Georgia Department of Transportation

Interoffice Memo
Office of Design Policy & Support

DATE: **9/25/2023**

FILE: P.I.# 0017982
Cherokee County / GDOT District 6 - Cartersville
SR 140 @ SR 5 CONN - Intersection Improvements

FROM: Dave Peters for R. Christopher Rudd, PE, State Design Policy Engineer

TO: SEE DISTRIBUTION

SUBJECT: **APPROVED CONCEPT REPORT**

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

Attachment

Distribution:
Hiral Patel, Director of Engineering
Albert Shelby, Director of Program Delivery
Clement Solomon, Director, Division of Intermodal
Darryl VanMeter, Assistant Director of P3/State Innovative Delivery Administrator
Matthew Markham, Deputy Director of Planning
Kim Nesbitt, Program Delivery Administrator
Derrick Brown, for State Program Control Administrator
Eric Duff, State Environmental Administrator
Donn Digamon, State Bridge Engineer
Alan Davis, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Erik Rohde, State Project Review Engineer
Patrick Allen, State Materials Engineer
Nick Fields, State Utilities Administrator
Eric Conklin, State Transportation Data Administrator
Attn: Systems & Classification Branch
Lee Howell, Statewide Location Bureau Chief
Grant Waldrop, District 6 District Engineer
David Acree, District 6 Preconstruction Engineer
Jennifer Deems, District 6 Utilities Manager
Keith Posey, Project Manager

Limited Scope Project Concept Report

Template version: 2021.12.22

Project Type:	Intersection Improvement	P.I. Number:	0017982
GDOT District:	6	County:	Cherokee
Federal Route Number:	N/A	State Route Number:	140, SR 5 Conn
Project Number:	N/A		

** Report updated 8-30-2023 and 9-12-2023 address review comments

Improvement of Intersection of SR 140/Waleska Road @ SR 5 Conn/Reinhardt College Parkway by replacing a signaled T-intersection with a multi-lane Roundabout

Submitted for approval:

Paul Murphy — 7-13-2023

Paul Murphy, P.E., Michael Baker International — Date

Bethany Watson — 7/13/23

Bethany Watson, PE, AICP, City of Canton City Engineer — Date

Kimberly W. Nesbitt — 7-19-23

State Program Delivery Administrator — Date

Keith Posey C.O.R — 7/14/2023

GDOT Project Manager — Date

* Recommendations on file - KLP

Recommendation for approval:

* Eric Duff — 7-25-2023

State Environmental Administrator — Date

* Oladimeji Onabanjo — 8-8-2023

State Traffic Engineer — Date

* Grant Waldrop — 8-2-2023

District Engineer — Date

☒ MPO Area: This project is consistent with the MPO adopted Regional Transportation Plan (RTP)/Long Range Transportation Plan (LRTP).

☐ Rural Area: This project is consistent with the goals outlined in the Statewide Transportation Plan (SWTP) and/or is included in the State Transportation Improvement Program (STIP).

* Matt Markham — 8-15-2023

for Division of Planning — Date

Approval:

Concur: Hiral Patel — 9/19/2023

GDOT Director of Engineering — Date

Approve: Meg Pirkle — Digitally signed by Andrew Heath DN: C=US, E=aheath@dot.ga.gov, O=Georgia DOT, OU=Chief Engineer Office, CN=Andrew Heath Date: 2023.09.25 14:31:44-04'00' — 9/25/2023

GDOT Chief Engineer — Date

* Albert Shelby, Director of Program Delivery, recommended for approval on 7-25-2023
* Alan Hood, Air Safety Data Program Manager, recommended for approval on 8-9-2023
* Joshua Taylor, State Project Review Engineer, recommended for approval on 9-6-2023
* Marcela Coll, State Utilities Pre-Construction Manager, recommended for approval on 8-7-2023

PROJECT LOCATION MAP

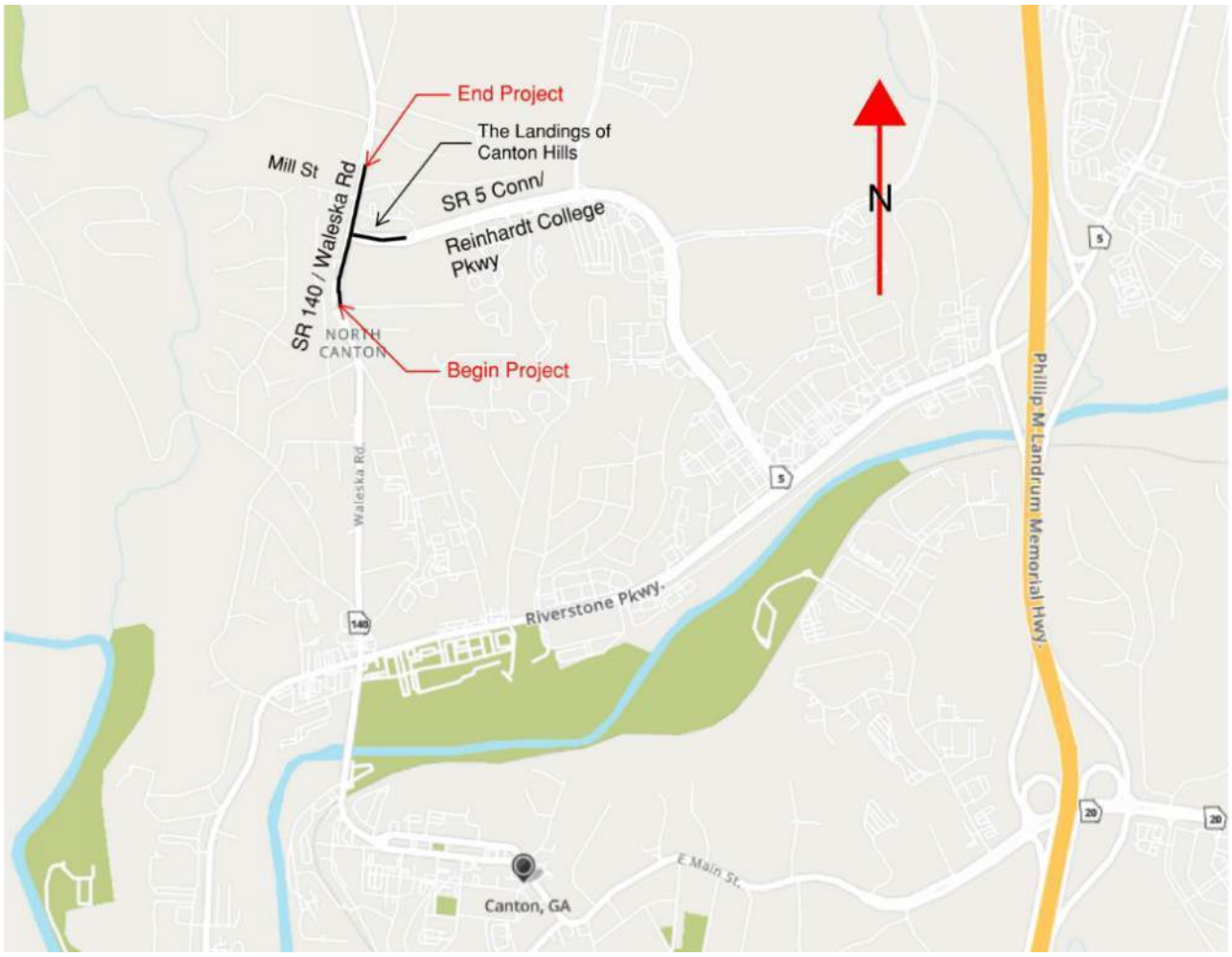


Image source: MapQuest

PROJECT LOCATION MAP
SR 140 @ SR 5 Conn
PI 0017982
Intersection Improvement, Cherokee County

PLANNING & BACKGROUND DATA

Prepared By: City of Canton/Michael Baker International **Date Completed:** *7/13/2023*
Project Justification Statement: The intersection of SR 140 (Waleska Road) and SR 5 Conn (Reinhardt College Parkway) experiences traffic congestion. The current overall intersection LOS is C in the PM, however queueing and traffic at this intersection exceeds storage space and backs up over 500 feet. Adding to the congestion is traffic from westbound SR 5 Conn heading northbound and a side road with a gas station that currently has no left turn lane for it so any left turning vehicles back up the northbound traffic.

SR 140 from Marietta Highway north to the city limits was identified in the 2019 SR 140 Corridor Planning Study (initiated by Cherokee County) as requiring operational improvements and including multimodal facilities.

Existing conditions: Existing SR 140 consists of two 11-foot travel lanes, one in each direction with a 9-foot flush median. There are 11-foot right turn and left turn lanes at the intersection of SR 140 and Reinhardt College Parkway, an 11-foot right turn lane entering The Landings of Canton Hills (right-in right-out island), and an 11-foot right turn lane at the Mill Street Intersection. There are short stretches of sidewalk at the entrances to both Mill Street (4-feet wide) and The Landings of Canton Hills (6-feet wide). The intersection of SR 140 and Reinhardt College Parkway is signalized. The overhead utilities are located on the east side of the corridor. The existing posted speed limit is 45 mph for both SR 140 (Waleska Road) and SR 5 Conn (Reinhardt College Parkway).

Other projects in the area:
PI 0017789 SR140 @ SR 5 BU – This project is an intersection improvement project approximately 0.9 miles to the south of the subject project. It is not expected to have a traffic or other impact on this project.

MPO: *Atlanta TMA* **TIP #:** CH-140A
Congressional District(s): *11*

Federal Oversight: ☐ **PoDI** ☒ **Exempt** ☐ **State Funded** ☐ **Other**

Projected Traffic:
SR 140:
24 HR T: 3.5 % Current Year (2022): 21,700
Open Year (2028): 24,400 Design Year (2048): 36,300
SR 5 Conn:
24 HR T: 3.0 % Current Year (2022): 11,700
Open Year (2028): 13,150 Design Year (2048): 19,550
Traffic data source: Field Counts and TADA data.
Traffic Projections Performed by: Michael Baker International
Date approved by the GDOT Office of Planning: *12/9/2022*

AASHTO Functional Classification (Mainline): Minor Arterial
AASHTO Context Classification (Mainline): Suburban
AASHTO Project Type (Mainline): Construction on existing roads
Is the project located on a NHS roadway? ☒ No ☐ Yes

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

Pedestrian Warrant #1: There are pedestrian travel generators (commercial areas) within the project limits. The proposed typical section includes a 5-foot sidewalk on both sides of the roundabout.

Bicycle Guideline Warrant #1: Future location of Cherokee High School is located within three miles of the project location. Bicycle accommodations were not considered due to lack current bicycle connectivity and lack of existing bicycle volumes.

Transit Warrant: CATS website lists a route stop for River Ridge Apts & Heritage Apts

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

Pavement Evaluation and Recommendations

Initial Pavement Evaluation Summary Report Required? ☒ No ☐ Yes

Feasible Pavement Alternatives: ☒ HMA ☐ PCC ☐ HMA & PCC

Is the project located on a Special Roadway or Network? ☒ No ☐ Yes

Do the limits of the project include one or more signalized intersections? ☐ No ☒ Yes

Is Federal Aviation Administration coordination anticipated? ☒ No ☐ Yes

DESIGN AND STRUCTURAL

Description of the proposed project: The project is located within the city limits of Canton in Cherokee County, PI 0017982 proposes replacing the existing T-intersection with a multilane roundabout. Traffic is to remain on existing and/or temporary alignments during construction of the multilane roundabout. The proposed reconstruction will have two 11-foot through lanes at the intersection of SR 140 and Reinhardt College Parkway and 11-foot turn lanes the entrances to both Mill Street and The Landings of Canton Hills. The length of this project is approximately 0.4 mile.

Major Structures: N/A

Mainline Design Features:

SR 140	**Functional Classification:** *Minor Arterial*		
Feature	**Existing**	***Policy**	**Proposed**
Typical Section:			
- **Number of Through Lanes**	**2**		**2-4**
- **Lane Width(s) (-ft)**	**11**	**11-12**	**11**
- **Median Width (-ft) & Type**	**11-flush**	**N/A**	**0-27**
- **Shoulder Width (-ft) (Outside)**	**4-10**	**N/A**	**10**
- **Border Area Width (-ft)**	**N/A**	**10**	**10**
- **Cross Slope (%)**	**2**	**2**	**2**
- **Outside Shoulder Slope (%)**	**6**	**2**	**2**
- **Inside Shoulder Width (-ft)**	**N/A**	**N/A**	**N/A**
- **Sidewalks (-ft)**	**N/A**	**5**	**5**
- **Auxiliary Lanes (-ft)**	**LTL – 11** **RTL - 12**		**LTL – 11**
- **Bike Accommodations**	**N/A**	**N/A**	**N/A**
Posted Speed (mph)	**45**		**45**
Design Speed (mph)	**45**	**45**	**45****
Minimum Horizontal Curve Radius (-ft)	**1390**	**711**	**1390**
Maximum Superelevation Rate (%)	**5**	**6**	**5.2**
Maximum Grade (%)	**5**	**8**	**5**
Access Control	**Permit**	**Permit**	**Permit**
Design Vehicle	**WB-67**		**WB-67**
Check Vehicle	**WB-109D**		**WB-109D**
Pavement Type	**HMA**		**HMA**

**According to current GDOT Design Policy if applicable*
***25 mph design speed within circulatory roadway*

Sideroad Design Features:

SR 5 CONN	**Functional Classification:** *Minor Arterial*		
Feature	**Existing**	***Policy**	**Proposed**
Typical Section:			
- Number of Through Lanes	**4**		**4**
- **Lane Width(s) (-ft)**	**12**	**11-12**	**12**
- **Median Width (-ft) & Type**	**44-depressed**	**44-depressed**	**44-depressed**
- **Shoulder Width (-ft) (Outside)**	**4-paved 6-grass**	**N/A**	**4-paved 6-grass**
- **Border Area Width (-ft)**	**N/A**	**10**	**10**
- **Cross Slope (%)**	**2**	**2**	**2**
- **Outside Shoulder Slope (%)**	**6**	**6**	**6**
- **Inside Shoulder Width (-ft)**	**2-paved 4-grass**	**2-paved 4-grass**	**2-paved 4-grass**
- **Sidewalks (-ft)**	**5**	**n/a**	**5**
- Auxiliary Lanes	**LTL – 11 RTL - 12**		**LTL – 11 RTL – 11**
- **Bike Accommodations**	**N/A**	**N/A**	**N/A**
Posted Speed (mph)	**45**		**45**
Design Speed (mph)	**45**	**45**	**45****
Minimum Horizontal Curve Radius (-ft)	**1390**	**711**	**1390**
Maximum Superelevation Rate (%)	**2**	**6**	**2**
Maximum Grade (%)	**5**	**8**	**5**
Access Control	**Permit**	**Permit**	**Permit**
Design Vehicle	**WB-67**		**WB-67**
Check Vehicle	**WB-67**		**WB-67**
Pavement Type	**HMA**		**HMA**

**According to current GDOT Design Policy if applicable*
***25 mph design speed within circulatory roadway*

Design Exceptions/Design Variances to FHWA or GDOT Controlling Criteria anticipated: None

Design Variances to GDOT Standard Criteria anticipated: A design Variance for complete streets is expected.

Lighting Proposed: ☐ No ☒ Yes
See attached Indication of Roundabout Support letter.

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

If yes:	Roadway type to be closed:	☒ Local Road	☐ State Route
	Detour Route selected:	☒ Local Road	☐ State Route
	District Concurrence w/Detour Route:	☒ No/Pending	☐ Received
	Detour Presented to Public:	☒ No	☐ Yes

Both Shoal Creek Road and Hospital Road will require temporary off-site detours.

Transportation Management Plan [TMP] Required: ☐ No ☒ Yes Non-Significant

INTERCHANGES AND INTERSECTIONS

Interchanges/Major Intersections: SR 140 / Waleska Road @ SR 5 Connector / Reinhardt College Parkway: Existing Signalized Intersection

Intersection Control Evaluation (ICE) Required: ☐ No ☒ Yes

Roundabout Concept Validation Required: ☐ No ☒ Yes ☐ Completed

Roundabout Validation Ongoing

UTILITY AND PROPERTY

Railroad Involvement: N/A

Utility Involvements: See attached Concept Utility Report for Details

Windstream *(Fiber)*	City of Canton-Water *(Water)*	Southern Gas Company aka AGL *(Gas)*
Comcast *(Coax, Fiber)*	City of Canton-Sewer *(Sewer)*	Waleska Water System *(No Facilities)*
Crown Castle *(Fiber)*	Georgia Power Company-Dist. *(Power)*	Ellijay Telephone Company *(No Facilities)*

SUE Required: ☐ No ☒Yes

Public Interest Determination Policy and Procedure recommended: ☒ No ☐ Yes

Right-of-Way (ROW): Existing width: 80/130ft. Proposed width: 80/160ft.

Required Right-of-Way anticipated: ☐ None ☒ Yes ☐ Undetermined

Easements anticipated: ☐ None ☒ Temporary ☒ Permanent * ☐ Utility ☐ Other

** Permanent easements include the right to place utilities.*

Anticipated total number of impacted parcels:		13
Displacements anticipated:	Businesses:	0
	Residences:	0
	Other:	0
Total Displacements:		0

Location and Design approval: ☐ Not Required ☒ Required

Impacts to federally managed property anticipated: ☒ No ☐ Yes ☐ Undetermined

ENVIRONMENTAL AND PERMITS

Anticipated Environmental Document: *NEPA ~ CE*

Level of Environmental Analysis:

☐ The environmental considerations noted below are based on preliminary desktop or screening level environmental analysis and are subject to revision after the completion of resource identification, delineation, and agency concurrence.

☒ The environmental considerations noted below are based on the completion of resource identification, delineation, and agency concurrence.

MS4 Permit Compliance – Is the project located in a MS4 area? ☐ No ☒ Yes
If yes, is the GDOT MS4 Permit anticipated to apply to all or part of this project? ☐ No ☒ Yes

Is ecology water quality mitigation anticipated? ☒ No ☐ Yes
Will a Non-MS4 Detention Report be required during preliminary design? ☒ No ☐ Yes

Environmental Permits, Variances, Commitments, and Coordination anticipated: *Section 404 Permit and Compensatory Mitigation; Buffer Variance Application and Compensatory Mitigation; NPDES GAR 10002 and Land Disturbance Fees; FEMA floodplain coordination is not currently anticipated, but may be required for areas that drain to Etowah River.*

Air Quality:

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

NEPA/GEPA Comments & Information:

- Ecology – gray bat and tri colored bat will require special provisions 107.23(h) – no significant effect; monarch butterfly – not likely to jeopardize. Ecology Resources Survey Report transmitted to USFWS/FHWA on 12/20/2022
- History – 11 Mill Street & 1165 SR 140. Historic Resources Survey Report (HRSR) revisions were resubmitted to GDOT History SME Chad Carlson on 4/14/2023
- Archaeology – no effect; no archaeological resources identified. Complete based on GDOT email dated 4/4/2023. No resources identified and no comments received.
- Air quality project consistent with state and federal air quality goals, including CO, Ozone, PM2.5, and MSATs and SIP for the attainment of clean air in Georgia.
- Noise – we anticipate that a Type III Screening will be needed

Public Involvement: No additional PIOH, Public Hearings, or other public involvement is anticipated.

COORDINATION, ACTIVITIES, RESPONSIBILITIES, AND COSTS

Constructability/Construction: A constructability meeting is not anticipated.

Project Meetings: Concept Team Meeting 06/08/2023

Other coordination to date: None

Project Activity	Party Responsible for Performing Task(s)
Concept Development	City of Canton/Michael Baker International
Design	City of Canton/Michael Baker International
Right-of-Way Acquisition	City of Canton
Utility Coordination (Preconstruction)	City of Canton/Michael Baker International
Utility Relocation (Construction)	Utility Owners
Letting to Contract	City of Canton
Construction Supervision	City of Canton
Providing Material Pits	Contractor
Providing Detours	Contractor
Environmental Studies, Documents, & Permits	City of Canton/Michael Baker International
Environmental Mitigation	City of Canton
Construction Inspection & Materials Testing	City of Canton

Project Cost Estimate Summary and Funding Responsibilities:

	PE Activities		ROW	Reimbursable Utilities	CST*	Total Cost
	PE Funding	Section 404 Mitigation				
Date of Estimate:		4/21/2023	4/24/2023	4/14/2023	4/20/2023	
Proposed Funding Source(s):	Federal\ Local	Federal\ Local	Local	Federal\ Local	Federal\ Local	
Programmed Cost:	PFR & PSR $1,182,755		$0	$211,415	$1,753,219	$3,147,389
Estimated Cost:	$1,200,000	~~$405,000~~ $132,153	**$1,151,000	$288,000	$6,811,447.55	~~$9,855,447.55~~ $9,294,600.55
Total Cost Difference:						~~$6,708,058.55~~ • $6,147,211.55

*CST Cost includes Construction, Engineering and Inspection, Contingencies and Asphalt Fuel Price Adjustment.
** ROW Estimate developed by Welsey Brock with THC, Inc. - submitted to GDOT for approval on 4/24/2023).

- Anticipated additional funding through federal program

ALTERNATIVES DISCUSSION

Alternative selection:.

Preferred Alternative: The preferred alternative is a multilane roundabout with splitter islands, curb and gutter and a five-foot sidewalk along the roundabout's extents. An additional left turn lane northbound onto Mill Street will be added to reduce congestion further.

Estimated Property Impacts:	13	**Estimated Total Cost:**	$9,294,600.55
Estimated ROW Cost:	*$1,151,000	**Estimated CST Time:**	18 months

Rationale: *This alternative was selected as it scored the best on the ICE analysis. It also addresses the needs of this project to reduce operational delays in the design year from an overall failing LOS to an overall LOS D, as well improving conditions from failing on most approaches. This alternative scored a 6.2 on the ICE Stage 2 and has a lower total cost than Alt 1.*

**Estimated ROW cost by design team.*

No-Build Alternative: Existing SR 140 consists of two 11-foot travel lanes, one in each direction with a 9-foot flush median. There are 11-foot right turn and left turn lanes at the intersection of SR 140 and Reinhardt College Parkway, an 11-foot right turn lane entering The Landings of Canton Hills (right-in right-out island), and an 11-foot right turn lane at the Mill Street Intersection. There are short stretches of sidewalk at the entrances to both Mill Street (4-feet wide) and The Landings of Canton Hills (6-feet wide). The intersection of SR 140 and Reinhardt College Parkway is signalized. The overhead utilities are located on the east side of the corridor.			
Estimated Property Impacts:	**n/a**	**Estimated Total Cost:**	**n/a**
Estimated ROW Cost:	**n/a**	**Estimated CST Time:**	**n/a**
Rationale: No Build alternative does not meet the goals of this project.			

Alternative 1: Alternative 1 is a continuous green T design with a continuous southbound flow along SR 140/ Waleska Road with a signal to phase the remaining movements. This alternative would allow for one lane of continuous southbound flow along Waleska Road that would improve Southbound AM peak traffic. But Northbound PM peak traffic would still be subject to a signal.			
Estimated Property Impacts:	15	**Estimated Total Cost:**	$10,523,662
Estimated ROW Cost:	*$1,375,325	**Estimated CST Time:**	18 months
Rationale: This alternative was not selected due to other alternatives receiving a better ICE score, longer project limits and costs more in total construction cost. *This alternative scored a 3.9 on the ICE Stage 2.* This High T alternative will require an entire rebuild of the intersection with the eventual widening of the SR 140 corridor to 4 lanes.			

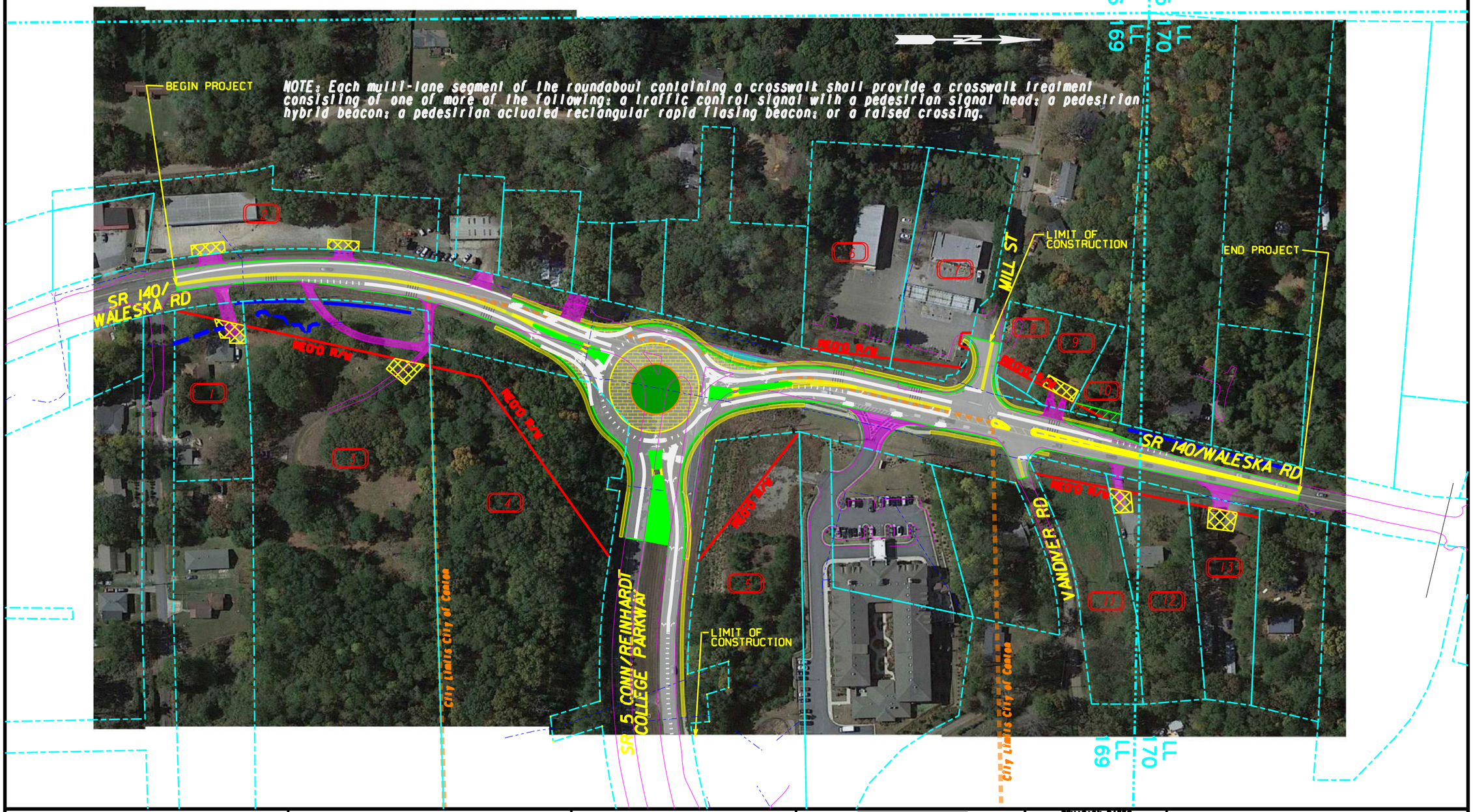
**Estimated ROW cost by design team.*

Comments: This is an interim project to tie into a future 4 lane widening of SR 140 corridor. The multilane roundabout alternative ties into this future widening while the High T alternative will require an entire rebuild of the intersection.

