ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0010925 **OFFICE** Design Policy & Support

Fulton County
GDOT District 7 - Metro Atlanta **DATE** 10/8/2014
I-285 Ramps @ CR 209/Riverside Drive

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

Attached is the approved Concept Report for the above subject project.

Attachment

DISTRIBUTION:

Glenn Bowman, Director of Engineering
Joe Carpenter, Director of P3/Program Delivery
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery
Albert Shelby, State Program Delivery Engineer
Bobby Hilliard, Program Control Administrator
Cindy VanDyke, State Transportation Planning Administrator
Hiral Patel, State Environmental Administrator
Ben Rabun, State Bridge Engineer
Kathy Zahul, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Mike Bolden, State Utilities Engineer
Richard Cobb, Statewide Location Bureau
Rachel Brown, District Engineer
Scott Lee, District Preconstruction Engineer
Patrick Allen, District Utilities Engineer
Marlo Clowers, Project Manager
BOARD MEMBERS - 6th & 11th Congressional Districts

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
PROJECT CONCEPT REPORT

Project Type:	Interchange Reconstruction	P.I. Number:	0010925
GDOT District:	7	County:	Fulton
Federal Route Number:	I-285	County Rd Number:	209
		Project Number:	N/A

The proposed Design-Build project reconfigures the existing conventional diamond interchange at CR 209/Riverside Drive and I-285 by replacing the traffic signals at each of the ramp terminals with single lane roundabouts to improve the safety of the interchange.

Submitted for approval:

Shamir Poudel, P.E., ARCADIS U.S. Inc.	DATE 3/17/14
Darryl D. VanMeter, P.E, State Innovative Delivery Engineer	DATE 3/17/14
Marlo L. Clowers, P.E., GDOT Project Manager	DATE 3/17/14

Recommendation for approval:

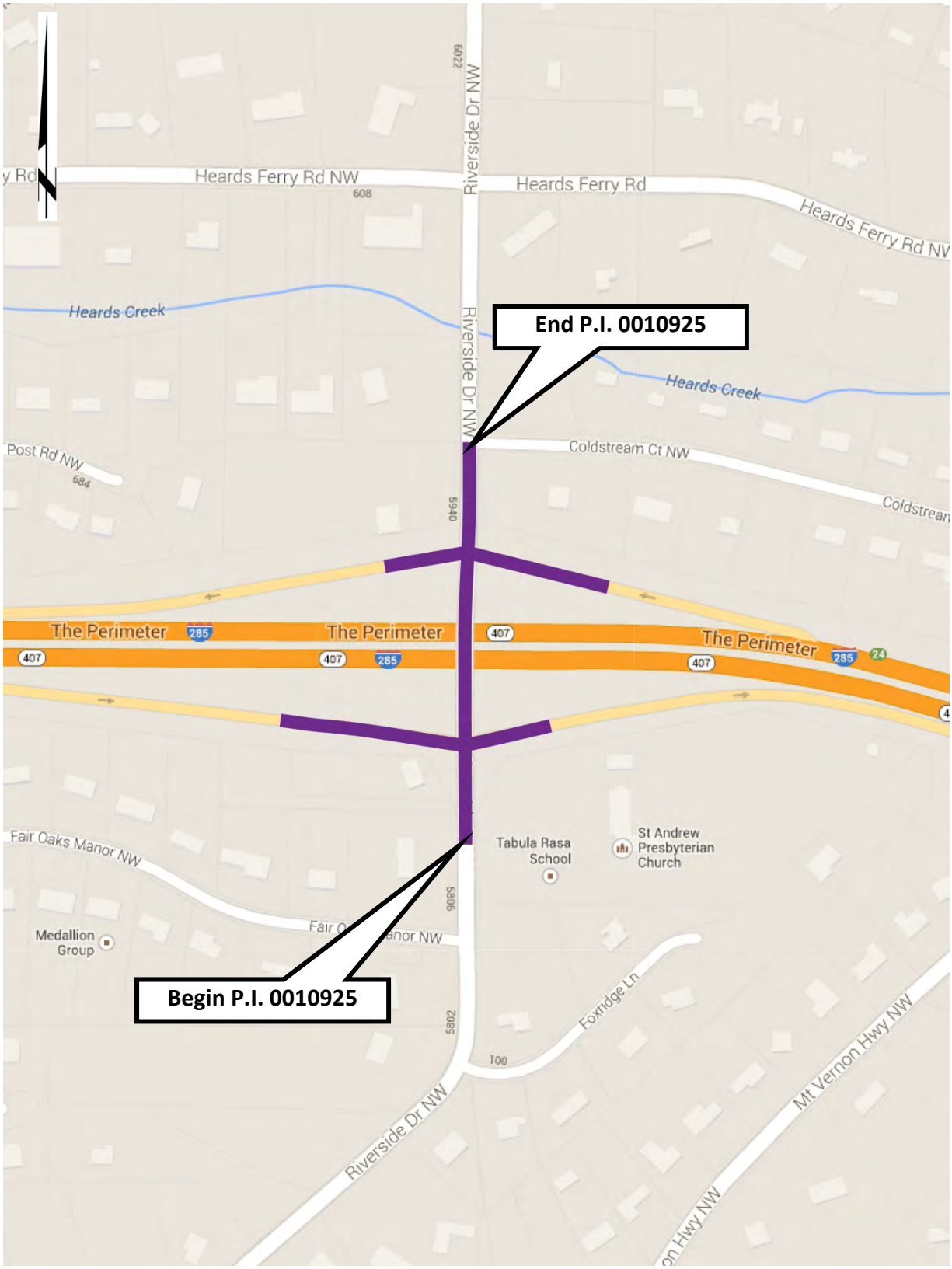
Program Control Administrator HIRAL PATEL*/EKP	DATE 3/23/2014
State Environmental Administrator KATHY ZAHUL*/EKP	DATE 4/8/2014
State Traffic Engineer LISA MYERS*/EKP	DATE 3/20/2014
Project Review Engineer JUN BIRNKAMMER*/EKP	DATE 3/25/2014
for State Utilities Engineer RACHEL BROWN*/EKP	DATE 4/16/2014
District Engineer BEN RABUN*/EKP	DATE 3/25/2014
State Bridge Design Engineer	DATE
State Transportation Financial Management Administrator	DATE

The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

State Transportation Planning Administrator CINDY VANDYKE*/EKP	DATE 3/28/2014

*-RECOMMENDATION ON FILE

PROJECT LOCATION



Not to Scale

PLANNING & BACKGROUND DATA

Project Justification Statement:

The proposed Design-Build project will enhance safety at the intersections of Riverside Drive and I-285 Ramps in Fulton County, GA. The project is intended to be an interim improvement until long term improvements under revive**285** *top end* are funded. In Georgia, nearly a third of fatal crashes occur at intersections making intersection safety a focus area for the Georgia Department of Transportation. Nationally, intersection crashes account for 40% of all reported crashes and approximately 20% of traffic fatalities. Of those fatalities, nearly 50% are the result of angle collisions. Angle collisions are often high speed, high impact crashes which often result in serious injuries or fatalities.

Roundabouts have been identified by Federal Highway Administration (FHWA) as one of the proven safety countermeasures in addressing crashes at intersections. The installation of roundabouts at existing signalized intersections have resulted in reduction in crash frequency. Roundabouts are generally navigated at slower speeds which correlate with lower impact and less severe crashes. Roundabout also present fewer conflict points than traditional intersections resulting in fewer collisions.

Crash data from 2008-2012 indicates that 73 crashes occurred at these two intersections of which 16 accidents caused injuries. 67% of the accidents were rear-end collisions accounting for 69% of the injuries. Studies have shown that the installation of a roundabout will result in a 48% reduction in all crash types including fatal crashes, injury crashes, and property damage only crashes.

Description of the proposed project:

The proposed Design-Build project is located on Riverside Drive at the interchange with I-285 in Fulton County Georgia and is within the city limits of Sandy Springs. The project consists of safety improvements to the existing interchange which will convert the two existing signalized intersections at each ramp terminal with roundabouts.

The current roadway configuration of Riverside Drive consists of one, twelve foot lane in both directions and traffic signals at the ramp termini. There are no turn lanes at the intersections with the I-285 entrance ramps, resulting in turning vehicles blocking the through movements. The existing bridge only provides for two lanes of traffic, one northbound and one southbound. The eastbound and westbound I-285 off ramps each consists of a single, sixteen foot lane. There are no existing sidewalks approaching the bridge, however there are existing sidewalks on the bridge itself. The existing right-of-way along Riverside Drive varies from 50 to 100 feet.

The proposed Design-Build project will convert the signalized intersections at the ramp termini to single lane roundabouts, one at each intersection. Each approach to the roundabout will be widened to two lanes with one lane entering the roundabout and the other serving as a right turn lane. Sidewalks will

be added to both sides of the roadway along Riverside Driveway within the limits of the project. The project is approximately 0.5 mile length.

The project will also include routine rehabilitation of the existing bridge. This work includes replacement of the joints at bent 2 and abutments 1 and 5. All construction joints will be resealed and the bridge deck will be sealed with a two-part polymer overlay. Concrete spalling will be repaired on bents 3 & 4 and abutment 5.

Federal Oversight: ☐ Full Oversight ☒ Exempt ☐ State Funded ☐ Other

MPO: Atlanta Regional Commission (ARC) MPO Project ID AR-118-2014

Regional Commission: Atlanta Regional Commission RC Project ID N/A

Congressional District(s): 6 & 11

Projected Traffic: ADT
Current Year (2012): 19,240 Open Year (2015): 19,350 Design Year (2035): 21,580
Traffic Projections Performed by: ARCADIS

Functional Classification (Mainline): Urban Minor Arterial Street

Is this a 3R (Resurfacing, Restoration, & Rehabilitation) Project? ☒ No ☐ Yes

Is this project on a designated Bike Route, Pedestrian Plan, or Transit Network?
☐ None ☐ Bike Route ☒ Pedestrian Plan ☐ Transit Network

Pavement Evaluation and Recommendations

Preliminary Pavement Evaluation Summary Report Required?	☐ No	☒ Yes
Preliminary Pavement Type Selection Report Required?	☒ No	☐ Yes
Feasible Pavement Alternatives:	☐ HMA ☐ PCC	☒ HMA & PCC

DESIGN AND STRUCTURAL DATA

Mainline Design Features: Riverside Drive at I-285 Interchange

Feature	Existing	Standard*	Proposed
Typical Section—Riverside Drive			
- Number of Lanes	2	2	2
- Lane Width(s)	10’-12’	11’-12’	10’-12’
- Median Width & Type	N/A	N/A	N/A
- Outside Shoulder Width	10’	10’-16’	10’
- Outside Shoulder Slope	6.25%	2%	2%
- Inside Shoulder Width	N/A	N/A	N/A
- Sidewalks	N/A	5’	5’
Posted Speed (mph)	35		35
Design Speed (mph)	35	35	35
Min Horizontal Curve Radius	Tangent	371’	Tangent
Superelevation Rate	N.C.	4% max	N.C.
Maximum Grade	9.56%	8%	11%
Access Control at Interchange	Full Control	Full Control	Full Control
Access Control Outside Interchange	Permitted	Permitted	Permitted
Right-of-Way Width	50’ to 100’	N/A	50’ to 100’
Design Vehicle	WB-40	WB-40	WB-40

Feature	Existing	Standard*	Proposed
Typical Section—Interstate Ramps			
- Lane Width(s)	16’ single lane,	16’ single lane, 12’ multilane	16’ single lane, 12’ multilane
- Outside Shoulder Width	10’/6’ paved	12’/10’ paved	In: 10’ w/ C&G Out: 9’/6’ paved
- Outside Shoulder Slope—pave/grass	4%	4%/6%	2%/ 6%
- Inside Shoulder Width	8’/4’ paved	6’/4’ paved	10’/0’ paved
Design Speed (mph)	45	45	45
Min Horizontal Curve Radius	Tangent	643’	Tangent
Superelevation Rate	2%	6% max	2%
Maximum Grade	6.0122%	6%	6.0122%
Design Vehicle	WB-67	WB-67	WB-67

*According to current GDOT design policy if applicable

Major Structures:

Structure	Existing	Proposed
I.D. # 121-0452-0 Riverside Drive overpass	Riverside Drive over I-285. This bridge contains two lanes and sidewalk on both sides. This bridge was constructed in 1962. Current sufficiency rating = 76.53	Existing bridge to be retained. Joint repair & or replacement and a polymer overlay of the bridge deck will be performed as part of the proposed project.
Retaining walls	N/A	Retaining walls will be required for fill slopes adjacent to the existing bridge and to retain fill slopes due to grading along Riverside Drive to the north of the interchange.

Major Interchanges/Intersections: I-285 at Riverside Drive interchange. Major intersections include Riverside Drive intersections with I-285 ramp terminals and Heards Ferry Road.

Utility Involvements: Known utility owners include: Georgia Power, GDOT & Atlanta Gas Light. SUE investigation is being conducted. Additional utility owners may be identified by SUE.

Public Interest Determination Policy and Procedure recommended (Utilities)? ☐ No ☒ Yes
Utility relocations (design and construction) are eligible for inclusion within all Design-Build contracts.

SUE Required: ☐ No ☒ Yes

Railroad Involvement: N/A

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:
Warrants met: ☐ None ☐ Bicycle ☒ Pedestrian ☐ Transit

Right-of-Way:
Required Right-of-Way anticipated: ☐ No ☒ Yes ☐ Undetermined
Easements anticipated: ☐ None ☒ Temporary ☒ Permanent ☐ Utility ☐ Other

Anticipated number of impacted parcels:		7
Displacements anticipated:	Total:	0
	Businesses:	0
	Residences:	7
	Other:	N//A

Location and Design approval: ☐ Not Required ☒ Required

Off-site Detours Anticipated: ☐ No ☒ Undetermined ☐ Yes

Transportation Management Plan [TMP] Required: ☐ No ☒ Yes
If Yes: Project classified as: ☒ Non-Significant ☐ Significant
TMP Components Anticipated: ☒ TTC ☐ TO ☒ PI

Design Exceptions to FHWA/AASHTO controlling criteria anticipated:

FHWA/AASHTO Controlling Criteria	No	Undeter-mined	Yes	Appvl Date (if applicable)
1. Design Speed	☒	☐	☐	
2. Lane Width	☒	☐	☐	
3. Shoulder Width	☒	☐	☐	
4. Bridge Width	☒	☐	☐	
5. Horizontal Alignment	☒	☐	☐	
6. Superelevation	☒	☐	☐	
7. Vertical Alignment	☒	☐	☐	
8. Grade	☐	☐	☒	
9. Stopping Sight Distance	☒	☐	☐	
10. Cross Slope	☒	☐	☐	
11. Vertical Clearance	☒	☐	☐	
12. Lateral Offset to Obstruction	☒	☐	☐	
13. Bridge Structural Capacity	☒	☐	☐	

Design Variances to GDOT Standard Criteria anticipated:

GDOT Standard Criteria	Reviewing Office	No	Undeter-mined	Yes	Appvl Date (if applicable)
1. Access Control - *Median Opening Spacing*	DP&S	☐	☐	☒	
2. Median Usage & Width	DP&S	☒	☐	☐	
3. Intersection Skew Angle	DP&S	☒	☐	☐	
4. Lateral Offset to Obstruction	DP&S	☒	☐	☐	
5. Intersection Sight Distance	DP&S	☒	☐	☐	
6. Bike, Pedestrian & Transit Accommodations	DP&S	☒	☐	☐	
7. GDOT Drainage Manual	DP&S	☒	☐	☐	
8. Georgia Standard Drawings	DP&S	☒	☐	☐	
9. GDOT Bridge & Structural Manual	Bridge Design	☒	☐	☐	
10. Roundabout Illumination	DP&S	☒	☐	☐	
11. Rumble Strips	DP&S	☒	☐	☐	
12. Safety Edge	DP&S	☒	☐	☐	

Grade: In order to accommodate a grade in the northern roundabout of 4% through the circulatory roadway, the approach grade of Riverside Drive to the north of the roundabout will have to be steepened to 11% in order to tie the project back to existing prior to the Heards Ferry Intersection.

Access Control: Several existing driveways and a side road (Coldstream Court) are present along Riverside Drive within the 300 foot minimum standard for access control for an interchange. These driveways and side road would need to be maintained or reconstructed in order to provide access to the parcels adjacent to the interchange.

VE Study anticipated: ☒ No ☐ Yes ☐ Completed – Date:
Formal Value Engineering (VE) Studies are not required for Design-Build projects. The Design-Build process provides comparable benefits to a formal VE Study.

CONTEXT SENSITIVE SOLUTIONS

Issues of Concern: Impacts as a result of construction of the proposed sidewalk to the historically eligible property in the southwest quadrant of the interchange. Also an existing vegetative screen, while not on the historic parcel itself, blocks the view of the interchange from the historically eligible property. This vegetative screen could be impacted by the construction of proposed driveways on the adjacent parcels.

Context Sensitive Solutions: In the areas adjacent to the historically eligible resource in the southwest quadrant of the project the construction of the proposed sidewalk will be performed in such a way as to minimize impacts to the property. No specimen trees will be impacted and disturbed during construction. In areas where vegetation will be removed on adjacent parcels as part of driveway construction, landscaping will be utilized to restore the vegetative screen of the historic parcel.

ENVIRONMENTAL DATA & PERMITS

Anticipated Environmental Document:
GEPA: ☐ **NEPA:** ☒ CE ☐ EA/FONSI ☐ EIS

MS4 Compliance – Is the project located in an MS4 area? ☐ No ☒ Yes
The project is located in Fulton County, which is within the MS4 boundary of the state. The project disturbs more than 1 acre of land, therefore compliance with post-construction storm water treatment requirement of the MS4 permit is required. These requirements include

- Removal of 80 % of the average annual TSS load from pavement runoff by treating the first 1.2 inch rainfall.
- Stream channel protection by detaining 1 year 24 hour rainfall for 24 hours.

- Provide overbank protection by not increasing the post-developed compared to pre-developed flows for the 25 year 24 hour rainfall event.
- Provide extreme flood protection by controlling the 100 year 24 hour flood and routing through the BMP.

Use of post-construction best management practices (BMPs) including detention ponds and enhanced swales are being evaluated. A summary of the conceptual hydrology study is attached to report with site specific discussions on these BMPs.

Environmental Permits/Variances/Commitments/Coordination anticipated:

Permit/ Variance/ Commitment/ Coordination Anticipated	No	Yes	Remarks
1. U.S. Coast Guard Permit	☒	☐	
2. Forest Service/Corps Land	☒	☐	
3. CWA Section 404 Permit	☒	☐	
4. Tennessee Valley Authority Permit	☒	☐	
5. Buffer Variance	☒	☐	
6. Coastal Zone Management Coordination	☒	☐	
7. NPDES	☐	☒	Disturbed area more than 1 acre
8. FEMA	☒	☐	
9. Cemetery Permit	☒	☐	
10. Other Permits	☒	☐	
11. Other Commitments	☒	☐	
12. Other Coordination	☒	☐	

Is a PAR required? ☒ No ☐ Yes ☐ Completed – Date:

Environmental Comments and Information:

NEPA/GEPA: Categorical Exclusions to be prepared; project may qualify for a Programmatic Categorical Exclusion (to be determined based on special studies and public involvement)

Ecology: Project will require Phase I and Phase II ecology reports. Project has been surveyed for Ga. Aster (none present).

History: One historic ranch style house is located in the project area. A sidewalk is being added as part of the proposed project adjacent to the historic property which will require construction easement on the parcel. No adverse effect is anticipated to this resource by construction of the sidewalk. SHPO concurrence will be required.

Archeology: Archaeology survey has been compiled. Negative Findings Short Form has been approved by GDOT OES. SHPO concurrence will not be required.

Air Quality:

Is the project located in a PM 2.5 Non-attainment area?	☐ No	☒ Yes
Is the project located in an Ozone Non-attainment area?	☐ No	☒ Yes
Is a Carbon Monoxide hotspot analysis required?	☒ No	☐ Yes

Air analysis will still need to be completed even though a roundabout is being proposed. A quantitative CO analysis will likely not be required but we will still have to prepare a PM2.5 Letter of Determination and an Air Impact Assessment Report explaining why the analysis is not necessary.

Noise Effects:

A noise impact assessment is needed due to required modifications to existing noise walls within the project area.

Public Involvement: A public information/ detour open house meeting was held on March 25, 2014. A total of 60 members of the public attended. Of the 31 people who left comments, 6 were in support of the project, 19 were opposed to the project, 5 were uncommitted, and 1 stated conditional support for the project. Comments received included concerns that construction of the roundabouts will result in continuous traffic flow on Riverside Drive, and there will be no break in traffic for those exiting I-285 wishing to turn onto Riverside Drive (leading to backups on the ramps and onto the interstate); concerns that there will be increased safety problems at the roundabouts since people in this area do not know how to use them; concerns that the project will increase traffic through the area's residential neighborhoods; concerns that the roundabouts would not be big enough in diameter or have enough lanes to accommodate existing and future traffic; concerns that the traffic light at the Riverside Drive/Heards Ferry Road intersection will cause a backup into the roundabouts; and the desire for noise walls in the southeast quadrant of the I-285/Riverside Drive interchange. Several commenters offered other solutions for the interchange, including retaining and synchronizing the existing signals, increasing storage capacity on the off-ramps, constructing a new interchange to relieve traffic from Riverside Drive, and adding capacity on Riverside Drive. No concerns regarding the detour were expressed in the comments received.

Major stakeholders: City of Sandy Springs

ROUNDABOUTS

Roundabout Lighting agreement/commitment letter received: ☐ No ☒ Yes

A lighting commitment letter has been received and an agreement is in process with the City of Sandy Springs.

Planning Level assessment: N/A

Feasibility Study: The operational analysis of the roundabout study found that roundabouts are a feasible alternative for providing traffic control at the ramp terminal intersections of Riverside Drive and I-285. The conceptual geometric designs illustrated that roundabout are also spatially feasible

however further investigation of the vertical geometry and utility impacts would be needed as the design progresses.

Peer Review required: ☐ No ☐ Yes ☒ Completed

The preliminary peer review for the project was completed on 3/5/2014. In this review the grade at the northern roundabout was to be held at the existing grade of Riverside Drive. During the costing plan review for the project concerns were raised that the existing grade of 9.56% could present a safety issue for vehicles with a high center of gravity. A supplemental peer review was completed on 8/5/2014 by MTJ Engineering to examine the grades through the northern roundabout. The recommendations of this supplemental peer review were deemed to be overly conservative and would have resulted in extending the project limits extensively. A final peer review was completed on 8/19/2014 which recommended improving the grade through the circulatory roadway at the northern portion of the northern roundabout to 4%. This is widely considered to be an acceptable design for roundabouts.

CONSTRUCTION

Issues potentially affecting constructability/construction schedule: The need for offsite detours due to the bridge rehabilitation work has yet to be determined. If it is feasible to do so, bridge rehabilitation will be performed by closing one lane of traffic across the bridge at a time and maintain traffic across the bridge utilizing a flagger. If it is not advantageous to perform the bridge rehabilitation in this manner then an offsite detour will be utilized. The rehabilitation work is anticipated to require only weekend closures of the bridge.

Early Completion Incentives recommended for consideration: ☒ No ☐ Yes

PROJECT RESPONSIBILITIES

Project Activities:

Project Activity	Party Responsible for Performing Task(s)
Concept Development	ARCADIS
Design	Design-Build Team
Right-of-Way Acquisition	GDOT
Utility Relocation	Design-Build Team
Letting to Contract	GDOT
Construction Supervision	GDOT
Providing Material Pits	Design-Build Team
Providing Detours	Design-Build Team
Environmental Studies, Documents, and Permits	ARCADIS
Environmental Mitigation	None Anticipated
Construction Inspection & Materials Testing	GDOT

Lighting required: ☐ No ☒ Yes
GDOT policy states that lighting should be considered in all interchange projects, especially in an urban area, given a lighting agreement can be reached with the local government. In addition all roundabout intersections are required to be lighted. Interchange lighting is currently included in the project. A lighting agreement between GDOT and the City of Sandy Springs will be required.

Initial Concept Meeting: November 14, 2013

Concept Meeting: March 6, 2014

Other projects in the area:
PI No. 0001758—revive**285** *top end*, I-285 N from I-75 to I-85—Long Range Program
PI No. 0003534—Transit Portion of revive**285** *top end*—Long Range Program
PI No. 0010782—Top End I-285 Variable Speed Limit Signs from I-20 to I-20 in Cobb, Dekalb and Fulton Counties—Design-Build/Under Construction
PI No. M004417—I-285 from Paces Ferry Road to Henderson Mill—Construction Work Program

Other coordination to date: Coordination with the City of Sandy Springs regarding lighting and landscaping preferences is ongoing.

Project Cost Estimate and Funding Responsibilities:

	PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
By Whom	GDOT	GDOT	GDOT	GDOT	N/A	
$ Amount	$962,138	$310,000	$363,300	$4,271,661.80	N/A	$5,907,099.80
Date of Estimate	2012	8/2014	4/15/2014	9/ 25/2014	N/A	

*CST Cost includes: Design Contingency, Construction Complete, Engineering and Inspection, & Liquid AC Cost Adjustment.

ALTERNATIVES DISCUSSION

Alternative selection:

Preferred Alternative: *Roundabout Interchange*			
Estimated Property Impacts:	**7 Parcels**	**Estimated Total Cost:**	**$5,907,100**
Estimated ROW Cost:	**$310,000**	**Estimated CST Time:**	**9-12 months**
Rationale: *The Roundabout Interchange alternative improves the safety of the interchange by reducing the number and severity of accidents. The roundabout alternative also provides improved traffic operations over the no-build condition and does not require replacement or widening of the existing bridge.*			

No-Build Alternative: *No-build*			
Estimated Property Impacts:	**None**	**Estimated Total Cost:**	**$0**
Estimated ROW Cost:	**$0**	**Estimated CST Time:**	**N/A**
Rationale: *A No-build alternative does not meet the project objective of improving the safety for the project corridor.*			

Alternative 2: *Bridge Widening*			
Estimated Property Impacts:	**8 Parcels**	**Estimated Total Cost:**	**$5,902,824**
Estimated ROW Cost:	**$340,000**	**Estimated CST Time:**	**12 months**
Rationale: *A conventional interchange configuration adding northbound and southbound left turn lanes on Riverside Drive to the I-285 on-ramps and widening the off-ramps to two lanes (right & left turn lanes) as they approached the intersections was assessed. This alternative required the existing Riverside Drive bridge be widened to accommodate the new left turn lanes. While the bridge widening alternative did address the operational deficiencies of the interchange it did not adequately address the safety concerns of the interchange, therefore it did not meet the project objectives, and had greater property impacts than the preferred alternative.*			

Attachments:

1. Approval to Add to Design-Build Program
2. Concept Layout
3. Typical sections
4. Detailed Cost Estimate, including:
    a. Design Complete
    b. Construction Complete with Engineering and Inspection
    c. Fuel & Asphalt Price Adjustment
    d. Right-of-Way
    e. Utility Relocations
5. Safety Analysis
6. Volume diagrams
7. Capacity analysis summary
8. Roundabout Data
    a. 2011 Roundabout feasibility study by Kittleson & Associates, Inc. in coordination with URS
    b. Lighting agreement or commitment letter
    c. Peer Review
9. Bridge inventory
10. Bridge and Bridge Deck Condition Surveys
11. Hydrology Study for MS4 Permit
12. Minutes of Concept meetings
    a. Initial Concept Team Meeting Minutes
    b. Concept Team Meeting Minutes
13. FHWA Detailed Traffic Report Approval/IMR Waiver

APPROVALS

Concur: _____
Director of Engineering

Approve: _____ 10/6/14
Chief Engineer Date

ATTACHMENT 1

APPROVAL TO ADD TO DESIGN-BUILD PROGRAM

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE P.I. No. 0010925, Fulton County
I-285 @ Riverside Drive Roundabouts

OFFICE Innovative Program Delivery

DATE November 28, 2012

FROM Darryl D. VanMeter P.E., State Innovative Program Delivery Engineer

TO Gerald M. Ross, P.E., Chief Engineer

SUBJECT: Request to Add Project to Design-Build Program

The Department has identified a need for an interchange improvement project on I-285 at Riverside Drive. In the public interest of accelerated delivery, the Office of Innovative Program Delivery is requesting that this project be added to the Department's Design-Build Program.

Description of Project: This project proposes to construct roundabouts at the I-285 eastbound and westbound ramp terminal intersections on Riverside Drive. The existing bridge will not be modified.

Preliminary Engineering Activities: A roundabout feasibility study was completed in 2011. The feasibility study indicated construction of roundabouts at the ramp terminal intersections was appropriate for this interchange. The Office of Innovative Program Delivery will begin the process of obtaining a consultant to produce a Concept Report, environmental document, costing plans, Special Provision 999 and other documents needed for the project's advertisement.

Utilities: This Office is coordinating with The State Utilities Office to accelerate the SUE investigation.

Right-of-Way: No right-of-way is anticipated to be required however construction easements are anticipated. Design-Build delivery allows the efficiency of early contractor involvement in establishing of the right of way footprint and incentivizes the contractor to minimize impacts.

Environmental: The environmental document is anticipated to be a Categorical Exclusion (CE). Environmental special studies already completed as part of revive**285** *top end* are expected to accelerate approval of the CE. Early coordination with Federal Highway Administration (FHWA) and the Office of Environmental Services indicate support for the project however, it is not possible to authorize federal funds prior to approval of the CE.

Public Involvement: Public Information Open House, local official and neighborhood briefings, as well as media outreach through the Office of Communications are anticipated.

Project Estimate: The current construction cost estimate for this project is $2,000,000.

Letting Responsibility: GDOT

Proposed Schedule: The project is currently anticipated to advertise the Design-Build Request for Qualifications (RFQ) in April 2013 and the Request for Proposals (RFP) in June 2013 for August 2013 letting. Design-Build delivery provides an opportunity to take advantage of available fiscal year 2013 Lump Sum Safety funding through the Office of Traffic Safety and Design.

The attached Design-Build Suitability Assessment supports delivering the project by Design-Build. This office recommends your favorable approval of this request. Please contact Marlo Clowers by email or at (404) 631-1713 should you need further information.

APPROVED: _____ 12-3-12
Chief Engineer Date

DVM:MLC

Attachment

Cc: William Farr, Federal Highway Administration, **Attention**: Melinda Roberson
Toby Carr, Director of Planning
Russell McMurry, Director of Engineering
Meg Pirkle, Director of Operations
Genetha Rice-Singleton, State Program Delivery Engineer
Thomas Howell, Director of Construction
Bobby Hilliard, Office of Program Control
Ben Rabun, State Bridge Engineer
Phil Copeland, State Right-of-Way Administrator
Glenn Bowman, Office of Environmental Services
Lisa Myers, Office of Engineering Services
Jeff Baker, State Utilities Engineer
Mark Mastronardi, State Construction Engineer
Charles A. Hasty, State Materials Engineer
David Hoge, Office of Construction Bidding Administration
Brent Story, Office of Design Policy and Support
Angela Robinson, Office of Financial Management
Kathy Zahul, Office of Traffic Operations
Treasury Young, Acting Chief Acquisition Officer
Darlene Parker, Transportation Services Procurement
Rachel Brown, District 7 Engineer
Jonathan Walker, District 7 Utilities Engineer
Lee Upkins, District 7 Construction Engineer

Design-Build Suitability Assessment
I-285 Ramps @ CR 209/Riverside Dr Roundabouts
P.I. No. 0010925
Fulton County
November 28, 2012

Purpose: Provide high level assessment of likelihood Design-Build could achieve GDOT desired goals.

Summary:

Design-Build Suitability Score for Project	
Project Delivery Schedule (relative importance of 35%)	28.0
Innovation (relative importance of 5%)	2.3
Level of Design (relative importance of 5%)	3.3
Project Delivery Cost (relative importance of 30%)	20.0
Quality (relative importance of 10%)	5.3
Staff Experience (relative importance of 5%)	3.3
Marketplace Conditions, Competition and Design Build Team Experience (relative importance of 10%)	7.3
Total Score for Project	**79.8**

Design-Build Suitability Score Ranges/Assessment	
Excellent DB candidate; DB risks have been properly assigned and mitigated	80-100
Good DB candidate; some mitigation measures necessary to ensure successful delivery	60-80
Mediocre DB candidate; DB delivery is risky; another delivery method is more suitable	50-60
Poor DB candidate; Another delivery method may be more suitable	40-50
Not suitable for DB delivery	Below 40

Notes and recommendations:

- Based on a score of 70.0, Design-Build could be a good candidate to achieve GDOT delivery goals.
- Opportunities exist for GDOT to leverage current work performed to date in order to develop the Design-Build RFP package (special studies and roundabout feasibility study).
- Additional work will be required to prepare RFP (survey database, concept report, NEPA document, SUE QL-B) in order to mitigate potential Design-Build risks.
- To achieve federal funding authorization by June 30, 2013 (FY 13 funding) the NEPA document should be approved by June 30, 2013. Otherwise, the project must be covered with non-federal funds until NEPA is approved. Discussions with GDOT OES and FHWA will continue.
- Assuming NEPA approval in June 2013, then the Design-Build procurement schedule may be:
    - RFQ advertisement in April 2013
    - RFP advertisement in June 2013
    - Letting in August 2013

1. General Project Information

Project Information	• I-285 Ramps @ CR 209/Riverside Drive • PI No. 0010925 • Fulton County (City of Sandy Springs)
Estimated Budget	• PE - $300,000 (FY 12; authorized) • ROW - $200,000 • CST - $2,000,000
Full Oversight (FOS)	• No
Source(s) of Project Funding	• Federal and State
Project Corridor	• I-285
Major Features of Work	• Operational improvement (installation of roundabouts at ramps)
Major Schedule Milestones	• Obtaining NEPA necessary for CST funding authorization • ROW acquisition (only easements are anticipated)
Project Stakeholders	• City of Sandy Springs
Major Challenges	• Expediting NEPA • Acquiring easements • Construction staging/MOT
Right of Way	• No Required ROW is expected • However, minimal amount of construction and driveway easements are needed
Utilities	• Overhead and underground exist; • SUE QL-B to be performed pre-let
NEPA	• NEPA document required • Anticipate CE

2. Specify Project Goals

Primary Delivery Goals	• Maximize opportunity to authorize use of available funds
Secondary Delivery Goals	• Expedited delivery • Schedule and cost certainty • Contractor/Designer interaction to: o enhance constructability, o effectively stage traffic, and o minimize impacts to the traveling public and adjacent residents

3. Design-Build "Deal-Breaker" Issues (If any responses are "No" then project not suitable)

a. Legal & Statutory Requirements: Considering the project characteristics (type and size), does Georgia current regulation allow for the use of Design Build contracting?

- Yes

b. Agency Resources and Experience: Considering available GDOT resources and/or GDOT's access to Design Build consultants, can this project be effectively managed as a Design Build contract?

- Yes

c. Project Funded: Considering GDOT's funding resources, can this project receive funding in foreseeable future, in order to be delivered using a Design Build contract?

- Yes

d. Leadership Support: Does GDOT's leadership support the utilization of Design Build contracting for this project?

- Yes

e. Design Build Marketplace Conditions: Considering available Design Build expertise in Georgia, and GDOT's potential access to qualified Design Build Teams, can this project be delivered using a Design Build contract?

- Yes

4. SWOT Analysis

a. SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis is used to determine the appropriateness of Design Build with respect to specific factors. These factors are given scores based on the importance of each factor. SWOT analysis addresses the following issues:

- Strengths: Characteristics of Design Build that give it an advantage with respect to the issue under consideration;
- Weaknesses (or Limitations): Characteristics of Design Build that create disadvantages with respect to the issue under consideration;
- Opportunities: Chances to improve performance (e.g. achieve GDOT's project goals; greater benefits; higher efficiencies) under a Design Build contract;
- Threats: Elements that could result in for GDOT with Design Build contracting.

b. Strengths and Weakness are scored on a 1-10 scale with Strengths receiving a positive score and Weaknesses a negative score.

c. Opportunities and Threats are scored on a 1-5 scale with Opportunities receiving a positive score and Threats a negative score.

d. The 4 scores are totaled and divided by 15 to determine the strength of Design-Build delivery for that factor. The following factors are considered in this SWOT analysis; each item is assigned a point value based on an overall 100 points scale to determine Design-Build Suitability.

a) Project Delivery Schedule (weigh = 35%)

b) Innovation (weigh = 5%)

c) Level of Design (weigh = 5%)

d) Project Delivery Cost (weight = 30%)

e) Quality (weigh = 10%)

f) Staff Experience (weight = 5%)

g) Marketplace Conditions, Competition, Design-Build Team Exp (weight = 10%)

a) Project Delivery Schedule (35%) is the overall project schedule from planning through design phase, construction phase and open to traffic.

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o The single point of responsibility (i.e., one contract) reduces the procurement time o Project delivery can be shortened due to concurrent design and construction processes o The contractor's input into the design process helps the Design-Build (DB) team establish a more realistic project schedule o The project schedule will be contractually established in DB proposals before detailed design plans are established o The collaboration and coordination between the designer and the contractor helps the DB team secure a project schedule before detailed design completion o It reduces the chances of project delays caused by disputes between GDOT and the DB Team	o The Request for Proposal (RFP) development process can become lengthy due to the time required to define technical requirements and expectations o Establishing Quality Assurance Programs for design and construction that are understood and accepted by all stakeholders is time-consuming o GDOT and other stakeholders need to understand and commit to an expeditious review of design
10	-2
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o It enables GDOT to maximize the use of available funds o It enables GDOT to issue RFQ and RFP, award the contract and issue NTP with preliminary design prior to conclusion of NEPA o It enables GDOT to allow the DB team to proceed to final design and construction for any portion of the project for which NEPA is complete o It enables GDOT to shift the schedule risk to the DB team o It enables GDOT to fast-track projects that are behind schedule in the PDP o It enables the contractor to work closely with the designer to procure long-lead items early in the design process o It enables the contractor to start work on early construction activities, such as construction mobilization, before the detailed design completion o It enables the contractor to start delivery of the project in multiple phases o It enables the contractor to start construction on portion of the project prior to final Right-of-Way (ROW), and utilities agreements o If authorized, GDOT can utilize an A-plus-B contracting method to include the project delivery schedule in selection of the DB team o It enables use of expedited construction process which minimizes impact on the public o GDOT may use the DB team's expertise in ROW acquisition and utility coordination services to expedite project delivery	o Undefined events or conditions found after procurement, but during design, can impact schedule o The DB team's internal conflicts can adversely impact the project delivery schedule o By defining the project scope with clear definitions, requirements and expectations may delay project procurement o Development of a comprehensive risk management plans (risk identification, assessment, allocation and mitigation) may delay project procurement
4	-2
	+10 pts

b) Innovation (5%) is the application of [new] methods, techniques and technologies in order to overcome project complexities, expedite the project delivery, reduce project costs and/or enhance quality.

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o The collaboration between the designer and the contractor helps the Design-Build team identify and optimize innovative designs and construction methods or techniques o The single point of responsibility and early team integration enable the DB team to smoothly and effectively implement innovative solutions o Constructability reviews and Value Engineering (VE) are inherent in process	o It requires desired solutions to complex projects to be well-defined through technical requirements and expectations o Qualitative aspects of design (e.g. aesthetics) are difficult to define and evaluation in low bid contracting o Cost and time constraints on the designer inhibits innovation o For simple and less complex projects, the projects of innovation are limited
10	-4
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o It enables GDOT to effectively deliver complex projects such as projects with a number of primary features tightly interrelated and/or closely located, projects with construction staging issues o It enables GDOT to benefit from both cost-saving and quality-improving innovative solutions o It enables GDOT to use innovative design and construction methods or techniques, in order to minimize the negative impact on the public o It enables GDOT to capitalize on the DB Team's access to unconventional mechanisms for the public outreach and engaging the people and other stakeholders in the project	o Innovation can be limited if the contractor does not allow the designer to have a legitimate seat at the table with the owner (i.e., the contractor relegates the designer to a back office design role only) o Some innovative solutions may not be implementable with the time and budget limits on the project o Prescriptive NEPA documents may limit GDOT's flexibility for accepting innovative design solutions o The DB team may enhance innovation only from the cost standpoint and not necessarily from the quality standpoint o Quality Assurance/Quality Control programs for innovative designs and construction methods or techniques are difficult to define in RFPs o There is a risk that innovative solutions do not perform as anticipated and therefore, delay the project delivery o The use of Low Bid procurement method may inhibit innovation o Innovation may be limited to the capability and comfort of the DB team selected for the project
5	-5
	+6 pts

c) Level of Design (5%) is the percentage of design completion at the time of delivery procurement.

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o It does not require complete design plans before awarding the project to the Design-Build team The contractor involvement in early design enhances constructability o The detailed design specifications are not required, in order to communicate the design to potential Design-Build teams (e.g., 10-30% complete design is often satisfactory to procure the DB projects) o The contractor involvement in the early design enhances constructability (e.g., the collaboration and coordination between the designer and the contractor enhances the opportunity to improve the constructability) o The Design-Build team accepts the liability for design errors/omission o The continuous execution of design and construction enhances the control and oversight over the final product	o The definitions, requirements and expectations (including the project scope and performance expectations) should be clearly defined in the RFP since they will be the basis for the contract o If design is too far advanced, it will limit the advantages of Design-Build o It is imperative to establish Quality Assurance Programs for design and construction that are understand and accepted by all stakeholders
9	-2
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o It enables GDOT to transfer design risks to the DB team o Flexibility in the project scope and incomplete design plans allow the DB team to develop of innovative designs o It enables GDOT to advance the design only to the level necessary for defining the contract requirements and allocating the risks o Not fully-developed design plans permit the utilization of ATCs proposed by the DB team o The continuous execution of design and construction enhances the control and oversight over the project o The collaboration and coordination between the designer and the contract enhances the opportunity to reduce the number of changes orders o The collaboration and coordination between the designer the contractor reduces the possibility of errors and omissions	o GDOT's requirements and expectations may not be met if they are not adequately defined in the RFP o By relinquishing the control over design details, GDOT may not be able to achieve some of its quality objectives o It can reduce the design standardization across GDOT's projects o There is a risk that the design plans are "defective" and cause a delay in the project delivery
3	0
	+10 pts

d) Project Delivery Cost (30%) is the overall project cost from planning through design phase, construction phase and open to traffic.

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o The collaboration between the designer and the contractor helps the DB team identify and optimize cost-efficient solutions to project goals o The project cost is contractually established in DB proposals before detailed design plans are completed o The collaboration between the designer and the contractor involvement in early design and constructability reviews moderate the cost o The single point of responsibility and early team integration create the potential for lower average cost growth o The single point of responsibility (i.e., one contract) reduces GDOT's procurement cost	o It is difficult to accurately estimate the lump sum cost when detailed design plans are not complete o The DB team may use high contingency when detailed design plans are not 100% complete o If design is too far advanced, there is limited potential for cost savings o The project delivery cost increases when stipends are paid to the shortlisted Design-Build teams
10	-2
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o The single point of responsibility (i.e., one contract) enables GDOT to reduce the contract administration costs	o Poor risk allocation can result in high contingencies o The DB team's internal conflicts can adversely impact the project delivery cost o In creased proposal cost may limit the number of Design-Build teams participating in the bidding process o The limited number of qualified DB teams in the market place can limit the potential for receiving price competitive proposals o The use of Low Bid procurement method may result in cost growth during project construction o Cost savings from innovative design and construction methods or technique may not be transferred to GDOT o Not selecting the lowest bidder without properly communicating assessment criteria and proposal evaluation process may result in negative outcomes, such as bid protest, public outcry and industry resistance
3	-1
	+10 pts

e) Quality (10%) is the ability of the delivered project to meet or exceed GDOT's requirements and performance expectations.

