ORIGINAL TO GENERAL FILES

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

OFFICE OF DESIGN POLICY & SUPPORT
INTERDEPARTMENTAL CORRESPONDENCE

FILE P.I. # 0007526
CSHPP-0007-00(526)
Forsyth & Fulton Counties
GDOT District 1 - Gainesville
GDOT District 7 - Metro Atlanta
SR 400 @ CR 41/CR 283/ McGinnis Ferry Road

OFFICE Design Policy & Support

DATE 11/19/2014

FROM for Brent Story, State Design Policy Engineer

TO SEE DISTRIBUTION

SUBJECT **APPROVED CONCEPT REPORT**

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

Attachment

DISTRIBUTION:

Glenn Bowman, Director of Engineering
Joe Carpenter, Director of P3/Program Delivery
Genetha Rice-Singleton, Assistant Director of P3/Program Delivery
Albert Shelby, State Program Delivery Engineer
Bobby Hilliard, Program Control Administrator
Cindy VanDyke, State Transportation Planning Administrator
Hiral Patel, State Environmental Administrator
Ben Rabun, State Bridge Engineer
Kathy Zahul, State Traffic Engineer
Angela Robinson, Financial Management Administrator
Lisa Myers, State Project Review Engineer
Charles "Chuck" Hasty, State Materials Engineer
Mike Bolden, State Utilities Engineer
Richard Cobb, Statewide Location Bureau
Brent Cook, D1 District Engineer
Justin Lott, D1 District Preconstruction Office
Neil Kantner, D1 District Utilities Engineer
Rachel Brown, D7 District Engineer
Scott Lee, D7 District Preconstruction Engineer
Patrick Allen, D7 District Utilities Engineer
Otis Clark, Project Manager
BOARD MEMBER - 6th & 7th Congressional Districts

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA
PROJECT CONCEPT REPORT

Project Type:	Interchange	P.I. Number:	0007526
GDOT Districts:	1 and 7	County:	Forsyth/Fulton
Federal Route Number:	n/a	State Route Number:	400
		Project Number:	CSHPP-0007-00(526)

Project Description This project will construct a full-diamond interchange at McGinnis Ferry Road and SR 400 on the Forsyth/Fulton County line. Auxiliary lanes will be added to SR 400 both north and south of the new interchange.

Submitted for approval:

Brad Hale, Moreland Altobelli Associates, Inc. — DATE 4/14/14

John Cunard, Forsyth County Engineering — DATE 4-15-14

State Program Delivery Engineer — DATE 4-29-14

GDOT Project Manager — DATE 4/23/14

Recommendation for approval:

Program Control Administrator — DATE

HIRAL PATEL*/EKP — DATE 5/15/2014

State Environmental Administrator — DATE

LISA MYERS*/EKP — DATE 5/2/2014

Project Review Engineer — DATE

JON BIRNKAMMER*/EKP — DATE 5/5/2014

FOR State Utilities Engineer — DATE

RACHEL BROWN*/EKP — DATE 5/22/2014

District Engineer — DATE

BEN RABUN*/EKP — DATE 7/21/2014

State Bridge Design Engineer

State Transportation Financial Management Administrator — DATE

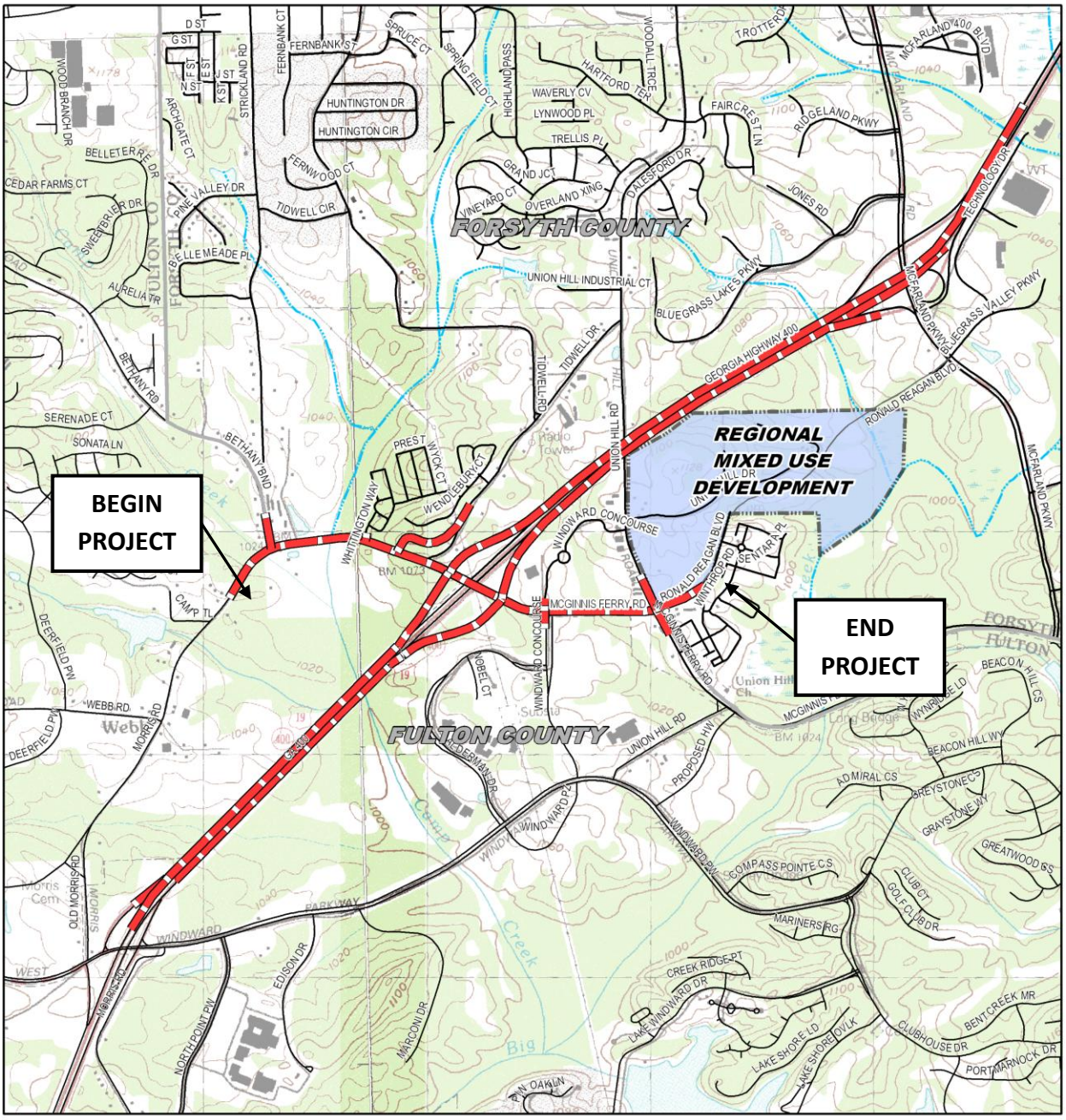
The concept as presented herein and submitted for approval is consistent with that which is included in the Regional Transportation Plan (RTP) and/or the State Transportation Improvement Program (STIP).

CINDY VANDYKE*/EKP — DATE 5/1/2014

State Transportation Planning Administrator

* - RECOMMENDATION ON FILE

PROJECT LOCATION



PLANNING & BACKGROUND DATA

Project Justification Statement:

PLANNING BACKGROUND

In February 2013, the Office of Planning approved the Interchange Justification Report (IJR) which proposes to construction a new interchange on Georgia 400 at McGinnis Ferry Road with auxiliary lanes on Georgia 400. This project was programmed at the request of Forsyth County.

SR 400 generally runs in a northeast-southwest direction in the project vicinity, and is part of the Appalachian Development Highway System. The proposed interchange project is located at the Fulton-Forsyth County boundary along McGinnis Ferry Road, and is situated approximately 1.4 miles northeast of the SR 400/Windward Parkway interchange at Exit 11 and approximately 1.5 miles southwest of the SR 400/McFarland Parkway interchange at Exit 12.

The proposed SR 400/McGinnis Ferry Road interchange project is consistent with the latest adopted comprehensive plans of Fulton and Forsyth Counties, and the Cities of Alpharetta, Johns Creek, and Milton.

This project was identified for earmark funding by the 109th US Congress (House Report 3) in two citations – Project No. 1048, $2,400,000 and Project No. 3363, $720,000. This high priority status was established as per provisions of a US Congressional Act referred to as the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" or SAFETEA-LU.

The new interchange would provide additional freeway access to facilitate the economic development of North Fulton and South Forsyth Counties, which includes a planned regional mixed-use development and relieve the existing traffic congestion of adjacent interchanges. The new interchange would also handle the projected future 2040 traffic volumes and it is anticipated to reduce the frequency and severity of collisions as a result of the expected reduction in congested roadways within the project corridor.

EXISTING AND FUTURE CONDITIONS

The existing roadway system in North Fulton County and South Forsyth County and the existing interchanges at SR 400/Windward Parkway and SR 400/McFarland Parkway will no longer efficiently handle future traffic in the year 2020 and will be significantly congested with worsening levels of service by 2040. Additionally, the study area roadways are showing higher than average collision rates on the major corridors. See attached crash analysis for more detail. The majority of collisions on the roads with higher than average collisions rates are rear-end type collisions. Commonly, this type of collision is an indicator of a roadway network that is congested with long traffic queues and unexpected stopping maneuvers.

Major planned developments are under way for the study area. A planned regional mixed-use development is located on approximately 160 acres of land at the intersection of McGinnis Ferry Road / Union Hill Road and Ronald Reagan Boulevard. The master plan of the development includes a luxury

retail mall, four 12-story office towers, ten combination buildings of retail/office space, several restaurants, 500+ hotel rooms and 875 dwelling units of residential development, some of which are located in combination with retail space. This development alone will add 7,842 new jobs, and the population would increase by 9,094 people. The first phase of this development consisting of 270 apartment units is already completed. The proposed retail mall is projected to be opened in 2018. The latest opening date for the retail mall is December 1, 2020 pursuant to the executed Development Agreement between Forsyth County and TRG Forsyth LLC. The remaining buildout is expected to continue after completion of the mall.

PROJECT JUSTIFICATION

The IJR traffic analysis supports the conclusion that new freeway access is needed to provide for the necessary infrastructure for continued future economic development and to facilitate future 2040 traffic. The new interchange access to SR 400 is needed to reduce traffic congestion at the existing interchanges of Windward Parkway and McFarland Parkway and reduce the frequency and severity of collisions in the study area. Without the new interchange, the new regional mixed-use center and other developments would not have the supportive infrastructure to market the location and create employment opportunities. Future development of a regional mixed-use development and further development of the existing Windward business park in the study area would create employment opportunities and revenue to Fulton and Forsyth Counties and the cities of the study area.

Existing Conditions: McGinnis Ferry Road is a two-lane roadway with 12-foot lanes with rural variable width grass shoulders. McGinnis Ferry Road bridges over SR 400. SR 400 is an eight-lane divided expressway with 12-foot lanes and a median barrier from Windward Parkway to just south of McFarland Parkway. Under the McFarland Parkway bridge and interchange area the number of lanes transition from four to three to two lanes. SR 400 north of McFarland Parkway is a four-lane divided expressway with a 52-foot grass median.

Major intersections located on McGinnis Ferry Road include Bethany Bend/Morris Road, Windward Concourse and Ronald Reagan Boulevard/Union Hill Road.

Major interchanges in the study include the interchange of SR 400/Windward Parkway located south of the McGinnis Ferry Road bridge and SR 400/McFarland Parkway located north of the McGinnis Ferry Road bridge.

A major utility that would require relocation includes Georgia Power Transmission poles located on both the north and south sides of McGinnis Ferry Road. Other utilities that may require relocation are listed under Utility Involvements shown on page 12.

Other projects in the area:
There are four major transportation infrastructure projects programmed in the study area and contained within the Atlanta Regional Commission's (ARC's) Transportation Improvement Program (TIP).

1. STP00-0114-01 (084) P.I. No. 721780, Fulton County: SR 9 (North Main Street/Cumming Highway) from Academy Street to Windward Parkway. The proposed project would widen the roadway from 2 lanes to 4 lanes. Engineering was authorized in fiscal year 2007. Right-of-way

acquisition is programmed for 2017 and construction is programmed for fiscal year 2019. The ARC TIP reference number is FN-067A.

2. CSSTP-0007-00(843) P.I. No. 0007843, Forsyth County: SR 9 (Atlanta Highway) from Fulton County Line to CR 458 (McFarland Parkway). This project is approximately 0.89 miles in length and would widen SR 9 (Atlanta Highway) from 2 to 4 lanes along the project limits. Engineering was authorized in fiscal year 2011. Right-of-way acquisition is programmed for 2017 and construction is programmed for fiscal year 2019. The ARC RTP reference number is FT-001A.
3. CSSTP-0007-00(844) P.I. No. 0007844, Forsyth County: SR 9 (Atlanta Highway) from CR 458 (McFarland Parkway) to SR 371 (Post Road). This project is approximately 2.2 miles in length and would widen SR 9 (Atlanta Highway) from 2 to 4 lanes along the project limits. Engineering was authorized in fiscal year 2007. Right-of-way acquisition is programmed for 2016 and construction is programmed for fiscal year 2020. The ARC RTP reference number is FT-001B.
4. CSSTP-0008-00(357) P.I. No. 0008357, Forsyth County: SR 9 (Atlanta Highway) from SR 371 (Post Road) to SR 141 (Peachtree Parkway). This project is approximately 3.8 miles in length and would widen SR 9 (Atlanta Highway) from 2 to 4 lanes along the project limits. Engineering was authorized in fiscal year 2011. Right-of-way acquisition is programmed for 2016 and construction is programmed for fiscal year 2020. The ARC TIP reference number is FT-001C.

There are other planned projects included within the ARC's Regional Transportation Plan (RTP) and the transportation plans of the counties that would also benefit the study area.

1. MSL00-0001-00 (757), P.I. No. 0001757, Forsyth and Fulton Counties: SR 400 Managed Lanes from I-285 North to McFarland Parkway. This 17-mile project consists of widening SR 400 to include 2 to 4 managed lanes with interchanges along the project limits. Engineering was authorized in fiscal year 2011. Right-of-way acquisition and construction is planned for the long-range program. The ARC RTP reference number is AR-ML-300.
2. STP00-0004-00(634), P.I. No. 0004634, Forsyth and Fulton Counties: McGinnis Ferry Road from Union Hill Road to Sargent Road. This project consists of widening and reconstruction of McGinnis Ferry Road from Union Hill Road to Sargent Road, and is approximately 4.6 miles in length. Engineering and right-of-way acquisition start dates are to be determined. Construction is planned for the long-range program. The ARC RTP reference number is FN-233A.
3. CSSTP-0007-00(838), P.I. No. 0007838, Forsyth & Fulton Counties: SR 9 (Cumming Highway) from Windward Parkway to McFarland Parkway. This project is approximately 3.9 miles in length and would widen SR 9 from 2 to 4 lanes along the project limits. Engineering and right-of-way acquisition start dates are to be determined. Construction is planned for the long-range program. The ARC RTP reference number is FN-222.
4. Fulton County: CR 65 (Jones Bridge Road) from Taylor Road to Douglas Road. This project is approximately 1.5 miles in length and would widen Jones Bridge Road from 2 to 4 lanes along the project limits. Engineering and right-of-way acquisition start dates are to be determined. Construction is planned for the long-range program. The ARC RTP reference number is FN-270.
5. Fulton County: SR 120 (Kimball Bridge Road) from Old Milton Parkway to Jones Bridge Road. This project is approximately 1.3 miles in length and would widen SR 120 from 2 to 4 lanes along the project limits. Engineering and right-of-way acquisition start dates are to be determined. Construction is planned for the long-range program. The ARC RTP reference number is FN-263.

6. Forsyth County Project: Union Hill Road: Segment 1, from McGinnis Ferry Road to McFarland Parkway. The proposed Forsyth County project is county-funded and would widen the existing 2-lane Union Hill Road from McGinnis Ferry Road to McFarland Parkway to 4 lanes. The project length is 2.23 miles. Engineering and right-of-way acquisition were programmed for fiscal year 2005 and 2006, respectively. Construction is planned for the long range program. The ARC RTP reference number is FT-063A.
7. Forsyth County Project: Union Hill Road / Mullinax Road from CR 458 (McFarland Parkway) to SR 9 (Atlanta Highway), Forsyth County. This project is approximately 2.35 miles in length and would widen Union Hill Road (Mullinax Road) from 2 to 4 lanes along the project limits. Engineering and right-of-way acquisition start dates are to be determined. Construction is funded in the Forsyth County SPLOST program covering the dates March, 2013 to March, 2019. The ARC RTP reference number is FT-063B.
8. Forsyth County Project: Ronald Reagan Boulevard: Segment 2 from McFarland Parkway to Shiloh Road. The proposed Forsyth County project is county-funded and would construct a 4-lane roadway on new location along the project limits. The project length is 1.2 miles. Engineering was authorized in fiscal year 2008. Right-of-way and construction is planned for the long range program. The ARC RTP reference number is FT-077B.
9. Forsyth County Project: Ronald Reagan Boulevard: Segment 3 from Shiloh Road to Majors Road. The proposed Forsyth County project is totally county-funded and would construct a 4-lane, roadway on new location along the project limits. The project length is 2.0 miles. Engineering was authorized in fiscal year 2008. Right-of-way and construction is planned for the long range program. The ARC RTP reference number is FT-077C.
10. Forsyth County Project: McFarland Parkway: Segment 1 from McGinnis Ferry Road to SR 400. The proposed Forsyth County project is county-funded and would widen the existing 4-lane roadway to 6 lanes along the project limits. The project length is 1.0 miles. Engineering was authorized for fiscal year 2007. Right-of-way and construction is planned for the long range program. The ARC RTP reference number is FT-065A.
11. Forsyth County Project: Brookwood Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway). The proposed Forsyth County project is county-funded and would widen the existing 2-lane roadway to 4 lanes along the project limits. The project length is 1.1 miles. Engineering was authorized for fiscal year 2005. Right-of-way and construction is planned for the long range program. The ARC RTP reference number is FT-067A.
12. Forsyth County Project: Old Alpharetta Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway). The proposed Forsyth County project is county-funded and would widen the existing 2-lane roadway to 4 lanes along the project limits. The project length is 2.5 miles. Engineering, right-of-way and construction is planned for the long range program. The ARC RTP reference number is FT-081.

MPO: Atlanta Regional Commission (ARC) MPO Project ID: FT-324

Regional Commission: Atlanta Regional Commission RC Project ID: FT-324

Congressional District(s): 6, 7

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

Projected Traffic: Build ADT

	Current Year (2013)	Open Year (2020)	Design Year (2040)
McGinnis Ferry Road	11,500 vpd	38,500 vpd	45,800 vpd
Georgia 400	90,400 vpd	130,400 vpd	162,800 vpd

Traffic Projections Performed by: Moreland Altobelli Associates, Inc.

Functional Classification (Mainline): Georgia 400: Urban Freeway and Expressway
McGinnis Ferry Road: Urban Minor Arterial

Complete Streets - Bicycle, Pedestrian, and/or Transit Warrants:

Warrants met: ☐ None ☒ Bicycle ☒ Pedestrian ☒ Transit

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

Pavement Evaluation and Recommendations

Preliminary Pavement Evaluation Summary Report Required? ☐ No ☒ Yes

Preliminary Pavement Type Selection Report Required? ☐ No ☒ Yes

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

DESIGN AND STRUCTURAL DATA

Description of the proposed project: The proposed project would consist of constructing a full-diamond interchange on SR 400 at McGinnis Ferry Road. The project would add a northbound and southbound auxiliary lane on SR 400 between Windward Parkway ramps and the McGinnis Ferry Road ramps and between the McGinnis Ferry Road ramps and the McFarland Parkway ramps. SR 400 southbound would be widened one additional lane from 1,900 feet south of the southbound McFarland Parkway exit ramp to 3,500 feet north of the southbound McFarland Parkway exit ramp. The project would replace the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend through the intersection of Union Hill Road onto Ronald Reagan Blvd to Counselors Way. All through lanes would be 11-foot wide and turn lanes would be 12-foot wide. McGinnis Ferry Road would be widened to four lanes with a 14-foot flush median from Bethany Bend to Deerfield Point Drive; four lanes with a 20-foot raised median from Deerfield Point Drive through the SR 400 interchange; and, six lanes with a 20-foot raised median from SR 400 through the intersection of Union Hill Road onto Ronald Reagan Blvd to Counselors Way. The typical section would include curb and gutter and five-foot sidewalks on the south side and a multi-use path on the north side along the entire length of McGinnis Ferry Road. Additional right-turn lanes and left-turn lanes would be provided along McGinnis Ferry Road at the major intersections of the project. The proposed bridge would be designed to span future managed lanes on SR 400.

The overall project length is estimated at 4.98 miles which includes the project length along SR 400 which is 3.28 miles and McGinnis Ferry Road and other minor side road improvements total 1.7 miles in length. The 2008 update to the Forsyth County Bicycle Transportation & Pedestrian Walkways 2025 Plan includes a 10-foot wide multi-use path, which will be incorporated into the project.

Major Structures:

Structure	Existing	Proposed
ID: 121-0285-0	McGinnis Ferry Road over Georgia 400 – 1.5 miles south of McFarland Parkway. Sufficiency Rating: 80.30, Bridge length = 304', Bridge width = 34.40' (two 12-foot roadway lanes). See attached inventory. This bridge will be replaced in order to lengthen and widen.	McGinnis Ferry Road over Georgia 400 - Bridge length = 328', Bridge width = 121'-5" (2-11' westbound lanes with 2-12' left-turn lanes and 2-11' eastbound lanes with 2-12' left-turn lane with sidewalk and 10' multi-use path)
ID: 121-0284-0	McGinnis Ferry Road over Camp Creek Tributary – 0.4 mile west of Georgia 400. Sufficiency Rating: 47.20, Bridge length = 60', Bridge width = 24.20' (two 12-foot roadway lanes). See attached inventory. This bridge will be replaced in order to widen.	McGinnis Ferry Road over Camp Creek Tributary - Bridge length = 80', Bridge width = 81'-11"' (4-11' lanes with 14' flush median and sidewalk and 10' multi-use path)
ID: 121-0131-0	Georgia 400 over Camp Creek Tributary – 0.4 mile south of McGinnis Ferry Road. Sufficiency Rating: 86.36, Bridge culvert length = 22', Bridge culvert width = 132 (four 12-foot roadway lanes in each direction). See attached inventory. This bridge culvert will be extended.	Georgia 400 over Camp Creek Tributary – Bridge culvert length = 22', Bridge culvert width = 156' (five 12-foot roadway lanes in each direction).
ID: 117-0042-0	McFarland Parkway over Georgia 400 – 1.5 miles north of McGinnis Ferry Road. Sufficiency Rating: 70.36, Bridge length = 310', Bridge width = 102.50' (eight 12-foot roadway lanes-two southbound through lanes, one southbound left-turn lane, two northbound left-turn lanes and three northbound through lanes). See attached inventory.	No modifications will be done under this project.
ID: 117-0031-0	Union Hill Road over Georgia 400 – 0.6 mile north of McGinnis Ferry Road. Sufficiency Rating: 71.70, Bridge length = 350', Bridge width = 34.00' (two 12-foot roadway lanes). See attached inventory.	No modifications will be done under this project.

Mainline Design Features: Georgia 400 (Urban Freeway and Expressway)

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	8		8 + 2 Auxiliary
- **Lane Width(s)**	12’	12’	12’
- **Median Width & Type**	Concrete Median Barrier		Concrete Median Barrier
- **Outside Shoulder or Border Area Width**	14’ with 12’paved & 2’ grassed	14’ with 12 ’paved & 2’ grassed	14’ with 12’paved & 2’ grassed
- **Outside Shoulder Slope**	6:1	4:1	6:1
- **Inside Shoulder Width**	6’ paved	6’ with 4’ paved & 2’ grassed	6’ paved
- **Sidewalks**	No	No	No
- **Auxiliary Lanes**	No	No	Yes
- **Bike Lanes**	No	No	No
Posted Speed	65 mph		65 mph
Design Speed	N/A	55-70 mph	65 mph
Min Horizontal Curve Radius	12,182’	1,060’	12,182’
Maximum Superelevation Rate	6%	6%	6%
Maximum Grade	4%	4%	4%
Access Control	Limited	Limited	Limited
Design Vehicle	WB-65	WB-67	WB-67
Pavement Type	Concrete	Concrete	Concrete

*According to current GDOT design policy if applicable

Mainline Design Features: McGinnis Ferry Road (Urban Minor Arterial)

Feature	Existing	Standard*	Proposed
Typical Section			
- **Number of Lanes**	2		4-6
- **Lane Width(s)**	12’	11 or 12’	11’ or 12’
- **Median Width & Type**	No Median	20’ raised	20’ raised
- **Outside Shoulder or Border Area Width**	Rural variable grassed	10’-16’ with curb & gutter	16’-22.5’ with curb & gutter
- **Outside Shoulder Slope**	4:1	4:1	4:1
- **Inside Shoulder Width**	N/A	N/A	N/A
- **Sidewalks**	No	Yes	Yes
- **Auxiliary Lanes (Turn lanes Right or Left)**	Yes	Yes	Yes
- **Bike Lanes (Multi-use Path)**	No	No	Yes (10-foot wide with a design speed of 18 mph)
Posted Speed	40 mph		45 mph
Design Speed	N/A	35-45 mph	45 mph
Min Horizontal Curve Radius	500’	711’	2000’
Maximum Superelevation Rate	4%	4%	4%
Maximum Grade	10%	7%	4.9%
Access Control	By Permit	By Permit	By Permit
Design Vehicle	WB-50	WB-40 or BUS-40	WB-50
Pavement Type	Asphalt	Asphalt	Asphalt

*According to current GDOT design policy if applicable

Major Interchanges/Intersections:

- Interchanges: Georgia 400 interchanges in the study area are Windward Parkway and McFarland Parkway.

- Intersections with proposed traffic signals:
  1. McGinnis Ferry Road at Bethany Bend/Morris Road
  2. McGinnis Ferry Road at Georgia 400 Southbound Ramps
  3. McGinnis Ferry Road at Georgia 400 Northbound Ramps

- Intersections with existing traffic signals:
  1. McGinnis Ferry Road at Ronald Reagan Blvd/Union Hill Road
  2. McGinnis Ferry Road at Windward Concourse

Traffic signal warrants studies were conducted at the major intersections of the project based on the traffic signal warrants, published in the *Manual On Uniform Traffic Control Devices, 2009* using the projected year 2020 traffic volumes. A summary of the traffic signal warrants studies are contained in the attachments.

Lighting required: ☒ No ☐ Yes

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

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

Design Exceptions to FHWA/AASHTO controlling criteria anticipated:

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

Design Variances to GDOT Standard Criteria anticipated:

GDOT Standard Criteria	Reviewing Office	No	Undeter--mined	Yes	Appvl Date (if applicable)
1. Access Control/Median Opening	DP&S	☐	☐	☒	
2. Intersection Sight Distance	DP&S	☒	☐	☐	
3. Intersection Skew Angle	DP&S	☒	☐	☐	
4. Lateral Offset to Obstruction	DP&S	☒	☐	☐	
5. Rumble Strips	DP&S	☒	☐	☐	
6. Safety Edge	DP&S	☒	☐	☐	
7. Median Usage	DP&S	☐	☐	☒	
8. Roundabout Illumination	DP&S	☒	☐	☐	
9. Complete Streets	DP&S	☒	☐	☐	
10. ADA & PROWAG	DP&S	☒	☐	☐	
11. Georgia Construction Standard	DP&S	☒	☐	☐	
12. GDOT Drainage Manual	DP&S	☒	☐	☐	
13. GDOT Bridge & Structural Manual	Bridges	☒	☐	☐	

Design Variances:

1. Substandard median opening spacing. The desirable median opening spacing from a limited access highway ramp terminal is 1,000 feet. Windward Concourse is located approximately 740 feet east of the northbound ramp terminal.
7. Median Usage. Raised medians are required for arterials with volumes >18,000 vehicles per day (vpd) in the Base Year and >24,000 vpd in the Design Year. The section of McGinnis Ferry Road from Bethany Bend to Deerfield Point Drive is proposed as a 5-lane section with a flush median. Currently, this section of roadway has only one access point and it is anticipated to have one additional access point in the future. Eliminating the raised median with only two access points on this 1,700-foot section of roadway would not create the potential for traffic crashes or traffic congestion. The median is proposed to be eliminated to reduce the footprint of the roadway, thereby reducing the potential wetland and stream impacts near Camp Creek stream.

VE Study anticipated: ☒ No ☐ Yes ☐ Completed – Date:

UTILITY AND PROPERTY

Temporary State Route needed: ☒ No ☐ Yes ☐ Undetermined

Railroad Involvement: None

Utility Involvements:

Electric	Georgia Power Company
	Georgia Power Transmission
	Georgia Transmission
	MEAG Power Distribution Corp.
	Sawnee EMC
Gas	Atlanta Gas Light Company
	Alpharetta Gas
Sewer	Forsyth County
	Fulton County
Water	Forsyth County
	Fulton County
Telephone	AT&T Telecommunications
Cable TV	AT&T
	Comcast,
	Charter Communications

SUE Required: ☐ No ☒ Yes, Level B

Public Interest Determination Policy and Procedure recommended (Utilities)? ☒ No ☐ Yes

Right-of-Way: McGinnis Ferry Road
Existing width: 80 feet Proposed width: 120-150 feet

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

Anticipated number of impacted parcels:		21
Displacements anticipated:	Total:	0
	Businesses:	0
	Residences:	0
	Other:	0

No additional right-of-way is anticipated along GA 400.

Location and Design approval: ☐ Not Required ☒ Required

CONTEXT SENSITIVE SOLUTIONS

Issues of Concern: There are no context sensitive issues or concerns identified within the corridor.

Context Sensitive Solutions:
This project is a collaborative effort between business and community leaders. Although there are not any specific context sensitive issues identified, the design will provide sidewalks and a multi-use path along McGinnis Ferry Road within the project limits. These facilities will provide a context sensitive feature to the environment.

ENVIRONMENTAL & PERMITS

Anticipated Environmental Document:

GEPA: ☐ **NEPA:** ☐ CE ☒ EA/FONSI ☐ EIS

MS4 Compliance – Is the project located in an MS4 area? ☐ No ☒ Yes
See attached report on MS4 Compliance.

Environmental Permits/Variances/Commitments/Coordination anticipated:

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

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

Environmental Comments and Information:

NEPA/GEPA: It is anticipated that an Environmental Assessment (EA) will be prepared to reflect the current economic, environmental, cultural and social affects. Based upon the Public Outreach, the final determination of the type of NEPA document will be finalized. All special studies will be conducted and completed in accordance with current GDOT standards.

Ecology: A preliminary in-house review of the proposed project for ecological resources has been conducted. This review covered applicable federal and state databases of natural resources in the area. Based on this preliminary information, the proposed project would potentially impact jurisdictional waterways. All of the identified waterways are likely perennial streams with one named stream (Camp Creek) present. In addition, there may be wetlands associated with these streams.

A preliminary check of federal and state protected species indicates the potential presence of any or all of the following: five species of fish, one species of crayfish, two species of bats and three species of plants. Field survey for these species would have to be coordinated with the overall

project schedule. These surveys could affect the schedule of completion of the special studies and draft EA

History: A review of existing information on previously identified historic and archaeological properties on the National Register of Historic Places was conducted in November 2013. There are no proposed National Register nominations or National Register listed properties nor any identified battlefield sites within the proposed project area. On May 30, 2008, a history scan was conducted on the northwest and southwest corners of the McGinnis Ferry Road and Union Hill Road intersection for eligible historic resources. One (1) potentially eligible historic resource was located at 4100 McGinnis Ferry Road, a Hall Parlor house-type. It was noted that the existing edge of pavement would serve as the historic boundary, and the proposed project-related widening improvements should take place on the south side of McGinnis Ferry Road to minimize any adverse impacts.

Additionally, there is a small cemetery located near the possible relocation of Tidwell Drive that would need to be documented and evaluated.

Archeology: A review of literature will be done and an Archaeological resource survey will be conducted to identify any additional eligible resources.

Air Quality:

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

The FY 2012-2017 Transportation Improvement Program (TIP) under the PLAN 2040 Regional Transportation Plan (RTP) is the current adopted plan for the Atlanta area showing the region's highest transportation priorities. It was adopted by the Atlanta TMA Board on August 18, 2011 and was approved by US DOT on September 6, 2011. This project is identified in the PLAN 2040 RTP and FY 2012-2017 TIP by reference number FT-324. The conforming plan model describes the proposed project as a new interchange at SR 400 and McGinnis Ferry Road. Also, McGinnis Ferry Road would be widened from Ronald Reagan Boulevard in Forsyth County to Bethany Bend Road in Fulton County. The TIP shows that engineering has been authorized in 2012 with local funds and SAFETEA-LU Earmark funds. The construction of FT-324 is shown to be locally funded.

Noise Effects: Noise Impact Assessment will be conducted using TNM. The assessment will be conducted in compliance with *23 USC Section 109(h) and (i) and* according to the new GDOT Noise Abatement policy, effective July 13, 2011.

Public Involvement: The project will have local coordination with the major stakeholders listed below. In addition, a Public Information Open House (PIOH) Meeting will be held. Other public involvement will also occur throughout the process which may include: neighborhood meetings, meetings with businesses, and other local interest groups as deemed necessary by GDOT/FHWA.

P.I. Number: 0007526

Major stakeholders: traveling public, cities of Alpharetta, Milton, Johns Creek, Forsyth and Fulton Counties, North Fulton CID, Forsyth County Chamber of Commerce, and other stakeholders as deemed appropriate.

CONSTRUCTION

Issues potentially affecting constructability/construction schedule: None

Early Completion Incentives recommended for consideration: ☒ No ☐ Yes

COORDINATION, ACTIVITIES, RESPONSIBILITIES, AND COSTS

Initial Concept Meeting: Meetings were held with stakeholders and the GDOT during the IJR approval process.

Concept Meeting: Meeting held on December 4, 2013. See attached minutes.

Other coordination to date: None.

Project Activity	Party Responsible for Performing Task(s)
Concept Development	Forsyth County/MAAI
Design	Forsyth County/MAAI
Right-of-Way Acquisition	To Be Determined
Utility Relocation	To Be Determined
Letting to Contract	Georgia DOT
Construction Supervision	Georgia DOT
Providing Material Pits	Contractor (if required)
Providing Detours	Contractor (if required)
Environmental Studies, Documents, and Permits	Forsyth County/MAAI
Environmental Mitigation	To Be Determined
Construction Inspection & Materials Testing	Georgia DOT

Project Cost Estimate and Funding Responsibilities:

	Breakdown of PE	ROW	Reimbursable Utility	CST*	Environmental Mitigation	Total Cost
By Whom	Forsyth County	To Be Determined	To Be Determined	To Be Determined	To Be Determined	
$ Amount	$1,749,374	$12,733,000	$3,852,000	~~$24,991,055~~ $28,583,661 EKP	$263,700	~~$43,589,129~~ $47,181,735 EKP
Date of Estimate	2/21/2014	11/20/2013	9/21/2013	2/21/2014	9/9/2013	

*CST Cost includes: Construction, Engineering and Inspection, Liquid AC Adjustment & Contingencies.

ALTERNATIVES DISCUSSION

Alternative selection: Six alternatives, including the no-build alternative were considered. All of these alternatives were studied in the IJR of this project. The cost estimates shown below were taken from the IJR. The cost estimates did not include the multi-use path, culvert extensions, the bridge over Camp Creek tributary, MS4 right-of-way and mitigation costs. Below is a brief rationale for the elimination of the No-Build Alternative (Alternative 1) and Alternatives 2, 4, 5 and 6.

Preferred Alternative: New Interchange at SR 400 /McGinnis Ferry Road with Auxiliary Lanes. Referred to in the IJR as Alternative 3.			
Estimated Property Impacts:	28 parcels	**Estimated Total Cost:**	~~$38,100,553~~ $47,181,735 EKP
Estimated ROW Cost:	$11,767,000	**Estimated CST Time:**	2 years
Rationale: The preferred alternative would improve the LOS on the freeway segments of SR 400, improve the ramp junctions at the interchanges of Windward Parkway and McFarland Parkway and improve the operations of the primary surface streets in the study area. Also, Alternative 3 has the lowest project cost and has the highest benefit-cost ratio of the evaluated alternatives. Additionally, the preferred alternative addresses the regional concern for improvement to regional east-west mobility across the northern Metropolitan Atlanta area.			
No-Build Alternative: The no-build alternative is an alternative in which Forsyth County would take no action to construct the project. Referred to in the IJR as Alternative 1.			
Estimated Property Impacts:	N/A	**Estimated Total Cost:**	$0
Estimated ROW Cost:	$0	**Estimated CST Time:**	N/A
Rationale: Traffic congestion and operational problems would worsen on GA 400 and its interchanges of Windward Parkway and McFarland Parkway. The existing roadways and interchanges of the area would be inadequate to handle the future (year 2040) traffic volumes.			
Alternative 2: New Interchange at SR 400/McGinnis Ferry Road with Collector-Distributor Roads			
Estimated Property Impacts:	28 parcels	**Estimated Total Cost:**	$51,717,575
Estimated ROW Cost:	$11,767,000	**Estimated CST Time:**	2 years
Rationale: This alternative does improve the LOS of the freeway, ramp junctions and surfaces streets of the area. However, this alternative has a much higher cost than the preferred alternative and has a benefit-cost ratio that is less than half the value of the preferred alternative.			
Alternative 4: Improvements to Windward Parkway Interchange and Area Roadways			
Estimated Property Impacts:	87 parcels	**Estimated Total Cost:**	$48,997,253
Estimated ROW Cost:	$16,377,000	**Estimated CST Time:**	2 years
Rationale: This alternative improves the LOS of the Windward Parkway Interchange; but has a benefit-cost ratio of less than half the value of the preferred alternative. Also, this alternative does not address the need for additional access to SR 400 to facilitate the increase in economic development along McGinnis Ferry Road.			
Alternative 5: Improvements to the McFarland Parkway Interchange and Area Roadways			
Estimated Property Impacts:	35 parcels	**Estimated Total Cost:**	$40,213,779
Estimated ROW Cost:	$10,913,000	**Estimated CST Time:**	2 years
Rationale: This alternative does not improve the ramp junctions of Windward Parkway. It also does not improve the surfaces streets of the area. Also, Alternative 5 has a benefit-cost ratio less than one.			

Alternative 6: Improvements to Windward Parkway and McFarland Parkway Interchanges and Area Roadways			
Estimated Property Impacts:	99 parcels	**Estimated Total Cost:**	$60,918,493
Estimated ROW Cost:	$23,431,000	**Estimated CST Time:**	2 years
Rationale: This alternative is the most expensive alternative and has the second to lowest benefit-cost ratio. It does not address the need for additional access to SR 400 to facilitate the increase in economic development along McGinnis Ferry Road.			