LIST OF ATTACHMENTS/SUPPORTING DATA

1. Concept Layout – Preferred Alternative
2. Typical sections
3. Detailed Cost Estimates:
    a. Construction Cost Estimate
    b. Right-of-Way
    c. Utilities
    d. Environmental Mitigation Cost Estimate
4. Concept Utility Report
5. Crash summaries and diagrams
6. Traffic diagrams or projections
7. Capacity analysis summary
8. ICE Stage 1 & 2, and Signed Waivers
9. MS4 Concept Report Summary
10. Minutes of Concept Meetings
11. Benefit/Cost Analysis
12. Sponsor Roundabout Support Letter
13. GDOT Roundabout validation (SIDRA & AutoTurn)

9/12/2023 1:19:37 PM PBMurphy	GPLOT-V8 gplotborder-v81-P0.tbl	SR140-SR5 CONN Proposal - Alt 2.dgn	P.I. No. 0017982



PROPERTY AND EXISTING R/W LINE	EXISTING PAVEMENT
REQUIRED R/W LINE	RAISED MEDIAN
CONSTRUCTION LIMITS	SIDEWALK
EDGE OF PAVEMENT	REMOVAL OF EXIST. PAVEMENT
EDGE OF PAVED SHOULDER	EASEMENT FOR DRIVES
RETAINING WALL	EASEMENT FOR CONST OF SLOPES
ENVIRONMENTALLY SENSITIVE AREA	
ESA BUFFER	

10/23/2015 GPLN

Est 1834 CANTON GEORGIA

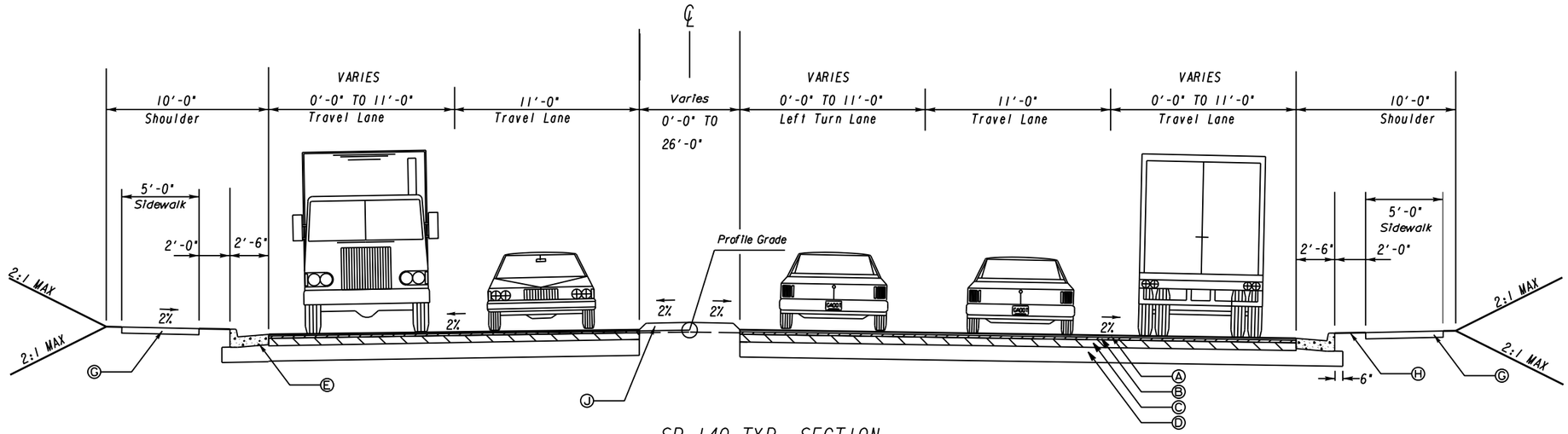
Michael Baker INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

SCALE IN FEET
0 75 150 300

REVISION DATES

SR 140 @ SR 5 CONN
PREFERRED ALTERNATIVE

CHECKED:	DATE:	DRAWING No.
BACKCHECKED:	DATE:	0002A
CORRECTED:	DATE:	
VERIFIED:	DATE:	



SR 140 TYP. SECTION

TYPICAL PAVEMENT SECTION

Ⓐ RECYCLED ASPH CONC 12.5 MM, SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 LB/SY)

Ⓑ RECYCLED ASPH CONC 19 mm SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME (220 LB/SY)

Ⓒ RECYCLED ASPH CONC 25 mm SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME (660 LB/SY)

Ⓓ GR AGGR BASE CRS, INCL MATL, 12 IN

Ⓔ CONCRETE CURB & GUTTER, GA STD 9032B, TYP 2, 8" X 30"

Ⓖ SIDEWALK, 4"

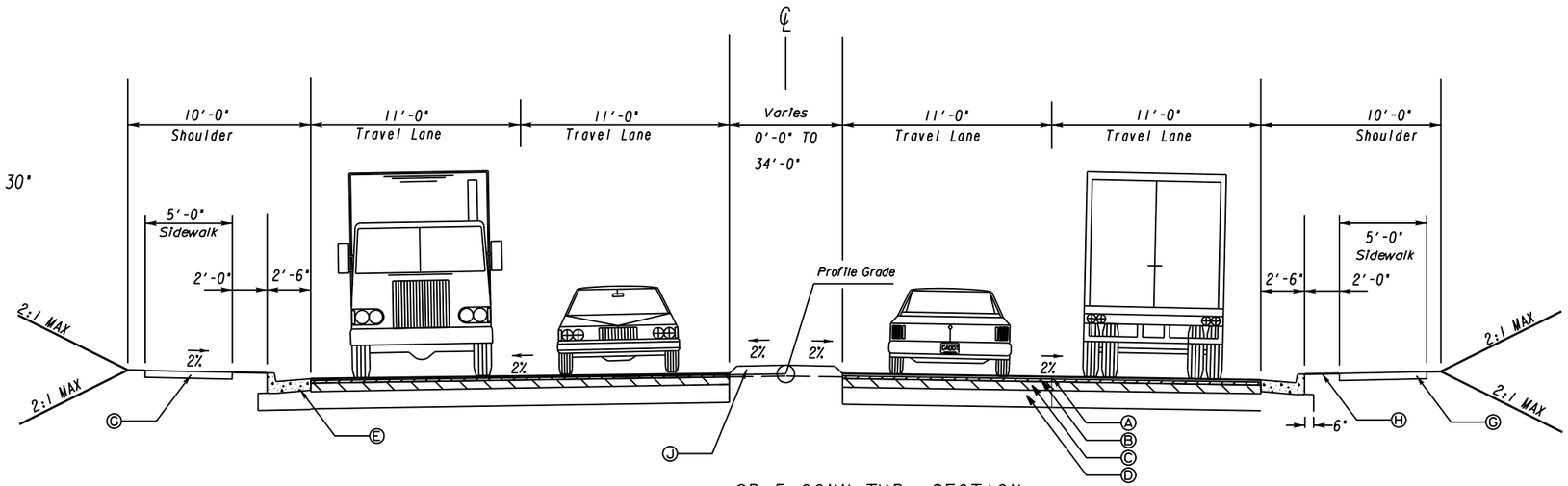
Ⓗ GRASS STRIP

Ⓙ CONCRETE MEDIAN, 6 IN WITH TYPE 7 FACE

Ⓛ PLAIN PC CONC PVMT, CL HES CONC, 10" THK, COLORED & STAMPED

Ⓜ CONCRETE HEADER CURB, 4 IN, TP 9

Ⓝ CONCRETE HEADER CURB, 6 IN, TP 7



SR 5 CONN TYP. SECTION

Michael Baker INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

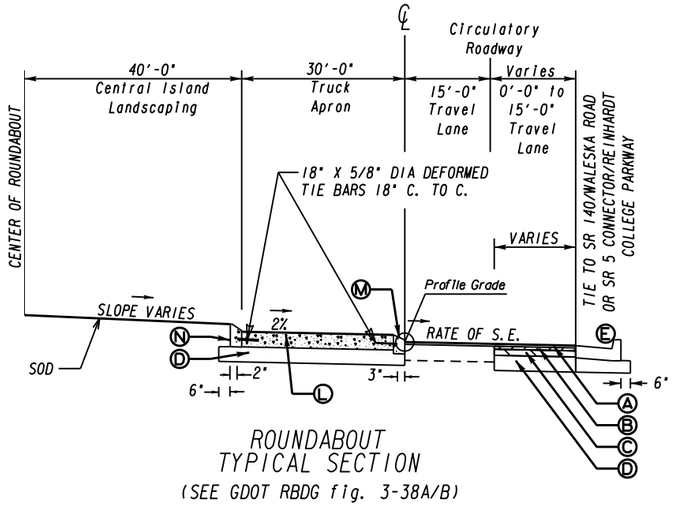
Est 1834 CANTON GEORGIA

REVISION DATES

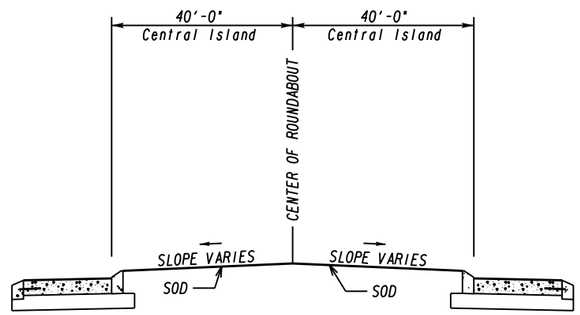
TYPICAL SECTIONS
SR 140 @ SR 5 CONN
CONCEPT

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		05-0001
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/2015 GPLN



ROUNDABOUT
TYPICAL SECTION
(SEE GDOT RBDG fig. 3-38A/B)



CENTER ISLAND DETAIL

TYPICAL PAVEMENT SECTION

Ⓐ RECYCLED ASPH CONC 12.5 MM, SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 LB/SY)

Ⓑ RECYCLED ASPH CONC 19 mm SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME (220 LB/SY)

Ⓒ RECYCLED ASPH CONC 25 mm SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME (660 LB/SY)

Ⓓ GR AGGR BASE CRS, INCL MATL, 12 IN

Ⓔ CONCRETE CURB & GUTTER, GA STD 9032B, TYP 2, 8" X 30"

Ⓖ SIDEWALK, 4"

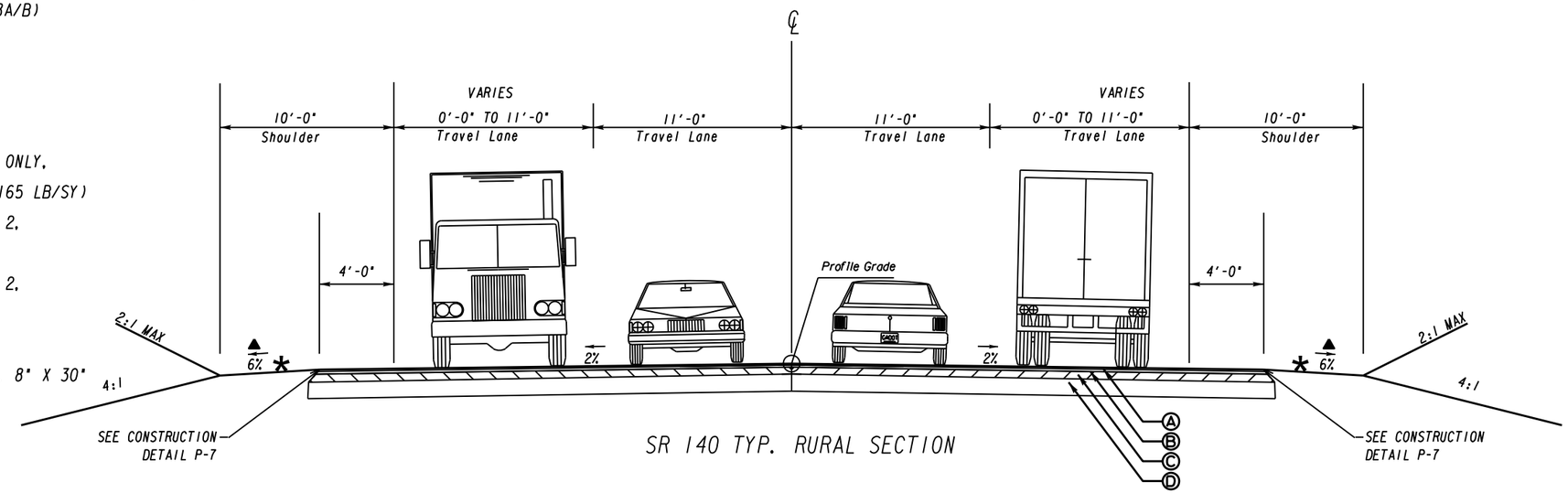
Ⓗ GRASS STRIP

Ⓙ CONCRETE MEDIAN, 6 IN WITH TYPE 7 FACE

Ⓛ PLAIN PC CONC PVMT, CL HES CONC, 10" THK, COLORED & STAMPED

Ⓜ CONCRETE HEADER CURB, 4 IN, TP 9

Ⓝ CONCRETE HEADER CURB, 6 IN, TP 7



SR 140 TYP. RURAL SECTION

Michael Baker
INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

Est 1834 CANTON GEORGIA

REVISION DATES

TYPICAL SECTIONS
SR 140 @ SR 5 CONN
CONCEPT

CHECKED: DATE:
BACKCHECKED: DATE:
CORRECTED: DATE:
VERIFIED: DATE:

DRAWING No. 05-0002

GDOT Georgia Department of Transportation

8/29/2023

Project Cost Estimate

Processed on: 8/29/2023 1:32:56 AM

Concept Name: 0017982
Concept Description: SR 140 @ SR 5 Conn
Spec Year: 21
Item History: BHP-ALL
Cost Estimate Phase: 2-DE

Cost Estimate Name: 0017982
Adhoc Pricing Total: $0.00
Typical Section Total: $0.00
Estimate Total: $5,773,841.18

ITEMS FOR CONCEPT NAME 0017982

0100 - Roadway

Line Number	Item	Quantity	Units	Price	Description	Amount
0220	005-0002	1	LS	350,000.00	INSTALLATION OF LIGHTING FACILITIES	$350,000.00
0005	150-1000	1	LS	250,000.00	TRAFFIC CONTROL - - 0017982 traffic control for roundabout	$250,000.00
0360	150-5010	4	EA	10,436.46	TRAFFIC CONTROL, PORTABLE IMPACT ATTENUATOR	$41,745.84
0365	153-1300	1	EA	117,501.30	FIELD ENGINEERS OFFICE TP 3	$117,501.30
0230	156-0100	1	LS	13,500.00	GPS DATA COLLECTION AND SUBMITTAL	$13,500.00
0010	210-0100	1	LS	950,000.00	GRADING COMPLETE - - 0017982 grading	$950,000.00
0015	441-0018	100	SY	100.00	DRIVEWAY CONCRETE, 8 IN TK	$10,000.00
0020	441-0104	1060	SY	70.73	CONC SIDEWALK, 4 IN	$74,971.70
0255	441-0108	75	SY	137.03	CONC SIDEWALK, 8 IN	$10,276.89
0025	441-0748	565	SY	103.00	CONCRETE MEDIAN, 6 IN	$58,195.00
0035	441-5008	300	LF	29.70	CONCRETE HEADER CURB, 6 IN, TP 7	$8,909.43
0030	441-5025	370	LF	27.62	CONCRETE HEADER CURB, 4 IN, TP 9	$10,218.23
0045	441-6222	2300	LF	35.00	CONC CURB & GUTTER, 8 IN X 30 IN, TP 2	$80,500.00
0260	446-1100	3650	LF	9.22	PVMT REINF FABRIC STRIPS, TP 2, 18 INCH WIDTH	$33,639.68
0265	456-2015	1	GLM	3,819.91	INDENTATION RUMBLE STRIPS - GROUND-IN-PLACE (SKIP)	$3,819.91
0050	500-3120	500	LF	1,002.45	CLASS A CONCRETE, TYPE P3, RETAINING WALL	$501,223.82

0100 - Roadway

Line Number	Item	Quantity	Units	Price	Description	Amount
0270	550-2180	500	LF	72.06	SIDE DRAIN PIPE, 18 IN, H 1-10	$36,028.50
0275	550-4118	20	EA	756.48	FLARED END SECTION 18 IN, SIDE DRAIN	$15,129.62
0355	620-0100	2000	LF	47.61	TEMPORARY BARRIER, METHOD NO. 1	$95,227.02
0055	632-0003	3	EA	14,000.00	CHANGEABLE MESSAGE SIGN, PORTABLE, TYPE 3	$42,000.00
0060	634-1200	6	EA	208.98	RIGHT OF WAY MARKERS	$1,253.87
0100 Total						$2,704,140.81

0110 - Pavement

Line Number	Item	Quantity	Units	Price	Description	Amount
0065	310-1101	10530.25	TN	50.00	GR AGGR BASE CRS, INCL MATL	$526,512.50
0070	318-3000	500	TN	46.53	AGGR SURF CRS	$23,266.93
0075	402-3121	4500	TN	130.00	RECYCLED ASPH CONC 25 MM SUPERPAVE, GP 1 OR 2, INCL BITUM MATL & H LIME	$585,000.00
0080	402-3190	1600	TN	142.00	RECYCLED ASPH CONC 19 MM SUPERPAVE, GP 1 OR 2,INCL BITUM MATL & H LIME	$227,200.00
0085	402-4510	1240	TN	169.00	RECYCLED ASPH CONC 12.5 MM SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME	$209,560.00
0090	413-0750	3411	GL	5.00	TACK COAT	$17,055.00
0250	432-5010	1030	SY	13.18	MILL ASPH CONC PVMT, VARIABLE DEPTH	$13,579.18
0040	439-0022	1200	SY	235.00	PLAIN PC CONC PVMT, CL 3 CONC, 10 INCH THK	$282,000.00
0110 Total						$1,884,173.61

0200 - Drainage

Line Number	Item	Quantity	Units	Price	Description	Amount
0110	550-4224	2	EA	1,517.01	FLARED END SECTION 24 IN, STORM DRAIN	$3,034.01
0115	550-4230	2	EA	1,729.40	FLARED END SECTION 30 IN, STORM DRAIN	$3,458.80
0095	550-5180	2000	LF	101.97	STORM DRAIN PIPE, 18 IN, CLASS III	$203,943.60
0100	550-5240	1400	LF	118.08	STORM DRAIN PIPE, 24 IN, CLASS III	$165,317.81
0105	550-5300	1000	LF	170.00	STORM DRAIN PIPE, 30 IN, CLASS III	$170,000.00

0200 - Drainage

Line Number	Item	Quantity	Units	Price	Description	Amount
0280	603-2181	100	SY	81.27	STN DUMPED RIP RAP, TP 3, 18 IN	$8,126.53
0285	603-7000	100	SY	6.66	PLASTIC FILTER FABRIC	$665.79
0120	668-1100	6	EA	7,000.00	CATCH BASIN, GP 1	$42,000.00
0125	668-2100	12	EA	5,600.00	DROP INLET, GP 1	$67,200.00
0200 Total						$663,746.54

0300 - Temporary Erosion Control

Line Number	Item	Quantity	Units	Price	Description	Amount
0130	163-0232	5	AC	838.39	TEMPORARY GRASSING	$4,191.94
0135	163-0240	192	TN	158.46	MULCH	$30,424.86
0140	163-0301	2	EA	2,713.92	CONSTRUCT AND REMOVE CONSTRUCTION EXITS	$5,427.85
0155	163-0501	3	EA	578.66	CONSTRUCT AND REMOVE SILT CONTROL GATE, TP 1	$1,735.97
0145	163-0528	400	LF	16.61	CONSTRUCT AND REMOVE FABRIC CHECK DAM - TYPE C SILT FENCE	$6,645.24
0150	163-0550	18	EA	299.94	CONSTRUCT AND REMOVE INLET SEDIMENT TRAP	$5,399.00
0160	165-0030	4750	LF	0.83	MAINTENANCE OF TEMPORARY SILT FENCE, TP C	$3,954.33
0165	165-0041	600	LF	3.47	MAINTENANCE OF CHECK DAMS - ALL TYPES	$2,083.42
0215	165-0085	3	EA	95.34	MAINTENANCE OF SILT CONTROL GATE, TP 1	$286.03
0170	165-0101	2	EA	1,033.46	MAINTENANCE OF CONSTRUCTION EXIT	$2,066.92
0225	165-0105	18	EA	114.31	MAINTENANCE OF INLET SEDIMENT TRAP	$2,057.56
0175	165-0310	2	EA	922.47	MAINTENANCE OF CONSTRUCTION EXIT TIRE WASH AREA (PER EACH)	$1,844.94
0235	167-1000	3	EA	450.00	WATER QUALITY MONITORING AND SAMPLING	$1,350.00
0240	167-1500	18	MO	1,300.00	WATER QUALITY INSPECTIONS	$23,400.00
0180	171-0030	9500	LF	5.47	TEMPORARY SILT FENCE, TYPE C	$51,988.37
0300 Total						$142,856.43

0400 - Permanent Erosion Control

Line Number	Item	Quantity	Units	Price	Description	Amount
0185	700-6910	9	AC	2,100.00	PERMANENT GRASSING	$18,900.00
0190	700-7000	18	TN	265.00	AGRICULTURAL LIME	$4,770.00
0195	700-8000	5	TN	1,589.97	FERTILIZER MIXED GRADE	$7,949.83
0200	700-8100	450	LB	3.20	FERTILIZER NITROGEN CONTENT	$1,442.22
0330	700-9300	560	SY	12.94	SOD	$7,248.06
0335	701-0010	1	AC	22,000.00	WILDFLOWER SEEDING	$22,000.00
0400 Total						$62,310.11

0500 - MS4

Line Number	Item	Quantity	Units	Price	Description	Amount
0205	169-0040	1	EA	115,000.00	WET DETENTION POND, NO. - - wet pond	$115,000.00
0500 Total						$115,000.00

0600 - Signing

Line Number	Item	Quantity	Units	Price	Description	Amount
0290	636-1033	60	SF	24.60	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 9	$1,476.10
0295	636-1036	80	SF	25.89	HIGHWAY SIGNS, TP 1 MATL, REFL SHEETING, TP 11	$2,071.42
0300	636-1077	80	SF	49.86	HIGHWAY SIGNS, ALUM EXTRUDED PANELS, REFL SHEETING, TP 9	$3,989.16
0305	636-2070	300	LF	11.51	GALV STEEL POSTS, TP 7	$3,451.75
0310	636-2080	300	LF	16.65	GALV STEEL POSTS, TP 8	$4,993.91
0315	636-3000	500	LB	14.77	GALV STEEL STR SHAPE POST	$7,382.67
0320	636-3010	20	EA	731.38	GROUND-MOUNTED BREAKAWAY SIGN SUPPORT	$14,627.69
0325	636-9094	60	LF	241.15	PILING IN PLACE, SIGNS, STEEL H, HP 12 X 53	$14,468.81
0350	647-1030	1	LS	12,000.00	RRFB INSTALLATION NO - - 3	$12,000.00
0340	647-1030	1	LS	12,000.00	RRFB INSTALLATION NO - - #1	$12,000.00
0345	647-1030	1	LS	12,000.00	RRFB INSTALLATION NO - - 2	$12,000.00
0600 Total						$88,461.51

0610 - Pavement Marking

Line Number	Item	Quantity	Units	Price	Description	Amount
0210	009-3000	1	LS	100,000.00	MISCELLANEOUS CONSTRUCTION - Signing & Marking complete	$100,000.00
0245	429-1000	17	EA	773.66	RUMBLE STRIPS	$13,152.17
0610 Total						$113,152.17

TOTALS FOR CONCEPT NAME 0017982

ITEMS COST:	$5,773,841.18
TYPICAL SECTION:	$0.00
AD-HOC PRICING:	$0.00
ESTIMATED COST:	$5,773,841.18
CONTINGENCY PERCENT:	
ENGINEERING AND INSPECTION:	
ESTIMATED COST WITH CONTINGNECY AND E&I:	

Georgia Department of Transportation

Interoffice Memo

FILE

PI NUMBER	0017982	PROJECT DESCRIPTION	SR 140 @ SR 5 CONN
OFFICE	Program Delivery		
DATE	Tuesday, August 29, 2023		

From: Kimberly W. Nesbitt, State Program Delivery Administrator

To: Erik Rohde, P.E., State Project Review Engineer
via email Mailbox: CostEstimatesandUpdates@dot.ga.gov

Subject: **REVISIONS TO PROGRAMMED COSTS**

Project Manager:	Keith Posey
Management Let Date:	9/15/2026
Management Right of Way Date:	2/14/2025

Cost Estimate Review Iteration

Date of Submittal #1	
Date of Submittal #2	
Date of Submittal #3	

Summary of Programmed Costs and Proposed Revised Costs:

Estimate Type	Cost Estimate Amounts (T-Pro Without Inflation)	Last Estimate Date	Revised Cost Estimate
CONSTRUCTION	$2,332,391.00		$6,811,447.55
RIGHT OF WAY	$500,000.00		$1,151,000.00
UTILITIES	$211,415.00		$288,000.00

Explanation for Cost Change and Contingency Justification:

As per Contingencies Table in GDOT Policy 3A-9, a conceptual contingency of 10% has been chosen.