Design Build	
Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o It provides GDOT with the capability to go beyond their normal level of quality in transportation projects o It reduces construction engineer and inspection costs to GDOT since these quality control activities and risks are transferred to the Design-Build Team o Quality Control System is enhanced through the continuous involvement of designer throughout the projects o While Quality Control is the Design-Build team's responsibility, Quality acceptance remains GDOT's responsibility	o It requires developing extensive systems for design acceptance/approval and construction acceptance (verification) o It requires establishing, understand and accepting a Design Quality Assurance Program and a Construction Quality Assurance Program by all stakeholders o It strikes at the foundation of the traditional Quality Assurance/Quality Control roles through the combination of engineering and construction
7	-3
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o It provides an opportunity for GDOT to maintain the same or higher level of quality while reducing the overall project cost and duration o It provide an opportunity for GDOT to evaluate Quality Control Systems for the design and construction, which are described by the Design-Build Teams in their proposals	o Contractor may drive designer to reduce costs at risk of quality o The Design-Build team may enhance innovation only from the cost standpoint and not necessarily from the quality standpoint o Quality Assurance Programs and Quality Control Systems for the design and construction are difficult to define in the RFP o Quality Assurance will become problematic if the Design-Build team is assigned the responsibility to perform any acceptance and verification function o By relinquishing the control over design details, GDOT may not be able to achieve its quality objectives o Checks and balances in design and construction Quality Assurance Programs may not be performed adequately
4	-3
	+5 pts

f) Staff Experience (5%)

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o The single point of responsibility reduces GDOT's administrative burden on GDOT staff	o It requires the commitment of GDOT management and technical resources and expertise at critical points in the process (i.e., RFP development, design review, etc.) o It requires the concurrent commitment of design and construction resources to administer the procurement and oversee the implementation of the project o It may require changing roles of the current GDOT staff o It may require additional training of the current GDOT staff o It may require additional consultant support o It may require additional staff with Design-Build oversight experience o It may require experience staff for risk management (identification, assessment, allocation and mitigation)
10	-3
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o It provides GDOT an opportunity to grow by learning/refining the DB delivery process o It enables GDOT to collaborate with the DB industry to delivery projects, which require specialty skills for design or construction that may not be available inside GDOT	o It requires GDOT willingness to accept the required culture shift for Design-Build project delivery systems o GDOT may have to dedicate considerable staff resources during the procurement phase o If GDOT staff have limited experiences in similar projects, there will be challenges to administer the procurement and oversee the implementation of the project
4	-1
	+10 pts

g) Marketplace Conditions, Competition and Design Build Team Experience (10%)

Strengths (scale 0 to 10)	**Weaknesses (scale 0 to -10)**
o Teaming of the designer and the contractor can result in added technical value	o In turbulent market conditions, early commitment to a price may increase the costs for GDOT o The need for Design-Build qualifications may limit the competition o It may be difficult for GDOT to find Design-Build teams with adequate experience with similar projects o GDOT heavily relies on the selected Design-Build team experience and expertise
10	-2
Opportunities (scale 0 to 5)	**Threats (scale 0 to -5)**
o Straight forward project can expand potential DB teams and increase participation o Reduced Design-Build qualification requirements to allow for more participation and competition o If authorized, Best Value procurement enables GDOT to balance qualifications and cost in the Design-Build procurement	o The gap between owner experience and DB team experience can create conflict o The gap between the designer and the contractor experience can create internal conflict o The limited number of qualified Design-Build teams in the marketplace can limit the potential for receiving price competitive proposals o The use of the Low Bid selection method does not necessarily lead to the selection of the best DB team
5	-3
	+10 pts

	Relative Weighting			Total Score
Project Delivery Schedule	35	**Strength (0-10)**	**Weakness (0 to -10)**	28.0
		10	-2	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		4	-2	
Innovation	5	**Strength (0-10)**	**Weakness (0 to -10)**	3.5
		10	-4	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		5	-5	
Level of Design	5	**Strength (0-10)**	**Weakness (0 to -10)**	4.2
		9	-2	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		3	0	
Project Delivery Cost	30	**Strength (0-10)**	**Weakness (0 to -10)**	25.0
		10	-2	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		3	-1	
Quality	10	**Strength (0-10)**	**Weakness (0 to -10)**	6.7
		7	-3	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		4	-3	
Staff Experience	5	**Strength (0-10)**	**Weakness (0 to -10)**	4.2
		10	-3	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		4	-1	
Marketplace Conditions, Competition and Design-Build team experience	10	**Strength (0-10)**	**Weakness (0 to -10)**	8.3
		10	-2	
		Opportunities (0 to 5)	**Threats (0 to -5)**	
		5	-3	
	100			**79.8**

	Low Risk
	Moderate Risk
	High Risk

5. Initial Risk Identification and Allocation

Risks are present in any project. This project has been identified as a Good Candidate for Design-Build delivery. A Risk Allocation Matrix is provided below as a preliminary assignment of generic risks to the project. A more detailed risk analysis should be completed prior to Requests for Proposals to properly allocate all known risks at that time. The below template is intended to give a high level risk allocation assessment and is prepared as a guide to identify risks and opportunities to mitigate. It is based on the general assumption of Georgia's current lowest qualified bid requirement for Design-Build projects.

Scope Issues	GDOT	Shared	DB Team	Comments
Define scope	X			GDOT obtain concept and NEPA approval.
Define project	X			
Establish performance requirement	X			
Manage/communicate changes in Scope	X			
Incorporate flexibility in project scope	X			Low-bid with no shortlist limits flexibility for innovation. NEPA prescriptiveness inhibits flexibility. Recommend develop list of mandatory scope items and limit amount of costing plan development.

Environmental Issues	GDOT	Shared	DB Team	Comments
Define initial project environmental impacts	X			NEPA/special studies to be used to advance NEPA document.
Define parameters for impacts	X			
Conduct environmental investigation	X			
Acquire environmental permits		X		DB Team prepares necessary permits for GDOT review and submittal to respective agencies.
Manage/implement environmental mitigation process		X		
Ensure environmental compliance		X		
Mitigate known hazardous waste	X			
Mitigate unknown/non-defined hazardous waste	X			
Obtain environmental approvals - construction related			X	

	Mitigate wetlands / stream / habitat issues			X	
	Mitigate permanent noise issues			X	GDOT specify location/type of noise barriers, if any.
	Address archaeological, cultural, historical discoveries	X			GDOT should specify avoidance if locations known.

	Design Issues	**GDOT**	**Shared**	**DB Team**	**Comments**
	Conduct preliminary surveys/ develop base map	X			
	Conduct Geotech investigation - initial borings based on preliminary design			X	If needed.
	Conduct Geotech investigation - initial borings based on proposal			X	If needed.
	Establish/define initial subsurface conditions			X	If needed.
	Perform initial project geotechnical analysis based on preliminary design			X	If needed.
	Develop proposal specific geotechnical analysis/report				NA
	Ensure plan conformance with regulations/guidelines/RFP			X	
	Ensure plan accuracy			X	
	Establish design criteria	X			
	Ensure conformance to design criteria			X	
	Perform design review	X			
	Conduct design QC			X	
	Conduct design QA			X	
	Communicate changes in design criteria	X			
	Manage hazardous waste site/contaminated materials			X	
	Conform with changes in design criteria			X	

	Right of Way Issues	**GDOT**	**Shared**	**DB Team**	**Comments**
	Establish ROW Limits			X	GDOT establish initial "footprint." DB Team revises based on their design.

	Obtain ROW plan approval			X	
	Conduct ROW plan appraisals/reviews			X	
	Establish just compensation			X	
	Acquire ROW			X	If needed.
	Acquire construction easements			X	Easements will be required.
	Acquire permanent easements			X	Easements will be required.
	Begin condemnation proceedings	X			
	Complete relocation	X			
	Take possession	X			
	Issue certification	X			
	Review objections to ROW appraisal	X			
	Mitigate hazardous waste (on acquired ROW)	X			

	Local Agency, Utility, Railroad, other Stakeholders Issues	**GDOT**	**Shared**	**DB Team**	**Comments**
	Identify initial utility impacts from preliminary design			X	
	Establish initial utility locations (SUE QL-B / conditions/ MOU)	X			Recommend GDOT Utilities execute TO to obtain SUE QL-B.
	Define required utility relocations from preliminary design			X	
	Relocate utilities included in the contract			X	
	Modify agreement with private utility based on final design		X		
	Modify agreement with public utility based on final design		X		
	Mitigate damage to utilities under construction			X	
	Verify utility locations/conditions			X	
	Coordinate with utility relocation efforts during contract		X		
	Address utility owner/third party caused/related delays		X		Escalation will document potential delay and elevate to GDOT and utility owner to resolve.
	Prevent delays caused by utility/third party involvement issues			X	
	Prevent utility/third party delays resulting from proposal/modified design			X	

	Obtain third party agreements (fed, local, private, etc.)			X	
	Coordinate with third parties under agreement			X	
	Coordinate with other projects			X	
	Coordinate with adjacent property owners			X	
	Identify/obtain local agency impacts/permits/requirements			X	

	Contracting and Procurement Issues	**GDOT**	**Shared**	**DB Team**	**Comments**
	Address issues related to contract language (warranties, bonding, etc.)	X			
	Prevent delays in ad/bid/award process (addenda, protests, etc.)	X			
	Ensure competitive procurement	X			Recommend informal industry outreach. GDOT requires 3 LOI/SOQs and a minimum of 2 bids.
	Avoid delays in procurement of specialty materials or equipment			X	
	Procure long lead equipment or items as soon as possible			X	
	Ensure contractor's compliance with performance expectations		X		

	Construction	**GDOT**	**Shared**	**DB Team**	**Comments**
	Address traffic control and staging issues			X	
	Acquire construction permits			X	
	Ensure safety / conduct safety QA			X	
	Establish/comply with traffic control requirements		X		GDOT establish, DB team complies.
	Address change orders / claim		X		
	Plan/coordinate construction staging issues			X	
	Ensure construction quality/workmanship				
	Comply with project schedule			X	Could depend on schedule aggressiveness for open to traffic.
	Conduct estimation			X	

Control/ensure materials quality		X		
Maintain materials documentation		X		
Ensure material availability			X	
Develop/comply final construction/materials QC/QA plan			X	
Conduct construction/materials QA			X	
Conduct construction QC			X	
Conduct construction QA/procedural compliance auditing			X	
Conduct construction IA testing/inspection	X			
Perform construction staking			X	
Carry out erosion control			X	
Perform spill prevention			X	
Prevent accidents within work zone / liability			X	
Avoid third party damages			X	
Perform operations and maintenance during construction			X	
Perform maintenance under construction - new features			X	
Perform maintenance under construction - exist. Features			X	
Manage traffic in construction zones			X	
Prevent damage to utilities under construction			X	
Avoid false work/rework			X	
Develop shop drawings			X	
Mitigate equipment failure/breakdown			X	
Manage community relations		X		
Ensure performance of defined mitigation measures			X	
Provide warranty			X	
Coordinate street/ramp closures			X	
Develop construction staging plans			X	
Comply with DBE requirements			X	
Assume long term ownership/final responsibility	X			
Pavement design	X			Recommend GDOT obtain prior to RFP.

Force Majeure / Acts of God	GDOT	Shared	DB Team	Comments
Handle strikes/labor disputes - on site labor			X	
Mitigate the consequences of tornado/earthquake		X		
Mitigate the consequences of epidemic, rebellion, war, riot, sabotage	X			
Handle the consequences of archaeological, paleontological discovery	X			
Mitigate the consequences of suspension of any environmental approval		X		
Manage lawsuits against project		X		
Mitigate the consequences of storm/flooding		X		
Prevent fire or other physical damages			X	

Financial & Economic Issues	GDOT	Shared	DB Team	Comments
Secure availability of funding / cash flow restrictions	X			
Overcome labor disruptions			X	
Mitigate uncertainty in escalation rate of labor, materials, and equipment			X	
Mitigate changes in market (premium for specific materials, labor, etc.)			X	

Management & Policy Issues	GDOT	Shared	DB Team	Comments
Guarantee leadership support in case of leadership change	X			
Assume the costs/consequences of political/policy changes	X			
Address the impact of regulatory/statutes changes	X			Recommend NPDES permit (new permit in Aug 2013) and MS4 possible impacts to project are further evaluated.

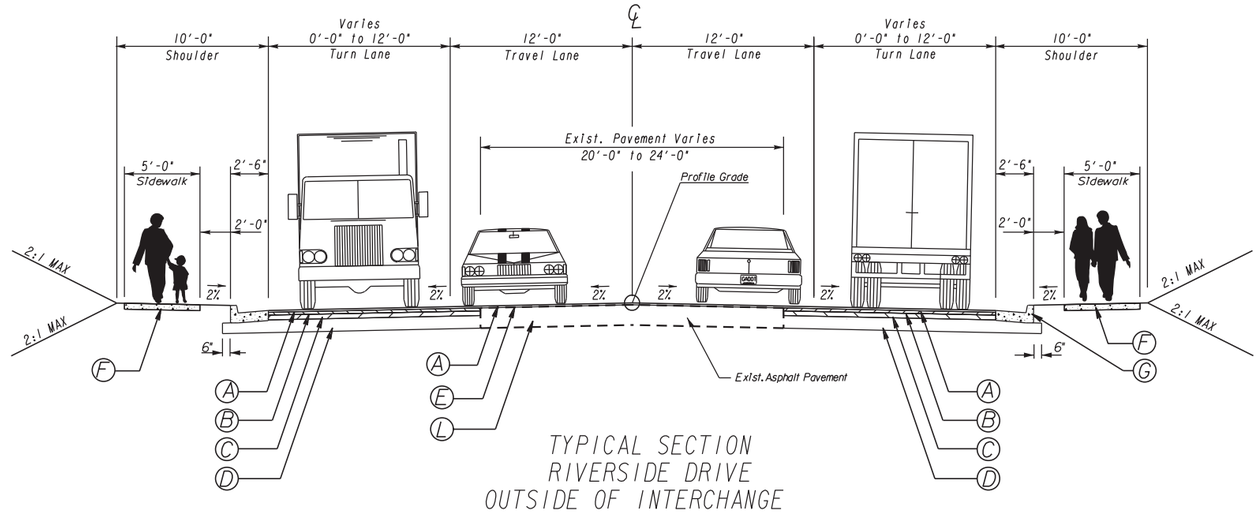
ATTACHMENT 2
CONCEPT LAYOUT

RIVERSIDE DRIVE ROUNDABOUT INTERCHANGE CONCEPT
PI NO. 0010925; FULTON COUNTY - AUGUST 2014
PROPOSED PAVEMENT
RAISED CENTRAL ISLAND
TRUCK APRON
PROPOSED SIDEWALK
EXISTING PROPERTY LINE
PROPOSED RIGHT OF WAY
PROPOSED EASEMENT
DRIVEWAY EASEMENT
POTENTIALLY ELIGIBLE HISTORIC RESOURCE
STREAM
ENVIRONMENTALLY SENSITIVE AREA
SCALE IN FEET
GDOT
Georgia Department of Transportation
ARCADIS
Fair Oaks Manor
Heards Ferry Rd.
Riverside Drive
Foxridge Ln.
Riverside Drive
285
Heards Ferry Rd.
Coldstream Ct.
Mt. Vernon Hwy.

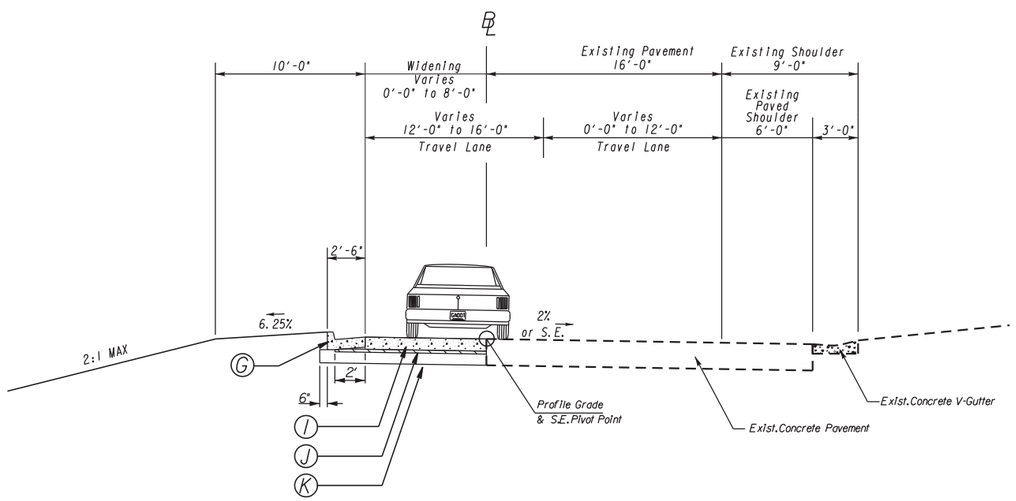
ATTACHMENT 3
TYPICAL SECTIONS

REQUIRED PAVEMENT

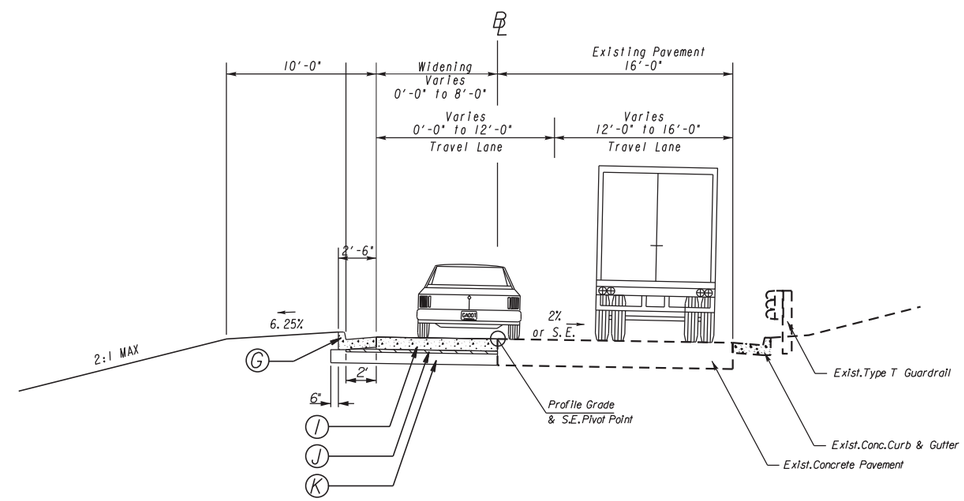
- (A) 165 LB/SY RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME
- (B) 220 LB/SY RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (C) 770 LB/SY RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (D) 12" GR AGGR BASE CRS, INCL MATL
- (E) RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME, AS REQUIRED
- (F) CONC SIDEWALK, 4 IN
- (G) CONC CURB AND GUTTER, 8 IN X 30 IN, TYPE 2
- (H) CONC CURB AND GUTTER, 8 IN X 30 IN, TYPE 7
- (I) PLAIN PC CONC PVMT, CL 3 CONC, 9 INCH THK
- (J) 330 LB/SY RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (K) 10" GR AGGR BASE CRS, INCL MATL
- (L) MILL ASPH CONC PVMT, VARIABLE DEPTH



TYPICAL SECTION
RIVERSIDE DRIVE
OUTSIDE OF INTERCHANGE



TYPICAL SECTION
I-285 EASTBOUND EXIT RAMP



TYPICAL SECTION
I-285 WESTBOUND EXIT RAMP

NOT TO SCALE

ARCADIS
Infrastructure, environment, buildings

COSTING PLANS
FOR DESIGN-BUILD

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

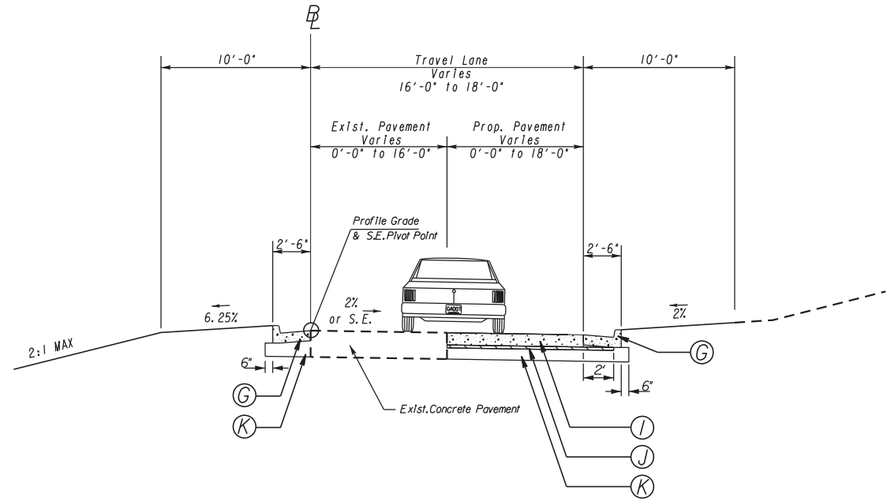
OFFICE:

TYPICAL SECTIONS

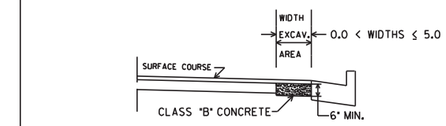
DRAWING No.
05-001

REQUIRED PAVEMENT

- (A) 165 LB/SY RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL BITUM MATL & H LIME
- (B) 220 LB/SY RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (C) 770 LB/SY RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (D) 12" GR AGGR BASE CRS, INCL MATL
- (E) RECYCLED ASPH CONC LEVELING, INCL BITUM MATL & H LIME, AS REQUIRED
- (F) CONC SIDEWALK, 4 IN
- (G) CONC CURB AND GUTTER, 8 IN X 30 IN, TYPE 2
- (H) CONC CURB AND GUTTER, 8 IN X 30 IN, TYPE 7
- (I) PLAIN PC CONC PVMT, CL 3 CONC, 9 INCH THK
- (J) 330 LB/SY RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME
- (K) 10" GR AGGR BASE CRS, INCL MATL
- (L) MILL ASPH CONC PVMT, VARIABLE DEPTH



TYPICAL SECTION
I-285 ENTRANCE RAMPS



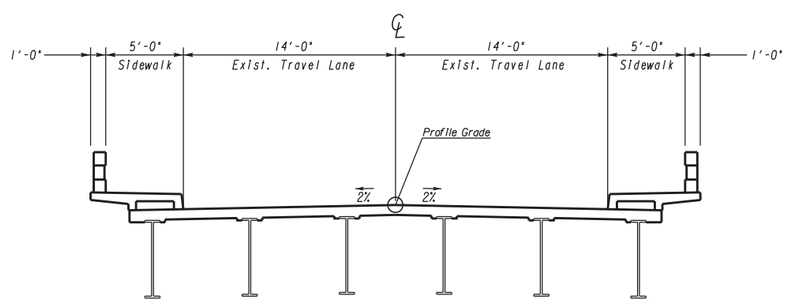
NO SCALE
CLASS "B" CONCRETE BASE OR PAVEMENT WIDENING
Item Code 500-9999 - Cu. Yds.

In excavated areas between the existing paving and new curb and gutter that are 5'-0" or less in width, Class "B" concrete shall be placed in lieu of the base and paving specified by the typical section. Payment will be made under "Class B Concrete Base and Pavement Widening".

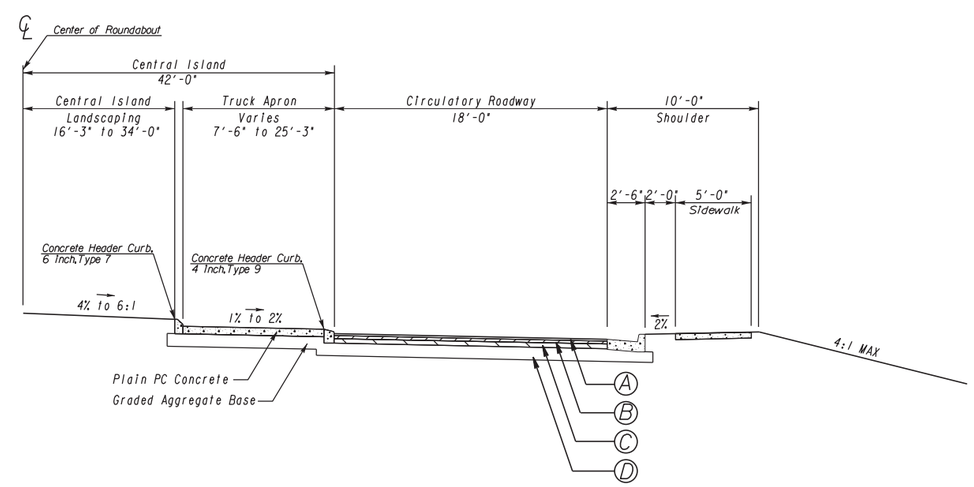
In excavated areas greater than 5'-0" in width, the Contractor shall place base and paving as specified on the typical section.

See plans for details of curb and gutter construction.

CLASS "B" CONCRETE BASE OR WIDENING DETAIL



TYPICAL SECTION
RIVERSIDE DRIVE BRIDGE OVER I-285



TYPICAL SECTION
RIVERSIDE DRIVE ROUNDABOUT
(SEE GDOT CONSTR. DETAIL RA-2)

NOT TO SCALE

ARCADIS
Infrastructure, environment, buildings

COSTING PLANS
FOR DESIGN-BUILD

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE:

TYPICAL SECTIONS

DRAWING No.
05-002

ATTACHMENT 4

DETAILED COST ESTIMATE

0010925 Cost Estimate Summary

Summary of Cost Estimates	
Construction	
Construction Cost	$3,464,706.56
Design-Build Contingency (15%)	$519,705.99
E&I (5%)	$173,235.33
Liquid Asphalt Adjustment	$114,013.92
Total Construction	$4,271,661.80
Right-of-Way	$310,000.00
Utilities (Reinb.)	$363,300.00
PE	$962,138.00
Total Project Cost	**$5,907,099.80**

STATE HIGHWAY AGENCY

DATE : 09/25/2014
PAGE : 1

JOB DETAIL ESTIMATE

JOB NUMBER : 0010925 SPEC YEAR: 01
DESCRIPTION: I 285 AT RIVERSIDE DR

ITEMS FOR JOB 0010925

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - PI 0010925	1.000	300000.00	300000.00
0010	210-0100		LS	GRADING COMPLETE - PI 0010925	1.000	400000.00	400000.00
0015	310-1101		TN	GR AGGR BASE CRS, INCL MATL	3500.000	22.50	78750.00
0024	310-5060		SY	GR AGGR BS CRS 6IN INCL MATL	390.000	16.00	6240.00
0025	402-1812		TN	RECYL AC LEVELING,INC BM&HL	3200.000	92.96	297472.00
0030	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	1700.000	82.47	140199.00
0035	402-3130		TN	RECYL AC 12.5MM SP,GP2,BM&HL	690.000	91.11	62865.90
0040	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	670.000	86.02	57633.40
0045	413-1000		GL	BITUM TACK COAT	740.000	3.80	2812.00
0050	432-5010		SY	MILL ASPH CONC PVMT,VARB DEPTH	3200.000	3.90	12480.00
0055	439-0020		SY	PLN PC CONC PVMT CL3 9" THK	2700.000	72.50	195750.00
0059	441-0016		SY	DRIVEWAY CONCRETE, 6 IN TK	49.000	44.30	2170.70
0060	441-0104		SY	CONC SIDEWALK, 4 IN	1300.000	34.45	44785.00
0065	441-0748		SY	CONC MEDIAN, 6 IN	410.000	53.55	21955.50
0070	441-3999		LF	CONCRETE V GUTTER	530.000	21.30	11289.00
0072	441-5010		LF	CONC HDR CURB, 6 IN, TP 9	650.000	10.00	6500.00
0073	441-5007		LF	CONC HEADER CURB, 8 IN, TP 7	1600.000	26.26	42016.00
0074	441-5004		LF	CONC HEADER CURB, 10", TP 4	63.000	8.35	526.22
0075	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	4100.000	15.35	62935.00
0081	999-2010		LS	DESIGN COMPLETE	1.000	348000.60	348000.60
0082	158-1000		HR	TRAINING HOURS	4000.000	0.80	3200.00
0083	150-9011		HR	TR CT-WORKZONE LAW ENF-CTR BIDS	5000.000	48.76	243841.55
0084	001-5000		*	UTILITY CONTINGENCY	1.000	363300.00	363300.00
0085	446-1100		LF	PVMT REF FAB STRIPS, TP2,18 INCH WIDTH	3158.000	8.00	25264.00
0090	500-3101		CY	CLASS A CONCRETE	1.000	462.81	462.81
0095	500-3201		CY	CL B CONC, RET WALL	257.000	510.00	131070.00
0099	500-3800		CY	CL A CONC, INCL REINF STEEL	10.000	950.00	9500.00
0100	500-9999		CY	CL B CONC,BASE OR PVMT WIDEN	24.000	211.00	5064.00
0105	550-1180		LF	STM DR PIPE 18",H 1-10	475.000	46.90	22277.50
0125	550-4118		EA	FLARED END SECT 18 IN, SIDE DR	2.000	425.00	850.00
0130	600-0001		CY	FLOWABLE FILL	50.000	265.05	13252.50
0135	610-0810		SF	REMOVE SOUND BARRIER	3235.000	10.00	32350.00
0140	610-1055		LF	REM GUARDRAIL	420.000	7.00	2940.00
0145	610-1075		EA	REM GUARDRAIL ANCH, ALL TYPES	9.000	400.00	3600.00
0148	610-5705		EA	REM CATCH BASIN	3.000	500.00	1500.00
0149	610-0959		LF	REMOVE PIPE - PI 0010925	15.000	6.50	97.50
0154	611-3000		EA	RECONSTR CATCH BASIN, GROUP 1	2.000	2150.00	4300.00
0159	611-3010		EA	RECONSTR DROP INLET, GROUP 1	2.000	2400.00	4800.00
0164	624-0400		SF	SOUND BARRIER, TYPE- PI 0010925	3214.000	30.00	96420.00
0169	641-1100		LF	GUARDRAIL, TP T	302.000	64.00	19328.00
0174	641-1200		LF	GUARDRAIL, TP W	1043.000	18.20	18988.36

JOB DETAIL ESTIMATE

0179	641-5001	EA	GUARDRAIL ANCHORAGE, TP 1	4.000	880.00	3520.00
0184	641-5006	EA	GUARDRAIL ANCHORAGE, TP 6	4.000	630.00	2520.00
0189	641-5012	EA	GUARDRAIL ANCHORAGE, TP 12	5.000	2300.00	11500.00
0192	647-2500	LS	QUEUE DETECTION AND WARNING SYSTEM	1.000	40000.00	40000.00
0193	647-0200	LS	TRAF DETECT LOOP SYSTEM, NO- PI 0010925-NO.1	1.000	7000.00	7000.00
0194	643-1152	LF	CH LK FEN,ZC COAT, 6', 9 GA	78.000	101.24	7896.85
0199	441-5002	LF	CONC HEADER CURB, 6", TP 2	260.000	12.80	3330.09
0204	668-1100	EA	CATCH BASIN, GP 1	6.000	2500.00	15000.00
0209	668-1110	LF	CATCH BASIN, GP 1, ADDL DEPTH	12.000	190.00	2280.00
0214	668-2100	EA	DROP INLET, GP 1	4.000	2450.00	9800.00
0219	668-2110	LF	DROP INLET, GP 1, ADDL DEPTH	6.000	230.00	1380.00
0224	766-7020	LS	IRRIGATION SYSTEM IRRIGATION SYSTEM FOR ROUNDABOUT	1.000	6500.00	6500.00
0229	766-7020	LS	IRRIGATION SYSTEM IRRIGATION SYSTEM FOR ROUNDABOUT	1.000	6500.00	6500.00
0234	207-0203	CY	FOUND BKFILL MATL, TP II	58.000	60.50	3509.00
0239	163-0232	AC	TEMPORARY GRASSING	3.000	600.00	1800.00
0244	163-0240	TN	MULCH	71.000	210.00	14910.00
0249	163-0300	EA	CONSTRUCTION EXIT	2.000	1500.00	3000.00
0254	163-0550	EA	CONS & REM INLET SEDIMENT TRAP	11.000	150.00	1650.00
0259	165-0010	LF	MAINT OF TEMP SILT FENCE, TP A	370.000	0.86	319.22
0264	165-0030	LF	MAINT OF TEMP SILT FENCE, TP C	1500.000	0.75	1136.93
0269	165-0101	EA	MAINT OF CONST EXIT	2.000	487.57	975.15
0274	165-0105	EA	MAINT OF INLET SEDIMENT TRAP	11.000	32.64	359.09
0279	167-1000	EA	WATER QUALITY MONITORING AND SAMPLING	1.000	350.00	350.00
0284	167-1500	MO	WATER QUALITY INSPECTIONS	12.000	700.00	8400.00
0289	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	700.000	1.65	1156.82
0294	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	2900.000	3.00	8700.00
0299	603-2180	SY	STN DUMPED RIP RAP, TP 3, 12"	50.000	64.80	3240.00
0304	603-7000	SY	PLASTIC FILTER FABRIC	50.000	4.80	240.00
0309	700-6910	AC	PERMANENT GRASSING	5.000	1250.00	6250.00
0314	700-7000	TN	AGRICULTURAL LIME	10.000	70.00	700.00
0319	700-8000	TN	FERTILIZER MIXED GRADE	5.000	600.00	3000.00
0324	700-8100	LB	FERTILIZER NITROGEN CONTENT	242.000	3.50	847.00
0329	700-9300	SY	SOD	467.000	5.80	2708.60
0334	702-0180	EA	CORNUS FLORIDA - PI 0010925	7.000	500.00	3500.00
0339	702-0470	EA	ILEX VOMITORIA NANA - PI 0010925	194.000	40.00	7760.00
0344	702-9005	LB	SPRING APPLICATION FERTILIZER	126.000	8.00	1008.00
0349	702-9025	SY	LANDSCAPE MULCH	294.000	6.50	1911.00
0354	716-2000	SY	EROSION CONTROL MATS, SLOPES	1500.000	1.35	2025.00
0359	615-1100	LF	DIRECTIONAL BORE PIPE - 3 INCH	355.000	26.00	9230.00
0364	636-1020	SF	HWY SGN,TP1MAT,REFL SH TP3	122.000	15.00	1830.00
0369	636-1029	SF	HWY SGN,TP2 MATL,REFL SH TP 3	338.000	21.00	7098.00
0374	636-1033	SF	HWY SIGNS, TP1MAT,REFL SH TP 9	438.000	19.00	8322.00
0379	636-2070	LF	GALV STEEL POSTS, TP 7	1236.000	8.00	9888.00
0384	636-2090	LF	GALV STEEL POSTS, TP 9	245.000	9.50	2327.50
0389	636-3010	EA	GROUND-MOUNTED BREAKAWAY SIGN SUPPORT	14.000	450.00	6300.00
0394	647-1000	LS	TRAF SIGNAL INSTALLATION NO - PI 0010925	1.000	46800.00	46800.00
0399	647-1000	LS	TRAF SIGNAL INSTALLATION NO - PI 0010925	1.000	47800.00	47800.00

JOB DETAIL ESTIMATE

0404	647-1000	LS	TRAF SIGNAL INSTALLATION NO - PI 0010925	1.000	5000.00	5000.00
0409	647-1000	LS	TRAF SIGNAL INSTALLATION NO - PI 0010925	1.000	5000.00	5000.00
0414	647-2120	EA	PULL BOX, PB-2	1.000	715.00	715.00
0419	653-0120	EA	THERM PVMT MARK, ARROW, TP 2	6.000	92.00	552.00
0424	653-0130	EA	THERM PVMT MARK, ARROW, TP 3	6.000	110.00	660.00
0429	653-0210	EA	THERM PVMT MARK, WORD , TP 1	6.000	140.00	840.00
0434	653-0296	EA	THERMO PVMT MARKING,WORD,TP 15	10.000	180.00	1800.00
0439	653-1501	LF	THERMO SOLID TRAF ST 5 IN, WHI	3775.000	0.65	2453.75
0444	653-1502	LF	THERMO SOLID TRAF ST, 5 IN YEL	2475.000	0.65	1608.75
0449	653-1504	LF	THERM SOLID TRAF STRIPE,12",WH	1237.000	4.00	4948.00
0454	653-3501	GLF	THERMO SKIP TRAF ST, 5 IN, WHI	578.000	0.55	317.90
0459	653-6004	SY	THERM TRAF STRIPING, WHITE	493.000	5.10	2514.30
0464	653-6006	SY	THERM TRAF STRIPING, YELLOW	146.000	4.40	642.40
0469	654-1001	EA	RAISED PVMT MARKERS TP 1	16.000	9.00	144.00
0474	654-1003	EA	RAISED PVMT MARKERS TP 3	20.000	8.00	160.00
0479	655-5000	EA	PVMT ARROW THERM W/R REFLECTOR	1.000	430.00	430.00
0484	449-1375	LF	PRFM SILICONE JT SL W/EP CONC HD, BR NO PI 0010925	121.000	175.00	21175.00
0489	461-2000	LF	RESEALING BRIDGE JOINTS, TP - PI 0010925	81.000	45.00	3645.00
0494	519-0515	SY	SURFACE PREPARATION	795.000	11.00	8745.00
0499	519-0530	SY	POLYMER OVERLAY	795.000	49.00	38955.00
0504	521-3000	SF	PATCHING CONCRETE BRIDGE	16.000	385.00	6160.00
0509	615-1200	LF	DIRECTIONAL BORE - 2 INCH	895.000	13.00	11635.00
0514	681-4155	EA	LT STD, 15' MH, 2' ARM	8.000	2800.00	22400.00
0519	681-6309	EA	LUMINAIRE,TP 3, 70 W, LED	8.000	750.00	6000.00
0524	681-3600	EA	LIGHTING STD, SPCL DES	19.000	4400.00	83600.00
0529	681-6900	EA	LUMINAIRE - TP 3, 135 W, LED	19.000	1200.00	22800.00
0534	682-1404	LF	CABLE, TP XHHW, AWG NO 10	10930.000	0.95	10383.50
0539	682-6222	LF	CONDUIT, NONMETL, TP 2, 2 IN	2025.000	6.50	13162.50
0544	682-6225	LF	CONDUIT, NONMETL, TP 2, 2 1/2 IN	100.000	9.50	950.00
0549	682-6233	LF	CONDUIT, NONMETL, TP 3, 2 IN	895.000	3.80	3401.00
0554	682-9000	LS	MAIN SVC PICK UP POINT	1.000	12000.00	12000.00
0559	682-9000	LS	MAIN SVC PICK UP POINT	1.000	12000.00	12000.00
0564	682-9022	EA	ELEC JCT BX,REF PLASTIC MORTAR	4.000	775.00	3100.00
0569	647-2140	EA	PULL BOX, PB-4	6.000	1250.00	7500.00
0574	647-2170	EA	PULL BOX, PB-7	5.000	1400.00	7000.00
0579	682-9950	LF	DIRECTIONAL BORE - RAMP METER INSTALLATION	500.000	15.00	7500.00
0584	935-4010	EA	FIBER OPTIC SPLICE, FUSION	180.000	31.00	5580.00
0589	657-1085	LF	PRF PL SD PVT MKG,8",B/W,TP PB	522.000	6.60	3445.20
0594	657-6085	LF	PRF PL SD PVMT MKG,8",B/Y,TPPB	522.000	6.60	3445.20
0599	682-9028	EA	ELECTRICAL COMM BOX, TP 5	6.000	6000.00	36000.00
0604	935-1116	LF	OUT PLNT FBR OPT CBL,LOOSE TB,SM,72 FBR	669.000	1.70	1137.30
0609	935-1512	LF	OUT PLNT FBR OPT CBL,DROP,SM,12 FBR	680.000	1.50	1020.00
0614	935-1513	LF	OUT PLNT FBR OPT CBL,DROP,SM,24 FBR	873.000	1.50	1309.50
0619	935-3103	EA	FIBER OPTIC CLOSURE,UNDRGRD,24 FBR	1.000	750.00	750.00
0624	935-3106	EA	FIBER OPTIC CLOSURE,UNDRGRD,72 FIBER	2.000	825.00	1650.00
0629	939-5010	EA	ELEC PWR SVC ASSEMBLY,AERIAL SVC POINT	2.000	3000.00	6000.00
0634	441-0204	SY	PLAIN CONC DITCH PAVING, 4 IN	150.000	31.37	4706.47

JOB DETAIL ESTIMATE

ITEM TOTAL	3828006.56
INFLATED ITEM TOTAL	3828006.56

TOTALS FOR JOB 0010925

ESTIMATED COST:	3828006.56
DESIGN CONTINGENCY (15.0):	574200.98
E&I (5.0):	220110.38
ESTIMATED TOTAL:	4622317.92

PROJ. NO.	N/A	CALL NO.	9/29/2009
P.I. NO.	0010925		
DATE	9/25/2014		

INDEX (TYPE)	**DATE**	**INDEX**
REG. UNLEADED	Sep-14	$ 3.335
DIESEL		$ 3.765
LIQUID AC		$ 601.00

Link to Fuel and AC Index:
http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx

LIQUID AC ADJUSTMENTS

PA=[((APM-APL)/APL)]xTMTxAPL

Asphalt

Price Adjustment (PA)			**112867.8**	**$**	**112,867.80**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 961.60		
Monthly Asphalt Cement Price month project let (APL)			$ 601.00		
Total Monthly Tonnage of asphalt cement (TMT)			313		

ASPHALT	**Tons**	**%AC**	**AC ton**
Leveling	3200	5.0%	160
12.5 OGFC		5.0%	0
12.5 mm	690	5.0%	34.5
9.5 mm SP		5.0%	0
25 mm SP	1700	5.0%	85
19 mm SP	670	5.0%	33.5
	6260		**313**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$ 1,146.12**	**$**	**1,146.12**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 961.60		
Monthly Asphalt Cement Price month project let (APL)			$ 601.00		
Total Monthly Tonnage of asphalt cement (TMT)			3.178374682		

Bitum Tack Gals	gals/ton	tons
740	232.8234	3.17837468

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)			**0**	**$**	**-**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 961.60		
Monthly Asphalt Cement Price month project let (APL)			$ 601.00		
Total Monthly Tonnage of asphalt cement (TMT)			0		

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.		0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT	**$**	**114,013.92**

GEORGIA DEPARTMENT OF TRANSPORTATION
DETAILED ROW COST ESTIMATE SUMMARY

Date (MM/YYYY):	March-14	Project:	Riverside Drive Roundabouts
Revised:	August-14	County:	Fulton
		PI:	10925
Description:			
Parcels:	7	R/W Plan Date:	8/23/2014

CONTRACT

Land and Improvements	$112,878.29
Valuation Services	$17,500.00
Legal Services	$79,725.00
Relocation	$19,500.00
Demolition	$0.00
TOTAL CONTRACT	**$229,603.29**

INHOUSE

TOTAL INHOUSE	**$78,750.00**
TOTAL ESTIMATED COSTS	$308,353.29
TOTAL ESTIMATED COSTS (ROUNDED)	***$310,000.00***

Preparation Credits	Hours	Signature

CG#: (DATE)

CG#: (DATE)

Attachment(s): **Project Location Map; Subject/Comp Location Map; Comparable Sales Data**

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTER-DEPARTMENT CORRESPONDENCE

FROM: Patrick Allen, P.E.
District Utilities Engineer

DATE: April 15, 2014

TO: Marlo Clowers, Project Manager

SUBJECT: PI# 0010925 Fulton County PRELIMINARY UTILITY COST ESTIMATE

As requested by your office, we are furnishing you with a Preliminary Cost Estimate for each utility with facilities potentially located with the project limits.

