

Interchange Justification Report SR 400 at McGinnis Ferry Road

***Georgia Department of Transportation,
Forsyth County***

***Prepared for:
Georgia Department of Transportation***

***Prepared by:
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August 2, 2012

EXECUTIVE SUMMARY

This report is an Interchange Justification Report (IJR) and evaluates the need for additional vehicular access to the freeway system along Georgia State Route 400 (SR 400). The purpose of the IJR is to determine that an additional access point is both necessary and beneficial to the study area, as well as to document the process which was used to make the determination. The IJR is both a record and a process.

This report is based on policies, procedures, and guidelines developed by the Federal Highway Administration (FHWA) and the Georgia Department of Transportation (GDOT). It strives to answer the eight policy points which are established in U.S. Code, Title 23, Section 111, dealing with Highways.

Six different project alternatives were analyzed, including the No Build condition. This report concludes that an interchange access point at SR 400 at McGinnis Ferry Road is the preferred alternative.

The North Fulton County and South Forsyth County areas are currently experiencing a high rate of growth in residential, office and retail commercial development. A major employment center, the Windward Office Park development, is located on the east side of the SR 400 along Windward Parkway, and another employment center is situated on the west side of SR 400 along Morris Road and Deerfield Parkway. McGinnis Ferry Road, Union Hill Road, and Bethany Bend Road all feed residential traffic through Windward Parkway to SR 400.

Additionally, a regional mixed-used development, with Michigan-based retail developer TRG Forsyth LLC (Taubman Company), is planned in South Forsyth County on approximately 160 acres at the intersection of McGinnis Ferry Road and Union Hill Road. The master plan of that development includes a luxury 650,000 square-foot 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 52,618 vehicle trips a day to the area, 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 currently under construction. 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 build out is expected to continue after completion of the mall.

The Forsyth Board of Commissioners has approved 10-year tax breaks and discounted sewer rates to support the luxury retail mall. Much of the deal is contingent on the mall opening no later than December 1, 2020, with at least two high-end anchor stores, such as Neiman-Marcus or Saks Fifth Avenue. A Georgia Tech Fiscal Impact Analysis study comparing premium and standard development options for the Taubman development (TRG Forsyth LLC), commissioned by Forsyth County, estimates that the project, at build-out, could bring 7,842 new jobs, \$1.1 billion in capital investments, and \$38.2 million-a-year in sales and property taxes into Forsyth County. “This will be the biggest commercial development in the county’s history,” said James McCoy, president and chief executive officer of the Cumming-Forsyth County Chamber of Commerce. “It blows everything else away.”

Forsyth County’s commitments include:

1. Payment of \$2,750,000 to TRG Forsyth LLC (Taubman Company) for right-of-way and engineering plans for the recently completed Ronald Reagan Boulevard extension between McGinnis Ferry Road and McFarland Parkway;

2. Reimbursing TRG Forsyth LLC over \$1 million for engineering fees for water, sewer, and transportation projects;
3. Offering TRG Forsyth LLC a reduced sewer tap fee that, at current costs, would save the company an estimated \$1,955,000;
4. Waiving the requirement that TRG Forsyth LLC pay a share of the \$12 million expense for extending Ronald Reagan Boulevard and providing water and sewer service to the area. Normally, the developer would have been expected to pay at least \$3 million;
5. 10-year tax abatements for the mall, the hotel, the office space, and other developments at the site. The specifics are still to be worked out and the exact value of the tax breaks is yet to be determined.

For its part, TRG Forsyth LLC (Taubman Company) has agreed to:

1. Donate 22 acres of green space, connecting Ronald Reagan Boulevard with Big Creek and the planned Forsyth County Greenway;
2. Repay the \$2,750,000, if, because of the economy or other reasons, the company cannot deliver the marquee mall as promised;
3. Submit its final plans to the county before claiming the sewer discounts.

The major finding of this report is that the new interchange access to SR 400 is needed to provide the necessary infrastructure for future economic development in the study area, 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 would not have the supportive infrastructure to market the location and create employment opportunities.

This IJR addresses all of the Georgia Department of Transportation and Federal Highway Administration guidelines for adding access points to limited access facilities. Satisfaction of these guidelines is documented in the report.

Two important conclusions are drawn by this document:

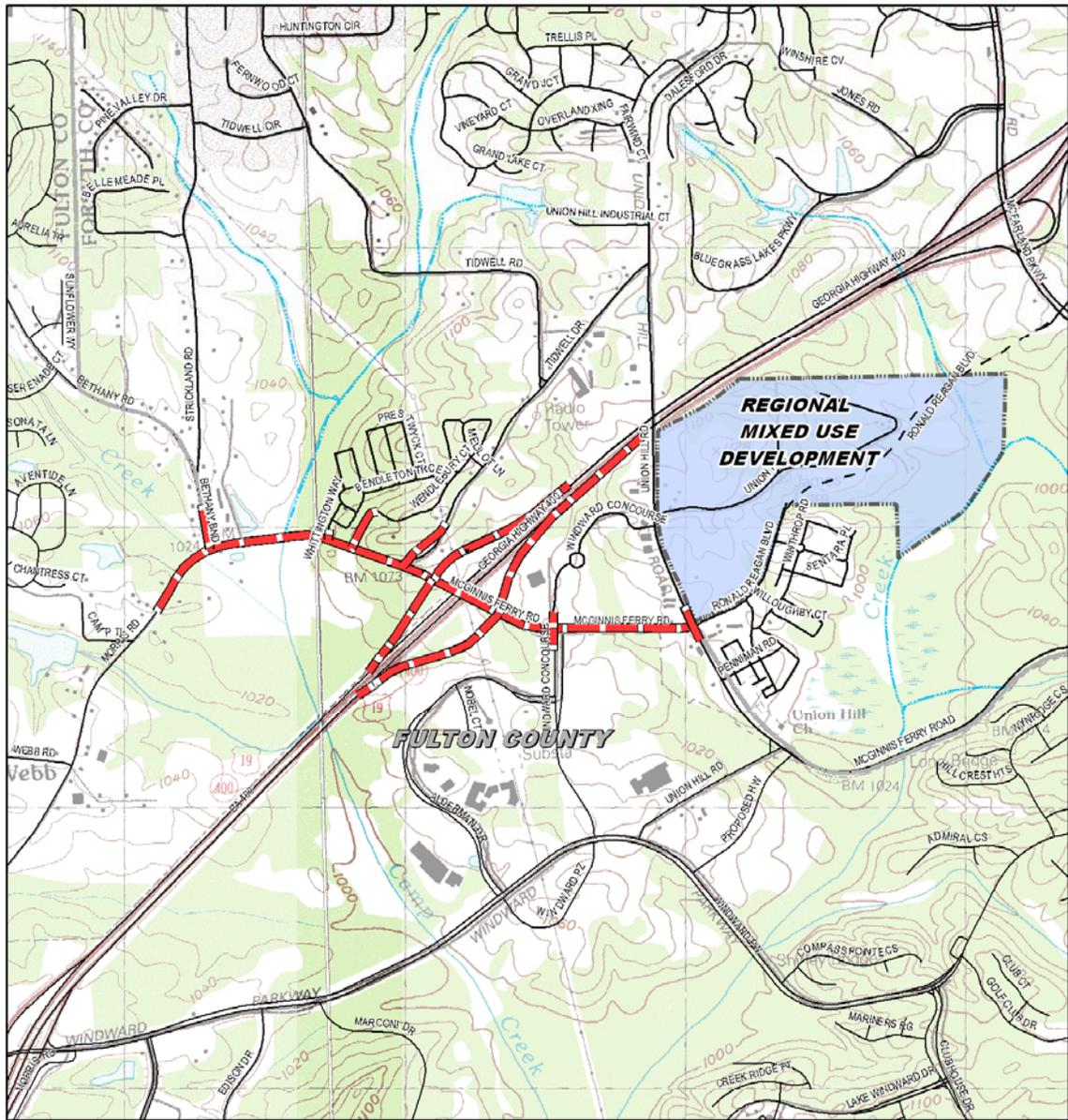
1. Even with reasonable improvements to the interchanges of Windward Parkway and McFarland Parkway, the projected traffic growth will overwhelm the existing infrastructure by the 2040 design year. Under the preferred alternative, the levels of service of nearly every intersection on McFarland Parkway and Windward Parkway will be improved.
2. The existing roadway network, including programmed improvements and other improvements not included in the program are not sufficient to carry the projected traffic growth at an acceptable level of service.

There would not be any adverse impacts to current traffic operations on the SR 400 mainline with the construction of the proposed SR 400/McGinnis Ferry Road interchange.

The new interchange at McGinnis Ferry Road would provide for the necessary infrastructure for continued future economic development. Future development of the SR 400 corridor in the study area would create major employment opportunities.

The proposed interchange concept layout is shown on the following page.

CONCEPT LAYOUT



Source: GA GIS DATA CLEARINGHOUSE & ARC

4-13-09

	<p>Project Location Map</p> <p>Project Limits</p>	<p>SR 400 at McGinnis Ferry Road Interchange P.I. Number 0007526 Forsyth County, Georgia</p>	
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1.0 INTRODUCTION

1.1 Purpose of the Report

This report is an Interchange Justification Report (IJR) and evaluates the need for additional vehicular access to the freeway system along Georgia State Route 400 (SR 400). The purpose of the IJR is to determine that an additional access point is both necessary and beneficial to the study area, as well as to document the process which was used to make the determination. The IJR is both a record and a process.

This report is based on policies, procedures, and guidelines developed by the Federal Highway Administration (FHWA) and the Georgia Department of Transportation (GDOT). It strives to answer the eight policy points which are established in U.S. Code, Title 23, Section 111, dealing with Highways. The eight policy points are addressed in Section 8.0.

1.2 Report Organization

This first section, this section, of the IJR identifies the sponsor of the proposed interchange, and provides a summation of the project history.

The second section provides detailed descriptions of the planning and background information associated with the area. The topics that are addressed include a needs statement supporting the proposed project, delineation of the project study area, an environmental scan identifying the known historic and natural resources, identification of the existing infrastructure within the study area, existing land uses and current zoning, existing and pending major land development projects in the near-term, future land uses and consistency with local, regional and state long-range plans.

The third section of the report describes the various project alternatives that were considered for addressing the needs identified in Section 2.0 and demonstrates that the alternatives considered would meet the adequate interchange spacing requirement of FHWA.

The fourth section shows the existing and future traffic conditions of the study area based on the alternatives described in Section 3.0. The methodology for deriving the traffic conditions is detailed in this section.

The fifth section provides existing and future traffic analyses of the roadway network under all alternatives described in Section 3.0 and using the traffic volumes shown in Section 4.0. This section contains a wealth of “raw” operational data concerning each of the studied alternatives but does not make any comparisons between them.

The sixth section contains the comparisons of each alternative to each. This section examines which alternative best meets the needs identified in Section 2.0. The section ends with a recommendation for the final build alternative.

The seventh section contains a description of the recommended alternative with detailed conceptual information.

The eighth section describes how the recommended alternative will be consistent with the eight policy points of the Federal Highway Administration (FHWA) guidelines.

The ninth section is the report conclusion and summarizes the important points contained within the IJR.

1.3 Project Sponsor

Georgia Department of Transportation (GDOT) policy establishes the “sponsor” as the governmental entity having jurisdiction over the geographic location containing the study area (i.e. a city or county).

The project sponsor is Forsyth County. The Forsyth County Board of Commissioners is responsible for the preparation of the IJR. The Forsyth County Engineering Department (Forsyth County Engineering) is working in conjunction with GDOT to prepare the requisite area information in order to seek approval of the new interchange.

1.4 Project History

Forsyth County Engineering personnel first initiated the proposed transportation improvement in the year 2007, when it was noticed that there were traffic capacity problems along the local street network in the vicinity of McGinnis Ferry Road near SR 400. Subsequently, a major regional mall coupled with a mixed-use development became a possibility. It was identified that there was a need to widen McGinnis Ferry Road near SR 400 to provide sufficient capacity since McGinnis Ferry Road had already been widened under other GDOT projects leading to SR 400. The proposed capacity improvements would also include the provision of adequate turn lanes at the major street intersections.

In 2007, Forsyth County employed a consultant to conduct a traffic study of this same geographic area and to establish the feasibility for a possible new interchange at SR 400 and McGinnis Ferry Road. The study was started in June 2007, and was authorized by GDOT's Office of Planning under the GDOT project number CSHPP-0007-00(526), SR 400 at McGinnis Ferry Road. On March 7, 2010, the GDOT Office of Planning approved the Interchange Feasibility Report, which allowed the Sponsor to authorize continued expenditures and to develop a full IJR.

In January of 2012, Forsyth County issued approval for their consultant to continue work on the IJR. This report documents that work.

1.5 Proposed Funding

There is identified funding in the 2040 Regional Transportation Plan to advance a project through the Concept phase of the GDOT Plan Development Process¹. This was listed under Atlanta Regional Commission project FT-324 and is a SAFTEA-LU² earmark. There is a project identified in the 2040 Atlanta Regional Commission Aspirations Plan under ASP-FT-320 which is listed as a new interchange access point on SR 400 at McGinnis Ferry Road. 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 SAFETEA-LU.

¹ See the GDOT website, sub-section "R.O.A.D.S." for a full description of the Plan Development Process.
<http://www.dot.state.ga.us/>

² SAFTEA-LU stands for "Safe Accountable Flexible Efficient Transportation Equity Act: A Legacy of Users" and was the U.S. Federal transportation funding act signed into law on August 10, 2005.

2.0 PLANNING AND BACKGROUND INFORMATION

2.1 Section Purpose and Organization

This report section establishes the planning and background information of the IJR. It describes and delineates the study area in which all the other data is gathered; it shows the inadequacy of the existing adjacent interchanges; it presents the crash data analysis; it describes the supporting local communities and stakeholders; it shows the documentation resulting from the environmental scan; and finally it presents the defined needs which the alternatives described in Section 2.12 are proposed to address.

Section 2.2 describes the study area. Section 2.3 contains the crash analysis. Section 2.5 presents the current inventory of supporting infrastructure including potable water, sanitary sewerage and other utilities, schools and other community facilities. Section 2.6 presents the existing land use and Section 2.7 provides the current zoning information. Existing and pending major land development projects are addressed in Section 2.8, and Section 2.9 describes the future land use plans and adopted comprehensive plans. Section 2.10 addresses consistency with state and regional transportation plans. The last subsection addresses the potential economic development opportunities associated with the study area.

2.2 Study Area

The study area was established based on a preliminary assessment of potential project traffic impacts caused by the construction of the proposed alternatives and the nature and extent of the potential environmental impacts.

The boundaries of the study area were based upon travel demand. The boundaries are at locations where a multi-lane roadway provides access for demand that is moving in a direction away from the study area or the limit of a two-lane roadway transitioning to four lanes within the study area. Alpharetta Highway in Forsyth County and the City of Milton (SR 9) is an example of a multi-lane roadway drawing travel demand away from the study area and McGinnis Ferry Road is an example of a two-lane roadway which transitions to four lanes. Travel demand will be throttled by the two-lane roadway which justifies the limit of the study area at that point.

The study area boundaries include two upstream interchanges and two downstream interchanges from the interchange point proposed in Alternative 2 and Alternative 3 (See Section 3.0). The study area is illustrated in Figure 1: Study Area Map and is generally described as follows: Old Milton Parkway on the south continuing on the east side along Kimball Bridge Road/Jones Bridge Road/Brookwood Road/Peachtree Parkway. The north boundary is Atlanta Highway (SR 9) which continues as the westerly boundary as Atlanta Highway/Cumming Highway which ties into Windward Parkway/Westside Parkway, which closes the boundary at Old Milton Parkway. The study area encompasses approximately 20,580 acres or 32.16 square miles.

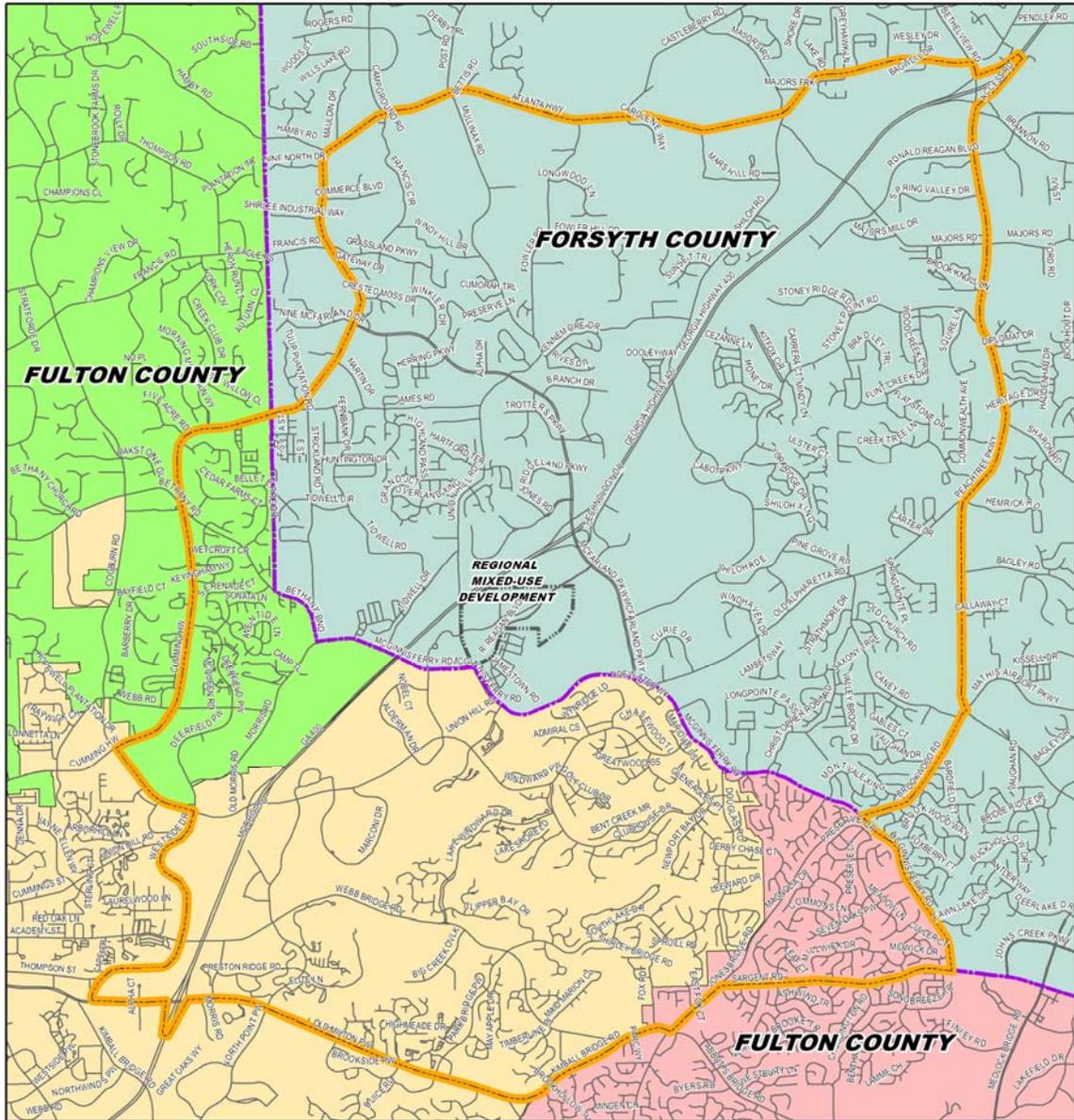
Two of the proposed alternatives, Alternative 2 and Alternative 3, include new freeway access points at McGinnis Ferry Road which is located at the Fulton-Forsyth County line in the lower third of the study area. The freeway crossroad of McGinnis Ferry Road is coterminous with the Fulton-Forsyth County line.

Four governmental jurisdictions are represented within the study area as shown Figure 1: Study Area Map. They include: Forsyth County, The City of Milton, The City of Alpharetta, and the City of Johns Creek. The City of Milton occupies the southwest quadrant of the intersection of the Forsyth/Fulton County line and SR 400. The City of Alpharetta forms the southeast quadrant of the same dividing lines. Both quadrants north of McGinnis Ferry Road are located in unincorporated Forsyth County as well as the northern two-thirds of the study area. The City of Johns Creek is in the eastern portion of the study area, within Fulton County.

Figure 2: Atlanta Metropolitan Regional Planning Area illustrates that this urbanized study area is within the Atlanta Regional Commission's metropolitan planning region, and is included in the Atlanta urbanized area established by the U.S. Census.

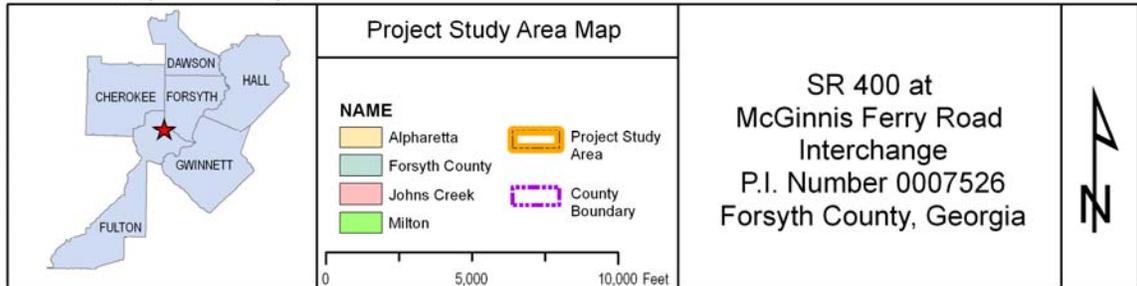
The southern part of the project study area includes a significant portion of the City of Alpharetta which is highly developed with a population base that is comparable to Fulton County. This community includes residential subdivisions, commercial offices, and retail commercial areas along McGinnis Ferry Road, Windward Parkway, Jones Bridge Road, Webb Bridge Road, and Old Milton Parkway. State Route 400 provides direct commuter access to downtown Atlanta, serving several North Fulton County and South Forsyth County communities. State Route 400 also links the north metro area with I-285, which permits circumferential mobility around the core-developed areas of the Atlanta region. The southern part of the study area is only provided access to SR 400 at two existing interchanges at Windward Parkway and Old Milton Parkway which must accommodate the traffic generated from the southern part of the study area.

Figure 1: Study Area Map



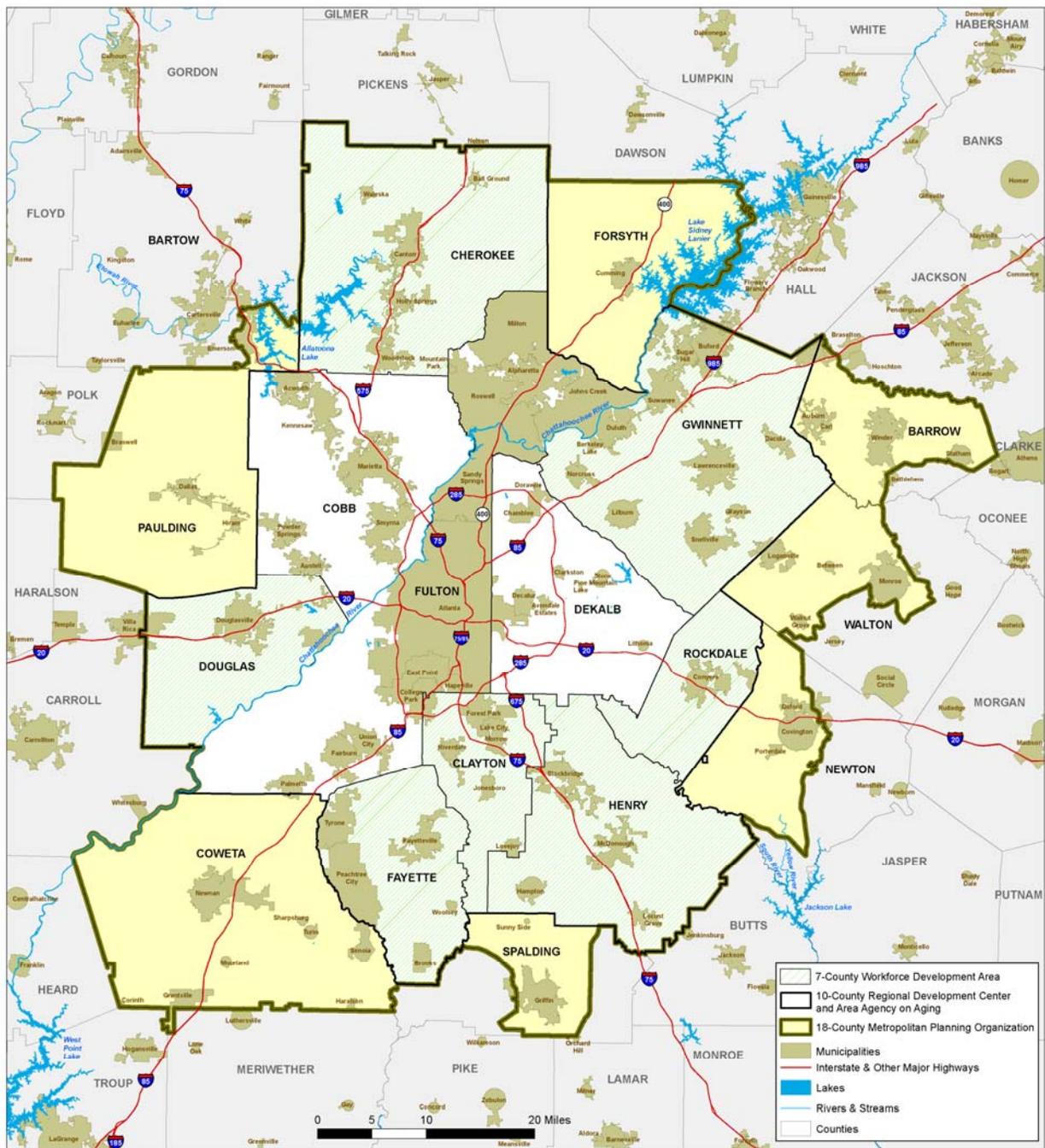
Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

4-12-12



Source: Moreland Altobelli Associates, Inc., Forsyth and Fulton County GIS Departments

Figure 2: Atlanta Metropolitan Regional Planning Area



The northern part of the study area within Forsyth County, north of McGinnis Ferry Road is less densely populated but is transitioning to a fully urbanized area. It too consists of residential subdivisions, commercial offices, and retail commercial centers, but those uses are fewer in number since the residential customer base is less than that associated with the City of Alpharetta. More in-depth discussions of the roadways and other supporting infrastructure and the existing land uses within the study area follow in the Subsections 2.5 and 2.6.

2.2.1 Inadequacy of Existing Interchanges

The existing traffic operations at the Windward Parkway and McFarland Parkway interchanges are projected to be below the threshold Level of Service (LOS) D by 2040. Forecasted growth in North Fulton and South Forsyth Counties is leading toward congested interchanges and roadways. Even with planned widening improvements to SR 400 and other committed and planned projects (see 2.10, Consistency with Regional and State Transportation Plans) the exit and entrance ramp junctions of these two interchanges would operate at Level of Service (LOS) “E” and “F” by the year 2040³ as shown in Table 1: Ramp Junction Conditions 2020 and 2040.⁴

Table 1: Ramp Junction Conditions 2020 and 2040

RAMP JUNCTIONS LOS (Density in pc/mi/ln)	Projected Ramp Conditions			
	2020		2040	
	AM	PM	AM	PM
SR 400 SB Off-Ramp to McFarland Rd	E (42.6)	B (14.7)	F (58.1)	C (22.4)
SR 400 SB On-Ramp from McFarland Rd	D (26.6)	B (17.4)	E (35.2)	C (21.3)
SR 400 SB Off-Ramp to Windward Pkwy	D (30.3)	C (21.7)	E (36.7)	C (25.7)
SR 400 SB On-Ramp from Windward Pkwy	E (35.5)	D (33)	E (40.9)	E (38)
SR 400 NB Off-Ramp to Windward Pkwy	D (32.6)	E (40.5)	E (37.6)	F (46.5)
SR 400 NB On-Ramp from Windward Pkwy	B (18.3)	C (27.8)	C (21.6)	D (33.1)
SR 400 NB Off-Ramp to McFarland Rd	B (19.3)	D (28.8)	C (25.8)	E (38.7)
SR 400 NB Loop Off-Ramp to McFarland Rd	B (12.7)	C (22.7)	B (15.9)	D (29)
SR 400 NB On-Ramp from McFarland Rd	B (19.6)	E (40.5)	C (23.7)	F (50.6)

Source: Moreland Altobelli Associates, Inc.

2.2.2 Local Supporting Communities or Stakeholders

A letter dated March 30, 2009 from Mr. John V. Cunard, Director of the Forsyth County Department of Engineering, addressed to Ms. Angela T. Alexander, Director of Transportation Data and Planning with GDOT, concerning the Forsyth County Board of Commissioners’ full support for a proposed interchange at SR 400 and McGinnis Ferry Road was prepared and a copy is included in Appendix A, Correspondence. In the letter Mr. Cunard explains that the County has adopted an overlay-zoning district associated with the TRG Forsyth LCC mixed-use development and entered into a Development Agreement. It is contained in Article IX, Ronald Reagan/Union Hill Overlay District in the Forsyth County Unified Development Code, and a copy is included in Appendix C.

The overlay zoning district ordinance expresses the Board’s desire for the area surrounding a proposed SR 400/McGinnis Ferry Road interchange to support regionally significant mixed-use developments as reflected in the County’s adopted Future Land Use Plan and development policies contained in their Comprehensive Plan. The overlay zoning district encourages flexibility and innovation concerning mixed-use projects blending residential, retail commercial, office, and recreational land uses in an approximately 160 acre area located in the northeast quadrant of the proposed interchange.

³ All Level of Service (LOS) tables shown in this subsection are derived from Section 5.0, Traffic Operations Analysis. For greater detail and explanation of the No Build condition, see that section.

⁴ For a full discussion of traffic analysis, see Section 5.0, Traffic Operations Analysis

The Development Agreement between the Forsyth County Board of Commissioners and the TRG Forsyth LLC outlines the funding of infrastructure improvements and services required to support their proposed development. In order to access the approximately two million square feet of retail and commercial development, as well as nearly 1,000 residential dwelling units, the Developer has agreed for Forsyth County to defer payment of \$2.75 million for public rights-of-way. Forsyth County has also agreed to reimburse the Developer over \$1 million worth of engineering fees for water, sewer, and transportation projects. Forsyth County has completed over \$12 million of road improvements funded from their SPLOST VI Transportation Program ensuring adequate water and sewer services.

2.3 Crash Data Analysis

In addition to traffic congestion, several roads within the study area have a higher than average rate of traffic collisions. An inventory of crash data from 2007 to 2009 is provided in Table 2 and Table 3 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 2: 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.

Table 3: 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.*

The GDOT Office of Traffic Operations and the Georgia Department of Public Safety, Crash Reporting Unit furnished the information shown in Table 2 and Table 3. 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 4 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 4: 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, Moreland Altobelli Associates, Inc.

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.

2.4 Environmental Scan

A preliminary environmental screening was conducted to identify existing environmental resources or constraints that may have a potential effect upon the constructability of the alternatives identified in Section 3.0.

2.4.1 Survey Area

The survey area for the environmental screening was coterminous with the IFR study area (See Figure 1), except for the hazardous materials and underground storage tanks. The survey area used for the hazardous materials and underground storage tanks was limited to the proposed alignment of the widened McGinnis Ferry Road from approximately Bethany Bend Drive to Union Hill Road. The established survey areas would best serve the need to identify any critical environmental constraints that would have major ramifications upon the feasibility of constructing and of the proposed alternatives.

2.4.2 Cultural Resources

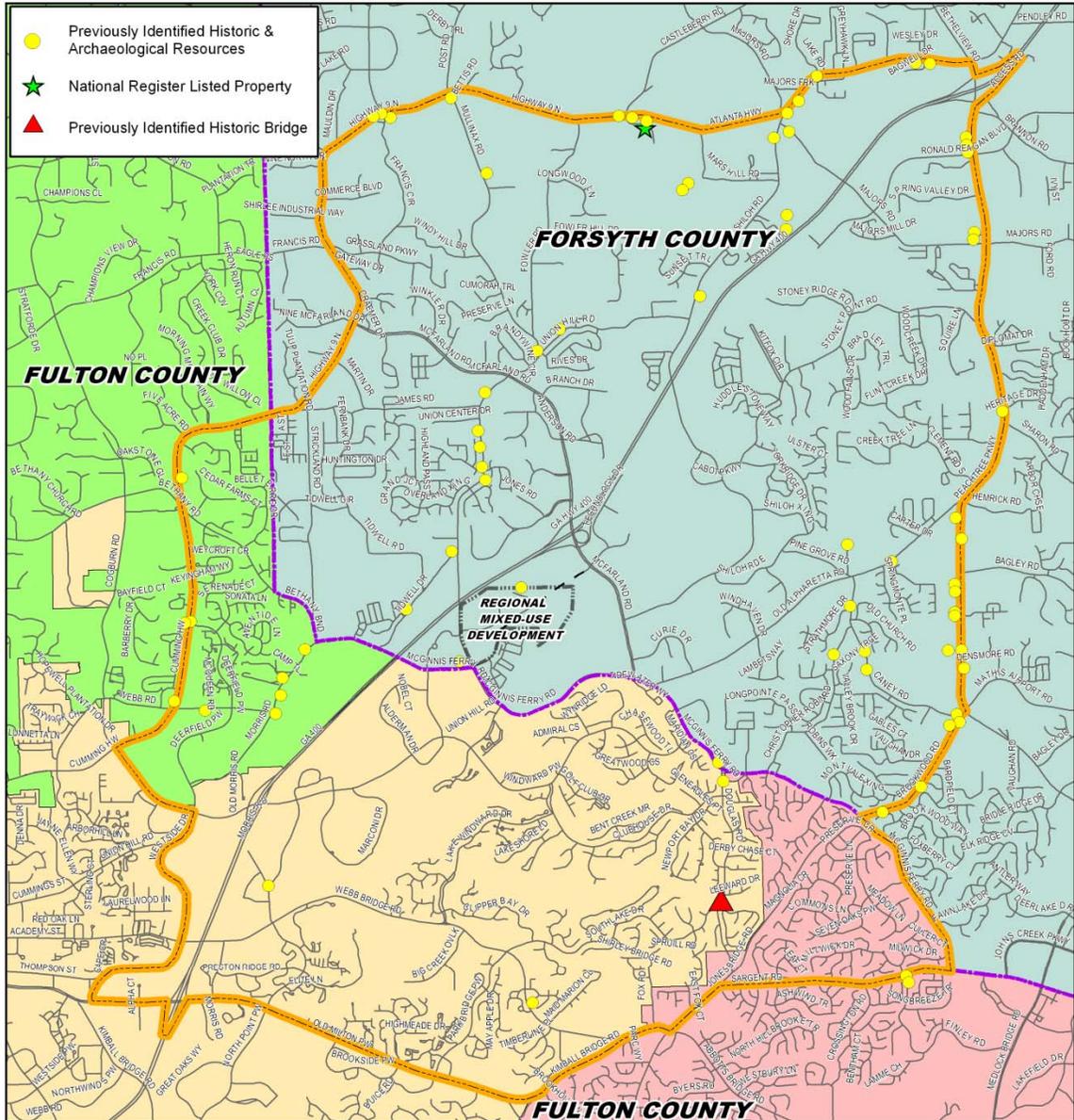
In support of the IJR, a cultural resources screening was conducted to determine the location of previously identified, potentially historic cultural resources within the proposed project's study area. This screening consisted mainly of literature review.