Attachments:

1.Detailed Cost Estimate (GDOT 411 Printout)

Georgia Department of Transportation

Interoffice Memo

Design Phase Leader Validation of Final QC/QA for Construction Cost Estimate Used In This Revision to Programmed Costs:

Consultant Company or GDOT Design Office:	Michael Baker International
Printed Name:	Paul Murphy, P.E.
Title:	Project Manager
Signature:	
Date:	8/29/2023

FOR PROJECTS WITH A LOCAL SPONSOR	
If the project has a local sponsor, the project manager should ensure that the local authority completes the following validation indicating that it has reviewed the construction cost estimate and whether it is in concurrence with the construction costs presented.	
Please select the appropriate validation below upon review of the cost estimate: ☐ I acknowledge that I have reviewed the project construction cost estimate and concur with the costs presented. ☐ I acknowledge that I have reviewed the project construction cost estimate but do not concur with the costs presented.	
Please provide an explanation for non-concurrence.	
Local Authority Name and Title:	
Local Authority Signature:	
Date:	

Georgia Department of Transportation

Interoffice Memo

Cost Estimate Worksheet:

CONSTRUCTION COST ESTIMATE (Required base estimate entered from AASHTOWare Project Estimation and should not include E&I). →	**A**	$ 5,773,841.18
ENGINEERING AND INSPECTION (The default E&I percentage is 5.0%, but may be adjusted per project scope.) →	**D**	$ 288,692.06

Construction Cost	E&I Percentage	E&I Cost
B	C	D = B x C
$ 5,773,841.18	5%	$ 288,692.06

CONTINGENCY (Refer to the Risk and Contingencies Table included in GDOT Policy 3A-9 Cost Estimating Purpose) →	**I**	$ 606,253.32

Construction Cost	E&I Cost	Construction + E&I	Contingency Percentage	Contingency Cost
E	F	G = E + F	H	I = G x H
$ 5,773,841.18	$ 288,692.06	$ 6,062,533.24	10%	$ 606,253.32

ASPHALT FUEL PRICE ADJUSTMENT (Leave blank if not applicable) →	**Q**	$ 142,660.99

Date	Aug 2023
Regular Unleaded	$3.590/ GAL
Diesel	$3.969/ GAL
Liquid AC	$623.00/ TON

Current Asphalt Fuel Index Prices can be found at the link below:

http://www.dot.ga.gov/PS/Materials/AsphaltFuelIndex

	Description	Tons	Percentage of Asphaltic Concrete	Tons of Asphaltic Concrete	Total Monthly Tonnage of Asphalt Cement (TMT)	Monthly Asphalt Cement Price month project let (APL)	Max. Cap	Monthly Asphalt Cement Price month placed (APM)	Price Adjustment (PA)
		J	K	L = J x K	M = Sum of Columns L, T & W	N	O	P = (N x O)+N	Q = [((P - N) / N)] x M x N
Liquid AC	Leveling				381.65 TN	$623.00/ TON	60%	$ 996.80	$ 142,660.99
	Patching								
	9.5 mm SP								
	12.5 OGFC								
	12.5 PEM								
	12.5 mm SP	1240.00 TN	5.00%	62.00 TN					
	19 mm SP	1600.00 TN	5.00%	80.00 TN					
	25 mm SP	4500.00 TN	5.00%	225.00 TN					

Bituminous Tack Coat	Description	Tack Coat	GL/TN	Tons
		R	S	T = R/S
	Tack Coat	3411.00 GL	232.8234 GL/TN	14.65 TN

Bituminous Tack Coat (Surface Treatment)	Description	SY	GL/SY	TN
		U	V	W = (U x V) / (232.8234 GL/TN)
	Single Surface Treatment		0.20 Gl/SY	
	Double Surface Treatment		0.44 Gl/SY	
	Triple Surface Treatment		0.71 Gl/SY	

CONSTRUCTION TOTAL COST →	**X = A+D+I+Q**	$ 6,811,447.55
RIGHT OF WAY COST →	**Y**	$ 1,151,000.00
UTILITIES COST (Provided by Utility Office) →	**Z = Sum of Reimbursable Costs**	$ 288,000.00

Utility Owner	Reimbursable Cost	Utility Owner	Reimbursable Cost
Georgia Power Company-Dist	$ 288,000.00		

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 4/20/2023 Project: SR140 @ SR5 Connector Alt 2
Revised: County: Cherokee
PI: 17982
Description: New road alignment and improvements
Project Termini: SR 140

Existing ROW: Varies
Parcels: 13 Required ROW: Varies

Land and Improvements		$814,200.00
Proximity Damage	*$0.00*	
Consequential Damage	*$0.00*	
Cost to Cures	*$5,000.00*	
Trade Fixtures	*$35,300.00*	
Improvements	*$2,500.00*	
Valuation Services		$91,250.00
Legal Services		$83,775.00
Relocation		$39,000.00
Demolition		$11,000.00
Administrative		$111,000.00
TOTAL ESTIMATED COSTS		$1,150,225.00
TOTAL ESTIMATED COSTS (ROUNDED)		***$1,151,000.00***

Prepared By: Wesley K. Brock Wesley K. Brock 4/24/2023
Print Name Signature Date

Cost Estimation Supervisor : _____
Print Name Signature Date

NOTE: Superviser is only attesting that the estimate was completed using the correct information provided for the the project. The Supervisor is not attesting to property values or the accuracy of the market value estimations provided in this report. No Market Appreciation is included in this Preliminary Cost Estimate.

Comments:

FILE

Project No:
County **Cherokee**
P.I.# **0017982**

Office: **Cartersville**
Date: **4/14/2023**

Description: **Alternate 2- Construction of a two lane roundabout at the existing tee intersection of SR 140/Waleska Road and SR 5 CONN/Reinhardt College Parkway**

FROM Kerry Gore, SAM Utility Coordination Department Manager

TO Felecia Basolo, Project Manager

SUBJECT **PRELIMINARY UTILITY COST ESTIMATE**

A review of utilities located on the above referenced project has been conducted with Concept Layout plans. Listed below is a breakdown of the anticipated reimbursable and non-reimbursable cost.

Utility Owner		Reimbursable	Non-Reimbursable	In Contract/CIA (Non-Reimbursable)	Estimate Based on
Southern Gas Company aka AGL		$0.00	$169,000.00	$0.00	Site Visit / Available Drawings
City of Canton-Water		$0.00	$595,500.00	$0.00	Site Visit / Available Drawings
City of Canton-Sewer		$0.00	$63,000.00	$0.00	Site Visit / Available Drawings
Comcast		$0.00	$75,000.00	$0.00	Site Visit / Available Drawings
Crown Castle		$0.00	$85,000.00	$0.00	Site Visit / Available Drawings
Georgia Power Company-Dist.	*	$288,000.00	$20,000.00	$0.00	Site Visit / Available Drawings
Windstream		$0.00	$120,000.00	$0.00	Site Visit / Available Drawings
Waleska Water System-No Facilties		$0.00	$0.00	$0.00	Site Visit / Available Drawings
Ellijay Telephone Company- No Facilities		$0.00	$0.00	$0.00	Site Visit / Available Drawings
Total	100.00%	$288,000.00	$1,127,500.00	$0.00	
Department Responsibility	0.00%	$0.00		$0.00	
Local Sponsor Responsibility	100.00%	$288,000.00		$0.00	PFA Dated N/A with N/A

*Indicates reimbursable cost based on potential prior right claim from utility owner

Estimate is based on the best available information at the current stage

If additional information is needed, please contact Kerry Gore at 478-978-2177.

cc: Nick Fields, State Utilities Administrator
Marcela Coll, State Utilities Preconstruction Manager
David Acree, P.E, District 6 Preconstruction Manager
Jennifer Deems, District 6 Utilities Manager

Qualitative Worksheet Summary For Stream Adverse Impacts						
Worksheet Number	**Name of Stream**	**Stream Type**	**Length of Impact (L.F.)**	**Impact Duration**	**2018 Credits**	**Legacy Credits**
1	PS 1	Perennial Streams (less than 3 square miles)	217	Permanent/Reoccurring	162.75	1953.00
2				Choose Duration	Credits Owed	Legacy Credits Owed
3				Permanent/Reoccurring	Pick Stream Type	Pick Stream Type
4				Choose Duration	Credits Owed	Legacy Credits Owed
5				Choose Duration	Credits Owed	Legacy Credits Owed
6				Choose Duration	Credits Owed	Legacy Credits Owed
7				Choose Duration	Credits Owed	Legacy Credits Owed
8				Choose Duration	Credits Owed	Legacy Credits Owed
9				Choose Duration	Credits Owed	Legacy Credits Owed
10				Choose Duration	Credits Owed	Legacy Credits Owed

Summary of Credits Owed			
Stream Type	**Length of Impact (L.F.)**	**2018 Credits**	**Legacy Credits**
Non-Perennial Streams		**0.00**	**0.00**
Perennial Streams (less than 3 square miles)	217	**162.75**	**1953.00**
Perennial Streams (greater than 3 square miles)		**0.00**	**0.00**
Open Water/Ditch/Canal		**0.00**	**0.00**

Canton Connector, PI No. 0017982 Mitigation Estimate:

Primary Service Area
HUC 03150104, Coosa Basin ~$60/Legacy Credit

Stream Mitigation
1,953 credits

Buffer Mitigation
10,850 square feet of impact * 0.046 credits per sq ft * 2.5 factor for off-site = 1247.75
1247.75 stream credits * 1.0 in-basin multiplier = 1247.75
1247.75 stream credits * 1.2 multiplier for hydrologic and water quality protection = 1497.3
1497.3 – 1247.75 =
249.55 Stream Credits

Total Mitigation
1953 + 249.55 = **2202.55 Legacy Credits**
2202.55 Legacy Credits * $60/credit =
$132,153.00

Project Manager
LAP Program, GDOT Office of Program Delivery
Atlas Technical Consultants/Southeastern Engineering, Inc.
(770) 309-6319 (Cell)

Southeastern Engineering, Inc. (SEI)
2470 Sandy Plains Road
Marietta, GA 30066
www.seengineering.com

From: Westberry, Lisa <lwestberry@dot.ga.gov>
Sent: Tuesday, June 27, 2023 9:21 AM
To: Keith Posey <kposey@seengineering.com>
Subject: FW: 0017982 Cherokee - Environmental Mitigation Cost Estimate

---

Good morning Keith,

Hope you're doing well! The way that you've requested concurrence works well. If the consultant would prefer to send me an email that would work as well.

Please accept this email as concurrence on the mitigation cost estimate of $132,153 as detailed in the email below and in the first attachment. The second attachment isn't needed, but if you want to include it for reference you can.

Do not hesitate to reach out to me with any other questions or need for additional information.

Best,

Lisa Westberry
Special Projects Coordinator

Original Version: May 24, 2013
Revision: Feb. April 5, 2018

Concept Utility Report

Project Number: 0017982 **District:** 6

County: Cherokee **Prepared by:** Kerry Gore

P.I. # 0017982 **Date:** April 14, 2023

Project Description: Construction of a two lane roundabout at the existing tee intersection of SR 140/Waleska Road and SR 5 CONN/Reinhardt College Parkway in the City of Canton, Ga.

The information provided herein has been gathered from Georgia811and/or field visits and serves as an estimate. Nothing contained in this report is to be used as a substitute for 1st Submission or SUE.

Are SUE services recommended? Choose an item.

Level: ☒A ☒B ☐C ☐D

Public Interest Determination (PID):

☐Automatic ☐Mandatory ☐Consideration ☒No Use ☐Exempt

Is a separate utility funding phase recommended? Yes

Potential Project (Schedule/Budget) Impacts: Georgia Power (GPC) will be subject to buying additional easements to facilitate their relocation plan. There are several (Crown Castle, Windstream, Comcast) attaches on the GPC pole line that will be dependent on the pole line. GPC-D will be claiming prior rights. The relocation of the pole line will be critical path for construction. The City of Canton 8"/12"/16" DIP water lines and 4/8" steel gas lines will impact widening on east side of SR 140.

Capital Improvement Projects (Utilities) Anticipated in the Area: None at this time

Project Specific Recommendations for Avoidance/Mitigation: Estimated GPC total non-current relocation days is 480 days. Based on additional attachees and high risk utility impacts to the project construction schedule, it is recommended to provide early authorization to GPC to begin easement acquisition.

Right of Way Coordination: Recommended to purchase permanent easements for the right to place utilities.

Environmental Coordination: Utility owners self-performing will be responsible for their environmental clearances. Facilities placed in the roadway contract are subject to be included in the project environmental document

Additional Remarks: N/A

Original Version: May 24, 2013
Revision: Feb. March 8, 2018

Utilities have facilities within the project limits.

Utilities have been identified using Georgia811 and/or field visits.

Facility Owner	**Facility Owner Contact Email Address**	**Existing Facilities/ Appurtenances**	**General Description of Location**	**Facilities to Avoid** *approx. limits*	**Facilities Retention Recommended** *approx. limits*	**Comments**
Southern Company Gas aka AGL	Megan Mclaurin, memclaur@southernco.com	2", 4", 8" steel (STL) gas mains	4" gas main parallels east side of SR 140 to just north of Reinhardt College Pkwy; 8" gas main parallels east side of SR 140 from Reinhardt College Pkwy North; 2" gas mains along side roads	Anticipate conflicts with gas lines	Anticipate conflicts with gas lines	Based on horizontal and vertical alignment of gas lines within the ROW, potential sections of the gas lines may be retained
City of Canton-Water	David.Hatabian, david.hatabian@cantonga.gov	6", 8", 12", 16" DIP water mains, One-Meter/Back Flow Preventer Vault, and appurtenances	8" water line parallels west side of SR 140; 16" water line parallels east side from Reinhardt College Pkwy heading North; 12" water main parallels south side of	Anticipate conflicts with water mains; Backflow Preventer Vault at the Landings of Canton Hills could be avoided; Possible	Anticipate conflicts with the water mains	Potential retention is dependent on horizontal and vertical alignment within the ROW

			Reinhardt College Pkwy; 6" water lines along side streets	retention of 16" water line from Landings of Canton Hills heading North and 12" water line along Reinhardt College Pkwy		
City of Canton-Sewer	David Hatabian, david.hatabian@cantonga.gov	8" PVC sewer main; 2 manholes; 5 potential service connections	8" PVC sewer main travels east on Mill Road into SR 140 ROW. From Mill Road sewer lines travel north and south approx. 250' in each direction on the west side of SR 140 to serve customers; 8" service line crosses at manhole in Mill Road to Landing of Canton Hills	8" PVC sewer lines	The entire system will not conflict with the project. Recommend retention where applicable; manholes subject to be adjusted to grade; service lines are subject to conflict with drainage/ditch cuts	Sewer lines are assumed to be PVC. Potential Sewer line retention will be based of horizontal and vertical alignment
Comcast (COM)	Jody Childers, jody_childers@comcast.com	Aerial COAX/48 fiber cables with underground feeds to customers	Aerial COAX/fiber cables along SR 140; Underground fiber parallels on north side of Reinhardt College Pkwy	Anticipate facilities to be in conflict with the project	Anticipate facilities to be in conflict with the project	COM is dependent on the pole line relocation and attaches
Crown Castle (CCN)	Venesia Horne, venesia.horne@crowncastle.com	Aerial 72 Fiber/Buried 288 fiber cable	Fiber cables attached to GPC pole line	Anticipate facilities to be in	Anticipate facilities to be	CCN is dependent on

			along SR 140 and underground along Reinhardt College Pkwy	conflict with the project	in conflict with the project	on power line relocation
Ellijay Telephone Company (ETC)	Frankie Rigdon, frankier@ellijay.com	None	None	None	None	ETC reported No Facilities
Georgia Power Company Distribution (GPC-D)	Chris Boggs, cjboggs@southernco.com	Aerial 3-Phase pole line; Underground 3-phas; 18 power poles within limits of project; 2 poles with GPC lighting	Aerial 3-phase line along SR 140 and side streets; Underground 3-phase along Reinhardt College Pkwy	Pole line is anticipated to be in conflict	9 of the 18 power poles are subject to be out of conflict; Underground facilities along Reinhardt College Pkwy will be in conflict	GPC will be claiming prior rights and will need to acquire additional easements to accommodate relocation
Windstream (WST)	Evan Yott, evan.yott@windstream.com	FO- 24(RCP-Buried), Aerial 2- FO 48, 144; Copper-300(RCP-Buried), Aerial 900, 600	Facilities are both underground and aerial along SR 140 and side roads	Anticipate facilities to be in conflict with the project	Anticipate facilities to be in conflict with the project	WST is dependent on the pole line relocation and attaches

Note: *To add additional rows, click the bottom right corner of the box above, then click the blue + that will appear. Please add additional rows prior to entering text.*

2.2 Crash Review

Crashes from the most recent 5 year of data was reviewed for this project. (January 2018 – December 2022). There are 111 crashes total in the project study area during the queried time period. After a review of the crash summaries, the majority of crashes along the corridor are rear ends (83) related to vehicles following too closely. There were no fatal crashes in the project area, and one A-level injury angle crash. Based on a review of crash reports, many of the rear end crashes are caused by congestion and cars trying to "make" the green light. Below is a summary of crash query area and crash types.

Figure 2-2: Crash Area Map

Source: Georgia Electronic Accident Reporting System

Table 2-1: Crash Type by Year

Year	Crash Type by Year						Total
	Angle	Head On	Rear End	Sideswipe - Same Direction	Sideswipe - Opposite Direction	Not a Collision w/ a Vehicle	
2018	4		22	1		1	28
2019	2		9			2	13
2020	4		11	1			16
2021	2		21	1		3	27
2022	6	1	20				27
Total	**18**	**1**	**83**	**3**	**0**	**6**	**111**

Table 2-2: Crash Severity by Year

Year	Injury Severity by Year					Total
	Fatality	Serious Injury	Minor Injury	Possible Injury or Complaint	No Apparent Injury	
2018			1	6	21	28
2019			1		12	13
2020		1	1	3	11	16
2021			2	4	21	27
2022				4	23	27
Total	**0**	**1**	**5**	**17**	**88**	**111**

Table 2-3: Crash Severity by Crash Type

Crash Type	Injury Severity by Crash Type					Total
	K	A	B	C	O	
Angle		1		4	13	18
Head On					1	1
Rear End			3	11	69	83
Sideswipe - Same Direction					3	3
Sideswipe - Opposite Direction					1	1
Not a Collision w/ a Vehicle			2	2	2	6
Total	**0**	**1**	**5**	**17**	**88**	**111**

Georgia Department of Transportation

Interoffice Memo

FILE: Cherokee County
P.I. # 0017982

DATE: December 9, 2022

FROM: Matt Markham, Deputy Director of Planning

TO: Kimberly Nesbitt, State Program Delivery Administrator
Attention: Keith Posey

SUBJECT: **Design Traffic Forecasts** for SR 140 @ SR 5 CONN

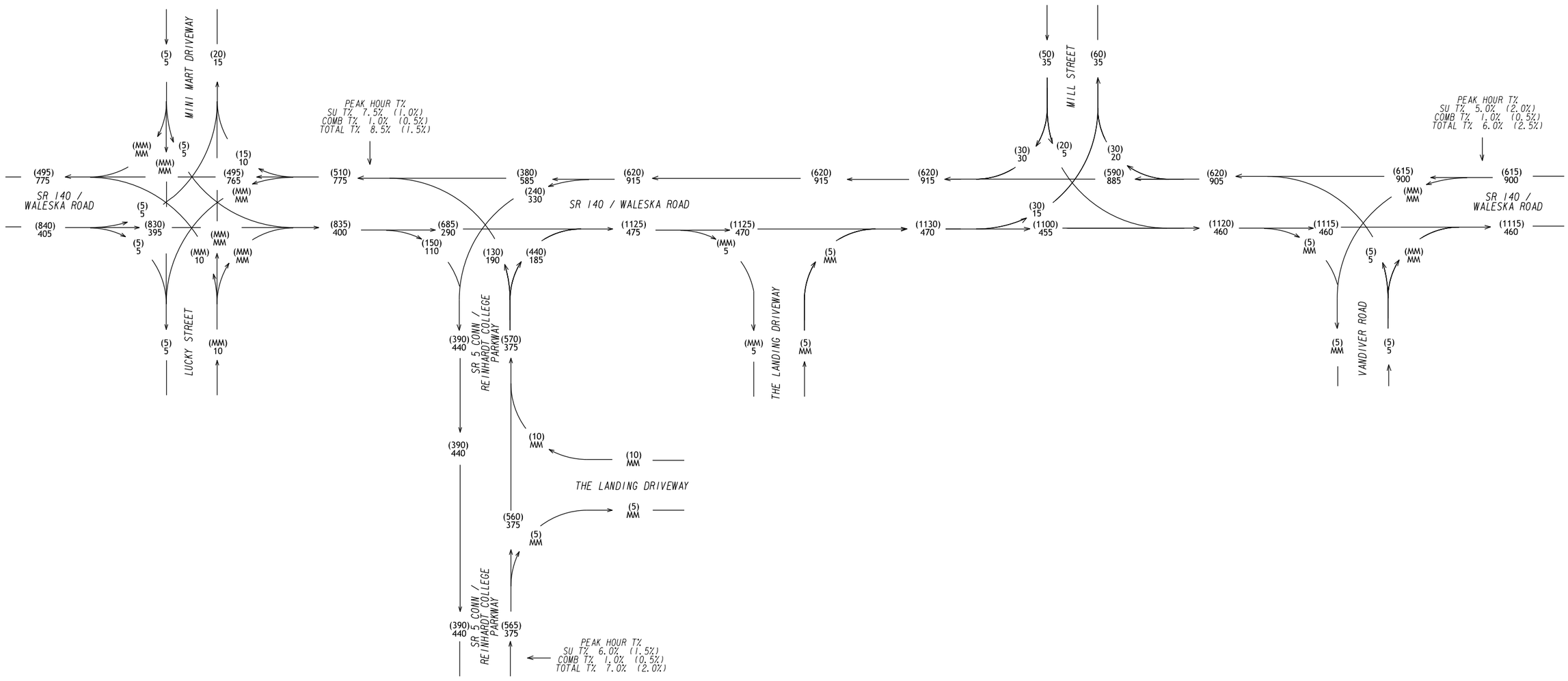
Per request, we have reviewed the consultant's design traffic forecasts for the above project. Based on the information furnished, we find the design traffic forecasts to be satisfactory, and the design traffic forecasting task to be complete for the above project. The reviewed and approved design traffic forecasts for the above project is attached in 0017982_10.pdf and 0017982_10.dgn.

If you have any questions concerning this information, please contact Andre Washington at 404-631-1925.

