

Williams, Gabrielle

From: Busby, Jeremy T.
Sent: Thursday, June 21, 2012 9:25 AM
To: Williams, Gabrielle
Subject: PI#0009891 IMR

Gabbie,

FHWA has informed us that an IMR will not be required, though they would like to see some additional traffic analyses. Please advance the concept report for approval. Thanks.

Jeremy T. Busby, PE
Project Manager
Office of Program Delivery
600 West Peachtree Street, 25th Floor
Atlanta, GA 30308
Office | 404-631-1154
Mobile | 404-309-1269
Fax | 404-631-1558
jbusby@dot.ga.gov

DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA PROJECT CONCEPT REPORT

Project Number: To Be Assigned
County: Whitfield County
P. I. Number: 0009891
Federal Route Number: N/A
State Route Number: SR 52

This project involves constructing a five-leg two lane roundabout to combine State Route 52, College Drive and the I-75 southbound ramps. West Bridge Road (Local Street) will be relocated west of the existing alignment to provide greater separation between the proposed roundabout and the I-75 southbound ramp intersection.

Submitted for approval:

DATE July 13, 2011

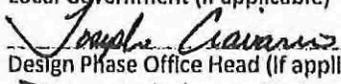
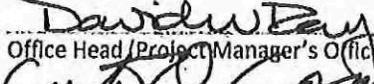
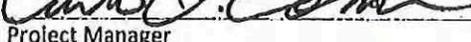
DATE July 13, 2011

DATE 7/14/2011

DATE 7/14/2011

DATE 7/19/2011


Design Consultant Name and Firm Name (If applicable) AMERICAN CONSULTING PROFESSIONALS, LLC

Local Government (If applicable) ALLEN PETERFELUND

Design Phase Office Head (If applicable) WHITFIELD COUNTY COMMISSIONER

Office Head (Project Manager's Office) MIKE BABS

Project Manager

Recommendation for approval:

DATE 9/30/2011

DATE

DATE 10/18/2011

DATE 10/2/2011

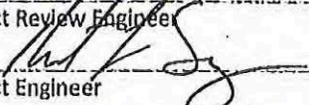
DATE 9/20/2011

DATE 7/14/11

DATE 11/7/2011

DATE

* PATRICK ALLEN FOR JEFF BAKER
State Design Policy Engineer

Program Control Administrator
* GLENN BOWMAN
State Environmental Administrator
* KATHY ZAHUK
State Traffic Operations Engineer
* ROY WISHOW
Project Review Engineer

District Engineer
* BEN PABLON
State Bridge Design Engineer (If applicable)

State Transportation Financial Management Administrator

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

DATE 10/4/2011

* CYNTHIA L. VANDIKE
State Transportation Planning Administrator

* RECOMMENDATION ON FILE 



Project Location Map
Project Number: To Be Assigned
P.I. Number: 0009891
County: Whitfield
Description: I-75 @ SR 52

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NEED AND PURPOSE:

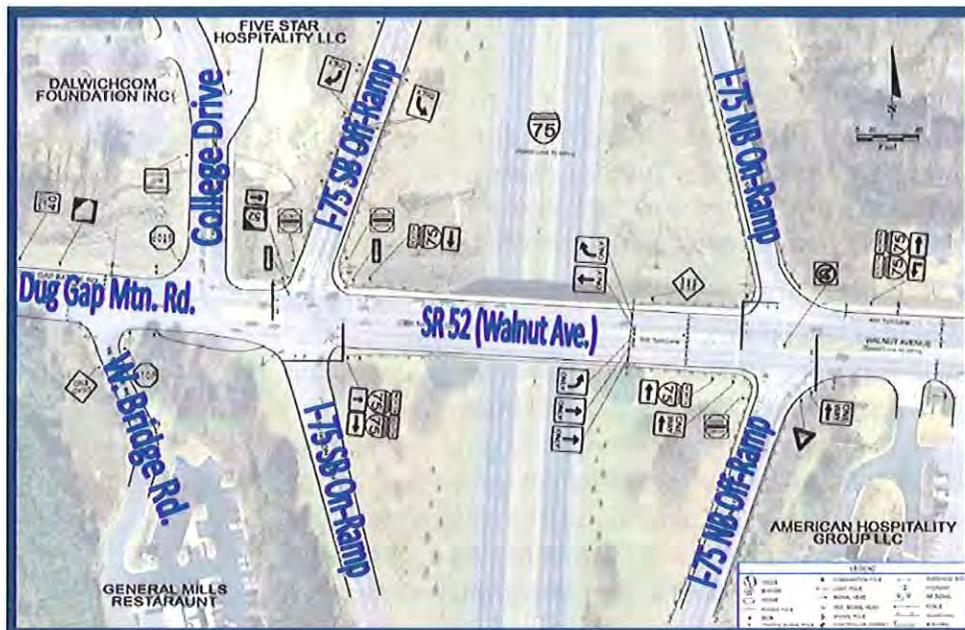
Background

This project is located in the City of Dalton in Whitfield County, Georgia along State Route (SR) 52 (Walnut Avenue) / Dug Gap Mountain Road in the proximity of the I-75 interchange. The purpose of the study is to evaluate the existing and future conditions and to determine what improvements are needed for the three closely spaced intersections. The SR 52 intersections at West Bridge Road and College Drive are currently unsignalized/stop-controlled operations while the I-75 northbound and southbound ramp intersections are signalized. The existing traffic is queuing along SR 52 in both directions and in the southbound direction along College Drive, resulting in site distance problems and traffic accidents.

Existing Travel Conditions

The SR 52 intersections at West Bridge Road and College Drive are currently unsignalized/stop-controlled operations for the side streets while the I-75 northbound and southbound ramp intersections are signalized. State Road 52 is functionally classified as a four-lane urban collector with a continuous left turn lane. However, in the vicinity of College Drive, SR 52 narrows to a two-lane roadway with a dedicated westbound right turn lane onto northbound College Drive and a dedicated eastbound left turn lane onto northbound College Drive. East of the I-75 southbound ramps the center lane is used for a dedicated left turn from westbound SR 52 to the I-75 southbound on-ramp. West of College Drive, Dug Gap Mountain Road returns to a four-lane facility with a continuous left turn lane. The vertical grade west of SR 52 is 9% from Dug Gap Mountain Road to the intersection at College Drive. College Drive is functionally classified as an urban collector and is a four-lane facility. West Bridge Road is a two-lane local road with curb and gutter which services traffic to a restaurant and two hotels. West Bridge Road dead ends and has a single point of access at SR 52/Dug Gap Mountain Road. The SR 52 lane reduction at College Drive reduces the traffic capacity and abrupt lane changes interrupt traffic flow along SR 52. The posted speed limit on both College Drive and SR 52 is 40 mph within the project limits.

FIGURE 1- EXISTING AND FUTURE - NO BUILD



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Land Use

The project is located in an urban area and the predominant adjacent land use is commercial with residential in the surrounding areas. Dalton State College is located north of the project on College Drive and the Northwest Georgia Trade and Convention Center is located west of the project on Dug Gap Mountain Road. Along the project corridor, the future land use is predominantly commercial adjacent to the roadway and residential in surrounding areas.

Bike and Pedestrian Facilities

State Road 52 and College Drive are part of the Mountain Crossing Bicycle Route, a state bicycle route. The Mountain Crossing Bicycle Route is a "share the road" bicycle route. Dug Gap Mountain Road, SR 52, and College Drive are all "share the road" bicycle routes for Whitfield County. Sidewalks only exist in the project limits on the north side of SR 52 and the east side of College Drive. In addition, there are sidewalks on both sides of the SR 52 bridge over I-75.

Projects in the Area

Other projects in the vicinity include:

| Project No. | P.I. No. | Project Type | Project Description | Program Year | STIP Code | Construction Status Code |
|--------------------|----------|-----------------------------------|---|------------------------------------|-----------|--------------------------|
| CSNHS-0007-00(898) | 0007898 | Reconstruction/ Rehabilitation | I-75 from CR 665 / Carbondale Road to SR 3 | PE – LR R/W – LR Const. – LR | N/A | Long Range |

Logical Termini

This project focuses on the operational improvements to three closely spaced intersections along SR 52 as previously mentioned. The logical termini for this project have been based on the need to reduce congestion within this area of SR 52 while maintaining or improving the LOS on the I-75 northbound and southbound ramps. The project termini are logical and consist of only enough length to help remedy the existing traffic congestion and meet Georgia Department of Transportation (GDOT) and American Association of State Highway and Transportation Officials (AASHTO) minimum design criteria for tying the proposed improvements into the existing alignment. This project has independent utility and is not anticipated to create the need for another project.

Existing and Projected Traffic Conditions

Twenty-four hour classification counts and eight hour turning movement counts were collected on all study roadway segments and intersections on Tuesday, February 1, 2011. The raw counts have been adjusted by the daily factor of 0.91 and monthly factor of 1.03 as obtained from the GDOT Statistics website. Twenty-four hour classification counts were collected at the following locations:

- Dug Gap Mountain Road west of West Bridge Road
- College Drive north of Dug Gap Mountain Road
- Dug Gap Mountain Road west of I-75 Southbound Ramps
- I-75 Southbound Off Ramp at SR 52 (Walnut Avenue)
- I-75 Southbound On Ramp from SR 52 (Walnut Avenue)
- SR 52 (Walnut Avenue) between I-75 Northbound and Southbound Ramps
- I-75 Northbound On Ramp from SR 52 (Walnut Avenue)
- I-75 Northbound Off Ramp from SR 52 (Walnut Avenue)
- SR 52 (Walnut Avenue) East of I-75 Northbound Ramps

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Eight-hour turning movement counts (TMC) and pedestrian counts were collected during the AM, Midday, and PM peak periods at the following intersections:

- West Bridge Road at Dug Gap Mountain Road (unsignalized)
- College Drive at Dug Gap Mountain Road (unsignalized)
- SR 52 (Walnut Avenue) at I-75 Southbound ramps (signalized)
- SR 52 (Walnut Avenue) at I-75 Northbound ramps (signalized)

The future traffic volumes for the opening year 2012 and the design year 2032 were developed for this study. Future traffic volumes were compared to locally-adopted plans such as the Greater Dalton Metropolitan Planning Organization 2035 Long Range Transportation Plan (dated June 2010) for consistency checks. A growth rate of 1.5% was developed by linear interpolation of the AADTs for the years 2003 and 2030 from the Dalton-Whitfield Traffic Demand Model (NGMPO). This growth rate of 1.50% per year was applied to the AM and PM peak hour traffic volumes for the existing year 2011 and projected to the opening year 2012 and to the design year 2032 for the three intersections along SR 52 at College Drive/West Bridge Road, I-75 southbound ramp, and I-75 northbound ramp. The same growth rate was used for the No-Build and the Build conditions.

The operational analysis was performed for the AM and PM peak periods. Although the southbound left-turns at College Drive during the Mid-day peak are approximately 20% higher than the PM peak because of the Dalton State College, the overall intersection volume for the intersection at SR 52 and College Drive is approximately 14% higher during the PM peak compared to the Mid-day peak. However, with the higher southbound left-turn movement during the Mid-day peak, there is no adverse impact on the intersection level of service.

The results of the existing analysis indicate that the overall intersections operate at an acceptable LOS C or better for the existing geometry conditions in the year 2011. However, the northbound ramp approach left and right turns, the southbound ramp approach left and right turns and the southbound left turn at College Drive operate at a LOS D (Table 1).

The signal timings have been optimized for the future No-Build conditions. The results of the No-Build analysis showed that the overall intersections will operate at an acceptable LOS C or better with the existing geometry conditions with the exceptions of the northbound ramp approach left and right turns and the southbound ramp approach left turn which will be operating at LOS D. Also, the No-Build analysis for the design year 2032 showed that the stop-controlled intersection of SR 52 and College Drive will not be operating at acceptable LOS during the PM peak period (Table 1).

TABLE 1 – OVERALL DELAY/LEVEL OF SERVICE SUMMARY

| Intersection of SR 52 at | Existing Year 2011 | | Opening Year 2012 | | Design Year 2032 | |
|--------------------------|--------------------|-----------|-------------------|-----------|------------------|-----------|
| | AM | PM | AM | PM | AM | PM |
| West Bridge Road | 9.2 A | 8.8 A | 9.1 A | 8.7 A | 9.3 A | 8.8 A |
| College Drive | 12.6 B | 29.6 D | 11.8 B | 21.4 C | 14.0 B | 74.9 F |
| I-75 SB Ramps | 28.2 C | 15.7 B | 20.1 C | 13.3 B | 22.6 C | 14.5 B |
| I-75 NB Ramps | 10.9 B | 11.5 B | 11.0 B | 10.6 B | 10.0 B | 14.4 B |

Crash Data

Crash data for the project area for the most recent consecutive three-year period for which data is available (2007 to 2009) was compiled. The automobile crash rates per million entering vehicles (MEV) in the project

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intersections have been provided below. There have been a total of 66 vehicle crashes within the project limits. Fifteen of the 66 (23%) crashes involved injuries. No fatalities were reported within the project limits for crashes at these intersections between 2007 and 2009. Table 2 summarizes the crash data for the intersections within the project limits.

TABLE 2 – CRASH HISTORY

| Intersection | Year | Total Accidents | Injuries | Fatalities | Average Crash Rate (per 100MEV) | | |
|---------------------------------|------|-----------------|-----------|------------|---------------------------------|----------|------------|
| | | | | | Accidents | Injuries | Fatalities |
| S.R. 52 @ West Bridge Road | 2007 | 3 | | | 179 | | |
| | 2008 | 5 | | | 293 | | |
| | 2009 | 6 | 1 | | 347 | 58 | |
| S.R. 52 @ College Drive | 2007 | 10 | 2 | | 233 | 47 | |
| | 2008 | 15 | 7 | | 344 | 160 | |
| | 2009 | 14 | 1 | | 316 | 23 | |
| S.R. 52 @ I-75 Southbound Ramps | 2007 | 2 | 2 | | 28 | 28 | |
| | 2008 | 4 | 1 | | 55 | 14 | |
| | 2009 | 7 | 1 | | 95 | 14 | |
| TOTALS (3 YEARS) | | 66 | 15 | 0 | - | | |

The predominant types of crashes at the intersection of SR 52 at College Drive are angle and rear-end collisions. The high number of angle crashes is a result of the unsignalized intersection at College Drive under the existing condition. The vehicles from southbound College Drive do not get adequate gap due to the congestion on SR 52 to complete the left turn maneuver. The main cause for the occurrence of the rear-end crashes is the close spacing between the intersections at the I-75 southbound ramps and College Drive, the lane drop at College Drive, and congestion along SR 52. The intersection improvements at SR 52, College Drive, and the I-75 southbound ramps will help to reduce the crash frequency by eliminating one intersection and providing greater separation between the roundabout and the realigned West Bridge Road intersection.

TABLE 3 – TYPE OF CRASH

| Type | Total | Percent | West Bridge Road | College Drive | I-75 SB Ramps |
|------------------------|-----------|---------|------------------|---------------|---------------|
| Rear End | 24 | 36% | 7 | 8 | 9 |
| Angle | 29 | 44% | 4 | 22 | 3 |
| Side Swipe | 6 | 9% | 1 | 4 | 1 |
| Head On | 4 | 6% | 0 | 4 | 0 |
| Not with a Vehicle | 3 | 5% | 2 | 1 | 0 |
| Total Accidents | 66 | | 14 | 36 | 13 |

Need and Purpose

The project need is to decrease congestion and reduce the crash frequency along SR 52 (Walnut Avenue)/Dug Gap Mountain Road between West Bridge Road and the I-75 southbound ramp intersections without impacting the traffic on the I-75 northbound and southbound interchange ramps. This need is based on design year (2032) evaluation of traffic and analysis of accident data for year 2007 through year 2009. **SECTION 3:**

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DESCRIPTION OF THE PROPOSED PROJECT:

This project involves constructing a five-leg, two-lane roundabout to combine State Route 52, College Drive and the I-75 southbound ramps. West Bridge Road will be relocated west of the existing location to provide greater separation between the proposed intersections.

The termini of the project limits along SR 52 are approximately 475 feet to the west of West Bridge Road and 400 feet to the east of the I-75 southbound ramp intersection. The terminus of the project limits along College Drive is approximately 625 feet to the north of the intersection of SR 52. The terminus of the project limits along West Bridge Road is approximately 375 feet the south of the intersection of SR 52. The terminus of the project limits along the I-75 Southbound Off-ramp is approximately 845 feet north of the SR 52 intersection and the terminus of the project limits along the I-75 southbound on-ramp is approximately 815 feet south of the SR 52 intersection. The roundabout will be elevated approximately 3.5 feet higher than the existing intersection at SR 52 and the I-75 southbound ramps to improve the vertical profile on SR 52 and the I-75 southbound ramps. Temporary detours will be constructed adjacent to the existing I-75 southbound ramps to allow for stage construction of the roundabout and approach roadways. The project will also include the construction of a stormwater pond if required.

The two-lane roundabout will consist of two fifteen-foot travel lanes and curb and gutter. Additional right-of-way (ROW) will be required between College Drive and the I-75 Southbound Off-ramp for the construction of the slip ramp onto College Drive. The realignment of West Bridge Road will require additional right-of-way west of the existing alignment. If a pond is required it will be constructed within the existing limited access ROW limits. The project length is approximately 0.313 miles north to south and 0.212 miles east to west. The total project area is approximately 10 acres in size.

IS THIS PROJECT LOCATED IN A PM 2.5 NON-ATTAINMENT AREA? Yes No

IS THIS PROJECT LOCATED IN AN OZONE NON-ATTAINMENT AREA? Yes No

PDP CLASSIFICATION: Major Minor

FEDERAL OVERSIGHT: Full Oversight Exempt State Funded Other

FUNCTIONAL CLASSIFICATION: Urban Collector

U.S. ROUTE NUMBER(S): Includes I-75 southbound ramps

STATE ROUTE NUMBER(S): Includes State Route 52

TRAFFIC (AADT):

| | | |
|-------------------------------|----------------------------------|------------------------------------|
| College Drive | Base Year: (2012): <u>8,345</u> | Design Year: (2032): <u>11,220</u> |
| SR 52 (East of NB Ramps) | Base Year: (2012): <u>19,380</u> | Design Year: (2032): <u>26,100</u> |
| SR 52 (West of College Drive) | Base Year: (2012): <u>4,790</u> | Design Year: (2032): <u>6,450</u> |
| West Bridge Road | Base Year: (2012): <u>1,055</u> | Design Year: (2032): <u>1,425</u> |
| I-75 SB Off-Ramp | Base Year: (2012): <u>7,000</u> | Design Year: (2032): <u>9,430</u> |
| I-75 SB On-Ramp | Base Year: (2012): <u>3,755</u> | Design Year: (2032): <u>5,060</u> |
| I-75 NB Off-Ramp | Base Year: (2012): <u>3,935</u> | Design Year: (2032): <u>5,300</u> |
| I-75 NB On-Ramp | Base Year: (2012): <u>7,030</u> | Design Year: (2032): <u>9,475</u> |

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EXISTING DESIGN FEATURES:

Typical Sections

- **SR 52 (Walnut Avenue) / Dug Gap Mountain Road:** (2) 12'-0" wide travel lanes in each direction separated by a center turn lane. Sidewalk on the north side from College Drive east and curb and gutter on both sides throughout the project limits.
- **College Drive:** (2) 12'-0" wide travel lanes in each direction. Sidewalk on the east side from SR 52 north and curb and gutter on both sides throughout the project limits.
- **West Bridge Road:** (1) 12'-0" wide travel lane in each direction with curb and gutter on both sides throughout the project limits.
- **I-75 Southbound Ramps:** (3) 12'-0" wide travel lanes for the southbound off-ramp and (2) 12'-0" wide lane for the southbound on-ramp.

EXISTING DESIGN CRITERIA

| Design Criteria | SR 52 (1) | College Drive (2) | W. Bridge Road (3) | I-75 SB Ramps (4) Off-Ramp (5) On-Ramp |
|--|--------------|----------------------|-----------------------|--|
| Posted Speed | 40 MPH | 40 MPH | 40 MPH | 60 MPH |
| Minimum Radius for Curve | 535' | 535' | 535' | (4) 1095' (5) 1095' |
| Maximum Super-elevation Rate for Curve | 5.0% | 5.0% | 5.0% | (4) 10% (5) 10% |
| Maximum Grade | 9.0% | 9.0% | 9.0% | (4) 4.0% (5) 4.0% |
| Width of Right-of-way | 90' | 60' | 40' | (4) Varies (5) Varies |
| Existing Length of Roadway Segments | 1000' | 770' | 400' | (4) 1270' (5) 800' |

- Major Structures: SR 52 Bridge over I-75 (Structure ID 313-0018-0)
- Major Interchange or Intersections along the Project: I-75 at SR 52

PROPOSED DESIGN FEATURES:

Proposed Typical Sections

- **SR 52 (Walnut Avenue) / Dug Gap Mountain Road:** (2) 12'-0" wide travel lanes in each direction separated by a center turn lane. Sidewalk on both sides east of the roundabout and around the outside of the proposed roundabout. Curb and gutter on both sides throughout the project limits.
- **College Drive:** (2) 12'-0" wide travel lanes in each direction. Sidewalk on the east side from SR 52 north and curb and gutter on both sides throughout the project limits.
- **West Bridge Road:** (1) 12'-0" wide travel lanes in each direction with curb and gutter on both sides throughout the project limits Sidewalks on the east side throughout the project limits.

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- **I-75 Southbound Ramps:** (3) 12'-0" wide travel lanes for the southbound off-ramp and (2) 12'-0" wide lanes for the southbound on-ramp.

PROPOSED DESIGN CRITERIA FOR INTERSECTING LEGS OF ROUNDABOUT

| Design Criteria | SR 52 (1) | College Drive (2) | West Bridge Road (3) | I-75 SB Ramps (4) Off-Ramp (5) On-Ramp |
|---|----------------------|----------------------|-------------------------|--|
| Proposed Design Speed | 35 MPH | 35 MPH | 35 MPH | 60 MPH |
| Maximum Grade Mainline (Proposed/Allowable) | 9.2% / 12.0% | 7.6% / 12.0% | 2.8% / 12.0% | (4) 6.0% / 6.0% (5) 3.0% / 6.0% |
| Maximum Grade Side Street (Proposed/Allowable) | (2) 3.0% (3) 2.0% | N/A | N/A | N/A |
| Maximum Grade Driveway (Proposed) | N/A | 10% | 10% | N/A |
| Minimum Radius of Curve (Proposed/Allowable) | N/A / 533' | N/A / 533' | N/A / 533' | (4) 1095' / 1095' (5) 1095' / 1095' |
| Max. Super-elevation Rate (Proposed/Allowable) | N/A / 4.00% | N/A / 4.00% | N/A / 4.00% | (4) 4.0% / 10.0% (5) 4.0% / 10.0% |
| Width of Right-of-way | 90' | Varies 60' – 90' | 40' | (4) Varies (5) Varies |

PROPOSED DESIGN CRITERIA FOR ROUNDABOUT

| Design Criteria | Proposed / Allowable |
|---------------------------|--------------------------------|
| Proposed Design Speed | 25 MPH / 25 MPH |
| Maximum Grade | 0.00% / 2.00% |
| Circulatory Roadway Width | 30' / 24' |
| Inscribed Circle Diameter | 240' / 150' – 250' (WB-67) |
| Central Island Diameter | 160' / 86' – 120'' |
| Splitter Island Length | 55' (Min.) - 190' (Max.) / 50' |

See Appendix 3 for the alternative 2 horizontal and vertical alignment, typical sections, fastest paths, design vehicle swept paths, and sign distances.

- Right-of-Way:
 - Width: See "Proposed Design Criteria for Intersecting Legs of Roundabout" Table
 - Easements: Temporary Permanent Utility Other
 - Type of access control: Full Partial By Permit Other
 - Number of Parcels: 2

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- Number of Displacements:

Business: 0 Residential: 0 Mobile Homes: 0 Other: 0

• Structures:

- Bridges (Structure ID 313-0018-0): *SR 52 over I-75, Whitfield County, Georgia – 68' wide – Sufficiency Rating = 99. The existing approach slab will be replaced with a special approach slab to tie into the roundabout.*
- Retaining walls: *Cast-in-place retaining wall will be constructed along the west side of West Bridge Road.*
- Box Culverts: *Box culvert extensions will be required between College Drive and the I-75 Southbound Off-ramp and east of the southbound off-ramp. Total length of extensions equals approximately 160 feet.*

- Major intersections, interchanges, median openings and signal locations. (List median openings indicating if existing and/or proposed. Attach Signal Warrant study for proposed signal locations)
- For ITS projects identify physical limits of field device location, location of any control centers and/or brief explanation of new features.

• Transportation Management Plan Anticipated: Yes No

• Design Exceptions to Controlling Criteria Anticipated:

- | | | | |
|------------------------------------|------------------------------|--|---------------------------------------|
| 1. DESIGN SPEED: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 2. LANE WIDTH: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 3. SHOULDER WIDTH: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 4. BRIDGE WIDTH: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 5. HORIZONTAL ALIGNMENT: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 6. SUPERELEVATION: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 7. VERTICAL ALIGNMENT: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 8. GRADE: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 9. STOPPING SIGHT DISTANCE: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 10. CROSS SLOPE: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 11. VERTICAL CLEARANCE: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 12. LATERAL OFFSET TO OBSTRUCTION: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |
| 13. BRIDGE STRUCTURAL CAPACITY: | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | <input type="checkbox"/> Undetermined |

This area of the Concept Report is for the indication of potential deviations from the controlling criteria followed by the Department. A brief description of the potential deviations should be included in the report. A design exception must be granted for design exceptions.

• Design Variances (List design variances anticipated): **None anticipated**

• Environmental Concerns:

- A preliminary environmental inventory was conducted which included field surveys and review of applicable federal and state databases. One perennial stream crossing, McLellan Creek, was located within the project limits. McLellan creek runs west to east parallel to Dug Gap Mountain Road/SR 52 and crosses underneath College Drive, the I-75 southbound off-ramp, I-

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75 and the I-75 northbound on-ramp.

- No threatened or endangered species or Critical Habitat were found within the project limits based on terrestrial field reviews conducted in May 2009 and October 2010 and an aquatic survey of McLellan Creek conducted in July 2010. On June 1, 2011, the FHWA determined the proposed action would have no effect on federally listed species in Whitfield County.
 - Anticipated environmental permits include a Nationwide 23 permit from the U.S. Army Corps of Engineers (USACE) for the perennial stream crossing at McLellan Creek, a Stream Buffer Variance from the Georgia Department of Natural Resources, Environmental Protection Division (EPD) for encroachment on the 25 foot buffer of McLellan Creek, and a NPDES construction activity permit for water quality from EPD.
 - There is one site that previously contained an underground storage tank along the project corridor. The parcel is located along College Drive north of SR 52, south of the Chili's restaurant. Land from this property may be required in the form of ROW.
 - There are no designated floodplains within the project area.
 - There are no potential noise sensitive sites within 500 feet of the proposed project.
 - Finding of No Historic Properties Affected approved October 6, 2010.
 - There are no potential environmental justice issues.
 - There are no business or residential relocations anticipated.
- Anticipated Level of Environmental Analysis:
 - Are Time Savings Procedures Appropriate? Yes No
 - Categorical Exclusion (CE) Yes No
 - Environmental Assessment/Finding of No Significant Impact (FONSI) Yes No
 - Environmental Impact Statement (EIS) Yes No
 - Utility Involvements: (Communications, Power, Gas, Petroleum, ITS, Railroad, etc)
 - Dalton Utilities – Power, Water, Gas, Sewer, Communications
 - Charter - Communications
 - Georgia Power – Power
 - Dalton College Telecommunication – Power, Gas, Water, Sewer, Communications
 - North Georgia Electric Membership Corporation – Power
 - Windstream – Communications
 - Public Interest Determination Policy and Prodecure Required? Yes No
 - VE Study Anticipated Yes No
 - Benefit/Cost Ratio: 2.35

PROJECT COST ESTIMATE AND FUNDING RESPONSIBILITIES:

| | PE | ROW | UTILITY | CST* | MITIGATION |
|-----------|------------------|------------------|-------------------------------------|----------------|------------------|
| By Whom | Whitfield County | Whitfield County | Utility Owners outside of easements | Georgia DOT | Whitfield County |
| \$ Amount | \$262,248.28 | \$1,110,000.00 | | \$3,725,647.63 | |

* CST Cost includes: Construction, Engineering and Inspection, Fuel Cost Adjustment, and Asphalt Cement Cost Adjustment.