The Preferred Alternative is proposed as a diamond interchange. A diverging diamond interchange (DDI) was considered for this location due to the high projected left-turn volume from westbound McGinnis Ferry Road onto southbound GA 400. A SYNCHRO analysis was conducted with both the traditional diamond and the DDI during the 2040 AM and PM peak hours. The results of the SYNCHRO analysis are shown in table below:

McGinnis Ferry Road Intersection	**Traditional Diamond**		**Diverging Diamond**	
	AM LOS	**PM LOS**	**AM LOS**	**PM LOS**
SB 400 ramps	B	C	C	B
NB 400 ramps	A	A	A	B
Windward Concourse	B	C	B	C
Ronald Reagan Blvd	B	D	C	D

The results of the SYNCHRO analysis indicate that the GA 400 ramp intersections would operate at good levels of service for both the traditional diamond interchange and the DDI. However, the DDI would have a lower LOS at the southbound ramp intersection in the AM and at the northbound ramp intersection in the PM. Additionally with a DDI configuration, if a signalized intersection is located too close to the diverging diamond crossover intersection, then weaving and queuing could occur that would interfere with the operation of the crossover intersection. The queue length between the GA 400 northbound ramp and Windward Concourse exceeds the distance between these two intersections. Therefore, the vehicle queues between these two intersections could impact the operations of the DDI. Consequently, the diverging diamond interchange was eliminated from consideration.

Comments: None.

Attachments:

1. Concept Layout
2. Typical sections
3. Detailed Cost Estimates:
    a. Construction including Engineering and Inspection
    b. Completed Fuel & Asphalt Price Adjustment forms
    c. Right-of-Way
    d. Utilities
    e. Environmental Mitigation
4. Crash summaries
5. Traffic diagrams
6. Capacity analysis summary
7. Signal Warrant Analysis
8. Bridge inventory
9. Hydrology Study for MS4 Permit
10. Pavement studies
11. Conforming plan's network showing project lanes
12. Minutes of Concept meeting December 4, 2013
13. Alternatives Considered for Tidwell Drive Access

APPROVALS

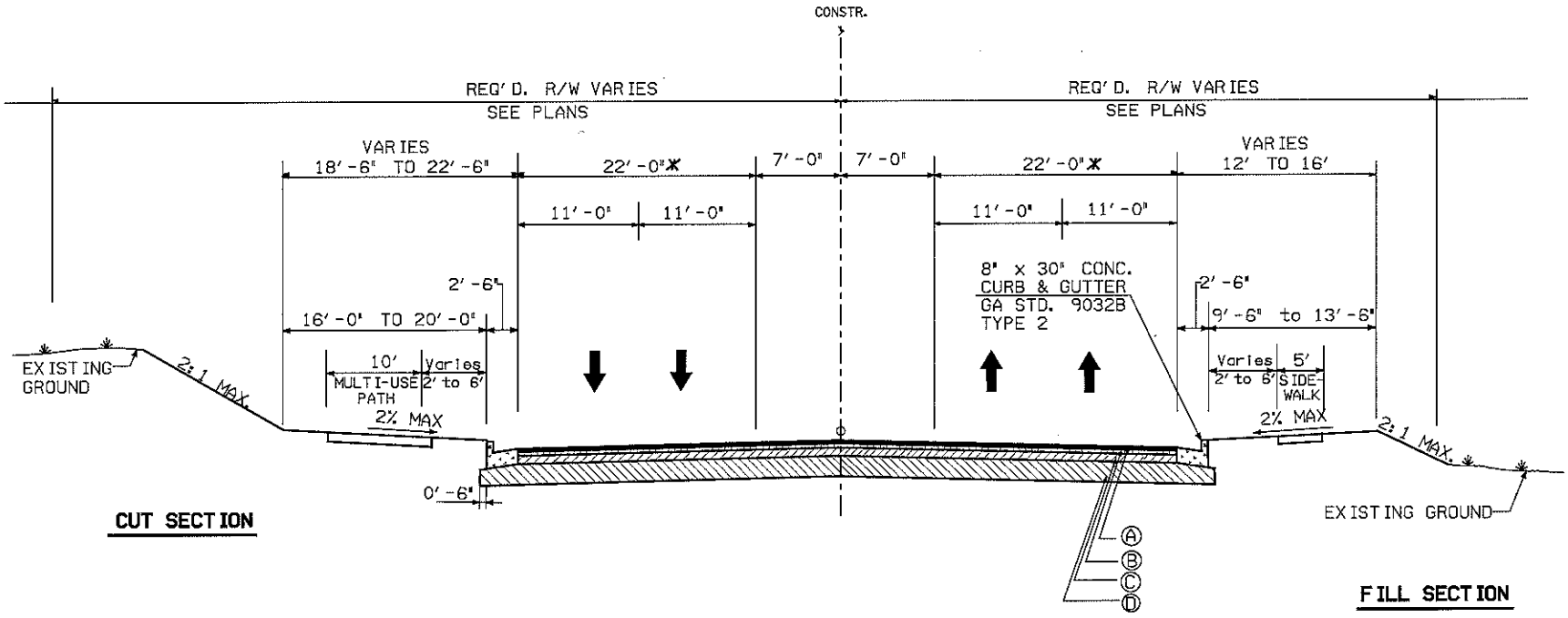
Concur: _____
Director of Engineering

Approve: _____ 11-13-14
Chief Engineer Date

Attachment 1
Concept Layout


UNION HILL RD
TRG FORSYTH LLC
RONALD REAGAN BLVD
MCGINNIS FERRY RD
JAMES WILLIAM ET AL
WADE WILLIAM J TR
EQUIFAX BUSINESS TRUST
TR WINDWARD CONCOURSE LLC
DAVIDSON REAL ESTATE INC
WB HOLDINGS WINDWARD LLC
TIDWELL DR
WINDWARD CONCOURSE
EQUIFAX
WHITEHALL WAY
DEERFIELD POINT DR
DEERFIELD LANDING TOWNHOME ASSOC INC
GEORGIA 400
BETHANY BEND
MORRIS RD

Attachment 2
Typical Section



TYPICAL SECTION

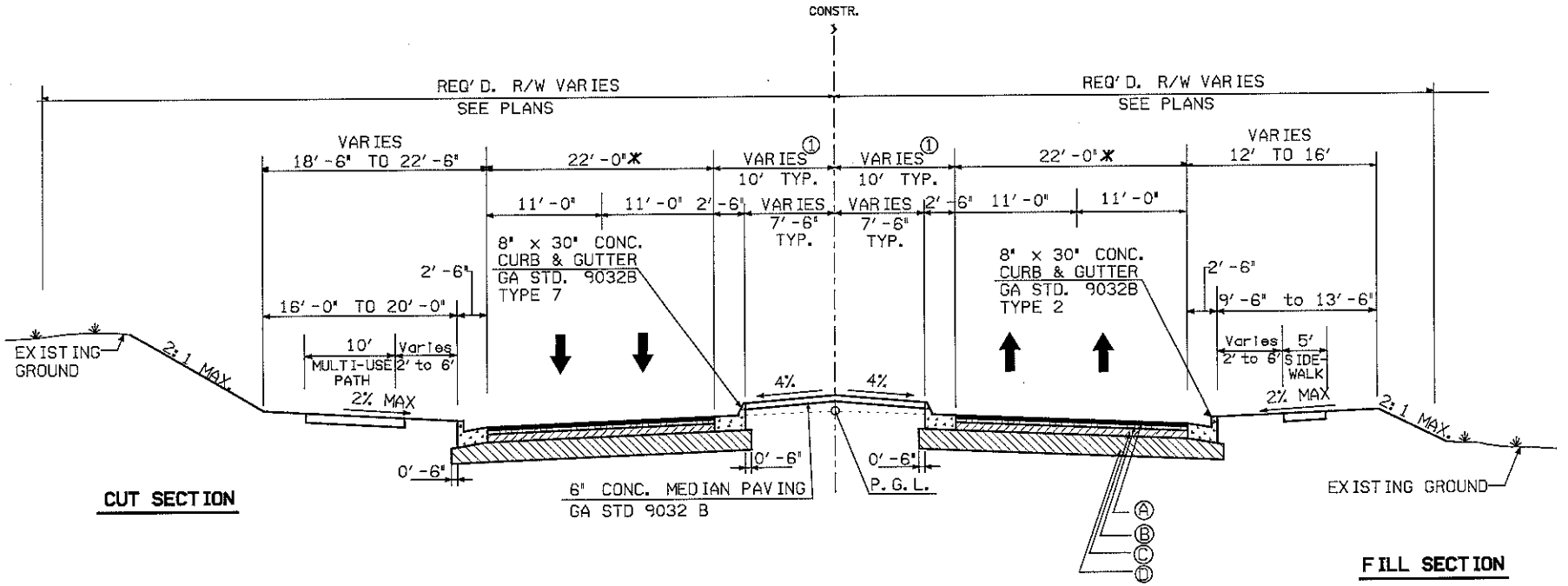
MCGINNIS FERRY ROAD FROM BETHANY BEND TO DEERFIELD POINT DRIVE

NOT TO SCALE

**ADDITIONAL 12' TURN LANES WHERE REQUIRED.*

PROPOSED PAVEMENT

Ⓐ RECYCLED ASPH CONC. 12.5 mm SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 LBS/SY)
Ⓑ RECYCLED ASPH CONC. 19 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (220 lbs/SY)
Ⓒ RECYCLED ASPH CONC. 25 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (660 lbs/SY)
Ⓓ GRADED AGGREGATE BASE (12")



TYPICAL SECTION

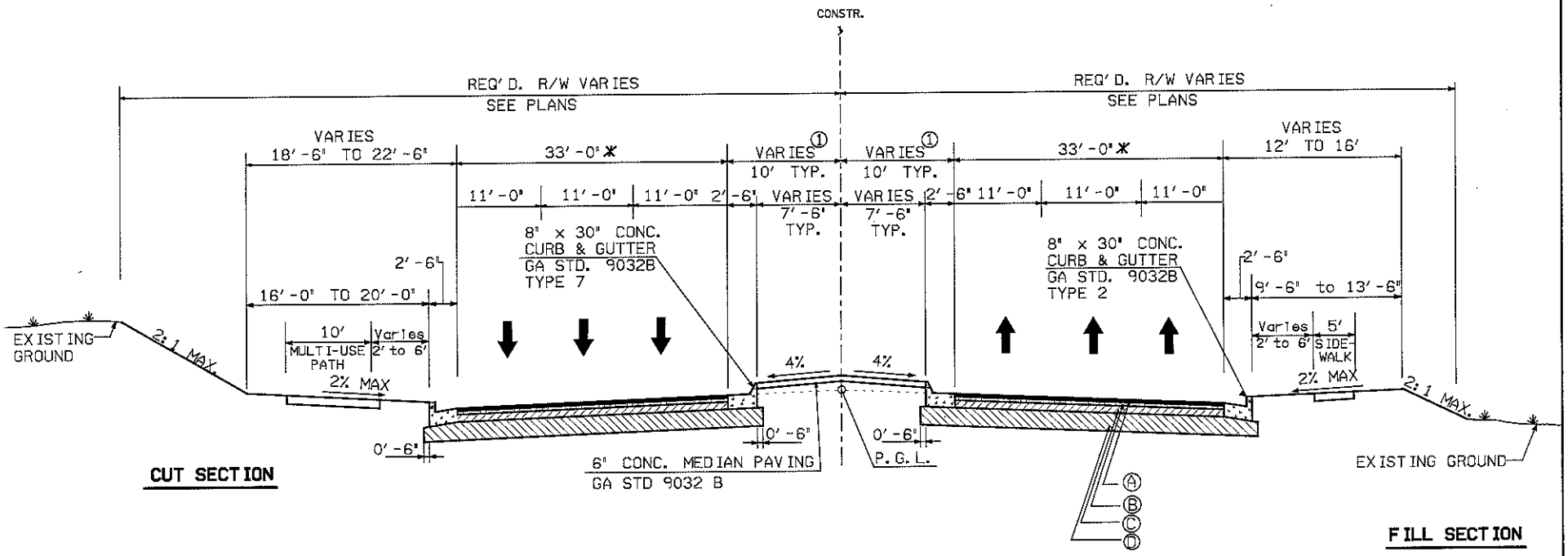
MCGINNIS FERRY ROAD FROM DEERFIELD POINT DRIVE TO GA 400

NOT TO SCALE

**ADDITIONAL 12' TURN LANES WHERE REQUIRED.*

PROPOSED PAVEMENT

Ⓐ RECYCLED ASPH CONC. 12.5 mm SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 LBS/SY)
Ⓑ RECYCLED ASPH CONC. 19 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (220 lbs/SY)
Ⓒ RECYCLED ASPH CONC. 25 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (660 lbs/SY)
Ⓓ GRADED AGGREGATE BASE (12")



TYPICAL SECTION

MCGINNIS FERRY ROAD EAST OF GA 400

NOT TO SCALE

**ADDITIONAL 12' TURN LANES WHERE REQUIRED.*

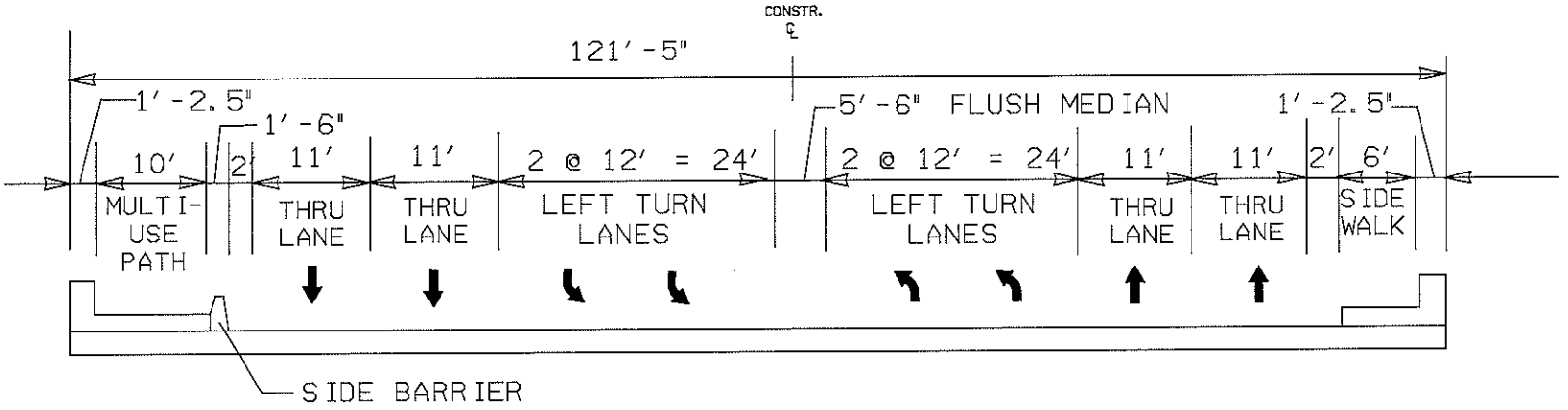
PROPOSED PAVEMENT

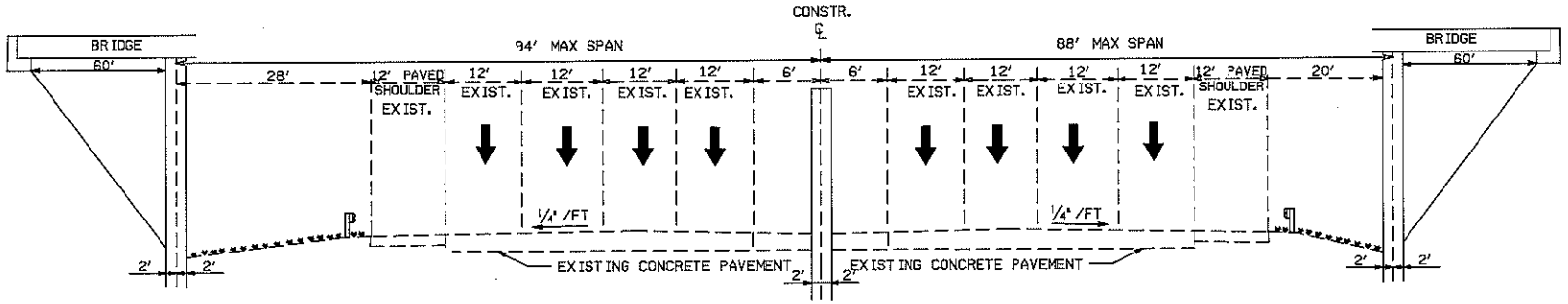
Ⓐ *RECYCLED ASPH CONC. 12.5 mm SUPERPAVE, GP 2 ONLY, INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 LBS/SY)*

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

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

Ⓓ *GRADED AGGREGATE BASE (12")*

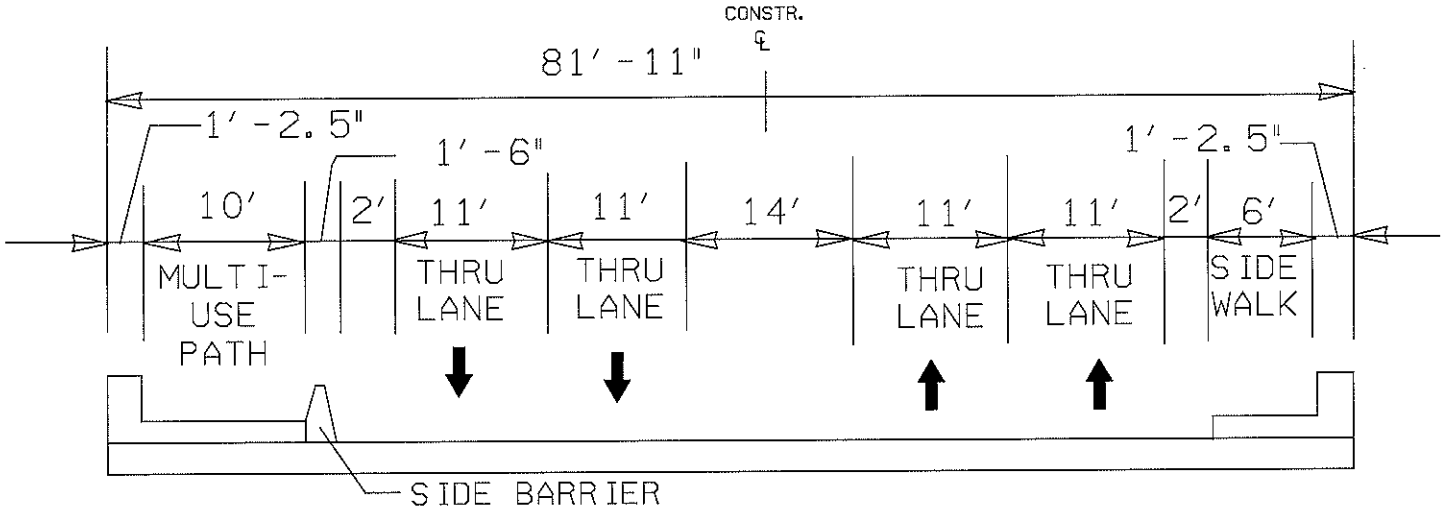




TYPICAL SECTION

MCGINNIS FERRY ROAD BRIDGE OVER GA 400

NOT TO SCALE

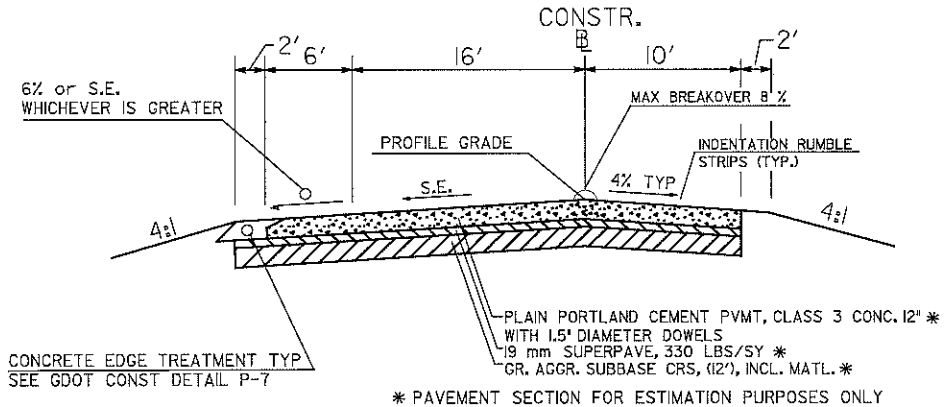


TYPICAL SECTION

MCGINNIS FERRY ROAD BRIDGE OVER CAMP CREEK

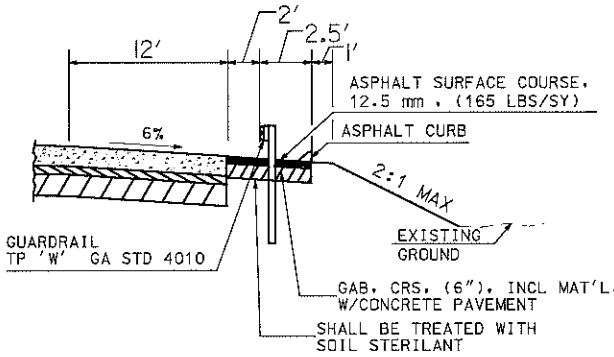
NOT TO SCALE

GA 400 RAMPS



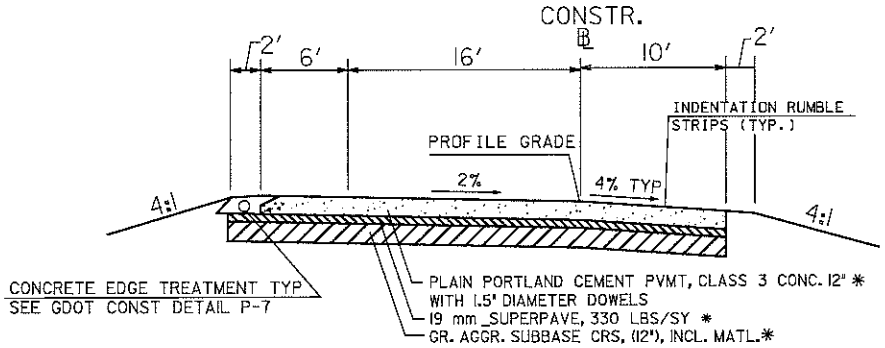
* PAVEMENT SECTION FOR ESTIMATION PURPOSES ONLY

SUPER ELEVATION SECTION



SHOULDER DETAIL FOR GUARDRAIL W/CONCRETE PAVEMENT

(SEE PLANS FOR LOCATION)
(SEE GA. STD. 4051 FOR DETAILS)
N.T.S.



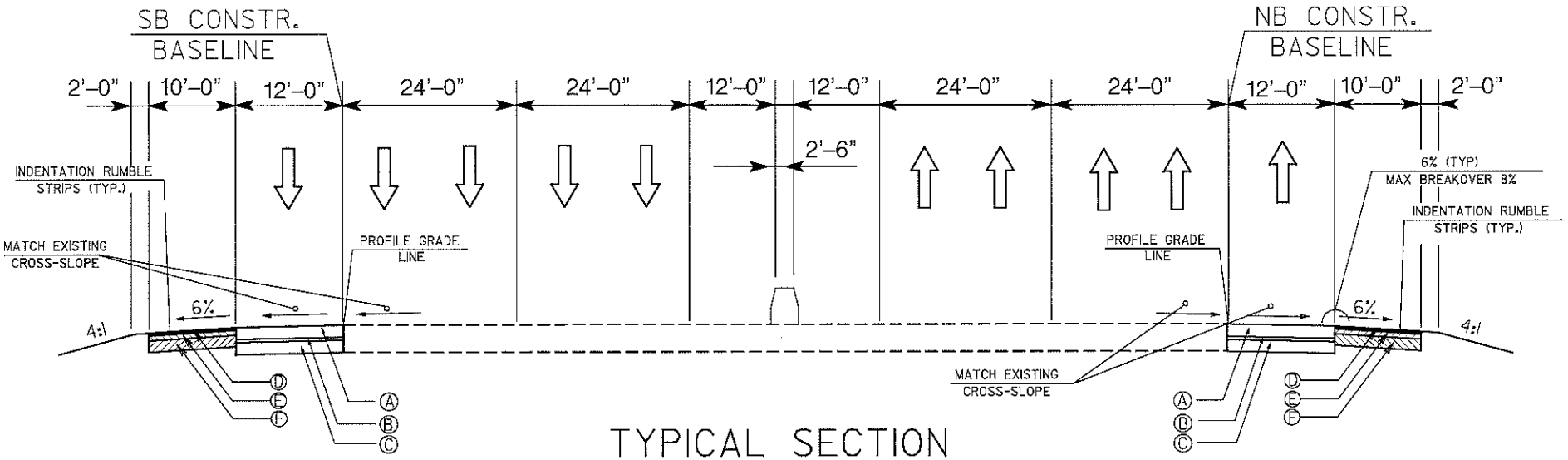
* PAVEMENT SECTION FOR ESTIMATION PURPOSES ONLY

NORMAL CROWN SECTION

TYPICAL SECTION

NOT TO SCALE

GA 400 AUXILIARY LANES



TYPICAL SECTION

NOT TO SCALE

PROPOSED PAVEMENT - FOR COST ESTIMATING ONLY

Ⓐ PLAIN PORTLAND CEMENT PVMT, CLASS 3 CONC., 12" WITH 1.5" DIAMETER DOWELS
Ⓑ RECYCLED ASPH CONC. 19 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (330 LBS/SY)
Ⓒ GRADED AGGREGATE SUBBASE CRS, (12"), INCL. MATL.
Ⓓ RECYCLED ASPH CONC.12.5 mm SUPERPAVE, GP 2 ONLY INCL POLYMER-MODIFIED BITUM MATL & H LIME (165 lbs/SY)
Ⓔ RECYCLED ASPH CONC. 19 mm SUPERPAVE, GP 1 OR 2 INCL BITUM MATL & H LIME (220 lbs/SY)
Ⓕ GRADED AGGREGATE BASE (6")

Attachment 3
Detailed Cost Estimates

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE P.I. No. **7526** **OFFICE** Program Delivery

PROJECT DESCRIPTION

SR 400 @ CR 41/CR 283/McGinnis Ferry Road

DATE August 15, 2014

From: Albert V. Shelby, III, State Program Delivery Engineer

To: Lisa L. Myers, State Project Review Engineer

Subject: REVISIONS TO PROGRAMMED COSTS

PROJECT MANAGER Otis Clark

MGMT LET DATE NA

MGMT ROW DATE NA

PROGRAMMED COSTS (TPro W/OUT INFLATION) **LAST ESTIMATE UPDATE**

CONSTRUCTION	$	22,423,881.00	DATE	3/19/2013
RIGHT OF WAY	$	11,767,000.00	DATE	3/19/2013
UTILITIES	$	2,340,000.00	DATE	

REVISED COST ESTIMATES

CONSTRUCTION*	$	28,583,660.56
RIGHT OF WAY	$	12,733,000.00
UTILITIES	$	3,852,000.00

*Cost Contains **15** % Contingency

REASONS FOR COST INCREASE AND CONTINGENCY JUSTIFICATION:

THE MID POINT CONTINGENCY OF 15% WAS USE DUE TO THE PROJECTS HIGH RISK COMPLEXITY AND POTENTIAL FOR INCREASED DEVELOPMENT WHICH COULD CAUSE INCREASES IN ASPHALT, RW, AND UTILITY COST.

CONTINGENCY SUMMARY

A.	**CONSTRUCTION COST ESTIMATE:**	$ 22,810,197.00	Base Estimate From CES		
B.	**ENGINEERING AND INSPECTION (E & I):**	$ 1,140,509.85	Base Estimate (A) x	**5**	%
C.	**CONTINGENCY:**	$ 3,592,606.03	Base Estimate (A) + E & I (B) x	**15**	%
			See % Table in "Risk Based Cost Estimation" Memo		
D.	**TOTAL LIQUID AC ADJUSTMENT:**	$ 1,040,347.68	Total From Liquid AC Spreadsheet		
E.	**CONSTRUCTION TOTAL:**	$ **28,583,660.56**	(A + B + C + D = E)		

REIMBURSABLE UTILTY COSTS

UTILITY OWNER	REIMBURSABLE COST
Forsyth/Fulton County Water	$55,000.00
Forsyth/Fulton County Sewer	$12,000.00
Electrical Power	$3,525,000.00
Cable & Communication	$260,000.00
TOTAL	**$ 3,852,000.00**

ATTACHMENTS:

Detailed Cost Estimate Printout From TRAQS
Liquid AC Adjustment Spreadsheet

JOB DETAIL ESTIMATE

JOB NUMBER : 0007526 SPEC YEAR: 01
DESCRIPTION: GA 400 AT MCGINNIS FERRY RD
NEW INTERCHANGE & IMPROVEMENTS

ITEMS FOR JOB 0007526

LINE	ITEM	ALT	UNITS	DESCRIPTION	QUANTITY	PRICE	AMOUNT
0005	150-1000		LS	TRAFFIC CONTROL - PROJECT CSHPP-0007-00(526)	1.000	200000.00	200000.00
0010	153-1300		EA	FIELD ENGINEERS OFFICE TP 3	1.000	65330.16	65330.16
0024	210-0100		LS	GRADING COMPLETE - PROJECT CSHPP-0007-00 (526)	1.000	2800000.00	2800000.00
0025	231-1250		EA	MISC CONSTR, UNPAVED RDS, STS AND DRWAYS	1.000	150000.00	150000.00
0030	310-1101		TN	GR AGGR BASE CRS, INCL MATL	98085.000	16.19	1588471.86
0035	402-1812		TN	RECYL AC LEVELING,INC BM&HL	500.000	78.33	39169.73
0045	402-3121		TN	RECYL AC 25MM SP,GP1/2,BM&HL	36491.000	57.62	2102714.69
0050	402-3190		TN	RECYL AC 19 MM SP,GP 1 OR 2 ,INC BM&HL	12688.000	63.41	804668.14
0054	402-4510		TN	RECYL AC 12.5 MM SP,GP2ONLY,INC P-MBM&HL	10724.000	79.80	855809.52
0055	413-1000		GL	BITUM TACK COAT	20307.000	2.33	47461.52
0060	432-5010		SY	MILL ASPH CONC PVMT,VARB DEPTH	180.000	7.70	1386.20
0065	439-0026		SY	PLN PC CONC PVMT CL3 12" THK	53254.000	61.23	3260814.85
0070	441-0016		SY	DRIVEWAY CONCRETE, 6 IN TK	135.000	33.93	4581.74
0075	441-0754		SY	CONC MEDIAN, 7 1/2 IN	6300.000	40.20	253263.47
0080	441-0104		SY	CONC SIDEWALK, 4 IN	17098.000	21.29	364174.41
0085	441-6222		LF	CONC CURB & GUTTER/ 8"X30"TP2	41036.000	9.91	406993.82
0090	441-6740		LF	CONC CURB & GUTTER/ 8"X30" TP7	30252.000	12.04	364298.21
0095	500-3800		CY	CL A CONC, INCL REINF STEEL	430.000	873.16	375460.94
0100	550-1300		LF	STM DR PIPE 30",H 1-10	3300.000	44.42	146593.66
0105	550-1301		LF	STM DR PIPE 30",H 10-15	3200.000	44.74	143194.05
0110	550-1361		LF	STM DR PIPE 36",H 10-15	1600.000	62.45	99934.32
0115	550-1480		LF	STM DR PIPE 48",H 1-10	1200.000	71.04	85249.58
0120	550-1540		LF	STM DR PIPE 54",H 1-10	1200.000	121.73	146077.03
0125	603-2036		SY	STN DUMPED RIP RAP, TP 1, 36"	100.000	51.42	5142.17
0130	624-0400		SF	SOUND BARRIER, TYPE- B	24000.000	26.50	636000.00
0135	641-1100		LF	GUARDRAIL, TP T	280.000	46.99	13158.51
0140	641-1200		LF	GUARDRAIL, TP W	1600.000	17.38	27817.97
0145	641-5001		EA	GUARDRAIL ANCHORAGE, TP 1	10.000	806.99	8069.91
0150	641-5012		EA	GUARDRAIL ANCHORAGE, TP 12	10.000	1877.81	18778.17
0155	668-1100		EA	CATCH BASIN, GP 1	68.000	2126.84	144625.33
0160	163-0232		AC	TEMPORARY GRASSING	38.000	45.79	1740.20
0165	163-0240		TN	MULCH	338.000	175.11	59190.14
0170	163-0300		EA	CONSTRUCTION EXIT	6.000	1094.46	6566.82
0210	165-0010		LF	MAINT OF TEMP SILT FENCE, TP A	7181.000	0.41	2953.47
0215	165-0030		LF	MAINT OF TEMP SILT FENCE, TP C	16755.000	0.46	7808.17
0230	165-0101		EA	MAINT OF CONST EXIT	6.000	491.77	2950.63
0240	167-1000		EA	WATER QUALITY MONITORING AND SAMPLING	3.000	205.95	617.85

JOB DETAIL ESTIMATE

0245	167-1500	MO	WATER QUALITY INSPECTIONS	18.000	376.89	6784.07
0250	171-0010	LF	TEMPORARY SILT FENCE, TYPE A	14362.000	1.31	18916.76
0255	171-0030	LF	TEMPORARY SILT FENCE, TYPE C	33510.000	2.30	77396.37
0259	603-2024	SY	STN DUMPED RIP RAP, TP 1, 24"	128.000	50.31	6440.19
0260	603-7000	SY	PLASTIC FILTER FABRIC	128.000	3.43	439.26
0265	700-6910	AC	PERMANENT GRASSING	75.000	819.10	61433.03
0270	700-7000	TN	AGRICULTURAL LIME	75.000	61.94	4645.69
0275	700-8000	TN	FERTILIZER MIXED GRADE	8.000	612.24	4897.97
0280	700-8100	LB	FERTILIZER NITROGEN CONTENT	1914.000	1.90	3641.88
0285	716-2000	SY	EROSION CONTROL MATS, SLOPES	45000.000	0.77	34705.35
0290	500-3101	CY	CLASS A CONCRETE	21.000	465.04	9766.02
0294	610-6515	EA	REM HIGHWAY SIGN, STD	2.000	144.93	289.88
0295	610-6520	EA	REM HWY SIGN, SPCL ROADSIDE	1.000	849.02	849.03
0299	611-5360	EA	RESET HIGHWAY SIGN	2.000	134.80	269.62
0300	611-5550	LS	RESET SIGN, STA - SPECIAL ROADSIDE SIGNS	1.000	608.31	608.31
0309	636-1020	SF	HWY SGN,TP1MAT,REFL SH TP3	70.000	14.22	995.86
0315	636-1033	SF	HWY SIGNS, TP1MAT,REFL SH TP 9	120.000	19.05	2286.61
0324	636-1070	SF	HWY SIGNS, ALUM E PLNS RS TP 2	1700.000	21.30	36210.00
0330	636-2080	LF	GALV STEEL POSTS, TP 8	110.000	8.31	915.20
0334	636-2090	LF	GALV STEEL POSTS, TP 9	130.000	6.65	865.31
0335	636-3000	LB	GALV STEEL STR SHAPE POST	7200.000	9.21	66312.00
0338	636-5010	EA	DELINEATOR, TP 1	80.000	31.65	2532.19
0339	636-5020	EA	DELINEATOR, TP 2	40.000	27.55	1102.14
0343	636-9094	LF	P-IN-PL,SIGNS,STL H,HP 12 X 53	100.000	92.28	9228.00
0344	638-1001	LS	STR SUPPORT OVHD SIGN,TP I,STA GA 400 NB EXIT	1.000	94926.04	94926.04
0349	638-1001	LS	STR SUPPORT OVHD SIGN,TP I,STA GA 400 SB EXIT	1.000	94926.04	94926.04
0354	638-1001	LS	STR SUPPORT OVHD SIGN,TP I,STA GA 400 EXIT	1.000	94926.04	94926.04
0363	638-1003	LS	STR SUPPORT OVHD,SIGN,TPIIISTA 5 TP ON GA 400	1.000	159106.00	159106.00
0364	639-2002	LF	STEEL WIRE STRAND CABLE, 3/8"	1000.000	2.84	2843.16
0368	639-4003	EA	STRAIN POLE, TP III	4.000	5930.67	23722.69
0369	639-3004	EA	STEEL STRAIN POLE, TP IV	24.000	13133.99	315215.86
0374	647-1000	LS	TRAF SIGNAL INSTALLATION NO - SIGNALS 1-6	1.000	480000.00	480000.00
0378	647-2160	EA	PULL BOX, PB-6	6.000	1140.28	6841.69
0379	647-2170	EA	PULL BOX, PB-7	6.000	1328.89	7973.36
0384	653-0120	EA	THERM PVMT MARK, ARROW, TP 2	105.000	69.33	7279.86
0389	653-0210	EA	THERM PVMT MARK, WORD , TP 1	16.000	104.79	1676.66
0404	653-1704	LF	THERM SOLID TRAF STRIPE,24",WH	864.000	4.56	3945.98
0408	653-1804	LF	THERM SOLID TRAF STRIPE, 8",WH	4000.000	1.93	7738.52
0409	653-1810	LF	THER SLD TRAF STRIPE, 10 IN, W	3337.000	1.10	3700.13
0412	653-2501	LM	THERMO SOLID TRAF ST, 5 IN, WH	12.000	1622.69	19472.30
0413	653-2502	LM	THERMO SOLID TRAF ST, 5 IN YE	10.000	1688.04	16880.45
0414	653-4501	GLM	THERMO SKIP TRAF ST, 5 IN, WHI	8.000	1055.70	8445.63
0429	653-6006	SY	THERM TRAF STRIPING, YELLOW	734.000	2.97	2185.37
0438	654-1001	EA	RAISED PVMT MARKERS TP 1	150.000	3.85	577.64
0439	654-1003	EA	RAISED PVMT MARKERS TP 3	900.000	3.57	3221.47
0444	655-7000	EA	PVMT ARROW, PREFORM PLASTIC W/RAISE REFL	4.000	726.65	2906.64
0449	657-1085	LF	PRF PL SD PVT MKG,8",B/W,TP PB	1500.000	5.45	8183.43

JOB DETAIL ESTIMATE

0459	657-3085	GLF	PRF PL SK PVMT MKG,8",B/W,TPPB	800.000	3.64	2918.39
0473	657-5003	EA	PRF PLASTIC PVMT MKG, WORD TP 1, TP PB	2.000	831.41	1662.83
0474	657-5017	EA	PRF PL PVT MKG,ARW TP2,WH,TPPB	9.000	514.64	4631.83
0479	657-6085	LF	PRF PL SD PVMT MKG,8",B/Y,TPPB	700.000	5.63	3943.85
0483	682-6140	LF	CONDUIT, RIGID, 4 IN	500.000	49.00	24500.00
0484	682-6233	LF	CONDUIT, NONMETL, TP 3, 2 IN	2400.000	3.99	9576.00
0488	687-1000	LS	TRAFFIC SIGNAL TIMING - MCGINNIS FERRY RD SIGNALS	1.000	15284.94	15284.94
0489	935-1113	LF	OUT PLNT FBR OPT CBL,LOOSE TB,SM,24 FBR	8163.000	1.56	12735.34
0493	935-3103	EA	FIBER OPTIC CLOSURE,UNDRGRD,24 FBR	6.000		
0494	935-4010	EA	FIBER OPTIC SPLICE, FUSION	24.000	62.78	1506.86
0498	935-8000	LS	TESTING	1.000	1415.28	1415.28
0499	937-6050	EA	INT VIDEO DET SYS ASMBLY, TP A	2.000	4249.83	8499.67
0503	937-8010	LS	TESTING - VIDEO DETECTION SYSTEM	1.000	750.00	750.00
0504	939-2305	EA	FIELD SWITCH, TYPE C	6.000	1869.41	11216.46
0509	543-9000	LS	CONSTR OF BRIDGE COMPLETE - BRIDGE OVER GA 400	1.000	4000000.00	4000000.00
0514	543-9000	LS	CONSTR OF BRIDGE COMPLETE - BRIDGE OVER CAMP CREEK TRIB	1.000	640000.00	640000.00
0519	540-1101	LS	REM OF EX BR, STA NO - BRIDGE OVER GA 400	1.000	125500.00	125500.00
0524	627-1000	SF	MSE WALL FACE, 0 - 10 FT HT, WALL NO - 1	4300.000	46.90	201676.49
0528	647-1000	LS	TRAF SIGNAL INSTALLATION NO - RAMP METER FOR NB RAMP	1.000	20000.00	20000.00
0529	647-1000	LS	TRAF SIGNAL INSTALLATION NO - RAMP METER FOR SB RAMP	1.000	20000.00	20000.00
0533	647-2170	EA	PULL BOX, PB-7	3.000	1328.89	3986.68
0534	682-6236	LF	CONDUIT, NONMETL, TP2-POWER SERVICE,2 IN	100.000	10.40	1040.00
0539	682-7062	LF	CONDUIT DUCT BANK, TYPE 3	32240.000	20.00	644800.00
0544	682-9950	LF	DIRECTIONAL BORE - BORE IN SHOULDER UNDER BRIDGES	400.000	15.97	6388.00
0549	935-1511	LF	OUT PLNT FBR OPT CBL,DROP,SM,6 FBR	400.000	0.80	321.85
0554	935-1512	LF	OUT PLNT FBR OPT CBL,DROP,SM,12 FBR	400.000	8.95	3580.00
0559	935-3102	EA	FIBER OPTIC CLOSURE,UNDRGRD,12 FIBER	4.000	550.00	2200.00
0564	935-3107	EA	FIBER OPTIC CLOSURE,UNDRGRD,96 FIBER	4.000	3200.00	12800.00
0569	935-4010	EA	FIBER OPTIC SPLICE, FUSION	500.000	51.54	25770.55
0578	936-1001	EA	CCTV SYSTEM,TYPE B	2.000	5700.00	11400.00
0579	937-3010	EA	VDS SYSTEM PROCESSOR, TYPE A	4.000	2900.00	11600.00
0584	937-8030	LS	TESTING - INTERSECTION VIDEO DETECTION	1.000	904.66	904.66
0589	939-2237	EA	GBIC, TYPE D	4.000	2000.00	8000.00
0594	939-2300	EA	FIELD SWITCH, TYPE A	4.000	2289.00	9156.00
0599	939-5010	EA	ELEC PWR SVC ASSEMBLY,AERIAL SVC POINT	2.000	1569.19	3138.38

ITEM TOTAL	22810197.00
INFLATED ITEM TOTAL	22810197.00

TOTALS FOR JOB 0007526

ESTIMATED COST:	22810197.00
CONTINGENCY PERCENT (0.0):	0.00
ESTIMATED TOTAL:	22810197.00

PROJ. NO.: CSHPP-0007-00(526) - GA 400 @ McGinnis Ferry Road Interchange
P.I. NO. 0007526
DATE: 2/21/2014

Base Construction Cost			22,810,197
E & I	5%	$	1,140,509.85
Subtotal Construction Cost		$	23,950,706.85
Liquid AC Adjustment (50 % cap)		$	1,040,347.68
Total Construction Cost		$	24,991,054.53

PROJ. NO.	CSHPP-0007-00(526) - GA 400 @ McGinnis Ferry Road Interchange
P.I. NO.	0007526
DATE	2/21/2014

CALL NO.

