

# **Interchange Modification Report**

**I-285 at Cascade Road  
Fulton County, GA**

**Prepared for:**

**Fulton County Public Works  
Georgia Department of Transportation**

**January 4, 2016**

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Fulton County, GA**



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## Executive Summary

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This Interchange Modification Report (IMR) documents the need to modify the interchange located along I-285 at Cascade Road in Fulton County, Georgia and the impact as it pertains to its location and design. 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 control.

Currently, traffic at the interchange experiences a high degree of vehicular congestion at the ramp terminals and adjacent intersections. It is anticipated with future traffic growth that the traffic operation on Cascade Road will become unsustainable, prompting the need to explore alternative designs to add capacity to the interchange and adjacent intersections. The following alternatives were evaluated for consideration in the redesign of the I-285 at Cascade Road Interchange:

- Conventional tight diamond interchange with traffic signal control
- Conventional diamond interchange with roundabout control
- Diverging diamond interchange (DDI) with traffic signal control

Based on a detailed evaluation of each of these alternatives, it was concluded that the DDI would be the recommended alternative. The results of the traffic analysis, costs associated with the reconstruction of the interchange, and the real estate implications of the design at the Cascade Road study area intersections provides the most feasible of all of the alternatives presented.

The proposed interchange and roadway modifications consist of constructing a DDI at the existing I-285/Cascade Road interchange, extending the existing I-285 northbound and southbound ramp exits to Cascade Road from I-285 to provide ample deceleration and storage area needed to accommodate the projected design year traffic, and reconstructing the intersections of Utoy Springs Road, Cascade Parkway SW, and Shanter Trail with Cascade Road to provide additional traffic capacity on the corridor. The recommended alternative does not cause modifications to the I-285 freeway segment or the I-285 bridges over Cascade Road.

The interchange modifications considered were examined in relation to the eight policy requirements of the Federal Register and included in the *Guidance on Interstate Access Requests*. These policies are listed as follows:

- Policy 1: Existing Network's Ability to Accommodate Traffic
- Policy 2: Transportation System Management
- Policy 3: Operational Analysis
- Policy 4: Access Connections and Design
- Policy 5: Transportation Plans

- Policy 6: Comprehensive Interstate Network Study
- Policy 7: Coordination with Transportation System Improvements
- Policy 8: Status of Planning and NEPA

This study provides a detailed assessment of the existing and future conditions, including:

- Project purpose and need;
- Alternate improvement concepts considered;
- Selection of the preferred build alternative;
- Concept project design criteria and parameters;
- Assessment of impact of the proposed improvements on I-285 and the adjacent interchanges;
- Coordination with local and regional land use and transportation plans;
- Preliminary environmental assessment; and
- Economic feasibility of the proposed improvement

Turning movement volumes were collected for the existing year (2015) and projected to determine the point at which the volumes on Cascade Road would reach an unsustainable level and require roadway widening to accommodate traffic. Based on a 0.5% growth rate, it was determined that Cascade Road could accommodate traffic volumes in the area through the year 2030, if the recommended modifications to the I-285 and Cascade Road interchange, and adjacent intersections on Cascade Road would to be implemented.

The proposed layout for the Cascade Road and I-285 Southbound ramps at the proposed DDI are as follows:

- Construct dual right-turn lanes and one left-turn lane on the southbound approach
- Construct two eastbound through lanes and a free flow-right-turn lane
- Construct two westbound through lanes; the left lane will provide entrance to southbound I-285

The proposed layout for the Cascade Road and I-285 Northbound ramps at the proposed DDI are as follows:

- Construct one right-turn lane and dual left-turn lanes on the northbound approach
- Construct two westbound through lanes and a right-turn lane

To accommodate the dual lane entry from the northbound and southbound off-ramps from I-285 to Cascade Road and the intersection geometry associated with the design of the proposed DDI, improvements to the I-285 northbound and southbound off-ramp deceleration areas have been recommended to provide additional lane capacity for motorists. Proposed adjustments include modifying the existing tapered deceleration ramp to a parallel deceleration ramp. Widening the off-ramps to accommodate the lane geometry at the proposed DDI will also require adjusting the off-ramps to exit I-285 using a dual-lane exit in both the northbound and southbound directions.

In addition to the evaluation of the operation characteristics associated with the proposed interchange improvements, other factors considered in the overall analysis include:

- Right-of-way impacts and costs
- Preliminary environmental evaluation
- Construction costs

The potential right-of-way relocations and acquisitions have been addressed with the right-of-way cost estimates prepared for each of the three alternatives. Estimates for each alternative are as follows:

<b>Right-of-Way Cost Estimates</b>			
<b>Alternative</b>	<b>Acres of fee</b>	<b>Easement acquisitions</b>	<b>Estimated Cost (million)</b>
Tight Diamond	2.35	0.66	\$1.03
Roundabout	4.87	0.45	\$2.02
Diverging Diamond	2.1	0.63	\$0.94

The tight diamond interchange alternative, at approximately 2.35 acres of fee and 0.66 acres of easement acquisitions, came in at an estimated cost of \$1.03 million. The roundabout interchange alternative, at approximately 4.87 acres of fee and 0.45 acres of easement acquisitions, came in at an estimated cost of \$2.02 million. This alternative also requires the relocation of 3 businesses and potentially 1 residential home. Relocation costs are not included in the estimated costs. The preferred DDI alternative came in at approximately 2.10 acres of fee and 0.63 acres of easement acquisitions, at an estimated cost of \$0.94 million, proved to be the least expensive alternative of all three considered.

A general construction cost estimate was completed for each control alternative. Quantities were measured for the major construction cost bid items such as: earthwork, aggregate, concrete curb and gutter, asphaltic pavement, and so forth. The cost estimate includes construction modifications to the I-285 ramp interchanges for each of the alternatives, Utoy Springs Road, Cascade Parkway SW, and Shanter Trail. The breakdowns of the cost estimates are as follows:

The following results are the total estimate values:

- Conventional Tight Diamond Alternative **\$25,900,000**
- Roundabout Interchange Alternative **\$18,200,000**
- Diverging Diamond Interchange Alternative **\$17,700,000**

All alternatives assume an inflation cost of approximately 3% over a two year time period, a 20% construction contingency, and utility relocations . The DDI alternative proved to be the least expensive to construct amongst the three alternatives considered.

# 1 Introduction and Project Need and Purpose

---

The purpose of an Interchange Modification Report (IMR) is to provide the Federal Highway Administration (FHWA) and the Georgia Department of Transportation (GDOT) 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.

## 1.1 Need and Purpose of the Report

The purpose of this project is to improve traffic along the study area and the connectivity and safety between the residential areas and businesses on Cascade Road in Fulton County, GA and the Interstate System as it encompasses I-285 in the study area.

The existing I-285 and Cascade Road interchange is a conventional diamond interchange that provides direct access from I-285 to Cascade Road from the north and south. The interchange serves a large portion of traffic from the west on Cascade Road. Currently, substantial back-ups persist on the west leg of Cascade Road, the I-285 Southbound off-ramp and I-285 Northbound on-ramp as a result of the traffic volumes approaching and exiting the interchange. This degrades the serviceability of the interchange as vehicles are routinely stuck in queue on the aforementioned segments of roadway during the peak hours of travel.

To mitigate these issues and improve connectivity to Cascade Road, it is proposed to improve the existing interchange by constructing a Diverging Diamond Interchange (DDI). Construction of the interchange will require extending the existing I-285 northbound and southbound ramp exits to Cascade Road along I-285 to provide ample deceleration and storage area, thus improving the safety of the interchange. It is anticipated that the construction of the DDI will not require the need to lengthen the existing I-285 bridge structure. These proposed ramps extensions would better satisfy driver expectations for connectivity between these two major corridors.

This report documents the following activities and criteria for FHWA's evaluation:

- Review of FHWA policy and guidelines
- Purpose and need for modifications
- Traffic operations and capacity analysis for existing, no-build and build conditions
- Consideration of existing and future traffic safety operations
- Accessibility to public roads
- Consistency with local and regional land use and transportation plans
- Impacts to adjacent interstate interchanges
- Environmental screening of potential area of impact
- Development of concept level interchange design
- Development of preliminary cost estimates

## 1.2 Study Area

The project is located in an unincorporated section of Fulton County, GA at the Cascade Road interchange just outside of the Atlanta city limits. The study area includes the following interchanges along I-285: the I-285/State Route (SR) 154/166 Interchange approximately 1.7 miles to the south, Cascade Road to the east and west, and the State Route 139 (Dr. Martin Luther King Jr. Drive) Interchange approximately 1.9 miles to the north.

The following intersections were analyzed on Cascade Road that are in close proximity to the I-285/Cascade Road interchange:

- Utoy Springs Road/Research Center Drive
- I-285 Northbound Ramp Terminal
- I-285 Southbound Ramp Terminals
- Cascade Parkway SW
- Shanter Trail

A project location map is included in **Figure 1.1**.

## 1.3 Other Projects in the Area

The South Fulton Comprehensive Transportation Plan (CTP), prepared by Fulton County, outlines other projects programmed in the study area for construction consideration. These projects have been classified as short-term, mid-term, or long-term in nature.

**Table 1.1** details projects that may occur concurrently with the proposed interchange reconstruction:

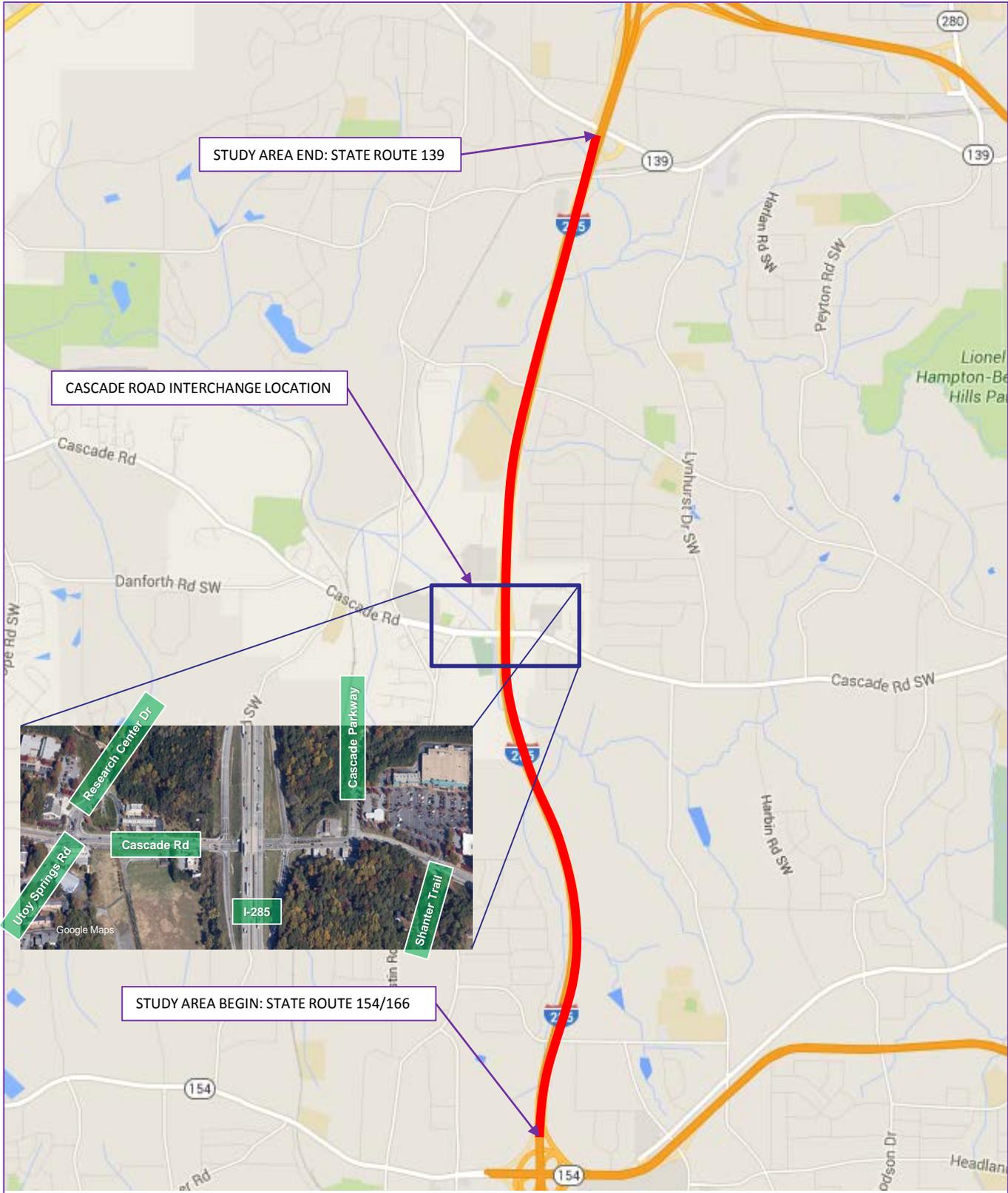
**Table 1.1: South Fulton County Regional Programmed Projects**

Project ID	Classification	Project Location	Category	Description	Project Planning Level Cost Estimate
R-20	Short-term	Cascade Road at I-285	Intersection Improvements	Provide additional ramp and arterial capacity in the vicinity of the interchange	\$16,463,260
R-21	Mid-term	Cascade Road between Fairburn Road and I-285	Roadway Widening	Widen from 4 to 6 lanes (0.5 miles)	\$7,760,170
R-39	Short-term	Cascade Road at Utoy Springs Road	Intersection Operation	Safety study and improvements	\$1,000,000

As shown in **Table 1.1**, modifications to the existing Cascade Road interchange are considered part of Project R-20. The proposed widening between Utoy Springs Road and I-285 in the westbound direction and signal improvements to the intersection of Utoy Springs Road are considered part of Projects 21 and 39 respectively.