FACILITY OWNER	REIMBURSABLE	NON-REIMBURSABLE	TOTAL
Georgia Power Company	$132,000.00	$0.00	$132,000.00
City of Atlanta Watershed Management Sewer	$95,300.00	$0.00	$95,300.00
AT&T	$62,000.00	$0.00	$62,000.00
Comcast of Georgia, Inc.	$12,000.00	$0.00	$12,000.00
Fulton County Sewer	$0.00	$0.00	$0.00
XO Communications	$62,000.00	$0.00	$62,000.00
TOTAL	**$363,300.00**	$0.00	$363,300.00

This estimate is based upon the current information. We will provide an updated estimate when the plans are further developed. Please note that the subject project satisfies the requirements for automatic Public Interest Determination (P&P 6863-12) thus the Department is responsible for all utility costs included in the construction contract.

If you have any questions, please contact Patrick Allen at 770-986-1117

RSB/PA

Cc: Michael J. Bolden, State Utilities Engineer

ATTACHMENT 5
SAFETY ANALYSIS

1. Safety Analysis

Safety is an important aspect related to development of the Riverside Drive and I-285 interchange. Traffic incidents (crashes) cause congestion, economic loss, and the potential for injuries or loss of life.

When analyzing crash data, it is important to note that there are usually multiple underlying reasons for each crash. These include roadway geometry, weather conditions, driver behavior, traffic operations, on-road or roadside hazards, and construction activity. In most cases, no single factor causes a crash. This report focuses on identifying the underlying causes of crashes to determine where motorist safety may be improved by means of upgrading roadway geometry, installing safety-related features, and/or improving traffic conditions.

1.1 Historical Crash Analysis

The latest five years of available crash data were collected from GDOT and analyzed to quantify the frequency, severity, and type of crashes occurring at the intersections of Riverside Drive and the I-285 eastbound ramps, Riverside Drive and the I-285 westbound ramps, and Riverside Drive and Heards Ferry Road. The latest crash data available for the three intersections were for the years 2008 to 2012. The following sections describe the crash rate, crash type, and crash severity analysis of the five years of historical crash data.

1.1.1 Crash Rate Analysis

The GDOT crash data were analyzed to determine the raw number of crashes that occurred at each study intersection each year. Table 1 presents a comparison between the raw number of study intersection crashes and the historical statewide average number of crashes that occurred at comparable intersections. Statewide average intersection crash rates were obtained from GDOT.

The results presented in the table show that the eastbound ramp intersection and the Heards Ferry Road intersection have exceeded the statewide average crash rate for total, injury, and property damage only (PDO) crashes during 2008 to 2012. Additionally, the westbound ramp intersection has exceeded the statewide average crash rate for total and PDO crashes. The table also shows that fatal crashes are less frequent at the Riverside Drive intersections compared to the statewide average rate; there were no fatal crashes at the study intersections during the five years analyzed.

Table 1 Study Area Intersection Crash Rates vs. Statewide Average Intersection Crash Rates

Riverside Drive		2008 – 2012*	2008	2009	2010	2011	2012
		Statewide Average	Actual Crashes	Actual Crashes	Actual Crashes	Actual Crashes	Actual Crashes
Eastbound Ramp Intersection	Total	6.1	6	5	7	4	9
	Fatality	0.0	0	0	0	0	0
	Injury	1.4	1	3	3	1	2
	PDO	4.7	5	2	4	3	7
Westbound Ramp Intersection**	Total	10.0	12	10	6	9	5
	Fatality	0.0	0	0	0	0	0
	Injury	2.1	1	0	1	2	2
	PDO	7.9	11	10	5	7	3
Heards Ferry Road	Total	7.6	1	3	11	11	9
	Fatality	0.0	0	0	0	0	0
	Injury	1.6	0	0	1	2	1
	PDO	6.0	1	3	10	9	8

Source: GDOT Crash Database (2008 – 2012)
*2008 statewide averages were used for years 2009 – 2012.
**This intersection was converted from a stop-controlled intersection to a signalized intersection in 2011.
Red boxes indicate actual crash rates greater than statewide average crash rates.

1.1.2 Crash Type Analysis

The GDOT crash data were also analyzed to determine the frequency of each crash type that occurred at each of the three study intersections. With the exception of one type, “not a collision with a motor vehicle,” the crash types focus on the manner in which the vehicles collided. A crash categorized as “not a collision with a motor vehicle” occurs when a vehicle strikes a fixed object (utility pole, guardrail, curb, structure, etc.), a bicyclist, or a pedestrian, or when the vehicle leaves the roadway. Figures 1 through 3 illustrate the total number and percentage of each type of crash that occurred at the Riverside Drive and I-285 eastbound ramp, Riverside Drive and I-285 westbound ramp, and Riverside Drive and Heards Ferry Road intersections, respectively.

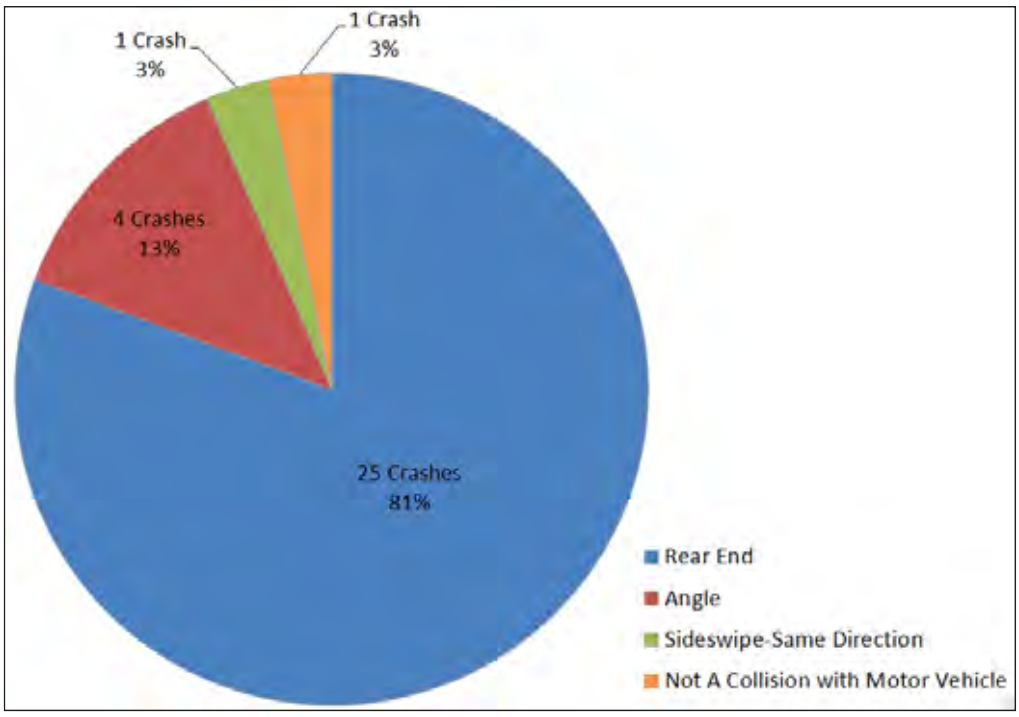


Figure 1 I-285 Eastbound Ramp Intersection Crash Frequency by Crash Type (2008-2012)

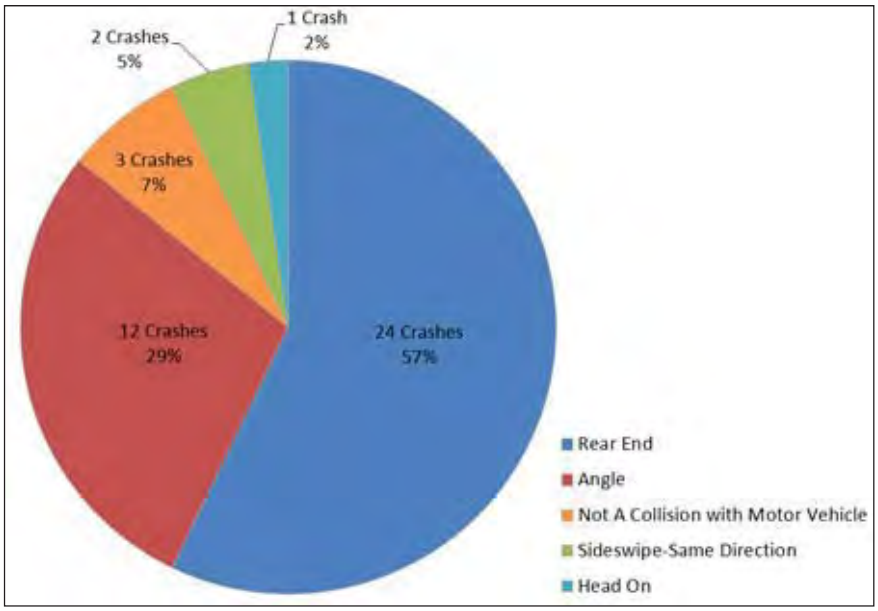


Figure 2 I-285 Westbound Ramp Intersection Crash Frequency by Crash Type (2008 - 2012)

Note: This intersection was converted from a stop-controlled intersection to a signalized intersection in 2011.

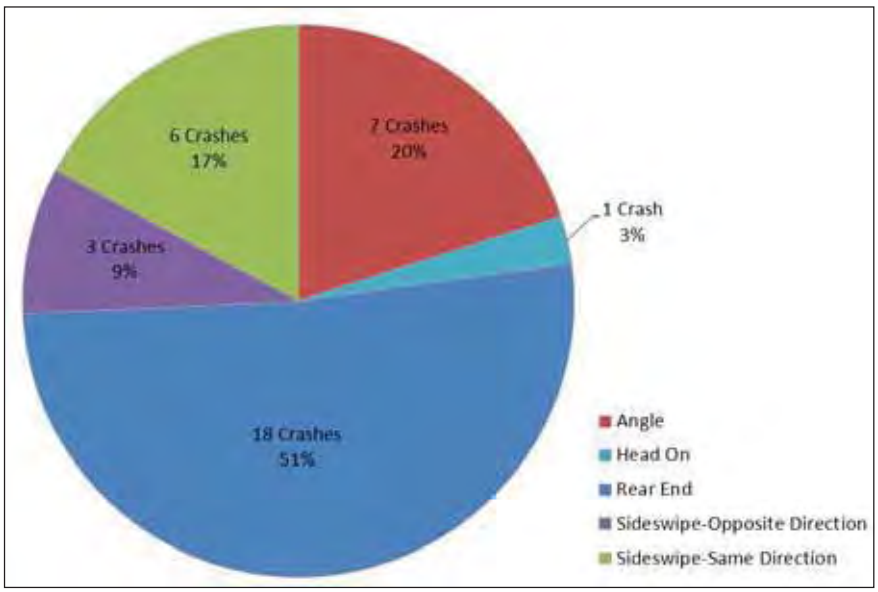


Figure 3 Heards Ferry Road Intersection Crash Frequency by Crash Type (2008 - 2012)

Figures 3 through 5 show that rear-end crashes and angle crashes are the most prevalent crash types at all three intersections along the study corridor. These two types of crashes represent approximately 94 percent of the total crashes that occurred at the I-285 eastbound ramp intersection, approximately 86 percent of the total crashes that occurred at the I-285 westbound ramp intersection, and approximately 71 percent of the total crashes that occurred at the Heards Ferry Road intersection. In general, these two crash types are the most prevalent at signalized intersections.

Figure 5 shows that 17 percent of the crashes that occurred at the Heards Ferry Road intersection were sideswipe – same direction crashes. Sideswipe crashes only accounted for 5 percent of the total crashes that occurred at the I-285 westbound ramp intersection and 3 percent of the total crashes that occurred at the I-285 eastbound ramp intersection. This crash type is common at locations where traffic must weave across lanes to access adjacent land uses.

1.1.3 Crash Severity Analysis

The severity of the crashes was analyzed by calculating the percentage of each type of crash that involved injuries or fatalities. At the study intersections, injuries are common for angle crashes and rear-end crashes. Tables 2 to 4 show the injury rates for each crash type for the three study intersections. Overall, 32 percent of the crashes at the I-285 eastbound ramp intersection involved injuries, 14 percent of the crashes at the I-285 westbound ramp intersection involved injuries, and 11 percent of the crashes at the Heards Ferry Road intersection involved injuries. During the five years of study, no crashes involving fatalities occurred at the study intersections.

Table 2 I-285 Eastbound Ramp Intersection Crash Severity (2008–2012)

Collision Type	Number of Crashes	Number of Injury Crashes	Percentage of Injury Crashes
Angle	4	2	50%
Not a Collision With a Motor Vehicle	1	0	0%
Rear End	25	8	32%
Sideswipe - Same Direction	1	0	0%
Total	31	10	32%

Table 3 I-285 Westbound Ramp Intersection Crash Severity (2008–2012)*

Collision Type	Number of Crashes	Number of Injury Crashes	Percentage of Injury Crashes
Rear End	24	3	13%
Angle	12	2	17%
Not a Collision With a Motor Vehicle	3	0	0%
Sideswipe - Same Direction	2	1	50%
Head On	1	0	0%
Total	42	6	14%

*This intersection was converted from a stop-controlled intersection to a signalized intersection in 2011.

Table 4 Heards Ferry Road Intersection Crash Severity (2008–2012)

Collision Type	Number of Crashes	Number of Injury Crashes	Percentage of Injury Crashes
Angle	7	1	14%
Head On	1	0	0%
Rear End	18	3	17%
Sideswipe - Opposite Direction	3	0	0%
Sideswipe - Same Direction	6	0	0%
Total	35	4	11%

1.1.4 Historical Crash Summary

The historical crash analysis shows that all three of the study area intersections have had crash rates above the statewide average within the five years of crash data studied. Rear-end and angle crashes were the most prevalent crash types at the intersections and are typically the most common crash types seen at signalized intersections. Crashes of these types have been particularly serious at the I-285 eastbound ramp intersection, where more than one-third of these crashes resulted in injuries. Crashes occurring around the interchange not only have the potential to cause injuries and property damage, but also to cause nonrecurring congestion along the

Riverside Drive and I-285 corridors, which adds to the already present congestion issues. By reducing conflict points, the roundabout design is expected to reduce the number and severity of crashes occurring at the interchange intersections, which will also contribute to reducing nonrecurring congestion.

1.2 Predictive Crash Analysis

To predict the reduction in crash rates that may occur at the Riverside Drive intersections with the I-285 westbound ramps and the I-285 eastbound ramps after their conversion to roundabouts, the Predictive Method for Urban and Suburban Arterials outlined in Chapter 12 of the 2010 Highway Safety Manual (HSM) was followed. The inputs to this method included signalization as the base condition for both ramp intersections, which is the existing condition as well as the no-build condition. Note, however, that the I-285 westbound ramp intersection was converted from stop controlled to signalized in 2011.

The HSM provides safety performance function (SPF) formulas for standard intersection types that use site-specific ADT values as an input. The predicted crashes from the SPFs are further modified to site-specific conditions using crash modification factors (CMFs) for certain geometric design and traffic control features such as the addition of left-turn lanes. Finally, a calibration factor is applied to the predicted crashes that is equal to the number of observed crashes divided by the number of predicted crashes to obtain the final number of predicted crashes.

The HSM methodology was followed to predict the number of multi-vehicle and single-vehicle crashes (separated further into injury/fatality crashes and PDO crashes) that are expected to occur at the two intersections in the 2015 open year and the 2035 design year under no-build conditions. The HSM methodology predicts the number of fatality and injury crashes that will occur as a combined number. However, because no fatalities occurred at the ramp termini intersections during the five years of available crash data, the fatality/injury crash prediction for these intersections is shown as a prediction for injury crashes only.

1.2.1 Crash Reduction

Chapter 12 of the HSM provides crash modification factors to be used to predict the reduction in crash rates expected to accompany conversion of intersections to roundabouts. The HSM provides a crash modification factor of 0.52 (equal to a reduction of 48 percent) for conversion from a signalized intersection to a roundabout.

To calculate the expected number of crashes for the build conditions, the no-build expected crash rates from the HSM methodology were multiplied by the roundabout crash modification factor from the HSM. The results of the HSM predictive method are shown in Table 5 and Table 6.

Table 5 Riverside Drive and I-285 Westbound Ramp Intersection Predicted Crash Rates and Percentage of Crash Reduction

Crash Type	Open Year (2015)			Design Year (2035)		
	No-Build	Build	Percent Reduction	No-Build	Build	Percent Reduction
Total Predicted Crashes	9.59	4.99	48%	10.90	5.67	48%
Predicted Injury Crashes	3.08	1.60	48%	3.53	1.84	48%
Predicted PDO Crashes	6.51	3.39	48%	7.37	3.83	48%

Table 6 Riverside Drive and I-285 Eastbound Ramp Intersection Predicted Crash Rates and Percentage of Crash Reduction

Crash Type	Open Year (2015)			Design Year (2035)		
	No-Build	Build	Percent Reduction	No-Build	Build	Percent Reduction
Total Predicted Crashes	6.40	3.33	48%	7.27	3.78	48%
Predicted Injury Crashes	1.94	1.01	48%	2.21	1.15	48%
Predicted PDO Crashes	4.47	2.32	48%	5.06	2.63	48%

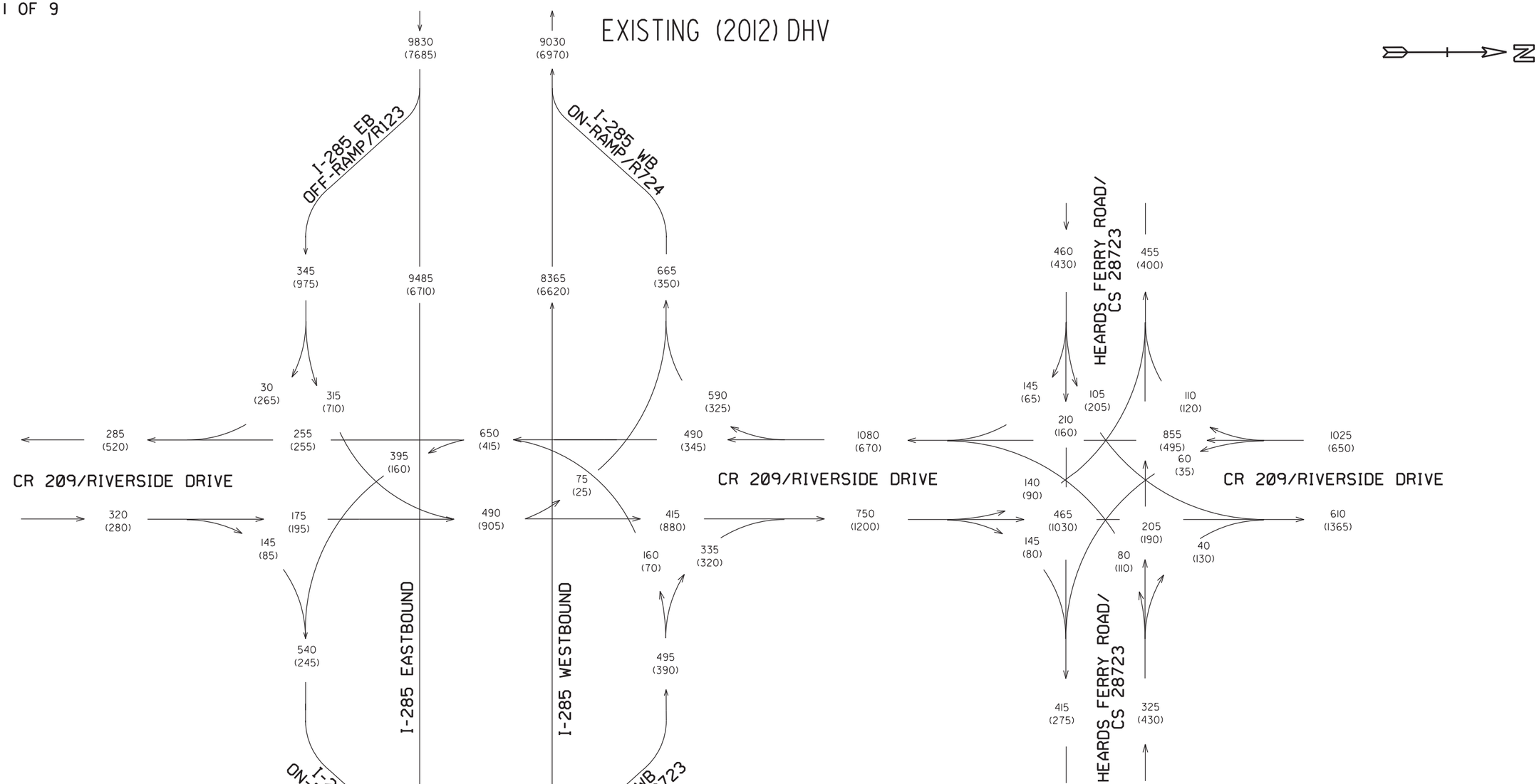
1.2.2 Crash Reduction Cost Savings

According to GDOT, injury crashes can be associated with an average cost value of $955,500, and PDO crashes can be associated with an average cost value of $27,300. Using these average cost values and the predicted crash rate and crash reduction information presented in Tables 5 and 6 above, the cost savings in crash reductions in open year 2015 and design year 2035 from no-build to build conditions were

calculated. Using this information, the total expected crash reduction cost savings for the two ramp termini intersections is approximately $2.4 million in open year 2015 and approximately $2.8 million in design year 2035. Assuming a linear increase in crash reduction cost savings over the life of the project, the conversion of the ramp termini intersections from signalized intersections to roundabouts is expected to save approximately $52.4 million over the 20-year life of the project.

ATTACHMENT 6
VOLUME DIAGRAMS

EXISTING (2012) DHV



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

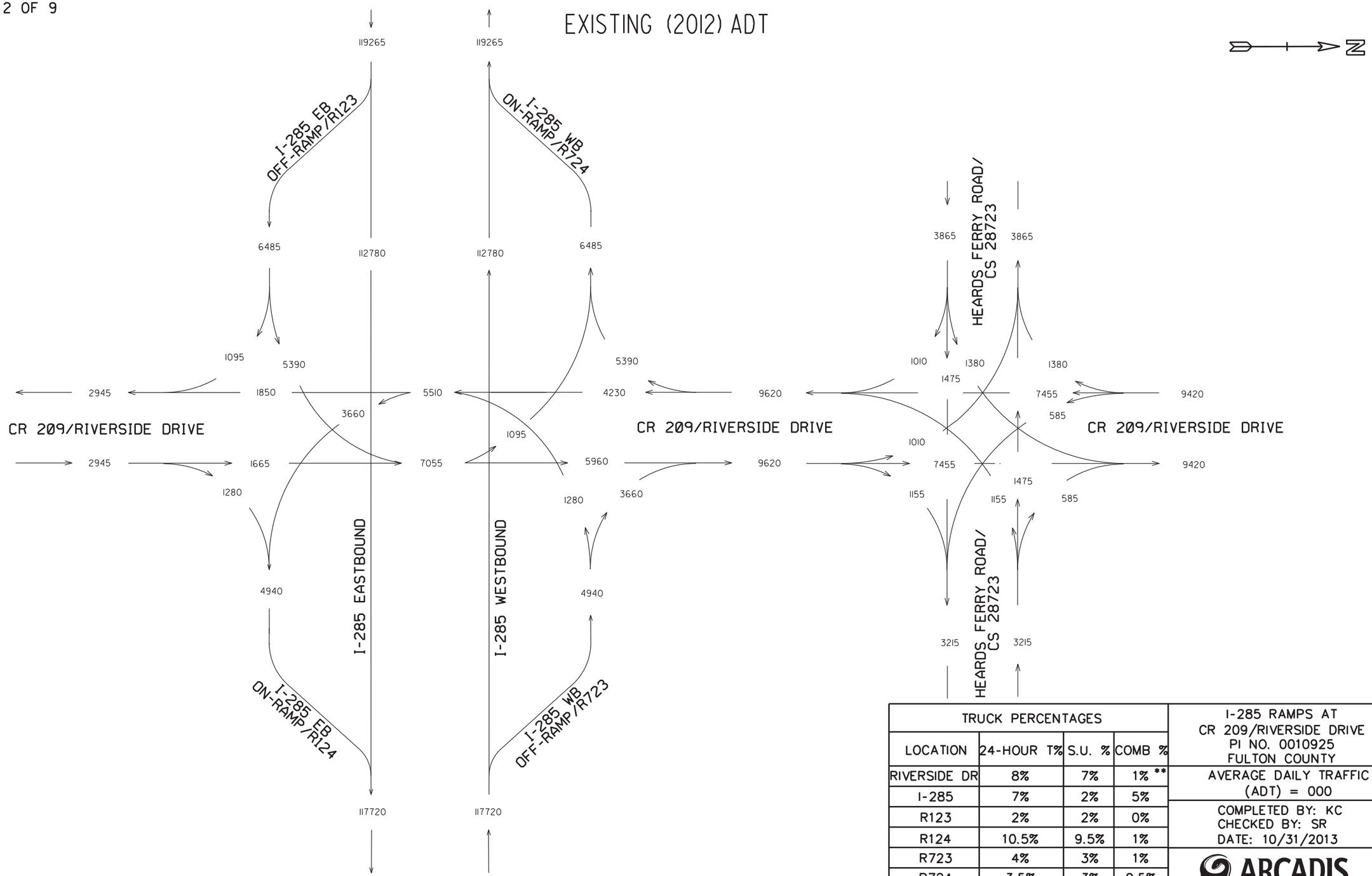
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

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

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

EXISTING (2012) ADT



TRUCK PERCENTAGES			
LOCATION	24-HOUR T%	S.U. %	COMB %
RIVERSIDE DR	8%	7%	1% **
I-285	7%	2%	5%
R123	2%	2%	0%
R124	10.5%	9.5%	1%
R723	4%	3%	1%
R724	3.5%	3%	0.5%
** LARGE TRUCKS PROHIBITED			

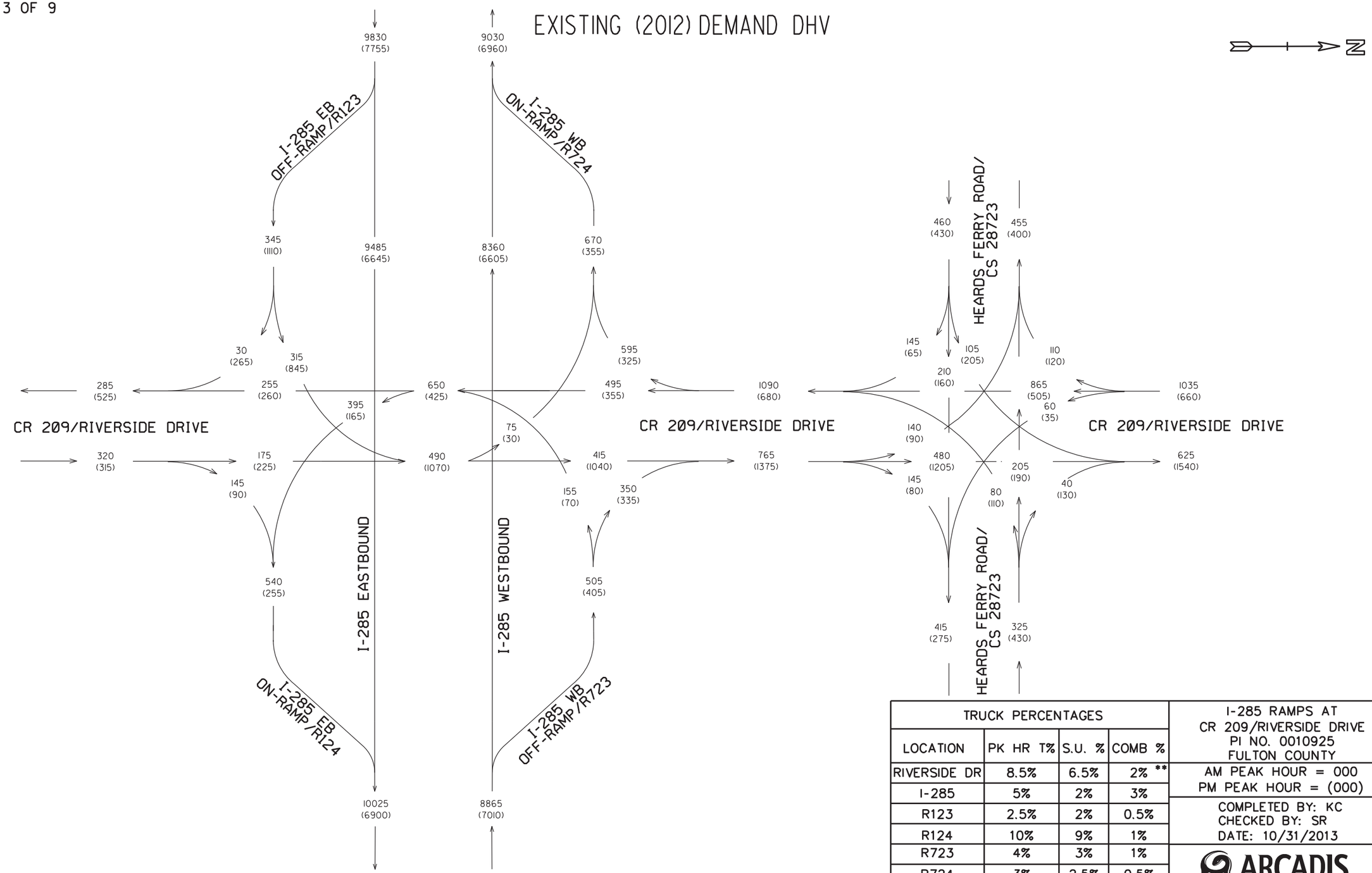
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

AVERAGE DAILY TRAFFIC
(ADT) = 000

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

EXISTING (2012) DEMAND DHV



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

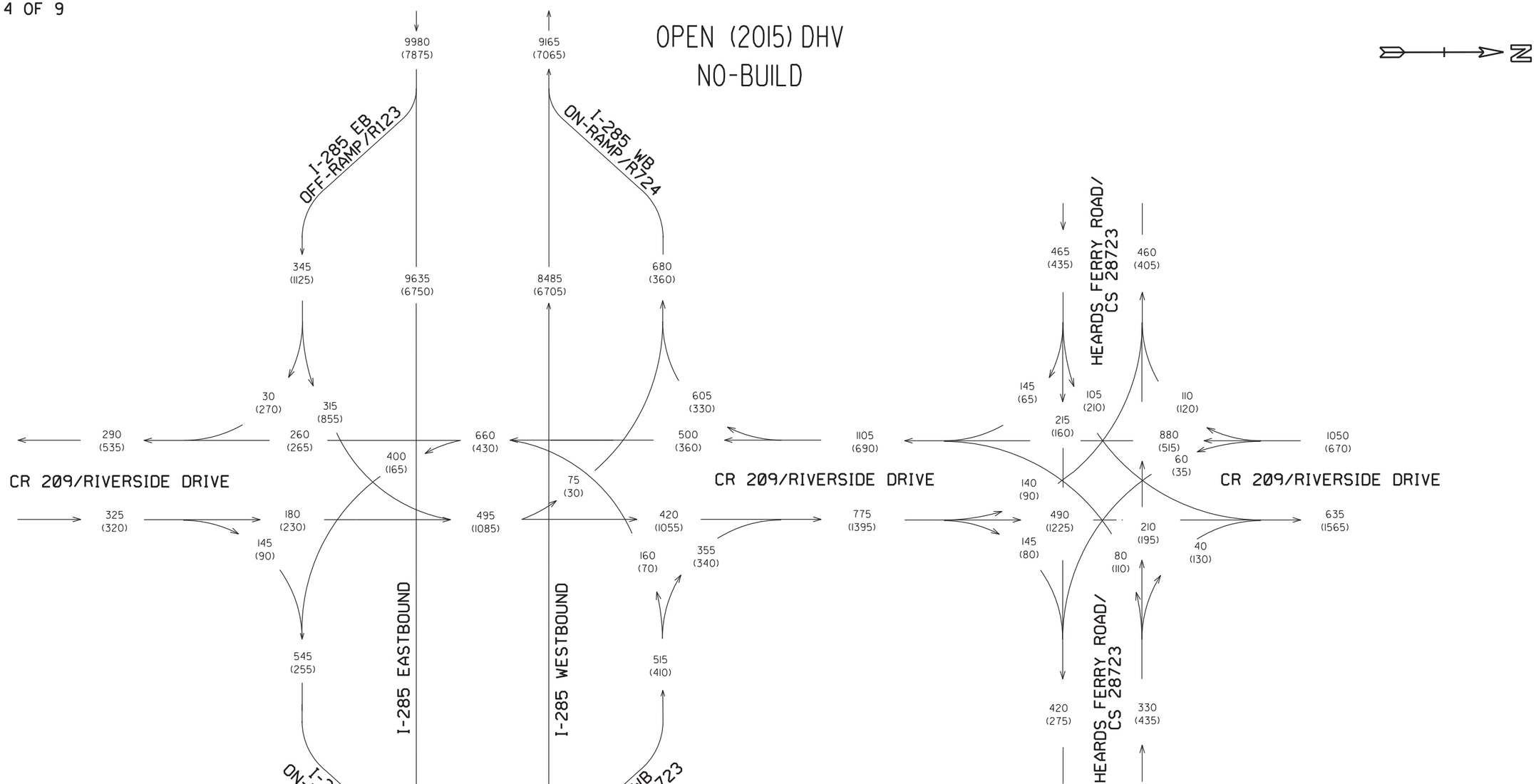
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

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

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

OPEN (2015) DHV
NO-BUILD



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

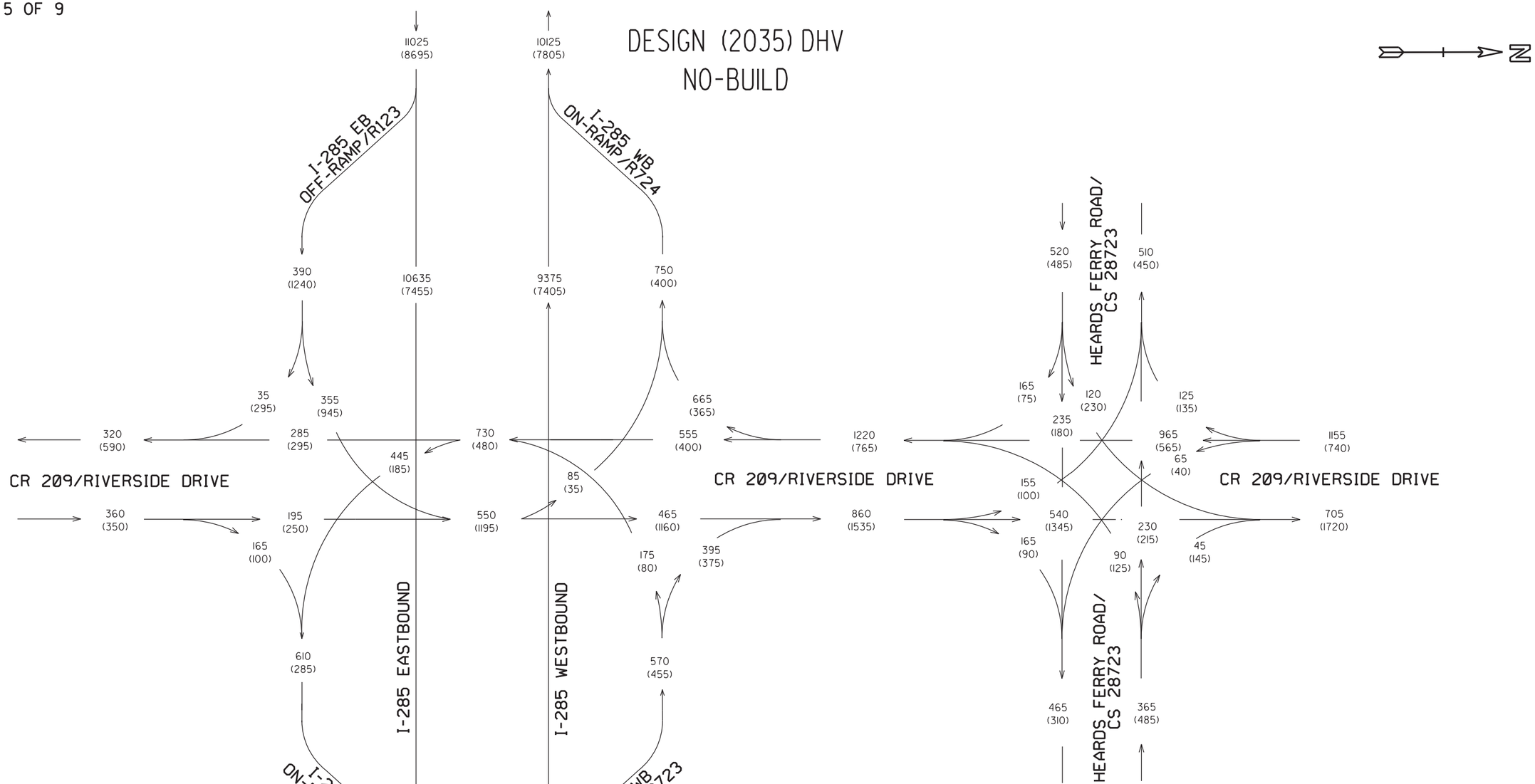
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

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

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

DESIGN (2035) DHV
NO-BUILD



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

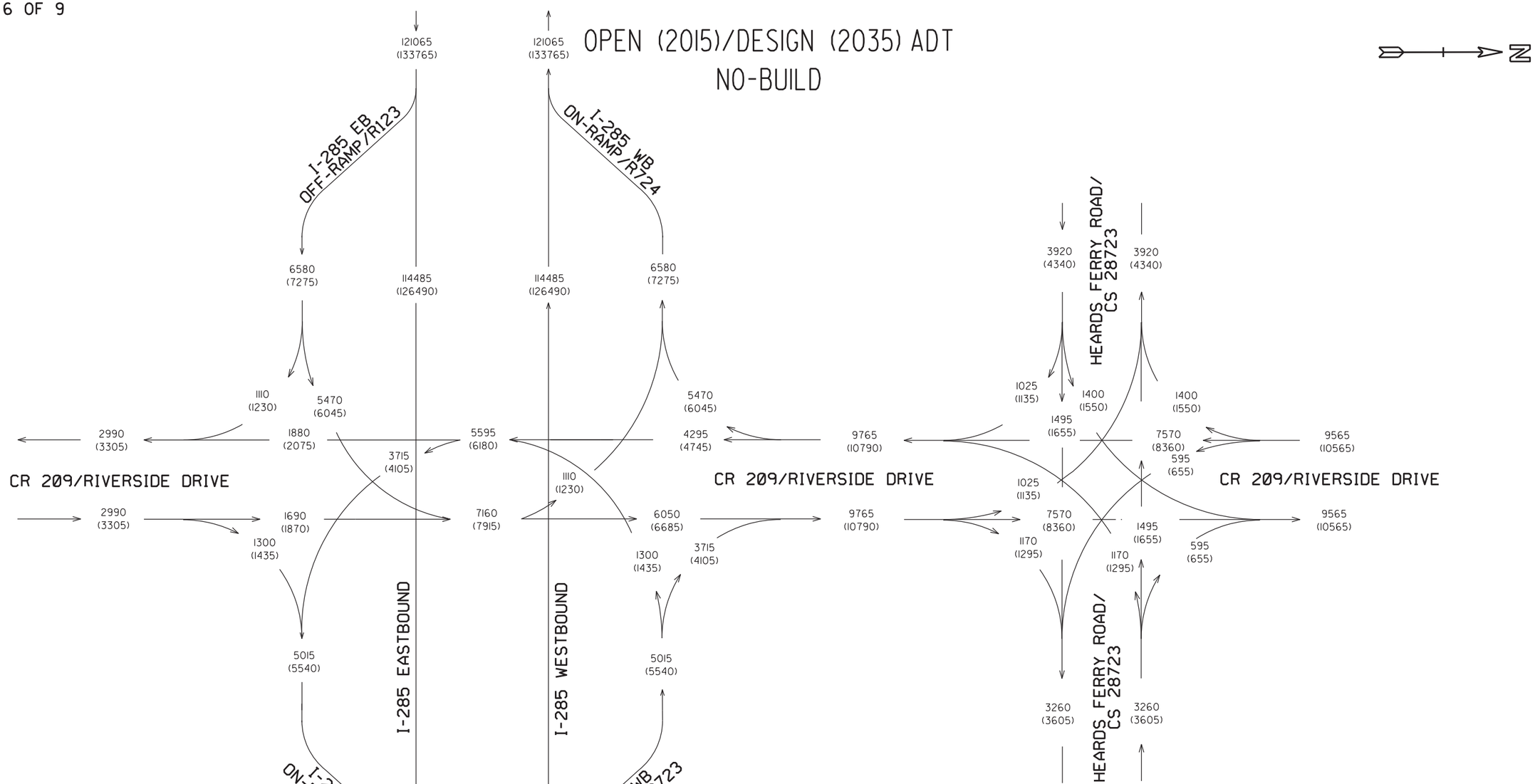
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

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

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

OPEN (2015)/DESIGN (2035) ADT
NO-BUILD



TRUCK PERCENTAGES			
LOCATION	24-HOUR T%	S.U. %	COMB %
RIVERSIDE DR	8%	7%	1% **
I-285	7%	2%	5%
R123	2%	2%	0%
R124	10.5%	9.5%	1%
R723	4%	3%	1%
R724	3.5%	3%	0.5%
** LARGE TRUCKS PROHIBITED			