Nabarjun Vashisth
Gresham Smith
Design Traffic Review Consultant to GDOT
678-518-3665

MM/NV

DHV TRAFFIC VOLUMES
EXISTING YEAR (2022)
PM PEAK HOUR = (XXX)
AM PEAK HOUR = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

EXISTING

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2022 EXISTING DHV

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

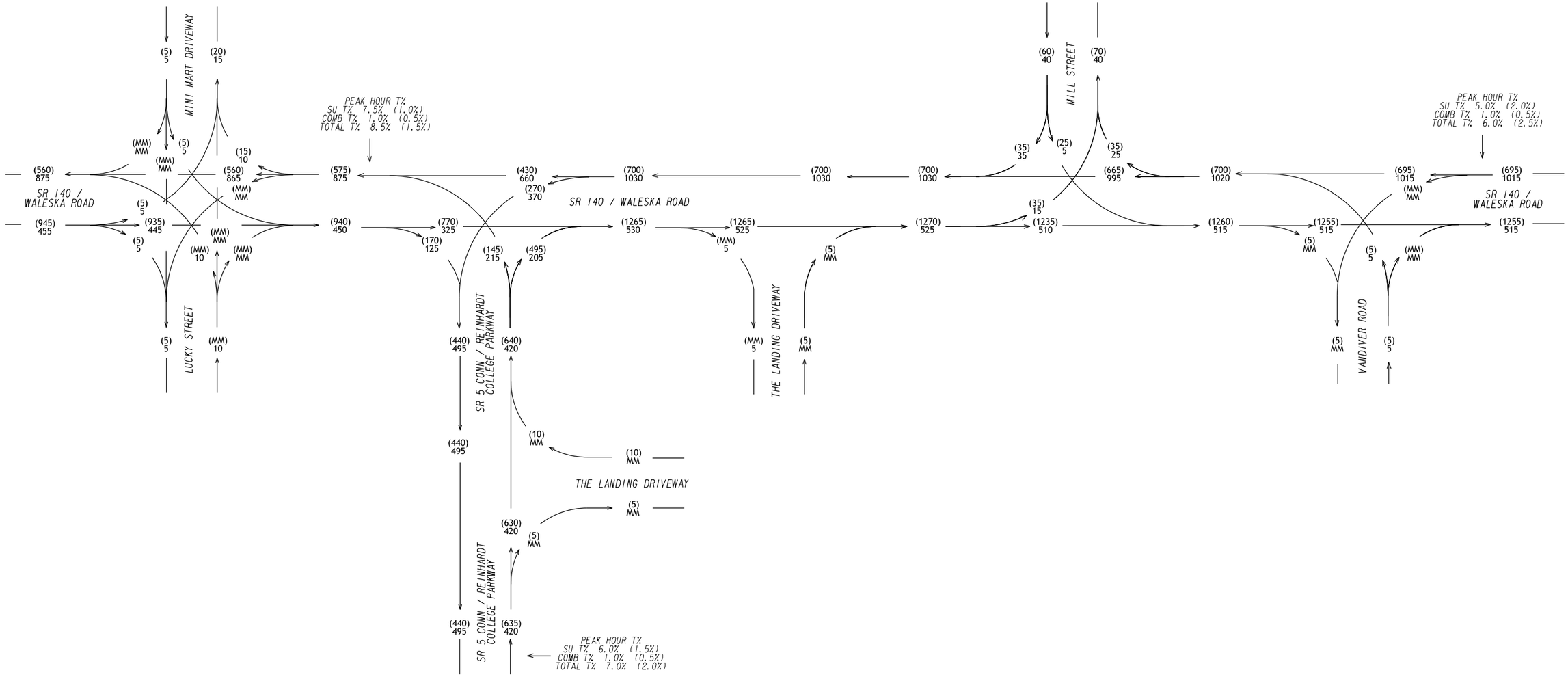
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0001
CORRECTED:		DATE:		
VERIFIED:		DATE:		

DHV TRAFFIC VOLUMES
OPEN YEAR (2028)
PM PEAK HOUR = (XXX)
AM PEAK HOUR = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2028 NO BUILD / BUILD DHV

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

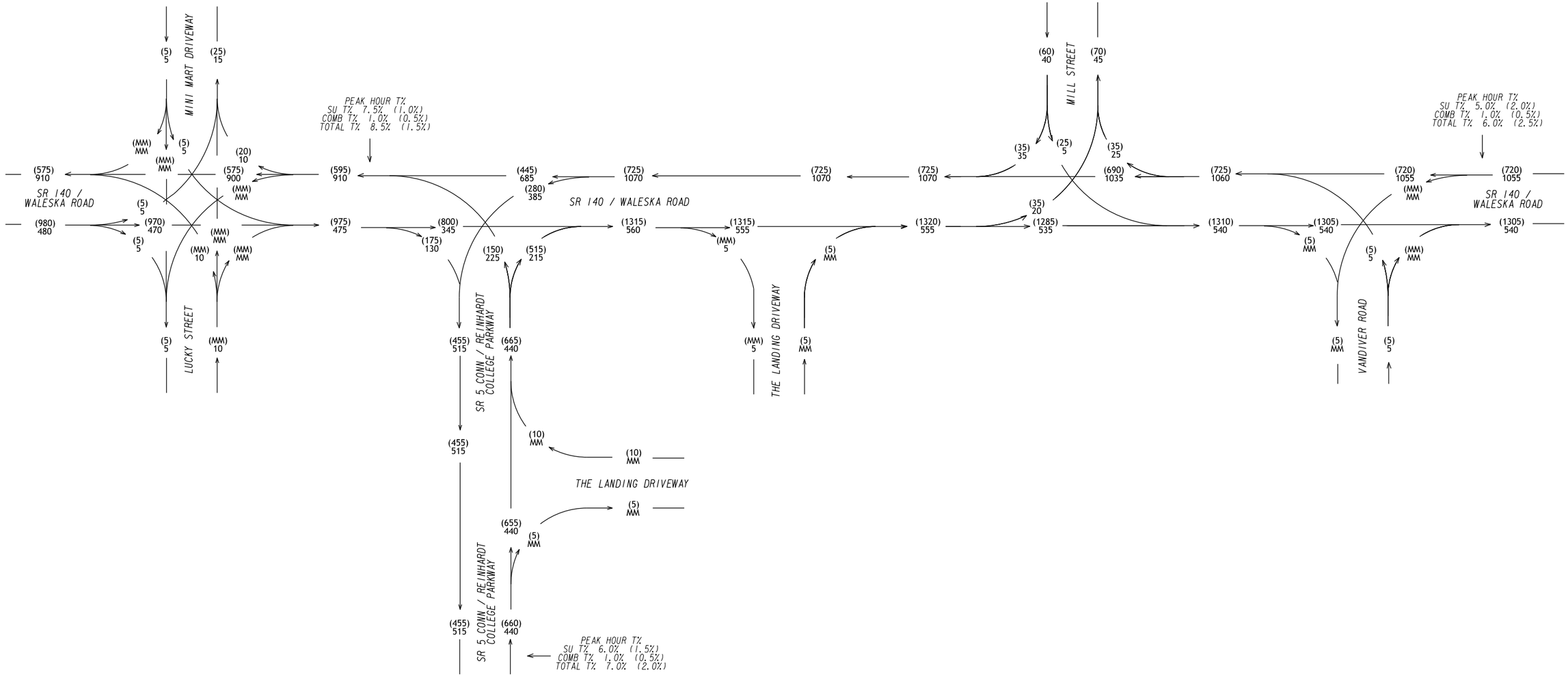
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0002
CORRECTED:		DATE:		
VERIFIED:		DATE:		

DHV TRAFFIC VOLUMES
OPEN YEAR + 2 (2030)
PM PEAK HOUR = (XXX)
AM PEAK HOUR = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2030 NO BUILD / BUILD DHV

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

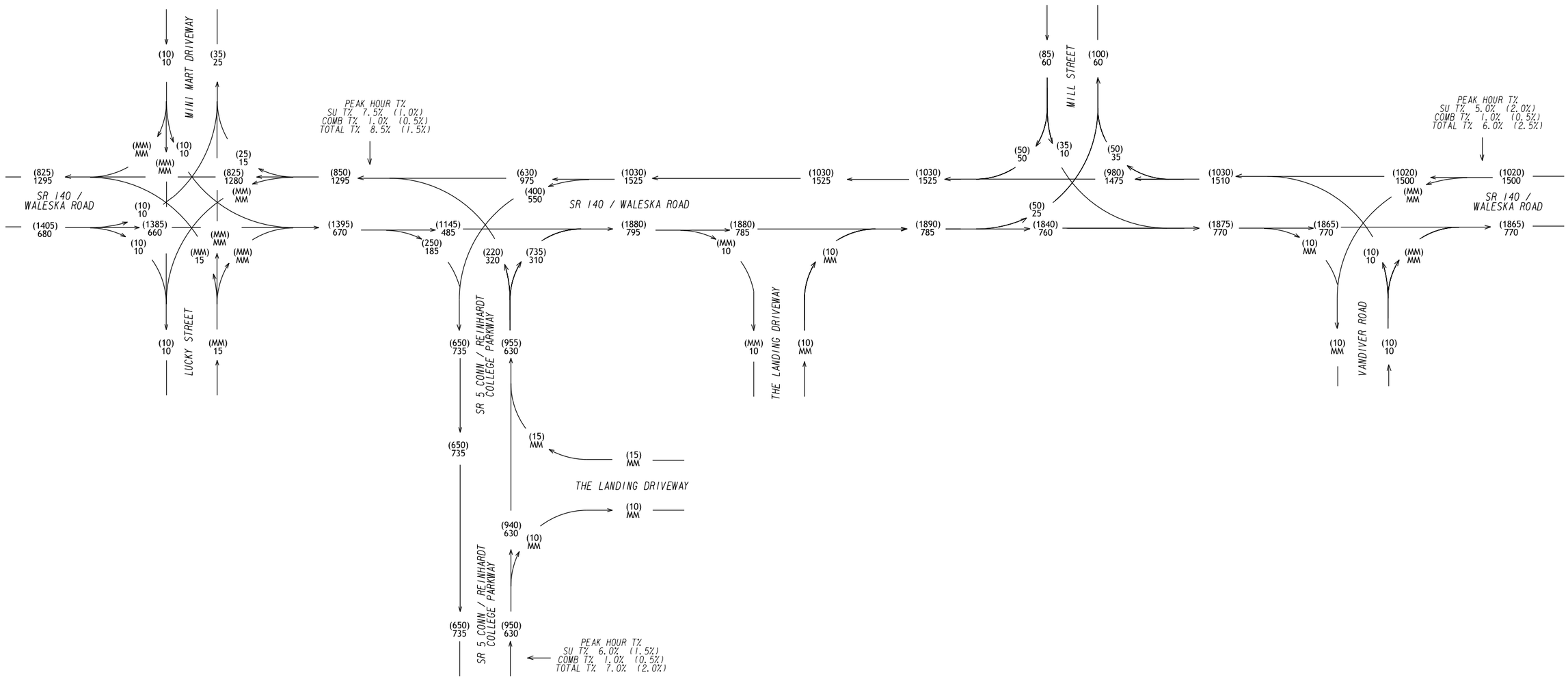
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0003
CORRECTED:		DATE:		
VERIFIED:		DATE:		

DHV TRAFFIC VOLUMES
DESIGN YEAR (2048)
PM PEAK HOUR = (XXX)
AM PEAK HOUR = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2048 NO BUILD / BUILD DHV

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

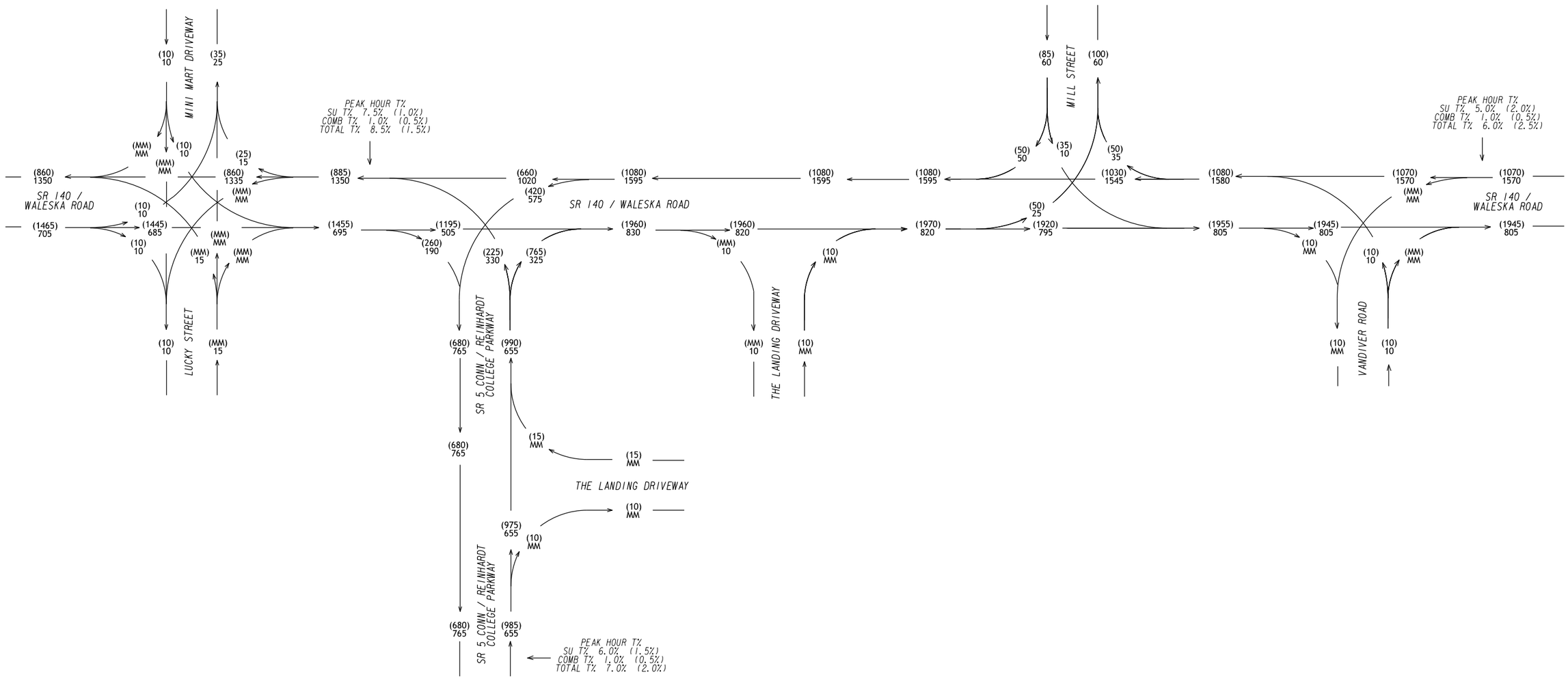
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0004
CORRECTED:		DATE:		
VERIFIED:		DATE:		

DHV TRAFFIC VOLUMES
DESIGN YEAR = 2 (2050)
PM PEAK HOUR = (XXX)
AM PEAK HOUR = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2050 NO BUILD / BUILD DHV

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

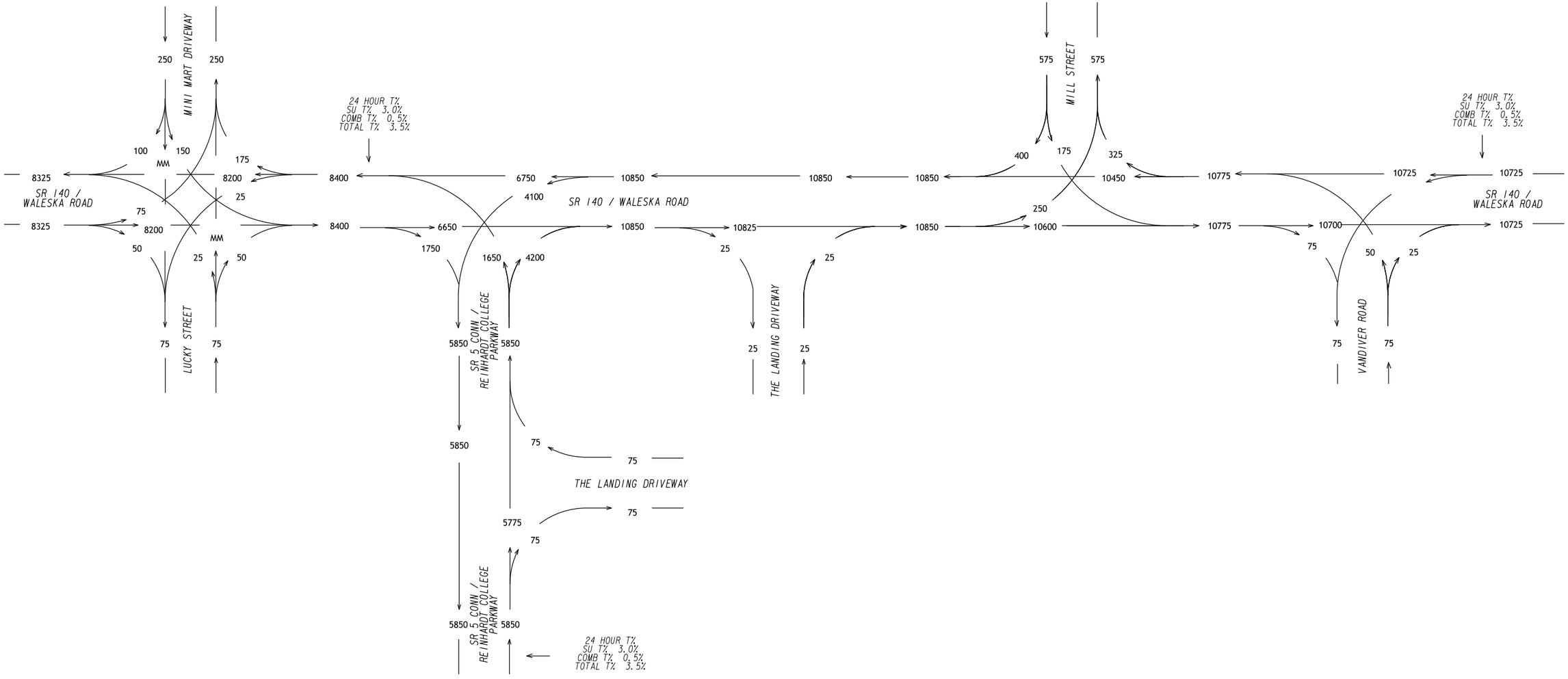
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0005
CORRECTED:		DATE:		
VERIFIED:		DATE:		

AADT TRAFFIC VOLUMES
EXISTING YEAR (2022)
AADT = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

EXISTING

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2022 EXISTING AADT

Michael Baker INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

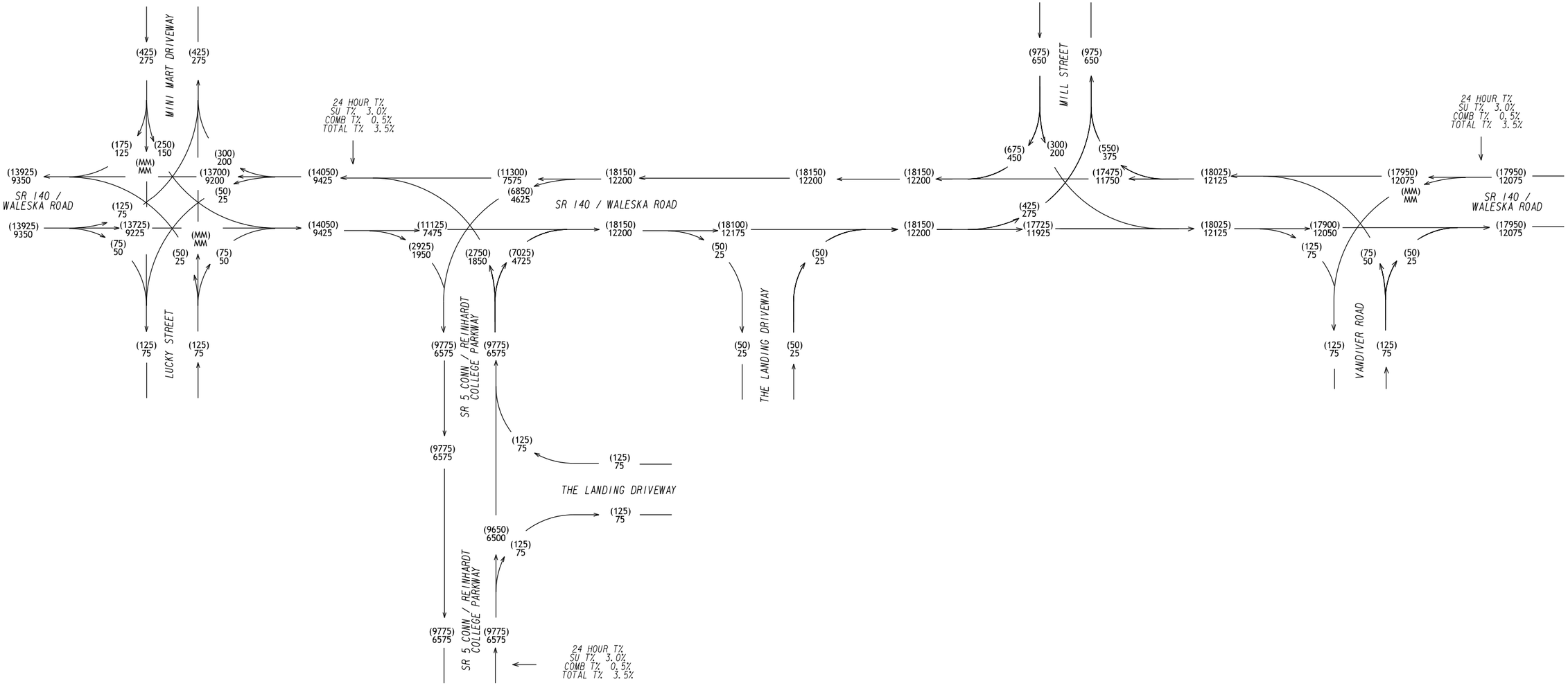
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0006
CORRECTED:		DATE:		
VERIFIED:		DATE:		

AADT TRAFFIC VOLUMES
DESIGN YEAR (2048)
AADT = (XXX)
OPEN YEAR (2028)
AADT = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2028/2048 NO BUILD / BUILD AADT

Michael Baker INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

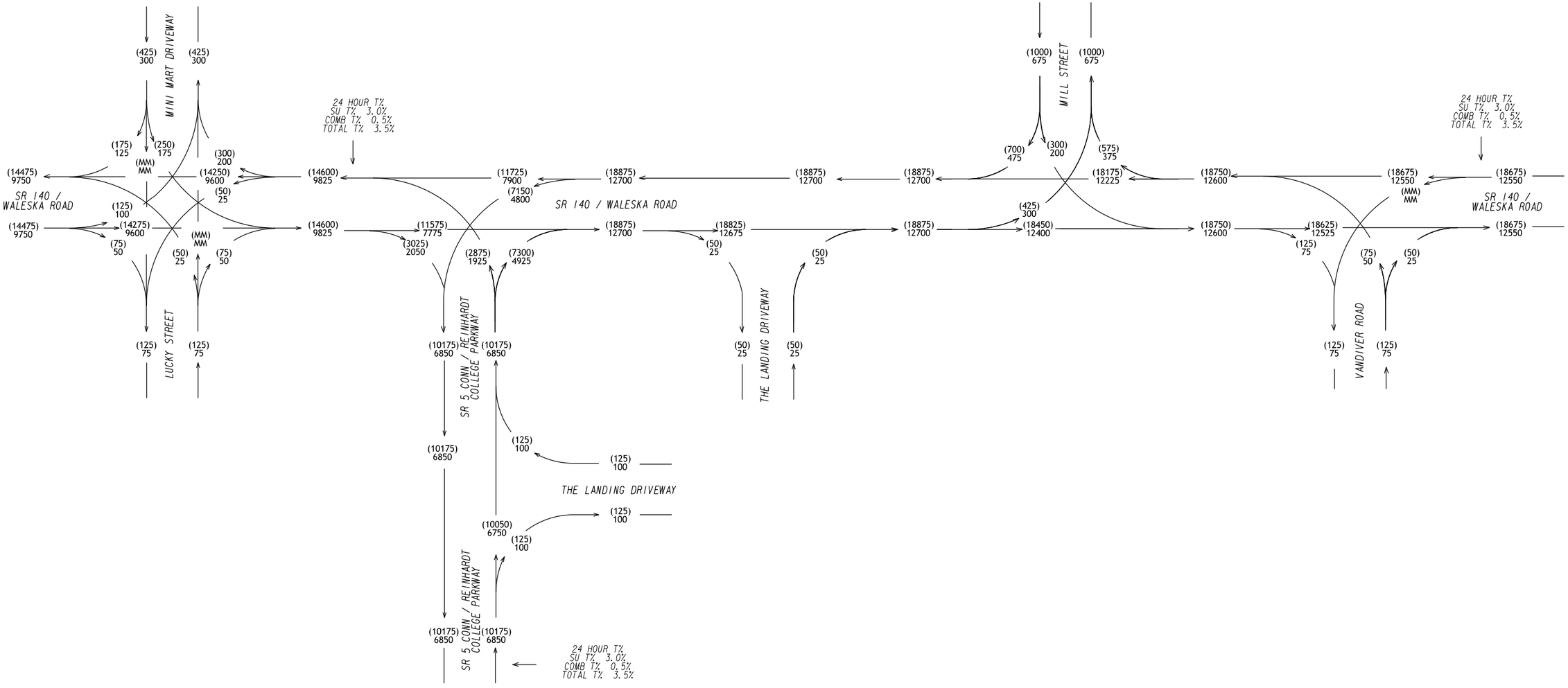
No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0007
CORRECTED:		DATE:		
VERIFIED:		DATE:		

AADT TRAFFIC VOLUMES
DESIGN YEAR + 2 (2050)
AADT = (XXX)
OPEN YEAR + 2 (2030)
AADT = XXX



NOTE: COUNTS COLLECTED DURING COVID-19 AND ADJUSTED PER GDOT FORECASTING GUIDANCE

NO BUILD / BUILD

PI# 0017982
CHEROKEE COUNTY
SR 140 @ SR 5 CONN

2030/2050 NO BUILD / BUILD AADT

Michael Baker
INTERNATIONAL
420 TECHNOLOGY PARKWAY, STE. 150
NORCROSS, GEORGIA 30092
(770) 263-9118

No Scale

REVISION DATES

TRAFFIC DIAGRAM

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		10-0008
CORRECTED:		DATE:		
VERIFIED:		DATE:		