The Transportation Investment Act (TIA) of 2010 provides a legal structure in which regions across the state can impose a one percent sales tax to fund needed transportation improvements. Reconstruction of the Cascade Road and I-285 interchange is included as TIA-FS-018 in the South Fulton CTP as a part of the final constrained TIA Investment List for South Fulton County. The project is to consist of improving the overall interchange. The project will also replace the existing bridge at Cascade Road/I-285 and at Cascade Road over Utoy Creek to the west. The interchange will be widened, as appropriate, with adequate turn lanes at all approaches. Sidewalk would be considered on both sides of Cascade Road. It should be noted that the intention of this IMR is not to provide a design that would impact the existing bridges or force the design anticipate as a part of TIA-FS-018.

Figure 1.1: Cascade Road Project Location



## 2 Policy 1: Existing Network's Ability to Accommodate Traffic

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*"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."*

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Currently, I-285 at Cascade Road is a diamond interchange with ramp entrances and exits for northbound and southbound traffic controlled by traffic signals. Traffic operation on Cascade Road has reached its service life as frequent back-ups persist in both directions. Back-ups also persist for traffic accessing Cascade Road from I-285 in both the northbound and southbound directions.

Data was collected for the transportation facilities at I-285 and the I-285/Cascade Road interchange. This information documents the 2015 baseline operating conditions and forms the foundation for analyzing existing characteristics in the study area, including:

- Existing Roadways and Structures
- Existing Traffic Data and Forecasts
- Existing Traffic Operation
- Existing Land Use and Development
- Historical Population

This report also examines the existing traffic conditions and those anticipated in the design year at the following five existing traffic signal controlled intersections along Cascade Road:

- Utoy Springs Road/Research Center Drive
- Southbound I-285 ramp terminal
- Northbound I-285 ramp terminal
- Cascade Parkway
- Shanter Trail

## 2.1 Existing Roadway and Structures

### 2.1.1 Existing Roadway Information

I-285, the perimeter highway around metropolitan Atlanta, serves commuter travel, traffic traveling through the Atlanta region, intraregional travel, and freight traffic. I-285, serving as a bypass of downtown Atlanta in conjunction with providing numerous connections to various employment centers located throughout the metropolitan Atlanta region. The Cascade Road interchange primarily provides freeway access for a densely populated area of the rural Atlanta region.

The existing characteristics of the roadways intersecting with I-285 along the study segment are summarized in **Table 2.1** as follows:

**Table 2.1: Existing Roadway Characteristic Summary**

Segment	Access Management	Roadway Type	Bike/Ped Facilities	Designated Roadway Lighting	Intersection Control	Posted Speed Limit (mph)
I-285	8-Lane Freeway	Interstate Highway	No	Yes	---	65
Cascade Road	6-Lane Facility with Turn Lanes	Major Arterial	No	Yes	Traffic Signal	45
Utoy Springs Road/Research Center Drive	2-Lane Facility with Turn Lanes	Minor Collector	No	Yes	Traffic Signal	25
Cascade Parkway	2-Lane Facility with Turn Lanes	Minor Collector	No	Yes	Traffic Signal	25
Shanter Trail	2-Lane Facility with Turn Lanes	Minor Collector	No	Yes	Traffic Signal	25

### 2.1.2 Existing Structures Information

The I-285 and Cascade Road bridge structure was evaluated to determine its 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. As a part of this project, it is anticipated that the existing bridge will be maintained through the reconstruction of the Cascade Road interchange. It is anticipated that the existing bridge structure will reach its service life by 2030.

## 2.2 Traffic Operational Analysis Methodology

The I-285 freeway segment and Cascade Road study area intersections were analyzed for the peak hour weekday morning and evening traffic volumes for the 2015 existing year and the 2030 design year using the procedures published in the 2010 Highway Capacity Manual (HCM). *Synchro 8.0* and *HCS 2010 software* were used to perform the analyses. The analyses performed concur and are based on the methodologies and standards contained within the HCM 2010. Each roadway section was analyzed to determine its Level-of-Service (LOS), queuing and delay. Comparisons are provided for the existing and proposed roadway geometrics.

The following are the types of analyses that were performed for this study:

- Freeway segment analysis;
- Merge/diverge ramp analysis; and
- Intersection capacity analysis

The following software input assumptions were used for both the proposed freeway segment and merge/diverge section analysis:

- Base free-flow speed of 65 miles per hour (mph)
- Peak hour factor of 0.92
- Grade set as “level” (short grades of 2 percent or less)
- Heavy vehicle percentage of 5 percent
- Ramp free-flow speed of 35 mph

### 2.3 LOS and Delay Criteria

Fulton County and the Georgia Department of Transportation (GDOT) recognize LOS ‘D’ or better as acceptable LOS for the proposed traffic operations on Cascade Road. The analysis results were used to identify locations where traffic operations fell below LOS ‘D’ for the design year 2030 and to determine recommended roadway improvements.

The HCM LOS and definitions for intersection operations are included in **Table 2.2**.

**Table 2.2: Intersection HCM LOS and Delay Criteria**

Alpha LOS	Signalized Delay (sec/veh)	Unsignalized Delay (sec/veh)	Description
A	< 10	< 10	No Congestion
B	> 10 - 20	> 10 - 15	No Congestion
C	> 20 - 35	> 15 - 25	Minimal Congestion
D	> 35 - 55	> 25 - 35	Moderate Congestion
E	> 55 - 80	> 35 - 50	Severe Congestion
F	> 80	> 50	Extreme Congestion

The HCM LOS and definitions for freeway and ramp operations are included in **Table 2.3**.

**Table 2.3: Freeway HCM LOS and Delay Criteria**

<b>Alpha LOS</b>	<b>Freeway Density (pc/mi/ln)</b>	<b>Ramp Density (pc/mi/ln)</b>	<b>Description</b>
A	< 11	< 10	No Congestion
B	> 11 - 18	> 10 - 20	No Congestion
C	> 18 - 26	> 20 - 28	Minimal Congestion
D	> 26 - 35	> 28 - 35	Moderate Congestion
E	> 35 - 45	> 35	Severe Congestion
F	> 45	Demand exceeds capacity	Extreme Congestion

LOS 'A' requires minimal driver interaction. This allows speed and vehicle path decisions to be unaffected by other roadway users resulting in no congestion and minimal delay. In comparison, LOS 'F' requires constant driver interaction. Speed and vehicle paths are totally dictated by interaction with other users resulting in high congestion levels and delay.

## 2.4 Existing Traffic Data

Traffic counts consist of vehicle volume counts, vehicle classification counts and peak hour turning movement counts collected in 2015 within the study area. The weekday turning movement traffic counts were collected by A&R Engineering in May 2015 at the study area intersections on Cascade Road. Turning movement counts were collected at the following five traffic signal controlled intersections along Cascade Road:

- Utoy Springs Road/Research Center Drive
- Southbound I-285 ramp terminal
- Northbound I-285 ramp terminal
- Cascade Parkway
- Shanter Trail

The Annual Average Daily Traffic (AADT) volumes on I-285, collected in 2014, were provided by GDOT. The existing AADT data has been provided for the following locations:

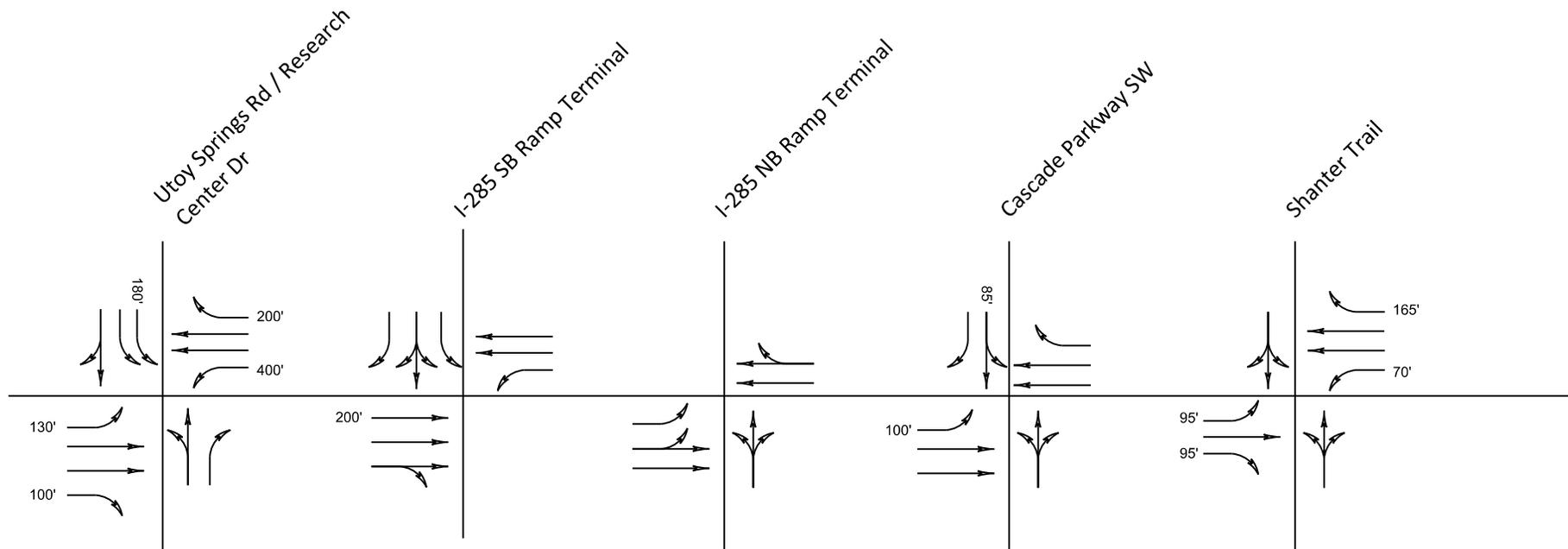
- Southbound I-285 on-ramp from SR 139
- Northbound I-285 off-ramp from SR 139
- Ramps to/from Cascade Road in both directions
- Southbound I-285 ramp to westbound SR 154
- Eastbound SR 154 ramp to northbound I-285

Traffic forecasts for the 2030 design year were developed based on historical background trends of traffic volumes along the Cascade Road corridor and discussions with Fulton County. It was determined that an annual growth rate of 0.5% would be used on the corridor to determine the potential growth in the area. This growth rate has been applied to both the Cascade Road corridor and I-285 freeway segment and ramps as a part of this study.

Existing intersection geometrics for the study area intersection on Cascade Road is included in **Figure 2.1**. The 2015 existing AM and PM turning movement volumes for the intersections on the Cascade Road corridor are included in **Figure 2.2** for the existing year. The 2030 projected AM and PM turning movement volumes for the intersections o the Cascade Road corridor are included in **Figure 2.3**.

CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 2.1 - Existing Intersection Geometrics (Cascade Road)



LEGEND

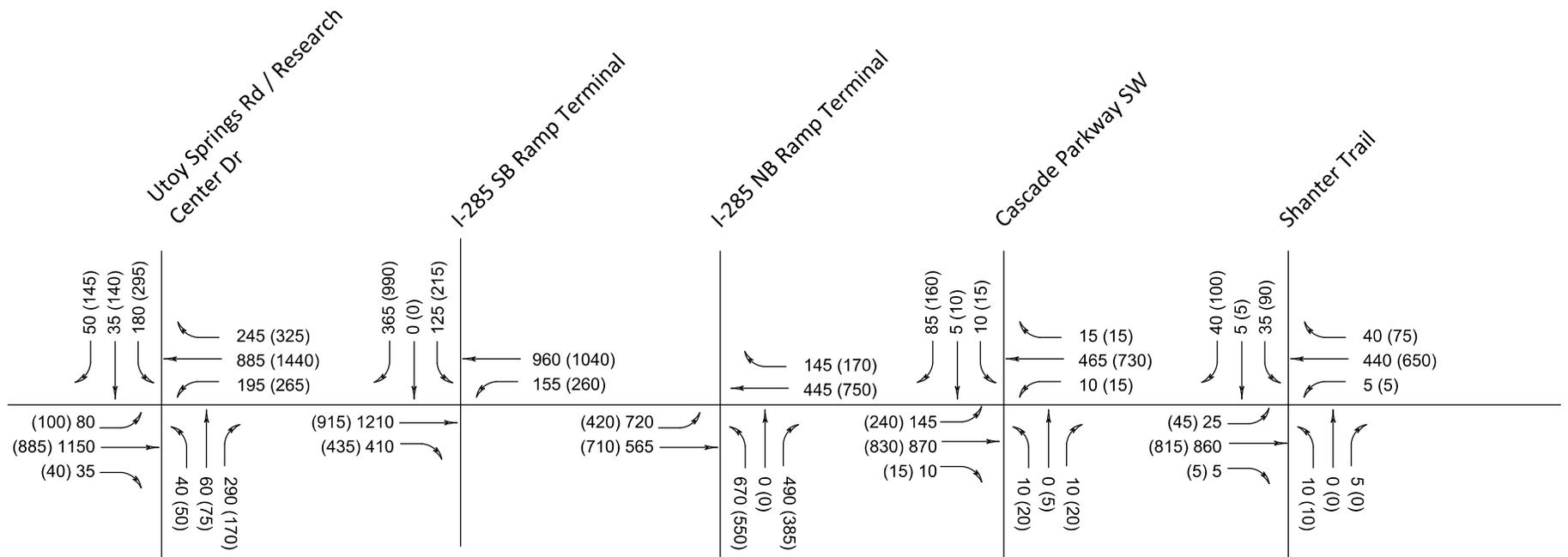
→ LANE DESIGNATION

###' TURN BAY LENGTHS



CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 2.2 - Existing (2015) Turning Movement Count Data (Cascade Road)



LEGEND

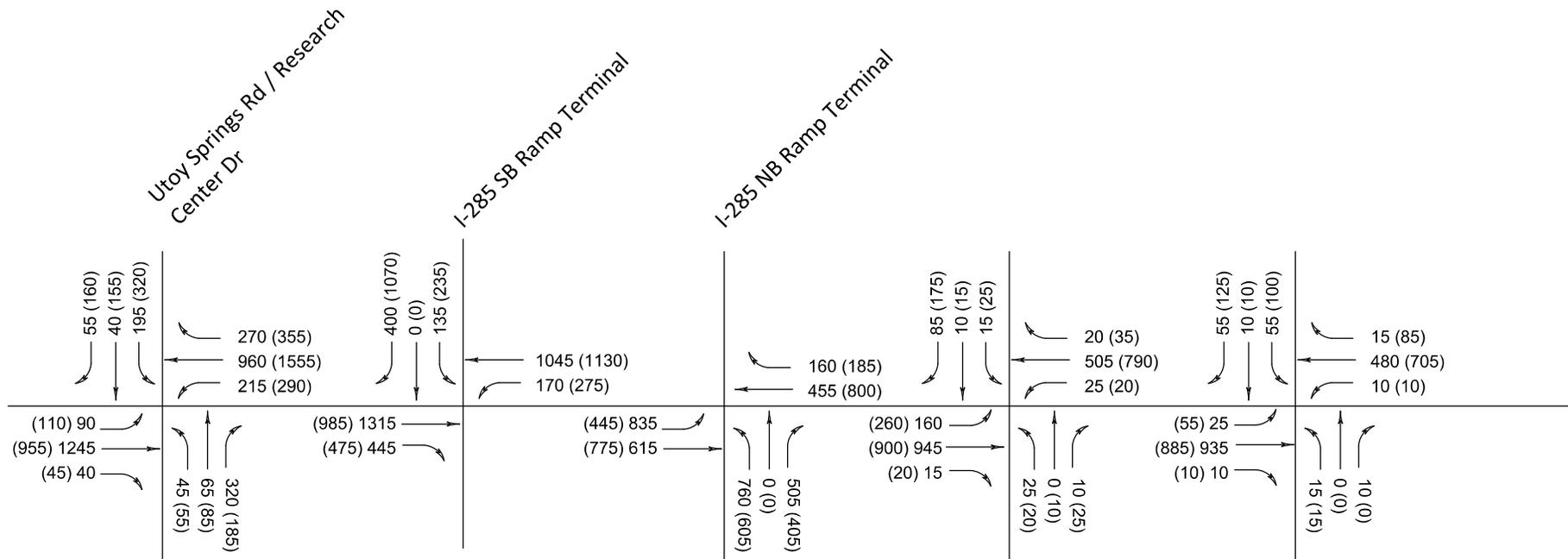
→ LANE DESIGNATION

### AM (PM) PEAK HOUR TRAFFIC DATA



CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 2.3 - Projected (2030) Turning Movement Count Data (Cascade Road)



LEGEND

→ LANE DESIGNATION

### AM (PM) PEAK HOUR TRAFFIC DATA

## 2.5 No Build Intersection Operational Analysis

Existing traffic operations at the I-285 and Cascade Road interchange experiences a notable amount of traffic congestion, especially during peak hours of travel. Anticipated increases in traffic volumes will cause an increase in the congestion experienced on these roadways. The expected increase in traffic volumes will continue to put stress on the traffic operations of the study interchange and adjacent intersections on Cascade Road.

### 2.5.1 2015 Existing Intersection Operational Analysis

**Table 2.4** summarizes the existing overall LOS and delay for the AM and PM peak hour periods at the Cascade Road signalized intersections in the study area.

**Table 2.4: 2015 Existing Intersection Operation Results**

Intersection	AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Utoy Springs and Cascade Rd	30.0	C	30.5	C
I-285 SB Ramps and Cascade Rd	14.4	B	38.7	D
I-285 NB Ramps and Cascade Rd	43.1	D	28.2	C
Cascade Pkwy SW and Cascade Rd	6.4	A	8.3	A
Shanter Trail and Cascade Rd	9.8	A	9.5	A

As shown in **Table 2.4**, all of the study intersections operate at LOS 'D' or better. However, a detailed look at each of the intersections, as provided in the *Cascade Road Conceptual Design Report* (included in **Appendix I**), and summarized below, shows that specific turning movements at some of the study intersections are operating below the acceptable criteria defined for this report.

The following list provides a look at the specific turning movements at each of the study intersections operating below an acceptable LOS:

- Utoy Springs Road/Research Center Drive
  - Southbound dual left-turn lanes (LOS E)
  - Northbound right-turn lane (LOS E)
- I-285 Southbound Ramps
  - Westbound left-turn lanes (LOS E)
- I-285 Northbound Ramps
  - Northbound right-turn lane (LOS F)

## 2.5.2 2030 Design Year Intersection No-Build Operational Analysis

**Table 2.5** summarizes the 2030 operating conditions for the AM and PM peak hour periods at the Cascade Road signalized intersections in the study area. The results indicate that the 2030 diverging diamond intersection operation conditions would be improved over a ‘no-build’ condition at the study area intersections.

**Table 2.5: 2030 Design Year Intersection No-Build Operation Results**

Intersection	2030 Design Year No-Build Analysis			
	AM Peak Hour		PM Peak Hour	
	Delay (s/veh)	LOS	Delay (s/veh)	LOS
Utoy Springs Road and Cascade Rd	36.1	D	36.1	D
I-285 SB Ramps and Cascade Rd	16.7	B	49.6	D
I-285 NB Ramps and Cascade Rd	51.4	D	38.2	D
Cascade Pkwy SW and Cascade Rd	6.7	A	9.5	A
Shanter Trail and Cascade Rd	32.0	C	12.0	B

Detailed analysis for each of the study intersections under a ‘no-build’ condition, as included in **Appendix I** and summarized below, shows that specific turning movements at some of the study intersections are operating below the acceptable criteria defined for this report.

The following traffic movements are expected to operate below LOS ‘D’ during the design year:

- Utoy Springs Road/Research Center Drive
  - Southbound dual left-turn lanes (LOS E)
  - Northbound right-turn lane (LOS F)
- I-285 Southbound Ramps
  - Eastbound through/right-turn lane (LOS E)
  - Southbound dual right-turn lanes (LOS E)
  - Westbound left-turn lane (LOS F)
- I-285 Northbound Ramps
  - Northbound right-turn lane (LOS F)
- Shanter Trail
  - Southbound shared left/through/right-turn lane (LOS F)

## 2.6 I-285 Freeway Operational Analysis

Analysis of the I-285 freeway segment was completed utilizing traffic volume data provided by GDOT count stations along the freeway in the vicinity of the Cascade Road interchange. Ramp volumes were provided utilizing the GeoCOUNTS website to establish the AADT, peak hour volumes and k-factor for each of the existing interchange ramps. As the preferred design does not remove or relocate any of the existing ramps to and from Cascade Road, it is anticipated that the future traffic growth projections for the proposed ramp interchange will follow the model of the existing traffic flow to and from the interchange. Growth projections follow the 0.5% annual growth rate established for Cascade Road.

The existing (2014) and 2030 projected freeway and ramp AADT volumes are included in **Table 2.6**. The existing and projected freeway and ramp peak hour volumes are included in **Table 2.7**. An existing map detailing the locations of the I-285 freeway segment AADT count stations near Cascade Road is included in **Figure 2.4**.

**Table 2.6: I-285 AADT Volumes**

Location	2014 AADT	2030 AADT
<i>Mainline</i>		
Cascade Road (west of Utoy Springs Rd SW)	26200	28400
I-285 (near Benjamin E Mays Dr SW)	142000	153800
I-285 (north of Mt Gilead Rd SW)	138000	149500
<i>Ramps</i>		
I-285 SB Off-ramp (to Cascade Rd)	11100	12000
I-285 SB On-ramp (from Cascade Rd)	9150	9900
I-285 NB Off-ramp (to Cascade Rd)	8580	9300
I-285 NB On-ramp (from Cascade Rd)	11000	11900