INDEX (TYPE)	DATE	INDEX
REG. UNLEADED	Feb-14	$ 3.183
DIESEL		$ 3.825
LIQUID AC		$ 558.00

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

LIQUID AC ADJUSTMENTS

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

Asphalt

Price Adjustment (PA)			**1011146.22**	**$ 1,011,146.22**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 892.80	
Monthly Asphalt Cement Price month project let (APL)			$ 558.00	
Total Monthly Tonnage of asphalt cement (TMT)			3020.15	

ASPHALT	Tons	%AC	AC ton
Leveling	500	5.0%	25
12.5 OGFC		5.0%	0
12.5 mm	10724	5.0%	536.2
9.5 mm SP		5.0%	0
25 mm SP	36491	5.0%	1824.55
19 mm SP	12688	5.0%	634.4
	60403		**3020.15**

BITUMINOUS TACK COAT

Price Adjustment (PA)			**$ 29,201.46**	**$ 29,201.46**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$ 892.80	
Monthly Asphalt Cement Price month project let (APL)			$ 558.00	
Total Monthly Tonnage of asphalt cement (TMT)			87.22061442	

Bitum Tack Gals	gals/ton	tons
20307	232.8234	87.2206144

PROJ. NO.	CSHPP-0007-00(526) - GA 400 @ McGinnis Ferry Road Interchange
P.I. NO.	0007526
DATE	2/21/2014

CALL NO.

BITUMINOUS TACK COAT (surface treatment)

Price Adjustment (PA)				**0**	**$ -**
Monthly Asphalt Cement Price month placed (APM)	Max. Cap	60%	$	892.80	
Monthly Asphalt Cement Price month project let (APL)			$	558.00	
Total Monthly Tonnage of asphalt cement (TMT)				0	

Bitum Tack	SY	Gals/SY	Gals	gals/ton	tons
Single Surf. Trmt.	0.00	0.20	0	232.8234	0
Double Surf.Trmt.		0.44	0	232.8234	0
Triple Surf. Trmt		0.71	0	232.8234	0
					0

TOTAL LIQUID AC ADJUSTMENT	**$ 1,040,347.68**

GEORGIA DEPARTMENT OF TRANSPORTATION
PRELIMINARY ROW COST ESTIMATE SUMMARY

Date: 10/25/2013
Revised:

Project: McGinnis Ferry Road @ GA 400
County: Fulton/Forsyth
PI: 0007526

Description: New Interchange with widening and auxiliary lanes on GA 400
Project Termini: Bethany Bend to Ronald Reagan Blvd

Existing ROW: 80
Parcels: 21
Required ROW: 120

Land and Improvements		$12,291,375.00
Proximity Damage	*$440,000.00*	
Consequential Damage	*$500,000.00*	
Cost to Cures	*$0.00*	
Trade Fixtures	*$0.00*	
Improvements	*$0.00*	
Valuation Services		$52,500.00
Legal Services		$164,175.00
Relocation		$42,000.00
Demolition		$0.00
Administrative		$182,000.00
TOTAL ESTIMATED COSTS		$12,732,050.00
TOTAL ESTIMATED COSTS (ROUNDED)		***$12,733,000.00***

Preparation Credits	Hours	Signature
Benjamin M. Garland Jr.		Ben M Garland Ga 270880
John G. Simshauser		JG Sim

Prepared By: JG Sim CG#: 2772 (DATE) 10-25-13
Approved By: Darlene Alexander CG#: 286999 (DATE) 11/20/2013

NOTE: No Market Appreciation is included in this Preliminary Cost Estimate

UTILITIES ESTIMATE
GA 400/McGinnis Ferry Road Interchange and Road Widening

Forsyth/Fulton County Water	
12 Fire Hydrant Relocations	$32,000
20 Valve Box Adjustments	$5,000
Water Meter Box Adjustment / Relocation	$18,000
Subtotal	$55,000
Forsyth/Fulton County Sewer	
Sewer Reconnection	$12,000
Electrical Power	
Relocate utility poles 15 at $35,000 a pole	$525,000
Relocate transmission poles 15 at $200,000	$3,000,000
	$3,525,000
Cable & Communications	
Relocate Communication Equipment	$260,000
UTILITY COST TOTAL	**$3,852,000**

Moreland Altobelli Associates, Inc.
2211 Beaver Ruin Road, Suite 190
Norcross, Georgia 30071
Phone: 770-263-5945 Fax: 770-263-5954

Preliminary Mitigation Cost Estimate

Project:	**SR 400 at McGinnis Ferry Interchange**
	CSHPP-0007-00(526), PI No. 0007526
Prepared By:	Matt Chamblee
Prepared On:	9/5/13

Date	09/5/13
MA Project No.	FOR081-CON
CC: Project File	

As requested for the concept cost estimate of the subject project, a preliminary mitigation cost estimate has been prepared as detailed below. The cost estimate is based on an anticipated cost of $27,000 per wetland credit and $50 per stream credit.

Wetlands Credits	Cost	Stream Credits	Cost
8.1	$218,700	900	$45,000
Total Cost	$263,700		

Attachment 4
Crash Summaries

Crash Data Analysis

An inventory of crash data from 2007 to 2009 is provided in Table 11 and 2 for SR 400, Old Milton Parkway (SR 120), Windward Parkway, McGinnis Ferry Road, Tidwell Drive, Union Hill Road, McFarland Parkway, and Bethelview Road/Peachtree Parkway (SR 141).

Table 1: Crash and Injury Rates for Roadway Segments in the Project Area

SR 400 from Milton Pkwy Interchange to Peachtree Parkway Interchange (9.46 miles) Urban Freeway & Expressway, NHS and CHPC.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	345	130	205	99	39	62
2008	263	103	207	85	34	67
2009	244	88	165	66	24	59
SR 120 (Milton Parkway), from Westside Parkway to Northpoint Parkway (1.29 miles). Urban Principal Arterial, NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	211	**1263**	445	47	**281**	174
2008	229	**1574**	430	64	**440**	167
2009	150	**990**	461	40	**264**	185
Windward Parkway, from North Main Street to Union Hill Rd. (3.03 miles) Urban Collector, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	146	**557**	475	39	149	166
2008	224	**728**	443	54	**175**	154
2009	168	**683**	431	36	146	149
McGinnis Ferry Road, from Morris Road to McFarland Parkway. (2.72 miles) Urban Minor Arterial, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	22	214	513	18	175	190
2008	16	156	469	7	68	176
2009	19	162	463	6	51	173

**Values for Rate of Crashes and Injuries are per 100 million vehicle-miles*

Source: Georgia Department of Transportation

Table 2: Crash and Injury Rates for Roadway Segments in the Project Area

Tidwell Drive, from McGinnis Ferry Road to Union Hill Road (0.88 miles) Urban Local, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	6	**1138**	407	9	**1707**	128
2008	4	**559**	317	3	**419**	98
2009	4	**559**	310	0	0	94
Union Hill Road, from McFarland Parkway to McGinnis Ferry Road (2.44 miles) Urban Local, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	33	**2283**	407	9	**623**	128
2008	31	**1581**	317	5	**255**	98
2009	28	**1428**	310	7	**357**	94
McFarland Parkway, from Union Hill Road to McGinnis Ferry Road (2.53 miles) Urban Minor Arterial, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	103	**519**	513	27	136	190
2008	85	464	469	17	93	176
2009	86	**489**	463	18	102	173
Bethelview Rd./SR 141(Peachtree Pkwy.), from Bennett Pkwy. to Ronald Reagan Blvd. (1.33 miles) Urban Minor Arterial, Not NHS.						
Year	No. of Crashes	Crash Rate	Average Crash Rate	No. of Injuries	Injury Rate	Average Injury Rate
2007	122	**1085**	513	22	**196**	190
2008	111	**1011**	469	27	**246**	176
2009	88	**928**	463	14	148	173

**Values for Rate of Crashes and Injuries are per 100 million vehicle-miles.*

Source: Georgia Department of Transportation

The GDOT Office of Traffic Operations and the Georgia Department of Public Safety, Crash Reporting Unit furnished the information shown in Table 11 and 2. Rates were calculated in units of number of collisions or injuries per 100 million vehicle-miles.

Calculated collision and injury rates for all the studied roadways were compared to the statewide averages for the corresponding roadway class. These comparisons indicate that the crash rates and injury rates on SR 400 and McGinnis Ferry Road, in the study area, are lower than the statewide average. The evaluated section of McFarland Parkway presents crash rates and injury rates that are consistent with the statewide averages. Collision and injury rates for the evaluated sections of SR 12 (Milton Parkway), Windward Parkway, Tidwell Drive, Union Hill Road and Bethelview Road/SR 141(Peachtree Pkwy) are much higher than the statewide averages.

Table 3 shows the types of collision by location in the project study area. The relative high number of rear-end type collisions on SR 400, SR120 (Milton Parkway), and Windward Parkway indicate that these roads are heavily congested as rear-ends are an indicator of failing levels of service conditions on a highway. Although less severe, an overview of the collisions occurred on Union Hill Road, McFarland Parkway, and Bethelview Road/SR 141(Peachtree Pkwy.) also shows a predominance of rear-end collisions over any other type, indicating high levels of congestion on these roads.

Table 3: Collisions by Type, by Location

SR 400 from Milton Pkwy Interchange to Peachtree Parkway Interchange (9.46 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	17	217	47	38	26
2008	18	155	28	34	28
2009	10	171	19	24	20
SR 120 (Milton Parkway), from Westside Parkway to Northpoint Parkway (1.29 miles).					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	18	160	25	4	4
2008	30	177	17	4	1
2009	23	115	9	2	1
Windward Parkway, from North Main Street to Union Hill Rd. (3.03 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	16	102	14	11	3
2008	38	155	20	7	4
2009	16	132	9	8	3
McGinnis Ferry Road, from Morris Road to McFarland Parkway. (2.72 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	8	5	0	2	1
2008	6	6	0	1	1
2009	6	5	1	2	0
Tidwell Drive, from McGinnis Ferry Road to Union Hill Road (0.88 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	2	1	0	2	1
2008	1	0	0	2	1
2009	3	1	0	0	0
Union Hill Road, from McFarland Parkway to McGinnis Ferry Road (2.44 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	13	15	1	2	2
2008	9	16	0	4	2
2009	5	20	0	2	1
McFarland Parkway, from Union Hill Road to McGinnis Ferry Road (2.53 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	30	61	5	6	1
2008	19	56	3	4	3
2009	9	68	3	4	2
Bethelview Rd. /SR 141(Peachtree Pkwy.), from Bennett Pkwy. to Ronald Reagan Blvd. (1.33 miles)					
Year	Angle[1]	Rear End	Sideswipe Same Direction	Object	Other
2007	4	29	2	0	0
2008	8	14	6	8	4
2009	5	20	5	2	1

[1] *Angle collisions occur at ramp terminals*

Source: Georgia Department of Transportation

A high proportion of angle-type collisions can be observed on McFarland Parkway in addition to a high proportion of rear-end collisions. A common interpretation is that there are insufficient gaps for left-turning vehicles to safely make maneuvers. Drivers will compensate for the lack of sufficient gaps by exploiting gaps that are much smaller than normally needed to safely complete the turn. Some drivers will misjudge these maneuvers, leading to angle collisions.

Attachment 5
Traffic Diagrams

Department of Transportation
State of Georgia

INTERDEPARTMENT CORRESPONDENCE

FILE CSHPP-0007-00(526),
P.I. # 0007526
Forsyth/Fulton County

OFFICE Planning

DATE August 5, 2013

FROM Cynthia L. VanDyke, State Transportation Planning Administrator

TO Genetha Rice-Singleton, State Program Delivery Design Engineer
Attention: Otis Clark

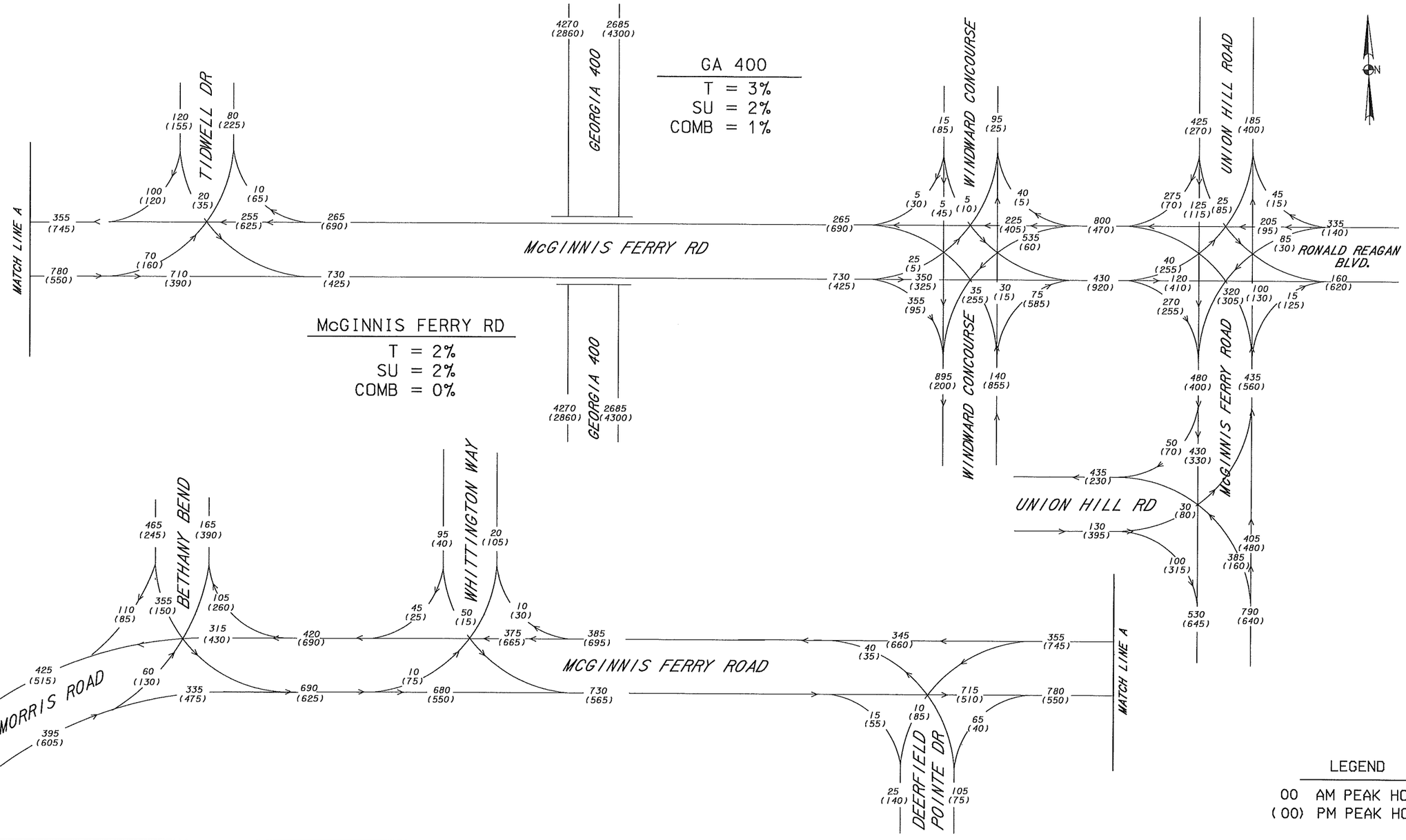
SUBJECT **Reviewed** Design Traffic for *SR 400 @ CR 41/CR 283/McGinnis Ferry Road*

We've done a final review on the consultant's Design Traffic for the above project.

The Design Traffic is approved based on the final information furnished. Any questions concerning this review should be addressed to Ms.Leslie R. Woods at e-mail lwoods2@dot.ga.gov or phone (404) 631-1773.

CLV/LRW

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



LEGEND

00 AM PEAK HOUR
(00) PM PEAK HOUR

Moreland Altobelli Associates, Inc.
2211 Beaver Ruin Road
Suite 190
Norcross, Georgia 30071
Telephone (770) 263-5945

CSHPP-0007-00(526)
P.I. No. 0007526
FORSYTH & FULTON
COUNTIES, GEORGIA

REVISION DATES

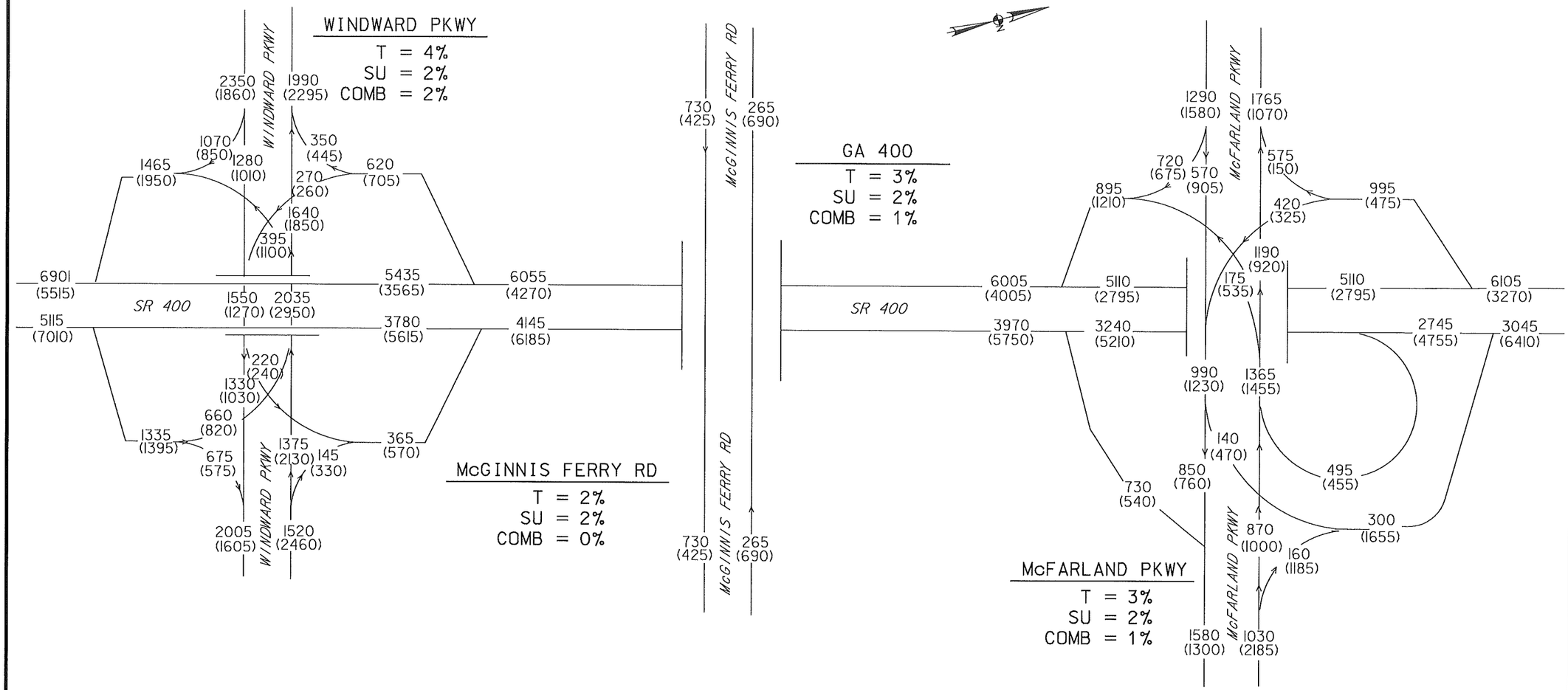
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE:

TRAFFIC FLOW DIAGRAMS
MCGINNIS FERRY ROAD
YEAR 2013 EXISTING
PEAK HOUR TRAFFIC

DRAWING No. 10-001

3/1/2001 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



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Norcross, Georgia 30071
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CSHPP-0007-00(526)
P. I. No. 0007526
FORSYTH & FULTON
COUNTIES, GEORGIA

REVISION DATES		

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE:

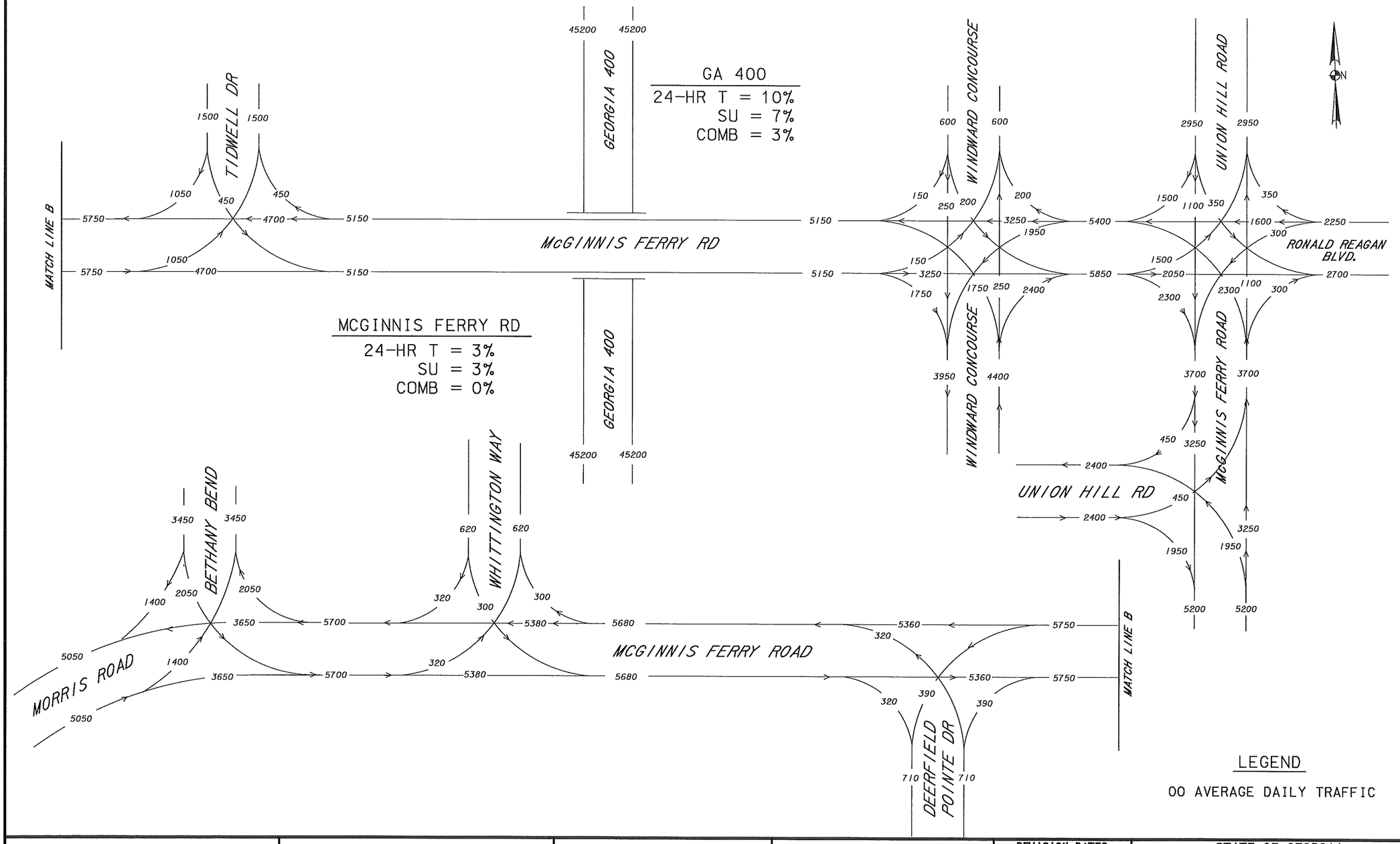
TRAFFIC FLOW DIAGRAMS

STATE ROUTE 400
YEAR 2013 EXISTING
PEAK HOUR TRAFFIC

DRAWING No. 10-002

3/1/2008 GFH

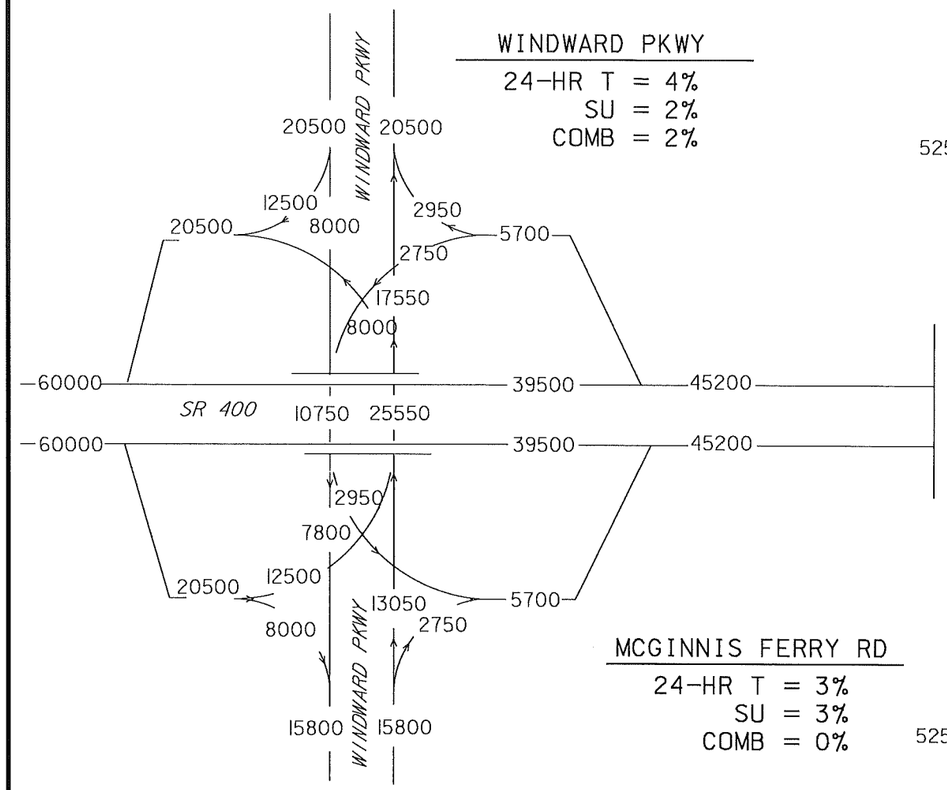
STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



			CSHPP-0007-00(526) P. I. No. 0007526 FORSYTH & FULTON COUNTIES, GEORGIA	REVISION DATES	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: TRAFFIC FLOW DIAGRAMS MCGINNIS FERRY ROAD YEAR 2013 EXISTING AVERAGE DAILY TRAFFIC DRAWING No. 10-003

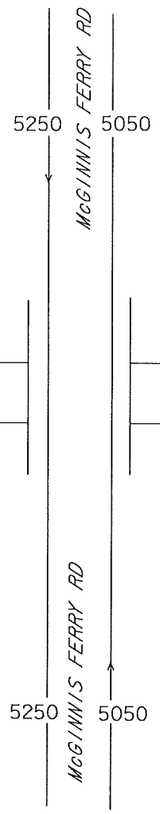
3/1/2007 GPLH

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



WINDWARD PKWY

24-HR T = 4%
SU = 2%
COMB = 2%



MCGINNIS FERRY RD

24-HR T = 3%
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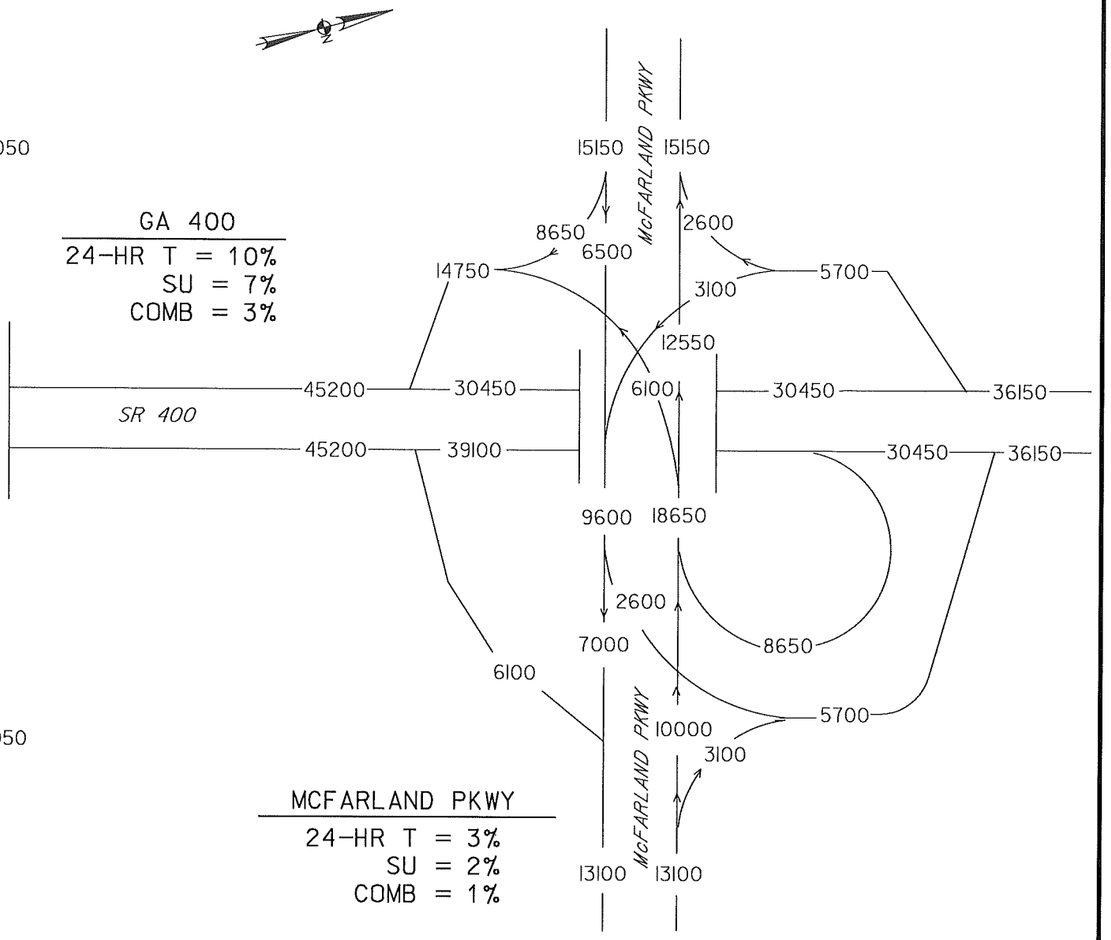
COMB = 0%



GA 400

24-HR T = 10%
SU = 7%
COMB = 3%

MCFARLAND PKWY

24-HR T = 3%
SU = 2%
COMB = 1%

LEGEND

00 AVERAGE DAILY TRAFFIC

3/1/2007 GPLH

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TRAFFIC FLOW DIAGRAMS

STATE ROUTE 400
2013 EXISTING
AVERAGE DAILY TRAFFIC

DRAWING No. 10-004

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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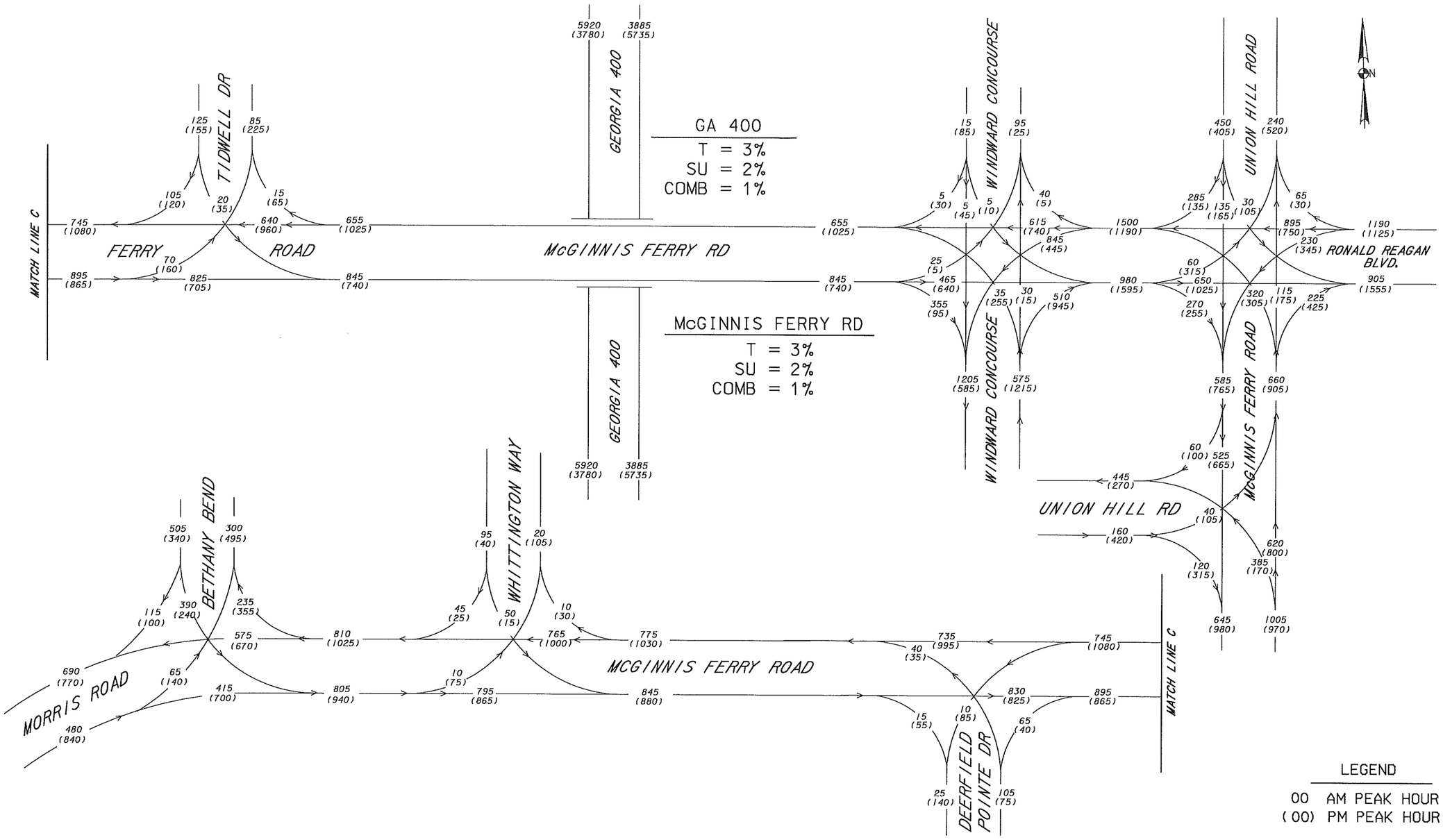

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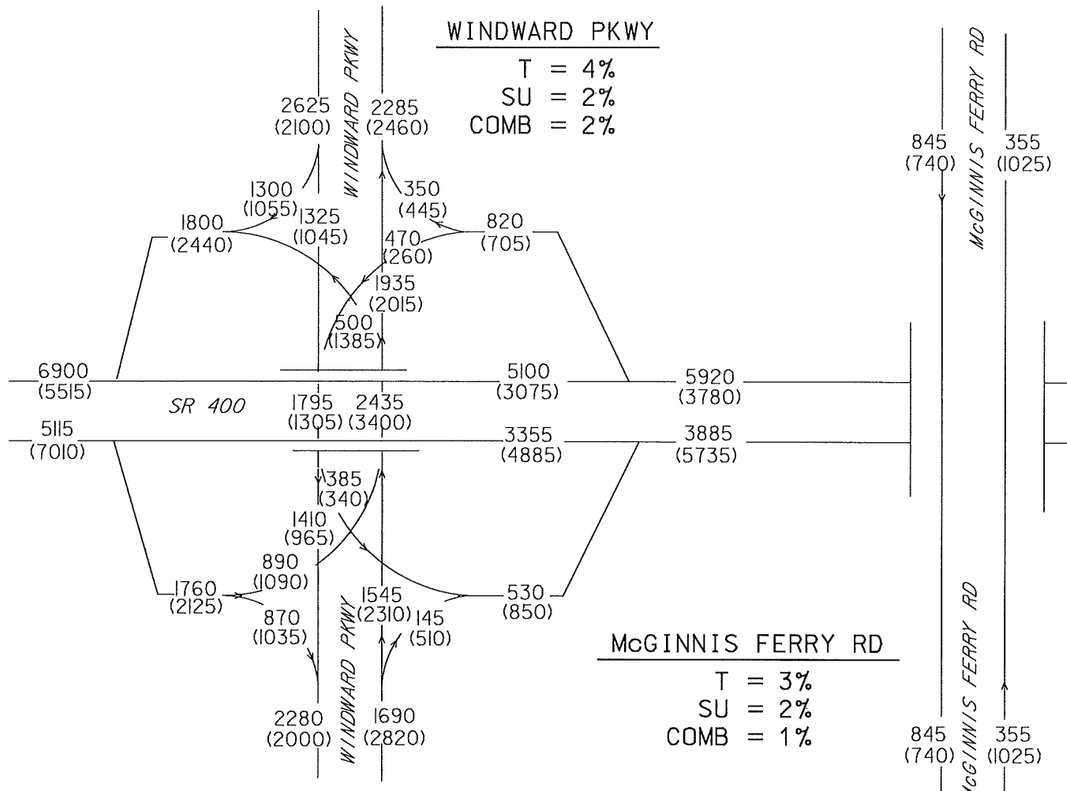
MCGINNIS FERRY ROAD
YEAR 2020 NO-BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-005