SR 140 at SR 5 CONN Capacity Analysis Summary

Updated 08/28/2023

Interesection	Approach	Control	AM Peak						PM Peak					
			Approach			Intersection			Approach			Intersection		
			Delay (sec/veh)	LOS	SimTraffic 95th % Queue (Ft)	Delay (sec/veh)	LOS	V/C Ratio	Delay (sec/veh)	LOS	SimTraffic 95th % Queue (Ft)	Delay (sec/veh)	LOS	V/C Ratio
2022 EXISTING														
SR 140 at SR 5 CONN	Westbound	Signal	26.5	C	192	**14.7**	**B**	**0.60**	32.0	C	358	**24.6**	**C**	**0.82**
	Northbound	Signal	14.7	B	189				28.6	C	457			
	Southbound	Signal	9.9	A	209				12.6	B	193			
2028 NO BUILD														
SR 140 at SR 5 CONN	Westbound	Signal	31.4	C	325	**21.5**	**C**	**0.87**	42.8	D	465	**35.5**	**D**	**0.93**
	Northbound	Signal	11.2	B	174				32.2	C	873			
	Southbound	Signal	20.9	C	886				32	C	394			
2028 BUILD - ROUNDABOUT														
SR 140 at SR 5 CONN	Westbound	Roundabout	8.3	A	52	**9.5**	**A**	**0.60**	11.1	B	99	**8.5**	**A**	**0.59**
	Northbound	Roundabout	9	A	91				6.7	A	96			
	Southbound	Roundabout	10.5	B	141				8.1	A	59			
2048 NO BUILD														
SR 140 at SR 5 CONN	Westbound	Signal	42.0	D	715	**85.2**	**F**	**1.51**	**137.0**	**F**	2,967	**144.2**	**F**	**1.48**
	Northbound	Signal	16.3	B	88				**166.2**	**F**	1,742			
	Southbound	Signal	**142.9**	**F**	3,327				**122.4**	**F**	3,470			
2048 BUILD - Roundabout														
SR 140 at SR 5 CONN	Westbound	Roundabout	10.1	B	98	**23.1**	**C**	**0.93**	**114.5**	**F**	1,045	**43.9**	**D**	**1.21**
	Northbound	Roundabout	32.0	C	353				15.8	B	349			
	Southbound	Roundabout	25.6	C	558				8.4	A	109			
2048 BUILD - Continuous Green T														
SR 140 at SR 5 CONN	Westbound	Signal	37.9	D	1,010	**36.2**	**D**	**1.03**	**56.7**	**E**	2,990	**41.6**	**D**	**1.15**
	Northbound	Signal	25.6	C	160				32.7	C	893			
	Southbound	Signal	44.5	D	593				33.3	C	313			

2022 Existing Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	31.4	D			40.8	E		
	WB	Stop	32.4	D			0.0	A		
	NB	Free	0.1	A			0.1	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Signal	26.5	C	**14.7**	**B**	32.0	C	**24.6**	**C**
	NB	Signal	14.7	B			28.6	C		
	SB	Signal	9.9	A			12.6	B		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			31.7	D		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	20.2	C			40.3	E		
	NB	Free	0.3	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	19.3	C			37.9	E		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			10.3	B		

2028 No Build Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	36.1	E			52.0	F		
	WB	Stop	37.7	E			0.0	A		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Signal	31.4	C	**21.5**	**C**	42.8	D	**35.5**	**D**
	NB	Signal	11.2	B			32.2	C		
	SB	Signal	20.9	C			32	C		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			42.1	E		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	23.6	C			78.4	F		
	NB	Free	0.3	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	22.2	C			49.7	E		
	NB	Free	0.3	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			11.1	B		

2048 No Build Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	134.0	F			315.9	F		
	WB	Stop	157.8	F			0.0	A		
	NB	Free	0.2	A			0.1	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Signal	42.0	D	85.2	F	137.0	F	144.2	F
	NB	Signal	16.3	B			166.2	F		
	SB	Signal	142.9	F			122.4	F		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			1059.8	F		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	74.5	F			749.2	F		
	NB	Free	0.5	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	46.3	E			245.7	F		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			13.1	B		

2028 Build - Roundabout Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	36.1	E			52.0	F		
	WB	Stop	37.7	E			0.0	A		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Roundabout	8.3	A	**9.5**	**A**	11.1	B	**8.5**	**A**
	NB	Roundabout	9	A			6.7	A		
	SB	Roundabout	10.5	B			8.1	A		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			10.7	B		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	22.3	C			25.8	D		
	NB	Free	0.3	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	22.2	C			49.7	E		
	NB	Free	0.3	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			11.1	B		

2048 Build - Roundabout Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	134.0	F			315.9	F		
	WB	Stop	157.8	F			0.0	A		
	NB	Free	0.2	A			0.1	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Roundabout	10.1	B			114.5	F		
	NB	Roundabout	32.0	C	23.1	C	15.8	B	43.9	D
	SB	Roundabout	25.6	C			8.4	A		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			10.3	B		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	59.1	F			123.5	F		
	NB	Free	0.5	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	46.3	E			245.7	F		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			13.1	B		

2048 Build - Continuous Green T Capacity Analysis Results

Updated 08/28/2023

Interesection	Approach	Control	AM PEAK				PM PEAK			
			Approach		Overall		Approach		Overall	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
SR 140 @ Lucky Street	EB	Stop	134.0	F			315.9	F		
	WB	Stop	157.8	F			0.0	A		
	NB	Free	0.2	A			0.1	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ SR 5 CONN	WB	Signal - High T	37.9	D			56.7	E		
	NB	Signal - High T	25.6	C	36.2	D	32.7	C	41.6	D
	SB	Signal - High T	44.5	D			33.3	C		
SR 140 @ The Landings Driveway	WB	Yield	0.0	A			10.3	B		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 140 @ Mill Street	EB	Stop	59.1	F			123.5	F		
	NB	Free	0.5	A			0.3	A		
	SB	Free	0.0	A			0.0	A		
SR 140 at Vandiver	WB	Stop	46.3	E			245.7	F		
	NB	Free	0.0	A			0.0	A		
	SB	Free	0.0	A			0.0	A		
SR 5 Conn @ The Landings Driveway	EB	Free	0.0	A			0.0	A		
	WB	Free	0.0	A			0.0	A		
	SB	Yield	0.0	A			13.1	B		

GDOT ICE Tool: Waiver Form for Multiple RIRO Intersections

ICE Version 2.2
Revised 10/01/2021

Project PI# (if applicable): 0017982

Study Intersection	Existing Intersection Type	Design Year Avg Daily Traffic (ADT)		Traffic Operations (optional):[1]			
				Opening Year		Design Year	
		Major Rd	Minor Rd	Delay	V/C	Delay	V/C
SR 140 at the Landings	Other	36,300	100	42.1 sec	0.81	900+	1.36
Reinhardt College Pkwy at the Landings	Other	19,550	250	11.1 sec	0.24	13.1 sec	0.37

[1] Capacity data is optional unless needed to justify basis of the waiver request.

Approved By: _____ Digitally signed by Alan Davis DN: C=US, E=aadavis@dot.ga.gov, O=Georgia Department of Transportation, OU=Traffic Operations, CN=Alan Davis Date: 2023.05.10 21:02:55-04'00' Date: _____ Name: _____

Chief Engineer or (Approved Delegate)

GDOT ICE TOOL: Waiver Form for Multiple TWSC Intersections

ICE Version 2.2
Revised 10/01/2021

Project PI# (or N/A):

0017982

Study Intersection	Existing Intersection Control	Proposed # Lanes on Mainline	Design Year Avg Daily Traffic		Minor Rd Percent	Open Year Warrants Met?		Traffic Operations Data[1]				Safety Data			
			Major Rd	Minor Rd		AWSC	Signal	Opening Year Delay	Opening Year V/C	Design Year Delay	Design Year V/C	Crash Severity PDO	Injury	Fatal	Total
SR 140 at 920 Waleska Road North Driveway	Conventional (Minor Stop)	2	28100	25	0.1%	No	No	N/A	N/A	N/A	N/A	0	0	0	0
SR 140 at 920 Waleska Road South Driveway	Conventional (Minor Stop)	2	28100	25	0.1%	No	No	N/A	N/A	N/A	N/A	0	0	0	0
SR 140 at 997 Reinhardt College Pkwy	Conventional (Minor Stop)	3	28100	25	0.1%	No	No	N/A	N/A	N/A	N/A	0	0	0	0
SR 140 at Lucky Street/ Mini Mart	Conventional (Minor Stop)	2	28100	850	2.9%	No	No	54.6	0.1	446	0.7	7	2	0	9
SR 140 at Mill Street	Conventional (Minor Stop)	3	36300	1950	5.1%	No	No	42	0.22	268.7	0.93	14	3	0	17
SR 140 at Vandiver Rd	Conventional (Minor Stop)	3	36050	250	0.7%	No	No	49.7	0.1	245.7	0.45	2	1	0	3
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0
	--- select one ---				0.0%	No	No					0	0	0	0

Notes:

[1] Traffic Operations data is optional unless needed to justify basis of the waiver request

Study intersections shown in **BOLD** indicate that the below criteria is met and a full ICE should be performed for this location:

- The existing intersection type is anything other than a conventional Two-Way (Minor Street) Stop Control
- AWSC is warranted and potentially feasible for the given cross section
- The minor street ADT is greater than that 10% of the overall intersection total
- Signal Warrants are met

Approved By: Digitally signed by Alan Davis DN: C=US, E=paladavis@dot.ga.gov, O=Georgia Department of Transportation, OU=Traffic Operations, CN=Alan Davis Date: 2023.05.10 21:03:08-04'00' **Date:** _____ **Name:** _____

GDOT INTERSECTION CONTROL EVALUATION (ICE) TOOL

ICE Version 2.22 | Revised 5/6/2022

GDOT PI#:	0017982	Request By:			
County:	Cherokee	GDOT District: 6 - Cartersville			
Major Road:	SR 140	Road Class:	Minor Arterial	Speed Limit:	45 mph
Crossing Road:	SR 5 Conn	Road Class:	Minor Arterial	Speed Limit:	45 mph
Major Rd Direction:	North/South	Area Type:	Suburb/Transition		
Intersection Control:	Signal (turn lanes on mainline)	Project ID:			
Prepared By:		Date:	8/29/2023		
Project Purpose:	Intersection Improvement				

Existing Data Year:	2022
Project Opening Year:	2028
Project Design Year:	2048
Annual Growth Rate:	2.0%
K Factor*:	8%

* K Factor = Proportion of average annual daily traffic occurring in the highest one hour of the day

LEGEND:

000 = AM Peak Approach Volume

(000) = PM Peak Approach Volume

[000] = ADT Volume (Estimate)

2022 EXISTING YEAR VOLUMES

APPROACH SPLITS:

SR 140: 76%

SR 5 Conn: 24%

				915 (620) [21700]						
				(0) (0) (380) (240)						
			SB SR 140	0 0 585 330			WB SR 5 Conn			
				Peds			Peds	0	(0)	
(0)	0							185	(440)	
(0)	0		2022 Intersection Daily Entering Volume (est): 25,100					0	(0)	375 (570) [11700]
(0)	0							190	(130)	
(0)	0	Peds					Peds			
[0] (0) 0		EB SR 5 Conn	0	290	110	0	NB SR 140			
			(0)	(685)	(150)	(0)				
			400 (835) [16800]							

PEAK HR % TRUCKS:

EB	WB	NB	SB
1%	5%	5%	5%

2028 OPENING YEAR VOLUMES

				1030 (700) [24400]						
				(0) (0) (430) (270)						
			SB SR 140	0 0 660 370			WB SR 5 Conn			
				Peds			Peds	0	(0)	
(0)	0							205	(495)	
(0)	0		2028 Intersection Daily Entering Volume (est): 28,200					0	(0)	420 (640) [13150]
(0)	0							215	(145)	
(0)	0	Peds					Peds			
[0] (0) 0		EB SR 5 Conn	0	325	125	0	NB SR 140			
			(0)	(770)	(170)	(0)				
			450 (940) [18850]							

2048 DESIGN YEAR VOLUMES

				1525 (1030) [36300]						
				(0) (0) (630) (400)						
			SB SR 140	0 0 975 550			WB SR 5 Conn			
				Peds			Peds	0	(0)	
(0)	0							310	(735)	
(0)	0		2048 Intersection Daily Entering Volume (est): 41,975					0	(0)	630 (955) [19550]
(0)	0							320	(220)	
(0)	0	Peds					Peds			
[0] (0) 0		EB SR 5 Conn	0	485	185	0	NB SR 140			
			(0)	(1145)	(250)	(0)				
			670 (1395) [28100]							

Introduction: In 2005, SAFETEA-LU established the Highway Safety Improvement Program (HSIP) and mandated that each state prepare a Strategic Highway Safety Plan (SHSP) to prioritize safety funding investments. Intersections quickly became a common component of most states' SHSP emphasis areas and HSIP project lists, including Georgia's SHSP. Intersection Control Evaluation (ICE) policies and procedures represent a traceable and transparent procedure to streamline the evaluation of intersection control alternatives, and further leverage safety advancements for intersection improvements beyond just the safety program. Approximately one-third of all traffic fatalities and roughly seventy five percent of all traffic crashes in Georgia occur at or adjacent to intersections. Accordingly, the Georgia SHSP includes an emphasis on enhancing intersection safety to advance the *Toward Zero Deaths* vision embraced by the Georgia Governor's Office of Highway Safety (GOHS). This ICE tool was developed to support the ICE policy, developed and adopted to help ensure that intersection investments across the entire Georgia highway system are selected, prioritized and implemented with defensible benefits for safety towards those ends.

Tool Goal: The goal of this ICE tool is to provide a simplified and consistent way of importing traffic, safety, cost, environmental impact and stakeholder posture data to assess and quantify intersection control improvement benefits. The tool supports the ICE policy and procedures to provide traceability, transparency, consistency and accountability when identifying and selecting an intersection control solution that both meets project purpose and reflects overall best value in terms of specific performance-based criteria.

Requirements: An ICE is required for any intersection improvement (e.g. new or modified intersection, widening/reconstruction or corridor project, or work accomplished through a driveway or encroachment permit that affects an intersection) where: **1)** the intersection includes at least one roadway designated as a State Route (State Highway System) or as part of the National Highway System; or **2)** the intersection will be designed or constructed using State or Federal funding. In certain circumstances where an ICE would otherwise be required, the requirement may be waived based on appropriate evidence presented with a written request. (See the "**Waiver**" tab to review criteria that may make a project waiver eligible and for instructions to submit a waiver request to the Department). An ICE is not required when the proposed work does not include any changes to the intersection design, involves only routine traffic signal timing and equipment maintenance, or for driveway permits where the driveway is not a new leg to an already existing intersection on either 1) a divided, multi-lane highway with a closed median and only right-in/right-out access or 2) an undivided roadway where the development is not required to construct left and/or right turn lanes (as per the Driveway Manual and District Traffic Engineer).

Two-Stage Process: A complete ICE process consists of two (2) distinct stages, and it is expected that the respective level of effort for completing both stages of ICE will correspond to the magnitude and complexity of the intersection. Prior to starting an ICE, the District Traffic Engineer and/or State Traffic Engineer should be consulted for advice on an appropriate level of effort. The Stage 1 and Stage 2 ICE forms are designed minimize required data inputs using drop-down menu choices and limiting text entry. All fields shaded grey include drop down menu choices and all fields shaded blue require data entry. All other cells in the worksheet are locked.

Stage 1: Screening Decision Record Stage 1 should be conducted early in the project development process and is intended to inform which alternatives are worthy of further evaluation in Stage 2. Stage 1 serves as a screening effort meant to *eliminate* non-competitive options and identify which alternatives merit further considerations based on their practical feasibility. Users should use good engineering judgement in responding to the seven policy questions by selecting "Yes" or "No" in the drop-down boxes. Alternatives should not be summarily eliminated without due consideration, and reasons for eliminating or advancing an alternative should be documented in the "Screening Decision Justification" column.

Stage 2: Alternative Selection Decision Record Stage 2 involves a more detailed and familiar evaluation of the alternatives identified in Stage 1 in order to support the selection of a preferred alternative that may be advanced to detailed design. Stage 2 data entry may require the use of external analysis tools to determine costs, operations and/or safety data that, combined with environmental and stakeholder posture data, form the basis of the ICE evaluation. A separate "CostEst" worksheet tab helps users develop pre-planning-level cost estimates for each Stage 2 alternative evaluated, and a separate Users Guide has been prepared to give guidance on Stage 1 and Stage 2 data entry. Once all data is entered, each alternative is scored and ranked, with the results reported at the bottom of the Stage 2 worksheet to inform on the best of the intersection controls evaluated for project recommendation.

Documentation: A complete ICE document consists of the combination of the outputs from either a completed and signed waiver form or both Stage 1 and Stage 2 worksheets (along with supporting costing and/or environmental documentation), to be included in the approved project Concept Report (or equivalent) or as a stand-alone document.

GDOT ICE STAGE 1: SCREENING DECISION RECORD

ICE Version 2.22 | Revised 5/6/2022

GDOT PI #	0017982
Project Location:	SR 140 @ SR 5 Conn
Existing Control:	Signal (turn lanes on mainline)
Prepared by:	
Date:	8/29/2023

Answer "Yes" or "No" to each policy question for each control type to identify which alternatives should be evaluated in the Stage 2 Decision Record; enter justification in the rightmost column

Note: Up to 5 alternatives may be selected and evaluated; Use this ICE Stage 1 to screen 5 or fewer alternatives to evaluate in Stage 2

	Intersection Alternative (see "Intersections" tab for detailed description of intersection/interchange type)	1. Does alternative address the project need in a balanced manner and in scale with the project?	2. Does alternative improve safety performance in terms of reducing severe crashes?	3. Does alternative incorporate safety, convenience and accessibility for pedestrians and/or bicyclists?	4. Does alternative improve (or preserve) traffic operations (congestion, delay, reliability, etc.)?	5. Does alternative appear feasible given the site characteristics, constrains & location context?	6. Does alternative appear feasible with respect to other project factors?	7. Overall feasible alternative (select alternative for further evaluation in Stage 2)?	Screening Decision Justification:
Unsignalized Intersections	Conventional (Minor Stop)	No	No	No	No	No	No	No	Existing is Signalized
	Conventional (All-Way Stop)	No	No	No	No	No	No	No	Existing is Signalized
	Mini Roundabout	No	No	No	No	No	No	No	Traffic Volumes too high
	Single Lane Roundabout	No	No	No	No	No	No	No	Traffic volumes too high
	Multilane Roundabout	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	Roundabout is long term planning design for city
	RCUT (stop control)	No	No	No	No	No	No	No	Existing is Signalized
	RIRO w/down stream U-Turn	No	No	No	No	No	No	No	Existing is Signalized
	High-T (unsignalized)	No	No	No	No	No	No	No	Existing is Signalized
	Offset-T Intersections	No	No	No	No	No	No	No	Existing is Signalized
	Diamond Interch (Stop Control)	No	No	No	No	No	No	No	Not feasible given space constraints
	Diamond Interch (RAB Control)	No	No	No	No	No	No	No	Not feasible given space constraints
	Add LT Lanes on SR 22 No RT Lane Improvements	No	No	No	No	No	No	No	Existing is Signalized
	Other unsignalized (provide description):	No	No	No	No	No	No	No	Existing is Signalized
Signalized Intersections	Traffic Signal	No	No	No	No	No	No	No	Existing is Signalized
	Median U-Turn (Indirect Left)	No	No	No	No	No	No	No	No good location for downstream uturn
	RCUT (signalized)	No	No	No	No	No	No	No	No good location for downstream uturn
	Displaced Left Turn (CFI)	No	No	No	No	No	No	No	not appropriate for volumes at intersection and project constraints
	Continuous Green-T	**Yes**	**No**	**No**	**Yes**	**No**	**No**	**Yes**	feasible with volume distribution and lower ROW impacts
	Jughandle	No	No	No	No	No	No	No	Not feasible given space constraints
	Quadrant Roadway	No	No	No	No	No	No	No	Not feasible given space constraints
	Diamond Interch (Signal Control)	No	No	No	No	No	No	No	Not feasible given space constraints
	Diverging Diamond	No	No	No	No	No	No	No	Not feasible given space constraints
	Single Point Interchange	No	No	No	No	No	No	No	Not feasible given space constraints
	No LT Lane Improvements No RT Lane Improvements	No	No	No	No	No	No	No	More improvements required
	Other Signalized (provide description):	No	No	No	No	No	No	No	

= Intersection type selected for more detailed analysis in Stage 2 Alternative Selection Decision Record

GDOT ICE STAGE 2: ALTERNATIVE SELECTION DECISION RECORD

ICE Version 2.22 | Revised 5/6/2022

Project Location: SR 140 @ SR 5 Conn
Existing Intersection Control: Signal (turn lanes on mainline)
Type of Analysis: Conventional Non-Safety Funded Project

District: 6 - Cartersville
County: Cherokee
Area: Suburb/Transitic

GDOT PI #: 0017982
Prepared by:
Date: 8/29/2023

Opening / Design Year Traffic Operations

Intersection meets signal/AWS warrants?	Meets Signal Warrants	
Traffic Analysis Measure of Effectiveness	Intersection Delay	
Traffic Analysis Software Used	Synchro	
Analysis Time Period	AM Peak Hr	PM Peak Hr
2028 Opening Yr No-Build Peak Hr Intersection Delay	21.5 sec	35.5 sec
2028 Opening Yr No-Build Peak Hr Intersection V/C	0.87	0.93
2048 Design Yr No-Build Peak Hr Intersection Delay	85.2 sec	144.2 sec
2048 Design Yr No-Build Peak Hr Intersection V/C	1.51	1.48

Complete Streets Warrants Met?
- ☐ PEDESTRIANS
- ☐ BICYCLES
- ☐ TRANSIT

Crash Data: Enter most recent 5 years of crash data	*Crash Severity* K*	A*	B*	C*	O	Years: 5
Crash Type: Angle	0	1	0	1	5	10%
Head-On	0	0	0	0	1	1%
Rear End	0	0	0	0	51	72%
Sideswipe - same	0	0	0	9	1	14%
Sideswipe - opposite	0	0	0	0	0	0%
Not Collision w/Motor Veh	0	0	1	0	1	3%
TOTALS:	0	1	1	10	59	71

* Number of crashes resulting in injuries / fatalities, not number of persons

Alternatives Analysis:	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Proposed Control Type/Improvement:	Multilane Roundabout	Continuous Green-T	N/A	N/A	N/A
Project Cost: (From CostEst Worksheet)	*Additional description here*	*Additional description here*	*Additional description here*	*Additional description here*	*Additional description here*
Construction Cost	$6,811,447	$7,303,337			
ROW Cost	$1,151,000	$1,375,325			
Environmental Cost	$405,000	$405,000			
Reimbursable Utility Cost	$288,000	$240,000			
Design & Contingency Cost	$1,200,000	$1,200,000			
Cost Adjustment (justification req'd)	0%	0%			
Total Cost	$9,855,447	$10,523,662			
	User Cost Override	*User Cost Override*			
Traffic Operations:					
Traffic Analysis Software Used	Sidra	Synchro			
Analysis Period	AM Peak Hr / PM Peak Hr	AM Peak Hr / PM Peak Hr			
2048 Design Yr Build Intersection Delay	23.1 sec / 43.9 sec	35.6 sec / 41.5 sec			
2048 Design Yr Build Intersection V/C	0.93 / 1.20	1.00 / 1.01			
Safety Analysis:					
Predefined CRF: PDO	26%	1%			
Predefined CRF: Fatal/Inj	71%	15%			
Predefined CRF Source:	FHWA Clearinghouse #s 4196 / 4195	FHWA Clearinghouse #s 8655 / 8656			
User Defined CRF: PDO					
User Defined CRF: Fatal/Inj					
User Defined CRF Source (write in if applicable):					
Environmental Impacts:[1]					
Historic District/Property	None	None			
Archaeology Resources	None	None			
Graveyard	None	None			
Stream	None	None			
Underground Tank/Hazmat	None	None			
Park Land	None	None			
EJ Community	None	None			
Wooded Area	None	None			
Wetland	None	None			
	*Note: If environmental impact is significant (**RED**), provide justification impact won't jeopardize project delivery using "Env" worksheet*				
Stakeholder Posture:	[1] *Environmental impacts are only preliminary estimates; detailed environmental impact documentation will be included with project concept report*				
Local Community Support	Unknown	Unknown			
GDOT Support	Unknown	Unknown			
Final ICE Stage 2 Score:	**6.2**	**4.0**			
Rank of Control Type Alternatives:	**1**	**2**			
Final Intersection Control Selection:	**1 - Multilane Roundabout**				

Note: Stage 2 score is not given (shown as "-") if signal or AWS is selected as control type but respective warrants are not met

Provide additional comments and/or explain any unique analysis inputs, or results (as necessary): An improved roundabout layout with an Eastbound LR-R lane configurations was compared against an improved High-T intersection layout with two northbound through lanes to provide the most equitible results. Design year traffic volumes include rerouted traffic from the relocated Cherokee High school which will be located on Reinhardt College Parkway for the most conservative analysis.