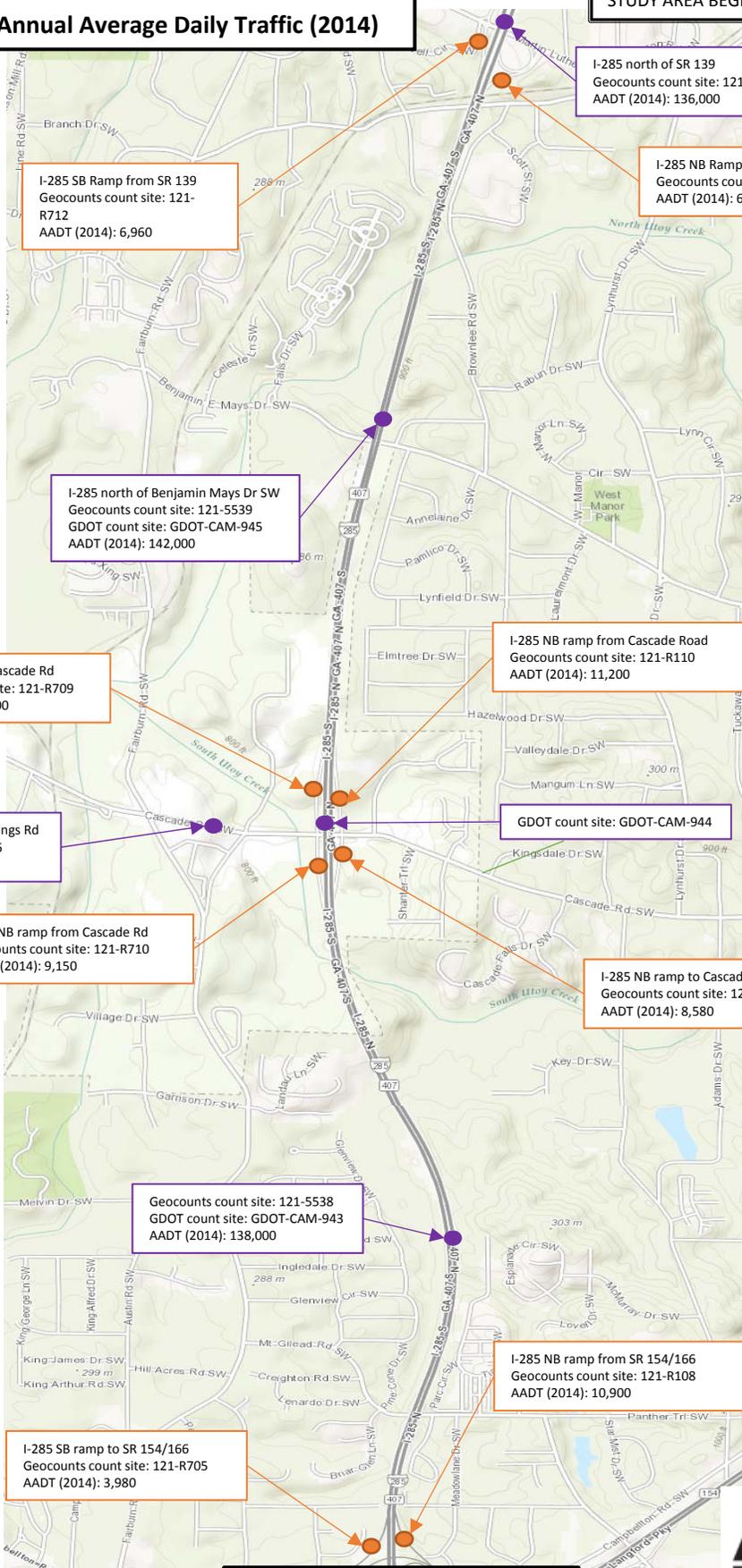
# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

## Figure 2.4: Existing Annual Average Daily Traffic (2014)

STUDY AREA BEGIN: STATE ROUTE 139



Ramp AADT = ●  
Mainline AADT = ●



Cascade Road west of Utoy Springs Rd  
Geocounts count site: 121-5376  
AADT (2014): 26,200

I-285 north of Benjamin Mays Dr SW  
Geocounts count site: 121-5539  
GDOT count site: GDOT-CAM-945  
AADT (2014): 142,000

I-285 north of SR 139  
Geocounts count site: 121-5540  
AADT (2014): 136,000

I-285 NB Ramp to SR 139  
Geocounts count site: 121-R111  
AADT (2014): 6,280

I-285 SB Ramp from SR 139  
Geocounts count site: 121-R712  
AADT (2014): 6,960

I-285 SB ramp to Cascade Rd  
Geocounts count site: 121-R709  
AADT (2014): 11,100

I-285 NB ramp from Cascade Road  
Geocounts count site: 121-R110  
AADT (2014): 11,200

GDOT count site: GDOT-CAM-944

I-285 NB ramp from Cascade Rd  
Geocounts count site: 121-R710  
AADT (2014): 9,150

I-285 NB ramp to Cascade Road  
Geocounts count site: 121-R109  
AADT (2014): 8,580

Geocounts count site: 121-5538  
GDOT count site: GDOT-CAM-943  
AADT (2014): 138,000

I-285 NB ramp from SR 154/166  
Geocounts count site: 121-R108  
AADT (2014): 10,900

I-285 SB ramp to SR 154/166  
Geocounts count site: 121-R705  
AADT (2014): 3,980

STUDY AREA END: STATE ROUTE 154/166



Image courtesy of GDOT Geocounts website

**Table 2.7: I-285 Peak Hour Traffic Volumes**

Facility	2014		Projected 2030	
	Peak Hour Volume	Time Period	Peak Hour Volume	Time Period
<b>Mainline</b>				
I-285 NB (N of Cascade Rd)	6800	7 AM	7370	7 AM
I-285 NB (S of Cascade Rd)	6115	7 AM	6630	7 AM
I-285 SB (N of Cascade Rd)	5005	5 PM	5430	5 PM
I-285 SB (S of Cascade Rd)	4740	5 PM	5150	5 PM
<b>Ramps</b>				
<i>Cascade Rd</i>				
I-285 NB Off-ramp (to Cascade Rd)	565	7 AM	620	7 AM
I-285 NB On-ramp (from Cascade Rd)	1250	7 AM	1360	7 AM
I-285 SB Off-ramp (to Cascade Rd)	1080	5 PM	1170	5 PM
I-285 SB On-ramp (from Cascade Rd)	815	5 PM	890	5 PM

A map of the peak hour traffic volumes on the I-285 freeway segment and the Cascade ramps is included in **Figure 2.5**. The peak hour of traffic flow on I-285 Northbound is 7AM. The peak hour of traffic flow on I-285 Southbound is 5PM.

**2.6.1 I-285 Freeway Segment and Ramp Analysis**

**Table 2.8** summarizes the 2030 HCS 2010 traffic operating analyses for the peak periods of travel along I-285 and the Cascade Road ramp connections.

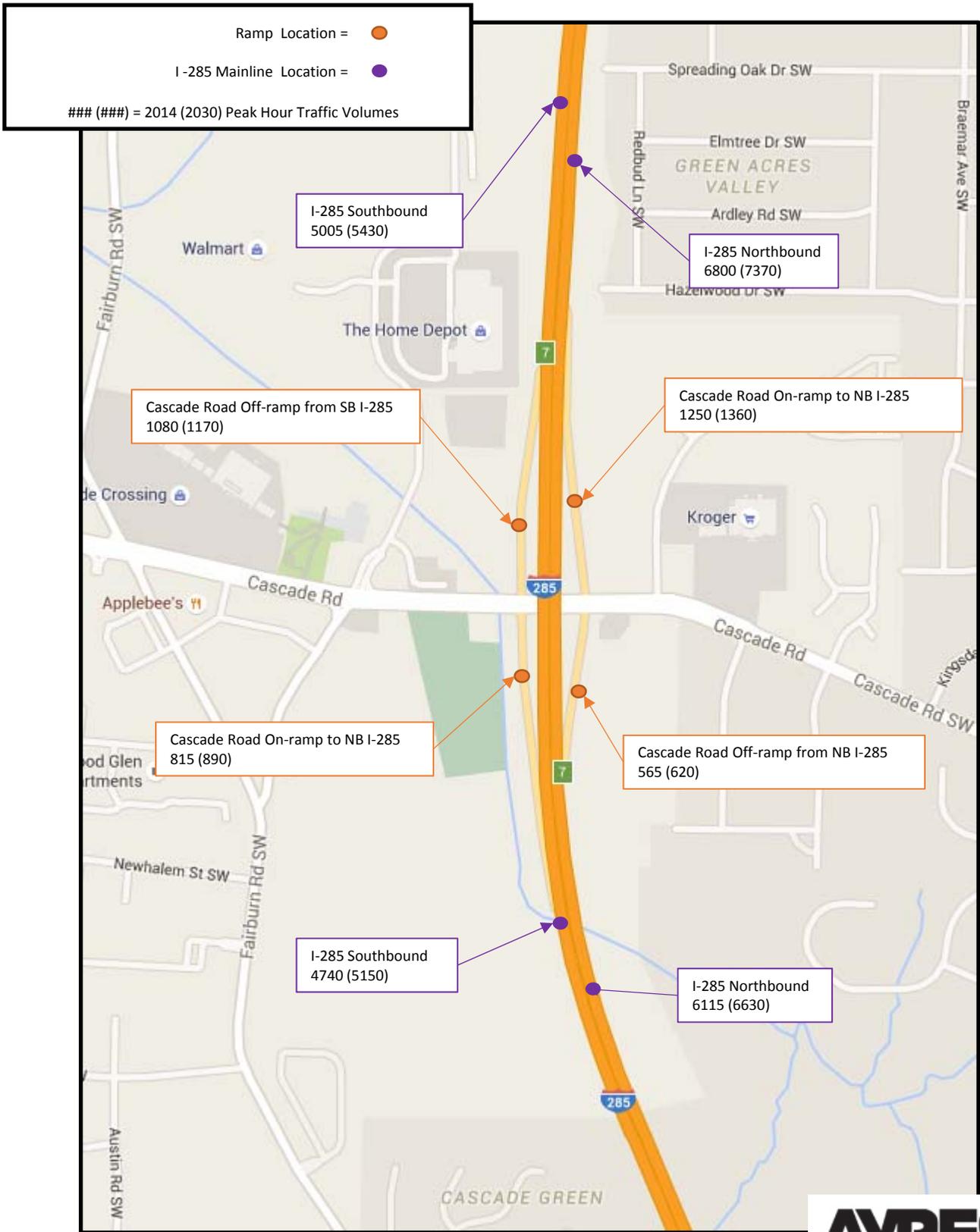
**Table 2.8: I-285 No-Build Freeway and Ramp Results**

Facility	Freeway / Merge / Diverge	2014 Peak Hour Analysis		2030 Peak Hour Analysis	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
<b>Mainline</b>					
I-285 NB (N of Cascade Rd)	Freeway	31.8	D	36.1	E
I-285 NB (S of Cascade Rd)	Freeway	27.5	D	30.6	D
I-285 SB (N of Cascade Rd)	Freeway	21.9	C	23.9	C
I-285 SB (S of Cascade Rd)	Freeway	20.8	C	22.6	C
<b>Ramps</b>					
<i>Cascade Rd</i>					
I-285 NB Off-ramp (to Cascade Rd)	Diverge	29.9	D	32.4	D
I-285 NB On-ramp (from Cascade Rd)	Merge	30.4	D	33.0	D
I-285 SB Off-ramp (to Cascade Rd)	Diverge	28.2	D	30.5	D
I-285 SB On-ramp (from Cascade Rd)	Merge	18.4	B	20.2	C

Traffic operation in 2030 is expected to operate at LOS ‘D’ or better for all locations with the exceptions of the I-285 Northbound segment north of Cascade Road. A linear schematic of the 2014 and 2030 laneage and LOS results are included in **Figure 2.6**.

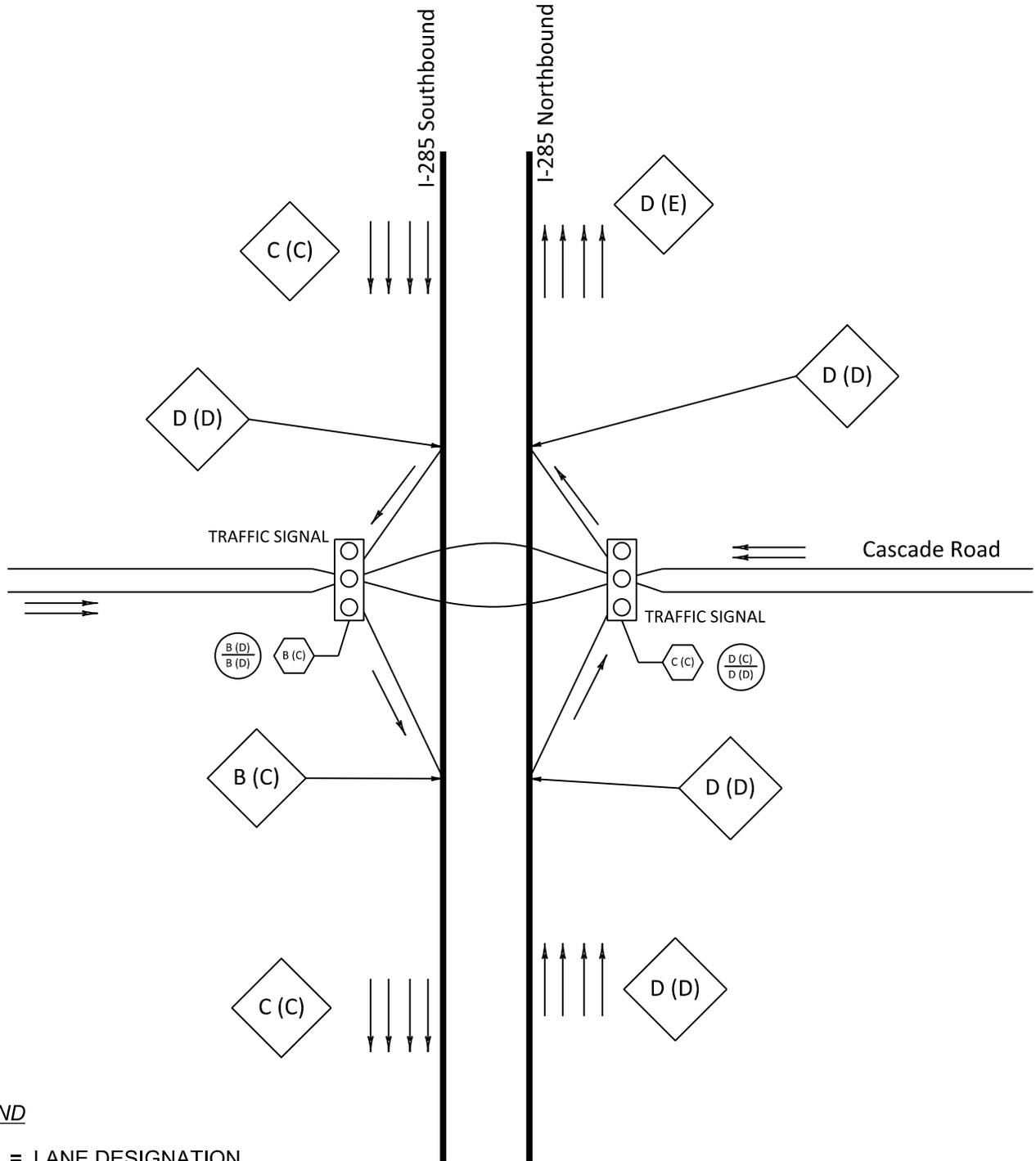
# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