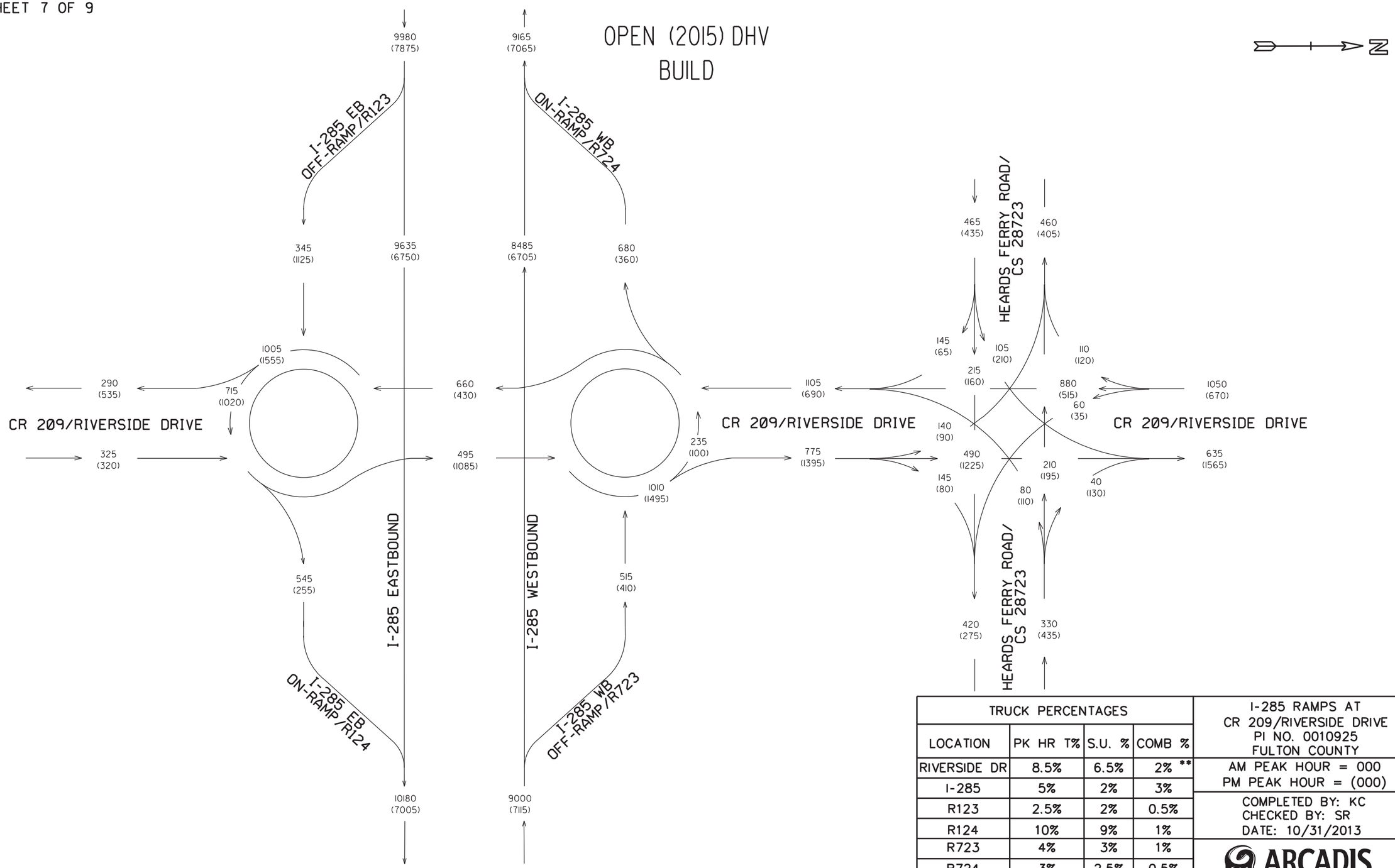
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

2015 ADT = 000
2035 ADT = (000)

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

OPEN (2015) DHV BUILD



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

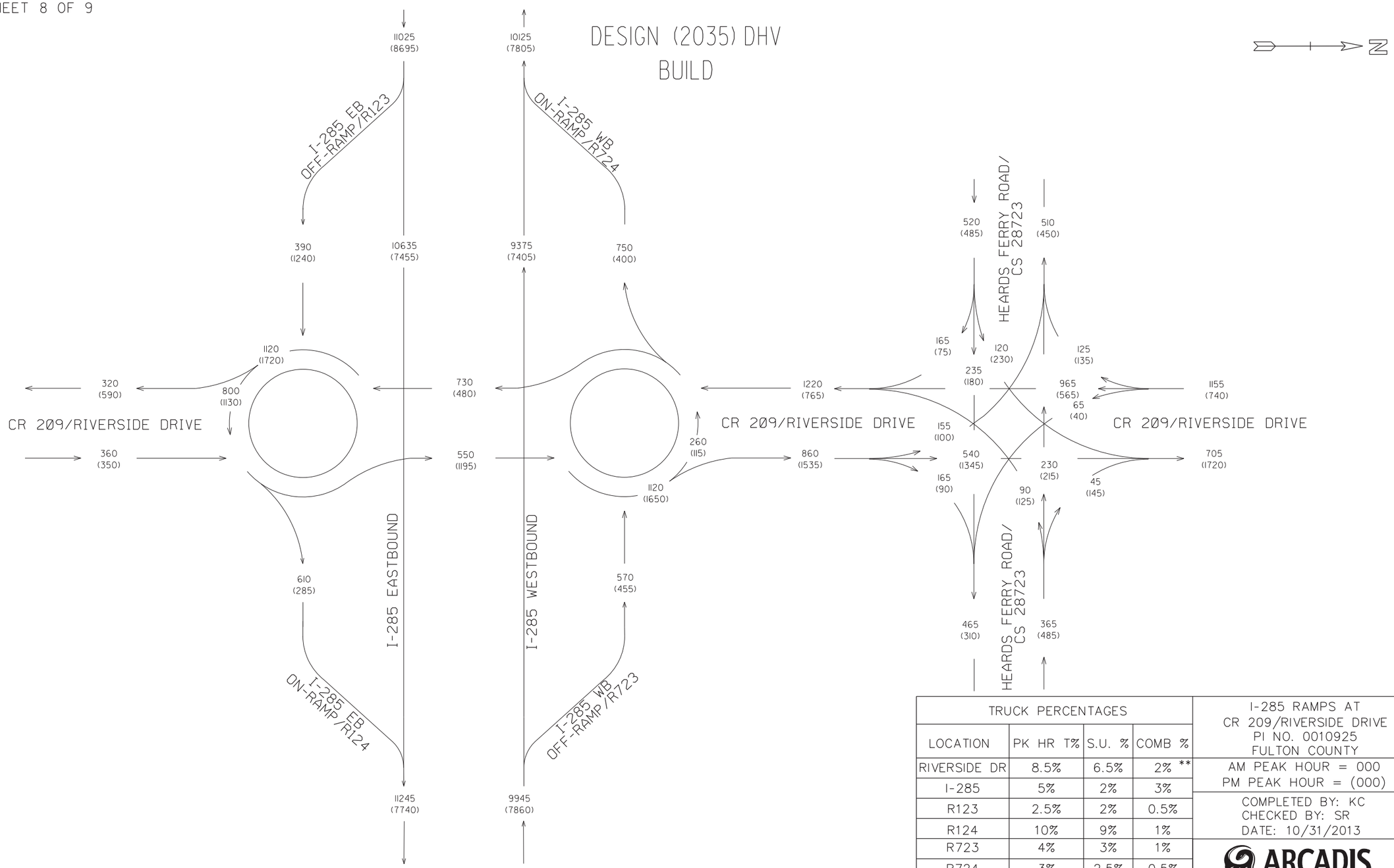
AM PEAK HOUR = 000
PM PEAK HOUR = (000)

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

SHEET 8 OF 9

DESIGN (2035) DHV
BUILD



TRUCK PERCENTAGES			
LOCATION	PK HR T%	S.U. %	COMB %
RIVERSIDE DR	8.5%	6.5%	2% **
I-285	5%	2%	3%
R123	2.5%	2%	0.5%
R124	10%	9%	1%
R723	4%	3%	1%
R724	3%	2.5%	0.5%
** LARGE TRUCKS PROHIBITED			

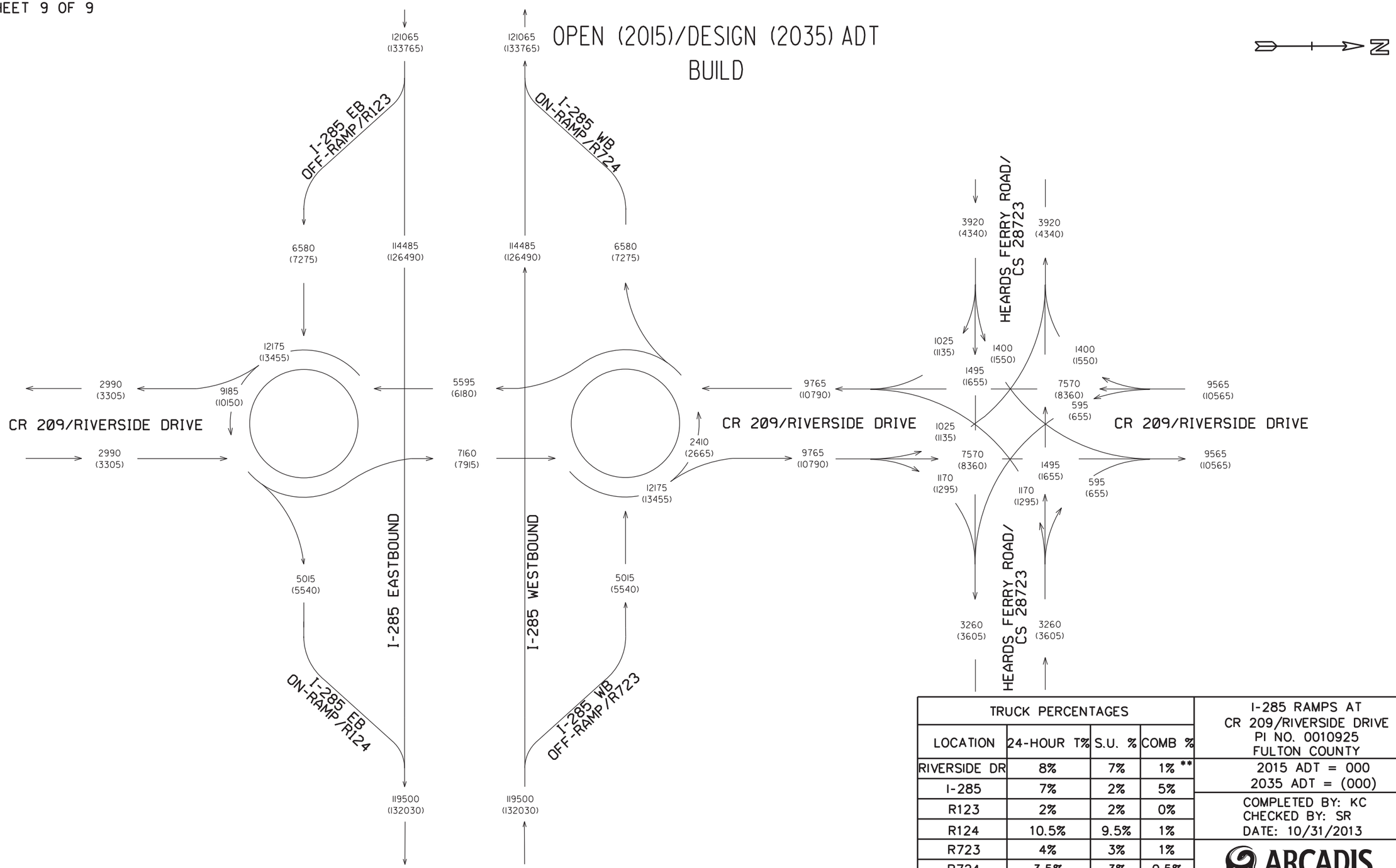
I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

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

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

OPEN (2015)/DESIGN (2035) ADT
BUILD



TRUCK PERCENTAGES			
LOCATION	24-HOUR T%	S.U. %	COMB %
RIVERSIDE DR	8%	7%	1% **
I-285	7%	2%	5%
R123	2%	2%	0%
R124	10.5%	9.5%	1%
R723	4%	3%	1%
R724	3.5%	3%	0.5%
** LARGE TRUCKS PROHIBITED			

I-285 RAMPS AT
CR 209/RIVERSIDE DRIVE
PI NO. 0010925
FULTON COUNTY

2015 ADT = 000
2035 ADT = (000)

COMPLETED BY: KC
CHECKED BY: SR
DATE: 10/31/2013

ARCADIS
Infrastructure, Water, Environment, Buildings

ATTACHMENT 7

CAPACITY ANALYSIS SUMMARY

1. Traffic Analysis

A detailed traffic analysis was completed for existing, no build, and build conditions using Synchro 8 and SIDRA 5.1. Synchro was used to develop signal timings using existing field timings provided by the City of Sandy Springs, and was also used to complete intersection capacity analyses. The existing field timings were maintained for future year scenarios for both the no-build and the roundabout build alternatives because these timings are already optimized for the corridor. Because the interchange lane configuration changes under the bridge widening build alternative, the signal timings for the ramp intersections were optimized within Synchro for these scenarios and the Heards Ferry Road signal timing was maintained at the existing timing plan. One limitation to the Synchro modeling software is that it's not able to easily evaluate overall network performance for innovative designs such as roundabouts. Instead, SIDRA was used to analyze interchange operations under roundabout build conditions, as the SIDRA modeling software is specifically designed to evaluate roundabout performance.

The existing Synchro networks were calibrated to existing traffic conditions using turning movement volumes and simulation visualization. Future year networks were developed based on the calibrated existing networks with the bridge widening project added for build conditions. Future year roundabout build models were developed using SIDRA.

The following section describes the findings of the Synchro and SIDRA capacity analysis. In the analysis, the roundabout concept is referred to as build Alternative 1 and the bridge widening concept is referred to as build Alternative 2.

1.1 Capacity Analysis

With Synchro, the intersection capacity analysis uses intersection geometry, peak hour volumes, and timings to determine the intersection delay based on guidance provided by the 2000 Highway Capacity Manual (HCM). SIDRA also bases intersection delay on guidance from the 2000 HCM as well as on model inputs such as geometry, peak hour volumes, and gap acceptance. Intersection delay can be associated with level of service (LOS) or a grade given to each intersection based on its operation. Table 1 shows the average delay associated with each LOS based on the 2000 HCM.

Table 1 HCM 2000 Intersection Level of Service

Level of Service (LOS)	Average Delay per Vehicle (Seconds/Vehicle)
A	Less than 10
B	10 – 20
C	20.1 – 35
D	35.1 – 55
E	55.1 – 80
F	Greater than 80

The results of the Synchro and SIDRA capacity analysis are presented in Tables 2 and 3, which show the delay and LOS at each of the study area intersections under the various scenarios. Table 2 presents the a.m. peak hour results and Table 3 presents the p.m. peak hour results.

Table 2 A.M. Peak Intersection Delay and Level of Service

Intersection	Existing Year (2012)	Open Year (2015)			Design Year (2035)		
		No-Build	Build Alt. 1	Build Alt. 2	No-Build	Build Alt. 1	Build Alt. 2
I-285 Eastbound Ramps	68.2 (LOS E)	76.4 (LOS E)	10.4 (LOS B)	36.2 (LOS D)	135.7 (LOS F)	11.5 (LOS B)	38.4 (LOS D)
I-285 Westbound Ramps	81.5 (LOS F)	95.2 (LOS F)	7.3 (LOS A)	15.8 (LOS B)	195.5 (LOS F)	8.1 (LOS A)	15.7 (LOS B)
Heards Ferry Road	158.4 (LOS F)	163.5 (LOS F)	169.7 (LOS F)	168.0 (LOS F)	211.5 (LOS F)	219.5 (LOS F)	218.2 (LOS F)

Table 3 P.M. Peak Intersection Delay and Level of Service

Intersection	Existing Year (2012)	Open Year (2015)			Design Year (2035)		
		No-Build	Build Alt. 1	Build Alt. 2	No-Build	Build Alt. 1	Build Alt. 2
I-285 Eastbound Ramps	221.1 (LOS F)	233.6 (LOS F)	23.2 (LOS C)	118.5 (LOS F)	292.8 (LOS F)	44.2 (LOS D)	152.3 (LOS F)
I-285 Westbound Ramps	101.2 (LOS F)	111.2 (LOS F)	12.1 (LOS B)	76.6 (LOS E)	210.9 (LOS F)	25.7 (LOS C)	119.5 (LOS F)
Heards Ferry Road	153.8 (LOS F)	160.0 (LOS F)	162.9 (LOS F)	160.3 (LOS F)	207.2 (LOS F)	209.4 (LOS F)	207.3 (LOS F)

I-285 Eastbound Ramp Intersection Summary

- Under existing conditions, this intersection operates at an LOS E during the a.m. peak period and at an LOS F during the p.m. peak period.

- Under the no-build alternative, this intersection is expected to continue to operate at an LOS F during the p.m. peak period in the open year 2015 as well as in the design year 2035. During the a.m. peak period, the LOS is expected to decrease to LOS F by the design year 2035.

- Under roundabout build conditions, this intersection will experience a significant reduction in delay and will operate at an LOS B during the a.m. peak throughout the design life. During the p.m. peak, this intersection is expected to operate at an LOS B in the open year and at an LOS D in the design year. The delay improvements are primarily due to the fact that the roundabout design greatly improves operations for the heavy eastbound off-ramp left-turn movement.

- Under bridge widening conditions, this intersection is expected to operate at an LOS D during the a.m. peak periods and at an LOS F during the p.m. peak periods. Although this intersection is expected to operate at LOS D or F under the bridge widening conditions, the delay is still significantly reduced from what is projected under no-build conditions.

I-285 Westbound Ramp Intersection Summary

- Under existing conditions, this intersection operates at an LOS F during both the a.m. and p.m. peak periods.

- Under the no-build alternative, this intersection will remain at an LOS F during both peak periods through the design year 2035.

- Under roundabout build conditions, this intersection will improve to LOS A during the a.m. peak period for both the open year and the design year. During the p.m. peak periods, this intersection will improve to LOS B in the open year 2015 and to LOS C in the design year 2035. However, as SIDRA cannot account for impacts from adjacent intersections, queuing from the Heards Ferry Road intersection could result in slightly higher delays.

- Under the bridge widening conditions, this intersection will improve to an LOS B during the a.m. peak periods. During the p.m. peak periods, this intersection will improve to an LOS E during the open year and will operate at an LOS F during the design year.

Heards Ferry Road Intersection Summary

- Under existing conditions, this intersection performs at an LOS F during both the a.m. and p.m. peak periods.

- Under the no-build alternative, this intersection is expected to remain at an LOS F during both peak periods through the design year 2035.

- Under roundabout build conditions, this intersection is expected to remain at an LOS F in all scenarios. Although the Heards Ferry Road traffic signal will no longer be tied to the ramp intersections in this build scenario, the signal timing at this intersection is expected to remain at its current timing in future years. Therefore, while the ramp intersections are expected to operate more efficiently in this alternative, the Heards Ferry Road intersection acts as a bottleneck for the heavy northbound traffic.

- Under bridge widening build conditions, this intersection is also expected to remain at an LOS F in all scenarios, as no geometric or signal timing improvements are being made to this intersection.

ATTACHMENT 8
ROUNDABOUT DATA

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
225 E Robinson Street, Suite 450, Orlando, FL 32801 P 407.540.0555 F 407.540.0550

TECHNICAL MEMORANDUM

I-285 at Riverside Drive Interchange, Fulton County, GA

Roundabout Feasibility Evaluation

Date:	November 23, 2011	Project #: 10956 Task 7
To:	Georgia Department of Transportation	
From:	Justin Bansen, P.E., Matt Ashby, and Rohit Rai	
cc:	Nick Castronova, URS	

INTRODUCTION

Kittelson & Associates, Inc. (KAI), in coordination with URS, evaluated the operational and geometric feasibility for utilizing roundabouts at the ramp terminal intersections at the Riverside Drive interchange on Interstate 285 (I-285) in Fulton County, Georgia. This memorandum summarizes the operational analysis for a roundabout alternative as well as a comparison to no-build and signal improvements. For the roundabout alternative, KAI developed a conceptual design for each ramp terminal intersection to identify the anticipated footprint for roundabout alternatives and identify potential design issues that would require further investigation as part of a future design process. Costs estimates and design performance checks are also provided in the Appendices.

The evaluation documented in this memorandum builds upon previous work by GDOT staff. GDOT provided the following base information for use in the project: existing and projected traffic volume data, preliminary roundabout operations analysis, aerial photography, and a preliminary conceptual roundabout layout.

Based upon KAI's evaluation, roundabouts are a feasible alternative for improving the operational performance of the ramp terminal intersections. Single-lane roundabouts with bypass lanes will adequately serve the ramp terminal intersections for the forecast 2034 traffic volumes without the need for replacement of the bridge over I-285. From a geometric standpoint, roundabouts can be accommodated within the existing right-of-way at both ramp terminal locations; however, more detailed investigation of drainage, utilities, and vertical constraints will be needed if the project moves into the design phase.

INTERSECTION OPERATIONS ANALYSIS

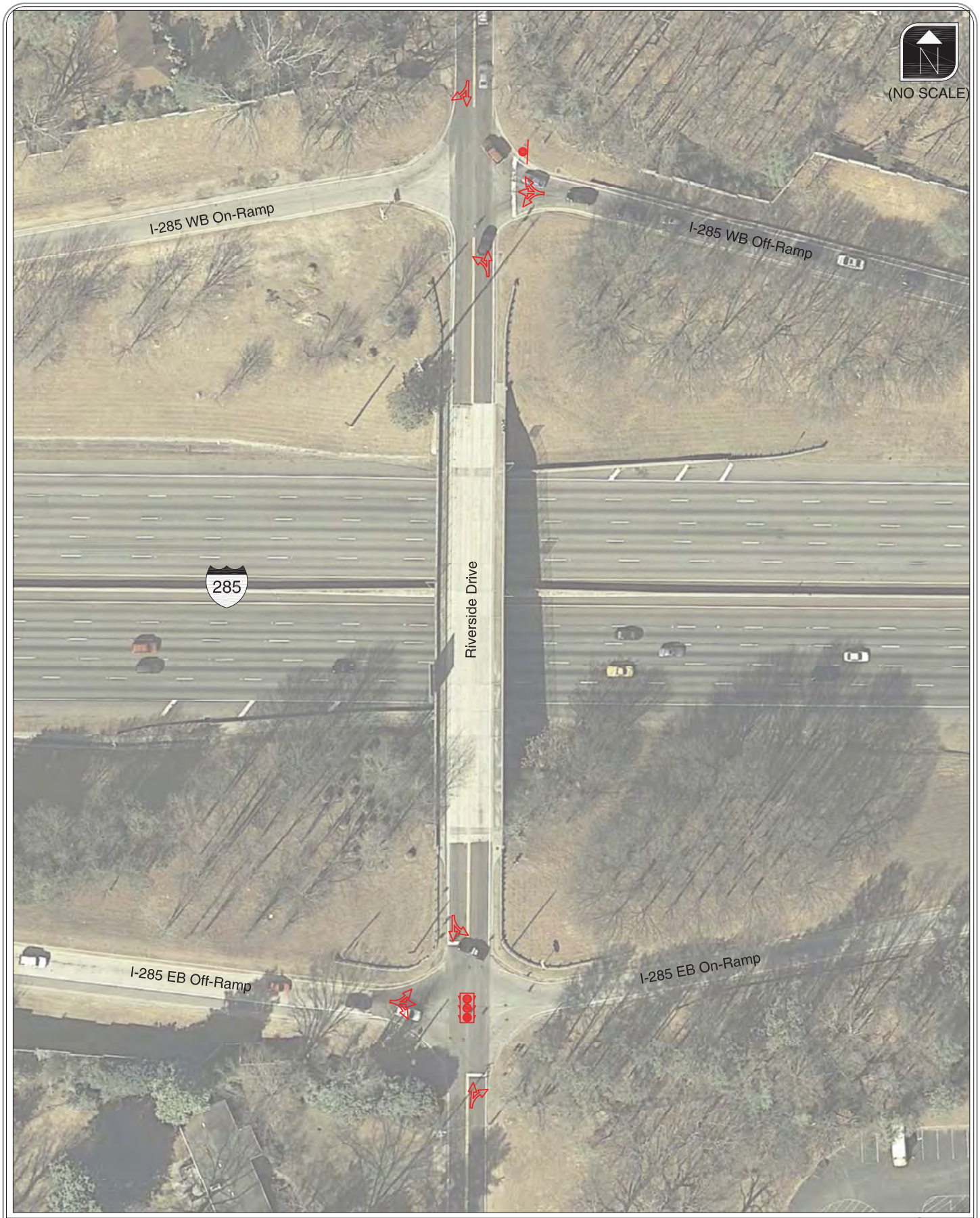
KAI evaluated the two ramp terminal intersections at the I-285 and Riverside Drive interchange using Highway Capacity Manual methodologies. KAI evaluated the existing 2009 traffic conditions at both study intersections as well as the following control scenarios for opening year 2014 and design year 2034 conditions:

1. No-Build conditions - Existing Two-Way Stop Control (TWSC) conditions at the westbound off-ramp intersection and signal control at the eastbound off-ramp intersection.
2. Signalized control alternatives were considered at both intersections along with improved lane configurations for future year 2034 only. The results of these analyses are provided for comparison of operational performance to a roundabout alternative.
3. Roundabout control alternatives were considered at both intersections. The analysis identifies the expected traffic operations and necessary geometric configurations.

Peak hour traffic volumes utilized for the analyses were sourced from information provided by GDOT staff. This included existing 2009 am and pm peak hour traffic volumes, historical volumes, identified growth rates for the design year, and opening and design year peak hour traffic forecasts. A heavy vehicle percent (%HV) of 5% was applied to all movements for all analysis scenarios. This value was obtained from the initial operations analysis prepared by Georgia DOT staff which identified 3% SU/BUS class vehicles and 2% Trucks/Combination vehicles. KAI aggregated the two classes together for the purposes of this analysis given that the heavy-vehicle equivalency factor for both vehicle types is the same for Highway Capacity Manual methodologies. Volume data and historical growth rate calculations are provided in Appendix A.

EXISTING (2009) INTERSECTION OPERATIONS

As illustrated in Figure 1, the westbound ramp intersection is currently operated under two-way stop control. The northbound and southbound approaches along Riverside Drive are uncontrolled, with the westbound off-ramp approach under stop control. Each approach has a single shared lane. Highway Capacity Software (HCS) 2010 was used to analyze the existing conditions. The stop controlled westbound off-ramp was found to operate with a v/c ratio > 1.0 and levels-of-service "F" during both am and pm peak hours. The 95th percentile queues of 10 to 16 vehicles are estimated on the westbound off-ramp for the am and pm peak hours respectively. The length of the off-ramp, from the painted gore exiting I-285 to the stop bar at Riverside Drive is approximately 950 feet. While the queue is currently being accommodated on the ramp, the length of the queue may result in vehicle deceleration occurring on the I-285 mainline. The results of this analysis are summarized in Table 1.



Existing Lane Configurations and Traffic Control Devices
Fulton County, GA

FIGURE 1

Table 1 I-285 Westbound Ramps – 2009 Existing Volumes (Existing Lane Configurations and Two-Way Stop Control)

Movement	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)	**1.10**	**106.8 [F]**	**16**	**0.92**	**59.5 [F]**	**10**
Riverside Drive (Northbound)	0.07	10.5 [B]	1	0.03	8.1 [A]	1

The eastbound ramp intersection currently operates under signalized control with a single shared lane on all approaches. The signalized intersection analysis was performed using the software Synchro (Version 5). The analysis assumed a 120-second cycle length and permissive left-turn phasing on the northbound and southbound Riverside Drive approaches. The analysis indicates that all movements operate with a v/c ratio less than 1.0 and have a level-of-service of E or better under year 2009 traffic volumes. However, the eastbound off-ramp approach is nearing capacity during the p.m. peak hour with a v/c ration of 0.93. This results in an estimated 95th percentile queue of 22 vehicles (550 feet) for the off-ramp approach. The length of the off-ramp, from the painted gore exiting I-285 to the stop bar at Riverside Drive is approximately 1,850 feet, which is sufficient to accommodate the existing queues. The results of the analysis are presented in Table 2.

Table 2 I-285 Eastbound Ramps – 2009 Existing Volumes (Existing Lane Configurations and Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Average Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through-Right Lane	0.76	57 (E)	14	**0.93**	**50 (D)**	**22**
Riverside Drive Northbound						
Shared Through-Right Lane	0.22	7 (A)	4	0.37	15 (B)	7
Riverside Drive (Southbound)						
Shared Left-Through Lane	0.62	7 (A)	4	0.57	17 (B)	5

Analysis output reports for the existing conditions scenarios are provided in Appendix B.

NO-BUILD 2014 AND 2034 INTERSECTION OPERATIONS

Tables 3 and 4 presents the estimated 2014 opening year traffic operations for the two study intersections under no-build conditions (existing intersection control and existing lane configurations). As previously shown in Table 1, the existing Two-Way Stop Control at the westbound ramp intersection provides a level-of-service "F" under existing 2009 conditions. Additional volume growth will further increase delays and queues at the intersection due to over-capacity conditions. Results shown in Table 3 allow for a relative comparison to the alternative signal and roundabout control options; however, the over-capacity conditions on the I-285 westbound off-ramp impact the accuracy of the model estimate for delay and queues. Results shown in Table 3 (as well as Table 5 presented for future 2034 conditions) should be considered as an "order of magnitude" estimate of impact and not as values to be used for design purposes. Analysis reports for all No-Build scenarios are provided in Appendix C.

Table 3 I-285 Westbound Ramps – 2014 Opening Year Volumes (Existing Lane Configuration and Two-Way Stop Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)	1.37	213.0 [F]	24	1.28	180.7 [F]	20
Riverside Drive (Northbound)	0.09	11.1 [B]	1	0.05	9.9 [A]	1

Table 4 I-285 Eastbound Ramps – 2014 Opening Year Volumes (Existing Lane Configuration and Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through-Right Lane	0.83	63 (E)	16	**1.01**	**69 (E)**	**26+**
Riverside Drive Northbound						
Shared Through-Right Lane	0.25	7 (A)	4	0.41	16 (B)	8
Riverside Drive (Southbound)						
Shared Left-Through Lane	0.70	7 (A)	6	0.70	20 (B)	7

\+ indicates that queue may be longer due to volume exceeding capacity

Tables 5 and 6 presents the estimated 2034 design year traffic operations for the two study intersections under no-build conditions (existing intersection control and existing lane configurations). As shown in Table 5, the increase in potential volume at the westbound ramp intersection is expected to result in v/c ratios of 2.75 and 2.42 for the am and pm peak hours respectively. This is resulting in queues that are expected to exceed the 950 foot off-ramp length, resulting in potential spill-back onto the I-285 mainline.

Table 5 I-285 Westbound Ramps – 2034 Design Year Volumes (Existing Lane Configuration and Two-Way Stop Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)	2.75	832.4	53	2.42	2613.0	160
Riverside Drive Northbound	0.14	13.2	1	0.08	11.1	1

Table 6 identifies that the existing lane configurations for the signalized eastbound ramp intersection are not expected to be sufficient to serve the 2034 projected design volumes. The I-285 eastbound off-ramp and southbound Riverside Drive approaches are both expected to exceed capacity during the am and pm peak hours. The resulting queues on the eastbound off-ramp are not expected to exceed the 1,850 feet of ramp length. However, queues on the southbound Riverside Drive approach have the potential to spill back through the upstream unsignalized intersection at the westbound ramp which would further exacerbate the operational issues at the westbound ramps.

Table 6 I-285 Eastbound Ramps – 2034 Design Year Volumes (Existing Lane Configuration and Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through-Right Lane	**1.07**	**114 [F]**	**27+**	**1.30**	**175 [F]**	**35+**
Riverside Drive Northbound						
Shared Through-Right Lane	0.31	7 [A]	5	0.52	18 [B]	11
Riverside Drive (Southbound)						
Shared Left-Through Lane	**0.99**	**17 [B]**	**6+**	**1.09**	**67 [E]**	**30+**

\+ indicates that queue may be longer due to volume exceeding capacity

Yellow highlighted values indicates potential for queues spilling back through upstream intersection

BUILD ALTERNATIVE 1: SIGNALIZED INTERSECTIONS

To address the projected operational deficiencies at the study intersections for the 2034 peak hour, improvement alternatives were considered to include the upgrade of the westbound ramp intersection to signal control as well as improvements to the lane configurations at both study intersections. Figure 2 presents the various signal configurations that were evaluated. Analysis reports for all signalized intersection alternatives are provided in Appendix D.

Signals at Both Intersections (No Additional Lane Improvements)

Tables 7 and 8 present the results of the analysis assuming the westbound ramps are upgraded to signal control and no additional geometric modifications are implemented. Note that for the eastbound ramp, the results presented in Table 8 reflect the same lane configurations as those from the analysis in Table 6; however, slightly different signal timing parameters are assumed to enable a common cycle length and coordination to be provided between the two ramp terminal intersections.

Table 7 I-285 WB Ramps – 2034 Future Year Volumes (Existing Lane Configuration and Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)						
Shared Left-Through-Right Lane	**1.63**	**340 [F]**	**31 +**	**1.65**	**346 [F]**	**20 +**
Riverside Drive Northbound						
Shared Left-Through Lane	**2.11**	**553 [F]**	**31 +**	**1.51**	**256 [F]**	**29 +**
Riverside Drive (Southbound)						
Shared Through-Right Lane	**1.28**	**155 [F]**	**93 +**	**1.03**	**53 [D]**	**37 +**

\+ indicates that queue may be longer due to volume exceeding capacity

Yellow highlighted values indicate queues spilling back through upstream intersection

As shown in Table 7, the addition of signal control at the westbound ramp intersection, with no further modifications to the lane configurations, is expected to result in a slight improvement in performance for the I-285 westbound off-ramp; however, the approach will still be operating with a v/c > 1.0 for the am and pm peak hours and queues will utilize up to 775 feet of the 950 feet of available ramp length. The northbound and southbound Riverside Drive approaches experience worse operations than existing conditions, with volume exceeding capacity and approach queues that will spill back through up the upstream eastbound ramp intersection (to the south) as well as through the upstream signal to the north at Heards Ferry Road.

Traffic Signal Alternative Analysis - Lane Configuration Scenarios
Fulton County, GA

FIGURE **2**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

C:\Documents and Settings\jbansen\Desktop\Task 7 - TO 35 I-285 at Riverside\Figures.dwg Dec 05, 2011 - 9:02pm - jbansen Layout Tab: Layout2

Table 8 I-285 EB Ramps – 2034 Future Year Volumes (Existing Lane Configuration and Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through-Right Lane	**1.07**	**114 [F]**	**22 +**	**1.30**	**174 [F]**	**36 +**
Riverside Drive Northbound						
Shared Through-Right Lane	0.35	11 [B]	6	0.63	26 [C]	13
Riverside Drive (Southbound)						
Shared Left-Through Lane	**1.04**	**32 [C]**	**6 +**	**1.21**	**119 [F]**	**9 +**

\+ indicates that queue may be longer due to volume exceeding capacity

Yellow highlighted values indicate queues spilling back through upstream intersection

The eastbound ramp intersection experiences a slight reduction in capacity and a slight increase in delay for some movements due to the modifications to the cycle length as a result of adding a signal to the westbound ramp intersection. However, as shown in Table 8, the upstream westbound ramp signal actually serves as a bottleneck to restrict the arrival of vehicles during the peak hour, which would reduce the queues for the southbound movements.

Signal Alternative with Right-Turn Lanes Added To Off-Ramps (Signal Improvements #1)

To improve the potential operations of the intersections under signal control, an "improved" scenario was evaluated where an additional right-turn lane was added to each of the I-285 off-ramps. No additional widening of Riverside Drive is included in this alternative and no modifications to the I-285 bridge would be required.

Table 9 I-285 WB Ramps – 2034 Future Year Volumes (Additional Right-Turn Lane on WB Approach, Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)						
Shared Left-Through Lane	0.77	80 (E)	10+	0.41	52 (D)	5
Right-turn Lane	**2.37**	**690 (F)**	**5**	**1.95**	**500 (F)**	**14+**
Riverside Drive Northbound						
Shared Left-Through Lane	**1.70**	**395 (F)**	**31+**	**0.99**	**52 (D)**	**26+**
Riverside Drive (Southbound)						
Through Lane	**1.06**	**60 (E)**	**59+**	**0.89**	**23 (C)**	**32**

\+ indicates that queue may be longer due to volume exceeding capacity

Yellow highlighted values indicate queues spilling back through upstream intersection

Comparing Table 9 to Table 7 shows that the addition of a right-turn lane on the westbound off-ramp approach results in a substantial improvement for the left-turn movement. However, the westbound right-turn demand is continuing to result in a v/c ratio > 1.0 and LOS "F" for the westbound right-turn lane during both the am and pm peak hours. The turn lane addition reduces queuing on the off-ramp by increasing queue storage capacity and allowing for increases in right-turn-on-red maneuvers. Along Riverside Drive, the lack of additional improvements is resulting in vehicle queues continuing to spill back into the upstream intersections to the north and south.

Table 10 I-285 EB Ramps – 2034 Future Year Volumes (Additional Right-Turn Lane on EB Approach, Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through Lane	**1.04**	**67 [E]**	**23+**	**0.99**	**75 [E]**	**28+**
Right-turn Lane	0.05	26 [C]	1	0.50	35 [C]	4
Riverside Drive Northbound						
Through Lane	0.34	10 [A]	7	0.53	21 [C]	13
Riverside Drive (Southbound)						
Shared Left-Through Lane	**1.03**	**33 [C]**	**12+**	0.99	50 [D]	12

\+ indicates that queue may be longer due to volume exceeding capacity

Similar to the results from the westbound ramp, Table 10 shows that the additional turn lane on the I-285 off-ramp will provide a slight improvement in operations. However, left-turning vehicles comprise the majority of the off-ramp traffic and therefore the turn lane addition results in more modest improvement to the overall intersection operations. However, during the pm peak hour, the intersection is estimated to be able to operate with all approaches having a v/c ratio less than 1.0 and a level-of-service of "E" or better. The off-ramp approach has the worst operations under both peak hours with a level-of-service "E" and queues exceeding 23 vehicles (575 feet).

Signal Alternative with Right-Turn Lanes Added To Off-Ramps and Riverside Dr. (Signal Improvements #2)

A second signal alternative explored the potential impact of providing both right-turn lanes to the off-ramps as well as right-turn lanes along Riverside Drive onto the I-285 on-ramp (NB right-turn lane at the eastbound ramps and SB right-turn lane at the westbound ramps). No additional widening of Riverside Drive is included beyond what has been noted in this alternative and no modifications to the I-285 bridge would be required.

Table 11 I-285 WB Ramps – 2034 Future Year Volumes (Additional Right-Turn Lane on SB and WB Approaches, Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)						
Shared Left-Through Lane	0.36	29 [C]	5	0.21	26 [C]	4
Right-turn Lane	**1.09**	**104 [F]**	**5**	**1.0**	**76 [E]**	**11+**
Riverside Drive Northbound						
Shared Left-Through Lane	0.74	21 [C]	12+	0.85	26 [C]	25 +
Riverside Drive (Southbound)						
Through Lane	0.66	18 [B]	370 ft	0.27	15 [B]	10
Right-Turn Lane	0.80	24 [C]	2	0.72	21 [C]	2

\+ indicates that queue may be longer due to volume exceeding capacity

Yellow highlighted values indicate queues spilling back through upstream intersection

As illustrated in Table 11, providing additional right-turn lanes on both the westbound off-ramp approach and on the southbound Riverside Drive approach results in improvement to the overall intersection operations. However, vehicle queues in the northbound direction are estimated to continue to spill back through the upstream intersection at the eastbound off-ramp. The I-285 off-ramp is estimated to operates with a v/c >1.0 and queues of up to 11 vehicles (275 feet).

Table 12 I-285 EB Ramps – 2034 Future Year Volumes (Additional Right-Turn Lane on NB and EB Approaches, Signal Control)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Shared Left-Through Lane	**0.95**	**67 [E]**	**16 +**	**0.92**	**49 [D]**	**21 +**
Right-turn Lane	0.04	26 [C]	1	0.47	25 [C]	2
Riverside Drive Northbound						
Through Lane	0.24	10 [A]	4	0.43	18 [B]	9
Right-Turn Lane	0.15	9 [A]	1	0.18	15 [B]	2
Riverside Drive (Southbound)						
Shared Left-Through Lane	0.95	33 [C]	11 +	0.91	39 [D]	8 +

\+ indicates that queue may be longer due to volume exceeding capacity

Comparing Table 12 to Table 10 indicates that the addition of the northbound right-turn lane results in improvement in performance for the overall intersection, including a reduction in the pm peak hour queues on the eastbound approach from 28 vehicles to 21 vehicles. In addition, v/c ratios on all approaches were reduced below 1.0.

BUILD ALTERNATIVE 2: ROUNDABOUTS

KAI evaluated the proposed roundabout alternative using the new Highway Capacity Manual 2010 methodologies, as applied by the HCS 2010 software. Operational performance measures used for the intersection analysis are volume-to-capacity (v/c) ratio, control delay, and vehicle queues for each intersection approach. For planning purposes, an approach v/c ratio below 0.85 is generally targeted for the design year operations for the roundabout alternatives. For approaches where the operational results show a v/c ratio exceeding 0.85, additional consideration of delay and queue lengths contributes to the determination of whether the approach operations may be acceptable.

KAI evaluated a single-lane roundabout configuration at both study intersections. Yield controlled right-turn bypass lanes were provided on selected approaches, where needed. Lane configurations needed to support the 2034 design year conditions were first identified and then additional analysis was performed for the opening year 2014 conditions to evaluate opportunities for staging the construction. Analysis output reports for all roundabout scenarios are provided in Appendix E.

2034 Design Year Intersection Operations

Roundabout analysis results for year 2034 conditions are summarized in Tables 13 and 14 for the westbound and eastbound ramp intersections, respectively. For the westbound ramp intersection, Yield controlled right-turn bypass lanes are provided on the southbound and westbound approaches. At the eastbound ramp intersection, a Yield controlled right-turn bypass lane is provided for the eastbound off-ramp approach. Figure 3 presents an illustration of the roundabout lane configuration.

