation, communications, and utilities right-of-way.

4.1 Cultural Resources (Historic and Archaeological Resources)

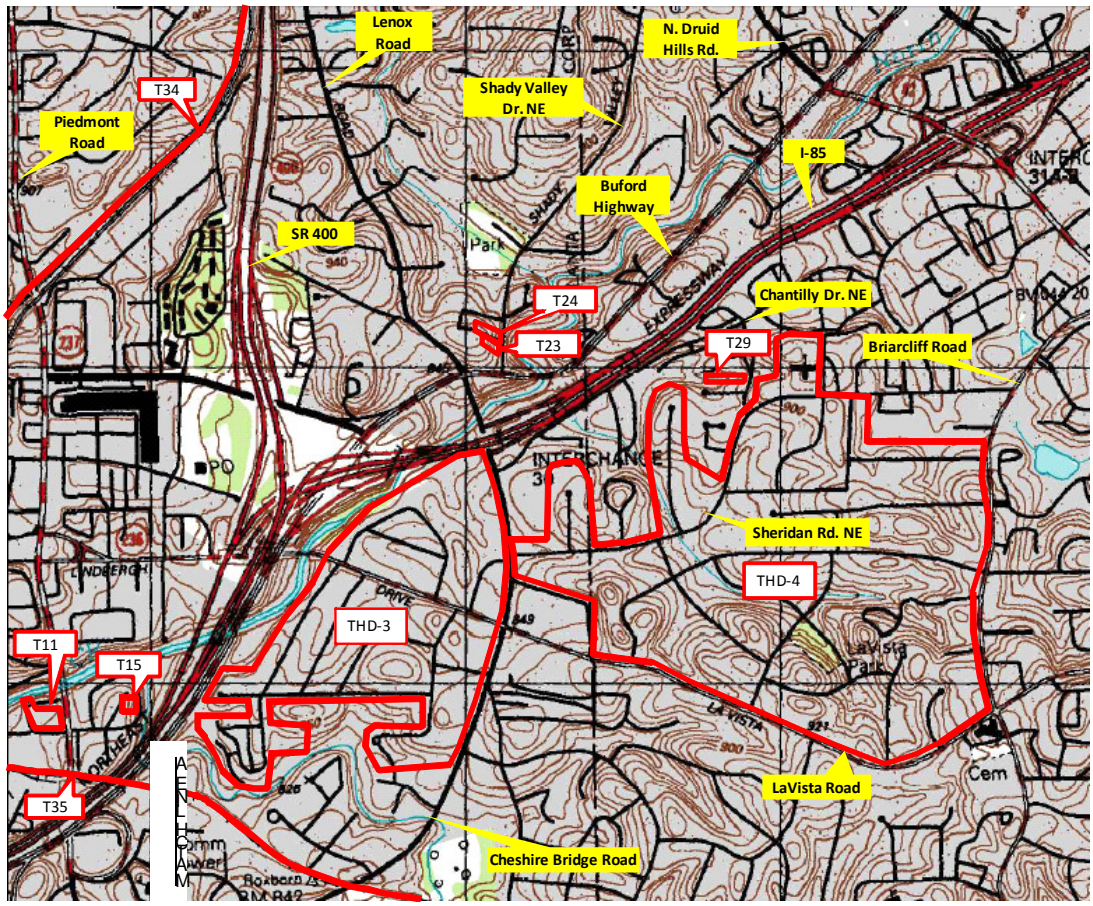
The proposed project has been surveyed for archaeological and historic resources, especially those on or eligible for inclusion in the National Register of Historic Places (NRHP), in compliance with Section 106 of the National Historic Preservation Act of 1966 (NHPA) and amendments thereto. The purpose of the survey was to locate, identify and evaluate the significance of any historic and archaeological resources within the project corridor.

A field survey for potentially eligible historic resources was also conducted along the project corridor. The APE, as defined in 36 CFR800.16(d), is the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties. The APE for this proposed project would include the areas within the proposed right of way and the viewshed of the proposed project within which all construction and ground-disturbing activity would be confined to.

All resources identified as being 50 years old or older were documented and evaluated for their potential eligibility for inclusion on the National Register. Determinations of eligibility were based upon the National Register criteria specified in the U.S. Department of the Interior regulations (36 CFR Part 60.4). Of the 35 individual properties and 5 districts 50 years old or older that were surveyed and to which the Criteria of Eligibility was applied, 11 individual properties and 4 districts have been recommended eligible for inclusion in the National Register of Historic Places.

Figure 4.1 and **Table 4.1** (see page 29) provide descriptions of the critical cultural resources in the APE (see **Appendix B** for complete Historic Resources Table and Location Maps).

Figure 4.1 Cultural Resources



Source: Draft Environmental Assessment, PI# 762380, Fulton County, GA

Table 4.1 Surveyed Cultural Resources

Name of Resource	Date of Construction	Type and/or Style	Location	National Register Recommendation
Dyer House 2 (T23)	1955	Ranch	2640 Shady Valley Drive NE	Eligible
Forsyth House (T24)	1940	Extended American Small House	2646 Shady Valley Drive NE	Eligible
Hunter House (T29)	1949	Extended American Small House	1524 Chantilly Drive	Eligible
Lindridge/ Martin Manor Historic District (THD-3)	1910-1960	Bungalows, American Small House, Ranch	Lindbergh Drive, Melante Drive, Armond Road, Cardova Drive	Eligible
LaVista Park Historic District (THD-4)	1940-1960	Bungalows, American Small House, Ranch	Briarcliff Road LaVista Road Sheridan Road Citadel Drive	Eligible

Source: Cultural Resources Survey Report, PI# 762380, Fulton County, GA, April 2009

4.2 Wetlands and Streams

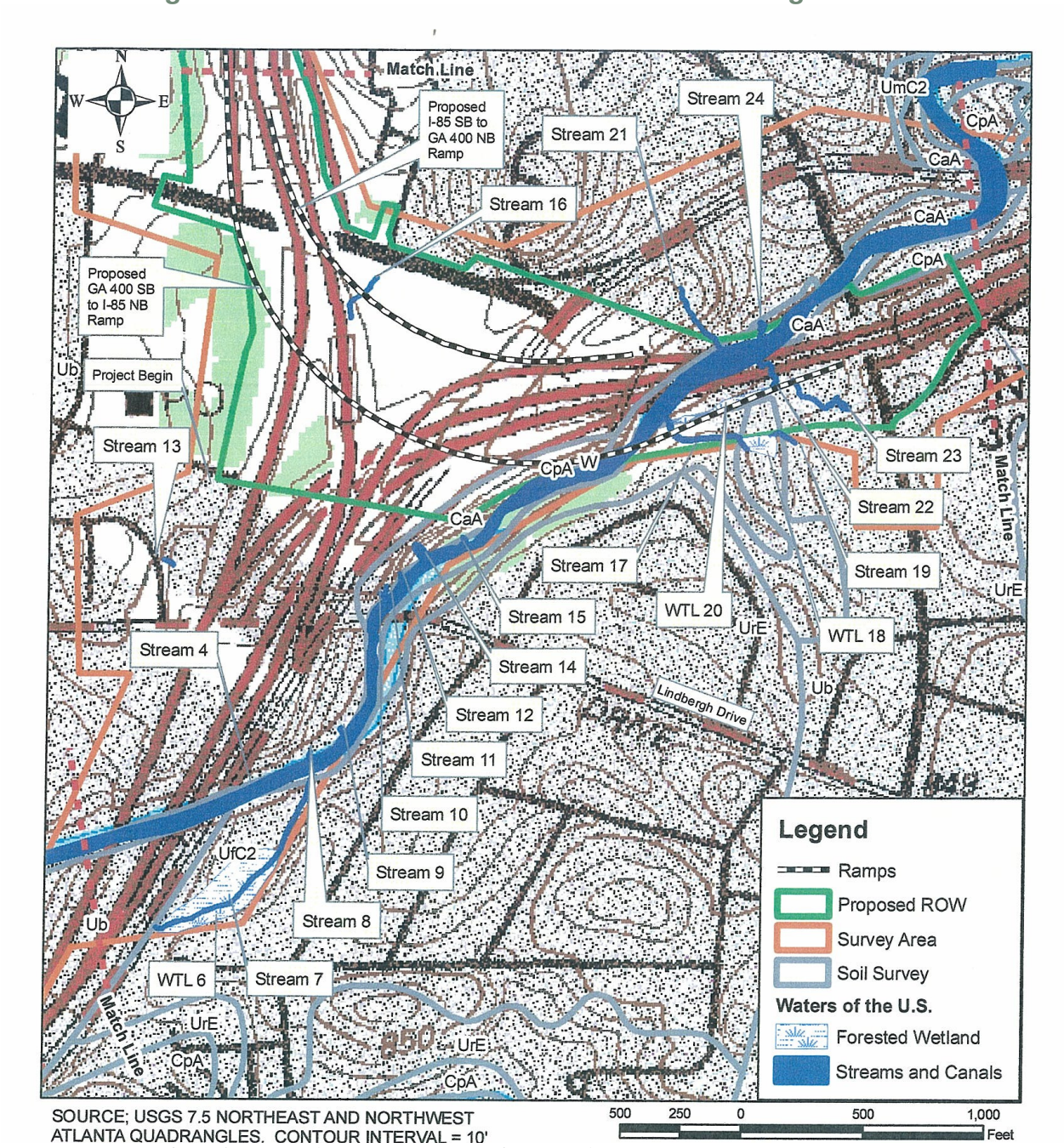
Jurisdictional waters are defined by 33 CFR Part 328.3(b) and are protected by Section 404 of the Clean Water Act (33 USC 1344), which is administered and enforced by the U.S. Army Corps of Engineers (ACOE). Minor impacts to jurisdictional waters are allowed without prior authorization by ACOE. However, if impacts exceed the allowed minor impacts (typically one tenth acre of wetlands or 100-linear feet of stream), permitting through the ACOE is required prior to any site development activities and mitigation to offset the impacts would be necessary. More stringent thresholds may be required for development within special protected areas, such as floodplains and the cumulative impacts of the project will be considered. Any longitudinal encroachments would have to be coordinated with ACOE and U.S. Fish and Wildlife Service (USFWS).

Background research included the identification of invasive pests listed by GDOT as being in the Appalachian Piedmont physiographic region; reviewing aerial photography for large areas of undisturbed habitat that may be used by migratory birds; reviewing the Georgia counties currently listed as containing essential fish habitat; reviewing National Wetlands Inventory maps of potential jurisdictional wetland locations; reviewing the *1958 Soil Survey of Fulton County, Georgia* for potential hydric soils and non-wetland waters of the U.S. locations; reviewing United States Geological Survey topographic maps of the area for potential stream and wetland locations; and reviewing the current federal list of threatened, endangered, and candidate species for Fulton County.

Four wetlands were identified within or adjacent to the project limits during the field survey. Project implementation would not impact any of the wetland areas. Eighteen ephemeral streams were identified within or adjacent to the project limits during the field survey. Four intermittent and five perennial streams were identified within or adjacent to the project limits during the field survey. These natural water resources are illustrated in **Figures 4.2** and **4.3** (see pages 31 and 32).The project alignment and bridge limits were configured to minimize environmental impacts to jurisdictional waters; therefore, project implementation would not impact any of these streams. A Section 404 Permit may not be required since there are no anticipated impacts to wetlands or streams. A stream buffer variance will be required.

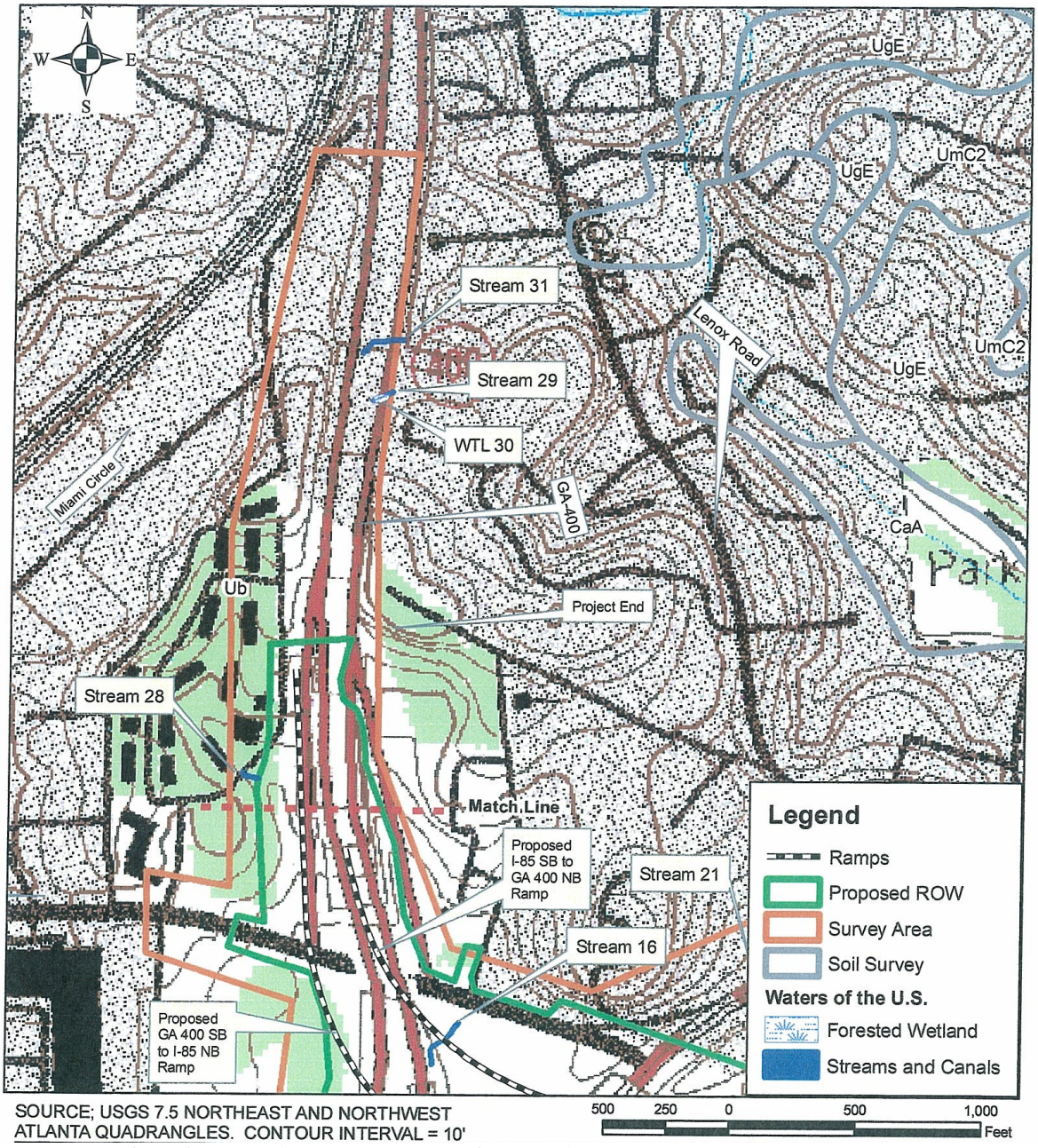
Avoidance and minimization alternatives have been evaluated for the proposed impacts to waters of the United States. The impacts are less than 0.1 acre; therefore, no mitigation is required.

Figure 4.2 Waters of the United States – Lindbergh Drive Area



Source: Draft Environmental Assessment, PI# 762380, Fulton County, GA

Figure 4.3 Waters of the United States – Sidney Marcus Boulevard Area



Source: Draft Environmental Assessment, PI# 762380, Fulton County, GA

4.3 Threatened and Endangered Species

The proposed project would have no affect on the federally listed Cherokee darter (Etheostoma scotti), Gulf moccasinshell mussel (Medionidus pencillatus), and shiny-rayed pocketbook mussel (Lampsilis subangulata). The proposed project will not "take" the federally protected bald eagle (Haliaeetus leucocephalus). The proposed project would have no significant adverse effect on the state listed bay star-vine (Schisandra glabra). None of these species, or other protected species, were observed along the proposed project during field surveys.

The USFWS County Listing of Threatened (T) and Endangered (E) Species was reviewed to determine the proposed interchange modifications' potential impact to protected species in Fulton County. **Table 4.2** (see page 34) lists the threatened and endangered species in Fulton County.

Table 4.2 Fulton County Protected Species and Habitat Requirements

Species	Federal Status	State Status	Habitat	Habitat Available?	Expected Species Impact
Bird					
Bald eagle Haliaeetus leucocephalus	None	E	Inland waterways and estuarine areas in Georgia.	No	No "take"; No significant adverse effect
Invertebrate					
Gulf moccasinshell mussel *Medionidus pencillatus*	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	No	No effect
Shiny-rayed pocketbook mussel *Lampsilis subangulata*	E	E	Medium creeks to the mainstems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	No	No effect
Fish					
Cherokee darter *Etheostoma scotti*	T	T	Shallow water (0.1-0.5 m) in small to medium warm water creeks (1-15 m wide) with predominantly rocky bottoms. Usually found in sections with reduced current, typically runs above and below riffles and at ecotones of riffles and backwaters.	No	No effect
Plant					
Bay star-vine *Schisandra glabra*	None	T	Twining on subcanopy and understory trees/shrubs in rich alluvial woods	No	No significant adverse effect

E = Endangered, T = Threatened

4.4 Migratory Bird Habitat

In accordance with the Migratory Bird Treaty Act, the proposed project was surveyed for migratory bird habitat in December of 2007. GDOT has adopted a policy of identifying tracts of contiguous habitat of 100 or more acres which would be impacted by the proposed project. An area of 100 acres is considered a sufficient size to allow the sensitive species to avoid predation and parasitism from species which will only penetrate a certain distance within a given habitat. In addition, GDOT surveys under bridges and large culverts which would be reconstructed or removed as part of a proposed project. If birds, such as the barn swallow, are observed nesting under the bridge or

culvert, demolition or reconstruction of that structure will be scheduled to take place at a time when the nests are not being used.

The proposed project corridor does not contain any contiguous habitat greater than 100 acres in size that would be considered significant to migratory birds. The project would be constructed in a highly developed urban area, with very few parcels of undisturbed land available to migratory birds. No migratory bird nests were observed on bridges along the project corridor.

4.5 Invasive Species

A survey for populations of invasive species that may be spread during construction, as required by Executive Order 13112, was conducted for this project. The invasive species for which the survey was conducted are those that have been identified by GDOT as having the highest priority due to environmental and economic impacts caused by those species. Both the selected species and the management practices specified will be reevaluated and revised appropriately as more information is obtained. Invasive plant species were abundant along the project corridor. Chinese privet, kudzu, Japanese honeysuckle, and mimosa were found at many wetland and upland sites.

The Department will take measures during project construction to prevent or minimize the spread of these species as appropriate for the time of the year. These measures will include removal and disposal of vegetative parts in the soil that may reproduce by root raking prior to moving the soil, burning on-site any such parts and above ground parts that bear fruit, controlling or eradicating infestations prior to construction, and cleaning of vehicles and other equipment prior to leaving the infested site. The measures used will be those that are appropriate for the particular species and the specific site conditions that exist on the project, as described in Georgia Standard Specifications Section 201, Clearing and Grubbing Right-of-Way.

4.6 Hazardous Materials

The U.S. Environmental Protection Agency (EPA) and Facility Registry System (FRS), and the Georgia Environmental Protection Division (EPD) Underground Storage Tank Database were reviewed to locate known hazardous material sites and underground storage tank (UST) locations in the vicinity of the proposed interchange. This review resulted in 252 locations of UST or other hazardous materials in the vicinity of the proposed interchange improvements.

This literature search and database review provided a preliminary determination of potentially contaminated sites that may impact a project in the study corridors. **Tables 4.3 and 4.4** (see page 36) list these sites and describe their location within the study area.

Table 4.3 Summary of UST Sites

SITE NAME/ ADDRESS	STATUS	UP GRADIENT	SIDE GRADIENT	DOWN GRADIENT
American Red Cross 1925 Monroe Drive	Active	X 200 ft		
Watkins Associated Industries 1958 Monroe Drive	Active	X		
Plaster Gas & Food 496 Plaster Avenue	Active		X 50 ft	
Monroe Drive BP 2200 Monroe Drive	Active	X 540 ft		
J.C. E.T., LLC 2195 Monroe Drive	Active	X 540 ft		
Stein Printing 2161 Monroe Drive	Inactive	X 240 ft		
Atlanta Fire Station #29 2167 Monroe Drive	Inactive	X 430 ft		

Table 4.4 Summary of LUST Sites

SITE NAME/ ADDRESS	STATUS	UP GRADIENT	SIDE GRADIENT	DOWN GRADIENT
American Red Cross 1925 Monroe Drive	NFA(1999)	X 200 ft		
Watkins Associated Industries 1958 Monroe Drive	NFA (2004)	X		
Plaster Gas & Food 496 Plaster Avenue	NFA(1989)		X 50 ft	
Stein Printing 2161 Monroe Drive	NFA(1996)	X 240 ft		
Monroe Drive BP 2200 Monroe Drive	In Remediation	X 540 ft		
J.C. E.T., LLC 2195 Monroe Drive	NFA(1992,94)	X 540 ft		

A field survey of the proposed corridor was not conducted. The preliminary review of regulatory agency databases identified one facility, Plaster Gas & Food that is immediately adjacent to the Property Corridor. This UST/LUST facility received a No Further Action (NFA) letter from the Georgia Environmental Protection Division (GEPD) in 1989 and is currently an active retail gasoline facility. Based on the preliminary review, the other facilities identified during the preliminary inventory were either downgradient of or not in the immediate vicinity of the proposed Property Corridor to have an impact on proposed construction activities.

4.7 Utilities

The study area in the City of Atlanta, Fulton County is served by several utilities. The City of Atlanta provides its own water in this area. The known utilities owners are shown in **Table 4.5**. These companies and agencies will be notified as the interchange approval process moves forward.

Table 4.5 Utility Owners

Utility Owners	Utility
Georgia Power	*Power Distribution*
Atlanta Gas & Light	*Gas*
City of Atlanta Sewer	*Sewer*
Comcast Cable	*Cable TV*
AT & T	*Telecommunications*
AGL Networks	*Telecommunications*
Level 3 Communications	*Telecommunications*
City of Atlanta Dept. of Watershed Management	*Water*

4.8 Community Impacts

An assessment of community impacts will be a necessary component of the NEPA process. The proposed interchange is a capacity and volume-adding project; therefore, some increases in noise, vibration, dust, or odor are anticipated. As currently planned, no residential displacements are expected to occur; however, minimal right of way impacts may occur.

The proposed project would not introduce new or additional barriers to existing neighborhoods that flank the corridor. The proposed project is not anticipated to cause substantial changes to population structure or demographic patterns in the project area.

The proposed project would retain the existing exit/entrance ramps with side streets, while adding additional access ramps connecting SR 400 southbound with I-85 northbound and I-85 southbound with SR 400 northbound. No properties would be cut off from utility or other municipal services. The project would benefit residents, schools and churches in the area by rerouting traffic from local streets to the proposed interchange connector ramps; thereby, freeing capacity on the local streets for local users.

The project alignment was chosen to minimize impacts to residents and property to the fullest extent possible. The impact of the build alternative on residential and commercial properties has been assessed through a Conceptual Stage Study. The study reports that the preferred alternative will not displace any residences or businesses.

There are a variety of churches, four public schools, and local government institutions located in the vicinity of the project corridor. The proposed project would not result in any direct impacts to any of the churches or institutions.

4.9 Early Coordination

During the early project concept development process, a number of agencies, including local governments and local planning agencies, were contacted and asked for their comments and input on the proposed action.

Below is a list of the agencies that were sent early coordination letters:

- U.S. Army Corps of Engineers, Morrow, GA
- U.S. Department of Agriculture, Natural Resource Conservation Service, Athens, GA
- U.S. Department of Housing and Urban Development, Atlanta, GA
- U.S. Department of Health and Human Services, Atlanta, GA
- National Park Service, Atlanta, GA
- U.S. Geological Survey, Reston, VA
- U.S. Environmental Protection Agency, Atlanta, GA
- U.S. Fish and Wildlife Service, Athens, GA
- Federal Highway Administration, Atlanta, GA
- Federal Emergency Management Agency, Atlanta, GA
- Centers for Disease Control, National Center for Environmental Health, Atlanta, GA
- Georgia Department of Natural Resources, Atlanta, GA
- Division of Floodplain Management, GDNR, Atlanta, GA
- Georgia Environmental Protection Division, Atlanta, GA
- Georgia Forestry Commission, Macon, GA
- Fulton County
- Fulton County Public Works Department
- City of Atlanta
- City of Atlanta Department of Public Works
- City of Atlanta Department of Planning & Community Development
- Atlanta Development Authority, Atlanta, GA

Coordination meetings were conducted with following local agencies:

- City of Atlanta Bureau of Planning
- DeKalb County Public Works Department
- DeKalb County Planning & Development
- Metropolitan Atlanta Rapid Transit Authority (MARTA)

Copies of early coordination letters, coordination meeting minutes, and comments received from the responding agencies are included in the **Appendix E-2**.

5.0 Description of Alternatives

Several alternatives were developed to evaluate the connector ramps between SR 400 and I-85. The impacts of each alternative and the ability of each alternative to meet FHWA's requirements are documented in the sections below.

5.1 No-Build Alternative

In this alternative, the proposed ramps are not included. All other projects currently planned in the ARC models within the study area are included. This alternative was not recommended since it does not provide the connectivity that is the intent of this project. However, this serves as a base case for comparison to the "build" alternatives.

5.2 Build Alternatives

Six alternatives were developed to demonstrate how I-85 and SR 400 operate in the future with the proposed interchange modifications. Schematics of the potential alternatives were developed for evaluation and comparison. As part of FHWA's requirements, documentation is required on why a particular interchange layout was recommended. Based on this requirement, a matrix was developed to summarize the alternative evaluation and comparison results. **Table 5.1** (see page 56) displays the potential interchange layouts and provides information that was used to determine the preferred interchange layout. Schematics of the potential interchange layouts are included as **Figures 5.1** through **5.6**.

An alternative that would develop a northbound collector-distributor road system adjacent to I-85 northbound between SR 13/Buford Highway and North Druid Hills Road was considered early in the concept development process. There is minimal space between the existing I-85 northbound lanes and major commercial buildings along the south side of I-85. This concept was dropped from further consideration after the environmental impacts to the adjacent commercial properties and substantial right-of-way costs were taken into consideration.

Four of the six alternatives (1, 1A, 1B and 2) would maintain the existing number of lanes on I-85 northbound south of the SR 13 northbound on-ramp. Two of the six alternatives (3 and 3A) would drop one I-85 northbound lane after the SR 400 northbound off-ramp. The existing lane that would be dropped in Alternatives 3 and 3A is the fourth general purpose lane that is added immediately north of the SR 400 off-ramp.