## Figure 2.5: I-285 Peak Hour Traffic Volumes



CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 2.6 - I-285 and Cascade Road Freeway and Ramp Merge/Diverge LOS Results



**LEGEND**

→ = LANE DESIGNATION

◇ xx (xx) = FREEWAY AND RAMP 2014 LOS (2030 LOS)

⊙  $\frac{xx (xx)}{xx (xx)}$  = INTERSECTION 2015 AM (PM) LOS  
2030 AM (PM) LOS

⬡ xx (xx) = PROPOSED INTERSECTION 2030 AM (PM) LOS

The results indicate that, as traffic grows continuously from 2014 to 2030, higher densities and lower LOS results would be expected on all segments of freeways and ramp connections with the 'No-Build' condition. Similar to the conditions in 2014, the freeway segment of I-285 is anticipated to remain four lanes in the northbound and southbound directions. The ramp connections were analyzed considering one entrance lane for all ramps, as it exists under the existing condition.

It should be noted that the results of this project focus on improvements to the I-285 and Cascade Road interchange, not the freeway segment of I-285. General mainline improvements are not anticipated on I-285 as a part of the Cascade Road interchange reconstruction.

## **2.7 Population Growth Projection**

According to the Atlanta Regional Commission's (ARC) PLAN 2040, the population in South Fulton is expected to grow at a faster rate than other locations within the region. From 2010 to 2040, it is anticipated that the population will increase by 33.7%.

Future economic growth will place additional demands on the transportation network. According to projections from ARC's PLAN 2040, the population growth in South Fulton is expected to continue growing at a faster rate than the region as a whole. The Atlanta region population in 2010 was 5,473,846. The Atlanta region population is projected to increase by 50.8 percent to 8,256,323 in 2040. The study area population in 2010 was 195,276. The South Fulton population is projected to increase by 97.6 percent to 385,816 in 2040. This growing population will put increasing demands on the transportation system. To mitigate the impacts of the potential population growth in the vicinity of the interchange, it is necessary to consider modifications to the interchange to ensure the additional demand can be accommodated.

### 3 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) improvements would not provide an acceptable alternative to modifying the interchange at I-285 and Cascade Road. The Cascade Road corridor at the I-285 ramp interchange is 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. The current traffic signals on Cascade Road in the study area are currently operating under an adaptive signal system.

The Metropolitan Atlanta Rapid Transit Authority (MARTA) has provided input on the potential transit impacts of the proposed DDI on Cascade Road. Currently, the existing study area is served by Route 71 (Cascade Road) which is considered a core route with approximately 3,800 boardings per weekday. Approximately 25% of the riders on this route travel to or from the study area. Considerations for TSM inclusions at the proposed interchange include the following:

1. Feasible locations for bus stops
  - a. The alternative has shown that the proposed design provides feasible locations for bus stops on the project corridor. Bus stop locations will be adjusted and/or consolidated as a result of the design.
2. Pedestrian walkways on both side of the street
  - a. A sidewalk on one side of the roadway at the proposed DDI interchange does not provide for the recommendations requested by MARTA.
  - b. There is no consistent sidewalk provided on the north side of the roadway between the ramps under I-285.
3. Safe crossings at bus stop locations
  - a. There are no crossings on Cascade Road provided at the proposed diverging diamond interchange.
  - b. Full access crossings are provided at the intersections of Utoy Springs Road/Research Center Drive and Shanter Trail on all intersection approaches.
  - c. There is no proposed crossing provided at Cascade Parkway.
4. Turns designed for buses
  - a. The intersections are designed to accommodate a WB-67 truck at the interchange and WB-62 at the intersections of Utoy Springs Road and Cascade Parkway SW. This meets the necessary area required to accommodate a bus.

Currently, there is ramp metering from Cascade Road to I-285 in both directions. As a part of the proposed DDI improvements, it is anticipated that the ramp meters would continue to be in use at the interchange.

There is no evidence that any other TSM applications would be effective in the Design Year as the proposed interchange modifications.

## 4 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."

### 4.1 2030 Design Year Traffic Operational Analysis

The 2030 improved traffic analysis is based on the proposed intersection geometrics of a DDI at the I-285 interchange ramp terminals with Cascade Road. The proposed lane designations for the Cascade Road intersections are included in **Appendix I**.

#### 4.1.1 2030 Design Year Intersection Operational Analysis

**Table 4.1** summarizes the 2030 intersection LOS and delay for the AM and PM peak hour periods at the Cascade Road signalized intersections in the study area. The results indicate that the 2030 diverging diamond intersection operational conditions would be improved over a 'no-build' condition at the study area intersections.

**Table 4.1: 2030 No-Build and Proposed Intersection Operation Results**

Intersection	2030 Design Year No-Build Analysis				2030 DDI Alternative			
	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
Utoy Springs Road and Cascade Rd	36.1	D	36.1	D	32.9	C	37.4	D
I-285 SB Ramps and Cascade Rd	16.7	B	49.6	D	19.2*	B*	25.6*	C*
I-285 NB Ramps and Cascade Rd	51.4	D	38.2	D	26.9*	C*	22.4*	C*
Cascade Pkwy SW and Cascade Rd	6.7	A	9.5	A	4.7	A	5.6	A
Shanter Trail and Cascade Rd	32.0	C	12.0	B	5.9	A	18.8	B

\* Intersection analyzed using HCM 2000 as the signal phasing is non-traditional

The results indicate significant reduction in delay between the ‘no-build’ condition and the proposed DDI alternative in 2030. It should be noted that there is some increased delay expected at the intersections of Utoy Springs Road/Research Center Drive and Shanter Trail during the PM peak hours of travel. There is some increased delay expected at the I-285 Southbound ramps during the AM peak hours of travel. However, these increases are minimal and do not degrade the operation of each intersection.

Detailed analysis for each of the study intersections, as provided in **Appendix I**, shows that specific turning movements at some of the study intersections will operate at LOS ‘D’ or better for the proposed DDI.

#### 4.1.2 2030 Design Year Freeway and Ramp Operational Analysis

As mentioned in *Section 2.5.1*, the results of the I-285 freeway and ramps under the ‘No-Build’ alternative showed that the traffic operation in 2030 is expected to operate at LOS ‘D’ or better for all locations with the exceptions of the I-285 Northbound segment north of Cascade Road. However, to accommodate the dual lane entry from the northbound and southbound off-ramps from I-285 to Cascade Road and the intersection geometry associated with the design of the proposed DDI, improvements to the I-285 northbound and southbound off-ramp deceleration areas have been recommended to provide additional lane capacity for motorists. Proposed adjustments include modifying the existing tapered deceleration ramp to a parallel deceleration ramp. Widening the off-ramps will also require adjusting the off-ramps to exit I-285 using a dual-lane exit

**Table 4.2** summarizes the 2030 freeway density and LOS for the freeway segments and ramps under the ‘no-build’ and proposed adjustments for the I-285 northbound and southbound diverge areas.

**Table 4.2: 2030 No-Build and Proposed Freeway and Ramp Operation Results**

Facility	Freeway / Merge / Diverge	2030 Existing Peak Hour Analysis		2030 Proposed Peak Hour Analysis	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
<b>Ramps</b>					
<i>Cascade Rd</i>					
I-285 NB Off-ramp (to Cascade Rd)	Diverge	32.4	D	19.0	B
I-285 SB Off-ramp (to Cascade Rd)	Diverge	30.5	D	13.1	B

As shown in **Table 4.2**, the addition of the parallel deceleration lane and modification to a dual-lane exit improves the density and LOS drastically in the diverge areas of I-285 to Cascade Road. There are no improvements anticipated to the I-285 freeway segment north of Cascade Road. As such modifications to the I-285 mainline traffic segments are not anticipated.

## 4.2 Crash Safety Analysis

An analysis of the crash data along I-285 from SR 139 to SR 154/155 and Cascade Road from Utoy Springs Road to Shanter Trail has been conducted to determine if the new on-ramp and off-ramp connections and adjustments to the roadway segment on Cascade Road occur within a high crash zone or could potentially increase crash frequency.

Based on the preferred diverging diamond concept, the new connector ramps will tie-in to I-285 beyond their existing locations. However, it is not anticipated that the ramp connections will extend beyond the influence area of Cascade Road and into the SR 154 or SR 139 interchange areas.

#### 4.2.1 I-285 Crash History

Crash data was collected on the 4.4-mile segment of I-285 from SR 139 to SR 154/155 between 2012 and 2014. To determine if there are any potential safety deficiencies, the crash rate for the segment was reviewed for each year. The segment crash rate (crashes per hundred million vehicle miles traveled) was calculated based on the following equation:

$$\text{Crash Rate} = \frac{(\# \text{ of Crashes per Year}) * 10^8}{(\text{Average AADT}) * 365 \text{ Days per Year} * \text{Distance}}$$

**Table 4.2** provides the number of crashes, injuries, and fatalities (with respective crashes, injury, and fatality rates). In addition, the statewide crashes and injury rates for Urban Freeway and Expressways, for 2012 through 2014 are provided in the table.

**Table 4.3: I-285 Crash Summary (2012 – 2014)**

Year	Crash Frequency and Severity			Crash Rate	Injury Rate	Fatality Rate	Statewide Crash Rate	Statewide Fatality Crash Rate
	Total No. of Crashes	Injury	Fatal					
2012	236	63	0	105	28	0	205	0.59
2013	325	83	0	145	37	0	200	0.45
2014	309	68	1	137	30	0.45	191	0.41
<b>Total</b>	<b>870</b>	<b>214</b>	<b>1</b>					

As shown in **Table 4.2**, the crash rate for the I-285 segment is below the statewide average crash rate the over the three year period analyzed. However, the fatality crash rate is higher than the statewide average. It should be noted that the one fatality crash in 2014 was not a function of substandard roadway conditions.

A more detailed safety analysis was performed at the Cascade Road interchange with some additional crash data from 2012 to 2014 and is summarized in **Table 4.4**.

**Table 4.4: Cascade Road Freeway Segment Crash Summary (2012 – 2014)**

Crash Types	Mainline				Ramp			
	Crashes	% of Total	Injuries	Fatalities	Crashes	% of Total	Injuries	Fatalities
Other	10	5%	2	0	2	33%	0	0
Sideswipe-Same Direction	67	32%	8	0	1	17%	0	0
Rear End	81	38%	13	0	3	50%	0	0
Not A Collision with Motor Vehicle	45	21%	3	0	0	0%	0	0
Improper Lane Change	8	4%	2	0	0	0%	0	0
Total	211				6			

The predominant crash type is Rear End, with these crashes making up 38 percent and 50 percent of the total crashes on the freeway segment and ramps, respectively. As I-285 is a heavily traveled corridor with significant queuing during the peak hours of travel, many of the rear end crashes were due to vehicles following too closely and rear-ending vehicles, as a result.