The review of existing information on previously identified historic and archaeological properties on the National Register of Historic Places revealed one (1) listed resource within the northern most extent of the proposed project's study area (see Figure 3: Historic and Archaeological Resources within Study Area). This resource is the Fowler Family Farm, which was also identified on Natural, Archaeological, and Historic Resources Geographic Information System (NAHRGIS) as Resource ID #81762. In the updated Georgia Historic Bridge Survey (GHBS), one (1) bridge potentially eligible for inclusion in the National Register was identified. The bridge's serial number is 121-5017-0, and it is located in the southeastern section of the study area on Douglas Road over Caney Creek. A total of fourteen (14) potentially historic resources 50 years old or older were identified within the proposed project's study area on the 1976 and 1995 Department of Natural Resources (DNR) Fulton County surveys as denoted on NAHRGIS. Nine (9) of those fourteen (14) resources are located in the City of Milton, three (3) are located in the City of Alpharetta, and two (2) resources are located in the City of Johns Creek. There are four (4) resources located on Morris Road and two located along Webb Road, and all of these potentially historic resources may be affected by increased noise resulting from redistributed traffic, which will be further documented in the environmental report prepared as part of the NEPA compliance process. A total of fifty-eight (58) potentially historic resources 50 years old or older were identified within the study area on the 1992 DNR Forsyth County Survey as denoted on NAHRGIS. Most of those fifty-eight (58) resources are located far removed from McGinnis Ferry Road, but two (2) resources are located on Tidwell Drive and may be affected by increased noise due to redistributed traffic. There are no proposed National Register nominations or National Historic Landmarks nor any identified battlefield sites within the proposed project's study area. For this cultural resource screening, archaeological research was not conducted.

Additionally, 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)

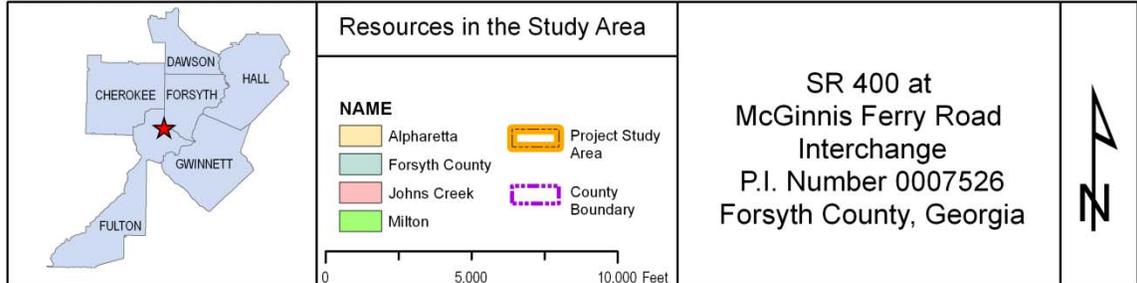
potentially eligible historic resource was located at 4100 McGinnis Ferry Road, a Hall Parlor house-type. It was noted that the existing edge of pavement would serve as the historic boundary, and the proposed project-related widening improvements should take place on the south side of McGinnis Ferry Road to minimize any adverse impacts.

Figure 3: Historic and Archaeological Resources within Study Area



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

4-16-12



SR 400 at
McGinnis Ferry Road
Interchange
P.I. Number 0007526
Forsyth County, Georgia

2.4.3 Jurisdictional Waters of the U.S.

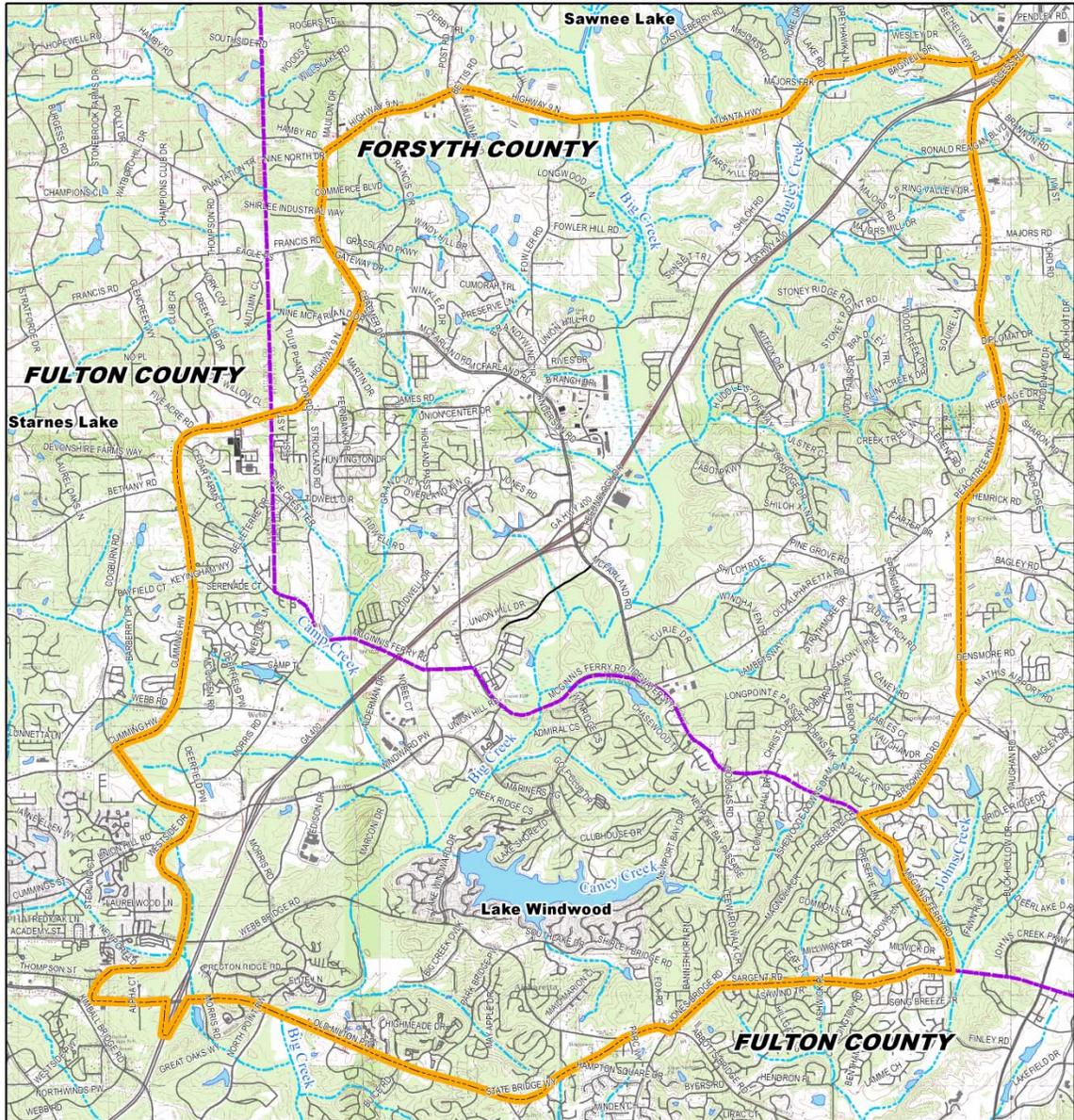
A preliminary in-house review of the proposed project study area has been conducted. All available data, including current aerial photography, the associated topographic quadrangle maps (Cumming, Duluth, Birmingham, and Roswell, GA) and the Forsyth and Fulton County USDA Soil Survey data, and relevant NWI maps, were thoroughly compiled and reviewed. Based on this information, the dominant habitat/land use types along the proposed corridor and surrounding area appear to be residential and commercial, existing road right-of-way (ROW), jurisdictional waters of the U.S., open fields, and small undeveloped tracts of mixed pine/hardwood forests.

Five (5) named jurisdictional waterways occur within the study area; with the exception of Lake Windwood, all named waterways are likely perennial streams (Big Creek, Bagley Creek, Camp Creek, and Caney Creek). Also, these named streams have over 50 unnamed tributaries that flow within the proposed project study area; most of these are perennial and intermittent streams. In addition, there are over 75 small, palustrine and lacustrine wetlands associated with the streams mentioned above (Figure 4: Jurisdictional Waters of the U.S.).

2.4.4 Threatened and Endangered Species

The jurisdictional waterways, existing ROW, open fields, and undeveloped tracts of mixed pine/hardwood forest could potentially serve as habitat for several protected species. The U. S. Fish and Wildlife Service (USFWS) County Listing of Threatened and Endangered Species in Forsyth and Fulton County, GA, the Georgia Department of Natural Resources (GDNR) County Listing of Locations of Special Concern Animals, Plants, and Natural Communities were reviewed. Based on this information, a total of five (5) different federally protected species and seven (7) additional state-protected species are known to occur in Forsyth and Fulton Counties. Potential habitat may exist within the study area for each of these species. Please refer to Table 5: Protected Species in Forsyth County, GA, Table 6: Forsyth County Georgia DNR Threatened and Endangered Species List, Table 7: Protected Species in Fulton County, GA, and Table 8: Fulton County Georgia DNR Threatened and Endangered Species List for a complete list of all protected species that may occur in the proposed project study area.

Figure 4: Jurisdictional Waters of the U.S.



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

3-22-12

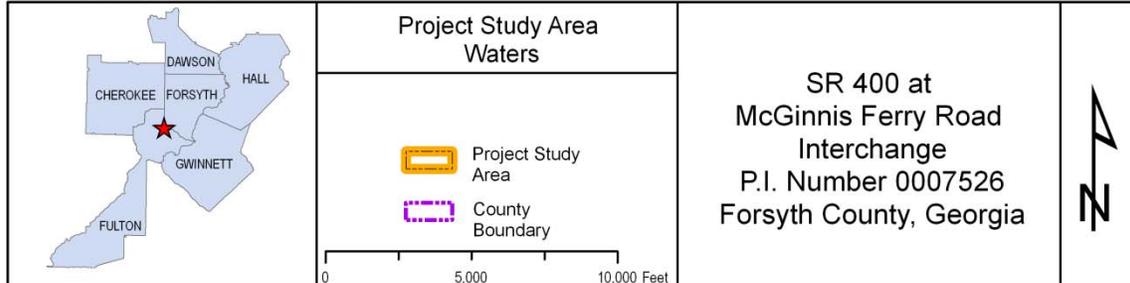


Table 5: Protected Species in Forsyth County, GA

Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	No Federal Status	T	Inland waterways and estuarine areas in Georgia.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Fish				
Amber darter <i>Percina antesella</i>	E	E	Gentle riffle areas over sand and gravel substrate that becomes vegetated (primarily with <i>Podostemum</i>) during summer; last taken in Etowah River in 1980; historic population in Shoal Creek probably extirpated by construction of Allatoona Reservoir in 1950	Habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality
Bluestripe shiner <i>Cyprinella callitaenia</i>	No Federal Status	T	Brownwater streams	Habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality
Cherokee darter <i>Etheostoma scotti</i>	T	T	Shallow water (0.1-0.5 m) in small to medium warm water creeks (1-15 m wide) with predominantly rocky bottoms. Usually found in sections with reduced current, typically runs above and below riffles and at ecotones of riffles and backwaters.	Habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality
Etowah darter <i>Etheostoma etowahae</i>	E	E	Shallow riffle habitat, with large gravel, cobble, and small boulder substrates. Usually found in medium and large cool water creeks or small rivers (15-30 m wide) with moderate or high gradients and rocky bottoms.	Habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality
Frecklebelly madtom <i>Noturus munitus</i>	No Federal Status	E	Rivers with moderate to swift current over substrates ranging from coarse gravel to boulders, submerged trees, and brush.	
Plant				
White fringeless orchid <i>Platanthera integrilabia</i>	Candidate Species	T	Red maple-blackgum swamps; also sandy damp stream margins; on seepy, rocky, thinly vegetated slopes. Also known as Monkey-face Orchid.	

Species	Federal Status	State Status	Habitat	Threats
Piedmont barren strawberry <i>Waldsteinia lobata</i>	No Federal Status	T	Rocky acidic woods along streams with mountain laurel; rarely in drier upland oak-hickory-pine woods	

Source: USFWS

* T = Threatened and E = Endangered

Table 6: Forsyth County Georgia DNR Threatened and Endangered Species List

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
Coosa Chub <i>Macrhybopsis</i> sp.	None	E	Coosa chubs are found in large streams and rivers and generally occur in swift water over gravel or cobble, often in association with riverweed (<i>Podostemum ceratophyllum</i>).	No	No effect
Etowah Darter <i>Etheostoma etowahee</i>	E	E	The Etowah darter typically occurs in swift riffle habitat over cobble and gravel substrata.	No	No effect
Cherokee Darter <i>Etheostoma scotti</i>	T	T	Cherokee darters typically inhabit small to medium-sized streams where they are found in association with gravel and cobble bed sediments. Cherokee darters may also occur in pools at the head or tail of riffles.	No	No effect
Amber Darter <i>Percina antesella</i>	E	E	Amber darters are found in the mainstems of the Conasauga and Etowah Rivers and the downstream reaches of two large tributaries to the Etowah River. Amber darters occur in riffles or shoals with cobble and gravel, and moderate to swift currents.	No	No effect
Rock Darter <i>Etheostoma rupestre</i>	None	R	As both its scientific and common names suggest, the rock darter occurs over rocky substrates in swift riffles. It is often associated with riverweed (<i>Podostemum ceratophyllum</i>).	No	No Effect
Ozark bunchflower <i>Veratrum woodii</i>	None	R	Lower slopes and stream terraces in moist, hardwood forests, usually over basic soils.	No	No effect
Georgia aster <i>Syphotrichum georgianum</i>	C	T	Dry open woods that are often disturbed, roadsides, and other openings.	No	No effect

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
White fringeless orchid <i>Platanthera integrilabia</i>	C	T	Habitat is seepage sphagnum bogs, springheads, seepy stream banks, red maple-black gum swamps. Often grows with primrose-leaved violet, green woodland orchid, cowbane, and grass-of-Parnassus.	No	No effect
Chattahoochee crayfish <i>Cambarus howardi</i>	None	T	Inhabits the riffle areas of streams under rocks, beneath undercut banks, and in woody debris piles.	No	No effect

GA Dept. of Natural Resources – Rare Animals, Plants and Natural Communities of Forsyth County, Georgia (generated from conservation database September 2011) *U=Unusual *R=Rare E=Endangered *T=Threatened *C=Candidate *SC=Special Concern

Table 7: Protected Species in Fulton County, GA

Species	Federal Status	State Status	Habitat	Threats
Bird				
Bald eagle <i>Haliaeetus leucocephalus</i>	No Federal Status	T	Inland waterways and estuarine areas in Georgia.	Major factor in initial decline was lowered reproductive success following use of DDT. Current threats include habitat destruction, disturbance at the nest, illegal shooting, electrocution, impact injuries, and lead poisoning.
Invertebrate				
Gulf moccasinshell mussel <i>Medionidus pencillatus</i>	E	E	Medium streams to large rivers with slight to moderate current over sand and gravel substrates; may be associated with muddy sand substrates around tree roots	Habitat modification, sedimentation, and water quality degradation
Shiny-rayed pocketbook mussel <i>Lampsilis subangulata</i>	E	E	Medium creeks to the main stems of rivers with slow to moderate currents over sandy substrates and associated with rock or clay	Habitat modification, sedimentation, and water quality degradation
Fish				
Bluestripe shiner <i>Cyprinella callitaenia</i>	No Federal Status	T	Brownwater streams	

Species	Federal Status	State Status	Habitat	Threats
Cherokee darter <i>Etheostoma scotti</i>	T	T	Shallow water (0.1-0.5 m) in small to medium warm water creeks (1-15 m wide) with predominantly rocky bottoms. Usually found in sections with reduced current, typically runs above and below riffles and at ecotones of riffles and backwaters.	Habitat loss due to dam and reservoir construction, habitat degradation, and poor water quality
Highscale shiner <i>Notropis hypsilepis</i>	No Federal Status	T	Blackwater and brownwater streams	
Plant				
Bay star-vine <i>Schisandra glabra</i>	No Federal Status	T	Twining on subcanopy and understory trees/shrubs in rich alluvial woods	
Piedmont barren strawberry <i>Waldsteinia lobata</i>	No Federal Status	T	Rocky acidic woods along streams with mountain laurel; rarely in drier upland oak-hickory-pine woods	

Source: USFWS

* T = Threatened and E = Endangered

Table 8: Fulton County Georgia DNR Threatened and Endangered Species List

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
Bachman's Sparrow <i>Aimophila aestivalis</i>	None	R	Mature open pinewoods, regenerating clear-cuts (both pine and hardwoods), utility rights-of-way, and old pastures with a dense ground cover of grasses (particularly wiregrass, bluestem, or broomsedge) and forbs, or palmetto scrub. This sparrow is often associated with open, mature pine forests where red-cockaded woodpeckers are found, since this habitat often provides the thick grassy ground cover this sparrow prefers.	No	No effect
Henslow's Sparrow <i>Ammodramus henslowii</i>	None	R	Breeding habitats include tallgrass prairie, lowland prairie, marshes, meadows and weedy pastures in the western part of its range and coastal marshes, swamps, dry fields, low wet meadows, weedy hayfields and pastures, clear-cut pocosins, and similar sites in the eastern part of the breeding range.	No	No effect

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
Chattahoochee crayfish <i>Cambarus howardi</i>	None	T	Inhabits the riffle areas of streams under rocks, beneath undercut banks, and in woody debris piles.	No	No effect
Bluestripe Shiner <i>Cyprinella callitaenia</i>	None	R	Bluestripe shiners inhabit mainstem reaches of rivers and large streams in riffles and runs with rubble or sand substrate and are most often collected in areas with swift current velocities. It has also been found in the lower reaches of several small impounded tributaries to the Chattahoochee River, where the backwaters of the reservoir apparently mimic large stream habitat.	No	No effect
Delicate Spike <i>Elliptio arctata</i>	None	E	Gravel or sand shoals in medium to large rivers. Occasionally found in sand-bottomed runs with slow, steady current. Usually found adjacent to or underneath large boulders or limestone bedrock in center channel; rarely found in slack water or silt.	No	No Effect
Cherokee Darter <i>Etheostoma scotti</i>	T	T	Cherokee darters typically inhabit small to medium-sized streams where they are found in association with gravel and cobble bed sediments. Cherokee darters may also occur in pools at the head or tail of riffles.	No	No effect
Peregrine Falcon <i>Falco peregrinus</i>	None	R	Natural nest sites, known as eyras, are normally located on inaccessible cliff ledges where the young are safe from predators. In recent decades peregrines have adapted to new habitats provided by cities, and many pairs now nest on city buildings, bridges, and smokestacks and forage in surrounding urban areas for pigeons and other birds.	No	No effect
Shinyrayed Pocketbook <i>Hamiota subangulata</i>	E	E	Typically occupies medium sized streams to large rivers in sandy to muddy substrates with slight to moderate current.	No	No effect

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
Gulf Moccasinshell <i>Medionidus penicillatus</i>	E	E	Typically occupies small streams to large rivers with moderate flow and sandy substrates. This species has also been found in gravel and cobble substrates.	No	No effect
Highscale Shiner <i>Notropis hypsilepis</i>	None	R	Highscale shiners are primarily found in tributary streams, often near stream confluences with larger rivers. These shiners inhabit runs and pools over sand and bedrock substrates.		
Pink Ladyslipper <i>Cypripedium acaule</i>	None	U	Upland pine and mixed pine-hardwood forests with acidic soils; in the mountains, near edges of rhododendron thickets and mountain bogs.		
Yellow Ladyslipper <i>Cypripedium parviflorum</i>	None	R	Both varieties of yellow lady's-slipper occur in rich, cove hardwood forests.		
Mountain Witch-alder <i>Fothergilla major</i>	None	SC	Mixed hardwood-pine forests on dry, rocky (sandstone or granite) slopes and bluffs, often with Virginia pine, scarlet oak, and black oak; occasionally, moist forests with tulip poplar, silverbell, and cucumber tree along rocky stream banks. Prefers acidic soils.		
Sweet Pinesap <i>Monotropsis odorata</i>	None	T	Mixed pine-hardwood or chestnut oak-dominated forests with dry, acidic soil, often with mountain laurel, rhododendron, and blueberry.		
Indian Olive <i>Nestronia umbellula</i>	None	R	Dry, open, upland woods with mixed hardwood-pine canopy.		
Dwarf Sumac <i>Rhus michauxii</i>	E	E	Dry, open, rocky, or sandy woodlands over mafic bedrock with high levels of calcium, magnesium, or iron; often on ridges and river bluffs.		
Bay Star-vine <i>Schisandra glabra</i>	None	T	Moist, deciduous hardwood forests, often with beech, usually on lower slopes, stream terraces, and floodplains.		

Species Name	Federal Status	State Status	Preferred Habitat	Potential Habitat Available	Expected Species Impact
Georgia aster <i>Syphotrichum georgianum</i>	C	T	Dry open woods that are often disturbed, roadsides, and other openings.	No	No effect
Barren Strawberry <i>Waldsteinia lobata</i>	None	R	Stream terraces, floodplain forests, and rocky, lower slopes with oak-hickory-pine forest; often with mountain laurel.		

GA Dept. of Natural Resources – Rare Animals, Plants and Natural Communities of Fulton County, Georgia (generated from conservation database October 2011) *U=Unusual *R=Rare E=Endangered *T=Threatened *C=Candidate *SC=Special Concern

2.4.5 Invasive Species

Several invasive species may also occur in Forsyth and Fulton Counties. The Georgia Department of Transportation (GDOT) currently surveys for 29 invasive species. These species have been identified by GDOT as having the highest priority due to their environmental and economic impacts. Please refer to Table 7: GDOT 2008 Invasive Pest Plant Species for a list of invasive species that may occur in the proposed project’s study area.

Table 7: GDOT 2008 Invasive Pest Plant Species

Scientific Name	Common Name
<i>Achyranthes japonica</i>	Japanese chaff flower
<i>Ailanthus altissima</i>	Tree-of-heaven
<i>Albizia julibrissin</i>	Mimosa
<i>Alliaria petiolata</i>	Garlic mustard
<i>Alternanthera philoxeroides</i>	Alligatorweed
<i>Arthraxon hispidus</i>	Small carpgrass
<i>Celastrus orbiculatus</i>	Oriental bitterweed
<i>Eichhornia crassipes</i>	Water hyacinth
<i>Elaeagnus umbellata</i>	Autumn olive
<i>Hedera helix</i>	English ivy
<i>Hydrilla verticillata</i>	Hydrilla
<i>Imperata cylindrica</i>	Cogongrass
<i>Lespedeza bicolor</i>	Shrubby lespedeza

<i>Scientific Name</i>	Common Name
<i>Lespedeza cuneata</i>	Sericea lespedeza
<i>Ligustrum sinense</i>	Chinese privet
<i>Lonicera japonica</i>	Japanese honeysuckle
<i>Lygodium japonicum</i>	Japanese climbing fern
<i>Melia azedarach</i>	Chinaberry tree
<i>Microstegium vimineum</i>	Nepalese browntop
<i>Murdannia keisak</i>	Marsh dewflower
<i>Paederia foetida</i>	Skunkvine
<i>Paulownia tomentosa</i>	Princesstree
<i>Polygonum cuspidatum</i>	Japanese knotweed
<i>Pueraria montana</i>	Kudzu
<i>Rosa multiflora</i>	Multiflora rose
<i>Salvinia molesta</i>	Giant Salvinia
<i>Sorghum halepense</i>	Johnsongrass
<i>Triadica sebifera</i>	Chinese tallow tree
<i>Wisteria sinensis</i>	Chinese wisteria

2.4.6 Hazardous Materials and USTs

A survey for sites that may contain hazardous materials, including soil and/or water contaminated by underground storage tanks (USTs)/leaking underground storage tanks (LUSTs), State/Tribal chemical spills (SPILLS), or waste generators, was conducted for the proposed alignment of the McGinnis Ferry Road widening. A one-mile radius search was conducted using databases maintained by the U.S. Environmental Protection Agency (EPA), Georgia Department of Natural Resources (GDNR), and the Environmental Protection Division (EPD), a division of the GDNR. A field survey was conducted following the initial database search, in an effort to verify that information, and to inspect the study area for any sites of concern that may not have been listed in the database.

According to the information collected from the records review, there were five (5) RCRA Gen (Resource Conservation and Recovery Information System Generators) sites, one (1) State SPILLS 90 (GA DNR SPILL Locations reported since 1990) site, one (1) State/Tribal LUST (GA EPA Leaking Underground Storage Tanks) site and one (1) State/Tribal UST/AST (GA EPD List of Underground Storage Tanks) site within a one-mile radius survey area. No other sites listed in the database search were likely to affect the project because of distance and/or topography.

Site 1: RCRA Gen, 1001 Windward Concourse Alpharetta, GA 30202

This site was identified as GAR000011957/SGN which is an ignitable waste and corrosive waste site owned by General Electric Company located at the above address, which is 0.03 miles southeast of the proposed interchange improvements with a ground elevation of 1052 feet AMSL (above mean sea level). The status has identified that this is a small quantity generator. The contact information is George Rolita North Castle Drive Armonk, NY 10504 and may be contacted by telephone at (914) 765-4612.

Site 2: RCRA Gen, 1360 Union Hill Road Alpharetta, GA 30004

This site was identified as GAR000034777/LGN which is a large quantity generator of hazardous waste owned by Union Hill Property Management located at the above address, which is 0.09 miles northwest of the proposed interchange improvements with a ground elevation of 1107 feet AMSL. The contact information is Vicki A. Hufford 1360 Union Hill Road Alpharetta, GA 30004 and may be contacted by telephone at (678) 566-3210.

Site 3: RCRA Gen, 1360 Union Hill Road Alpharetta, GA 30004

This site was identified as GAR000035253/Transporter which is a transporter of hazardous waste owned by American Environmental and Construction Services, Inc. located at the above address, which is 0.09 miles northwest of the proposed interchange improvements with a ground elevation of 1107 feet AMSL. The contact information is Roger Daniel Union Hill Road, Building 4C Alpharetta, GA 30004 and may be contacted by telephone at (770) 754-6440.

Site 4: RCRA Gen, 1685 Bluegrass Lakes Parkway Alpharetta, GA 30004

This site was identified as GAR000035256/VGN which is a conditionally exempt generator of hazardous waste owned by Alcoa Fujikura Ltd. (AFL) located at the above address, which is 0.23 miles northeast of the proposed interchange improvements with a ground elevation of 1079 feet AMSL. The hazardous wastes involved at this site include corrosive wastes, chromium, cadmium, benzene, methyl ethyl ketone, mercury, lead, and ignitable waste. The contact information is Kevin Mullins 1685 Bluegrass Lakes Parkway Alpharetta, GA 30004 and may be contacted by telephone at (770) 664-4949.

Site 5: RCRA Gen, 136 Noble Court Alpharetta, GA 30005

This site was identified as GAR000014795/VGN which is a conditionally exempt generator of hazardous waste owned by Orkin Exterminating Company located at the above address, which is 0.25 miles southeast of the proposed interchange improvements with a ground elevation of 1054 feet AMSL. The hazardous wastes involved at this site include aluminum phosphide (R, T) and reactive waste. The contact information is Matthew Davis 136 Noble Court Alpharetta, GA 30005 and may be contacted by telephone at (770) 442-0916.

Site 6: State SPILLS 90, 1725 Windward Concourse Alpharetta, GA 30202

This site was identified as GASP-1007-48450 which is a site where a spill of 10 to 15 gallons of hydraulic fluid occurred in 2007 due to a ruptured hydraulic line on a boom truck owned by L and W Supply Company located at the above address, which is 0.06 miles southeast of the proposed interchange improvements with an unknown ground elevation. The contact information is L and W Supply Company 1725 Windward Concourse Alpharetta, GA 30202.

Site 7: LUST, 6185 Windward Parkway Alpharetta, GA 30005

This site was identified as 09060871/NFA which is a no further action site owned by Sam's Mart #504 located at the above address, which is 0.45 miles southwest of the proposed interchange improvements

with an unknown ground elevation. The hazardous wastes involved at this site included two (2) leaking underground storage tanks, both of which occurred in 2000. The contact information is Sam's Mart #504 6185 Windward Parkway Alpharetta, GA 30005.

Site 8: UST, 1001 Windward Concourse Alpharetta, GA 30202

This site was identified as 0602016/Amended which is a spill site of hazardous waste owned by General Electric located at the above address, which is 0.03 miles southeast of the proposed interchange improvements with a ground elevation of 1052 feet AMSL. The hazardous wastes involved at this site include diesel fuel which occurred due to an overflow in 1992. The contact information is General Electric 1001 Windward Concourse Alpharetta, GA 30202 and may be contacted by telephone at (678) 526-6200.

It is concluded that these sites, or other sites listed in the database search, would not likely have an adverse affect on project implementation. Implementation of the proposed project would not preclude any necessary site remediation, if the need arises.

2.5 Existing Infrastructure within Project Vicinity

The existing supporting infrastructure within the study area is addressed in this report section. New interchanges can have an effect of inducing additional new land development, and the presence of sufficient infrastructure and facilities to serve the needs associated with that growth is important. Otherwise, there could be a substantial financial burden placed upon the local government with jurisdiction over that particular area. In this case, it would include Forsyth County as well as the Cities of Alpharetta, Milton, and Johns Creek.

2.5.1 Potable Water and Sanitary Sewerage

An attempt to collect the existing potable water and sanitary sewerage systems information was made to Forsyth County, and the Cities of Alpharetta, Milton, and Johns Creek. However, the requested information was only provided by Forsyth County, and is reflected in Figure 5: Existing Potable Water and Sanitary Sewerage. Based upon the nature of land development throughout the study area, it is expected that a similar pattern of potable water and sanitary sewer facilities would exist in the cities where no specific data were provided.

2.5.2 Other Utilities

This report section addresses the other requisite utilities that are necessary to support community development including electricity, natural gas, and stormwater drainage facilities.

2.5.2.1 Electricity

Adequate electrical service is of paramount importance to support urban development in all communities. The existing electrical facilities are illustrated in Figure 6: Electrical Facilities. It is readily evident that an extensive electrical system is currently available to support new development throughout the study area.

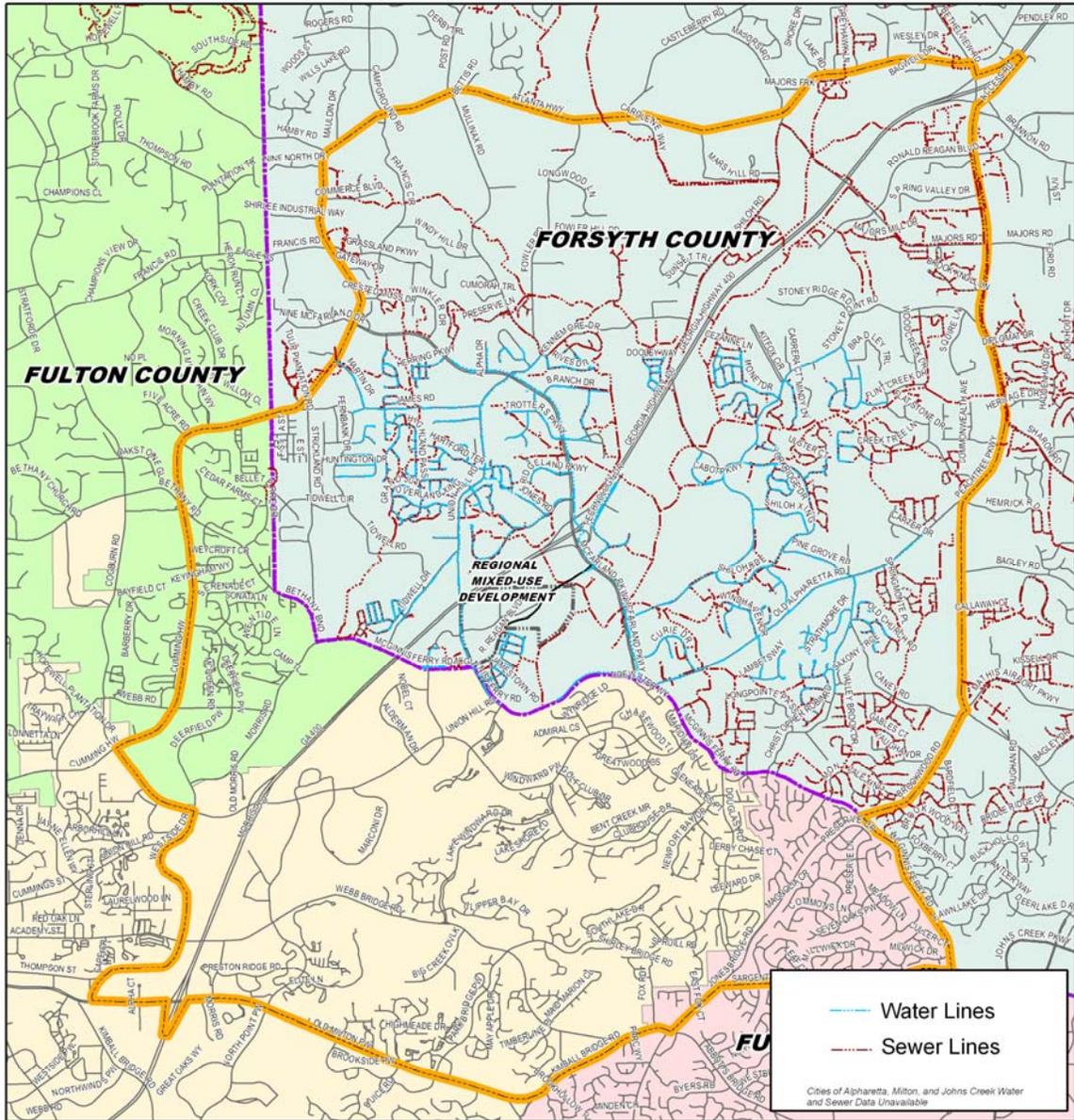
2.5.2.2 Natural Gas

An attempt to collect the existing natural gas systems information was made to Forsyth County, and the Cities of Alpharetta, Milton, and Johns Creek. However, the requested information was not provided by any of the jurisdictions.