Figure 3 Roundabout Lane Configurations

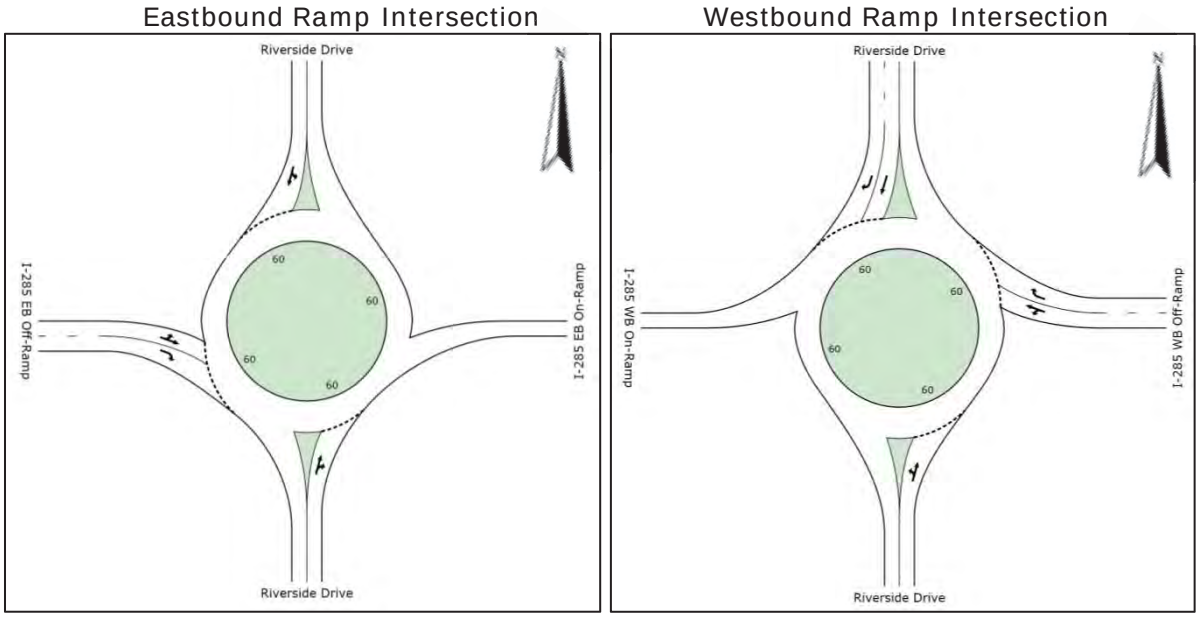


Table 13 I-285 WB Ramps – 2034 Design Year Volumes (**Roundabout Control**)

	AM Peak Hour			PM Peak Hour		
	v/c	Critical Lane Delay (sec/v)	Critical Lane 95% Queue	v/c	Critical Lane Delay (sec/v)	Critical Lane 95% Queue
I-285 Off Ramp (Westbound)						
Entry Lane	0.29	10.4 [B]	1	0.25	13.1 [B]	1
Yield Right-Turn Bypass Lane	0.73	24.1 [C]	6	**1.0**	**75.7 [F]**	**13**
Riverside Drive Northbound						
Entry Lane	0.57	10.6 [B]	4	0.87	25.0 [C]	12
Riverside Drive (Southbound)						
Entry Lane	0.80	22.7 [C]	8	0.53	10.9 [B]	3
Yield Right-Turn Bypass Lane	0.68	14.4 [B]	6	0.62	11.4 [B]	4

Table 14 I-285 EB Ramps – 2034 Design Year Volumes (**Roundabout Control**)

	AM Peak Hour			PM Peak Hour		
	v/c	Critical Lane Delay (sec)	Critical Lane 95% Queue	v/c	Critical Lane Delay (sec)	Critical Lane 95% Queue
I-285 Off Ramp (Eastbound)						
Entry Lane	0.83	38.3 [E]	8	0.88	36.1 [E]	11
Yield Right-Turn Bypass Lane	0.02	5.1 [A]	1	0.30	7.4 [A]	2
Riverside Drive Northbound						
Entry Lane	0.83	39.3 [E]	8	**1.09**	**100.2 [F]**	**16**
Riverside Drive (Southbound)						
Entry Lane	0.71	14.6 [B]	6	0.43	7.9 [A]	2

As summarized in Tables 13 and 14, the roundabout configurations illustrated in Figure 3 provide adequate capacity to achieve a v/c ratio less than 0.85 for all approaches for the forecast 2034 am peak hour conditions. For 2034 pm peak hour conditions, the westbound right-turn bypass lane at the westbound ramp reaches a v/c ratio of 1.0 and the northbound approach at the eastbound ramp intersection is estimated to have a v/c ratio of 1.09 based upon HCM 2010 methodologies. All other approaches have a v/c ratio of 0.88 or less.

For the westbound ramp intersection, the heavy right-turn movement from the westbound off-ramp to northbound Riverside Drive is resulting in the right-turn only lane being at capacity for the 2034 pm with Yield Control. Providing a continuous channelized turn lane for the right-turn movement is one strategy to provide additional capacity to improve operations of this movement. However, right-

of-way and topographic constraints limit the feasibility of implementing a continuous bypass lane. In addition, the 900 foot spacing to the downstream signal at Heards Ferry Road would result in a relatively short weave section for traffic to merge right. Queuing from the Heards Ferry Signal is also expected to interfere with vehicles merging from the bypass lane into the northbound Riverside Drive travel lane, which could likely limit the effective capacity of a continuous bypass lane relative to the Yield Control bypass identified in Table 13. Therefore, a continuous bypass lane was not explored further as a part of this analysis. The resulting 13 vehicle queue for the 2034 pm peak hour conditions is comparable to the expected performance with the signal alternative (assuming that both a westbound and southbound right-turn lane implemented for the signal alternative).

At the eastbound ramp intersection, the northbound Riverside Drive approach was evaluated with and without a right-turn bypass lane. The analysis results reported in Table 14 identify the performance of the northbound approach with a single-lane entrance only. This is projected to result in a v/c ratio of 1.09 and a queue of 16 vehicles. The addition of a right-turn bypass lane would reduce the v/c to 0.81 for the northbound roundabout entry. The queue would have a corresponding reduction to approximately 7 vehicles. Based upon the HCM 2010 methodology, a northbound right-turn bypass may be needed to provide adequate capacity to serve the 2034 pm peak hour conditions. Additional discussion is presented later in this section regarding the expected design life for the northbound approach if the northbound right-turn bypass is omitted for initial construction.

2014 Opening Year Intersection Operations

KAI evaluated the ultimate roundabout configurations illustrated in Figure 3 to identify the expected performance for the opening year 2014 traffic conditions. Results of the analysis are presented in Tables 15 and 16. For the opening year, all approaches to both roundabouts are projected to operate with a v/c ratio of 0.7 or less and a level-of-service of “C” or better.

Table 15 I-285 WB Ramps – 2014 Design Year Volumes (**Roundabout Control**)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)						
Entry Lane	0.19	7.8 [A]	1	0.16	9.4 [A]	1
Yield Right-Turn Bypass Lane	0.50	12.9 [B]	3	0.64	21.3 [C]	4
Riverside Drive Northbound						
Entry Lane	0.45	8.2 [A]	2	0.68	13.5 [B]	6
Riverside Drive (Southbound)						
Entry Lane	0.59	12.6 [B]	4	0.40	8.3 [A]	2
Yield Right-Turn Bypass Lane	0.52	10.0 [B]	3	0.46	8.7 [B]	2

Table 16 I-285 EB Ramps – 2014 Design Year Volumes (**Roundabout Control**)

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Entry Lane	0.54	16.0 [C]	3	0.62	15.6 [C]	4
Yield Right-Turn Bypass Lane	0.01	4.6 [A]	1	0.23	6.2 [A]	1
Riverside Drive (Northbound)						
Entry Lane	0.53	16.2 [C]	3	0.70	24.5 [C]	6
Riverside Drive (Southbound)						
Entry Lane	0.55	10.2 [B]	4	0.33	6.7 [A]	2

Roundabout Sensitivity Analysis

As identified in Tables 14 and 16, the northbound approach at the eastbound ramp intersection is estimated to operate acceptably for 2014 conditions; however, a v/c ratio of 1.09 is estimated for the 2034 pm peak hour. KAI performed additional sensitivity analysis to identify the approximate year when an additional right-turn bypass lane may be needed on the northbound approach. The lane configuration illustrated in Figure 3 is anticipated to last at least 10 years (through 2024) before the northbound approach exceeds a v/c ratio of 0.85. The northbound approach is anticipated to reach a v/c ratio of 1.0 after 16 years (year 2030) based upon the HCM 2010 methodologies. Based upon these findings, KAI recommends that the additional northbound right-turn lane be omitted for the opening year configuration, but that space be preserved in the design for the potential future addition of the bypass lane, if needed.

The HCM 2010 methodology used for the roundabout analysis reflects measured roundabout capacity for average driver conditions across the United States. However, to better reflect local driver conditions, the HCM 2010 methodology is specifically set up to allow for calibration of the capacity model. A few jurisdictions have taken the step to develop a locally calibrated model, including the City of Bend (Oregon) and the California Department of Transportation. These two agencies both found slightly higher capacities than the HCM 2010 as part of their local calibration effort. There are a variety of potential reasons for the observed local capacities being higher than national averages including more aggressive driver characteristics, driver familiarity, and increased use of turn signals.

As previously discussed, KAI developed the lane configuration recommendations for the two study intersections based upon the HCM 2010 capacity model. However, to provide some perspective on the potential range of long-term performance of the roundabouts, KAI performed additional analysis using the alternative City of Bend, Oregon calibrated model for the design year 2034. Either of the two models could have been used for the purpose of this analysis and the selection of the City of Bend model is not intended to imply any correlation between Bend and Atlanta drivers.

As summarized in Tables 17 and 18, the City of Bend capacity model suggests that the proposed lane configurations illustrated in Figure 3 would be able to adequately accommodate the 2034 am and pm peak hour volumes without the need for the additional northbound right bypass lane at the eastbound ramp intersection. Again, these results represent an example of the potential increase in intersection performance over the 20-year design life based upon measured driver characteristics and capacities achieved in other parts of the US. Actual performance is expected to likely fall somewhere in between the results presented in Tables 15-16 and Tables 17-18 due to variation in actual local driver characteristics.

Table 17 I-285 WB Ramps – 2034 Design Year Volumes **(Roundabout Control – City of Bend, Oregon Calibrated Model)**

	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Westbound)						
Entry Lane	0.21	6.9 [A]	1	0.17	8.0 [A]	1
Yield Right-Turn Bypass Lane	0.54	12.2 [B]	3	0.68	20.6 [C]	5
Riverside Drive Northbound						
Entry Lane	0.49	7.9 [A]	3	0.74	14.0 [B]	7
Riverside Drive (Southbound)						
Entry Lane	0.64	12.4 [B]	5	0.43	7.8 [A]	2
Yield Right-Turn Bypass Lane	0.57	9.7 [A]	4	0.49	8.3 [A]	3

Table 18 I-285 EB Ramps – 2034 Design Year Volumes (**Roundabout Control – City of Bend, Oregon Calibrated Model**)

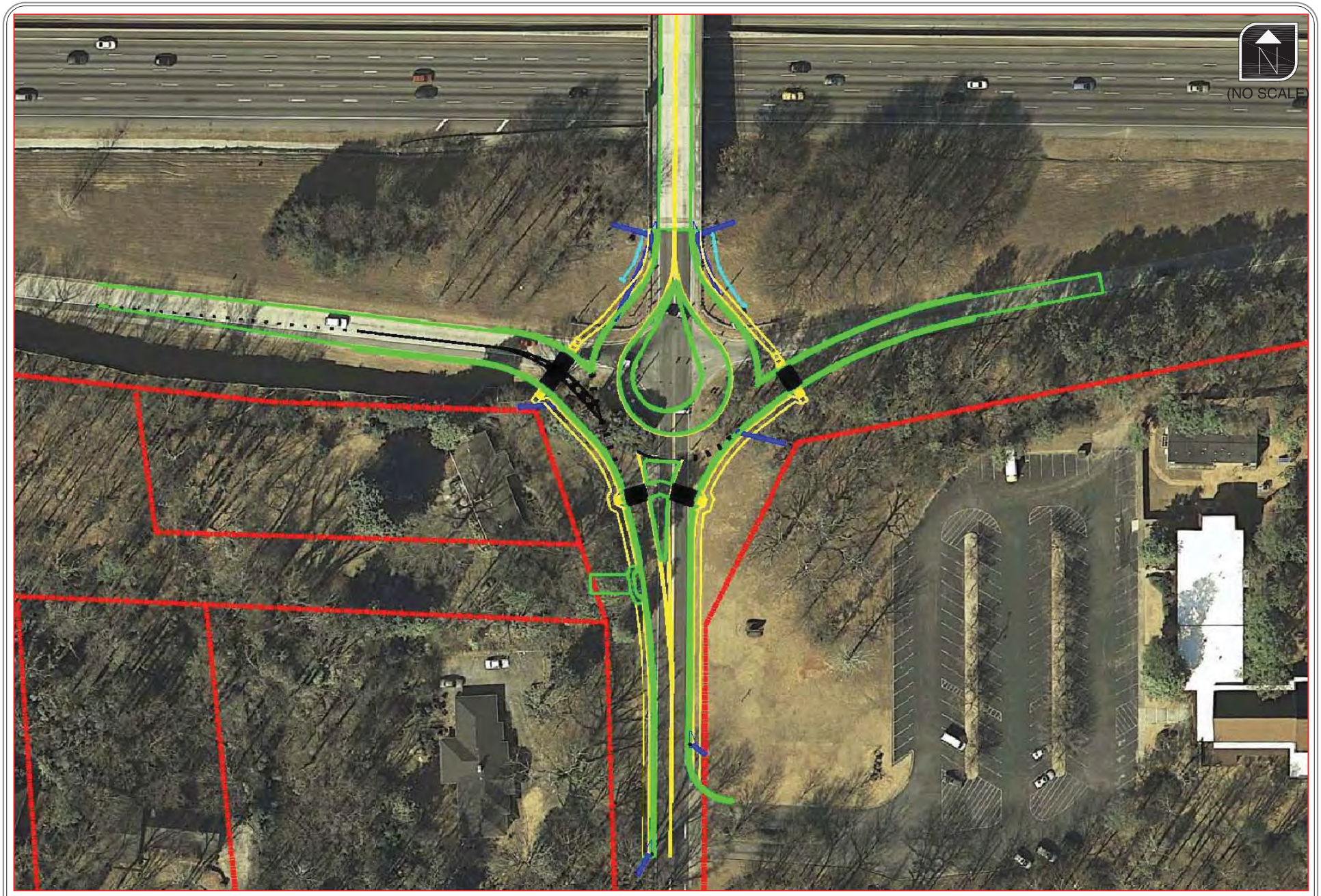
	AM Peak Hour			PM Peak Hour		
	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)	v/c	Control Delay (sec/v) [LOS]	95% Queue (veh)
I-285 Off Ramp (Eastbound)						
Entry Lane	0.58	15.1 [C]	4	0.66	15.1 [C]	5
Yield Right-Turn Bypass Lane	0.02	3.9 [A]	1	0.24	5.6 [A]	1
Riverside Drive Northbound						
Entry Lane	0.57	15.3 [C]	4	0.75	24 [C]	7
Riverside Drive (Southbound)						
Entry Lane	0.60	10.0 [B]	4	0.36	6.2 [A]	2

CONCEPTUAL GEOMETRIC DESIGN

KAI developed conceptual roundabout designs for each of the interchange ramp intersections. Concepts were developed initially in a pencil sketch format over scaled aerial photography and then refined in Microstation. The concepts have been developed in accordance with the design principles outlined in the *NCHRP Report 672 Roundabouts: An Informational Guide – 2nd Edition*.

The concepts presented in this section represent one set of possible options for the roundabout horizontal geometry. Roundabout design is based upon a set of fundamental principles which guide the design process. These principles include: (1) achieving speed control at entry, (2) providing appropriate lane numbers and arrangements, (3) appropriately aligning the natural path of vehicles, (4) accommodating the design vehicle, (5) accommodating non-motorized users, and (6) providing adequate sight distance and visibility. Alternative sizes, shapes, placement, and approach alignments may also be acceptable provided that they result in a design that meets these fundamental principles.

Figures 4 and 5 present the conceptual designs for the I-285 eastbound and westbound ramp intersections respectively. As discussed in the operational analysis, both intersections are designed as single-lane roundabouts with right-turn bypasses on selected approaches. The concepts demonstrate that the roundabouts can be accommodated within the existing right-of-way. Some widening of the I-285 eastbound and westbound off-ramps will be required to facilitate a dedicated right-turn lane on each approach; however, connection to the I-285 mainline is not affected.

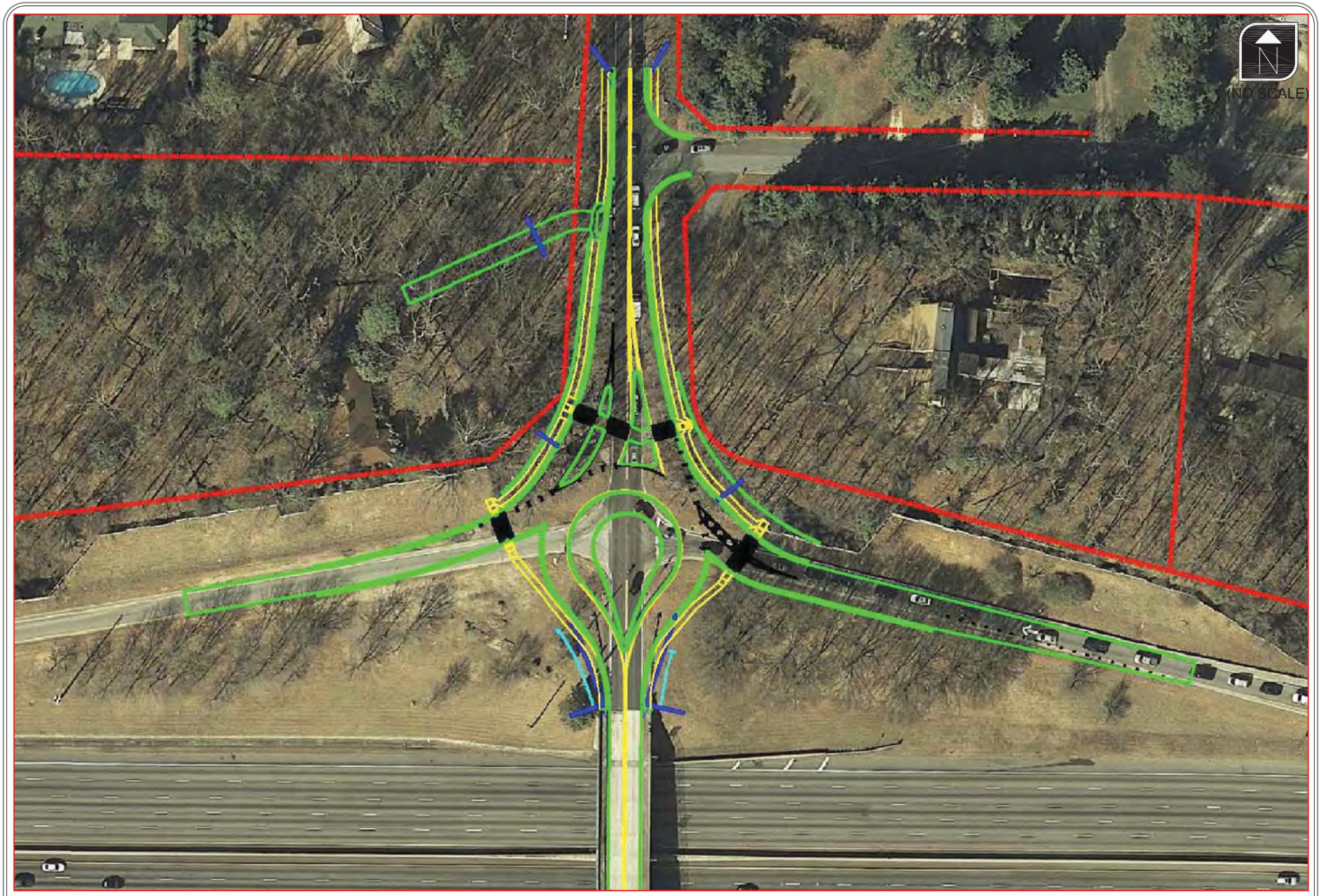


Conceptual Roundabout Design - I-285 Eastbound Ramp Intersection
Fulton County, GA

FIGURE 4

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

C:\Documents and Settings\jbansen\Desktop\Task 7 - TO 35 I-285 at Riverside\Figures.dwg Dec 05, 2011 - 9:03pm - jbansen Layout Tab: Layout3



Conceptual Roundabout Design - I-285 Westbound Ramp Intersection
Fulton County, GA

FIGURE 5

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

C:\Documents and Settings\jbansen\Desktop\Task 7 - TO 35 I-285 at Riverside\Figures.dwg Dec 05, 2011 - 9:04pm - jbansen Layout Tab: Layout3 (2)

The following bullet points summarize the key considerations in the development of the conceptual designs. The features shown in the concept designs, and discussed below, were developed based upon an iterative process to balance vehicle fastest path speeds, vehicle alignment, and truck accommodations. Concept designs were prepared over aerial photography and minor refinements may be needed during the design process based upon actual surveyed conditions.

- Design Environment –
  - Interchange ramp terminals – high-order facility with emphasis on auto accommodation to avoid back-ups onto interstate mainline.
  - Suburban conditions in primarily established residential area.
  - Emphasis on truck navigation due to connection to interstate. WB-67 or equivalent size vehicles are expected to be infrequent, but still require accommodation.
  - Emphasis on improving safety and operations.

- Lane Configurations – The proposed lane configurations in the KAI design concepts reflect the detailed operational analysis that was performed for both intersections. Single-lane roundabouts are provided at both locations with Yield controlled right-turn bypass lanes on the I-285 off-ramps. A Yield controlled right-turn bypass lane is also provided for the southbound Riverside Drive approach to the westbound ramp intersection. The eastbound ramp intersection was designed to allow for an additional northbound right-turn bypass to be provided at a later date (if needed) to serve 2034 traffic conditions; however, that additional lane is not recommended as part of the opening year design. (See operational analysis section of this report for details).

- Truck Navigation – The design concepts were developed to accommodate a WB-67 truck and provide side-by-side navigation of a WB-67 with a passenger car on the two-lane entries. Design checks illustrating the swept path for WB-67, WB-50, and BUS-40 vehicles are provided in Appendix F.

- Speed Control – Speed control at entry is one of the fundamental design criteria for roundabouts. The designs were developed based upon the fastest path criteria from NCHRP Report 672. Consistent with new guidance, the procedure estimates the fastest path that would be achieved by a vehicle ignoring all lane lines approaching and traveling through the roundabout. The designs were developed to maintain fastest path speeds entering the roundabout of less than 30 mph on all multilane approaches (which would apply to the off-

ramp approaches that have no raised channelization between lanes). The estimated entering speeds achieved in the design concepts range from 24 to 30 mph depending upon individual approach. These fastest path speeds reflect an aggressive driver in an off-peak (low volume) condition that is trying to go as fast as possible by weaving across all lane lines. For most drivers, typical entering speeds will be closer to the range of 20 to 25 mph, particularly during time periods where other vehicles are present and drivers must maintain their lane. Fastest path vehicle speed design checks are provided in Appendix G.

The concept designs present one option for the two-lane entry geometry for the I-285 off-ramps. The concepts meet the NCHRP 672 guidance for providing a maximum of 30 mph speeds when vehicle cross both lanes of a multilane entry. However, if desired by GDOT, alternative designs could be explored as part of the design process that would result in slower speeds, but would have trade-offs for truck accommodation. The current design concepts provide a striped gore island between the two entry lanes to allow additional space for WB-67 offtracking but results in a wider entry width. This gore striping could be removed and the entry width narrowed to further reduce entry speeds. However, under this alternative, WB-67 trucks would be expected to need to straddle both entry lanes to be adequately accommodated. Another option would be the use of a raised splitter island between the lanes, which would require increases in the lane width for truck accommodation and may require additional modification to the approach alignment to avoid right-of-way impacts.

- Natural Vehicle Paths and Path Overlap – On the I-285 off-ramp approaches the KAI design concepts emphasize the natural vehicle path to align vehicles in the right-turn bypass lane such that their vehicles are aimed toward the downstream exit and not into the circulatory roadway. Correct alignment of vehicle paths reduces the potential for vehicle path overlap and improves the potential intersection safety performance. The KAI concepts use a short segment of tangent at the yield line to encourage proper natural paths alignment. The length of tangent on each approach is not a standard value, but rather is a product of the entry alignment, entry angle, and entry radius. These values were achieved through an iterative process to balance alignment, vehicle speeds, and truck accommodations.

- Non-motorized users – For the suburban interchange environment, the design assumes potential pedestrian presence. Splitter island lengths and widths were carefully laid out to allow sufficient space for the incorporation of pedestrian crossings and pedestrian refuges

into the design and space within the right-of-way for sidewalk accommodations. As per NCHRP Report 672 recommendations for bicycle facilities, bike lanes should be terminated at least 100 feet upstream of the roundabout to require bikes to either ride through the roundabout as an automobile or divert onto a multiuse path. Bike lanes are not currently provided on Riverside Drive; and therefore no provisions for termination of the bike lanes was required for the study intersections.

- Geometric Characteristics:
  - Inscribed Circle Diameter: The KAI designs used a 125-foot inscribed circle diameter to minimize the overall intersection footprint, stay within existing right-of-way, and allow for provision of adequate vehicle alignment and view angles on the off-ramp approaches. The selected diameter is on the low end of the typical range for situations where a WB-67 truck is the design vehicle. Therefore a slightly wider truck apron is needed to accommodate the design vehicle swept paths.
  - Approach alignment – The alignments of each approach were offset to the left of the center of the roundabout. The offset-left alignment emphasizes the entry path deflection to maintain adequate speed control while allowing the use of larger entry radii to accommodate the wider tracking of trucks. The offset-left alignment also improves the channelization of vehicles on the approach.
  - Entry Curves – The KAI design concepts use slightly larger entry curves and much larger exit curves to better accommodate truck navigation. For the entry curves, an entry radius of approximately 100 feet was used for most approaches. Entry radii typically range from approximately 65 to 100 feet. The use of the offset-left approach alignment assists in providing the needed deflection for speed control while still using a smaller inscribed circle diameter and larger entry curves.
  - Exit Curves – For the exit curves, large radii of approximately 200 feet or greater (with most approaches having an exit radii > 500 feet) were used for all approaches except the exits onto the bridge over I-285. Due to the proximity of the roundabouts to the bridge, radii in the 80 to 100 foot range were utilized. A larger exit radius helps to provide smoother maneuvering for trucks; however, within the constrained location, the radii used represent the largest possible radii without relocation of the roundabout. For exits with larger radii, the potential speed of vehicles through the exit is limited by the acceleration characteristics of the vehicles.

- Lane Widths – A 20 foot circulatory roadway width was utilized (22 feet from curb to curb). This is at the upper end of the typical range; however, a slightly larger width was needed for accommodation of the design vehicle due to the smaller inscribed circle diameter that was selected. Entry widths vary by approach. The lane widths on the off-ramp approaches are 13 feet, with additional width between the lanes to allow for design vehicle off-tracking. The remaining single-lane approaches are approximately 15 feet in the vicinity of the ped crossing and flare out to match the 20-foot circulatory roadway width at the yield line.
- Bypass Lanes – The design of the bypass lanes (yield control versus a full bypass) was largely driven by the operational needs as presented in the operational analysis section of this report. In general, the design of the bypass applies the same principles as the entry design whereby a balance is struck between maintaining low speeds and accommodating trucks. Bypass lanes are only used where needed and are identified as optional where not needed for the opening years of operation.

CONCEPTUAL CONSTRUCTION STAGING

Staging for the construction of the roundabout could be accomplished through a variety of options including full closure, partial diversion, or under full traffic. At the request of GDOT, KAI prepared planning-level considerations for the construction staging of the roundabout, assuming that construction under full or partial traffic would be desired. The information below presents a couple of potential staging options; however, actual staging will require additional development during the design phase. Additional considerations that may impact the construction staging include final vertical profiles along Riverside Drive (particularly at the westbound ramp intersection) and any potential utility relocation.

PARTIAL TRAFFIC DIVERSIONS

Within the vicinity of the interchange, the roadway network does provide opportunities for traffic diversion to allow partial closures during portions of construction. These roadways include: Mt. Vernon Highway to the south, Heards Ferry Road to the north, and Raider Drive/Powers Ferry Road to the west, which create an interconnected triangle of roadways surrounding the I-285/Riverside interchange. One potential option for construction sequencing for the eastbound ramp intersection with partial diversion is provided below (illustrations of the stages are provided in Appendix H):

1. Construct outside widening of I-285 off-ramp and widening within the SE quadrant of the intersection. This includes all new outside curblines in the SE quadrant and sidewalk. Construct widening within SW quadrant of the intersection. Within the SE quadrant, construct additional temporary widening along the east side of Riverside Drive to allow for two-way traffic to be temporarily shifted to the east side of the proposed splitter island.
2. Shift two-way traffic to east side of proposed splitter island on the south leg of Riverside Drive (using appropriate signing, markings, and cones). Construct the splitter island on south leg of roundabout.
3. Relocate southbound Riverside Drive traffic to use the actual exit alignment from the roundabout. Shift northbound Riverside Drive traffic to the final northbound approach alignment. Construct final outside curbline and sidewalk within SE quadrant.
4. Implement partial traffic diversion to require all traffic coming from the I-285 eastbound off-ramp to make a right-turn to travel southbound on Riverside Drive. Similarly, all northbound Riverside Drive traffic would be required to make a right-turn onto I-285 eastbound. Upstream signing would be necessary on Riverside Drive to warn drivers that no through traffic over the I-285 bridge is permitted. With the partial intersection closure in place, construct additional outside widening in the NE and NW quadrants, construct curblines and sidewalk in NE and NW quadrants, and construct central-island curbs and truck apron. Prepare and apply final paving course for the circulatory roadway. The widening in the NE and NW quadrants could alternatively be constructed as part of Stage 1 along with the widening in the SE and SW quadrants. This would reduce the overall time that the temporary traffic diversion and partial intersection closure is in place.
5. Implement final signing and markings. Open intersection back up to full traffic (simultaneous opening of both roundabouts required) with traffic operating in proper roundabout circulation pattern.

At the westbound off-ramp, a similar general procedure would be followed. However, retaining walls and fill would be required to be constructed prior to commencing any roadway widening. The presence of the southbound right-turn bypass lane would also avoid the need for temporary widening since the combination of the right-turn bypass lane and northbound entry lane provides sufficient width for temporary two-way traffic (without construction of the raised island between the lanes).

CONSTRUCTION UNDER FULL TRAFFIC

Construction under full traffic creates additional conflicts and will need to be managed through signing, markings, and flagging. Construction of the central island requires additional temporary

width around the periphery of the ultimate inscribed circle diameter to allow for truck and trailer to stay off of the central island curb and truck apron during construction. One potential option for construction sequencing for the eastbound ramp intersection with partial diversion is provided below (illustrations of the stages are provided in Appendix I):

1. Construct outside widening in all quadrants of the intersection for roundabout and approach footprint. Construct temporary widening along the periphery of the inscribed circle (behind the curbline location for width of approximately 10 feet) and along each side of Riverside Drive.
2. Install roundabout signing. Use cones to designate shape of central island and begin operating intersection using final roundabout circulation patterns. Vehicles will use the temporary widening around the perimeter of the inscribed circle to provide a buffer from the central island construction such that truck trailers do not track over the truck apron during construction of the apron. Construct central island curb and truck apron.
3. Relocate traffic onto roundabout circulatory roadway when the truck apron concrete curbing and travel surface has cured enough to carry vehicle loading. Along Riverside Drive, traffic continues to use the temporary widening. Construct splitter island on the south leg of the intersection.
4. Relocate Riverside Drive traffic (on south leg of roundabout) to use the actual roundabout entry and exit lanes. Remove all temporary widening and construct outside curb and gutter. Construct final paving course. Construct final markings and remaining signing.

COST CONSIDERATIONS

Conceptual level construction costs were developed by URS staff for the proposed roundabout layout shown and an additional conceptual cost estimate was provided based on an improved signalized intersection design at this interchange. This alternate design cost estimate was based on the necessary improvements modeled in the report and based on the traffic operational analysis for the two intersections to operate at an acceptable LOS. The traffic queues for the through and left movements at the on ramps necessitate a back to back left turn bay on the bridge, which means that the bridge would need to be modified.

These cost estimates are included in Appendix J and can be used for planning and programming a new project and for comparative purposes. The costs were developed based upon the planning-level conceptual layout and therefore should be recognized as approximate in nature. These costs were

completed after a site visit to estimate the topography and walls needed to limit the construction to within the existing right way as was a requirement for the construction of this project.

The construction cost estimate was developed in the CES (Cost Estimating Software) as is standard for GDOT projects. No additional contingencies were added since this project is not currently programmed. Inflation and other contingencies can be added at a later date once more information about scheduling is known.

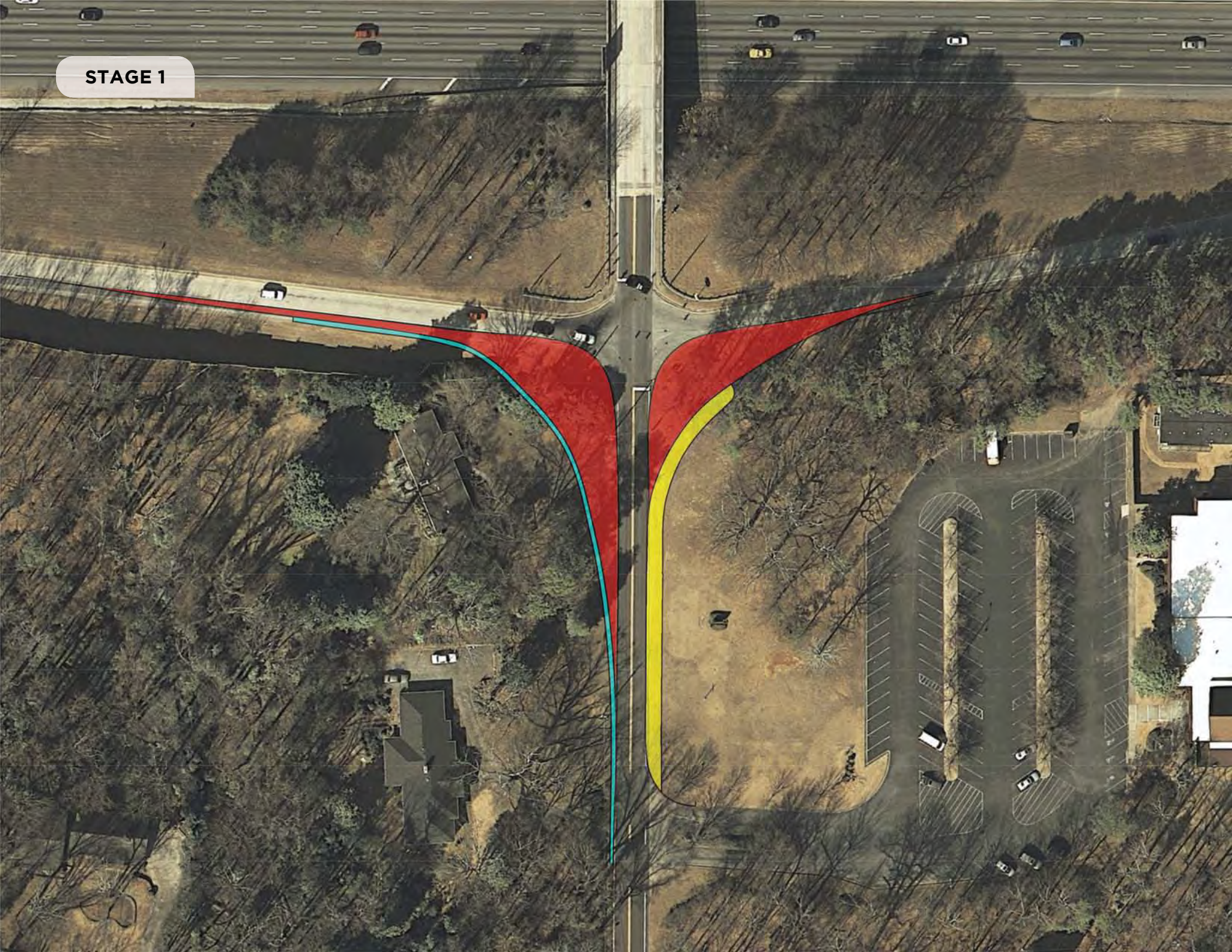
SUMMARY AND CONCLUSIONS

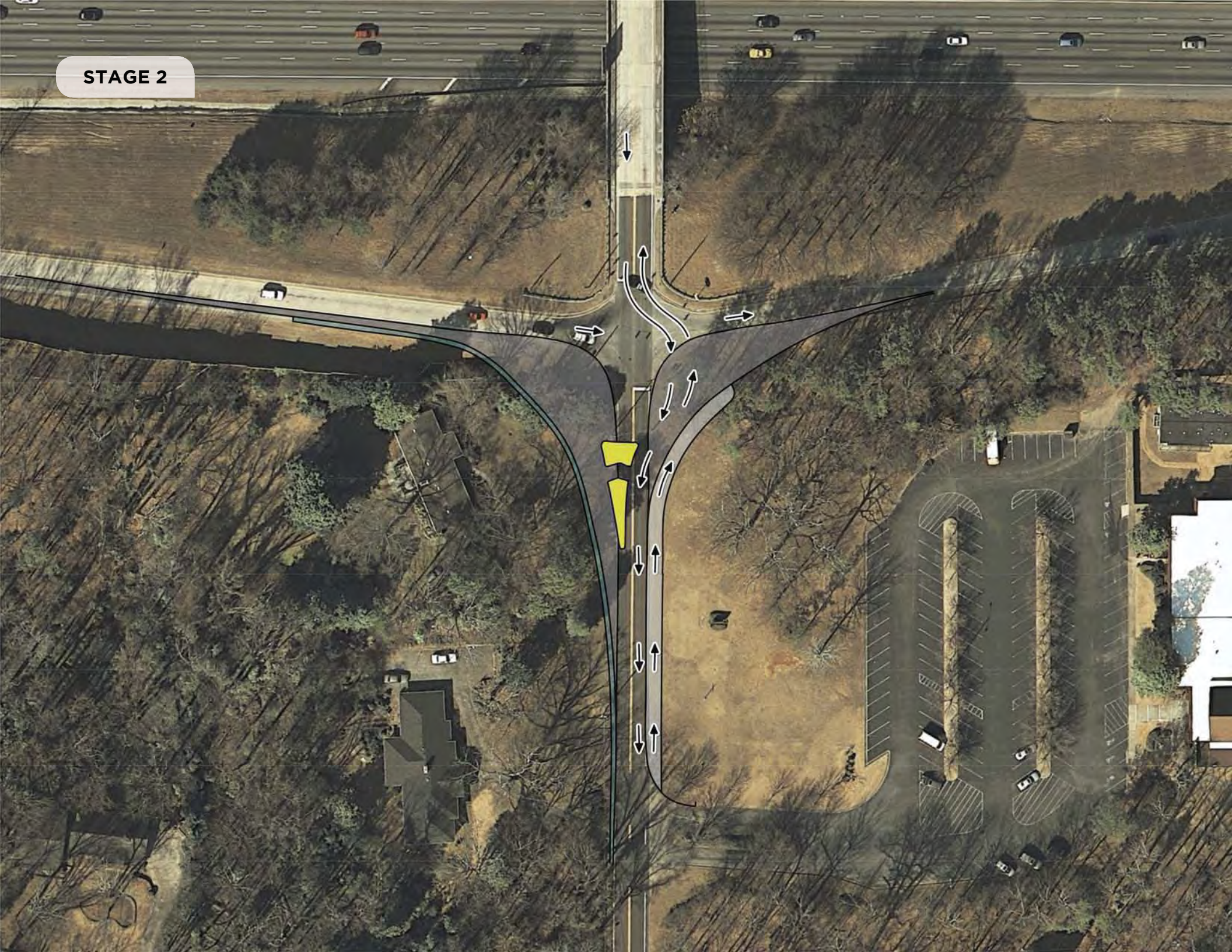
The following bullet-points summarize the findings of the operational analysis:

- The existing Two-Way Stop Control at the westbound ramp intersection operates over-capacity during the existing 2009 peak hour. For 2034 design year conditions, stop control on the I-285 off-ramp is estimated to result in queue spillback onto the I-285 mainline.
- Signal control at both ramp terminal intersections alone (no lane additions) is not expected to provide sufficient capacity to provide acceptable operations for 2034 design year conditions. Queue spillback is estimated to occur over the bridge between the two ramp terminal intersections, on the westbound I-285 off ramp, and upstream to the Heards Ferry Road intersection.
    - The addition of right-turn lanes on the off-ramp approaches provides incremental improvement in performance. However, the westbound ramp intersection is expected to continue to operate with v/c ratio above 1.0 and queues spilling back into the eastbound ramp intersection as well as to the upstream Heards Ferry Road intersection.
    - The addition of right-turn lanes on the off-ramp approaches, plus a southbound right-turn lane at the westbound ramps and a northbound right-turn lane at the eastbound ramps provides further operational improvement. The eastbound ramp intersection would operate with all movement v/c ratios below 1.0. However, the westbound ramp intersection continues to have over-capacity operations on the I-285 westbound off-ramp and queues on the northbound approach are estimated to spill back to the eastbound ramp intersection.
    - With signal control at the ramp terminal intersections, turn lane improvements over the I-285 bridge are anticipated to be needed to further improve future operations and provide adequate queue storage between the two ramp terminal intersections.