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PROJECT ACTIVITIES RESPONSIBILITIES:

- Design: Whitfield County/American Consulting Professionals, LLC
- Right-of-Way Acquisition: Whitfield County/American Consulting Professionals, LLC
- Right-of-Way Funding (real property): Whitfield County/American Consulting Professionals, LLC
- Relocation of Utilities: Utility owners outside of easements
- Letting of Contract: Georgia DOT
- Supervision of Construction: Georgia DOT
- Providing Material Pits: Contractor (if required)
- Providing Detours: Contractor (if required)
- Environmental Studies/Documents/Permits: Whitfield County / American Consulting Professionals, LLC
- Environmental Mitigation: Whitfield County/American Consulting Professionals, LLC

COORDINATION:

- Initial Concept Meeting: 09/01/2010 (meeting minute attached)
- Concept Meeting: Scheduled for 10/28/2010
- P A R Meeting Date and Brief Summary: None Anticipated
- FEMA, USCG, and/or TVA: N/A
- Public Involvement: PIOH - 1/6/2011
- Local Government Comments: None
- Other Projects in the Area: None
- Railroads: None
- Peer Review Documentation: Kittelson & Associates, Inc. – 02/14/2011, see Appendix 10

SCHEDULING – RESPONSIBLE PARTIES’ ESTIMATE:

- Time to complete the environmental process: Begin: 02/01/2011 End: 10/31/2011
- Time to complete preliminary construction plans: Begin: 11/01/2011 End: 01/31/2012
- Time to complete right-of-way plans: Begin: 02/01/2012 End: 03/30/2012
- Time to complete section 404 permit: Begin: 03/01/2012 End: 04/30/2012
- Time to complete final construction plans: Begin: 03/01/2012 End: 06/30/2012
- Time to complete purchase of right-of-way: Begin: 07/02/2012 End: 10/31/2012
- List other major items that will affect the project schedule: Begin: N/A End: N/A

Project Concept Report

Project Number: To Be Assigned

P.I. Number: 0009891

County: Whitfield

OTHER ALTERNATIVES CONSIDERED:

Several viable alternatives were analyzed, including various locations and configurations of roundabouts that are discussed in greater detail under the section titled Other Alternatives Considered. The proposed Build Alternative consists of a five-leg roundabout including SR 52/Dug Gap Mountain Road, College Drive, and the I-75 southbound ramps. The proposed Build Alternative also includes the relocation of West Bridge Road further west to allow greater separation between the intersections. In addition to the Build Alternative, the No-Build Alternative is also being evaluated.

This roundabout combines the two closely spaced intersections into a single intersection, eliminates the need for a traffic signal at the I-75 southbound ramps and provides greater separation between the roundabout and the West Bridge Road intersection. The proposed improvements will serve to increase capacity by maintaining two through lanes on SR 52 / Dug Gap Mountain Road in each direction, remove abrupt lane changes along SR 52 in the westbound direction, maintain access on all legs of the roundabout and improve overall operation within the I-75 interchange area. By removing the side street stop control, the roundabout will reduce backups and allow for better traffic flow during peak periods and convention events from the North Georgia Trade and Convention Center west of the project limits. The roundabout lane geometry and location increases the capacity for the I-75 southbound off-ramp and improves traffic movement at the intersections of the I-75 southbound ramps and College Drive along SR 52 / Dug Gap Mountain Road. In addition, the project will help serve travel demands created by anticipated countywide population growth, future employment and growth of the Dalton State College, located just north of the project limits. The Build Alternative protects and meets the requirements of the Federal Highway Administration (FHWA) and allows for better access to and from the interstate.

The Build analysis was conducted for the two alternatives.

- **Alternative 1** - Proposed roundabout at College Drive / West Bridge Road / SR 52
- **Alternative 2** - Proposed roundabout at College Drive / I-75 Southbound Ramps / SR 52

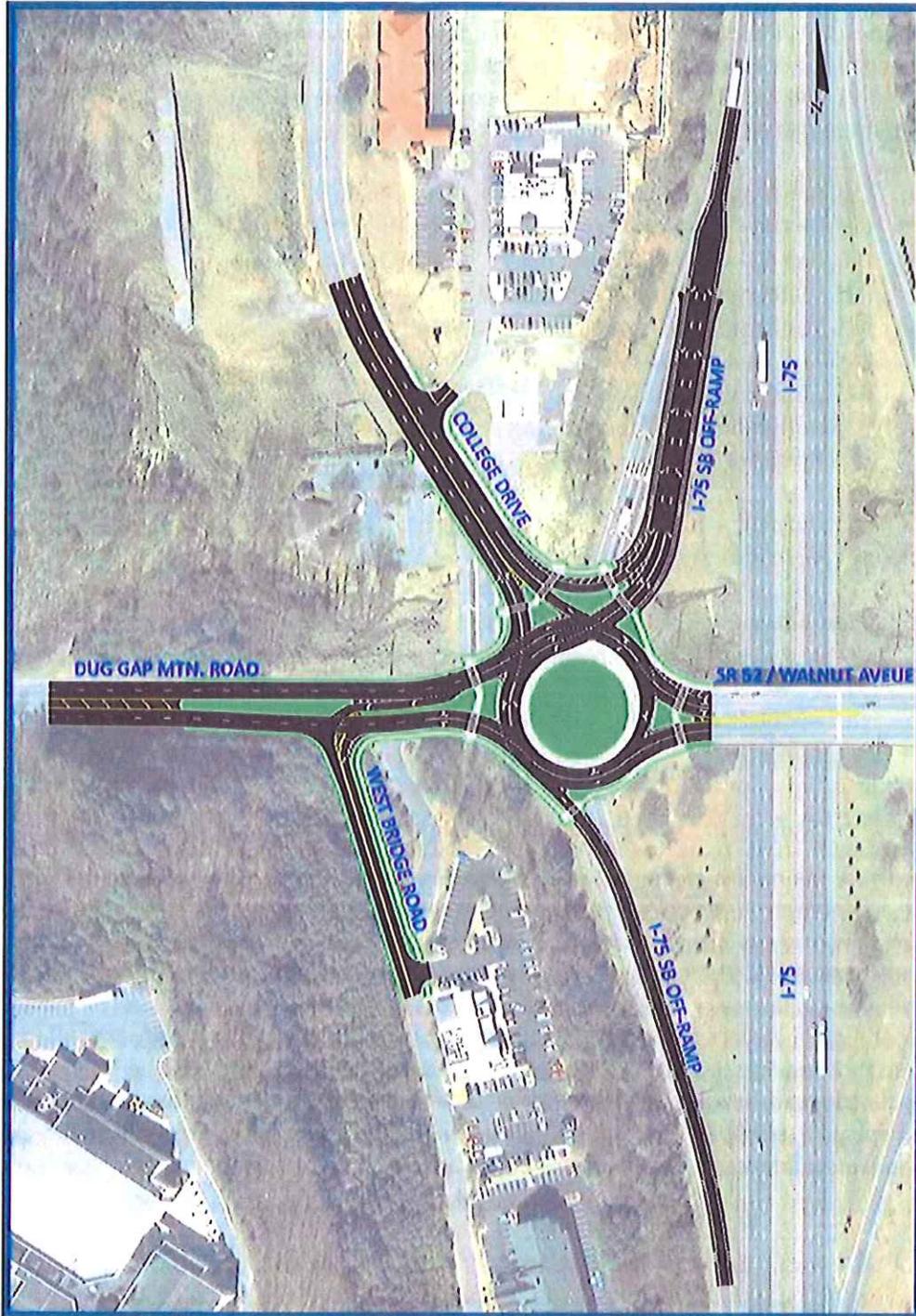
Build Alternative 1 – Four Leg Roundabout at College Drive / West Bridge Road / SR 52

The results of the Build Alternative 1 analysis for the opening year 2012 and the design year 2032 showed that the overall intersections will operate at an acceptable LOS for the proposed roundabout but the I-75 ramp approaches will continue to operate at LOS D. Also, under Build Alternative 1, the intersection of College Drive still remains too close to the I-75 southbound ramp intersection as in the existing condition and there could be a right turn trap problem resulting side swipe and rear end crashes. This build configuration requires that vehicles desiring to turn right and go up to the Trade Center have to weave across one lane of traffic to get to the through lane within a distance of approximately 115 feet (Table 1).

Project Concept Report
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Preferred Alternate

FIGURE 3 – BUILD - ALTERNATIVE 2: PROPOSED ROUNDABOUT AT COLLEGE DR. / I-75 SB RAMPS / SR 52



Project Concept Report

Project Number: To Be Assigned

P.I. Number: 0009891

County: Whitfield

FIGURE 3 – BUILD - ALTERNATIVE 2: PROPOSED ROUNDABOUT AT COLLEGE DR. / I-75 SB RAMPS / SR 52



Project Concept Report
Project Number: To Be Assigned
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Operational Analysis:

Existing and Projected Traffic Conditions

Twenty-four hour classification counts and eight hour turning movement counts were collected on all study roadway segments and intersections on Tuesday, February 1, 2011. The raw counts have been adjusted by the daily factor of 0.91 and monthly factor of 1.03 as obtained from the GDOT Statistics website. Twenty-four hour classification counts were collected at the following locations:

- Dug Gap Mountain Road west of West Bridge Road
- College Drive north of Dug Gap Mountain Road
- Dug Gap Mountain Road west of I-75 Southbound Ramps
- I-75 Southbound Off-ramp at SR 52 (Walnut Avenue)
- I-75 Southbound On-ramp from SR 52 (Walnut Avenue)
- SR 52 (Walnut Avenue) between I-75 Northbound and Southbound Ramps
- I-75 Northbound On-ramp from SR 52 (Walnut Avenue)
- I-75 Northbound Off-ramp from SR 52 (Walnut Avenue)
- SR 52 (Walnut Avenue) East of I-75 Northbound Ramps

Eight-hour turning movement counts (TMC) and pedestrian counts were collected during the AM, Midday, and PM peak periods at the following intersections:

- West Bridge Road at Dug Gap Mountain Road (unsignalized)
- College Drive at Dug Gap Mountain Road (unsignalized)
- SR 52 (Walnut Avenue) at I-75 Southbound ramps (signalized)
- SR 52 (Walnut Avenue) at I-75 Northbound ramps (signalized)

The future traffic volumes for the opening year 2012 and the design year 2032 were developed for this study. Future traffic volumes were compared to locally-adopted plans such as the Greater Dalton Metropolitan Planning Organization 2035 Long Range Transportation Plan (dated June 2010) for consistency checks. A growth rate of 1.5% was developed by linear interpolation of the AADTs for the years 2003 and 2030 from the Dalton-Whitfield Traffic Demand Model (NGMPO). This growth rate of 1.50% per year was applied to the AM and PM peak hour traffic volumes for the existing year 2011 and projected to the opening year 2012 and to the design year 2032 for the three intersections along SR 52 at College Drive/West Bridge Road, I-75 southbound ramp, and I-75 northbound ramp. The same growth rate was used for the No-Build and the Build conditions.

The operational analysis was performed for the AM and PM peak periods. The southbound left-turns at College Drive during the Mid-day peak are approximately 20% higher than the PM peak because of the Dalton State College; the overall intersection volume for the intersection at SR 52 and College Drive is approximately 14% higher during the PM peak compared to the Mid-day peak. However, with the higher southbound left-turn movement during the Mid-day peak, there is no adverse impact on the intersection level of service.

The results of the existing analysis indicate that the overall intersections operate at an acceptable LOS C or better for the existing geometry conditions in the year 2011. However, the northbound ramp approach left and right turns, the southbound ramp approach left and right turns and the southbound left turn at College Drive operate at a LOS D (Table 1).

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The signal timings have been optimized for the future No-Build conditions. The results of the No-Build analysis showed that the overall intersections will operate at an acceptable LOS C or better with the existing geometry conditions but the northbound ramp approach left and right turns, the southbound ramp approach left turn will be operating at LOS D. Also, the No-Build analysis for the design year 2032 showed that the stop controlled intersection of SR 52 and College Drive will not be operating at acceptable LOS during the PM peak period (Table 1). The detailed results of each traffic analysis are presented in the attached traffic report.

TABLE 3 – OVERALL DELAY/LEVEL OF SERVICE SUMMARY

| Intersection of SR 52 at | Existing Year 2011 | | Opening Year 2012 | | | | | | Design Year 2032 | | | | | |
|--------------------------|--------------------|-----------|-------------------|-----------|--------------|-----------|--------------|-----------|------------------|-----------|--------------|-----------|--------------|-----------|
| | | | No-Build | | Build Alt. 1 | | Build Alt. 2 | | No-Build | | Build Alt. 1 | | Build Alt. 2 | |
| | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| West Bridge Road | 9.2 A | 8.8 A | 9.1 A | 8.7 A | 3.3 A | 4.1 A | 9.1 A | 8.7 A | 9.3 A | 8.8 A | 3.5 A | 5.7 A | 9.3 A | 8.8 A |
| College Drive | 12.6 B | 29.6 D | 11.8 B | 21.4 C | | | 6.5 A | 5.7 A | 14.0 B | 74.9 F | | | | |
| I-75 SB Ramps | 28.2 C | 15.7 B | 20.1 C | 13.3 B | 21.3 C | 14.8 B | | | 22.6 C | 14.5 B | 23.2 C | 15.9 B | | |
| I-75 NB Ramps | 10.9 B | 11.5 B | 11.0 B | 10.6 B | 9.3 A | 11.7 B | 9.1 A | 10.0 B | 10.0 B | 14.4 B | 9.9 A | 13.7 B | 11.0 B | 12.2 B |

Cost Comparison:

The total estimated cost for the proposed roundabout is \$5,281,656.77 which includes Construction, Engineering and Inspection, price adjustments for materials and fuel, preliminary engineering, right-of-way, and utilities. Whitfield County will be funding the preliminary engineering and right-of-way cost which equals \$1,372,248.28 and the remaining \$3,909,408.49 will be funded by the Georgia Department of Transportation. The estimated benefit of constructing the roundabout is \$12,397,091.33 which was determined based on operational benefits and safety benefits over a five year period. A breakdown of the total estimated cost and the benefits are included in the appendix.

In addition to the operational benefits that the selected alternative has over the No-Build Alternative and Alternative One it is clear that there are additional benefits such as lower operating and maintenance costs vs. the no-build alternative and reduced staging costs vs. alternative one.

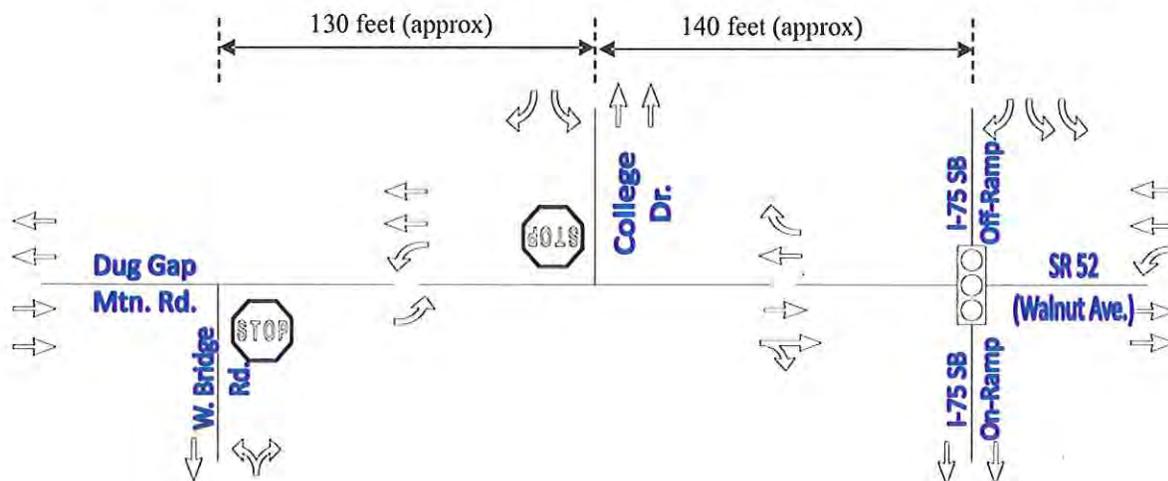
Project Concept Report
 Project Number: To Be Assigned
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 County: Whitfield

Alternative Selection:

No Build Alternative

The No-Build Alternative is an alternative in which Georgia DOT and Whitfield County would take no action to construct the project. The signal timing for the No-Build Alternative has been adjusted and optimized to improve the LOS for the intersections within the project limits. Under this alternative, the intersection of SR 52 and College Drive is very closely spaced to the I-75 southbound ramp intersection. In the vicinity of College Drive, SR 52 narrows from four lanes to two lanes with a dedicated westbound right turn lane onto northbound College Drive and a dedicated eastbound left turn lane onto northbound College Drive. This configuration results in a weaving issue which increases the potential for side swipe and rear end crashes.

FIGURE 4 – CONFIGURATION FOR EXISTING CONDITIONS AND NO-BUILD ALTERNATIVE



PROS:

- No cost to the Georgia DOT or the County
- No utility impacts/relocation cost
- No right of way impacts/cost
- No change in pedestrian crossings

CONS:

- The I-75 SB approach operates at a LOS D for existing AM and PM peak traffic
- The intersection at College Drive and SR 52 operates at a LOS D for existing PM peak traffic and a LOS F for design year PM peak traffic
- Shows deficiencies from a safety prospective due to the potential of side swipe and rear end crashes. Additionally, accident history shows a high rate of angle collisions at the intersection of SR 52 and College Drive.
- Longer traffic delays than other alternatives
- Existing vertical curve geometry does not meet the 40 mph design speed

Project Concept Report

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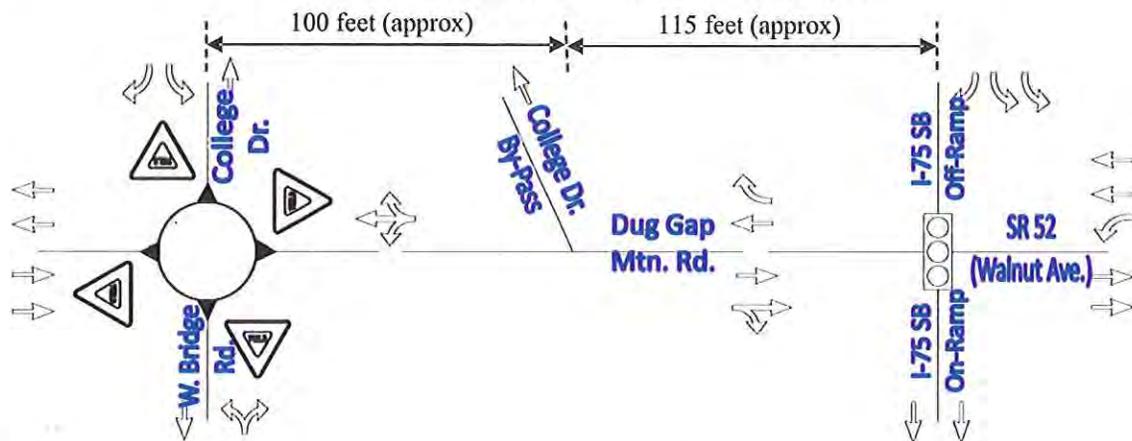
P.I. Number: 0009891

County: Whitfield

Alternative 1: Four-Leg Roundabout Constructed at the West Bridge Road Intersection without Dedicated Right Turn Lane

Alternative 1 is a four-leg roundabout alternative with a westbound bypass right turn lane to remain and stay closely spaced (approximately 115 feet) to the intersection of SR 52 and the I-75 southbound ramps as in the existing condition. The westbound SR 52 to northbound College Drive traffic movement is incorporated into the roundabout. This modification improves the functionality of the proposed roundabout and the I-75 southbound ramps. Since the traffic signal at the I-75 southbound ramps will remain and the proposed roundabout is still located in close proximity of the ramp intersection, the continuous flow intersection will not function at optimal capacity during peak periods. The eastbound SR 52 traffic shows the potential of backing up into the roundabout due to the close proximity of the signalized intersection at the I-75 southbound ramp intersection.

FIGURE 5 – LANE CONFIGURATION FOR BUILD ALTERNATIVE 1 – FOUR LEG ROUNDABOUT AT COLLEGE DRIVE / WEST BRIDGE ROAD/ SR 52

**PROS:**

- Since the project is located entirely within the limits of the local county roadway, there will be no cost to the Georgia DOT
- Eliminates one intersection and provides greater separation (360') between the proposed intersection and the intersection at the I-75 southbound ramps
- No change in pedestrian crossings

CONS:

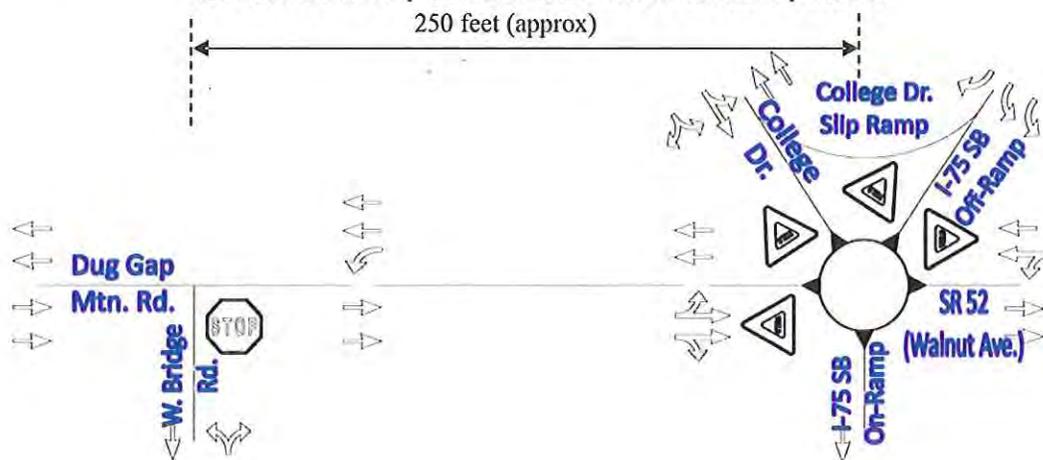
- The I-75 SB approach operates at a LOS D for existing PM peak traffic
- Shows deficiencies from a safety prospective due to the potential of side swipe and rear end crashes where vehicles must weave across one lane of traffic to go westbound through the roundabout
- Due to the amount of earthwork required to construct the roundabout, the number of construction stages and the construction schedule will be increased
- Does not eliminate the traffic signal at the I-75 southbound ramps which could potentially impact the operation of the roundabout during peak periods when traffic along eastbound Dug Gap Mountain Road backs up

Project Concept Report
 Project Number: To Be Assigned
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 County: Whitfield

Alternative 2: Five-Leg Roundabout Constructed Combining College Drive and I-75 Southbound Ramps

Alternative 2 combines the two closely spaced intersections of SR 52 at College Drive and SR 52 at the I-75 southbound ramps together into a single intersection, eliminates the need for a traffic signal at the I-75 southbound ramps, decreases the southbound left queue along College Drive, and has no adverse impacts to the northbound ramp signalized intersection. It reduces the queue length along the southbound off-ramp and prevents spill back onto I-75. The proposed improvements will serve to increase capacity by maintaining two through lanes on SR 52 / Dug Gap Mountain Road in each direction, removes abrupt lane changes along SR 52 in the westbound and eastbound direction, maintains access on all legs of the roundabout and improves overall operation within the interchange area.

FIGURE 6 – LANE CONFIGURATION FOR BUILD ALTERNATIVE 2 – FIVE LEG ROUNDABOUT AT COLLEGE DRIVE / I-75 SOUTHBOUND RAMPS / SR 52



PROS:

- Operates at an acceptable LOS and improves delays for all intersections within the project limits
- The I-75 ramp movements which operated at LOS D now operate at LOS B (southbound) and LOS C (northbound).
- Requires less storage along the I-75 southbound off-ramp than the existing storage length.
- Provides the greatest separation (360 feet) between West Bridge Road and the I-75 southbound ramps
- Improves operation and capacity by eliminating conflict points and providing two through lanes along SR 52 through the roundabout
- Improves vertical geometry for SR 52 / Dug Gap Mountain Road, College Drive, and the I-75 southbound ramps
- Reduces the number of construction stages and earthwork quantities

CONS:

- Increased right of way impacts/cost
- Increased construction cost
- Results in one additional pedestrian crossing

Project Concept Report

Project Number: To Be Assigned

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County: Whitfield

Recommendations:

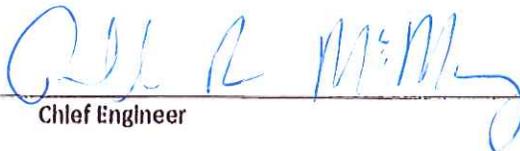
The recommended alternative for this project is Alternative Two. The proposed improvements that Alternative Two offers are needed to enhance the overall operation and capacity along State Route 52, College Drive and the I-75 Interchange. This proposed alternative will also serve to calm traffic and thus improve safety by requiring vehicles to reduce travel speed to negotiate the roundabout and provide a continuous traffic flow to reduce congestion. The proposed improvements will eliminate one intersection. West Bridge Road will be relocated further to the west to provide greater separation between the proposed intersections. By constructing the roundabout at the location of the I-75 southbound ramps, the amount of earthwork along State Route 52 will be reduced allowing for fewer construction stages and reducing interruptions to the flow of traffic during construction.

Based on the *FHWA Roundabouts: An Informational Guide*, a reduction of crashes after building a roundabout has been reported to be 37% for all crashes and 51% for crashes involving injuries. Additionally, for pedestrians, recent statistics show that the risk of being involved in a severe collision is lower at roundabouts than at other forms of intersections due to the slower vehicle speeds and because there are a fewer number of conflict points reducing the likelihood of collisions.