3/1/2007 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



LEGEND

00 AM PEAK HOUR
(00) PM PEAK HOUR

3/1/2007 GPLM

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TRAFFIC FLOW DIAGRAMS

STATE ROUTE 400
YEAR 2020 NO-BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-006

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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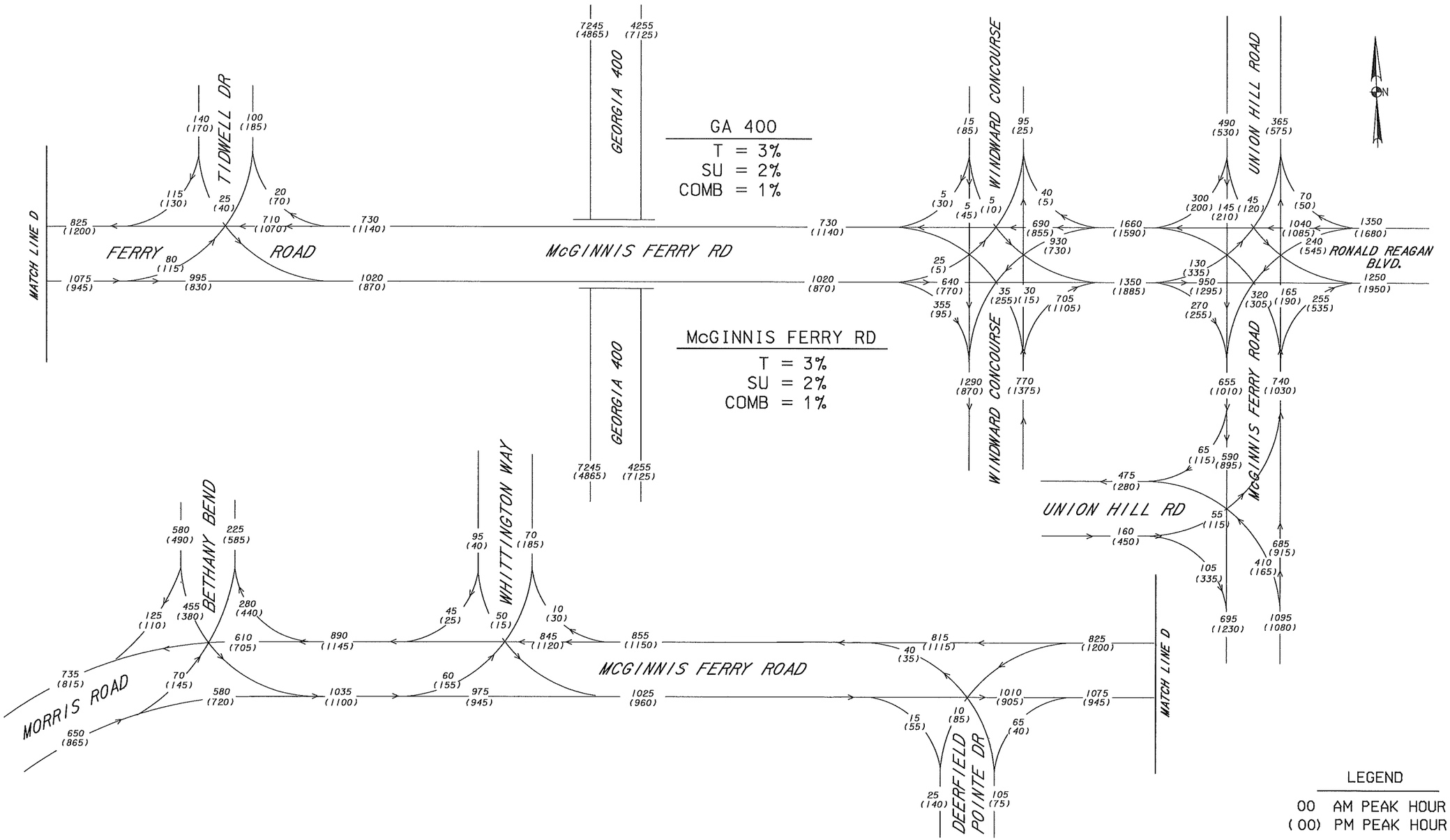

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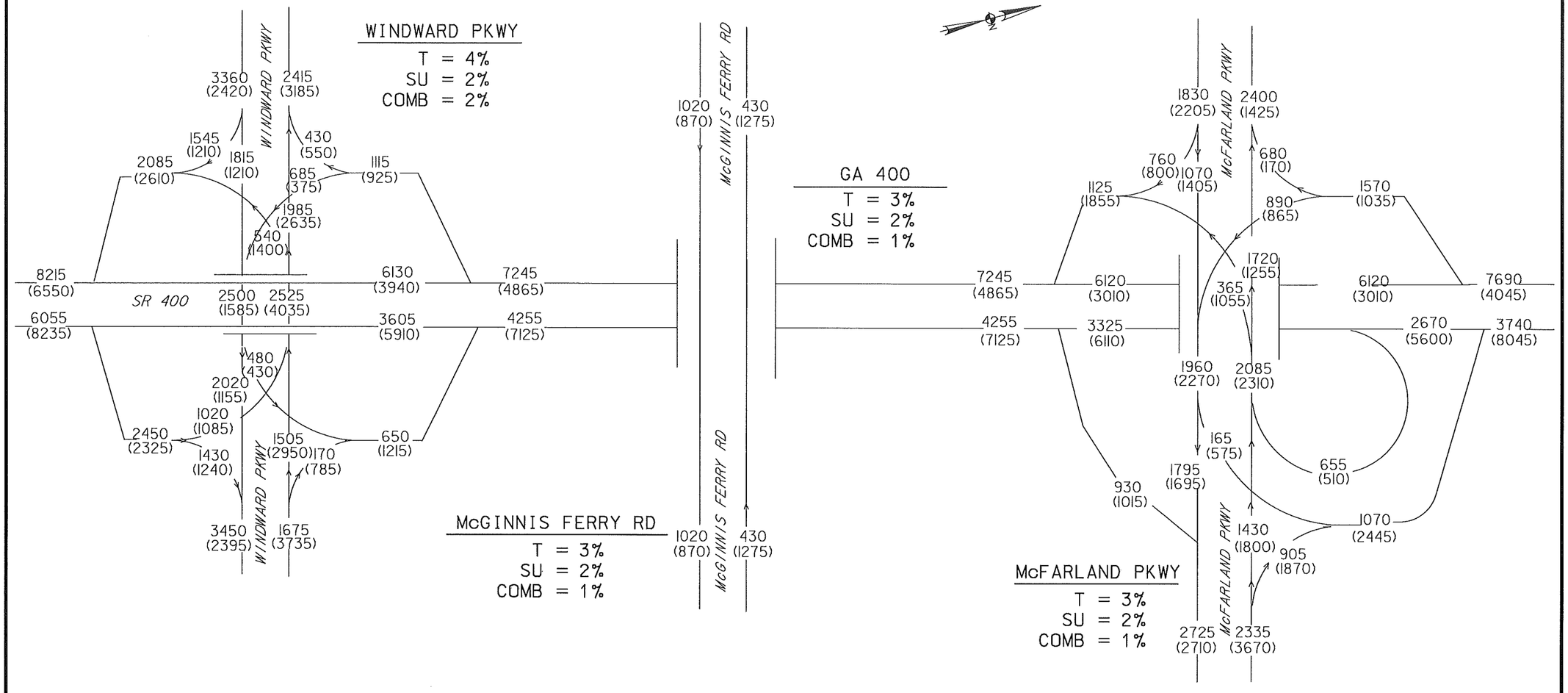
3/1/2007 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



McFARLAND PKWY
T = 3%
SU = 2%
COMB = 1%

LEGEND

00 AM PEAK HOUR
(00) PM PEAK HOUR

3/1/2007 GPLN

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STATE ROUTE 400
YEAR 2040 NO-BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-008

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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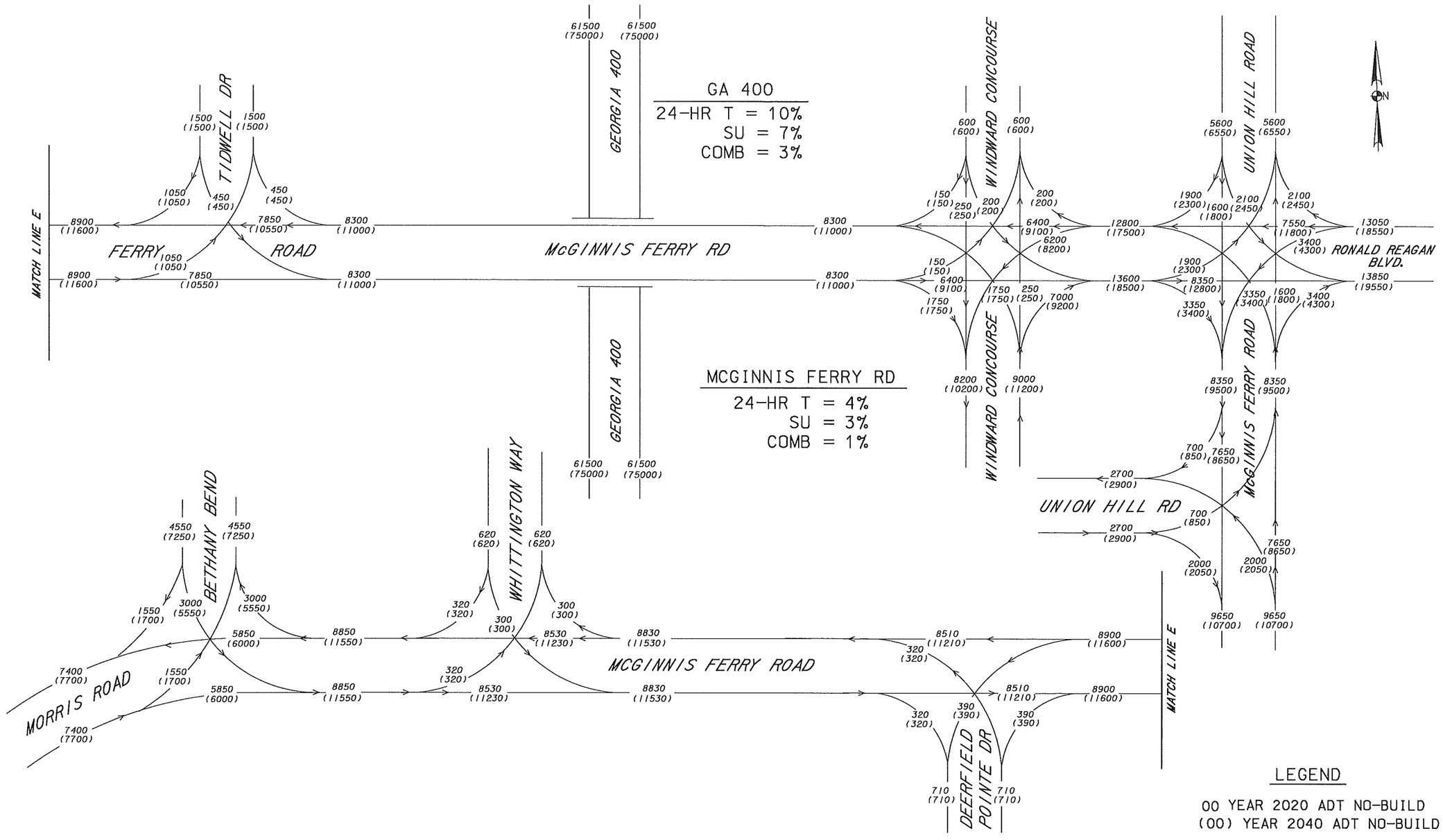

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TRAFFIC FLOW DIAGRAMS
MCGINNIS FERRY ROAD
YEAR 2020/2040 NO-BUILD
AVERAGE DAILY TRAFFIC

DRAWING No. 10-009

3/1/2007 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
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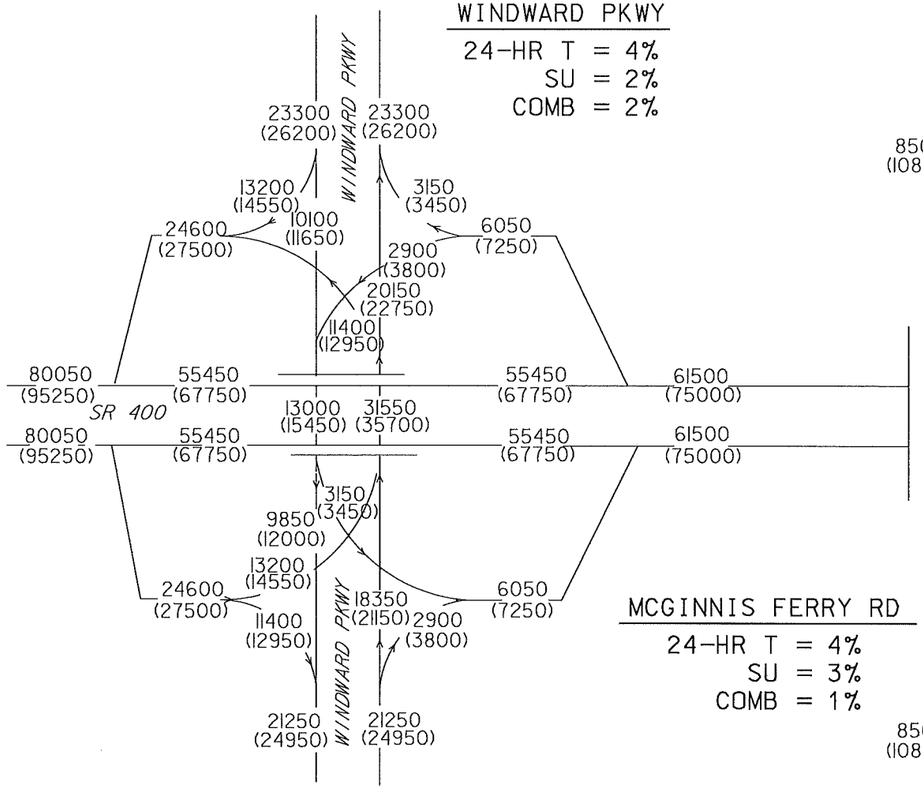

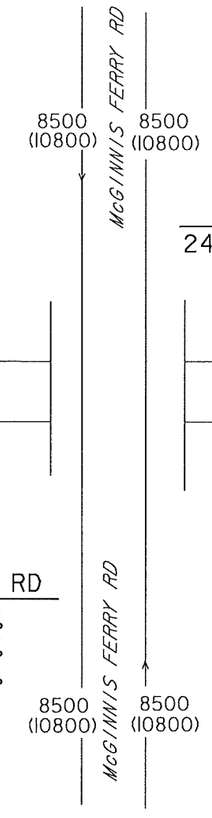

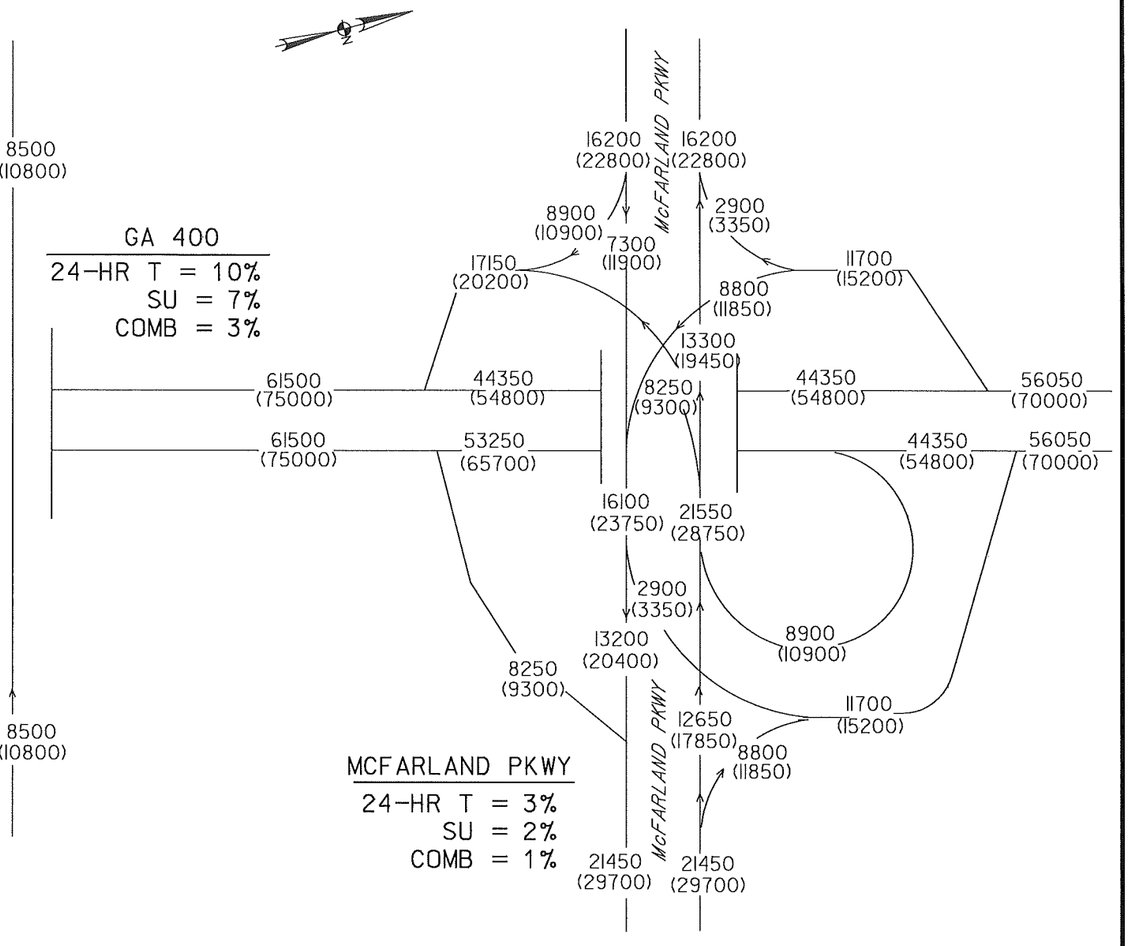

MCFARLAND PKWY
24-HR T = 3%
SU = 2%
COMB = 1%

LEGEND

00 YEAR 2020 ADT NO-BUILD
(00) YEAR 2040 ADT NO-BUILD

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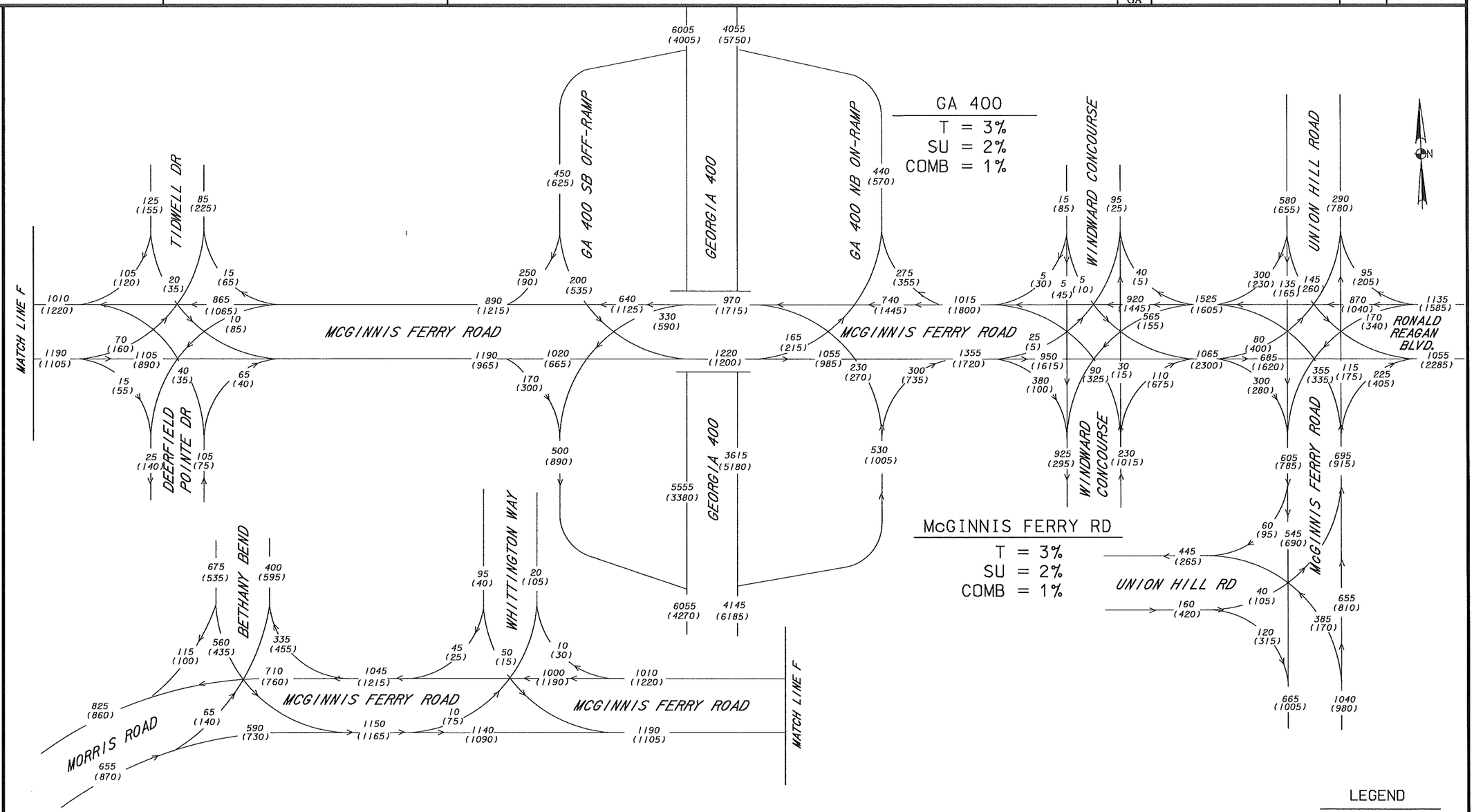
STATE ROUTE 400
YEAR 2020/YEAR 2040 NO-BUILD
AVERAGE DAILY TRAFFIC

DRAWING No. 10-010

3/1/2008 GPLW

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



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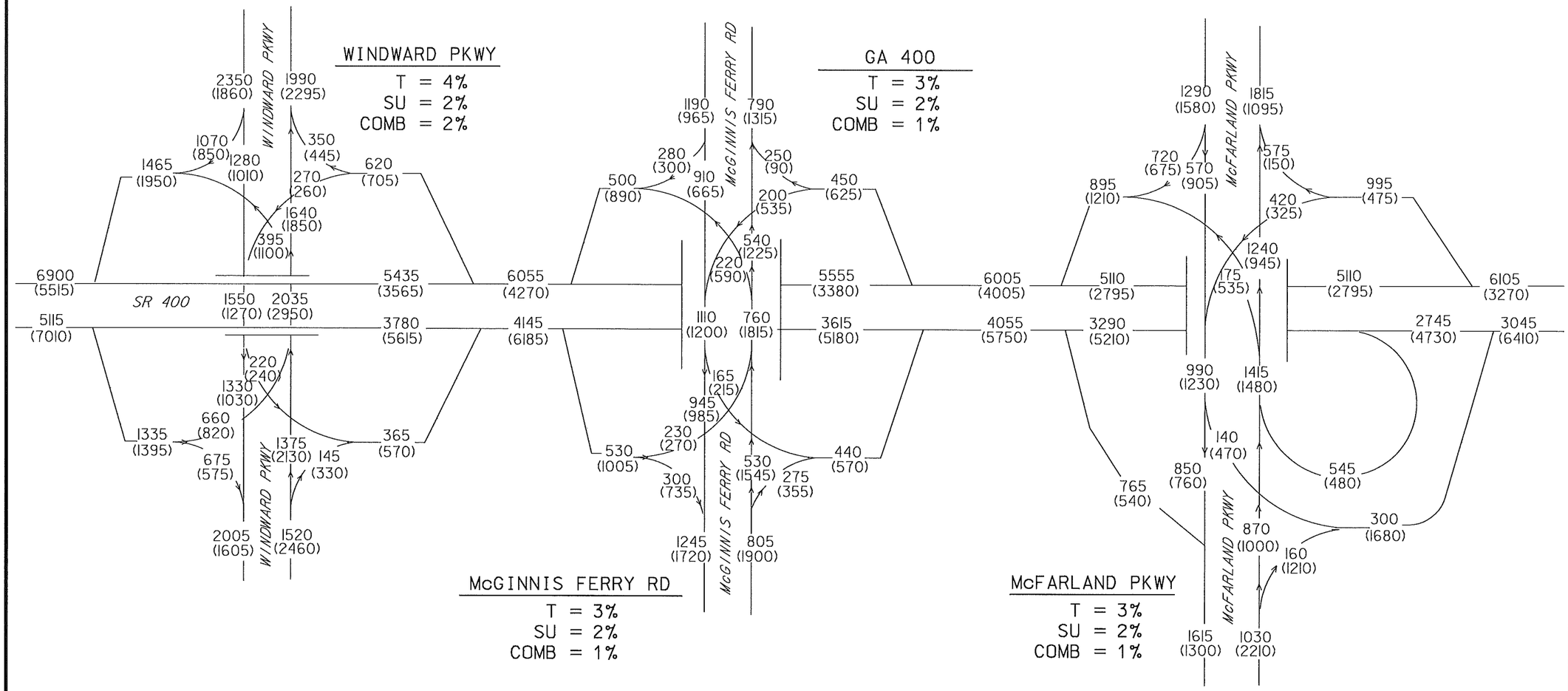
3/1/2007 GFH

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



LEGEND

00 AM PEAK HOUR
(00) PM PEAK HOUR

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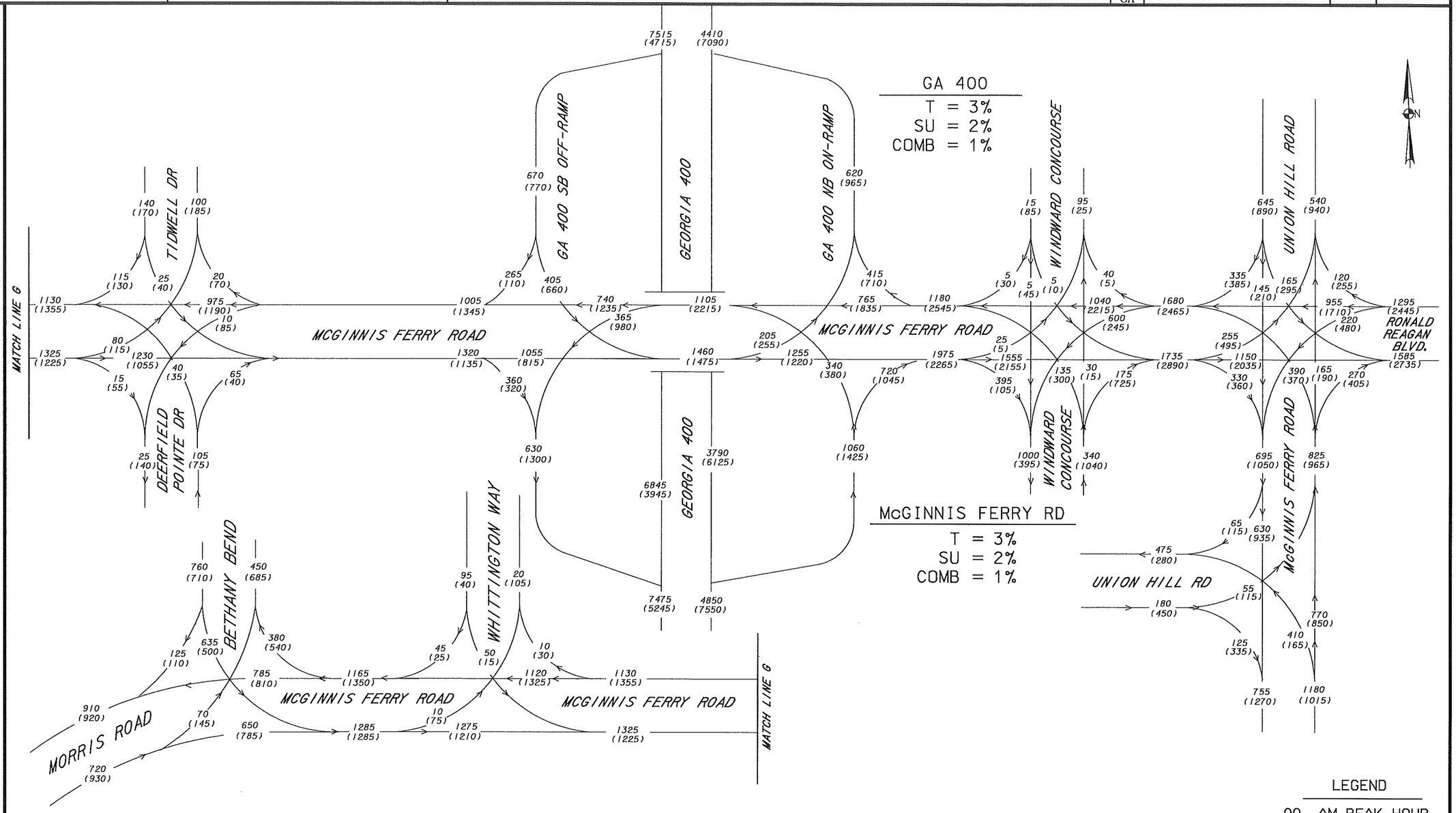
STATE ROUTE 400
YEAR 2020 BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-012

3/11/2002 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



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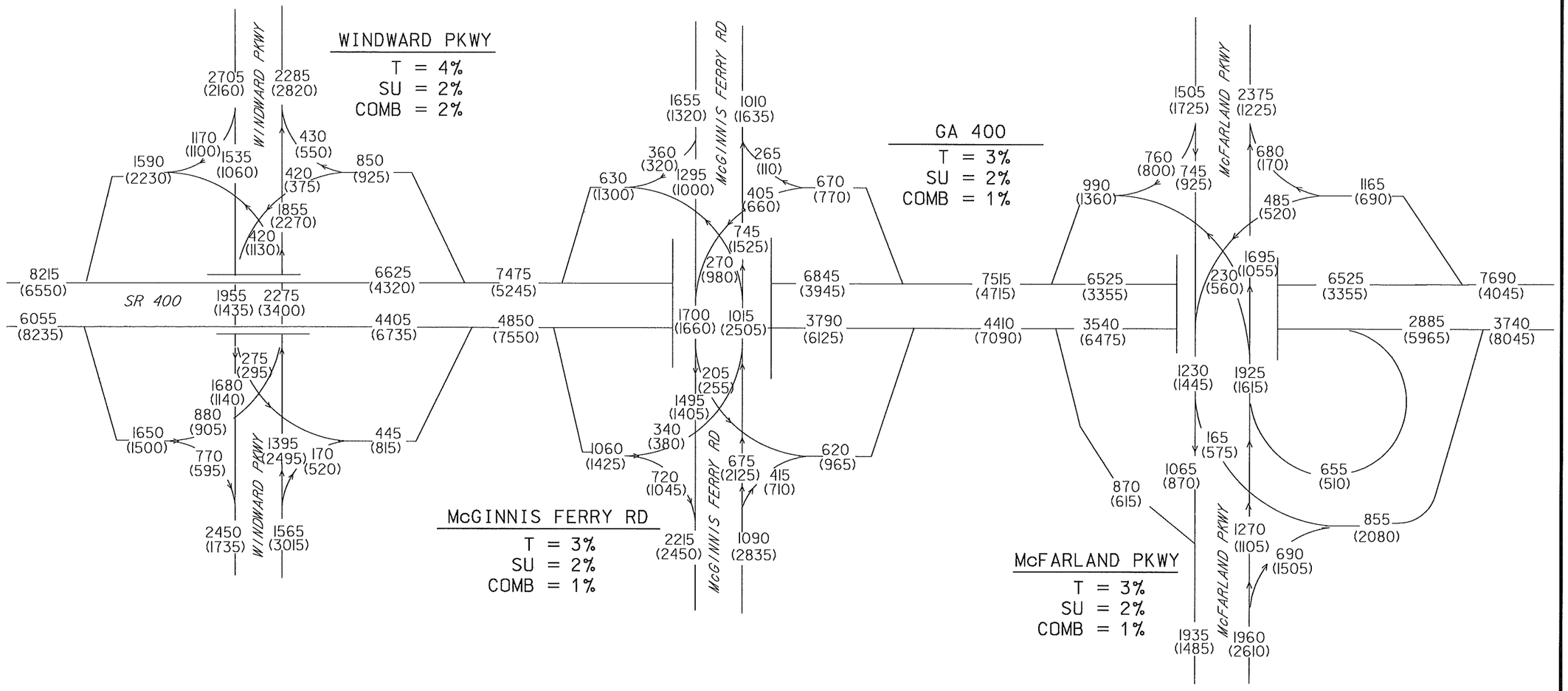
MCGINNIS FERRY ROAD
YEAR 2040 BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-013

3/1/2007 GFLH

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



LEGEND

00 AM PEAK HOUR
(00) PM PEAK HOUR

3/1/2007 GPLN

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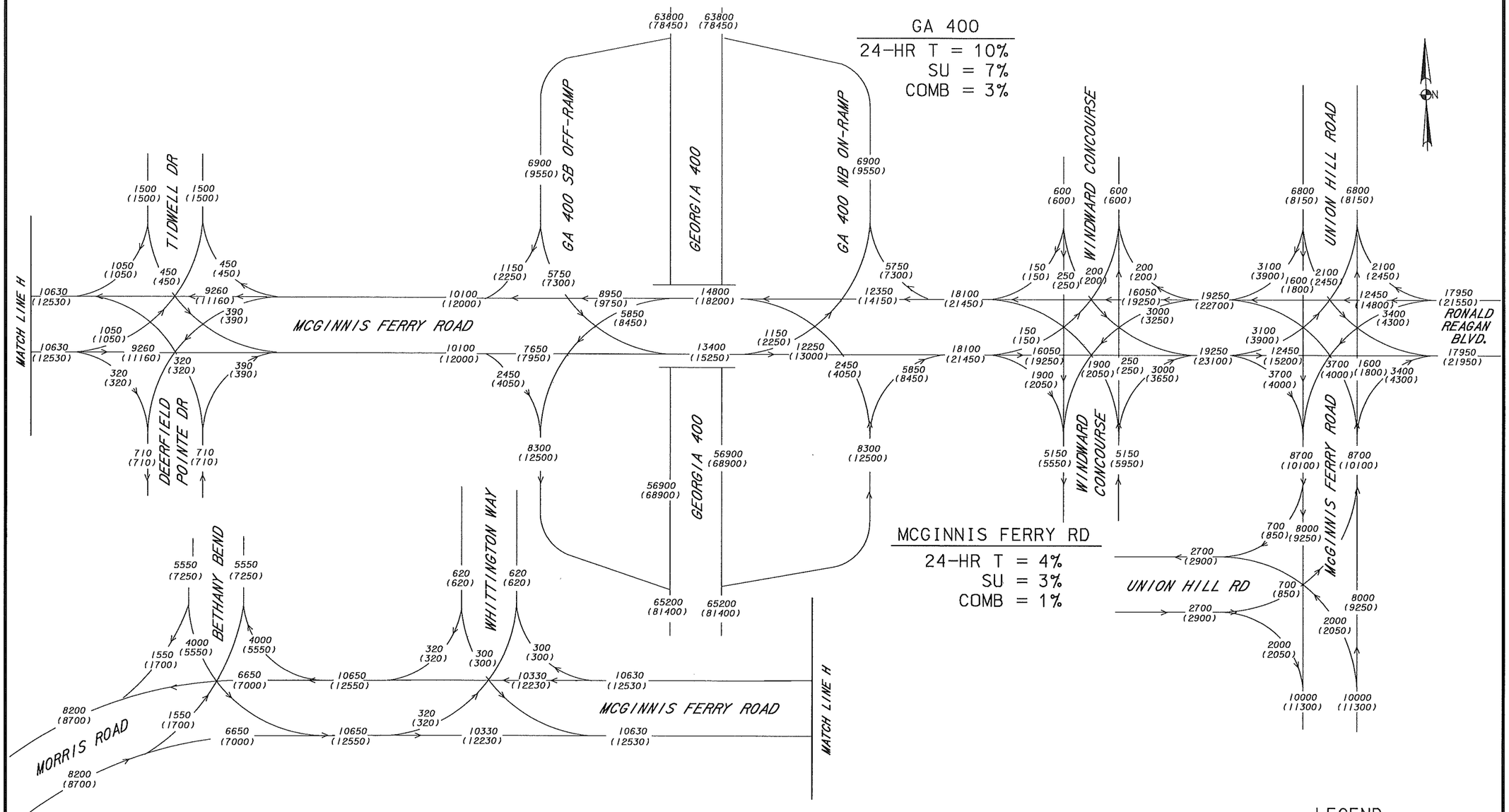
STATE ROUTE 400
YEAR 2040 BUILD
PEAK HOUR TRAFFIC

DRAWING No. 10-014

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



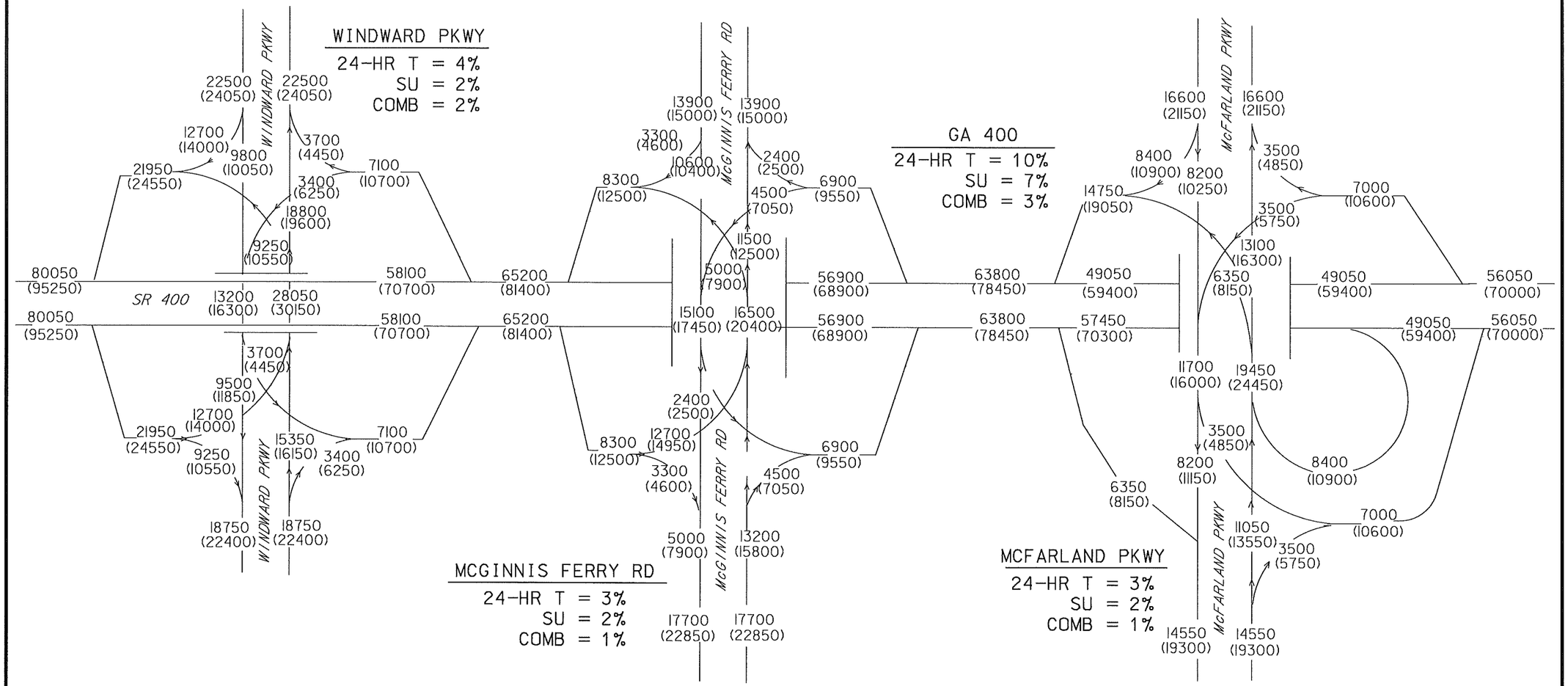
LEGEND

00 YEAR 2020 ADT BUILD
(00) YEAR 2040 ADT BUILD

			CSHPP-0007-00(526) P. I. No. 0007526 FORSYTH & FULTON COUNTIES, GEORGIA	REVISION DATES	STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION OFFICE: TRAFFIC FLOW DIAGRAMS MCGINNIS FERRY ROAD YEAR 2020/2040 BUILD AVERAGE DAILY TRAFFIC DRAWING No. 10-015

3/11/2007 GPLN

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



LEGEND

00 YEAR 2020 ADT BUILD
(00) YEAR 2040 ADT BUILD

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TRAFFIC FLOW DIAGRAMS

STATE ROUTE 400
YEAR 2020/2040 BUILD
AVERAGE DAILY TRAFFIC

DRAWING No. 10-016

3/4/2008 GPM

Attachment 6
Capacity Analysis Summary

CAPACITY ANALYSIS

Freeway segments and ramp junctions along SR 400 in the study area and major street intersections within the study area were all evaluated with Highway Capacity Software (HCS), which is based on the methodology of the 2010 HCM. The measure of effectiveness used in this operational evaluation is Level of Service (LOS). The levels of service range from LOS A to LOS F. LOS "A" represents free-flow traffic conditions and LOS "F" represents extreme delays with stopped traffic conditions. The levels of service of the build and no-build alternative were evaluated and compared in this analysis.