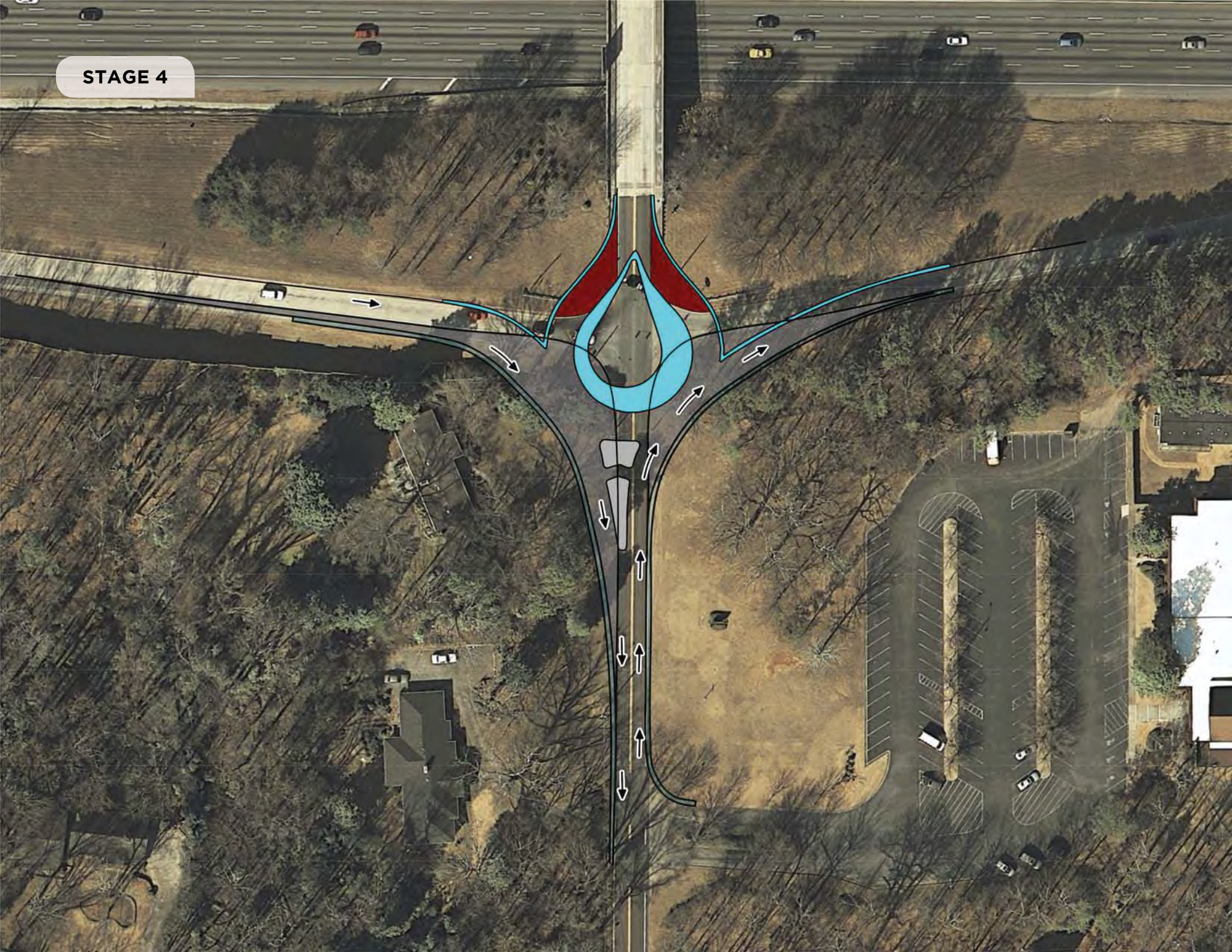
- Implementation of single-lane roundabouts (with right-turn bypass lanes on selected movements) at both study intersections is estimated to provide adequate operations for both ramp terminal intersections through the 2034 design year. Implementation of the roundabouts at the interchange ramp terminals provides operational and safety improvement to the interchange while avoiding the need for costly bridge modifications.
    - At the westbound ramp intersection, the westbound right-turn bypass lane is expected to operate at a v/c ratio of 1.0 during the 2034 pm peak hour. All other approaches operate with a v/c ratio of 0.87 or less.
    - At the eastbound ramp intersection, an additional northbound right-turn bypass lane is projected to be needed to serve design year 2034 traffic conditions. Without the bypass, a single-lane northbound entry is expected to reach a v/c ratio of 1.0 in approximately year 2030; however adequate operations could potentially be provided through the 2034 design year if capacity increases over time. Given that the roundabout concept will operate acceptably for over ten years after opening without the bypass, the design concept presented in this memorandum omits the northbound right-turn bypass from the opening year configuration, but preserved space for potential future addition (if needed).
    - If capacity increases over the design life of the intersection, to more closely resemble driver characteristics and corresponding capacities observed in other areas of the US, the proposed lane configurations could result in adequate operations on all approaches for the 2034 design year. The application of the locally calibrated Bend Oregon model identified that all roundabout lanes could potentially operate with a v/c of 0.75 or less for the 2034 peak hours. However, actual performance will depend on actual local driver characteristics.

The operational analysis results presented in this memorandum identifies that roundabouts are a feasible alternative for providing traffic control at the ramp terminal intersections at the Riverside Drive interchange on Interstate 285. The conceptual geometric designs illustrate that roundabouts are also spatially feasible at the interchange ramps and stay within the existing right-of-way. At the eastbound ramp intersection, additional space was preserved in the concept design to allow for a future northbound right-turn bypass lane to be implemented, if needed. Additional investigation of vertical geometry and utility impacts will be needed if the project proceeds into design.


STAGE 1


STAGE 2

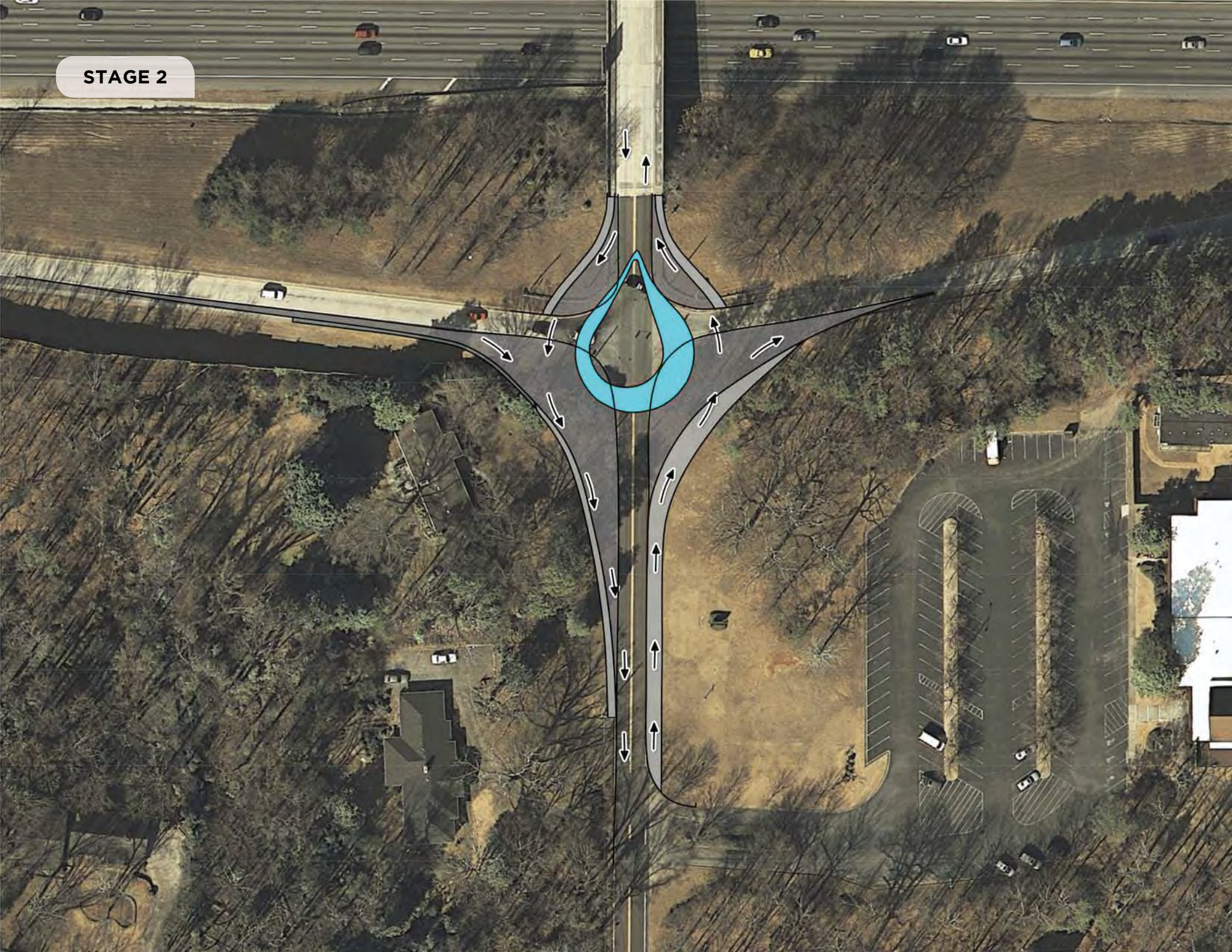
STAGE 3


STAGE 4

Appendix I

Construction Under Full Traffic Staging Illustrations

STAGE 1


STAGE 2

STAGE 3

STAGE 4

INDEX OF APPENDICES

Appendix A Volume Data and Historical Growth Information Excluded from CR

Appendix B 2009 Existing Conditions Operations Analysis Excluded from CR

Appendix C No-Build Future Conditions Operations Analysis Excluded from CR

Appendix D Signal Build Alternatives Operations Analysis Excluded from CR

Appendix E Roundabout Build Alternative Operations Analysis Excluded from CR

Appendix F Design Vehicle Accommodation Performance Checks Excluded from CR

Appendix G Fastest Path Vehicle Performance Checks Excluded from CR

Appendix H Partial Traffic Diversion Construction Staging Illustrations

Appendix I Construction Under Full Traffic Staging Illustrations

Appendix J Planning Level Cost Estimates Excluded from CR

Appendix K Scaled Plot of Roundabout Concept Design Excluded from CR

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INDICATION OF ROUNDABOUT SUPPORT

To the Georgia Department of Transportation:

Attn: State Traffic Engineer
935 E. Confederate Ave, Building 24
Atlanta, GA 30316

Location

The City of Sandy Springs in Fulton County supports the consideration of a roundabout at the location specified below.

Local Street Names: Riverside Drive Ramps at I-285

State/County Route Numbers: Riverside Drive Ramps at State Route 407

Associated Conditions

The undersigned agrees to participate in the following maintenance of the intersection in the event that the roundabout is selected as the preferred concept alternative:

- The full and entire cost of the electric energy used for any lighting installed and the maintenance thereof (if needed)
- Any maintenance costs associated with the landscaping as approved by the local government and the Georgia Department of Transportation (after construction is complete)

We agree to participate in a formal Local Government Lighting Project Agreement during the preliminary design phase. This indication of support is submitted and all of the conditions are hereby agreed to. The undersigned are duly authorized to execute this agreement.

This is the 15th day of March, 2011.

Attest: Michael Casey
Clerk

By: Eva Galambos

Title: Mayor

SANDY SPRINGS
FOUNDED 2005
GEORGIA
HONEST EFFICIENT RESPONSIVE

Peer Review of the Proposed Roundabout Interchange of I-285 @ Riverside Drive in Fulton County, Georgia

By Howard McCulloch, PE

ARCADIS

Table of Contents

Preliminary Peer review – March 2014

1. **Review of Roundabout Feasibility Report**

2. **Roundabout Selection as Preferred Alternative**

3. **Roundabout Design Review**
   a. **Overall Design Comments**
   b. **Fastest Path Analysis**
   c. **Truck Turn Analysis**

4. **Vertical Geometry Review**

5. **Roundabout Capacity Analysis Review**

Revised Peer Review – August 2014

6. **Review of Roundabout Technical Memorandum by MTJ Roundabout Engineering**
   a. **Capacity Analysis**
   b. **2D Layout**
   c. **Grading**

7. **Current ARCADIS grading**

8. **Conclusions and Recommendations**

1. Review of Roundabout Feasibility Report

A preliminary study of the Riverside Drive interchange with I-285 in Fulton County, GA was performed to determine if a roundabout interchange was feasible for this location. . This feasibility study, conducted by Kittelson & Associates, Inc. (KAI), in coordination with URS, dated November, 2011, is included as Attachment A. The report concludes that a roundabout interchange is a viable alternative for this location.

While the feasibility study is a comprehensive report a few items could be revised and/or improved within the report. The roundabout capacity analysis described from pages 12 through 17 of the report uses the default HCM 2010 equations as well as the revised values from Bend, Oregon. Both of these formulas are conservative; but even with a more realistic capacity estimation the recommended layout isn't likely to change. The only likely change from using a more realistic capacity equation is improved future traffic operations.

- Please Note: The traffic counts were redone by ARCADIS between the end of 2011 and early 2012 and the traffic analysis was revised with the new existing volumes and traffic projections – this is covered in Section 5.

Construction staging is discussed from pages 23 to 25. The staging represented in the feasibility study accommodates tractor-trailer traffic. Riverside Drive is a truck restricted route so another option that might be worth considering is a temporary truck detour during construction. Not needing to accommodate the swept path of interstate type tractor-trailers will allow for a more efficient work zone without the need to reroute personal vehicles away from the intersection during construction.

Appendix E of the feasibility study, the roundabout operations section, didn't include any material. Appendix F, the vehicle path checks, shows WB-67 and WB-50 design vehicles making all the necessary maneuvers. If the WB-67 design vehicle works for all maneuvers than it shouldn't be necessary to display the WB-50 design vehicle swept paths. Also, the BUS-40 design vehicle paths should be shown to ensure that bus traffic can navigate the interchange without needing to traverse the truck apron of either roundabout.

2. Roundabout Selection as Preferred Alternative

As mentioned in Section 1, the Roundabout Feasibility Evaluation conducted by Kittelson & Associates, Inc. (KAI), in coordination with URS, dated November, 2011 concludes that this is a potential location for a roundabout interchange. This conclusion appears to be based primarily on the fact that the roundabout alternative was the only one projected to provide acceptable operations once the future volumes were considered. The other alternatives considered, stop controlled or signalized intersections, either had unacceptable delay at the intersections or queues that were expected to reach I-285. Being the only alternative that was expected to provide acceptable operations into the future without adding lanes across I-285 is a valid reason for selecting this as the preferred alternative.

3. Roundabout Design Review

The proposed geometry was reviewed based on overall design, fastest paths, and truck turning movements. These specific topics are reviewed below:

a) Overall Design Comments

The proposed roundabout designs are very similar and each have reasonable dimensions for single lane roundabouts being utilized where right-of-way (ROW) is constrained. The inscribed circle diameters (ICDs) for each roundabout are 120' and the 18' travel lanes accommodate buses without them having to use the truck apron. The truck apron has been customized to accommodate the WB-67 design vehicle movements, ranging from 7'-6" to a maximum of 25'-3". The entry radii are either 100 or 110' and the exit radii, except for those between the roundabouts, ranges from 500 to 800' which are typical dimensions for these design elements. The exit radii utilized between the roundabouts approaching the bridge over I-285 are either 80 or 100'; these values are generally considered to be low but with the compact type roundabout interchange being designed here they will work well. The splitter islands are reasonable in length, from around 55 to just under 100' long – except for the two between the roundabouts. These splitters are only around 15' long but with the compact type roundabout interchange implemented here the short splitters, just like the small exit radii, will work well. The entry widths range from 15.5 to 18.5' which are quite common for single lane roundabouts.

b) Fastest Path Analysis

The fastest path analysis is shown in Attachment B. The fastest path analysis results show values from implementing the radius or R value method as well as the use of the recommended formulas for entry and exit speeds that account for vehicular acceleration (exit) and deceleration (approach). Most of the values are as expected, with the entry and exit speeds typically being higher using the radius or R value method compared to the formulas that account for acceleration and deceleration. Values for the entering vehicles (R1), ranged from 24 to 30 mph using the R method with a few being significantly lower using the other method. The right turning speeds (R5) ranged from 26 to 31 mph, reasonable values for this type design. The only values that came in well above the recommended maximum values were the exit speeds using the R value method, coming in at 45 mph. Below are the images showing the radii that were used to calculate the R based speeds:

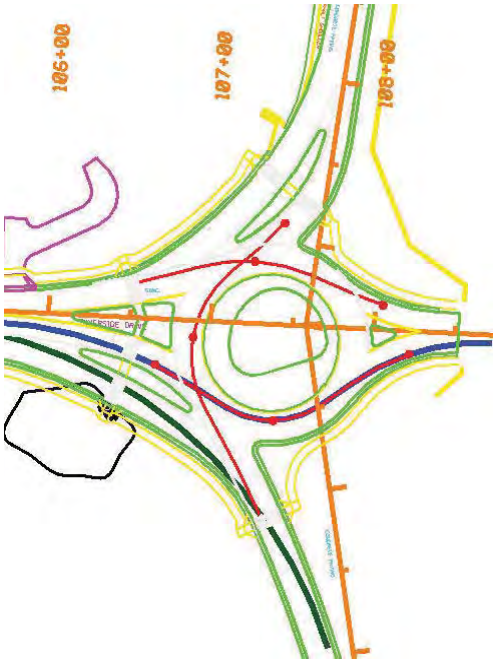


Image 1

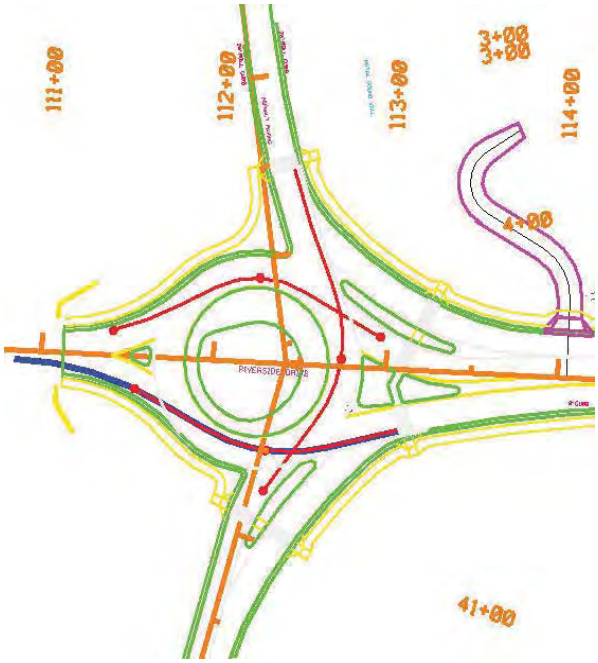


Image 2

The exit speed predictions were lowered to a more reasonable 32 mph using the formula that accounted for acceleration leaving the roundabout.

c) Truck Turn Analysis

The truck turn analysis shows that the proposed design does adequately accommodate the BUS-40 design vehicle. Examples of this design accommodating the BUS-40 design vehicle without the need to utilize the truck apron are shown in Image 3 and Image 4 below:

Image 3

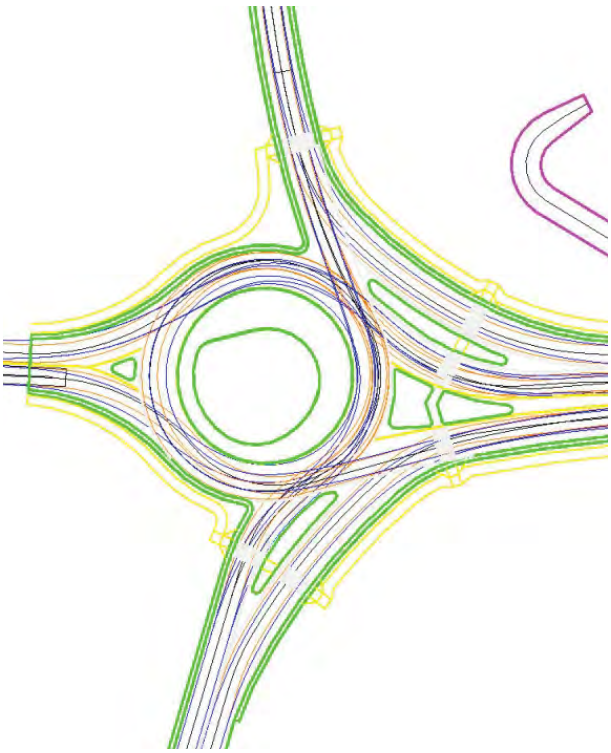


Image 4

The irregularly shaped truck apron is the result of accommodating theWB-67 design vehicle even though Riverside Drive is a truck restricted route. The swept path analysis for the WB-67 vehicle is shown in Image 5 and Image 6 below:

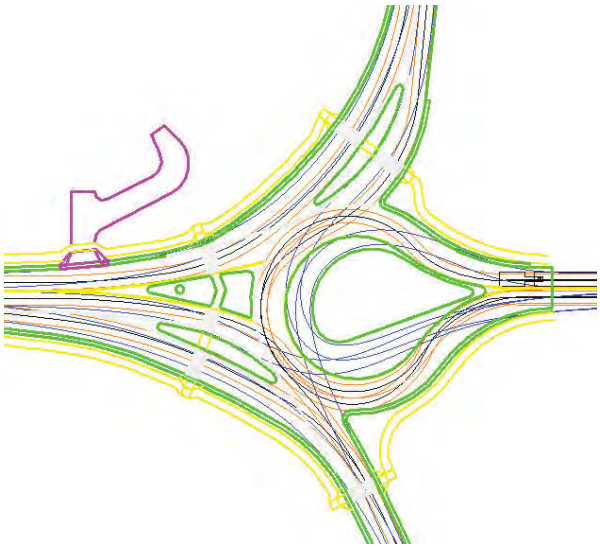


Image 5

Image 6

Please note that Image 5 and Image 6 above are from the previous geometric layout for this project when a “tear drop” type roundabout interchange was going to be implemented. Although the design has been modified to allow full movements at the roundabouts the actual WB-67 design vehicle movements will occur as shown above.

Although none of the design vehicle movements are likely to cause problems, some might consider it a better design if a little spare width for some of these movements was available. Based on looking at projects that did provide a little more width at the approaches to better accommodate the larger vehicle swept path it seems any of the extra width provided doesn’t get utilized since mot vehicles “hug” the outer curb line anyway.

4. Vertical Geometry Review

The original construction plan sheet showing the profile for Riverside Drive at this interchange is included as Attachment C. The existing grade through the northern roundabout is 9.56%. This is definitely beyond the normal range of grades that roundabouts are constructed upon. A major concern is the effect that such a significant grade will have upon turning vehicles, particularly the left turning trucks from Riverside Drive northbound to I-285 westbound. Fortunately, this condition already exists at the current interchange as has not been called out as being a significant issue. The feasibility report, Attachment A, even concluded that the vertical geometry will need further investigation during further design development. One possible technique that may help alleviate this concern is banking the circulatory roadway of the southern

roundabout towards the eastbound ramp as compared to the traditional method of banking the circulatory roadway outwards.

5. Roundabout Capacity Analysis Review

The roundabout capacity analysis was performed by Howard McCulloch as well as by other engineers at ARCADIS. All the traffic analysis was performed using the updated volumes shown in Attachment D. Howard McCulloch performed the SIDRA analysis using the 2015 peak hour volumes displayed on page 4 and the 2035 peak hour volumes shown on page 5 in Attachment D. There was an overall growth of 10% between the 2015 and 2035 volumes so a constant 0.5% annual growth rate was used for the 2025 peak hour SIDRA analysis. All of the SIDRA results are in Attachment E.

Please note that the SIDRA analysis has the additional right turn only (RTO) lanes modeled as if they go to the yield line rather than as a slip lane. The advantage with modeling these lanes as slip lanes in SIDRA in an increase in capacity over modeling it as a RTO lane, as was done here, because the right turning traffic only needs to yield to exiting traffic in the slip lane scenario. These lanes were kept as normal RTO lanes since the divider island was just large enough to provide a safe pedestrian refuge as was not perceived as being wide enough so that right turning traffic would not yield to circulating traffic, as they might not have if larger divider islands were utilized.

The 2025 volumes were analyzed in SIDRA as well since the revised 2035 volumes were resulting in less than desirable performance, primarily the result of the heavy PM left coming from the west (945 vehicles) and going through both roundabouts. The 2035 PM volumes result in excessive delay for Riverside Drive heading northbound into the interchange and for westbound traffic coming off I-285. The predicted performance in 2025 (10 year projection) was very good in SIDRA with both movements operating with less delay and shorter queues. Knowing the project would perform acceptably for at least 10 years was desired from a “project is worthwhile” perspective.

Attachment F contains the roundabout capacity analysis for the 2035 peak hours developed by Ryan Graves with ARCADIS utilizing the GDOT Analysis Tool Version 2.1, dated 2/24/12. Neither of the 2015 AM or PM, nor the 2025 peak hour analyses were provided utilizing the GDOT Analysis Tool. A quick summary of the results is that the roundabouts should work well during the AM peak, even in 2035 most moves in the morning were LOS C or better. For the 2035 PM volumes the results from the GDOT Analysis Tool were similar to those from SIDRA except for the moves coming over I-285 that do not need to yield to any movements since this is an interchange design being implemented here – no vehicles are expected to cross in front of the movements crossing I-285. These maneuvers are limited to a capacity of 1041 vph using the

default HCM roundabout capacity model and 1229 vph using the more aggressive capacity values based on roundabouts in Bend, OR and California. Having nearly "free flow" type maneuvers limited to such low capacities does not make sense and provides extremely different results when compared to that of SIDRA.

6. Review of Roundabout Technical Memorandum by MTJ Roundabout Engineering

A supplemental peer review of the proposed layout for the Riverside Drive Roundabout Interchange project was performed by MTJ Roundabout Engineering; this peer review is now referred to as Attachment A. The primary reason for this additional peer review was to address the concerns over the vertical grade at the northern roundabout of the project. In addition to the vertical grade issue, this peer review also addresses a few other parts of the project, primarily the capacity analysis and the horizontal layout. These specific topics, including grading, are addressed below:

a) Capacity Analysis

MTJ Roundabout Engineering used RODEL to verify the proposed lane configuration of the roundabout interchange. The results from the capacity analysis using RODEL, shown from pages 10 through 21 of Attachment A, were similar to the previous analysis performed using SIDRA. One area where the analysis differed was that the RODEL analysis showed the eastbound I-285 off-ramp was going to fail and the queue caused by the left turn movement for this approach was going to be long enough to block access to the right turn only lane. Another difference was that the northbound movement at this same roundabout didn't need the right turn only lane in the RODEL analysis and it was recommended for removal.

It is well known that the results from SIDRA and RODEL don't always agree. A VISSIM model was also developed for this project and it resulted in similar operation to that predicted by SIDRA. Since SIDRA and VISSIM provided similar results the proposed lane configuration is still recommended. If another check was desired the GDOT roundabout analysis tool could be utilized. If this additional check is performed the spreadsheet should be updated based on the newest research – these formulas are available from the following link:
http://teachamerica.com/RAB14/RAB1406CRodegerdts/index.htm

b) 2D Layout

Notwithstanding the recommended lane configuration revisions recommended by the peer review performed by MTJ Roundabout Engineering there are a few other geometric revisions recommended within this study. Below is an image from page 5 of Attachment A showing the revisions recommended at the southern roundabout:

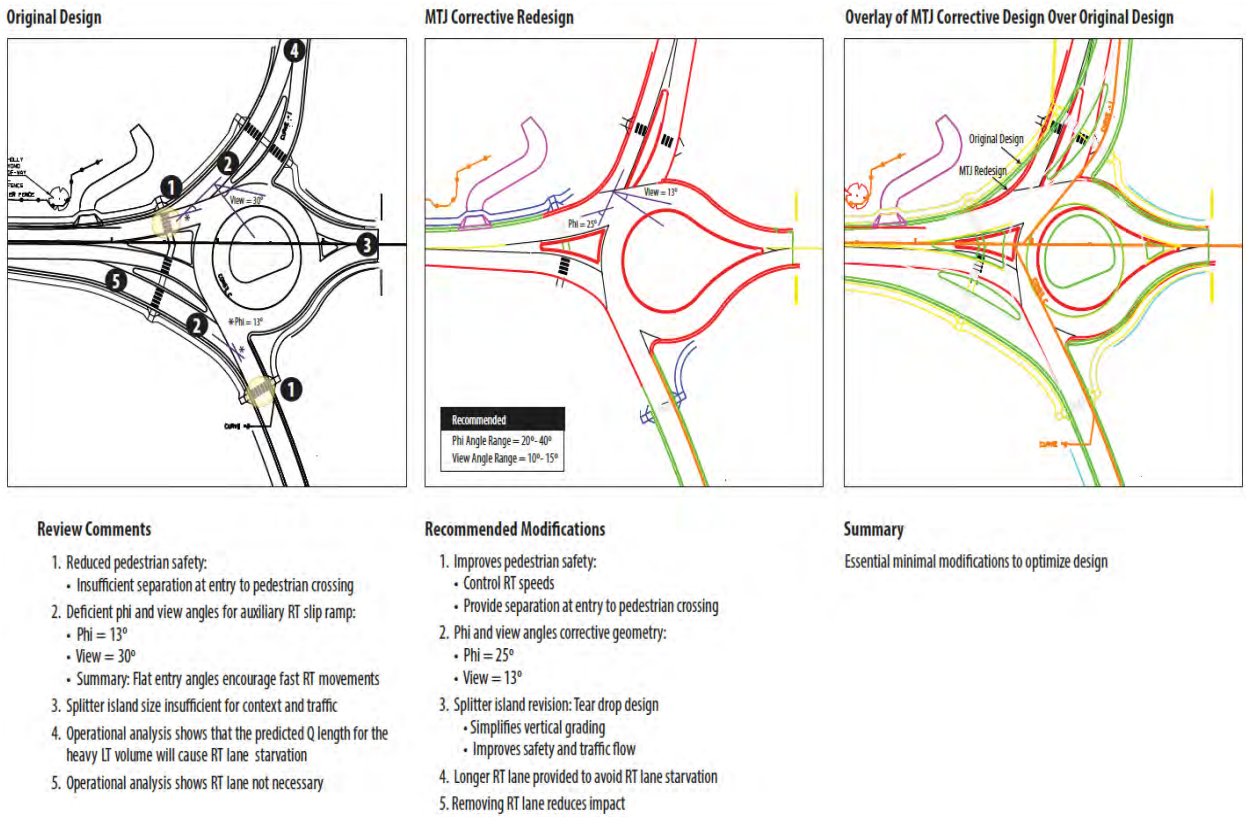


Image 1

A quick summary of the recommended revisions are moving the pedestrian crossings further from the roundabout, revising the approach angles to increase the Phi angle and to reduce the view angle, and going back to the teardrop design.

The pedestrian crossings are currently placed just beyond where the right turn only lanes enter the roundabout. While this crossing location does not provide much separation between the cars leaving the approaching roadway and the pedestrian crossing it does provide excellent sight lines between the approaching drivers and the pedestrians. Whether or not the increased conspicuity of the pedestrian with the crossing locations as currently designed is better or worse than moving them back around a car length is debatable.

The “straighter” approach angle to revise the Phi and view angles is another debatable improvement. The potential trade off with this design philosophy is that the drivers really don’t experience any advance curvature as they approach the roundabout. The drivers are able to maintain a higher speed to the yield line and then are slowed down by deflection by center island or splitter island.

The use of the teardrop design, while still debatable by some as to whether or not this provides sufficient speed control, is the most beneficial of the design revision recommendations.

Below is an image from page 4 of Attachment A showing the revisions recommended at the northern roundabout:

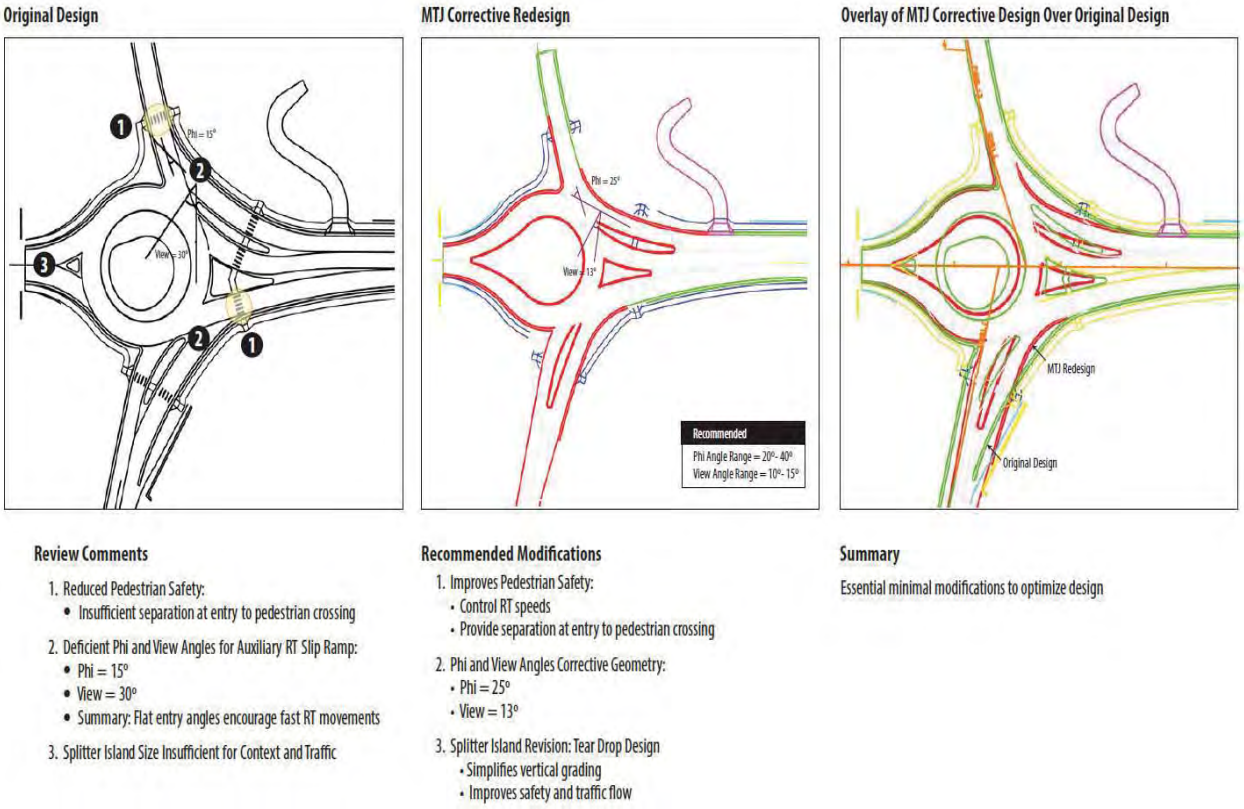


Image 2

For the most part these are the same recommendations but it should be noted that the radius coming from the westbound off-ramp to Riverside Drive northbound has been reduced substantially by the recommended revisions. Some residents have complained about vehicles excessively accelerating from the westbound off-ramp and it is possible that this revised radius could alleviate this condition. Unfortunately, whether or not a

vehicle has to roll around this curve at 5 mph with the revised layout or 10 mph with the proposed design, it is likely that this situation will continue to exist. Riverside Drive is a straight downgrade from the roundabout and the next intersection is 900 feet away. One thing that may help reduce the occurrence of this is that drivers may acknowledge that the roundabouts are a change in driving conditions and maintain a lower speed as they leave the roundabout. A possible treatment to address this is raised pedestrian crossings are car length or two past the roundabout.

c) Grading

At the time of the peer review conducted by MTJ Roundabout Engineering the profile developed by ARCADIS had a 5% slope on the northern side of the northern roundabout – this has been revised and will be addressed later. The proposed grading profile from page 8 in Attachment A is shown in Image 3 below:

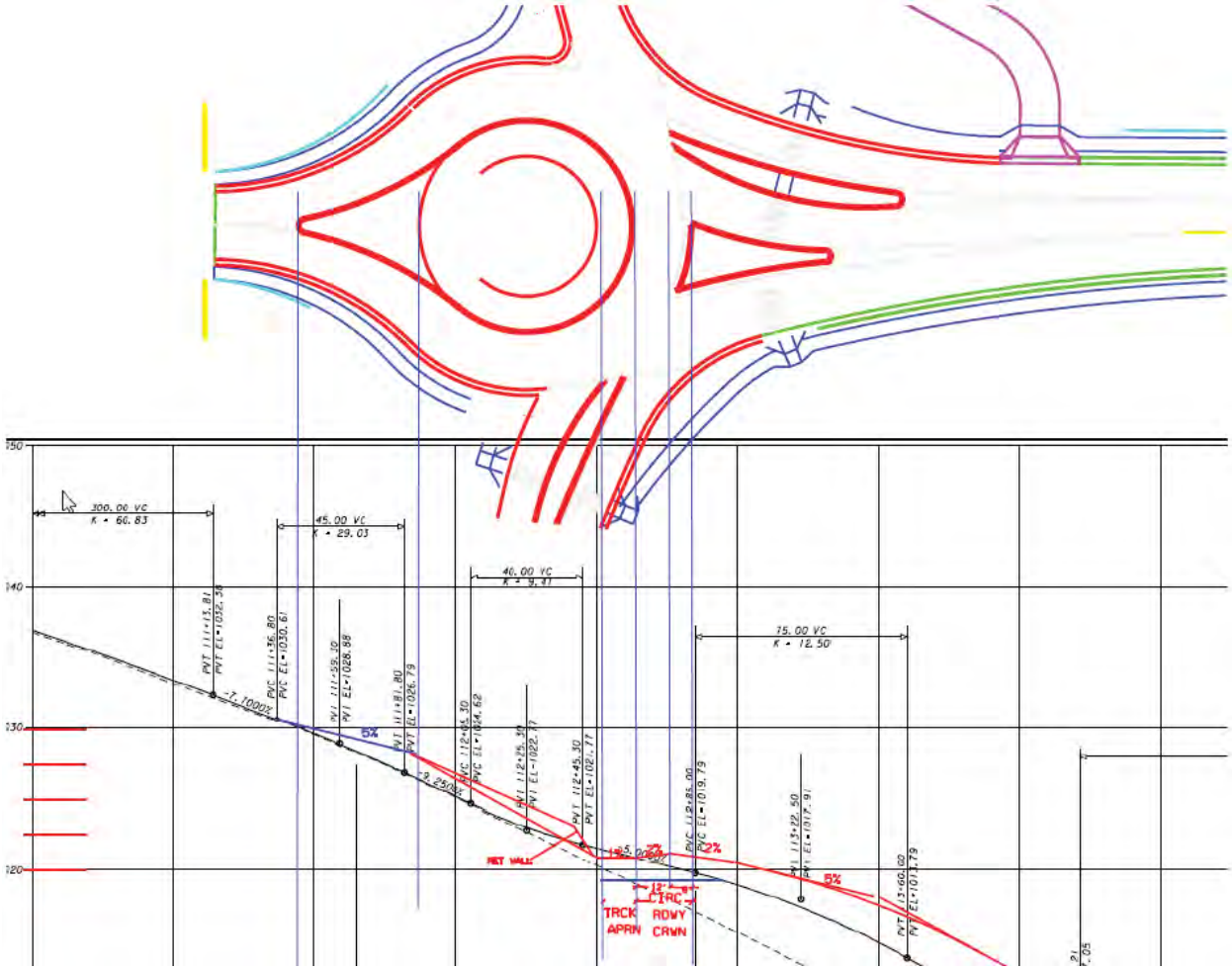


Image 3

With the use of the teardrop design to ensure that no vehicle will circulate around the southern side of the northern roundabout the reasoning behind the use of a 5% slope instead of keeping the profile at the existing 7.7% isn't obvious since it raises the elevation is this area without a perceivable benefit. Other changes recommended within the MTJ peer review is the use of a crowned circulatory roadway and banking the truck apron in towards the center of the roundabout rather than the traditional outward slope. Overall the recommended revisions show some potential but with an approximate 8 foot increase in elevation over the existing pavement elevation that would need to chase the existing grade of Riverside Drive to the intersection of Heards Ferry Road to tie back into the existing roadway, these revisions are not easy to construct or fiscally reasonable.

7. Current ARCADIS grading

A revised profile developed by ARCADIS for Riverside Drive at this interchange is included as Attachment B. The existing grade is maintained from the bridge to approximately the center of the northern roundabout. At this point the existing 9.25% slope is relaxed to a more acceptable 4%. The most recent grading profile developed by ARCADIS in this area of the project is shown in Image 4 below:

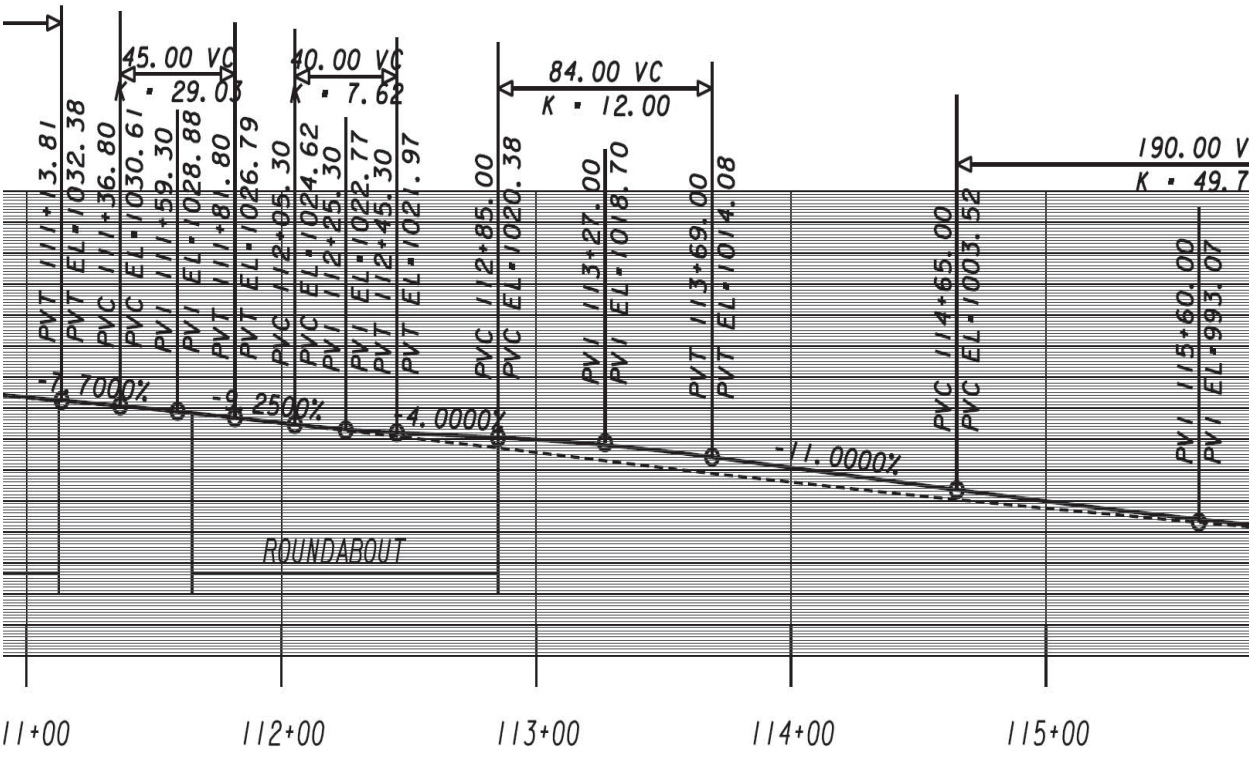


Image 4

A couple of advantages of this profile over that of the recommended profile from Attachment A is that the total vertical difference is under 5 feet instead of 8 feet or so from the MTJ peer review and this vertical difference is terminated approximately 400 feet north of the westbound ramp intersection under the ARCADIS profile while the MTJ profile still has an approximately 3 foot vertical difference to account for at this location.

8. Conclusion and Recommendations

The proposed single lane compact type roundabout interchange design with a few right turn only lanes added is an excellent choice for this location. Even though the site is constrained the geometric design is very good; the deflection will promote speeds low enough to provide the desired overall safety benefit and efficient operations. The roundabouts are expected to provide an acceptable LOS for at least the next 10 years. Beyond the 10 year projections the capacity of the 2 lane bridge becomes the limiting factor to the acceptable operations at this interchange.

There are a few recommendations from the MTJ Roundabout Engineering peer review that could be implemented by ARCADIS. The relocation of the pedestrian crossings may provide a safer crossing experience and the teardrop design will provide smoother flow across the interchange since the threat of circulating traffic will be removed. The teardrop design will also prevent vehicles from circulating on the southern side of the northern roundabout where the slope is going to remain at the existing 9.25%.

The 4% slope at the northern side of the northern roundabout should work quite well, especially if there is minimal or even no vertical difference between the circulating roadway and the truck apron for this part of the roundabout. The 4% slope will cause the inside tires of the tractor-trailer to be approximately 4 inches higher than the outside tires. A very common design for roundabouts is 2% slopes for the travel lane and truck apron with a 4 inch mountable curb between the two surfaces – resulting in approximately 6 inches of vertical difference between the inside and outside tires. It is recommended that consideration be given to reducing the height of the curb between the travel lane and truck apron for this critical part of the roundabout. The typical 3 inch or 4 inch mountable curb could start at the beginning of the teardrop and then transition to flush across from the westbound off-ramp approach. An advantage to implementing this flush curb here is that there is no real demand for the through movement from the westbound off-ramp so the speed control normally provided by the vertical difference between the surfaces isn't required.