The advantages of dropping one I-85 northbound lane are as follows:

- Significant reduction in environmental impacts on properties on the south side of I-85 between Cheshire Bridge Road and North Druid Hills Road
- Reduction in construction and right-of-way costs
- Improved traffic flow through the section of I-85 northbound between SR 400 and North Druid Hills Road

The traffic flow improvements associated with the I-85 northbound lane drop would result from the reduced fluctuations in densities along this section of I-85. The No-Build, 2035 PM peak hour, CORSIM simulation results (see **Appendix D-2**) indicate that leaving the existing fourth lane open would result in lower densities on I-85 northbound and allow traffic to travel at an average speed of 56 mph after passing the SR 400 exit. However, this I-85 northbound traffic would then slow down to 37 mph in the section north of the Lenox Road/Cheshire Bridge Road on-ramp.

The Build, 2035 PM peak hour, CORSIM simulation results (see **Appendix D-2**) indicate that closing the existing fourth lane open would result in higher densities on I-85 northbound, but would result in maintaining a minimum speed of 54 mph in the section north of the Lenox Road/Cheshire Bridge Road on-ramp. This traffic flow improvement was demonstrated in CORSIM as described in **Section 6.5** (see page 92) which predicted travel time savings on this section of I-85 northbound between the 2035 PM No-Build and Build models even with increased traffic volumes in the 2035 PM Build conditions.

The preferred interchange configuration is Alternative 3. The interchange layout was chosen for the following reasons:

- It provides no displacements and minimal right-of-way acquisition
- Provides minimal environmental and utility impacts
- Minimize impacts to the existing ramp operations for several interchanges
- Would have the least impact to existing structures and roadways, thus having a lower construction cost
- Allows for a design with minimal design exceptions
- Matches user expectancy.

The preferred interchange layout was moved forward and went through a more detailed design concept. The design concept of the preferred interchange layout on an aerial is provided in **Appendix C-1**.

The following sections describe the Alternatives Considered.

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5.2.1 Alternative 1 (SR 400 Collector Distributor Option)

SR 400 Southbound to I-85 Northbound Ramp:
Combined with the off-ramp to Sidney Marcus Boulevard, the proposed ramp would exit from the right side of SR 400 southbound mainline approximately 1500 feet north of the existing Sidney Marcus Boulevard off-ramp. After exiting as a single two-lane ramp, the ramps to I-85 northbound and to Sidney Marcus Boulevard would share a common, two-lane section for approximately 1,000 feet before splitting. Then the proposed ramp to I-85 northbound would cross over Sidney Marcus Boulevard and the existing SR 400/I-85 Interchange structures. It would join the I-85 northbound mainline on the left side of SR 13/Buford Highway on-ramp. With this alternative, the existing SR 13/Buford Highway northbound on-ramp would be shifted outside to accommodate the new ramp from SR 400 southbound. In addition, the SR 13/Buford Highway northbound on-ramp would merge down from two lanes to one lane before joining I-85 northbound mainline. The proposed posted speed limit for this ramp would be 45 miles per hour (mph).

With this alternative, the existing SR 13/Buford Highway northbound on-ramp would be shifted outside to accommodate the new ramp from SR 400 southbound. In addition, the SR 13/Buford Highway northbound on-ramp would merge down from two lanes to one lane before joining I-85 northbound mainline. The proposed posted speed limit for this ramp would be 45 miles per hour (mph). The reduction of SR 13/Buford Highway northbound on-ramp from two lanes to one lane would result in significant congestion on this ramp and would increase the differential speed between the I-85 northbound mainline and this on-ramp, which would result in more congestion on I-85.

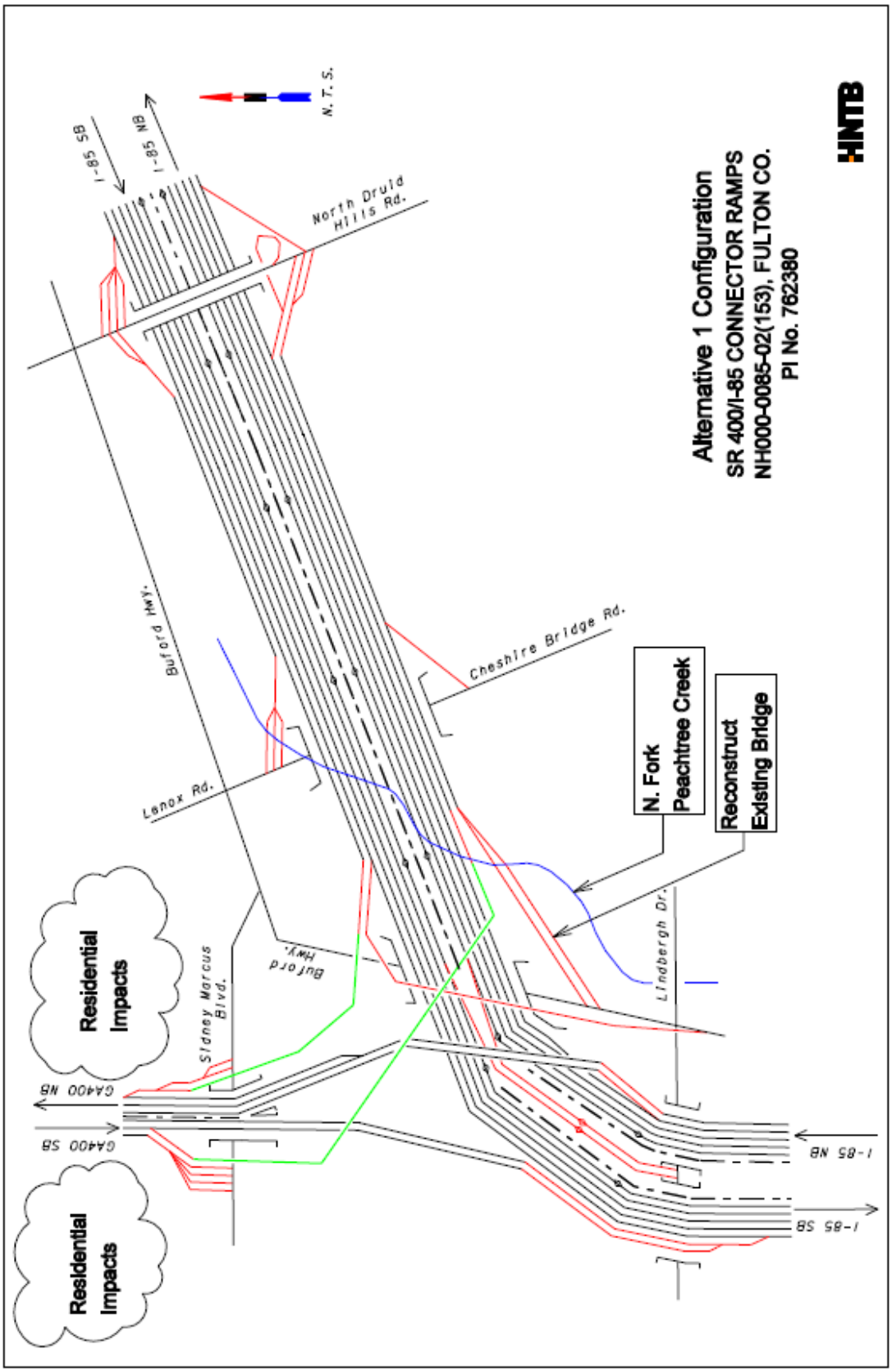
Typical Section:
One 16-foot wide travel lane with a 6-foot wide inside shoulder and a 10-foot wide outside shoulder.

I-85 Southbound to SR 400 Northbound Ramp
The proposed ramp would exit the existing I-85 southbound mainline with the existing off-ramp to SR 13/Buford Highway southbound. After exiting as a single two-lane ramp, the ramps to SR 400 northbound and to SR 13/Buford Highway southbound would share a common, two-lane section for approximately 1,000 feet before separating. Then the proposed ramp to SR 400 northbound would turn north. From this point, the proposed ramp would cross over SR 13/Buford Highway and Sidney Marcus Boulevard and then continue north. The existing Sidney Marcus Boulevard northbound on-ramp would be shifted outside and merge with the proposed ramp from I-85 southbound for approximate 1000 feet before merging onto the SR 400 northbound mainline. The proposed posted speed limit for this ramp would be 45 mph.

Typical Section:
One 16-foot wide travel lane with a 4-foot wide inside shoulder and a 12-foot wide outside shoulder.

The combination of SR 400 southbound off-ramps to Sidney Marcus Boulevard and I-85 northbound would mix system-to-system interchange traffic with local interchange traffic and would require additional cost to reconstruct the existing Sidney Marcus Boulevard off-ramp. The beginning point of the combined southbound exit is constrained by the nearby MARTA substation. Both combined ramps would have right-of-way impacts to the residential properties along the SR 400 mainline on both sides. This alternative would also have significant negative impacts on SR 13/Buford Highway northbound traffic by merging the SR 13/Buford Highway ramp to I-85 northbound to one lane prior to the merge with I-85. This alternative would require the reconstruction of the existing SR 13/Buford Highway northbound to I-85 northbound ramp structure over North Fork of Peachtree Creek to make space for the SR 400 southbound to I-85 northbound ramp, which would increase the construction cost significantly. **Figure 5.1** (see page 43) is a schematic representation of Alternative 1.

Figure 5.1 Alternative 1 Schematic Diagram



5.2.2 Alternative 1A (I-85 Collector Distributor Option)

SR 400 Southbound to I-85 Northbound Ramp:
The proposed ramp would be similar to Alternative 1 except the area where the proposed ramp from SR 400 southbound joins I-85 northbound mainline. With this alternative, the proposed ramp would join on the left side of SR 13/Buford Highway on-ramp to create a new I-85 northbound Collector-Distributor (CD) Road. This alternative would convert the Lenox Road/Cheshire Bridge Road on-ramp into a loop ramp so it would merge with the new I-85 northbound CD Road sooner. After the merge, the three-lane I-85 northbound CD Road would continue for approximate 2500 foot before merging down to two lanes. The two-lane I-85 northbound CD Road would join the five I-85 northbound mainline lanes (one HOV lane and four general purpose lanes) to match the existing seven-lane section on I-85. The proposed posted speed limit for this ramp would be 45 miles per hour (mph). The proposed posted speed limit for the new I-85 northbound CD Road would be 55 mph.

Typical Section:
Same as Alternative 1.

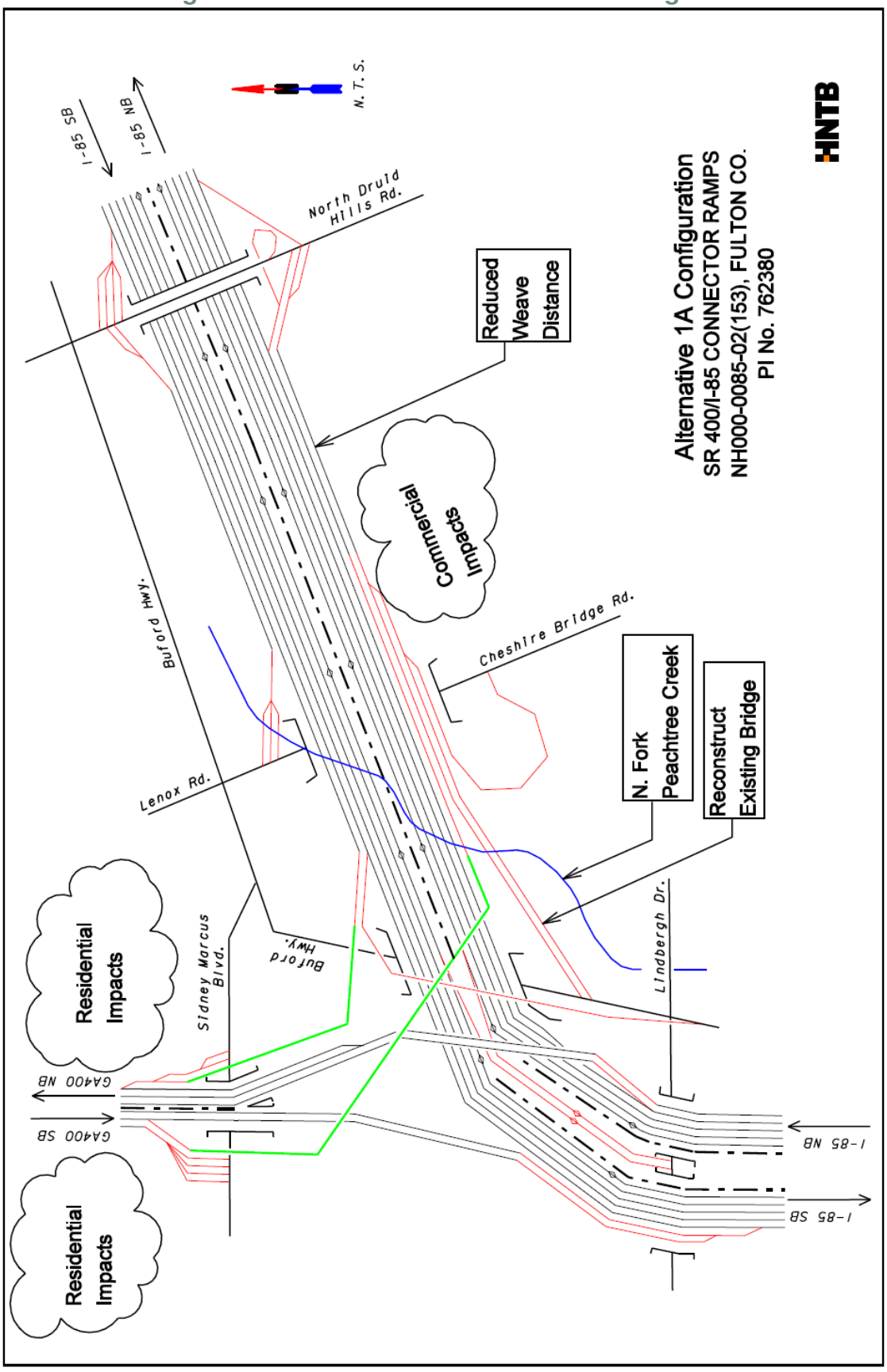
I-85 Southbound to SR 400 Northbound Ramp
Same as Alternative 1.

Typical Section:
Same as Alternative 1.

Similar to Alternative 1, this alternative would have the same negative feature related to the SR 400/Sidney Marcus Boulevard interchange. The widening along I-85 northbound would require the relocation of the adjacent surface street, Chantilly Drive, and numerous commercial displacements. Even though the problem with the SR 13/Buford Highway lane drop in Alternative 1 would be eliminated in Alternative 1A, another operational problem would be created by this alternative. With the new I-85 northbound CD Road joining the I-85 mainline much farther north than the other alternatives, there would be inadequate weaving distance between the I-85 northbound CD Road and the off-ramp to North Druid Hills Road to adequately accommodate the project traffic. This alternative would require the reconstruction of the existing SR 13/Buford Highway northbound to I-85 northbound ramp structure over North Fork of Peachtree Creek to make space for the SR 400 southbound to I-85 northbound ramp, which would increase the construction cost significantly.

Figure 5.2 (see page 45) is a schematic representation of Alternative 1A.

Figure 5.2 Alternative 1A Schematic Diagram



5.2.3 Alternative 1B (I-85 Direct Merge Option)

SR 400 Southbound to I-85 Northbound Ramp:
The proposed ramp would be similar what was proposed in Alternative 1 except the area where the proposed ramp from SR 400 southbound joins I-85 northbound mainline. With this alternative, the proposed ramp would still join the I-85 northbound mainline on the left side of SR 13/Buford Highway on-ramp as it would in Alternative 1. However, this alternative would maintain the SR 13/Buford Highway on-ramp as two-lanes to the merge with I-85 northbound mainline. The outside lane from the SR 13/Buford Highway on-ramp would continue for approximately 2,500 feet prior to merging into the existing seven-lane section on I-85. Similar to Alternative 1A, it would convert the Lenox Road/Cheshire Bridge Road on-ramp into a loop ramp so it would merge with the I-85 northbound mainline sooner. The proposed posted speed limit for this ramp would be 45 mph.

Typical Section:
Same as Alternative 1.

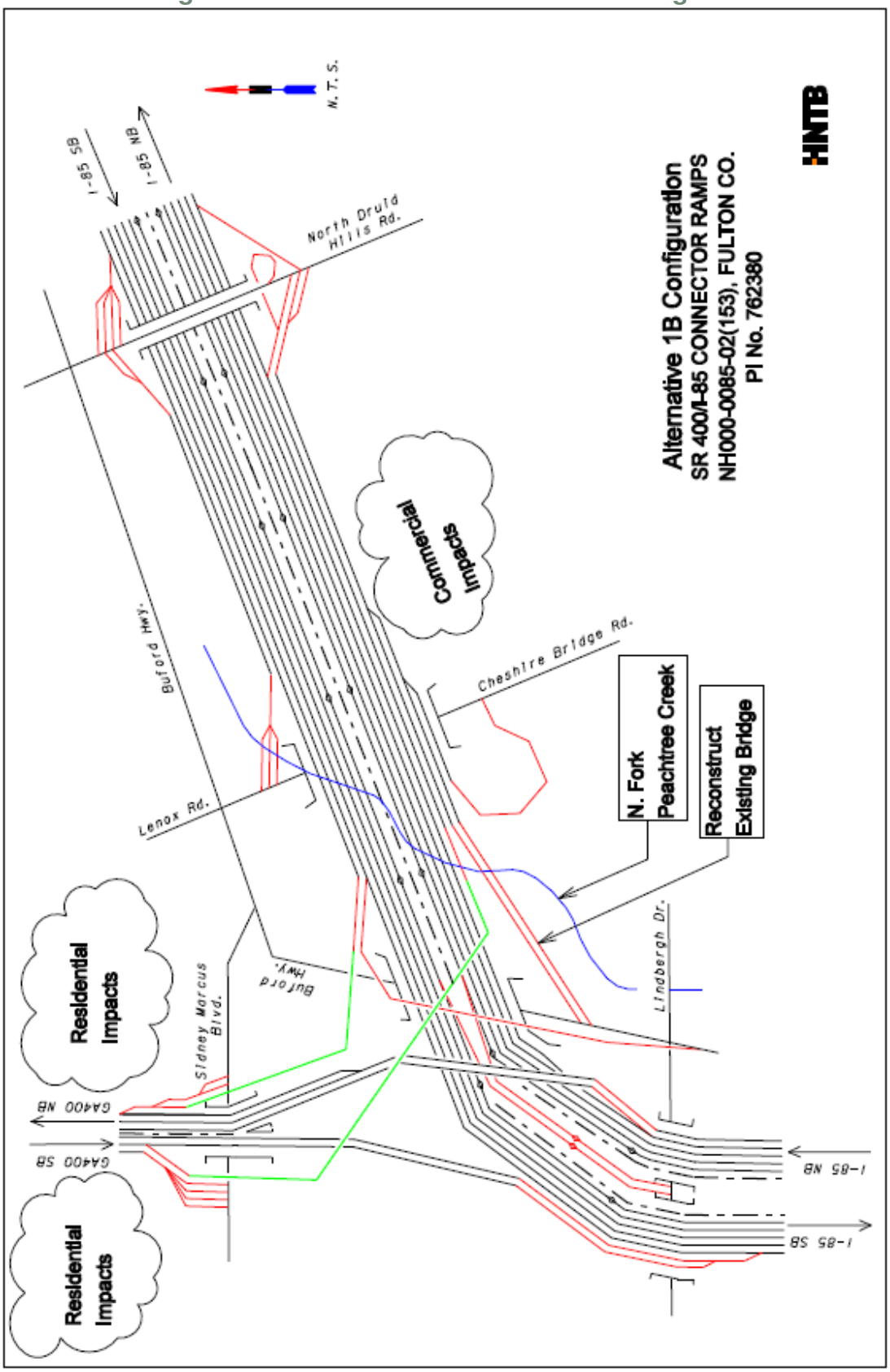
I-85 Southbound to SR 400 Northbound Ramp
Same as Alternative 1.

Typical Section:
Same as Alternative 1.

Similar to Alternatives 1 and 1A, this alternative would have the same negative feature related to the SR 400/Sidney Marcus Boulevard interchange. Similar to Alternative 1A, the widening along I-85 northbound would require the relocation of the adjacent surface street, Chantilly Drive, and numerous commercial displacements. This widening would be slightly reduced from Alternative 1A since SR 400 southbound and SR 13/Buford Highway northbound to I-85 northbound ramps would merge with the I-85 northbound mainline and not require the additional shoulders and concrete barrier that the new CD Road would need. This alternative would require the reconstruction of the existing SR 13/Buford Highway northbound to I-85 northbound ramp structure over North Fork of Peachtree Creek to make space for the SR 400 southbound to I-85 northbound ramp, which would increase the construction cost significantly.

Figure 5.3 (see page 47) is a schematic representation of Alternative 1B.

Figure 5.3 Alternative 1B Schematic Diagram



5.2.4 Alternative 2 (Lindbergh Drive Flyover Option)

SR 400 Southbound to I-85 Northbound Ramp:
The proposed ramp would exit from the right side of SR 400 southbound mainline after SR 400 crosses over Sidney Marcus Boulevard (approximately 2,100 feet south of the SR 400 southbound off-ramp to Sidney Marcus Boulevard). From this point, it would continue southward to avoid crossing the existing SR 400/I-85 Interchange structures. It would cross over the edge of the previously occupied Home Depot site. The ramp would loop around just south of Lindbergh Drive and cross over I-85 mainline and SR 13/Buford Highway. It would then turn north and cross over Lindbergh Drive again toward I-85 northbound. It would merge with the outside lane of the existing SR 13/Buford Highway on-ramp prior to joining I-85 northbound mainline. The proposed design speed and posted speed limit for this ramp would be 40 mph, which is 5 mph less than the other alternatives.

Typical Section:
One 16-foot wide travel lane with a 12-foot wide inside shoulder and a 4-foot wide outside shoulder, which is opposite from the standard shoulder configuration.

I-85 Southbound to SR 400 Northbound Ramp
The proposed ramp would exit the existing I-85 southbound mainline with the existing off-ramp to SR 13/Buford Highway southbound. After exiting as a single two-lane ramp, the ramps to SR 400 northbound and to SR 13/Buford Highway southbound would share a common, two-lane section for approximately 1,000 feet before splitting. Then the proposed ramp to SR 400 northbound would turn north. From this point, the proposed ramp would cross over SR 13/Buford Highway and Sidney Marcus Boulevard and then join SR 400 northbound mainline as the third lane south of the northbound on-ramp from Sidney Marcus Boulevard. The existing SR 400 northbound lane addition, which is immediately north of I-85 and widens SR 400 northbound to three lanes, would be eliminated to accommodate the proposed ramp from I-85 southbound. The proposed posted speed limit for this ramp would be 45 mph.

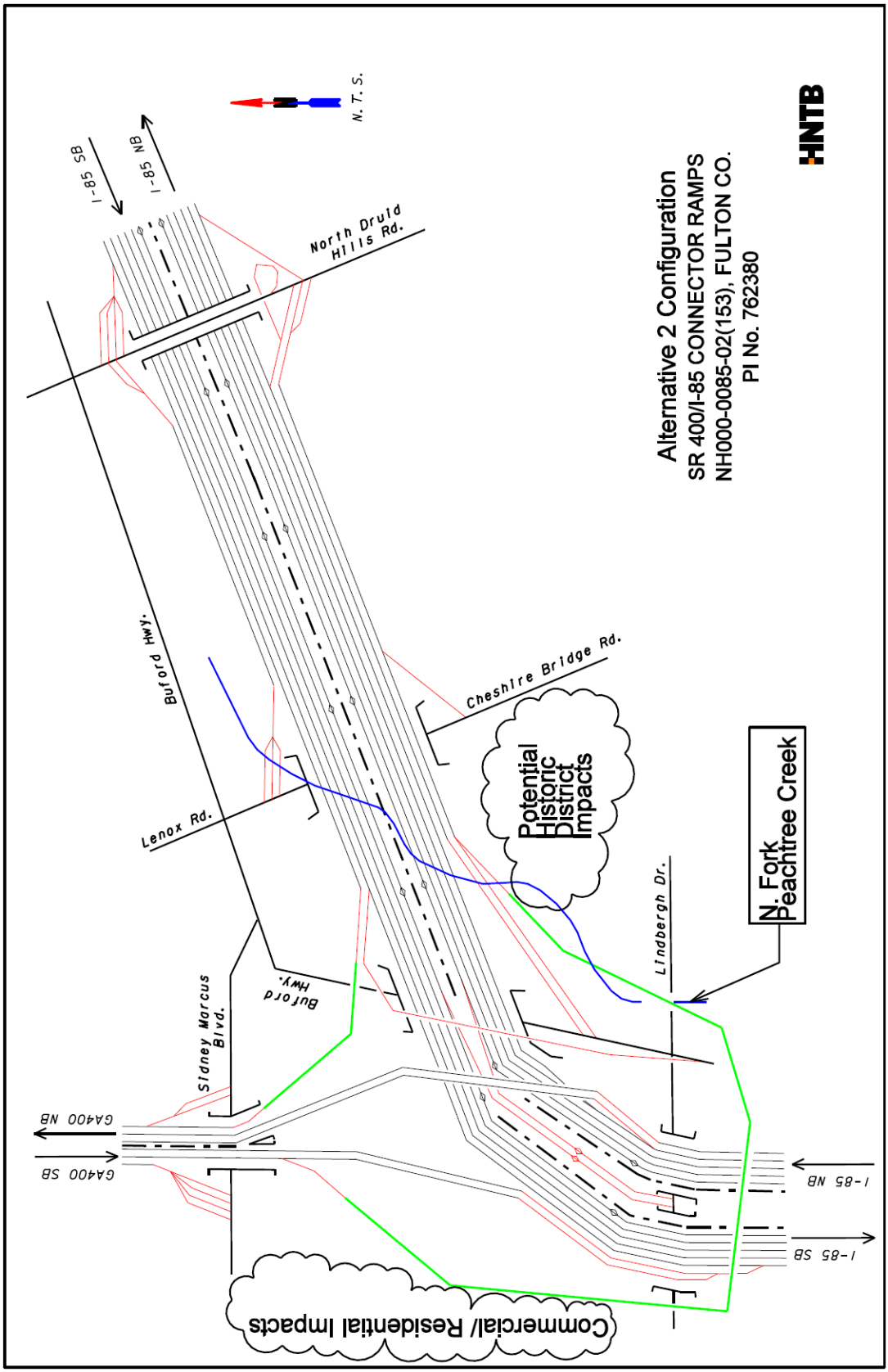
Typical Section:
One 16-foot wide travel lane with a 4-foot wide inside shoulder and a 12-foot wide outside shoulder.

This alternative would have substantial impacts to commercial and residential properties on the west side of the SR 400/I-85 Interchange and the potential historic district on the east side of the SR 400/I-85 Interchange. It would also have higher construction cost due to its longer alignment. Similar to previous alternatives, the widening along I-85 northbound would require the relocation of the adjacent surface street, Chantilly Drive, and numerous commercial displacements.

One derivation of Alternative 2 is a concept that would merge SR 13/Buford Highway on-ramp to one lane after joining I-85 northbound but before the proposed ramp from SR 400 southbound would tie to I-85 northbound. This concept was not carried forward because the horizontal geometry and therefore, the impacts would be similar to the Alternative 2 concept.

Figure 5.4 (see page 49) is a schematic representation of Alternative 2.