P.I. Number: 0017982

MS4 Concept Report Summary

MS4 Concept Workflow Based on Project Type

- Safety, bridge replacement, operational and intersection improvement, or passing lane projects:
    - Evaluate for PLE 1-4 and 6. PLE 5 will be evaluated during Preliminary Design.
        - If PLE 1-4 or 6 apply, fill out the PLE Evaluation section and include in the Concept Report. Also submit PLE Documentation per the MS4 Help File to stormreports@dot.ga.gov.
        - If the project does not qualify for PLE 1-4 or 6, include the PLE Concept Evaluation Section in the Concept Report, indicating that no Project Level exclusion applies to the project.
            - Add 4% to the project construction and ROW cost estimate.
- Signs, resurfacing, bridge rehabilitation, cable barrier, guardrail, ITS, or signal upgrades (with no added lanes):
    - Notify stormreports@dot.ga.gov. However, do not fill out the rest of the MS4 Concept Report Summary.
    - Place a note in the project file indicating that PLE 3 applies to this project.
- Reconstruction or New Construction projects:
    - Evaluate for PLE 1-4 and 6. PLE 5 will be evaluated during Preliminary Design.
        - If PLE 1-4 or 6 apply, fill out the PLE Concept Evaluation section and include in the Concept Report. Also submit PLE Documentation per the MS4 Help File to stormreports@dot.ga.gov.
        - If the project does not qualify for PLE 1-4 or 6, include the PLE Concept Evaluation Section in the Concept Report, indicating that no Project Level exclusion applies to the project.
            - Fill out the Concept Outfall Evaluation and include in the Concept Report.
                - Add about 4% to the project construction and ROW cost estimate. However, do consider number of structural BMPs which are anticipated to be built to adjust this percentage.

PLE Evaluation

Attach the following checklist information to the Concept Report Template:

Is there a Project Level Exclusion that applies to this project: ☒ No ☐ Yes

If yes, please indicate which of the following exclusions apply:

☐ 1. Roadways that are not owned or operated (maintained) by GDOT may not require post-construction BMPs. Coordinate with the appropriate local government or entity to determine stormwater management requirements.

☐ 2. The project location is not within a designated MS4 area.

☐ 3. Maintenance and safety improvement projects whereby the sites are not connected and disturb less than one acre at each individual site. This includes projects such as repaving, bridge maintenance, maintenance projects that do not add impervious surface area, driveway access paving, shoulder paving and building, fiber optic line installation, sign addition, safety projects whereby the sites are not connected and the individual site disturbs less than one acre, and sound barrier installation.

☐ 4. Projects that have their environmental documents approved or right-of-way plans submitted for approval on or before June 30th, 2012.

5. Road projects that disturb less than 1 acre or for site development projects that add less than 5,000 ft^2 of impervious area **(Evaluate during Preliminary Design).**

☐ 6. Projects in MS4 areas added to GDOT's 2017 MS4 permit with concept approval (start of preliminary engineering) before January 3, 2018.

Concept Outfall Evaluation

Complete the tables below and include as an attachment to the Concept Report. Add additional rows, if necessary. It is understood that this information will be approximate based on available information at the time of the concept.

Drainage Area Summary		
Outfall	Pre-Development Area (Acres)	Post-Development Area (Acres)
1	25.29	25.29
2	0.88	0.88

Concept Level Judgement	
Outfall	Using a concept level judgement, is this outfall likely to have a structural BMP? *This will be finalized later in the design process.
1	Yes
2	No - negligible increase in impervious area

In addition to the above charts, attach the Drainage Area Map (using existing topographic information) to the Concept Report.

Things to consider while making this concept level judgement are:

- Discharges which exit right-of-way as sheet flow
- Flows that originate offsite
- Reduction or no change (or negligible increase) in impervious area
- Impact on a cultural / community resource
- Displacement of residence or business
- Violation of state or federal law (e.g. fill in a FEMA zone or structural BMP in the clear zone)

APPENDIX A

DRAINAGE AREA MAPS

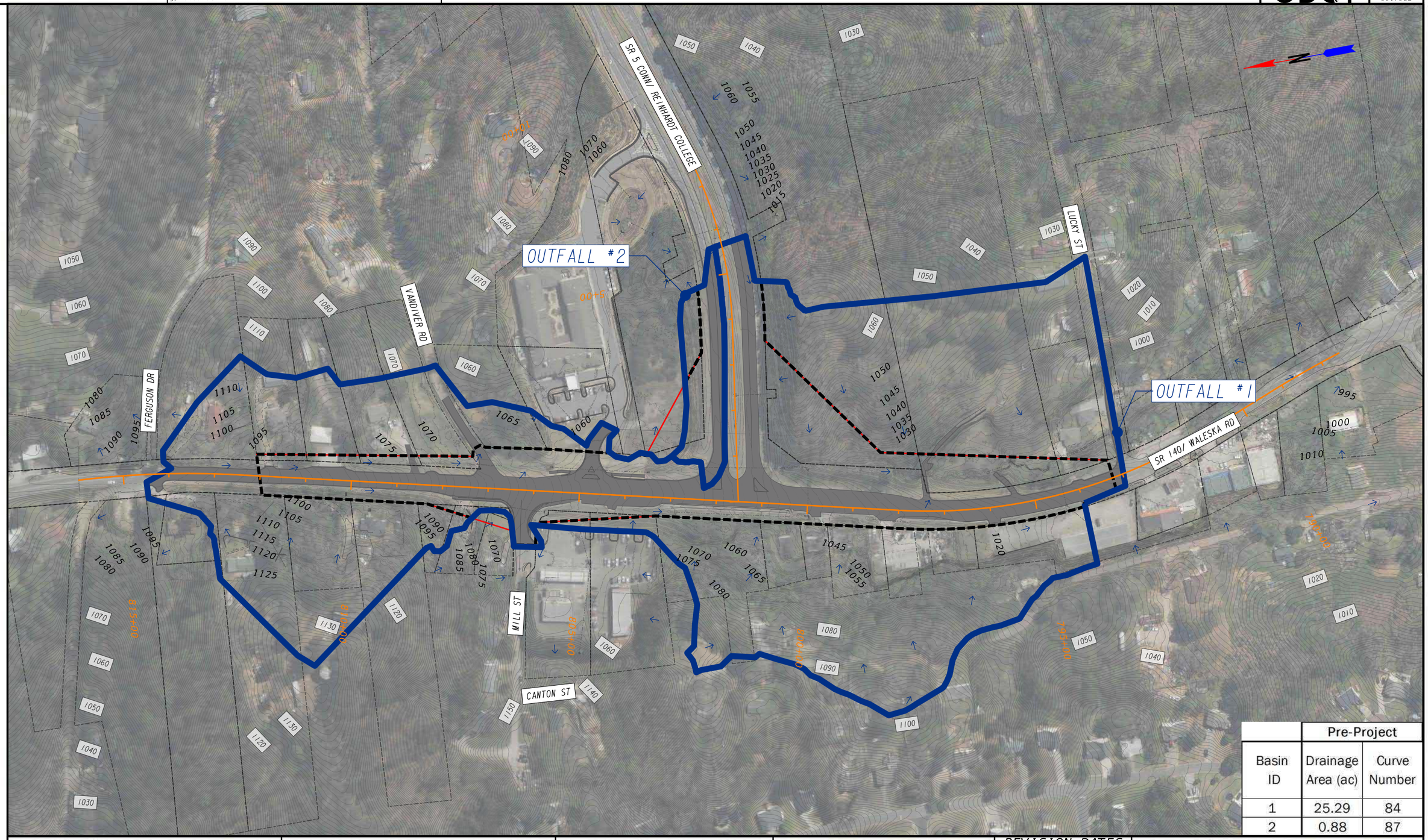
4/20/2023 12:39:53 PM
ZacharyDavis

GPLOT-ORD
gplotborder-ORD-PO.tbl

PI0017982DAM EX.dgn

GDOT

P.I. No.
0017982



	Pre-Project	
Basin ID	Drainage Area (ac)	Curve Number
1	25.29	84
2	0.88	87

DRAINAGE AREA TO STUDY POINT
ON-SITE AREA TO STUDY POINT
EXISTING IMPERVIOUS AREA

ULICK ENGINEERING LLC
STORMWATER | HYDRAULICS | EROSION CONTROL
AIRFIELD & CIVIL SITE | CONSTRUCTION SERVICES

GDOT
Georgia Department of Transportation

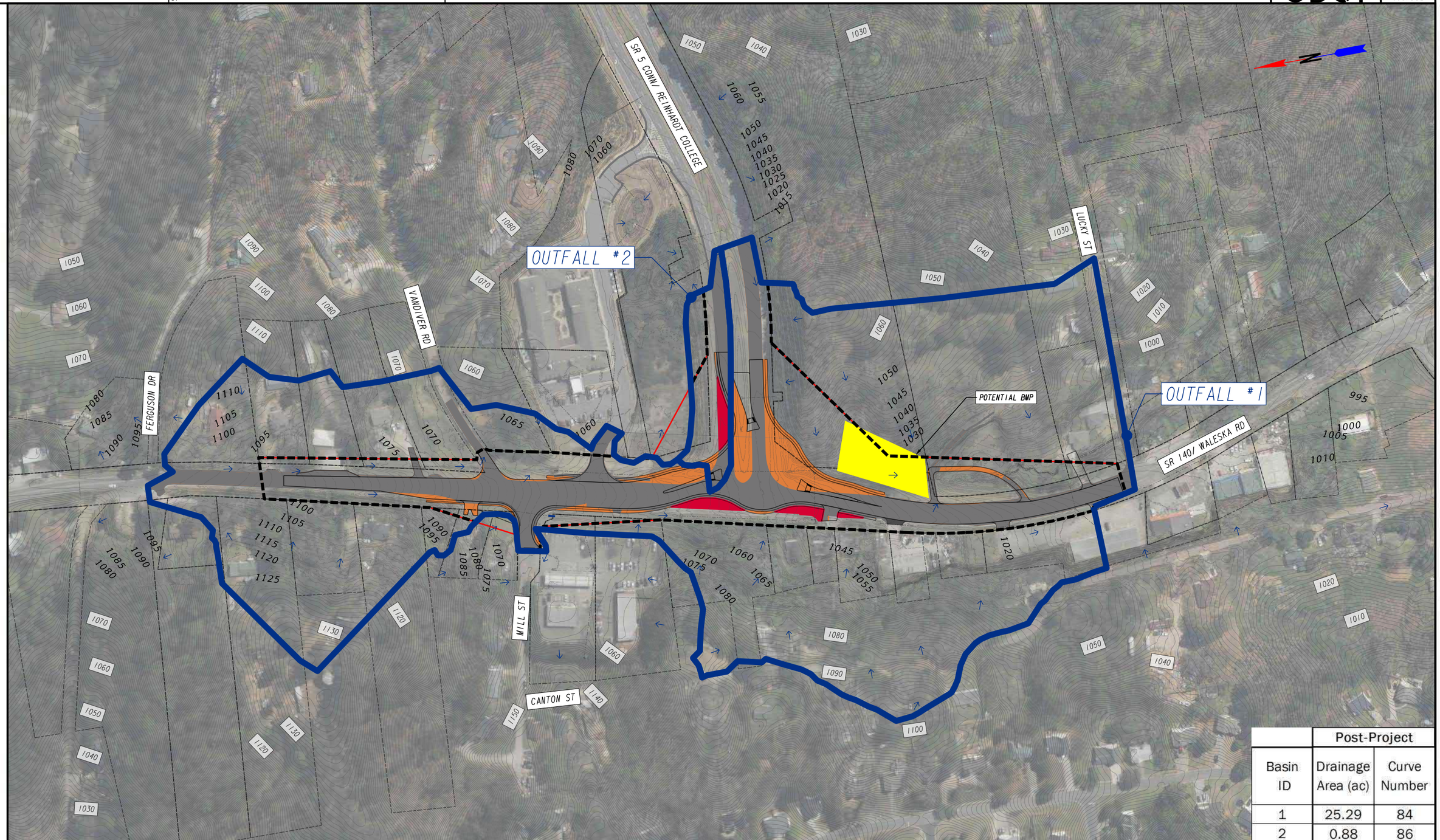
SCALE IN FEET
0 100 200 400

REVISION DATES

EXISTING DRAINAGE AREA MAP
SR 140 AT SR 5 CONNECTOR

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		DAM-EX-1
CORRECTED:		DATE:		
VERIFIED:		DATE:		

GPLN-CE
11/05/2020



	Post-Project	
Basin ID	Drainage Area (ac)	Curve Number
1	25.29	84
2	0.88	86

DRAINAGE AREA TO STUDY POINT
ON-SITE AREA TO STUDY POINT
EXISTING IMPERVIOUS AREA
EXISTING IMPERVIOUS TO BE REMOVED
PROPOSED IMPERVIOUS AREA

AULICK ENGINEERING LLC
STORMWATER | HYDRAULICS | EROSION CONTROL
AIRFIELD & CIVIL SITE | CONSTRUCTION SERVICES

GDOT
Georgia Department of Transportation

SCALE IN FEET
0 100 200 400

REVISION DATES

PROPOSED DRAINAGE AREA MAP
SR 140 AT SR 5 CONNECTOR

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		DAM-PR-1
CORRECTED:		DATE:		
VERIFIED:		DATE:		

GPLN-CE
11/05/2020

Michael Baker
INTERNATIONAL

PI Number 0017982, Cherokee County
SR 140 @ SR 5 CONN

CONCEPT TEAM MEETING
June 8, 2023

MEETING NOTES

Location

Virtual via Microsoft Teams. 10:00 AM Eastern.

Attendees

Bethany Watson	bethany.watson@cantonga.gov	City of Canton
Billy Peppers	billy.peppers@cantonga.gov	City of Canton
Rep Mandi Ballinger	mandi.ballinger@house.ga.gov	Georgia State Representative
Reginald James	RJames@atlantaregional.org	Atlanta Regional Commission
Harry Johnston	hjohnston@cherokeega.com	Chairman, Cherokee County Board of Commissioners
Geoff Morton	gmorton@cherokeega.com	Cherokee County
Ben L Morgan	BLMorgan@cherokeega.com	Cherokee County
Will C. Jones	wcjones@cherokeega.com	Cherokee County
Eddie Robinson	erobinson@cherokeega.com	Cherokee County
Mitch Hamilton	mitch.hamilton@cherokeek12.net	Cherokee County School District
Trey Moores	trey.moores@cherokeek12.net	Cherokee County School District
Mark Lawing	MLawing2@dot.ga.gov	GDOT Office of Program Delivery/Atlas
Felecia Basolo	Felecia.Basolo@oneatlas.com	GDOT Office of Program Delivery/Atlas
Emily Trung	Emily.Trung@oneatlas.com	GDOT Office of Program Delivery/Atlas
Keith Posey	kposey@seengineering.com	GDOT Office of Program Delivery/Atlas/SEI
Yun Luo	yluo@seengineering.com	GDOT Office of Program Delivery/Atlas/SEI
Cassie Mills	CaMills@dot.ga.gov	GDOT Office of Environmental Services
Tom Moore	ToMorre@dot.ga.gov	GDOT Office of Environmental Services
Alexis Kriegh	AKriegh@dot.ga.gov	GDOT Office of Environmental Services
Kelly Burdette	KBurdette@dot.ga.gov	GDOT Office of Environmental Services
Laura Nesbitt	LaNesbitt@dot.ga.gov	GDOT Office of Traffic Operations
Oladimeji Onabanjo	oonabanjo@dot.ga.gov	GDOT Office of Traffic Operations
Collin Abbey	RAbbey@dot.ga.gov	GDOT Office of Traffic Operations
Victoria Coulter	VCoulter@dot.ga.gov	GDOT Office of Traffic Operations
David Acree	dacree@dot.ga.gov	GDOT D6 Preconstruction
Chris Raymond	craymond@dot.ga.gov	GDOT D6 Traffic Operations
Stan McCarley	StMccarley@dot.ga.gov	GDOT D6 Utilities
James Ciavarro	jdciavarro@dot.ga.gov	GDOT D6 Utilities
Keith Day	KDay@dot.ga.gov	GDOT D6, Area 1 Manager
Joseph Baldwin	jbaldwin@dot.ga.gov	GDOT D6, Area 1 Maintenance
Samantha Henry	SaHenry@dot.ga.gov	GDOT D6 Planning & Programing Manager
Kimberly Grayson	KGrayson@dot.ga.gov	GDOT Office of Planning

Freida Black	FBlack@dot.ga.gov	GDOT Office of Intermodal
Charnele Dobbins	CDobbins@dot.ga.gov	GDOT Office of Intermodal
Mohammed Alamayreh	MAlamayreh@dot.ga.gov	GDOT Human Resources
Lauren McDonald	LMcDonald@dot.ga.gov	GDOT Human Resources
Bill Ruhsam	Bill.Ruhsam@mbakerintl.com	Michael Baker
Paul Murphy	PBMurphy@mbakerintl.com	Michael Baker
Frank Henning	Frank.Henning@mbakerintl.com	Michael Baker
Paul Condit	PFCondit@mbakerintl.com	Michael Baker
Natalie Galt	Natalie.Galt@mbakerintl.com	Michael Baker
Bailie Hildebrand	bhildebrand@aulickengineering.com	Aulick Engineering
Kerry Gore	Kerry.Gore@sam.biz	SAM
Mike Reynolds	MikeReynolds@brockington.org	Brockington & Associates

The purpose of the Concept Team Meeting was to discuss and receive feedback on the concept report and design alternatives.

- Keith Posey of the LAP team introduced the project and welcomed the participants
- The project schedule is as follows:

Approved Concept Report:	9/26/2023
PFPR:	11/28/2024
ROW Authorization:	6/16/2025 (FY 2025)
FFPR:	1/23/2026
Let to CST:	9/15/2026 (FY 2027)

  The project is currently tracking on baseline.

- Bill Ruhsam presented the Concept Report presentation (attached)
- The project goal is to improve the operation of the intersection by increasing the flow through the intersection by adding an additional thru lane in both northbound and southbound directions. The proposed two-lane roundabout will help improve the flow of traffic through this intersection while also reducing the likelihood of severe crashes. Project limits are set by tapering from one lane in each direction to two lanes in each direction and back to a single in each direction.
- The existing typical section on SR 140/Waleska Road is two 11-ft lanes, one in each direction, with 10 foot shoulders and partial sidewalk coverage. The functional classification is Urban Minor Arterial. The posted speed is 45 MPH.
- The existing typical section on SR 5 CONN/Reinhardt College Parkway is two 12-ft lanes, one in each direction, with rural shoulders. The functional classification is Urban Minor Arterial. The posted speed is 45 MPH.
- The proposed conditions were reviewed which are maintain the speed limits, and functional classification, increasing the number of through lanes at the intersection to 4 lanes for northbound and southbound, adding sidewalk and an urban shoulder throughout the project and constructing a multilane roundabout.
- Traffic volumes and truck percentages were briefly reviewed.
- The layout for the preferred alternative (multilane roundabout) was shown and described to the meeting team and its impacts and costs were reviewed.
- The alternative construction concept (“High T” signalized intersection) was shown to the team and its impacts and costs were reviewed.

- The preferred alternative has a lower construction cost and right of way cost due to a smaller project length. The length is shorter due to shorter lane tapers required by the roundabout design.

- Preferred Alternative Concerns and Solutions were presented:
  - **Concerns**
    - Access
    - ROW Impacts
    - Impacts to Perennial Stream (PS1)
    - Utility Impacts
  - **Solutions**
    - Maintaining access through staging
    - Using 11-foot lanes, Roundabout alternatives to locate optimal roundabout location
    - Adding Retaining Walls to Reduce Impacts to Businesses and Streams
    - Utilizing SUE \
- The design criteria table was briefly discussed. Michael Baker stated that no design variances were anticipated.
  - A comment that had been received on the morning of the concept team meeting would increase the size of the design vehicle to a WB 67 for the roundabout, per the GDOT DPM. A discussion was had concerning the appropriate design vehicle for this intersection. Michael Baker will coordinate with Traffic Operations to ensure the roundabout is designed per policy or a design variance will be included in the project. The Concept report will be updated per the results of this coordination.
    - Liberty Church
- Utility involvement (Kerry Gore)
  - 7 types involved, impacting gas on E side and water/Sewer at mill street
  - Both cost estimates for both alternative with a difference of &35k without any significant changes.
  - The team will need to reassess utilities after design is finalized
  - Poles with underground feeds at the existing T-intersection – both alternatives will displace utilities.
- Mike Reynolds – Historical discussion of properties
  - Addressing access issues on 1165 Waleska
  - Landscaping is not likely to be impacted
- Frank Henning - Stream impacts – one stream impacted but is minor with a regional permit 34 If they do exceed thresholds, but permitting should be normal and buffer impacts may possibly be exempt
- Comments:
  - The project funding (80% federal/20% local match) is through ARC, and the current programmed amounts are as follows:

PE:	$1,182,755
ROW:	To be added
Reimb Utilities:	$211,415
CST:	$1,402,575

There was discussion that this is the currently programmed cost estimates and may be low. A revision to programmed cost will be entered with the Concept report and the construction cost and others will reflect the work completed by the consultant, including updating the utility cost estimate.

- PLANNING
    - No Comments
- CONSTRUCTABILITY REVIEW
    - No Comments
- DETOURS
    - Michael Baker is not planning on any detours.
    - No comments
- STATE OR DISTRICT RIGHT OF WAY
    - No comments
- ENVIRONMENTAL
    - No comments
- DISTRICT UTILITIES
    - No Comments
- LOCAL GOVERNMENT AGREEMENTS
    - Keith Posey said that he would be sending the Roundabout Support Letter template for the City to fill out and authorize.
- OFFICE OF DESIGN POLICY COMMENTS
    - No Comments
- OFFICE OF ENGINEERING SERVICES COMMENTS
    - No Comments
- OFFICE OF INTERMODAL COMMENTS
    - No Comments
- STATE OR DISTRICT MAINTENACE COMMENTS
    - No Comments
- OFFICE OF MATERIALS AND TESTING COMMENTS
    - No Comments
- OFFICE OF PROGRAM DELIVERY COMMENTS
    - The LAP team represents Program Delivery for this project. Comments on the Concept report have been provided to the Design Team via email.
- OFFICE OF ROADWAY DESIGN COMMENTS
    - No Comments
- STATE OR DISTRICT TRAFFIC OPERATIONS COMMENTS
- Laura Nesbitt wanted to clarify if this was a reconstruction/rehab project or if this was an operational improvement.
    - Keith posey said it is classified as an intersection improvement and reconstruction/rehabilitation
    - There needs to be a clear identification for the Concept report to avoid confusion.
- Laura then asked to receive the roundabout files to assess the outputs with the roundabout to see what the traffic analysis said about the crash frequency.
    - Michael Baker will coordinate with Laura Nesbitt and the Roundabout team with respect to the traffic operational analysis.
- Keith said concept report will include benefit/cost analysis
- Laura asked if anyone in the region (public) had talked about their comfort level with the roundabout
    - Chairman Johnston was concerned about the historic properties to see what level of impacts there would be. Bill Ruhsam responded that the best estimate at this time was for minor impacts; slight taking of property or viewshed impacts.
    - Chairman Johnston expressed concern about the multilane roundabout and vehicular conflicts. There was considerable discussion between the design team, GDOT Traffic Operations, and Chairman Johnston concerning the roundabout, with the end of the discussion that Chairman Johnson was not opposed.
    - Billy Peppers from the City shared comments. That this intersection improvement was an important part of the joint Canton/Cherokee Master Plan published in 2019. He expressed interested in interior roundabout landscaping or public art and would be happy to assist or even

maintain the roundabout and that they already have agreements with GDOT like this to add landscaping or art

- DISTRICT COMMENTS
  - No Comments
- ADDITIONAL COMMENTS & CONCERNS FROM ATTENDEES

Prepared by: Bill Ruhsam, P.E., PTOE for Paul Murphy, PE (Project Manager)
Michael Baker International
June 9, 2023

7/13/2023

BENEFIT COST ANALYSIS WORKSHEET

Multilane Roundabout Alternative

PI# 0017982

Area Type	**Urban**
Existing Intersection Control	**Signal (turn lanes on mainline)**
Proposed Intersection Control	**Multilane Roundabout**

IMPORT CRASH DATA ON NEXT TAB

CRASH DATA (5 years preferred)			**ENTER DATES BELOW**
			1/1/2018
Description	Symbol	Value	12/31/2022
Fatal Crash	K	0	0
Serious Injury	A	0.2	1
Visible Injury	B	0.2	1
Complaint of Injury	C	2	10
Property Damage Only	O	5.8	29

FIXED VALUES

Description	Symbol	Value
Fatality Cost	Kc	$12,450,000
Serious Injury Cost	Ac	$2,740,000
Visible Injury Cost	Bc	$600,000
Complaint of Injury Cost	Cc	$129,000
Property Damage Cost	Pc	$28,000
Maintenance/Operating Cos	Cm	

TABLE VALUES

Description	Symbol	Value
Reduction Factor (fatalities and injuries) (Appendix E)	R	0.71
Reduction Factor (property damage) (Appendix E)	Rp	0.26
Capital Recovery Factor (Appendix E)	Ek	0.087
Initial Improvement Cost (Itemized Cost Estimate)	Ci	$6,351,003.00

Assumed values		USER OVERRIDE

$6,351,003.00 Total

BENEFIT/COST RATIO: 1.27

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

7/13/2023

BENEFIT COST ANALYSIS WORKSHEET

High-T Alternative

PI# 0017982

Area Type	**Urban**
Existing Intersection Control	**Signal (turn lanes on mainline)**
Proposed Intersection Control	**Continuous Green-T**

IMPORT CRASH DATA ON NEXT TAB

CRASH DATA (5 years preferred)			**ENTER DATES BELOW**
			1/1/2018
Description	Symbol	Value	12/31/2022
Fatal Crash	K	0	0
Serious Injury	A	0.2	1
Visible Injury	B	0.2	1
Complaint of Injury	C	2	10
Property Damage Only	O	5.8	29

FIXED VALUES

Description	Symbol	Value
Fatality Cost	Kc	$12,450,000
Serious Injury Cost	Ac	$2,740,000
Visible Injury Cost	Bc	$600,000
Complaint of Injury Cost	Cc	$129,000
Property Damage Cost	Pc	$28,000
Maintenance/Operating Cos	Cm	

TABLE VALUES

Description	Symbol	Value
Reduction Factor (fatalities and injuries) (Appendix E)	R	0.154
Reduction Factor (property damage) (Appendix E)	Rp	0.0142
Capital Recovery Factor (Appendix E)	Ek	0.102
Initial Improvement Cost (Itemized Cost Estimate)	Ci	$7,067,217.00

Assumed values		USER OVERRIDE

$7,067,217.00 Total

BENEFIT/COST RATIO: 0.20

BENEFIT COST ANALYSIS FACTOR DEFINITIONS

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INDICATION OF ROUNDABOUT SUPPORT

Georgia Department of Transportation
Office of Program Delivery
600 West Peachtree Street, 25th Floor
Atlanta, Georgia 30308
ATTN: Keith Posey, Project Manager

Location

The City of Canton supports the consideration of a roundabout at the location specified below.