#### 4.2.2 Cascade Road Intersection-Related Collisions

For the intersections along Cascade Road, traffic crash data was collected from GDOT and Fulton County for a five-year time period between 2010 and 2014 at the intersections of Cascade Road with the I-285 ramps. At the intersections of Cascade Road with Utoy Springs Drive, Cascade Parkway, and Shanter Trail, crash data was provided from June 2013 through June 2015. It should be noted that the intersections of Cascade Road with both Utoy Springs Drive and I-285 are defined as one of the top ten locations for crashes in South Fulton County.

The crash statistics related to the study area intersections on Cascade Road are shown in **Table 4.5**. Crash statistics sheets are included in **Appendix I**.

**Table 4.5: Cascade Road Intersection-Related Collisions**

Intersection	Time Period	No. of Crashes	Predominate Types (% of crashes)	
Utoy Springs Dr & Cascade Rd	2013 - 2015	60	Rear-end (73%)	Sideswipe-Same (12%)
I-285 SB Ramps & Cascade Rd	2010 - 2014	113	Rear-end (51%)	Sideswipe-Same (17%)
I-285 NB Ramps & Cascade Rd	2010 - 2014	120	Rear-end (34%)	Left-turn (34%)
Cascade Pkwy & Cascade Rd	2013 - 2015	23	Rear-end (83%)	Sideswipe-Same (13%)
Shanter Trail	2013 - 2015	0	---	---

As shown in **Table 4.5**, the leading crash type shown occurring at all of the intersections were rear-end collisions. These crashes were followed by left-turn and sideswiped same direction collisions which encompassed the majority of crashes. Various improvements have been recommended to reduce the potential for collisions at the intersections.

According to the Crash Modification Factors Clearinghouse, the proposed DDI has the potential to completely remove the possibility of left-turn crossing collisions. All intersection-related collisions are potentially reduced by 57% under the proposed DDI. Though it is apparent that rear-end collisions are predominate collision type at each of the study intersections, there is not substantial research available to support the theory that the construction of a DDI will lead to a reduction in rear-end collisions specifically.

At Utoy Springs Drive, installing a right-turn lane on the southbound approach has the potential to lower rear-end collisions by 15%. At Cascade Parkway SW, installing a raised median and closing off left-turns has the potential to reduce all intersection related crashes by 39%.

## 5 Policy 4: Access Connections and Design

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*"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 existing interchange serves to connect I-285 and Cascade Road, which is a principal arterial under the control of Fulton County. The proposed DDI design at I-285 and Cascade Road maintains all access to and from Cascade Road in both the northbound and southbound directions to/from I-285. The access points will continue under the proposed configuration to Cascade Road and to the communities served by this freeway access point. No additional access to other roadways is planned with this project. As result of this reconstruction, the interchange will meet or exceed current standards. Deficiencies at the merge/diverge points from I-285 will be addressed in the updated design.

The *Cascade Road Conceptual Design Report* was prepared for Cascade Road from Utoy Springs Road to Shanter Trail to identify alternatives that alleviate the high degree of vehicular congestion at the ramp terminals and adjacent intersections. The report serves to examine the existing traffic conditions and those anticipated in the design year 2030 at the following five existing traffic signal controlled intersections along Cascade Road:

- Utoy Springs Road/Research Center Drive
- Southbound I-285 ramp terminal
- Northbound I-285 ramp terminal
- Cascade Parkway
- Shanter Trail

Through analysis of the Cascade Road study intersections, improvements were identified for the existing intersections and the interchange as a whole. For the purpose of this report and as accepted by GDOT, LOS 'D' was used to define acceptable peak hour operating conditions. All intersections were analyzed based on the procedures set forth in the 2010 HCM, where appropriate.

Based on the results of the traffic analysis, costs associated with the reconstruction of the interchange, and the real estate implications of the design at the Cascade Road study area intersections, it is recommended that the DDI and its associated intersection improvements stand as the chosen alternative.

The intersection improvements for each of the study area intersections is included in **Appendix I**.

## 6 Policy 5: Transportation Plans

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*“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.”*

---

Existing land use in the study area is composed of a mixture of residential, commercial, and office development. The residential development consists of a mixture of single family, town homes, condominiums, and multi-family units. The commercial uses include: restaurants, service stations, truck stops, neighborhood shopping centers, big box chain stores, and other retail development. Office uses include both office parks and multistory office buildings. **Figure 6.1** shows a land use map of the area in the vicinity of the Cascade Road interchange. All of these land uses combine to form the high levels of traffic volumes observed in the study area during the existing A.M. and P.M. peak hours.

As Fulton County is located in a metropolitan planning organization area, improvements to the design of its facilities are not currently included in the GDOT Statewide Transportation Improvement Program FY 2015 – 2018; however, it will be included in the Atlanta Regional Commission’s Regional Transportation Plan, which is scheduled for adoption in the Spring 2016.

The project is included as a part of the South Fulton CTP of Fulton County. Modifications to the existing Cascade Road interchange are considered part of Project R-20. The proposed widening between Utoy Springs Road and I-285 in the westbound direction and signal improvements to the intersection of Utoy Springs Road are considered part of Projects 21 and 39 respectively.

The preferred design of a DDI is not intrinsically defined as the recommendation in the plan. However, **Appendix I** provides the analysis that serves as the baseline for support of the preferred alternative recommended in this report.

# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 6.1: Fulton County Land Use Map

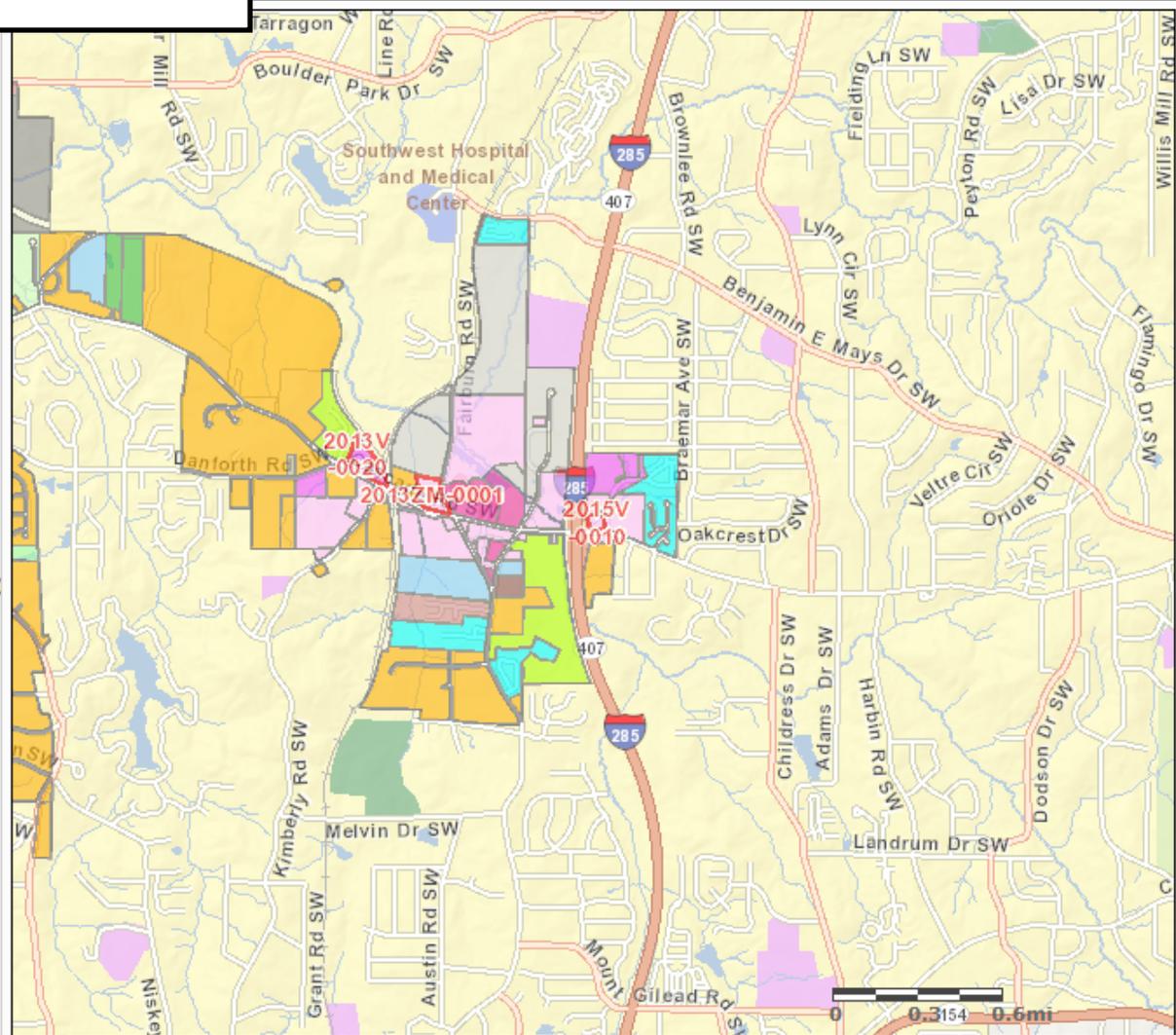
## Planning and Development

### Pending Zoning Petitions



### Zoning (unincorporated)

- AG-1 (Agricultural)
- C-2 (Commercial)
- C-1 (Community Business)
- O-I (Office & Institutional)
- M-1 (Light Industrial)
- M-1A (Industrial Park)
- M-2 (Heavy Industrial)
- Cemetery
- CUP (Community Unit Plan)
- CUP-CHC (Community Unit Plan - Chattahoochee Hill Country)
- NUP (Neighborhood Unit Plan)
- MIX (Mixed Use)
- CHC-MIX (Chattahoochee Hill Country - Mix)
- MHP (Mobile Home Park)
- R-1 (Single Family Dwelling)
- R-2 (Single Family Dwelling)
- R-2A (Single Family Dwelling)
- R-3 (Single Family Dwelling)
- R-3A (Single Family Dwelling)
- R-4 (Single Family Dwelling)
- R-4A (Single Family Dwelling)
- R-5 (Single Family Dwelling)
- R-5A (Single Family Dwelling)
- R-6 (Single Family Dwelling)
- SUB-A (Single Family Dwelling)
- SUB-C (Single Family Dwelling)
- A (Medium Density Apartment)
- A-O (Apartment-Office)
- A-L (Apartment Limited Dwelling)
- A-1 (Apartment Dwelling)
- TR (Townhouse Residential)
- Water
- R-O-W



*Fulton County*  
*Fulton County, Georgia*

Fulton County provides the data on this map for your personal use "as is". The data are not guaranteed to be accurate, correct, or complete. The feature locations depicted in these maps are approximate and are not necessarily accurate to surveying or engineering standards. Fulton County assumes no responsibility for losses resulting from the use these data, even if Fulton County is advised of the possibility of such losses.



**AYRES**  
**ASSOCIATES**

## 7 Policy 6: Comprehensive Interstate Network Study

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*"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-285 in proximity to the Cascade Road that are currently included in a local or state Transportation Plan. The DDI proposed modifications would improve overall traffic operations in the area without any additional future improvements to the roadway system.

## 8 Policy 7: Coordination with Transportation System Improvements

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*“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 proposed interchange reconstruction is not due to new, expanded, or a substantial change in current or planned future development or land use and no new access will be provided with the improvements. Considering the current anticipated growth in the area, the revisions are due to traffic operational deficiencies in the current interchange configuration expected by the design year.

## 9 Policy 8: Status of Planning and NEPA

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*“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).”*

---

### 9.1 Environmental Screening

An environmental screening was conducted in the vicinity of the proposed Cascade Road and I-285 interchange modification. 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. If federal funds are utilized on this project, this environmental screening does not fulfill FHWA’s requirements in addressing NEPA.

The study area consisted of a buffer located immediately around the existing interchange of Cascade Road at I-285 as well as approximately 1500 feet west of the interchange along Cascade Road and approximately 1120 feet east of the interchange along Cascade Road (see **Figure 9.1**). The overall survey area boundary encompasses a total of approximately 22 acres. Approximately 8.6 acres are in existing transportation, communications, and utilities right-of-way.