Figure 5.4 Alternative 2 Schematic Diagram



5.2.5 Alternative 3 (Compact Flyover Option)

Alternative 3 would occupy a much smaller footprint when compared to the previous four alternatives. This would be accomplished by locating the proposed SR 400 southbound to I-85 northbound flyover ramp closer to the center of the existing I-85/SR 400 interchange and by dropping one existing lane on I-85 northbound between SR 400 off-ramp and SR 13/Buford Highway on-ramp. Alternative 3 is the Preferred Alternative.

SR 400 Southbound to I-85 Northbound Ramp:
The proposed ramp would exit from the right side of SR 400 southbound mainline approximately 1000 feet south of the SR 400 southbound off-ramp to Sidney Marcus Boulevard. From this point, it would cross over Sidney Marcus Boulevard and the existing SR 400/I-85 Interchange structures. Continuing to I-85, it would cross over the existing SR 13/Buford Highway on-ramp and then turn north to join the I-85 northbound mainline on the right side of the existing SR 13/Buford Highway on-ramp. The existing I-85 northbound lane addition, which is immediately north of the SR 400 northbound off-ramp and widens I-85 to five lanes, would be eliminated to accommodate an additional lane on I-85 northbound from the SR 400 southbound to I-85 northbound ramp. The existing SR 13/Buford Highway on-ramp would shift to the left and join with a reduced four-lane I-85 northbound mainline, which opens a lane for the proposed ramp. The proposed posted speed limit for this ramp would be 45 mph.

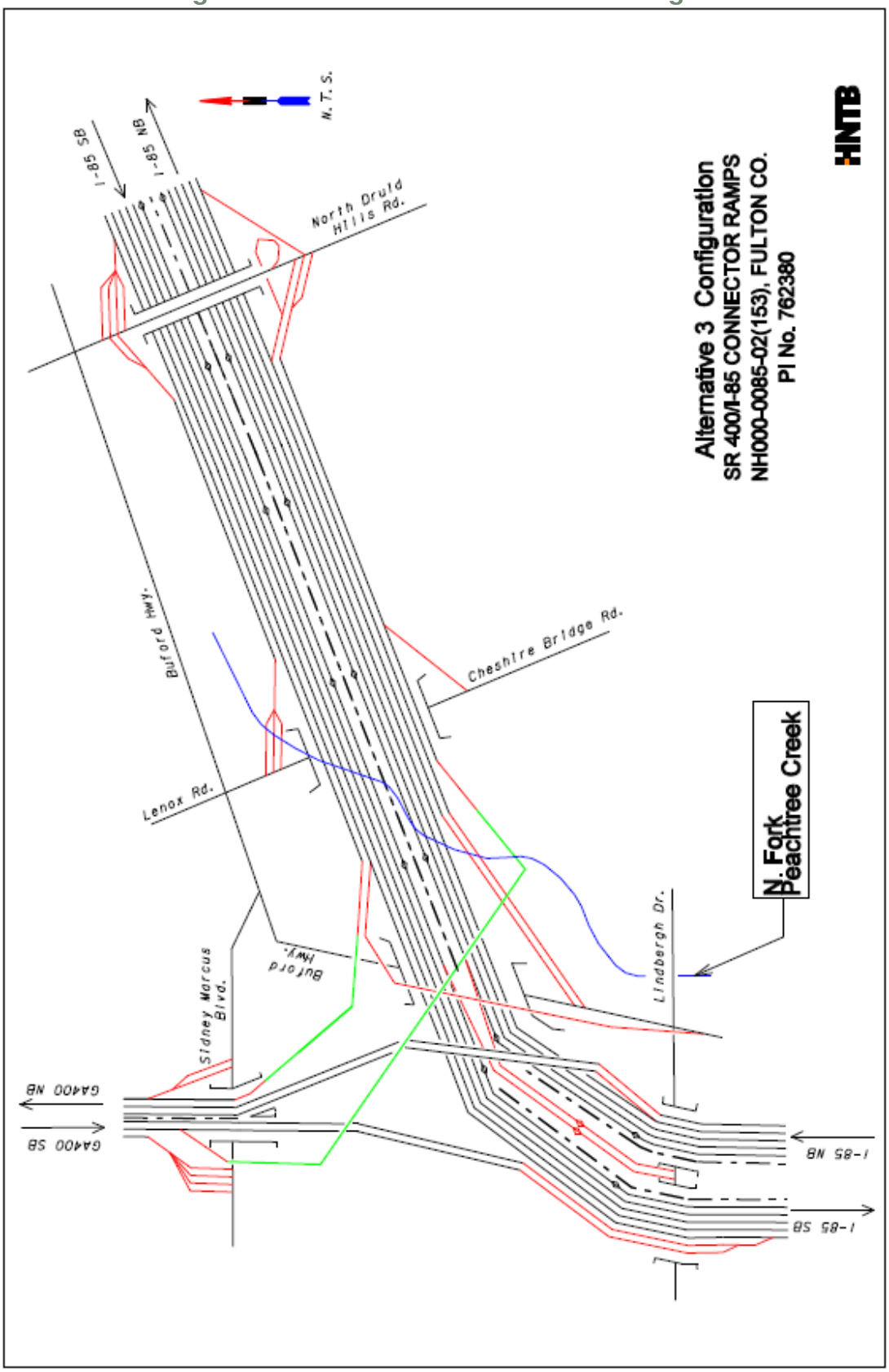
Typical Section:
One 16-foot wide travel lane with a 6-foot wide inside shoulder and a 8-foot wide outside shoulder.

I-85 Southbound to SR 400 Northbound Ramp
The proposed ramp would exit the existing I-85 southbound mainline with the existing off-ramp to SR 13/Buford Highway southbound. After exiting as a single two-lane ramp, the ramps to SR 400 northbound and to SR 13/Buford Highway southbound would share a common, two-lane section for approximately 1,000 feet before splitting. Then the proposed ramp to SR 400 northbound would turn north. From this point, the proposed ramp would cross over SR 13/Buford Highway and Sidney Marcus Boulevard and then join SR 400 northbound mainline as the third lane south of the northbound on-ramp from Sidney Marcus Boulevard. The existing SR 400 northbound lane addition, which is immediately north of I-85 and widens SR 400 northbound to three lanes, would be eliminated to accommodate the proposed ramp from I-85 southbound. The proposed posted speed limit for this ramp would be 45 mph.

Typical Section:
One 16-foot wide travel lane with a 4-foot wide inside shoulder and a 8-foot wide outside shoulder.

Figure 5.5 (see page 51) is a schematic representation of Alternative 3.

Figure 5.5 Alternative 3 Schematic Diagram



Alternative 3 would have no impact to any the historical properties in the area. It also would have the least impact to existing structures, thus it would significantly reduce construction cost.

By using one of the existing I-85 northbound lanes for the proposed ramp from SR 400 southbound, the footprint and impacts of this alternative would be reduced. Even though this lane reduction, from four to three general purpose lanes, would increase congestion on this isolated section of I-85 southbound, it would improve overall traffic operations by providing a smoother transition between the two congested areas on I-85 northbound at the SR 400 ramp diverge area and the SR 13/Buford Highway ramp merge area. In **Section 6.4.3** (see page 83), the Build, 2035 PM peak hour, CORSIM simulation results indicate that the freeway density would steadily decrease from 66.4 vehicles/mile/lane at the SR 400 diverge to 36.5 vehicles/mile/lane through the 3-lane freeway segment, then continue decreasing to 30.7 vehicles/mile/lane at the SR 13/Buford Highway on-ramp area. Without the proposed lane reduction on I-85 southbound, the No-Build, 2035 PM peak hour, CORSIM simulation results indicate that traffic after passing through the SR 400 off-ramp area (density = 65.3 vehicles/mile/lane) would accelerate through the less congested 4-lane segment of I-85 northbound (density = 31.5 vehicles/mile/lane) only to decelerate when approaching the congested area at the SR 13/Buford Highway on-ramp (density = 37.1 vehicles/mile/lane).

Alternative 3, the Preferred Alternative, would reduce the weaving distance for vehicles traveling on the I-85 northbound mainline lanes between the SR 400 northbound off-ramp and the North Druid Hills Road off-ramp. Currently, these vehicles have the opportunity to weave over one lane in a distance of 3,350 feet between the SR 400 off-ramp and the SR 13/Buford Highway on-ramp. Then they can weave over a second lane between the SR 13/Buford Highway on-ramp and the North Druid Hills Road off-ramp (4,250 feet), which is an average of 3,800 feet per lane to weave two lanes. The Preferred Alternative would reduce this distance from 7,600 feet to 4,200 feet, which is equivalent to 2,100 feet per weave maneuver. Even though this shorter weave could potentially increase congestion on I-85 northbound, the 2035 PM peak hour, CORSIM simulation results indicate that the I-85 northbound freeway between Lenox Road/Cheshire Bridge Road and North Druid Hills Road would operate better under the Build Conditions.

This potential increase in congestion on I-85 northbound from the shorter weave section for North Druid Hills Road-bound traffic resulting from dropping an existing lane would be offset by numerous operational improvements:

- decrease in the number of vehicles merging from Lenox Road/Cheshire Bridge Road on-ramp by shifting traffic to the proposed ramp from SR 400 southbound
- smoother transition on I-85 northbound between SR 400 off-ramp and SR 13/Buford Highway on-ramp resulting from the proposed lane reduction
- reduction in weave maneuvers for vehicles entering from SR 13/Buford Highway on-ramp resulting from shifting this ramp over by one lane
- increase in weave distance by 1,100 feet for vehicles using the proposed SR 400 on-ramp instead of the Lenox Road/Cheshire Bridge Road on-ramp (from 2,900 feet to 4,000 feet)

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5.2.6 Alternative 3A (Modified Compact Flyover Option)

Alternative 3A is very similar to Alternative 3 except for the manner of tying the proposed SR 400 southbound to I-85 northbound flyover ramp to I-85.

SR 400 Southbound to I-85 Northbound Ramp:
Similar to Alternative 3, the proposed ramp would exit from the right side of SR 400 southbound mainline approximately 1000 feet south of the SR 400 southbound off-ramp to Sidney Marcus Boulevard. From this point, it would cross over Sidney Marcus Boulevard and the existing SR 400/I-85 Interchange structures. It would join the I-85 northbound mainline on the left side of SR 13/Buford Highway on-ramp. With this alternative, the SR 13/Buford Highway Ramp would be shifted outside to accommodate the ramp from SR 400 southbound. Similar to Alternative 3, the existing I-85 northbound lane addition, which is immediately north of the SR 400 northbound off-ramp and widens I-85 to five lanes, would be eliminated to accommodate an additional lane on I-85 northbound from the SR 400 southbound to I-85 northbound ramp. It would differ from Alternative 3 since the proposed ramp from SR 400 southbound would join the I-85 northbound mainline at the existing abandoned lane instead of the SR 13/Buford Highway ramp shifting left to use this lane. The proposed posted speed limit for this ramp would be 45 mph.

Typical Section:
Same as Alternative 3.

I-85 Southbound to SR 400 Northbound Ramp
Same as Alternative 3.

Typical Section:
Same as Alternative 3.

This alternative would require the reconstruction of the existing SR 13/Buford Highway northbound to I-85 northbound ramp structure over North Fork of Peachtree Creek to make space for the SR 400 southbound to I-85 northbound ramp, which would increase the construction cost significantly.

Figure 5.6 (see page 55) is a schematic representation of Alternative 3A.

Figure 5.6 Alternative 3A Schematic Diagram

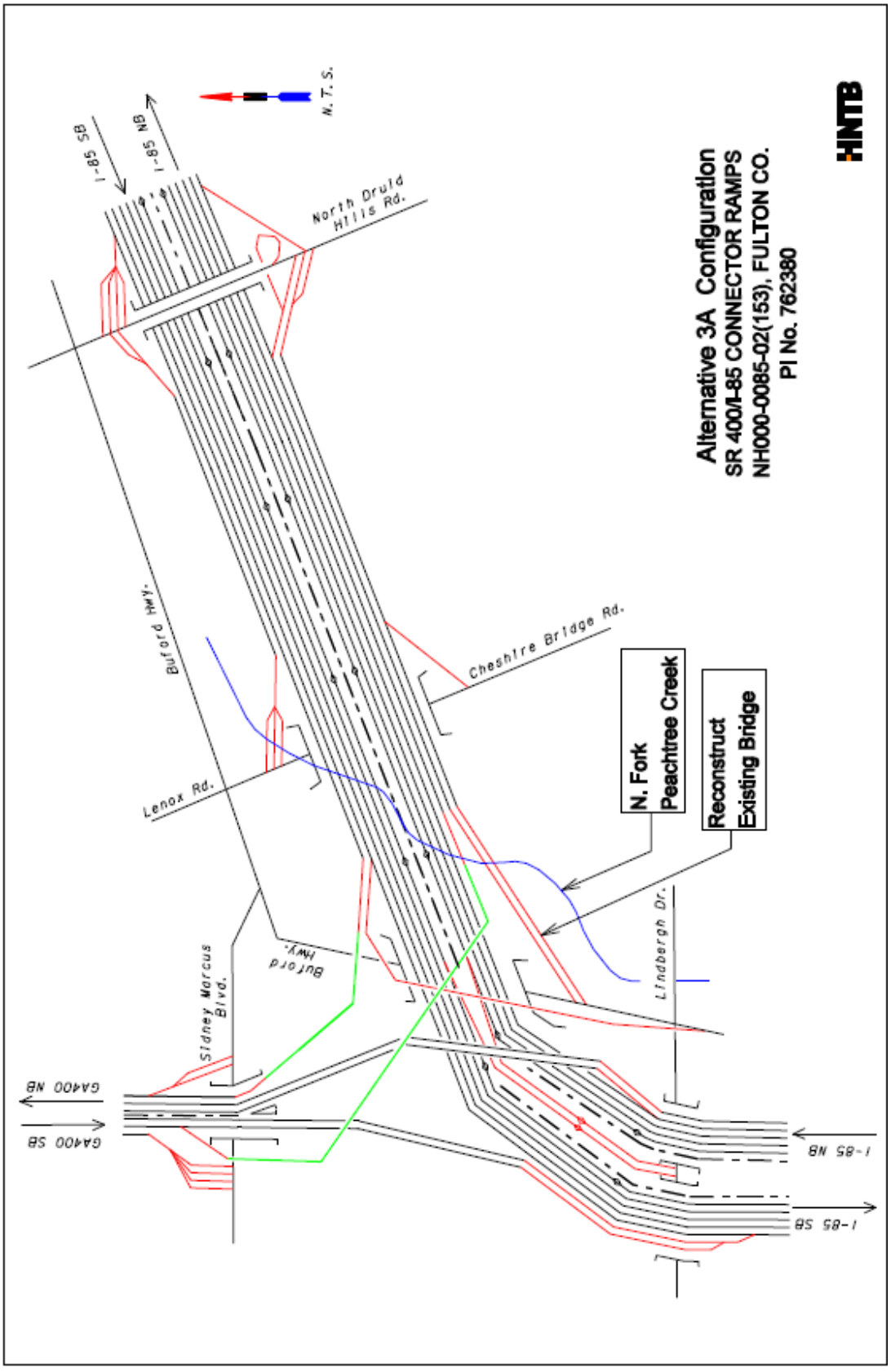


Table 5.1 Qualitative Evaluation of Potential Interchange Layouts

	Proposed Alternatives					
	Alternative 1	Alternative 1A	Alternative 1B	Alternative 2	Alternative 3 (Preferred)	Alternative 3A
Configuration	SR 400 SB to I-85 NB ramp diverges as a shared off-ramp with Sidney Marcus Blvd. off-ramp then splits. Ties to I-85 NB to the left of SR 13/Buford Highway on-ramp I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects on the left of Sidney Marcus Entrance Ramp as a shared ramp that then ties to SR 400 NB	SR 400 SB to I-85 NB ramp diverges as a shared off-ramp with Sidney Marcus Blvd. then splits. Ramp then connects to C-D system, Lenox Rd/Cheshire Bridge Rd. on ramp converted to loop ramp that ties to C-D. C-D then ties in past existing Lenox Rd/Cheshire Bridge Rd on-ramp location I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects on the left of Sidney Marcus on-ramp as a shared ramp that then ties to SR 400 NB	SR 400 SB to I-85 NB ramp diverges as a shared off-ramp with Sidney Marcus Blvd. then splits. Ramp then connects to I-85 and SR 13/Buford Hwy 2-lane on- ramp connects further north, Cheshire Bridge Rd. on-ramp converted to loop ramp I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects on the left of Sidney Marcus on-ramp as a shared ramp that then ties to SR 400 NB	SR 400 SB to I-85 NB ramp diverges south of Sidney Marcus off-ramp merges into the right lane of the two lane SR 13/Buford Hwy. on-ramp I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects to SR 400 before Sidney Marcus on-ramp as a 3rd lane, currently the 3rd lane is just added before the Sidney Marcus Blvd. overpass	SR 400 SB to I-85 NB ramp diverges south of Sidney Marcus off-ramp ties to I-85 NB to the right of the 2- lane SR 13/Buford Hwy. on-ramp, eliminates current I-85 NB lane add just north of the SR 400 NB exit I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects to SR 400 before Sidney Marcus on-ramp as a 3rd lane, currently the 3rd lane is just added before the Sidney Marcus Blvd. overpass	SR 400 SB to I-85 NB ramp diverges south of Sidney Marcus off-ramp ties to the left of the 2-lane SR 13/Buford Hwy. on-ramp, eliminates current I-85 lane add just north of the SR 400 NB exit I-85 SB to SR 400 NB ramp splits from SR 13/Buford Hwy. off-ramp, connects to SR 400 before Sidney Marcus on-ramp as a 3rd lane, currently the 3rd lane is just added before the Sidney Marcus Blvd. overpass
Environmental	Higher impacts streams, possible historic properties	Higher impacts streams	Higher impacts streams	Higher impacts streams, potential historic district	Minor stream impacts	Minor stream impacts
Displacement	High, considerable take near SR 400 SB off ramp	High, requires taking several businesses for I-85 NB tie-in	High, requires taking several businesses for I-85 NB tie-in	High, require commercial and residential impacts west of the interchange	Low	Medium, more impact than Alternative 3
Utilities	Minor utility impacts expected	Minor utility impacts expected	Minor utility impacts expected	Minor utility impacts expected	Minor utility impacts expected	Minor utility impacts expected
Impacts to Adjacent Interchanges, side streets	High, reduces SR 13/Buford Hwy. on ramp from 2 to 1 lane, mixes local and system traffic on C-Ds	High, converts Lenox Rd/ Cheshire Bridge Road on-ramp to loop ramp	High, converts Lenox Rd/ Cheshire Bridge Road on-ramp to loop ramp	Medium, SR 400 traffic would merge into SR 13/Buford Hwy. on-ramp lane	Low	Low
Impacts to Interstate	Low	High, creates inadequate weave area on I-85 NB between C-D on-ramp and North Druid Hills Road off-ramp	Low	Low	Medium, eliminates current I-85 NB lane add just north of SR 400 NB exit	Medium, eliminates current I-85 NB lane add just north of SR 400 NB exit
Future Flexibility	Low	Low	Low	Low	Medium	Low
Safety	Medium	Lower	Lower	Medium	Medium	Medium
Operations	Lane drop on SR 13/Buford Hwy NB ramp could cause severe congestion	Tie in to I-85 NB could cause weaving issues	Tie in to I-85 NB could cause weaving issues	Slower Design Speed on 400 SB to I-85 NB ramp	Eliminates added I-85 NB lane	Medium
Relative Construction Cost(1)	High, requires reconstruction of existing SR 13/Buford Hwy. to I-85 NB structure	High, shared ramp and C-D	High, longer construction length along I-85 and SR 400	High, longer 400 SB to I-85 NB ramp length	Low, less ROW needed, less impact to existing structures	Medium, requires reconstruction of existing SR 13/Buford Hwy. to I-85 NB structure
Relative Right of Way Estimate(1)	High, greater impacts	High, requires taking several commercial properties	High	High, more ROW needed than others	Low, less ROW needed than others	Medium
Relative Total Cost Estimate(1)	High	High	High	High	Low	Medium

1 – Detailed cost estimate information for Alternative 3 can be found in Appendix C-2

5.3 Cost Estimates

A necessary element of any study or alternative comparison is estimating the costs associated with the potential improvements. Over the past several years construction material costs have increased dramatically throughout the United States. As one of the most variable components, it is important that costs are revisited on a regular basis to ensure accuracy. In recognition of this situation, GDOT is in the process of evaluating all project costs in the Construction Work Program and establishing guidelines for cost updates.

The Preferred Alternative was chosen in part due to its low impact to existing structures which kept the proposed cost lower. The proposed interchange modification is to construct two new connector ramps with little additional work to the existing facilities needed. Using the concept design present in **Appendix C-2**, a detailed cost estimated was calculated. This alternative represents approximate $37.9 million in the construction of the proposed connector ramps between I-85 and SR 400. This construction cost can be broken down as:

$3.9 million for E & C
$28.9 million for construction of the connector ramps
$3.5 million for contingency
$1.5 million for right of way
$150,000 for utilities

A detailed cost estimate is provided in **Appendix C-2**.

The current cost estimate is less than the previous program cost estimate in GDOT's Preconstruction Status Report, which indicated a construction cost of $49.0 million. This cost did not include an additional $13.0 million for right of way. The primary difference between the two estimates is the earlier estimate was based on an alignment similar to Alternative 2. This alignment would require a longer bridge for the SR 400 southbound to I-85 northbound ramp and substantially more right of way for this same ramp.

6.0 Operation Analysis and Design Issues

Operational analysis was performed for No-Build and the Preferred Alternative using the projected traffic volumes to assess the impacts to freeways, ramps and intersections if the proposed project is implemented. The existing conditions for the freeway and roadway operations within the study area were also analyzed using the existing traffic volumes, lane configurations, and signal operations.

The North Druid Hills Road interchange was selected as the northern limits of the IMR study because this interchange is the second interchange north of the proposed SR 400 interchange modifications. Even though the traffic analysis summarized in this section indicates that there would be a slight degradation of traffic operations north of the North Druid Hills Road interchange in 2035, the average daily traffic volumes on I-85 would increase only 6 percent in 2035 with the proposed interchange modifications. The northern study limit would have to extend several additional interchanges to the north before the traffic analysis would indicate no negative impacts due to increased traffic volume.

6.1 Traffic Operation Analysis Methodology

The methodology used for evaluating traffic operations is based on criteria set forth in the Transportation Research Board's Highway Capacity Manual, 2000 Edition (HCM 2000). HCS + software, which emulates HCM 2000 methodology, was used for interstate/freeway analysis. Synchro 7 Traffic Signal Timing Software, which provides HCM 2000 based intersection analysis, was used for signalized intersection analysis. In additional, above mentioned analysis was supplemented by operational analysis using CORSIM 6.0, a traffic micro-simulation software.

The level of service results of the traffic micro-simulation, outlined in subsequent sections of this report, differed slightly from the HCM level of service results because the simulation models metered future traffic volumes passing through the interchange due to upstream congestion and the capacity limitations of the upstream roadway facilities. The densities also differed because CORSIM does not use peak hour factors and reports densities using total number of vehicles and not the equivalent number of passenger cars. Since the primary purpose of using CORSIM was to compare changes in congestion and travel speeds, changes in densities were more critical than changes in level of service.

The HCM2000 categorizes roadway operating conditions based on Level of services (LOS). Six levels of service are defined as a qualitative measure of traffic flow. They are given letter designations from A to F, with LOS A representing the best operating conditions and F representing the worst. Transportation facilities may operate at a range of level of service depending upon time of day, day of week, or period of the year. A description of the different levels of service is provided below.

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

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

LOS C – Travel speeds are slightly lower than the posted speed with noticeable delay in intersection areas.

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

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

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

The HCS freeway LOS was calculated based on density, measured in passenger cars per mile per lane. **Table 6.1** shows the LOS thresholds based on various densities.

Table 6.1 Freeway Level of Service

Level of Service	Freeway Density (pc/mi/ln)	Ramp Density (pc/mi/ln)
A	0 – 11	0 – 10
B	11 – 18	10 – 20
C	18 – 26	20 – 28
D	26 – 35	28 – 35
E	35 – 45	> 35
F	> 45	Demand exceeds Capacity

Source: 2000 Highway Capacity Manual

Intersection LOS is calculated based on weighted average delay to motorists at an intersection. **Table 6.2**, below, shows the LOS thresholds based on various seconds of delay.

Table 6.2 Intersection Level of Service

Level of Service	Signalized Intersection Control Delay (s/veh)	Unsignalized Intersection Control Delay (s/veh)
A	0 – 10	0 – 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

Source: 2000 Highway Capacity Manual

The CORSIM freeway LOS was calculated based on density, measured in total vehicles per mile per lane. The same LOS thresholds shown in **Table 6.1** for HCS LOS were used for CORSIM LOS. The CORSIM freeway segment densities were weighted averages of the model links that covered the specific segment of freeway. Calculations of these weighted densities are shown in **Appendix D-2**. The CORSIM links used to calculate freeway densities differed between No-Build and Build conditions in segments that included the proposed ramps. The Build results report the segments upstream and downstream of the proposed ramps separately while the No-Build results combine these same segments into a single weighted value.

6.2 Existing 2007 Traffic Operation Analysis

6.2.1 Existing 2007 Freeway Analysis

Table 6.3 (see page 61) summarizes the HCS results for the existing traffic operation conditions for the AM and PM peak hour periods along I-85 and SR 400. Weaving analyses were not conducted for the I-85 auxiliary lanes between Lenox Road/SR 13/Buford Highway and North Druid Hills Road because the distances between the on-ramps and the respective downstream off-ramps exceed the Highway Capacity Manual's (HCM) maximum analysis threshold of 2,500 feet in all cases. Therefore, the merge and diverge areas were considered separately. Based on the HCS results, most of the freeway segments operate at LOS D or better in the AM peak and PM peak except for I-85 in both directions south of the SR 400 interchange. The levels of service for the southbound sections of I-85 and SR 400 do not take into consideration backups from the SR 400 ramp merge or the occasional downstream spillback effects from the I-75/I-85 Downtown Connector or SR 13/Buford Highway.

The HCS ramp level of service results indicate the most severe congestion is located along I-85 southbound at the on-ramp from SR 400 southbound. This heavily used, two-lane ramp merges with I-85 without adding any lanes and overloads the outside lanes of I-85. Since much of this area is on structure, the cost to increase the capacity of this merge area would be substantial and is not included in the scope of this project. This bottleneck results in significant queues on SR 400 southbound and on I-85 southbound to a lesser extent.