2.5.2.3 Stormwater Drainage

Stormwater drainage facilities are utilized to collect rainwater after a storm event and redistribute that runoff to a stormwater pond wherein the runoff may slowly percolate into the soil. The collection system may include storm inlets, pipes, and manholes. Figure 7: Stormwater Drainage Facilities illustrates the location of the existing drainage features within the study area, except for the City of Alpharetta which could not provide that information. As illustrated, the study area is well served by existing stormwater drainage system facilities.

Figure 5: Existing Potable Water and Sanitary Sewerage



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

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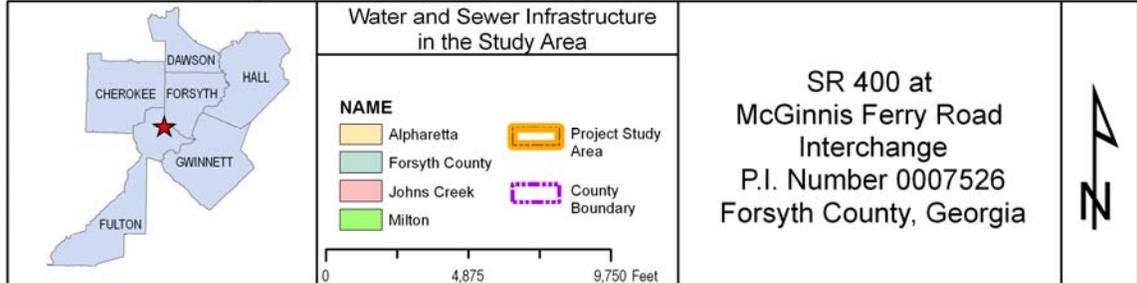
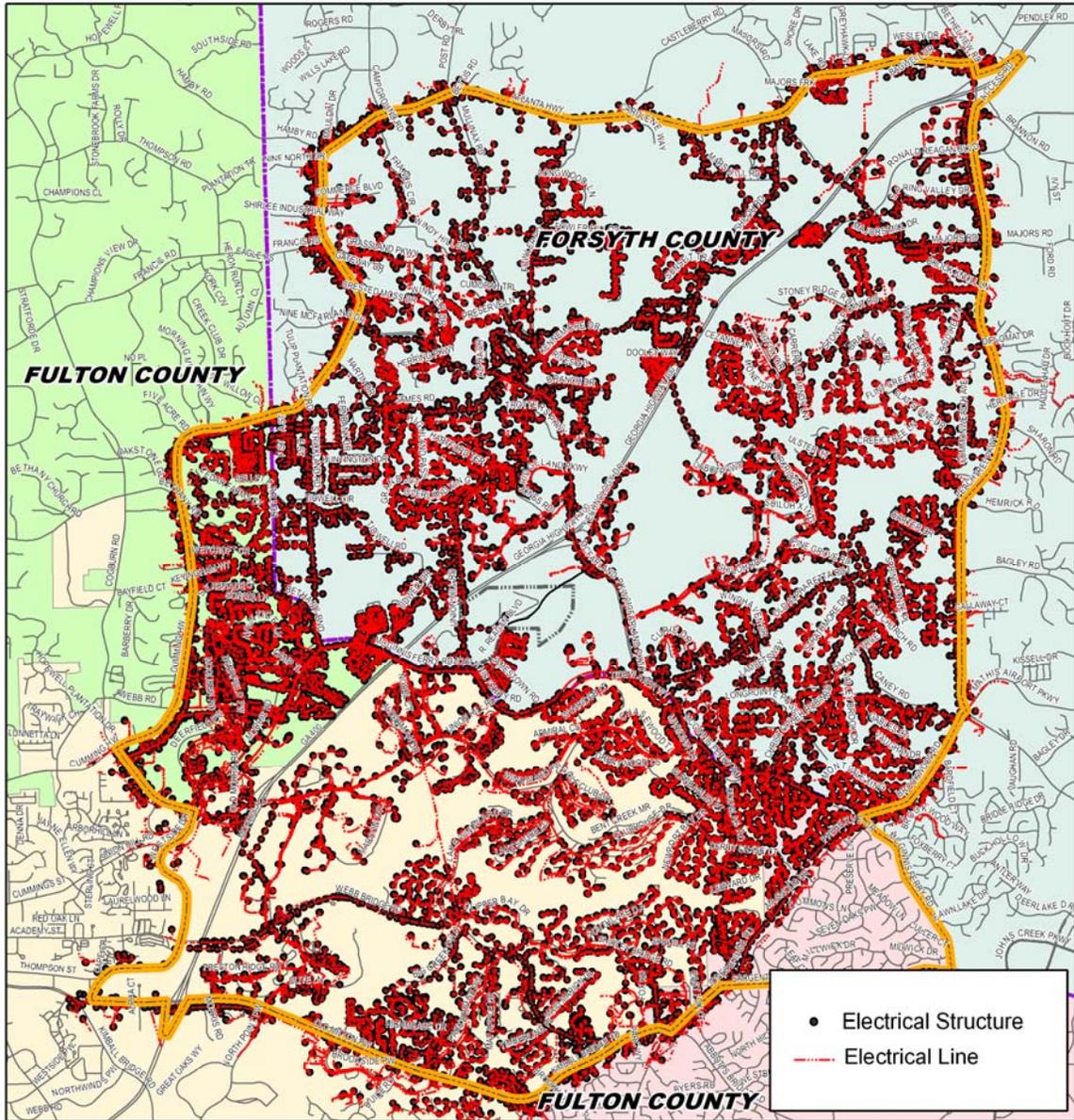


Figure 6: Electrical Facilities



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

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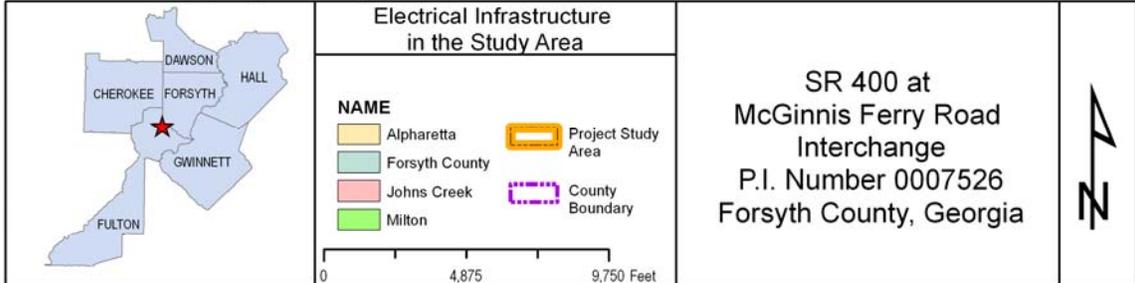
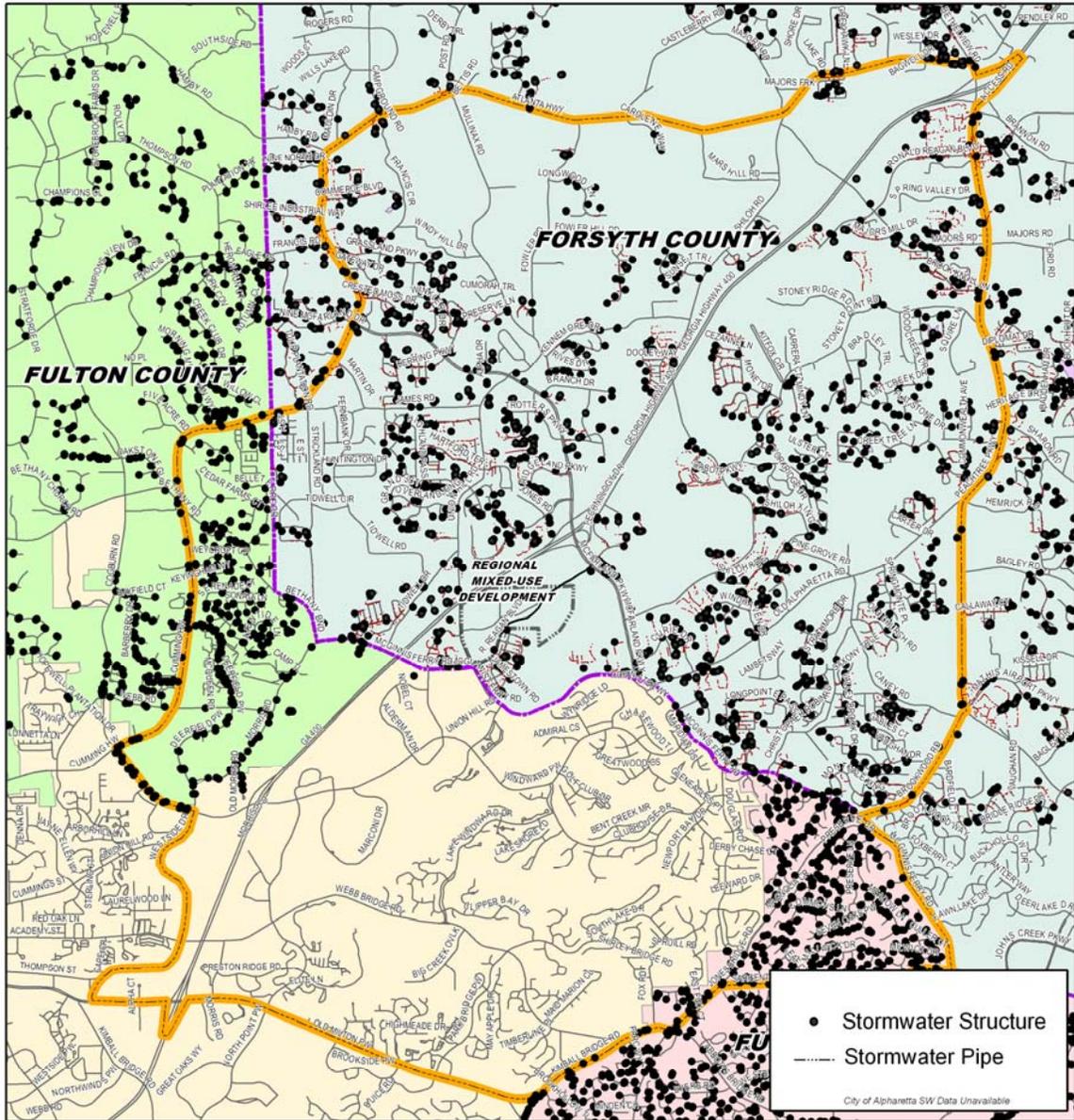
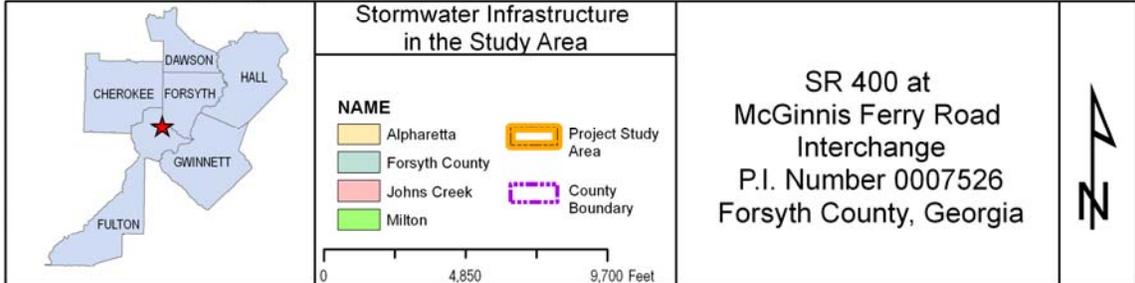


Figure 7: Stormwater Drainage Facilities



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

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2.5.3 Community Facilities

Community facilities provide the necessary support services to area residents as a community grows and develops. New growth areas without sufficient community facilities place an undue financial burden upon the local government. An evaluation of all existing community facilities within the study area was undertaken including public and private school facilities, parks, hospitals, churches, fire stations and police stations. As illustrated in Figure 8: Community Facilities in Study Area, the study area is a mature community with all of the requisite community facilities in place.

There are a number of schools located in the southern and northeastern portions of the study area and their names, locations, and school characteristics are presented in Table 10: Existing Schools in Study Area (1 of 2) and Table 11: Existing Schools in Study Area (2 of 2).

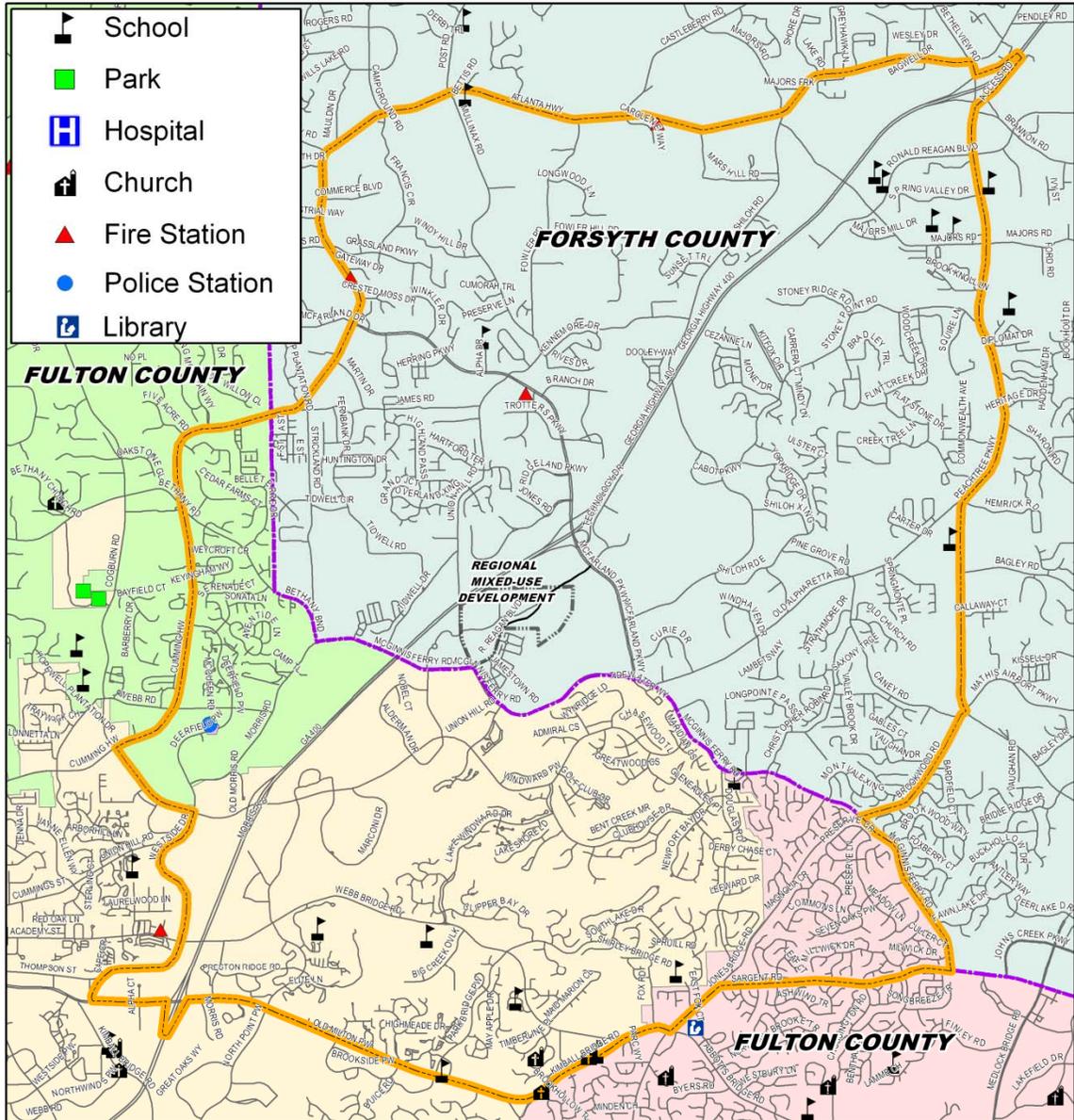
Besides schools, there are a number of other important community facilities existing within the study area. Hospitals, fire stations, and police stations are among the most important.

The City Hall building of the City of Milton is located at 13000 Deerfield Parkway within the study area and is also the location of the Milton Police Department. Forsyth County has three fire stations within the study as listed in Table 9: Forsyth County Fire Stations.

Table 9: Forsyth County Fire Stations

Name, Address and Telephone Number
Forsyth County Fire Station #2 4055 Carolene Way Cumming, GA 30040 Ph: (770) 781-2182
Forsyth County Fire Station #6 5885 Atlanta Highway Alpharetta, GA 30004 Ph: (770) 752-4772
Forsyth County Fire Station #14 800 McFarland Parkway Alpharetta, GA 30004 Ph: (770) 475-7971

Figure 8: Community Facilities in Study Area



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

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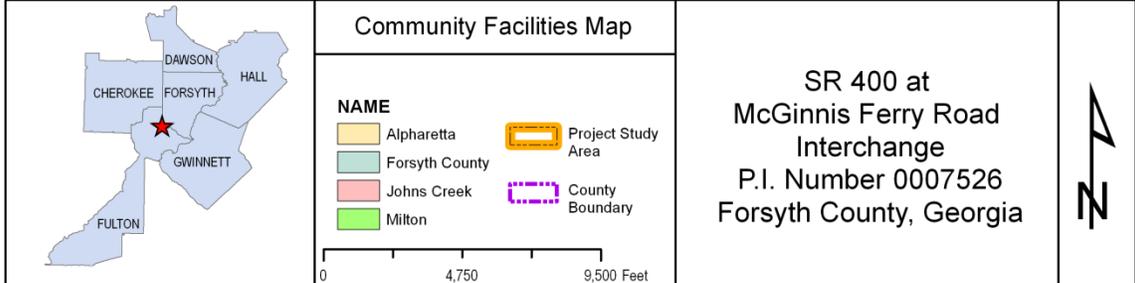


Table 10: Existing Schools in Study Area (1 of 2)

School Name & Address	Type & Grades
Alpharetta Christian Academy 44 Academy Street Alpharetta, GA 30004 Ph: (770) 475-5762	Private - Grades: KG-4 Status: <i>Operational</i>
Alpharetta High School 3595 Webb Bridge Road Alpharetta, GA 30005 Ph: (770) 521-7640	Public - Grades: 9-12 Status: <i>Operational</i> District: Fulton County
Alpharetta International Academy 4772 Webb Bridge Road Alpharetta, GA 3005 Ph: (770) 475-0558	Private - Grades: PK-3 Status: <i>Operational</i>
Big Creek Elementary 1994 Peachtree Parkway Cumming, GA 30041-7200 Ph: (770) 887-4584	Public - Grades: PK-5 Status: <i>Operational</i> District: Forsyth County
Bridgeway Christian Academy 4755 Kimball Bridge Road Alpharetta, GA 30005 Ph: (770) 751-1972	Private - Grades: PK-9 Status: <i>Operational</i>
Chattahoochee High School 5230 Taylor Road Alpharetta, GA 30022-6015 Ph: (770) 521-7600	Public - Grades: 9-12 Status: <i>Operational</i> District: Fulton County
Covenant Christian Academy 6905 Post Road Cumming, GA 30040 Ph: (770) 674-2990	Private - Grades: PK-12 Status: <i>Operational</i>
Creek View Elementary 3995 Webb Bridge Road Alpharetta, GA 30005 Ph: (770) 667-2932	Public - Grades: KG-5 Status: <i>Operational</i> District: Fulton County
Daves Creek Elementary School 3740 Trammel Road Cumming, GA 30041-6940 Ph: (770) 888-1222	Public - Grades: PK-5 Status: <i>Operational</i> District: Forsyth County
Forsyth Christian School 1250 Alpha Drive Alpharetta, GA 30004 Ph: (770) 781-4385	Private - Grades: KG-12 Status: <i>Operational</i>
Forsyth County Academy 7745 Majors Road Cumming, GA 30041 Ph: (770) 781-3141	Public Charter - Grades: 9-12 Status: <i>Operational</i> District: Forsyth County

Table 11: Existing Schools in Study Area (2 of 2)

School Name & Address	Type & Grades
Lake Windward Elementary School 11770 East Fox Court Alpharetta, GA 30005-7800 Ph: (770) 740-7050	Public - Grades: PK-5 Status: <i>Operational</i> District: Fulton County
Lanier Technical College 7745 Majors Road Cumming, GA 30041 Ph: (770) 781-6800	Private - Grades: College Status: <i>Operational</i> District: Forsyth County
McGinnis Woods Country Day School 5368 McGinnis Ferry Road Alpharetta, GA 30005 Ph: (770) 664-7764	Private - Grades: PK-7 Status: <i>Operational</i>
Midway Elementary School 4805 Highway 9 North Alpharetta, GA 30004-2920 Ph: (770) 475-6670	Public - Grades: PK-5 Status: <i>Operational</i> District: Forsyth County
New Prospect Elementary School 3055 Kimball Bridge Road Alpharetta, GA 30022-4417 Ph: (770) 667-2800	Public - Grades: PK-5 Status: <i>Operational</i> District: Fulton County
Ocee Elementary School 4375 Kimball Bridge Road Alpharetta, GA 30022 Ph: (770) 667-2960	Public - Grades: PK-5 Status: <i>Operational</i> District: Fulton County
Piney Grove Middle School 8135 Majors Road Cumming, GA 30041 Ph: (770) 887-2461	Public Status: <i>Operational</i> District: Forsyth County
Shiloh Point Elementary School 8145 Majors Road Cumming, GA 30041 Ph: (770) 887-2461	Public Status: <i>Operational</i> District: Forsyth County
South Forsyth High School 585 Peachtree Parkway Cumming, GA 30041 Ph: (770) 781-2264	Public - Grades: 9-12 Status: <i>Operational</i> District: Forsyth County
South Forsyth Middle School 2865 Old Atlanta Road Cumming, GA 30041 Ph: (770) 888-3170	Public - Grades: 6-8 Status: <i>Operational</i> District: Forsyth County
Teach Charter High School 4100 Old Milton Parkway Alpharetta, GA 30005 Ph: (404) 768-3600	Public Charter - Grades: 9-10 Status: <i>Operational</i> District: Fulton County
Webb Bridge Middle School 4455 Webb Bridge Road Alpharetta, GA 30005-4256 Ph: (770) 667-2940	Public - Grades: 6-8 Status: <i>Operational</i> District: Fulton County

There are two churches within the study area: Messiah Evangelical Lutheran Church and Bridgeway Baptist Church. There are several other churches located near the perimeter of the study area in North Fulton County and the City of Milton.

There are no hospitals located within the study area; however, there are two such facilities located near the study area: Emory Johns Creek Hospital east of the study area at 6325 West Johns Crossing Johns Creek, GA 30097 and Northside Hospital Forsyth located at 1200 Northside Forsyth Drive Cumming, GA 30041 near the SR 400/SR 20 interchange.

There are no existing parks within the study area; however, there are two such facilities located near the study area. The Providence Outdoor Recreation Center is located at 3440 Providence Park Drive in Alpharetta, GA 30004 which is just west of the study area. The Ocee Park is located just south of the study area at 10900 Buice Road in Alpharetta, GA 30201.

2.5.4 Existing Roads

The study area is served by both north-south and east-west roadways including urban principal arterials, urban minor arterials, urban collectors, and urban local streets. The roads within the North Fulton County part of the study area are very densely spaced and include many residential streets. The most significant roadways within the study area include those listed in Table 12: Existing Major Roadways in Study Area and are shown in Figure 9: Existing Major Roadways within Study Area.

2.6 Existing Land Use

Over the past 20 years, the Atlanta region has experienced explosive growth, primarily driven by the communications industry and the increased transportation infrastructure. Between 1990 and 2000, the Atlanta region grew by 34%, averaging an annual growth rate of 3.4%, or adding approximately 87,700 new residents per year. According to the 2010 census, the growth between 2000 and 2010 slowed to approximately 68,000 additional residents per year. The twenty county ARC air quality region had an approximate population of 5.5 million according to the 2010 census, and is expected to increase to more than 8.3 million by 2040, according to ARC projections.

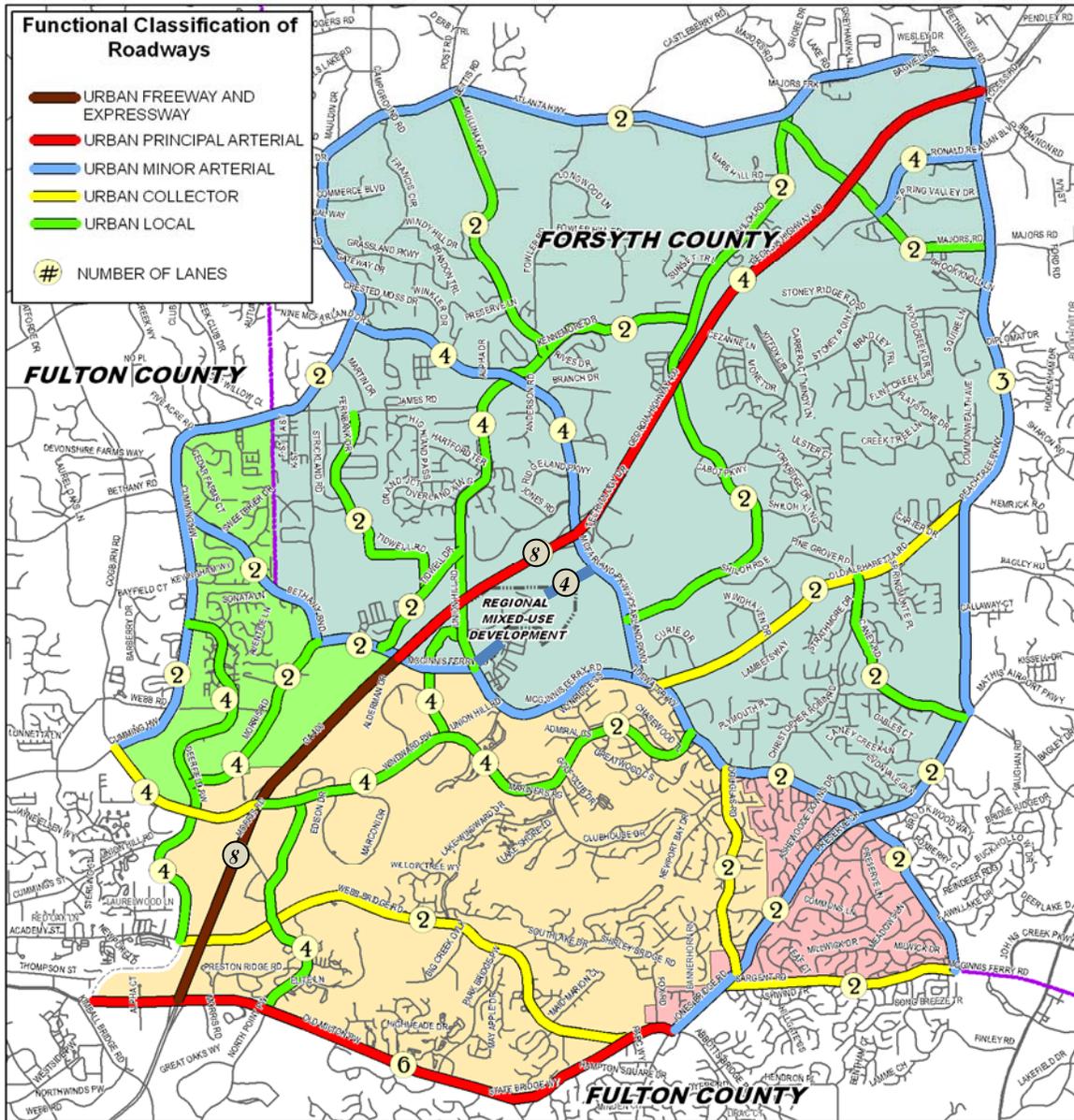
The regional job growth has mirrored this increase in population. Much of the region's job growth occurred along the SR 400 corridor, from the North Fulton Community Improvement District (CID) to central Forsyth County. Since the late 1990s, the North Fulton area has evolved into a community unto itself, with a thriving business and living climate. The population of the City of Alpharetta in 2010 was approximately 57,551 and is expected to increase to 69,395 by 2030. Forsyth County has experienced dramatic employment and population growth since 2000. The growth forecasts show an increase of 114% totaling approximately 202,000 persons and 71,300 jobs by 2040. Forsyth County had a population of approximately 181,840 according to the 2010 census. Based on ARC projections, that population is projected to grow to approximately 378,400 by 2040. Forsyth employment was estimated by the ARC to be 57,700 in 2010 and is forecasted to grow to 129,000 by 2040⁵. The City of Milton, incorporated in 2006, had a population of 32,661 in 2010 with growth expected to mirror that of Alpharetta and Forsyth County. The City of Johns Creek was also incorporated in 2006 and has an existing population of 76,728, according to the 2010 Census. It is estimated in the City's Comprehensive Plan that the total population will be approximately 94,304 people in the year 2030.

⁵ Atlanta Regional Commission projections taken from the February, 2011 Regional Snapshot.

Table 12: Existing Major Roadways in Study Area

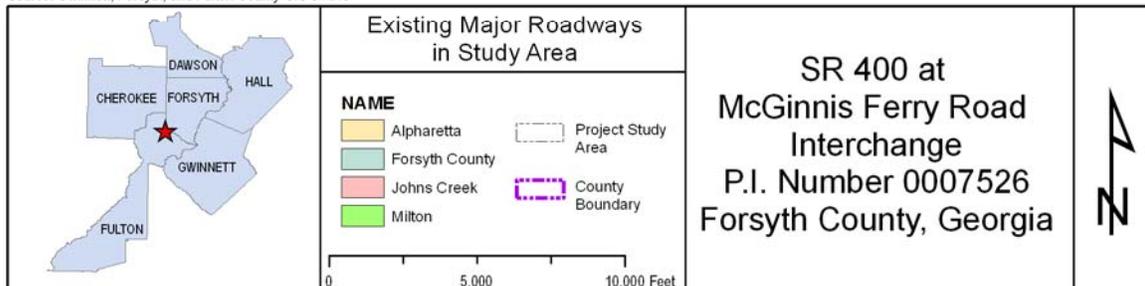
Roadway	Functional Classification	Number of Lanes
SR 400 (Fulton County)	Urban Freeway and Expressway	8
SR 400 (Forsyth County)	Urban Principal Arterial	6/4
Atlanta Highway (SR 9)	Urban Minor Arterial	2/3
Cumming Highway (SR 9)	Urban Minor Arterial	2
Peachtree Parkway (SR 141)	Urban Minor Arterial	2/3
Brookwood Road	Urban Minor Arterial	2
Jones Bridge Road	Urban Minor Arterial	2
Old Milton Parkway (SR 120)	Urban Principal Arterial	6
Westside Parkway	Urban Local Street	4
Majors Road	Urban Local Street	2
Shiloh Road	Urban Local Street	2
Mullinax Road	Urban Local Street	2
McFarland Parkway	Urban Minor Arterial	4
Union Hill Road	Urban Local Street	2/4
Tidwell Drive	Urban Local Street	2
Tidwell Drive	Urban Local Street	2
Bethany Bend Road	Urban Minor Arterial	2
Old Alpharetta Road	Urban Collector Street	2
McGinnis Ferry Road	Urban Minor Arterial	2/3
Sargent Road	Urban Collector Street	2
Windward Parkway (West of SR 400)	Urban Collector	4
Windward Parkway (East of SR 400)	Urban Local Street	4
Windward Concourse	Urban Local Street	4
North Point Parkway	Urban Local Street	4
Webb Bridge Road	Urban Collector Street	2
Douglas Road	Urban Collector Street	2
Deerfield Parkway	Urban Local Street	4
Ronald Reagan Boulevard	Urban Minor Arterial	4
Caney Road	Urban Local Street	2
Morris Road	Urban Local Street	2/4

Figure 9: Existing Major Roadways within Study Area



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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Existing employment centers are located primarily adjacent to the SR 400 corridor with dense nodes of offices adjacent to freeway interchanges (Figure 10: Existing Land Use Map). Development patterns from I-285 and the North Fulton CID area to north of the McFarland Parkway interchange appear to favor office and commercial uses along the SR 400 corridor, with high-to-low density residential uses beyond both sides of the corridor. The interchange areas, especially those with undeveloped land or redevelopment potential, are expected to continue this development trend. The east and west side of the SR 400 corridor between Windward Parkway and McFarland have more undeveloped land than the freeway interchanges farther south. As the population in the area continues to increase, the existing employment and commercial sectors are expected to grow to accommodate those demands of the expanding population. These expanding employment centers will require additional freeway access in order to satisfy future travel demands. The residential, commercial, and office development is expected to continue in this area despite no additional access point. Without relief, the interchanges at McFarland Parkway and Windward Parkway will experience unacceptably high levels of congestion as this area continues to develop.

In addition to providing traffic relief, the new access to the freeway will provide regional economic benefits by providing the necessary infrastructure for future economic development. Continued development of the Windward Business Park and commercial properties in the study area would provide goods and services to the region and create employment opportunities.