Additionally, CORSIM, micro-simulation modeling, was conducted to evaluate the freeway and roadway system improvements as a supplemental tool to the HCS analysis. HCS is a static analysis that does not take into account traffic queuing and traffic signal operations that can affect the results of the service level of the freeway and local roadways. For this reason, CORSIM is an important tool in the comparison of proposed improvements under various alternatives.

Basic Freeway Segment Analysis

Freeway segment analyses were conducted on freeway segments of SR 400. The resulting LOS values for the build and no-build alternatives for the existing, 2020 and 2040 years are shown in Table 1.

As shown in Table 1, in the year 2040 most of the SR 400 freeway segments under the no-build, are operating at LOS E or LOS F conditions for one or both AM and PM peak hours. However, within the area of influence, under build (Alternative 3), the LOS is restored to an acceptable level of service.

Table 1: HCS Freeway Segment Analysis Results

FREEWAY SEGMENTS	Existing		No-Build Alternative 1		New Interchange Alternative 3		No-Build Alternative 1		New Interchange Alternative 3	
LOS (Density in pc/mi/ln)	2011		2020		2020		2040		2040	
	AM	**PM**	AM	PM	AM	PM	**AM**	**PM**	**AM**	**PM**
SR 400 NB between McFarland Pkwy and SR 141	B (15.4)	F (53.3)	B (17.8)	F (49.1)	B (17.8)	F (49.1)	C (21.9)	F (118.3)	C (21.9)	F (118.3)
SR 400 SB between SR 141 and McFarland Pkwy	F (50.7)	B (16.9)	E (43.9)	C (19.1)	E (43.9)	C (19.1)	F (91.5)	C (23.8)	F (91.5)	C (23.8)
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	B (15.7)	C (25.5)	B (17.0)	C (25.5)	B (13.9)	C (20.2)	C (18.7)	D (34.3)	B (16.5)	C (25.2)
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	C (18.7)	B (12.6)	D (26.5)	B (16.6)	C (21.1)	B (14.1)	E (35.2)	C (21.4)	D (27.0)	B (16.6)
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	B (11.8)	C (18.9)	B (17.0)	C (25.5)	B (14.6)	C (21.7)	C (18.7)	D (34.3)	B (17.0)	D (27.1)
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	C (18.7)	B (12.6)	D (26.5)	B (16.6)	C (21.3)	B (15.0)	E (35.2)	C (21.4)	D (26.8)	C (18.4)
SR 400 NB Between SR 120 and Windward Pkwy	B (17.1)	C (22.1)	C (22.5)	D (33.4)	C (22.5)	D (33.4)	D (27.2)	F (45.6)	D (27.2)	F (45.6)
SR 400 SB between Windward Pkwy and SR 120	C (22.5)	B (18.0)	D (32.6)	C (24.4)	D (32.6)	C (24.4)	E (44.8)	D (30.2)	E (44.8)	D (30.2)
SR 400 NB between Haynes Bridge Rd and SR 120	C (19.9)	C (22.1)	D (26.01)	D (33.5)	D (26.01)	D (33.5)	D (32.7)	F (45.7)	D (32.7)	F (45.7)
SR 400 SB between SR 120 and Haynes Bridge Rd	C (18.6)	C (20.6)	D (26.1)	D (28.1)	D (26.1)	D (28.1)	D (33.4)	E (36.5)	D (33.4)	E (36.5)

Source: Moreland Altobelli Associates, Inc.

Note: Shaded freeway segments do not change in LOS. These segments of freeway are outside the alternatives' area of influence.

Ramp Junction Analysis

Ramp junction analysis was performed on all the ramp junctions of SR 120, Windward Parkway, McGinnis Ferry Road, and McFarland Parkway interchanges with SR 400 for the existing year and years 2020 and 2040. Results of this analysis are shown in Table 1 for the analysis years 2011, 2020 and 2040.

Year 2020 Analysis

Within the project area, the ramp junction analysis of Alternative 1 – No-Build indicates that the junctions of the south-facing ramps at Windward Parkway and the southbound off ramp to McFarland Parkway in the AM peak hour and the northbound on-ramp from McFarland Parkway in the PM peak hour would operate at capacity or have failing levels of service during either or both AM or PM peak hours during the year 2020.

Alternative 3 would improve all of the ramp junctions to LOS D or better with the exception of the northbound off-ramp to Windward Parkway that improves from a LOS F to a LOS E in the PM peak hour and the northbound on-ramp from McFarland in the PM peak hour that also only improves to a LOS E. All other ramp junctions either improve in LOS or maintain the same LOS as the no-build alternative.

Year 2040 Analysis

Within the project area, the ramp junction analysis of Alternative 1 – No-Build indicates that seven of the nine ramp junctions at Windward Parkway and McFarland Parkway interchanges within the project area would operate at capacity or have failing levels of service during either or both AM or PM peak hours during the year 2040.

Alternative 3 would improve all of the ramp junctions to LOS D or better with the exception of the two south-facing ramps of Windward Parkway and the two north-facing ramps of McFarland Parkway. The northbound off-ramp to Windward Parkway improves from a LOS F to a LOS E under AM and PM peak hour conditions. The southbound on-ramp from Windward Parkway improves, but the level of service remains LOS E for both the AM and PM peak hour conditions. The northbound on-ramp and southbound off-ramp at McFarland Parkway interchange improves but remains at LOS F during the AM peak hour in the southbound direction and the PM peak hour in the northbound direction because the upstream freeway segment (outside the project area) is operating at LOS F.

Table 1: HCS Ramp Junction Segment LOS Analysis Results

	Year 2011		Year 2020				Year 2040			
RAMP JUNCTIONS	Existing		Alternative #1 (No-Build)		Alternative #3 (Interchange)		Alternative #1 (No-Build)		Alternative #3 (Interchange)	
LOS (Density in pc/mi/ln)	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
SR 400 SB Off-Ramp to McFarland Pkwy	F (25.2)	A (1.5)	E (43.9)	C (19.1)	B (13.3)	A (0.01)	F (91.5)	C (23.8)	F* (31.3)	A (1.7)
SR 400 SB On-Ramp from McFarland Pkwy	C (18.7)	B (12.6)	D (26.5)	B (16.6)	C (21.1)	B (14.1)	E (35.2)	C (21.4)	D (27.0)	B (16.6)
SR 400 SB Off-Ramp to McGinnis Ferry Rd	C (21.5)	B (13.6)	N/A	N/A	C (21.1)	B (14.1)	N/A	N/A	D (27.0)	B (16.6)
SR 400 SB On-Ramp from McGinnis Ferry Rd	C (22.5)	B (18.0)	N/A	N/A	C (21.3)	B (15.0)	N/A	N/A	D (26.8)	C (18.4)
SR 400 SB Off-Ramp to Windward Pkwy	C (20.2)	C (19.5)	D (31.3)	C (21.5)	C (21.3)	B (15.0)	E (38.6)	C (27.4)	D (26.8)	B (17.1)
SR 400 SB On-Ramp from Windward Pkwy	B (18.6)	C (20.6)	E (36.5)	D (34.5)	D (34.9)	D (32.2)	E (42.5)	E (39.0)	E (40.2)	E (37.2)
SR 400 NB Off-Ramp to Windward Pkwy	C (27.9)	D (29.2)	D (33.0)	F (43.0)	D (30.7)	E (39.1)	F* (40.7)	F (49.4)	E (36.4)	E (44.9)
SR 400 NB On-Ramp from Windward Pkwy	C (20.4)	C (26.6)	B (19.9)	C (27.9)	B (14.6)	C (21.7)	C (21.7)	D (34.6)	B (17.0)	D (27.1)
SR 400 NB Off-Ramp to McFarland Pkwy	C (26.3)	D (30.2)	B (20.0)	C (27.8)	B (13.9)	C (20.2)	C (24.4)	E (38.4)	B (16.5)	C (25.2)
SR 400 NB Off-Ramp to McGinnis Ferry Rd	B (14.5)	C (21.7)	N/A	N/A	B (14.6)	C (21.7)	N/A	N/A	B (17.0)	D (27.1)
SR 400 NB On-Ramp from McGinnis Ferry Rd	B (11.8)	C (18.9)	N/A	N/A	B (13.9)	C (20.2)	N/A	N/A	B (16.5)	C (25.2)
SR 400 NB Loop Off-Ramp to McFarland Pkwy	B (11.5)	C (22.1)	B (13.4)	C (21.6)	B (14.2)	C (25.6)	B (14.6)	D (27.5)	B (17.8)	D (34.7)
SR 400 NB On-Ramp from McFarland Pkwy	B (17.1)	F (40.2)	B (14.7)	F (37.0)	B (18.6)	E (38.7)	C (20.1)	F (47.3)	B (18.7)	F (46.4)

Source: Moreland Altobelli Associates, Inc.

**A ramp junction has LOS F when the traffic volume on the upstream freeway segment exceeds its capacity, regardless of the ramp density.*

CORSIM Analysis

To further evaluate the operational performance of SR 400 with and without the proposed McGinnis Ferry Road interchange, CORSIM, micro-simulation modeling was conducted. The models were calibrated using observed field data. The CORSIM network includes the primary roadways that would be impacted by a new interchange and SR 400 from SR 120 to McFarland Parkway. CORSIM was used as a supplement to the Highway Capacity Software rather than a replacement. There are situations where the static analysis of HCS is not sufficient to fully determine the impacts of a proposed project.

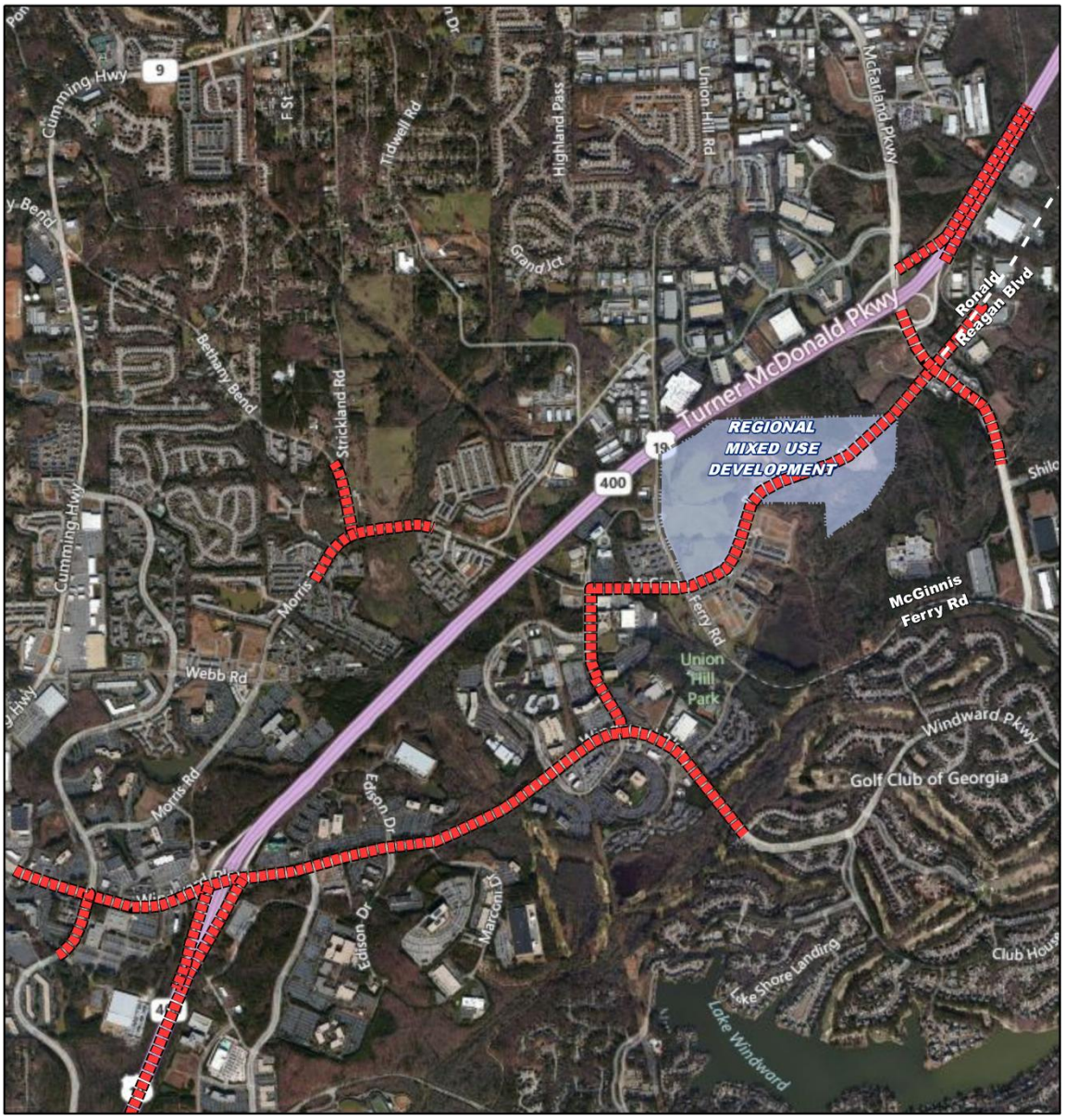
The CORSIM analysis illustrates that Alternative 3 (the build alternative with a new interchange) would improve operations on SR 400 when compared to Alternative 1 (the no-build alternative without a new interchange). To visually demonstrate the comparison of the build and no-build alternatives, Figures 1 and 2 show graphical representations of the traffic congestion displayed by the CORSIM simulation for the 2040 PM peak hour. The PM peak hour represents the highest traffic volume peak hour of the study area. The figures show only the portion of the study area along SR 400 from Windward Parkway to McFarland Parkway because traffic operations at the SR 120 interchange with GA 400 would remain the same in all alternatives because no improvements are proposed and the traffic volumes are the same.

As seen in Figure 1: CORSIM Results Alternative 1 – No-Build Alternative -- 2040 PM Peak Hour, there is traffic congestion along SR 400 freeway being caused by the exiting and entering traffic movements of the south -facing ramps of Windward Parkway interchange. Likewise, the southbound off- ramp to McFarland Parkway interchange is also creating traffic congestion. The CORSIM simulation also shows that Windward Parkway, Windward Concourse and Ronald Reagan Blvd are congested due to the traffic traveling to and from the regional mixed-use development proposed on Ronald Reagan Blvd.

The traffic operation of the northbound off-ramp of Windward Parkway and southbound off-ramp of McFarland Parkway, simulated in the CORSIM analysis, reveal that the traffic would queue onto the freeway. HCS is not able to model this sort of queuing activity with accuracy.

As seen in Figure 2: CORSIM Results Alternative 3 – New Interchange with Auxiliary Lanes --- 2040 PM Peak Hour, the south-facing ramps of Windward Parkway and the north-facing of McFarland Parkway do not queue onto SR 400. There would be some congestion created at McFarland Parkway with the northbound traffic. However, motorists would change their traffic pattern to utilize the available northbound on-ramp capacity at McGinnis Ferry Road. Therefore, this traffic congestion would dissipate.

Figure 1: CORSIM Results Alternative 1 – No-Build Alternative -- 2040 PM Peak Hour



Source: Bing and ARC

1-24-13

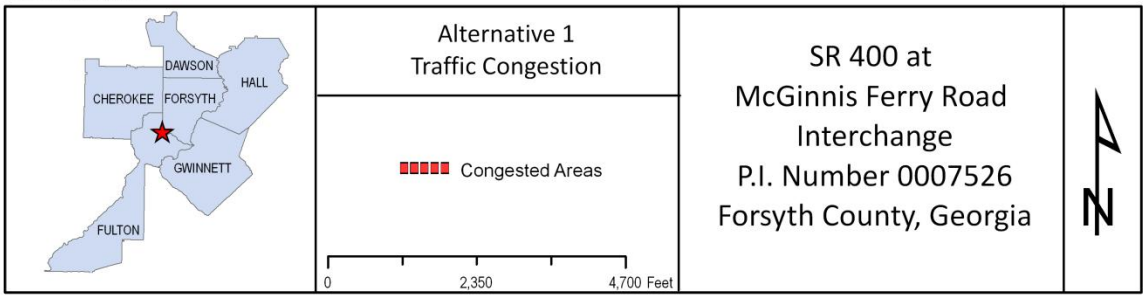


Figure 2: CORSIM Results Alternative 3 – New Interchange with Auxiliary Lanes --- 2040 PM Peak Hour

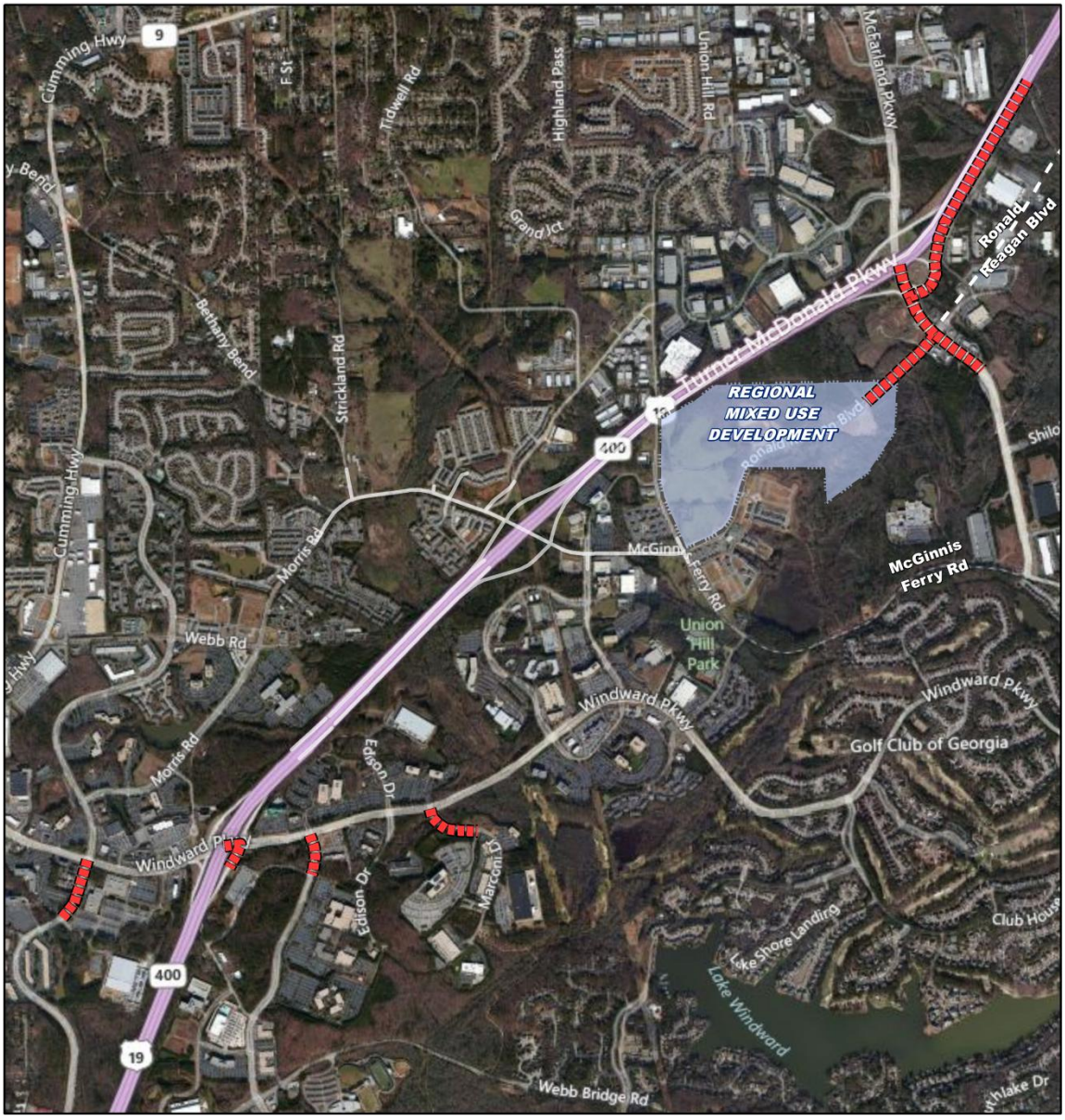


Table 3: CORSIM Comparison to HCS LOS & Density for 2040 PM Peak Hour

FREEWAY SEGMENTS	Alternative #1 (No-Build)		Alternative #3 (Interchange)	
LOS (Density in pc/mi/ln)	2040		2040	
	CORSIM	HCS	CORSIM	HCS
SR 400 NB between McFarland Pkwy and SR 141*	F (64.3)	F (118.3)	F (70.0)	F (118.3)
SR 400 SB between SR 141 and McFarland Pkwy	F (46.8)	C (23.8)	B (16.2)	C (23.8)
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	C (22.1)	D (34.3)	C (20.0)	C (25.2)
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	B (17.1)	C (21.4)	B (14.3)	B (16.6)
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	C (21.3)	D (34.3)	C (22.1)	D (27.1)
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	B (17.2)	C (21.4)	B (15.5)	C (18.4)
SR 400 NB Between SR 120 and Windward Pkwy	F (106.3)	F (45.6)	D (30.3)	F (45.6)
SR 400 SB between Windward Pkwy and SR 120	D (29.3)	D (30.2)	C (24.0)	D (30.2)
SR 400 NB between Haynes Bridge Rd and SR 120*	F (64.1)	F (45.7)	F (78.6)	F (45.7)
SR 400 SB between SR 120 and Haynes Bridge Rd*	C (23.9)	E (36.5)	C (22.4)	E (36.5)

Source: Moreland Altobelli Associates, Inc.

*Freeway Segment beyond project limits.

Note: The LOS results of the CORSIM analysis are shaded.

The results of the LOS and density comparison in Table 3: CORSIM Comparison to HCS LOS & Density for 2040 PM Peak Hour show that there is an improvement in the level of service on SR 400 between SR 120 and Windward Parkway with the inclusion of a new interchange at McGinnis Ferry Road. This is due to the relief of the Windward Parkway northbound off-ramp. Because queuing onto SR 400 does not occur in the build alternative, the traffic flows more smoothly and does not create severe backups that extend to SR 120 and beyond.

The results also show that southbound SR 400 at McFarland Parkway would improve from LOS F to a LOS B with proposed southbound lane improvements (see Alternative 3-build). To improve SR 400 north of McFarland Parkway, SR 400 would need to be widened from 4 to 6 lanes.

Intersection Analysis

Intersection capacity analysis was performed using existing 2011 and future 2020 and 2040 traffic volumes for the build and no-build alternatives. A summary of the intersection capacity analyses in terms of level of service is shown in Table 4.

The results of the intersection level of service analysis demonstrate that with the construction of the SR 400/McGinnis Ferry Road interchange (Alternative 3), the LOS at the intersections along McGinnis Ferry Road from Bethany Bend/Morris Road to Union Hill Road/Ronald Reagan Boulevard would have acceptable levels of service (LOS D or better) although there would be increased volume due to the interchange. However, since the increase of traffic volume on McGinnis Ferry Road is a consequence of local traffic redistribution, traffic volumes would decrease at intersections of Windward Parkway and McFarland Parkway, which results in improved levels of service at those intersections.

Table 2: Summary of Intersection Capacity Analysis (LOS)

INTERSECTIONS	Existing		Alternative #1 (No-Build)		Alternative #3 (Interchange)		Alternative #1 (No-Build)		Alternative #3 (Interchange)	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Windward Pkwy @ SR 400 SB Ramps	C (22.7)	C (25)	C (21.5)	F (128.2)	B (18.4)	D (53.4)	D (54.0)	F (154.3)	C (23.9)	E (75.2)
Windward Pkwy @ SR 400 NB Ramps	D (42.8)	C (28.7)	D (46.8)	F (195.9)	D (38.3)	C (29.4)	F (294.4)	F (501.6)	E (71.2)	E (73.2)
McGinnis Ferry Rd @ Bethany Bend	B (12.8)	B (12.4)	B (15.1)	F (973)	B (13.7)	A (9.6)	D (36.9)	F(1979)	B (16.3)	B (11.7)
McGinnis Ferry Rd @ Deerfield Point Dr.	N/A	N/A	N/A	N/A	B (12.1)	B (10.8)	N/A	N/A	B (14.9)	B (10.9)
McGinnis Ferry Rd @ Tidwell Drive	C (22.9)	C (23.2)	F (107)	E (38.5)	A (10.0)	C (22.0)	F (624.3)	F (2885)	B (10.8)	C (23.4)
McGinnis Ferry Rd @ GA400 SB Ramps	N/A	N/A	N/A	N/A	B (13.0)	B (17.8)	N/A	N/A	C (20.8)	C (30.9)
McGinnis Ferry Rd @ GA400 NB Ramps	N/A	N/A	N/A	N/A	A (9.5)	B (13.1)	N/A	N/A	C (29.7)	B (16.7)
McGinnis Ferry Rd @ Windward Conc.`	F (869.9)	F (204.4)	F (999)	F (999)	C (21.7)	D (42.9)	F (999)	F (999)	C (27.4)	D (54.4)
McGinnis Ferry Rd @ Ronald Reagan Blvd	D (38.8)	C (22.4)	D (36.5)	F (425.5)	B (19.5)	C (25.4)	D (50.9)	F (1036)	C (32.1)	D (42.9)
McFarland Pkwy @ SR 400 SB Ramps	B (17.2)	B (15.5)	D (44.7)	F (266.3)	C (30.8)	C (28.4)	E (62.8)	F (389.0)	B (17.1)	C (24.2)
McFarland Pkwy @ SR 400 NB Ramps	A (3.8)	B (10.1)	A (3.2)	A (6.8)	A (3.2)	A (9.0)	A (3.4)	C (21.1)	A (3.4)	A (9.6)

Source: Moreland Altobelli Associates, Inc

Attachment 7
Signal Warrant Analysis

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

TRAFFIC ENGINEERING REPORT

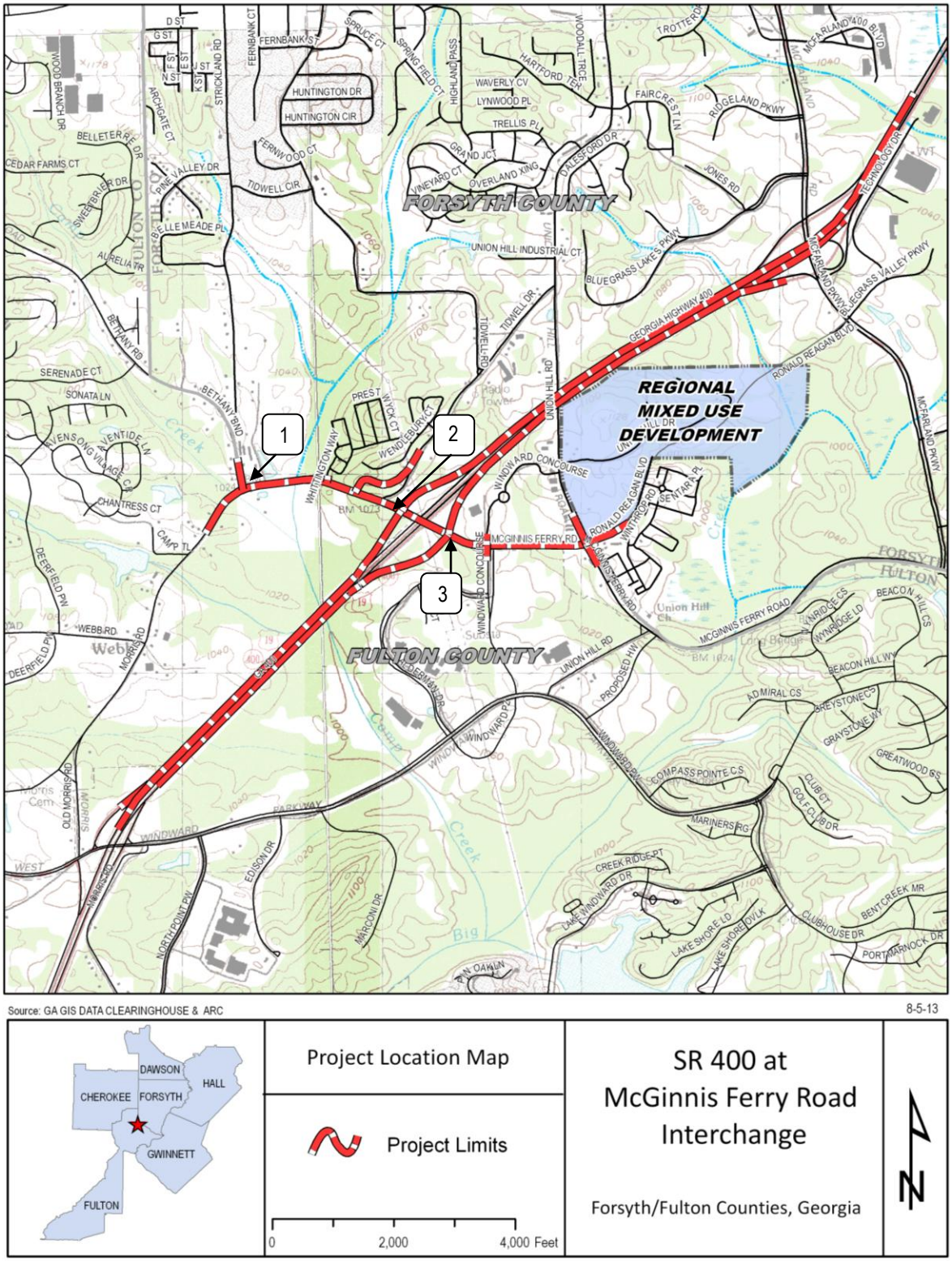
Traffic Signals To Be Installed In Conjunction With
CSHPP-0007-00(526)
P.I. Number: 0007526
GA 400 at McGinnis Ferry Road
Fulton & Forsyth Counties, Georgia

Intersection locations are indicated on the map on the following page.

Traffic Signal Locations

1. McGinnis Ferry Road at Bethany Bend/Morris Road
2. McGinnis Ferry Road at Georgia 400 Southbound Exit Ramp
3. McGinnis Ferry Road at Georgia 400 Northbound Exit Ramp

Intersection Location Map



Introduction: This report documents the traffic signal warrant analyses that lead to the recommendation to install traffic signals at three intersections that are created or affected by the proposed GA 400 Interchange at McGinnis Ferry Road between Bethany Bend and Ronald Reagan Boulevard. For each of these intersections, the appropriateness of a roundabout in lieu of a traffic signal is also studied.

The studied intersections are analyzed using 2020 ADT traffic volumes under the criteria set forth in the *Manual on Uniform Traffic Control Devices, 2009*. In addition to the four intersections recommended to be signalized, one other intersection was analyzed -- McGinnis Ferry Road at Tidwell Drive/Deerfield Pointe Drive -- but because this intersection did not meet the traffic signal volume warrants, the analysis was not included in this report.

Roundabouts were considered at the three intersections that warrant traffic signal control. The Georgia Department of Transportation (GDOT) Policy 4A-2, *Use of Modern Roundabouts on State Facilities* was used to analyze each of these intersections for roundabouts. Intersections that do not meet the GDOT Policy 4A-2 criteria of average daily traffic (ADT) less than 40,000 vehicles per day (VPD) and percent of total approach traffic on the major road less than 80% are not further analyzed in regard to roundabouts. AM and PM peak roundabout operation was analyzed with the NCHRP-572 model parameters for the 2040 build year and with the UK model parameters.

Description of Intersections and Summary of Analyses: Below are descriptions of each of the intersections with a summary of the traffic signal warrants met and a summary of the roundabout analysis. At the intersections analyzed in this report, McGinnis Ferry Road is considered an east-west road and the intersecting arterials north-south roads.

Intersection No. 1: McGinnis Ferry Road at Bethany Bend/Morris Road:

Bethany Bend is a two-lane roadway with two left-turn lanes and one right-turn lane at its approach to McGinnis Ferry Road. The posted speed limit of Bethany Bend is 35 mph. McGinnis Ferry Road would be posted at 45 mph and have one westbound through lane and one right-turn lane and Morris Road would have two eastbound lanes and one left-turn lane. Warrants 1 and 2 are satisfied. A roundabout was evaluated at this location and the northbound approach of the intersection was found to operate at a LOS F during the 2040 design year. Therefore, a roundabout is not recommended.

Intersection No. 2: McGinnis Ferry Road at Georgia 400 Southbound Exit Ramp:

The Georgia 400 Southbound Exit Ramp would have dual left-turn lanes and dual right-turn lanes. Only the left-turn exit ramp volumes are considered in the analysis. McGinnis Ferry Road would have a posted speed limit of 45 mph and have two westbound left-lanes, two westbound through lanes, two eastbound through lanes and one eastbound right-turn lane. The right-turn lane volume was not included in the analysis. Warrants 1 and 2 are satisfied and the two left-turn lanes require signal control. A roundabout was not evaluated, since the total design year approach volumes for the Georgia 400 Northbound Exit Ramp exceed 40,000 VPD and it would not be practical to have half an interchange with a roundabout.

Intersection No. 3: McGinnis Ferry Road at Georgia 400 Northbound Ramps:

The Georgia 400 Northbound Exit Ramp would have dual left-turn lanes and dual right-turn lanes. Only the left-turn exit ramp volumes are considered in the analysis. McGinnis Ferry Road would have a posted speed limit of 45 mph and have two eastbound left-lanes, two eastbound through lanes, two westbound through lanes and one westbound right-turn lane. The right-turn lane volume was not included in the analysis. Warrants 1 and 2 are satisfied and the two left-turn lanes require signal control. A roundabout would not be practical, since the total design year approach volumes exceed 40,000 VPD.

Hourly Approach Volumes: Hourly approach volumes are required for the warrant analyses. The available data are the approved concept ADT and peak hour traffic diagrams for the 2020 Build Year and 24-hour hourly traffic counts that were taken in 2012 and 2013 at various locations in order to develop the traffic diagrams.

These data are used in the following way to develop hourly traffic volumes for the warrant analyses. The hourly traffic counts are used as sources for hourly traffic volume profiles indicating each hour's percent of the ADT volume. The hourly profile sources are selected for each intersection approach based upon their correlation to the expected AM and PM peak predominant flow and their proximity to the analyzed intersection. The projected 2020 AM and PM peak hour volumes are directly utilized as the 7:00 AM to 8:00 AM and the 5:00 PM to 6:00 PM hourly volumes in the warrant analyses. The hourly profile for each approach is applied to the projected 2020 ADT volumes, less the peak hour volumes, to project the other hourly volumes. A summary of the ADT and peak hour volumes that were used to generate the hourly volumes is in the Appendix.

Traffic Signal Warrant Analyses: At each intersection, right-turn volumes are disregarded in the analysis, and the warrant analyses are based upon the left-turn and through volumes. Volume thresholds are not discounted for approach speeds. Crash history is not evaluated.

Roundabouts: Table 1 is a summary of the results of the roundabout analysis at each studied intersection. A roundabout would not be practical at one of the three intersections since the total design year approach volumes exceed 40,000 VPD (see table below). However, the GA 400 Southbound Exit Ramp was not evaluated further because the volume threshold was exceeded by the GA 400 Northbound Exit Ramp in the design year 2040 and it would not be practical to have half of the interchange signalized and half of the interchange with a roundabout. Therefore, the only intersection evaluated for a roundabout was the intersection of McGinnis Ferry Road/Morris Road at Bethany Bend.

TABLE 1: ROUNDABOUT CRITERIA SUMMARY												
			Approach ADT's							Major Rd %Traffic	Single Lane	Multi Lane
Int. No.		Year	EB	WB	EB+ WB	NB	SB	NB+ SB	TOTALS			
	Bethany Bend	2020	8200	10650	18850		5550	5550	24400	77%	No	Yes
1	McGinnis Ferry Rd	2040	8700	12550	21250		7250	7250	28500	75%	No	Yes
	GA 400 SB Exit Ramp	2020	10100	14800	24900		6900	6900	31800	78%	No	Yes
2	McGinnis Ferry Rd	2040	12000	18200	30200		9550	9550	39750	76%	No	Yes
	GA 400 NB Exit Ramp	2020	13400	18100	31500	8300		8300	39800	79%	No	Yes
3	McGinnis Ferry Rd	2040	15250	21450	36700	12500		12500	49200	75%	No	No

Note: Although the Southbound Exit Ramp does meet the ADT criteria for a Multi-Lane Roundabout, it was not evaluated because the volume threshold was exceeded at the Northbound Exit Ramp in the design year 2040.