Description: SR 140 @ SR 5 Connector

State/County Route Numbers: SR 140 @ SR 5 Connector

Project Information: PI# 0017982, Cherokee County

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 to energize the lighting system installed and to provide for the operation/maintenance thereof.

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 the conditions are hereby agreed to. The undersigned are duly authorized to execute this agreement.

This 6 day of July, 2023

By: Bill Cist

Title: Mayor

Attest:

County or City Clerk

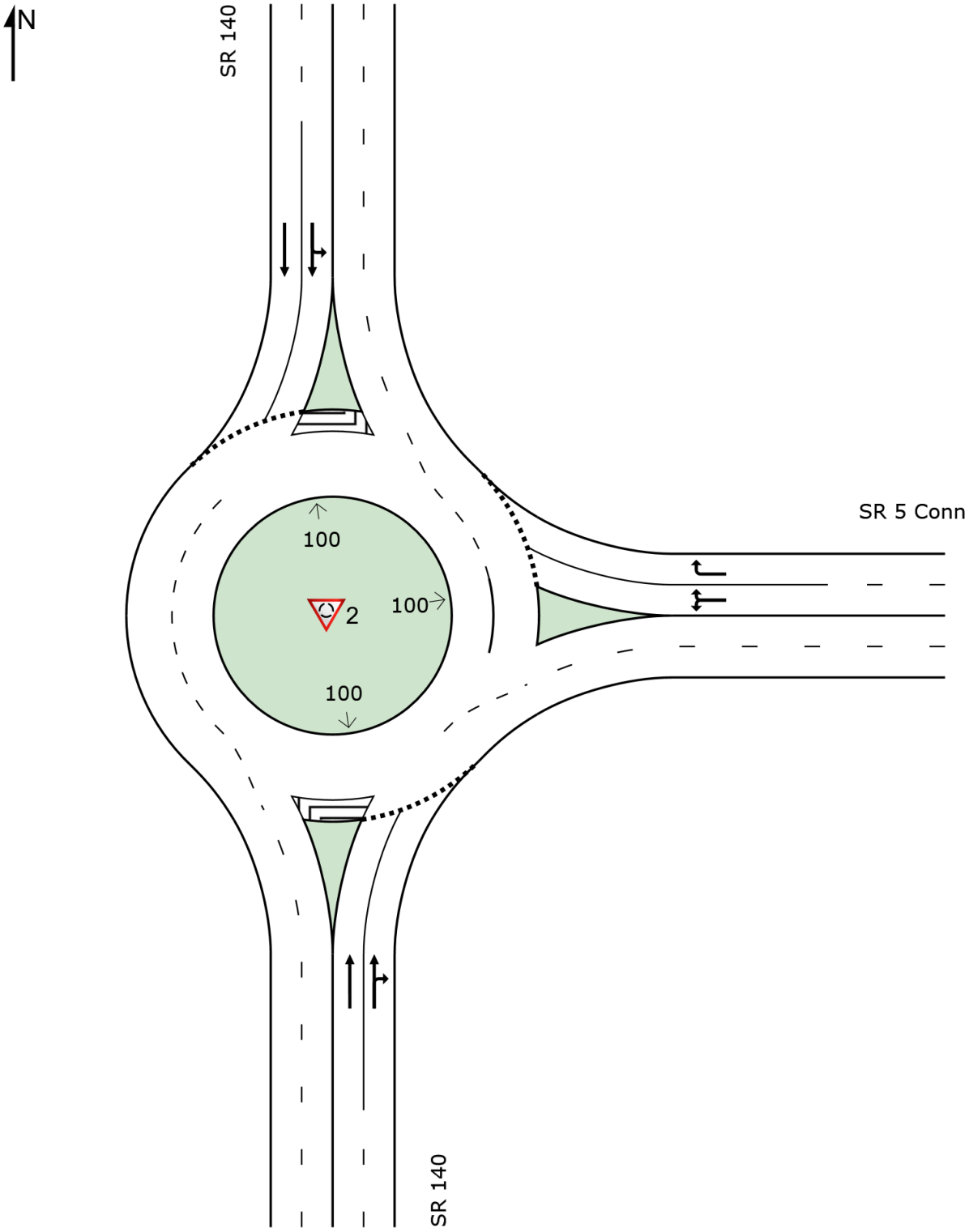
City of Canton Est 1834 CANTON GEORGIA Official Seal

SITE LAYOUT

Site: 2

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



ROUNDABOUT ANALYSIS

Site: 2 [2028 AM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App. Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0
East	SR 5 Conn	100.00	35.00	170.0	65.0	30.0	2	2	13.00	1600.0	NA[5]	0.0
North	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	Turn	Lane No	Lane Type	Opng Flow veh/h	Opng Flow pcu/h	In-Bunch Hdwy sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	Gap Acc Factor	Follow-up Hdwy (tf) sec	Critical Gap (tc) [Hdwy sec	Dist] ft	Ratio tf / tc
South: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
North	T1	1	Subdom.	658	671	2.00	0.566	No	Yes[10]	0.844	1.02	2.54	4.48	106.2	0.57
East	R2	2	Dominant	658	671	2.00	0.566	No	Yes[10]	0.844	1.02	2.19	3.86	91.6	0.57
East: SR 5 Conn Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
South	L2	1	Subdom.	234	238	2.00	0.251	No	Yes[10]	0.949	1.02	2.79	4.48	160.7	0.62
North	R2	1	Subdom.	234	238	2.00	0.251	No	Yes[10]	0.949	1.02	2.79	4.48	160.7	0.62
North	R2	2	Dominant	234	238	2.00	0.251	No	Yes[10]	0.949	1.02	2.79[9]	4.48	160.7	0.62
North: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
East	L2	1	Dominant	332	338	2.00	0.337	No	Yes[10]	0.958	1.02	2.32	4.30	102.0	0.54
South	T1	2	Subdom.	332	338	2.00	0.337	No	No	0.958	1.02	2.62	4.86	115.2	0.54

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

9 Subdominant lane follow-up headway was calculated as less than the dominant lane value and was set to the dominant lane va
10 Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Circulating Lane Flow Rates

Circ. Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: SR 140			
Lane 1	658	671	100.0
Approach	658	671	
East: SR 5 Conn			
Lane 1	234	238	100.0
Lane 2	0	0	0.0
Approach	234	238	
North: SR 140			

Lane 1	332	338	100.0
Approach	332	338	

Roundabout Capacity Model: The SIDRA HCM Roundabout Capacity Model option is in use. This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Lanes)

Opposed Lane	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140					
1	20.19	11.15	9.04	0.448	3.5
2	18.65	9.79	8.86	0.475	2.9
East: SR 5 Conn					
1	24.49	5.59	18.90	0.772	0.8
2	24.49	5.59	18.90	0.772	0.8
North: SR 140					
1	20.01	5.80	14.21	0.710	1.2
2	20.88	6.53	14.36	0.688	1.5

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Movements)

To Approach	Turn	Opsd Lane No	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140							
North	T1	1	20.19	11.15	9.04	0.448	3.5
East	R2	2	18.65	9.79	8.86	0.475	2.9
East: SR 5 Conn							
South	L2	1	24.49	5.59	18.90	0.772	0.8
North	R2	1	24.49	5.59	18.90	0.772	0.8
North	R2	2	24.49	5.59	18.90	0.772	0.8
North: SR 140							
East	L2	1	20.01	5.80	14.21	0.710	1.2
South	T1	2	20.88	6.53	14.36	0.688	1.5

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

ROUNDABOUT ANALYSIS

Site: 2 [2028 PM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App. Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0
East	SR 5 Conn	100.00	35.00	170.0	65.0	30.0	2	2	13.00	1600.0	NA[5]	0.0
North	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	Turn	Lane No	Lane Type	Opng Flow veh/h	Opng Flow pcu/h	In-Bunch Hdwy sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	Gap Acc Factor	Follow-up Hdwy (tf) sec	Critical Gap (tc) [Hdwy sec	Dist] ft	Ratio tf / tc
South: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
North	T1	1	Subdom.	353	360	2.00	0.355	No	No	0.953	1.02	2.52	4.66	110.5	0.54
North	T1	2	Dominant	353	360	2.00	0.355	No	Yes[10]	0.953	1.02	2.31	4.27	101.2	0.54
East	R2	2	Dominant	353	360	2.00	0.355	No	Yes[10]	0.953	1.02	2.31	4.27	101.2	0.54
East: SR 5 Conn Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
South	L2	1	Subdom.	772	787	1.17	0.431	No	No	0.869	1.02	2.64	3.84	137.9	0.69
North	R2	1	Subdom.	772	787	1.17	0.431	No	No	0.869	1.02	2.64	3.84	137.9	0.69
North	R2	2	Dominant	772	787	1.17	0.431	No	No	0.869	1.02	2.58	3.75	134.6	0.69
North: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
East	L2	1	Subdom.	212	216	2.00	0.231	No	No	0.956	1.02	2.54	4.82	114.3	0.53
South	T1	1	Subdom.	212	216	2.00	0.231	No	No	0.956	1.02	2.54	4.82	114.3	0.53
South	T1	2	Dominant	212	216	2.00	0.231	No	No	0.956	1.02	2.37	4.48	106.2	0.53

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

10 Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Circulating Lane Flow Rates

Circ. Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: SR 140			
Lane 1	353	360	100.0
Approach	353	360	
East: SR 5 Conn			
Lane 1	475	485	61.6
Lane 2	296	302	38.4
Approach	772	787	

North: SR 140			
Lane 1	212	216	100.0
Approach	212	216	

Roundabout Capacity Model: The SIDRA HCM Roundabout Capacity Model option is in use. This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Lanes)

Opposed Lane	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140					
1	20.16	6.51	13.65	0.677	1.5
2	19.53	5.99	13.55	0.693	1.3
East: SR 5 Conn					
1	14.47	7.17	7.30	0.505	2.3
2	14.25	6.98	7.27	0.510	2.2
North: SR 140					
1	26.26	5.94	20.32	0.774	0.8
2	25.80	5.56	20.23	0.784	0.7

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Movements)

To Approach	Turn	Opsd Lane No	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140							
North	T1	1	20.16	6.51	13.65	0.677	1.5
North	T1	2	19.53	5.99	13.55	0.693	1.3
East	R2	2	19.53	5.99	13.55	0.693	1.3
East: SR 5 Conn							
South	L2	1	14.47	7.17	7.30	0.505	2.3
North	R2	1	14.47	7.17	7.30	0.505	2.3
North	R2	2	14.25	6.98	7.27	0.510	2.2
North: SR 140							
East	L2	1	26.26	5.94	20.32	0.774	0.8
South	T1	1	26.26	5.94	20.32	0.774	0.8
South	T1	2	25.80	5.56	20.23	0.784	0.7

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

ROUNDABOUT ANALYSIS

Site: 2 [2048 AM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App. Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0
East	SR 5 Conn	100.00	35.00	170.0	65.0	30.0	2	2	13.00	1600.0	NA[5]	0.0
North	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	Turn	Lane No	Lane Type	Opng Flow veh/h	Opng Flow pcu/h	In-Bunch Hdwy sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	Gap Acc Factor	Follow-up Hdwy (tf) sec	Critical Gap (tc) [Hdwy sec	Dist] ft	Ratio tf / tc
South: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
North	T1	1	Subdom.	853	879	2.00	0.677	No	Yes[10]	0.680	1.03	2.45	4.21	99.8	0.58
North	T1	2	Dominant	853	879	2.00	0.677	No	Yes[10]	0.680	1.03	2.13	3.66	86.8	0.58
East	R2	2	Dominant	853	879	2.00	0.677	No	Yes[10]	0.680	1.03	2.13	3.66	86.8	0.58
East: SR 5 Conn Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
South	L2	1	Dominant	408	420	1.59	0.334	No	Yes[10]	0.906	1.03	2.74[9]	4.25	152.7	0.64
North	R2	1	Dominant	408	420	1.59	0.334	No	Yes[10]	0.906	1.03	2.74[9]	4.25	152.7	0.64
North	R2	2	Subdom.	408	420	1.59	0.334	No	Yes[10]	0.906	1.03	2.74	4.25	152.7	0.64
North: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
East	L2	1	Dominant	446	459	2.00	0.430	No	Yes[10]	0.914	1.03	2.30	4.18	99.0	0.55
South	T1	1	Dominant	446	459	2.00	0.430	No	Yes[10]	0.914	1.03	2.30	4.18	99.0	0.55
South	T1	2	Subdom.	446	459	2.00	0.430	No	No	0.914	1.03	2.53	4.60	109.0	0.55

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

9 Subdominant lane follow-up headway was calculated as less than the dominant lane value and was set to the dominant lane va
10 Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Circulating Lane Flow Rates

Circ. Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: SR 140			
Lane 1	853	879	100.0
Approach	853	879	
East: SR 5 Conn			
Lane 1	368	380	90.4
Lane 2	39	40	9.6

Approach	408	420	
North: SR 140			
Lane 1	446	459	100.0
Approach	446	459	

Roundabout Capacity Model: The SIDRA HCM Roundabout Capacity Model option is in use. This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Lanes)

Opposed Lane	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140					
1	26.24	18.51	7.72	0.294	5.6
2	24.11	16.55	7.56	0.314	4.7
East: SR 5 Conn					
1	18.32	6.47	11.86	0.647	1.4
2	18.32	6.47	11.86	0.647	1.4
North: SR 140					
1	18.61	7.22	11.39	0.612	1.8
2	19.40	7.89	11.51	0.593	2.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Movements)

To Approach	Turn	Opsd Lane No	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140							
North	T1	1	26.24	18.51	7.72	0.294	5.6
North	T1	2	24.11	16.55	7.56	0.314	4.7
East	R2	2	24.11	16.55	7.56	0.314	4.7
East: SR 5 Conn							
South	L2	1	18.32	6.47	11.86	0.647	1.4
North	R2	1	18.32	6.47	11.86	0.647	1.4
North	R2	2	18.32	6.47	11.86	0.647	1.4
North: SR 140							
East	L2	1	18.61	7.22	11.39	0.612	1.8
South	T1	1	18.61	7.22	11.39	0.612	1.8
South	T1	2	19.40	7.89	11.51	0.593	2.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

ROUNDABOUT ANALYSIS

Site: 2 [2048 PM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Roundabout Basic Parameters

Location	Name	Central Island Diam ft	Circ Width ft	Insc Diam ft	Entry Radius ft	Entry Angle °	Circ Lanes	Entry Lanes	Av.Entry Lane Width ft	App. Dist ft	Prop Queued Upstr Signal	Extra Bunching %
South	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0
East	SR 5 Conn	100.00	35.00	170.0	65.0	30.0	2	2	13.00	1600.0	NA[5]	0.0
North	SR 140	100.00	35.00	170.0	65.0	30.0	1	2	13.00	1600.0	NA[5]	0.0

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

5 Not Applicable (single Site analysis or unconnected Site in Network analysis).

Roundabout Entry and Circulating / Exiting Stream Parameters

To Approach	Turn	Lane No	Lane Type	Opng Flow veh/h	Opng Flow pcu/h	In-Bunch Hdwy sec	Prop. Bunched	Cap Const Effect	Priority Sharing	OD Factor	Gap Acc Factor	Follow-up Hdwy (tf) sec	Critical Gap (tc) [Hdwy sec	Dist] ft	Ratio tf / tc
South: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
North	T1	1	Subdom.	484	494	2.00	0.454	No	No	0.911	1.02	2.50	4.52	107.1	0.55
North	T1	2	Dominant	484	494	2.00	0.454	No	Yes[10]	0.911	1.02	2.26	4.09	96.9	0.55
East	R2	2	Dominant	484	494	2.00	0.454	No	Yes[10]	0.911	1.02	2.26	4.09	96.9	0.55
East: SR 5 Conn Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
South	L2	1	Subdom.	1142	1165	1.14	0.564	No	Yes[10]	0.684	1.02	2.59	3.58	128.6	0.72
North	R2	1	Subdom.	1142	1165	1.14	0.564	No	Yes[10]	0.684	1.02	2.59	3.58	128.6	0.72
North	R2	2	Dominant	1142	1165	1.14	0.564	No	Yes[10]	0.684	1.02	2.43	3.37	121.0	0.72
North: SR 140 Environment Factor: 1.20 Entry/Circ Flow Adjustment: None															
East	L2	1	Subdom.	237	241	2.00	0.254	Yes	No	0.938	1.02	2.54	4.80	113.6	0.53
South	T1	1	Subdom.	237	241	2.00	0.254	Yes	No	0.938	1.02	2.54	4.80	113.6	0.53
South	T1	2	Dominant	237	241	2.00	0.254	Yes	No	0.938	1.02	2.36	4.45	105.3	0.53

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

10 Priority sharing means Follow-up Headway plus Intra-bunch Headway is larger than the Critical Gap.

Circulating Lane Flow Rates

Circ. Lane No	Circulating Flow Rate veh/h	pcu/h	Percent
South: SR 140			
Lane 1	484	494	100.0
Approach	484	494	
East: SR 5 Conn			
Lane 1	681	695	59.7
Lane 2	461	470	40.3
Approach	1142	1165	

North: SR 140			
Lane 1	237	241	100.0
Approach	237	241	

Roundabout Capacity Model: The SIDRA HCM Roundabout Capacity Model option is in use. This model takes into account the total circulating flow as well as the effect of flow distribution in circulating lanes on the entry capacity results.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Lanes)

Opposed Lane	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140					
1	19.02	8.08	10.94	0.575	2.2
2	18.19	7.37	10.82	0.595	1.9
East: SR 5 Conn					
1	17.91	12.16	5.76	0.321	3.6
2	17.08	11.40	5.68	0.333	3.2
North: SR 140					
1	25.04	6.46	18.58	0.742	0.9
2	24.54	6.05	18.49	0.754	0.8

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

Gap Acceptance Cycle Parameters (Movements)

To Approach	Turn	Opsd Lane No	Cycle Time sec	Blocked Time sec	Unblocked Time sec	Unblocked Time Ratio	Minimum Delay sec
South: SR 140							
North	T1	1	19.02	8.08	10.94	0.575	2.2
North	T1	2	18.19	7.37	10.82	0.595	1.9
East	R2	2	18.19	7.37	10.82	0.595	1.9
East: SR 5 Conn							
South	L2	1	17.91	12.16	5.76	0.321	3.6
North	R2	1	17.91	12.16	5.76	0.321	3.6
North	R2	2	17.08	11.40	5.68	0.333	3.2
North: SR 140							
East	L2	1	25.04	6.46	18.58	0.742	0.9
South	T1	1	25.04	6.46	18.58	0.742	0.9
South	T1	2	24.54	6.05	18.49	0.754	0.8

Roundabout Capacity Model: SIDRA HCM
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

MOVEMENT SUMMARY

Site: 2 [2028 AM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 140															
2	T1	All MCs	234	2.0	234	2.0	0.368	9.3	LOS A	2.5	64.3	0.83	0.72	0.83	33.7
3	R2	All MCs	348	2.0	348	2.0	0.447	8.9	LOS A	3.6	91.2	0.87	0.74	0.91	33.6
Approach			582	2.0	582	2.0	0.447	9.0	LOS A	3.6	91.2	0.86	0.73	0.88	33.6
East: SR 5 Conn															
4	L2	All MCs	332	2.0	332	2.0	0.336	11.3	LOS B	2.1	52.1	0.50	0.64	0.50	32.0
6	R2	All MCs	348	2.0	348	2.0	0.336	5.4	LOS A	2.1	52.4	0.50	0.54	0.50	34.8
Approach			679	2.0	679	2.0	0.336	8.3	LOS A	2.1	52.4	0.50	0.59	0.50	33.4
North: SR 140															
7	L2	All MCs	658	2.0	658	2.0	0.598	13.0	LOS B	5.6	141.4	0.74	0.70	0.79	31.5
8	T1	All MCs	462	2.0	462	2.0	0.488	6.8	LOS A	3.6	91.1	0.68	0.59	0.68	34.2
Approach			1120	2.0	1120	2.0	0.598	10.5	LOS B	5.6	141.4	0.72	0.65	0.74	32.5
All Vehicles			2380	2.0	2380	2.0	0.598	9.5	LOS A	5.6	141.4	0.69	0.66	0.71	33.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 2 [2028 PM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 140															
2	T1	All MCs	772	2.0	772	2.0	0.492	6.7	LOS A	3.8	95.9	0.69	0.60	0.69	34.2
3	R2	All MCs	234	2.0	234	2.0	0.492	6.5	LOS A	3.8	95.9	0.69	0.60	0.69	34.1
Approach			1005	2.0	1005	2.0	0.492	6.7	LOS A	3.8	95.9	0.69	0.60	0.69	34.2
East: SR 5 Conn															
4	L2	All MCs	212	2.0	212	2.0	0.586	15.5	LOS B	3.9	98.6	0.78	0.90	0.98	31.6
6	R2	All MCs	603	2.0	603	2.0	0.586	9.5	LOS A	3.9	99.5	0.78	0.88	0.98	32.9
Approach			815	2.0	815	2.0	0.586	11.1	LOS B	3.9	99.5	0.78	0.88	0.98	32.5
North: SR 140															
7	L2	All MCs	353	2.0	353	2.0	0.330	11.3	LOS B	2.3	58.6	0.52	0.62	0.52	32.0
8	T1	All MCs	402	2.0	402	2.0	0.330	5.3	LOS A	2.4	59.8	0.51	0.48	0.51	34.7
Approach			755	2.0	755	2.0	0.330	8.1	LOS A	2.4	59.8	0.52	0.55	0.52	33.4
All Vehicles			2576	2.0	2576	2.0	0.586	8.5	LOS A	3.9	99.5	0.67	0.67	0.73	33.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 2 [2048 AM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 140															
2	T1	All MCs	408	3.0	408	3.0	0.863	33.5	LOS C	13.8	353.4	1.00	1.28	1.89	24.9
3	R2	All MCs	413	3.0	413	3.0	0.863	30.6	LOS C	13.8	353.4	1.00	1.29	1.89	25.3
Approach			821	3.0	821	3.0	0.863	32.0	LOS C	13.8	353.4	1.00	1.28	1.89	25.1
East: SR 5 Conn															
4	L2	All MCs	446	3.0	446	3.0	0.531	13.1	LOS B	3.8	98.2	0.71	0.75	0.77	31.5
6	R2	All MCs	457	3.0	457	3.0	0.531	7.3	LOS A	3.8	98.2	0.71	0.70	0.77	34.3
Approach			902	3.0	902	3.0	0.531	10.1	LOS B	3.8	98.2	0.71	0.72	0.77	32.8
North: SR 140															
7	L2	All MCs	853	3.0	853	3.0	0.925	27.6	LOS C	21.8	558.1	1.00	1.28	1.86	26.5
8	T1	All MCs	804	3.0	804	3.0	0.925	23.6	LOS C	21.8	558.1	1.00	1.29	1.90	27.9
Approach			1658	3.0	1658	3.0	0.925	25.6	LOS C	21.8	558.1	1.00	1.29	1.88	27.2
All Vehicles			3380	3.0	3380	3.0	0.925	23.1	LOS C	21.8	558.1	0.92	1.14	1.59	27.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 2 [2048 PM (Site Folder: Roundabout_Shared Lane)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