Table 6.3 Existing (2007) Freeway & Ramp HCS Operational Analysis

Facility	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline				
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	24.6	C	31.6	D
SR 400 SB, south of Sidney Marcus Blvd. off-ramp	24.6	C	29.7	D
SR 400 NB, south of Sidney Marcus Blvd. on-ramp	18.8	C	16.0	B
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	31.6	D	24.6	C
I-85 SB, north of Lenox Rd./Cheshire Bridge Rd. off-ramp	26.7	D	18.7	C
I-85 SB, between Lenox Rd./Cheshire Bridge Rd. off-ramp and SR 13/Buford Hwy. off-ramp	28.0	D	18.7	C
I-85 SB, south of SR 13/Buford Hwy. off-ramp	29.1	D	20.0	C
I-85 SB, south of SR 400 SB on-ramp	X	**F**	X	**F**
I-85 NB, south of SR 400 NB off-ramp	41.2	**E**	X	**F**
I-85 NB, south of SR 13/Buford Hwy. on-ramp	20.0	C	29.1	D
I-85 NB, between SR 13/Buford Hwy. on-ramp and Lenox Rd. on-ramp	15.8	B	22.8	C
I-85 NB, north of Lenox Rd./Cheshire Bridge Rd. on-ramp	19.4	C	27.6	D
Ramps				
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	Under Capacity		**Over Capacity**	
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	34.9	D	28.7	D
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	Under Capacity		Under Capacity	
I-85 SB, off-ramp to SR 13/Buford Hwy., (ramp configuration-lane drop)	Under Capacity		Under Capacity	
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	19.6	**F**	20.1	**F**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	24.9	C	29.3	C
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)	Under Capacity		Under Capacity	
I-85 NB, on-ramp from Lenox Rd./Cheshire Bridge Rd., (ramp configuration-merge)	19.2	B	21.8	C

Note: X denotes volume that exceeds capacity, LOS F

6.2.2 Existing 2007 Intersection Analysis

Table 6.4 (see page 62) summarizes the existing traffic operation conditions for the AM and PM peak hour periods at the major signalized intersections in the project area. As the results indicate, in 2007, the intersection of Lenox Road at SR 13/Buford Highway operates at LOS F in both the AM and PM peak. The two Lenox Road intersections at the I-85 ramps; the two Sidney Marcus Boulevard intersections at the SR 400 ramps; and the Sidney Marcus Boulevard intersection at SR 13/Buford Highway operate at either LOS C or D during the 2007 AM peak hour. In comparison, two intersections (Sidney Marcus Boulevard at SR 13/Buford Highway and Lenox Road at SR 13/Buford Highway) operate at LOS E and F, respectively, during the 2007 PM peak hour.

The surface streets and associated intersections utilized by motorists transitioning between I-85 southbound to SR 400 northbound and between SR 400 southbound to I-85 northbound are also used as arterial routes for motorists traveling in the vicinity of the neighborhoods that surround these surface streets. Given this multi-purpose use of these existing roads and intersections, traffic counts cannot differentiate between those motorists who are using these corridors as a result of the missing SR 400/I-85 interchange ramps and those motorists who are using the corridors for other local uses.

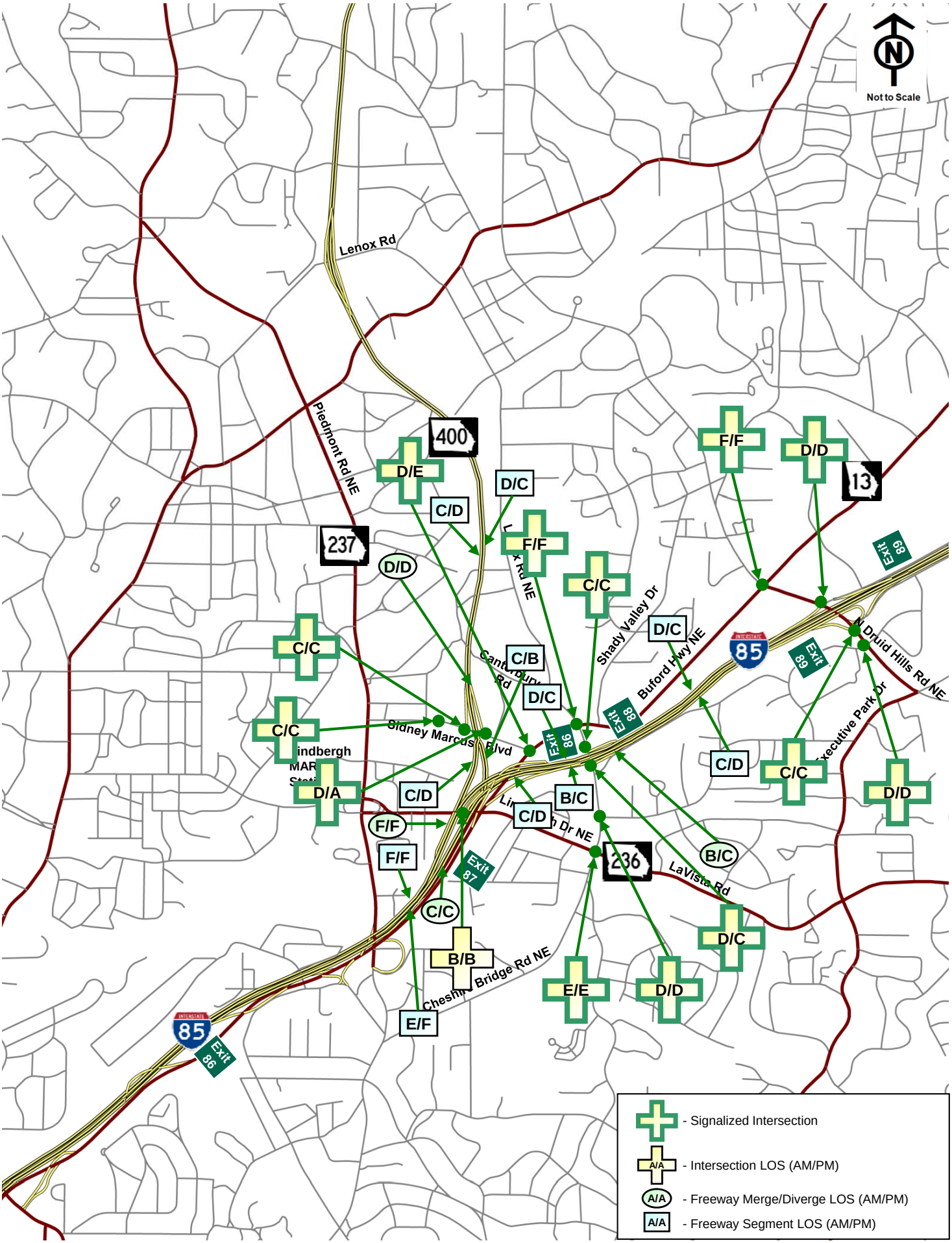
The existing (2007) peak hour HCS results for freeways and signalized intersections in the project area are illustrated in **Figure 6-1** (see page 63).

Table 6.4 Existing 2007 Intersection Operational Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Sidney Marcus Blvd at SR 400 SB	20.7	C	25.5	C
Sidney Marcus Blvd at SR 400 NB	40.6	D	7.7	A
Sidney Marcus Blvd at SR 13/Buford Highway	36.6	D	79.4	**E**
Lenox Rd at SR 13/Buford Highway	117.5	**F**	114.9	**F**
Lenox Rd at I-85 SB	25.2	C	24.6	C
Lenox Rd at I-85 NB	46.0	D	25.0	C

6.2.3 Existing 2007 CORSIM Analysis

Typically, capacity analysis using HCS intersection analysis is limited in evaluating a large study area as it focuses on a finite space and analyzes individual locations one at a time. To better evaluate the traffic operation conditions, supplement analysis using the CORSIM traffic simulation software was used to analyze travel conditions along I-85, SR 400 and the existing interchanges in the study area. CORSIM provides a better overall evaluation of a study area and its global operations.


Not to Scale
Lenox Rd
Piedmont Rd NE
400
237
13
85
236
Exit 86
Exit 87
Exit 88
Exit 89
Buford Hwy NE
Shady Valley Dr
Sidney Marcus Blvd
Cheshire Bridge Rd NE
LaVista Rd
N Druid Hills Rd NE
Executive Park Dr
D/E
C/D
D/C
F/F
D/D
C/C
C/B
D/A
B/C
B/B
E/E
E/F
- Signalized Intersection
A/A - Intersection LOS (AM/PM)
A/A - Freeway Merge/Diverge LOS (AM/PM)
A/A - Freeway Segment LOS (AM/PM)

The HCS intersection module, which is based on the Highway Capacity Manual methodology, analyzes individual locations one at a time. Since HCS analyzes locations individually, it has limited ability to recognize the impact from adjacent locations. It determines LOS assuming that all the traffic will reach the subject location during the specific hour of analysis. In contrast, CORSIM considers all the locations simultaneously on a network basis. Therefore, it is better capable of recognizing the impact from adjacent locations. A congested upstream location will limit the amount of traffic that can enter the downstream location during the specific hour of analysis, which will result in a better LOS for the downstream location. A congested downstream location, when queues reach the upstream location, will cause the upstream location to operate at a lower LOS.

The models developed for existing conditions were calibrated based on measured traffic volumes and travel times. The results of the traffic volume and travel time comparison are included in **Appendix D-2**. CORSIM methodology and model default parameters that were adjusted for this project are also included in **Appendix D-2**.

Table 6.5 (see Page 65) summarizes the CORSIM results for the existing operating conditions along I-85 and SR 400 for the AM and PM peak hour periods.

Table 6.5 Existing (2007) Freeway & Ramp CORSIM Operational Analysis

Facility	AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline				
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	24.9	C	30.8	D
SR 400 SB, south of Sidney Marcus Blvd. off-ramp	56.7	**F**	36.6	**E**
SR 400 NB, south of Sidney Marcus Blvd. on-ramp	21.5	C	18.9	C
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	29.7	D	24.6	C
I-85 SB, between North Druid Hills Rd. on-ramp and Lenox Rd/Cheshire Bridge Rd. off-ramp	26.7	D	17.3	B
I-85 SB, between Lenox Rd./Cheshire Bridge Rd. off-ramp and SR 13/Buford Hwy. SB off-ramp	29.3	D	17.4	B
I-85 SB, between SR 13/Buford Hwy. SB off-ramp and SR 400 SB on-ramp	45.8	**F**	17.9	B
I-85 SB, south of SR 400 SB on-ramp	50.2	**F**	38.5	**E**
I-85 NB, south of SR 400 NB off-ramp	29.7	D	37.2	**E**
I-85 NB, between SR 400 NB off-ramp and SR 13/Buford Hwy. NB on-ramp	18.5	C	27.5	D
I-85 NB, between SR 13/Buford Hwy. NB on-ramp and Lenox Rd./Cheshire Bridge Rd. on-ramp	15.2	B	22.5	C
I-85 NB, between Lenox Rd./Cheshire Bridge Rd. on-ramp and North Druid Hills Rd. off-ramp	17.9	B	25.9	C
Ramps				
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	26.8	D	34.2	D
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	27.6	D	22.4	C
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	32.1	D	18.6	C
I-85 SB, off-ramp to SR 13/Buford Hwy., (ramp configuration-lane drop)	27.7	D	17.1	B
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	68.1	**F**	36.6	**E**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	29.7	D	37.4	**E**
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)	15.2	B	22.5	C
I-85 NB, on-ramp from Lenox Rd./Cheshire Bridge Rd., (ramp configuration-merge)	17.4	B	24.8	C

As the results indicate, SR 400 southbound freeway segment currently operates at LOS F in the AM peak and LOS E in the PM peak due to the merge with I-85 southbound traffic. Due to the same impact, the I-85 southbound freeway segment north of the SR 400/I-85 merge operates at LOS F in the AM peak. All other segments of SR 400 and I-85 within the study area operate at LOS D or

better. The same freeway segments of SR 400 southbound and I-85 southbound that operate at LOS E or F in CORSIM are shown as LOS D or better in HCS. The SR 400 southbound on-ramp merge with I-85 southbound is LOS F (AM) and LOS E (PM) in CORSIM while HCS indicated LOS F for both peak hours. CORSIM indicates LOS D (AM) and LOS E (PM) for the I-85 northbound off-ramp diverge at SR 400 northbound while HCS indicates at LOS C for both peak hours.

6.3 Opening Year 2015 Traffic Operation Analysis

6.3.1 Opening Year 2015 HCS Freeway Analysis

Table 6.6 (see page 67) summarizes the 2015 HCS operating analysis for the AM and PM peak hour periods along I-85 and SR 400. The results indicate that, as traffic grows from 2007 to 2015, higher densities would be expected on many freeway segments in the Preferred Alternative when compared to the No-Build Conditions. There are three factors that contributed to these higher densities:

- Increased interchange efficiency
- Proposed mainline lane reductions
- Shifting traffic downstream to new or modified off-ramps

The first factor, the increased efficiency of the I-85/SR 400 interchange with the two proposed ramps, would increase the overall future traffic on I-85 and SR 400 to and from the north, which in turn would increase densities. This is traffic that currently avoids the interchange due to the difficulty in traveling between the two corridors. The second factor, the reduction in the number of northbound general purpose lanes on I-85 and SR 400, would increase density on I-85 and SR 400 without any increase in traffic. The third factor, shifting of traffic to downstream ramps, would impact both southbound lanes of I-85 and SR 400. The following paragraphs describe the specific traffic operation issues.

Freeway Segments

The AM/PM peak hour densities of the I-85 southbound segment north of the Lenox Road/Cheshire Bridge Road off-ramp and the SR 400 southbound segment north of the Sidney Marcus Boulevard off-ramp would increase with the proposed improvements. This would result from the new traffic that would be attracted by the proposed ramps.

The existing segment of I-85 northbound between the SR 400 northbound off-ramp and the SR 13/Buford Highway northbound on-ramp begins with three general purpose lanes at the SR 400 ramp gore. Immediately north of the SR 400 northbound off-ramp gore a fourth general purpose lane is added and continues until the SR 13/Buford Highway on-ramp. The Preferred Alternative would close this fourth general purpose lane along this segment of I-85, which would maintain three general purpose lanes for the entire segment. With this change proposed by the Preferred Alternative, the AM/PM peak hour LOS for this segment of I-85 would degrade from C/E to D/F.

The existing segment of SR 400 northbound between the beginning of SR 400 at I-85 and the Lenox Road/Buckhead Loop interchange begins with two lanes at I-85. Immediately after SR 400 northbound crosses over I-85, a third lane is added and continues through the Lenox Road/Buckhead Loop interchange. The Preferred Alternative would close this third lane on SR 400 until the proposed ramp from I-85 southbound merges with SR 400 northbound. This proposed ramp would tie into the existing third lane. With this change proposed by the Preferred Alternative, the AM/PM peak hour LOS for this segment of SR 400 would degrade from C/C to E/D.

The AM/PM peak hour LOS of the segment of SR 400 southbound, south of Sidney Marcus Boulevard off-ramp, between the Sidney Marcus Boulevard off-ramp and the proposed I-85

northbound off-ramp would degrade from D/E to F/F with the proposed improvements. This would result from the shift of traffic from the Sidney Marcus Boulevard off-ramp to the proposed I-85 northbound off-ramp. This segment would be relatively short, approximately 1000 feet, between the two off-ramps.

Table 6.6 Opening Year (2015) Freeway HCS Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline								
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	30.9	D	X	**F**	37.3	**E**	X	**F**
SR 400 SB, south of Sidney Marcus Blvd. off-ramp	31.3	D	42.2	**E**	X	**F**	X	**F**
SR 400 SB, south of I-85 NB off-ramp	N/A	N/A	N/A	N/A	31.3	D	42.2	**E**
SR 400 NB, south of I-85 SB on-ramp	N/A	N/A	N/A	N/A	42.2	**E**	31.3	D
SR 400 NB, south of Sidney Marcus Blvd. on-ramp	22.9	C	19.5	C	33.3	D	25.6	C
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	X	**F**	30.9	D	X	**F**	37.3	**E**
I-85 SB, between North Druid Hills Rd. on-ramp and Lenox Rd/Cheshire Bridge Rd. off-ramp	35.8	**E**	22.2	C	41.4	**E**	23.7	C
I-85 SB, between Lenox Rd./Cheshire Bridge Rd. off-ramp and SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp*	39.2	**E**	22.2	C	X	**F**	26.2	D
I-85 SB, between SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp and SR 400 SB on-ramp	40.8	**E**	23.0	C	40.8	**E**	23.0	C
I-85 SB, south of SR 400 SB on-ramp	X	**F**	X	**F**	X	**F**	X	**F**
I-85 NB, south of SR 400 NB off-ramp	X	**F**	X	**F**	X	**F**	X	**F**
I-85 NB, between SR 400 NB off-ramp and SR 13/Buford Hwy. NB on-ramp*	23.0	C	40.8	**E**	33.2	D	X	**F**
I-85 NB, between SR 400 SB on-ramp and Lenox Rd./Cheshire Bridge Rd. on-ramp*	18.0	B	28.3	D	20.9	C	34.8	D
I-85 NB, between Lenox Rd./Cheshire Bridge Rd. on-ramp and North Druid Hills Rd. off-ramp	22.4	C	36.5	**E**	23.9	C	42.3	**E**

Note: X denotes volume that exceeds capacity, LOS F
* denotes change in geometry between No-Build and Build conditions

The AM/PM peak hour densities and LOS of the segment of SR 400 southbound, south of the I-85 northbound off-ramp, between the new I-85 northbound off-ramp and I-85 southbound would be unchanged between the No-Build and Build conditions.

Traffic would also be shifted on I-85 southbound between Lenox Road/Cheshire Bridge Road off-ramp and the combined SR 13/Buford Highway southbound and SR 400 northbound off-ramp. The AM/PM peak hour LOS of the segment of I-85 southbound between the Lenox Road/Cheshire Bridge Road off-ramp and the combined SR 13/Buford Highway southbound and SR 400 northbound off-ramp would degrade from E/C to F/D with the proposed improvements. This is due to the shift of traffic from the Lenox Road/Cheshire Bridge Road off-ramp to the combined SR 13/Buford Highway southbound and SR 400 northbound off-ramp. This segment is relatively short, approximately 1300 feet, between the two off-ramps.

Ramp Merge/Diverge Areas

Table 6.7 (see page 69) summarizes the 2015 HCS operating analysis for the AM and PM peak hour periods along the I-85 and SR 400 ramps. The proposed connector ramps would divert some traffic that is currently accessing I-85 at Lenox Road and SR 400 at Sidney Marcus Boulevard to the new ramps. The shift would reduce the traffic volumes on the existing ramps, but would slightly increase densities at those existing merge/diverge areas due to the additional traffic attracted by the new ramps. The existing I-85 southbound single lane off-ramp to SR 13/Buford Highway would be widened to two lanes to accommodate the additional traffic to SR 400 northbound. The new SR 400 southbound off-ramp to I-85 northbound would more evenly distribute traffic between this ramp and the existing off-ramp to Sidney Marcus Boulevard.

The AM/PM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at Lenox Road/Cheshire Bridge Road would remain Under Capacity for No-Build and Build conditions.

The AM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at SR 13/Buford Highway would be Over Capacity in the No-Build condition. This would improve to LOS E in the Build condition with the conversion from a one-lane ramp to a two-lane ramp. The PM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at SR 13/Buford Highway would be Under Capacity in the No-Build condition. This would change to LOS C in the Build condition with the conversion from a one-lane ramp to a two-lane ramp.

The AM/PM peak hour LOS of the merge area at the I-85 southbound on-ramp at SR 400 southbound and the diverge area at the I-85 northbound off-ramp at SR 400 northbound would not change with the proposed improvements.

The AM/PM peak hour traffic operations of the merge area at the I-85 northbound on-ramp at SR 13/Buford Highway northbound would degrade slightly with the proposed improvements; however, it would remain Under Capacity.

The AM/PM peak hour LOS of the merge area at the I-85 northbound on-ramp at Lenox Road/Cheshire Bridge Road would improve very slightly from C/C to B/C with the proposed improvements.

The AM/PM peak hour LOS of the merge area at the SR 400 northbound on-ramp at Sidney Marcus Boulevard would degrade slightly from F/D to F/E with the proposed improvements due to the additional traffic attracted by the new ramps.

The AM peak hour traffic operations of the diverge area at the SR 400 southbound off-ramp at Sidney Marcus Boulevard would improve slightly with the proposed improvements due to the traffic diverted to the proposed ramp to I-85 northbound. The PM peak hour traffic operations of the diverge area at the SR 400 southbound off-ramp at Sidney Marcus Boulevard would improve significantly with the proposed improvements (from Over Capacity to Under Capacity) due to the traffic diverted to the proposed ramp to I-85 northbound.

Table 6.7 Opening Year (2015) Ramp HCS Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Ramps								
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	Under Capacity		**Over Capacity**		Under Capacity		Under Capacity	
SR 400 SB off-ramp to I-85 NB, (ramp configuration- diverge)	N/A	N/A	N/A	N/A	44.3	**F**	53.5	**F**
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	41.3	**F**	33.9	D	44.5	**F**	35.7	**E**
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	Under Capacity		Under Capacity		Under Capacity		Under Capacity	
I-85 SB, off-ramp to SR 400 NB and/or SR 13/Buford Hwy.SB, (ramp configuration-lane drop)*	**Over Capacity**		Under Capacity		35.1	E	23.8	C
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	27.4	**F**	27.5	**F**	27.4	**F**	27.5	**F**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	29.4	D	35.7	**E**	29.4	D	35.7	**E**
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)*	Under Capacity		Under Capacity		Under Capacity		Under Capacity	
I-85 NB, on-ramp from Lenox Rd./ Cheshire Bridge Rd., (ramp configuration-merge)	20.5	C	24.8	C	19.8	B	27.7	C
I-85 SB to SR 13/Buford Highway/SR 400 NB ramp, one/two-lane segment*	**Over Capacity**		Under Capacity		Under Capacity		Under Capacity	
I-85 SB to SR 400 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	Under Capacity		Under Capacity	
SR 400 SB to I-85 NB ramp, segment	N/A	N/A	N/A	N/A	Under Capacity		Under Capacity	

Note: X denotes volume that exceeds capacity, LOS F
* denotes change in geometry between No-Build and Build conditions

6.3.2 Opening Year 2015 Intersection Analysis

Table 6.8 (see page 70) summarizes the 2015 operating conditions for the AM and PM peak hour periods at major signalized intersections along the study corridors in the study area.

The results indicate that arterial intersections operations with the No-Build conditions would improve with the Preferred Alternative at the majority of these intersections. The 2015 Build condition LOS is equal to or better than the No-Build LOS for all of the listed intersections.

While these intersections do show Build condition LOS improvements in 2015 (Build Year), the Build LOS at several of these intersections would still be E or F between in 2015. Specifically, intersections with Build LOS E or F in the AM or PM peak hours are Sidney Marcus Boulevard at SR 13/Buford Highway and Lenox Road at SR 13/Buford Highway. These intersections would require extensive improvements, which are not included in the scope of this project, to operate at LOS D or better in the Build condition during 2015.

Table 6.8 Opening Year (2015) Intersection Operational Analysis

Intersection	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Sidney Marcus Blvd at SR 400 SB	22.4	C	38.3	D	18.7	C	22.7	C
Sidney Marcus Blvd at SR 400 NB	61.8	**E**	8.4	A	20.9	C	8.5	A
Sidney Marcus Blvd at SR 13/Buford Highway	91.9	**F**	131.4	**F**	57.8	**E**	82.9	**F**
Lenox Rd at SR 13/Buford Highway	205.5	**F**	231.9	**F**	71.7	**E**	71.2	**E**
Lenox Rd at I-85 SB	53.0	D	37.4	D	22.8	C	17.7	B
Lenox Rd at I-85 NB	76.4	**E**	50.7	D	21.1	C	17.4	B

6.3.3 Opening Year 2015 CORSIM Analysis

Table 6.9 (see page 71) summarizes the AM and PM peak periods CORSIM analysis results for both No-Build and Build conditions in Opening Year 2015 along I-85 and SR 400. Even though the LOS of the proposed ramps would be C in 2015, the CORSIM results indicate that several freeway segments and ramps along I-85 and SR 400 would operate at an unacceptable LOS in 2015. This would be the case with or without the proposed ramps.

Freeway Segments

The Preferred Alternative would attract new traffic to SR 400 and I-85 by improving traffic flow with the proposed ramps. These are road users that currently avoid I-85 and SR 400 because of the congestion and delays on Sidney Marcus Boulevard and Buford Highway, which serve as connectors between these two freeways.

The AM/PM peak hour LOS for most of the SR 400 southbound segments would be E or F for both No-Build and Build conditions. These congested conditions would result primarily from the backups from the SR 400 southbound merge at I-85 southbound.

The SR 400 southbound AM peak hour congestion at the merge with I-85 southbound is greater for the No-Build condition than the Preferred Alternative because volumes in the outside lane of this segment of I-85 are higher in the No-Build condition. The reason for the higher I-85 volumes is covered in the subsequent discussion on I-85 southbound. This congestion extends to the north past the Sidney Marcus Boulevard ramps. The No-Build density is significantly higher than Build for the segments immediately south of Sidney Marcus Boulevard because the No-Build segment is impacted more by the queues from the SR 400 southbound merge at I-85 southbound. The reason these queues impact the No-Build segment more than the Build segment is the southern limit of the No-Build segment extends approximately 3,900 feet to I-85 while the southern limit of the Build segment extends approximately 1,000 feet to the proposed ramp to I-85 northbound.

During the PM peak hour, the Preferred Alternative would attract new SR 400 southbound traffic and this increased traffic would exceed the capacity of the one-lane SR 400 southbound on-ramp from Lenox Road/Buckhead Loop. Therefore, SR 400 southbound PM peak hour traffic from Lenox Road/Buckhead Loop (regardless of destination) would be metered by the limited capacity of this one-lane ramp. The new SR 400 southbound traffic that would use the proposed ramp to travel

north on I-85 would displace some of the SR 400 southbound traffic that would use the existing ramp to travel south on I-85. During the PM peak hour in 2015, the SR 400 southbound traffic volume to I-85 southbound would be reduced in the Build condition by the metering of the Lenox Road/Buckhead Loop ramp and the displacement of No-Build traffic by new traffic attracted by the Preferred Alternative. There would be less congestion at the merge of I-85 southbound and SR 400 in the Preferred Alternative as a result of the reduced volumes.

Table 6.9 Opening Year (2015) Freeway CORSIM Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline								
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	114.6	**F**	38.6	**E**	107.2	**F**	40.5	**E**
SR 400 SB, south of Sidney Marcus Blvd. off-ramp*	160.6	**F**	92.4	**F**	111.3	**F**	49.2	**F**
SR 400 SB, south of I-85 NB off-ramp	N/A	N/A	N/A	N/A	153.1	**F**	34.9	D
SR 400 NB, south of I-85 SB on-ramp	N/A	N/A	N/A	N/A	31.8	D	22.4	C
SR 400 NB, south of Sidney Marcus Blvd. on-ramp*	26.6	D	18.9	C	30.3	D	23.0	C
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	32.1	D	25.4	C	43.1	**E**	30.6	D
I-85 SB, between North Druid Hills Rd. on-ramp and Lenox Rd/Cheshire Bridge Rd. off-ramp	77.4	**F**	20.5	C	88.3	**F**	22.1	C
I-85 SB, between Lenox Rd./ Cheshire Bridge Rd. off-ramp and SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp*	46.7	**F**	20.7	C	38.8	**E**	25.6	C
I-85 SB, between SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp and SR 400 SB on-ramp	76.0	**F**	23.2	C	64.4	**F**	20.4	C
I-85 SB, south of SR 400 SB on-ramp	53.4	**F**	43.2	**E**	52.4	**F**	41.6	**E**
I-85 NB, south of SR 400 NB off-ramp	63.2	**F**	66.6	**F**	60.9	**F**	64.4	**F**
I-85 NB, between SR 400 NB off-ramp and SR 13/Buford Hwy. NB on-ramp*	22.2	C	30.3	D	26.3	D	34.9	D
I-85 NB, between SR 400 SB on-ramp and Lenox Rd./Cheshire Bridge Rd. on-ramp*	17.5	B	24.5	C	20.3	C	27.7	D
I-85 NB, between Lenox Rd./ Cheshire Bridge Rd. on-ramp and North Druid Hills Rd. off-ramp	21.8	C	28.2	D	21.5	C	29.2	D

Note: * denotes change in geometry between No-Build and Build conditions

The AM/PM peak hour densities for SR 400 northbound, south of Sidney Marcus Boulevard on-ramp, would increase (14 to 34 percent) for the Build condition due to the reduction in one lane on SR 400. North of the Sidney Marcus Boulevard on-ramp, the increased AM/PM peak hour densities for SR 400 northbound would result from increased traffic volumes attracted by the proposed I-85 southbound to SR 400 northbound ramp.