The design year total approach volume for the intersection of McGinnis Ferry Road/Morris Road at Bethany Bend is 28,500 VPD vpd in the design year 2040, which supports the consideration of a multi-lane roundabout. Two approach lanes would be needed on the west, east and north legs. This analysis indicates that during the 2040 PM peak hour the northbound approach would operate at LOS F as shown in the table below. Therefore, a roundabout is not recommended.

Multi-Lane Roundabout Operation Summary McGinnis Ferry Road/Morris Road at Bethany Bend					
Analysis Year / Analysis Model	Peak Hour	Intersection Approach Legs - Level of Service			
		North	East	South	West
Build Year 2040 NCHRP 472 Model	AM	E	C	--	B
	PM	F	C	--	C
Design Year 2040 UK Model	AM	A	A	--	A
	PM	A	A	--	A

Traffic Signal Warrants Met: Traffic signals are warranted for intersections 1 through 3. The numbers of hours each warrant is satisfied for each intersection are summarized below.

Intersection		Hours Warranted			
		W1A	W1B	W1 A & B	W2
1	McGinnis Ferry Road @ Bethany Bend/Morris Road	12	8	12	14
2	McGinnis Ferry Road @ Georgia 400 Southbound Exit Ramp	13	8	10	8
3	McGinnis Ferry Road @ Georgia 400 Northbound Exit Ramp	5	10	6	9

Recommendations:

Traffic Signals should be included in Projects CSHPP-0007-00(526) at the following 3 locations:

Intersection No. 1: McGinnis Ferry Road at Bethany Bend/Morris Road

Intersection No. 2: McGinnis Ferry Road at Georgia 400 southbound ramps

Intersection No. 3: McGinnis Ferry Road at Georgia 400 northbound ramps

The sketches of the proposed traffic signals are included in the Appendix and are intended to be schematic. The sketches show vehicle and pedestrian signals and their proposed phasing. Other details, such as crosswalks, are not represented in these conceptual sketches.

RECOMMENDED BY: ……..…….. DATE: ……..……
District Traffic Engineer

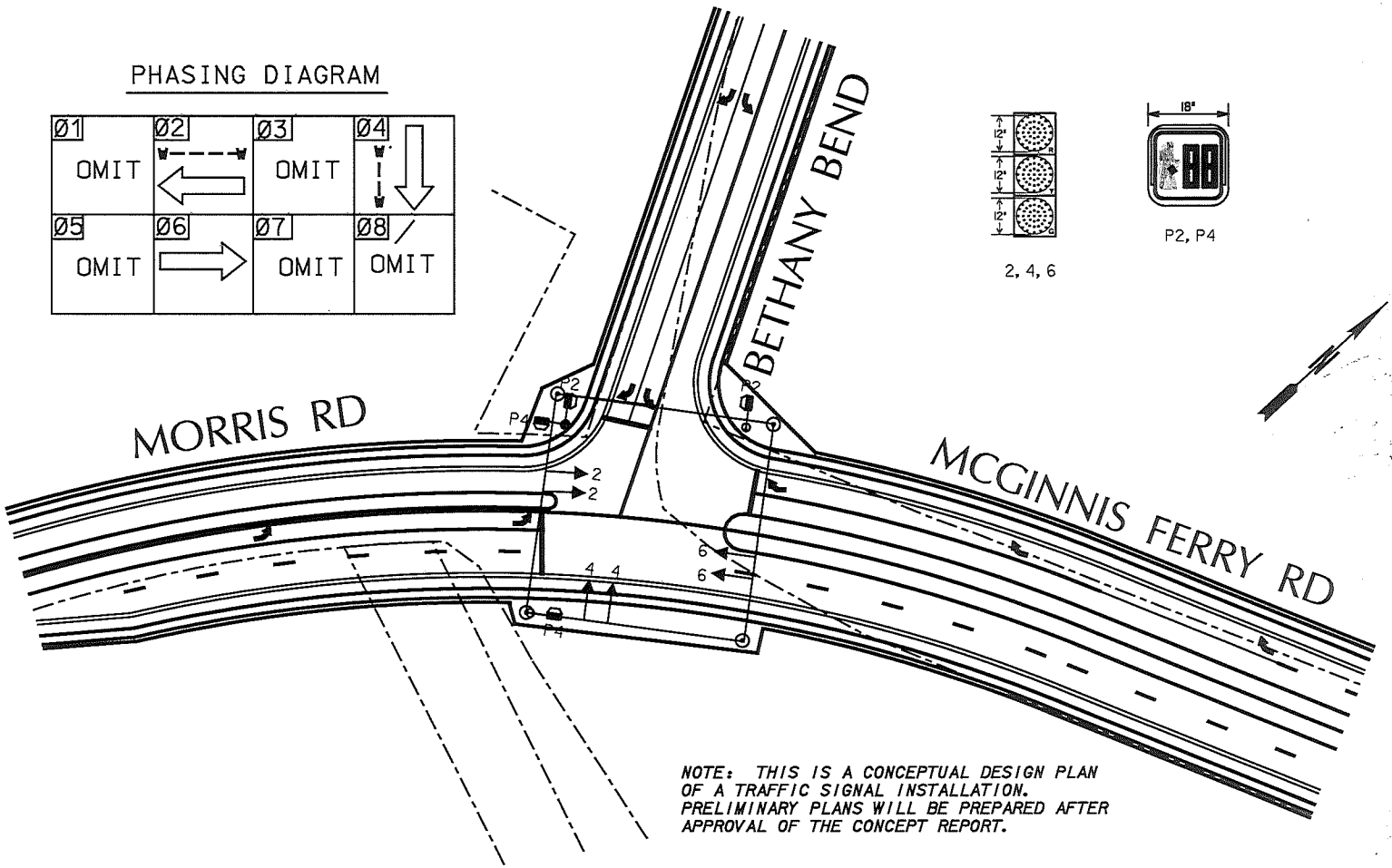
Appendix

- Sketches of the Proposed Traffic Signal Installations
- Traffic Signal Warrant Analyses
- Summary of 2020 ADT and Peak Hour Volumes Used To Develop Warrant Analyses
- Hourly Data Calculations
- Roundabout Analysis

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			

PHASING DIAGRAM

Ø1 OMIT	Ø2	Ø3 OMIT	Ø4
Ø5 OMIT	Ø6	Ø7 OMIT	Ø8 OMIT



2, 4, 6

P2, P4

NOTE: THIS IS A CONCEPTUAL DESIGN PLAN OF A TRAFFIC SIGNAL INSTALLATION. PRELIMINARY PLANS WILL BE PREPARED AFTER APPROVAL OF THE CONCEPT REPORT.

Moreland Altobelli Associates, Inc.
2211 Beaver Ruin Road
Suite 190
Norcross, Georgia 30071
Telephone (770) 263-5945

SCALE IN FEET

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: URBAN DESIGN

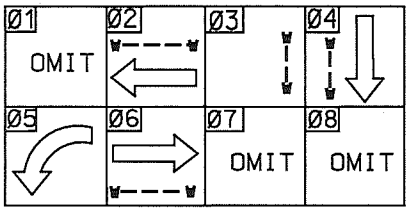
TRAFFIC SIGNAL NO. 1

GA 400 / MCGINNIS FERRY ROAD INTERCHANGE
MCGINNIS FERRY RD/MORRIS RD
AT BETHANY BEND

DRAWING NO. 27-01

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			

PHASING DIAGRAM



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REVISION DATES

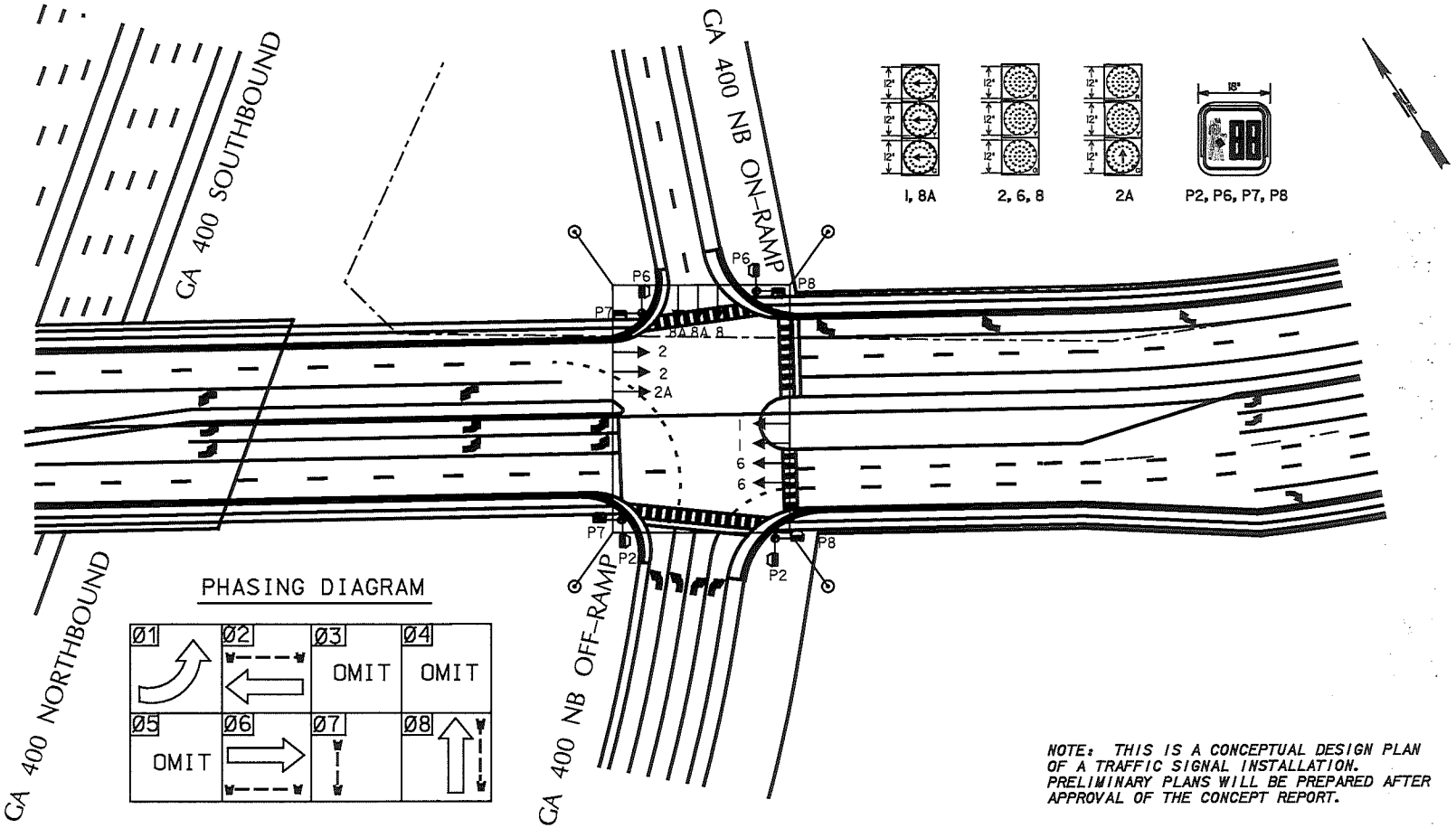
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: URBAN DESIGN

TRAFFIC SIGNAL NO. 2

GA 400 / MCGINNIS FERRY ROAD INTERCHANGE
MCGINNIS FERRY RD AT
GEORGIA 400 SOUTHBOUND EXIT RAMP

DRAWING NO. 27-02

STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
GA			



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SCALE IN FEET

REVISION DATES

STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION
OFFICE: URBAN DESIGN

TRAFFIC SIGNAL NO. 3

GA 400 / MCGINNIS FERRY ROAD INTERCHANGE
MCGINNIS FERRY ROAD AT
GA 400 NORTHBOUND EXIT RAMP

DRAWING NO. 27-03

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Bethany Bend/Morris Road
Year 2020 Analysis

Signal Warrants - Summary

Major Street Approaches

Eastbound: **Morris Road**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **8,199**

Westbound: **McGinnis Ferry Road**
Number of Lanes: **1**
Approach Speed: **45**
Total Approach Volume: **6,652**

Minor Street Approaches

Southbound: **Bethany Bend**
Number of Lanes: **1**

Total Approach Volume: **4,000**

Warrant Summary **(Urban values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume .....**Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic .....**Satisfied**
Required volumes reached for 8 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants .....**Satisfied**
Required volumes reached for 12 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (14) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Not Evaluated**

Warrant 3A - Peak Hour Delay .....**Not Evaluated**

Warrant 3B - Peak Hour Volumes .....**Not Evaluated**

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

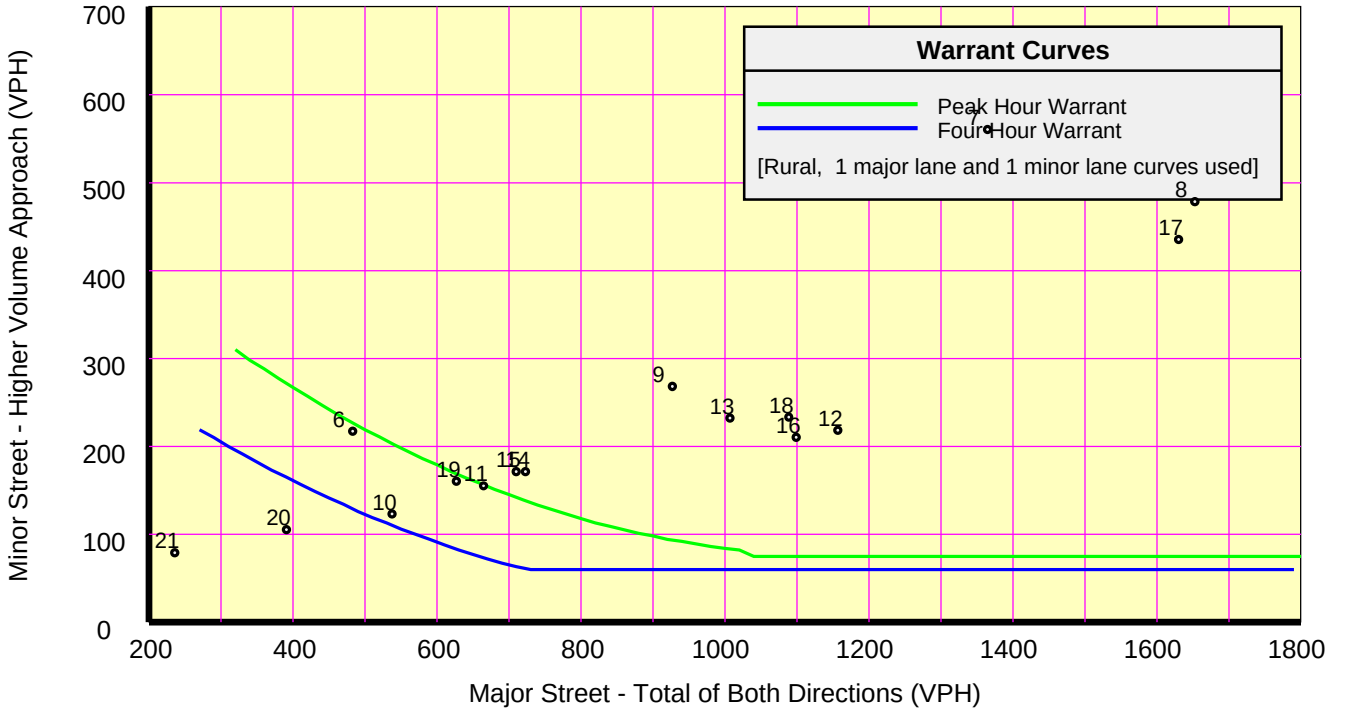
Warrant 7 - Crash Experience ..... **Not Evaluated**

Warrant 8 - Roadway Network ..... **Not Evaluated**

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Bethany Bend/Morris Road
Year 2020 Analysis

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	39	13	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
01:00	20	8	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
02:00	8	11	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
03:00	10	7	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
04:00	47	11	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
05:00	162	58	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
06:00	483	217	SB	500-No	150-Yes	Minor	750-No	75-Yes	Minor	600-No	120-Yes	Minor
07:00	1,365	560	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
08:00	1,653	478	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
09:00	927	268	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
10:00	538	123	SB	500-Yes	150-No	Major	750-No	75-Yes	Minor	600-No	120-Yes	Minor
11:00	665	155	SB	500-Yes	150-Yes	Both	750-No	75-Yes	Minor	600-Yes	120-Yes	Both
12:00	1,157	218	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
13:00	1,007	232	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
14:00	723	171	SB	500-Yes	150-Yes	Both	750-No	75-Yes	Minor	600-Yes	120-Yes	Both
15:00	710	171	SB	500-Yes	150-Yes	Both	750-No	75-Yes	Minor	600-Yes	120-Yes	Both
16:00	1,099	210	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
17:00	1,630	435	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
18:00	1,089	233	SB	500-Yes	150-Yes	Both	750-Yes	75-Yes	Both	600-Yes	120-Yes	Both
19:00	627	160	SB	500-Yes	150-Yes	Both	750-No	75-Yes	Minor	600-Yes	120-Yes	Both
20:00	391	105	SB	500-No	150-No	---	750-No	75-Yes	Minor	600-No	120-No	---
21:00	236	79	SB	500-No	150-No	---	750-No	75-Yes	Minor	600-No	120-No	---
22:00	144	41	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---
23:00	121	36	SB	500-No	150-No	---	750-No	75-No	---	600-No	120-No	---

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Georgia 400 Southbound Exit Ramp
Year 2020 Analysis

Signal Warrants - Summary

Major Street Approaches

Eastbound: **McGinnis Ferry Road**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **7,650**

Westbound: **McGinnis Ferry Road**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **7,650**

Minor Street Approaches

Southbound: **GA 400 SB Off-Ramp**
Number of Lanes: **2**

Total Approach Volume: **5,748**

Warrant Summary **(Urban values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume .....**Satisfied**
Required volumes reached for 13 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic .....**Satisfied**
Required volumes reached for 8 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants .....**Satisfied**
Required volumes reached for 10 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (8) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Not Evaluated**

Warrant 3A - Peak Hour Delay .....**Not Evaluated**

Warrant 3B - Peak Hour Volumes .....**Not Evaluated**

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

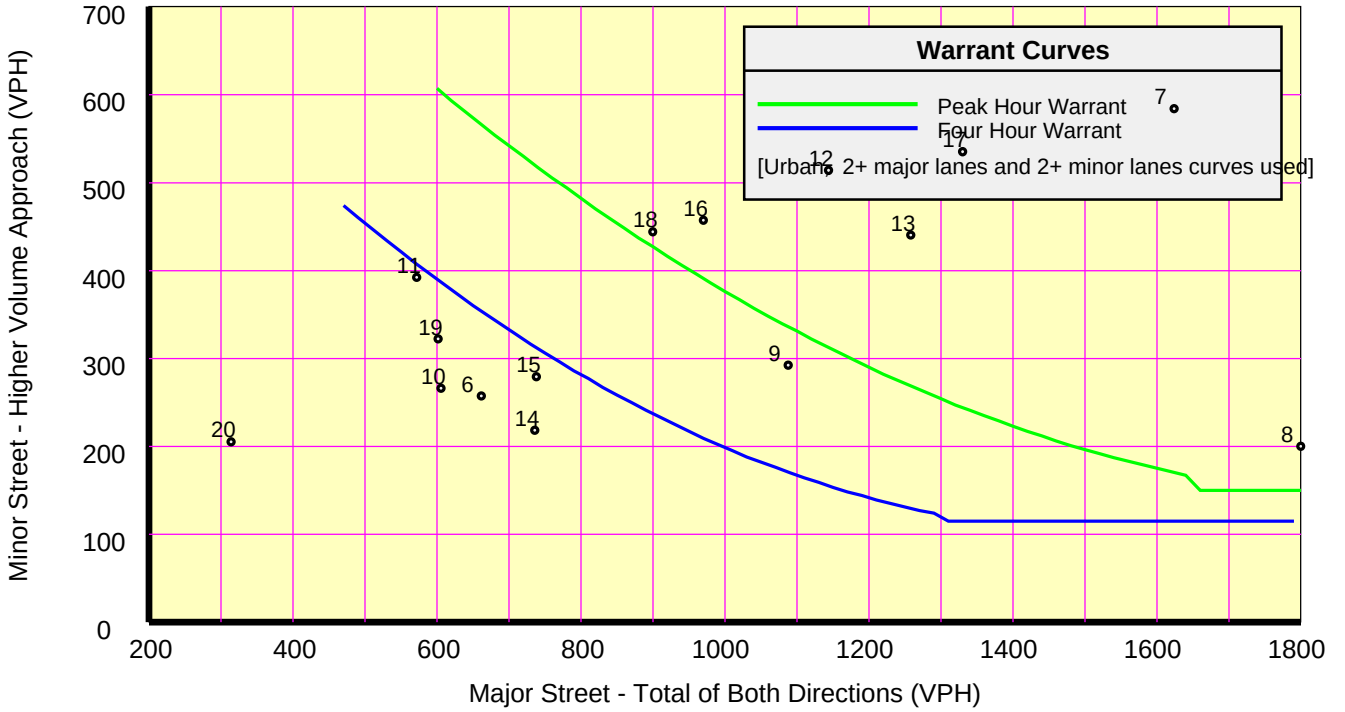
Warrant 7 - Crash Experience ..... **Not Evaluated**

Warrant 8 - Roadway Network ..... **Not Evaluated**

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Georgia 400 Southbound Exit Ramp
Year 2020 Analysis

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	24	13	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
01:00	12	13	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
02:00	12	4	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
03:00	8	17	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
04:00	70	9	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
05:00	196	61	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
06:00	662	257	SB	600-Yes	200-Yes	Both	900-No	100-Yes	Minor	720-No	160-Yes	Minor
07:00	1,624	584	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
08:00	2,040	200	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
09:00	1,088	292	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
10:00	606	266	SB	600-Yes	200-Yes	Both	900-No	100-Yes	Minor	720-No	160-Yes	Minor
11:00	572	392	SB	600-No	200-Yes	Minor	900-No	100-Yes	Minor	720-No	160-Yes	Minor
12:00	1,144	514	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
13:00	1,258	440	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
14:00	736	218	SB	600-Yes	200-Yes	Both	900-No	100-Yes	Minor	720-Yes	160-Yes	Both
15:00	738	279	SB	600-Yes	200-Yes	Both	900-No	100-Yes	Minor	720-Yes	160-Yes	Both
16:00	970	457	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
17:00	1,330	535	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
18:00	900	444	SB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
19:00	602	322	SB	600-Yes	200-Yes	Both	900-No	100-Yes	Minor	720-No	160-Yes	Minor
20:00	314	205	SB	600-No	200-Yes	Minor	900-No	100-Yes	Minor	720-No	160-Yes	Minor
21:00	176	126	SB	600-No	200-No	---	900-No	100-Yes	Minor	720-No	160-No	---
22:00	112	70	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
23:00	106	30	SB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Georgia 400 Northbound Exit Ramp
Year 2020 Analysis

Signal Warrants - Summary

Major Street Approaches

Eastbound: **McGinnis Ferry Road**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **13,401**

Westbound: **McGinnis Ferry Road**
Number of Lanes: **2**
Approach Speed: **45**
Total Approach Volume: **12,350**

Minor Street Approaches

Northbound: **GA 400 NB Exit Ramp**
Number of Lanes: **2**

Total Approach Volume: **2,451**

Warrant Summary **(Urban values apply.)**

Warrant 1 - Eight Hour Vehicular Volumes ..... **Satisfied**

Warrant 1A - Minimum Vehicular Volume .....**Not Satisfied**
Required volumes reached for 5 hours, 8 are needed

Warrant 1B - Interruption of Continuous Traffic .....**Satisfied**
Required volumes reached for 10 hours, 8 are needed

Warrant 1 A&B - Combination of Warrants .....**Not Satisfied**
Required volumes reached for 6 hours, 8 are needed

Warrant 2 - Four Hour Volumes ..... **Satisfied**
Number of hours (9) volumes exceed minimum >= minimum required (4).

Warrant 3 - Peak Hour ..... **Not Evaluated**

Warrant 3A - Peak Hour Delay .....**Not Evaluated**

Warrant 3B - Peak Hour Volumes .....**Not Evaluated**

Warrant 4 - Pedestrian Volumes ..... **Not Evaluated**

Warrant 5 - School Crossing ..... **Not Evaluated**

Warrant 6 - Coordinated Signal System ..... **Not Evaluated**

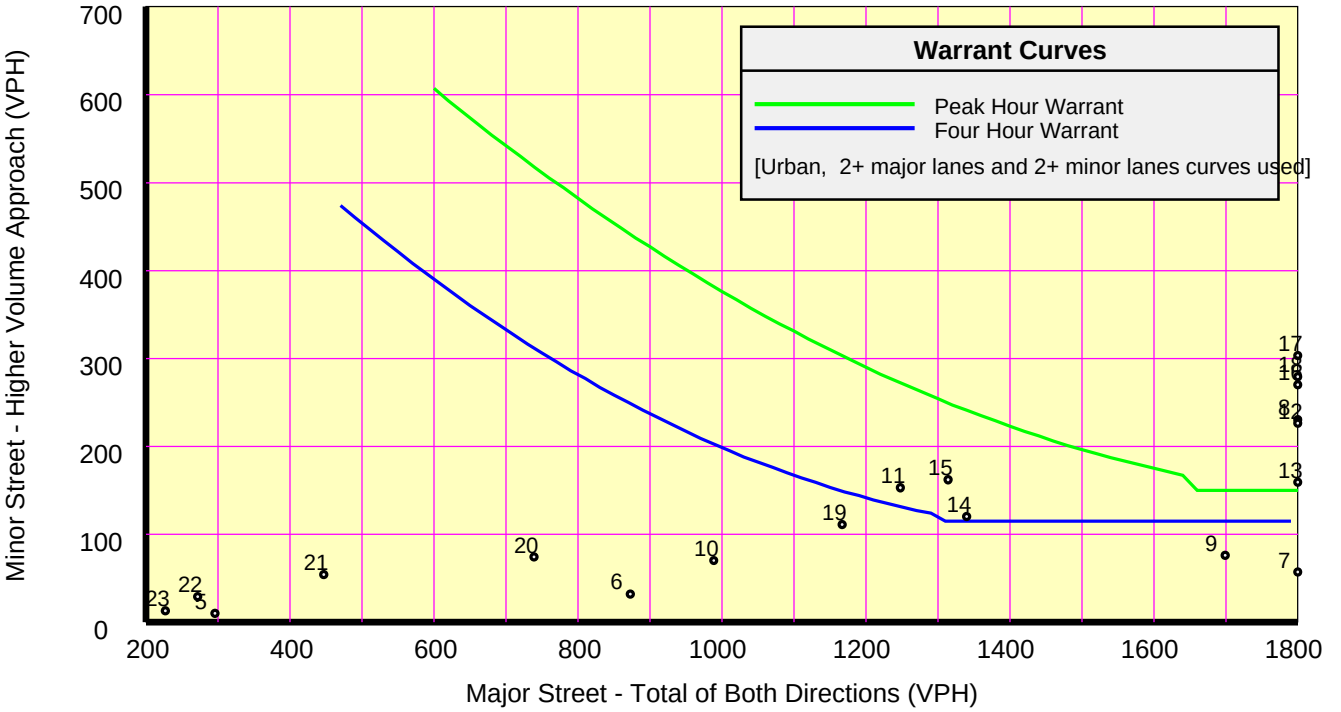
Warrant 7 - Crash Experience ..... **Not Evaluated**

Warrant 8 - Roadway Network ..... **Not Evaluated**

Traffic Signal Warrant Analysis

McGinnis Ferry Rd at
Georgia 400 Northbound Exit Ramp
Year 2020 Analysis

Signal Warrants - Summary



Analysis of 8-Hour Volume Warrants:

Hour	Major	Higher Minor		War-1A			War-1B			War-1A&B		
Begin	Total	Vol	Dir	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?	Major Crit	Minor Crit	Meets?
00:00	76	8	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
01:00	38	5	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
02:00	16	4	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
03:00	18	4	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
04:00	85	2	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
05:00	296	10	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
06:00	873	32	NB	600-Yes	200-No	Major	900-No	100-No	---	720-Yes	160-No	Major
07:00	2,210	57	NB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
08:00	1,960	230	NB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
09:00	1,699	76	NB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
10:00	989	70	NB	600-Yes	200-No	Major	900-Yes	100-No	Major	720-Yes	160-No	Major
11:00	1,248	153	NB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
12:00	2,150	226	NB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
13:00	1,836	159	NB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
14:00	1,340	120	NB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
15:00	1,314	162	NB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
16:00	2,057	270	NB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
17:00	2,645	303	NB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
18:00	2,049	279	NB	600-Yes	200-Yes	Both	900-Yes	100-Yes	Both	720-Yes	160-Yes	Both
19:00	1,167	111	NB	600-Yes	200-No	Major	900-Yes	100-Yes	Both	720-Yes	160-No	Major
20:00	739	74	NB	600-Yes	200-No	Major	900-No	100-No	---	720-Yes	160-No	Major
21:00	447	54	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
22:00	272	29	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---
23:00	227	13	NB	600-No	200-No	---	900-No	100-No	---	720-No	160-No	---

McGinnis Ferry Road Summary of 2020 ADT and Peak Hour Volumes for Traffic Signal Warrants				
Intersection	Approach	Daily Traffic (vpd)	AM Peak Hour (vph)	PM Peak Hour (vph)
Intersection No. 1 McGinnis Ferry Road at Bethany Bend	Morris Road EB Left + Thru Approach	8,200	655	870
	McGinnis Ferry Road WB Thru Approach	6,650	710	760
	Bethany Bend SB Left-Turn	4,000	560	435
Intersection No. 2 McGinnis Ferry Road at GA 400 Southbound Exit Ramp	McGinnis Ferry Road EB Thru Approach	7,650	1,020	665
	McGinnis Ferry Road WB Left + Thru Approach	14,800	970	1,715
	GA 400 Southbound Exit Ramp SB Left-Turn	5,750	200	535
Intersection No. 3 McGinnis Ferry Road at GA 400 Northbound Exit Ramp	McGinnis Ferry Road EB Left + Thru Approach	13,400	1,220	1,200
	McGinnis Ferry Road WB Thru Approach	12,350	740	1,445
	GA 400 Northbound Exit Ramp NB Left-Turn	2,450	230	270

1. McGinnis Ferry Road at Bethany Bend Hourly Volumes Based Upon ADT and Hourly Data Profile While Retaining Known Hourly Volumes									
	Source	Morris Road EB		Source	McGinnis Ferry Rd		Source	Bethany Bend	
	Morris Rd Eastbound	ADT = 8200	ADT Minus Peaks = 6675	McGinnis Ferry Rd Westbound	ADT = 6650	ADT Minus Peaks = 5180	Bethany Bend	ADT = 4000	ADT Minus Peaks = 3005
Hour	Hourly Data Profile	Known Hourly Vols	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes
12:00 AM	8		12	22		27	11		13
1:00 AM	4		6	11		14	7		8
2:00 AM	4		6	2		2	9		11
3:00 AM	3		5	4		5	6		7
4:00 AM	24		37	8		10	9		11
5:00 AM	67		104	47		58	49		58
6:00 AM	226		351	107		132	183		217
7:00 AM	554	655	655	291	710	710	361	560	560
8:00 AM	779		1211	359		442	403		478
9:00 AM	371		577	284		350	226		268
10:00 AM	207		322	175		216	104		123
11:00 AM	195		303	294		362	131		155
12:00 PM	390		606	447		551	184		218
1:00 PM	429		667	276		340	196		232
2:00 PM	251		390	270		333	144		171
3:00 PM	252		392	258		318	144		171
4:00 PM	331		515	474		584	177		210
5:00 PM	405	870	870	659	760	760	191	435	435
6:00 PM	307		477	497		612	197		233
7:00 PM	205		319	250		308	135		160
8:00 PM	107		166	183		225	89		105
9:00 PM	60		93	116		143	67		79
10:00 PM	38		59	69		85	35		41
11:00 PM	36		56	53		65	30		36
TOTALS	5253	1525	8200	5156	1470	6650	3088	995	4000

For each approach, enter hourly values for an appropriate data profile; enter ADT and any known hourly values.
"Adjusted Hourly Volumes" retains the known hourly values, and allocates the remainder of the ADT based upon the hourly profile.

2. McGinnis Ferry Road Southbound Exit Ramp
Hourly Volumes Based Upon ADT and Hourly Data Profile
While Retaining Known Hourly Volumes

	Source	McGinnis Ferry Rd EB		Source	McGinnis Ferry Rd WB		Source	GA 400 SB Exit Ramp	
	McGinnis Ferry Rd EB	ADT = 7650	ADT Minus Peaks = 5965	McGinnis Ferry Rd WB	ADT = 14800	ADT Minus Peaks = 12115	Tidwell Rd SB	ADT = 5750	ADT Minus Peaks = 5015
Hour	Hourly Data Profile	Known Hourly Vols	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes
12:00 AM	8		12	22		64	3		13
1:00 AM	4		6	11		32	3		13
2:00 AM	4		6	2		6	1		4
3:00 AM	3		4	4		12	4		17
4:00 AM	24		35	8		23	2		9
5:00 AM	67		98	47		138	14		61
6:00 AM	226		331	107		313	59		257
7:00 AM	554		812	291		852	134		584
8:00 AM	779	1020	1020	359	970	970	161	200	200
9:00 AM	371		544	284		831	67		292
10:00 AM	207		303	175		512	61		266
11:00 AM	195		286	294		861	90		392
12:00 PM	390		572	447		1309	118		514
1:00 PM	429		629	276		808	101		440
2:00 PM	251		368	270		790	50		218
3:00 PM	252		369	258		755	64		279
4:00 PM	331		485	474		1388	105		457
5:00 PM	405	665	665	659	1715	1715	130	535	535
6:00 PM	307		450	497		1455	102		444
7:00 PM	205		301	250		732	74		322
8:00 PM	107		157	183		536	47		205
9:00 PM	60		88	116		340	29		126
10:00 PM	38		56	69		202	16		70
11:00 PM	36		53	53		155	7		30
TOTALS	5253	1685	7650	5156	2685	14800	1442	735	5750

For each approach, enter hourly values for an appropriate data profile; enter ADT and any known hourly values.
"Adjusted Hourly Volumes" retains the known hourly values, and allocates the remainder of the ADT based upon the hourly profile.

3. McGinnis Ferry Road Northbound Exit Ramp Hourly Volumes Based Upon ADT and Hourly Data Profile While Retaining Known Hourly Volumes									
	Source	McGinnis Ferry Rd EB		Source	McGinnis Ferry Rd WB		Source	GA 400 NB Exit Ramp	
	McGinnis Ferry Rd EB	ADT = 13400	ADT Minus Peaks = 10980	McGinnis Ferry Rd WB	ADT = 12350	ADT Minus Peaks = 10165	Windward Concourse NB	ADT = 2450	ADT Minus Peaks = 1950
Hour	Hourly Data Profile	Known Hourly Vols	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes	Hourly Data Profile	Known Hourly Volumes	Adjusted Hourly Volumes
12:00 AM	8		22	22		54	12		8
1:00 AM	4		11	11		27	8		5
2:00 AM	4		11	2		5	6		4
3:00 AM	3		8	4		10	6		4
4:00 AM	24		65	8		20	3		2
5:00 AM	67		181	47		115	15		10
6:00 AM	226		610	107		263	49		32
7:00 AM	554		1495	291		715	88		57
8:00 AM	779	1220	1220	359	740	740	126	230	230
9:00 AM	371		1001	284		698	116		76
10:00 AM	207		559	175		430	108		70
11:00 AM	195		526	294		722	235		153
12:00 PM	390		1052	447		1098	347		226
1:00 PM	429		1158	276		678	244		159
2:00 PM	251		677	270		663	184		120
3:00 PM	252		680	258		634	248		162
4:00 PM	331		893	474		1164	556	270	270
5:00 PM	405	1200	1200	659	1445	1445	465		303
6:00 PM	307		828	497		1221	429		279
7:00 PM	205		553	250		614	171		111
8:00 PM	107		289	183		450	113		74
9:00 PM	60		162	116		285	83		54
10:00 PM	38		103	69		169	44		29
11:00 PM	36		97	53		130	20		13
TOTALS	5253	2420	13400	5156	2185	12350	3676	500	2450

For each approach, enter hourly values for an appropriate data profile; enter ADT and any known hourly values.
"Adjusted Hourly Volumes" retains the known hourly values, and allocates the remainder of the ADT based upon the hourly profile.

Roundabout Analysis Tool

v 1.1

Updated: 9/1/09

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the Instructions tab before using the spreadsheet.

Analyst:	Karla Poshedly
Agency/Company:	Moreland Altobelli Assoc.
Date:	9/12/2013
Project Name or PI#:	GA 400 at McGinnis Ferry Rd, P.I. 0007526
Year, Peak Period:	2040 AM peak
County/District:	Forsyth County / District 1
Intersection:	#1: Bethany Bend at McGinnis Ferry Road

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 20,000	less than 80%
Multi-Lane	less than 40,000	less than 80%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	21,250	75%
Minor Street	7,250	25%
Total volumes	28,500	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)? 0 mi 2753'

3 Is the proposed intersection located within a coordinated signal network? No

Go up to next section...

Proposed Design Configuration Chart

Directions for this Section only: *(see **Instructions Tab** for other sections)*

1. Select the type of roundabout you are analyzing.
2. Key in the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
   a. Select the Street Name from the pulldown menu for each approach leg
   b. Select the Lane Type for each entry apporach lane
      **The first box is the inner lane, the second box is the outer lane*
   c. Select Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:	Multi-Lane
# of Approaches:	3
Name of Streets:	McGinnis Ferry Rd
	Morris Rd
	Bethany Bend

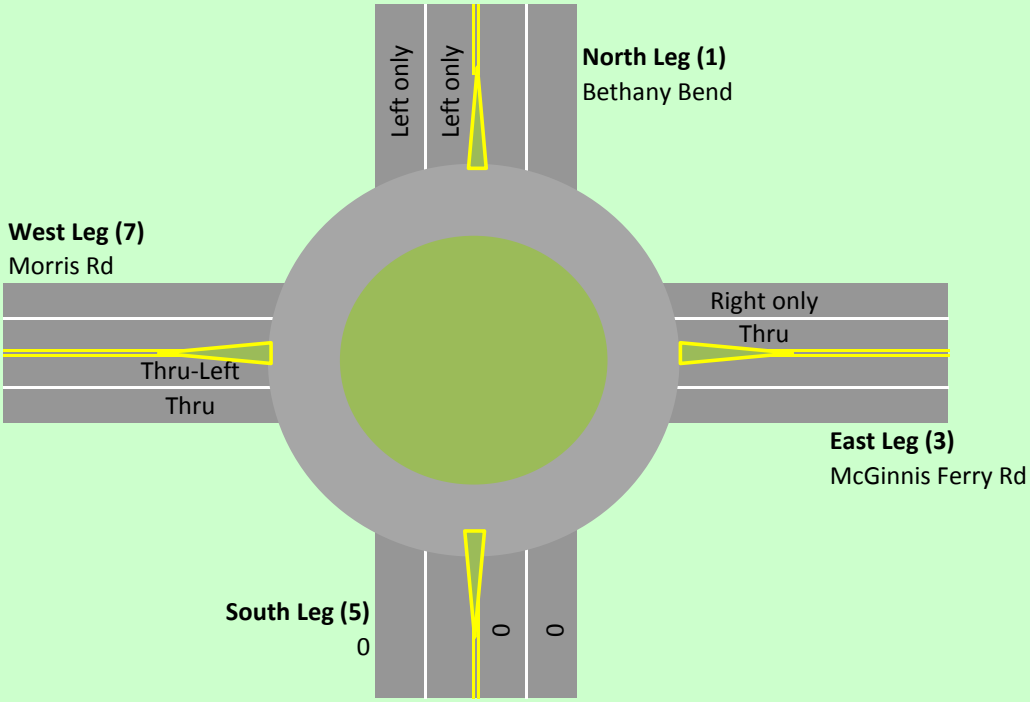
Chart Key:

Single Lane	Street Name	
	All	
	Bypass?	
Multi-lane	Street Name	
	Inner Ln	Outer Ln
	Bypass?	