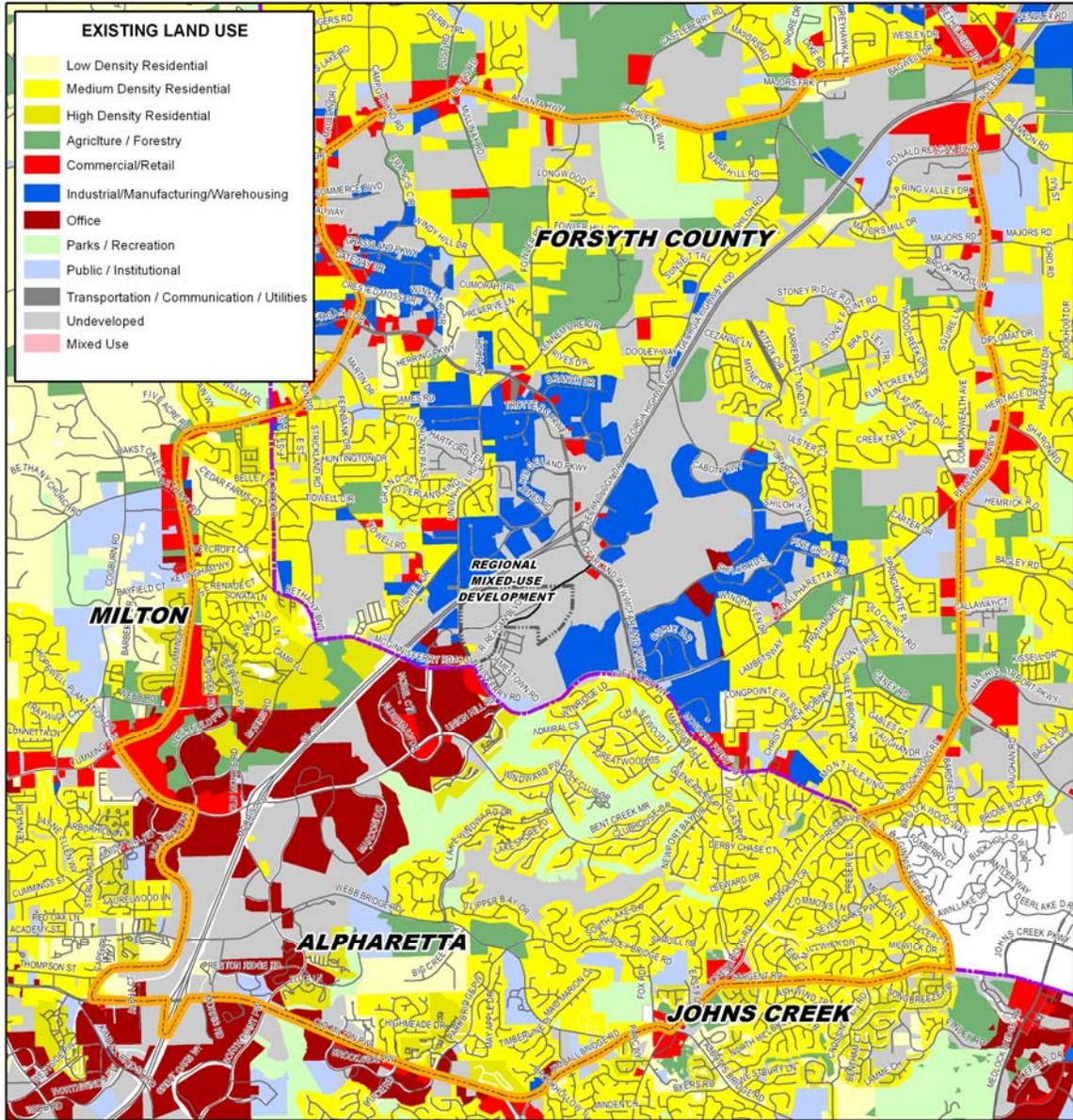
The importance of a new freeway access point has been recognized in Forsyth County, and the Cities of Alpharetta, Johns Creek, and Milton. Furthermore, the North Fulton Community Improvement District (CID) has recognized the need for an additional SR 400 interchange due to decreasing levels of service and congestion in the areas of the existing SR 400 interchanges. Existing land uses in the study area include mostly medium-to-low density residential with some high density residential, office and retail commercial, industrial, parks, public/institutional, and undeveloped land. While the area is well served in terms of the types and number of major thoroughfares, the capacity of the facilities is routinely exceeded during peak travel periods. Figure 14 illustrates that this urbanized corridor of North Fulton County and South Forsyth County is within the Atlanta planning region.

2.7 Current Zoning

Most local governments utilize zoning to establish the applicable land development regulations pertaining to a particular parcel of land within their jurisdiction. Zoning regulates the location of specific land uses; building height, size, and separation; and the intensity or density of development. Thus, zoning has a major effect on traffic generation and distribution. The current zoning classifications for the local government jurisdictions occurring within the study area are illustrated in the composite map presented in Figure 11: Current Zoning Classifications.

As illustrated, the predominate zoning classifications in North Fulton County are Planned Unit Development in the City of Alpharetta east of SR 400, Office and Industrial District west of SR 400, and Commercial zoning along SR 9 in the City of Milton. In South Forsyth County, there is a major allocation of Restricted Industrial zoning towards the center of the study area with Commercial zoning on the east side of SR 400 where the proposed regional mixed-use mall development is planned. Additionally, there is a significant allocation of Commercial zoning distributed along SR 141 (Peachtree Parkway) from Brookwood Road to Majors Road.

Figure 10: Existing Land Use Map



Source: Forsyth County, Cities of - Alpharetta, Milton, and Johns Creek

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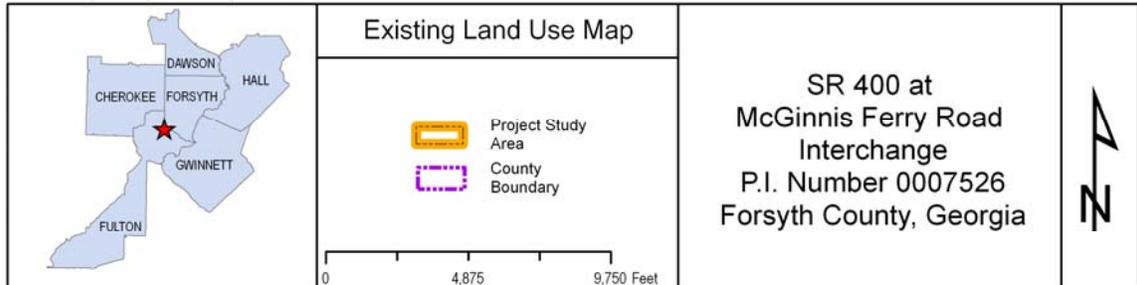
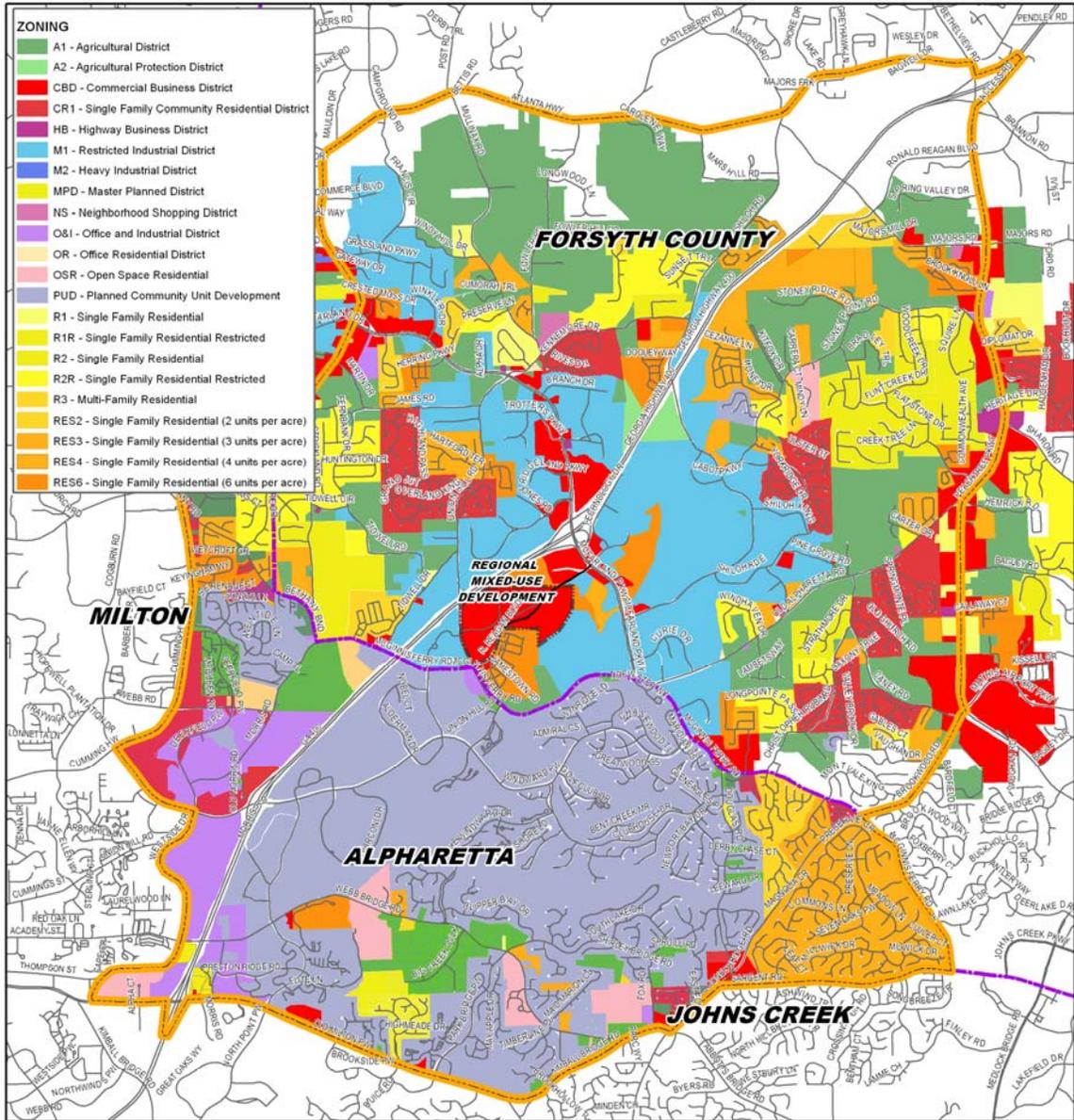
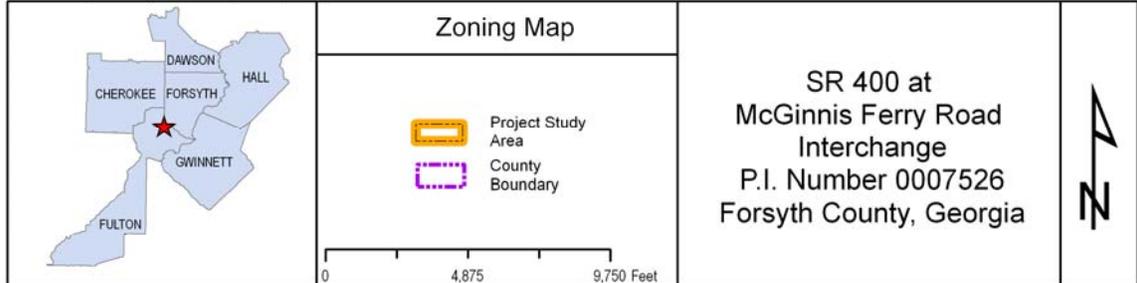


Figure 11: Current Zoning Classifications



Source: Forsyth County, Cities of - Alpharetta, Milton, and Johns Creek

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Based upon the current zoning classifications within the study area, there will be a strong attraction of work and shopping related trips to the core of the study area, which will demand future interchanges at urban spacing standards along SR 400.

2.8 Existing and Pending Land Development Projects

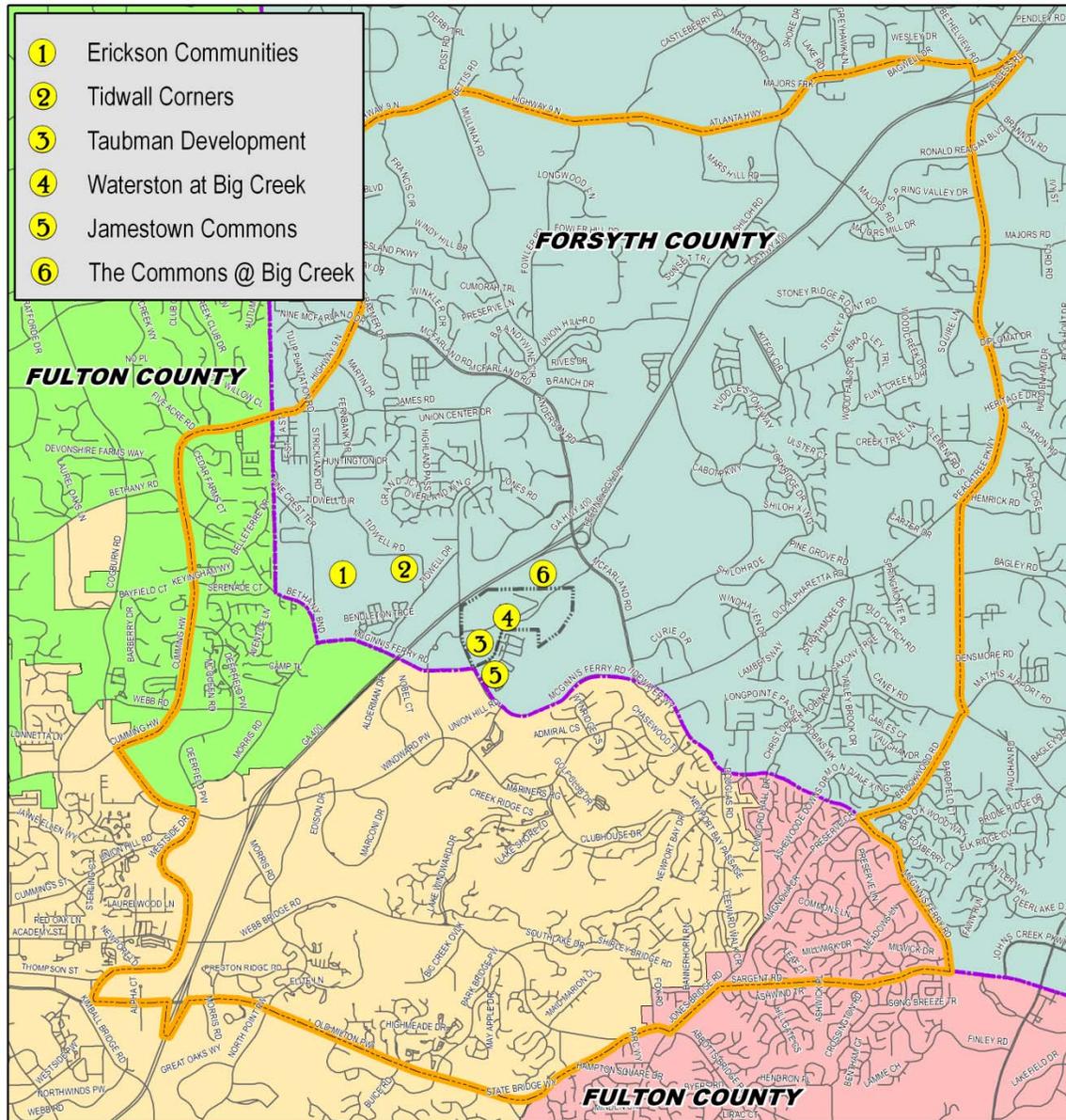
The existing private land development projects that either have been recently completed or are pending over the next five years were identified and are listed in Table 13: Existing and Pending Land Developments within Study Area. The geographic locations of those listed projects within the study area are illustrated in Figure 12: Existing and Pending Land Development Locations within Study Area.

Table 13: Existing and Pending Land Developments within Study Area

Project Name or Developer	Local Government Jurisdiction	Project Size & Type	Proposed Land Use(s)	Status
Erickson Communities	Forsyth County	160 Acres of Mixed-Use Residential and Commercial	983 Dwelling Units and 250,000 SF of Retail Commercial	Not Yet Submitted for Permit
Tidwell Corners	Forsyth County	Warehousing	Warehouse Buildings	As-Built for Phase III Approved 4-30-10
TRG Forsyth LCC (Taubman Company)	Forsyth County	Mixed-Use, High End Retail and Office Complex	1,400,000 SF of Retail Commercial, 900,000 SF of Rentable Square Feet of Offices, 500 Room Hotel, 875 Residential Units	Not Yet Submitted for Permit
Waterstone at Big Creek	Forsyth County	Multi-Family Development	270 Unit Apartments	Permit, File #SD 110042, Issued 1-31-12
Jamestown Commons	Forsyth County	Office	34 Unit Office Condominiums	Phase III As Built approved 5-11-11, File #SD 070052
The Commons at Big Creek	Forsyth County	Mixed Use residential, retail, hotel, office.	586 Residential Units, 330,000 SF retail, 345 Hotel Rooms, 96,000 SF Office.	Under DRI review

Source: Forsyth County, 2012

Figure 12: Existing and Pending Land Development Locations within Study Area



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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	<p>Existing & Pending Land Development Projects in Study Area</p> <table border="0"> <tr> <td> Alpharetta</td> <td> Forsyth County</td> <td> Johns Creek</td> <td> County Boundary</td> </tr> <tr> <td> Project Study Area</td> <td></td> <td></td> <td></td> </tr> </table> <p>0 5,000 10,000 Feet</p>	 Alpharetta	 Forsyth County	 Johns Creek	 County Boundary	 Project Study Area				<p style="text-align: center;">SR 400 at McGinnis Ferry Road Interchange P.I. Number 0007526 Forsyth County, Georgia</p>	
 Alpharetta	 Forsyth County	 Johns Creek	 County Boundary								
 Project Study Area											

2.9 Future Land Use Plan and Currently Adopted Comprehensive Plans

Future development trends in the study area consist of expansions of the current land use patterns, with elements of residential, retail commercial, office, and industrial uses. The adopted Future Land Use Plans for the Cities of Alpharetta, Johns Creek and Milton as well as South Forsyth County were collected and utilized to create a composite Future Land Use Map presented in Figure 13: Future Land Use Map of Study Area. As illustrated in Figure 13, the future land uses along this urbanized corridor would continue to grow as expansions of the current land use pattern presented in Figure 10. The Future Land Use Map illustrates retail commercial, industrial, and office centers in the immediate vicinity of SR 400, with high-density and mixed-use residential uses just beyond the employment centers and offices.

The land uses that surround two of the alternatives described in Section 3.0 which propose a new interchange at SR 400 and McGinnis Ferry Road include a major commercial/industrial node with retail commercial in both southern quadrants of the interchange and include industrial and retail commercial development in the northeast quadrant. The northwest quadrant would be comprised of high-density residential uses with a small amount of retail commercial as well as some activity center development. Forsyth County established in their Comprehensive Plan a policy of promoting Traditional Neighborhood Development and activity center type developments that can have a strong affect on the future land use patterns of the county. Such developments will offer a greater variety of housing choices and help to promote easier access to retail markets and employment opportunities. These types of development also lend a greater sense of character and community identity, which could help distinguish Forsyth County from other surrounding counties.

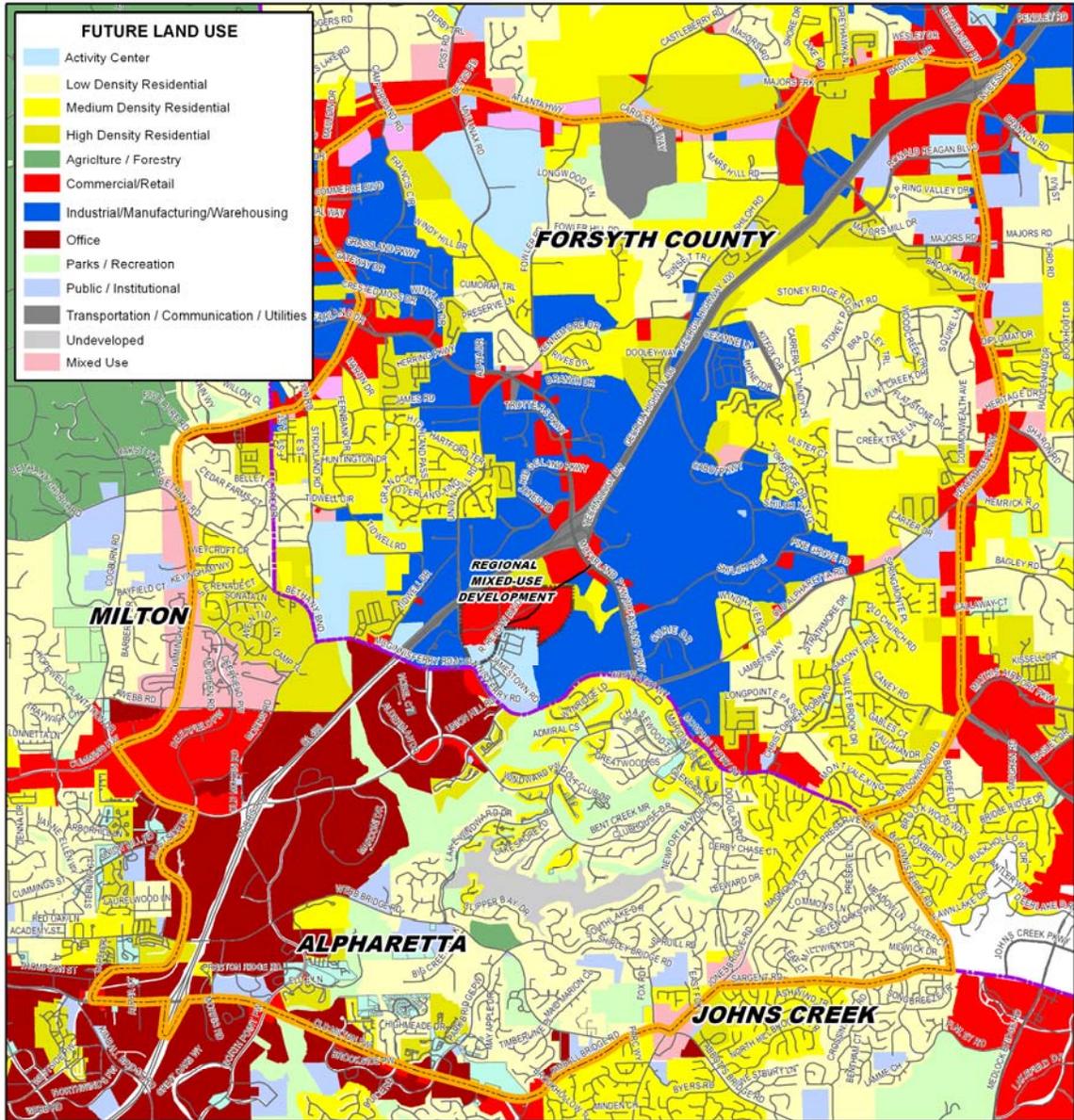
The future development beyond the immediate uses adjacent to SR 400 would include low-to-medium density residential uses, a park, recreation and open spaces, various activity center developments, and commercial mixed uses. The study area has a large amount of developable land especially adjacent to SR 400 accounting for approximately half of the total area, as illustrated in Figure 10. All of the considered alternatives would be compatible with the planned future land uses in the study area.

The Comprehensive Plan (2004 – 2025) of Forsyth County was adopted on February 23, 2004. On December 14, 2004; June 5, 2008; and September 4, 2008, the County amended their Comprehensive Plan. Currently the Comprehensive Plan is undergoing a major revision to update for the next ten year period and will be good for the years 2012-2032. The purpose of this plan is to guide the intensity, location, and timing of new development and redevelopment and to ensure compatibility with existing development, future population and economic development trends, community infrastructure, and natural and cultural resources.

The Alpharetta Comprehensive Plan - 3030 is a long-range plan for guiding development in the city for the next twenty years. The overall goal of the plan is to accommodate development in a timely, orderly, and efficient arrangement of land uses and public facilities and services that meet the needs of the present and future residents and businesses of Alpharetta. In addition, the plan encompasses neighboring areas outside of the city limits that may be considered for annexation. The City of Alpharetta adopted the Comprehensive Plan - 2030 on November 28, 2011.

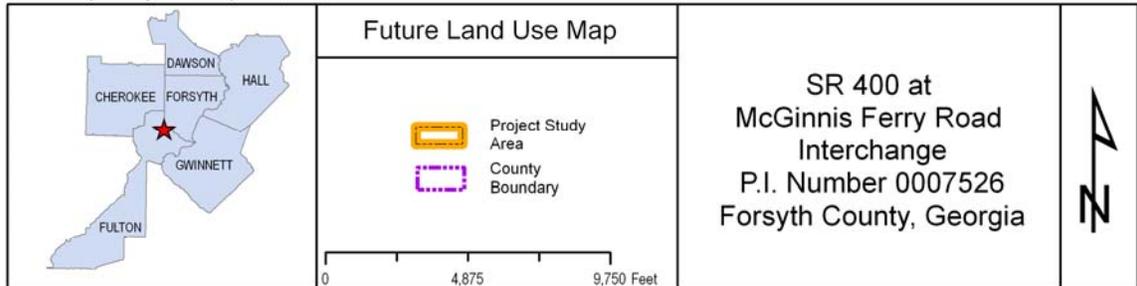
The City of Milton adopted their 2030 Comprehensive Plan on June 6, 2011. The plan contains a list of issues and opportunities, a future development map, and a future land use map.

Figure 13: Future Land Use Map of Study Area



Source: Forsyth County, Cities of - Alpharetta, Milton, and Johns Creek

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On November 10, 2008, the City of Johns Creek adopted its Comprehensive Plan 2030. The Plan includes a Future Development map with established character areas and land uses, a Transportation Master Plan, a Green Plan, and a Short-Term Work Program for implementation purposes.

A new interchange at SR 400 and McGinnis Ferry Road is called for within the comprehensive plans of the City of Milton and Forsyth County.

2.10 Consistency with Regional and State Transportation Plans

Both the regional plan prepared and adopted by the Atlanta Regional Commission (ARC) and the State Transportation Improvement Plan prepared and adopted by the Georgia Department of Transportation (GDOT) were reviewed to ensure consistency of this IJR with those other applicable long-range planning documents.

2.10.1 ARC Plan

Transportation is central to metro Atlanta's growth and success. On behalf of the Metropolitan Planning Organization (MPO), the Atlanta Regional Commission (ARC) develops regional plans and policies to enhance connectivity, reduce traffic congestion and meet ambient air quality standards (Figure 14).

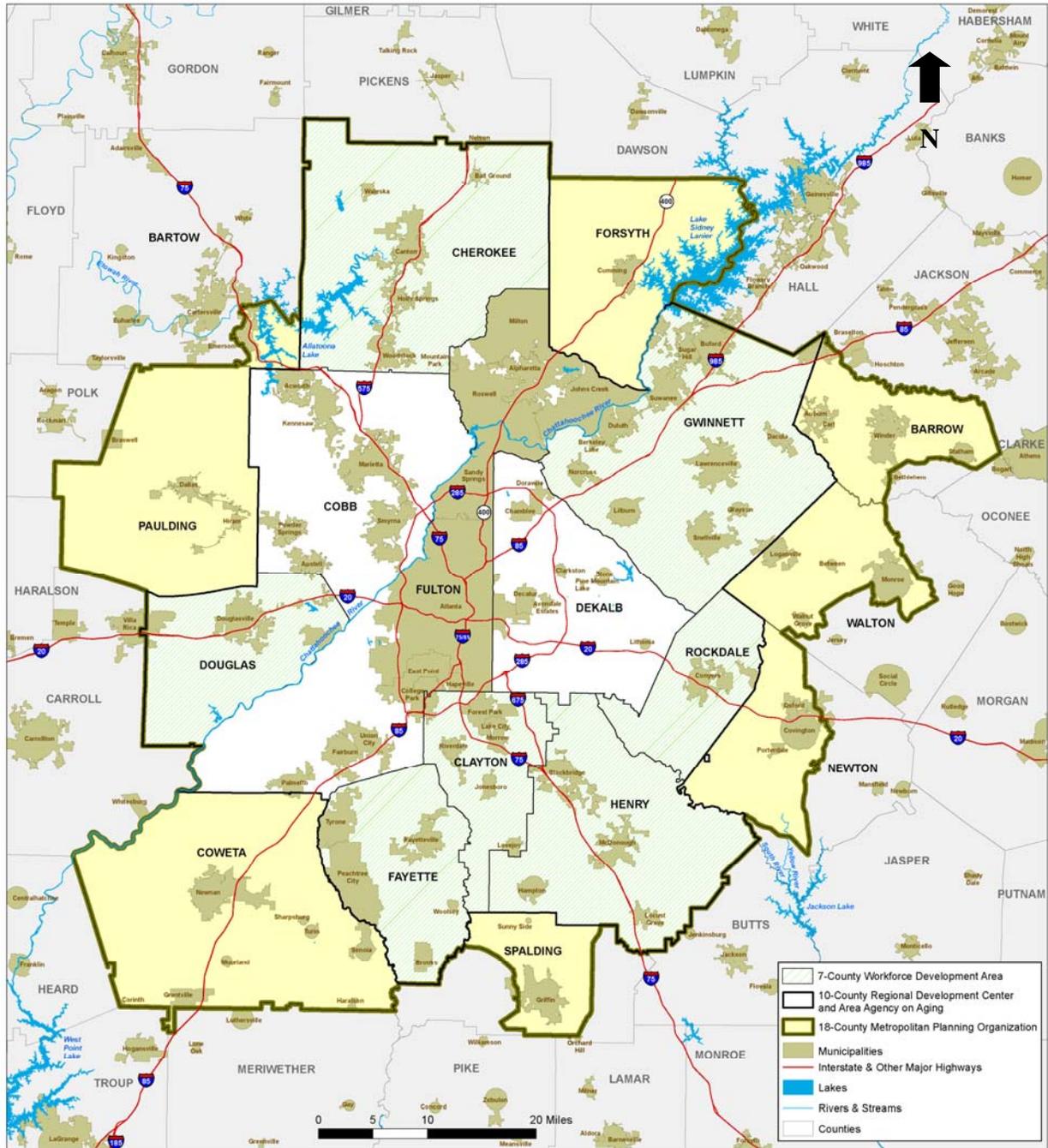
The Regional Transportation Plan (RTP) is a long-range plan which includes a balanced mix of projects such as bridges, bicycle paths, sidewalks, transit services, new and upgraded roadways, safety improvements, transportation demand management initiatives, and emission reduction strategies. By federal law, the RTP must cover a minimum planning horizon of 20 years and be updated every four years in geographic areas that do not meet federal air quality standards, such as the Atlanta metro area.

The Atlanta Regional Commission is responsible for the development of the RTP for the City of Atlanta and the eighteen surrounding counties: Barrow, Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, Spalding, Rockdale, and Walton.

The Atlanta Regional Commission forecasts that 2.3 million more people will move to this region in the next 25 years. *Plan 2040*, the current RTP, integrates land use, transportation, and water planning. The long-range RTP forms the basis upon which the short-range Transportation Improvement Program, which covers a six-year time period, is developed. The MPO adopted *Plan 2040*, FY 2012-2017 Transportation Improvement Program (TIP), Conformity Determination Report, and the Public Involvement Report in July, 2011. In September, 2011, the U.S. Department of Transportation in coordination with the U.S. Environmental Protection Agency found the *Plan 2040* RTP/TIP conforms to the air quality requirements for the 8-hour ozone standard and the Particulate Matter (PM) 2.5 standard. The Board of the Georgia Regional Transportation Authority (GRTA) on behalf of the Governor approved the FY 2012-2017 TIP in August, 2011.

The considered alternatives are located within the MPO area jurisdiction. However, none of the considered Alternatives are contained in *Plan 2040*. If the GDOT Office of Planning's review indicates that the proposed alternative is appropriate and will benefit regional access, GDOT will notify the Sponsor, Forsyth County, and the ARC. Upon such notification, the Sponsor may request that ARC include the proposed SR 400/McGinnis Ferry Road interchange in the Regional Transportation Plan in accordance with their procedures.

Figure 14: The Atlanta Metropolitan Planning Region



2.10.2 Committed Projects

Committed projects are those projects that are in the RTP which have been programmed for funding during the first six years of the planning horizon. The committed projects for this part of Forsyth County, the City of Alpharetta and the remainder of the study area that would provide sustainable traffic capacity and connectivity have been identified. The No-Build Alternative would be comprised of the existing roadways plus the committed short-term projects listed in the adopted Transportation Improvement Program (TIP) as being programmed and currently funded as well as any local government projects that

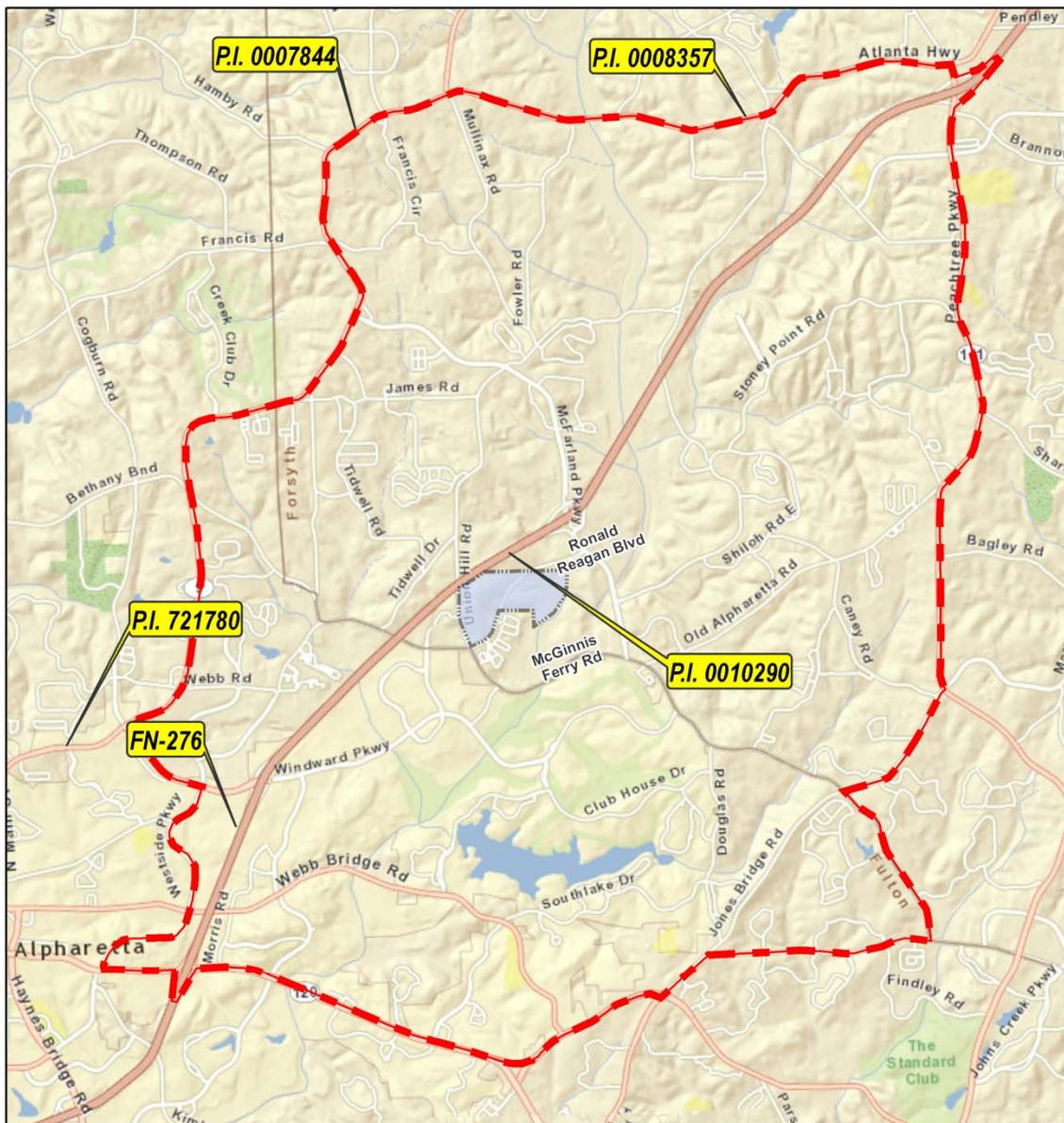
are fully funded and programmed for construction within the next 6 years. Table 14: Committed Transportation Projects in the Study Area provides those projects that are currently listed in the TIP 2012-2017 and located within the study area as well as applicable local projects, and all of these project locations are shown in Figure 15: Committed Transportation Projects in the Study Area. There are five major transportation infrastructure projects programmed in the study area that are directly or indirectly related to the proposed alternatives:

1. SR 400 restriping to create a continuous fourth lane in the southbound direction from Windward Parkway to the southbound exit ramp at SR 140 (Holcomb Bridge Road), Fulton County. This project would add highway capacity to SR 400 southbound along the project limits by adding one new travel lanes in the southbound direction. The project length is approximately 5.7 miles. Construction is programmed for fiscal year 2012. The ARC TIP reference number is FN-276.
2. 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.
3. SR 400 lane extension in the northbound direction, P.I. No. 0010290, Forsyth County. The proposed project would extend a 12-foot general purpose lane on SR 400 in the northbound direction from the end of the four-lane cross-section just south of McGinnis Ferry Road overpass to the Big Creek Greenway Bridge. The total project length is approximately 1.75 miles. This project is proposed to be let as a design-build contract in fiscal year 2012. The ARC TIP reference number is FT-321.
4. 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.
5. 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.