CONCUR

 3/26/2013
Director of Engineering

APPROVE


Chief Engineer

DATE

4/1/13

APPENDIX:

1. Detailed Cost Estimate:
 - a. Construction Including Engineering and Inspection
 - b. Detailed Cost Estimate
 - c. Complete Fuel & Asphalt Price Adjustment forms
 - d. Right-of-Way
2. Sketch Location Map
3. Recommended Alternative
 - a. Size and Location
 - b. Profiles
 - c. Typical Sections
 - d. Fastest Path
 - e. Design Vehicle Swept Path – AutoTurn
 - f. Sight Distances
4. Accident Summaries
5. Capacity Analysis and Traffic Diagrams

Project Concept Report

Project Number: To Be Assigned

P.I. Number: 0009891

County: Whitfield

6. Bridge Inventory
7. Minutes of Initial Concept Meetings
8. FHWA - Appendix A: Determination of Need to Prepare an IMR
9. Benefit Cost Analysis
10. Peer Review Comments and Responses
11. "Letter of Support", from Local Government

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

Summary of Costs

Project Number: To Be Assigned
County: Whitfield
Project P.I. Number: 0009891
Federal Route Number: N/A
State Route Number: 52

Five Leg Roundabout to combine SR 52, I-75, and College Drive

| | | | |
|-------------------------------------|---------------|----|-------------------------|
| Subtotal Construction Cost | | \$ | 3,062,681.01 |
| Engineering & Inspection | 5% | \$ | 153,134.05 |
| Construction Contingency | 6% | \$ | 183,760.86 |
| Total Fuel Adjustment | | \$ | 270,691.63 |
| Total Liquid AC Adjustment | | \$ | 239,140.94 |
| Total Construction Cost | | \$ | 3,909,408.49 |
| Preliminary Engineering (LOCAL) | | \$ | 262,248.28 |
| Right-of-Way (LOCAL) | | \$ | 1,110,000.00 |
| Reimbursable Utilities (LOCAL) | | \$ | - |
| <u>Total Project Cost</u> | | \$ | 5,281,656.77 |

3,725,647.43

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5,047,895.91

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**DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA**

Detailed Conceptual Cost Estimate

Project Number: To Be Assigned
County: Whitfield
Project P.I. Number: 0009891
Federal Route Number: N/A
State Route Number: 52

Five Leg Roundabout to combine SR 52, I-75, and College Drive

| Section: EARTHWORK | | | | | | |
|---------------------------|----------|-------|---------------|-------------------------|------|----------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 205-0001 | 18477 | CY | \$ 4.20 | UNCLASS EXCAV | \$ | 77,603.40 |
| 206-0002 | 41196 | CY | \$ 4.00 | BORROW EXCAV, INCL MATL | \$ | 164,784.00 |
| 210-0100 | 1 | LS | \$ 200,000.00 | GRADING COMPLETE | \$ | 200,000.00 |
| Section Sub Total: | | | | | | \$ 442,387.40 |

| Section: DEMOLITION | | | | | | |
|---------------------------|----------|-------|------------|-------------------------------|------|---------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 610-1005 | 1190 | LF | \$ 1.50 | REM GUARDRAIL | \$ | 1,785.00 |
| 610-1075 | 6 | EA | \$ 139.58 | REM GUARDRAIL ANCH, ALL TYPES | \$ | 837.48 |
| 610-2705 | 230 | SY | \$ 50.00 | REM CONCRETE APPROACH SLAB | \$ | 11,500.00 |
| Section Sub Total: | | | | | | \$ 14,122.48 |

| Section: BRIDGES/RETAINING WALLS/SOUND BARRIERS | | | | | | |
|---|----------|-------|-------------|------------------------------------|------|---------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 433-1000 | 230 | SY | \$ 140.70 | REINF CONC APPROACH SLAB | \$ | 32,361.00 |
| 573-2006 | 400 | LF | \$ 13.03 | UNDDR PIP INCL DRAINAGE AGGR, 6 IN | \$ | 5,212.00 |
| 621-0461 | 200 | LF | \$ 50.00 | CONC SIDE BARRIER 6A | \$ | 10,000.00 |
| 641-1200 | 1112 | LF | \$ 16.16 | GUARDRAIL TP W | \$ | 17,969.92 |
| 641-5001 | 1 | EA | \$ 637.50 | GUARDRAIL ANCHORAGE, TP 1 | \$ | 637.50 |
| 641-5012 | 3 | EA | \$ 2,275.34 | GUARDRAIL ANCHORAGE, TP 12 | \$ | 6,826.02 |
| Section Sub Total: | | | | | | \$ 73,006.44 |

| Section: PAVING | | | | | | |
|---------------------------|----------|-------|------------|--|------|------------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 310-1101 | 13715 | TN | \$ 17.46 | GR AGG BASE CRS, INCL MATL | \$ | 239,463.90 |
| 402-3113 | 810 | TN | \$ 58.00 | RECYCLED ASPH CONC 12.5 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL & H LIME | \$ | 46,980.00 |
| 402-3121 | 3982 | TN | \$ 61.69 | RECYCLED ASPH CONC 25 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL & H LIME | \$ | 245,649.58 |
| 402-3190 | 1610 | TN | \$ 66.74 | RECYCLED ASPH CONC 19 MM SUPERPAVE GP 1 OR 2, INCL BITUM MATL & H LIME | \$ | 107,451.40 |
| 413-1000 | 1267 | GL | \$ 2.54 | BITUM TACK COAT | \$ | 3,218.18 |
| 430-0520 | 9100 | SY | \$ 65.00 | PLAIN PC CONC PVMT, CL HES CONC, 12 INCH THK | \$ | 591,500.00 |
| Section Sub Total: | | | | | | \$ 1,234,263.06 |

| Section: CONCRETE | | | | | | |
|---------------------------|----------|-------|------------|--|------|----------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 439-0082 | 517 | SY | \$ 60.00 | CONT. REINF CONC PAVT, CL3, 1" THICK | \$ | 31,020.00 |
| 441-0016 | 103 | SY | \$ 36.21 | DRIVEWAY CONCRETE, 6 IN TK | \$ | 3,729.63 |
| 441-0104 | 1140 | SY | \$ 27.43 | CONC SIDEWALK, 4 IN | \$ | 31,270.20 |
| 441-6012 | 5019 | LF | \$ 30.93 | CONC CURB & GUTTER, 8 IN X 24 IN, TP 2 | \$ | 155,237.67 |
| 500-3101 | 100 | CY | \$ 530.00 | CLASS A CONCRETE | \$ | 53,000.00 |
| 511-1000 | 12000 | LB | \$ 0.90 | BAR REINF STEEL | \$ | 10,800.00 |
| Section Sub Total: | | | | | | \$ 254,037.50 |

| Section: DRAINAGE | | | | | | |
|---------------------------|----------|-------|-------------|---|------|----------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost | |
| 550-1180 | 200 | LF | \$ 30.26 | STORM DRAIN PIPE, 18 IN, H 1-10 | \$ | 6,052.00 |
| 550-1240 | 400 | LF | \$ 39.32 | STORM DRAIN PIPE, 24 IN, H 1-10 | \$ | 15,728.00 |
| 550-4118 | 4 | EA | \$ 446.73 | FLARED END SECTION 18 IN, SIDE DRAIN | \$ | 1,786.92 |
| 550-4224 | 6 | EA | \$ 563.37 | FLARED END SECTION 24 IN, STROM DRAIN | \$ | 3,380.22 |
| 668-1100 | 10 | EA | \$ 2,165.67 | CATCH BASIN, GP 1 | \$ | 21,656.70 |
| 574-0206 | 1500 | LF | \$ 50.00 | EDGEDRAIN PIPE, INLC BKFILL MATL & FILTER FABRIC 6 IN | \$ | 75,000.00 |
| Section Sub Total: | | | | | | \$ 123,603.84 |

| Section: SIGNAGE AND LIGHTING | | | | | |
|-------------------------------|----------|-------|--------------|---|----------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost |
| 634-1200 | 15 | EA | \$ 95.86 | RIGHT OF WAY MARKERS | \$ 1,437.90 |
| 636-1020 | 300 | SF | \$ 20.62 | HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 3 | \$ 6,186.00 |
| 636-2020 | 150 | LF | \$ 8.05 | GALV STEEL POSTS, TP2 | \$ 1,207.50 |
| 638-1005 | 4 | LS | \$ 60,000.00 | STR SUPPORT FOR OVERHEAD SIGN, TP V, STA - | \$ 240,000.00 |
| 639-4003 | 4 | EA | \$ 5,845.23 | STRAIN POLE, TP III | \$ 23,380.92 |
| 647-1000 | 2 | LS | \$ 44,083.10 | TRAFFIC SIGNAL INSTALLATION NO - | \$ 88,166.20 |
| 653-0110 | 6 | EA | \$ 71.14 | THERMOPLASTIC PVMT MARKINGS, ARROW, TP 1 | \$ 426.84 |
| 653-0120 | 19 | EA | \$ 73.32 | THERMOPLASTIC PVMT MARKINGS, ARROW, TP 2 | \$ 1,393.08 |
| 653-0130 | 10 | EA | \$ 99.41 | THERMOPLASTIC PVMT MARKINGS, ARROW, TP 3 | \$ 994.10 |
| 653-0210 | 7 | EA | \$ 104.14 | THERMOPLASTIC PVMT MARKING, WORD, TP 1 | \$ 728.98 |
| 653-2501 | 1.5 | LM | \$ 1,345.07 | THERMOPLASTIC SOLID TRAF STRIP, 5 IN, WHITE | \$ 2,017.61 |
| 653-2502 | 0.5 | LM | \$ 1,325.52 | THERMOPLASTIC SOLID TRAF STRIP, 5 IN, YELLOW | \$ 662.76 |
| 653-3501 | 3320 | GLF | \$ 0.39 | THERMOPLASTIC SKIP TRAF STRIP, 5 IN, WHITE | \$ 1,294.80 |
| 653-6004 | 250 | SY | \$ 3.04 | THERMOPLASTIC TRAF STRIPING, WHITE | \$ 760.00 |
| 653-6006 | 260 | SY | \$ 2.97 | THERMOPLASTIC TRAF STRIPING, YELLOW | \$ 772.20 |
| 681-4300 | 15 | EA | \$ 5,150.00 | LIGHTING STD, 30 FT MH, 6 FT ARM | \$ 77,250.00 |
| 681-6520 | 15 | EA | \$ 1,564.05 | LUMINAIRE, TP 5, 150 W, HP SODIUM | \$ 23,460.75 |
| 682-1406 | 2000 | LF | \$ 1.14 | CABLE, TP XHHW, AWG NO 6 | \$ 2,280.00 |
| 682-6233 | 2000 | LF | \$ 3.71 | CONDUIT, NONMETL, TP 3, 2 IN | \$ 7,420.00 |
| Section Sub Total: | | | | | \$ 479,839.64 |

| Section: EROSION CONTROL | | | | | |
|---------------------------|----------|-------|-------------|---|---------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost |
| 163-0232 | 3 | AC | \$ 296.36 | TEMPORARY GRASSING | \$ 889.08 |
| 163-0240 | 75 | TN | \$ 214.93 | MULCH | \$ 16,119.75 |
| 163-0300 | 4 | EA | \$ 1,082.02 | CONSTRUCTION EXIT | \$ 4,328.08 |
| 163-0503 | 3 | EA | \$ 432.48 | CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 3 | \$ 1,297.44 |
| 163-0521 | 20 | EA | \$ 71.00 | CONSTRUCT AND REMOVE TEMPORARY DITCH CHECKS | \$ 1,420.00 |
| 163-0530 | 1000 | LF | \$ 3.75 | CONSTRUCT AND REMOVE BALED STRAW EROSION CHECK | \$ 3,750.00 |
| 163-0531 | 2 | EA | \$ 5,233.48 | CONSTRUCT AND REMOVE SEDIMENT BASIN, TP 1, STA NO - | \$ 10,466.96 |
| 165-0030 | 2000 | LF | \$ 0.77 | MAINTENANCE OF TEOMPORARY SILT FENCE, TP C | \$ 1,540.00 |
| 165-0040 | 20 | EA | \$ 71.00 | MAINT OF EROSION CONTROL CHECKDAMS/DITCH CHECKS | \$ 1,420.00 |
| 165-0060 | 2 | EA | \$ 1,415.23 | MAINT OF TEMPORARY SEDIMENT BASIN, STA NO - | \$ 2,830.46 |
| 165-0070 | 1000 | LF | \$ 3.75 | MAINT OF BALED STRAW EROSION CHECK | \$ 3,750.00 |
| 165-0087 | 3 | EA | \$ 170.00 | MAINT OF SILT CONTROL GATE, TP 3 | \$ 510.00 |
| 165-0101 | 4 | EA | \$ 498.01 | MAINT OF CONSTRUCTION EXIT | \$ 1,992.04 |
| 171-0030 | 2000 | LF | \$ 3.09 | TEMPORARY SILT FENCE, TYPE C | \$ 6,180.00 |
| 700-6910 | 3 | AC | \$ 669.77 | PERMANENT GRASSING | \$ 2,009.31 |
| 700-7000 | 9 | TN | \$ 52.05 | AGRICULTURAL LIME | \$ 468.45 |
| 700-7010 | 9 | GL | \$ 20.70 | LIQUID LIME | \$ 186.30 |
| 700-8000 | 1 | TN | \$ 456.78 | FERTILIZER MIXED GRADE | \$ 456.78 |
| 700-8100 | 150 | LB | \$ 2.54 | FERTILIZER NITROGEN CONTENT | \$ 381.00 |
| 710-9000 | 4500 | SY | \$ 3.65 | PERMANENT SOLID REINFORCING MAT | \$ 16,425.00 |
| Section Sub Total: | | | | | \$ 76,420.65 |

| Section: MOBILIZATION | | | | | |
|---------------------------|----------|-------|---------------|--|----------------------|
| Item Number | Quantity | Units | Unit Price | Item Description | Cost |
| 150-1000 | 1 | LS | \$ 300,000.00 | TRAFFIC CONTROL / MAINTENANCE OF TRAFFIC | \$ 300,000.00 |
| 153-1300 | 1 | EA | \$ 65,000.00 | FIELD ENGINEERS OFFICE, TP 3 | \$ 65,000.00 |
| Section Sub Total: | | | | | \$ 365,000.00 |

Total Estimated Cost: \$ 3,062,681.01

P.I. Number 9891

County Whitfield

Date 6/1/2011

Project Number _____

Special Provision, Section 109-Measurement and Payment
FUEL PRICE ADJUSTMENT (ENGLISH 125% MAX)

| | |
|------------------|-------|
| ENTER FPL DIESEL | 3.923 |
| ENTER FPM DIESEL | 8.827 |

| | |
|--------------------|-------|
| ENTER FPL UNLEADED | 3.664 |
| ENTER FPM UNLEADED | 8.244 |

<http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx>

| |
|----------------------------|
| INCREASE ADJUSTMENT |
| 125.00% |

| |
|----------------------------|
| INCREASE ADJUSTMENT |
| 125.00% |

| ROADWAY ITEMS | QUANTITY | DIESEL FACTOR | GALLONS DIESEL | UNLEADED FACTOR | GALLONS UNLEADED | REMARKS |
|--|-----------|---------------|----------------|-----------------|------------------|---------|
| Excavations paid as specified by Sections 205 (CUBIC YARD) | 18477.000 | 0.29 | 5358.33 | 0.15 | 2771.55 | |
| Excavations paid as specified by Sections 206 (CUBIC YARD) | 41196.000 | 0.29 | 11946.84 | 0.15 | 6179.40 | |
| GAB paid as specified by the ton under Section 310 (TON) | 13715.000 | 0.29 | 3977.35 | 0.24 | 3291.60 | |
| Hot Mix Asphalt paid as specified by the ton under Sections 400 (TON) | | 2.90 | | 0.71 | | |
| Hot Mix Asphalt paid as specified by the ton under Sections 402 (TON) | 6402.000 | 2.90 | 18565.80 | 0.71 | 4545.42 | |
| PCC Pavement paid as specified by the square yard under Section 430 (SY) | 9100.000 | 0.25 | 2275.00 | 0.20 | 1820.00 | |

| BRIDGE ITEMS | Quantity | Unit Price | QF/1000 | Diesel Factor | Gallons Diesel | Unleaded Factor | Gallons Unleaded | REMARKS |
|---|----------|------------|---------|---------------|----------------|-----------------|------------------|---------|
| Bridge Excavation (CY) Section 211 | | | | 8.00 | | 1.50 | | |
| Class __ Concrete (CY) Section 500 | 100.00 | 530.00 | 53.0000 | 8.00 | 424.00 | 1.50 | 79.50 | |
| Class __ Concrete (CY) Section 500 | | | | 8.00 | | 1.50 | | |
| Class __ Concrete (CY) Section 500 | | | | 8.00 | | 1.50 | | |
| Superstru Con Class __ (CY) Section 500 | | | | 8.00 | | 1.50 | | |
| Superstru Con Class __ (CY) Section 500 | | | | 8.00 | | 1.50 | | |
| Superstru Con Class __ (CY) Section 500 | | | | 8.00 | | 1.50 | | |
| Concrete Handrail (LF) Section 500 | | | | 8.00 | | 1.50 | | |
| Concrete Barrier (LF) Section 500 | | | | 8.00 | | 1.50 | | |

| BRIDGE ITEMS | Quantity | Unit Price | QF/1000 | Diesel Factor | Gallons Diesel | Unleaded Factor | Gallons Unleaded | REMARKS |
|--------------|----------|------------|---------|---------------|----------------|-----------------|------------------|---------|
|--------------|----------|------------|---------|---------------|----------------|-----------------|------------------|---------|

| | | | | | | | | |
|--|--|--|--|-----------------|-------------------------|------|-----------------|--|
| Stru Steel Plan Quantity (LB) Section 501 | | | | 8.00 | | 1.50 | | |
| Stru Steel Plan Quantity (LB) Section 501 | | | | 8.00 | | 1.50 | | |
| PSC Beams____ (LF) Section 507 | | | | 8.00 | | 1.50 | | |
| PSC Beams____ (LF) Section 507 | | | | 8.00 | | 1.50 | | |
| PSC Beams____ (LF) Section 507 | | | | 8.00 | | 1.50 | | |
| Stru Reinf Plan Quantity(LB) Section 511 | | | | 8.00 | | 1.50 | | |
| Stru Reinf Plan Quantity(LB) Section 511 | | | | 8.00 | | 1.50 | | |
| Bar Reinf Steel (LB) Section 511 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Piling__ inch (LF) Section 520 | | | | 8.00 | | 1.50 | | |
| Drilled Caisson,____ (LF) Section 524 | | | | 8.00 | | 1.50 | | |
| Drilled Caisson,____ (LF) Section 524 | | | | 8.00 | | 1.50 | | |
| Drilled Caisson,____ (LF) Section 524 | | | | 8.00 | | 1.50 | | |
| Pile Encasement,____(LF) Section 547 | | | | 8.00 | | 1.50 | | |
| Pile Encasement,____(LF) Section 547 | | | | 8.00 | | 1.50 | | |
| SUM QF DIESEL= | | | | 42547.32 | SUM QF UNLEADED= | | 18687.47 | |
| DIESEL PRICE ADJUSTMENT(\$) | | | | | \$191,950.11 | | | |
| UNLEADED PRICE ADJUSTMENT(\$) | | | | | \$78,741.52 | | | |

ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(Surface Treatment 125% MAX)

APPLICABLE TO CONTRACTS CONTAINING THE 413 SPEC. SECTION 413.5.01 ADJUSTMENTS ASPHALT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT

<http://www.dot.ga.gov/doingbusiness/Materials/Pages/asphaltcementindex.aspx>

ENTER APL

ENTER APM

| | |
|----------------|----------------------------|
| 125.00% | INCREASE ADJUSTMENT |
|----------------|----------------------------|

Use this side for Asphalt Emulsion Only

| L.I.N. | TYPE | ASPHALT EMULSION (GALLONS) |
|---|------|----------------------------|
| | | |
| TMT = <input style="width: 100px;" type="text"/> | | |
| REMARKS: <input style="width: 90%; height: 20px;" type="text"/> | | |

Use this side for Asphalt Cement Only

| L.I.N. | TYPE | TACK (GALLONS) |
|---|------|----------------|
| | | |
| TMT = <input style="width: 100px;" type="text"/> | | |
| REMARKS: <input style="width: 90%; height: 20px;" type="text"/> | | |

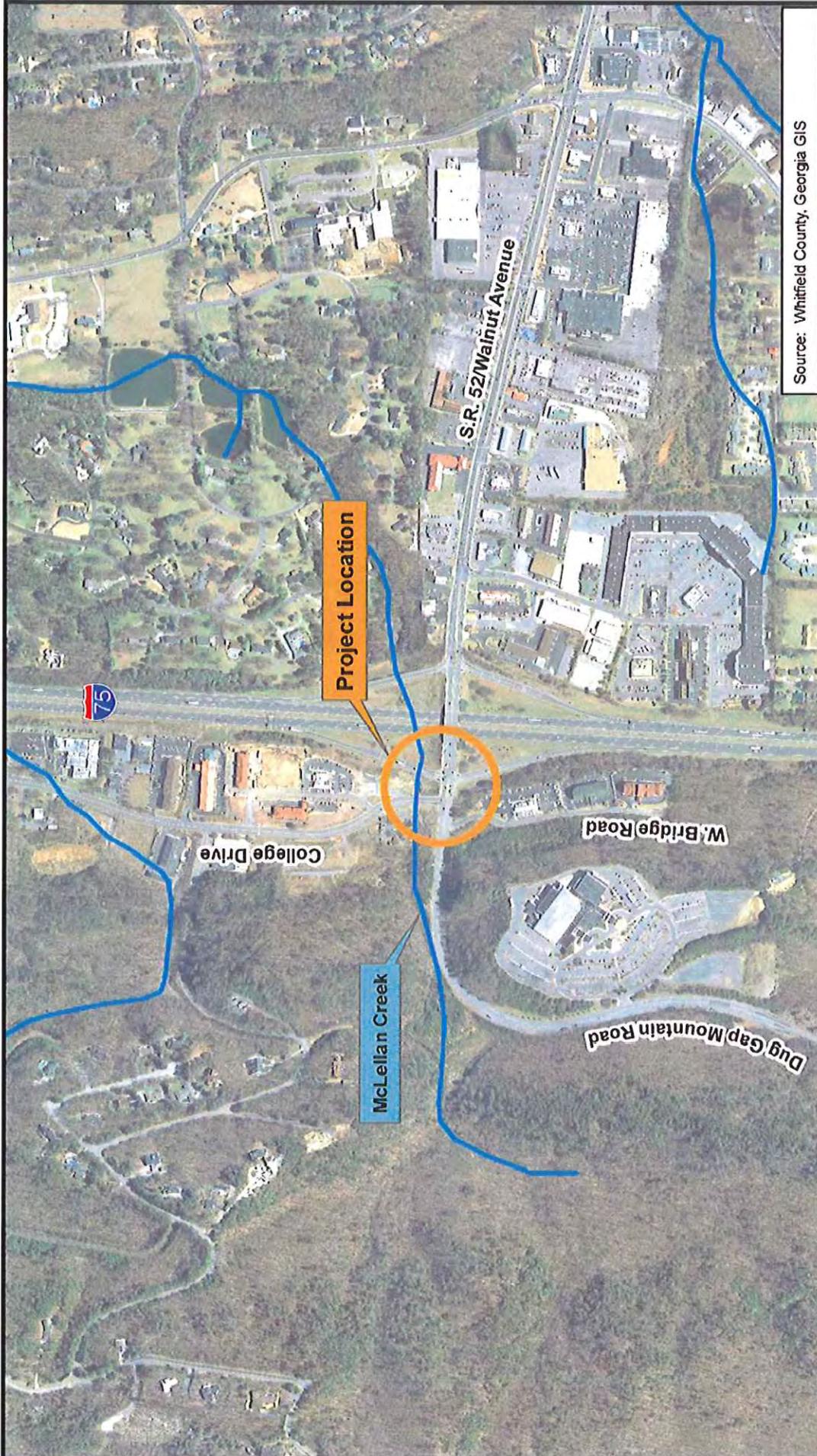
| | |
|-------------------------------------|--|
| MONTHLY PRICE ADJUSTMENT(\$) | |
|-------------------------------------|--|

ADJUSTMENT SUMMARY

| | |
|---|---------------------|
| FUEL PRICE ADJUSTMENT (<i>ENGLISH 125% MAX</i>) | |
| DIESEL PRICE ADJUSTMENT(\$) | <u>\$191,950.11</u> |
| UNLEADED PRICE ADJUSTMENT(\$) | <u>\$78,741.52</u> |
| | |
| ASPHALT CEMENT PRICE ADJUSTMENT (BITUMINOUS TACK COAT 125% MAX) | <u>\$3,291.26</u> |
| | |
| 400 / 402 ASPHALT CEMENT PRICE ADJUSTMENT 125% MAX | <u>\$235,849.68</u> |
| | |
| ASPHALT CEMENT PRICE ADJUSTMENT FOR BITUMINOUS TACK COAT(<i>Surface Treatment 125% MAX</i>) | |

REMARKS:

| | |
|--------------------------|---------------------|
| TOTAL ADJUSTMENTS | \$509,832.57 |
|--------------------------|---------------------|



Source: Whitfield County, Georgia GIS

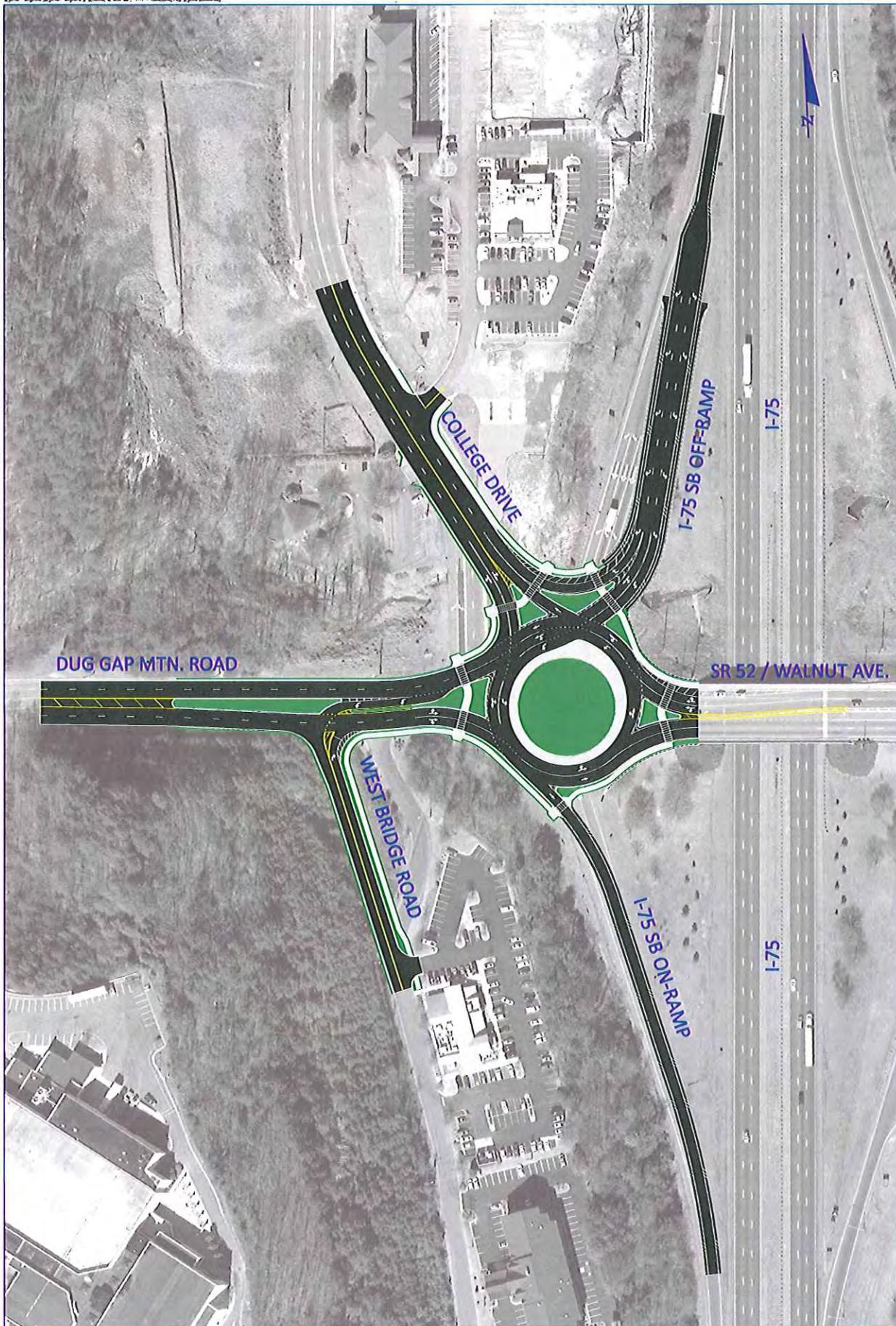


Intersection/Interchange Improvements to
 College Drive at Dug Gap Mountain Road (SR 52/I-75)
 Project # To Be Assigned
 P.I. # 0009891
 Whitfield County, Georgia

Project Area Map



1 inch = 750 feet

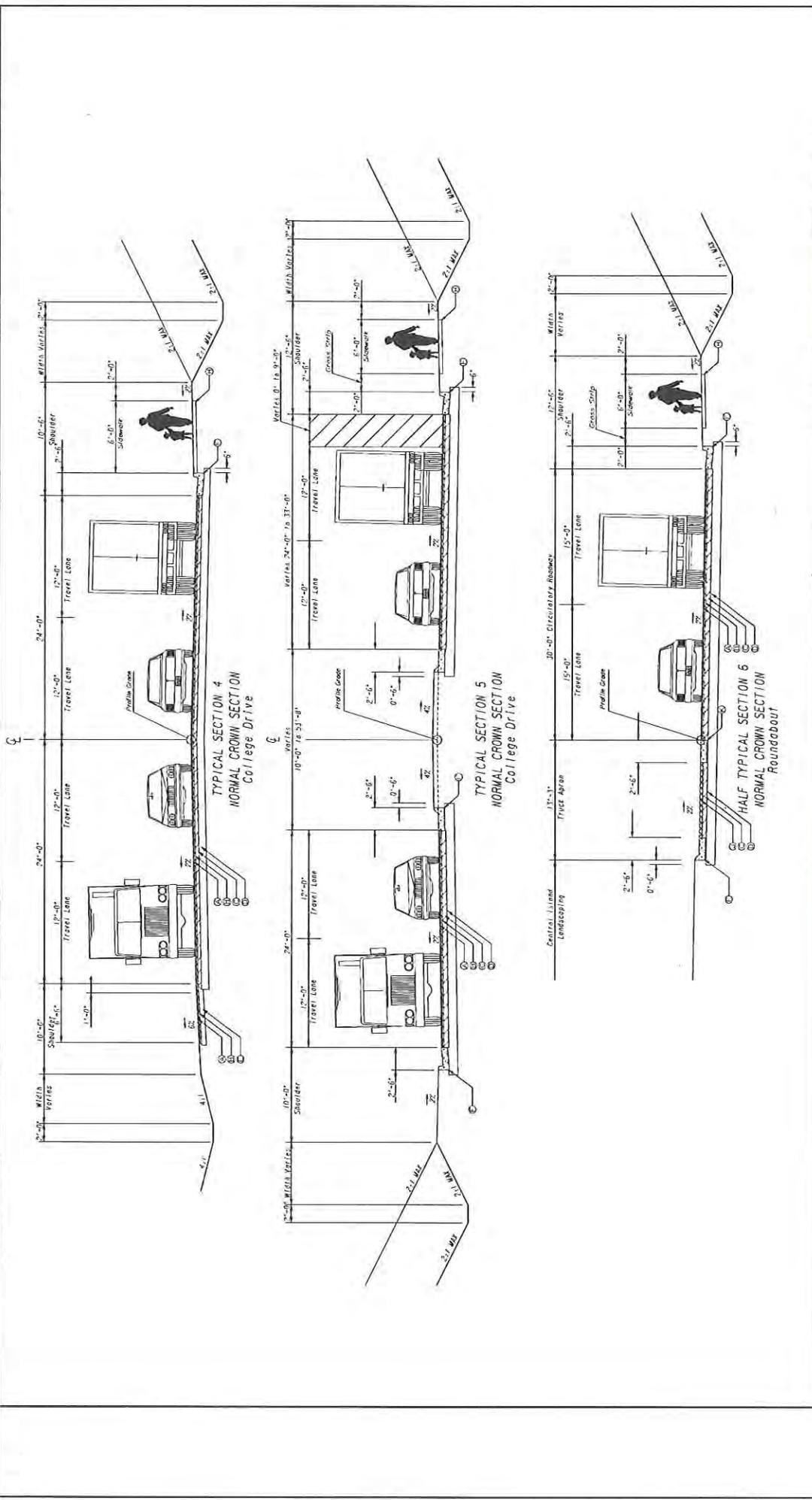


APPENDIX 3A

STATE ROAD 52 / I-75 SOUTHBOUND RAMP
 / COLLEGE DRIVE ROUNDABOUT
 P.I. Number: 00009891
 Whitfield County / City of Dalton