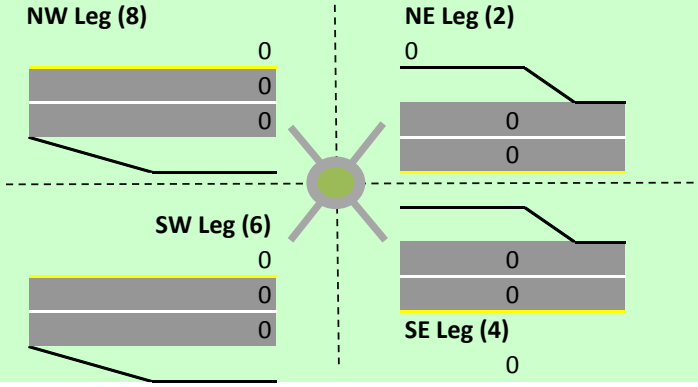
Approach Leg Characteristics:

	North Leg (1)		NE Leg (2)		East Leg (3)		SE Leg (4)	
Street Name:	Bethany Bend				McGinnis Ferry Rd			
Entry Lane Config	Left only	Left only			Thru	Right only		
Bypass to Adj Leg?	No				No			
	South Leg (5)		SW Leg (6)		West Leg (7)		NW Leg (8)	
Street Name:					Morris Rd			
Entry Lane Config					Thru-Left	Thru		
Bypass to Adj Leg?					No			

Preliminary Roundabout Rendering**



Additional Legs

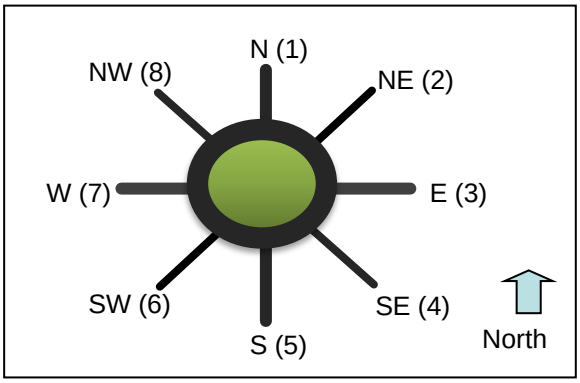


***Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information

Analyst:	Karla Poshedly
Agency/Company:	Moreland Altobelli Assoc.
Date:	9/12/2013
Project Name or PI#:	0 at McGinnis Ferry Rd, P.I. 00
Year, Peak Hour:	2040 PM peak
County/District:	Forsyth County / District 1
Intersection:	#1: Bethany Bend at McGinnis Ferry Road



Volumes

		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph								
Exit	NE (2), vph								
Legs	E (3), vph	255	380						
(TO)	SE (4), vph								
	S (5), vph								
	SW (6), vph								
	W (7), vph	125				785	380		
	NW (8), vph								
	Entry Volume, vph	380	380	0	0	785	380	0	0
		S1 (5)	S2 (5)	SW1 (6)	SW2 (6)	W1 (7)	W2 (7)	NW1 (8)	NW2 (8)
	N (1), vph					70			
	NE (2), vph								
	E (3), vph					290	360		
	SE (4), vph								
	S (5), vph								
	SW (6), vph								
	W (7), vph								
	NW (8), vph								
	Entry Volume, vph	0	0	0	0	360	360	0	0

Critical Lane Volumes

	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	0	0	0	0	70	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	255	0	0	0	0	0	290	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	0	0	0	0	0	0	0	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	125	0	785	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	380	0	785	0	0	0	360	0

Roundabout Analysis Tool
Multi-Lane

9/13/2013
Version 1.1

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100%	100%	100%	100%	100%	100%	100%	100%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	0%	0%	0%	0%	0%	0%	0%	0%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pcu/h	0	0	0	0	0	0	76	0
Leg #	NE (2), pcu/h	0	0	0	0	0	0	0	0
	E (3), pcu/h	690	0	0	0	0	0	707	0
	SE (4), pcu/h	0	0	0	0	0	0	0	0
	S (5), pcu/h	0	0	0	0	0	0	0	0
	SW (6), pcu/h	0	0	0	0	0	0	0	0
	W (7), pcu/h	136	0	1266	0	0	0	0	0
	NW (8), pcu/h	0	0	0	0	0	0	0	0
	Conflicting flow, pcu/h	1266	0	76	0	0	0	690	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	466	NA	1071	NA	NA	NA	697	NA
Crit. Lane Entry Flow pcu/h	413	0	853	0	0	0	391	0
V/C ratio	**0.89**		**0.80**				**0.56**	
Control Delay, sec/pcu	**43.4**		**15.0**				**11.6**	
LOS	E		C				B	
95th % Queue (ft)	**240**		**221**				**88**	

UK Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1517	NA	2370	NA	NA	NA	1930	NA
Entry Flow pcu/h	826	0	1266	0	0	0	783	0
V/C ratio	**0.54**		**0.53**				**0.41**	
Control Delay, sec/pcu	**5.2**		**3.2**				**3.1**	
LOS	A		A				A	
95th % Queue (ft)	**86**		**84**				**50**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Georgia Department of Transportation
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Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)						
Select Exit Leg for Bypass (TO)						
Volumes						
Entry Leg: Insert Right Turn Volume						
Exit Leg: ***(Select Input Method)***						
*Critical Lane Flow (Default) in Exit Leg****						
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)						
F_{HV} (Entry Leg)						
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
****Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.**						
Entry/Conflicting Flows						
Entry Flow						
Conflicting Critical Flow						
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr						
V/C ratio						
Control Delay, sec/pcu						
LOS						
95th % Queue (ft)						

Roundabout Analysis Tool

v 1.1

Updated: 9/1/09

Welcome to GDOT's Roundabout Analysis Tool. This tool is designed for the user to determine the functionality of a proposed roundabout. The analysis is based on NCHRP Report 572 and the FHWA's Roundabout Design Guide (2000) standards. Please read the notes in the Instructions tab before using the spreadsheet.

Analyst:	Karla Poshedly
Agency/Company:	Moreland Altobelli Assoc.
Date:	9/12/2013
Project Name or PI#:	GA 400 at McGinnis Ferry Rd, P.I. 0007526
Year, Peak Period:	2040 PM peak
County/District:	Forsyth County / District 1
Intersection:	#1: Bethany Bend at McGinnis Ferry Road

Insert Project Information Here in the BLUE SPACE. This information is linked to the Single Lane and Multi Lane Worksheets.

Roundabout Considerations Worksheet

Roundabouts may not operate well if there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. Candidate intersections shall be analyzed to determine whether a roundabout will perform acceptably. Shown below are thresholds to determine if a roundabout capacity analysis is required:

# of circulatory lanes	ADTs (current/ build year)	% traffic on Major Road
Single Lane	less than 20,000	less than 80%
Multi-Lane	less than 40,000	less than 80%

Other things to consider when evaluating roundabouts as an alternative are Right of Way, sight distance, environmental impacts, and access to adjacent properties.

Volume Information (for Analysis Time Period)

1 Enter the Major/Minor Street ADT Volumes in the Chart below:

	Volumes	Split
Major Street	21,250	75%
Minor Street	7,250	25%
Total volumes	28,500	

Proximity to Other Intersections

2 How close is the nearest signal (miles or feet)? 0 mi 2753'

3 Is the proposed intersection located within a coordinated signal network? No

Go up to next section...

Proposed Design Configuration Chart

Directions for this Section only: *(see **Instructions Tab** for other sections)*

1. Select the type of roundabout you are analyzing.
2. Key in the number of approaches and the street names at the proposed intersections.
3. Complete the Approach Characteristics Chart:
   a. Select the Street Name from the pulldown menu for each approach leg
   b. Select the Lane Type for each entry apporach lane
      **The first box is the inner lane, the second box is the outer lane*
   c. Select Yes or No if a right turn bypass will be added to each approach leg

Roundabout Characteristics

Roundabout Type:	Multi-Lane
# of Approaches:	4
Name of Streets:	McGinnis Ferry Rd
	Morris Rd
	Bethany Bend

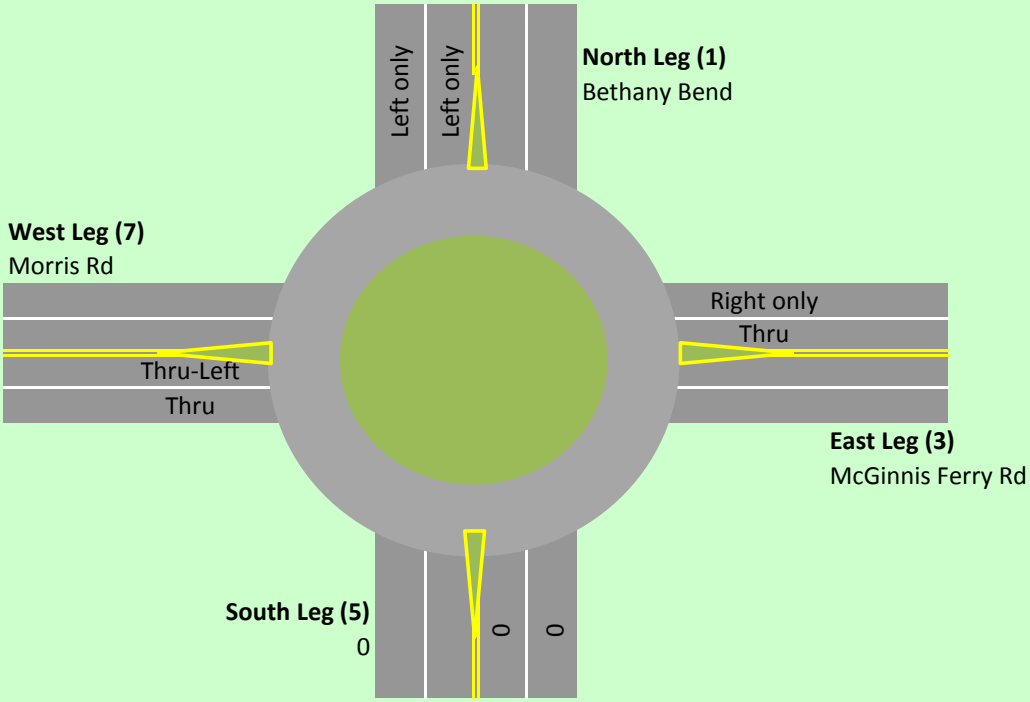
Chart Key:

Single Lane	Street Name	
	All	
	Bypass?	
Multi-lane	Street Name	
	Inner Ln	Outer Ln
	Bypass?	

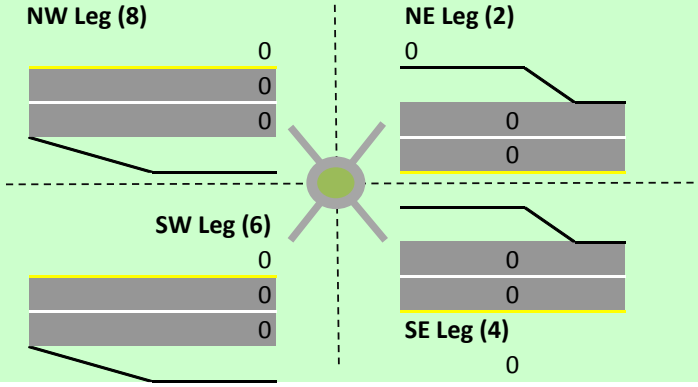
Approach Leg Characteristics:

	North Leg (1)		NE Leg (2)		East Leg (3)		SE Leg (4)	
Street Name:	Bethany Bend				McGinnis Ferry Rd			
Entry Lane Config	Left only	Left only			Thru	Right only		
Bypass to Adj Leg?	No				No			
	South Leg (5)		SW Leg (6)		West Leg (7)		NW Leg (8)	
Street Name:					Morris Rd			
Entry Lane Config					Thru-Left	Thru		
Bypass to Adj Leg?					No			

Preliminary Roundabout Rendering**



Additional Legs

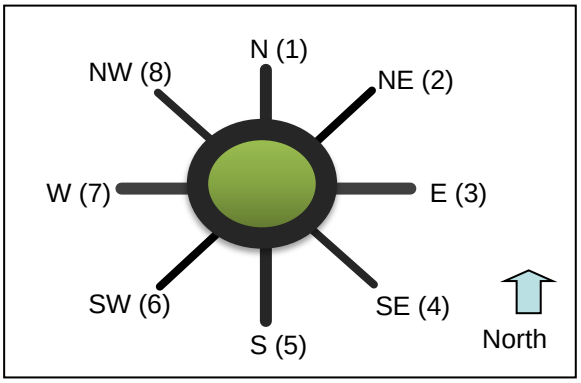


***Note**

This roundabout sketch does not include the secondary cardinal direction legs due to restrictions in the Excel software. For complex roundabouts, a separate sketch is recommended by the designer.

General & Site Information

Analyst:	Karla Poshedly
Agency/Company:	Moreland Altobelli Assoc.
Date:	9/12/2013
Project Name or PI#:	0 at McGinnis Ferry Rd, P.I. 00
Year, Peak Hour:	2040 PM peak
County/District:	Forsyth County / District 1
Intersection:	#1: Bethany Bend at McGinnis Ferry Road



Volumes

		Entry Legs (FROM)							
		N1 (1)	N2 (1)	NE1 (2)	NE2 (2)	E1 (3)	E2 (3)	SE1 (4)	SE2 (4)
	N (1), vph								
Exit	NE (2), vph								
Legs	E (3), vph	**245**	**355**						
(TO)	SE (4), vph								
	S (5), vph								
	SW (6), vph								
	W (7), vph	**110**				**810**	**540**		
	NW (8), vph								
	Entry Volume, vph	355	355	0	0	810	540	0	0
		S1 (5)	**S2 (5)**	**SW1 (6)**	**SW2 (6)**	**W1 (7)**	**W2 (7)**	**NW1 (8)**	**NW2 (8)**
	N (1), vph					**70**			
	NE (2), vph								
	E (3), vph					**320**	**465**		
	SE (4), vph								
	S (5), vph								
	SW (6), vph								
	W (7), vph								
	NW (8), vph								
	Entry Volume, vph	0	0	0	0	390	465	0	0

Critical Lane Volumes

	N	NE	E	SE	S	SW	W	NW
N (1), vph	0	0	0	0	0	0	0	0
NE (2), vph	0	0	0	0	0	0	0	0
E (3), vph	245	0	0	0	0	0	465	0
SE (4), vph	0	0	0	0	0	0	0	0
S (5), vph	0	0	0	0	0	0	0	0
SW (6), vph	0	0	0	0	0	0	0	0
W (7), vph	110	0	810	0	0	0	0	0
NW (8), vph	0	0	0	0	0	0	0	0
Entry Volume, vph	355	0	810	0	0	0	465	0

Roundabout Analysis Tool
Multi-Lane

9/13/2013
Version 1.1

Volume Characteristics	N	NE	E	SE	S	SW	W	NW
% Cars	100%	100%	100%	100%	100%	100%	100%	100%
% S.U./ Bus	0%	0%	0%	0%	0%	0%	0%	0%
% Trucks/ Combin.	0%	0%	0%	0%	0%	0%	0%	0%
% Bicycles	0%	0%	0%	0%	0%	0%	0%	0%
PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
F_{hv}	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Entry/Conflicting Flows		N	NE	E	SE	S	SW	W	NW
Flow to	N (1), pcu/h	0	0	0	0	0	0	76	0
Leg #	NE (2), pcu/h	0	0	0	0	0	0	0	0
	E (3), pcu/h	652	0	0	0	0	0	853	0
	SE (4), pcu/h	0	0	0	0	0	0	0	0
	S (5), pcu/h	0	0	0	0	0	0	0	0
	SW (6), pcu/h	0	0	0	0	0	0	0	0
	W (7), pcu/h	120	0	1467	0	0	0	0	0
	NW (8), pcu/h	0	0	0	0	0	0	0	0
	Conflicting flow, pcu/h	1467	0	76	0	0	0	652	0

Results: Approach Measures of Effectiveness

NCHRP-572 Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	405	NA	1071	NA	NA	NA	716	NA
Crit. Lane Entry Flow pcu/h	386	0	880	0	0	0	505	0
V/C ratio	**0.95**		**0.82**				**0.71**	
Control Delay, sec/pcu	**61.2**		**16.7**				**16.2**	
LOS	F		C				C	
95th % Queue (ft)	**273**		**245**				**147**	

UK Model	N	NE	E	SE	S	SW	W	NW
Crit. Entry Capacity pcu/h	1373	NA	2370	NA	NA	NA	1957	NA
Entry Flow pcu/h	772	0	1467	0	0	0	929	0
V/C ratio	**0.56**		**0.62**				**0.47**	
Control Delay, sec/pcu	**5.9**		**4.0**				**3.5**	
LOS	A		A				A	
95th % Queue (ft)	**92**		**117**				**66**	

Notes:

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
F_{HV} = heavy vehicle factor
pcu = passenger car unit

Georgia Department of Transportation
Office of Traffic Operations

Bypass Lane Merge Point Analysis (if applicable)						
Bypass Characteristics	**Bypass #1**	**Bypass #2**	**Bypass #3**	**Bypass #4**	**Bypass #5**	**Bypass #6**
Select Entry Leg from Bypass (FROM)	**E (3)**					
Select Exit Leg for Bypass (TO)	**N (1)**					
Volumes						
Entry Leg: Insert Right Turn Volume	540					
Exit Leg: ***(Select Input Method)***	Default					
*Critical Lane Flow (Default) in Exit Leg****	51					
Sum of inner circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
Sum of outer circulatory flow lane to exit leg (leg bypass merges into)	N/A	N/A	N/A	N/A	N/A	N/A
*Critical Lane Flow (Manual) in Exit Leg****						
Volume Characteristics						
PHF (Entry Leg)	0.92					
F_{HV} (Entry Leg)	1.00					
PHF (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
F_{HV} (Exit Leg)***	N/A	N/A	N/A	N/A	N/A	N/A
Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.						
Entry/Conflicting Flows						
Entry Flow	587					
Conflicting Critical Flow	51					
Bypass Lane Results (NCHRP-572 Method)						
Entry Capacity at bypass merge point, pcu/hr	1074					
V/C ratio	0.55					
Control Delay, sec/pcu	7.3					
LOS	A					
95th % Queue (ft)	**86**					

Attachment 8
Bridge Inventory

Processed Date:8/21/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:121-0285-0 **Fulton** **SUFF. RATING:** 80.30

Location & Geography

Structure ID:	121-0285-0
200 Brdge Information:	06
*6A Feature Int:	SR 400 (US 19)
*6B Critical Bridge:	0
*7A Route No Carried:	CR00041
*7B Facility Carried:	McGINNIS FERRY RD
9 Location:	APP .5 MI W JCT FAS 2349
2 Dot District:	7
207 Year Photo:	2012
*91 Inspection Frequency:	24 Date: 08/15/2012
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
* 4 Place Code:	01696
*5 Inventory Route(O/U):	1
Type:	4
Designation:	1
Number:	02564
Direction:	0
*16 Latitude:	34 06.1690 HMMS Prefix:00
*17 Longtitude:	84 -14.6970 HMMS Suffix:000 MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1212004100
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	001.89
*208 Inspection Area:	7 Initials: EFP
Engineer's Initials:	gmc
* Location ID No:	121-02564F-001.91E

*104 Highway System:	0
*26 Functional Classification:	19
*204 Federal Route Type:	S No: 02564
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	1
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	01
*20 Toll:	3
*21 Maintanance:	01
*22 Owner:	01
*31 Design Load:	6
37 Historical Significance:	5
205 Congressional District:	09
27 Year Constructed:	1974
106 Year Reconsrtucted:	0000
33 Bridge Medium:	0
34 Skew:	20
35 Structure Flared:	0
38 Navigation Control:	N
213 Special Steel Design:	0
267 Type of Paint:	5
*42 Type of Service On:	1
Type of Service Under:	1
214 Movable Bridge:	0
203 Type Bridge:	O
259 Pile Encasement	3
*43 Structure Type Main:	4 02
45 No.Spans Main:	004
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	0 Vert: 0
111 pier Protection	0
107 Deck Structure Type:	1
108 Wearing Structure Type:	1
Membrane Type:	0
Deck Protection:	8

Signs & Attachments

225 Expansion Joint Type:	15
242 Deck Drains:	0
243 Parapet Location:	3
Height:	2
Width:	1
238 Curb Height:	0
Curb Material:	0
239 Handrail	77
*240 Medium Barrier Rail:	0
241 Bridge Median Height:	0
* Bridge Median Width:	0
230 Guardrail Loc. Dir. Rear:	3
Fwrd:	3
Oppo. Dir. Rear:	0
Oppo. Fwrd:	0
244 Aproach Slab	3
224 Retaining Wall:	0
233Posted Speed Limit:	45
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	0
237 Utilities Gas:	23
Water:	00
Electric:	00
Telephone:	22
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

Bridge Inventory Data Listing

Structure ID:121-0285-0

Programming Data

201 Project No:	APD-056-1 (15)
202 Plans Available:	4
249 Prop Proj No:	000000000000000000000000
250 Approval Status:	0000
251 PI Number:	0000000
252 Contract Date:	02/01/1901
260 Seismic No.	00000
75 Type Work:	00 0
94 Bridge Imp. Cost:	$1,188
95 Roadway Imp. Cost:	119
96 Total Imp Cost:	1782
76 Imp Length:	000000
97 Imp Year:	2013
114Furure ADT:	010905 Year:2030

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000000
113 Scour Critical	N
216Water Depth:	00.0 Br.Height:00.0
222Slope Protection:	4
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	000
Type:	0
No. Barrels:	0
* Width:	0.00 Height:0.00
* Length:	0 Apron:0
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	121-02564F-001.91E

Measurements:

*29ADT	007270 Year:2008
109%Trucks:	1
* 28 Lanes On:	02 Under:04
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0094
* 49 Structure Length:	304
51 Br. Rwdy. Width	32.00
52 Deck Width:	34.40
* 47 Tot. Horiz. Cl:	32
50 Curb / Sidewalk Width	0.00 / 0.00
32 Approach Rdwy. Width	020
*229 Shoulder Width:	
Rear Lt:	8.00 Type:8 Rt:8.00
Fwd. Lt:	8.00 Type:8 Rt:8.00
Permanent Width:	
Rear:	20.00 Type:8
	20.00 Type:2
Intersaction Rear:	0 Fwd: 0
36Safety Features Br. Rail:	1
Transition:	2
App. G. Rail:	2
App. Rail End:	2
53 Minimum Cl. Over:	99' 99 "
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir::	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	H 25 25
56 Lateral Undercl. Lt:	5.70
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main	7.50
Deck Thick Approach:	0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup:2001Sub:0000

65 Inventory Rating Mathod:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 23
64 Operating Type:	2 Rating: 23
231Calculated Loads:	
H-Modified:	21 0
HS-Modified:	30 0
Type 3:	31 0
Type 3s2:	34 0
Timber:	33 0
Piggyback:	00 0
261 H Inventory Rating:	26
262 H Operating Rating	43
67 Structural Evaluation:	5
58 Deck Condition:	6
59 Superstructure Condition:	7
* 227 Collision Damage:	1
60A Substructure Condition:	7
60B Scour Condition:	N
60C Underwater Condition	N
71 Waterway Adequacy:	N
61 Channel Protection Cond.:	N
68 Deck Geometry:	4
69 UnderClr. Horz/Vert:	5
72 Appr. Alignment:	8
62 Culvert:	N

Posting Data

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

Processed Date:8/21/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:121-0284-0 **Fulton** **SUFF. RATING:** 47.20

Location & Geography

Structure ID:	121-0284-0
200 Bridge Information:	06
*6A Feature Int:	CAMP CREEK TRIB
*6B Critical Bridge:	0
*7A Route No Carried:	CR00041
*7B Facility Carried:	McGINNIS FERRY RD
9 Location:	3.2 MI NE OF ALPHARETTA
2 Dot District:	7
207 Year Photo:	2012
*91 Inspection Frequency:	24 Date: 08/21/2012
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
* 4 Place Code:	00000
*5 Inventory Route(O/U):	1
Type:	5
Designation:	1
Number:	02564
Direction:	0
*16 Latitude:	34 06.2770 HMMS Prefix:0
*17 Longtitude:	84 -15.0650 HMMS Suffix:0 MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1212004100
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	001.49
*208 Inspection Area:	7 Initials: EFP
Engineer's Initials:	gmc
* Location ID No:	121-02564F-001.53E

*104 Highway System:	0
*26 Functional Classification:	19
*204 Federal Route Type:	S No: 02564
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	1
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	02
*20 Toll:	3
*21 Maintanance:	04
*22 Owner:	04
*31 Design Load:	2
37 Historical Significance:	5
205 Congressional District:	06
27 Year Constructed:	1954
106 Year Reconsrtucted:	0000
33 Bridge Medium:	0
34 Skew:	00
35 Structure Flared:	0
38 Navigation Control:	0
213 Special Steel Design:	0
267 Type of Paint:	3
*42 Type of Service On:	1
Type of Service Under:	5
214 Movable Bridge:	0
203 Type Bridge:	G
259 Pile Encasement	1
*43 Structure Type Main:	1 01
45 No.Spans Main:	002
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	0 Vert: 0
111 pier Protection	0
107 Deck Structure Type:	2
108 Wearing Structure Type:	6
Membrane Type:	1
Deck Protection:	0

Signs & Attachments

225 Expansion Joint Type:	02
242 Deck Drains:	1
243 Parapet Location:	0
Height:	0
Width:	0
238 Curb Height:	1
Curb Material:	1
239 Handrail	2 2
*240 Medium Barrier Rail:	0
241 Bridge Median Height:	0
* Bridge Median Width:	0
230 Guardrail Loc. Dir. Rear:	0
Fwrd:	0
Oppo. Dir. Rear:	0
Oppo. Fwrd:	0
244 Aproach Slab	0
224 Retaining Wall:	0
233Posted Speed Limit:	45
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	1
237 Utilities Gas:	00
Water:	00
Electric:	00
Telephone:	32
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

Bridge Inventory Data Listing

Structure ID:121-0284-0

Programming Data

201 Project No:	COUNTY DESIGN
202 Plans Available:	1
249 Prop Proj No:	000000000000000000000000
250 Approval Status:	0000
251 PI Number:	0000000
252 Contract Date:	02/01/1901
260 Seismic No:	00000
75 Type Work:	31 1
94 Bridge Imp: Cost:	$234
95 Roadway Imp. Cost:	23
96 Total Imp Cost:	352
76 Imp Length:	001380
97 Imp Year:	2013
114Furure ADT:	000150 Year:2031

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000000
113 Scour Critical	U
216Water Depth:	7.8 Br.Height:4.8
222Slope Protection:	6
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	000
Type:	0
No. Barrels:	0
* Width:	0.00 Height:0.00
* Length:	0 Apron:0
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	121-02564F-001.53E

Measurements:

*29ADT	001500 Year:2011
109%Trucks:	1
* 28 Lanes On:	02 Under:00
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0030
* 49 Structure Length:	60
51 Br. Rwdy. Width	22.80
52 Deck Width:	24.20
* 47 Tot. Horiz. Cl:	23
50 Curb / Sidewalk Width	0.70 / 0.70
32 Approach Rdwy. Width	020
*229 Shoulder Width:	
Rear Lt:	6.00 Type:8 Rt:6.00
Fwd. Lt:	6.00 Type:8 Rt:6.00
Permanent Width:	
Rear:	20.00 Type:8
	20.00 Type:2
Intersaction Rear:	1 Fwd: 0
36Safety Features Br. Rail:	3
Transition:	0
App. G. Rail:	0
App. Rail End:	0
53 Minimum Cl. Over:	99' 99 "
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir::	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	N 0 0
56 Lateral Undercl. Lt:	0.00
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main Deck Thick Approach:	4.00 0.00
246 Overlay Thickness:	3.00
212 Year Last Painted:	Sup:0000Sub:2003

65 Inventory Rating Mathod:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 18
64 Operating Type:	2 Rating: 18
231Calculated Loads:	
H-Modified:	17 1
HS-Modified:	19 1
Type 3:	17 1
Type 3s2:	28 1
Timber:	23 1
Piggyback:	00 0
261 H Inventory Rating:	14
262 H Operating Rating	24
67 Structural Evaluation:	4
58 Deck Condition:	6
59 Superstructure Condition:	5
* 227 Collision Damage:	0
60A Substructure Condition:	6
60B Scour Condition:	6
60C Underwater Condition	N
71 Waterway Adequacy:	9
61 Channel Protection Cond.:	7
68 Deck Geometry:	3
69 UnderClr. Horz/Vert:	N
72 Appr. Alignment:	7
62 Culvert:	N

Posting Data

70 Bridge Posting Required	4
41 Struct Open, Posted, CL:	B
* 103 Temporary Structure:	0
232 Posted Loads	
H-Modified:	19
HS-Modified:	00
Type 3:	19
Type 3s2:	00
Timber:	24
Piggyback	00
253 Notification Date:	11/23/2012
258 Fed Notify Date:	11/23/2013 12:00:00

Processed Date:8/21/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:121-0131-0 **Fulton** **SUFF. RATING:** 86.36

Location & Geography

Structure ID:	121-0131-0
200 Bridge Information:	07
*6A Feature Int:	CAMP CREEK
*6B Critical Bridge:	0
*7A Route No Carried:	SR00400
*7B Facility Carried:	US 19 / SR 400
9 Location:	IN NORTH ALPHARETTA
2 Dot District:	7
207 Year Photo:	2012
*91 Inspection Frequency:	24 Date: 10/23/2012
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
*4 Place Code:	01696
*5 Inventory Route(O/U):	1
Type:	2
Designation:	1
Number:	00019
Direction:	0
*16 Latitude:	34 05.9040 HMMS Prefix:SR
*17 Longtitude:	84 -14.9850 HMMS Suffix:00 MP:21.90
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1211040000
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	021.90
*208 Inspection Area:	7 Initials: EFP
Engineer's Initials:	RES
* Location ID No:	121-00400D-021.90N

*104 Highway System:	1
*26 Functional Classification:	12
*204 Federal Route Type:	F No: 00561
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	0
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	02
*20 Toll:	3
*21 Maintanance:	01
*22 Owner:	01
*31 Design Load:	6
37 Historical Significance:	5
205 Congressional District:	06
27 Year Constructed:	1975
106 Year Reconsrtucted:	0000
33 Bridge Medium:	3
34 Skew:	20
35 Structure Flared:	0
38 Navigation Control:	0
213 Special Steel Design:	0
267 Type of Paint:	0
*42 Type of Service On:	1
Type of Service Under:	5
214 Movable Bridge:	0
203 Type Bridge:	Q
259 Pile Encasement	3
*43 Structure Type Main:	1 19
45 No.Spans Main:	002
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	0 Vert: 0
111 pier Protection	0
107 Deck Structure Type:	N
108 Wearing Structure Type:	N
Membrane Type:	N
Deck Protection:	N

Signs & Attachments

225 Expansion Joint Type:	00
242 Deck Drains:	0
243 Parapet Location:	0
Height:	0
Width:	0
238 Curb Height:	0
Curb Material:	0
239 Handrail	0 0
*240 Medium Barrier Rail:	1
241 Bridge Median Height:	5
* Bridge Median Width:	3
230 Guardrail Loc. Dir. Rear:	0
Fwrd:	0
Oppo. Dir. Rear:	4
Oppo. Fwrd:	4
244 Aproach Slab	0
224 Retaining Wall:	0
233Posted Speed Limit:	65
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	0
237 Utilities Gas:	00
Water:	00
Electric:	00
Telephone:	00
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

Bridge Inventory Data Listing

Structure ID:121-0131-0

Programming Data

201 Project No:	APD-056-1 (15)
202 Plans Available:	1
249 Prop Proj No:	000000000000000000000000
250 Approval Status:	0000
251 PI Number:	0000000
252 Contract Date:	02/01/1901
260 Seismic No:	00000
75 Type Work:	00 0
94 Bridge Imp: Cost:	$227
95 Roadway Imp. Cost:	23
96 Total Imp Cost:	340
76 Imp Length:	000000
97 Imp Year:	2013
114Furure ADT:	136350 Year:2031

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000200
113 Scour Critical	8
216Water Depth:	02.2 Br.Height:09.6
222Slope Protection:	0
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	14
Type:	1
No. Barrels:	2
* Width:	10.00 Height:10.00
* Length:	256 Apron:1
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	121-00400D-021.90N

Measurements:

*29ADT	090900 Year:2011
109%Trucks:	0
* 28 Lanes On:	08 Under:00
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0011
* 49 Structure Length:	22
51 Br. Rwdy. Width	0.00
52 Deck Width:	0.00
* 47 Tot. Horiz. Cl:	70
50 Curb / Sidewalk Width	0.00 / 0.00
32 Approach Rdwy. Width	132
*229 Shoulder Width:	
Rear Lt:	6.00 Type:1 Rt:12.00
Fwd. Lt:	6.00 Type:1 Rt:12.00
Permanent Width:	
Rear:	48.00 Type:1
	48.00 Type:1
Intersaction Rear:	0 Fwd: 0
36Safety Features Br. Rail:	1
Transition:	1
App. G. Rail:	1
App. Rail End:	1
53 Minimum Cl. Over:	99' 99 "
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir::	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	N 0 0
56 Lateral Undercl. Lt:	0.00
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main	0.00
Deck Thick Approach:	0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup:0000Sub:0000

65 Inventory Rating Mathod:	0
63 Operating Rating Method:	0
66 Inventory Type:	2 Rating: 99
64 Operating Type:	2 Rating: 99
231Calculated Loads:	
H-Modified:	00 0
HS-Modified:	00 0
Type 3:	00 0
Type 3s2:	00 0
Timber:	00 0
Piggyback:	00 0
261 H Inventory Rating:	20
262 H Operating Rating	34
67 Structural Evaluation:	7
58 Deck Condition:	N
59 Superstructure Condition:	N
* 227 Collision Damage:	0
60A Substructure Condition:	N
60B Scour Condition:	6
60C Underwater Condition	N
71 Waterway Adequacy:	9
61 Channel Protection Cond.:	7
68 Deck Geometry:	N
69 UnderClr. Horz/Vert:	N
72 Appr. Alignment:	8
62 Culvert:	7

Posting Data

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

Processed Date:8/21/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:117-0042-0 **Forsyth** **SUFF. RATING:** 70.36

Location & Geography

Structure ID:	117-0042-0
200 Bridge Information:	06
*6A Feature Int:	SR 400 (US 19) & RAMP
*6B Critical Bridge:	0
*7A Route No Carried:	CR00458
*7B Facility Carried:	MCFARLAND ROAD
9 Location:	8 MI SW OF CUMMING
2 Dot District:	1
207 Year Photo:	2011
*91 Inspection Frequency:	24 Date: 08/16/2011
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
* 4 Place Code:	00000
*5 Inventory Route(O/U):	1
Type:	4
Designation:	1
Number:	02883
Direction:	0
*16 Latitude:	34 06.8745 HMMS Prefix:00
*17 Longtitude:	84 -13.3792 HMMS Suffix:000 MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1172045800
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	002.43
*208 Inspection Area:	1 Initials: EFP
Engineer's Initials:	eep
* Location ID No:	117-02883F-000.95N

*104 Highway System:	0
*26 Functional Classification:	16
*204 Federal Route Type:	S No: 02883
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	1
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	01
*20 Toll:	3
*21 Maintanance:	01
*22 Owner:	01
*31 Design Load:	6
37 Historical Significance:	5
205 Congressional District:	09
27 Year Constructed:	1973
106 Year Reconsrtucted:	2004
33 Bridge Medium:	2
34 Skew:	25
35 Structure Flared:	0
38 Navigation Control:	N
213 Special Steel Design:	0
267 Type of Paint:	5
*42 Type of Service On:	5
Type of Service Under:	1
214 Movable Bridge:	0
203 Type Bridge:	J
259 Pile Encasement	3
*43 Structure Type Main:	4 02
45 No.Spans Main:	004
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	1 Vert: 1
111 pier Protection	0
107 Deck Structure Type:	1
108 Wearing Structure Type:	1
Membrane Type:	0
Deck Protection:	8

Signs & Attachments

225 Expansion Joint Type:	02
242 Deck Drains:	0
243 Parapet Location:	3
Height:	3
Width:	1
238 Curb Height:	1
Curb Material:	1
239 Handrail	1 1
*240 Medium Barrier Rail:	0
241 Bridge Median Height:	1
* Bridge Median Width:	4
230 Guardrail Loc. Dir. Rear:	5
Fwrd:	5
Oppo. Dir. Rear:	5
Oppo. Fwrd:	5
244 Aproach Slab	3
224 Retaining Wall:	0
233Posted Speed Limit:	55
236 Warning Sign:	0.00
234 Delineator:	1.00
235 Hazzard Boards:	0
237 Utilities Gas:	21
Water:	21
Electric:	00
Telephone:	22
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

Bridge Inventory Data Listing

Structure ID:117-0042-0

Programming Data

201 Project No:	APD-056-1 (15)
202 Plans Available:	4
249 Prop Proj No:	STP-2883 (1)
250 Approval Status:	0000
251 PI Number:	141870-
252 Contract Date:	07/25/2003
260 Seismic No:	00000
75 Type Work:	00 1
94 Bridge Imp: Cost:	$3,193
95 Roadway Imp. Cost:	319
96 Total Imp Cost:	4790
76 Imp Length:	000000
97 Imp Year:	2013
114Furure ADT:	032925 Year:2030

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000000
113 Scour Critical	N
216Water Depth:	00.0 Br.Height:00.0
222Slope Protection:	4
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	000
Type:	0
No. Barrels:	0
* Width:	0.00 Height:0.00
* Length:	0 Apron:0
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	117-02883F-000.95N

Measurements:

*29ADT	021950 Year:2010
109%Trucks:	0
* 28 Lanes On:	08 Under:05
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0097
* 49 Structure Length:	310
51 Br. Rwdy. Width	102.50
52 Deck Width:	118.10
* 47 Tot. Horiz. Cl:	100
50 Curb / Sidewalk Width	5.80 / 5.80
32 Approach Rdwy. Width	102
*229 Shoulder Width:	
Rear Lt:	2.00 Type:2 Rt:2.00
Fwd. Lt:	2.00 Type:2 Rt:2.00
Permanent Width:	
Rear:	47.20 Type:2
	47.20 Type:2
Intersaction Rear:	1 Fwd: 1
36Safety Features Br. Rail:	1
Transition:	1
App. G. Rail:	1
App. Rail End:	1
53 Minimum Cl. Over:	99' 99 "
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir.:	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	H 0 0
56 Lateral Undercl. Lt:	0.00
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main	8.00
Deck Thick Approach:	0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup:2004Sub:0000