Table 14: Committed Transportation Projects in the Study Area

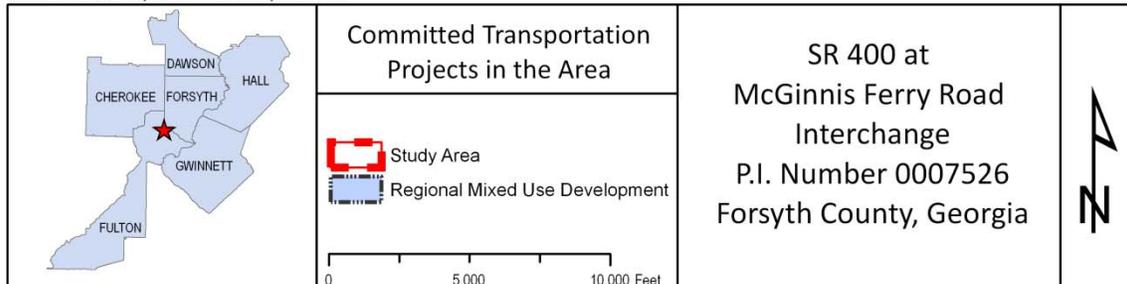
GDOT PI # (Jurisdiction)		ARC TIP Reference Number	Project Description	Type	Implementation	Network Year
GDOT Project #						Open Year
1	Fulton County	FN-276	SR 400 Restriping to create continuous fourth lane in southbound direction	Southbound Restriping from Windward Parkway to Southbound Exit Ramp at SR 140 (Holcomb Bridge Road)	ROW – None Required Design-Build Contract Construction - 2012	2016
	N/A					2012
2	P.I. No. 721780 (Fulton County)	FN-067A	SR 9 (North Main Street/Cumming Hwy) from Academy Street to Windward Parkway	Widening from 2 to 4 lanes	Engineering – 2007, ROW Acquisition – 2017 Construction - 2019	2010
	STP00-0114-01(084)					2021
3	P.I. No. 0010290 (Forsyth County)	FT-321	SR 400 Lane Extension in Northbound Direction	From end of four lane cross-section just south of McGinnis Ferry Road overpass to Big Creek Bridge	Engineering – 2011 ROW – None Required Design Build Contract Construction – 2012	2016
	N/A					2016
4	P.I. No. 0007844 (Forsyth County)	FT-001B	SR 9 (Atlanta Highway) from McFarland Pkwy to SR 371 (Post Road)	Widening from 2 to 4 lanes	Engineering – 2007 ROW Acquisition – 2016 Construction - 2020	2030
	CSSTP-0007-00(844)					2022
5	P.I. No. 0008357 (Forsyth County)	FT-001C	SR 9 (Atlanta Highway) from SR 371 (Post Road) to SR 141 (Peachtree Parkway)	Widening from 2 to 4 lanes	Engineering – 2011 ROW Acquisition – 2016 Construction - 2020	2030
	CSSTP-0008-00(357)					2022

Figure 15: Committed Transportation Projects in the Study Area



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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2.10.3 Planned Projects

There are other planned projects included within the RTP that may be funded in future years that would also benefit the study area. These projects were included in the year 2040 technical analyses. Table 15: Planned Transportation Projects in the Study Area presents the planned projects and their summary information. Refer to Figure 16: Planned Transportation Projects in the Area for the geographical location of the planned projects listed below:

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 is programmed for fiscal year 2012. Right-of-way acquisition is planned for fiscal year 2016 and construction is planned for long-range fiscal year 2019. The ARC RTP reference number is FN-222.
4. CSSTP-0006-00(055), P.I. No. 0006055, 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. 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.
6. 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.
7. 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.
8. 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.

9. 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.
10. 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.
11. 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.

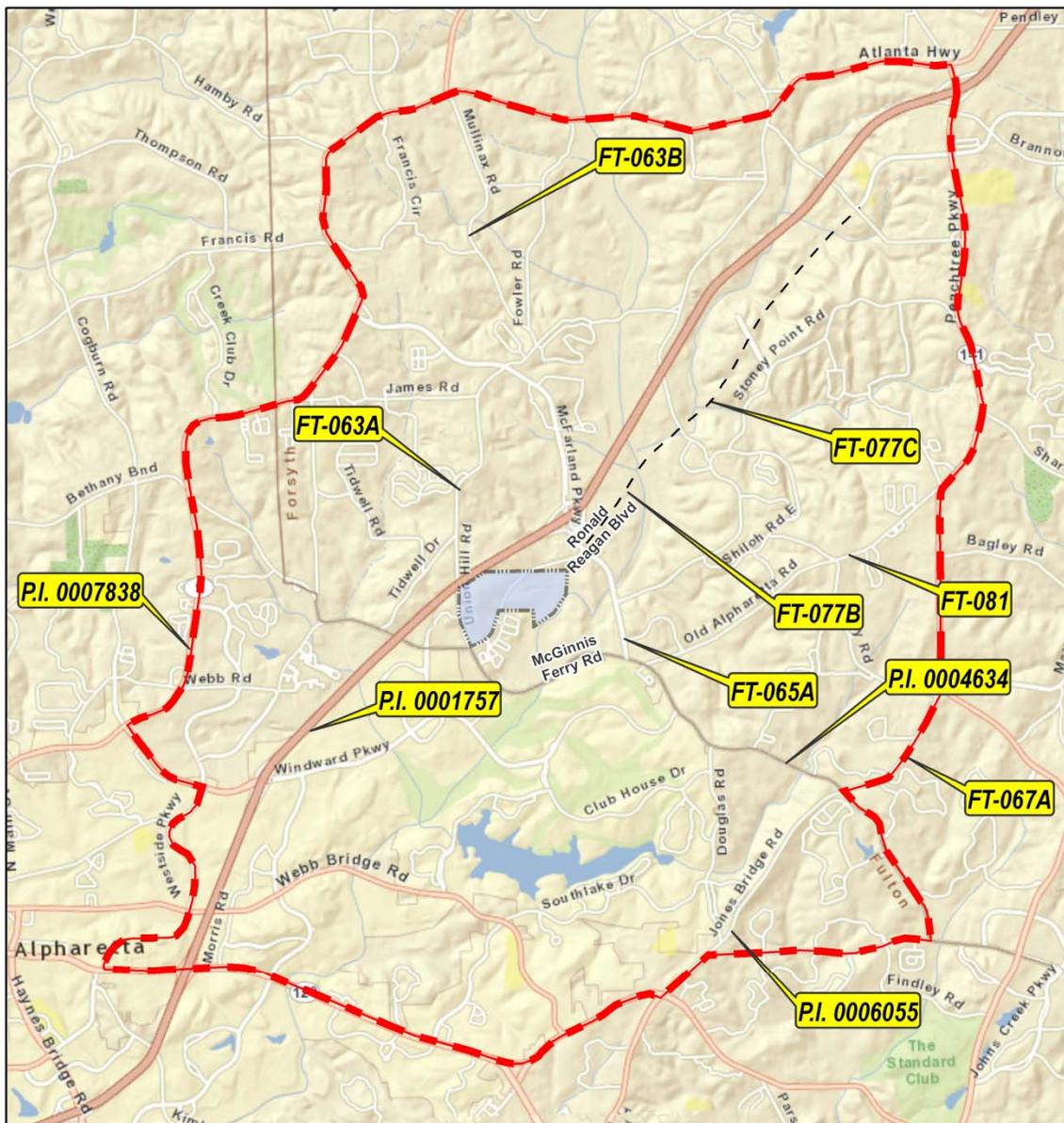
Table 15: Planned Transportation Projects in the Study Area (1 of 2)

GDOT PI # (Jurisdiction)		ARC RTP Reference Number	Project Description	Type	Implementation	Network Year
GDOT Project #						Open Year
1	P.I. No. 0001757 (Forsyth & Fulton Counties)	FN-233A	SR 400 Managed Lanes from I-285 North to McFarland Parkway	Widening to provide 2/4 Managed Lanes with interchanges	Engineering – 2011 ROW Acquisition – LR Construction – LR 2031-2040	2040
	MSL00-0001-00 (757)					2040
2	P.I. No. 0004634 (Forsyth & Fulton Counties)	FN-233A	McGinnis Ferry Road from Union Hill Road to Sargent Road	Widening of 2 to 4 lanes	Engineering – LR ROW Acquisition - LR Construction – LR 2018-2030	2030
	STP00-0004-00(634)					2030
3	P.I. No. 0007838 (Fulton County)	FN-222	SR 9 (Cumming Highway) from Windward Parkway to McFarland Parkway	Widening of 2 to 4 lanes	Engineering – 2012 ROW Acquisition - 2016 Construction - 2019	2040
	CSSTP-0007-00(838)					2021
4	P.I. No. 0006055 (Fulton County)	FN-049B	CR 65 (Jones Bridge Road) from Taylor Road to Douglas Road	Widening of 2 to 4 lanes	Engineering – LR ROW Acquisition – LR Construction – LR 2018-2030	2030
	CSSTP-0006-00(055)					2030
5	Forsyth County	FT-063A	Union Hill Road from McGinnis Ferry Road to McFarland Parkway	Widening of 2 to 4 lanes	Engineering – 2005 ROW Acquisition – 2006 Construction – LR 2018-2030	2030
	N/A					2030
6	Forsyth County	FT-063B	Union Hill Road/Mullinax Road from (McFarland Parkway) to SR 9 (Atlanta Highway)	Widening of 2 to 4 lanes	Engineering – LR ROW Acquisition – LR Construction – LR 2031-2040	2040
	N/A					2040
7	Forsyth County	FT-077B	Ronald Reagan Blvd from McFarland Parkway to Shiloh Road	New Location 4 lanes	Engineering – 2008 ROW Acquisition – LR Construction – LR 2018-2030	2030
	N/A					2030
8	Forsyth County	FT-077C	Ronald Reagan Blvd from Shiloh Road to Majors Road	New Location 4 lanes	Engineering – 2008 ROW Acquisition – LR Construction – LR 2018-2030	2030
	N/A					2030

Table 16: Planned Transportation Projects in the Study Area (2 of 2)

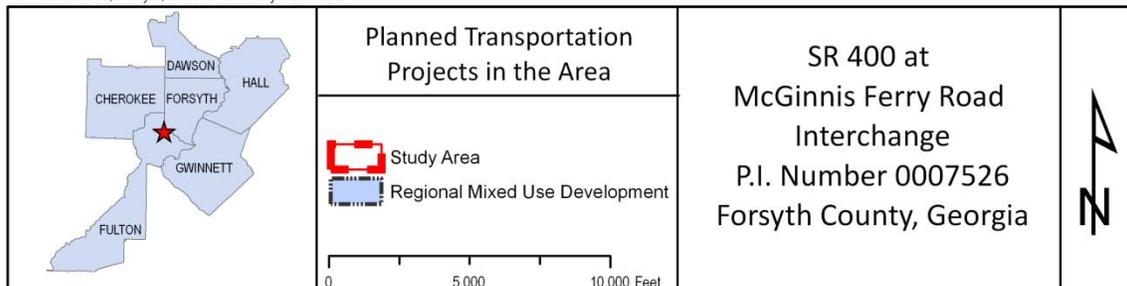
GDOT PI # (Jurisdiction)		ARC RTP Reference Number	Project Description	Type	Implementation	Network Year
GDOT Project #						Open Year
9	Forsyth County	FT-065A	McFarland Parkway from McGinnis Ferry Road to SR 400	Widening of 4 to 6 lanes	Engineering – 2013-2019 ROW Acquisition – LR Construction – LR 2031-2040	2040
	N/A					2040
10	Forsyth County	FT-067A	Brookwood Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway)	Widening of 2 to 4 lanes	Engineering – 2013-2019 ROW Acquisition – LR Construction – LR 2031-2040	2040
	N/A					2040
11	Forsyth County	FT-081	Old Alpharetta Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway)	Widening of 2 to 4 lanes	Engineering – LR ROW Acquisition – LR Construction – LR 2031-2040	2040
	N/A					2040

Figure 16: Planned Transportation Projects in the Area



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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2.10.4 Georgia STIP

The Georgia Statewide Transportation Improvement Program (STIP) includes a priority list of highway, passenger rail, and transit projects to be implemented. The STIP Financial Plan is the financially constrained short-term plan which covers a 4-year period, years 2012-2015. The Fiscal Years 2012-2015 STIP was adopted by the State Transportation Board on September 15, 2011 and was approved by the Federal Highway Administration and Federal Transit Administration on October 19, 2011.

Projects located within Fulton and Forsyth County and being fully or partially funded with federal funds are included within the ARC long-range transportation plan and the Transportation Improvement Program (TIP). These projects are also included as part of the STIP by reference.

2.11 Potential Economic Development

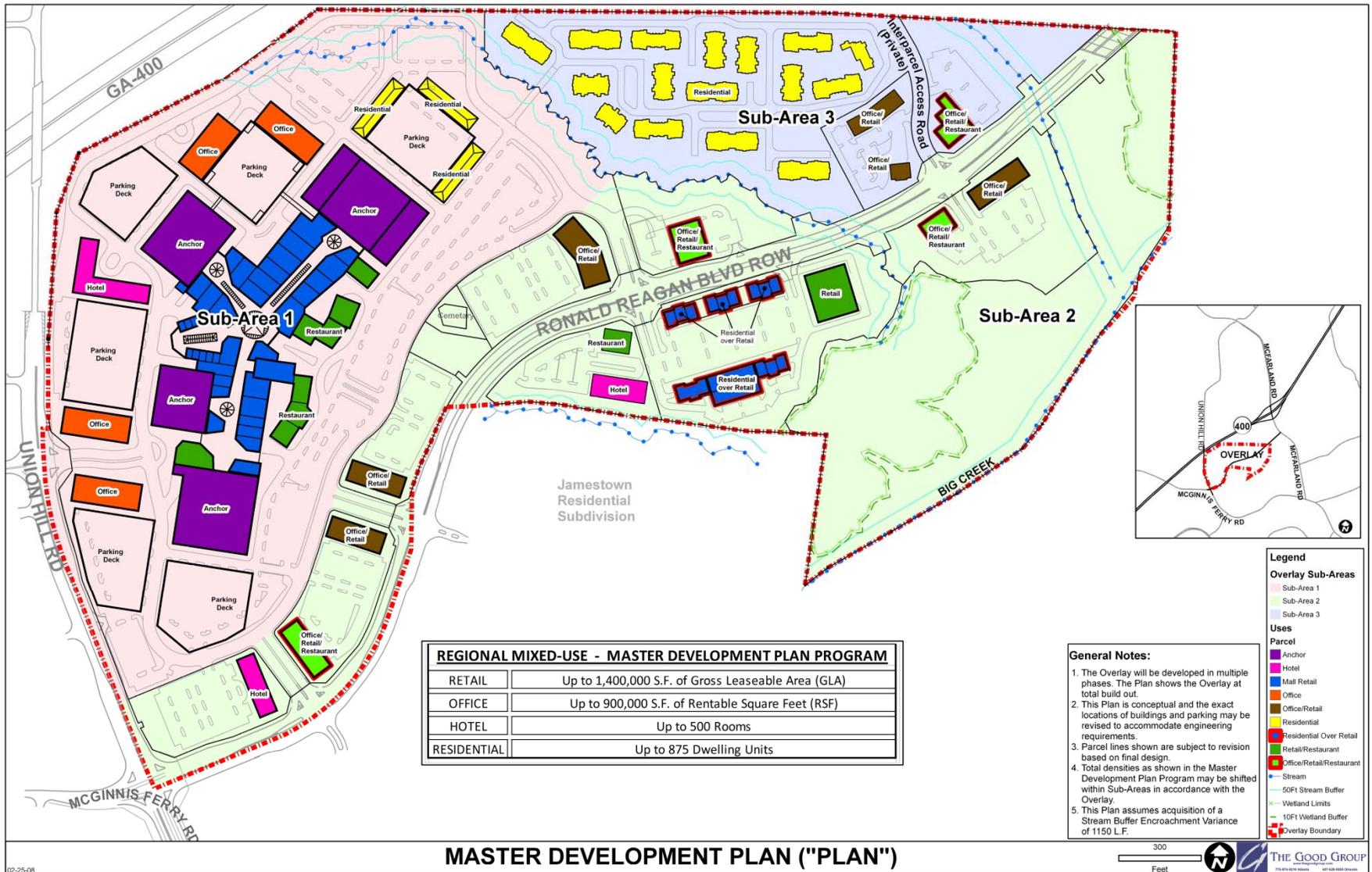
TRG Forsyth LCC (Taubman Company) has received planning approval from Forsyth County to develop a multi-phase, regional mixed use project (Figure 17: Master Development Plan, TRG Forsyth LLC Project). The project will be located in the northeast quadrant of SR 400/McGinnis Ferry Road interchange along the east side of Union Hill Road.

The proposed project will be constructed in three phases with the total development program including the following uses:

- Retail Commercial – Up to 1,400,000 SF of Gross Leasable Area
- Office – Up to 900,000 SF of Rentable Square Feet
- Hotel – Up to 500 Rooms
- Residential – Up to 875 Dwelling Units

The first phase of the development will include a regional mall, the hotel, offices, residential uses and six parking decks. Phase two will be comprised of two smaller hotels, three office/retail/restaurant buildings, four office/retail buildings, a free-standing restaurant, four residential over retail buildings, and a free-standing retail building. The last phase of the project will contain 16 multiple-family, high-density residential buildings along with a free-standing Office/Retail/Restaurant building, and two Office/Retail buildings. The planned Ronald Reagan Boulevard will divide the property generally separating Phases 1 and 3 from Phase 2. Ronald Reagan Boulevard will connect to the existing intersection of McGinnis Ferry Road and Union Hill Road and extend northeasterly to McFarland Parkway.

Figure 17: Master Development Plan, TRG Forsyth LLC Project



2.12 Study Area Needs

The study area needs are developed with the data that was assembled throughout Section 2.0, Planning and Background Information. The needs establish why an improvement alternative is warranted based upon the existing conditions in the project area.

Three major needs were identified within the Study Area. The first is to relieve traffic congestion at the exiting and entering ramp junctions of the SR 400 interchanges of Windward Parkway and McFarland Parkway. Even with widening improvements on SR 400 and widening of the ramps at these two interchanges, the ramp junctions cannot handle the future 2040 traffic volumes. The second is to provide additional freeway access to facilitate the economic development of North Fulton and South Forsyth Counties, which includes a planned regional mixed-used development. The third is to reduce the frequency and severity of collisions within the study area.

2.12.1 Relieve Traffic Congestion at Existing Interchanges

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, which was summarized in the Section 2.2.1 and is fully detailed in Section 5.0, Traffic Operations Analysis.

2.12.2 Additional Freeway Access for Economic Development

Major planned improvements 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 and Union Hill Road. 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 52,618 vehicle trips a day to the area, 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 currently under construction. 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 build out is expected to continue after completion of the mall.

The Forsyth County Board of Commissioners has taken the first steps to facilitate this development by approving a Development Agreement which includes 10-years of tax breaks and discounted sewer rates to support the luxury retail mall. A copy of the Development Agreement is included in Appendix C, Other Supporting Documents. Much of the deal is contingent on the mall opening no later than December 1, 2020, with at least two high-end anchor stores, such as Neiman-Marcus or Saks Fifth Avenue. A Georgia Tech Fiscal Impact Analysis study comparing premium and standard development options for the Taubman development (TRG Forsyth LLC), commissioned by Forsyth County, estimates that the project, at build-out, could bring 7,842 new jobs, \$1.1 billion in capital investments, and \$38.2 million-a-year in sales and property taxes into Forsyth County. A copy of the presentation prepared by Georgia Tech is also included in Appendix C, Other Supporting Documents.

Additionally, Forsyth County constructed the Ronald Reagan Boulevard Extension from McGinnis Ferry Road to McFarland Parkway. This roadway provides a four-lane divided highway to facilitate local traffic access to and from the regional mixed-use development. To this end, Forsyth County has agreed to pay the TRG Forsyth LLC (Taubman Company, a Michigan-based retail developer) \$2,750,000 for the

required right-of-way and the preparation of roadway engineering plans. Forsyth County also offered TRG Forsyth LLC (Taubman Company) a reduced sewer tap fee that, at current costs, would save the company an estimated \$1,955,000 to facilitate the construction of other requisite improvement projects.

For its part, TRG Forsyth LLC (Taubman Company) has agreed to donate 22 acres of green space, connecting Ronald Reagan Boulevard with Big Creek and the planned Forsyth County Greenway. Also, the TRG Forsyth LLC (Taubman Company) has committed to repay the \$2,750,000, if, because of the economy or other reasons, the company cannot deliver the marquee mall as promised. The Development Services Agreement between the Forsyth County Board of Commissioners and the Developer, TRG Forsyth LLC, outlines the funding of infrastructure improvements required to support their proposed mixed-use development. The Developer has agreed for Forsyth County to defer payment of \$2.75 million for property to be converted to public right-of-way for required roadway improvements associated with accessing the proposed mall project. Forsyth County has also contracted over \$12 million of roadway improvements funded by Forsyth County's SPLOST VI Transportation Program and ensuring adequate water and sewer services. These public and private sector projects are viewed as necessary to accommodate the anticipated growth forecasted for South Forsyth County along SR 400.

Additionally, Windward Parkway Business Park, a commercial community in North Fulton County, is developing on both sides of Windward Parkway from Webb Bridge Road to McGinnis Ferry Road. The Windward Parkway development also has a residential component that provides a combination of single family, townhomes and apartments along several roadways that feed into Windward Parkway. Secondary to the Windward area community is the large number of east-west trips, primarily generated by commuter traffic traveling to and from SR 400 originating from surrounding new residential and commercial developments. The combination of home-based work trips, home-based shopping trips and other local trips will create congested conditions in this area on a daily basis.

2.12.3 Reduction in Severity and Frequency of Collisions

The study area roadways are showing higher than average collision rates on the major corridors. Section 2.3 details the crash analysis. The majority of collisions on the roads with higher than average collisions rates are rear-end type collisions. Commonly, these indicators point at a roadway network that is congested with chokepoints that are causing queuing, unexpected stopping maneuvers, therefore leading to collisions.¹ There is a need to reduce the severity and frequency of collisions within the study area.

¹ See Section 2.3 for a detailed discussion of crash types and frequencies.

3.0 ALTERNATIVES CONSIDERED

3.1 Section Purpose and Organization

A series of alternatives were proposed to address the identified needs of the study area as described in Section 2.12, Study Area Needs. The study area needs were developed using information detailed in Section 2.0, Planning and Background Information which itself references the traffic analysis conducted as a part of Section 5.0, Traffic Operations Analysis.

These alternatives are described in this section and take two forms: interchange and non-interchange alternatives. The interchange alternatives are exactly that: alternatives that propose new access points on SR 400 to address the study area needs. The non-interchange alternatives form a more broad-based set of project concepts, focused around improving the roadway infrastructure that is already in place or will be constructed as a part of the planned and committed projects.

This section will describe the various alternatives under consideration and detail what will be included within their project limits. No analysis is conducted in this section. See Section 5.0, Traffic Operations Analysis, and Section 6.0, Comparison of Alternatives for a detailed breakdown of the operational results and comparisons of the alternatives.

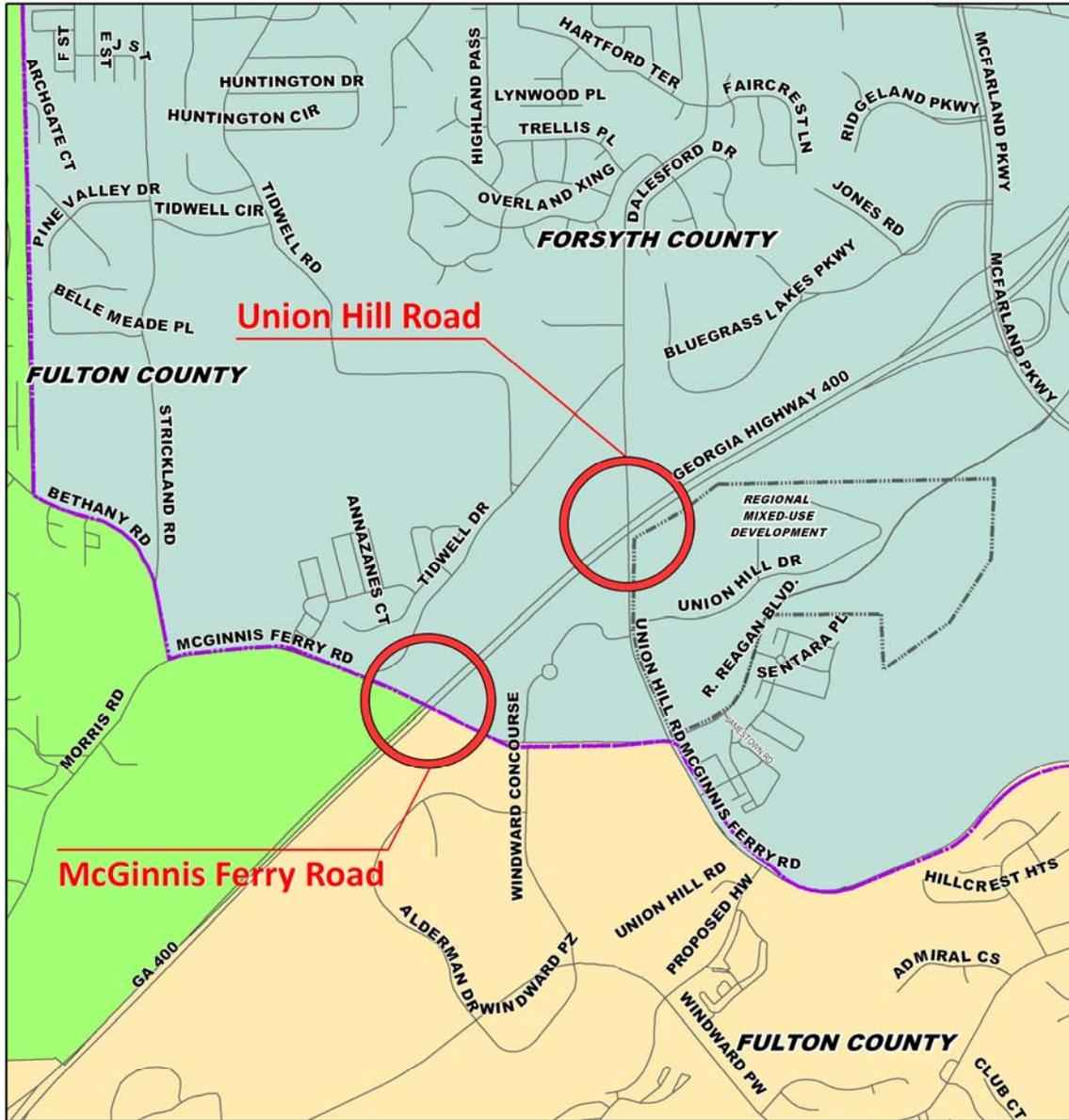
3.2 Alternatives

In determining the feasibility of the location of a proposed new interchange, the spacing/distance between interchanges is important to maintaining quality traffic flow on the freeway/expressway. There were two locations considered for a new access interchange with SR 400: McGinnis Ferry Road and Union Hill Road. The Union Hill Road bridge over SR 400 is located 0.9 miles from McFarland Parkway. See Figure 18: Locations Considered for New Interchanges. This bridge location would place the north-facing ramps of a Union Hill Road Interchange only 1,800 feet from the south-facing ramps of McFarland Parkway. This is well within the ramp-to-ramp distance considered to be a weaving maneuver by the Highway Capacity Manual and would contribute to additional traffic congestion on SR 400 by the interaction of vehicles entering and exiting the freeway. A collector-distributor system of roadways at Union Hill Road was considered, to alleviate the weaving concerns on SR 400, but Union Hill Road is a north-south road that connects McFarland Parkway to McGinnis Ferry Road, and would not serve east-west travel movements or provide the traffic connection between SR 9 and McFarland Parkway which would cause traffic to reroute in significant volumes. Due to these concerns, a Union Hill Road interchange was not considered further.

McGinnis Ferry Road is located at a more suitable location to place an interchange between the interchanges of Windward Parkway and McFarland Parkway. The location provides the access to the freeway at a minimum spacing of 1.5 miles south of the McFarland Parkway Interchange and 1.4 miles north of the Windward Parkway Interchange. Further discussion of interchange spacing is found in Section 3.3, Adequate Interchange Spacing.

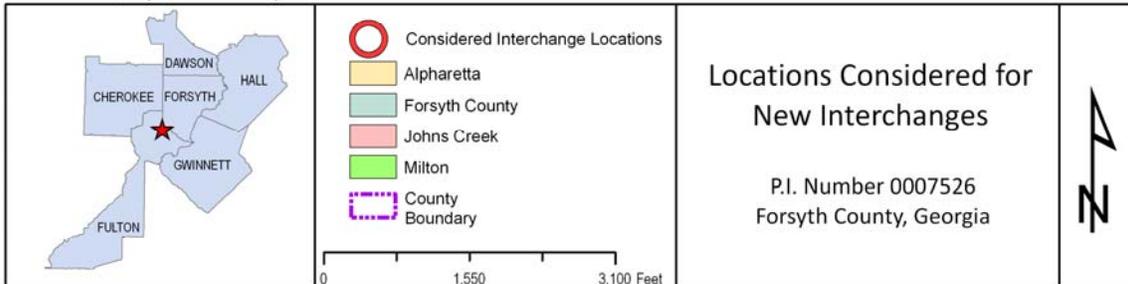
Therefore, six alternatives were considered for addressing the study area needs. The following paragraphs contain a description of each alternative considered.

Figure 18: Locations Considered for New Interchanges



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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3.2.1 *Alternative 1 - No-Build Alternative*

Alternative 1 is the No-Build Alternative, which consists of the existing roadway network plus the committed roadway improvements listed in the ARC's TIP 2012-2017 (Table 14: Committed Transportation Projects in the Study Area) and the ARC's RTP. The RTP consists of projects that are planned to be funded in future years. The TIP projects are included in the 2020 technical analysis while both the TIP and RTP projects are included in the 2040 technical analysis.

The No-Build Alternative is included within each Build alternative by reference, i.e. every TIP or RTP project that is listed under Alternative 1 will be included inside the other Alternatives.

The TIP projects in the study area are listed below:

- ARC# FN-276, P.I No. 0010857, Fulton County: SR 400 Restriping to create continuous fourth lane in southbound direction from Windward Parkway to southbound exit ramp at SR 140 (Holcomb Bridge Road).
- ARC # FN-067A, STP00-0114-01(084) P.I. No. 721780, Fulton County: Widening of SR 9 (North Main Street/Cumming Highway) from Academy Street to Windward Parkway from two to four lanes.
- ARC #FT-321, P.I. No. 0010290, Forsyth County: SR 400 Lane Extension in Northbound Direction.. Addition of a 12-foot General Purpose lane.
- ARC #FT-001B, CSSTP-0007-00(844) P.I. No. 0007844, Forsyth County: Widening of SR 9 (Atlanta Highway) from McFarland Parkway to SR 371 (Post Road) from two to four lanes.
- ARC #FT-001C, CSSTP-0008-00(357) P.I. No. 0008357, Forsyth County: Widening of SR 9 (Atlanta Highway) from SR 371 (Post Road) to SR 141 (Peachtree Parkway) from two to four lanes.

The RTP projects in the study area are listed below:

- ARC #AR-ML-300, MSL00-0001-00 (757), P.I. No. 0001757, Forsyth and Fulton Counties: Construction of Managed Lanes on SR 400 from I-285 North to McFarland Parkway to include 2 or 4 managed lanes with interchanges along the project limits.
- ARC #FN-233A, STP00-0004-00(634), P.I. No. 0004634, Forsyth and Fulton Counties: Widening of McGinnis Ferry Road from Sargent Road to Union Hill Road from two to four lanes.
- ARC# FN-222, CSSTP-0007-00(838), P.I. No. 0007838, Forsyth & Fulton Counties: Widening SR 9 (Cumming Highway) from Windward Parkway to McFarland Parkway from two to four lanes.
- ARC #FN-270, Fulton County: Widening CR 65 (Jones Bridge Road) from Taylor Road to Douglas Road from two to four lanes.
- ARC #FN-264, P.I. No. 721000, Fulton County: Widening of SR 120 (Kimball Bridge Road) from Old Milton Parkway to Jones Bridge Road from two to four lanes.
- ARC #FT-063B, Forsyth County Project: Widening Union Hill Road from McGinnis Ferry Road to McFarland Parkway from two to four lanes.
- Forsyth County Project: Widening Union Hill Road (Mullinax Road) from CR 458 (McFarland Parkway) to SR 9 (Atlanta Highway) from two to four lanes.
- ARC #FT-077B, Forsyth County Project: Constructing on new location, Ronald Reagan Boulevard from McFarland Parkway to Shiloh Road as a four-lane divided highway.
- ARC #FT-077C, Forsyth County Project: Constructing on new location, Ronald Reagan Boulevard from Shiloh Road to Majors Road as a four-lane divided highway.
- ARC #FT-065A, Forsyth County Project: Widening McFarland Parkway from McGinnis Ferry Road to SR 400 from four lanes to six lanes.