The AM/PM peak hour densities for I-85 southbound would increase slightly (8 to 14 percent) between the North Druid Hills Road on-ramp and the Lenox Road/Cheshire Bridge Road off-ramp for the Build condition due to increased traffic volumes attracted by the proposed I-85 southbound to SR 400 northbound ramp.

Even with higher traffic volumes, the AM peak hour density for I-85 southbound would decrease 17 percent between the Lenox Road/Cheshire Bridge Road off-ramp and the SR 13/Buford Highway off-ramp for the Build condition due to the proposed geometric improvements. This increased volume during the AM peak hour would be offset by the improved geometry of the SR 13/Buford Highway off-ramp. The proposed two-lane ramp in the Preferred Alternative requires less weaving for SR 13/Buford Highway traffic, which is heaviest in the AM peak hour. This two-lane ramp would require most of the capacity of the outside, optional lane on I-85 southbound, which would leave very few vehicles in this outside lane that would conflict with traffic entering from the SR 400 southbound on-ramp. This is the reason that the SR 400 southbound on-ramp would be less congested in the Build Condition.

The PM peak hour density for I-85 southbound would increase 24 percent between the Lenox Road/Cheshire Bridge Road off-ramp and the SR 13/Buford Highway off-ramp for the Build condition due to the shifting of traffic from the Lenox Road/Cheshire Bridge Road off-ramp to the proposed SR 400 northbound off-ramp.

The AM/PM peak hour densities for I-85 southbound segment between the SR 13/Buford Highway off-ramp and the SR 400 southbound on-ramp would decrease (12 to 15 percent) for the Build condition due to the decrease in congestion at the SR 400 southbound on-ramp resulting primarily from the shift of traffic away from the outside lane of I-85 southbound at the upstream SR 13/Buford Highway off-ramp. This same decrease in congestion on I-85 southbound continues downstream of the SR 400 southbound on-ramp for both AM and PM peak hours.

The AM/PM peak hour densities for the I-85 northbound segment, south of the SR 400 northbound off-ramp, between the SR 13/Buford Highway northbound off-ramp and the SR 400 northbound off-ramp would change minimally from the No-Build condition to the Build condition.

The AM/PM peak hour densities for the segment of I-85 northbound between the SR 400 northbound off-ramp and SR 13/Buford Highway northbound on-ramp would increase (15 to 18 percent) for the Build condition due to the proposed reduction in one general purpose lane on I-85 northbound.

The AM/PM peak hour densities for I-85 northbound between the SR 400 southbound on-ramp and Lenox Road/Cheshire Bridge Road on-ramp would increase (13 to 16 percent) for the Build condition due to the shift in traffic from the Lenox Road/Cheshire Bridge Road on-ramp to the proposed SR 400 southbound on-ramp plus the general increase in traffic that would be attracted by the proposed SR 400 southbound ramp.

The AM/PM peak hour densities for the segment of I-85 northbound between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills Road off-ramp would change minimally from the No-Build condition to the Build condition. The increase in volumes would be offset by the longer weave distance for the traffic from the proposed SR 400 southbound ramp.

Ramp Merge/Diverge Areas and Ramp Segments

Table 6.10 (see page 74) summarizes the AM and PM peak periods CORSIM analysis results for both No-Build and Build conditions in Opening Year 2015 along the I-85 and SR 400 ramps. The results indicate that the diverge area of the proposed SR 400 southbound off-ramp to I-85 northbound would operate at LOS F during the 2015 AM and PM peaks. This poor level of service would result from the downstream backups on SR 400 from the merge with I-85 southbound.

The AM/PM peak hour densities for SR 400 northbound merge area at the Sidney Marcus Boulevard on-ramp would increase (25 to 42 percent) for the Build condition due to the increase in traffic that would be attracted by the new I-85 southbound ramp.

The AM peak hour density for the I-85 southbound diverge area at Lenox Road/Cheshire Bridge Road off-ramp would decrease slightly with the proposed improvements. This reduction would result from the reduced weaving traffic from the downstream SR 13/Buford Highway off-ramp.

The PM peak hour density for the I-85 southbound diverge area at Lenox Road/Cheshire Bridge Road off-ramp would increase by 17 percent with the proposed improvements. This increase would result from the increase traffic attracted by the proposed SR 400 northbound ramp.

The AM peak hour density for the I-85 southbound diverge area at SR 13/Buford Highway off-ramp would decrease by 30 percent with the proposed improvements. This reduction would result from the proposed geometric improvements of the SR 13/Buford Highway off-ramp. The PM peak hour density for I-85 southbound diverge area at SR 13/Buford Highway off-ramp would increase by 23 percent with the proposed improvements. The increase in PM peak hour density would be a result of higher traffic volumes in the Build condition.

The AM peak hour density for the I-85 southbound merge area at SR 400 southbound on-ramp would change minimally with the proposed improvements. The reduced traffic in the outside lane of I-85 southbound would be replaced with traffic from SR 400 southbound in the merge area. The PM peak hour density for I-85 southbound merge area at SR 400 southbound on-ramp would decrease by 18 percent with the proposed improvements. This reduction would result from the reduced traffic in the outside lane of I-85 southbound in the Build condition.

The AM/PM peak hour densities for I-85 northbound at the SR 400 northbound off-ramp would differ minimally between the Build and No-Build conditions. The AM/PM peak hour segment levels of service for this existing ramp would be LOS E.

The AM/PM peak hour densities for I-85 northbound at the SR 13/Buford Highway northbound on-ramp would increase (13 to 16 percent) with the Build conditions. This increase would result from the reduced number of lanes on I-85 northbound in this area.

The AM/PM peak hour densities for I-85 northbound merge area at the Lenox Road/Cheshire Bridge Road on-ramp would differ minimally between the Build and No-Build conditions. The AM/PM peak hour segment levels of service for this existing ramp would be LOS C/D.

With the Preferred Alternative, the AM/PM peak hour densities for the I-85 southbound ramp to SR 13/Buford Highway would decrease by 24 percent and 3 percent, respectively. All of the segments of proposed one-lane ramps (SR 400 southbound to I-85 northbound and I-85 southbound to SR 400 northbound) would operate at LOS C.

Table 6.10 Opening Year (2015) Ramp CORSIM Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Ramps								
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	117.9	**F**	56.5	**F**	93.4	**F**	55.4	**F**
SR 400 SB off-ramp to I-85 NB, (ramp configuration- diverge)	N/A	N/A	N/A	N/A	111.3	**F**	49.2	**F**
SR 400 NB on-ramp from I-85 SB, (ramp configuration-lane add)*	N/A	N/A	N/A	N/A	30.3	D	23.0	C
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	29.0	D	23.4	C	41.2	**E**	29.1	D
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	53.1	**F**	21.6	C	50.3	**F**	25.3	C
I-85 SB, off-ramp to SR 400 NB and/or SR 13/Buford Hwy.SB, (ramp configuration-lane drop)*	52.8	**F**	20.1	C	37.0	**E**	24.7	C
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	71.9	**F**	50.7	**F**	74.0	**F**	41.8	**E**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	40.3	**E**	43.5	**E**	40.1	**E**	42.1	**E**
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)*	17.5	B	24.5	C	20.3	C	27.7	D
I-85 NB, on-ramp from SR 400, (ramp configuration-lane add)	N/A	N/A	N/A	N/A	20.3	C	27.7	D
I-85 NB, on-ramp from Lenox Rd./ Cheshire Bridge Rd., (ramp configuration-merge)	19.7	C	26.9	D	20.7	C	27.8	D
I-85 SB to SR 13/Buford Highway/SR 400 NB ramp, one/two-lane segment*	35.5	**E**	21.4	C	26.9	D	20.7	C
I-85 SB to SR 400 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	22.1	C	19.9	C
SR 400 SB to I-85 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	18.9	C	25.1	C

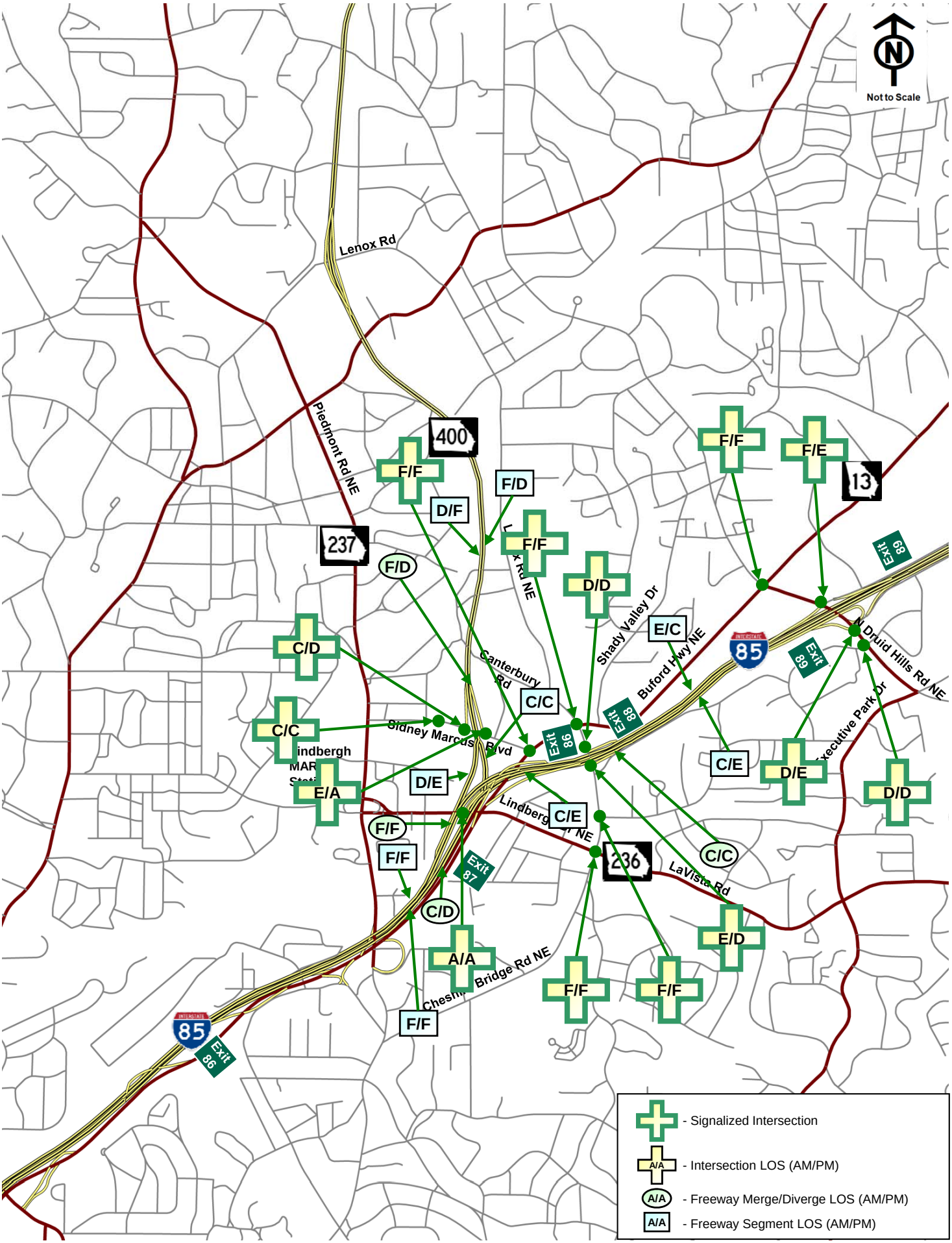
Note: * denotes change in geometry between No-Build and Build conditions

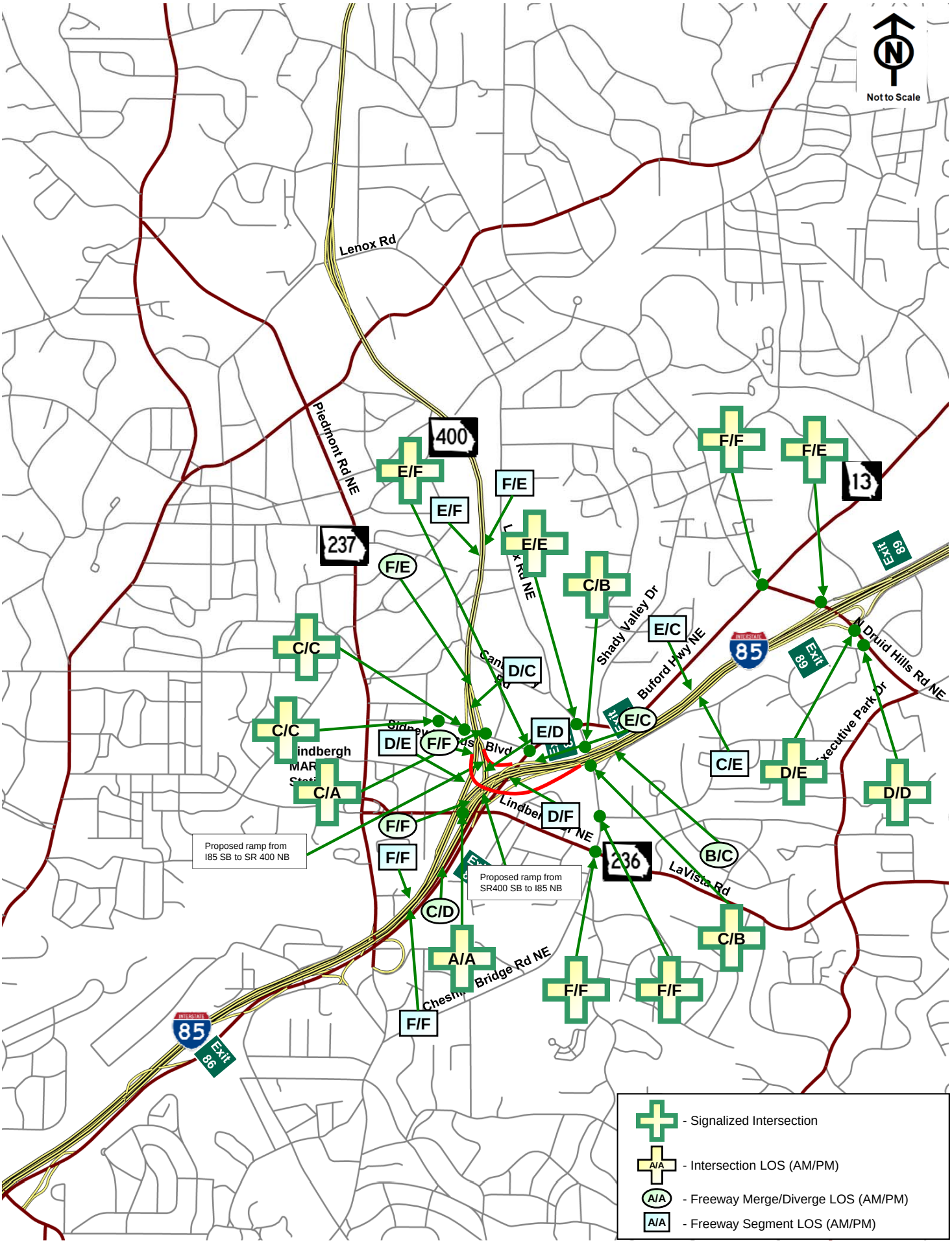
6.3.4 Summary of Opening Year 2015 Analysis

The HCS results generally indicate better levels of service for I-85 and SR 400 than are indicated by the CORSIM results. The two primary reasons for these apparent operational discrepancies are related to I-85 and SR 400 southbound queues from the SR 400 merge at I-85 and the weaving impacts on I-85 southbound between North Druid Hills Road and Lenox Road/Cheshire Bridge Road. The 2015 CORSIM models are predicting southbound queues from the SR 400 merge at I-85 that extend to the north past Sidney Marcus Boulevard on SR 400 and that extend to the north past the SR 13/Buford Highway off-ramp on I-85. Since the weaving distances on I-85 between the North Druid Hills Road and Lenox Road/Cheshire Bridge Road interchanges are greater than 2,500 feet, HCS analysis is not capable of assessing the impacts of weaving vehicles between these two interchanges. Whereas, the CORSIM results predict that these weaving vehicles will impact traffic flow in the area between North Druid Hills Road and Lenox Road/Cheshire Bridge Road.

The CORSIM results also indicate less level of service degradation than the HCS results indicate when comparing the No-Build to the Build condition. This is because CORSIM models metered the amount of traffic reaching the interchange on I-85 northbound and SR 400 southbound. The I-85 northbound traffic volumes would be metered slightly at the SR 400 off-ramp during both peak hours. The CORSIM model indicated that the SR 400 southbound on-ramp from Lenox Road/Buckhead Loop could not carry the amount of traffic necessary to reach the traffic volume levels assumed in the 2015 PM peak hour traffic forecasts. The most significant level of service degradations in the Build condition would be at locations where the number of existing northbound I-85 and SR 400 general purpose lanes would be reduced by one lane.

Figure 6.2 (see page 76) and **Figure 6.3** (see page 77) illustrate the HCS LOS of the study corridors in 2015 No-Build and Build Conditions.


Not to Scale
Lenox Rd
Piedmont Rd NE
400
237
F/F
F/D
D/F
F/D
F/F
D/D
C/D
C/C
C/C
Sidney Marcus Blvd
Canterbury Rd
Shady Valley Dr
E/C
Buford Hwy NE
85
Exit 88
Exit 89
Exit 86
Exit 87
F/E
13
Exit 89
N Druid Hills Rd NE
Executive Park Dr
C/E
D/E
D/D
E/A
D/E
C/E
Lindbergh NE
236
C/C
LaVista Rd
F/F
F/F
C/D
A/A
Bridge Rd NE
E/D
F/F
F/F
F/F
- Signalized Intersection
A/A - Intersection LOS (AM/PM)
A/A - Freeway Merge/Diverge LOS (AM/PM)
A/A - Freeway Segment LOS (AM/PM)


Not to Scale
Lenox Rd
Piedmont Rd NE
400
237
236
13
85
Exit 86
Exit 89
Shady Valley Dr
Buford Hwy NE
Druid Hills Rd NE
Executive Park Dr
LaVista Rd
Bridge Rd NE
Blvd
E/F
F/E
E/E
C/B
C/C
D/C
E/C
E/D
D/E
F/F
C/A
D/F
B/C
C/D
A/A
C/E
D/D
Proposed ramp from I85 SB to SR 400 NB
Proposed ramp from SR400 SB to I85 NB
- Signalized Intersection
- Intersection LOS (AM/PM)
- Freeway Merge/Diverge LOS (AM/PM)
- Freeway Segment LOS (AM/PM)

6.4 Design Year 2035 Traffic Operation Analysis

Future traffic volumes were developed to determine the anticipated traffic operations of the study corridors in 2035. The future traffic volumes, as describe in **Section 3**, were developed from the study's travel demand model for the year 2035.

6.4.1 Design Year 2035 HCS Freeway Analysis

Table 6.11 (see page 80) summarizes the 2035 HCS operating analyses for the AM and PM peak hour periods along I-85, SR 400 and their ramps.

The results indicate that, as traffic grows continuously from 2015 to 2035, higher densities would be expected on all segments of freeways with the No-Build Condition. Similar to the conditions in 2015, there are three factors that contributed to these higher densities:

- Increased interchange efficiency
- Proposed mainline lane reductions
- Shifting traffic downstream to new or modified off-ramps

A detailed description of these factors is included in **Section 6.3.1** (see page 66). The following paragraphs describe the specific traffic operation issues.

Freeway Segments

The AM/PM peak hour densities of the segments of I-85 southbound between the North Druid Hills Road on-ramp and the Lenox Road/Cheshire Bridge Road off-ramp and the SR 400 southbound north of the Sidney Marcus Boulevard off-ramp would increase with the proposed improvements. This would result from the increased traffic attracted by the proposed ramps.

The AM/PM peak hour LOS of the segment of I-85 northbound between the SR 400 northbound off-ramp and the SR 13/Buford Highway on-ramp would degrade from D/F to E/F with the proposed improvements. This would result from the elimination of the existing general purpose lane addition that occurs immediately after the SR 400 northbound off-ramp.

The AM/PM peak hour LOS of the segment of SR 400 northbound, south of the I-85 southbound on-ramp, between I-85 and the proposed I-85 southbound on-ramp would degrade from D/C to F/E with the proposed improvements. This would result from the elimination of the existing general purpose lane addition that occurs after SR 400 northbound splits from I-85.

The AM/PM peak hour LOS of the segment of SR 400 northbound between the proposed I-85 southbound on-ramp and the existing Sidney Marcus Boulevard on-ramp would degrade from E/F to F/F with the proposed improvements. The AM/PM peak hour LOS of the segment of SR 400 northbound between the existing Sidney Marcus Boulevard on-ramp and the Lenox Road/Buckhead Loop off-ramp and would degrade from F/E to F/F with the proposed improvements. The increased densities at both locations would result from the increased traffic attracted by the Preferred Alternative.

The AM/PM peak hour LOS of the segment of SR 400 southbound, north of Sidney Marcus Boulevard off-ramp, between the Lenox Road/Buckhead Loop on-ramp and the Sidney Marcus Boulevard off-ramp would degrade from E/F to F/F with the proposed improvements. The AM/PM peak hour LOS of the segment of SR 400 southbound between Sidney Marcus Boulevard off-ramp and the new I-85 northbound off-ramp would degrade from E/F to F/F with the proposed improvements. This would result from the shift of traffic from the Sidney Marcus Boulevard off-ramp

to the new I-85 northbound off-ramp. This segment is relatively short, approximately 1000 feet, between the two off-ramps.

The AM/PM peak hour densities and LOS of the segment of SR 400 southbound between the new I-85 northbound off-ramp and I-85 southbound would be unchanged between the No-Build and Build conditions.

Traffic would also be shifted on I-85 southbound between Lenox Road/Cheshire Bridge Road and SR 13/Buford Highway/SR 400 northbound. The AM/PM peak hour LOS of the segment of I-85 southbound between Lenox Road/Cheshire Bridge Road and SR 13/Buford Highway/SR 400 northbound off-ramps would degrade from F/C to F/D with the proposed improvements. This is due to the shift of traffic from the Lenox Road/Cheshire Bridge Road off-ramp to the SR 13/Buford Highway/SR 400 northbound off-ramp. This segment is relatively short, approximately 1300 feet, between the two off-ramps.

Table 6.11 Design Year (2035) Freeway HCS Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline								
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	36.7	**E**	X	**F**	X	**F**	X	**F**
SR 400 SB, south of Sidney Marcus Blvd. off-ramp	38.7	**E**	X	**F**	X	**F**	X	**F**
SR 400 SB, south of I-85 NB off-ramp	N/A	N/A	N/A	N/A	38.7	**E**	X	**F**
SR 400 NB, south of I-85 SB on-ramp	N/A	N/A	N/A	N/A	X	**F**	38.7	**E**
SR 400 NB, south of Sidney Marcus Blvd. on-ramp	26.1	D	22.0	C	44.8	**E**	30.8	D
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	X	**F**	36.7	**E**	X	**F**	X	**F**
I-85 SB, between North Druid Hills Rd. on-ramp and Lenox Rd/Cheshire Bridge Rd. off-ramp	X	**F**	24.5	C	X	**F**	26.8	D
I-85 SB, between Lenox Rd./ Cheshire Bridge Rd. off-ramp and SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp*	X	**F**	24.4	C	X	**F**	30.1	D
I-85 SB, between SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp and SR 400 SB on-ramp	X	**F**	26.2	D	X	**F**	26.2	D
I-85 SB, south of SR 400 SB on-ramp	X	**F**	X	**F**	X	**F**	X	**F**
I-85 NB, south of SR 400 NB off-ramp	X	**F**	X	**F**	X	**F**	X	**F**
I-85 NB, between SR 400 NB off-ramp and SR 13/Buford Hwy. NB on-ramp*	26.2	D	X	**F**	41.7	**E**	X	**F**
I-85 NB, between SR 400 SB on-ramp and Lenox Rd./Cheshire Bridge Rd. on-ramp*	20.9	C	34.6	D	24.7	C	X	**F**
I-85 NB, between Lenox Rd./Cheshire Bridge Rd. on-ramp and North Druid Hills Rd. off-ramp	26.1	D	X	**F**	28.6	D	X	**F**

Note: X denotes volume that exceeds capacity, LOS F
* denotes change in geometry between No-Build and Build conditions

Ramp Merge/Diverge Areas

Table 6.12 (see page 82) summarizes the 2035 HCS operating analyses for the AM and PM peak hour periods along the I-85 and SR 400 ramps. The proposed connector ramps would divert some traffic that is currently accessing I-85 at Lenox Road and SR 400 at Sidney Marcus Boulevard to the new ramps. The shift would reduce the traffic volumes on the existing ramps, but would slightly increase densities at those existing merge/diverge areas due to the additional traffic attracted by the new ramps. The existing I-85 southbound single lane off-ramp to SR 13/Buford Highway would be widened to two lanes to accommodate the additional traffic to SR 400 northbound. The new SR

400 southbound off-ramp to I-85 northbound would more evenly distribute traffic between this ramp and the existing off-ramp to Sidney Marcus Boulevard.

The AM/PM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at Lenox Road/Cheshire Bridge Road would remain Under Capacity for No-Build and Build conditions.

The AM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at SR 13/Buford Highway would be Over Capacity in the No-Build condition. This would improve to LOS E in the Build condition with the conversion from a one-lane ramp to a two-lane ramp. The PM peak hour traffic operations of the diverge area at the I-85 southbound off-ramp at SR 13/Buford Highway would be Under Capacity in the No-Build condition. This would change to LOS C in the Build condition with the conversion from a one-lane ramp to a two-lane ramp.

The AM/PM peak hour LOS of the merge area at the I-85 southbound on-ramp at SR 400 and the diverge area at the I-85 northbound off-ramp would not change with the proposed improvements.

The AM peak hour traffic operations of the merge area at the I-85 northbound on-ramp at SR 13/Buford Highway would degrade slightly with the proposed improvements; however, it would remain Under Capacity. The PM peak hour traffic operations of the merge area at the I-85 northbound on-ramp at SR 13/Buford Highway would degrade more than the AM peak hour with the proposed improvements. The PM peak hour traffic operations would degrade from Under Capacity to Over Capacity with the proposed improvements.