If the final result ends up with a 4 inch or less vertical difference between the wheel paths for the left turning trucks from Riverside Drive northbound onto I-285 westbound then the design will more than adequately accommodate this maneuver. The use of the MUTCD truck roll over warning sign with a very low advisory speed may help as well.

Attachment A

313 Price Place, Suite #5
Madison, WI 53705
Office: 608.238.5000
Fax: 866.846.5552
www.mtjengineering.com

Technical Memorandum

TO: Shamir Poudel, P.E., ARCADIS U.S., Inc.

FROM: Mark T. Johnson, P.E. (GA), MTJ Engineering, LLC

SUBJECT: **Riverside Drive / I-285 Interchange Roundabout Review, PI #0010925, Fulton County, GA**

DATE: 8/5/14

I am very pleased to provide this summary of our review for the proposed roundabout interchange located at the Riverside Drive Interchange with I-285 in Fulton County, GA.

MTJ has reviewed the proposed horizontal designs for both roundabouts and the vertical geometrics for the WB ramp roundabout to understand expected operations and safety. Based on this review we developed highly developed concept horizontal geometric recommendations and vertical/grading recommendations for the northerly most roundabout (WB off ramp). This was followed by horizontal design recommendations modifications for the EB ramp roundabout to promote consistency in design application between these two closely spaced roundabouts.

We have worked closely with ARCADIS U.S., Inc. (Prime) and the GA DOT to build upon the previous design work completed to provide essential minimal design recommendations to optimize vertical and also horizontal geometrics to address the profile grades.

We've completed an operational and horizontal review for both roundabouts and have developed the essential minimal recommendations to promoted optimal safety and improved operations. This review is summarized below and in the attached design graphics.

2015 OPERATIONAL ANALYSIS (see attached)

MTJ has performed an operational analysis using the latest version of Rodel (v. 1.88). Rodel is a geometrically sensitive analysis program that accurately predicts operations based on differing geometrics and has been validated on U.S. roundabouts. Key results of the 2015 operations analysis include the following:

South Roundabout:

EB Off Ramp

The PM peak operational analysis for the EB off-ramp movement shows sensitivity to Delay and Queuing.

- Delay is predicted to be greater than 50 seconds for the heavy left turn movement
- 15-min. Q is predicted to be ~20 vehicles (500')
- 95%Q predicted to be 40 vehicles (1000')
- As designed, Queuing for off-ramp left turn movement will preclude use of RT lane (starve out the RT lane). In the event this occurred, the off-ramp Q would be much greater than the predicted 500'.
- The revised design provides a much longer RT lane to minimize potential for RT starvation, and therefore minimizing Q on off-ramp

NB Riverside Entry

- The operational analysis shows that the NB Aux. Right Turn is not necessary
- Delay without the RT lane is ~ 10 seconds for both AM and PM
- Removing the RT lane allows for reduced impacts with recommended re-design modifications

North Roundabout:

- Analysis shows sensitivity to Delay for NB entry in the PM Peak
- Tear-Drop Design for NB entry may assist with improved operations for the NB movement to reduce sensitivity to Delay
- No other changes with respect to traffic operations

HORIZONTAL DESIGN (See attached)

MTJ has developed minimal necessary horizontal concept design modifications to optimize safety and the operations for all modes within available constraints.

The concept geometric design recommendations include:

- Geometrics to accommodate large truck (WB-67) movements. It is noted that these are concept designs. Preliminary and final design may identify some slight modifications to fully accommodate desired large truck movements to include inside and potentially outside aprons (a.k.a. blisters).

VERTICAL DESIGN (See attached)

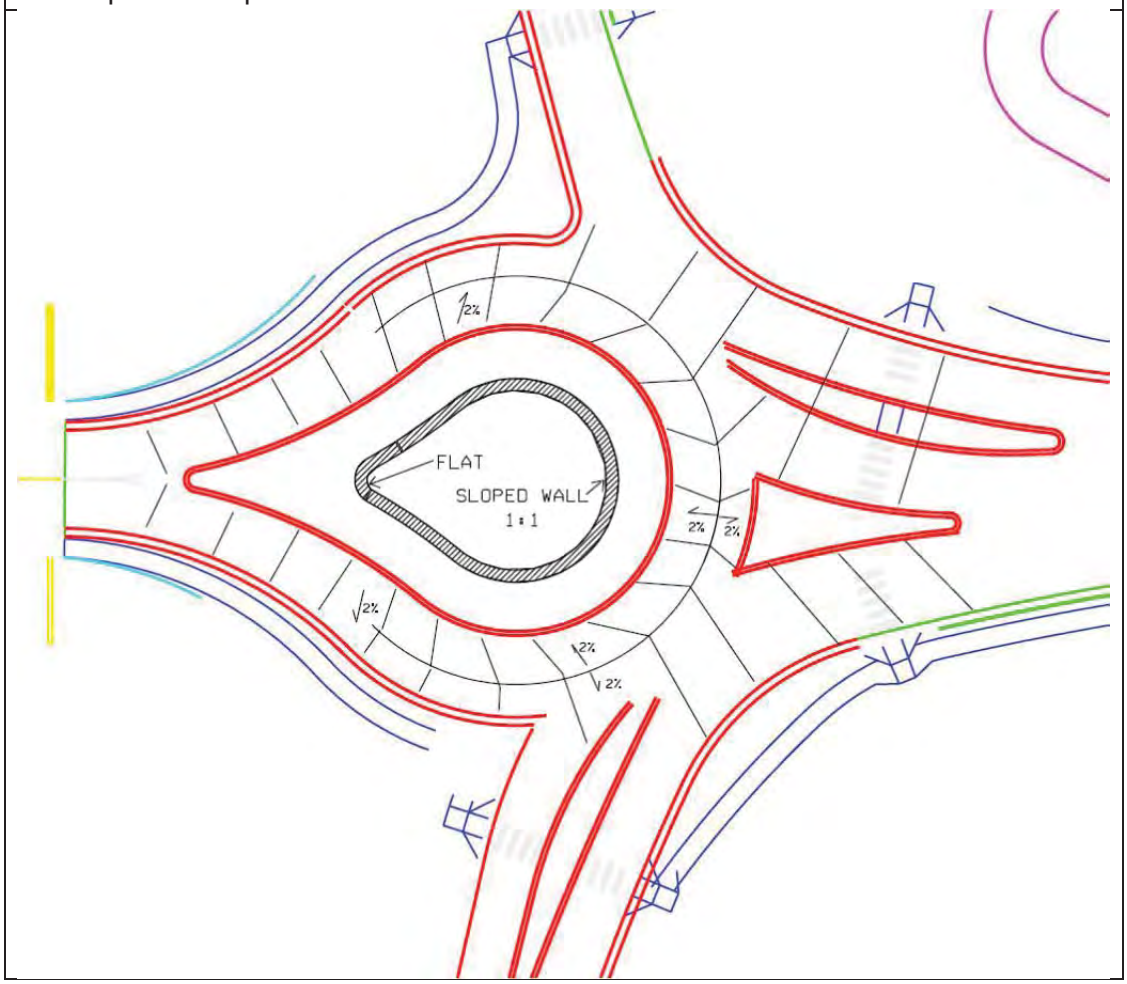
We have provided concept recommendations to vertical grading and profiles for the north roundabout and north Riverside Roadway profile to improve the safety and ride of vehicular movements.

Key Recommendations include:

- Absolute maximum longitudinal roadway profile around the roundabout of 6%, preferred max = 4%.
- Maximum outward cross-slope of 2% on north side of the roundabout (see below).

These recommendations are aimed at improved vehicular comfort and safety for large vehicles with high or fluid type loads.

Concept Development of Crown on Downhill Side of Roundabout



Please see the attached concept profiles we've developed to achieve vertical design recommendations.

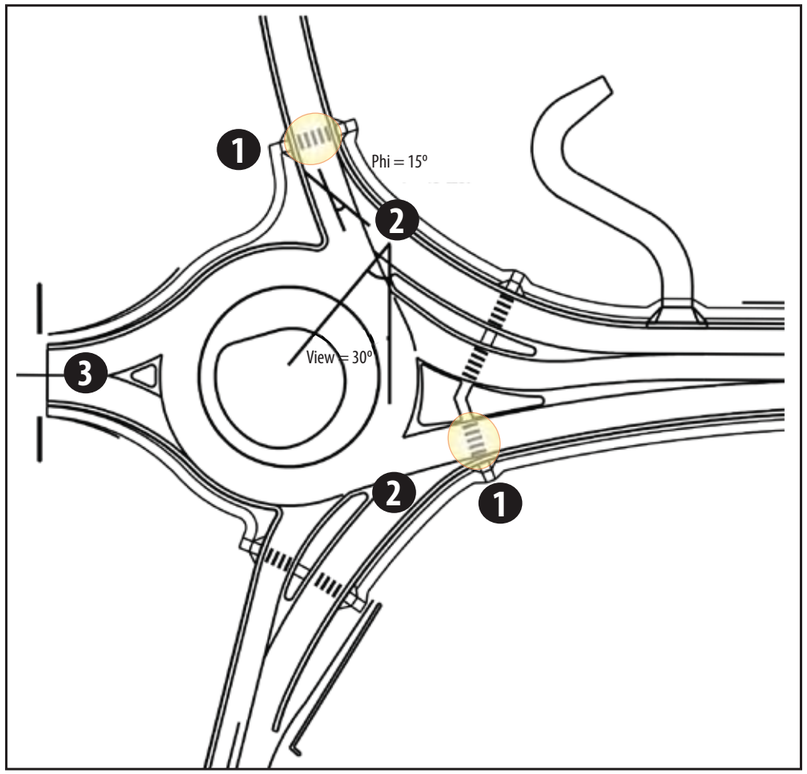
If you have any questions or would like to discuss, please feel free to contact me.

Sincerely,

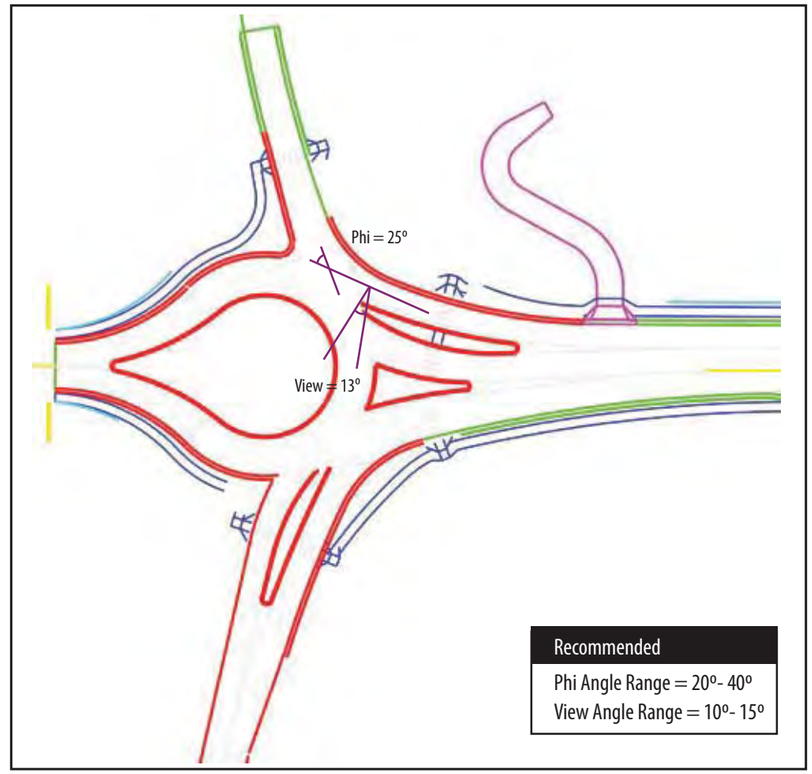
Mark T. Johnson, P.E.

(Attachments)

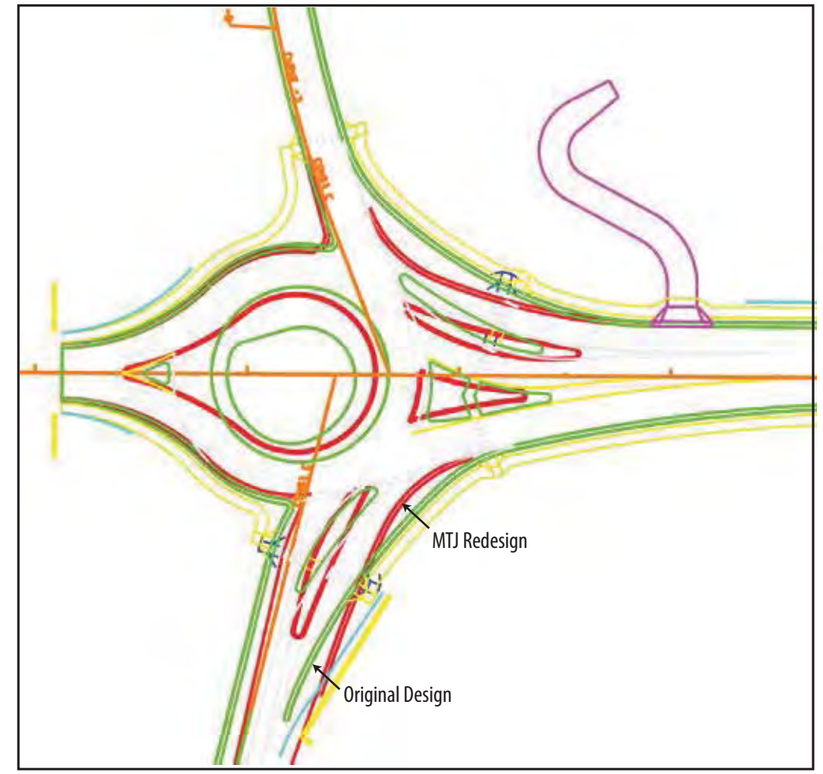
Original Design



MTJ Corrective Redesign



Overlay of MTJ Corrective Design Over Original Design



Review Comments

1. Reduced Pedestrian Safety:
   - Insufficient separation at entry to pedestrian crossing
2. Deficient Phi and View Angles for Auxiliary RT Slip Ramp:
   - Phi = 15º
   - View = 30º
   - Summary: Flat entry angles encourage fast RT movements
3. Splitter Island Size Insufficient for Context and Traffic

Recommended Modifications

1. Improves Pedestrian Safety:
   - Control RT speeds
   - Provide separation at entry to pedestrian crossing
2. Phi and View Angles Corrective Geometry:
   - Phi = 25º
   - View = 13º
3. Splitter Island Revision: Tear Drop Design
   - Simplifies vertical grading
   - Improves safety and traffic flow

Summary

Essential minimal modifications to optimize design

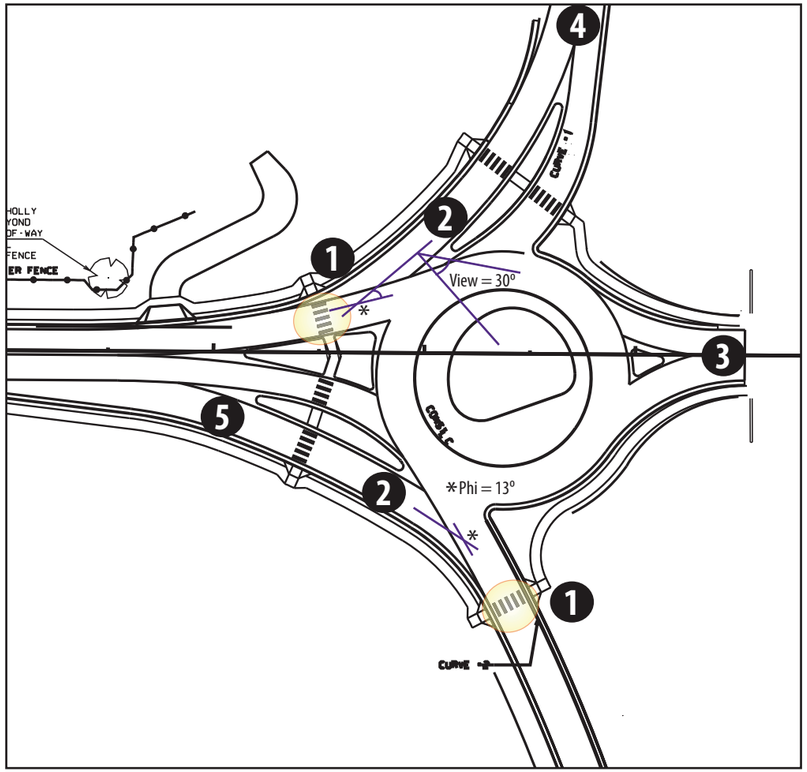
RIVERSIDE DR. & I-285 INTERCHANGE
FULTON COUNTY, GA

DESIGN REVIEW OF WB OFF RAMP
(NORTH RAMP)

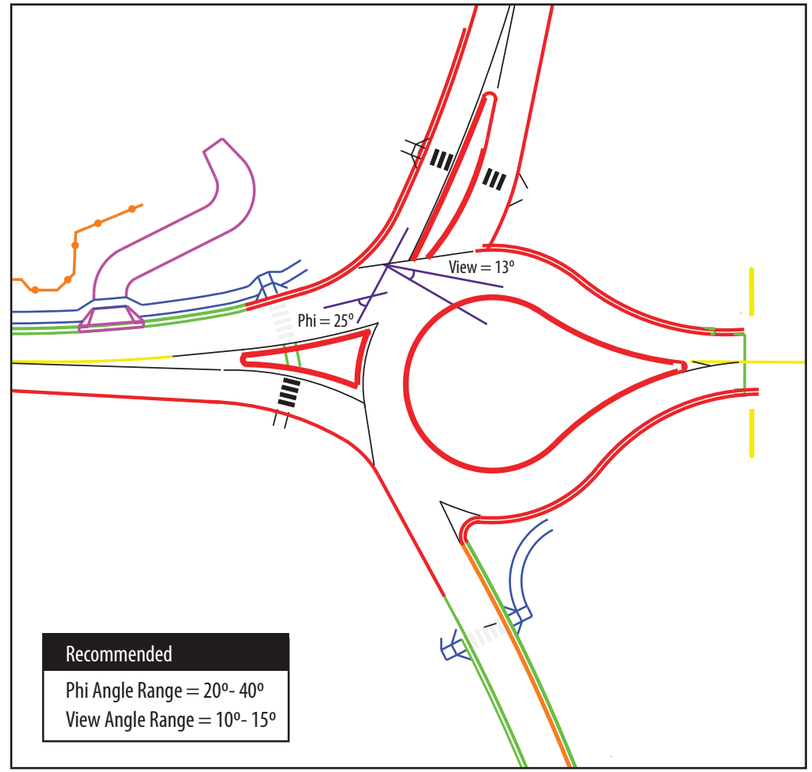
Scale= NTS

MTJ Roundabout Engineering
313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com

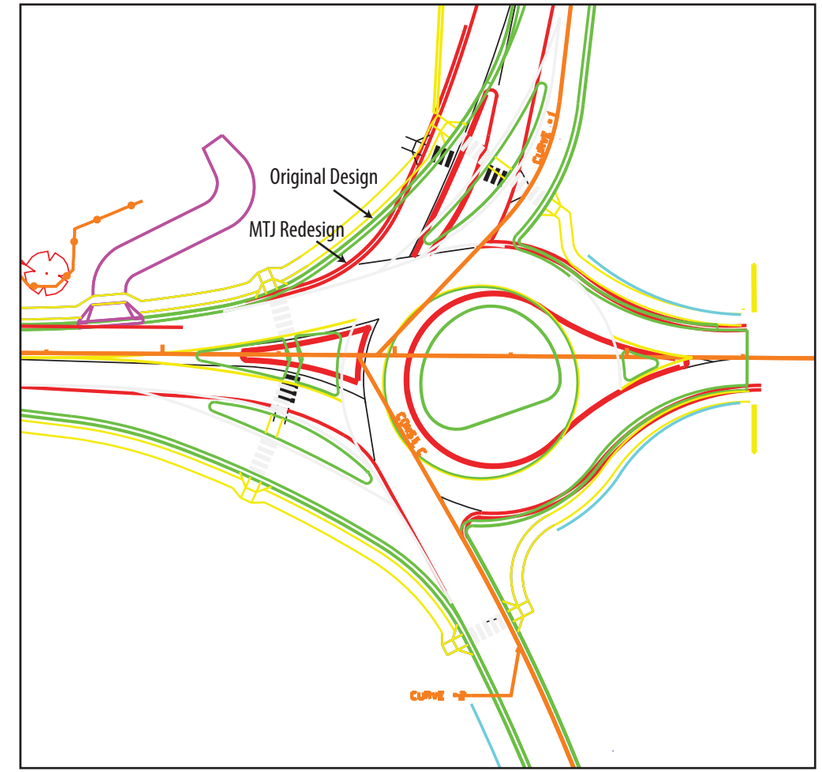
Original Design



MTJ Corrective Redesign



Overlay of MTJ Corrective Design Over Original Design



Review Comments

1. Reduced pedestrian safety:
   - Insufficient separation at entry to pedestrian crossing
2. Deficient phi and view angles for auxiliary RT slip ramp:
   - Phi = 13°
   - View = 30°
   - Summary: Flat entry angles encourage fast RT movements
3. Splitter island size insufficient for context and traffic
4. Operational analysis shows that the predicted Q length for the heavy LT volume will cause RT lane starvation
5. Operational analysis shows RT lane not necessary

Recommended Modifications

1. Improves pedestrian safety:
   - Control RT speeds
   - Provide separation at entry to pedestrian crossing
2. Phi and view angles corrective geometry:
   - Phi = 25°
   - View = 13°
3. Splitter island revision: Tear drop design
   - Simplifies vertical grading
   - Improves safety and traffic flow
4. Longer RT lane provided to avoid RT lane starvation
5. Removing RT lane reduces impact

Summary

Essential minimal modifications to optimize design

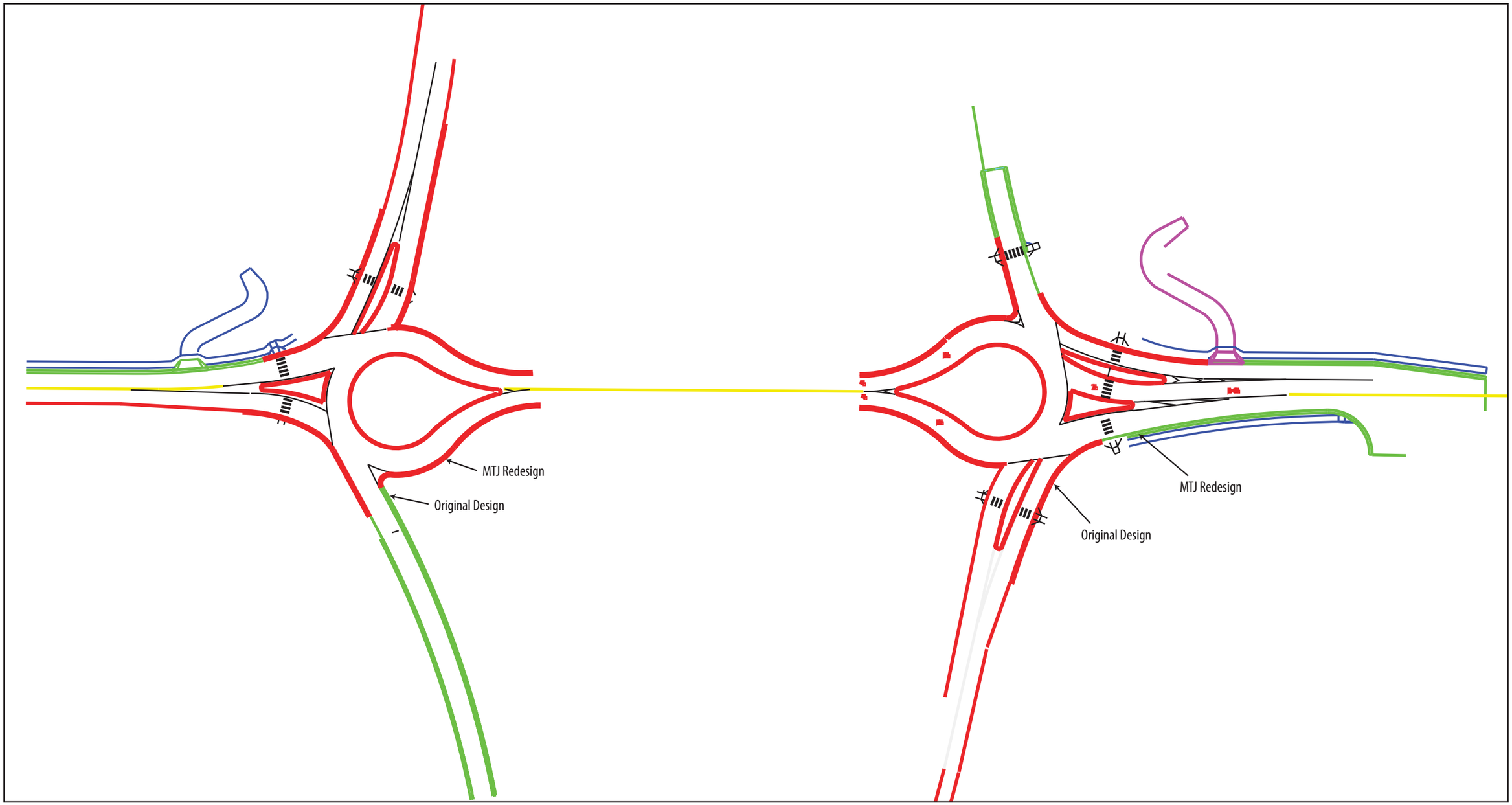
RIVERSIDE DR. & I-285 INTERCHANGE
FULTON COUNTY, GA

DESIGN REVIEW OF EB OFF RAMP
(SOUTH RAMP)

Scale= NTS

MTJ Roundabout Engineering
313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com

MTJ Corrective Design



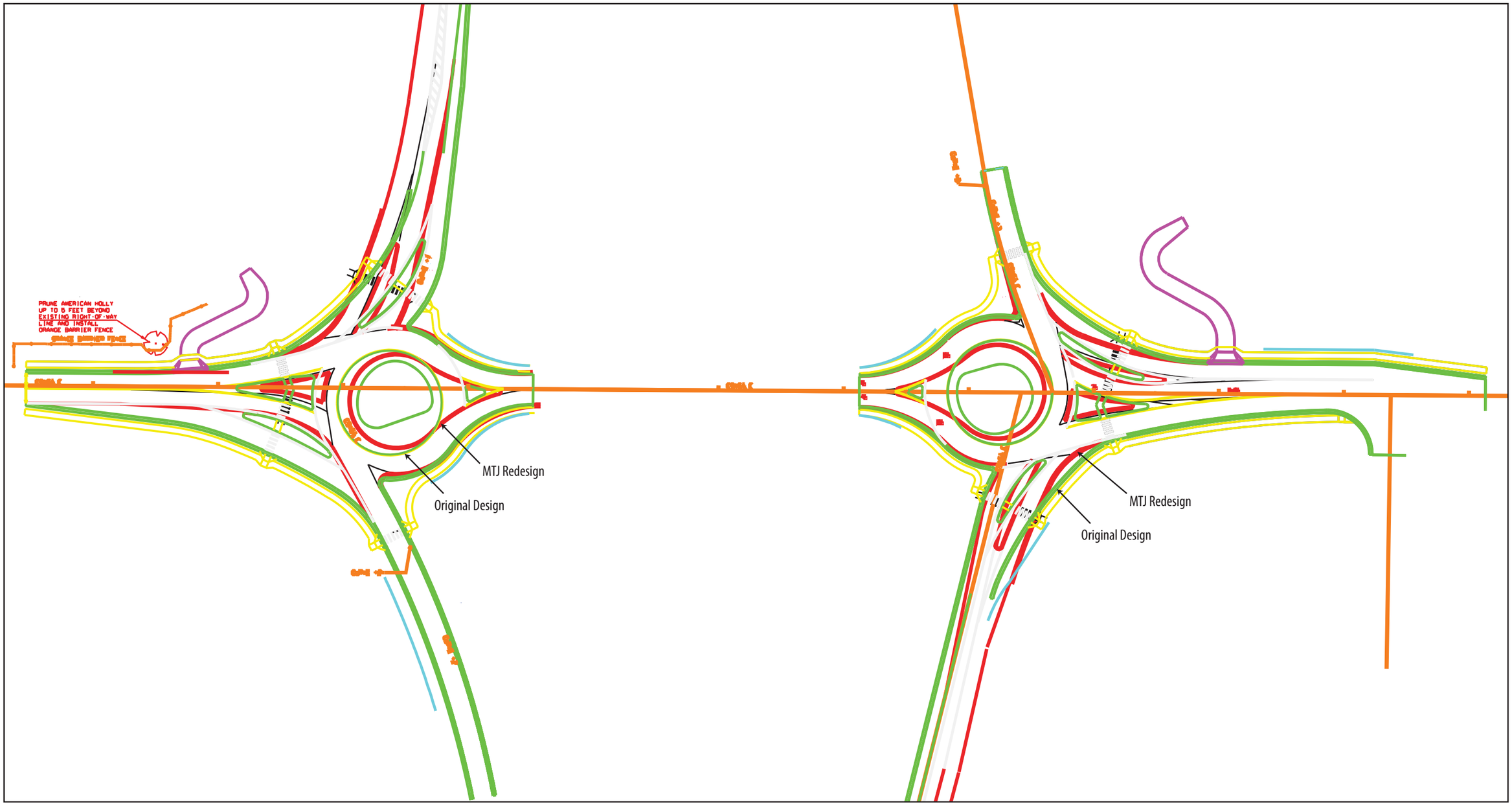
RIVERSIDE DR. & I-285 INTERCHANGE
FULTON COUNTY, GA

DESIGN REVIEW OF EB & WB OFF RAMP

Scale= NTS

313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com

Overlay of MTJ Corrective Design Over Original Design



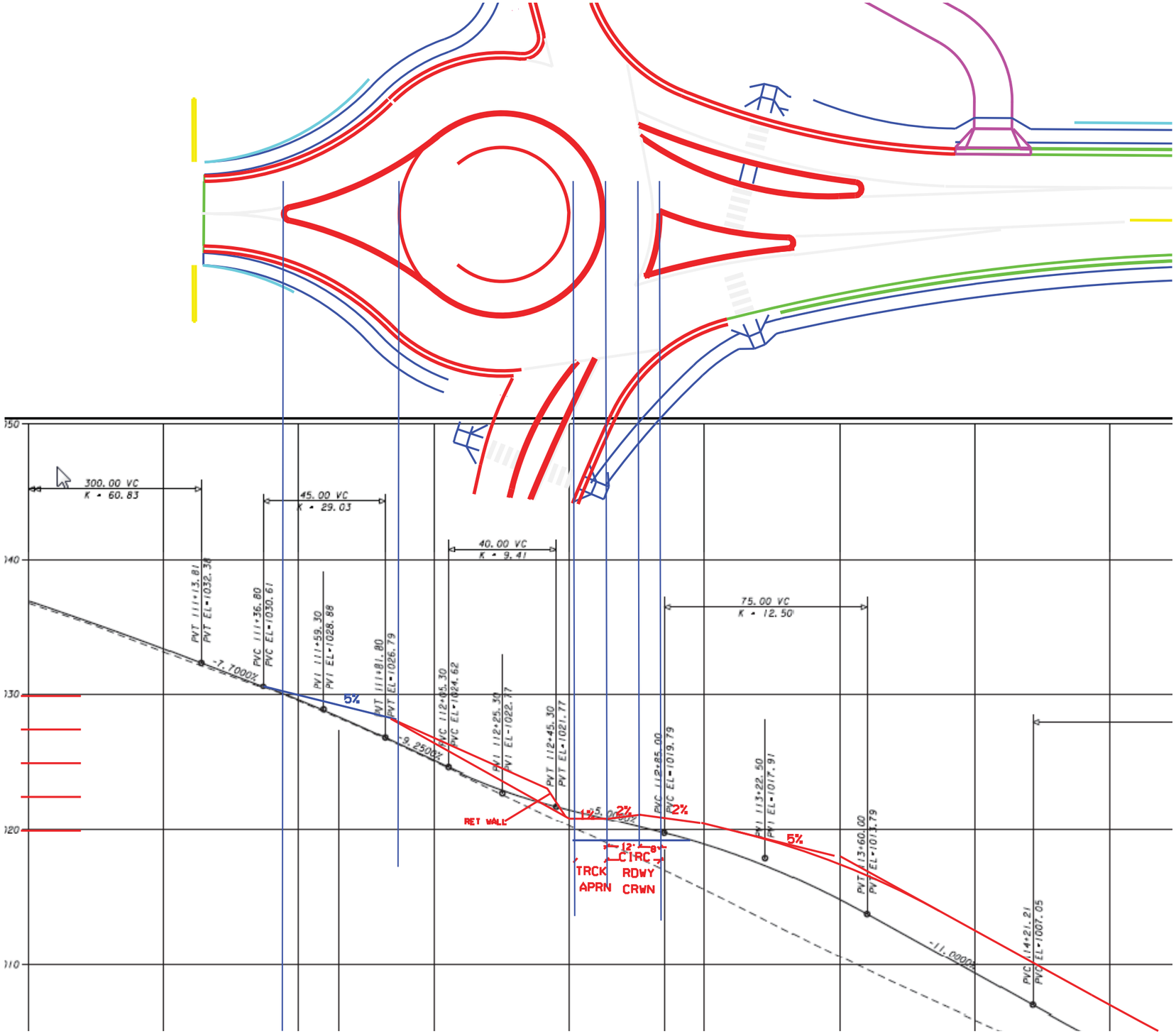
RIVERSIDE DR. & I-285 INTERCHANGE

FULTON COUNTY, GA

DESIGN REVIEW OF EB & WB OFF RAMP

Scale= NTS

313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com



RIVERSIDE DR. & I-285 INTERCHANGE

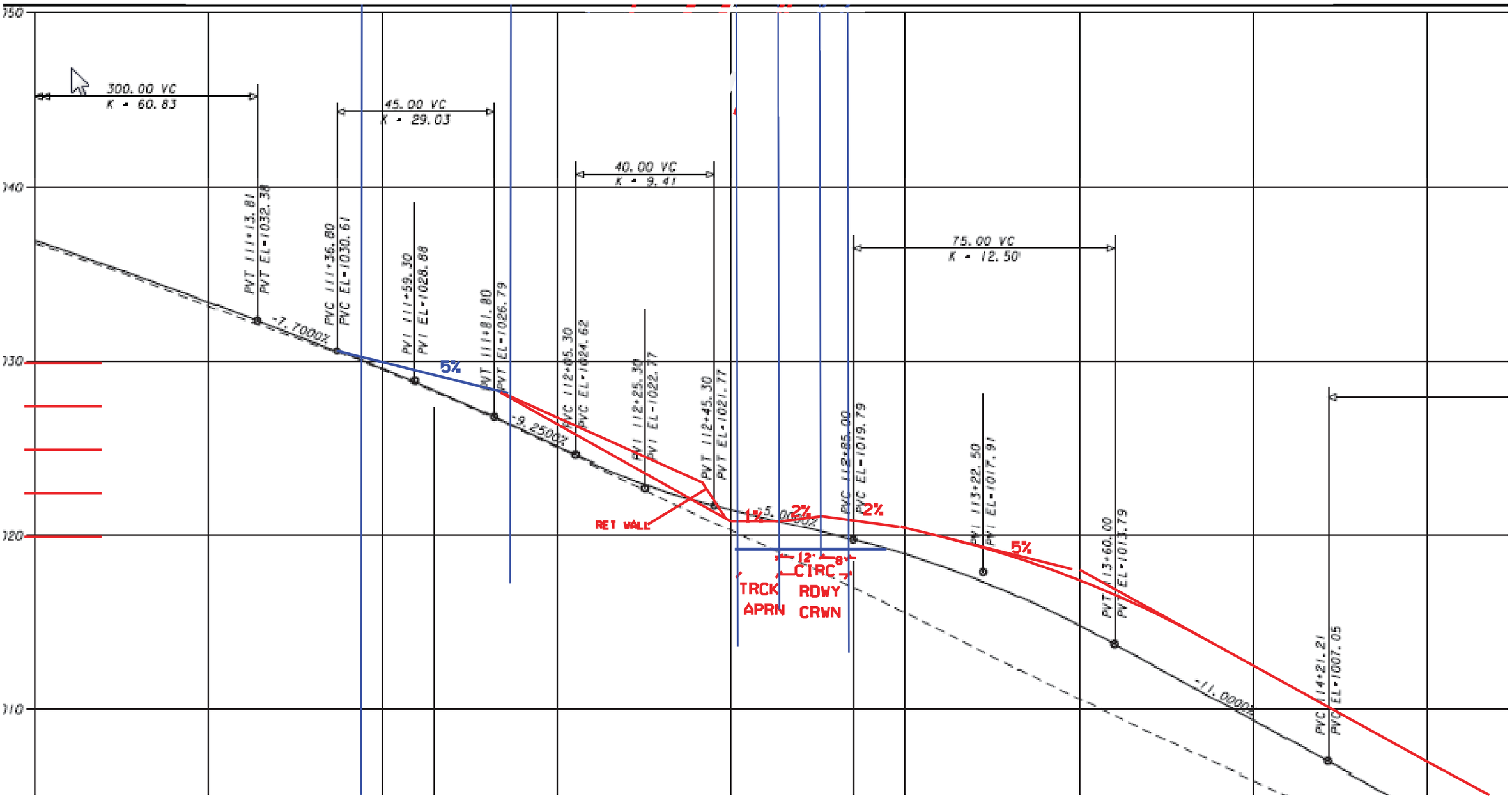
FULTON COUNTY, GA

VERTICAL PROFILE

Scale= NTS

MTJ Roundabout Engineering

313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com



RIVERSIDE DR. & I-285 INTERCHANGE
FULTON COUNTY, GA

VERTICAL PROFILE

Scale= NTS

MTJ Roundabout Engineering
313 Price Place, Suite #5
Madison, WI 53705
PH I 608.238.5000
FX I 866.846.5552
EM I info@mtjengineering.com
www.mtjengineering.com

Scheme Summary

Control Data

Control Data and Model Parameters

I 285	2015 PHF Flow Profile (veh)
North Rndbt 2015	7.5 min Time Slice
Rodel-Win1	Queuing Delays (sec)
Right Hand Drive	Daylight conditions
PM Peak Hour	Peak 60/15 min Results
Full Geometry	Output flows: Vehicles
English Units (ft)	50% Confidence Level

Available Data

Entry Capacity Calibrated	No
Entry Capacity Modified	No
Crosswalks	No
Flows Factored	No
Approach/Exit Road Capacity Calibrated	No
Accidents	No
Accident Costs	No
Bypass Model	Yes
Bypass Calibration	No
Global Results	Yes

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB	0	0	12.00	1	14.00	1	164.00	66.00	20.00
2	Off ramp	90	0	12.00	1	14.00	1	164.00	66.00	20.00
3	SB	180	0	12.00	1	14.00	1	164.00	66.00	20.00
4	on ramp	270	0	12.00	1	14.00	1	164.00	66.00	20.00

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
2	Off ramp	0	1.000	0	1.000	12.00	1792	0	12.00	1792	0
3	SB	0	1.000	0	1.000	20.00	2987	0	12.00	1792	0
4	on ramp	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0

Bypass Geometry

Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
2	Off ramp	Yield	340	12	1	12	1	12	1
3	SB	Yield	1	12	1	12	1	20	2

Bypass Entry Capacity Modifiers and Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Calibration	
		Capacity + or -	Cross Walk Factor	Intercept + or -	Slope Factor
2	Off ramp	0	1.000	0	1.000
3	SB	0	1.000	0	1.000

Traffic Flow Data (veh/hr)

2015 PM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	NB	0	30	1055	0	0	1.0	1.00	0.9
2	Off ramp	0	70	1	0	340	1.0	1.00	0.9
3	SB	0	0	360	330	1	1.0	1.00	0.9
4	on ramp	0	0	0	0	0	1.0	1.00	0.9

Operational Results

2015 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB	None	1085		0		430	1227		0.9319	
2	Off ramp	Yield	71	340	1083	1083	0	617	681	0.1185	0.5181
3	SB	Yield	690	1	101	431	1393	1171	870	0.6015	0.0012
4	on ramp	None	0		0		362	0		0.0000	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB	None	23.06		23.06	28.64		C		C
2	Off ramp	Yield	6.46	10.65	9.93	0.43	3.82	A	B	A
3	SB	Yield	7.23	0.00	7.22	4.57	0.00	A	A	A
4	on ramp	None	0.00		0.00	0.00		A		A

2015 PM Peak - 15 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB	None	1206		0		477	1227		1.0337	
2	Off ramp	Yield	79	378	1188	1188	0	558	620	0.1434	0.6240
3	SB	Yield	767	1	112	478	1530	1165	845	0.6688	0.0013
4	on ramp	None	0		0		349	0		0.0000	

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB	None	30.20		30.20	28.64		D		D
2	Off ramp	Yield	6.81	12.55	11.56	0.43	3.82	A	B	B
3	SB	Yield	7.81	0.00	7.80	4.57	0.00	A	A	A
4	on ramp	None	0.00		0.00	0.00		A		A

Scheme Summary

Control Data

Control Data and Model Parameters

I 285	2015 PHF Flow Profile (veh)
South Roundabout 2015	7.5 min Time Slice
Rodel-Win1	Queuing Delays (sec)
Right Hand Drive	Daylight conditions
PM Peak Hour	Peak 60/15 min Results
Full Geometry	Output flows: Vehicles
English Units (ft)	50% Confidence Level

Available Data

Entry Capacity Calibrated	No
Entry Capacity Modified	No
Crosswalks	No
Flows Factored	No
Approach/Exit Road Capacity Calibrated	No
Accidents	No
Accident Costs	No
Bypass Model	Yes
Bypass Calibration	No
Global Results	Yes

Operational Data

Main Geometry (ft)

Approach and Entry Geometry

Leg	Leg Names	Approach Bearing (deg)	Grade Separation G	Half Width V	Approach Lanes n	Entry Width E	Entry Lanes n	Flare Length L'	Entry Radius R	Entry Angle ?
1	NB	0	0	12.00	1	14.00	1	164.00	50.00	20.00
2	On ramp	90	0	12.00	1	14.00	1	164.00	50.00	20.00
3	SB	180	0	12.00	1	14.00	1	164.00	50.00	30.00
4	off ramp	270	0	12.00	1	14.00	1	164.00	50.00	20.00

Capacity Modifiers and Capacity Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Entry Calibration		Approach Road			Exit Road		
		Capacity + or -	XWalk Factor	Intercept + or -	Slope Factor	V (ft)	Default Capacity	Calib Capacity	V (ft)	Default Capacity	Calib Capacity
1	NB	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
2	On ramp	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
3	SB	0	1.000	0	1.000	20.00	1792	0	12.00	1792	0
4	off ramp	0	1.000	0	1.000	16.00	2390	0	12.00	1792	0

Bypass Geometry

Bypass Approach Geometry (ft)