- ARC #FT-067A, Forsyth County Project: Widening Brookwood Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway) from two to four lanes.
- ARC #FT-081, Forsyth County Project: Widening Old Alpharetta Road from McGinnis Ferry Road to SR 141 (Peachtree Parkway) from two to four lanes.

3.2.2 *Alternative 2 - New Interchange at SR 400/McGinnis Ferry Road with Collector-Distributor Roads*

Alternative 2 would consist of all Alternative 1 projects plus constructing a full-diamond interchange with SR 400 at McGinnis Ferry Road. Additionally, two-lane directional collector-distributor roadway would be built between McGinnis Ferry Road and McFarland Parkway. The project would replace the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend to Union Hill Road. McGinnis Ferry Road would be widened to four lanes from Bethany Bend to SR 400 and to six lanes from SR 400 to Union Hill Road. The typical section would include curb and gutter and five-foot sidewalks on both sides of McGinnis Ferry Road through the entire length of the project. Dual left-turn lanes and a right-turn lane would be constructed at its intersections with the SR 400 on-ramps. The proposed bridge would be designed to span future managed lanes on SR 400.

3.2.3 *Alternative 3 - New Interchange at SR 400/McGinnis Ferry Road*

Alternative 3 would consist of all Alternative 1 projects plus constructing a full-diamond interchange with SR 400 at McGinnis Ferry Road. The project would replace the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend to Union Hill Road. McGinnis Ferry Road would be widened to four lanes from Bethany Bend to SR 400 and to six lanes from SR 400 to Union Hill Road. The typical section would include curb and gutter and five-foot sidewalks on both sides of McGinnis Ferry Road through the entire length of the project. Dual left-turn lanes and a right-turn lane would be constructed at its intersections with the SR 400 on-ramps. The proposed bridge would be designed to span future managed lanes on SR 400.

3.2.4 *Alternative 4 – Improvements to Windward Parkway Interchange and Area Roadways*

Alternative 4 would include all Alternative 1 projects plus improvements on SR 400 at Windward Parkway and improvements along Windward Parkway and area roadways. These improvements would include the following projects.

- Windward Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between SR 120 and Windward Parkway ramps and widen the northbound exit to Windward Parkway to two lanes. Add a northbound and southbound auxiliary lane on SR 400 between Windward Parkway and McFarland Parkway ramps and widen the northbound and southbound exit ramps to McFarland Parkway to two lanes.
- Windward Parkway – Widening from 4 to 6 lanes from SR 9 to Union Hill Road/Market Place.
- McGinnis Ferry Road – Widen the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend to Windward Concourse from two to four lanes. Widen McGinnis Ferry Road from Windward Concourse to Union Hill Road from two to six lanes.
- Windward Concourse – Addition of turning lanes at Windward Parkway.

3.2.5 *Alternative 5 – Improvements to the McFarland Parkway Interchange and Area Roadways*

Alternative 5 would include all Alternative 1 projects plus improvements on SR 400 at McFarland Parkway and improvements along McFarland Parkway and area roadways. These improvements would include the following projects.

- McFarland Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between Windward Parkway and McFarland Parkway ramps and widen the northbound and southbound exit ramps to McFarland Parkway to two lanes. Add an acceleration lane (northbound) and deceleration lane (southbound) north of McFarland Parkway.
- Ronald Reagan Blvd – Widen from 4 to 6 lanes from McFarland Parkway to McGinnis Ferry Road.
- McFarland Parkway at Ronald Reagan Blvd – Add an eastbound right turn free-flow lane that would become an additional southbound lane on Ronald Reagan Blvd. Add an additional northbound left turn lane on Ronald Reagan Blvd.
- McGinnis Ferry Road – Widen the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend to Windward Concourse from two to four lanes. Widen McGinnis Ferry Road from Windward Concourse to Union Hill Road from two to six lanes.

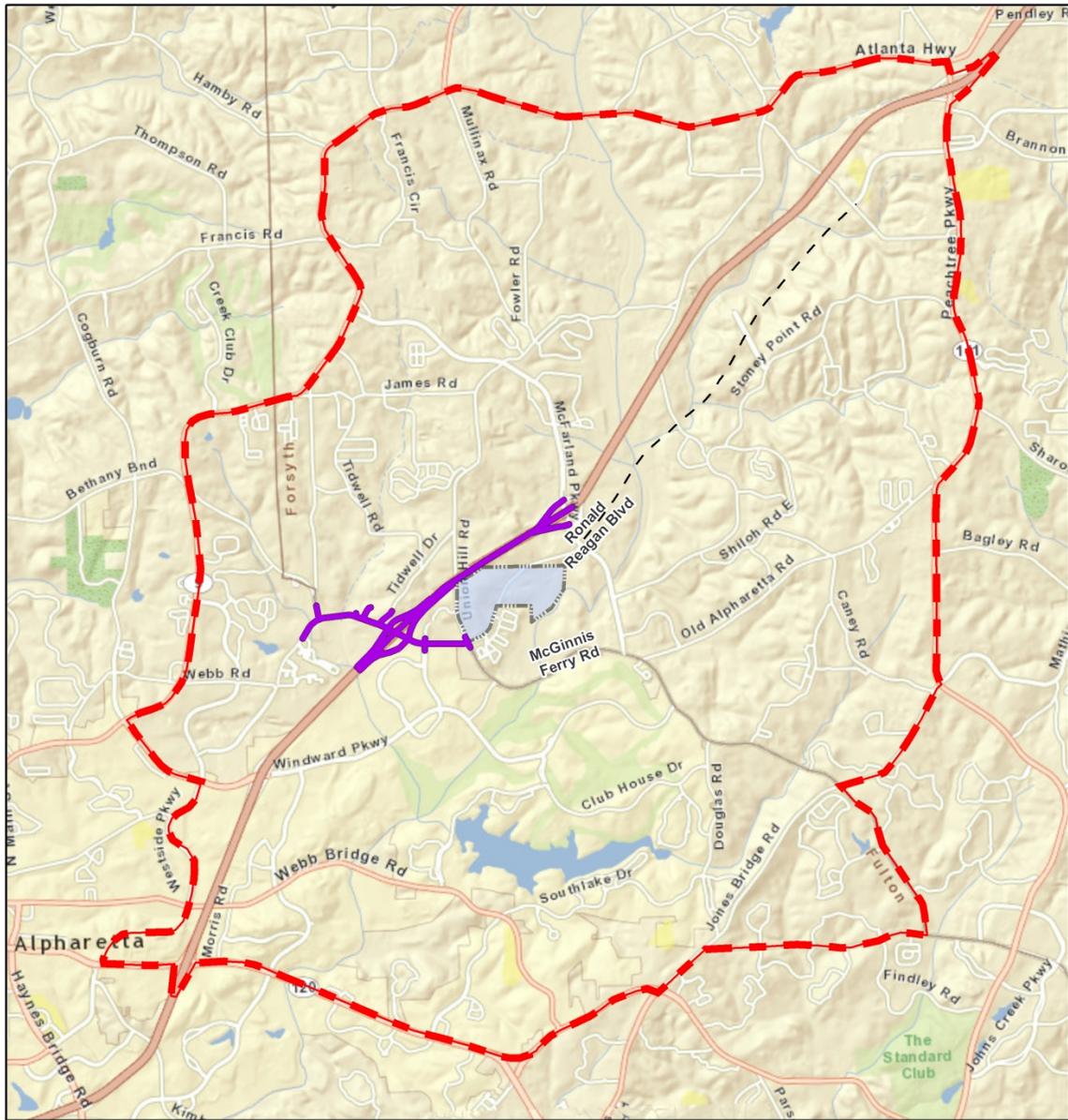
3.2.6 Alternative 6 – Improvements to interchanges of Windward Parkway and McFarland Parkway and other Area Roadways

Alternative 6 would include all Alternative 1 projects plus improvements on SR 400 at the interchanges of Windward Parkway and McFarland Parkway and other area roadways as described in Alternatives 5 and 6. This Alternative is identical to a combined Alternative 4 and Alternative 5 but is split out for analysis sake for ease of comparison. These improvements would include the following projects.

- Windward Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between SR 120 and Windward Parkway ramps and widen the northbound exit to Windward Parkway to two lanes.
- Windward Parkway – Widening from 4 to 6 lanes from SR 9 to Union Hill Road/Market Place.
- McFarland Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between Windward Parkway and McFarland Parkway ramps and widen the northbound and southbound exit ramps to McFarland Parkway to two lanes. Add an acceleration lane (northbound) and deceleration lane (southbound) north of McFarland Parkway.
- Windward Concourse – Addition of turning lanes at Windward Parkway.
- Ronald Reagan Blvd – Widen from 4 to 6 lanes from McFarland Parkway to McGinnis Ferry Road.
- McFarland Parkway at Ronald Reagan Blvd – Add an eastbound right turn free-flow lane that would become an additional southbound lane on Ronald Reagan Blvd. Add an additional northbound left turn lane on Ronald Reagan Blvd.
- McGinnis Ferry Road – Widen the existing bridge over SR 400 and widen McGinnis Ferry Road from Bethany Bend to Windward Concourse from two to four lanes. Widen McGinnis Ferry Road from Windward Concourse to Union Hill Road from two to six lanes.
- Windward Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between SR 120 and Windward Parkway ramps and widen the northbound exit to Windward Parkway to two lanes.
- Windward Parkway – Widening from 4 to 6 lanes from SR 9 to Union Hill Road/Market Place.
- McFarland Parkway Interchange Improvements – Add a northbound and southbound auxiliary lane on SR 400 between Windward Parkway and McFarland Parkway ramps and widen the northbound and southbound exit ramps to McFarland Parkway to two lanes. Add an acceleration lane (northbound) and deceleration lane (southbound) north of McFarland Parkway.
- Ronald Reagan Blvd – Widen from 4 to 6 lanes from McFarland Parkway to McGinnis Ferry Road.

- McFarland Parkway at Ronald Reagan Blvd – Add an eastbound right turn free-flow lane that would become an additional southbound lane on Ronald Reagan Blvd. Add an additional northbound left turn lane on Ronald Reagan Blvd.

Figure 19: Alternative 2 - New Interchange at SR 400/McGinnis Ferry Road with Collector-Distributor Roads



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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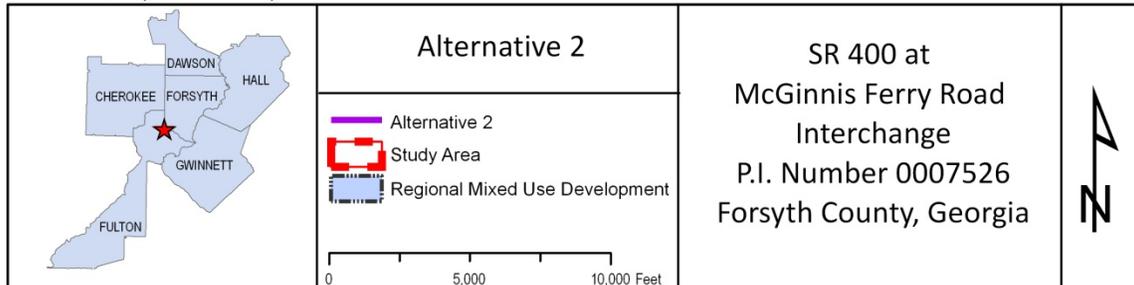
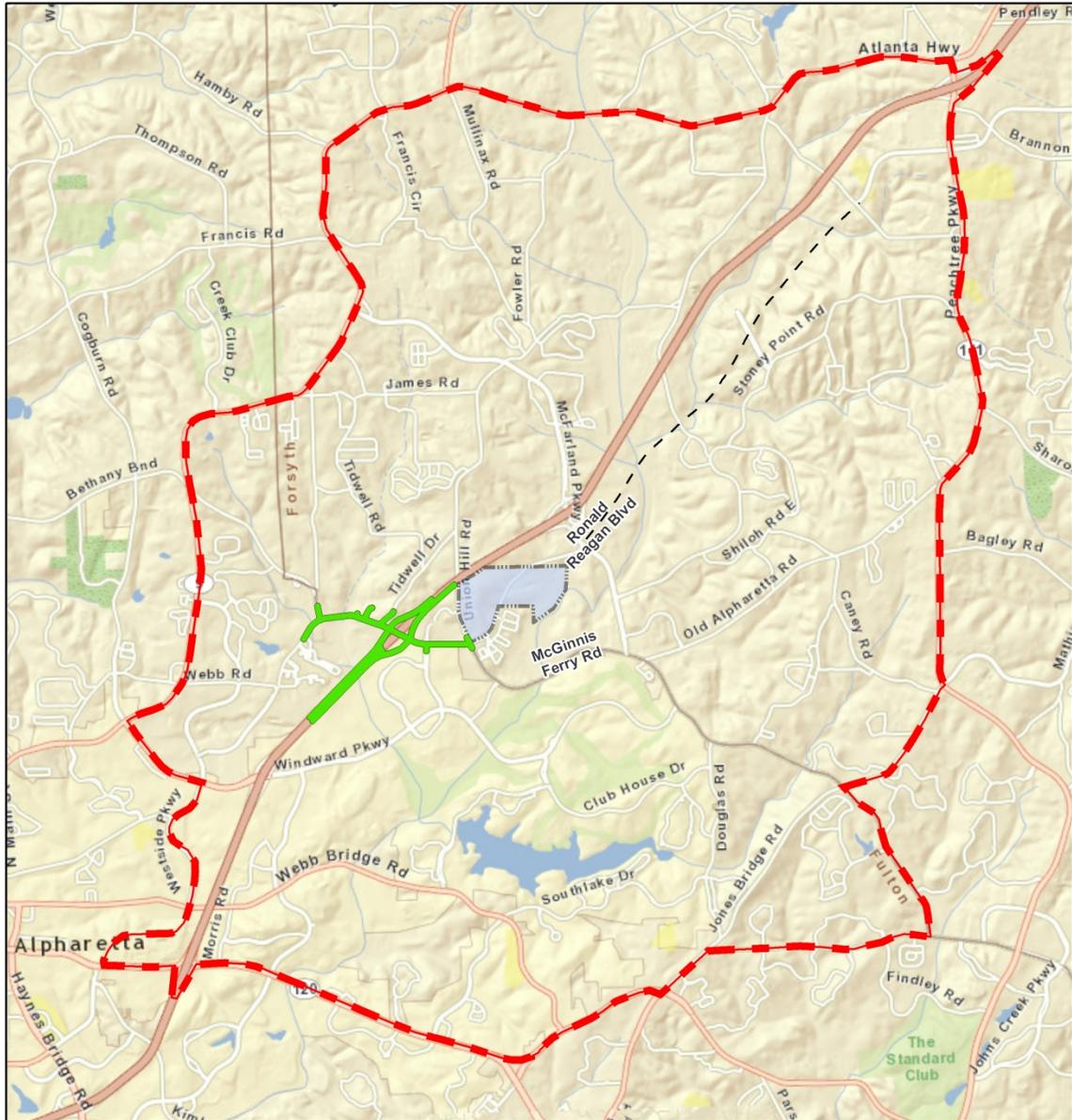


Figure 20: Alternative 3 - New Interchange at SR 400/McGinnis Ferry Road



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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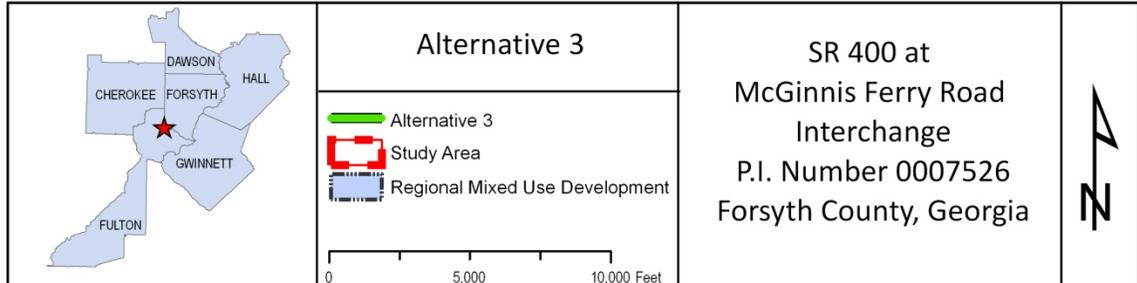
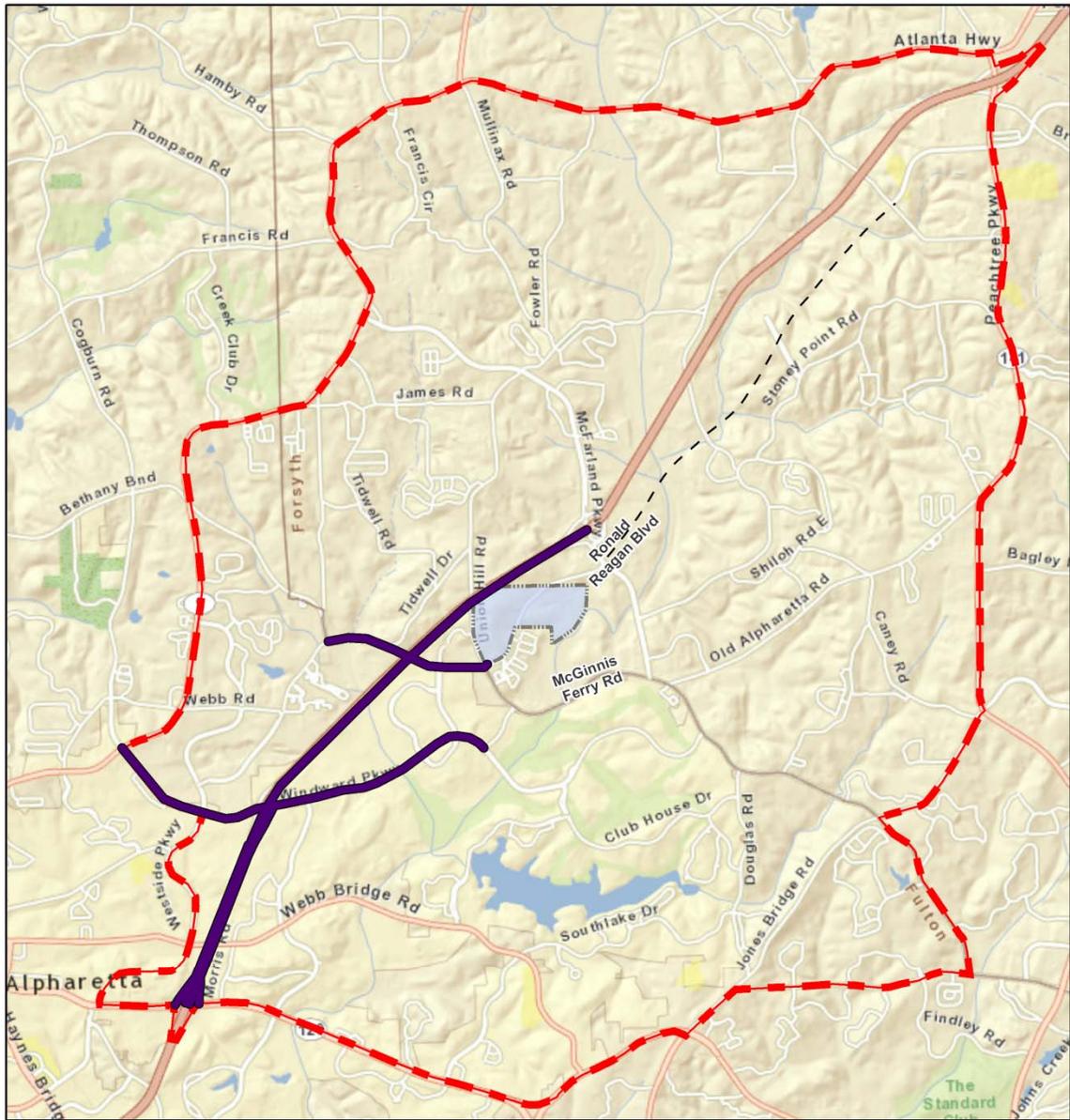


Figure 21: Alternative 4 - Improvements to the Windward Parkway Interchange and Area Roadways



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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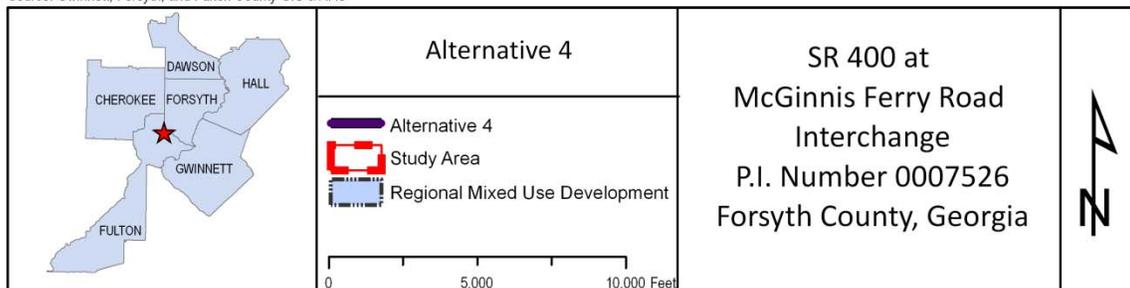
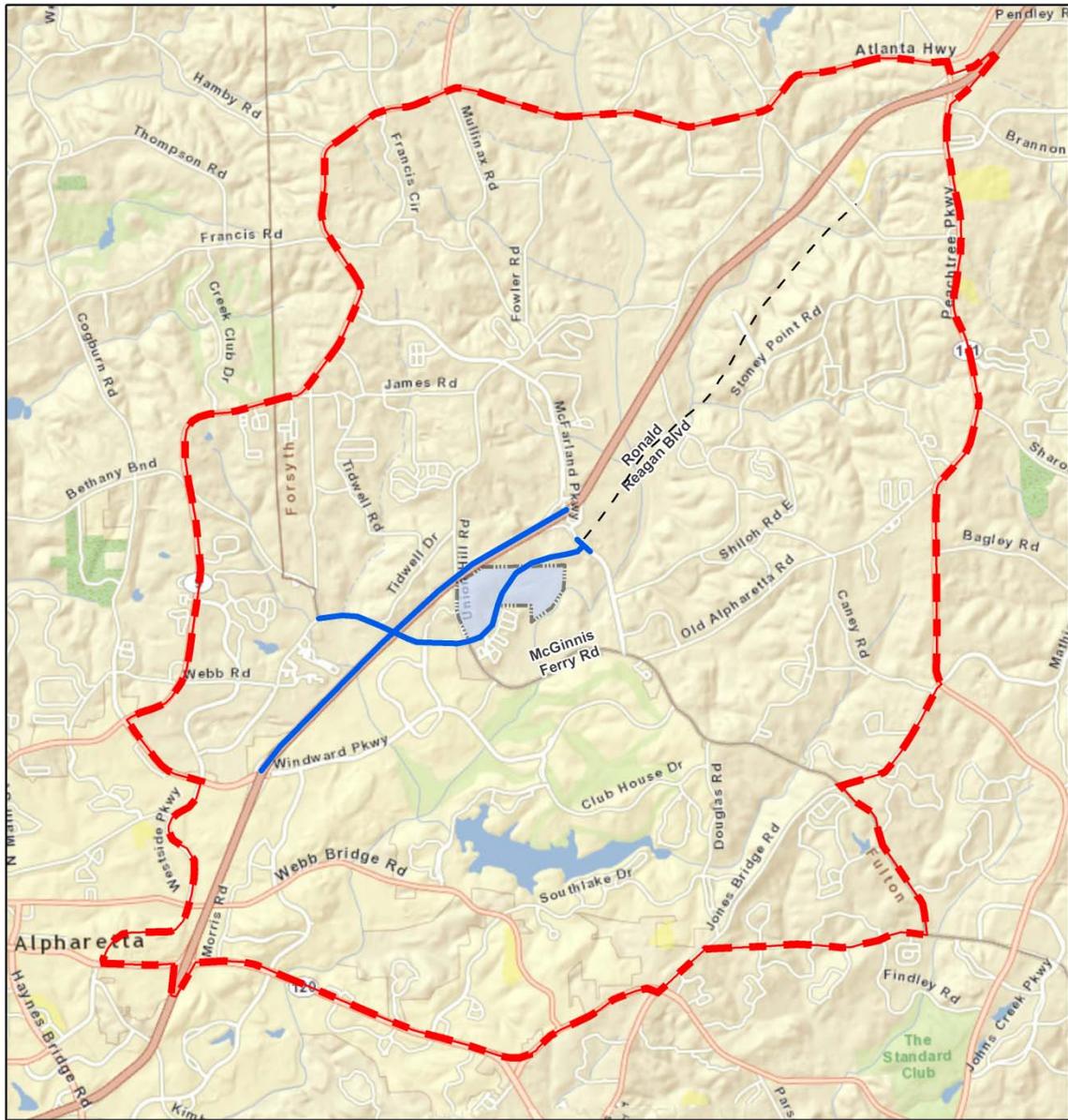


Figure 22: Alternative 5 - Improvements to the McFarland Parkway Interchange and Area Roadways



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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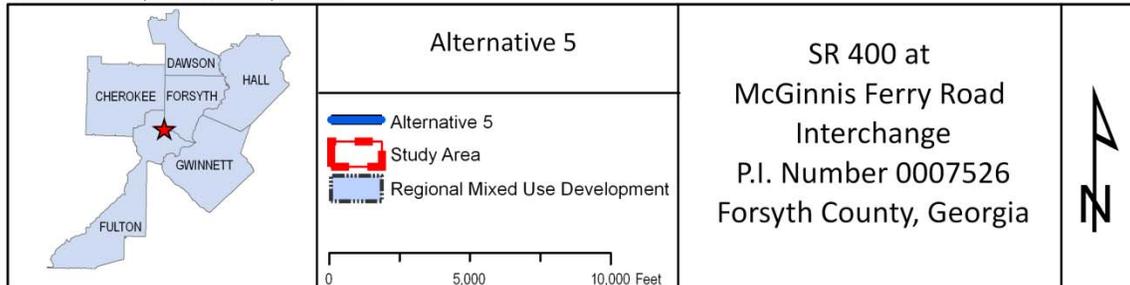
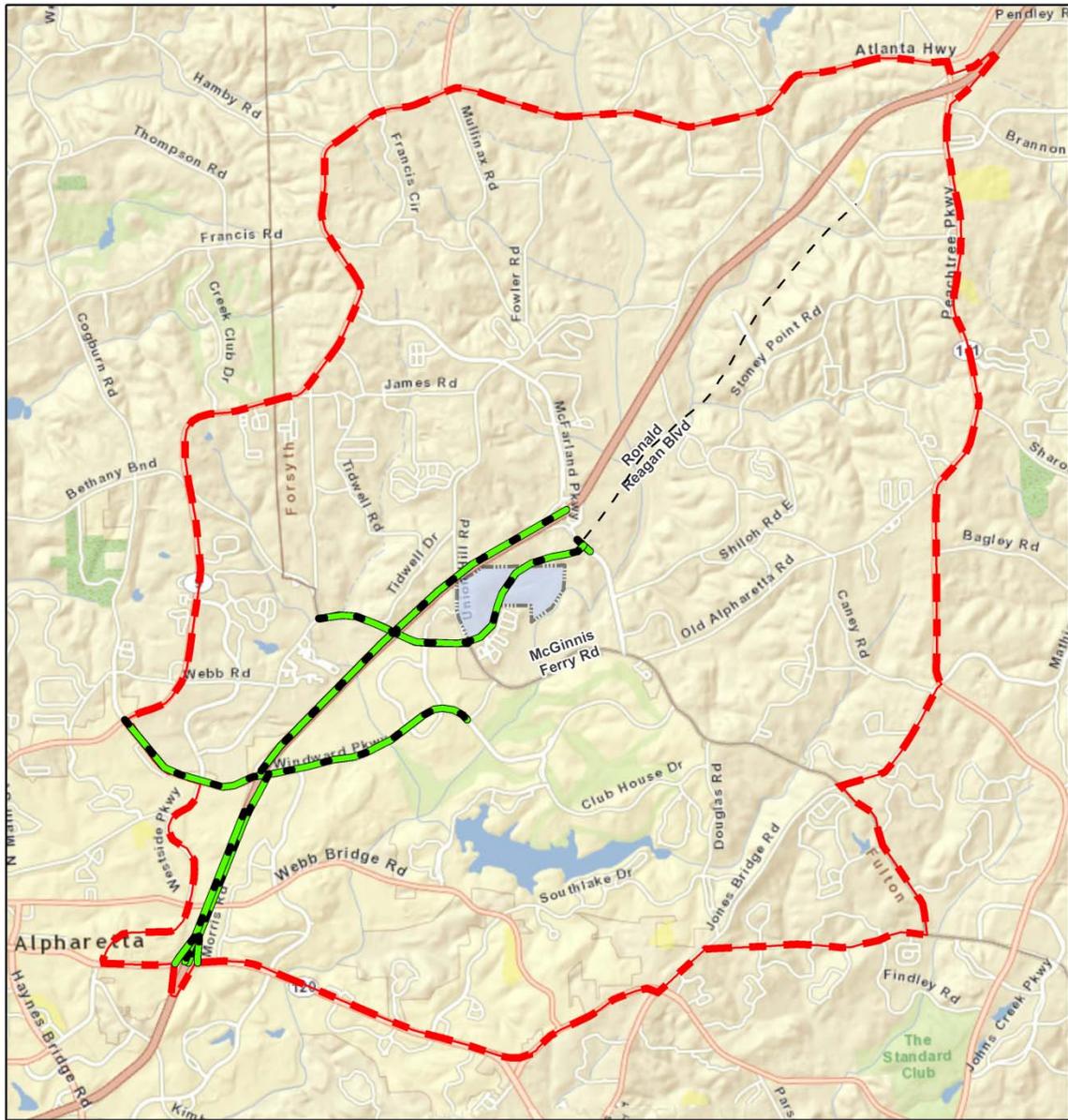
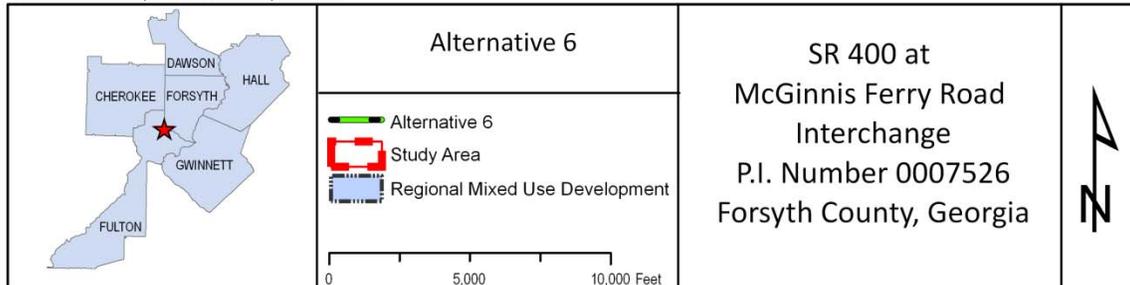


Figure 23: Alternative 6 - Improvements to the Windward & McFarland Parkway Interchanges and Area Roadways



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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3.3 Adequate Interchange Spacing

It is important to note that the ARC MPO Planning Region map includes the geographic location of the interchange at SR 400 and McGinnis Ferry Road that Alternatives 2 and 3 both propose, as well as all of Forsyth and Fulton Counties (Figure 24: ARC MPO Planning Region). This region is defined as urban according to the 2010 census.

The distance between the proposed SR 400/McGinnis Ferry Road interchange and the first existing downstream (south) interchange at SR 400/Windward Parkway is 1.4 miles, which exceeds the minimum spacing requirement of 1 mile, and the distance from the SR 400/Windward Parkway interchange to the second downstream interchange at SR 400/Old Milton Parkway is 1.5 miles (Figure 25: Existing and Proposed Interchange Spacing). The distance from SR 400/McGinnis Ferry Road interchange to the first upstream interchange at SR 400/McFarland Parkway is 1.5 miles, which exceeds the minimum spacing requirement of 1 mile, and the distance from the SR 400/McFarland Parkway interchange to the second upstream interchange at SR 400/SR 141 (Peachtree Parkway) (Bethelview Road) is 4.3 miles. The interchange spacing guidelines are presented in Table 17. All distances were measured along the centerline of SR 400 from crossroad to crossroad. The proposed SR 400/McGinnis Ferry Road interchange meets the minimum spacing guideline of 1 mile for new interchanges located in Urban Areas.

Table 17: Interchange Spacing Guidelines

Criteria	Urban Areas	Suburban Areas	Rural Areas
Minimum Spacing	1 Mile	2 Miles	2 Miles
Average Spacing	2 Miles	4 Miles	8 Miles

The average spacing reflects the crossroad-to-crossroad distance between the two outer most interchanges included as part of the two existing upstream and two downstream interchange analysis areas. The total distance along SR 400 between the two outer interchanges is 8.7 miles. The existing average spacing between the SR 400/Old Milton Parkway interchange and SR 400/Peachtree Parkway interchange is 2.9 miles, which is more than the established guideline for urban interchange average spacing of 2.0 miles. The proposed average interchange spacing between the SR 400/Old Milton Parkway interchange and SR 400/Peachtree Parkway interchange is 2.175 miles, which is still more than the established guideline for urban interchange average spacing of 2.0 miles.

Figure 24: ARC MPO Planning Region



Source: http://www.atlantaregional.com/documents/tp_rtp_summary_7_13_07.pdf

Figure 25: Existing and Proposed Interchange Spacing



Source:

4.0 TRAFFIC MODELING AND FORECASTING

4.1 Traffic Methodology

To facilitate the understanding of how the traffic data were forecasted for future analysis scenarios, a description of the methodology that was employed is presented below. This methodology was implemented using existing (2011) traffic volumes, trip generation, distribution and assignment data, and the latest Atlanta Regional Commission's (ARC) travel demand model.

Step 1 – Existing traffic volumes were obtained from three sources: (1) MA conducted 24-hour traffic volumes on major roadways and peak hour turning movement counts at key intersections in the study area; (2) GDOT annual coverage counts were obtained for the year 2010, and (3) ARC provided the 2010 model which contained base year traffic volumes. Using these three sources, the existing 2011 traffic volumes were diagrammed and balanced to produce the existing traffic flow volume sheets.

Step 2 – Research was conducted to determine the permitted and future permitted land development in the study area. Trip generation of each of these land developments were calculated using the latest edition of the ITE Trip Generation Manual. Trip distribution was calculated for each of the developments based on the existing distribution and location of each individual development. Based on the trip generation and distribution, traffic was assigned onto the existing network and added to the existing traffic. This process was done for the 2020 base year and 2040 design year.