American Consulting Professionals, LLC.
 243 North Hamilton Street, Suite 2
 Dalton, Georgia 30720
 Phone: (706) 608-4029
 Fax: (706) 629-2748
 Allen D. Petzfreund, P.E. No. PE31841

ALTERNATIVE 2
 SIZE AND LOCATION



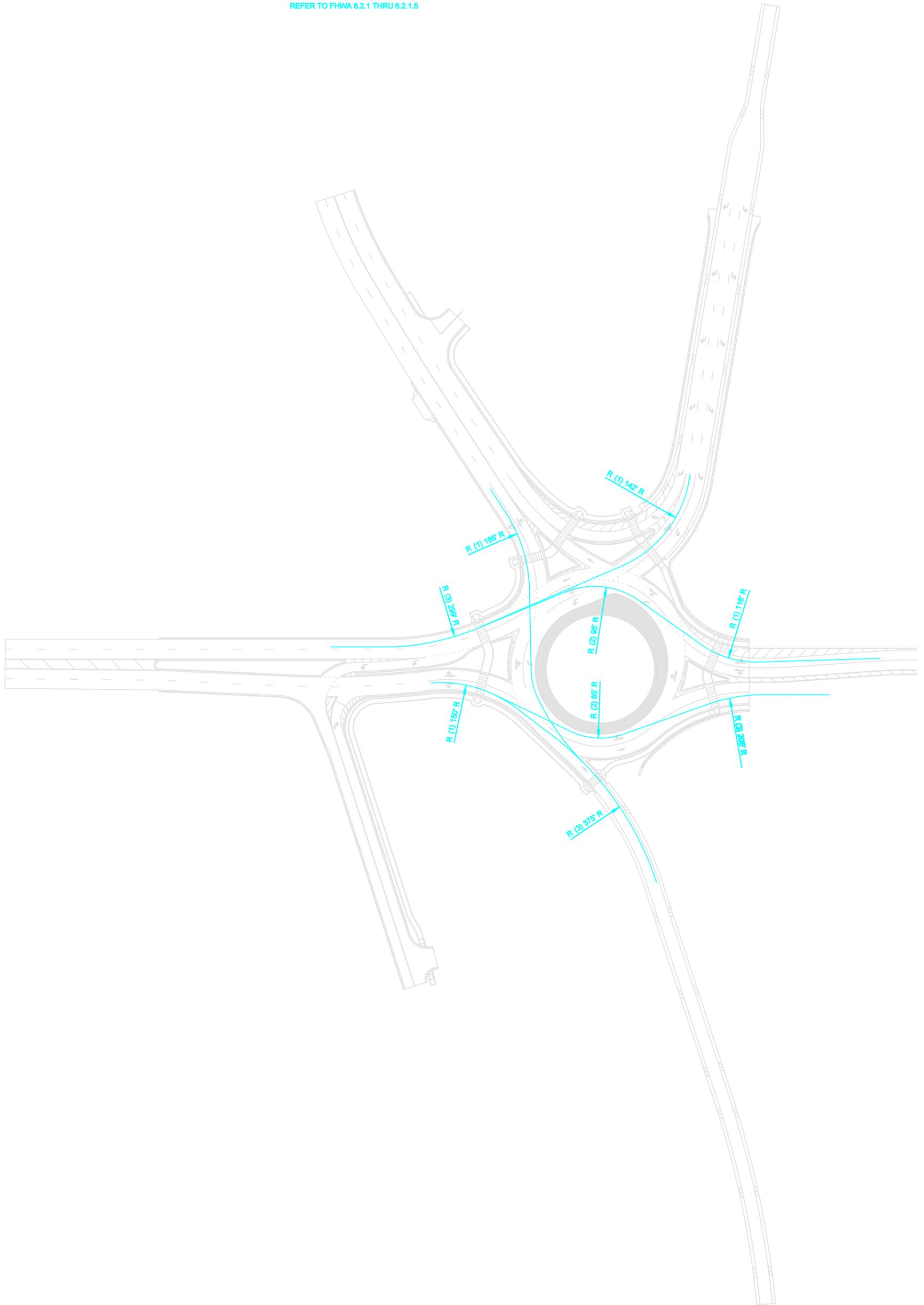
American
 Consulting Professionals, LLC

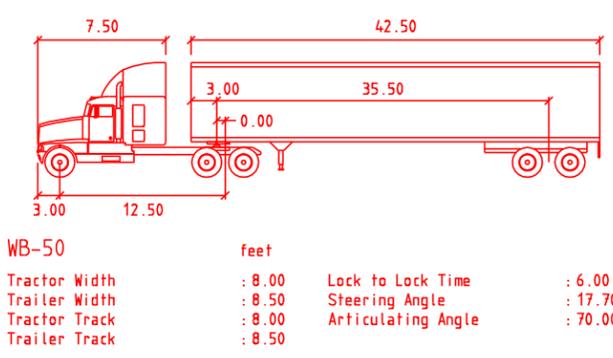
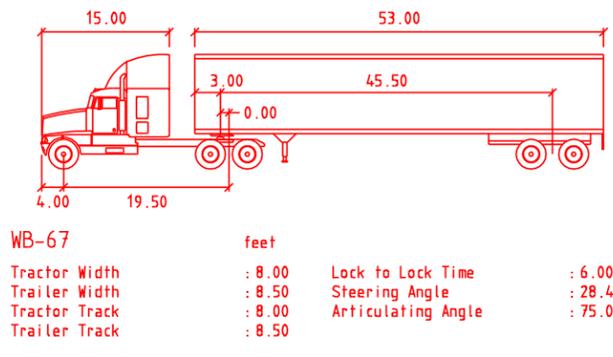
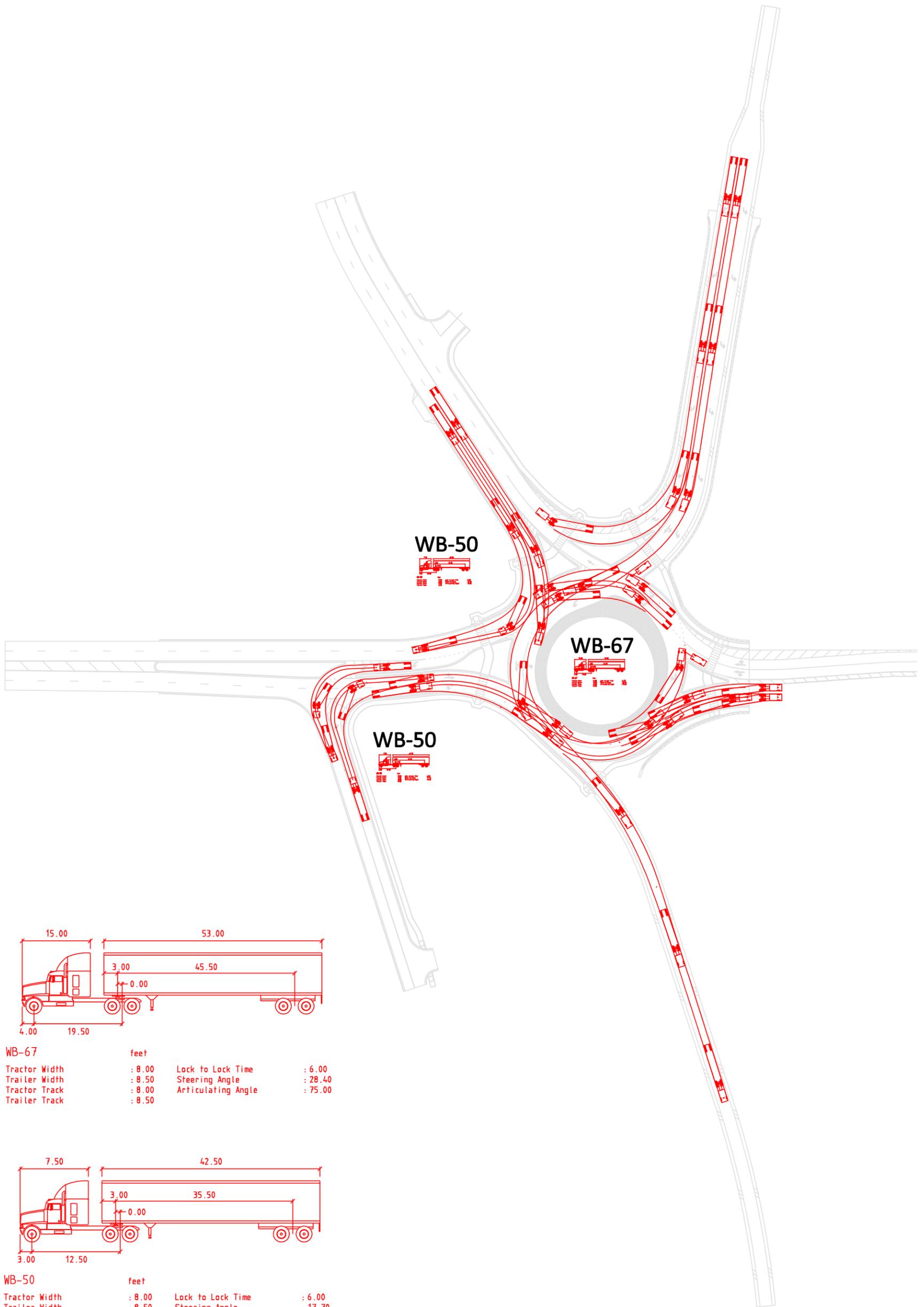
STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION
 OFFICE: TYPICAL SECTIONS
 COLLEGE DRIVE
 ROUNDABOUT

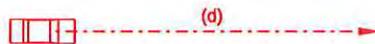
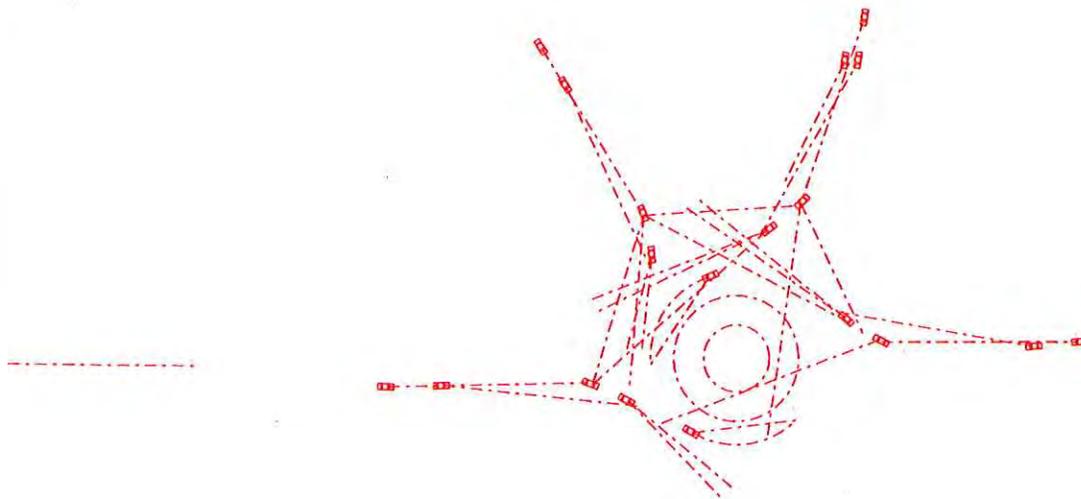
DRAWING NO.
 5-002

| DOUBLE-LANE ROUNDABOUT INSCRIBED CIRCLE DIAMETER (FT) | APPROXIMATE R (4) VALUE | | APPROXIMATE R (1) VALUE * | |
|--|-------------------------|-------------|---------------------------|-------------|
| | RADIUS (FT) | SPEED (MPH) | RADIUS (FT) | SPEED (MPH) |
| 240 | 85 | 18 | 116 | <25 |
| | 95 | 18 | 142 | <25 |
| | | | 150 | <25 |
| | | | 185 | 28 |

* RECOMMENDED MAXIMUM ENTRY DESIGN SPEED = 30 MPH
REFER TO FHWA 6.2.1 THRU 6.2.1.5







APPROXIMATE R (1) VALUE *

RADIUS (FT) SPEED (MPH) COMPUTED SSD (d) (FT)

| | | |
|-----|-----|-------|
| 116 | <25 | 77.0 |
| 142 | <25 | 77.0 |
| 150 | <25 | 112.4 |
| 185 | 26 | 158.8 |

*** RECOMMENDED MAXIMUM ENTRY DESIGN SPEED = 30 MPH (197.8 FT)**

REFER TO FHWA 6.3.9 THRU 6.3.10

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

TRAFFIC ENGINEERING REPORT

For the Intersections of:

SR 52 (WALNUT AVENUE) / DUG GAP MOUNTAIN ROAD AND WEST BRIDGE ROAD / COLLEGE DRIVE / I-75 SOUTHBOUND RAMP

In the City of Dalton / Whitfield County



Report Prepared By:

American Consulting Professionals, LLC – 206 West Hawthorne Street Dalton, GA 30720

Date Report Prepared: April 19, 2011

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EXECUTIVE SUMMARY

PROJECT INFORMATION

This project is located in the City of Dalton in Whitfield County, Georgia along State Route (SR) 52 (Walnut Avenue) / Dug Gap Mountain Road in the proximity of the I-75 interchange. State Route 52 (Walnut Avenue) ends at I-75 at which time it becomes Dug Gap Mountain Road. The project includes improvements to three closely spaced intersections along SR 52 comprising of the I-75 southbound ramps, College Drive, and West Bridge Road. The I-75 northbound ramps are not included within the project limits. For the purposes of the traffic analysis, the I-75 northbound ramp intersection was included in the traffic study to ensure the project will not result in impact to the level of service (LOS) for these ramps. College Drive is located 130 feet west of the I-75 southbound ramp intersection and West Bridge Road is located 140 feet west of College Drive. Due to the proximity of these intersections, traffic along SR 52 and College Drive experience heavy traffic congestion and long queues during peak periods. It is anticipated that the opening year for these intersection improvements will be in 2012 therefore the design year of the project is 2032.

The purpose of the study is to evaluate the existing and future conditions and to determine what improvements are needed for the three closely spaced intersections. The SR 52 intersections at West Bridge Road and College Drive are un-signalized/stop controlled conditions for the side streets while the I-75 northbound and southbound ramp intersections are signalized. The existing traffic is queuing along SR 52 in both directions and in the southbound direction along College Drive, causing safety and site distance problems. The proposed improvements will increase capacity, remove lane changes along SR 52 in the eastbound and westbound directions for thru traffic while focusing on maintaining safe access at all legs of the intersection and improving the overall operation within the interchange area.

This traffic analysis focuses on the future no-build alternative and two build alternatives. The build alternatives consist of roundabouts at two different locations as described below:

- **Alternative 1** – Proposed four-leg roundabout at College Drive / West Bridge Road / SR 52.
- **Alternative 2** - Proposed five-leg roundabout at College Drive / I-75 Southbound Ramps / SR 52.

RESULTS AND RECOMMENDATIONS

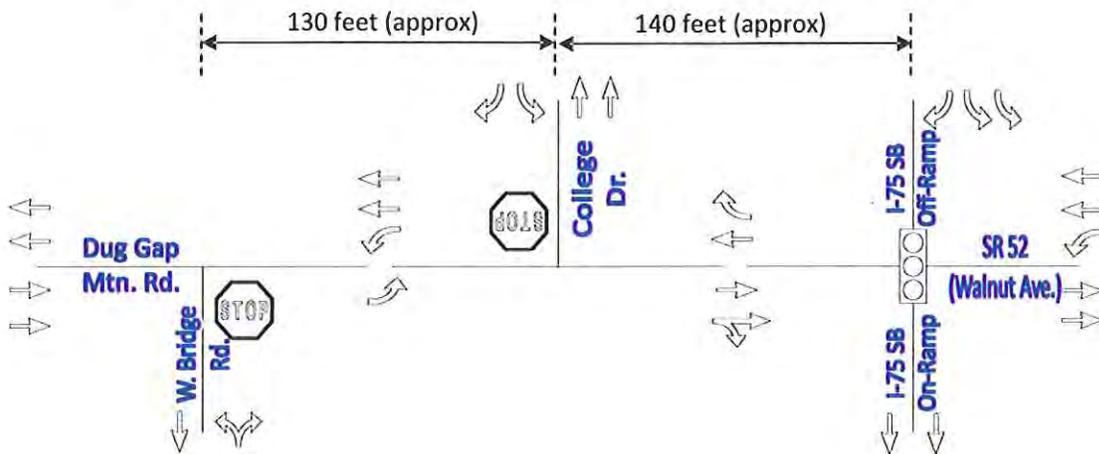
Alternative 2, the five leg roundabout at College Drive / I-75 Southbound Ramps / SR 52 appears to provide better operation because it improves the operation along SR 52 at College Drive, West Bridge Road, and the I-75 southbound ramps as well as enhancing the overall safety of the interchange. The following illustrates the results for the existing No-Build geometry and each Build alternative:

No-Build Alternative

The existing geometry with the projected traffic volumes for design year 2032 shows that the overall intersection level of service (LOS) are acceptable except at SR 52 and College Drive will not operate at an acceptable LOS. Also, at the ramp intersections the northbound and southbound approaches will operate at LOS D.

In the existing condition in the vicinity of College Drive, SR 52 narrows from four lanes to two lanes with a dedicated westbound right turn lane onto northbound College Drive and a dedicated eastbound left turn lane onto northbound College Drive. SR 52 has deficiencies from a safety and capacity prospective, based lane reduction at College Drive and the close proximity of the three intersections.

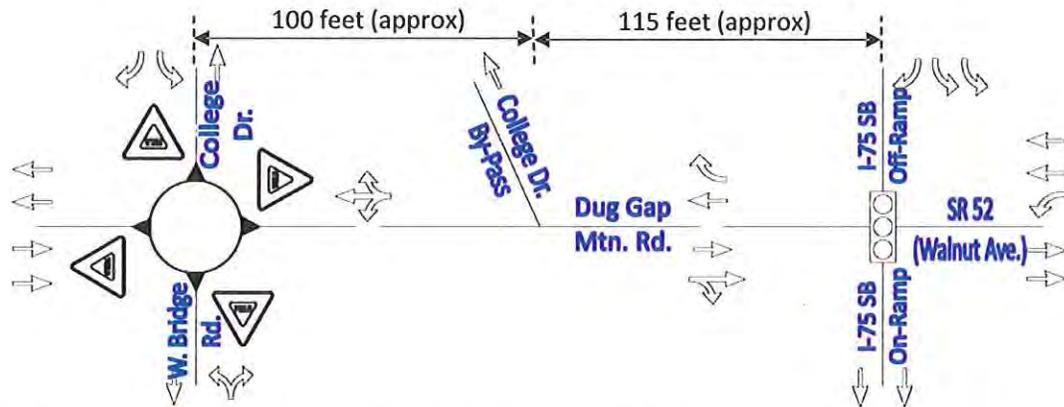
FIGURE 1 – CONFIGURATION FOR EXISTING CONDITIONS AND NO-BUILD ALTERNATIVE



Build Alternative 1 – Four Leg Roundabout at College Drive / West Bridge Road / SR 52

Alternative 1 considers a roundabout at the intersection of SR 52 and College Drive/West Bridge Road. This alternative appears to improve the operation at the intersection of SR 52 and College Drive with the roundabout. Alternative 1 shows a roundabout with the westbound bypass right turn lane to remain and stay closely spaced (approximately 115 feet) to the intersection of SR 52 and the I-75 southbound ramps as in the existing condition. The westbound through lane located before the bypass lane at this intersection drops within a short distance of approximately 115 feet as a right-turn lane. This causes vehicles to be trapped in that lane and cause backups and safety concerns. Also this configuration requires that vehicles that desire to turn right and go up to the Trade Center must weave across one lane of traffic to get to the through lane within a very short distance.

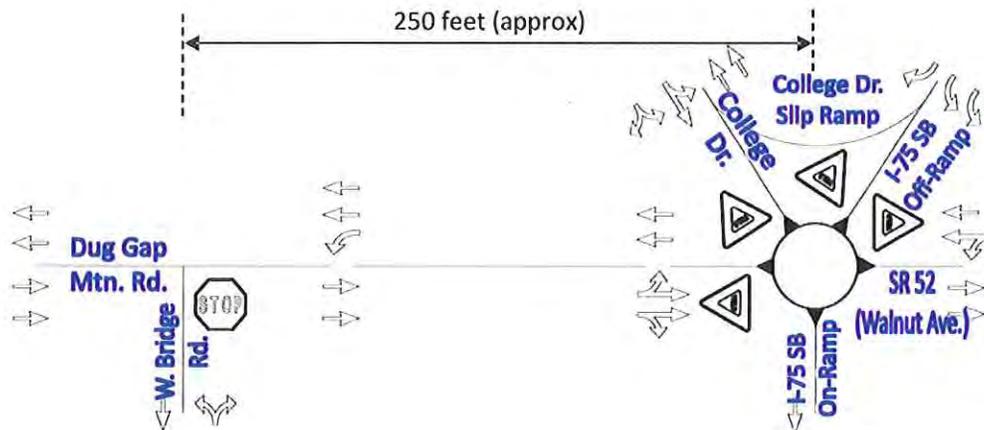
FIGURE 2 – LANE CONFIGURATION FOR BUILD ALTERNATIVE 1 – FOUR LEG ROUNDABOUT AT COLLEGE DRIVE / WEST BRIDGE ROAD/ SR 52



Build Alternative 2 – Five Leg Roundabout at College Drive / I-75 Southbound Ramps / SR 52

Alternative 2 is the recommended alternative and shows a five leg roundabout that combines SR 52, College Drive and the I-75 southbound ramps. Under this alternative, slip ramp is added for the I-75 southbound off ramp to northbound College Drive traffic. The roundabout lane geometry and location increases the capacity for the I-75 southbound off ramp and prevents westbound SR 52 right turning vehicles from being trapped in the westbound thru lane and missing the westbound right turn. This roundabout combines the two closely spaced intersections of SR 52 at College Drive and SR 52 at I-75 Southbound ramps, eliminates the need for a traffic signal at I-75 southbound ramps, decreases the southbound left queue along College Drive, reduces the queue length along the southbound off ramp and prevents spill back onto I-75. Also, this Alternative does not impact the northbound ramp signalized intersection and the ramp approaches at the northbound ramp intersection operate at a LOS C.

FIGURE 3 – LANE CONFIGURATION FOR BUILD ALTERNATIVE 2 – FIVE LEG ROUNDABOUT AT COLLEGE DRIVE / I-75 SOUTHBOUND RAMPS / SR 52



5. CONCLUSION AND RECOMMENDATIONS

Alternative 2 with the revised proposed roundabout geometry appears to provide better operation for the intersection at College Drive and West Bridge Road and improves overall safety at the I-75 interchange than a No-Build scenario or an Alternative #1 configuration. Alternative 2 is a roundabout connecting SR 52, the I-75 southbound ramps and College Drive. The results for the existing No-Build geometry and each Build alternative are illustrated below.

NO-BUILD

Based on the analysis and level of service results, the existing geometry with the projected traffic volumes for design year 2032 shows that the overall intersection level of service (LOS) are acceptable except at SR 52 and College Drive will not operate at an acceptable LOS. At the I-75 ramp intersections the northbound and southbound ramp approaches will operate at LOS D. The existing geometry seems to show deficiency from a safety and capacity prospective, as the intersection of SR 52 and College Drive is very closely spaced to the I-75 southbound ramp intersection approximately 140 feet.

BUILD

Alternative 1 considers a roundabout at the intersection of SR 52 and College Drive/West Bridge Road. This alternative appears to improve the operation at the intersection of SR 52 and College Drive with the roundabout. Alternative 1 shows a roundabout with the westbound bypass right turn lane to remain and stay closely spaced to the intersection of SR 52 and the I-75 southbound ramps at a distance of approximately 115 feet. The westbound through lane located before the bypass lane at this intersection drops within a short distance of 115 feet as the right-turn lane. This causes vehicles to be trapped in that lane and results in backups and potential safety concerns. Also this configuration requires that vehicles desiring to turn right and go up to the Trade Center must weave across one lane of traffic to get to the through lane.

Alternative 2 is the recommended alternative and shows a roundabout connecting SR 52, College Drive and I-75 southbound ramps. Under this alternative, channelized right turn lane is added for the I-75 southbound off ramp to northbound College Drive movement. The roundabout lane geometry and location increases the capacity for the I-75 southbound off ramp and prevents eastbound SR 52 right turning vehicles from being trapped and missing the turn. This roundabout combines the two closely spaced intersections of SR 52 at College Drive and SR 52 at I-75 Southbound ramps, eliminates the need for a traffic signal at I-75 southbound ramps, decreases the southbound left queue along College Drive, and with no impacts to the northbound ramp signalized intersection. It reduces the queue length along the southbound off ramp and prevents spill back onto I-75. Also, the ramp approaches at the northbound ramp intersection operate better than in Alternative 1 or No-Build at a LOS C.

APPENDIX B

DESIGN TRAFFIC VOLUMES AND APPROVAL

Department of Transportation State of Georgia

INTERDEPARTMENT CORRESPONDENCE

FILE Whitfield County **OFFICE** Planning
P.I. # 0009891
DATE March 16, 2011

FROM Cindy VanDyke, State Transportation Planning Administrator

TO Kent Sager, P.E., District Engineer, Cartersville
Attention: DeWayne Comer

SUBJECT **Reviewed** Design Traffic for I-75 @ S.R. 52.

As per your request, we reviewed the consultant's Design Traffic for the above project.

The Design Traffic is approved based on the information furnished. If you have any questions concerning this information please contact Abby Ebodaghe at (404) 631-1923.

CLV/AFE



American Consulting Professionals, LLC

206 W Hawthorne Street
Dalton, Georgia 30720

Tel 706.508.4029 • Fax 706.529.2746
american@acp-ga.com • www.acp-americas.com

March 15, 2011

To: Cindy VanDyke, State Transportation Planning Administrator
Department of Transportation, State of Georgia

Cc: Joe W. Sheffield, District Engineer, GDOT
Abby F. Ebodaghe, GDOT
DeWayne Comer, GDOT

From: Arpita Guha/Akram M. Hussein, American Consulting Professionals, LLC

Re: **Response to GDOT Comments for the Design Traffic for I-75 at SR 52
Whitfield County, P.I. # 0009891**

Dear Ms. VanDyke:

This letter summarizes our responses to GDOT review comments dated March 2, 2011.

GDOT comments and our responses are listed below.

1. The Existing 2011 ADT for ramps R008 & R607 appear low compared to GDOT coverage counts for 2009 & 2010 (6900).

Response: The raw classification count conducted along the I-75 Southbound Off Ramp (corresponding to R607) show a traffic volume of 6,893 compared to the 2009 GDOT coverage count of 6,900. And, the raw classification count conducted along the I-75 Northbound On Ramp (corresponding to R008) show a traffic volume of 6,627 compared to the 2009 GDOT coverage count of 6,930. The raw counts have been adjusted by monthly factor of 1.03 and by daily factor of 0.91 resulting into 2011 ADTs of 6,475 and 6,200 on the I-75 Southbound Off Ramp and on the I-75 Northbound On Ramp respectively.

The traffic volumes on the I-75 Southbound Off Ramp and on the I-75 Northbound On Ramp have been adjusted to 6,900 and 6,930 respectively to reflect the 2009 GDOT coverage counts.