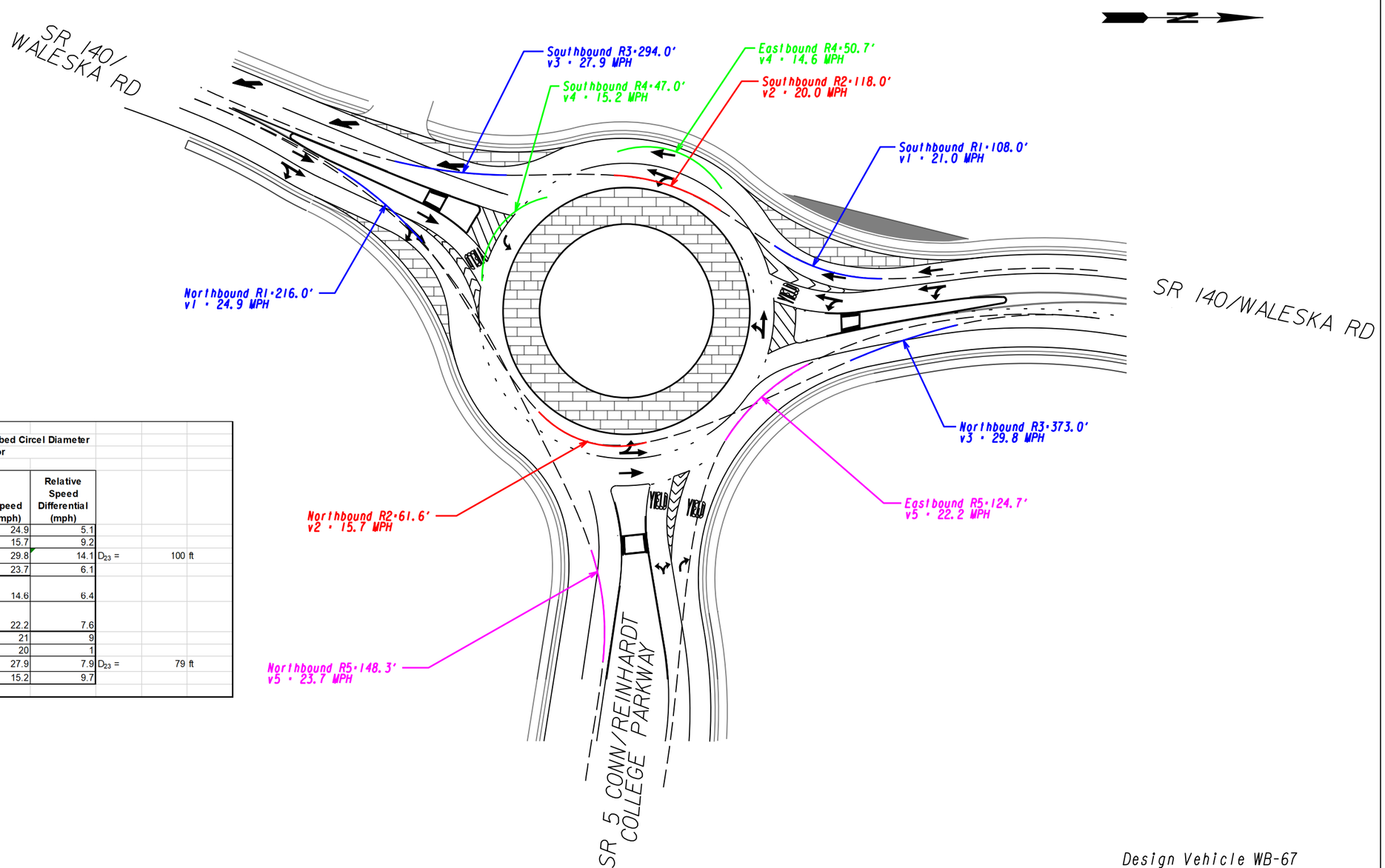
SR 140 @ SR 5 BU
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] ft	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed mph
South: SR 140															
8	T1	All MCs	1142	2.0	1142	2.0	0.826	16.0	LOS B	13.7	349.1	1.00	1.03	1.52	30.8
18	R2	All MCs	316	2.0	316	2.0	0.826	15.1	LOS B	13.7	349.1	1.00	1.01	1.49	30.8
Approach			1458	2.0	1458	2.0	0.826	15.8	LOS B	13.7	349.1	1.00	1.02	1.51	30.8
East: SR 5 Conn															
1	L2	All MCs	284	2.0	284	2.0	1.211	119.4	LOS F	37.8	960.3	1.00	2.53	5.82	13.0
16	R2	All MCs	842	2.0	842	2.0	1.211	112.8	LOS F	41.2	1045.3	1.00	2.60	5.97	13.1
Approach			1126	2.0	1126	2.0	1.211	114.5	LOS F	41.2	1045.3	1.00	2.59	5.93	13.1
North: SR 140															
7	L2	All MCs	484	2.0	484	2.0	0.499	11.7	LOS B	4.2	106.2	0.66	0.63	0.66	31.8
4	T1	All MCs	605	2.0	605	2.0	0.499	5.8	LOS A	4.3	109.2	0.65	0.53	0.65	34.2
Approach			1089	2.0	1089	2.0	0.499	8.4	LOS A	4.3	109.2	0.66	0.58	0.66	33.1
All Vehicles			3674	2.0	3674	2.0	1.211	43.9	LOS D	41.2	1045.3	0.90	1.37	2.61	22.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA HCM.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

08/29/23 00:06:45	GPLOT-V8	SR140-SR5 CONN Proposal - Alt 2 - fastest path.dgn		P.I. No.
PBMurphy	gplotborder-v81-P0.tbl			0017982



Design Speed Summary Table - 200' Inscribed Circel Diameter
SR 140 & SR 5 Connector

Approach Roadway	Curve	Radius (Feet)	Speed (mph)	Relative Speed Differential (mph)		
Northbound SR 140/ Waleska Road	R1	216	24.9	5.1		
	R2	61.6	15.7	9.2		
	R3	373	29.8	14.1	D_{23} =	100 ft
	R5	148.3	23.7	6.1		
Eastbound Leg SR 5 Connector/ Reinhardt College Parkway	R4	50.7	14.6	6.4		
	R5	124.7	22.2	7.6		
Southbound SR 140/ Waleska Road	R1	108	21	9		
	R2	118	20	1		
	R3	294	27.9	7.9	D_{23} =	79 ft
	R4	47	15.2	9.7		

Design Vehicle WB-67

PROPERTY AND EXISTING R/W LINE		EXISTING PAVEMENT	
REQUIRED R/W LINE		RAISED MEDIAN	
CONSTRUCTION LIMITS	—C—	SIDEWALK	
EDGE OF PAVEMENT		REMOVAL OF EXIST. PAVEMENT	
EDGE OF PAVED SHOULDER		EASEMENT FOR DRIVES	
PARAPET RETAINING WALL		EASEMENT FOR CONST OF SLOPES	
ENVIRONMENTALLY SENSITIVE AREA			
ESA BUFFER			

10/23/2015 GPLN

Est 1834 CANTON GEORGIA

Michael Baker INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

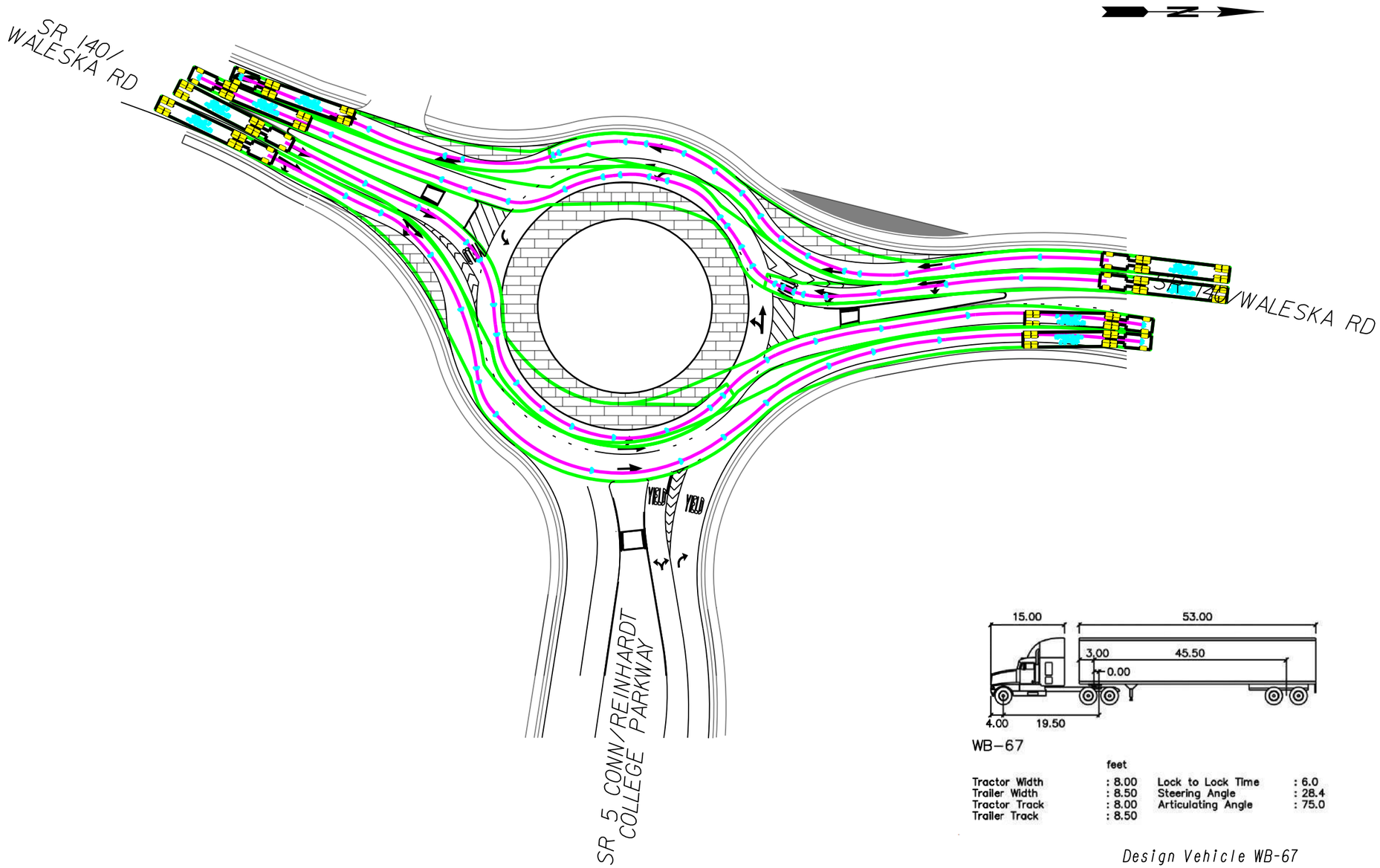
SCALE IN FEET
0 30 60 120

REVISION DATES		

SR 140 @ SR 5 CONN
Fastest Path

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		0001
CORRECTED:		DATE:		
VERIFIED:		DATE:		

08/28/23 23:51:00 PBMurphy	GPLOT-V8 gplotborder-v81-P0.tbl	SR140-SR5 CONN Proposal - Alt 2 - Autoturn 02.dgn		P.I. No. 0017982



WB-67

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

Design Vehicle WB-67

PROPERTY AND EXISTING R/W LINE		EXISTING PAVEMENT	
REQUIRED R/W LINE		RAISED MEDIAN	
CONSTRUCTION LIMITS	—C—	SIDEWALK	
EDGE OF PAVEMENT		REMOVAL OF EXIST. PAVEMENT	
EDGE OF PAVED SHOULDER		EASEMENT FOR DRIVES	
PARAPET RETAINING WALL		EASEMENT FOR CONST OF SLOPES	
ENVIRONMENTALLY SENSITIVE AREA			
ESA BUFFER			

Est 1834 CANTON GEORGIA

Michael Baker
INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

SCALE IN FEET
0 30 60 120

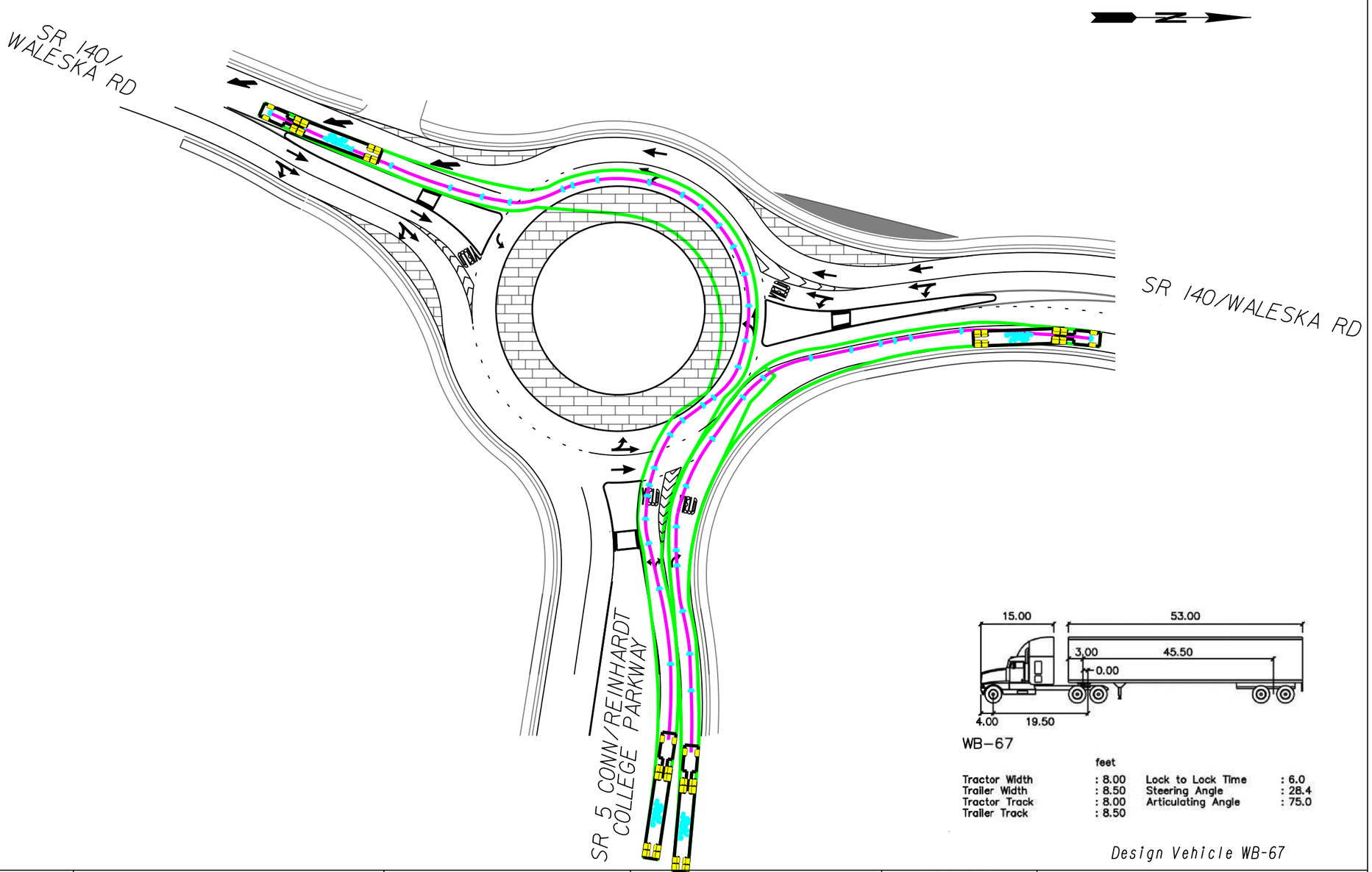
REVISION DATES		

SR 140 @ SR 5 CONN
Autoturn NB & SB

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		0002
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/2015 GPLN

08/28/23 23:43:33	GPLOT-V8	SR140-SR5 CONN Proposal - Alt 2 - Autoturn 03.dgn		P. I. No.
PBMurphy	gplotborder-v81-P0.tbl			0017982



WB-67

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

Design Vehicle WB-67

PROPERTY AND EXISTING R/W LINE		EXISTING PAVEMENT	
REQUIRED R/W LINE		RAISED MEDIAN	
CONSTRUCTION LIMITS	—C—	SIDEWALK	
EDGE OF PAVEMENT		REMOVAL OF EXIST. PAVEMENT	
EDGE OF PAVED SHOULDER		EASEMENT FOR DRIVES	
PARAPET RETAINING WALL		EASEMENT FOR CONST OF SLOPES	
ENVIRONMENTALLY SENSITIVE AREA			
ESA BUFFER			

10/23/2015 GPLN

Est 1834 CANTON GEORGIA

Michael Baker
INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

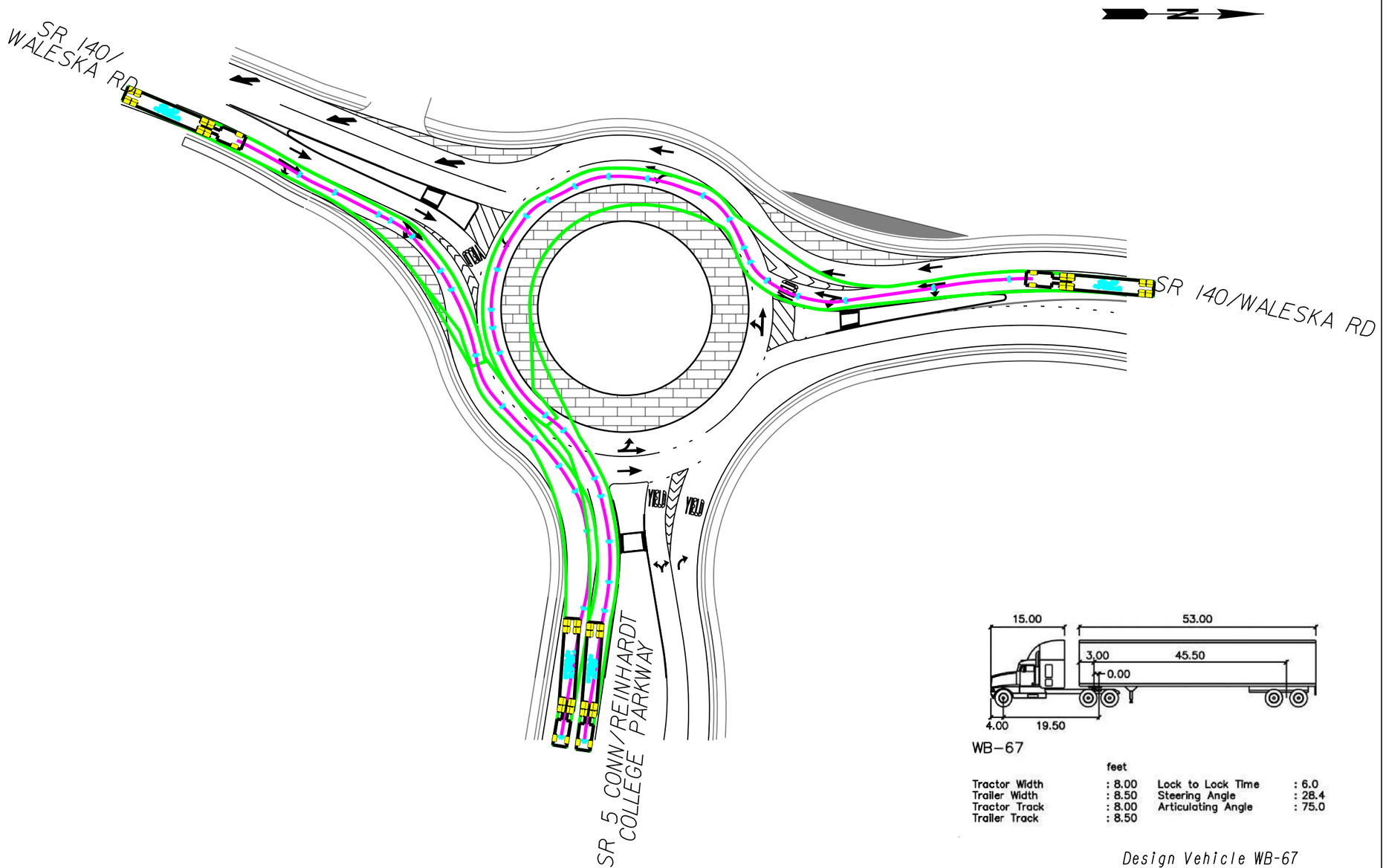
SCALE IN FEET
0 30 60 120

REVISION DATES		

SR 140 @ SR 5 CONN
Autoturn WB

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		0003
CORRECTED:		DATE:		
VERIFIED:		DATE:		

08/29/23 00:09:23 PBMurphy	GPLOT-V8 gplotborder-v81-P0.tbl	SR140-SR5 CONN Proposal - Alt 2 - Autoturn 04.dgn		P.I. No. 0017982



WB-67

feet			
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		

Design Vehicle WB-67

PROPERTY AND EXISTING R/W LINE		EXISTING PAVEMENT	
REQUIRED R/W LINE		RAISED MEDIAN	
CONSTRUCTION LIMITS	—C—	SIDEWALK	
EDGE OF PAVEMENT		REMOVAL OF EXIST. PAVEMENT	
EDGE OF PAVED SHOULDER		EASEMENT FOR DRIVES	
PARAPET RETAINING WALL		EASEMENT FOR CONST OF SLOPES	
ENVIRONMENTALLY SENSITIVE AREA			
ESA BUFFER			

Est 1834 CANTON GEORGIA

Michael Baker
INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

SCALE IN FEET
0 30 60 120

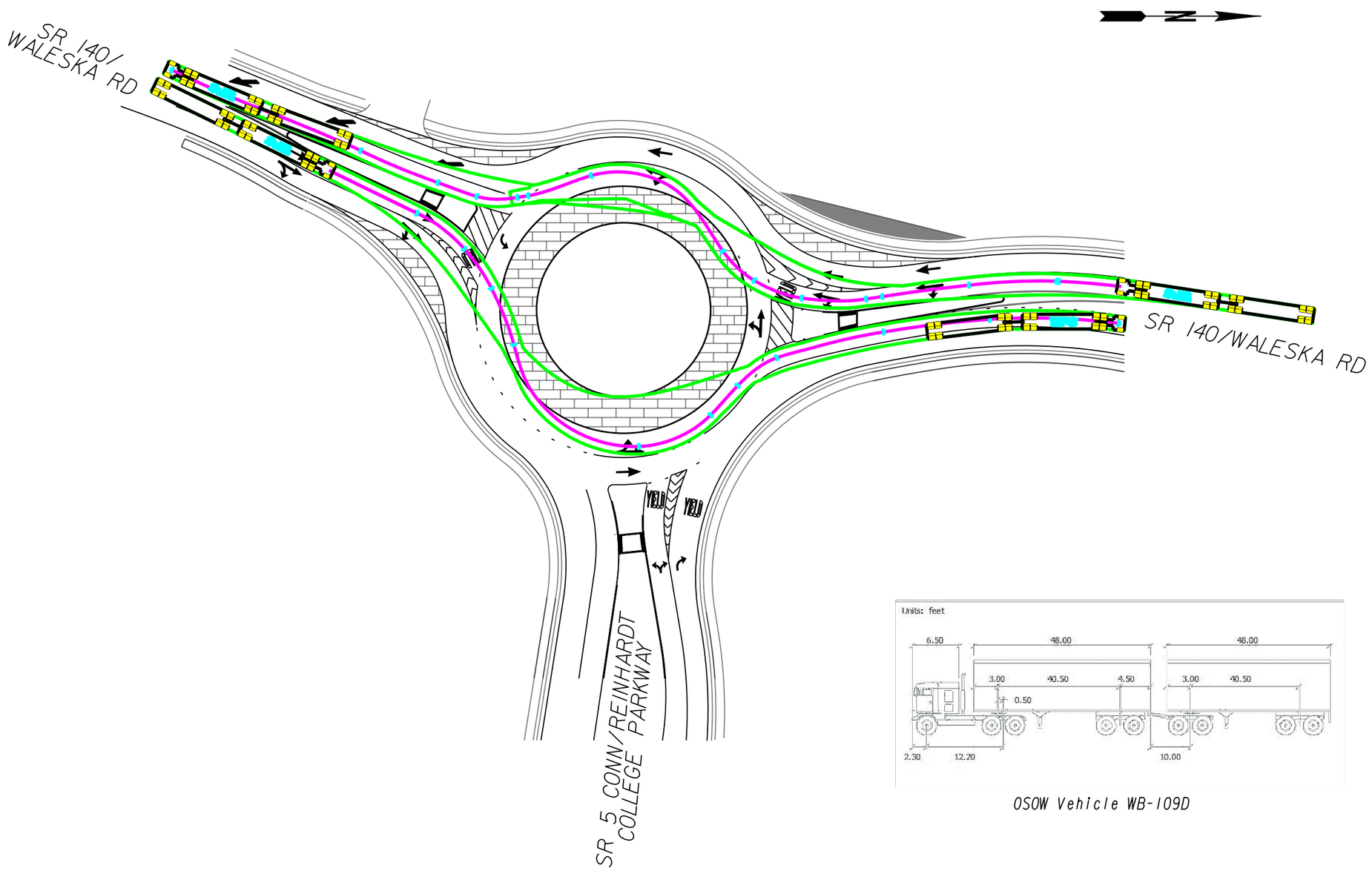
REVISION DATES		

SR 140 @ SR 5 CONN
Autoturn EB

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		0004
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/2015 GPLN

09/12/23 09:26:31	GPLOT-V8	SR140-SR5 CONN Proposal - Alt 2 - OSOW.dgn		P.I. No.
PBMurphy	gplotborder-v81-P0.tbl			0017982



OSOW Vehicle WB-109D

PROPERTY AND EXISTING R/W LINE		EXISTING PAVEMENT	
REQUIRED R/W LINE		RAISED MEDIAN	
CONSTRUCTION LIMITS	—G— —	SIDEWALK	
EDGE OF PAVEMENT		REMOVAL OF EXIST. PAVEMENT	
EDGE OF PAVED SHOULDER		EASEMENT FOR DRIVES	
PARAPET RETAINING WALL		EASEMENT FOR CONST OF SLOPES	
ENVIRONMENTALLY SENSITIVE AREA			
ESA BUFFER			

10/23/2015 GPLN

Est 1834 CANTON GEORGIA

Michael Baker
INTERNATIONAL
420 Technology Pkwy, Suite 150
Norcross, GA 30092
Phone: (770) 263-9118

SCALE IN FEET
0 30 60 120

REVISION DATES		

SR 140 @ SR 5 CONN
OSOW

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		0005
CORRECTED:		DATE:		
VERIFIED:		DATE:		