65 Inventory Rating Mathod:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 18
64 Operating Type:	2 Rating: 18
231Calculated Loads:	
H-Modified:	21 0
HS-Modified:	24 0
Type 3:	24 0
Type 3s2:	26 0
Timber:	25 0
Piggyback:	00 0
261 H Inventory Rating:	23
262 H Operating Rating	39
67 Structural Evaluation:	4
58 Deck Condition:	7
59 Superstructure Condition:	6
* 227 Collision Damage:	0
60A Substructure Condition:	7
60B Scour Condition:	N
60C Underwater Condition	N
71 Waterway Adequacy:	N
61 Channel Protection Cond.:	N
68 Deck Geometry:	6
69 UnderClr. Horz/Vert:	2
72 Appr. Alignment:	6
62 Culvert:	N

Posting Data

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

Bridge Inventory Data Listing

Structure ID:117-0031-0

Programming Data

201 Project No:	APD-56-1 (15)
202 Plans Available:	4
249 Prop Proj No:	000000000000000000000000
250 Approval Status:	0000
251 PI Number:	0000000
252 Contract Date:	02/01/1901
260 Seismic No:	00000
75 Type Work:	00 0
94 Bridge Imp. Cost:	$1,368
95 Roadway Imp. Cost:	137
96 Total Imp Cost:	2051
76 Imp Length:	000000
97 Imp Year:	2013
114Furure ADT:	003303 Year:2030

Hydralic Data

215Waterway Data:	
High Water Elev:	0000.0 Year:1900
Flood Elev:	0000.0 Freq:00
Avg Streambed Elev:	0000.0
Drainage Area:	00000
Area of Opening:	000000
113 Scour Critical	N
216Water Depth:	00.0 Br.Height:00.0
222Slope Protection:	4
221Slope Protection	0 Fwd:0
219Fender System	0
220Dolphin:	0
223Current Cover:	000
Type.	0
No. Barrels:	0
* Width:	0.00 Height:0.00
* Length:	0 Apron:0
265 U/W Insp. Area	0 Diver:ZZZ
Location ID No:	117-00456X-006.87S

Measurements:

*29ADT	002202 Year:2010
109%Trucks:	0
* 28 Lanes On:	02 Under:04
210 No. Tracks On:	00 Under:00
* 48 Max. Span Length	0110
* 49 Structure Length:	350
51 Br. Rwdy. Width	31.80
52 Deck Width:	34.00
* 47 Tot. Horiz. Cl:	32
50 Curb / Sidewalk Width	0.00 / 0.00
32 Approach Rdwy. Width	020
*229 Shoulder Width:	
Rear Lt:	6.50 Type:8 Rt:4.00
Fwd. Lt:	6.50 Type:8 Rt:7.60
Permanent Width:	
Rear:	20.40 Type:8
	20.30 Type:2
Intersaction Rear:	0 Fwd: 1
36Safety Features Br. Rail:	1
Transition:	2
App. G. Rail:	2
App. Rail End:	2
53 Minimum Cl. Over:	99' 99 "
Under:	
*228 Minimum Vertical Cl	
Act. Odm Dir.:	99' 99"
Oppo. Dir:	99' 99"
Posted Odm. Dir:	00' 00"
Oppo. Dir:	00' 00"
55 Lateral Undercl. Rt:	H 31 31
56 Lateral Undercl. Lt:	18.20
*10 Max Min Vert Cl:	99' 99" Dir:0
39 Nav Vert Cl:	000 Horiz:0000
116 Nav Vert Cl Closed:	000
245 Deck Thickness Main Deck Thick Approach:	7.00 0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup:1995Sub:0000

65 Inventory Rating Mathod:	1
63 Operating Rating Method:	1
66 Inventory Type:	2 Rating: 18
64 Operating Type:	2 Rating: 18
231Calculated Loads:	
H-Modified:	21 0
HS-Modified:	22 0
Type 3:	21 0
Type 3s2:	25 0
Timber:	23 0
Piggyback:	28 0
261 H Inventory Rating:	20
262 H Operating Rating	34
67 Structural Evaluation:	4
58 Deck Condition:	6
59 Superstructure Condition:	6
* 227 Collision Damage:	0
60A Substructure Condition:	6
60B Scour Condition:	N
60C Underwater Condition	N
71 Waterway Adequacy:	N
61 Channel Protection Cond.:	N
68 Deck Geometry:	4
69 UnderClr. Horz/Vert:	9
72 Appr. Alignment:	7
62 Culvert:	N

Posting Data

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

Processed Date:8/21/2013

Parameters: Bridge Serial Num

Bridge Inventory Data Listing

Structure ID:117-0031-0 **Forsyth** **SUFF. RATING:** 71.70

Location & Geography

Structure ID:	117-0031-0
200 Brdge Information:	06
*6A Feature Int:	SR 400 (US 19)
*6B Critical Bridge:	0
*7A Route No Carried:	CR00456
*7B Facility Carried:	UNION HILL ROAD
9 Location:	.65 MI N FULTON CO LN
2 Dot District:	1
207 Year Photo:	2011
*91 Inspection Frequency:	24 Date: 08/16/2011
92A Fract Crit Insp Freq:	0 Date: 02/01/1901
92B Underwater Insp Freq:	0 Date: 02/01/1901
92C Other Spc. Insp Freq:	0 Date: 02/01/1901
* 4 Place Code:	00000
*5 Inventory Route(O/U):	1
Type:	4
Designation:	1
Number:	00456
Direction:	0
*16 Latitude:	34 06.4813 HMMS Prefix:00
*17 Longtitude:	84 -14.2082 HMMS Suffix:000 MP:0.00
98 Border Bridge:	000%Shared:00
99 ID Number:	000000000000000
*100 STRAHNET:	0
12 Base Highway Network:	1
13A LRS Inventory Route:	1172045600
13B Sub Inventory Route:	0
101 parellel Structure:	N
*102 Direction of Traffic:	2
*264 Road Inventory Mile Post:	003.13
*208 Inspection Area:	1 Initials: EFP
Engineer's Initials:	eep
* Location ID No:	117-00456X-006.87S

*104 Highway System:	0
*26 Functional Classification:	19
*204 Federal Route Type:	0 No: 00000
105 Federal Lands Highway:	0
*110 Truck Route:	0
2006 School Bus Route:	1
217 Benchmark Elevation:	0000.00
218 Datum:	0
*19 Bypass Length:	03
*20 Toll:	3
*21 Maintanance:	01
*22 Owner:	01
*31 Design Load:	3
37 Historical Significance:	5
205 Congressional District:	09
27 Year Constructed:	1972
106 Year Reconsrtucted:	0000
33 Bridge Medium:	0
34 Skew:	36
35 Structure Flared:	0
38 Navigation Control:	N
213 Special Steel Design:	0
267 Type of Paint:	5
*42 Type of Service On:	1
Type of Service Under:	1
214 Movable Bridge:	0
203 Type Bridge:	J
259 Pile Encasement	3
*43 Structure Type Main:	4 02
45 No.Spans Main:	004
44 Structure Type Appr:	0 00
46 No Spans Appr:	0000
226 Bridge Curve Horz	0 Vert: 0
111 pier Protection	0
107 Deck Structure Type:	1
108 Wearing Structure Type:	1
Membrane Type:	0
Deck Protection:	8

Signs & Attachments

225 Expansion Joint Type:	03
242 Deck Drains:	0
243 Parapet Location:	3
Height:	2
Width:	1
238 Curb Height:	0
Curb Material:	0
239 Handrail	77
*240 Medium Barrier Rail:	0
241 Bridge Median Height:	0
* Bridge Median Width:	0
230 Guardrail Loc. Dir. Rear:	3
Fwrd:	3
Oppo. Dir. Rear:	0
Oppo. Fwrd:	0
244 Aproach Slab	3
224 Retaining Wall:	0
233Posted Speed Limit:	45
236 Warning Sign:	0.00
234 Delineator:	0.00
235 Hazzard Boards:	0
237 Utilities Gas:	21
Water:	00
Electric:	00
Telephone:	22
Sewer:	00
247 Lighting Street:	0
Navigation:	0
Aerial:	0
*248 County Continuity No.:	00

Attachment 9
Hydrology Study for
MS4 Permit

MS4 Requirements
McGinnis Ferry Road @ SR400

The topography of the proposed project peaks near SR400 and falls to the east and west along McGinnis Ferry Road.

Blue line streams (Camp Creek and an unnamed tributary to Camp Creek) are shown on the concept plan.

Wetland areas are shown on the concept plan. After consulting the National Wetlands Maps and the Moreland Ecology Department, we determined that the undeveloped area south of Morris Road/ McGinnis Ferry Road between Bethany Bend and Deerfield Point Drive was a potential wetland. In addition, the areas around Camp Creek and its unnamed tributary were also determined to be potential wetlands. No MS4 structures will be considered in these areas.

Area 1

Morris Road/McGinnis Ferry Road from the west terminus of the project to the intersection of Morris Road and Bethany Bend

All the land in this area is either occupied by multifamily housing or was determined to be wetlands. Therefore, based on the criteria set forth by Georgia EPD and DOT, no water quality infrastructure will be constructed in this area. No water quality infrastructure is allowed in wetland areas or stream buffers and the areas occupied by the multifamily housing would exceed the cost parameters established by the department.

Area 2

Morris Road/McGinnis Ferry Road from the intersection of Morris Road and Bethany Bend to a highpoint approximately 400 feet east of Bethany Bend. This area will include the new construction on Bethany Bend.

Area 2

Pervious Area	1.65	Acres
Total Area	1.86	Acres
Impervious Area	0.21	Acres
Percent Imp. Cover	11.11%	
Rv=	0.15	
WQv=	0.027892562	acre-ft
WQv=	1215	Cubic Ft
Permanent Pool=	607.5	Cubic Ft
CPv=	3645	Cubic Ft
25-year detention	4374	Cubic Ft
Total Volume	8626.5	Cubic Ft
Length	57	ft
Width	38	ft
Depth	4	ft

Area 3

Morris Road/McGinnis Ferry Road from a highpoint approximately 400 feet east of Bethany Bend to the unnamed tributary of Camp Creek.

Area 3

Pervious Area	0.78	Acres
Total Area	0.87	Acres
Impervious Area	0.09	Acres
Percent Imp. Cover	10.53%	
Rv=	0.144736842	
WQv=	0.012626263	acre-ft
WQv=	550	Cubic Ft
Permanent Pool=	275	Cubic Ft
CPv=	1650	Cubic Ft
25-year detention	1980	Cubic Ft
Total Volume	3905	Cubic Ft
Length	39	ft
Width	26	ft
Depth	4	ft

Area 4

Morris Road/McGinnis Ferry Road from the unnamed tributary of Camp Creek to the intersection of Morris Road/McGinnis Ferry Road and Deerfield Point Drive

All the land in this area is either occupied by multifamily housing or was determined to be wetlands. Therefore, based on the criteria set forth by Georgia EPD and DOT, no water quality infrastructure will be constructed in this area. No water quality infrastructure is allowed in wetland areas or stream buffers and the areas occupied by the multifamily housing would exceed the cost parameters established by the department.

Area 5

Morris Road/McGinnis Ferry Road from the intersection of Morris Road/McGinnis Ferry Road and Deerfield Point Drive to the peak of the bridge over SR400, excluding the ramps. This area will also include the relocated Tidwell Drive.

Area 5

Pervious Area	3.51	Acres
Total Area	3.93	Acres
Impervious Area	0.41	Acres
Percent Imp. Cover	10.53%	
Rv=	0.144736842	
WQv=	0.056818182	acre-ft
WQv=	2475	Cubic Ft
Permanent Pool=	1237.5	Cubic Ft
CPv=	7425	Cubic Ft
25-year detention	8910	Cubic Ft
Total Volume	17572.5	Cubic Ft
Length	81	ft
Width	54	ft
Depth	4	ft

Area 6

Northwest quadrant of the new interchange

Area 6

Pervious Area	2.15	Acres
Total Area	5.65	Acres
Impervious Area	3.50	Acres
Percent Imp. Cover	61.97%	
Rv=	0.607701513	
WQv=	0.343333219	acre-ft
WQv=	14956	Cubic Ft
Permanent Poolv=	7478	Cubic Ft
CPv=	44868	Cubic Ft
25-year detention	53841.6	Cubic Ft
Total Volume	106187.6	Cubic Ft
Length	164	ft
Width	109	ft
Depth	6	ft

Area 7

Southwest quadrant of the new interchange

Area 7

Pervious Area	1.43	Acres
Total Area	3.21	Acres
Impervious Area	1.77	Acres
Percent Imp. Cover	55.31%	
Rv=	0.547814333	
WQv=	0.175608701	acre-ft
WQv=	7650	Cubic Ft
Permanent Poolv=	3825	Cubic Ft
CPv=	22950	Cubic Ft
25-year detention	27540	Cubic Ft
Total Volume	54315	Cubic Ft
Length	117	ft
Width	78	ft
Depth	6	ft

Area 8

Northeast and Southeast quadrants of the new interchange

Area 8

Pervious Area	3.70	Acres
Total Area	13.50	Acres
Impervious Area	9.80	Acres
Percent Imp. Cover	72.58%	
Rv=	0.703214522	
WQv=	0.949047406	acre-ft
WQv=	41341	Cubic Ft
Permanent Poolv=	20670.5	Cubic Ft
CPv=	124023	Cubic Ft
25-year detention	148827.6	Cubic Ft
Total Volume	293521.1	Cubic Ft
Length	272	ft
Width	181	ft
Depth	6	ft

Area 9

Morris Road/McGinnis Ferry Road from the eastern ramp intersection to the intersection of Morris Road/McGinnis Ferry Road and Winward Concourse

Area 9 90+00 Left

Pervious Area	1.56	Acres
Total Area	1.74	Acres
Impervious Area	0.18	Acres
Percent Imp. Cover	10.53%	
Rv=	0.144736842	
WQv=	0.025252525	acre-ft
WQv=	1100	Cubic Ft
Permanent Poolv=	550	Cubic Ft
CPv=	3300	Cubic Ft
25-year detention	3960	Cubic Ft
Total Volume	7810	Cubic Ft
Length	54	ft
Width	36	ft
Depth	4	ft

Area 10

Morris Road/McGinnis Ferry Road from the intersection of Morris Road/McGinnis Ferry Road and Winward Concourse to the eastern terminus of the project.

Area 10

Pervious Area	3.32	Acres
Total Area	3.71	Acres
Impervious Area	0.39	Acres
Percent Imp. Cover	10.53%	
Rv=	0.144736842	
WQv=	0.053661616	acre-ft
WQv=	2338	Cubic Ft
Permanent Poolv=	1169	Cubic Ft
CPv=	7014	Cubic Ft
25-year detention	8416.8	Cubic Ft
Total Volume	16599.8	Cubic Ft
Length	80	ft
Width	53	ft
Depth	4	ft

Attachment 10
Pavement Studies

Flexible Pavement Design Analysis

PI Number	0007526	**County(s)**	Forsyth (south) & Fulton (north)
Project Number	FOR081	**Design Name**	McGinnis Ferry- full depth
Project Description	SR 400 at McGinnis Ferry Road Interchange		

Traffic Data (AADTs are one-way)						**Miscellaneous Data**	
Initial Design Year	2020	**Initial AADT, VPD**	18,100	**24 Hour Truck %**	4.00	**Lanes in one direction**	2
Final Design Year	2040	**Final AADT, VPD**	21,450	**SU Truck %**	3.00	**Curb & Gutter/Barrier**	Yes
		Mean AADT, VPD	19,775	**MU Truck %**	1.00		

Design Data					
Lane Distribution Factor (%)	60.00	**Soil Support Value**	2.00	**Single Unit ESAL**	0.40
Terminal Serviceability Index	2.50	**Regional Factor**	1.80	**Multiple Unit ESAL**	1.50
		User Defined 18-KIP ESAL	0.00	**Calculated 18-KIP ESAL**	0.68
Non-Standard Value Comment					

Design Loading (Calculated 18-KIP ESAL)					
Mean AADT, VPD	**LDF (%)**	**Vehicle Type**	**Volume (%)**	**ESAL Factor**	**Daily ESAL**
19,775	60.00	Single Unit Truck	3.00	0.40	143
		Multi Unit Truck	1.00	1.50	178
				Total Daily ESALs	321
				Total Design Period ESALs	2,343,300

Proposed Flexible Full Depth Pavement Structure				
Course	**Material**	**Thickness (inches)**	**Structural Coefficient**	**Structural Value**
Course 1	12.5 mm Superpave	1.50	0.4400	0.66
Course 2	19 mm Superpave	2.00	0.4400	0.88
Course 3	25 mm Superpave	1.00	0.4400	0.44
		5.00	0.3000	1.50
Course 4	Graded Aggregate Base	12.00	0.1600	1.92

Required SN 5.54 **Proposed pavement is 2.52% Underdesigned** **Proposed SN** 5.40

Design Remarks	

Prepared By 9/3/2013 10:25 AM

Moreland Altobelli **Date**

Recommended By

Consultant Design Phase Leader **Date**

Approved By

State Pavement Engineer **Date**

Filename: C:\Documents and Settings\bpadgett\My Documents\0007526 GDOT Pavement Design Tool v2.0.xlsm

GDOT Pavement Design Tool - Version 2.0

Attachment 11
Conforming plan's network showing project

FT-322 | **SR 369 (BROWNS BRIDGE ROAD) BRIDGE REPLACEMENT**

122012- | AT CHATTAHOOCHEE RIVER/LAKE LANIER

Programmed

Jurisdiction: Forsyth County | Sponsor: GDOT | Service Type: **Roadway / Bridge Upgrade** | Analysis: Exempt from Air Quality Analysis (40 CFR 93)

Existing	Planned	Length (mi.)	Network Year
N/A	N/A	N/A	2020

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE		2017	STP - Statewide Flexible (GDOT)	$8,000	$2,000	$0,000	$0,000	**$10,000**
ROW		2015	STP - Statewide Flexible (GDOT)	$1,677,125	$419,281	$0,000	$0,000	**$2,096,406**
UTL		2018	STP - Statewide Flexible (GDOT)	$33,376	$8,344	$0,000	$0,000	**$41,720**
CST		2018	STP - Statewide Flexible (GDOT)	$11,743,124	$2,935,781	$0,000	$0,000	**$14,678,905**
				$13,461,625	**$3,365,406**	**$0,000**	**$0,000**	**$16,827,031**

FT-324 | **SR 400 - NEW INTERCHANGE**

0007526 | AT MCGINNIS FERRY ROAD

Programmed

Jurisdiction: Forsyth County | Sponsor: GDOT | Service Type: **Roadway / Interchange Capacity** | Analysis: In the Region's Air Quality Conformity Analysis

Existing	Planned	Length (mi.)	Network Year
N/A	N/A	N/A	2030

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	2012	Federal Earmark Funding	~~$2,549,688~~	~~$0,000~~	~~$637,422~~	~~$0,000~~	**$3,187,110**
ROW		2017	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$11,767,000	$0,000	**$11,767,000**
UTL		LR 2020-2030	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$2,340,000	$0,000	**$2,340,000**
CST		LR 2020-2030	Local Jurisdiction/Municipality Funds	$0,000	$0,000	$22,423,881	$0,000	**$22,423,881**
				$2,549,688	**$0,000**	**$37,168,303**	**$0,000**	**$39,717,991**

FT-328 | **TRAFFIC SIGNAL CABINET UPGRADES AT 15 LOCATIONS**

0012639

Programmed

Jurisdiction: Forsyth County | Sponsor: Forsyth County | Service Type: **Roadway / Operations & Safety** | Analysis: Exempt from Air Quality Analysis (40 CFR 93)

Existing	Planned	Length (mi.)	Network Year
N/A	N/A	N/A	2020

	Status	Year	Fund Type	Federal	State	Local	Bonds	Total
PE	AUTH	2014	STP - Urban (>200K) (ARC)	~~$16,000~~	~~$0,000~~	~~$4,000~~	~~$0,000~~	**$20,000**
CST		2015	STP - Urban (>200K) (ARC)	$304,000	$0,000	$76,000	$0,000	**$380,000**
				$320,000	**$0,000**	**$80,000**	**$0,000**	**$400,000**

Attachment 12
Minutes of Concept Team Meeting

Minutes of Concept Team Meeting

CSHPP-0007-00 (526), P.I. No. 0007526
Forsyth and Fulton Counties

Georgia 400 at McGinnis Ferry Road Interchange
With Auxiliary Lanes on Georgia 400

December 4, 2013 at 10:00 A.M.
Conference Room at District 1 Gainesville Office

ATTENDEES	ORGANIZATION	PHONE	EMAIL
Otis Clark	GDOT Project Manager	404-631-1577	oclark@dot.ga.gov
Brent Cook	GDOT Asst. District Engineer	770-532-5522	bcook@dot.ga.gov
Ken Werho	GDOT Traffic Ops. TMC	404-635-2859	kwerho@dot.ga.gov
Todd Wood	GDOT Construction GO	706-567-8691	twood@dot.ga.gov
Kevin York	GDOT Right of Way D1	770-718-5043	kevyork@dot.ga.gov
David Olson	GDOT Traffic Ops D1	770-532-5533	dolson@dot.ga.gov
Joel Cantoran	GDOT Engineering Services	678-209-9603	jcantoran@dot.ga.gov
Leisa Jones	GDOT Utilities	404-631-1358	leijones@dot.ga.gov
Shonnell Gibbs	GDOT SUE	404-631-1356	sgibbs@dot.ga.gov
Katrina Lawrence	GDOT Planning	404-631-1646	klawrence@dot.ga.gov
Kaycee Mertz	GDOT Planning	404-347-0245	kmertz@dot.ga.gov
Eugene Utsalo	GDOT OMAT	404-608-4775	eutsalo@dot.ga.gov
Harold D. Mull	GDOT District Utilities	770-718-5004	hmull@dot.ga.gov
Doug Fadool	GDOT District Utilities	770-531-4015	dfadool@dot.ga.gov
John Cunard	Forsyth County	770-886-2875	jvcunard@forsythco.com
Tim Allen	Forsyth County	770-886-2786	tlallen@forsythco.com
Karl Ledford	Georgia Transmission Co.	770-270-7990	karl.ledford@gatrans.com
Tim Ashton	Georgia Transmission Co.	770-270-7868	tim.ashton@gatrans.com
Kris Stephens	Georgia Power	706-357-6670	x2ksteph@southernco.com
Mike Jobe	AT & T	770-429-7916	mike.jobe@att.com
Tim Samples	Sawnee EMC	678-455-1349	tim.samples@sawnee.com
Jason McCook	MAAI	770-781-5507	jmccook@maai.net
LN Manchi	MAAI	404-931-3792	lmanchi@maai.net
Ralph Ramsdell	MAAI	770-263-5945	rramsdell@maai.net
Karla Poshedly	MAAI	770-263-5945	kposhedly@maai.net

Mr. Otis Clark, GDOT project manager, opened the meeting welcoming the county representatives and calling for all attendees to introduce themselves and state their affiliation.

Mr. Clark identified the project and stated its description. He noted that right-of-way is anticipated to be scheduled for 2017 and construction in 2019. He discussed that the project included the replacement of two bridges and a bridge culvert. He said that the project is anticipated to be a Categorical Exclusion according to the concept report but the final decision on the type of document would be made during the environmental phase of the project. There are a number of utilities that would be relocated and Neil Kantner with the District 1 Utilities Office would be in charge of the coordination of the utility relocation process. Mr. Clark stated that the project would require a design variance for the median spacing between the GA 400 northbound ramp and the Windward Concourse intersection along McGinnis Ferry Road. He

noted other projects in the area and stated that P.I. No. 0007843 needs to be added to the concept report.

Mr. Clark called on Moreland Altobelli Associates, Inc representatives to present the concept layout and discuss the project justification, typical sections, costs, environmental data and alternatives considered.

Ms. Karla Poshedly presented the concept layout, stating the need and purpose, project justification, typical section and other features of the project.

Mr. LN Manchi discussed environmental data. He stated that preliminary coordination with FHWA was done with regards to their involvement in the project. He said that MA has received correspondence stating that because the project is a state route and under the Appalachian Regional Commission jurisdiction that FHWA would not be reviewing the environmental documents. The review of the documents would be with GDOT OES.

Mr. Manchi stated that based on the preliminary environmental screenings, the project would only have some wetland impacts near Camp Creek that would require mitigation. Also, because there is already a bridge over Georgia 400, he believes there is a good case to be made that a Categorical Exclusion document would address all environmental impacts of the project.

Ms. Poshedly then discussed the costs of the project, the typical sections and the alternatives considered.

Mr. Otis Clark then called on attendees of the meeting to comment on the project. He first called on Forsyth County representatives.

Mr. John Cunard, Forsyth County Engineer, stated that he had no comments with regard to the specifics of the project but would like to add the County's support for this project.

Mr. Tim Allen, Forsyth County Traffic Engineer stated that he had no further comments on the project.

Mr. Ken Werho, GDOT Traffic Operations – TMC office, commented that the design vehicle used on this project should be WB 67. He also commented that there should be an additional four feet of right-of-way beyond the multi-use path along McGinnis Ferry Road. Mr. Werho also indicated that there is already existing ATMS on Georgia 400 that will require removal and replacement. He said to contact his office and he would be able provide MA with the information. The cost of removal and replacement of this equipment will need to be added to the cost of the project.

Ms. Kaycee Mertz, GDOT Planning, stated that she had no comments on the project.

Mr. Brent Cook, GDOT Assistant District Engineer, asked if MA had considered a compressed Diverging Diamond Interchange (DDI) at this location. He stated that because the project has a heavy southbound left-turn traffic volume, a DDI may work better than a traditional interchange.

Also, a DDI may help avoid a design variance. Mr. Manchi said that DDIs are usually used where there is an existing interchange because of the cost benefits. Ms. Poshedly said that the design variance would still be needed because the DDI crossovers are signalized and the DDI crossover spacing intersections would not be able to be compressed enough to avoid the design variance. Ms. Poshedly said that the DDI design would be traffic evaluated and documented in the concept report as an alternative considered.

Mr. Doug Fadool, GDOT District 1 Utilities Engineer, commented that his office will need a copy of the signed PFA that includes the responsibilities of utilities relocation.

Ms. Leisa Jones, GDOT Utilities commented that a SUE, Level B would be needed for this project.

Mr. Eugene Utsalo, GDOT OMAT, commented that the pavement design for McGinnis Ferry Road should be based on traffic volumes. He commented that the pavement design for the auxiliary lanes on GA 400 should match in kind. Also, the 12 mm superpave asphalt should be replaced with modified polymer asphalt. Lastly, he commented to remove the 25 mm interlaid on the ramp typical and replace it with 19 mm interlaid.

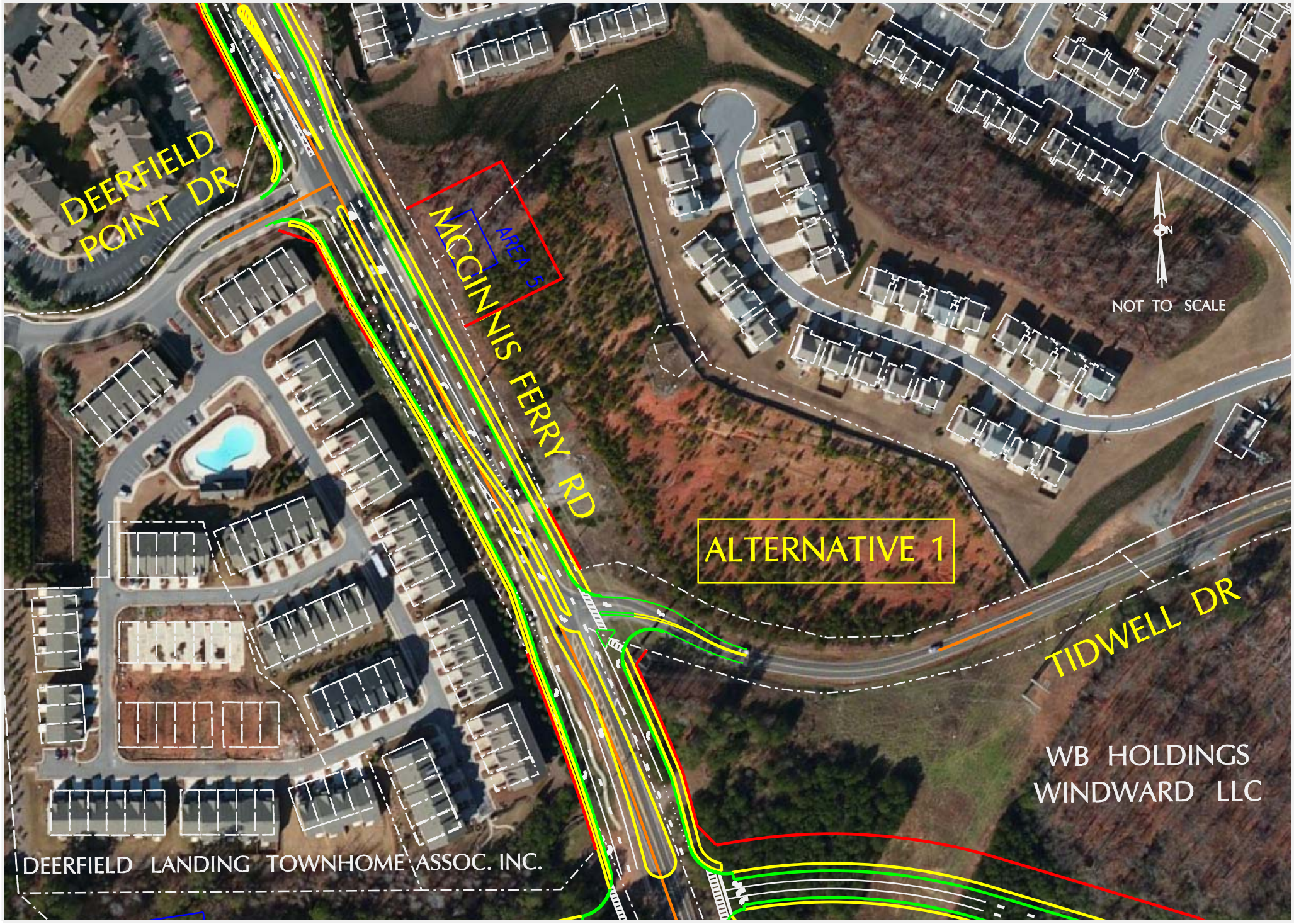
Mr. Otis Clark stated to send additional comments to him or Brent Cook within the next three weeks.

Mr. Ken Werho asked if the auxiliary lanes would be barrier separated on GA 400. Ms. Poshedly said that the auxiliary lanes would be built alongside the outer general purpose lane. Barrier separated auxiliary lanes are collector-distributor roads and would require more right-of-way and would not facilitate traffic well between the interchanges.

Mr. Brent Cook commented that the GDOT district numbers on the cover page of the concept report should be corrected to show Districts 1 and 7.

With no further comments, Mr. Otis Clark adjourned the meeting.

Attachment 13
Alternatives Considered for Tidwell Drive Access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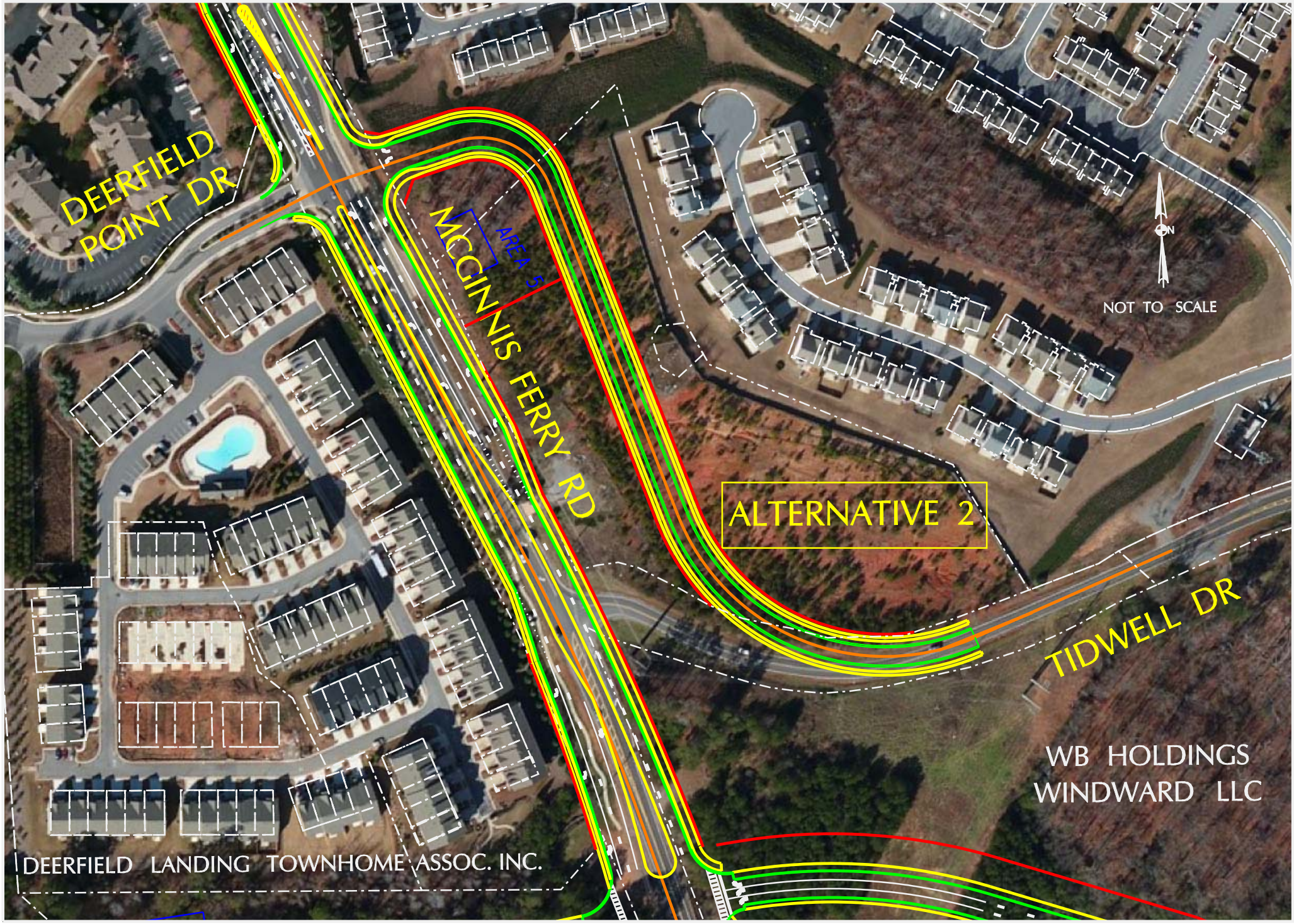
ALTERNATIVE 1
TIDWELL DR
NOT TO SCALE
WB HOLDINGS
WINDWARD LLC
DEERFIELD LANDING TOWNHOME ASSOC. INC.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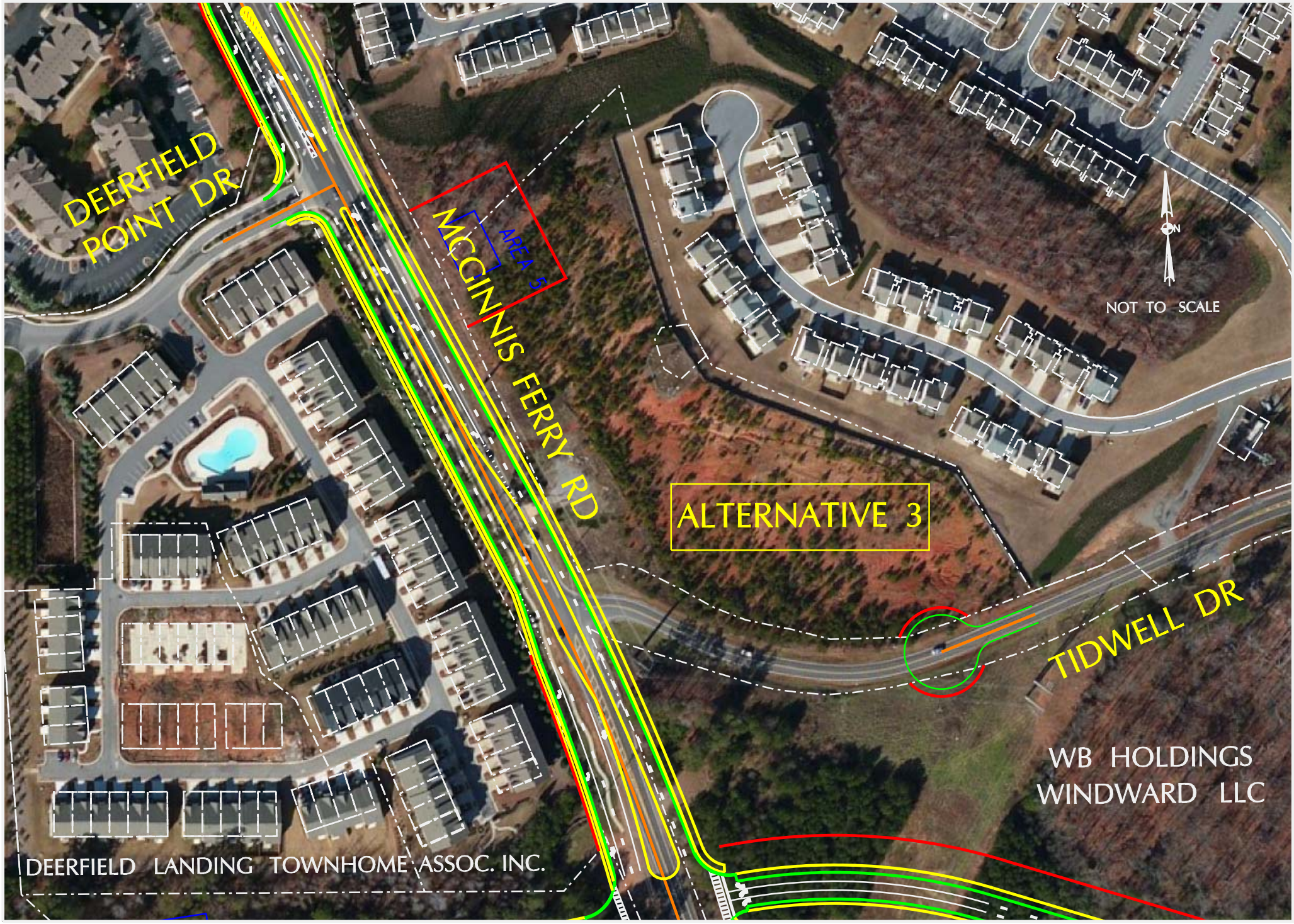
AREA 5
ALTERNATIVE 2
TIDWELL DR
NOT TO SCALE
WB HOLDINGS
WINDWARD LLC
DEERFIELD LANDING TOWNHOME ASSOC. INC.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AREA 3
MCGINNIS FERRY RD
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ALTERNATIVE 3
TIDWELL DR
WB HOLDINGS
WINDWARD LLC
DEERFIELD LANDING TOWNHOME ASSOC. INC.