Step 3 – During the feasibility stage of this project, the *2030 Envision6* travel demand model was modified to include Ronald Reagan Blvd and to direct the location of the proposed regional mixed-use development onto Ronald Reagan Blvd. The ARC's modeling team ran the travel demand model to provide base data for use in the study. Between the interchange feasibility report and this interchange justification report, the ARC adopted *Plan 2040* which had made changes to the base model included in *Envision6*. To evaluate these changes, the *Plan 2040* model was obtained from ARC. This model was compared to the *2030 Envision6* model and it was found that the ADT volumes in the study area for both models were nearly the same. The freeway lane configuration south of McFarland Parkway for *Plan 2040* model had not changed from the *2030 Envision6* model.

Step 4 – Using the modified ARC model, ADT traffic volumes were assigned to the existing network. The ADT network was compared with the Design Hourly Volume (DHV) network to determine K-values. These K-values were checked to determine if the turning movements and ADT's were matching the existing K-values where the roadway network did not change. In areas, where there were new roadways or intense development then the K-value was compared to the K-value for the most predominate land use of the area. Adjustments to the ADT volumes and/or the DHV volumes were made as necessary to represent the no-build condition for the 2020 opening year and 2040 design year.

Step 5 – The ARC model was modified to include a diamond interchange at McGinnis Ferry Road. Using the modified ARC model, ADT traffic volumes were assigned to the existing network. The ADT network was compared with the Design Hourly Volume (DHV) network to determine K-values. These K-values were checked to determine if the turning movements and ADT's were matching the existing K-values where the roadway network did not change. In areas, where there were new roadways or intense development then the K-value was compared to the K-value for the most predominate land use of the area. Adjustments to the ADT volumes and/or the DHV volumes were made as necessary to represent the build condition for the 2020 opening year and 2040 design year.

The resulting ADT traffic volumes for Opening Year 2020 and Design Year 2040 for No-Build and Build Alternatives are shown in Figure 28 through Figure 31. The 2020 and 2040 peak hour traffic volumes with and without the interchange are found in Appendix B.

During the modeling process, no changes to the social-economic base data within the traffic analysis zones were made. The only assumption difference between modeled outcomes was the inclusion of a new interchange between Windward Parkway and McFarland Parkway.

5.0 TRAFFIC OPERATIONS ANALYSIS

The traffic analysis chapter begins by establishing the specific roadways that were included in the technical level of service analyses in Section 5.1. The existing roadway conditions were then described in Section 5.1.1 including the existing 24-hour traffic counts and peak hour turning movement counts, and the existing level of service analysis for the freeway segments and ramp junctions. The traffic methodology is then established for the forecasting of future traffic in 4.1. The following section pertains to the travel demand model for the opening year traffic volumes, and the last section presents the evaluation of alternatives including the No-Build and Build Alternatives.

5.1 Existing Roadway Network Analyzed

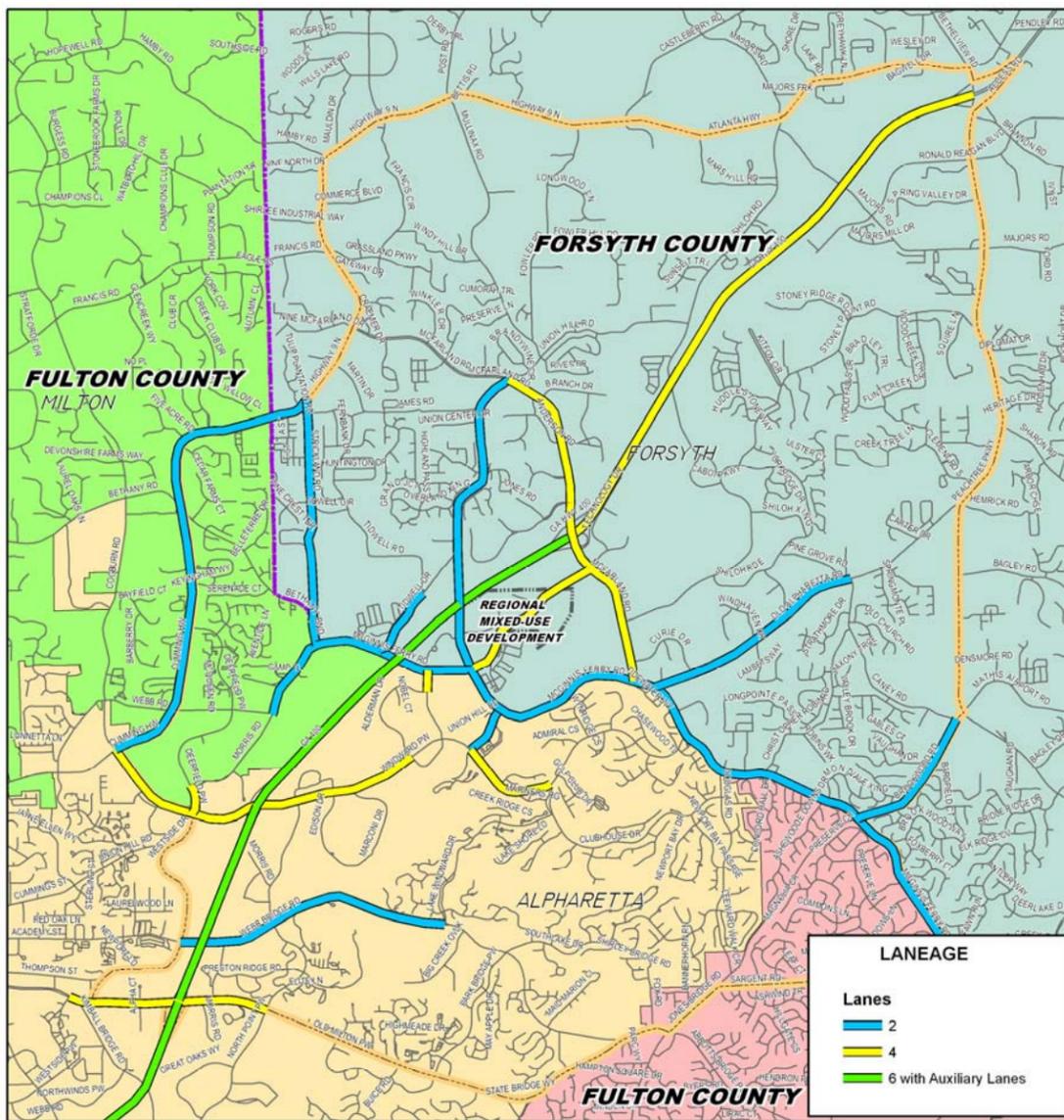
The study area contains SR 400, a major north-south freeway located diagonally across Forsyth County. SR 400 is a limited-access multi-lane freeway within the study area. In the study area, SR 400 is a 6-lane facility with auxiliary lanes between the interchanges from Haynes Bridge Road to the McFarland Parkway overpass. From that point SR 400 becomes a 4-lane facility. McGinnis Ferry Road is an east-west 2-lane roadway bridging over SR 400 at the proposed location of the SR 400/McGinnis Ferry Road interchange. Windward Parkway is a major four-lane divided urban collector providing east-west access to SR 400. McFarland Parkway is a 4-lane roadway that provides north-south access from the McGinnis Ferry Road east of SR 400 to SR 9 (Atlanta Highway) northwest of its interchange with SR 400. Other routes in the study area include Deerfield Parkway, a 4-lane roadway which parallels SR 400 on its west side, 2-lane Union Hill Road which extends northerly from McGinnis Ferry Road across SR 400 to McFarland Parkway, 2-lane Bethany Bend which extends northerly from McGinnis Ferry Road west of SR 400 to SR 9, 2-lane Morris Road which extends southerly from McGinnis Ferry Road west of SR 400 to Deerfield Parkway, and Ronald Reagan Boulevard which extends from McGinnis Ferry Road east of SR 400 to McFarland Parkway at its intersection with Bluegrass Valley Parkway. The existing primary roadway network was analyzed within the study area and is illustrated in Figure 26.

5.1.1 Existing 2011 Conditions

Twenty-four hour traffic volumes for the freeway and surface street segments within the study area were counted in July 2007 and some locations were recounted in September 2007. Additionally, traffic counts were obtained from Georgia Department of Transportation (GDOT) coverage. Due to a delay in the project study, twenty-four hour traffic volumes were recounted in January 2012 on Windward Parkway, SR 120, McGinnis Ferry Road, McFarland Parkway, Webb Bridge Road and SR 9. With these updated traffic volumes, the increase in traffic between the 2007 traffic counts and 2011 traffic counts was calculated on these roadways and used to adjust the other 2007 traffic volumes in the area (Figure 27).

Existing (2007) peak hour traffic turning movement counts were also counted in July 2007 and September 2007 for the major intersections in the study area. The 2007 peak hour traffic turning movement counts were adjusted to 2011 peak hour traffic counts based on the increases determined by the twenty-four hour traffic counts collected in January 2012. (See Existing 2012 Peak Hour Traffic Counts in Appendix B).

Figure 26: Existing Roadway Network Analyzed



Source: Gwinnett, Forsyth, and Fulton County GIS & ARC

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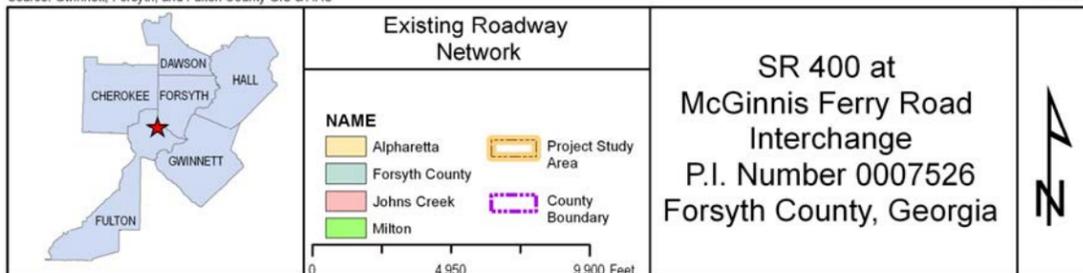
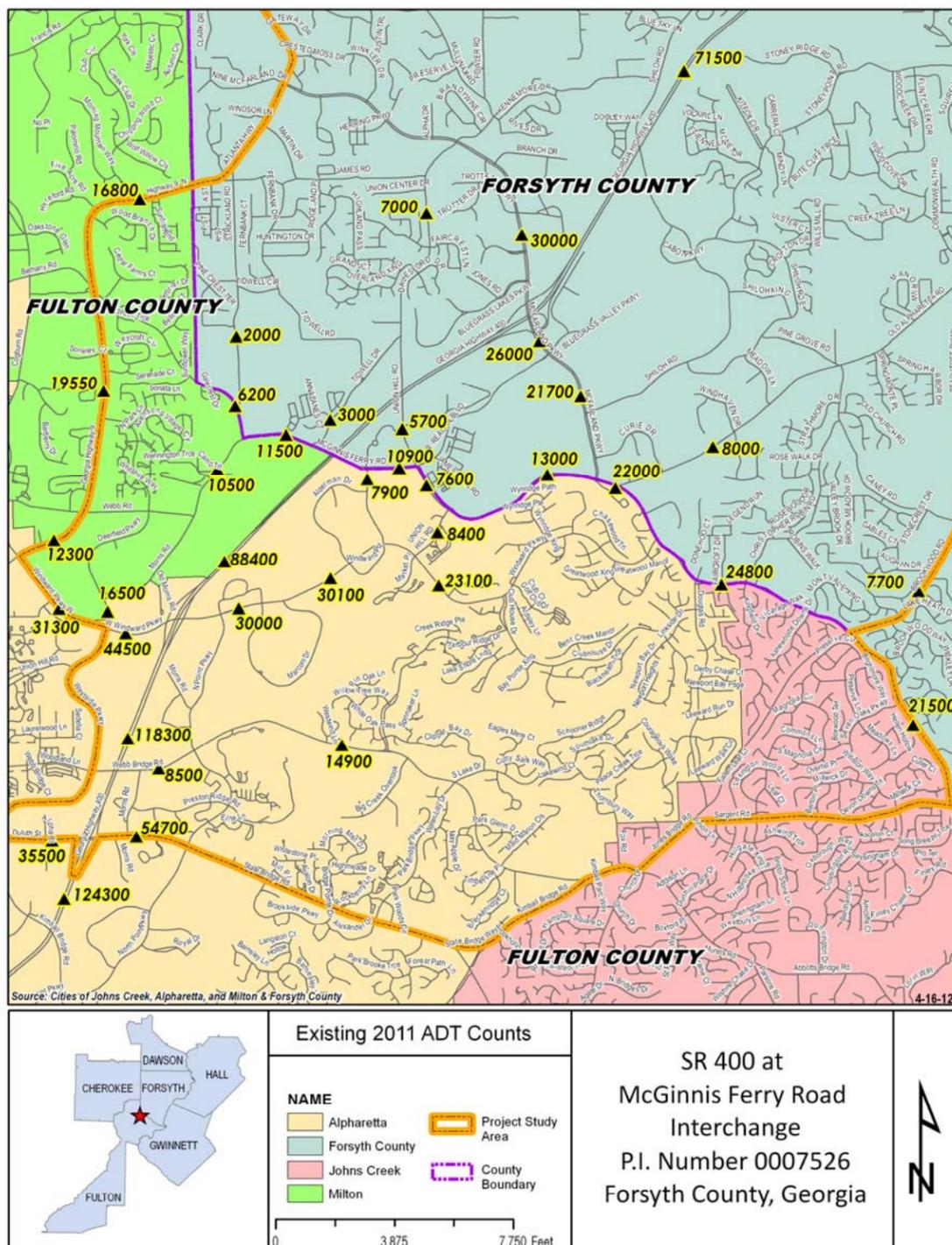


Figure 27: Existing 2011 ADT Volumes



5.1.1.1 Intersection Analysis

Existing 2011 intersection operations within the study area were analyzed using existing traffic volumes, lane configurations, and signal operations (Table 18: Summary of Existing (2011) Intersection Capacity Analysis Results). The most widely used measure of effectiveness is the intersection Level of Service (LOS), which is based on the amount of average delay experienced by drivers as they travel through an intersection or along a roadway segment. 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 results of the existing intersection level of service analysis shows that McGinnis Ferry Road at Windward Concourse, which is currently a stop-controlled intersection, has failing levels of service for both AM and PM peak hours. Also, five of the intersections along Windward Parkway are experiencing exceeded capacity or failing LOS conditions during at least one of the peak hours: Windward Parkway at Deerfield/Westside Parkway, Windward Parkway at Deerfield Plaza Driveway, Windward Parkway at North Point Parkway, Windward Parkway at Windward Plaza/Alderman Drive, and Windward Parkway at Windward Plaza/Windward Concourse. These intersections would require additional turn lanes to handle some of the peak hour turning movement volumes. Additionally, both intersections on SR120 at the SR 400 on and off ramps are currently at failing levels of service. The intersections on McFarland Parkway are currently operating at acceptable levels of service.

Table 18: Summary of Existing (2011) Intersection Capacity Analysis Results

Intersection	Control Type	LOS (Delay in sec.)	
		AM	PM
Windward Pkwy @ Deerfield/Westside Pkwy	Signal	F (310.8)	F (137.2)
Windward Pkwy @ Deerfield Plaza Driveway	Signal	A (9.9)	F (136.5)
Windward Pkwy @ SR 400 Southbound Ramps	Signal	C (22.7)	C (25)
Windward Pkwy @ SR 400 Northbound Ramps	Signal	D (42.8)	C (28.7)
Windward Pkwy @ North Point Pkwy	Signal	D (38.7)	F (92.5)
Windward Pkwy @ Edison Drive	Signal	B (11.4)	B (17)
Windward Pkwy @ Marconi Drive	Signal	B (19.4)	C (34.4)
Windward Pkwy @ Windward Plaza/Alderman Dr.	Signal	C (27.4)	E (57.9)
Windward Pkwy @ Windward Plaza/Windward Concourse	Signal	F (86.3)	D (46.5)
Windward Pkwy @ Market Pl/Union Hill Rd	Signal	D (41)	B (11.8)
McGinnis Ferry Road @ Bethany Bend	Signal	B (12.8)	B (12.4)
McGinnis Ferry Road @ Tidwell Drive	Stop	C (22.9)	C (23.2)
McGinnis Ferry Road @ Windward Concourse`	Stop	F (869.9)	F (204.4)
McGinnis Ferry Road @ Union Hill Road South	Signal	D (38.8)	C (22.4)
McFarland Parkway @ Bluegrass Lakes Pkwy	Signal	A (4.9)	B (10.8)
McFarland Parkway @ SR 400 Southbound Ramps	Signal	B (17.2)	B (15.5)
McFarland Parkway @ SR 400 Northbound Ramps	Signal	A (3.8)	B (10.1)
McFarland Parkway @ Ronald Reagan Blvd./Bluegrass Valley Pkwy	Signal	B (16.5)	D (40.4)
McFarland Parkway @ Shiloh Road	Signal	B (15.8)	A (8.4)
McFarland Parkway @ McGinnis Ferry Rd.	Signal	C (25.3)	C (22.8)
SR 120 at SR 400 Southbound Ramps	Signal	F (533.4)	F (304.4)
SR 120 at SR 400 Northbound Ramps	Signal	F (540.9)	F (214)
Union Hill Rd at Tidwell Rd	Stop	B (14.7)	C (17.2)

Source: Moreland Altobelli Associates, Inc.

5.1.1.2 Basic Freeway Segments

The level of service (LOS) of the freeway (SR 400) was determined according to the methodology of the Highway Capacity Manual 2010. The existing levels of service of the SR 400 freeway segments are shown in Table 19.

Table 19: Existing HCS Freeway Segment LOS Analysis for Year 2011

Freeway Segments	No. of Lanes	LOS (pc/mi/ln)	
		AM	PM
SR 400 NB between McFarland Pkwy and SR 141	2	B (14.3)	F (*)
SR 400 SB between SR 141 and McFarland Pkwy	4	F (*)	B (15.7)
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	4	B (14.6)	C (23.6)
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	4	B (17.4)	B (11.7)
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	4	A (10.9)	B (17.5)
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	4	B (17.4)	B (11.7)
SR 400 NB Between SR 120 and Windward Pkwy	4	B (15.9)	C (20.5)
SR 400 SB between Windward Pkwy and SR 120	4	C (20.9)	B (16.7)
SR 400 NB between Haynes Bridge Rd and SR 120	4	C (18.5)	C (20.6)
SR 400 SB between SR 120 and Haynes Bridge Rd	4	B (17.2)	C (19.2)

Source: Moreland Altobelli Associates, Inc.

* Density measures in severely over-capacity conditions are not reported. Cells marked with an asterisk had no density measure for their LOS F condition to compare against and are not reported.

The results of the level of service analysis indicate that SR 400 north of McFarland Parkway to SR 141 operates with LOS F in the southbound direction during the AM peak hour and in the northbound direction for the PM peak. However, the sections of roadway south of McFarland Parkway have acceptable levels of service during the AM and PM peak hours in both directions. This is primarily due to the number of travel lanes on SR 400 being much greater from the south side of the study area to McFarland Parkway, ranging from eight lanes south of Windward Parkway to six lanes at McFarland Parkway. The section of SR 400 north of McFarland Parkway is a four-lane divided freeway.

5.1.1.3 Ramp Junctions

Ramp junction analyses for the existing conditions (2011) were performed on all the ramp junctions of Windward Parkway, SR 120, and McFarland Parkway interchanges with SR 400. Results of this analysis are shown in Table 20.

As per the 2010 Highway Capacity Manual for ramps and ramp junction methodology, average volumes and speeds of lane 1 and lane 2 of the freeway are used to determine the density of the merge or diverge junction. For the merge junction, density is calculated using lanes 1 and 2 immediately downstream from the merge influence area and, for the diverge junction, lanes 1 and 2 immediately upstream of the diverge influence area. However, when analyzing major merge and diverge ramp junctions, the analysis is limited to a check of capacities on the approaching and departing freeway segments. This is a default assumption of the Highway Capacity Manual methodology. In the case of major merge areas, insufficient capacity in

the downstream segment is the deciding factor. In the case of major diverges, operational problems are most often created by insufficient capacity on one or more of the departing legs. For ramp junctions with these characteristics, the LOS shown is for the approaching or the departing freeway segment.

Table 20: Existing HCS Ramp Merge/Diverge LOS Analysis Results for Year 2011

Ramp Junction	LOS (pc/mi/ln)	
	AM	PM
SR 400 SB Off-Ramp to McFarland Rd	C (25.2)	A (1.5)
SR 400 SB On-Ramp from McFarland Rd	C (18.7)	B (12.6)
SR 400 SB Off-Ramp to Windward Pkwy	C (21.5)	B (13.6)
SR 400 SB On-Ramp from Windward Pkwy	C (22.5)	B (18)
SR 400 SB Off-Ramp to SR 120	C (20.2)	B (19.5)
SR 400 SB On-Ramp from SR 120	B (18.6)	C (20.6)
SR 400 NB Off-Ramp to SR 120	C (27.9)	D (29.2)
SR 400 NB On-Ramp from SR 120	C (20.4)	C (26.6)
SR 400 NB Off-Ramp to Windward Pkwy	C (26.3)	D (30.2)
SR 400 NB On-Ramp from Windward Pkwy	B (14.5)	C (21.7)
SR 400 NB Off-Ramp to McFarland Rd	B (11.8)	B (18.9)
SR 400 NB Loop Off-Ramp to McFarland Rd	B (11.5)	C (22.1)
SR 400 NB On-Ramp from McFarland Rd	B (17.1)	E (40.2)

Source: Moreland Altobelli Associates, Inc.

The ramp junction analysis for the existing conditions (2011) indicates that the SR 400 ramp junctions during the peak hours mostly operate at acceptable levels of service. Only the SR 400 northbound on ramp to McFarland Parkway in the PM peak hour is showing a failing level of service.

5.2 Traffic Analyses of the Alternatives

The alternatives were evaluated individually to determine the traffic benefits that could potentially be achieved through capacity improvements and/or new interstate access. All Intersections along SR 400 in the study area, the local arterial roadway network, and the on/off ramp junctions were evaluated. The Level of Service (LOS) was the measure of effectiveness used in this operational evaluation. 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.⁷

⁷ All tables in this section list the output of the capacity analysis for each alternative. No attempt is made at a comparative analysis. For ease of comparison between alternatives, see Section 6.0, Comparison of Alternatives.

5.2.1 Basic Freeway Segments

Freeway segment analyses were conducted on freeway segments of SR 400. The resulting LOS values for all six alternatives for the year 2020 and the year 2040 are shown in Table 21.

As presented, under Alternative 1 - (No-Build), most SR 400 freeway segments would exhibit LOS E or LOS F conditions for one or both AM and PM peak hours by the Year 2040.

Alternative 2 results show that levels of service on SR 400 between McGinnis Ferry Road and McFarland Parkway would improve by two or more LOS grades in the year 2040 and all other freeway segments would be maintained at LOS levels equivalent to the no build. In 2020, the LOS between Windward Parkway and McGinnis Ferry Road would have a one-grade deterioration in LOS, but maintain a LOS of D or better.

Alternative 3 results show that the addition of an interchange on SR 400 at McGinnis Ferry Road would minimally deteriorate or maintain the levels of service of the segments upstream and downstream of the interchange. The maintenance or minor deterioration in the levels of service on the segments can be directly attributed to the traffic diversions created by the new interchange. The interchange would have no adverse effect upon SR 400 within the study area.

Alternative 4 improves the levels of service of SR 400 between SR 120 and Windward Parkway by adding auxiliary lanes between the ramp junctions. 2040 LOS improvements are significant between Windward Parkway and McFarland Parkway, some segments improving by two LOS grades.

Alternative 5 improves the levels of service of SR 400 between Windward Parkway and McFarland Parkway by adding auxiliary lanes between the ramp junctions. Similarly to Alternative 4, significant LOS improvements are shown in 2040.

Alternative 6 combines the improvements of Alternatives 4 and 5. The improvements shown are the same, with significant LOS grade improvements on the SR 400 mainline between SR 120 and McFarland Parkway.

Table 21: HCS Freeway Segment Analysis Results for 2020 and 2040 in All Alternatives

FREEWAY SEGMENTS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
LOS (Density in pc/mi/ln)																								
SR 400 NB between McFarland Pkwy and SR 141	B (16.5)	F (46.7)	C (20.5)	F (102.6)	B (16.5)	F (46.7)	C (20.5)	F (102.6)	B (16.5)	F (46.7)	C (20.5)	F (102.6)	B (16.5)	F (46.7)	C (20.5)	F (102.6)	B (16.5)	F (46.7)	C (20.5)	F (102.6)	B (16.5)	F (46.7)	C (20.5)	F (102.6)
SR 400 SB between SR 141 and McFarland Pkwy	F (367.2)	D (28.8)	F (*)	E (41.4)	F (367.2)	D (28.8)	F (*)	E (41.4)	F (367.2)	D (28.8)	F (*)	E (41.4)	F (367.2)	D (28.8)	F (*)	E (41.4)	F (367.2)	D (28.8)	F (*)	E (41.4)	F (367.2)	D (28.8)	F (*)	E (41.4)
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	B (15.2)	C (25.5)	C (18.6)	E (35.6)	A (9) (18.6)	C (9.7)	A (10.8)	C (22.3)	B (17.4)	D (28.6)	C (21) (39.5)	E (19.3)	B (12.2)	C (19.6)	B (14.9)	C (24.7)	B (12.2)	C (19.6)	B (14.9)	C (24.7)	B (12.2)	C (19.6)	B (14.9)	C (24.7)
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	C (25.2)	B (16.2)	E (35.2)	C (19.9)	C (19.2)	A (9.7)	C (24.8)	A (10.5)	D (27.2)	B (17.4)	E (37.5)	C (19.3)	C (19.4)	B (13)	C (24.5)	B (15.8)	C (19.4)	B (13)	C (24.5)	B (15.8)	C (19.4)	B (13)	C (24.5)	B (15.8)
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	B (15.2)	C (25.5)	C (18.6)	E (35.6)	B (17.3)	D (28.4)	C (21.3)	E (38.1)	B (17.3)	D (28.4)	C (21.3)	E (38.1)	B (12.2)	C (19.6)	B (14.9)	C (24.7)	B (12.2)	C (19.6)	B (14.9)	C (24.7)	B (12.2)	C (19.6)	B (14.9)	C (24.7)
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	C (25.2)	B (16.2)	E (35.2)	C (19.9)	D (27.6)	C (18.6)	E (37.2)	C (23.1)	D (27.6)	C (18.6)	E (37.2)	C (23.1)	C (19.4)	B (13)	C (24.5)	B (15.8)	C (19.4)	B (13)	C (24.5)	B (15.8)	C (19.4)	B (13)	C (24.5)	B (15.8)
SR 400 NB Between SR 120 and Windward Pkwy	D (27) (31.2)	D (32)	C (25.9)	E (43.5)	D (27) (31.2)	D (32)	C (25.9)	E (43.5)	D (27) (31.2)	D (32)	C (25.9)	E (43.5)	C (18.7)	C (23.5)	C (25.9)	E (43.5)	D (27) (31.2)	D (32)	C (25.9)	E (43.5)	C (18.7)	C (23.5)	C (25.9)	E (43.5)
SR 400 SB between Windward Pkwy and SR 120	D (31.2)	C (23) (32)	E (42.8)	D (29.1)	D (31.2)	C (23) (32)	E (42.8)	D (29.1)	D (31.2)	C (23) (32)	E (42.8)	D (29.1)	C (23) (31.2)	B (18)	D (29)	C (21.8)	D (31.2)	C (23) (32)	E (42.8)	D (29.1)	C (23) (31.2)	B (18)	D (29)	C (21.8)
SR 400 NB between Haynes Bridge Rd and SR 120	C (24.7)	D (32)	D (31.3)	E (43.7)	C (24.7)	D (32)	D (31.3)	E (43.7)	C (24.7)	D (32)	D (31.3)	E (43.7)	C (24.7)	D (32)	D (31.3)	E (43.7)	C (24.7)	D (32)	D (31.3)	E (43.7)	C (24.7)	D (32)	D (31.3)	E (43.7)
SR 400 SB between SR 120 and Haynes Bridge Rd	C (24.8)	D (26.7)	D (32)	D (34.9)	C (24.8)	D (26.7)	D (32)	D (34.9)	C (24.8)	D (26.7)	D (32)	D (34.9)	C (24.8)	D (26.7)	D (32)	D (34.9)	C (24.8)	D (26.7)	D (32)	D (34.9)	C (24.8)	D (26.7)	D (32)	D (34.9)

Source: Moreland Altobelli Associates, Inc.

* Density measures in over-capacity conditions are not reported. This is an assumption of the Highway Capacity Manual method. This represents a volume to capacity ratio of greater than 1.0.

Cells marked with an asterisk had no density measure to allow for quantitative comparison

5.2.2 Ramp Junctions

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. The analysis is according to the methodology described in Section 4.1. Results of this analysis are shown in Table 22.

The ramp junction analysis of the Alternative 1 – No-Build indicates that most of the SR 400 ramp junctions at Windward Parkway, McFarland Parkway, and SR 120 would operate at capacity or have failing levels of service during either or both AM or PM peak hours during the year 2040.

The improved LOS in alternatives 4, 5, and 6, and partially in Alternative 2, are due to either the displacement of the ramps from the major flow of SR 400 or due to the addition of travel lanes and/or auxiliary lanes, whereas the improvements of Alternative 3 are due only to the redistribution of traffic volumes on the on/off ramps to SR 400 after the addition of a new interchange at McGinnis Ferry Road.

Alternative 2 shows ramp junction improvements at most ramps between Windward Parkway to McFarland Parkway. All ramp junctions either improved in LOS or maintained their no-build ratings. Several ramps, notably the southbound on ramp from Windward Parkway and the northbound off ramp to Windward Parkway will remain LOS E in the year 2040.

Under Alternative 3 (new interchange at McGinnis Ferry Road), during the 2040 PM peak hour, the levels of service of the southbound off ramp to Windward Parkway would drop to an LOS D. All other ramp junctions of the interchanges of Windward Parkway and McFarland Parkway would remain the same. All ramp junctions would operate at LOS D or better, during the AM and PM peak hours under Alternative 3.

Alternative 4 shows LOS improvements of one or two grades at nearly every ramp junction within the project study area. The exceptions are the ramps south of the SR 120 crossover of SR 400 and the ramps north of the McFarland Road crossover of SR 400. These ramp junctions are not affected by any of the proposed improvements contained in Alternative 4. All ramp junctions not improved by this Alternative are maintained at their no-build LOS grades.

Alternative 5 similarly maintains or improves LOS grades at all ramp junctions. Significant improvements are shown at McFarland Parkway, notably reducing the 2020 and 2040 LOS E and F of the southbound off ramp to LOS B and D respectively.

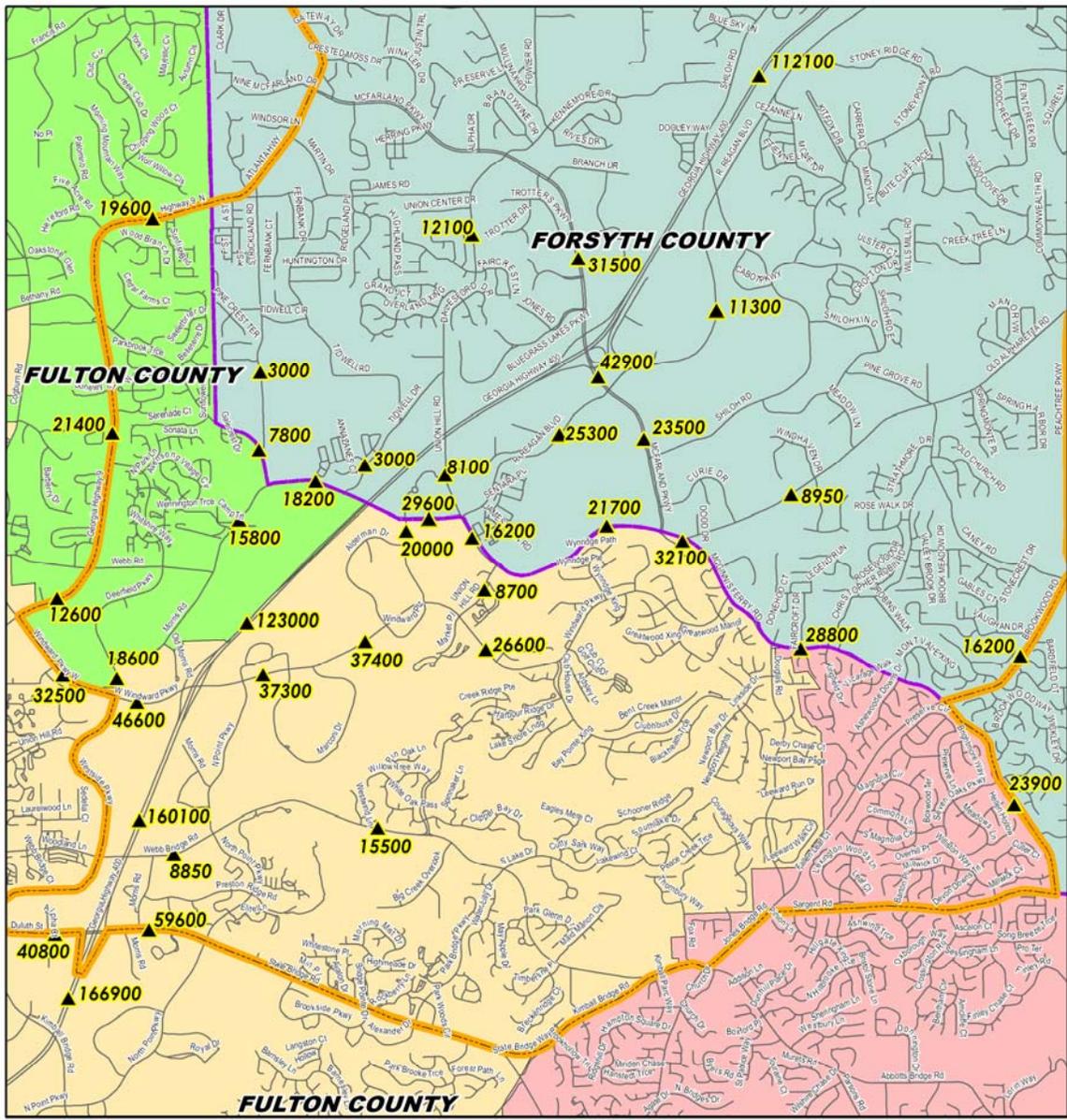
Alternative 6 is a combination of the proposed improvements in Alternatives 4 and 5, and likewise shows similar ramp junction LOS grade improvements. All ramp junctions are maintained or improved in LOS grade.