2. Please submit all counts collected for this project.

Response: All the counts collected (including classification counts and turning movement counts) were submitted as the PDF file – “SR 52 @ College Drive --- Counts and Summaries”. The counts collected will be resubmitted with the response to the comments.

3. The 2012 & 2032 ADT diagrams were not included in the submittal.

Response: The No-Build 2012 and 2032 ADT diagrams were included in the submittal as Figure 2. These will be resubmitted with the response to the comments.

The Build 2012 and 2032 ADT diagrams for the two proposed alternatives have been added and will be submitted with the comment-responses.

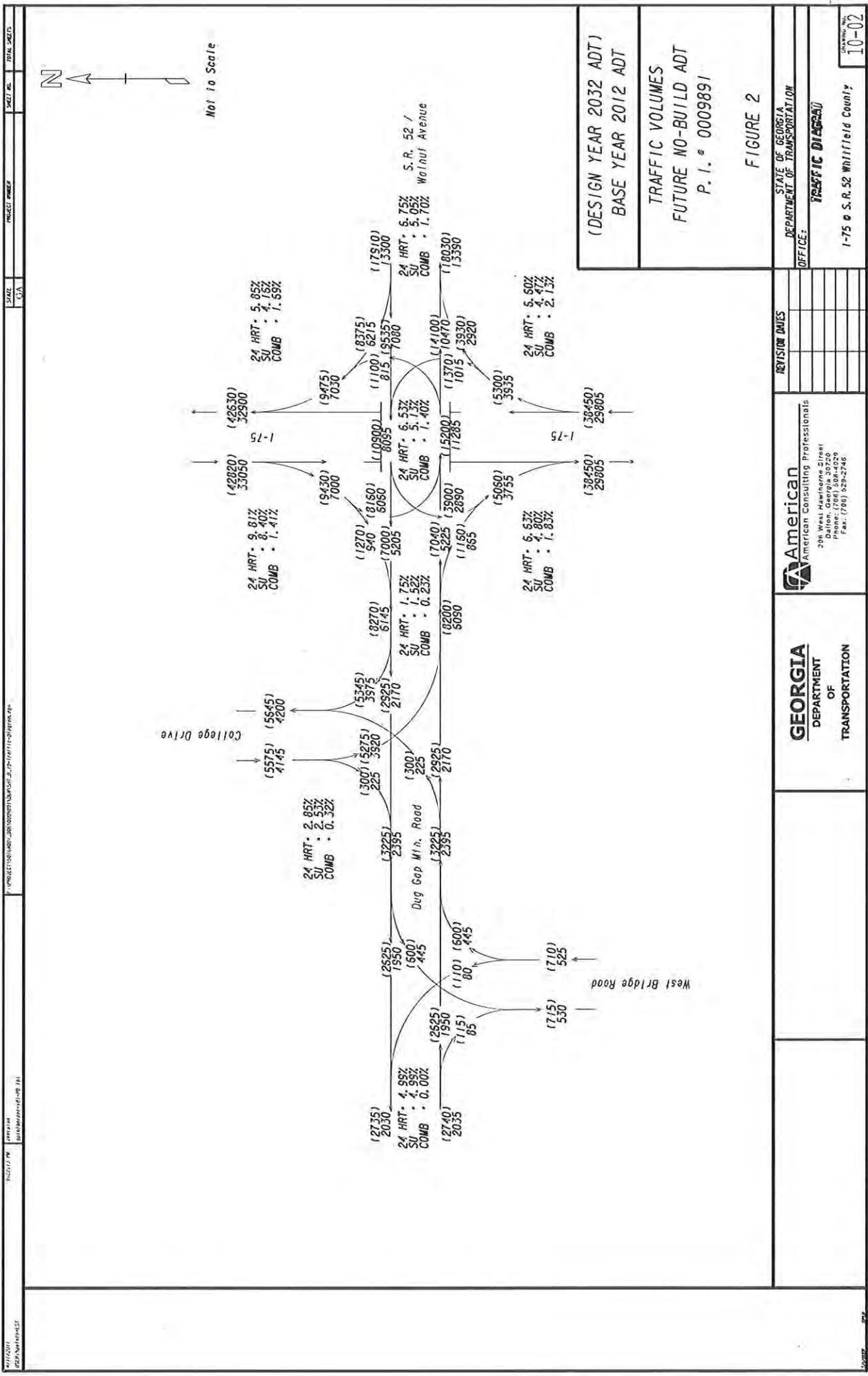
4. Since there are several designs, could you please label the different designs?

Response: The different design alternatives have been labeled in the traffic diagrams and will be submitted with the response to the comments.

5. Please label the diagrams with Build and No Build ADT & DHV.

Response: The traffic diagrams have been labeled Build and No Build ADT and DHV as appropriate and will be submitted with the response to the comments.

If you should have any questions, or require clarification on the above items, please feel free to contact Akram Hussein at 813-435-2565 or Arpita Guha at 813-435-2618.



(DESIGN YEAR 2032 ADT)
 BASE YEAR 2012 ADT

TRAFFIC VOLUMES
 FUTURE NO-BUILD ADT
 P. I. # 0009891

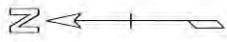
FIGURE 2

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION
 OFFICE:
TRAFFIC DESIGN
 1-75 @ S.R. 52 Whitfield County

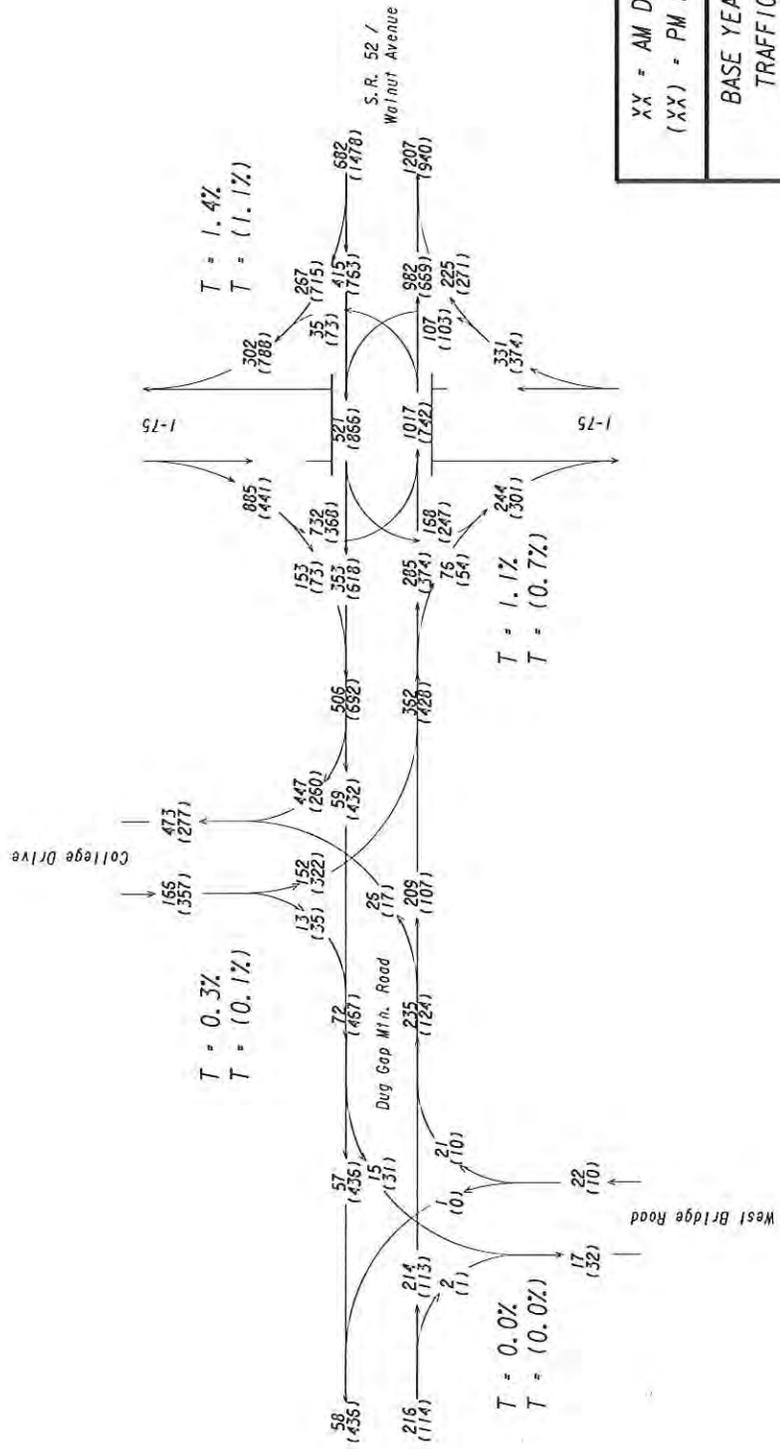
| REVISION DATES |
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American
 American Consulting Professionals
 216 West Hawthorne Street
 Dalton, Georgia 30720
 Phone: (706) 588-4029
 Fax: (706) 528-2746

GEORGIA
 DEPARTMENT
 OF
 TRANSPORTATION



Not to Scale



XX = AM DESIGN HOUR
 (XX) = PM DESIGN HOUR

BASE YEAR 2012 DHV
 TRAFFIC VOLUMES
 NO-BUILD DHV
 P. I. # 0009891
 FIGURE 6

STATE OF GEORGIA
 DEPARTMENT OF TRANSPORTATION
 OFFICE: **TRAFFIC DESIGN**
 1-75 & S.R. 52 Whitfield County

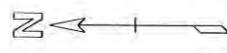
REVISION DATES

| NO. | DATE | DESCRIPTION |
|-----|------|-------------|
| | | |
| | | |
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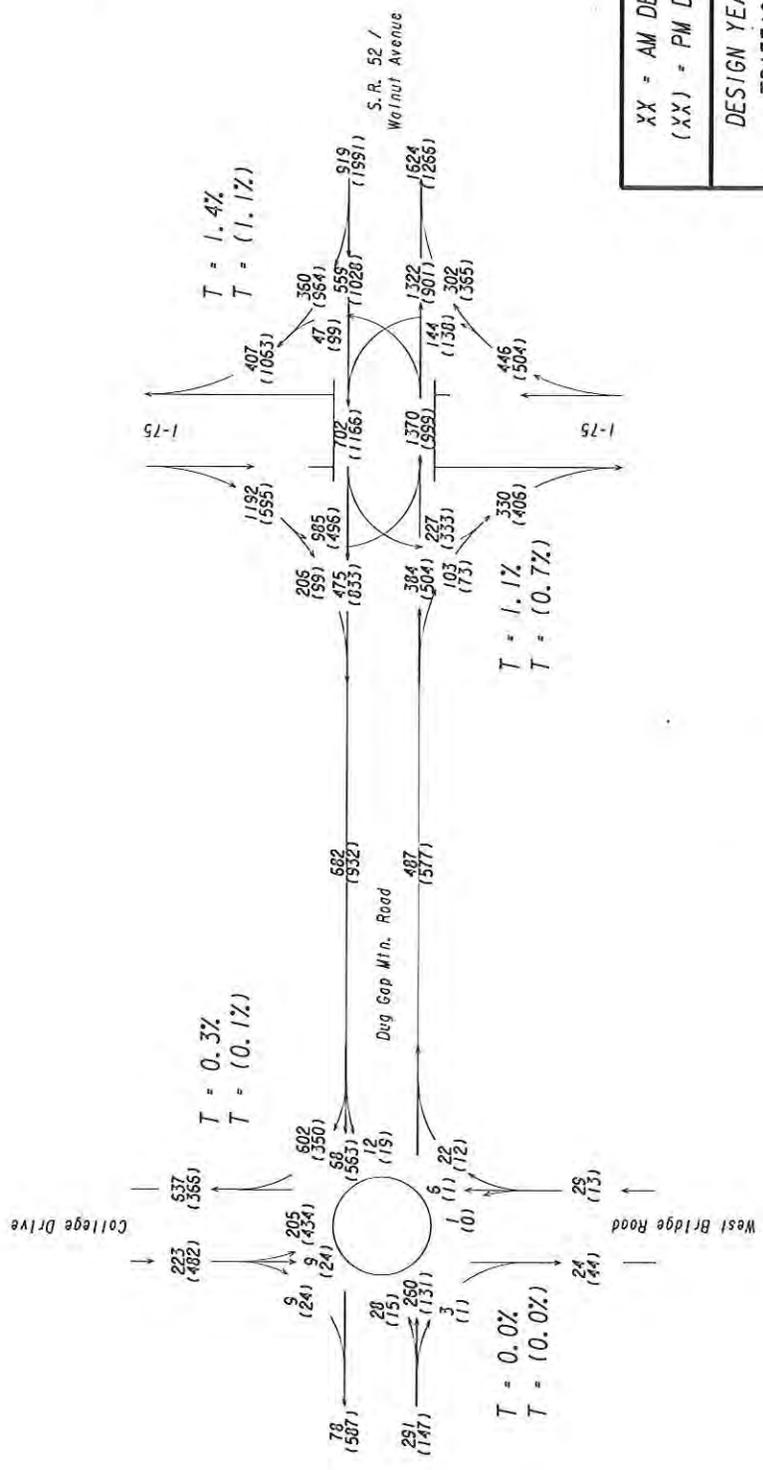
American
 American Consulting Professionals
 208 West Hawthorne Street
 Dalton, Georgia 30720
 Phone: (706) 301-0529
 Fax: (706) 301-2440

GEORGIA
 DEPARTMENT
 OF
 TRANSPORTATION

DATE: 10-06



Not to Scale



ALTERNATIVE 1 - BUILD: PROPOSED ROUNDABOUT AT COLLEGE DRIVE / WEST BRIDGE ROAD / S.R. 52

XX = AM DESIGN HOUR
 (XX) = PM DESIGN HOUR
 DESIGN YEAR 2032 DHV
 TRAFFIC VOLUMES
 FUTURE (ALT. 1) - BUILD DHV
 P. I. # 0009891
 FIGURE 9

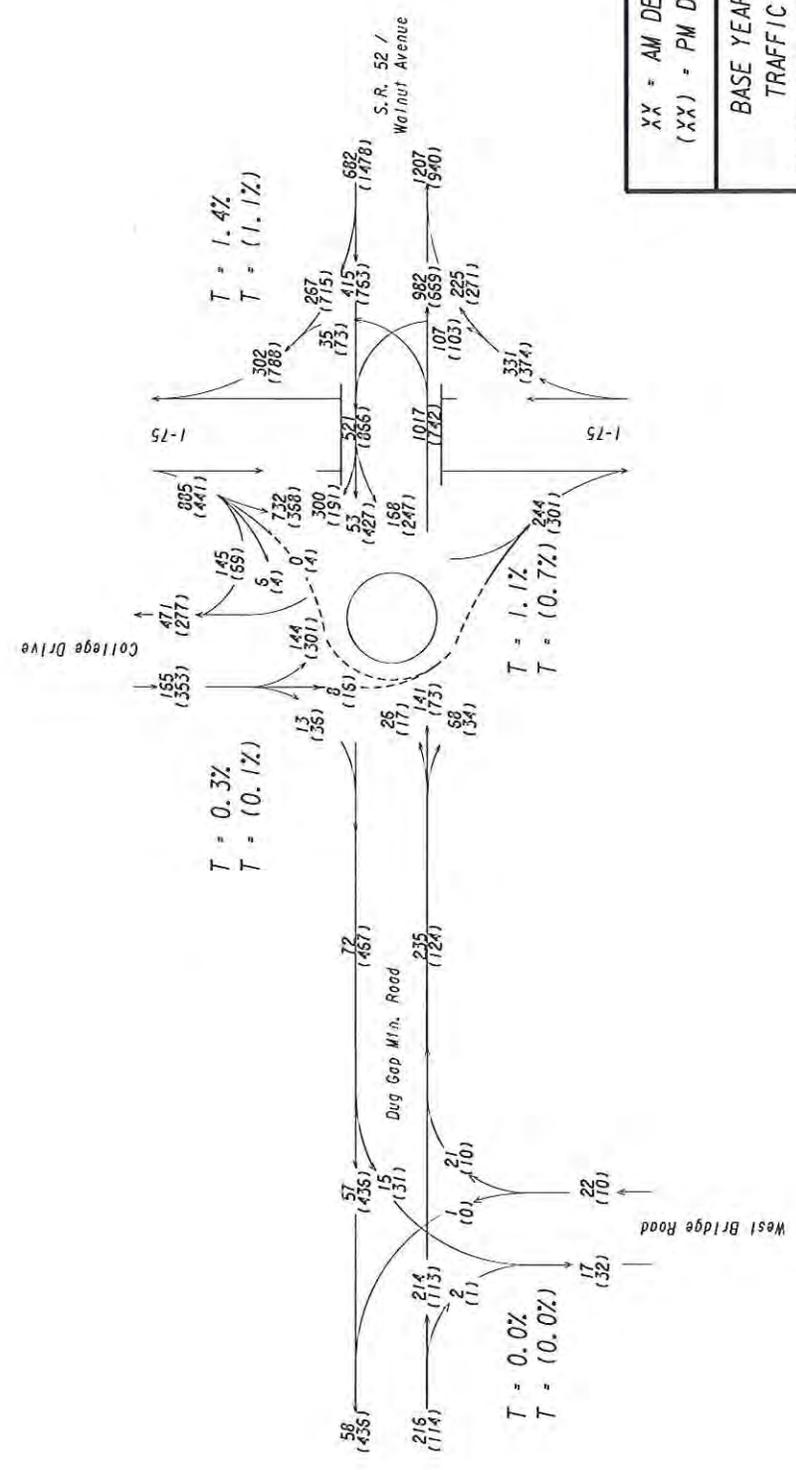
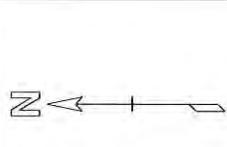
GA American
 American Consulting Professionals
 208 West Hawthorne Street
 Dalton, Georgia 30720
 Phone: (706) 529-2746
 Fax: (706) 529-2746

GEORGIA
 DEPARTMENT
 OF
 TRANSPORTATION

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: **TRAFFIC DESIGN**

1-75 e S.R. 52 Whitfield County

DATE: 10-09



XX = AM DESIGN HOUR
 (XX) = PM DESIGN HOUR

BASE YEAR 2012 DHV
 TRAFFIC VOLUMES
 FUTURE (ALT.2) - BUILD DHV
 P. I. # 0009891
 FIGURE 10

ALTERNATIVE 2 - BUILD: PROPOSED ROUNDABOUT AT COLLEGE DRIVE / 1-75 SOUTHBOUND RAMP / S. R. 52

| | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|------------------------|
| <p>American Consulting Professionals 206 West Hawthorne Street Dalton, Georgia 30720 Phone: (706) 584-0229 Fax: (706) 522-2140</p> | <p>STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE:</p> | | | | | | | | | | | | | | | | | | | | |
| | <p>1-75 @ S.R. 52 Whitfield County</p> | | | | | | | | | | | | | | | | | | | | |
| <p>REVISION DATES</p> <table border="1"> <tr><td> </td><td> </td></tr> </table> | | | | | | | | | | | | | | | | | | | | | <p>TRAFFIC DIAGRAM</p> |
| | | | | | | | | | | | | | | | | | | | | | |
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GEORGIA DEPARTMENT OF TRANSPORTATION



Bridge Inventory Data Listing

Processed Date: 9/19/2010

Parameters: Bridge Serial Num

Structure ID: 313-0018-0

Whitfield

SUFF. RATING: 99.00

Location & Geography

Structure ID: 313-0018-0
 200 Bridge Information: 04
 *6A Feature Int: I-75
 *6B Critical Bridge: 0
 *7A Route No Carried: SR000052
 *7B Facility Carried: WALNUT AVE.
 9 Location: AT SW DALTON CITY LIMIT
 2 Dot District: 6

Signs & Attachments

*104 Highway System: 0
 *26 Functional Classification: 17
 *304 Federal Route Type: F No: 00821
 105 Federal Lands Highway: 0
 *110 Truck Route: 0
 2006 School Bus Route: 0
 217 Benchmark Elevation: 0000.00
 218 Datum: 0
 *19 Bypass Length: 00
 *20 Toll: 3
 *21 Maintenance: 01
 *22 Owner: 01
 *31 Design Load: 6
 37 Historical Significance: 5
 205 Congressional District: 09
 27 Year Constructed: 1964
 106 Year Reconstructed: 1980
 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: J
 258 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
 228 Bridge Curve Horz: 0 Vert: 1
 111 pier Protection: 0
 107 Deck Structure Type: 1
 108 Wearing Structure Type: 6
 Membrane Type: 0
 Deck Protection: 8

*25 Expansion Joint Type: 02
 242 Deck Drains: 0
 243 Parapet Location: 3
 Height: 2
 Width: 1
 238 Curb Height: 0
 Curb Material: 0
 239 Handrail: 7 7
 *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 Approach Slab: 3
 224 Retaining Wall: 0
 233 Posted Speed Limit: 40
 236 Warning Sign: 0 00
 234 Delineator: 0 00
 235 Hazzard Boards: 0
 237 Utilities Gas: 00
 Water: 00
 Electric: 34
 Telephone: 21
 Sewer: 00
 247 Lighting Street: 0
 Navigation: 0
 Aerial: 0
 *248 County Continuity No.: 00

207 Year Photo: 2008
 *91 Inspection Frequency: 24 Date: 06/11/2008
 92A Frat 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 Pile Code: 21390
 *5 Inventory Route(OVD): 1

Type: 3
 Designation: 1
 Number: 00052
 Direction: 0
 *16 Latitude: 34 45.662 HMMS Prefix: SR
 *17 Longitude: 85 -0.1147 HMMS Suffix: 00 MP: 6.00
 98 Boulder Bridge: 000% Shared: 00
 99 ID Number: 000000000000000000
 *100 STRAHNET: 0

12 Base Highway Network: 1
 13A LRS Inventory Route: 3131005200
 13B Sub Inventory Route: 0
 101 parcel Structure: N
 *102 Direction of Traffic: 2
 *364 Road Inventory Mile Post: 000.06
 *208 Inspection Area: 6 Initials: EEP
 Engineer's Initials: sign
 * Location ID No: 313-00052D-000.06E



Bridge Inventory Data Listing

Processed Date: 9/19/2010

Parameters: Bridge Serial Num

Structure ID: 313-0018-0

| Preparam Data | | Measurements | |
|------------------------------|--------------------|------------------|------------------|
| 201 Project No | DPF-082-1 (12) | 027260 | Year: 2007 |
| 202 Plans Available | 1 | 0 | |
| 249 Prop Proj No: | MAIN-75-3 (240) | 05 | Under 06 |
| 250 Approval Status: | 0000 | 00 | Under 00 |
| 251 PI Number | 611245- | 0070 | |
| 252 Contract Date | 08/21/1998 | 210 | |
| 260 Sesame No. | 00015 | 68.00 | |
| 75 Type Work | 00 0 | 82.40 | |
| 94 Bridge Imp. Cost: | \$0 | 68 | |
| 95 Roadway Imp. Cost: | 0 | 6.00 / 6.00 | |
| 96 Total Imp Cost: | 0 | 068 | |
| 76 Imp Length: | 000000 | 2.00 | Type: 2 Rt: 2.00 |
| 97 Imp Year | 0000 | 2.00 | Type: 2 Rt: 2.00 |
| 114 Future ADT: | 040890 | | |
| Hydraulic Data | | | |
| 213 Waterway 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 | | |
| 215 Water Depth: | 00.0 | Br. Height: 00.0 | |
| 222 Slope Protection: | 4 | | |
| 221 Slope Protection | 0 | Fwd: 0 | |
| 219 Fender System | 0 | | |
| 220 Dolphin: | 0 | | |
| 225 Current Cover: | 000 | | |
| Type: | 0 | | |
| No. Bunnels: | 0 | | |
| Width: | 0.00 | Height: 0.00 | |
| Length: | 0 | Apron: 0 | |
| 265 UW Insp Area | 0 | Diver: ZZZ | |
| Location ID No: | 313-00052D-000.06E | | |
| 65 Inventory Rating Method: | 2 | | |
| 63 Operating Rating Method: | 2 | | |
| 66 Inventory Type: | 2 Rating: 36 | | |
| 64 Operating Type: | 2 Rating: 36 | | |
| 231 Calculated Loads: | | | |
| H-Modified: | 20 | 0 | |
| HS-Modified: | 25 | 0 | |
| Type 3: | 28 | 0 | |
| Type 3a: | 40 | 0 | |
| Timber: | 36 | 0 | |
| Piggy back: | 40 | 0 | |
| 261 H Inventory Rating: | 20 | | |
| 262 H Operating Rating: | 28 | | |
| 67 Structural Evaluation: | 6 | | |
| 58 Deck Condition: | 7 | | |
| 59 Superstructure Condition: | 8 | | |
| * 227 Collision Damage: | 1 | | |
| 60A Substructure Condition: | 6 | | |
| 60B Scour Condition: | N | | |
| 60C Underwater Condition: | N | | |
| 71 Waterway Adequacy: | N | | |
| 61 Channel Protection Cont.: | N | | |
| 68 Deck Geometry: | 6 | | |
| 69 UnderClk. Horiz/Vert: | 5 | | |
| 72 Appr. Alignment: | 8 | | |
| 62 Culvert: | N | | |
| Posting Data | | | |
| 70 Bridge Posting Required: | S | | |
| 41 Struct Open, Posted, CL: | A | | |
| * 103 Temporary Structure: | 0 | | |
| 232 Posted Loads: | | | |
| H-Modified: | 00 | | |
| HS-Modified: | 00 | | |
| Type 3: | 00 | | |
| Type 3a: | 00 | | |
| Timber: | 00 | | |
| Piggyback: | 00 | | |
| 253 Notification Date: | 02/01/1901 | | |
| 258 Fed Notify Date: | 2/1/1901 | 12:00:00AM | |
| 212 Year Last Painted: | Sup: 2002 | Sub: 0000 | |



American Consulting Professionals, LLC

206 W Hawthorne Street
Dalton, Georgia 30720
Tel 706.508.4029 • Fax 706.529.2746
american@acp-ga.com • www.acp-americas.com

MEETING MINUTES

Meeting Date: September 1, 2010 Date Issued: September 2 2010
Location: Georgia DOT District 6 Office, Cartersville, GA
Project Name: Roundabout (I-75 SB Ramps, SR 52, College Drive)
Purpose: Initial Team Concept Meeting
Notes by: Anna Peterfreund American Project #: 507GA001.006
Copies to: All attendees

Table with 4 columns: Attendees, Representing, Phone, Fax or e-mail. Lists names of attendees, their organizations, phone numbers, and contact emails.

The following notes reflect our understanding of the discussions and decisions made at this meeting. If you have any questions, additions or comments, please contact us at the above address. We will consider the minutes to be accurate unless written notice is received within 10 working days of the date issued.

Allen kicked off the meeting at 10:00 am. All attendees introduced themselves including the company or agency they represented. A sign-in sheet was passed around the room.

Allen gave an overview of the project and referenced the aerial displays which showed the foot print of the recommended alternative. The updated cost estimate, design criteria and need and purpose was provided to Dewayne for review.

Dewayne mentioned that the concept plans were sent to Kittelson but that the task review contract between GDOT and Kittelson was still being finalized. Dewayne indicated that he would follow-up on the status of the contract next week.

Allen indicated that the roundabout would require that the existing profile be raised approximately 4 feet and that the ramps don't meet the minimum AASHTO design criteria resulting in reconstruction for both the southbound ramps.

Dewayne will provide a contact for FHWA and GDOT will send FHWA a copy of the concept layout and traffic report so that they can review and indicate if an IMR will be required for this project.

Dewayne indicated that the traffic report has been sent to GDOT OES for review. He will follow up with them next week.

Brian indicated that three pond sites were being considered, all within the FHWA right-of-way. The pond sites are just west of the southbound on-ramp, between the southbound on-ramp and the I-75 mainline, and west of the southbound off-ramp. Benny mentioned that another possible pond site would be on the Chamber of Commerce property. He indicated that there are possible plans for the Chamber to relocate down town and that Dalton Utilities has discussed constructing a stormwater pond on the existing property. Steve Smith indicated that nothing has been decided on the status of the stormwater pond at the Chamber property and does not believe anything will happen in the near future. Benny will coordinate with the Mayor of Dalton and Dalton Utilities to determine the status of the pond. Allen will follow up with Benny about the pond and possibly set up a meeting with the City and Dalton Utilities. GDOT doesn't have any objections to any of the pond sites but would prefer that the pond be located at the Chamber property or on or adjacent to the abandoned gas station north of the project. Anna indicated that there could be contamination issues if the pond is constructed where the abandoned gas station is located.