The AM/PM peak hour LOS of the merge area at the I-85 northbound on-ramp at Lenox Road would degrade from C/C to C/F with the proposed improvements.

The AM/PM peak hour densities of the merge area at the SR 400 northbound on-ramp at Sidney Marcus Boulevard would increase slightly (7 to 10 percent) with the proposed improvements due to the additional traffic attracted by the new ramps. The AM/PM peak hour LOS would be F for AM and PM peak hours for both No-Build and Build conditions.

The AM peak hour traffic operations of the diverge area at the SR 400 southbound off-ramp at Sidney Marcus Boulevard would improve slightly with the proposed improvements due to the traffic diverted to the proposed ramp to I-85 northbound. The PM peak hour traffic operations of the diverge area at the SR 400 southbound off-ramp at Sidney Marcus Boulevard would improve significantly with the proposed improvements (from Over Capacity to Under Capacity) due to the traffic diverted to the proposed ramp to I-85 northbound.

Table 6.12 Design Year (2035) Ramp HCS Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Ramps								
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	Under Capacity		**Over Capacity**		Under Capacity		Under Capacity	
SR 400 SB off-ramp to I-85 NB, (ramp configuration- diverge)	N/A	N/A	N/A	N/A	51.0	**F**	61.6	**F**
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	45.2	**F**	37.2	**F**	49.5	**F**	39.7	**F**
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	Under Capacity		Under Capacity		Under Capacity		Under Capacity	
I-85 SB, off-ramp to SR 400 NB and/or SR 13/Buford Hwy.SB, (ramp configuration-lane drop)*	**Over Capacity**		Under Capacity		36.5	**E**	26.4	C
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	33.0	**F**	33.1	**F**	33.0	**F**	33.1	**F**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	33.1	D	40.3	**E**	33.1	D	40.3	**E**
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)*	Under Capacity		Under Capacity		Under Capacity		**Over Capacity**	
I-85 NB, on-ramp from Lenox Rd./ Cheshire Bridge Rd., (ramp configuration-merge)	22.0	C	27.8	C	21.8	C	32.7	**F**
I-85 SB to SR 13/Buford Highway/SR 400 NB ramp, one/two-lane segment*	**Over Capacity**		Under Capacity		**Over Capacity**		Under Capacity	
I-85 SB to SR 400 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	Under Capacity		Under Capacity	
SR 400 SB to I-85 NB ramp, segment	N/A	N/A	N/A	N/A	Under Capacity		Under Capacity	

Note: X denotes volume that exceeds capacity, LOS F
* denotes change in geometry between No-Build and Build conditions

6.4.2 Design Year 2035 Intersection Analysis

Table 6.13 (see page 83) summarizes the 2035 operating conditions for the AM and PM peak hour periods at major signalized intersection along the study corridors in the study area.

The results indicate that the 2035 Build condition arterial intersections operation condition would be improved over No-Build conditions at all the major intersections.

However, while the results indicate the reduction in delay from Build condition to No-Build condition in 2035, significant delay would still be experienced at some intersections These intersections would require extensive improvement in order for them to operate at acceptable LOS in 2035.

Table 6.13 Design Year (2035) Intersection Operational Analysis

Intersection	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Sidney Marcus Blvd at SR 400 SB	29.9	C	52.9	D	20.6	C	23.7	C
Sidney Marcus Blvd at SR 400 NB	85.1	**F**	66.8	**E**	39.0	D	8.8	A
Sidney Marcus Blvd at SR 13/Buford Highway	170.5	**F**	194.2	**F**	105.0	**F**	138.8	**F**
Lenox Rd at SR 13/Buford Highway	331.5	**F**	371.5	**F**	140.5	**F**	174.0	**F**
Lenox Rd at I-85 SB	79.1	**F**	52.6	D	26.7	C	19.5	B
Lenox Rd at I-85 NB	143.9	**F**	103.9	**F**	25.5	C	19.0	B

6.4.3 Design Year 2035 CORSIM Analysis

Table 6.14 (see page 84) summarizes the CORSIM analysis results during 2035 AM and PM peak periods for both No-Build and Build conditions along I-85 and SR 400. The results indicate that several freeway segments along I-85 would operate at an unacceptable LOS in 2035 due to growing traffic. This would be the case with or without the proposed ramps.

Freeway Segments

The Preferred Alternative would attract new traffic to SR 400 and I-85 in 2035 by improving traffic flow with the proposed ramps. These are road users that currently avoid I-85 and SR 400 because of the congestion and delays on Sidney Marcus Boulevard and Buford Highway, which serve as connectors between these two freeways.

The AM/PM peak hour LOS for the SR 400 southbound segments would be F for both No-Build and Build conditions. These congested conditions would result primarily from the backups from the SR 400 southbound merge at I-85 southbound.

The SR 400 southbound AM peak hour congestion at the merge with I-85 southbound is greater for the No-Build condition than the Preferred Alternative because volumes in the outside lane of this segment of I-85 are higher in the No-Build condition. The reason for the higher I-85 volumes is covered in the subsequent discussion on I-85 southbound. This congestion extends to the north past the Sidney Marcus Boulevard ramps. The No-Build density is significantly higher than Build for the segments immediately south of Sidney Marcus Boulevard because the No-Build segment is impacted more by the queues from the SR 400 southbound merge at I-85 southbound. The reason these queues impact the No-Build segment more than the Build segment is the southern limit of the No-Build segment extends approximately 3,900 feet to I-85 while the southern limit of the Build segment extends approximately 1,000 feet to the proposed ramp to I-85 northbound.

During the PM peak hour, the Preferred Alternative would attract new SR 400 southbound traffic and this increased traffic would exceed the capacity of the one-lane SR 400 southbound on-ramp from Lenox Road/Buckhead Loop. Therefore, SR 400 southbound PM peak hour traffic from Lenox Road/Buckhead Loop (regardless of destination) would be metered by the limited capacity of this

one-lane ramp. The new SR 400 southbound traffic that would use the proposed ramp to travel north on I-85 would displace some of the SR 400 southbound traffic that would use the existing ramp to travel south on I-85. During the PM peak hour in 2035, the SR 400 southbound traffic volume to I-85 southbound would be reduced in the Build condition by the metering of the Lenox Road/Buckhead Loop ramp and the displacement of No-Build traffic by new traffic attracted by the Preferred Alternative. There would be less congestion at the merge of I-85 southbound and SR 400 in the Preferred Alternative as a result of the reduced volumes.

Table 6.14 Design Year (2035) Freeway CORSIM Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Mainline								
SR 400 SB, north of Sidney Marcus Blvd. off-ramp	156.2	**F**	114.1	**F**	144.6	**F**	107.6	**F**
SR 400 SB, south of Sidney Marcus Blvd. off-ramp*	175.2	**F**	145.2	**F**	127.2	**F**	79.3	**F**
SR 400 SB, south of I-85 NB off-ramp	N/A	N/A	N/A	N/A	166.8	**F**	121.5	**F**
SR 400 NB, south of I-85 SB on-ramp	N/A	N/A	N/A	N/A	31.5	D	22.7	C
SR 400 NB, south of Sidney Marcus Blvd. on-ramp*	27.5	D	19.0	C	29.9	D	23.6	D
SR 400 NB, north of Sidney Marcus Blvd. on-ramp	33.8	D	25.0	C	41.8	**E**	30.9	D
I-85 SB, between North Druid Hills Rd. on-ramp and Lenox Rd/Cheshire Bridge Rd. off-ramp	77.5	**F**	25.1	C	88.3	**F**	25.3	C
I-85 SB, between Lenox Rd./ Cheshire Bridge Rd. off-ramp and SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp*	63.6	**F**	23.3	C	39.8	**E**	31.4	D
I-85 SB, between SR 400 NB and/or SR 13/Buford Hwy. SB off-ramp and SR 400 SB on-ramp	84.6	**F**	27.9	D	69.6	**F**	25.7	C
I-85 SB, south of SR 400 SB on-ramp	46.0	**F**	40.9	**E**	44.5	**E**	41.0	**E**
I-85 NB, south of SR 400 NB off-ramp	66.6	**F**	65.3	**F**	66.3	**F**	66.4	**F**
I-85 NB, between SR 400 NB off-ramp and SR 13/Buford Hwy. NB on-ramp*	23.7	C	31.5	D	27.4	D	36.5	**E**
I-85 NB, between SR 400 SB on-ramp and Lenox Rd./Cheshire Bridge Rd. on-ramp*	19.4	C	37.1	**E**	21.5	C	30.7	D
I-85 NB, between Lenox Rd./ Cheshire Bridge Rd. on-ramp and North Druid Hills Rd. off-ramp	22.0	C	45.6	**F**	22.8	C	33.8	D

Note: * denotes change in geometry between No-Build and Build conditions

The AM/PM peak hour densities for SR 400 northbound, south of the Sidney Marcus Boulevard on-ramp, would increase (15 to 19 percent) for the Build condition due to the reduction in one lane on SR 400. North of the Sidney Marcus Boulevard on-ramp, the increased AM/PM peak hour densities (approximately 24 percent) for SR 400 northbound would result from increased traffic volumes attracted by the proposed I-85 southbound to SR 400 northbound ramp.

The AM/PM peak hour densities for I-85 southbound would increase slightly (1 to 14 percent) for the Build condition between the North Druid Hills Road on-ramp and the Lenox Road/Cheshire Bridge Road off-ramp due to the increased traffic volumes attracted by the proposed I-85 southbound to SR 400 northbound ramp.

Even with higher traffic volumes, the AM peak hour density for I-85 southbound would decrease 37 percent between the Lenox Road/Cheshire Bridge Road off-ramp and the SR 13/Buford Highway off-ramp for the Build condition as a result of the proposed geometric improvements. This increased volume during the AM peak hour would be offset by the improved geometry of the SR 13/Buford Highway off-ramp. The proposed two-lane ramp in the Preferred Alternative requires less weaving for SR 13/Buford Highway traffic, which is heaviest in the AM peak hour. This two-lane ramp would require most of the capacity of the outside, optional lane on I-85 southbound, which would leave very few vehicles in this outside lane that would conflict with traffic entering from the SR 400 southbound on-ramp. This is the reason that the SR 400 southbound on-ramp would be less congested in the Build Condition.

The PM peak hour density for I-85 southbound would increase 35 percent between the Lenox Road/Cheshire Bridge Road off-ramp and the SR 13/Buford Highway off-ramp for the Build condition due to the increase in traffic exiting to SR 13/Buford Highway southbound and SR 400 northbound.

The AM/PM peak hour densities for I-85 southbound segment between the SR 13/Buford Highway off-ramp and the SR 400 southbound on-ramp would decrease (8 to 18 percent) for the Build condition due to the decrease in congestion at the SR 400 southbound on-ramp resulting primarily from the shift of traffic away from the outside lane of I-85 southbound at the upstream SR 13/Buford Highway off-ramp. This same decrease in congestion continues downstream of the SR 400 southbound on-ramp for AM peak hour. The PM peak hour indicates the same congestion for No-Build and Build conditions in 2035.

The AM/PM peak hour densities for the I-85 northbound segment, south of the SR 400 northbound off-ramp, between the SR 13/Buford Highway northbound off-ramp and the SR 400 northbound off-ramp would change minimally from the No-Build condition to the Build condition.

The AM/PM peak hour densities for I-85 northbound would increase 16 percent for the Build condition due to the proposed reduction in one general purpose lane between the SR 400 northbound off-ramp and the SR 13/Buford Highway northbound on-ramp. The AM peak hour density for I-85 northbound between the SR 13/Buford Highway/SR 400 on-ramp and Lenox Road on-ramp would increase 11 percent for the Build condition due to the increase in traffic that would be attracted by the new SR 400 southbound ramp. The PM peak hour density for I-85 northbound between the SR 13/Buford Highway/SR 400 on-ramp and Lenox Road on-ramp would decrease 17 percent for the Build condition due to the metering of traffic in the upstream congested section of I-85 northbound.

The AM peak hour density for I-85 northbound between the proposed SR 400 southbound on-ramp and Lenox Road/Cheshire Bridge Road on-ramp would increase (approximately 12 percent) for the Build condition due to the shift in traffic from the Lenox Road/Cheshire Bridge Road on-ramp to the proposed SR 400 southbound on-ramp plus the general increase in traffic that would be attracted by the proposed SR 400 southbound ramp.

The PM peak hour density for I-85 northbound between the proposed SR 400 southbound on-ramp and Lenox Road/Cheshire Bridge Road on-ramp would decrease (approximately 15 percent) for the Build condition due to the reduced congestion downstream between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills Road off-ramp.

The AM peak hour density for the segment of I-85 northbound between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills Road off-ramp would change minimally from the No-Build condition to the Build condition. The increase in volumes would be offset by the longer weave distance for the traffic from the proposed SR 400 southbound ramp.

The PM peak hour density for the segment of I-85 northbound between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills Road off-ramp would decrease 26 percent from the No-Build condition to the Build condition. The longer weave distance for the traffic from the proposed SR 400 southbound ramp is the primary factor for the decrease in density.

Ramp Merge/Diverge Areas

Table 6.15 (see page 88) summarizes the CORSIM analysis results during 2035 AM and PM peak periods for both No-Build and Build conditions for the I-85 and SR 400 ramps. The results indicate that in 2035, the SR 400 southbound to I-85 northbound ramp would operate at LOS B/C in the AM/PM peak hours, while the I-85 southbound to SR 400 northbound ramps would operate at LOS D and C during the AM and PM peaks, respectively. As observed in CORSIM, the heavy congestion on mainlines of SR 400 and I-85 would restrict all the projected traffic from reaching the proposed ramps.

The AM/PM peak hour densities for SR 400 northbound merge area at the Sidney Marcus Boulevard on-ramp would increase (29 to 39 percent) for the Build condition due to the increase in traffic that would be attracted by the new I-85 southbound ramp.

The results indicate that the diverge area of the proposed SR 400 southbound off-ramp to I-85 northbound would operate at LOS F during the 2035 AM and PM peaks. This poor level of service would result from the downstream backups on SR 400 from the merge with I-85 southbound.

The AM peak hour density for the I-85 southbound diverge area at Lenox Road/Cheshire Bridge Road off-ramp would decrease 12 percent with the proposed improvements. This reduction would result from the reduced volumes exiting at this ramp and reduced weaving traffic from the downstream SR 13/Buford Highway off-ramp.

The PM peak hour density for the I-85 southbound diverge area at Lenox Road/Cheshire Bridge Road off-ramp would increase by 13 percent with the proposed improvements. This increase would result from the increase traffic attracted by the proposed SR 400 northbound ramp.

The AM peak hour density for the I-85 southbound diverge area at SR 13/Buford Highway off-ramp would decrease by 43 percent with the proposed improvements. This reduction would result from the proposed geometric improvements of the SR 13/Buford Highway off-ramp and from reduced backups from the downstream I-85 southbound merge at SR 400. The PM peak hour density for I-85 southbound diverge area at SR 13/Buford Highway off-ramp would increase by 27 percent with the proposed improvements. The increase in PM peak hour density would be a result of higher traffic volumes in the Build condition.

The AM/PM peak hour densities for the I-85 southbound merge area at SR 400 southbound on-ramp would change minimally with the proposed improvements. The reduced traffic in the outside lane of I-85 southbound would be replaced with traffic from SR 400 southbound in the merge area.

The AM/PM peak hour densities for I-85 northbound at the SR 400 northbound off-ramp would differ minimally between the Build and No-Build conditions. The AM/PM peak hour segment levels of service for this existing ramp would be LOS E.

The AM peak hour density for I-85 northbound at the SR 13/Buford Highway northbound on-ramp would increase 11 percent with the Build conditions. This increase would result from the reduced number of lanes on I-85 northbound in this area.

The PM peak hour density for I-85 northbound at the SR 13/Buford Highway northbound on-ramp would decrease 17 percent with the Build conditions. This decrease would result from the reduced congestion downstream at the Lenox Road on-ramp.

The AM peak hour density for I-85 northbound at the Lenox Road/Cheshire Bridge Road merge area would change minimally with the proposed improvements.

The PM peak hour density for I-85 northbound at the Lenox Road/Cheshire Bridge Road merge area would decrease 31 percent with the Build condition due to the 48 percent reduction in traffic from this ramp and to the improved weaving conditions with the longer weaves for the proposed ramp from SR 400 southbound. The LOS would improve from F to D with the Preferred Alternative.

Table 6.15 Design Year (2035) Ramp CORSIM Operational Analysis

	No-Build				Preferred Alternative 3			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Ramps								
SR 400 SB, off-ramp to Sidney Marcus Blvd., (ramp configuration-lane drop)	141.0	**F**	112.9	**F**	106.4	**F**	74.3	**F**
SR 400 SB off-ramp to I-85 NB, (ramp configuration- diverge)	N/A	N/A	N/A	N/A	127.2	**F**	79.3	**F**
SR 400 NB on-ramp from I-85 SB, (ramp configuration-lane add)*	N/A	N/A	N/A	N/A	21.7	**C**	22.1	C
SR 400 NB on-ramp from Sidney Marcus Blvd., (ramp configuration-merge)	29.7	D	22.8	C	41.3	**E**	29.4	D
I-85 SB, off-ramp to Lenox Rd./Cheshire Bridge Rd., (ramp configuration-lane drop)	57.3	**F**	28.9	D	50.3	**F**	32.7	D
I-85 SB, off-ramp to SR 400 NB and/or SR 13/Buford Hwy.SB, (ramp configuration-lane drop)*	69.1	**F**	22.7	C	39.7	**E**	28.8	D
I-85 SB on-ramp from SR 400 SB, (ramp configuration-merge)	74.5	**F**	64.3	**F**	74.1	**F**	65.6	**F**
I-85 NB off-ramp to SR 400 NB, (ramp configuration-lane drop)	41.1	**E**	43.5	**E**	40.8	**E**	43.2	**E**
I-85 NB, on-ramp from SR 13/Buford Hwy., (ramp configuration-lane add)*	19.4	C	37.1	**E**	21.5	C	30.7	D
I-85 NB, on-ramp from SR 400, (ramp configuration-lane add)	N/A	N/A	N/A	N/A	21.5	C	30.7	D
I-85 NB, on-ramp from Lenox Rd./ Cheshire Bridge Rd., (ramp configuration-merge)	21.2	C	45.7	**F**	21.8	C	31.7	D
I-85 SB to SR 13/Buford Highway/SR 400 NB ramp, one/two-lane segment*	32.3	D	20.9	C	27.5	D	22.1	C
I-85 SB to SR 400 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	21.7	C	21.1	C
SR 400 SB to I-85 NB ramp, one-lane segment	N/A	N/A	N/A	N/A	16.5	B	23.9	C

Note: * denotes change in geometry between No-Build and Build conditions

6.4.4 Operation Analysis Summary

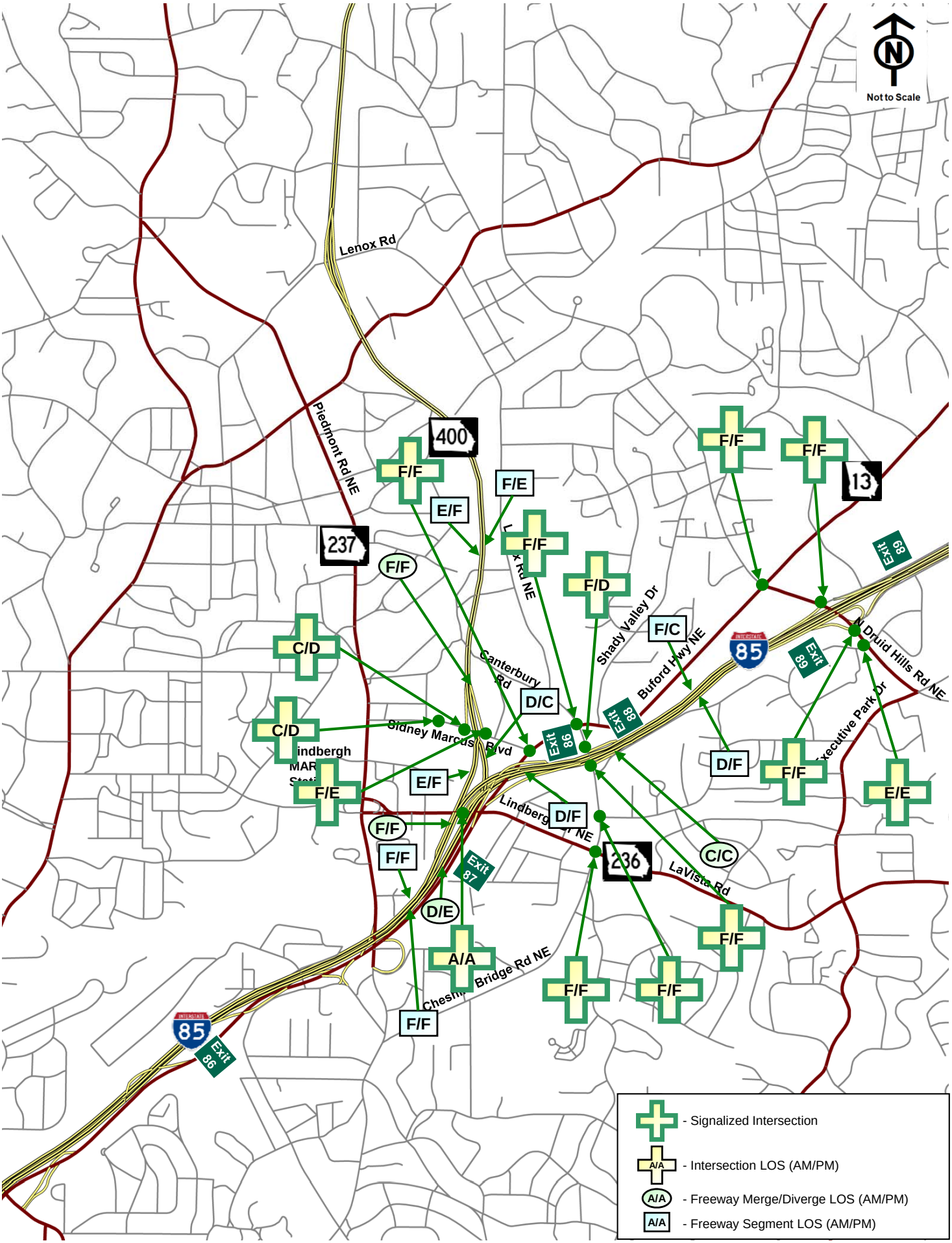
The 2035 CORSIM results do not indicate the same degradation of LOS between the No-Build and Build conditions as the HCS results indicate. This is because CORSIM metered the amount of traffic on I-85 northbound and SR 400 southbound. The I-85 northbound traffic would be metered at the SR 400 off-ramp during both peak hours. The SR 400 southbound on-ramp from Lenox Road could not carry the amount of traffic necessary to reach the levels assumed in the 2035 PM peak hour traffic forecasts. The most significant degradations of LOS in the Build condition were in the areas where one existing mainline lane would be eliminated along northbound I-85 and SR 400.

HCS and CORSIM analyses were conducted to evaluate the operational conditions of the freeways and intersections in the study area for 2007 existing, 2015 No-Build and Build conditions, and 2035 No-Build and Build conditions. As indicated by the results, most of the freeway segments and

intersections are currently operating at acceptable LOS except at some critical areas including the SR 400 southbound and I-85 southbound merge area, and the intersection of Lenox Road and SR 13/Buford Highway. In 2015 and 2035, as traffic grows, more segments of freeways and intersections would operate at unacceptable LOS. Significant increases in delay would be expected in the project area for both No-Build and Build conditions. The proposed ramps would carry a significant amount of traffic that is currently traveling between SR 400 north and I-85 north via the local arterial streets.

Analyses indicate that the proposed ramps would significantly relieve the congestion level on the arterials that are currently serving as the connection between SR 400 north and I-85 north. The proposed connector ramps would shift some of the traffic that is currently entering or exiting I-85 at Lenox Road and entering or exiting SR 400 at Sidney Marcus Boulevard further downstream/upstream. The proposed ramps would also introduce some regional traffic that does not currently travel through this area because of no direct connections. However, the proposed ramps would not significantly increase densities in the study area when compared to No-Build conditions except for freeway segments where existing lanes would be eliminated.

Figure 6.4 (see page 900) and **Figure 6.5** (see page 91) illustrate the HCS LOS of the study corridors in 2035 No-Build and Build Conditions.


Not to Scale
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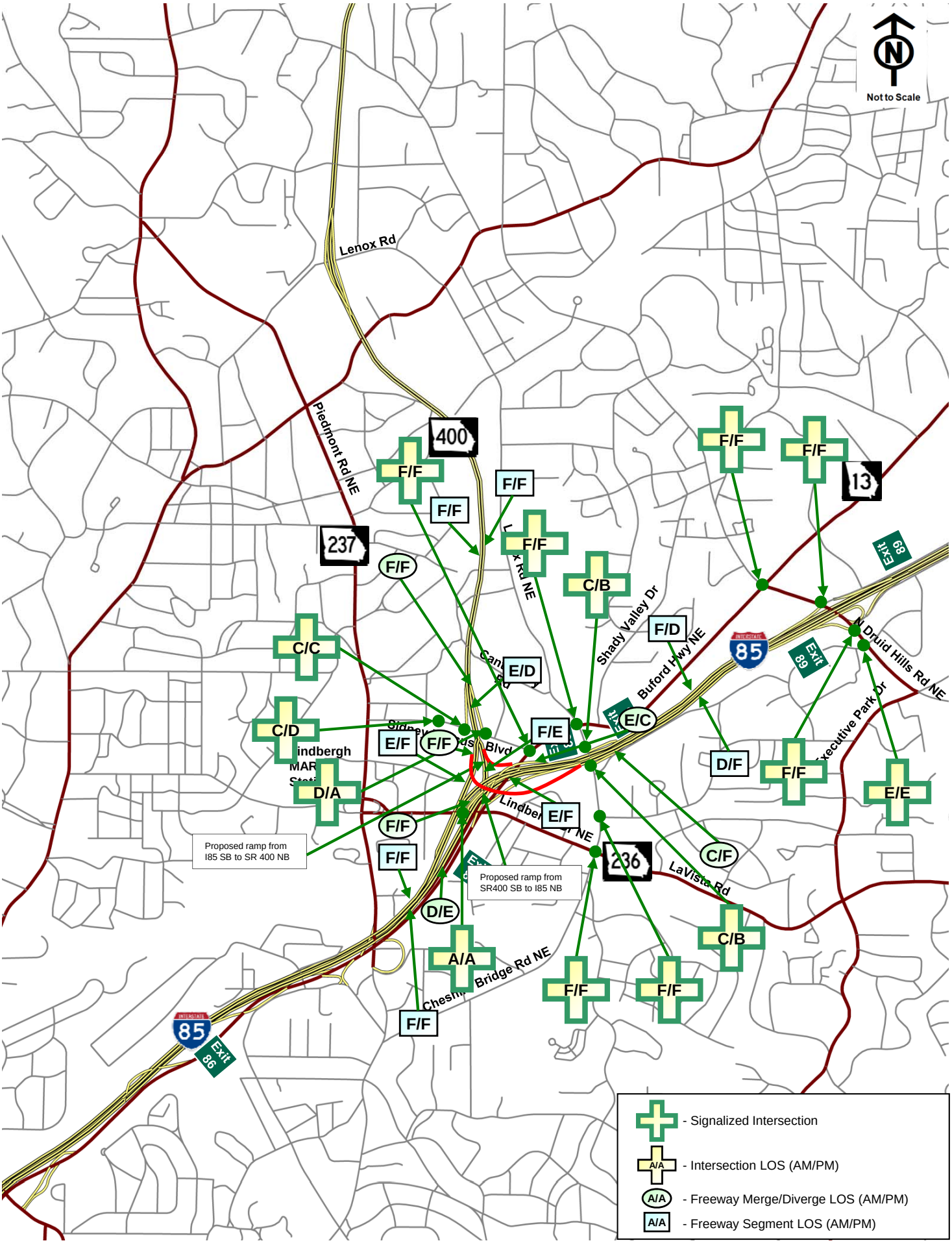
237
13
85
236
Exit 86
Exit 87
Exit 88
Exit 89
Canterbury Rd
Shady Valley Dr
Buford Hwy NE
Sidney Marcus Blvd
Lindbergh
Lindbergh Dr NE
LaVista Rd
Executive Park Dr
N Druid Hills Rd NE
Chesh Bridge Rd NE
F/F
F/E
E/F
E/E
F/D
F/C
C/D
D/C
D/F
D/E
C/C
A/A
- Signalized Intersection
- Intersection LOS (AM/PM)
- Freeway Merge/Diverge LOS (AM/PM)
- Freeway Segment LOS (AM/PM)


Not to Scale
Lenox Rd
Piedmont Rd NE
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Exit 86
Shady Valley Dr
Buford Hwy NE
Druid Hills Rd NE
Executive Park Dr
Lindbergh Blvd
LaVista Rd
Chesh Bridge Rd NE
236
F/F
C/B
C/C
C/D
D/A
E/D
E/F
F/E
E/C
F/D
D/F
E/E
C/F
D/E
A/A
Proposed ramp from I85 SB to SR 400 NB
Proposed ramp from SR400 SB to I85 NB
- Signalized Intersection
- Intersection LOS (AM/PM)
- Freeway Merge/Diverge LOS (AM/PM)
- Freeway Segment LOS (AM/PM)

6.5 Travel Time

One of the benefits of the proposed connector ramps is the reduction of travel times within the study area and further in the Atlanta region. A study was conducted to estimate vehicular travel times and travel time savings for existing conditions and future No-Build and Build conditions.