Leg	Leg Names	Bypass Type	Bypass Flows	V	nv	Vb	nvb	Vt	nvt
4	off ramp	Yield	270	12	1	16	1	16	1

Bypass Entry Capacity Modifiers and Calibration (veh/hr)

Leg	Leg Names	Entry Capacity		Calibration	
		Capacity + or -	Cross Walk Factor	Intercept + or -	Slope Factor
4	off ramp	0	1.000	0	1.000

Traffic Flow Data (veh/hr)

2015 PM Peak Peak Hour Flows

Leg	Leg Names	Turning Flows					Flow Modifiers		
		U-Turn	Exit-3	Exit-2	Exit-1	Bypass	Trucks %	Flow Factor	Peak Hour Factor
1	NB	0	0	230	90	0	1.0	1.00	0.9
2	On ramp	0	0	0	0	0	1.0	1.00	0.9
3	SB	0	165	265	0	0	1.0	1.00	0.9
4	off ramp	0	855	0	0	270	1.0	1.00	0.9

Operational Results

2015 PM Peak - 60 minutes

Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB	None	320		1008		535	649		0.5053	
2	On ramp	None	0		0		255	0		0.0000	
3	SB	None	430		0		1073	1168		0.3724	
4	off ramp	Yield	855	270	430	430	0	886	941	1.0850	0.2906

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB	None	10.51		10.51	2.81		B		B
2	On ramp	None	0.00		0.00	0.00		A		A
3	SB	None	4.76		4.76	1.60		A		A
4	off ramp	Yield	58.91	5.31	46.05	40.93	1.14	F	A	E

2015 PM Peak - 15 minutes

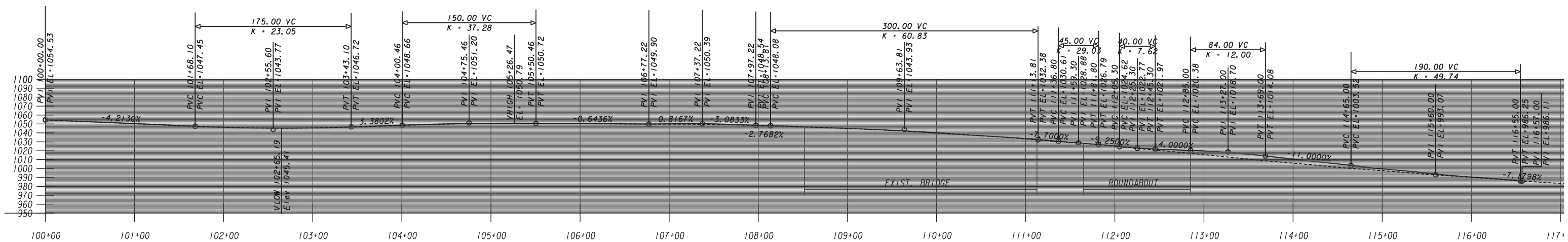
Flows and Capacity

Leg	Leg Names	Bypass Type	Flows (veh/hr)					Capacity (veh/hr)			
			Arrival Flow		Opposing Flow		Exit Flow	Capacity		Average VCR	
			Entry	Bypass	Entry	Bypass		Entry	Bypass	Entry	Bypass
1	NB	None	337		1037		563	633		0.5443	
2	On ramp	None	0		0		251	0		0.0000	
3	SB	None	453		0		1105	1168		0.3916	
4	off ramp	Yield	900	284	452	452	0	874	929	1.1467	0.3095

Delays, Queues and Level of Service

Leg	Leg Names	Bypass Type	Average Delay (sec)			95% Queue (veh)		Level of Service		
			Entry	Bypass	Leg	Entry	Bypass	Entry	Bypass	Leg
1	NB	None	10.90		10.90	2.81		B		B
2	On ramp	None	0.00		0.00	0.00		A		A
3	SB	None	4.77		4.77	1.60		A		A
4	off ramp	Yield	61.82	5.37	48.27	40.93	1.14	F	A	E

Attachment B


PVI 100+00.00
PVI EL=1054.53
-4.2130%
175.00 VC
K = 23.05
PVC 101+68.10
PVC EL=1047.45
PVI 102+55.60
PVI EL=1043.77
VLOW 102+65.19
Elev 1045.41
PVT 103+43.10
PVT EL=1046.72
3.3802%
150.00 VC
K = 37.28
PVC 104+00.46
PVC EL=1048.66
PVI 104+75.46
PVI EL=1051.20
VHIGH 105+26.47
EL=1050.79
PVT 105+50.46
PVT EL=1050.72
-0.6436%
PVI 106+77.22
PVI EL=1049.90
0.8167%
PVI 107+37.22
PVI EL=1050.39
-3.0833%
PVI 107+97.22
PVC EL=1048.54
-2.7682%
PVC EL=1048.08
300.00 VC
K = 60.83
PVI 109+63.81
PVI EL=1043.93
PVT 111+13.81
PVT EL=1032.38
-7.7000%
PVC 111+36.80
PVC EL=1030.61
45.00 VC
K = 29.03
PVI 111+59.30
PVI EL=1028.88
PVT 111+81.80
PVT EL=1026.79
-9.2500%
PVC 112+05.30
PVC EL=1024.62
40.00 VC
K = 7.62
PVI 112+25.30
PVI EL=1022.77
PVT 112+45.30
PVT EL=1021.97
4.0000%
84.00 VC
K = 12.00
PVC 112+85.00
PVC EL=1020.38
PVI 113+27.00
PVI EL=1018.70
PVT 113+69.00
PVT EL=1014.08
-11.0000%
190.00 VC
K = 49.74
PVC 114+65.00
PVC EL=1003.52
PVI 115+60.00
PVI EL=993.07
PVT 116+55.00
PVT EL=986.25
PVI 116+57.00
PVI EL=986.11
-7.1798%
EXIST. BRIDGE
ROUNDABOUT
1100
1090
1080
1070
1060
1050
1040
1030
1020
1010
1000
990
980
970
960
950
100+00
101+00
102+00
103+00
104+00
105+00
106+00
107+00
108+00
109+00
110+00
111+00
112+00
113+00
114+00
115+00
116+00
117+

ATTACHMENT 9

BRIDGE INVENTORY

Processed Date:10/2/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:121-0452-0 **Fulton** **SUFF. RATING:** 70.20

Location & Geography

Structure ID:	121-0452-0
200 Brdge Information:	07
*6A Feature Int:	I-285 (SR 407)
*6B Critical Bridge:	0
*7A Route No Carried:	CR00209
*7B Facility Carried:	RIVERSIDE DRIVE
9 Location:	IN N FULTON
2 Dot District:	7
207 Year Photo:	2011
*91 Inspection Frequency:	24 Date: 07/19/2011
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
* 4 Place Code:	68516
*5 Inventory Route(O/U):	1
Type:	5
Designation:	1
Number:	09248
Direction:	0
*16 Latitude:	33 54.954 HMMS Prefix:
*17 Longtitude:	84 -24.3995 HMMS Suffix: MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1213020923
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	006.06
*208 Inspection Area:	7 Initials: EFP
Engineer's Initials:	JTB
* Location ID No:	121-09248M-000.60N

*104 Highway System:	0
*26 Functional Classification:	16
*204 Federal Route Type:	M No: 09248
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	1
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	01
*20 Toll:	3
*21 Maintanance:	01
*22 Owner:	01
*31 Design Load:	6
37 Historical Significance:	5
205 Congressional District:	11
27 Year Constructed:	1962
106 Year Reconsrtucted:	0000
33 Bridge Medium:	0
34 Skew:	00
35 Structure Flared:	0
38 Navigation Control:	N
213 Special Steel Design:	0
267 Type of Paint:	5
*42 Type of Service On:	5
Type of Service Under:	1
214 Movable Bridge:	0
203 Type Bridge:	Z
259 Pile Encasement	3
*43 Structure Type Main:	4 02
45 No.Spans Main:	004
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	0 Vert: 1
111 pier Protection	0
107 Deck Structure Type:	1
108 Wearing Structure Type:	1
Membrane Type:	0
Deck Protection:	8

Signs & Attachments

225 Expansion Joint Type:	02
242 Deck Drains:	0
243 Parapet Location:	0
Height:	0
Width:	0
238 Curb Height:	1
Curb Material:	1
239 Handrail	1 1
*240 Medium Barrier Rail:	0
241 Bridge Median Height:	0
* Bridge Median Width:	0
230 Guardrail Loc. Dir. Rear:	3
Fwrd:	3
Oppo. Dir. Rear:	0
Oppo. Fwrd:	0
244 Aproach Slab	3
224 Retaining Wall:	0
233Posted Speed Limit:	35
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	0
237 Utilities Gas:	22
Water:	00
Electric:	00
Telephone:	21
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

"The Information contained in this File/Report is the property of GDOT and may not be released to any other party without the written consent of the Data Custodian. Please dispose of this information by shredding or other confidential method."

Bridge Inventory Data Listing

Structure ID:121-0452-0

Programming Data

201 Project No:	I-285-1 (16) 88 CT.2
202 Plans Available:	4
249 Prop Proj No:	IM-285-1(351)
250 Approval Status:	0000
251 PI Number:	713230-
252 Contract Date:	02/01/1901
260 Seismic No:	00000
75 Type Work:	34 1
94 Bridge Imp. Cost:	$1,008
95 Roadway Imp. Cost:	101
96 Total Imp Cost:	1512
76 Imp Length:	000467
97 Imp Year:	2013
114Furure ADT:	007005 Year:2032

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000000
113 Scour Critical	N
216Water Depth:	00.0 Br.Height:00.0
222Slope Protection:	4
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	000
Type:	0
No. Barrels:	0
* Width:	0.00 Height:0.00
* Length:	0 Apron:0
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	121-09248M-000.60N

Measurements:

*29ADT	004670 Year:2012
109%Trucks:	0
* 28 Lanes On:	02 Under:10
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0073
* 49 Structure Length:	258
51 Br. Rwdy. Width	28.00
52 Deck Width:	40.00
* 47 Tot. Horiz. Cl:	28
50 Curb / Sidewalk Width	5.00 / 5.00
32 Approach Rdwy. Width	028
*229 Shoulder Width:	
Rear Lt:	2.00 Type:3 Rt:2.00
Fwd. Lt:	2.00 Type:1 Rt:2.00
Permanent Width:	
Rear:	24.00 Type:3
	24.00 Type:2
Intersaction Rear:	1 Fwd: 1
36Safety Features Br. Rail:	2
Transition:	2
App. G. Rail:	2
App. Rail End:	1
53 Minimum Cl. Over:	99' 99"
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir.:	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	H 2 2
56 Lateral Undercl. Lt:	5.00
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main	7.50
Deck Thick Approach:	0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup:1995Sub:0000

65 Inventory Rating Mathod:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 28
64 Operating Type:	2 Rating: 28
231Calculated Loads:	
H-Modified:	21 0
HS-Modified:	29 0
Type 3:	27 0
Type 3s2:	35 0
Timber:	31 0
Piggyback:	00 0
261 H Inventory Rating:	25
262 H Operating Rating	42
67 Structural Evaluation:	6
58 Deck Condition:	6
59 Superstructure Condition:	6
* 227 Collision Damage:	0
60A Substructure Condition:	7
60B Scour Condition:	N
60C Underwater Condition	N
71 Waterway Adequacy:	N
61 Channel Protection Cond.:	N
68 Deck Geometry:	4
69 UnderClr. Horz/Vert:	2
72 Appr. Alignment:	8
62 Culvert:	N

Posting Data

70 Bridge Posting Required	5
41 Struct Open, Posted, CL:	A
* 103 Temporary Structure:	0
232 Posted Loads	
H-Modified:	00
HS-Modified:	00
Type 3:	00
Type 3s2:	00
Timber:	00
Piggyback	00
253 Notification Date:	02/01/1901
258 Fed Notify Date:	2/1/1901 12:00:00AM

"The Information contained in this File/Report is the property of GDOT and may not be released to any other party without the written consent of the Data Custodian. Please dispose of this information by shredding or other confidential method."

ATTACHMENT 10

BRIDGE AND BRIDGE DECK CONDITION SURVEYS

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENTAL CORRESPONDENCE

FILE: P.I. No 0010925, Fulton County

OFFICE: Bridge Maintenance Unit
DATE: September 25, 2013

FROM: Andy Doyle, P.E., State Bridge Maintenance Engineer

TO: Marlo Clowers, P.E., Project Manager, Office of Innovative Program Delivery

SUBJECT: Bridge Condition Survey

Our office received the request for a Bridge Condition Survey to be conducted. This request was dated December 10, 2013; a Bridge Condition Survey has been completed for this project.

Structure ID 121-0452-0
CR 209 (Riverside Drive) over I-285

The bridge is an HS-20 design and was constructed in 1962. The superstructure consists of a concrete deck, four (4) spans of steel beams on concrete caps with concrete columns.

After conducting a field inspection of the structure our office recommends the following rehabilitation:

- **Joints:**
  - Replace the joints at Bent 2, Abutment 1 and 5. Seal the joints at Bent 2 and Abutment 5 with a performed silicone joint.
  - Reseal all construction joints.
- **Deck:**
  - The deck has numerous transverse cracks in all spans. We recommend the deck be sealed by using a two-part polymer overlay system.
- **Substructure**
  - Repair concrete spalls at the following locations:
    - Bent 3, forward face of cap: approximately 2 square feet.
    - Bent 4, bottom of cap: approximately 6 square feet.
    - Abutment 5: approximately 8 square feet

I see no reason why the project cannot proceed, as long as correction of the issues cited above are incorporated into the plans.

If you have any questions, please contact Clayton Bennett at (404) 635-2889.
JAD:cbb
Cc: Reading File

ATTACHMENT 1M

HYDROLOGY STUDY FOR MS4 PERMIT

PI: 0010925
Riverside Drive Roundabout Interchange
Conceptual Hydraulics Analysis for Post-construction BMP
(March 2014)

Study Purpose: To evaluate the proposed design and assessment of post construction stormwater management measures (BMPs) and MS4 permit compliance for the project.

Introduction: In January 2012 the Environmental Protection Division of the Georgia Department of Natural Resources (EPD) issued the Georgia Department of Transportation (GDOT) first Municipal Separate Storm Sewer System (MS4) Permit (General NPDES Permit No. GAR041000 (Permit).

The Permit regulates new and existing point source discharges of stormwater from roadways owned and operated by GDOT to waters of the State of Georgia. The Riverside at I-285 project (Project) must meet the requirements of the Permit which includes the incorporating permanent water quality control and detention measures (BMPs) into the design where appropriate and where those BMPs have not been determined to be infeasible based on the infeasibility criteria identified in Section 1.4 of the GDOT Guidelines for Design of Post-Construction BMPs (GDOT Guidelines) issued August 23, 2013

Design Criteria: To the extent feasible, the BMPs were designed in accordance with the Permit requirements, the GDOT Guidelines, and the Georgia Stormwater Management Manual (GSMM).
A summary of the standard design criteria from the GDOT Guidelines is as follows:

- **Stormwater runoff quality and reduction** – demonstrate 80% of the total suspended solids (TSS) from runoff generated by a 1.2-inch rainfall event. The GSMM refers to this design criteria as the Water Quality Sizing Criteria.

- **Stream channel protection** – detain the 1-year 24-hour rainfall event. The GSMM refers to this design criteria as the Channel Protection Sizing Criteria.

- **Overbank protection** – calculated post-construction peak discharge rate that is less than or equal to pre-construction rates, for the 25-year 24-hour rainfall event. The GSMM refers to this design criteria as the Overbank Flood Protection Sizing Criteria.

- **Extreme flood protection** – control the 100-year 24-hour flood such that flooding is not exacerbated. The GSMM refers to this design criteria as the Extreme Flood Protection Sizing Criteria.

Hydraulic Analysis: Study of the existing drainage pattern indicates that the project area drains towards the northwest quadrant of the interchange and leaves the project area via one 36" RCP. Table 1 summarizes the existing and proposed hydraulic conditions within the project limits.

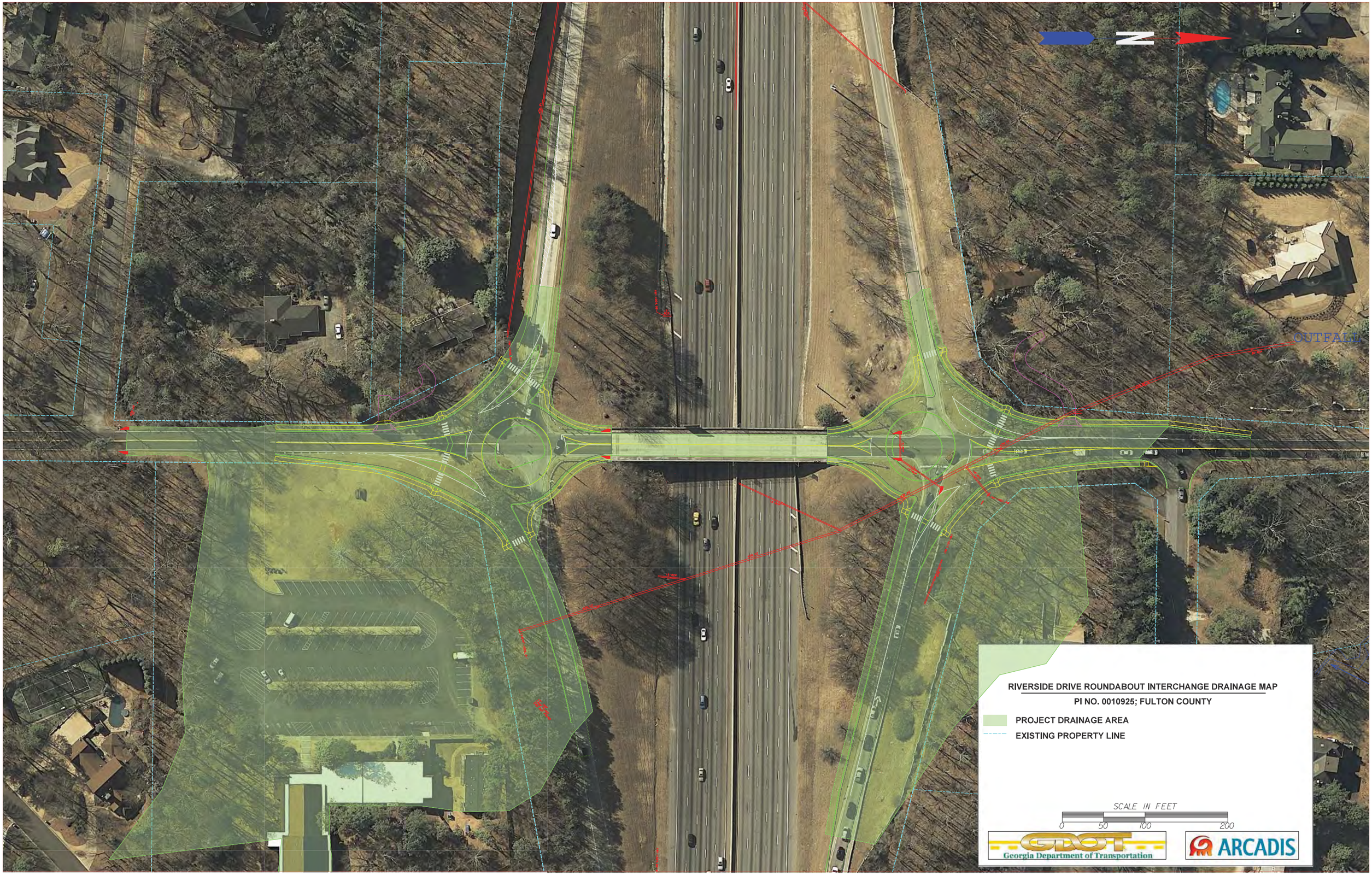
Table 1: Conceptual Drainage Area Summary

Description	Existing		Proposed	
	Area (ac)	Existing CN	Area (ac)	Proposed CN
Total Area	8.33	75	8.33	79
Roadway Impervious	1.18	98	2.05	98
Non-Roadway Impervious	2.02	98	2.02	98
Pervious	5.13	60	4.26	60

Table 2 summarizes the stormwater treatment requirement. It is anticipated that a detention pond can meet the MS4 requirements. Detention pond details and location will be further evaluated during the design-build phase of the project. Attempts should be made to by-pass as much of the existing drainage area especially any on-site and off-site impervious areas to minimize the size of the post-construction BMP.

Table 2: Conceptual post-construction stormwater treatment requirement

Description	
Water Quality Volume (WQ_v)	11,900 cubic feet
Channel Protection Volume	22,400 cubic feet
Overbank Protection	18,500 cubic feet
Extreme Flood Protection	7,900 cubic feet


N
OUTFALL
RIVERSIDE DRIVE ROUNDABOUT INTERCHANGE DRAINAGE MAP
PI NO. 0010925; FULTON COUNTY
PROJECT DRAINAGE AREA
EXISTING PROPERTY LINE
SCALE IN FEET
0
50
100
200
GDOT
Georgia Department of Transportation
ARCADIS

ATTACHMENT 1H

MINUTES OF CONCEPT MEETINGS

ARCADIS U.S., Inc.
2410 Paces Ferry Road
#400
Atlanta
Georgia 30339
Tel 770 431 8666
Fax 770 435 2666

MEETING REPORT

Subject:
I-285 Ramps at CR 209/Riverside Drive
Fulton County
P.I. 0010925

Department:
Infrastructure

ARCADIS Project No.:
GADT0201.0141

Place/Date of Meeting:
Georgia Department of Transportation
Main Conference Room, 27th Floor
November 14, 2013

Report No.:
1

Minutes by:
Ryan Graves

Issue Date:
November 21, 2013

Participants:
See List of Attendees

An initial concept team meeting was held to discuss the project scope, schedule, roles, and responsibilities for the concept development of the I-285 Ramps at Riverside Drive interchange improvements project (P.I. 0010925). Following is a summary of discussion items, decisions made, and action items identified during the meeting.

1. Marlo Clowers, GDOT Project Manager, opened the meeting and provided some background information for the project. The project is a safety project that includes the installation of roundabouts at the interchange of I-285 and Riverside Drive. It is a design-build project with ARCADIS preparing the concept report, NEPA document, and costing plans. Given ARCADIS' knowledge of the corridor as a result of the Revive285 project, ARCADIS was asked to complete this work without going through the PTIP process. HNTB will be assisting GDOT with design-build procurement.

2. Ryan Graves of ARCADIS provided an overview of the project. The project is a safety project that focuses on reducing the number and severity of accidents at the project interchange through implementation of single-lane roundabouts at the I-285 ramp intersections with Riverside Drive. Operational benefits are also anticipated through implementation of roundabouts without needing to replace the existing bridge.

3. Sujith Racha of ARCADIS provided an overview of existing traffic volumes and crash data for the project area. Mr. Racha identified the crash frequency and types of crashes within the project area as well as comparisons of crash data for the project with statewide averages for crash frequency.

4. Mr. Graves identified several areas of the project that may require project design exceptions or variances:

    a. A potential design exception was identified for the shoulder widths on the ramps. The proposed design calls for matching the existing typical section of the ramps, which do not meet current design standards.

    b. Design exceptions for vertical grades will be necessary for Riverside Drive (existing grade 9.56 percent) and the I-285 eastbound exit ramp (existing grade 6.0122 percent). The existing grades of Riverside Drive and the eastbound I-285 off-ramp both exceed the maximum grades for their respective roadway classifications. Modifying these grades will require replacement of the bridge on Riverside Drive and/or reconstruction of the entire eastbound off-ramp.

    c. A design variance for access control will be required because several existing side streets and driveways are present within 300 feet of the existing interchange and will remain after the proposed project construction.

    d. A lighting agreement between the City of Sandy Springs and GDOT will be required because current GDOT policy requires lighting for all roundabouts and interchanges. If a lighting agreement cannot be reached, a design variance will be required for the interchange to remain unlit.

    e. Sidewalks will be provided as part of the project. Sidewalks in the southwest quadrant of the interchange may need to be omitted to avoid impacting a historically eligible resource.

    f. The standard design vehicle for interchange ramps is a WB-67. Designing the roundabouts for a WB-67 will result in a much smaller central island. Scott Zehngraff of GDOT commented that the concrete truck apron could be designed for a WB-50, and the central island could be designed using a traversable hardscape to accommodate the WB-67 design vehicle.

5. As part of this project, routine rehabilitation work will be performed on the existing Riverside Drive bridge. This work includes repairing or replacing several joints, repairing concrete spalling, and sealing the bridge deck with a two-part polymer overlay. Mr. Graves presented a potential detour plan to accommodate traffic if the bridge needs to be closed temporarily to perform the bridge rehabilitation work. It was noted that the bridge rehabilitation could potentially be performed one lane at a time, allowing the other travel lane to remain open and eliminating the need for a detour. The project team will need to determine whether to proceed with a detour or to maintain traffic on the bridge during this rehabilitation work.

6. It was discussed that a potential detour route will be presented to the public during the Public Information Open House.

7. Mr. Racha provided an overview of the anticipated crash reductions after implementation of the roundabouts. He also presented the anticipated level of service (LOS) of the interchange once the proposed project is constructed. This data showed that the interchange performed slightly better than in the no-build condition.

8. Mr. Graves concluded the presentation by providing an overview of the project schedule and highlighting some of the key milestones in the project schedule:

    a. Concept Approval – May 2014

b. Categorical Exclusion Approval – September 2014

c. Anticipated Let Date – November 2014

9. Mr. Zehngraff mentioned that a good three-dimensional VISSIM simulation video will be needed for the public meeting (to be held February 2014) to demonstrate the project and gain public support.

10. Brad Edwards of the City of Sandy Springs mentioned that the LOS summary presented in the draft concept report does not accurately reflect the current operational conditions of the existing interchange. The analysis needs to be updated to reflect current traffic operations. Mr. Racha noted that the LOS data needs to be updated because the data presented in the meeting was a draft version and does not match approved traffic volumes.

11. Mr. Racha noted that the traffic data was approved by the GDOT Office of Planning on November 14, 2013.

12. Ken Werho of GDOT noted that careful consideration of the cross slopes within the roundabout will be necessary to ensure that trucks are able to navigate the roundabout without flipping.

13. Mr. Werho commented that the ramp meters and other ITS-related equipment will likely be impacted during construction of this project. The cost of moving this equipment will need to be factored into the construction cost of the project.

Action by:	Number:	Comments:
ARCADIS, GDOT Project Manager	1	Set up a meeting with Office of Environmental Services to discuss schedule ramifications of construction of a segment of sidewalk along Riverside Drive that would require right-of-way/easement from a historically eligible property.
GDOT Project Manager	2	Schedule a meeting with the City of Sandy Springs to discuss the project. Items for discussion include traffic analysis, landscaping requirements, lighting requirements, and traffic detours.
GDOT Project Manager	3	Schedule a meeting with the Office of Construction to discuss bridge rehabilitation work and potential for maintaining one lane of traffic during rehabilitation work versus a full bridge closure and detour.
GDOT Project Manager	4	Submit request for lighting agreement to GDOT Design, Policy, and Support.
GDOT Project Manager	5	Coordinate landscaping agreement with GDOT Landscaping Office.
ARCADIS, GDOT TMC	6	Verify potential impacts to the existing ITS system and ramp meters. Develop required modifications and associated costs.
ARCADIS, GDOT Project Manager	7	Submit SUE request to Office of Utilities.

ARCADIS

List of Attendees:

Name	Company	Email Address	Telephone Number
Shamir Poudel	ARCADIS	shamir.poudel@arcadis-us.com	770.431.8666
Alvin Gutierrez	FHWA	alvin.gutierrez@dot.gov	404.562.3632
Marlo Clowers	GDOT – IPD	mclowers@dot.ga.gov	404.631.1713
Landon Perry	GDOT – Traffic Operations	laperry@dot.ga.gov	404.635.2461
Steve Matthews	GDOT	smatthews@dot.ga.gov	404.635.1769
Kate D'Ambrosio	GDOT – Traffic Operations	kdambrosio@dot.ga.gov	404.635.2842
Ken Werho	GDOT – Traffic Operations	kkwerho@dot.ga.gov	404.635.2859
Ryan Graves	ARCADIS	ryan.graves@arcadis-us.com	770.431.8666
Sujith Racha	ARCADIS	sujith.racha@arcadis-us.com	770.431.8666
Melissa Harper	GDOT	mharper@dot.ga.gov	404.631.1971
Paul Alimia	GDOT – OES	palimia@dot.ga.gov	404.631.1353
Leisa Jones	GDOT – Utilities	leijones@dot.ga.gov	404.631.1358
Julia Billings	GDOT – Planning	jbillings@dot.ga.gov	404.631.1774
Brad Edwards	City of Sandy Springs	bedwards@sandyspringsga.gov	404.821.0801
Jan Phelps	GDOT – Utilities	japhelps@dot.ga.gov	404.631.1379
Mike Bolden	GDOT – Utilities	mbolden@dot.ga.gov	404.631.1380
Bryant Poole	Sandy Springs	bpoole@sandyspringsga.gov	770.206.1415
LaShane Alexander	GDOT – Right-of-Way	lalexander@dot.ga.gov	478.553.1569
Dustin O'Quinn	HNTB	doquinn@hntb.com	404.960.9323
David Acree	GDOT	dacree@dot.ga.gov	404.631.1621
Dave Peters	GDOT– DP&S	dpeters@dot.ga.gov	404.631.1738
Scott Zehngraff	GDOT – Traffic Operations	szehngraff@dot.ga.gov	404.635.2848
Garrin Coleman	City of Sandy Springs	gcoleman@sandyspringsga.gov	770.206.2017
William Martin	City of Sandy Springs	mmartin@sandyspringsga.gov	770.206.2012
Rob Lewis	HNTB	rtlewis@hntb.com	404.556.2981

ARCADIS U.S., Inc.
2410 Paces Ferry Road
#400
Atlanta
Georgia 30339
Tel 770 431 8666
Fax 770 435 2666

MEETING REPORT

Subject:
Concept Team Meeting Minutes
I-285 Ramps at CR 209/Riverside Drive
Fulton County
P.I. 0010925

Department:
Infrastructure

ARCADIS Project No.:
GADT0201.0141

Place/Date of Meeting:
Georgia Department of Transportation
Main Conference Room, 4th Floor
March 6, 2014

Report No.:
5

Minutes by:
Kate Colberg

Issue Date:
March 12, 2014

Participants:
See List of Attendees

A concept team meeting was held to discuss and review the concept report for the I-285 Ramps at Riverside Drive interchange improvements project (P.I. 0010925). Following is a summary of discussion items, decisions made, and action items identified during the meeting.

1. Marlo Clowers, GDOT Project Manager, opened the meeting and provided some background information for the project. The project is funded as a safety project and includes the installation of roundabouts at the interchange of I-285 and Riverside Drive. Because the project is design-build, it is operating on an accelerated schedule.

2. Ryan Graves of ARCADIS provided an overview of the various aspects of the project that are discussed in the concept report:

    a. The project is a safety project that focuses on reducing the number and severity of accidents at the project interchange through implementation of single-lane roundabouts at the I-285 ramp intersections with Riverside Drive. Some operational benefits are also anticipated through the implementation of roundabouts, and the project will serve as an interim project until other projects such as Revive 285 are constructed.

    b. Existing conditions to be considered include the historically eligible resource on the southwest quadrant, St. Andrew Presbyterian Church on the southeast quadrant, and Heards Creek on the northern side of the project area.

c. Historical crash data shows that crash rates at the intersections are consistent with statewide averages; however, the intersections could be performing significantly better than the statewide averages.

d. In existing conditions, the eastbound off-ramp is performing at a failing level of service (LOS) during the p.m. peak period, primarily due to the heavy left-turn movement to northbound Riverside Drive. Additionally, the maximum queue on the eastbound off-ramp during the p.m. peak period currently extends close to 4,000 feet in length and well exceeds the available ramp storage length.

e. The proposed improvements for the interchange include two single-lane roundabouts. The initial design for the roundabouts was a tear-drop shape that did not allow U-turn movements. The new design for the roundabouts is a full-roundabout design that allows U-turn movements and also creates some hesitation in traffic approaching the roundabouts from the bridge, which increases vehicle gap size.

f. The proposed typical section for the ramps and roundabouts and various design exceptions that will be required were discussed:

   i. A potential design exception was identified for the shoulder widths on the ramps. The proposed design calls for matching the existing typical section of the ramps, which do not meet current design standards.

   ii. Design exceptions for vertical grades will be necessary for Riverside Drive (existing grade 9.56 percent) and the I-285 eastbound exit ramp (existing grade 6.0122 percent). The existing grades of Riverside Drive and the eastbound I-285 off-ramp both exceed the maximum grades for their respective roadway classifications. Modifying these grades will require replacement of the bridge on Riverside Drive and/or reconstruction of the entire eastbound off-ramp.

   iii. A design variance for access control will be required because several existing side streets and driveways are present within 300 feet of the existing interchange and will remain after the proposed project construction.

g. Context-sensitive solutions for the historically eligible resource will be necessary to achieve a *de-minimis* finding for the historical resource. These solutions include obtaining an easement from the resource for construction of proposed sidewalk, holding the edge of pavement (EOP) and widening the roadway to the eastern side of Riverside Drive, and replacing the vegetative screen between the property and the interchange.

h. GDOT policy requires lighting for all roundabouts and interchanges. Sandy Springs has requested upgraded lighting similar to what is designed for the Northridge Road at Georgia 400 interchange. A lighting agreement between GDOT and the City of Sandy Springs will be required.

i. The concept includes sidewalks but does not include bike lanes due to the existing bridge width. The proposed sidewalk will tie into the current sidewalk on the northern end of the project.

j. Bridge rehabilitation will include replacement and/or resealing of multiple joints, sealing the bridge deck with a two-part polymer overlay, and repairing concrete spalling on the substructure. The bridge rehabilitation may require a construction detour.

k. The estimated total project cost is $3.9 million. It was mentioned that the last GDOT programmed project update was in 2012, and the cost for this project needs to be updated.

3. Jody Peace of ARCADIS provided a summary of predicted crash rates as well as expected traffic operations for future years:

   a. The 2010 Highway Capacity Manual (HCM) identified an expected crash reduction of 48 percent for conversion of a signalized intersection to a roundabout. No fatalities have occurred at either of the ramp intersections during the past five years of available traffic data. An average cost of $955,500 was used for injury crashes and an average cost of $27,300 was used for property damage only crashes. Based on these average costs per crash and the predicted crash data, it is estimated that just more than $50 million could be saved over the 20-year project life as a result of the reduced crash rate.

   b. Synchro and SIDRA were used to model the standard intersections and roundabouts, respectively. VISSIM was used to model the intersections as a network and to compare between no-build and build scenarios. Both open year (2015) and design year (2035) results show that the primary issue will be the eastbound off-ramp intersection during the p.m. peak period under no-build conditions; this intersection currently performs at a failing LOS and operations will continue to worsen.

   c. Under build conditions in the p.m. peak period, the eastbound off-ramp intersection will be improved to LOS A in the open year and to LOS B in the design year. However, by the design year, operations at the westbound off-ramp intersection will worsen from LOS B under no-build conditions to LOS E under build conditions. This occurs because the improved operations for the heavy eastbound off-ramp left-turn movement limit the gaps available to the heavy westbound off-ramp right-turn movement.

   d. Maximum queue lengths on the eastbound off-ramp will be reduced to approximately 275 feet in the open year and to approximately 430 feet in the design year. Maximum queues on the westbound off-ramp during the p.m. peak period are expected to increase to approximately 560 feet by the open year and to approximately 1,100 feet by the design year, which will exceed the available ramp storage length. Under the Revive 285 project, an auxiliary lane is programmed to be constructed between the Roswell Road interchange and the Riverside Drive interchange between 2020 and 2030 and could contain the ramp spillback.

   e. Some operational improvement is also expected to occur at the Heards Ferry Road intersection under build conditions because the signal is able to be optimized independently from the ramp termini intersections.

4. Ryan Graves presented a concept report review to address any comments or questions regarding the concept report:

   a. It was stated that it may be beneficial to indicate in the concept report that the historical crash rates at each of the study intersections have been above the statewide average at some point in the last five years.

   b. Minor project pavement design will be used for the project, and it was pointed out that there may be an average daily traffic (ADT) limit for this pavement.

   c. It was suggested that the difference between a historical resource and other properties be described at the public meeting to quell any questions about differing treatments for these two types of properties.

   d. It was suggested that early coordination and approval of design exceptions be obtained in order to speed the project schedule.

e. There was a short discussion about the MS4, and it was determined that a follow-up meeting is needed to talk through various ideas such as a pond or a swale. It was mentioned that underground detention is not preferred by GDOT.

f. It was mentioned that the City of Sandy Springs has an LED fixture and pedestrian lights that they would like to use and that they will send specifications. It was also mentioned that FHWA will need to approve the lighting if the intent is to use a proprietary lighting. Buy America specifications will also have to be included.

g. The following updates were discussed:

   i. The public information open house (PIOH) is schedule for March 25, 2014.

   ii. The PIOH dry run is scheduled for March 13, 2014 at 1 p.m. It was requested that representation from the City of Sandy Springs attend the dry run.

   iii. Archaeology has been approved.

   iv. Noise and air studies are ongoing.

   v. Because the project is not impacting the ramp gores, an interchange modification report (IMR) is not planned. A detailed traffic report similar to what was completed for the I-285 at Ashford Dunwoody Road Diverging Diamond Interchange (DDI) project will be completed. This report is expected to be completed within the next couple of weeks.

   vi. To date, the roundabout peer review has involved a back-and-forth discussion between the peer reviewer and ARCADIS. A full peer review report has been completed and will be attached to the concept report.

   vii. The project will be let for construction. Ground-breaking will occur six to nine months after the project is let but will also depend on the right-of-way acquisition.

h. It was recommended to document the fact that an IMR is not required for this project.

i. The gap acceptance length used in the VISSIM model was discussed. A 3.0 second gap was used and those are the results shown in the report. A smaller 2.7 second gap was also analyzed and it was suggested that these results also be shown in the report.

j. Driveway access from Riverside Drive is being pursued by the property owner for a parcel on the northeast quadrant of the Coldstream/Riverside Drive intersection.

k. Dustin O'Quinn from HNTB provided information about the new design-build contract and procedures. GDOT has moved away from a SP 999 and will have design-build specific specifications.

5. Marlo Clowers concluded the meeting by reiterating that the project is design-build, which along with the accelerated schedule, should be kept in mind when various documents are awaiting review and approval.

6. Action Items

Action by:	Number:	Comments:
GDOT Project Manager	1	Send concept layout to FHWA for review and decision regarding whether an IMR is required. - **COMPLETED**.
GDOT Project Manager	2	Send the City of Sandy Springs information regarding the PIOH for display on their website. - **COMPLETED**.
City of Sandy Springs	3	Send updated lighting and landscaping specifications.
ARCADIS	4	Submit documentation for the necessary design exceptions
GDOT Project Manager	5	Provide updated cost estimates to update TPro with the estimated project cost.
GDOT Project Manager	6	Confirm if the minor project pavement design can be used or if a separate pavement design is required.

List of Attendees:

Name	Company	Email Address	Telephone Number
Julio Nunez	FHWA	julio.nunez@dot.gov	404.562.3638
Marlo Clowers	GDOT – IPD	mclowers@dot.ga.gov	404.631.1713
Marisha Pena	GDOT – Traffic Operations	mpena@dot.ga.gov	
Michael Turpeau Jr.	GDOT – Traffic Operations	mturpeau@dot.ga.gov	404.635.2831
Kate D'Ambrosio	GDOT – Traffic Operations	kdambrosio@dot.ga.gov	404.635.2842
Matt Sanders	GDOT – Engineering Services	msanders@dot.ga.gov	404.631.1752
Ryan Graves	ARCADIS	ryan.graves@arcadis-us.com	770.431.8666
Jody Peace	ARCADIS	jody.peace@arcadis-us.com	770.384.6621
Shamir Poudel	ARCADIS	shamir.poudel@arcadis-us.com	770.431.8666
Ashely Ikpelue	GDOT – D7 Traffic	aikpelue@dot.ga.gov	770.986.1773
Dylan Eagleton	GDOT – DP&S	deagleton@dot.ga.gov	404.631.1741
Paul DeNard	GDOT – Traffic Operations	pdenard@dot.ga.gov	404.635.2843
Julia Billings	GDOT – Planning	jbillings@dot.ga.gov	404.631.1774
Kristen Wescott	City of Sandy Springs	kwescott@sandyspringsga.gov	770.206.2018
Kate Colberg	ARCADIS	kate.colberg@arcadis-us.com	770.384.6623
Dustin O'Quinn	HNTB	doquinn@hntb.com	404.960.9323

ATTACHMENT MO

FHWA Detailed Traffic Report Approval/IMR Waiver

U.S. Department of Transportation
Federal Highway Administration

Georgia Division

61 Forsyth Street S.W.
Suite 17T100
Atlanta, Georgia 30303
Fax 404-562-3630
Phone 404-562-3703
Georgia.fhwa@fhwa.dot.gov

April 1, 2014

RECEIVED
Time _____ am pm
APR - 3 2014
OFFICE OF
INNOVATIVE PROGRAM DELIVERY

In Reply Refer To:
HPE-GA

Keith Golden, P.E., Commissioner
Georgia Department of Transportation
One Georgia Center
600 West Peachtree Street, NW
Atlanta, GA 30308

Dear Commissioner Golden:

We have reviewed the Design Traffic Report (DTR) for I-285 Ramps @ CR 209/Riverside Drive, PI #0010925 in Fulton County and within the limits of the City of Sandy Springs. The referenced project is a Design Build project that consists of safety improvements to the existing interchange which will convert the two existing signalized intersections at each ramp terminal to roundabouts and provide routine maintenance on the bridge over I-285.

As a result of the review, FHWA has determined that the Design Traffic Report is acceptable with respect to the proposed roundabout innovative design, safety, traffic, and capacity analysis presented in the March 2014, DTR document prepared by Arcadis, Inc.

This approval is subject to reevaluation if significant changes occur, that require any revision to the design traffic analysis.

If you have any questions, please contact Mr. Julio A. Nuñez, Transportation Engineer at (404) 562-3638 or Ms. Melinda Roberson, Project Delivery Team Leader at (404) 562-3652.

Sincerely,

for Rodney N. Barry, P.E.
Division Administrator

Cc: Ms. Marlo L. Clowers, Senior Project Manager Office of Innovative Delivery

Route Slip

U.S. DEPARTMENT OF TRANSPORTATION

To:
Ms. Marlo Clowers, Senior Project Manager Office of Innovative Delivery

Date:
April 1, 2014

____Per Your Request
__X_ For Your Review
____Per Our Conservation
____For Your Information
____Discuss With Me
____For Your Approval
____For Your Signature
____Take Appropriate Action
____Please Answer
____Prepare Reply For

From:
Julio Nunez - FHWA

Telephone
(404) 562-3638

Org/Rtg Symbol
HPE-GA

Form DOT F1320.9 (Rev 5-81) Supersedes All Previous Editions
056/40223

*U.S. Government Printing Office: 1991 -525-

RECEIVED
APR 2 2014
OFFICE OF PROGRAM CONTROL