Allen indicated that right-of-way would be required on two properties, one west of the West Bridge Road and one between College Drive and the I-75 southbound off-ramp. Brian added that there is also a sliver of the Chamber of Commerce property that might be impacted.

The utility representatives would prefer to hold off until after the meeting to determine possible impacts. The utility representatives' asked if this is a cut or fill project and Allen mentioned that this will be a fill project. The utility representatives' indicated that there might be some locations where man holes would have to be raised and that they would have to verify that the existing utilities could handle the additional earth load. Allen will send them a copy of the concept layout and it will be mentioned that the plans are conceptual and could change during the preliminary design phase. Ronnie asked that American also include a conceptual staging plan for the utility owners.

Allen mentioned that the 1st plans submission would be sent to the utility owners in March 2011.

Anna will coordinate with Gail D'Avino to confirm that this project will require a Cat Ex. She will send her the concept layout. In addition, DeWayne will provide the contact with FHWA to confirm the level of documentation and begin coordination.

Dewayne suggested that the conceptual cost estimate be updated to include concrete pavement on the ramps and at the roundabout.

Dewayne indicated everything required for the LAP certification has been turned in and that the interview will take place next week.

Ronnie inquired if a GDOT signal permit will be required for the roundabout. It was verified that a signal permit will be required. Steve Sanders said that the permit will be less formal because a roundabout has been approved.

A question was asked about the diameter of the roundabout. Brian indicated that the inside circle is 160 feet and the outside circle is 235 feet. This will handle a WB-67 truck used for interstate ramp design.

The date for the Concept Team Meeting will be determined after the Kittelson peer review. Dewayne will coordinate with Kittelson to provide a time frame for the review and the Concept Team Meeting.

The PIOH can still be held in October but it will likely be later than what is indicated on the current schedule. At this time the PIOH will only include displays but no video.

Dewayne asked if American has coordinated with Dalton College. Anna indicated that American has not directly contacted the College but that American would contact them. An early coordination letter will be prepared and sent to the College.

Dewayne recommended that the schedule be updated. He suggested that everything be moved out one month.

Dewayne asked if the roundabout would impact the bridge approach slab on the east side of the roundabout. Allen indicated that the approach slab will be impacted. Dewayne will coordinate with the bridge office; Allen will follow up with Dewayne on this matter.

Allen will send the sign in sheet and meeting minutes to all attendees.

The utility owners asked for an approximate date of the Concept Meeting. Dewayne indicated that the meeting will likely be held in the beginning of October.

The utility owners asked if the utility poles that would have to be replaced would have to be concrete. Brian indicated that the poles would have to be located outside the clear zone but we would check if the new poles must be concrete.

Lighting needs to be included in the roundabout. The conceptual cost estimate will be updated to include lighting. It was agreed that lighting needs to be included around the roundabout and that a lighting plan will be submitted in the second phase.

Benny has the current high mast lighting plans and will provide them to American. Allen will coordinate with Benny.

Dewayne requested that Joe be copied on all action items.

The meeting ended around 11:00 am.

Summary of Action Items:

- Dewayne
 - Coordinate with Kittelson on peer review of concept layout
 - Coordinate with FHWA to determine if an IMR is required
 - Coordinate with the Bridge Office regarding the impact to the east approach slab for the SR 52 bridge over I-75.
- Allen
 - Send concept layout and sketch of staging plan to utility owners
 - Update cost estimate to include concrete pavement around roundabout and lighting
 - Coordinate with Dewayne for date of concept meeting
 - Meet with Dalton College to discuss roundabout

- Coordinate with Benny for high mast lighting plans at interchange
- Anna
 - Send Dalton College an early coordination letter
 - Contact GDOT and FHWA regarding level of documentation for project
- Benny
 - Coordinate with the Mayor and Dalton Utilities to get an update on the status and schedule of the storm water pond on the Chamber of Commerce property.

The above represents our understanding of the items discussed. Please notify Allen Peterfreund of any discrepancies or questions as soon as possible.

Appendix A: Determination of Need to Prepare an IMR

Project Number: _____

PI Number: _____

County: _____

Interchange Routes: _____

This project is a:

New Concept

Revised concept

List changes to original concept: _____

1. What is the problem to be solved? (Check all applicable)

Safety

Operational

Capacity

Other _____

1(a). Describe the problem(s) [give details of the issues related to the interchange insufficiency as well as problem(s) to be solved]: **The conflicting movements in close proximity to the I-75 SB ramp intersection along SR 52 creates operational, safety and capacity challenges. The introduction of a roundabout at this location eliminates these conflicts and issues while providing sufficient capacity to handle future traffic projections.**

2. Has the LOS for the system been determined and can improvements be made to solve the problem (s)? What is the distance to and the LOS of the interchange upstream and downstream?

Yes, summarize the results and attach the analysis documents:

See attached Traffic Report _____

No, explain why analyzing the existing facilities is not necessary:

3. Describe what is being proposed to improve efficiency and safety of the system: Two build alternatives were analyzed, but the recommended Alternative 2 roundabout with the combination of SR 52 and I-75 southbound ramps and College Drive will eliminate the conflicts and safety issues because of the conflicting movements in close proximity to the I-75 SB ramp intersection and will provide sufficient capacity to handle future traffic projections. Also, the recommended alternative will not impact the operation of the I-75 northbound ramp intersection.
4. Does the modification result in any design exceptions or does it allow existing design exceptions to remain in place?
 Not applicable, no new or existing design exceptions
 Yes, describe and determine if an exception is granted

5. What are the limits of access control for the interchange (measured from the ramp terminal)?
Existing: 800 feet for I-75 southbound off-ramp and 800' for I-75 southbound on-ramp.
Proposed: No changes to limits of access control
6. Will the proposed modification add a new ramp?
 Yes, note the type of ramp and location of the ramp to be added: _____

 No
7. Will the proposed modification remove an existing ramp?
 Yes, note the type of ramp and location of the ramp to be removed: _____

 No
8. Will the proposed modification change the existing interchange configuration?
 Yes, note the configuration of the existing interchange and the configuration of the proposed interchange: _____

 No
9. Will the proposed modification complete basic movements at a partial interchange?
 Yes, note the movements to be completed and the traffic for those movements:

 No

10. Will deceleration lane(s) or acceleration lane(s) be decreased or increased in length?
 Yes, note the type of lane to be modified and the change in length (check the revised interchange spacing): _____

- No
11. What data and graphics are available to demonstrate the problem? and What are the proposed modification(s) necessary to correct the insufficiency?
 Yes, list the data and graphics included for this purpose:
See Attached Traffic Report

- No, list needs: _____

12. What is the base year traffic and LOS?
Year 2011 LOS at northbound and southbound ramp approaches is D. Base year traffic can be found in the Attached Traffic Report.

- What is the design (open to traffic) year traffic and LOS?
Year 2012 LOS are C or better.

13. How does the proposed modification(s) address the problem(s) noted above? Explain.
Proposed modification will eliminate the conflicts and safety issues because of the conflicting movements in close proximity to the I-75 SB ramp intersection along SR 52 and will provide sufficient capacity to handle future traffic projections. Also, the proposed modification will not impact the operation of the I-75 northbound ramp intersection.
14. What solutions that do not involve geometric modification been analyzed, explain?
Optimizing signal timings.

15. How will the modifications possibly impact the system, also note the adjacent interchanges and consider possible impacts of the proposal?
No negative impacts.

16. What other build alternatives were considered and analyzed?
Explain: **Apart from the No-Build Alternative, Build Alternative 1 Roundabout at SR 52, College Drive and West Bridge Road was analyzed.**

Why was the preferred alternative chosen? Alternative 2 will eliminate the conflicts and safety issues because of the conflicting movements in close proximity to the I-75 SB ramp intersection along SR 52 and will provide sufficient capacity to handle future traffic projections. Also, it will not impact the operation of the I-75 northbound ramp intersection.

17. Do you need further information to complete this request? List.
No

Georgia Department of Transportation remarks:

GDOT Office Head

FOR FHWA USE ONLY.

Based on this review:

- IMR is required
 IMR is not required

Operational Analysis is required

FHWA remarks:

Recommending approval:

Approve:

FHWA Transportation Engineer

Transportation Manager

Date

Date

**Benefit Cost Analysis Work Sheet
OPERATIONAL AND SAFETY BENEFIT**

P.I. 0009891

Whitfield County
Five Leg Roundabout to combine SR 52, I-75, and College Drive

Operational Benefit = Tb + CMb

Time Benefit (Tb)

| | | |
|------------|---|-----------------|
| Db (hrs) | <i>(Based on PM Traffic for I-75 SB Off Ramp)</i> | 0.003861111 |
| ADT (2032) | | 29,466.00 |
| Tb (\$s) | | \$ 3,825,566.69 |

Commercial Benefit (CMb)

| | | |
|-----------------|---|---------------|
| Db (hrs) | <i>(Based on PM Traffic for I-75 SB Off Ramp)</i> | 0.003861111 |
| % Truck Traffic | <i>(Based on PM Traffic at I-75 SB Ramp Intersection)</i> | 0.007 |
| ADT (2032) | | 29,466.00 |
| CMb | | \$ 141,460.64 |

Safety Benefit (2005 - 2009 Crashes)

| Type | Total | Avg. Crashes | Value | Reduction | Total |
|------------------|-------|--------------|-----------------|-----------|-----------------|
| Fatal: | 0 | 0 | \$ 5,800,000.00 | 0.80 | \$ - |
| Injury: | 31 | 6 | \$ 333,500.00 | 0.80 | \$ 1,654,160.00 |
| PDO: | 110 | 16 | \$ 4,800.00 | 0.42 | \$ 31,852.80 |
| Benefit per Year | | | | | \$ 1,686,012.80 |
| Total Benefit | | | | | \$ 8,430,064.00 |

Total Operational Benefit \$ 3,967,027.33

Total Safety Benefit \$ 8,430,064.00

TOTAL BENEFIT \$ 12,397,091.33

Preliminary Engineering (LOCAL) \$ 262,248.28

Right-of-Way (LOCAL) \$ 1,110,000.00

Construction (GDOT) \$ 3,909,408.49

TOTAL CONSTRUCTION COST \$ 5,281,656.77

B/C Ratio 2.35



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-75 Southbound Off-Ramp @ SR 52 (Whitfield County)

Roundabout Peer Review

Date: February 14, 2011 Project #: 10956.4
To: Georgia Department of Transportation
From: Justin Bansen; Pete Jenior; and Lee Rodegerdts, P.E.

Kittelison & Associates, Inc. (KAI) reviewed two conceptual roundabout designs for the intersection of the I-75 SB ramps/SR 52 (Walnut Avenue - Dug Gap Mountain Road)/College Drive in Whitfield County, Georgia. Both concepts were developed by American Consulting Professionals (ACP) and are dated January 11, 2011. They can be characterized as follows:

- The base design (shown in Appendix 1) features two-lane entries on all four approaches and additional right-turn bypass lanes on three approaches. The circulatory roadway has two lanes throughout, except in front of the east leg splitter island, where it is one lane. For the westbound entry and exit, only one lane continues through along SR 52. The second westbound entry lane is designated for vehicles traveling to College Drive only.
- In the alternate design (shown in Appendix 2), the westbound entry, circulatory roadway, and exit are modified to provide two lanes for the westbound through movement. To accommodate the additional through lane along SR 52, a portion of the circulatory roadway is modified to be three lanes, and the southbound right-turn bypass lane was converted from a continuous free-flow lane to a yield-control right-turn lane.

Our review has been conducted in general accordance with the guidance provided in NCHRP Report 672, *Roundabouts: An Informational Guide, Second Edition* (Reference 1) and our experience with peer reviews of this type. It is recognized that the intersection site presents a number of challenges: hilly terrain, a fixed approach (the SR 52 bridge over I-75), and five legs. Considering these constraints, ACP has done a good job in working through some key design issues. However, we believe that the geometry, signing, and striping in the ACP concepts can still be further enhanced to improve navigation through the roundabout. The intent of our changes is to clarify lane assignments, reduce

fastest path speeds on some entries, and remove unnecessary lanes. The following sections summarize our review in detail.

TRAFFIC OPERATIONS AND LANE NEEDS

KAI conducted an independent review of projected traffic operations under 2019 design year conditions using traffic volumes in APC's March 2010 Intersection Analysis Report (Reference 2). The 2019 forecast traffic volumes are included in the Appendix. Our analysis was performed using the GDOT Roundabout Analysis Tool that implements the operational analysis procedures of NCHRP Report 572 (Reference 3).

Our review indicates that both alternatives will operate acceptably with volume-to-capacity (v/c) ratios under 0.85. Some approaches are well below capacity, and we recommend the following changes (these are applicable to both the base design and the alternate design):

- Consider removing the right-turn bypass from SR 52 eastbound to the I-75 on-ramp. This is a very low-volume movement (highest projected hourly volume is 44 vehicles) and can adequately be served by the approach without a bypass lane. The bypass lane as currently designed presents a number of challenges:
 - Entry speeds on this approach are well above the 30 mph threshold for a double-lane roundabout. This is discussed further in the next section.
 - The three-lane pedestrian crossing distance will be challenging to some users, particularly those with vision impairments.
 - Circulating drivers may perceive the bypass as a second exit lane for their use, as it is only separated with striping. Removal of the right-turn bypass lane will not create lane continuity issues, as it is added immediately prior to the roundabout and dropped on the on-ramp.
- Consider removing the southbound right turn bypass/lane from College Drive to SR 52 westbound. The bypass/lane is not needed for capacity and is not a continuation of a basic lane on College Drive. Its inclusion creates additional conflict points, a wider pedestrian crossing, and complex signing and striping needs.

Traffic operations analysis for the base design with and without the changes noted above is summarized in Tables 1 and 2. Complete analysis is shown in the Appendix.

Table 1 2019 AM Peak Hour Traffic Operations

| | Base Design | | | Base Design with KAI Modifications* | | |
|-------------------------------|-------------|-------|-----|-------------------------------------|-------|-----|
| | v/c | Delay | LOS | v/c | Delay | LOS |
| I-75 off-ramp | 0.69 | 15.8 | C | 0.69 | 15.8 | C |
| SR 52 (Walnut Avenue) | 0.36 | 5.2 | A | 0.36 | 5.2 | A |
| SR 52 (Dug Gap Mountain Road) | 0.25 | 10.9 | B | 0.31 | 11.8 | B |
| College Drive | 0.19 | 9.2 | A | 0.21 | 9.4 | A |

* KAI modifications are elimination of right-turn bypass lanes on SB College Avenue and EB Dug Gap Mountain Road entries

Table 2 2019 PM Peak Hour Traffic Operations

| | Base Design | | | Base Design with KAI Modifications* | | |
|-------------------------------|-------------|-------|-----|-------------------------------------|-------|-----|
| | v/c | Delay | LOS | v/c | Delay | LOS |
| I-75 off-ramp | 0.42 | 11.1 | B | 0.42 | 11.1 | B |
| SR 52 (Walnut Avenue) | 0.45 | 6.0 | A | 0.45 | 6.0 | A |
| SR 52 (Dug Gap Mountain Road) | 0.16 | 7.9 | A | 0.19 | 8.1 | A |
| College Drive | 0.24 | 8.2 | A | 0.27 | 8.5 | A |

* KAI modifications are elimination of right-turn bypass lanes on SB College Avenue and EB Dug Gap Mountain Road entries

From a lane continuity standpoint, the base design results in a lane drop along westbound SR 52 where only one lane continues through the roundabout in the westbound direction despite SR 52 being a four lane roadway (two lanes in each direction) upstream and downstream of the study intersection. The alternate design maintains lane continuity through the intersection by maintaining two through lanes along SR 52 in the westbound direction. From a lane continuity standpoint, the alternate design is preferred and is expected to be more intuitive to drivers.

DESIGN FEATURES

Fastest Path Speeds

KAI performed a check of fastest path speeds for base design; these checks are shown in Figures 1 and 2. Both the southbound and eastbound entries are estimated to allow entering vehicle speeds in excess of 30 mph when vehicles ignore lane markings on the roundabout approach. Speed control at

entry is one of the key design objectives to provide for safe roundabout operations. Refinements to the entry geometry should be considered to further limit potential fastest path speeds.

For the southbound and eastbound entries, the current design uses bypass lanes with no raised channelization to separate the bypass from the adjacent entry lanes. These are key contributors to the lack of speed control in the current design. Removal of these lanes, as previously discussed, will help to improve speed control of the entries. However, removal of the bypass lanes alone may not be sufficient to fully meet speed control objectives on these approaches.

Design Vehicle Accommodation

KAI reviewed a truck turning template for the base design that was prepared by ACP and dated January 12, 2011. ACP used a WB-40 as the design vehicle for the right turn from College Drive to SR 52 westbound and for turns in and out of Bridge Road; ACP used a WB-67 for all other movements. Our review assumes that these design vehicles have been previously confirmed with GDOT as the appropriate vehicles for this location. However, we note that it is uncommon for WB-40 vehicles to be used as a design vehicle at roundabouts; WB-50 vehicles are more commonly used in cases where a larger WB-67 is not specified.

The templates indicate that WB-67s are able to enter, circulate, and exit the roundabout without running over curbs. However, in many locations, they must travel several feet into an adjacent lane to do so. Consideration should be given to providing sufficient space for a passenger car to travel adjacent to a WB-67 through the roundabout. As an example, for the southbound left-turn and the eastbound through movements, a WB-67 truck traveling in the outside lane appears to off-track into the inside circulating lane a sufficient distance that a passenger car would not have sufficient width to travel adjacent to the truck. In addition, the truck paths should not overlap the entrance lines (see the eastbound entry as an example).

Natural Vehicle Paths

Design of multilane roundabout entries requires a consideration of the natural paths of vehicles. Natural paths are drawn by assuming vehicles stay within their lane up to the yield/entrance line of the roundabout. Beyond this point, vehicles are assumed to maintain their trajectory when entering the roundabout. If the trajectories do not carry side-by-side vehicles into the appropriate circulating lanes of the roundabout, path overlap occurs. Exhibits 6-28 and 6-29 of NCHRP Report 672 illustrate path overlap concepts.

The APC designs exhibit potential for path overlap on some entries. Path overlap on the east leg is illustrated in Figure 5. On entries with path overlap, adjustments to improve the alignment of entering vehicles need to be balanced with the concurrent need to maintain low entry speeds.

General Layout, Geometry, and Signing/Striping

Our comments on the two roundabout concepts are indicated with redline mark-ups on Figures 3 and 4. Comments are also described below.

Base Design (Figure 3)

- 1) Consider providing a buffer between the sidewalk and circulatory roadway, as shown in Exhibits 6-63 and 6-65 of NCHRP Report 672.
- 2) The right turn arrow suggests that a turn can be made to College Drive from the southbound I-75 off ramp, which is not the case. A diagonal arrow may be more effective here.
- 3) The lane use arrows identified on the circulatory roadway, upstream of the I-75 off-ramp entry, should be removed. The two through arrows here have different meanings and are intended to direct drivers to different approaches. The arrow in the right lane is inconsistent with the upstream right-turn arrow, but if a right-turn arrow were used here it would appear to direct drivers onto the off-ramp.
- 4) Within the circulatory roadway in front of the southbound entry, one of the circulatory lanes drops as an exit onto College Drive. To reinforce lane assignment (drivers in the right lane must exit to College Drive), align the lane line stripe with the exit. The lane stripe currently curves toward the west, which may mislead some drivers into thinking that they can continue to circulate in the outside lane.
- 5) Within the circulatory roadway near the I-75 off-ramp entry, spiral markings and hatching is used to direct vehicles into the appropriate lanes. An extended truck apron may be more effective than hatching here, considering all of the movements occurring in this part of the roundabout.
- 6) At the eastbound exit, the solid lane line should be extended to the crosswalk. This is intended to reinforce to drivers that the outside lane must exit.
- 7) A minor modification is needed to the channelization within the circulatory roadway in front of the westbound SR 52 entry. The single-lane portion of the circulatory roadway should more clearly direct vehicles only to the outer lane downstream. As currently shown, drivers may

- incorrectly believe that both lanes exit to College Drive, which may cause sudden lane changing.
- 8) Each of the roundabout approaches exhibits some potential for entry path overlap. The alignment of the entries into the circulatory roadway could be improved with the use of a tangent or larger radius curve between the controlling entry curve and the inscribed circle. This would help to better align vehicles at entry to maintain their correct lane as they enter the circulatory roadway.
 - 9) For the right-turn bypass lane between the southbound I-75 off-ramp and College Drive, the hatching is unnecessary and could become a maintenance issue when trucks off-track and other vehicles drive over it.
 - 10) At the southbound I-75 off-ramp entry, it appears that the distance between the crosswalk and the edge of the circulatory roadway is less than one vehicle length. Crosswalks should be located one vehicle length back from the circulatory roadway to separate decision points for drivers and to allow pedestrians to cross the approach behind a vehicle stopped at the yield line.
 - 11) The crosswalk across College Drive should be moved to a one-car length (approximately 20-foot) setback from the circulatory roadway. This will reduce the likelihood of queued vehicles stopping on the crosswalk, and lower vehicle speeds on the exit. Also, if the pedestrian crossing of College Drive was incorporated into the right-turn bypass island (for southbound I-75 to College Drive), then the crosswalk will significantly shorten the path for pedestrians walking along SR 52 and prevent them from having to cross the right-turn bypass lane twice.
 - 12) The hatching separating the southbound College Drive entry lanes from the right-turn bypass lane offers no speed control because it can be easily driven across. For reasons noted previously, it is recommended that the right turn lane be removed. If the designers choose to keep the right turn lane, a raised island should be used to separate the right-turn bypass.
 - 13) For the westbound exit, we recommend that the taper for the left-turn lane should begin after the crosswalk to simplify the exit geometry and lane assignments of the roundabout. This change would also shorten the pedestrian crossing distance. The reduced storage length should still adequately accommodate queues for what is a low-volume movement.
 - 14) On the eastbound approach the right-turn bypass lane reduces the potential speed control, allowing fastest path entry speeds well above the 30 mph maximum recommended value for a double-lane roundabout.
 - 15) The provision of a two-lane exit onto I-75 southbound has the potential to confuse drivers within the circulatory roadway to think that they can exit from either lane (when only the

outside lane is allowed to exit here). The lack of raised channelization separating the eastbound right-turn bypass contributes to this issue. The right-turn lane should be eliminated (and the exit reduced to a single lane) or physically separated with a treatment such as a raised island.

- 16) [not shown in figure] Typical Section 6 is labeled as I-95 SB on-ramp and should be changed to I-75 SB on-ramp.
- 17) [not shown in figure] Consideration should be given to modifying the splitter islands to offset the approach nose to improve vehicle channelization. NCHRP Report 672, *Roundabouts: An Information Guide – 2nd Edition* provides additional detail.
- 18) [not shown in figure] Consider modifying the curb ramps for the pedestrian crossings to eliminate the “wings” on the side of the ramps where the sidewalk is set back from the roadway by a landscape buffer. NCHRP Report 672, *Roundabouts: An Information Guide – 2nd Edition* provides additional detail in Section 6.8.1.
- 19) [not shown in figure] Within the splitter island on the east and west legs of the intersection, consider modifying the pedestrian refuge area to be at the same grade as the roadway (cut through) instead of ramped. This type of design is less cumbersome for wheelchair users.

Alternate Design (Figure 4)

Many of the comments noted for the base design also apply to this design. Additional comments are noted below:

- 1) The overhead lane-use signs have a high number of word elements that may be difficult for drivers to quickly comprehend. Instead of the “Left Lane”, “Center Lane”, etc. text, upward arrows could be used. Upward arrows are included in the “Guide Signs – Freeways and Expressways” chapter of the 2009 MUTCD. They are intended for major diverges on freeways but could be useful here as well. The arrows could be shown diagonally if necessary.
- 2) For the signs on the southbound and eastbound approaches in advance of the right-turn lanes, right-turn arrows may be more effective than diagonal arrows on these signs to avoid confusing the right-turn movement with the overall diagonal entry into the roundabout.
- 3) In front of the splitter island adjacent to the College Drive approach, consider changing the dotted line to a solid line where no lane changes are needed and no vehicles will be entering the roundabout.
- 4) Add another set of pavement marking lane-use arrows within the circulatory roadway adjacent to the College Drive splitter island.

- 5) For the lane-use arrows provided downstream of the westbound SR 52 entry, the right turn arrow should be removed to avoid directing drivers onto the I-75 off-ramp.

Of the two designs, we believe that the alternative design is superior to the base design in terms of lane continuity and assignment. The alternative design maintains two lanes through the roundabout on SR 52 in the westbound direction. This is particularly desirable due to the difficulties in signing and marking lane assignments in the northern portion of the circulatory roadway under the base design.

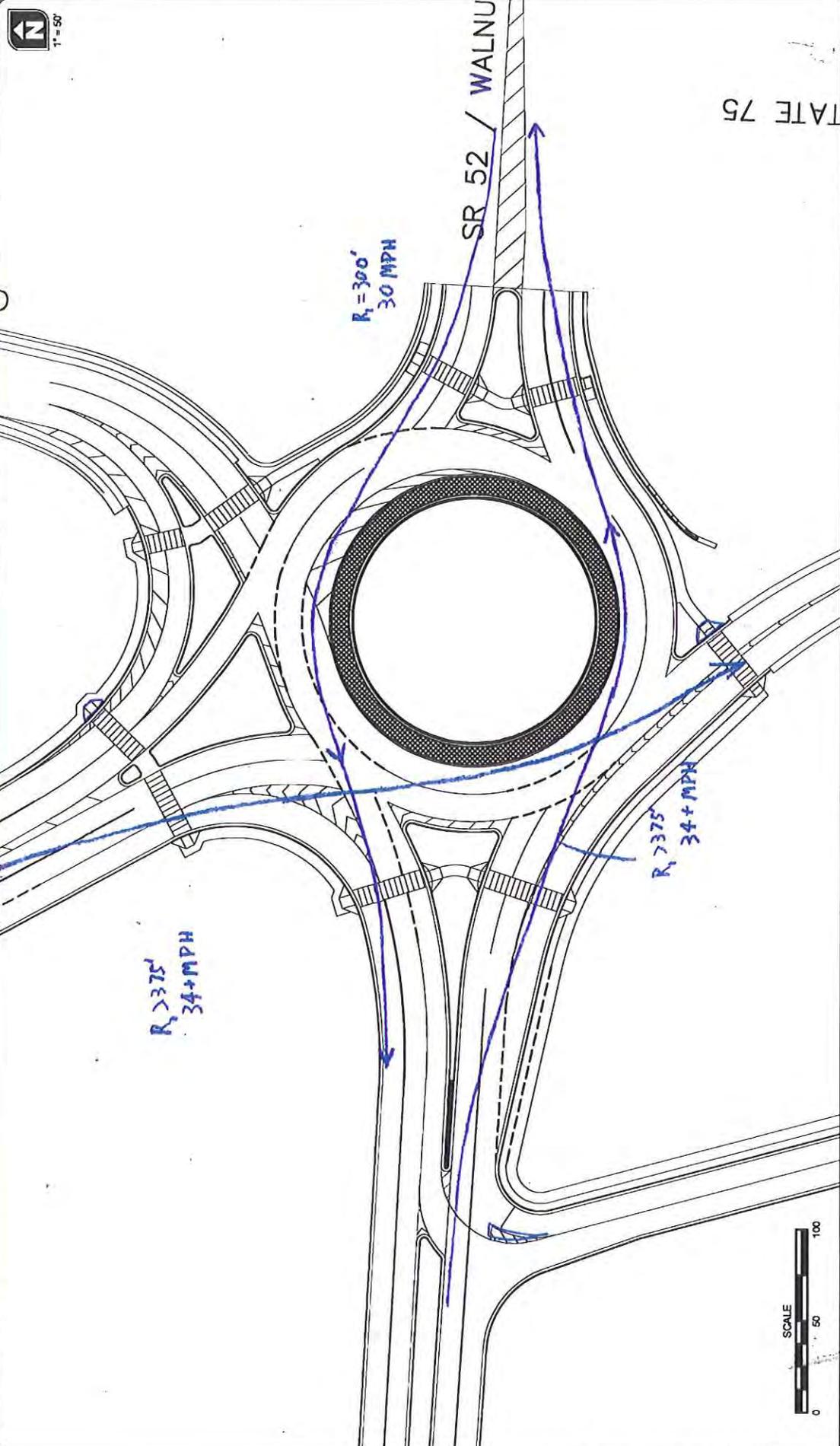
CONCLUSIONS AND RECOMMENDATIONS

A number of recommendations for both of the ACP design concepts are offered in this technical memorandum. Of the two concepts, we believe that the "Alternative Design" offers advantages over the base design because it maintains lane continuity on SR 52 westbound and the complex northern portion of the roundabout can be better signed and striped. Major recommendations for this design include the removal of two right turn bypass lanes, improvement to speed control on the southbound and eastbound entries, improvement to natural vehicle paths, relocation of some crosswalks, and modifications to the signing and markings.