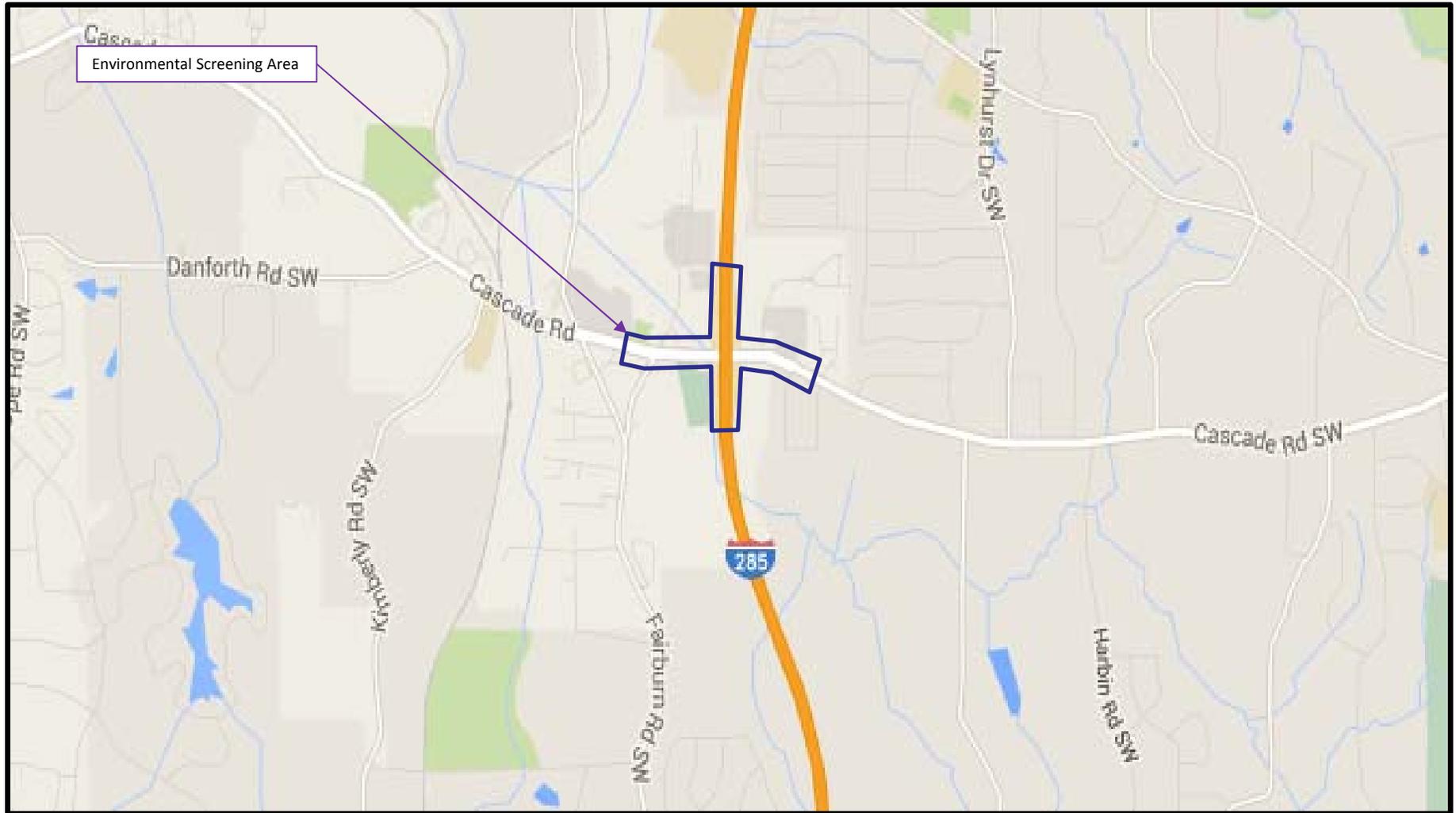
#### 9.1.1 Cultural Resources

The proposed project has been screened for cultural 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 and identify potential cultural resources within the project corridor.

A desktop survey for potentially eligible historic resources was conducted within the project area. The area of potential effect (APE), as defined in 36 CFR 800.16(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. Information regarding the dates of construction on properties located within the study area was obtained from the Fulton County Tax Assessors website. Of the 20 parcels located within the study area, three were identified as being at least 50 years old.

# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

## Figure 9.1: Cascade Road Environmental Screening Area



Map data © 2015 Google

A full historic resource survey and assessment of effects required for compliance with NEPA and Section 106 was not scoped for this environmental screening. Therefore, for the purposes of this assessment, each of the following three properties, as shown in **Table 9.1**, are considered eligible for listing on the National Register of Historic Places.

**Table 9.1: Probable Historical Properties on Cascade Road**

<b>Address</b>	<b>Property Type/Use</b>	<b>Property Size</b>	<b>Year Constructed</b>
3520 Cascade Road	Commercial/Cascade Road Driving Range	21.72 acres	1955
3470 Cascade Road	Residential/Single Family	5.0 acres	1951
3434 Cascade Road	Residential/Duplex	2.6 acres	1950

Location of this eligible historic properties are shown in **Figure 9.2**.

### 9.1.2 Waters of the US

Jurisdictional waters are defined by 33 CFR Part 328.3(b) and are protected by Section 404 of the Clean Water Act (CWA, 33 USC 1344), which is administered and enforced by the US Army Corps of Engineers (USACE). Under CWA Section 404, a permit is required for the discharge of dredged or fill material into waters of the United States. Many waterbodies and wetlands in the nation are waters of the United States and are subject to the USACE regulatory authority.

A review of aerial photography, National Wetland Inventory (NWI) Maps as provided by US Fish and Wildlife Service (FWS), surface water mapping provided by the US Environmental Protection Agency (EPA) and topographic maps available through the US Geological Survey (USGS) indicates the presence of several streams and one potential wetland within the project study area.

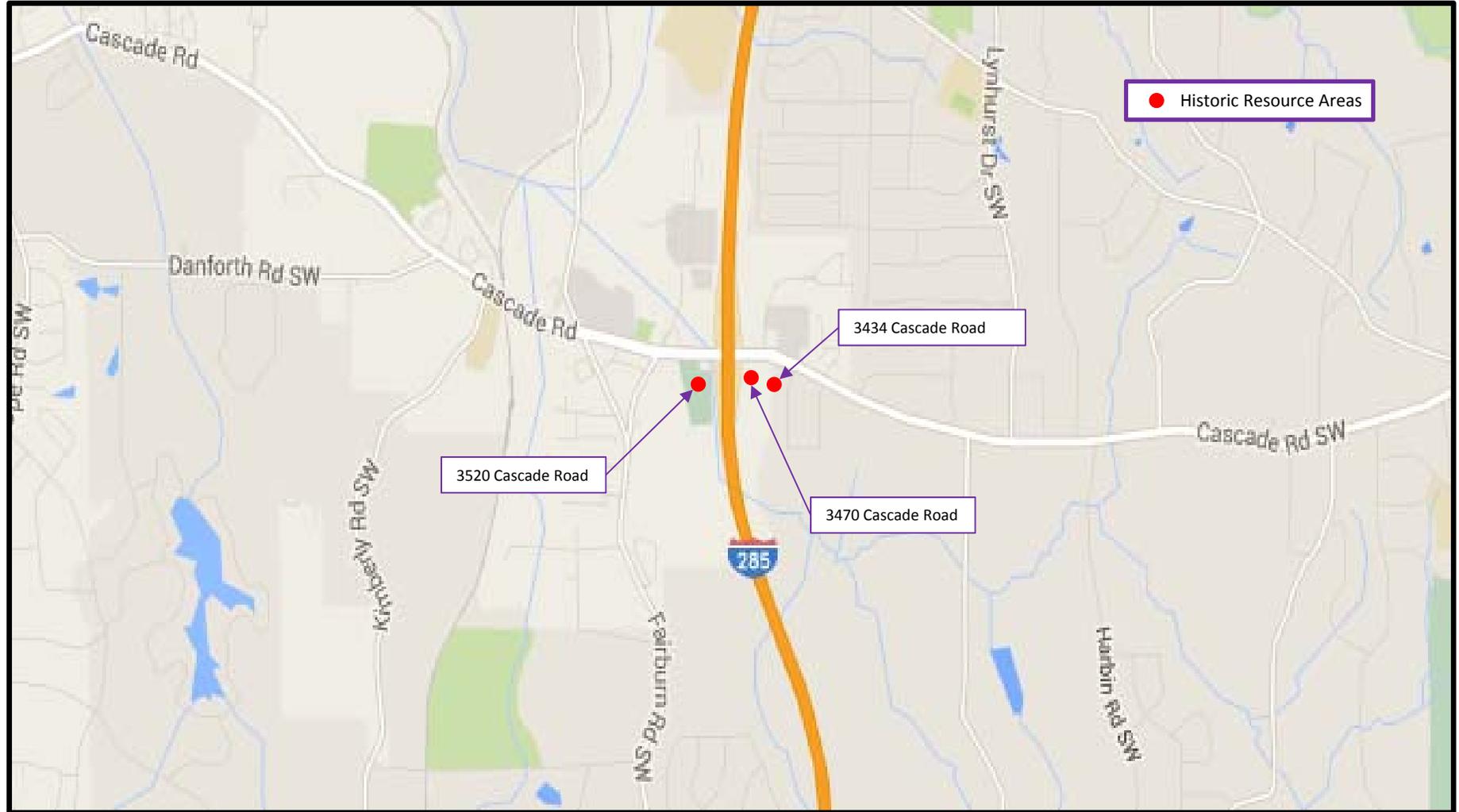
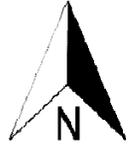
**Table 9.2: List of Potential Streams and Wetlands near I-285 and Cascade Road**

<b>Water Type / Name</b>	<b>Location</b>
Wetland (W/L) 1	Northwest corner of Cascade Road at Research Center Drive
Intermittent Stream (IS) 2	South of Cascade Road located between the overhead transmission corridor and the Cascade Road Driving Range
Perennial Stream (PS) 3 (South Utoy Creek)	West of I-285 running south to north under Cascade Road
IS 4 (Tributary to South Utoy Creek)	North of Cascade Road running east to west under I-285

**Figure 9.3** details the locations of the streams and wetlands in the vicinity of the project.

# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

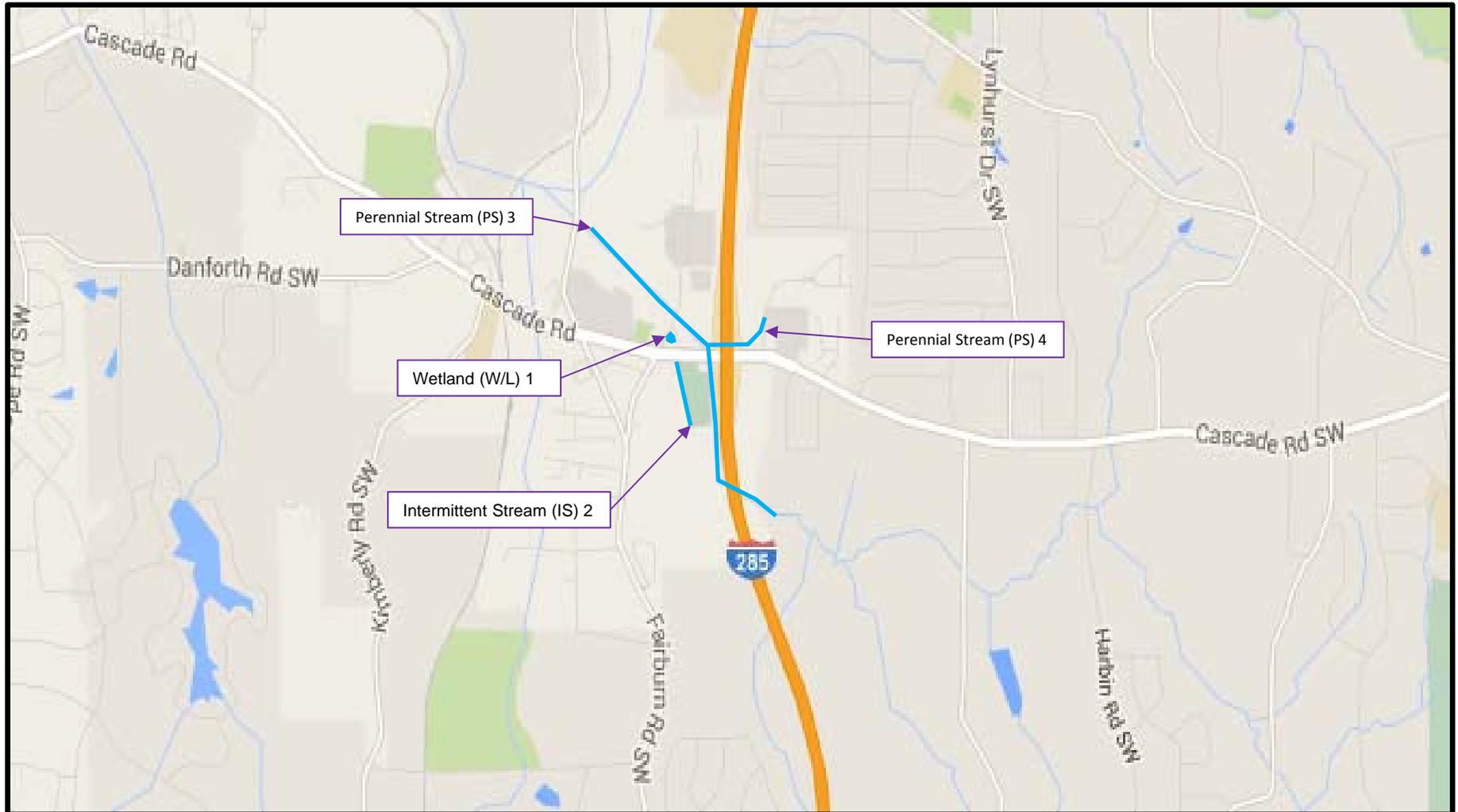
## Figure 9.2: Cascade Road Potential Historic Resource Areas



Map data © 2015 Google

# CASCADE ROAD INTERCHANGE MODIFICATION REPORT

Figure 9.3: Cascade Road Potential Waters of the U.S.