Six routes between predetermined points were chosen to study travel times. The starting points for the analyses are along SR 400 immediately south of the Lenox Road interchange and along I-85 immediately south of North Druid Hills Road Interchange. The points were chosen because travelers in the region would experience similar travel times beyond these locations under any alternative. In the No-Build condition, the majority of travel delays would occur along the local surface streets. In the Build condition, these travel delays would be mitigated by the proposed connector ramps. By using these locations, travel times between various points in the study area were estimated with and without the proposed connector ramps.

Existing and projected travel times on segments of SR 400 and I-85 in the vicinity of the SR 400/I-85 interchange are presented in **Table 6.16** (see page 93). In this table, the first two segments represent the existing local street system segments used by motorists traveling between SR 400 southbound and I-85 northbound and between I-85 southbound and SR 400 northbound.

As shown in **Table 6.16**, motorists utilizing the proposed connector ramps instead of the local street system to travel between SR 400 southbound and I-85 northbound would save an estimated 5.3 minutes in the AM and 4.4 minutes in the PM in 2015 (Build Year) and an estimated 7.3 minutes in the AM and 9.1 minutes in the PM Peak Hours in 2035 (Design Year) under the Build condition. The travel paths along the existing and proposed arterial/freeway facilities in the immediate area of the I-85/SR 400 interchange are illustrated in **Figure 6.6** (see page 94).

Motorists utilizing the proposed connector ramps instead of the local street system to travel between I-85 southbound and SR 400 northbound would save an estimated 6.1 minutes in the AM and 3.6 minutes in the PM Peak Hours in 2015 (Build Year) and an estimated 7.5 minutes in the AM and 4.1 minutes in the PM Peak Hours under the Build condition in 2035 (Design Year).

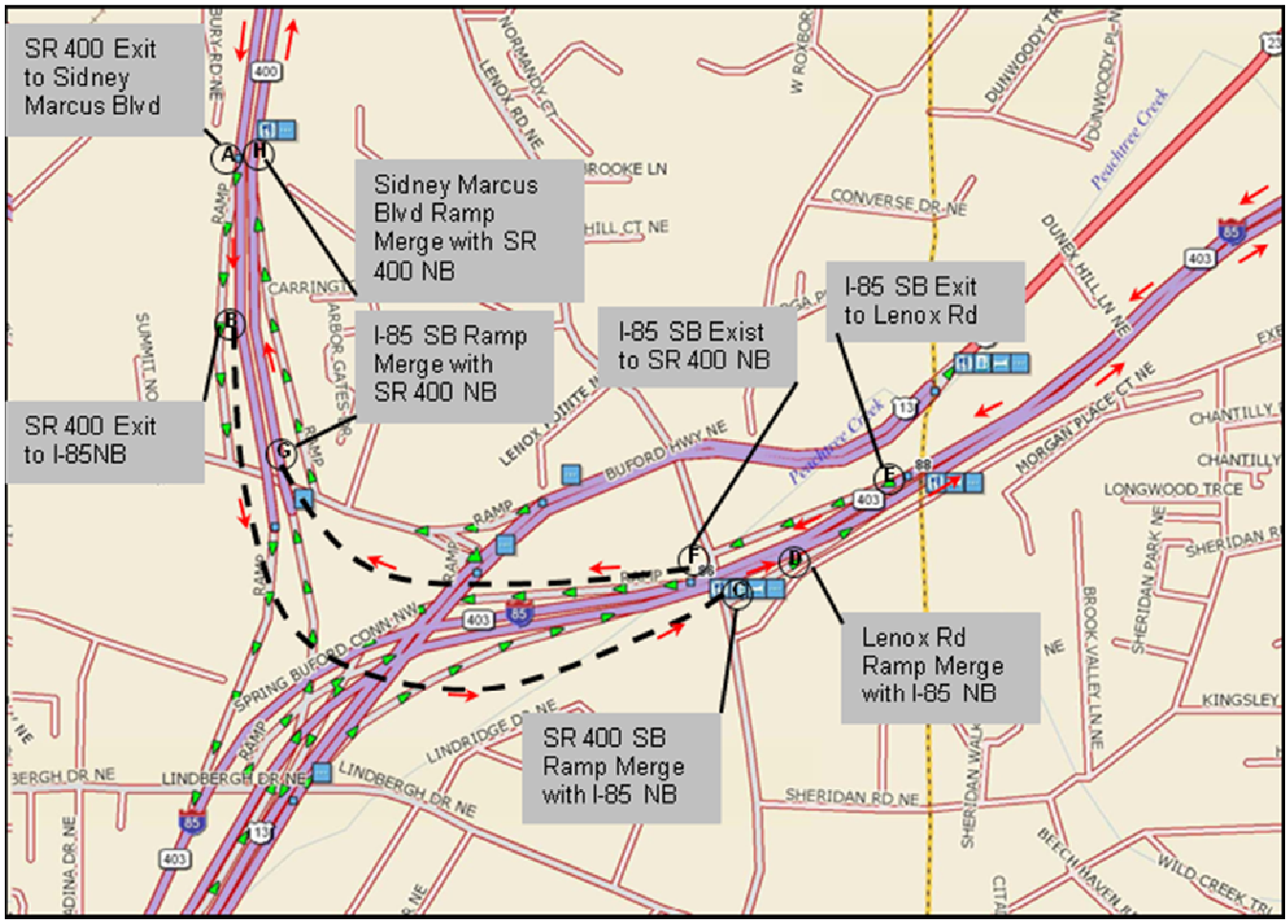
As can be seen in **Table 6.16** (see page 93), the Build condition in 2015 and 2035 has very little to no impact on the travel time along the mainline lanes on SR 400 and I-85. The purpose of the proposed project is to add ramps to the SR 400/I-85 interchange where none currently exist and this resultant construction would not significantly increase or decrease the projected travel times on either SR 400 or I-85 in the 2015 and 2035 Build conditions. The most severe negative impact of the Build condition would be an increase in travel time during the AM peak hour of 2015 on I-85 southbound between North Druid Hills Road on-ramp and the SR 400 on-ramp of 0.9 minutes.

Table 6.16 Travel Times (in minutes) for AM and PM Traffic Movements

	Existing Year and No-Build and Build Conditions in the Build and Design Year									
	Existing (2007)		No-Build (2015)		Preferred Alternative 3 (2015)		No-Build (2035)		Preferred Alternative 3 (2035)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
From: SR 400 SB at Lenox Road Merge **To:** I-85 NB at N Druid Hills Rd Diverge**	6.9	7.3	13.0	8.3	7.7 (5.3)	3.9 (4.4)	17.6	15.9	10.3 (7.3)	6.8 (9.1)
From: I-85 SB at N Druid Hills Rd Merge **To:** SR 400 NB at Lenox Rd Diverge**	6.0	6.4	10.9	6.9	4.8 (6.1)	3.3 (3.6)	12.4	7.4	4.9 (7.5)	3.3 (4.1)
From: I-85 SB at North Druid Hills Road **To:** I-85 SB at SR 400 Merge	2.3	1.8	4.0	1.8	4.9 (+0.9)	1.9 (0.1)	5.4	2.0	5.2 (0.2)	1.9 (0.1)
From: I-85 NB at SR 400 Diverge **To:** I-85 NB at North Druid Hills Road Diverge	2.1	2.1	2.1	2.1	2.1 (0.0)	2.1 (0.0)	2.1	2.8	2.1 (0.0)	2.3 (0.5)
From: SR 400 SB at Lenox Rd Merge **To:** SR 400 SB at I-85 Merge	3.4	2.4	12.0	4.0	10.1 (1.9)	3.0 (1.0)	14.9	9.5	13.1 (1.8)	7.6 (1.9)
From: SR 400 NB at I-85 NB Diverge **To:** SR 400 NB at Lenox Rd Diverge	2.5	2.4	2.5	2.4	2.7 (+0.2)	2.5 (+0.1)	2.7	2.4	2.6 (0.1)	2.5 (+0.1)

NOTES: Time Savings of the Build versus No-Build shown in parenthesis; + corresponds to additional time in the build condition.
** -- Existing travel movements that would be replaced by the proposed interchange ramps.

Figure 6.6 Proposed Travel Time Paths



6.6 Benefit Cost Analysis

Using the method developed by GDOT, a benefit cost (B/C) analysis was conducted to determine the benefit of the proposed modifications to the SR 400 interchange with I-85. Under the existing and No-Build conditions, vehicles predominantly rely on local roads to travel from SR 400 southbound to I-85 northbound and to travel I-85 southbound to SR 400 northbound. With the new connections between SR 400 and I-85, many motorists will be provided a new mobility option that can be expected to reduce their travel times.

The Benefit Cost Analysis used by GDOT is based on the following equations:

$Benefit = T_b + CM_b + F_b$

$T_b = D_b * (P * ADT) * (Wd * Dy * VOT_c)$

$CM_b = D_b * (P * T_p * ADT) * (Wd * Dy * VOT_t)$

$F_b = [D_b * (P * ADT) * MPH * G_P * (Wd * Dy * VOT_t)] / V_e$

Where,

T_b = person time savings benefit ($)
CM_b = commercial or truck time savings benefit ($)
F_b = fuel savings benefit ($)
D_b = delay (hr)
P = percent of daily travel in peak periods
ADT = average daily traffic (veh/day)
Wd = working days per year (day/yr)
Dy = life of project (yr)
VOT_c = value of time for passenger vehicles ($/hr)
T_p = percent truck traffic
VOT_t = value of time for trucks ($/hr)
MPH = average speed (mi/hr)
G_p = average gas price ($/gal)
V_e = vehicle efficiency (mi/gal)

A B/C ratio that is greater than 1.0 indicates whether or not a project produces a greater benefit to motorists when compared to the cost.

Users of the new connector ramps would receive direct benefits. In determining the B/C ratio for the proposed interchange modifications, the total costs were developed for the proposed connector ramps. The equations above were used to calculate the benefits expected for users of the connector ramps between SR 400 and I-85. The combined B/C for these two ramps is 5.33.

The implementation of the proposed connector ramps would be highly beneficial and would provide needed connectivity between two major regional facilities and traffic congestion relief to the arterial network in the study area. The worksheets used to calculate the benefit cost ratios are included in **Appendix E-3**.

6.7 Safety Analysis

An analysis of the 2006, 2007 and 2008 crash data along I-85 and SR 400 at the proposed new ramp connections has been conducted to determine if the new on-ramp and off-ramp connections occur within a high crash zone or if the modification in traffic patterns could increase crash frequency. Based on the Preferred Alternative concept, the new connector ramps will tie-in to SR 400 and I-85 at the following locations:

- SR 400 southbound ramp to I-85 northbound:
  - will diverge from SR 400 between mile-logs 0.70 and 0.80
  - will merge with SR 13/Buford Highway onto I-85 between mile-logs 30.98 and 31.15
- I-85 southbound ramp to SR 400 northbound:
  - will diverge from I-85 between mile-logs 30.98 and 31.15
  - will merge onto SR 400 between mile-logs 0.70 and 0.80

Table 6.17 summarizes the crash totals along mainline SR 400 at the proposed ramp diverge area. At this location there are two existing mainline general purpose lanes and no existing ramp lanes.

Table 6.17 SR 400 Crash Analysis

Crash History of SR 400 from I-85 to Lenox Road/Buckhead Loop (Urban Freeway and Expressway)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	233	70	2	202	61	1.73	200	59	0.37
2007	209	54	0	185	48	0.00	205	62	0.27
2008	154	51	0	137	45	0.00	207	67	0.87

The crash rate for the segment of SR 400 where the proposed ramp will diverge is about equal to or slightly greater than the statewide rate in 2006. In 2007 and 2008, the segment crash rates are considerably lower than the statewide rates. The injury rates and fatality rates are also lower than the statewide rates in 2007 and 2008.

A more detailed SR 400 safety analysis was performed with some additional crash data from 2004 to 2008 and is summarized in **Tables 6.18** and **6.19** (see page 97). The data indicate a similar number of crashes in both directions. The predominant crash type is Rear End, with these crashes making up 67 percent and 75 percent of the total crashes in the northbound and southbound directions, respectively. The southbound rear end crashes are probably related to the queues that form at the merge with I-85. Since these queues regularly back up past the Sidney Marcus Boulevard interchange, the proposed SR 400 southbound ramp to I-85 northbound should not increase the number of rear end accidents.

Table 6.18 Supplemental SR 400 Northbound Crash Analysis

Crash History of SR 400 Northbound at I-85 Interchange Milelog 0.65 to 0.85										
Crash Types	**Mainline Crashes**	**% of ML Total**	**Mainline Injuries**	**Mainline Fatalities**	**Ramp Crashes**	**% of Ramp Total**	**Ramp Injuries**	**Ramp Fatalities**	**% ML of Grand Total**	**% RP of Grand Total**
Angle	2	11%	2	0	0	0%	0	0	11%	0%
Head On	0	0%	0	0	0	0%	0	0	0%	0%
Rear End	12	67%	1	0	0	0%	0	0	67%	0%
Sideswipe	1	6%	0	0	0	0%	0	0	6%	0%
Not a Collision with a Motor Vehicle	3	17%	0	0	0	0%	0	0	17%	0%
Total	18	100%	3	0	0	0%	0	0	100%	0%

*Note: Includes accident data from 2004 through 2008

Table 6.19 Supplemental SR 400 Southbound Crash Analysis

Crash History of SR 400 Southbound at I-85 Interchange Milelog 0.65 to 0.85										
Crash Types	**Mainline Crashes**	**% of ML Total**	**Mainline Injuries**	**Mainline Fatalities**	**Ramp Crashes**	**% of Ramp Total**	**Ramp Injuries**	**Ramp Fatalities**	**% ML of Grand Total**	**% RP of Grand Total**
Angle	2	12.5%	4	0	0	0%	0	0	12.5%	0%
Head On	0	0%	0	0	0	0%	0	0	0%	0%
Rear End	12	75%	5	0	0	0%	0	0	75%	0%
Sideswipe	2	12.5%	0	0	0	0%	0	0	12.5%	0%
Not a Collision with a Motor Vehicle	0	0%	0	0	0	0%	0	0	0%	0%
Total	16	100%	9	0	0	0%	0	0	100%	0%

*Note: Includes accident data from 2004 through 2008

Table 6.20 summarizes the crash totals and rates for I-85 where the proposed SR 400 southbound to I-85 northbound ramp would terminate. The crash and injury rates on I-85 are higher than the statewide rates for all three years. The fatality rate is higher than the statewide rate for one of the three years.

Table 6.20 I-85 Crash Analysis

Crash History of I-85 from Piedmont Road to North Druid Hills Road (Urban Interstate Principal Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	574	200	0	315	110	0.00	200	69	0.73
2007	549	151	3	298	82	1.63	186	63	0.58
2008	500	143	0	271	78	0.00	187	63	0.62

A more detailed I-85 safety analysis was performed with some additional crash data from 2004 to 2008 and is summarized in **Tables 6.21** and **6.22** (see page 99). The data indicate a definite trend of more accidents on I-85 in the southbound direction than the northbound direction. Almost 40 percent of all the accidents in both directions were rear end accidents in the southbound direction. The combination of the rear end accidents in both directions make up 53 percent of all the accidents. Similar to SR 400, the southbound rear end crashes are probably related to the queues that form at the merge with SR 400. The northbound rear end crashes could be related to the frequent merge maneuvers from the Lenox Road/Cheshire Bridge Road on-ramp. Sideswipe accidents were the second highest accident type at 26 percent of the total number of accidents in the northbound direction. Some of these sideswipe accidents could be related to weaving maneuvers between interchanges.

In this section of I-85 northbound, the existing travel lanes consist of one high occupancy vehicle (HOV) lane, four mainline general purpose lanes and two lanes from SR 13/Buford Highway on-ramp. The proposed plan would reduce the mainline general purpose lanes from four to three and the new ramp would connect on the outside of the two-lane on-ramp from SR 13/Buford Highway. These three lanes would join I-85 northbound each with their own dedicated lane.

The proposed ramp is expected to take a significant amount of traffic (3,000 vehicles per day in the Design Year) off of the Lenox Road/Cheshire Bridge on-ramp which is approximately 1,100 feet' further north. This would improve safety by reducing the number of merging vehicles while increasing the weave distance for vehicles using the proposed ramp from SR 400 southbound, which would reduce the number of rear end and sideswipe accidents related to the existing ramp merge. The proposed shift of the SR 13/Buford Highway on-ramp by one lane to the inside would eliminate the need for SR 13/Buford Highway traffic to weave before the North Druid Hills Road interchange, which would reduce the weaving maneuvers in this section of I-85 northbound. These safety enhancements would be offset by introducing a new conflict point created by the proposed ramp and by adding one lane to the weaving maneuvers for the I-85 northbound traffic exiting at the North Druid Hills Road off-ramp.

Table 6.21 Supplemental I-85 Northbound Crash Analysis

Crash History of I-85 Northbound at SR 400 and SR 13/Buford Highway Interchanges Milelog 30.93 to 31.20										
Crash Types	**Mainline Crashes**	**% of ML Total**	**Mainline Injuries**	**Mainline Fatalities**	**Ramp Crashes**	**% of Ramp Total**	**Ramp Injuries**	**Ramp Fatalities**	**% ML of Grand Total**	**% RP of Grand Total**
Angle	37	24%	15	1	0	0%	0	0	23%	0%
Head On	3	2%	8	0	0	0%	0	0	2%	0%
Rear End	57	37%	16	1	4	57%	0	0	35%	2%
Sideswipe	40	26%	1	0	3	43%	0	0	25%	2%
Not a Collision with a Motor Vehicle	18	12%	4	0	0	0%	0	0	11%	0%
Total	155	100%	44	2	7	100%	0	0	96%	4%

*Note: Includes accident data from 2004 through 2008

Table 6.22 Supplemental I-85 Southbound Crash Analysis

Crash History of I-85 Southbound at SR 400 and SR 13/Buford Highway Interchanges Milelog 30.93 to 31.20										
Crash Types	**Mainline Crashes**	**% of ML Total**	**Mainline Injuries**	**Mainline Fatalities**	**Ramp Crashes**	**% of Ramp Total**	**Ramp Injuries**	**Ramp Fatalities**	**% ML of Grand Total**	**% RP of Grand Total**
Angle	43	16%	12	0	0	0%	0	0	15%	0%
Head On	2	1%	1	0	1	5%	0	0	1%	0%
Rear End	169	62%	49	0	17	85%	5	0	58%	6%
Sideswipe	47	17%	8	0	2	10%	0	0	16%	1%
Not a Collision with a Motor Vehicle	12	4%	2	0	0	0%	0	0	4%	0%
Total	273	100%	72	0	20	100%	5	0	93%	7%

*Note: Includes accident data from 2004 through 2008

The proposed ramp from SR 400 southbound would join I-85 northbound as an add-lane from the right side of the SR 13/Buford Highway ramp. This traffic would be required to weave over one lane to continue on I-85 northbound through the North Druid Hill Road interchange; however, these vehicles would have an additional 1,100 feet to weave when compared to the Lenox Road/Cheshire Bridge Road traffic. If the improved traffic operations on I-85 northbound between SR 13/Buford Highway and North Druid Hills Road predicted by the CORSIM simulation models are indicators of overall safety enhancements, then safety should be improved in the northbound direction of I-85 with the proposed project.

The proposed I-85 southbound to SR 400 northbound ramp would modify the existing I-85 southbound off-ramp at SR 13/Buford Highway. The existing one-lane, off-ramp would be enlarged to a two-lane, off-ramp with an optional lane and a lane drop. This design would reduce the number of required weaving maneuvers for vehicles exiting to SR 13/Buford Highway. The CORSIM models indicate that this expansion of the SR 13/Buford Highway off-ramp would accommodate the anticipated increase in ramp volume. Therefore, the proposed improvements to I-85 southbound should improve safety.

Table 6.23 summarizes the crash totals for Sidney Marcus Boulevard from SR 400 to SR 13/Buford Highway.

Table 6.23 Sidney Marcus Boulevard Crash Analysis

Crash History of Marcus Boulevard from SR 400 to SR 13/Buford Highway (Urban Minor Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	93	27	0	2,043	593	0.00	548	208	1.55
2007	145	29	0	3,999	800	0.00	513	190	1.48
2008	121	25	0	3,337	690	0.00	469	176	1.47

The crash rates and injury rates for Sidney Marcus Boulevard are higher than the statewide rates for all three years. The fatality rates are lower than the statewide rates for all three years.

Table 6.24 (see page 101) summarizes the crash totals along SR 13/Buford Highway from Lenox Road to North Druid Hills Road.

Table 6.24 SR 13/Buford Highway (North) Crash Analysis

Crash History of SR 13/Buford Highway from Lenox Road to North Druid Hills Road (Urban Principal Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	101	34	0	793	267	0.00	787	291	1.87
2007	184	39	2	1,429	303	15.53	649	227	1.53
2008	156	61	1	1,212	474	7.77	612	213	1.33

The crash rates, injury rates and fatality rates for SR 13/Buford Highway from Lenox Road to North Druid Hills Road are higher than the statewide rates for two years.

Table 6.25 summarizes the crash totals along SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road.

Table 6.25 SR 13/Buford Highway (South) Crash Analysis

Crash History of SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road (Urban Principal Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	174	37	0	2,246	478	0.00	787	291	1.87
2007	203	53	0	2,621	684	0.00	649	227	1.53
2008	179	52	0	2,311	671	0.00	612	213	1.33

The crash rates and injury rates for SR 13/Buford Highway from Sidney Marcus Boulevard to Lenox Road are higher than the statewide rates for all three years. The fatality rates are lower than the statewide rates for all three years.

Table 6.26 (see page 102) summarizes the crash totals for Lenox Road from SR 13/Buford Highway to Chantilly Drive.

Table 6.26 Lenox Road Crash Analysis

Crash History of Lenox Road from SR 13/Buford Highway to Chantilly Drive (Urban Minor Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	177	43	0	5,742	1,395	0.00	548	208	1.55
2007	157	34	0	5,093	1,103	0.00	513	190	1.48
2008	134	34	0	4,347	1,103	0.00	469	176	1.47

The crash rates and injury rates for Lenox Road from SR 13/Buford Highway to Chantilly Drive are higher than the statewide rates for all three years. The fatality rates are lower than the statewide rates for all three years.

Table 6.27 summarizes the crash totals for North Druid Hills Road from SR 13/Buford Highway to I-85 northbound ramps.

Table 6.27 North Druid Hills Road Crash Analysis

Crash History of North Druid Hills Road from SR 13/Buford Highway to I-85 Northbound Ramps (Urban Minor Arterial)									
Year	No. of Crashes	No. of Injuries	No. of Fatalities	Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Injury Rate	Statewide Fatality Rate
2006	107	21	0	3,841	754	0.00	548	208	1.55
2007	123	23	0	2,891	541	0.00	513	190	1.48
2008	228	41	0	5,359	964	0.00	469	176	1.47

The crash rates and injury rates for North Druid Hills Road from SR 13/Buford Highway to I-85 northbound ramps are higher than the statewide rates for all three years. The fatality rates are lower than the statewide rates for all three years.

6.8 Interchange Spacing and Conceptual Signing Plan

There are two important components of interchange spacing:

- Minimum spacing between the modified interchange and the existing upstream and downstream interchanges; and
- Average spacing between the adjacent two upstream and two downstream interchanges.

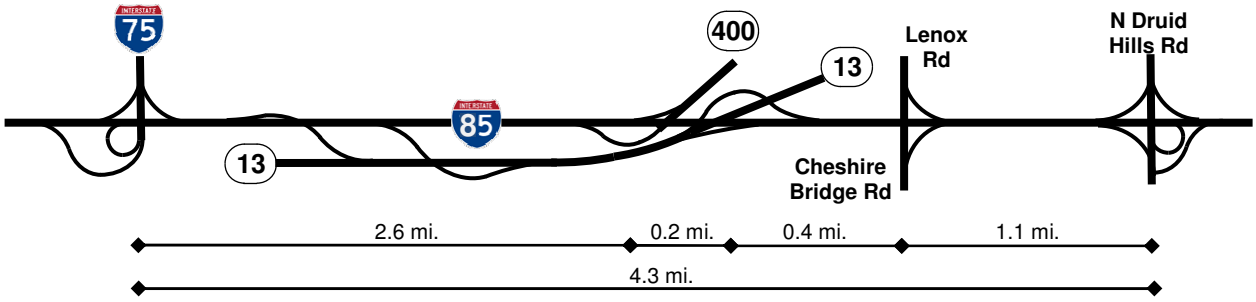
The minimum spacing is calculated as the crossroad to crossroad distance between the proposed interchange and the adjacent upstream and downstream interchanges. The following minimum spacing requirements are used by GDOT based on the AASHTO's A Policy on Geometric Design of Highways and Streets and A Policy on Design Standards Interstate System:

- Urban Areas – 1-mile minimum spacing
- Suburban Areas – 2-mile minimum spacing
- Rural Areas – 2-miles minimum spacing

Within the project area, SR 13/Buford Highway is a parallel route to I-85. The SR 13/Buford Highway interchange is a partial four-leg interchange with ramps only to and from the same direction of travel as I-85. For example, the only ramp from I-85 southbound is to SR 13/Buford Highway southbound. The only ramp from SR 13/Buford Highway northbound is to I-85 northbound. These SR 13/Buford Highway ramps are spaced more than two miles apart on I-85. The next interchange to the north of SR 13/Buford Highway is the Lenox Road/Cheshire Bridge Road partial diamond interchange with only ramps to and from the north. The next interchange to the south of SR 13/Buford Highway is the I-75 interchange.