We trust these review comments and observations are helpful in enhancing this roundabout design. Please feel free to contact us if you have comments or questions.

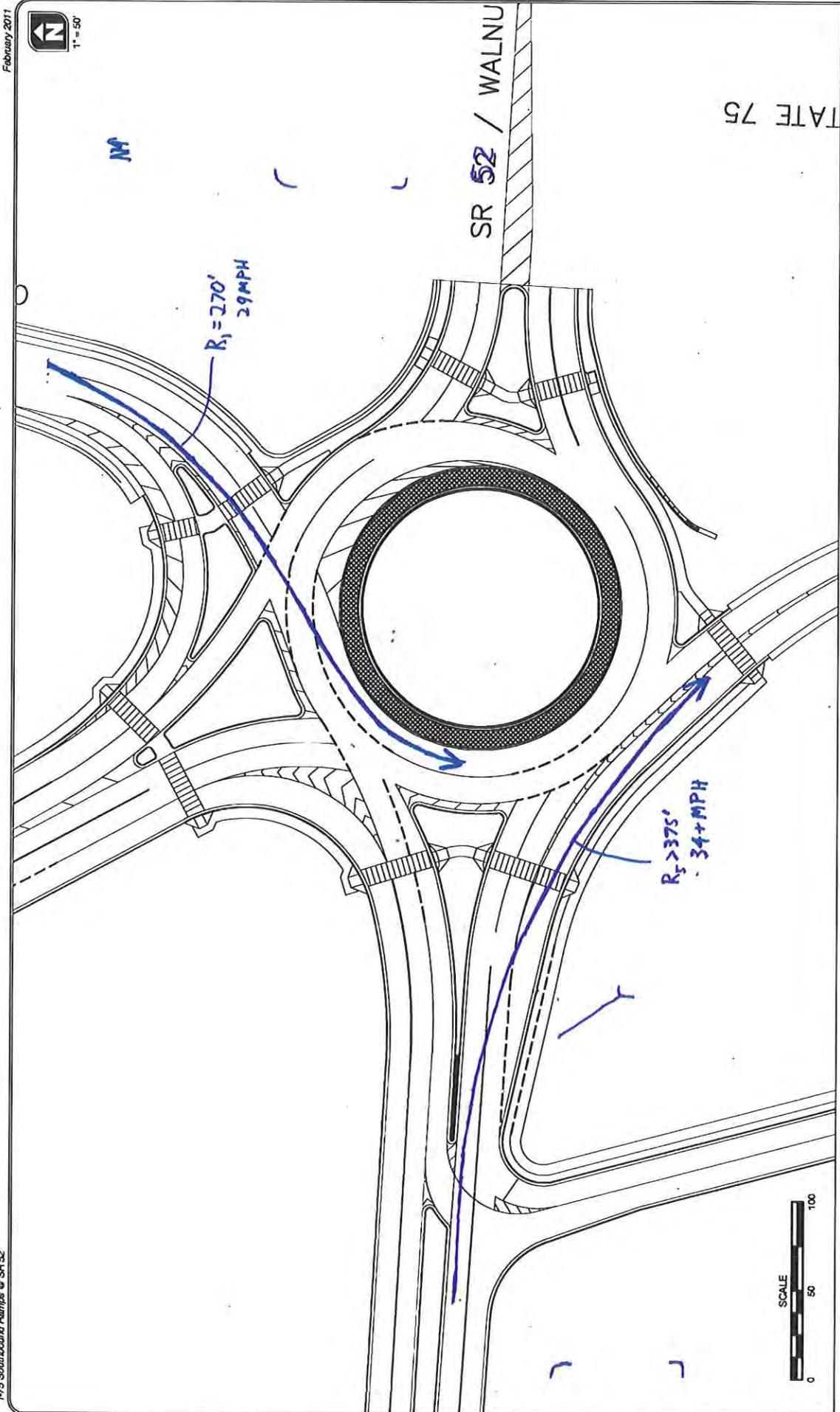
REFERENCES

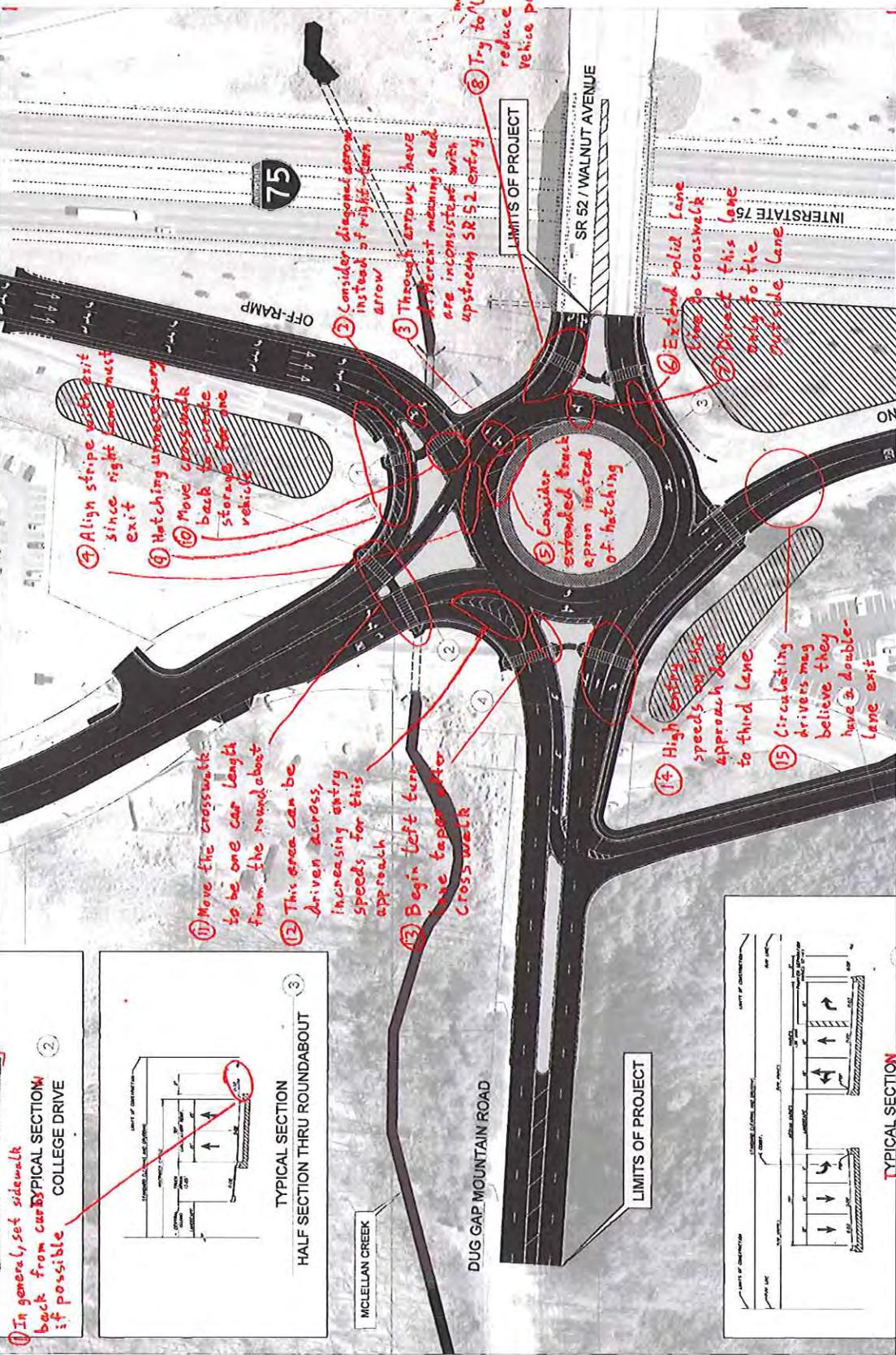
1. Rodegerdts, L., J. Bansen, C. Tiesler, J. Knudsen, E. Myers, M. Johnson, M. Moule, B. Persaud, C. Lyon, S. Hallmark, H. Isebrands, R. B. Crown, B. Guichet, and A. O'Brien. *NCHRP Report 672: Roundabouts: An Informational Guide, Second Edition*. Transportation Research Board of the National Academies, Washington, D.C., 2010.
2. American Consulting Professionals. *Intersection Analysis Report for SR 52 (Walnut Avenue)/Dug Gap Battle Road and Holliday Avenue/College Drive*. Prepared for Whitfield County, Georgia, March 2010.
3. Rodegerdts, L., M. Blogg, E. Wemple, E. Myers, M. Kyte, M. Dixon, G. List, A. Flannery, R. Troutbeck, W. Brilon, N. Wu, B. Persaud, C. Lyon, D. Harkey, and D. Carter. *NCHRP Report 572: Roundabouts in the United States*. Transportation Research Board of the National Academies, Washington, D.C., 2007.



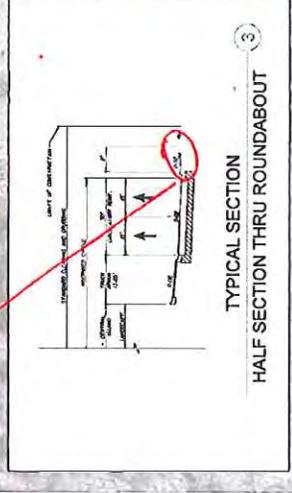
TATE 75

H:\proj\1109560\Track 4 - I-75 at SR 52\figs\fig110956-4-Whitfield.co.dwg Feb 17, 2011 - 10:24am - gpkw Layout Title Fig 1





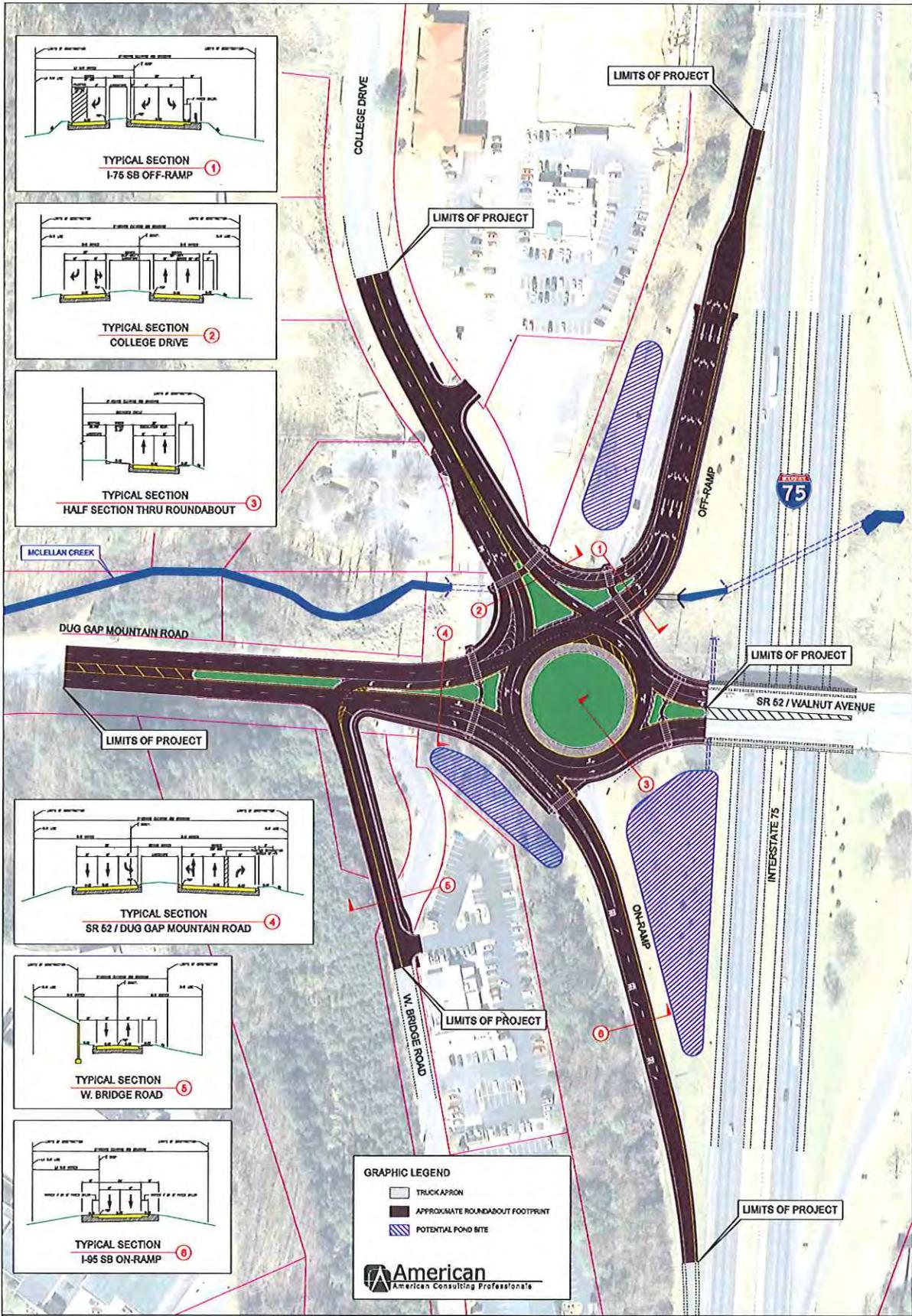
① In general, set sidewalk back from curb if possible



NO SCALE

RECOMMENDED CHANGES TO BASE DESIGN
WHITFIELD COUNTY, GEORGIA
FIGURE 3

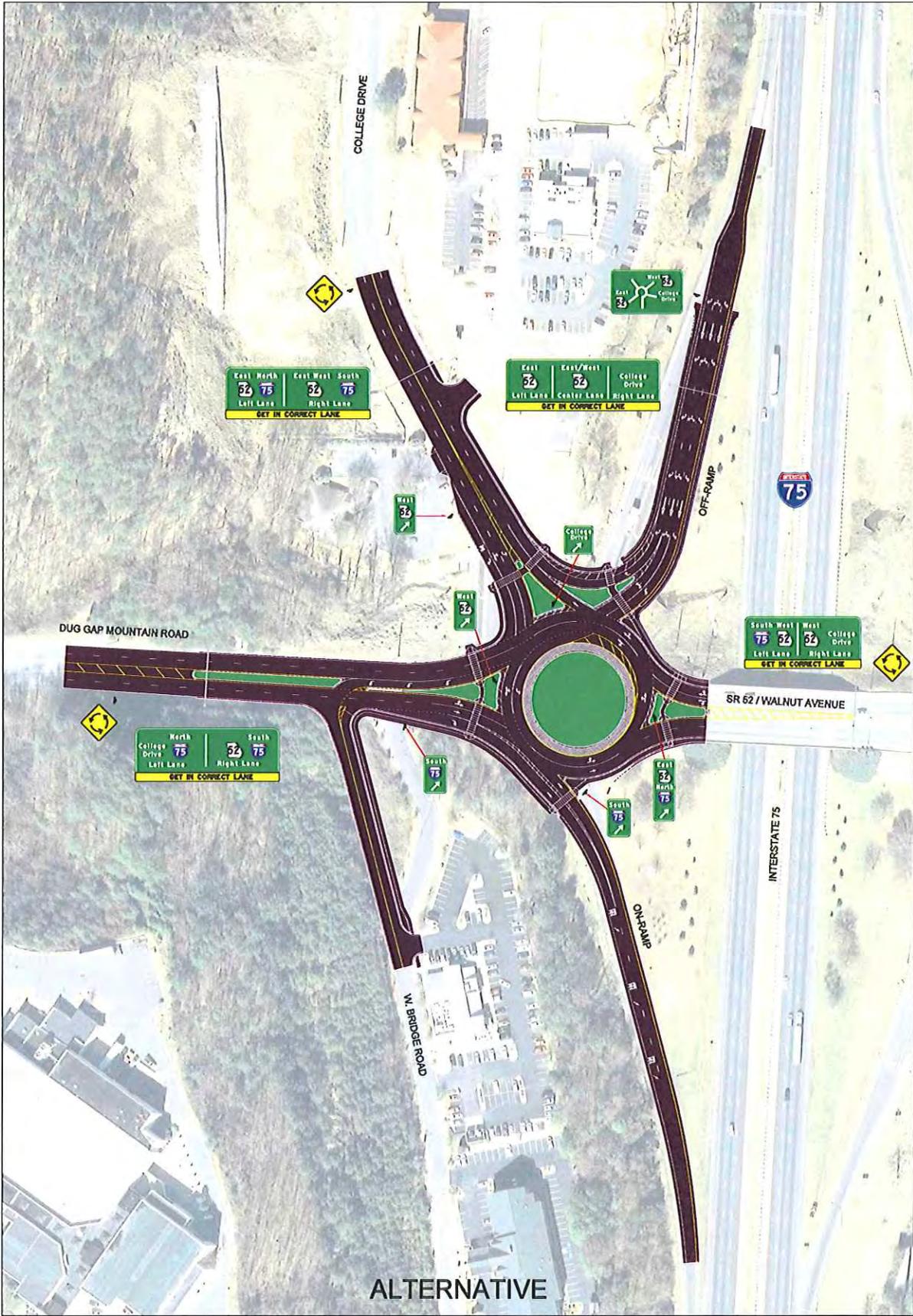
Appendix 1
ACP Base Design



5-LEG ROUNDABOUT (WITH INTERSTATE RAMPS)
I-75 @ SR-52 (DUG GAP MOUNTAIN ROAD / COLLEGE DRIVE / W. BRIDGE ROAD)
 P.I. # 0009891 / WHITFIELD COUNTY, GEORGIA



Appendix 2
ACP Alternate Design



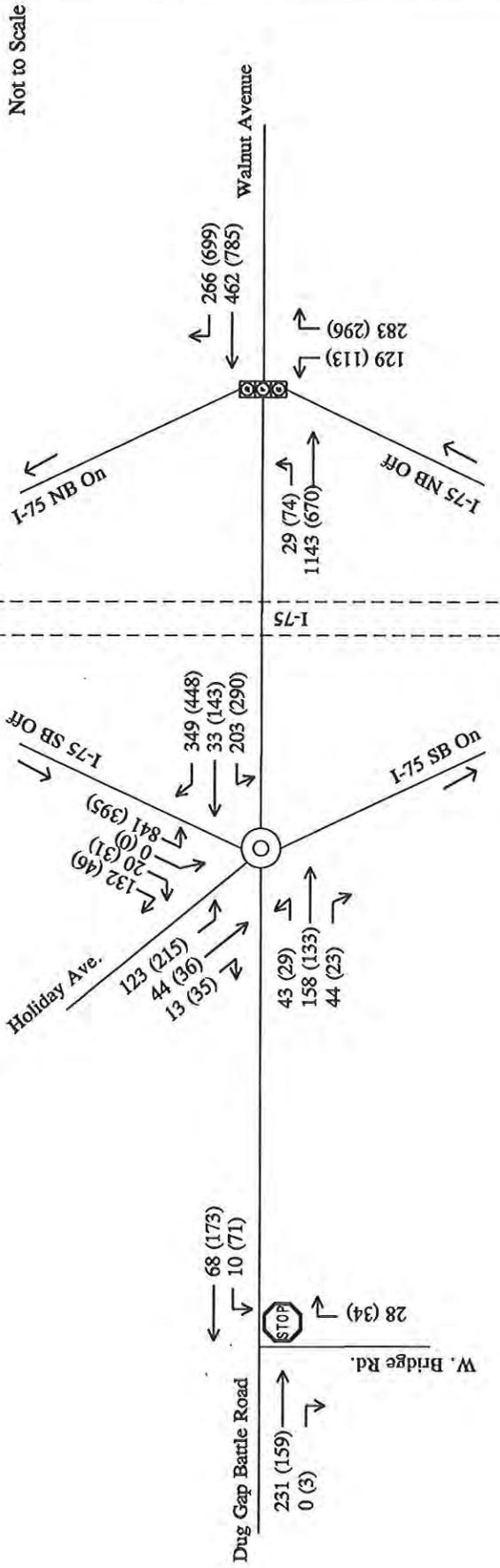
ALTERNATIVE

PROPOSED ROUNDABOUT GUIDE SIGN LAYOUT
 I-75 @ SR-52 (DUG GAP MOUNTAIN ROAD / COLLEGE DRIVE / W. BRIDGE ROAD)
 P.I. # 0009891 / WHITFIELD COUNTY, GEORGIA



Appendix 3 Projected Traffic Volumes

Alternative 5



Not to Scale

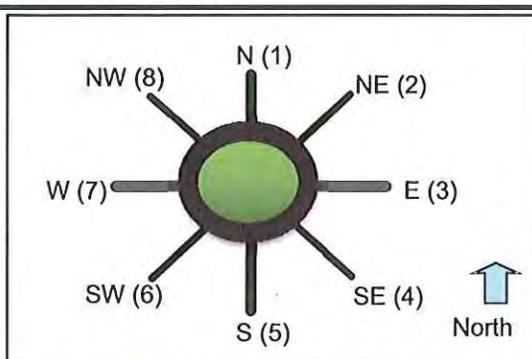
I-75 AT DUG GAP BATTLE ROAD / WALNUT AVENUE

PROJECTED YEAR 2019 PEAK HOUR TRAFFIC

FIGURE 7

Appendix 4 Traffic Operations Analysis

| General & Site Information | |
|----------------------------|------------------------------|
| Analyst: | Pete Jenior |
| Agency/Company: | Kittelson & Associates, Inc. |
| Date: | 2/15/2011 |
| Project Name or PI#: | 10956.4 - I-75 @ GA 52 |
| Year, Peak Hour: | 2019 AM Peak (Base Design) |
| County/District: | Whitfield County |
| Intersection: | Southbound Ramp Terminals |



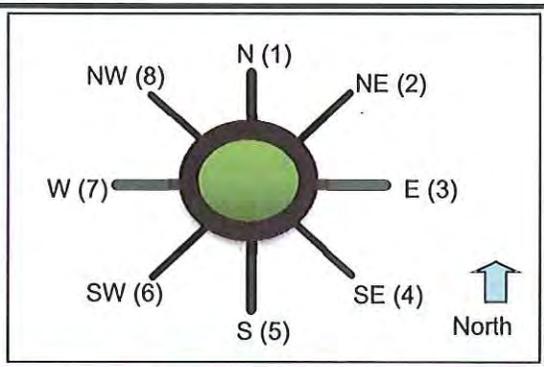
| Volumes | | Entry Legs (FROM) | | | | | | | |
|-----------------------|-------------------|-------------------|--------|---------|---------|--------|--------|---------|---------|
| | | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
| | N (1), vph | | | | | | | | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | | | 431 | 410 | | | | |
| (TO) | SE (4), vph | | | | | 203 | | | |
| | S (5), vph | | | | | | | | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | | | | 20 | 33 | | | |
| | NW (8), vph | | | | | | 349 | | |
| | Entry Volume, vph | 0 | 0 | 431 | 430 | 236 | 349 | 0 | 0 |
| | | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
| | N (1), vph | | | | | | | | |
| | NE (2), vph | | | | | | | | |
| | E (3), vph | | | | | 58 | 100 | 83 | 40 |
| | SE (4), vph | | | | | | | | 44 |
| | S (5), vph | | | | | | | | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | | | | | | | | |
| | NW (8), vph | | | | | 43 | | | |
| | Entry Volume, vph | 0 | 0 | 0 | 0 | 101 | 100 | 83 | 84 |
| Critical Lane Volumes | | N | NE | E | SE | S | SW | W | NW |
| | N (1), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NE (2), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), vph | 0 | 431 | 0 | 0 | 0 | 0 | 58 | 40 |
| | SE (4), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 |
| | S (5), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NW (8), vph | 0 | 0 | 349 | 0 | 0 | 0 | 43 | 0 |
| | Entry Volume, vph | 0 | 431 | 349 | 0 | 0 | 0 | 101 | 84 |

| Volume Characteristics | | N | NE | E | SE | S | SW | W | NW |
|--------------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| % Cars | | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% |
| % S.U./ Bus | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Trucks/ Combin. | | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| % Bicycles | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| PHF | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| F _{HV} | | 1.000 | 0.980 | 0.980 | 1.000 | 1.000 | 1.000 | 0.980 | 0.980 |
| Entry/Conflicting Flows | | | | | | | | | |
| | | N | NE | E | SE | S | SW | W | NW |
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 0 | 932 | 0 | 0 | 0 | 0 | 175 | 136 |
| | SE (4), pcu/h | 0 | 0 | 225 | 0 | 0 | 0 | 0 | 49 |
| | S (5), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 0 | 22 | 37 | 0 | 0 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 387 | 0 | 0 | 0 | 48 | 0 |
| | Conflicting flow, pcu/h | 0 | 696 | 48 | 0 | 0 | 0 | 1343 | 1216 |
| Number of Conflicting Lanes | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

| Results: Approach Measures of Effectiveness | | | | | | | | |
|--|----|------|------|----|----|----|------|------|
| NCHRP-572 Model | N | NE | E | SE | S | SW | W | NW |
| Crit. Entry Capacity pcu/h | NA | 694 | 1077 | NA | NA | NA | 441 | 482 |
| Crit. Lane Entry Flow pcu/h | 0 | 478 | 387 | 0 | 0 | 0 | 112 | 93 |
| V/C ratio | | 0.69 | 0.36 | | | | 0.25 | 0.19 |
| Control Delay, sec/pcu | | 15.8 | 5.2 | | | | 10.9 | 9.2 |
| LOS | | C | A | | | | B | A |
| 95th % Queue (ft) | | 140 | 42 | | | | 25 | 18 |
| Notes: | | | | | | | | |
| Unit Legend: | | | | | | | | |
| vph = vehicles per hour | | | | | | | | |
| PHF = peak hour factor | | | | | | | | |
| F _{HV} = heavy vehicle factor | | | | | | | | |
| pcu = passenger car unit | | | | | | | | |

Bypass Lane Merge Point Analysis (if applicable)
Not applicable - all bypass lanes have dedicated receiving lane

| General & Site Information | |
|----------------------------|------------------------------|
| Analyst: | Pete Jenior |
| Agency/Company: | Kittelson & Associates, Inc. |
| Date: | 2/15/2011 |
| Project Name or PI#: | 10956.4 - I-75 @ GA 52 |
| Year, Peak Hour: | 2019 PM Peak (Base Design) |
| County/District: | Whitfield County |
| Intersection: | Southbound Ramp Terminals |



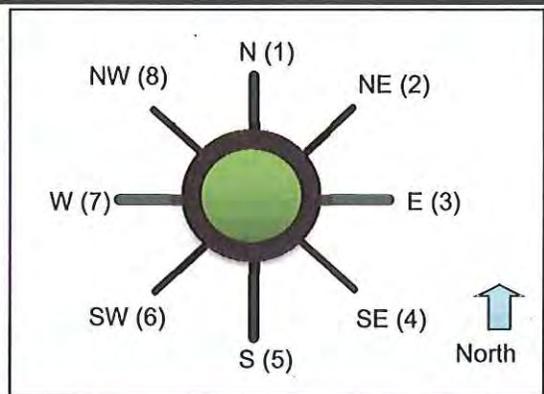
| Volumes | | Entry Legs (FROM) | | | | | | | |
|-----------------------|-------------------|-------------------|--------|---------|---------|--------|--------|---------|---------|
| | | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
| Exit | N (1), vph | | | | | | | | |
| Legs | NE (2), vph | | | | | | | | |
| (TO) | E (3), vph | | | 213 | 182 | | | | |
| | SE (4), vph | | | | | 290 | | | |
| | S (5), vph | | | | | | | | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | | | | 31 | 143 | | | |
| | NW (8), vph | | | | | | 448 | | |
| | Entry Volume, vph | 0 | 0 | 213 | 213 | 433 | 448 | 0 | 0 |
| | | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
| | N (1), vph | | | | | | | | |
| | NE (2), vph | | | | | | | | |
| | E (3), vph | | | | | 52 | 81 | 125 | 90 |
| | SE (4), vph | | | | | | | | 36 |
| | S (5), vph | | | | | | | | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | | | | | | | | |
| | NW (8), vph | | | | | 29 | | | |
| | Entry Volume, vph | 0 | 0 | 0 | 0 | 81 | 81 | 125 | 126 |
| Critical Lane Volumes | | N | NE | E | SE | S | SW | W | NW |
| | N (1), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NE (2), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), vph | 0 | 213 | 0 | 0 | 0 | 0 | 52 | 90 |
| | SE (4), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 |
| | S (5), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | NW (8), vph | 0 | 0 | 448 | 0 | 0 | 0 | 29 | 0 |
| | Entry Volume, vph | 0 | 213 | 448 | 0 | 0 | 0 | 81 | 126 |

| Volume Characteristics | | N | NE | E | SE | S | SW | W | NW |
|-----------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| % Cars | | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% |
| % S.U./ Bus | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Trucks/ Combin. | | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| % Bicycles | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| PHF | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| F _{hv} | | 1.000 | 0.980 | 0.980 | 1.000 | 1.000 | 1.000 | 0.980 | 0.980 |
| Entry/Conflicting Flows | | N | NE | E | SE | S | SW | W | NW |
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 0 | 438 | 0 | 0 | 0 | 0 | 147 | 238 |
| | SE (4), pcu/h | 0 | 0 | 322 | 0 | 0 | 0 | 0 | 40 |
| | S (5), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 0 | 34 | 159 | 0 | 0 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 497 | 0 | 0 | 0 | 32 | 0 |
| | Conflicting flow, pcu/h | 0 | 1009 | 32 | 0 | 0 | 0 | 1038 | 952 |
| Number of Conflicting Lanes | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

| Results: Approach Measures of Effectiveness | | | | | | | | |
|---|----|------|------|----|----|----|------|------|
| NGHRP-572 Model | N | NE | E | SE | S | SW | W | NW |
| Crit. Entry Capacity pcu/h | NA | 558 | 1094 | NA | NA | NA | 547 | 580 |
| Crit. Lane Entry Flow pcu/h | 0 | 236 | 497 | 0 | 0 | 0 | 90 | 140 |
| V/C ratio | | 0.42 | 0.45 | | | | 0.16 | 0.24 |
| Control Delay, sec/pcu | | 11.1 | 6.0 | | | | 7.9 | 8.2 |
| LOS | | B | A | | | | A | A |
| 95th % Queue (ft) | | 53 | 62 | | | | 15 | 24 |
| Notes: | | | | | | | | |
| <u>Unit Legend:</u> | | | | | | | | |
| vph = vehicles per hour | | | | | | | | |
| PHF = peak hour factor | | | | | | | | |
| F _{HV} = heavy vehicle factor | | | | | | | | |
| pcu = passenger car unit | | | | | | | | |