Map data © 2015 Google

### 9.1.3 Threatened and Endangered Species

The USFWS Information for Planning and Conservation (IPac) website was consulted and a list of potential species occurring in Fulton County and which should be considered under Section 7 of the Endangered Species Act was identified.

**Table 9.3: List of Potential Threatened and Endangered Species Near I-285 and Cascade Road**

Common Name	Species Name	Federal Rank	Habitat
Gulf Moccasinshell	<i>Medionidus penicillatus</i>	Endangered	clean sand and gravel substrates, in areas of slow to moderate current, within medium-sized creeks and large rivers
Oval Pigtoe	<i>Pleurobema pyriforme</i>	Endangered	small to medium-sized creeks and small rivers where substrate is dominated by silt and sand or sand and gravel and requires slow to moderate currents and prefers to remain in the center of the stream channel
Purple Bankclimber	<i>Elliptoideus sloatianus</i>	Threatened	sand, sand mixed with mud, or gravel substrates in areas of medium-sized streams to large rivers with slow to moderate current
Shinyrayed Pocketbook	<i>Lampsilis subangulata</i>	Endangered	clean sand, silty sand substrates in areas of slow to moderate current, within medium-sized creeks and rivers.

A full ecological and protected species resource survey and assessment of effects required for compliance with NEPA should federal funds be utilized on the proposed improvements, and for compliance with the CWA, was not scoped for this environmental screening. Based on the desktop survey completed as part of this assessment, it is anticipated that an effect determination of “no effect” would be recommended for all of the species listed in the above table, as the study area appears to lack the necessary habitat for each of these species. This project is not anticipated to require section 7 consultation under the Endangered Species Act.

The Migratory Bird Treaty Act (MBTA) and the Executive Order on the Responsibility of Federal Agencies to Protect Migratory Birds (EO 13186), requires the protection of migratory birds and their habitats. The project study area occurs within a highly developed portion of Fulton County. No large forested areas would be bisected and the smaller forested tracts would be minimally disturbed, considering they are next to a very busy state highway. The majority of the proposed improvements would occur within the existing, maintained ROW or developed areas immediately adjacent to the existing roadway. No bridges or rock overhangs were identified within the survey corridor. Existing bridges and culverts to be reconstructed or extended would require field survey to determine if signs of migratory bird nesting activity are present. If birds, such as the barn swallow, are observed nesting under the existing 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.

#### 9.1.4 Air and Noise

The proposed improvements considered for the study area would improve operations and capacity of the interchange. Based on the type of proposed improvements, and that no increase in capacity is proposed as part of potential interchange modifications, it is anticipated that an air assessment would indicate that the project is consistent with the State Implementation Plan (SIP) for the attainment of clean air quality in Georgia and is in compliance with both state and federal air quality standards. Some increases in noise, vibration, dust, or odor are anticipated during construction of the proposed improvements. However, the proposed improvements within the study area are not anticipated to alter the overall noise volumes. Detailed air and noise assessments would be required in accordance with NEPA if federal funds were utilized on the proposed improvements.

#### 9.1.5 Materials

The Georgia Environmental Protection Division (EPD) Underground Storage Tank Database was reviewed to locate known hazardous material sites, such as underground storage tank (UST) or leaking underground storage tanks (LUST) locations in the vicinity of the study area. In addition, available aerial photography and the Fulton County Tax Assessor Website were reviewed to identify other current or previous apparent hazardous material or UST sites. This review resulted in four locations of UST or LUST locations in the immediate vicinity of the proposed interchange improvements. This literature search and database review provides a preliminary determination of potentially contaminated sites that may impact a project in the study area. **Table 9.4** summarizes locations of USTs and LUSTs in the study area.

**Table 9.4: Locations of USTs and LUSTs near the I-285 / Cascade Road Interchange**

Site Name/Address	Status	UST	LUST	Relative Location to Area of Improvements		
				Up gradient	Side gradient	Down gradient
Quick E Mart 3450 Cascade Road	Active	X		X		
Chevron 3460 Cascade Road	Closed	X	X	X		
Vacant, evidence of UST on site 3505 Cascade Road	Closed				X	
BP AM/PM 3515 Cascade Road	Active	X	X		X	
Shell Food Mart 3580 Cascade Road	Active	X	X		X	
H M Patterson & Son/Cascade Hill 3610 Cascade Road	Closed	X			X	

### 9.1.6 Community Resources

An assessment of community impacts will be a necessary component of the NEPA process. In addition to area shopping, fast food, gas stations, and other services located within the study area, the Southeastern Regional Library (Atlanta - Fulton Public Library System) is located north of Cascade Road and to the west of Research Center Drive. On the library site there is greenspace area with walking trails/sidewalks and a gazebo.

The proposed project would not introduce new or additional barriers to existing neighborhoods that flank the study area. 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 improving operations at the interchange between I-285 and Cascade Road. No properties would be cut off from utility or other municipal services.

## 9.2 Impacts

Three proposed alternatives are considered for the project study area: (1) Conventional Diamond Interchange, (2) Roundabout Controlled Ramp Intersections, and (3) Diverging Diamond Interchange (DDI). **Table 9.5** summarizes anticipated impacts of these alternatives on identified environmental resources.

**Table 9.5: Anticipated Environmental Impacts on I-285**

	Conventional Diamond	Roundabout Control	Diverging Diamond
<b>Cultural Resources</b>	No Adverse Effect to 3 Resources	Possible Adverse Effect to 1 Resource	No Adverse Effect to 3 Resources
<b>Waters of the US</b>	Potentially no impact to W/L 1, IS 2, PS 3; ~ 100 ft impact to IS 4	Potentially no impact to W/L 1, IS 2, PS 3; ~ 500 ft impact to PS 3 ~ 125 ft impact to IS 4	Potentially no impact to W/L 1, IS 2, PS 3; ~ 50 ft impact to IS 4
<b>Threatened &amp; Endangered Species</b>	No Effect Anticipated	No Effect Anticipated	No Effect Anticipated
<b>Air and Noise</b>	No Adverse Effect Anticipated	No Adverse Effect Anticipated	No Adverse Effect Anticipated
<b>Hazard Material Sites</b>	Minor impact to 5 sites; Major impact to 1 site	Minor impact to 4 sites; Major impact/ displacement to 2 sites	Minor impact to 6 sites
<b>Community Resources</b>	Relocation of driveway to library; no adverse effects anticipated	Relocation of driveway to library; no adverse effects anticipated	Relocation of driveway to library; no adverse effects anticipated

## 10 Conclusions

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The proposed modification consists of constructing a diverging diamond interchange (DDI) at the existing I-285/Cascade Road interchange. The proposed modification requires extending the existing I-285 northbound and southbound ramp exits to Cascade Road to provide ample deceleration and storage area needed to accommodate the projected design year traffic. The DDI alternative provides improved traffic operation in the design year and proved to be the most cost effective of the three alternatives analyzed (Conventional Tight Diamond, Roundabout Controlled Diamond, and DDI). Therefore, it was selected as the preferred alternative. The need for an interchange modification at the I-285 interchange with Cascade Road 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."*

Currently, I-285 at Cascade Road is a conventional diamond interchange with ramp entrances and exits for northbound and southbound traffic under traffic signal control. Traffic operation on the ramps has reached its service life as frequent back-ups persist in both directions. Traffic operational analyses of I-285, Cascade Road and nearby intersections were conducted under the existing and 2030 design years.

The No-Build traffic analysis indicated that some of the traffic movements at the I-285 and Cascade Road interchange will operate below LOS 'D' during the existing and 2030 design years. Queuing on I-285 southbound ramp to Cascade Road regularly backs up to the diverge area from I-285. The No-Build analyses for 2014 and 2030 indicate that the severely congested (LOS F) areas would expand gradually over time to encompass a significant percentage of the local streets by 2030.

The I-285 freeway segment and ramp merge/diverge areas in the vicinity of Cascade Road currently operate at LOS 'D' or better. Traffic operation in 2030 is expected to operate at LOS 'D' or better for all locations with the exceptions of the I-285 Northbound segment north of Cascade Road. However, improvements to the I-285 freeway segments are not anticipated as a part of this project.

Policy 1 is satisfied as a part of the IMR.

### 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 a new interchange on Cascade Road. Cascade Road at the I-285 ramp interchange is 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.

Policy 2 is satisfied as a part of the IMR.

### **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."*

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

- Conventional tight diamond interchange with traffic signal control
- Conventional diamond interchange with roundabout control
- DDI with traffic signal control

These options were reviewed by Fulton County and GDOT and presented at public information meetings to the general public and local stakeholders to ensure that the design requirement was met. The proposed DDI with traffic signal control was recommended for the following reasons:

- The right-of-way acquisition and costs were the least amongst all alternatives
- There is minor bridge widening needed at South Utoy Creek Crossing
- The construction duration is 2 years
- Total estimated construction cost is the least amongst all alternatives

It is anticipated that traffic operation on Cascade Road will operate at LOS 'D' or better during the 2030 design year.

Policy 3 is satisfied as a part of the IMR.

#### **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 proposed interchange reconstruction is not due to new, expanded, or a substantial change in current or planned future development or land use and no new access will be provided with the improvements. Considering the current anticipated growth in the area, the revisions are due to traffic operational deficiencies in the current interchange configuration expected by the design year.

Policy 4 is satisfied as a part of the IMR.

#### **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."*

As Fulton County is located in a metropolitan planning organization area, improvements to the design of its facilities are included in the South Fulton Comprehensive Transportation Plan of Fulton County. Modifications to the interchange are listed as regional short-term improvements categorized as 'interchange improvements' under project number R-20. The project will be included in the Atlanta Regional Commission's Regional Transportation Plan, which is scheduled for adoption in the Spring 2016.

Policy 5 is satisfied as a part of the IMR.

#### **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-285 in proximity to the Cascade Road interchange that is currently included in a local or state Transportation Improvement Plan. The proposed DDI has independent utility as the proposed interchange modifications would improve overall traffic operations in the project area without any additional future improvements.

Policy 6 is satisfied as a part of the IMR.

## **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)).”*

There are no other planned interchanges on I-285 in proximity to the Cascade Road at I-285 interchange that are currently included in a local or state Transportation Plan. The Preferred Alternative has independent utility as the proposed interchange modifications would improve overall traffic operations in the area without any additional future improvements to the roadway system.

Policy 7 is satisfied as a part of the IMR.

## **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 screening was conducted in the vicinity of the proposed Cascade Road and I-285 interchange modification. 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. The preferred alternative, the DDI, was chosen to minimize impacts to residents and property to the fullest extent possible. There are no threatened or endangered species impacts anticipated and there are minimal impacts anticipated to hazardous waste sites.

Policy 8 is satisfied as a part of the IMR.

## **11 Recommendation**

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This proposed project will maintain access to I-285 to and from Cascade Road utilizing the existing ramp connections. The I-285 off-ramps in the northbound and southbound directions will be extended to provide the appropriate deceleration distances in compliance with the FHWA Interstate Access policies, per the 2010 *Guide*. This would not have an adverse impact on the safety and operation of the I-285 Interstate facility (which includes mainline lanes, existing or modified ramps, and ramp intersections with crossroads) or on the local street network based on both the current and the planned future traffic projections. Therefore, it is recommended for approval.