The original SR 400 partial three-leg interchange was constructed between the SR 13/Buford Highway ramps. The SR 400 interchange is able to fit between the SR 13/Buford Highway ramps because it has ramps only to and from the south. The proposed SR 400 ramps to and from the north would connect with I-85 at approximately the same locations as the SR 13/Buford Highway ramps to and from the north. Since SR 400 terminates at I-85, there is no crossroad location to define the location of this interchange. The effective crossroad location based on the existing ramp locations is immediately north of the Lindbergh Drive overpass, which is approximately 1,000 feet south of the SR 13/Buford Highway crossroad location. **Figure 6.7** displays the existing interchange spacing distances along I-85 between I-75 and North Druid Hills in Fulton and DeKalb Counties.

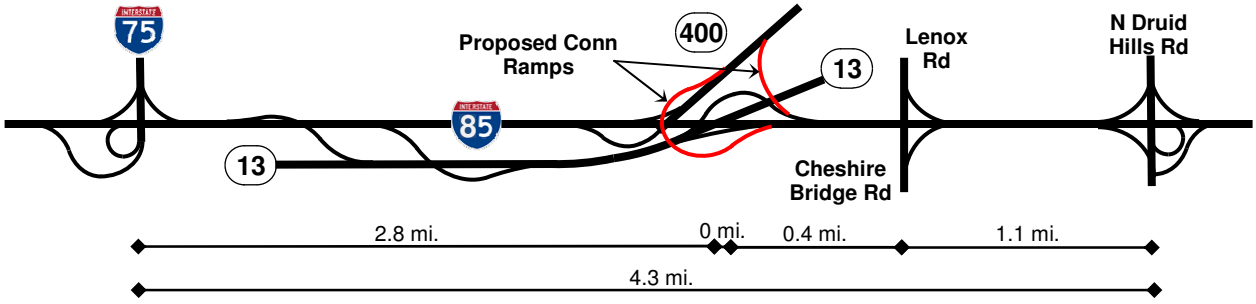
Figure 6.7 Existing I-85 Interchange Spacing



A review of **Figure 6.7** above indicates that the existing SR 400 interchange does not meet the minimum spacing requirements for urban areas due to the close proximity to the SR 13/Buford Highway interchange.

- Distance to southern interchange (I-75) – 2.6 miles
- Distance to northern interchange (SR 13/Buford Highway) – 0.2 miles

Figure 6.8 Proposed I-85 Interchange Spacing



The proposed SR 400 ramps would expand the footprint of the interchange, which would effectively move the SR 400 crossroad location northward to match the SR 13/Buford Highway location. **Figure 6.8** displays the proposed interchange spacing distances along I-85 between I-75 and North Druid Hills in Fulton and DeKalb Counties. A review of **Figure 6.8** above shows that the modified SR 400 interchange would continue to not meet the minimum spacing requirements for urban areas.

- Distance to southern interchange (I-75) – 2.8 miles
- Distance to northern interchange (SR 13/Buford Highway) – 0 miles

Average spacing reflects the crossroad to crossroad distance between the adjacent two downstream and upstream interchanges. The following average spacing requirements are used by GDOT:

- Urban Areas – 2-mile average spacing
- Suburban Areas – 4-mile average spacing
- Rural Areas – 8-mile average spacing

Using five interchanges (I-75, SR 13/Buford Highway, SR 400, Lenox Road/Cheshire Bridge Road and North Druid Hills Road) in the calculation, the existing average interchange spacing is 1.1 miles, which is less than the 2-mile requirement for urban areas.

To evaluate the signage requirement of the proposed concept, a conceptual signing plan was developed based on the current version of FHWA's Manual on Uniform Traffic Control Devices (MUTCD) and GDOT's Interstate Sign Design Guidelines. The conceptual signing plan can be found in **Appendix C-3**.

6.9 Design Exception

The proposed I-85 southbound to SR 400 northbound ramp would exit I-85 southbound mainline with the existing off-ramp to SR 13/Buford Highway. All proposed ramp shoulder widths would provide adequate sight distance to satisfy stopping distance requirements and satisfy the requirements for carrying less than 5 percent trucks. The alignment of the existing bridge that carries the ramp from I-85 southbound to SR 13/Buford Highway (Structure ID 121-0558-0) has an inside shoulder width of 6.5 feet (measured from the project Concept Base Mapping); therefore, based on the existing horizontal curve radius, the ramp meets the speed design of 38 mph based on Stopping Sight Distance. This speed is less than the required 45 mph design speed based on current version of American Association of State Highway and Transportation Officials' (AASHTO's) a Policy on Geometric Design of Highways and Streets. In order for the ramp from I-85 southbound to SR 13/Buford Highway to meet the required 45 mph speed design, it was assumed that the entire ramp structure would have to be reconstructed due to the type of bridge superstructure (concrete box girder). The construction cost was estimated at $10.3 million. It is recommended to leave the existing ramp from I-85 southbound to SR 13/Buford Highway unaltered. Posting a speed limit of 35 mph along this ramp to minimize the potential for accidents is also recommended.

A draft Design Exception Request can be found in **Appendix C-4**.

7.0 FHWA Guidance and Policy Compliance

The purpose of an IMR is to provide the FHWA with all the necessary information to independently evaluate the request for modification of access points along the interstate system. An IMR also demonstrates that all pertinent factors and alternatives have been appropriately considered. A summary of FHWA's requirements[2] and how they specifically relate to the proposed interchange modifications at I-85 and SR 400 are detailed in this section.

7.1 General Interchange Requirements

Table 7.1 summarizes how this IMR for SR 400 at I-85 addresses all thirteen of FHWA's general requirements.

Table 7.1 FHWA's General Information Requirements

General Requirement	Location
Location and type of proposed access	Section 7.1.1 and Appendix C-1
Purpose and need for the revised access points	Section 7.1.2 and Appendix E-1
Background or supporting information that further explains the basis of the proposed interchange modification	Section 7.1.2 and Appendix E-1
Is the interchange within a Transportation Management Area (TMA)	Section 7.1.3
Identification of any known issues of concern or controversy	Sections 7.1.4 and 4.0
Description of design alternatives considered and why the proposed alternative was selected	Sections 7.1.5 and 5.0
Estimated costs of the project, proposed funding sources and implementation schedule	Section 7.1.6 and Appendix C-2
Relationship and distance of the interchange to adjacent interchanges and the ability to provide adequate signing	Section 6.8
Any necessary design exceptions from currently adopted AASHTO Interstate design standards	Section 6.9
Existing and proposed limits of access	Section 7.1.7
Schematic drawings showing current and design year ADT and DHV for mainline traffic volumes, ramp volumes, cross road volumes, and intersection turning movements	Section 2.0, 3.0, Figure 2.2, 2.3, 3.4, 3.5, and Appendix A
Additional proposed traffic signalization and signing	Section 7.1.8 and Appendix C-3
Safety issues regarding the existing conditions and proposed alternatives	Section 6.7

7.1.1 Interchange Modification Description

The existing interchange of SR 400 and I-85 in the City of Atlanta is a three-leg, semidirectional interchange. This interchange provides ramps for all movements except for two: I-85 southbound to SR 400 northbound and SR 400 southbound to I-85 northbound. The proposed interchange modification would construct the two missing connector ramps. The Preferred Alternative (Alternative 3A) would include the following features:

[2] Source: FHWA, Georgia Division, Guidance on Interstate Access Requests, August 5, 2003

- I-85 Southbound to SR 400 Northbound Ramp – One-lane ramp that would be combined with the SR 13/Buford Highway southbound off-ramp to produce a two-lane off-ramp. One lane of the two-lane ramp would split to SR 13/Buford Highway and one to SR 400. The three-lane section of SR 400 northbound would be reduced to two lanes upstream of the merge with the proposed ramp. The proposed ramp would join SR 400 northbound as the third lane. This ramp would require the widening of the existing I-85 bridge over the North Fork of Peachtree Creek. It would also require two new bridges over SR 13/Buford Highway and Sidney Marcus Boulevard.

- SR 400 Southbound to I-85 Northbound Ramp – One-lane ramp that would exit SR 400 southbound approximately 1,000 feet south of the Sidney Marcus Boulevard off-ramp. The four general purpose lanes of I-85 northbound would be reduced to three lanes between the SR 400 northbound off-ramp and the SR 13/Buford Highway northbound on-ramp. The SR 13/Buford Highway northbound on-ramp would be realigned to join I-85 northbound as the fourth and fifth general purpose lanes. The proposed ramp from SR 400 southbound would join I-85 northbound as an auxiliary lane after the SR 13/Buford Highway northbound on-ramp. This ramp would require the widening of the existing I-85 bridge over the North Fork of Peachtree Creek. It would also require one new bridge that spans over Sidney Marcus Boulevard, I-85 and SR 13/Buford Highway.

- Ramp Typical Section – The I-85 southbound to SR 13/Buford Highway northbound/SR 400 northbound ramp would be two travel lanes at 16 feet wide each with 4-foot inside shoulder and 8-foot outside shoulder. The I-85 southbound to SR 400 northbound ramp would be one travel lane at 16 feet wide with 4-foot inside shoulder and 8-foot outside shoulder. The SR 400 southbound to I-85 northbound ramp would be one travel lane at 16 feet wide with 6-foot inside shoulder and 8-foot outside shoulder. Both ramp typicals meet stopping sight distance requirements and have adequate shoulder widths for the design speed and minimal truck traffic (under 5% of average daily traffic or daily hourly volume) expected.

Concept designs were developed for the recommended interchange layout and are located in **Appendix C-1**. These concept designs contain the following design elements:

- Project limits
- Adjacent interchanges
- Proposed interchange modification
- Travel lane widths
- Shoulder widths
- Ramps
- Ramp radii
- Ramp grades

7.1.2 Interchange Purpose & Need

The proposed Georgia Department of Transportation (GDOT) project (Project Number NH000-0085-02(153), PI No. 762380, Fulton County) would construct two new connector ramps at the interchange of State Route (SR) 400 and I-85 in the City of Atlanta (**Figure 1.1**, see page 2). The proposed project is part of the Atlanta Regional Commission (ARC) Transportation Improvement Program (TIP)/ Regional Transportation Plan (RTP) and is programmed in the GDOT Construction Work Plan (CWP) with construction scheduled in long range. According to the 2007 ARC 2030 RTP, alleviating the bottleneck at this interchange is identified as a regional need.

The justification of this interchange modification is predicated on improving the connectivity of the important corridors of SR 400 and I-85. At the time of the SR 400 construction between I-285 and I-85 in the early 1990's, SR 400 traffic was forecasted to move in an almost exclusive southbound direction during AM peaks and in the opposite northbound direction during PM peaks. Viewed as a commuter route for northern Atlanta suburbs to downtown Atlanta, justification for connectivity to I-85 north of the SR 400/I-85 interchange was limited based on forecasted traffic demand at that time. Therefore, the interchange between SR 400 and I-85 was built with I-85 northbound ramps to SR 400 northbound and SR 400 southbound ramps to I-85 southbound; however, no ramps were constructed at that time to provide access from SR 400 southbound to I-85 northbound or from I-85 southbound to SR 400 northbound. No physical accommodations (i.e., embankments, right-of-way, etc.) were made for future additional ramps when the original interchange was built. During the years since the completion of the interchange, traffic volumes have increased and traffic patterns have changed. As a result, conditions have deteriorated on nearby surface streets that are being used as the alternate route for these missing connections.

The SR 400 and I-85 interchange is an important node of the metropolitan Atlanta transportation network. As employment centers have developed throughout Atlanta, motorists utilize both SR 400 and I-85 as important commuter routes. Motorists utilize the SR 400 and I-85 interchange as access points between the northern Atlanta suburbs, northern DeKalb County and further into the northeast metropolitan Atlanta suburbs including Gwinnett County. Additionally, as the Buckhead community has, and continues to grow as a popular employment center, motorists traveling from the northeast suburbs utilize SR 400 as a primary access point to Buckhead and further north on SR 400 to employment centers located near I-285, Sandy Springs, and into the north Fulton communities of Roswell and Alpharetta.

According to the RTP, the 20-county Atlanta metropolitan area is expected to increase approximately 46 percent, adding 2.2 million residents through 2030 for a total population of almost 7,000,000. From 2000 to 2030, ARC forecasts the area will add about 91,000 new residents per year on average. This continued rapid growth will create significant challenges from a congestion standpoint as additional vehicles use regional transportation infrastructure, including the I-85 and SR 400 corridors. ARC is the federally-designated Metropolitan Planning Organization (MPO) for the Atlanta region.

7.1.3 Transportation Management Area

The proposed interchange at I-85 and SR 400 is in the Atlanta Transportation Management Area.

7.1.4 Issues of Concern

The only potential environmental issue that has been identified during project surveys is the potential impacts to the single-family residential neighborhood (Lindridge-Martin Manor) that is adjacent to the existing interchange. This neighborhood that was developed in the 1940's and 1950's and is a potentially eligible historic district. The types of the potential impacts are noise and visual impacts. The extent of the noise impacts will be determined with the completion of the noise study that is currently being conducted for the project. The extent of the visual impacts will be determined with the completion of the cultural resources analysis.

This neighborhood and its City of Atlanta, citizen advisory council, Neighborhood Planning Unit F, do not support the implementation of the proposed modifications to the I-85/SR 400 interchange.

7.1.5 Design Alternatives Considered

As describe in **Section 5.0** (see page 39), six interchange ramp configurations were considered at the proposed location. These interchange layouts included:

1. Alternative 1 – SR 400 Collector Distributor Option
2. Alternative 1A – I-85 Collector Distributor Option
3. Alternative1B – I-85 Direct Merge Option
4. Alternative 2 – Lindbergh Drive Flyover Option
5. Alternative 3 – Compact Flyover Option (Preferred Alternative)
6. Alternative 3A – Modified Compact Flyover Option

The primary difference between these alternatives is the manner of their connections to I-85 and SR 400 except for Alternative 2, which would follow a significantly different alignment from the other five alternatives.

Alternative 3 was selected as the Preferred Alternative because it would have the least environmental impacts and the lowest construction costs.

7.1.6 Cost Estimates

The estimated project cost for the proposed interchange modifications is $38 million. This total project cost can be broken down as:

- $3.9 million for preliminary engineering
- $28.9 million for construction of the interchange and new alignments
- $3.5 million for contingency
- $1.5 million for right of way
- $0.2 million for utilities

A detailed cost estimate is provided in **Appendix C-2**.

7.1.7 Limits of Access

The proposed interchange modifications will not materially alter the existing limits of access to I-85, SR 400 or the local street network.

7.1.8 Traffic Signals and Signage

No additional traffic signals are necessary to implement the proposed interchange modifications.

The new I-85 southbound advance guide and exit directions signs necessary for the proposed SR 400 northbound ramp will be incorporated into the SR 13/Buford Highway southbound signs. The new SR 400 southbound advance guide and exit directions signs necessary for the proposed I-85 northbound ramp will be coordinated with the signs to I-85 southbound. The changes to the existing freeway guide signs located along the southbound approaches to the I-85/SR 400 interchange are illustrated in the Conceptual Signing Plan that is provided in **Appendix C-3**.

7.2 FHWA Interchange Policies

The information below addresses each of the eight FHWA policy requirements in regards to the proposed interchange modifications at I-85 and SR 400.

Table 7.2 FHWA's Policy Requirements

Policy Requirements	Location
Existing Facilities: *"The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands."*	Section 7.2.1
Transportation System Management: *"The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access."*	Section 7.2.2
Operational Analysis: *"An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative."*	Section 7.2.3
Access Connections and Design: *"The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a) (2), and 655.603(d))."*	Section 7.2.4
Transportation Plans: *"The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93."*	Section 7.2.5
Comprehensive Interstate Network Study: *"In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111)."*	Section 7.2.6

Policy Requirements	Location
Coordination with Transportation System Improvements: *"When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d))."*	Section 7.2.7
Status of Planning and NEPA: *"The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111)."*	Section 7.2.8

7.2.1 Existing Facilities

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

No ramps are currently provided for I-85 southbound traffic to access SR 400 northbound, or for SR 400 southbound traffic to access I-85 northbound. Currently motorists must exit from I-85 and SR 400 and use surface streets (Sidney Marcus Boulevard, SR 13/Buford Highway, and Lenox Road/Cheshire Bridge Road) to travel from I-85 southbound to SR 400 northbound and from SR 400 southbound to I-85 northbound. The posted speed limit for SR 400 and I-85 in this area is 55 mph. The posted speed limit for Lenox Road and Cheshire Bridge Road is 35 mph. The speed limits for Sidney Marcus Boulevard and SR13/Buford Highway are 40 mph and 45 mph, respectively. Vehicles traveling the surface street route from I-85 southbound to SR 400 northbound pass through four signalized intersections. The vehicles traveling the surface street route from SR 400 southbound to I-85 northbound pass through six signalized intersections.

SR 400 was originally constructed as a commuter route between the northern Atlanta suburbs and midtown/downtown Atlanta and little justification existed for ramps between SR 400 and I-85 on the north side of the I-85/SR 400 interchange. Therefore, the two ramps that would serve this traffic were omitted from the original interchange. As traffic has steadily increased since the early 1990's, the demand for the omitted ramps has grown. Over 46,000 vehicles per day currently travel on Sidney Marcus Boulevard between SR 400 and SR 13/Buford Highway. Without the omitted ramps, this volume is projected to increase to 65,700 vehicles per day by 2035. Approximately 39,400 vehicles per day in 2035 are projected to travel between SR 400 North and I-85 North, which would be over 50 percent of the traffic on Sidney Marcus Boulevard. With these anticipated traffic volumes, Sidney Marcus Boulevard could not provide an acceptable level of service for the I-85/SR 400 vehicles by 2035 even if it was widened from four to eight lanes. This inability to accommodate future 2035 traffic volumes would apply similarly to SR 13/Buford Highway. Therefore, there are no feasible improvements to the existing local streets that would accommodate the 2035 traffic volumes without the proposed interchange modifications.

The other alternative to the proposed interchange modifications would be to improve one or more of the existing interchanges (I-85/SR 400, I-85/Lenox Road/Cheshire Bridge Road, or SR 400/Sidney Marcus Boulevard) to accommodate the demand for the omitted ramps. There are no feasible interchange modifications that would connect the I-85/Lenox Road/Cheshire Bridge Road interchange directly with the SR 400/Sidney Marcus Boulevard interchange to bypass the capacity constraints of the local streets that was previously described.

Since none of the existing I-85/SR 400 interchange ramps carry the traffic that would use the omitted ramps, there are no feasible improvements of the existing interchange that would accommodate the future traffic demand except for the proposed ramps. Therefore, there are no feasible improvements to the existing interchanges in the immediate vicinity that would accommodate the 2035 traffic volumes except for the proposed interchange modifications.

7.2.2 Transportation System Management

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

Transportation system management (TSM) applications would not provide an acceptable alternative to constructing the omitted ramps from SR 400 southbound to I-85 northbound and I-85 southbound to SR 400 northbound. I-85 currently has HOV lanes and selective ramp metering and neither of these TSM applications accommodate the need for the omitted ramps. The local road system in the project area already has numerous bus routes and access to a transit station; however, the local road system is still at or near capacity. The future congestion on the local road system is also too severe to be remedied by retiming of the affected traffic signals. There is no evidence that any other TSM applications would serve as effectively in the Design Year as the proposed interchange modifications.

As part of the concept development, six different design options were considered in addition to the No-Build Alternative:

1. Alternative 1 – SR 400 Collector Distributor Option
2. Alternative 1A – I-85 Collector Distributor Option
3. Alternative1B – I-85 Direct Merge Option
4. Alternative 2 – Lindbergh Drive Flyover Option
5. Alternative 3 – Compact Flyover Option
6. Alternative 3A – Modified Compact Flyover Option

These options, as documented in **Section 5.3**, were reviewed by FHWA and GDOT to ensure that the design requirement was met. Potential alternatives were evaluated and the considerations were summarized in **Table 5.1** (page 56). The Preferred Alternative (Alternative 3 – Compact Flyover Option) was recommended for the following reasons:

- It provides no displacements and minimal right-of-way acquisition
- Provides minimal environmental and utility impacts
- Minimize impacts to the existing ramp operations
- Would have the least impact to existing structures and roadways, thus having a lower construction cost
- Allows for a design with minimal design exceptions
- Matches user expectancy

7.2.3 Operational Analysis

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

Complete operational analyses of I-85, SR 400, and the local streets Lenox Road, Cheshire Bridge Road, Sidney Marcus Boulevard and SR 13/Buford Highway were conducted with and without the proposed connector ramps and the results reported in **Section 6**.

The No-Build traffic analysis indicated that the majority of the areas of I-85 and SR 400 currently operate at acceptable levels of service (LOS D or better) except for the areas impacted by the heavily congested merge of I-85 southbound and SR 400 southbound (LOS F). The queues on SR 400 southbound from this merge regularly back up past the upstream interchange at Sidney Marcus Boulevard. The weaving sections of I-85 between North Druid Hills Road and SR 13/Buford Highway operate at LOS D or better during the existing AM and PM peak hours. The current local street PM peak hour congestion results in intersection LOS E and F for the SR 13/Buford Highway intersections at Sidney Marcus Boulevard and Lenox Road, respectively. The No-Build analyses for 2015 and 2035 indicate that the severely congested (LOS F) areas would expand gradually over time to encompass a significant percentage of the freeways and almost all of the local streets by 2035.

The Build traffic analysis indicated that the overall operations on I-85 and SR 400 would be improved with the proposed ramps as illustrated by the estimated reductions in freeway travel times through the corridor. The freeway travel time on I-85 northbound would decrease by 0.5 min. from the SR 400 off-ramp to the North Druid Hills off-ramp during PM peak hour of 2035 under the Build condition. There would be some isolated sections of these freeways that would experience more congestion and lower speeds with the proposed interchange modifications. Traffic congestion (LOS F) in the 2035 AM peak hour would increase by 14 percent for the weave section of I-85 southbound between the North Druid Hills Road on-ramp and the Lenox Road/Cheshire Bridge Road off-ramp. The I-85 northbound level of service between the SR 400 off-ramp and the SR 13/Buford Highway on-ramp would drop from LOS D to LOS E in the 2035 PM peak hour with the proposed interchange modifications. However, north of the section of I-85 northbound between the Lenox Road/Cheshire Bridge Road on-ramp and the North Druid Hills off-ramp, the level of service of this weaving area would improve from LOS F to LOS D. Traffic operations along the local streets would be substantially improved with the proposed interchange modifications because the vehicles traveling between I-85 southbound to SR 400 northbound and between SR 400 southbound to I-85 northbound on the local streets would reroute to the proposed connector ramps in the Build condition. For the intersection of Lenox Road/Cheshire Bridge Road and I-85 northbound on-ramp,

this would result in an improvement in intersection level of service from LOS F to LOS B in the 2035 PM peak hour.

7.2.4 Access Connections and Design

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

The original SR 400 at I-85 interchange provided connections between two public roads; however, it did not provide for all traffic movements. The I-85 southbound to SR 400 northbound and SR 400 southbound to I-85 northbound movements were omitted from the original construction project and no physical accommodations were made to facilitate their future addition. The Preferred Alternative would upgrade the existing interchange to a "full interchange" that would provide ramps to service all possible traffic movements. The Preferred Alternative would also connect to public roads and meet current standards for Federal-aid projects on the Interstate System. The concept design for the Preferred Alternative can be found in **Appendix C-1**.

7.2.5 Transportation Plans

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

The Preferred Alternative is currently in GDOT's FY 2010-2013 Statewide Transportation Improvement Program. Additionally, the proposed modifications to the interchange are a high priority recommendation in ARC's Long Range Transportation Plan. It is contained in Atlanta Region FY 2008-2013 TIP by reference number AT-AR-212B. The Preferred Alternative also demonstrates consistency with the City of Atlanta's Transportation Plan.

7.2.6 Comprehensive Interstate Network Study

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

There are no other planned interchanges on I-85 in proximity to the SR 400 at I-85 interchange that are currently included in a local or state Transportation Plan. The Preferred Alternative has independent utility as the proposed interchange modifications would provide enhanced connectivity between SR 400 and I-85 and would improve overall traffic operations in the area without any additional future improvements.

7.2.7 Coordination with Transportation System Improvements

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

The Preferred Alternative is consistent with ARC's Comprehensive Plan and Future Land Use maps. Through the preparation of this report, coordination has been maintained with FHWA, GDOT, ARC, Fulton and DeKalb Counties, and community groups. The development assumptions used for this analysis are consistent with the currently submitted DRIs and growth plans of the counties. These nineteen DRI's, which are located in the Buckhead, Lindbergh Drive and North Druid Hills Road corridors, represent future construction of approximately 20,000 residential units and 6,000,000 square feet of commercial, retail and office space. These new developments would have varying impacts to the SR 400 at I-85 interchange.

7.2.8 Status of Planning and NEPA

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

An Environmental Assessment has been undertaken for this project. Preliminary environmental screening has been conducted. The Preferred Alternative was chosen to minimize impacts to residents and property to the fullest extent possible. No residence or business will be displaced by the Preferred Alternative. The impacts of the Preferred Alternative on existing and potentially eligible cultural resources in the study area have not been determined at this time. The Preferred Alternative would not result in any direct impacts to any of the churches or institutions located in the vicinity of the proposed project.

The Preferred Alternative has also been surveyed for wetlands and non-wetland waters of the U.S. Four wetlands, eighteen ephemeral streams, and nine intermittent/perennial streams were observed within the project study area. A Section 404 Permit may not be required since there are no anticipated impacts to wetlands or streams. A stream buffer variance will be required. The project is anticipated to have no effect on any protected species.

Final approval of the IMR is contingent upon approval of NEPA. The development of final plans, right-of-way acquisition, and construction may not be performed until approval of the environmental document.

7.3 Recommendations

The Preferred Alternative is recommended. The proposed ramps would provide vastly improved connectivity between the two regionally significant facilities, and would better satisfy driver expectations for connectivity between these two major corridors. These proposed ramps would reduce freeway-related traffic on the heavily congested surface streets in the area that currently serve as the only connection from SR 400 southbound to I-85 northbound and I-85 southbound to SR 400 northbound. As a result of the proposed ramp connections, the potential for future accidents would be reduced for the vehicles using these ramps instead of the local streets.