Bypass Lane Merge Point Analysis (if applicable)
Not applicable - all bypass lanes have dedicated receiving lane

| General & Site Information | |
|----------------------------|--|
| Analyst: | Pete Jenior |
| Agency/Company: | Kittelson & Associates, Inc. |
| Date: | 2/15/2011 |
| Project Name or PI#: | 10956.4 - I-75 @ GA 52 |
| Year, Peak Hour: | 2019 AM Peak (Base Design) with KAI modifications |
| County/District: | Whitfield County |
| Intersection: | Southbound Ramp Terminals |



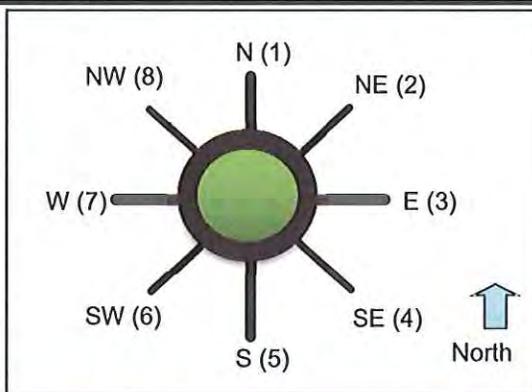
| Volumes | | Entry Legs (FROM) | | | | | | | |
|-----------------------|--|-------------------|--------|---------|---------|--------|--------|---------|---------|
| | | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
| N (1), vph | | | | | | | | | |
| Exit NE (2), vph | | | | | | | | | |
| Legs E (3), vph | | | 431 | 410 | | | | | |
| (TO) SE (4), vph | | | | | 203 | | | | |
| S (5), vph | | | | | | | | | |
| SW (6), vph | | | | | | | | | |
| W (7), vph | | | | 20 | 33 | | | | |
| NW (8), vph | | | | | | 349 | | | |
| Entry Volume, vph | | 0 | 0 | 431 | 430 | 236 | 349 | 0 | 0 |
| | | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
| N (1), vph | | | | | | | | | |
| NE (2), vph | | | | | | | | | |
| E (3), vph | | | | | | 79 | 79 | 90 | 33 |
| SE (4), vph | | | | | | | 44 | | 44 |
| S (5), vph | | | | | | | | | |
| SW (6), vph | | | | | | | | | |
| W (7), vph | | | | | | | | | 13 |
| NW (8), vph | | | | | | 43 | | | |
| Entry Volume, vph | | 0 | 0 | 0 | 0 | 122 | 123 | 90 | 90 |
| Critical Lane Volumes | | N | NE | E | SE | S | SW | W | NW |
| N (1), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NE (2), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), vph | | 0 | 431 | 0 | 0 | 0 | 0 | 79 | 90 |
| SE (4), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 0 |
| S (5), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW (6), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), vph | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW (8), vph | | 0 | 0 | 349 | 0 | 0 | 0 | 0 | 0 |
| Entry Volume, vph | | 0 | 431 | 349 | 0 | 0 | 0 | 123 | 90 |

| Volume Characteristics | | N | NE | E | SE | S | SW | W | NW |
|-----------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| % Cars | | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% |
| % S.U./ Bus | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Trucks/ Combin. | | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| % Bicycles | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| PHF | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| F _{HV} | | 1.000 | 0.980 | 0.980 | 1.000 | 1.000 | 1.000 | 0.980 | 0.980 |
| Entry/Conflicting Flows | | N | NE | E | SE | S | SW | W | NW |
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 0 | 932 | 0 | 0 | 0 | 0 | 175 | 136 |
| | SE (4), pcu/h | 0 | 0 | 225 | 0 | 0 | 0 | 49 | 49 |
| | S (5), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 0 | 22 | 37 | 0 | 0 | 0 | 0 | 14 |
| | NW (8), pcu/h | 0 | 0 | 387 | 0 | 0 | 0 | 48 | 0 |
| | Conflicting flow, pcu/h | 0 | 696 | 48 | 0 | 0 | 0 | 1343 | 1216 |
| Number of Conflicting Lanes | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

| Results: Approach Measures of Effectiveness | | | | | | | | |
|---|----|------|------|----|----|----|------|------|
| NCHRP-572 Model | N | NE | E | SE | S | SW | W | NW |
| Crit. Entry Capacity pcu/h | NA | 694 | 1077 | NA | NA | NA | 441 | 482 |
| Crit. Lane Entry Flow pcu/h | 0 | 478 | 387 | 0 | 0 | 0 | 136 | 100 |
| V/C ratio | | 0.69 | 0.36 | | | | 0.31 | 0.21 |
| Control Delay, sec/pcu | | 15.8 | 5.2 | | | | 11.8 | 9.4 |
| LOS | | C | A | | | | B | A |
| 95th % Queue (ft) | | 140 | 42 | | | | 33 | 20 |
| Notes: | | | | | | | | |
| Unit Legend: | | | | | | | | |
| vph = vehicles per hour | | | | | | | | |
| PHF = peak hour factor | | | | | | | | |
| F _{HV} = heavy vehicle factor | | | | | | | | |
| pcu = passenger car unit | | | | | | | | |

Bypass Lane Merge Point Analysis (if applicable)
Not applicable - all bypass lanes have dedicated receiving lane

| General & Site Information | |
|----------------------------|--|
| Analyst: | Pete Jenior |
| Agency/Company: | Kittelson & Associates, Inc. |
| Date: | 2/15/2011 |
| Project Name or PI#: | 10956.4 - I-75 @ GA 52 |
| | 2019 PM Peak (Base Design) with KAI Modifications |
| Year, Peak Hour: | |
| County/District: | Whitfield County |
| Intersection: | Southbound Ramp Terminals |



| Volumes | | Entry Legs (FROM) | | | | | | | |
|-------------------|--|---|--------|---------|---------|--------|--------|---------|---------|
| | | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
| N (1), vph | | | | | | | | | |
| Exit NE (2), vph | | | | | | | | | |
| Legs E (3), vph | | | 213 | 182 | | | | | |
| (TO) SE (4), vph | | | | | 290 | | | | |
| S (5), vph | | | | | | | | | |
| SW (6), vph | | | | | | | | | |
| W (7), vph | | | | 31 | 143 | | | | |
| NW (8), vph | | | | | | 448 | | | |
| Entry Volume, vph | | 0 | 0 | 213 | 213 | 433 | 448 | 0 | 0 |
| | | S1 (5) S2 (5) SW1 (6) SW2 (6) W1 (7) W2 (7) NW1 (8) NW2 (8) | | | | | | | |
| N (1), vph | | | | | | | | | |
| NE (2), vph | | | | | | | | | |
| E (3), vph | | | | | 64 | 69 | 143 | 72 | |
| SE (4), vph | | | | | | 23 | | 36 | |
| S (5), vph | | | | | | | | | |
| SW (6), vph | | | | | | | | | |
| W (7), vph | | | | | | | | | 35 |
| NW (8), vph | | | | | | 29 | | | |
| Entry Volume, vph | | 0 | 0 | 0 | 0 | 93 | 92 | 143 | 143 |

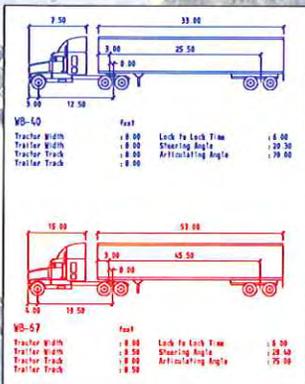
| Critical Lane Volumes | N | NE | E | SE | S | SW | W | NW |
|-----------------------|---|-----|-----|----|---|----|----|-----|
| N (1), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NE (2), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), vph | 0 | 213 | 0 | 0 | 0 | 0 | 64 | 143 |
| SE (4), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SW (6), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), vph | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NW (8), vph | 0 | 0 | 448 | 0 | 0 | 0 | 29 | 0 |
| Entry Volume, vph | 0 | 213 | 448 | 0 | 0 | 0 | 93 | 143 |

| Volume Characteristics | | N | NE | E | SE | S | SW | W | NW |
|-----------------------------|-------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| % Cars | | 98% | 98% | 98% | 98% | 98% | 98% | 98% | 98% |
| % S.U./ Bus | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Trucks/ Combin. | | 2% | 2% | 2% | 2% | 2% | 2% | 2% | 2% |
| % Bicycles | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| PHF | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| F _{hv} | | 1.000 | 0.980 | 0.980 | 1.000 | 1.000 | 1.000 | 0.980 | 0.980 |
| Entry/Conflicting Flows | | N | NE | E | SE | S | SW | W | NW |
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 0 | 438 | 0 | 0 | 0 | 0 | 147 | 238 |
| | SE (4), pcu/h | 0 | 0 | 322 | 0 | 0 | 0 | 26 | 40 |
| | S (5), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 0 | 34 | 159 | 0 | 0 | 0 | 0 | 39 |
| | NW (8), pcu/h | 0 | 0 | 497 | 0 | 0 | 0 | 32 | 0 |
| | Conflicting flow, pcu/h | 0 | 1009 | 32 | 0 | 0 | 0 | 1038 | 952 |
| Number of Conflicting Lanes | | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |

| Results: Approach Measures of Effectiveness | | | | | | | | | |
|--|-------|----|------|------|----|----|----|------|------|
| NCHRP-572 Model | | N | NE | E | SE | S | SW | W | NW |
| Crit. Entry Capacity | pcu/h | NA | 558 | 1094 | NA | NA | NA | 547 | 580 |
| Crit. Lane Entry Flow | pcu/h | 0 | 236 | 497 | 0 | 0 | 0 | 103 | 159 |
| V/C ratio | | | 0.42 | 0.45 | | | | 0.19 | 0.27 |
| Control Delay, sec/pcu | | | 11.1 | 6.0 | | | | 8.1 | 8.5 |
| LOS | | | B | A | | | | A | A |
| 95th % Queue (ft) | | | 53 | 62 | | | | 18 | 28 |
| Notes: | | | | | | | | | |
| Unit Legend: | | | | | | | | | |
| vph = vehicles per hour | | | | | | | | | |
| PHF = peak hour factor | | | | | | | | | |
| F _{HV} = heavy vehicle factor | | | | | | | | | |
| pcu = passenger car unit | | | | | | | | | |

Bypass Lane Merge Point Analysis (if applicable)
Not applicable - all bypass lanes have dedicated receiving lane

Appendix 5 ACP Truck Turning Templates



AUTOTURN VEHICLE TURNING SIMULATIONS
I-75 @ SR-52 (DUG GAP MOUNTAIN ROAD / COLLEGE DRIVE / W. BRIDGE ROAD)
P.I. # 0009891 / WHITFIELD COUNTY, GEORGIA





Review Comments

PROJECT: I-75 Southbound Off-Ramp @ SR 52 (Whitfield County) PROJECT NO.: 507GA001.006 PROJECT ID: 0009891
 COMMENTS BY: Kittelson & Associates, Inc. RESPONSE BY: Allen Peterfreund DATE: 02/14/2011
 DOCUMENT: Concept Layout CHECKED BY: Brian Mirson SUBMITTAL: Peer Review Page 1 of 6

| NO. | PAGE | COMMENT | RESPONSE |
|-----|------|---|---|
| 1 | 2 | Consider removing the right-turn bypass from SR 52 eastbound to the I-75 on-ramp. This is a very low-volume movement (highest projected hourly volume is 44 vehicles) and can adequately be served by the approach without a bypass lane. The bypass lane as currently designed presents a number of challenges. | This lane was included to provide a dedicated lane for SR 52 eastbound traffic and SR 52 westbound traffic, similar to the existing configuration. Additionally, the bypass lane pulled the SR 52 eastbound to I-75 southbound traffic out of the roundabout. Based on the new traffic counts and the revised design year projections (changed from 2019 to 2032), the highest projected hourly volume is 103 vehicles. Our analysis indicates that the proposed roundabout has adequate capacity to handle the additional traffic from SR 52 eastbound to the I-75 on-ramp. Based on the peer review recommendation and realizing the concerns related to entry speeds, pedestrian safety and functionality, the by-pass lane at this location will be eliminated. |
| 2 | 2 | Consider removing the southbound right turn bypass/lane from College Drive to SR 52 westbound. The bypass/lane is not needed for capacity and is not a continuation of a basic lane on College Drive. Its inclusion creates additional conflict points, a wider pedestrian crossing, and complex signing and striping needs. | This lane was included to provide a dedicated lane for College Drive southbound traffic to SR 52 westbound, similar to the existing configuration. Additionally, the bypass lane pulled the SR 52 eastbound to I-75 southbound traffic out of the roundabout. Based on the new traffic counts and the revised design year projections (changed from 2019 to 2032), the highest projected hourly volume is 47 vehicles. Our analysis indicates that the proposed roundabout has adequate capacity to handle the additional traffic from College Drive southbound traffic to SR 52 westbound. Based on the peer review recommendation and realizing the concerns related to conflict points, pedestrian safety and signing, the by-pass lane at this location will be eliminated. |
| 3 | 3 | KAI performed a check of fastest path speeds for base design; these checks are shown in Figures 1 and 2. Both the southbound and eastbound entries are estimated to allow entering vehicle speeds in excess of 30 mph when vehicles ignore lane markings on the roundabout approach. Speed control at entry is one of the key design objectives to provide for safe roundabout operations. Refinements to the entry geometry should be considered to further limit potential fastest path speeds. | Removing the slip ramps for SR 52 eastbound traffic to the I-75 southbound on-ramps and for College Drive southbound traffic to SR 52 westbound reduces the entering speeds for these movements. Further refinements to the roundabout approaches provide entry speeds of 25 mph for SR 52 eastbound traffic and 25 mph for College Drive southbound traffic. Entry speeds are based on vehicles ignoring lane markings on the roundabout approach. |
| 4 | 4 | For the southbound and eastbound entries, the current design uses bypass lanes with no raised channelization to separate the bypass from the adjacent entry lanes. These are key contributors to the lack of speed control in the current design. Removal of these lanes, as previously discussed, will help to improve speed control | The bypass lanes for these two approaches have been eliminated and the geometry of the entry approaches have been refined to reduce the entry speeds for SR 52 eastbound traffic and College Drive southbound traffic as discussed above. |



Review Comments

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 COMMENTS BY: Kittelson & Associates, Inc. RESPONSE BY: Allen Peterfreund DATE: 02/14/2011
 DOCUMENT: Concept Layout CHECKED BY: Brian Mirson SUBMITTAL: Peer Review Page 2 of 6

| NO. | PAGE | COMMENT | RESPONSE |
|-----|------|---|---|
| 5 | 4 | <p>of the entries. However, removal of the bypass lanes alone may not be sufficient to fully meet speed control objectives on these approaches.</p> <p>KAI reviewed a truck turning template for the base design that was prepared by ACP and dated January 12, 2011. ACP used a WB-40 as the design vehicle for the right turn from College Drive to SR 52 westbound and for turns in and out of Bridge Road; ACP used a WB-67 for all other movements. Our review assumes that these design vehicles have been previously confirmed with GDOT as the appropriate vehicles for this location. However, we note that it is uncommon for WB-40 vehicles to be used as a design vehicle at roundabouts; WB-50 vehicles are more commonly used in cases where a larger WB-67 is not specified.</p> | <p>WB-40 vehicles were used for the College Drive southbound to SR 52 westbound movement based on the requirements outlined in the GDOT Design Policy Manual Table 3.1 and article 8.3.2. With the exception of the College Drive southbound to SR 52 westbound movement, all of the movements within the roundabout are either coming from or going to a state route or interchange ramp and therefore designed for the WB-67 truck. Since College Drive and SR 52 (west of the roundabout) are not state routes and based on low anticipated truck traffic from College Drive southbound to SR 52 westbound the WB-50 truck was used for the design of this turning movement.</p> |
| 6 | 4 | <p>The templates indicate that WB-67s are able to enter, circulate, and exit the roundabout without running over curbs. However, in many locations, they must travel several feet into an adjacent lane to do so. Consideration should be given to providing sufficient space for a passenger car to travel adjacent to a WB-67 through the roundabout. As an example, for the southbound left-turn and the eastbound through movements, a WB-67 truck traveling in the outside lane appears to off-track into the inside circulating lane a sufficient distance that a passenger car would not have sufficient width to travel adjacent to the truck. In addition, the truck paths should not overlap the entrance lines (see the eastbound entry as an example).</p> | <p>Based on the design vehicle WB-67 substantial turning movement swept paths, consideration has been given to providing side-by-side or staggered simultaneous circulation. A CAD-based computer program (AutoTURN) was utilized to determine the vehicle's swept path through the critical turning movements. The entry widths have been increased to provide adequate lane width to reduce overlapping entrance lines.</p> |
| 7 | 5 | <p>The APC designs exhibit potential for path overlap on some entries. Path overlap on the east leg is illustrated in Figure 5. On entries with path overlap, adjustments to improve the alignment of entering vehicles need to be balanced with the concurrent need to maintain low entry speeds.</p> | <p>The College Drive, SR 52 eastbound, and SR 52 westbound legs have been redesigned to provide greater deflection and vehicular alignment at the entries to the roundabout. The SR 52 (EB/WB) utilizes successive approach curves. College Drive alignment has been shifted to the east providing a more direct approach to the center of the roundabout. Furthermore, the modifications to the entry curves have reduced the entry speeds at each leg.</p> |
| 8 | 5 | <p>Consider providing a buffer between the sidewalk and circulatory roadway, as shown in Exhibits 6-63 and 6-65 of NCHRP Report 672.</p> | <p>Per the GDOT Design Policy Manual, a 2' minimum buffer will be provided for all new sidewalks.</p> |



Review Comments

PROJECT: I-75 Southbound Off-Ramp @ SR 52 (Whitfield County) PROJECT NO.: 507GA001.006 PROJECT ID: 0009891
 COMMENTS BY: Kittelson & Associates, Inc. RESPONSE BY: Allen Peterfreund DATE: 02/14/2011
 DOCUMENT: Concept Layout CHECKED BY: Brian Mirson SUBMITTAL: Peer Review Page 3 of 6

| <u>NO.</u> | <u>PAGE</u> | <u>COMMENT</u> | <u>RESPONSE</u> |
|------------|-------------|---|--|
| 9 | 5 | The right turn arrow suggests that a turn can be made to College Drive from the southbound I-75 off ramp, which is not the case. A diagonal arrow may be more effective here. | Added the appropriate combination "through-left" directional arrow for this lane designation. |
| 10 | 5 | The lane use arrows identified on the circulatory roadway, upstream of the I-75 off-ramp entry, should be removed. The two through arrows here have different meanings and are intended to direct drivers to different approaches. The arrow in the right lane is inconsistent with the upstream right-turn arrow, but if a right-turn arrow were used here it would appear to direct drivers onto the off-ramp. | This comment pertains to the base design, Kittelson and American recommend to proceed forward with the alternative design therefore this has not been revised. |
| 11 | 5 | Within the circulatory roadway in front of the southbound entry, one of the circulatory lanes drops as an exit onto College Drive. To reinforce lane assignment (drivers in the right lane must exit to College Drive), align the lane line stripe with the exit. The lane stripe currently curves toward the west, which may mislead some drivers into thinking that they can continue to circulate in the outside lane. | This comment pertains to the base design, Kittelson and American recommend to proceed forward with the alternative design therefore this has not been revised. |
| 12 | 5 | Within the circulatory roadway near the I-75 off-ramp entry, spiral markings and hatching is used to direct vehicles into the appropriate lanes. An extended truck apron may be more effective than hatching here, considering all of the movements occurring in this part of the roundabout. | The truck apron has been extended to the limits of the hatching as noted. |
| 13 | 5 | At the eastbound exit, the solid lane line should be extended to the crosswalk. This is intended to reinforce to drivers that the outside lane must exit. | The solid lane line will be extended to the crosswalk for the eastbound exit. |
| 14 | 5 | A minor modification is needed to the channelization within the circulatory roadway in front of the westbound SR 52 entry. The single-lane portion of the circulatory roadway should more clearly direct vehicles only to the outer lane downstream. As currently shown, drivers may incorrectly believe that both lanes exit to College Drive, which may cause sudden lane changing. | The SR 52 westbound entry has been redesigned by using successive curves. This configuration creates more deflection and clearly directs the vehicles at the roundabout entry to the appropriate lane assignments. |
| 15 | 6 | Each of the roundabout approaches exhibits some potential for entry path overlap. The alignment of the entries into the circulatory roadway could be improved with the use of a tangent or larger radius curve between the controlling entry curve and | The College Drive, SR 52 eastbound, and SR 52 westbound legs have been redesigned to provide greater deflection and vehicular alignment at the entries to the roundabout. The SR 52 (EB/WB) utilizes successive approach |



Review Comments

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 COMMENTS BY: Kittelson & Associates, Inc. RESPONSE BY: Allen Peterfreund DATE: 02/14/2011
 DOCUMENT: Concept Layout CHECKED BY: Brian Mirson SUBMITTAL: Peer Review

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| 16 | 6 | <p>the inscribed circle. This would help to better align vehicles at entry to maintain their correct lane as they enter the circulatory roadway.</p> <p>For the right-turn bypass lane between the southbound I-75 off-ramp and College Drive, the hatching is unnecessary and could become a maintenance issue when trucks off-track and other vehicles drive over it.</p> | <p>curves. College Drive alignment has been shifted to the east providing a more direct approach to the center of the roundabout. Furthermore, the modifications to the entry curves have reduced the entry speeds at each leg.</p> <p>The additional pavement within the limits of the hatching is required for the WB-67 trucks. The hatching used to restrict small vehicles to a more defined lane.</p> |
| 17 | 6 | <p>At the southbound I-75 off-ramp entry, it appears that the distance between the crosswalk and the edge of the circulatory roadway is less than one vehicle length. Crosswalks should be located one vehicle length back from the circulatory roadway to separate decision points for drivers and to allow pedestrians to cross the approach behind a vehicle stopped at the yield line.</p> | <p>The cross walk at this location will be shifted on vehicle length from the edge of the circulatory roadway.</p> |
| 18 | 6 | <p>The crosswalk across College Drive should be moved to a one-car length (approximately 20-foot) setback from the circulatory roadway. This will reduce the likelihood of queued vehicles stopping on the crosswalk, and lower vehicle speeds on the exit. Also, if the pedestrian crossing of College Drive was incorporated into the right-turn bypass island (for southbound I-75 to College Drive), then the crosswalk will significantly shorten the path for pedestrians walking along SR 52 and prevent them from having to cross the right-turn bypass lane twice.</p> | <p>The cross walk at this location will be shifted on vehicle length from the edge of the circulatory roadway.</p> |
| 19 | 6 | <p>The hatching separating the southbound College Drive entry lanes from the right-turn bypass lane offers no speed control because it can be easily driven across. For reasons noted previously, it is recommended that the right turn lane be removed. If the designers choose to keep the right turn lane, a raised island should be used to separate the right-turn bypass.</p> | <p>The dedicated right-turn bypass lane will be removed as discussed above.</p> |
| 20 | 6 | <p>On the eastbound approach the right-turn bypass lane reduces the potential speed control, allowing fastest path entry speeds well above the 30 mph maximum recommended value for a double-lane roundabout.</p> | <p>The dedicated right-turn bypass lane will be removed as discussed above.</p> |
| 21 | 6 | <p>The provision of a two-lane exit onto I-75 southbound has the potential to confuse drivers within the circulatory roadway to think that they can exit from either lane (when only the outside lane is allowed to exit here). The lack of raised channelization</p> | <p>The dedicated right-turn bypass lane will be removed as discussed above therefore the two-lane exit ramp will be reduced to a single lane exit ramp. The revised traffic analysis supports this change.</p> |



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| | | separating the eastbound right-turn bypass contributes to this issue. The right-turn lane should be eliminated (and the exit reduced to a single lane) or physically separated with a treatment such as a raised island. | |
| 22 | 7 | [not shown in figure] Typical Section 6 is labeled as I-95 SB on-ramp and should be changed to I-75 SB on-ramp. | Noted and will be updated. |
| 23 | 7 | [not shown in figure] Consideration should be given to modifying the splitter islands to offset the approach nose to improve vehicle channelization. NCHRP Report 672, Roundabouts: An Information Guide – 2nd Edition provides additional detail. | Splitter islands will be modified accordingly. |
| 24 | 7 | [not shown in figure] Consider modifying the curb ramps for the pedestrian crossings to eliminate the "wings" on the side of the ramps where the sidewalk is set back from the roadway by a landscape buffer. NCHRP Report 672, Roundabouts: An Information Guide – 2nd Edition provides additional detail in Section 6.8.1. | Curb ramps will be modified accordingly. |
| 25 | 7 | [not shown in figure] Within the splitter island on the east and west legs of the intersection, consider modifying the pedestrian refuge area to be at the same grade as the roadway (cut through) instead of ramped. This type of design is less cumbersome for wheelchair users. | Splitter island pedestrian refuge area will be modified accordingly. |
| 26 | 7 | The overhead lane-use signs have a high number of word elements that may be difficult for drivers to quickly comprehend. Instead of the "Left Lane", "Center Lane", etc. text, upward arrows could be used. Upward arrows are included in the "Guide Signs – Freeways and Expressways" chapter of the 2009 MUTCD. They are intended for major diverges on freeways but could be useful here as well. The arrows could be shown diagonally if necessary. | The overhead guide signs shall be revised to use "Down" arrows over the correct lanes. This will reduce the word elements and provide for quicker comprehension to motorists approaching the roundabout. |
| 27 | 7 | For the signs on the southbound and eastbound approaches in advance of the right-turn lanes, right-turn arrows may be more effective than diagonal arrows on these signs to avoid confusing the right-turn movement with the overall diagonal entry into the roundabout. | Agreed. "Right" turn arrows shall be utilized for these sign panels. |
| 28 | 7 | In front of the splitter island adjacent to the College Drive approach, consider | The dotted line has been revised to a solid lane line as noted. |



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| | | changing the dotted line to a solid line where no lane changes are needed and no vehicles will be entering the roundabout. | |
| 29 | 7 | Add another set of pavement marking lane-use arrows within the circulatory roadway adjacent to the College Drive splitter island. | Will add an additional set of pavement markings adjacent to College Drive splitter island. |
| 30 | 8 | For the lane-use arrows provided downstream of the westbound SR 52 entry, the right turn arrow should be removed to avoid directing drivers onto the I-75 off-ramp. | Will remove right turn arrow at this location. |

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 Commissioner of Whitfield County supports the consideration of a roundabout at the location specified below.

State/County Route Numbers: **State Route 401 (I-75) at State Route 52 Southbound Ramp/College Street**

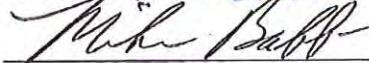
Associated Conditions

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 11th day of October, 2010

By: 

Title: Chairman

Attest:


Clerk