Table 22: HCS Ramp Junction Segment LOS Analysis Results for 2020 and 2040 on All Alternatives

RAMP JUNCTIONS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)				
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
SR 400 SB Off-Ramp to McFarland Rd	E (42.6)	B (14.7)	F (58.1)	C (22.4)	B (12.4)	A (7.3)	B (16.3)	B (12.8)	E (42.6)	B (14.7)	F (58.1)	C (22.4)	E (42.6)	B (14.7)	F (58.1)	C (22.4)	B (19.4)	A (1.3)	D (34.9)	A (6)	B (19.4)	A (1.3)	D (34.9)	A (6)	
SR 400 SB On-Ramp from McFarland Rd	D (26.6)	B (17.4)	E (35.2)	C (21.3)	B (13.1)	B (14.8)	B (15.6)	C (19.4)	D (27.2)	B (17.4)	E (37.5)	C (20.7)	C (20.9)	B (14)	C (25.8)	B (17)	C (20.9)	B (14)	C (25.8)	B (17)	C (20.9)	B (14)	C (25.8)	B (17)	
SR 400 SB Off-Ramp to McGinnis Ferry Rd	n/a ()	n/a ()	n/a ()	n/a ()	B (14.6)	B (16.5)	B (17.4)	C (21.9)	D (28.1)	B (20)	E (37.7)	C (25.9)	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()
SR 400 SB On-Ramp from McGinnis Ferry Rd	n/a ()	n/a ()	n/a ()	n/a ()	B (15.7)	B (19.1)	B (17.3)	C (25.9)	C (27)	E (39.6)	D (33.1)	D (28.3)	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()
SR 400 SB Off-Ramp to Windward Pkwy	D (30.3)	C (21.7)	E (36.7)	C (25.7)	C (21.5)	B (14.9)	D (26.8)	C (18.4)	D (27.4)	C (23.3)	E (38.1)	D (27.9)	C (20.9)	B (14)	C (25.8)	B (17)	C (20.9)	B (14)	C (25.8)	B (17)	C (20.9)	B (14)	C (25.8)	B (17)	
SR 400 SB On-Ramp from Windward Pkwy	E (35.5)	D (33)	E (40.9)	E (38)	E (35.2)	C (27)	E (40.2)	E (36.6)	E (35.2)	C (27)	E (40.2)	E (36.6)	C (24.4)	B (19.4)	D (30.3)	C (21.8)	E (35.5)	D (33)	E (40.9)	E (38)	C (24.4)	B (19.4)	D (30.3)	C (21.8)	
SR 400 SB Off-Ramp to SR 120	E (41.5)	D (29.9)	F (48.7)	E (35.2)	E (41.5)	D (29.9)	F (48.7)	E (35.2)	E (41.5)	D (29.9)	F (48.7)	E (35.2)	C (24.4)	B (19.4)	D (30.3)	C (23.2)	E (41.5)	D (29.9)	F (48.7)	E (35.2)	C (24.4)	B (19.4)	D (30.3)	C (23.2)	
SR 400 SB On-Ramp from SR 120	D (33)	D (28.5)	D (33.3)	E (38.2)	D (28.5)	D (33)	D (33.3)	E (38.2)	D (28.5)	D (33)	D (33.3)	E (38.2)	D (33)	D (28.5)	D (33.3)	E (38.2)	D (33)	D (28.5)	D (33.3)	E (38.2)	D (33)	D (28.5)	D (33.3)	E (38.2)	
SR 400 NB Off-Ramp to SR 120	D (34.4)	E (38.6)	E (40.3)	F (45.1)	D (34.4)	E (38.6)	E (40.3)	F (45.1)	D (34.4)	E (38.6)	E (40.3)	F (45.1)	D (34.4)	E (38.6)	E (40.3)	F (45.1)	D (34.4)	E (38.6)	E (40.3)	F (45.1)	D (34.4)	E (38.6)	E (40.3)	F (45.1)	
SR 400 NB On-Ramp from SR 120	C (25.2)	D (34.5)	D (29)	E (39.9)	C (25.2)	D (34.5)	D (29)	E (39.9)	C (25.2)	D (34.5)	D (29)	E (39.9)	C (20.6)	C (21.8)	C (21.3)	D (30.7)	C (25.2)	D (34.5)	D (29)	E (39.9)	C (20.6)	C (21.8)	C (21.3)	D (30.7)	
SR 400 NB Off-Ramp to Windward Pkwy	D (32.6)	E (40.5)	E (37.6)	F (46.5)	D (31.7)	E (39.6)	E (36.4)	F (45.4)	D (31.7)	E (39.6)	E (36.4)	F (45.4)	B (18)	C (24.8)	C (21.3)	D (30.7)	D (32.6)	E (40.5)	E (37.6)	F (46.5)	B (18)	C (24.8)	C (21.3)	D (30.7)	
SR 400 NB On-Ramp from Windward Pkwy	B (18.3)	C (27.8)	C (21.6)	D (33.1)	B (13.8)	C (22)	B (17)	C (27.3)	B (19.3)	D (29.3)	C (22.9)	D (34.5)	B (13.1)	C (21)	B (16)	C (26)	B (13.1)	C (21)	B (16)	C (26)	B (13.1)	C (21)	B (16)	C (26)	
SR 400 NB Off-Ramp to McFarland Rd	B (19.3)	D (28.8)	C (25.8)	E (38.7)	B (15.5)	B (15.3)	B (19.3)	C (21.3)	C (21.8)	D (31.7)	C (25.8)	E (38.5)	B (13.1)	C (21)	B (16)	C (26)	B (13.1)	C (21)	B (16)	C (26)	B (13.1)	C (21)	B (16)	C (26)	
SR 400 NB Off-Ramp to McGinnis Ferry Rd	n/a ()	n/a ()	n/a ()	n/a ()	B (18)	B (17.7)	C (22.5)	C (22.6)	B (15)	C (25.9)	C (26.6)	E (40.1)	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()
SR 400 NB On-Ramp from McGinnis Ferry Rd	n/a ()	n/a ()	n/a ()	n/a ()	B (18.4)	B (18.1)	C (21.7)	C (23.2)	B (16.1)	C (25.6)	C (24.1)	E (37.1)	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()	n/a ()
SR 400 NB Loop Off-Ramp to McFarland Rd	B (12.7)	C (22.7)	B (15.9)	D (29)	A (8.5)	A (10.2)	B (12.2)	B (16.1)	B (14.2)	C (25.6)	B (17.8)	D (34.7)	B (12.7)	C (22.7)	B (15.9)	D (29)	B (12.7)	C (22.7)	B (15.9)	D (29)	B (12.7)	C (22.7)	B (15.9)	D (29)	
SR 400 NB On-Ramp from McFarland Rd	B (19.6)	E (40.5)	C (23.7)	F (50.6)	A (8.7)	B (17.1)	B (10.9)	C (24.1)	B (18.6)	E (38.7)	C (22.5)	F (51.2)	B (19.6)	E (40.5)	C (23.7)	F (50.6)	B (19.6)	E (40.5)	C (23.7)	F (50.6)	B (19.6)	E (40.5)	C (23.7)	F (50.6)	

Source: Moreland Altobelli Associates, Inc.

Figure 28: Year 2020 (Alternatives 1, 4, 5, and 6) Average Daily Traffic



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

4-16-12

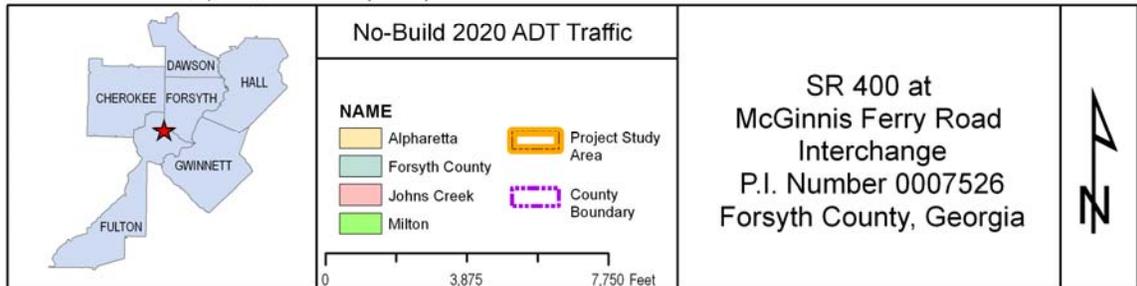
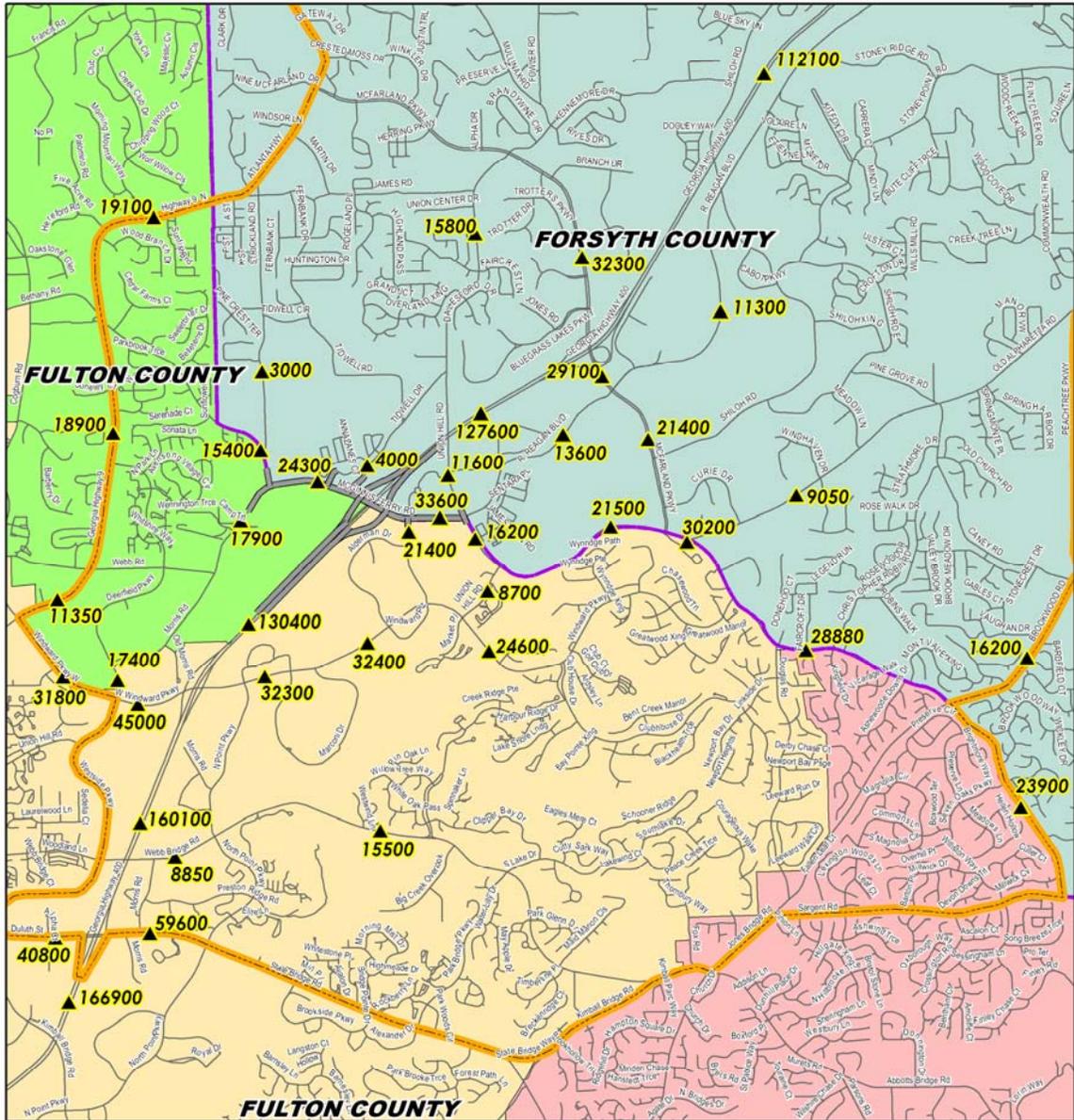


Figure 29: Year 2020 Build (Alternatives 2 and 3) Average Daily Traffic

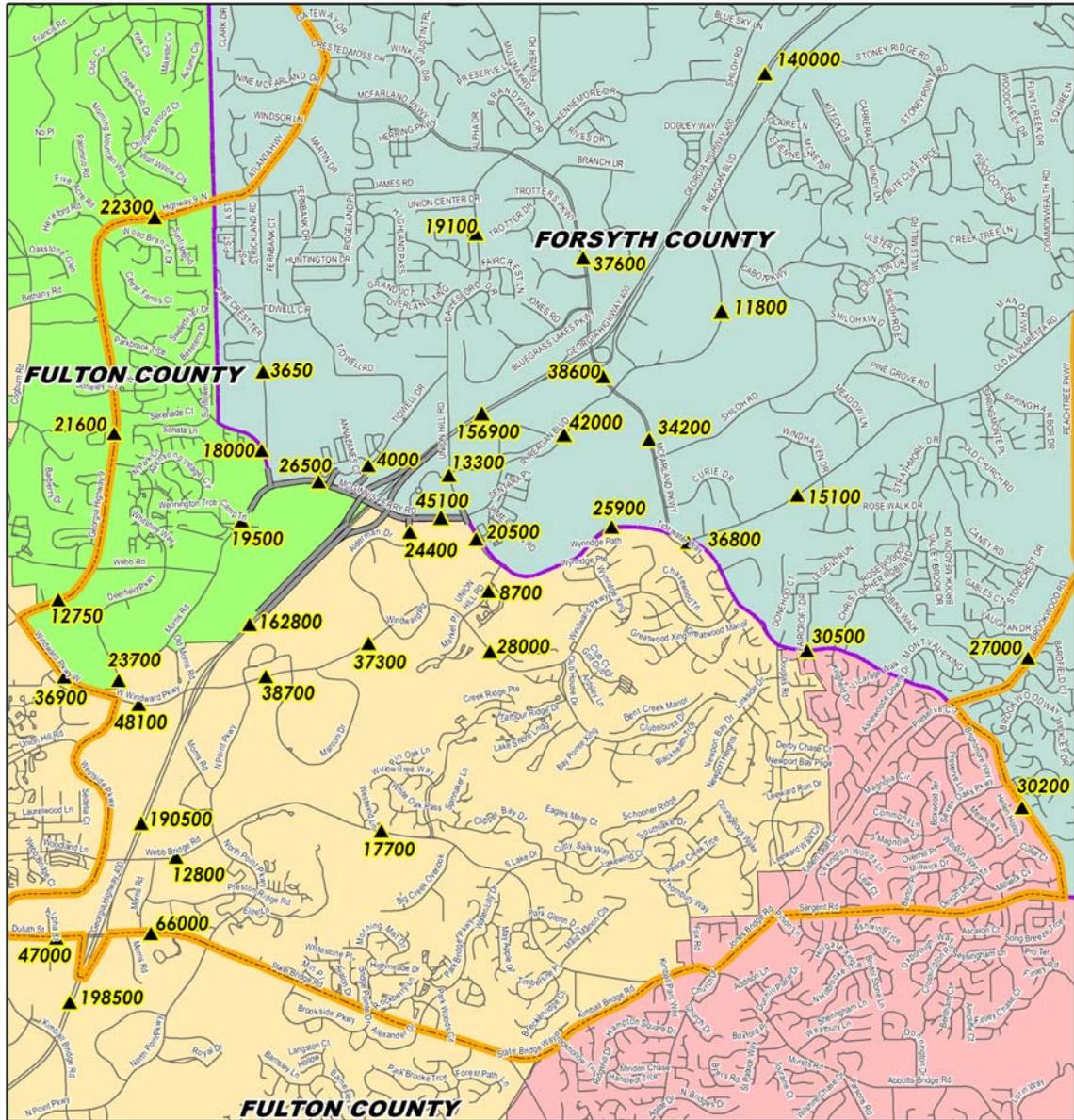


Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

4-16-12

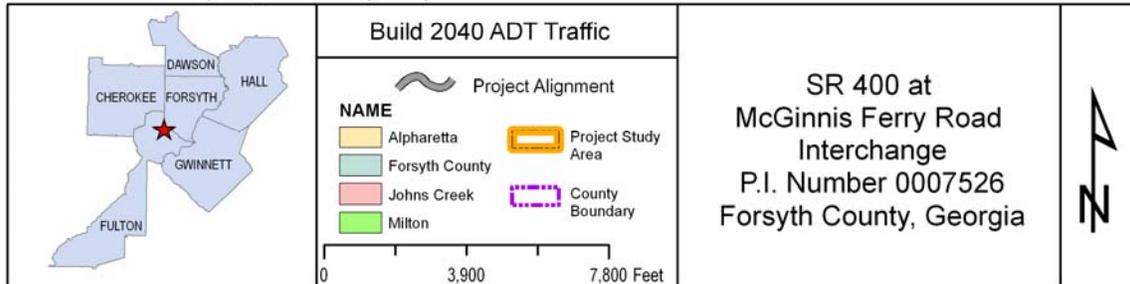
	<p align="center">Build 2020 ADT Traffic</p>		<p align="center">SR 400 at McGinnis Ferry Road Interchange P.I. Number 0007526 Forsyth County, Georgia</p>
	<p>NAME</p> <ul style="list-style-type: none"> Alpharetta Forsyth County Johns Creek Milton 	<ul style="list-style-type: none"> Project Alignment Project Study Area County Boundary 	

Figure 31: Year 2040 Build (Alternatives 2 and 3) Average Daily Traffic



Source: Cities of Johns Creek, Alpharetta, and Milton & Forsyth County

4-16-12



5.2.3 Intersection Analysis

Intersection capacity analysis was performed using future 2020 and 2040 traffic volumes for all six alternatives. Since the No-Build traffic patterns will remain unchanged under Alternatives 4, 5, and 6, the same traffic volumes on the roadway network for 2020 and 2040 outside of SR 400 in the study area were used for Alternatives 1, 4, 5 and 6 as shown in Figure 28 and Figure 30. Since the addition of an interchange on SR 400 at McGinnis Ferry Road, as described under alternatives 2 and 3, would result in a redistribution of traffic of the surface streets in the study area, traffic volumes were calculated for this scenario and projected to the years 2020 and 2040 as shown in Figure 29 and Figure 31. A summary of the intersection capacity analyses in terms of level of service for all six alternatives are shown in Table 23: Summary of Year 2020 & Year 2040 Intersection Capacity Analysis.

The results of the intersection level of service analysis demonstrate that with the construction of the SR 400/McGinnis Ferry Road interchange (Alternatives 2 and 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 certain intersections of Windward Parkway and McFarland Parkway, which results in improved levels of service at those intersections. This can be appreciated on the results shown in Table 23.

Table 23: Summary of Year 2020 & Year 2040 Intersection Capacity Analysis (LOS)

INTERSECTIONS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Windward Pkwy @ Deerfield/Westside Pkwy	F	F	F	F	F	F	F	F	F	F	F	F	F	D	F	F	F	F	F	F	F	F	F	F
Windward Pkwy @ Deerfield Plaza Driveway	B	F	B	F	A	F	B	F	A	F	B	F	A	C	A	C	B	F	B	F	A	C	A	C
Windward Pkwy @ SR 400 Southbound Ramps	C	E	C	F	C	E	C	E	C	E	C	E	B	D	C	F	C	E	C	F	B	D	C	F
Windward Pkwy @ SR 400 Northbound Ramps	D	F	F	F	D	D	E	F	D	D	E	F	C	C	E	E	D	F	F	F	C	C	E	E
Windward Pkwy @ North Point Pkwy	E	F	F	F	E	F	F	F	E	F	F	F	D	D	F	F	E	F	F	F	D	D	F	F
Windward Pkwy @ Edison Drive	A	B	A	F	A	B	A	D	A	B	A	D	A	C	A	F	A	B	A	F	A	C	A	F
Windward Pkwy @ Marconi Drive	C	E	E	F	C	C	D	F	C	C	D	F	B	E	E	F	C	E	E	F	B	E	E	F
Windward Pkwy @ Windward Plaza/Alderman Dr	C	F	C	F	C	F	C	F	C	F	C	F	C	D	E	F	C	F	C	F	C	D	E	F
Windward Pkwy @ Windward Plaza/Windward Concourse	F	F	F	F	F	F	F	F	F	F	F	F	C	C	F	D	F	F	F	F	C	C	F	D
Windward Pkwy @ Market Pl/Union Hill Rd	D	B	F	B	D	B	F	B	D	B	F	B	C	B	F	C	D	B	F	B	C	B	F	C
McGinnis Ferry Road @ Bethany Bend	B	F	D	F	B	A	B	B	B	A	B	B	A	A	A	A	B	F	D	F	A	A	A	A
McGinnis Ferry Road @ Deerfield Point Dr.	n/a	n/a	n/a	n/a	B	B	B	B	B	B	B	B	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ Tidwell Drive	F	F	F	F	B	D	B	C	B	D	B	C	D	D	E	F	D	D	E	F	D	D	E	F
McGinnis Ferry Road @ SR 400 SB Ramps	n/a	n/a	n/a	n/a	B	B	B	C	B	B	B	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ SR 400 NB Ramps	n/a	n/a	n/a	n/a	B	B	B	D	B	B	B	D	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ Windward Concourse`	F	F	F	F	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C
McGinnis Ferry Road @ Union Hill Road South	D	F	D	F	B	C	B	D	B	C	B	D	C	C	C	E	C	C	C	E	C	C	C	E
McFarland Parkway @ Bluegrass Lakes Pkwy	A	B	C	C	A	B	B	C	A	B	B	C	A	B	C	C	A	B	C	C	A	B	C	C
McFarland Parkway @ SR 400 Southbound Ramps	C	F	E	F	B	B	B	E	B	B	B	E	C	F	E	F	C	F	E	F	C	F	E	F
McFarland Parkway @ SR 400 Northbound Ramps	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
McFarland Parkway @ Ronald Reagan Blvd./Bluegrass Valley Pkwy	D	F	F	F	C	D	C	F	C	D	C	F	D	F	F	F	C	F	D	F	C	F	D	F
McFarland Parkway @ Shiloh Road	B	A	F	A	B	A	C	B	B	A	C	B	B	A	F	A	B	A	B	A	B	A	B	A
McFarland Parkway @ McGinnis Ferry Rd.	D	F	F	F	C	C	C	F	C	C	C	F	D	F	F	F	B	B	C	F	B	B	C	F
SR 120 at SR 400 Southbound Ramps	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SR 120 at SR 400 Northbound Ramps	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F
Union Hill Rd at Tidwell Rd	B	E	C	F	C	F	D	F	C	F	D	F	B	E	C	F	B	E	C	F	B	E	C	F

Source: Moreland Altobelli Associates, Inc

Table 24: Summary of Year 2020 & Year 2040 Intersection Capacity Analysis (Delay)

INTERSECTIONS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Delay (sec.)																								
Windward Pkwy @ Deerfield/Westside Pkwy	399.3	213.3	598.7	246.4	351.4	184.7	503.2	274.9	351.4	184.7	503.2	274.9	100.3	45.1	216.6	102.8	399.3	213.3	598.7	246.4	100.3	45.1	216.6	102.8
Windward Pkwy @ Deerfield Plaza Driveway	10.4	84	12.7	116	9	93.4	11.6	136	9	93.4	11.6	136	7	21.4	8.8	26.3	10.4	84	12.7	116	7	21.4	8.8	26.3
Windward Pkwy @ SR 400 Southbound Ramps	21.7	69.8	29	177.1	21.1	75.5	24	56.7	21.1	75.5	24	56.7	17.3	42	20.4	107.7	21.7	69.8	29	177.1	17.3	42	20.4	107.7
Windward Pkwy @ SR 400 Northbound Ramps	53	128.3	318	303.2	42.9	49.9	73	261.8	42.9	49.9	73	261.8	28.7	29.5	61.2	78.3	53	128.3	318	303.2	28.7	29.5	61.2	78.3
Windward Pkwy @ North Point Pkwy	80	247	291.6	368.6	58.7	173.8	207.8	341.2	58.7	173.8	207.8	341.2	46.2	42.1	288.3	216.1	80	247	291.6	368.6	46.2	42.1	288.3	216.1
Windward Pkwy @ Edison Drive	5.8	18.4	8.6	98	5.9	19	9.8	46.7	5.9	19	9.8	46.7	3.1	21.4	8.6	101.3	5.8	18.4	8.6	98	3.1	21.4	8.6	101.3
Windward Pkwy @ Marconi Drive	25	70.2	59.6	306.9	23.1	30.4	49.5	139.2	23.1	30.4	49.5	139.2	13.5	69.6	59.7	306	25	70.2	59.6	306.9	13.5	69.6	59.7	306
Windward Pkwy @ Windward Plaza/Alderman Dr	28.5	141.8	33.2	218.3	30.4	83.1	32.5	136	30.4	83.1	32.5	136	28	54	71.1	87.3	28.5	141.8	33.2	218.3	28	54	71.1	87.3
Windward Pkwy @ Windward Plaza/Windward Concourse	307.7	344.8	830.2	674.8	138.5	119.5	264.9	157.3	138.5	119.5	264.9	157.3	23.6	31.8	129.5	36.8	307.7	344.8	830.2	674.8	23.6	31.8	129.5	36.8
Windward Pkwy @ Market Pl/Union Hill Rd	46.7	15.5	122.5	15.2	47	12.8	119.3	18.8	47	12.8	119.3	18.8	21.3	18.2	84.9	25.6	46.7	15.5	122.5	15.2	21.3	18.2	84.9	25.6
McGinnis Ferry Road @ Bethany Bend	15.1	431.2	36.9	1613	14.6	9.4	15.2	13.4	14.6	9.4	15.2	13.4	9.4	6.9	9.7	7.4	15.1	431.2	36.9	1613	9.4	6.9	9.7	7.4
McGinnis Ferry Road @ Deerfield Point Dr.	514.7	8.5	1101	8.5	11.5	12.3	14.2	14.1	11.5	12.3	14.2	14.1	514.7	8.5	1101	8.5	514.7	8.5	1101	8.5	514.7	8.5	1101	8.5
McGinnis Ferry Road @ Tidwell Drive	107	189.4	624.3	1396	10.01	26	10.8	18.8	10.01	26	10.8	18.8	25.7	31.8	42.1	96.6	25.7	31.8	42.1	96.6	25.7	31.8	42.1	96.6
McGinnis Ferry Road @ GA400 SB Ramps	n/a	n/a	n/a	n/a	13.3	14.2	14.7	28	13.3	14.2	14.7	28	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ GA400 NB Ramps	n/a	n/a	n/a	n/a	11.6	15.6	13.1	41.4	11.6	15.6	13.1	41.4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ Windward Concourse`	*	*	*	*	16.9	23.3	19.2	34.7	16.9	23.3	19.2	34.7	17	22.8	19.2	27.1	17	22.8	19.2	27.1	17	22.8	19.2	27.1
McGinnis Ferry Road @ Union Hill Road South	36.3	347.8	50.9	951.9	17.7	25.7	17.8	43.3	17.7	25.7	17.8	43.3	21.1	29.7	22.9	73.1	21.1	29.7	22.9	73.1	21.1	29.7	22.9	73.1
McFarland Parkway @ Bluegrass Lakes Pkwy	4.3	10.9	21.6	30.9	4.9	10.2	17.9	27.5	4.9	10.2	17.9	27.5	4.3	10.9	21.6	30.9	4.4	11.8	21	33	4.4	11.8	21	33
McFarland Parkway @ SR 400 Southbound Ramps	29.1	172	77.9	276.6	14.7	13.2	15.6	59.2	14.7	13.2	15.6	59.2	29.1	172	77.9	276.6	30.6	169.3	75.1	387.8	30.6	169.3	75.1	387.8
McFarland Parkway @ SR 400 Northbound Ramps	2.5	6.9	2.2	4.7	2.6	7.6	2.4	7.3	2.6	7.6	2.4	7.3	2.5	6.9	2.2	4.7	2.2	5.9	2.3	4.4	2.2	5.9	2.3	4.4
McFarland Parkway @ Ronald Reagan Blvd/Bluegrass Valley Pkwy	39	244.5	82.3	654.8	26.7	39.9	31.8	106.4	26.7	39.9	31.8	106.4	39	244.5	82.3	654.8	33.9	244.3	43.8	250.6	33.9	244.3	43.8	250.6
McFarland Parkway @ Shiloh Road	15.9	8.5	504.5	9.5	16	8.5	22.8	15.5	16	8.5	22.8	15.5	15.9	8.5	504.5	9.5	10.8	5.9	10.6	6	10.8	5.9	10.6	6
McFarland Parkway @ McGinnis Ferry Rd.	44.8	109.4	465.1	584.4	23.1	26.2	31.7	108.3	23.1	26.2	31.7	108.3	44.8	109.4	465.1	584.4	18.3	16.3	30.3	86.9	18.3	16.3	30.3	86.9
SR 120 at SR 400 Southbound Ramps	698.3	542.4	845.2	541.3	698.3	538.4	845.2	541.3	698.3	538.4	845.2	541.3	698.3	542.4	845.2	541.3	698.3	542.4	845.2	541.3	698.3	542.4	845.2	541.3
SR 120 at SR 400 Northbound Ramps	14.8	164.3	22.6	193.1	14.8	175.5	22.6	193.1	14.8	175.5	22.6	193.1	14.8	164.3	22.6	193.1	14.8	164.3	22.6	193.1	14.8	164.3	22.6	193.1
Union Hill Rd at Tidwell Drive	14.1	46.6	18.5	1044	15.5	895.1	27.6	4332	15.5	895.1	27.6	4332	14.1	46.6	18.5	1044	14.1	46.6	18.5	1044	14.1	46.6	18.5	1044

Source: Moreland Altobelli Associates, Inc

* Delay measures in over-capacity conditions are not reported. This is an assumption of the Highway Capacity Manual method. This represents a volume to capacity ratio of greater than 1.0.

Cells marked with an asterisk had no delay measure to allow for quantitative comparison

6.0 COMPARISON OF ALTERNATIVES

6.1 Section Purpose and Organization

The purpose of this section is to compare and contrast the alternatives described in Section 3.0 with respect to the planning and environmental aspects of the study area detailed in Section 2.0, and with the operational analysis described in Section 5.0.

This section will show how each alternative addresses the needs of the study area and will conclude with a recommendation for a preferred alternative.

6.2 Operational Comparison of Alternatives

Section 5.0, the Traffic Operations Analysis, presented an enormous amount of data and results based on methods from the *Highway Capacity Manual*. This subsection will show in graphical and tabulated form how each alternative stacks up against each other.

All of the following exhibits use a color scheme to visually distinguish whether an Alternative has changed the effectiveness measure or the Level of Service (LOS) of each studied area as compared to the No-Build (Alt 1) condition.

Figure 32: Color Scheme for Comparison



A red color represents a deterioration of either the LOS or the measure of effectiveness. A blue color represents an improvement. The deepness of the color is a qualitative measure of the difference between the Alternative and the No-Build condition (Alternative 1).

It is important to remember, while using the comparison exhibits, that the LOS is a qualitative measurement rated arbitrarily between “A” and “F”. Table 25, Table 27, and Table 29 contain the LOS comparison tables but the true measure of worth of each of these alternatives will be found in Table 26, Table 28, and Table 30, the comparison of the measure of effectiveness that determines the LOS.

6.2.1 Freeway Segments

As shown in Table 25 and Table 26, Alternatives 2, 5 and 6 have the greatest relative improvement in freeway operations when compared to the No Build. Table 25 shows the LOS that can be expected on each individual freeway segment and how that LOS compares to the No-Build alternative. Table 26 shows the quantitative improvement or deterioration in traffic density, which is what LOS for freeway segments is measured in (passenger car equivalents/mile/lane). A negative number in Table 26 is an improvement due to a reduction in density.

Both Alternative 2 and 3, which involve a new freeway interchange, show a level of service drop on SR 400 in 2020 and the level of service holding steady in 2040, as compared to the No Build alternative. This is expected due to the re-routing of traffic because of the new interchange that is proposed in Alternative 2 and 3. None of the deterioration would drop the level of service on the freeway from a LOS D (considered acceptable) to a LOS E (considered unacceptable). It should be noted that there are freeway segments that will be LOS E and F in year 2040 in alternatives 1, 2, and 3, but are reduced to more acceptable LOS D or better in alternatives 4, 5, and 6.

Table 25: Freeway Segments LOS Comparison

FREEWAY SEGMENTS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)							
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040					
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM				
SR 400 NB between McFarland Pkwy and SR 141	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F
SR 400 SB between SR 141 and McFarland Pkwy	F	D	F	E	F	D	F	E	F	D	F	E	F	D	F	E	F	D	F	E	F	D	F	E	F	D	F	E
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	B	C	C	E	A	C	A	C	B	D	C	E	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	C	B	E	C	C	A	C	A	D	B	E	C	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	B	C	C	E	B	D	C	E	B	D	C	E	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	C	B	E	C	D	C	E	C	D	C	E	C	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B
SR 400 NB Between SR 120 and Windward Pkwy	D	D	C	E	D	D	C	E	D	D	C	E	C	C	C	E	D	D	C	E	C	C	C	E	C	C	C	E
SR 400 SB between Windward Pkwy and SR 120	D	C	E	D	D	C	E	D	D	C	E	D	C	B	D	C	D	C	E	D	C	B	D	C	C	B	D	C
SR 400 NB between Haynes Bridge Rd and SR 120	C	D	D	E	C	D	D	E	C	D	D	E	C	D	D	E	C	D	D	E	C	D	D	E	C	D	D	E
SR 400 SB between SR 120 and Haynes Bridge Rd	C	D	D	D	C	D	D	D	C	D	D	D	C	D	D	D	C	D	D	D	C	D	D	D	C	D	D	D

Source: Moreland Altobelli Associates, Inc.

Table 26: Freeway Segments Density Comparison

FREEWAY SEGMENTS	Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)							
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040					
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM				
SR 400 NB between McFarland Pkwy and SR 141	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 SB between SR 141 and McFarland Pkwy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 NB between McGinnis Ferry Rd and McFarland Pkwy	-6.2	-6.9	-7.8	-13.3	2.2	3.1	2.4	3.9	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9
SR 400 SB between McFarland Pkwy and McGinnis Ferry Rd	-6.0	-6.5	-10.4	-9.4	2.0	1.2	2.3	-0.6	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1
SR 400 NB between Windward Pkwy and McGinnis Ferry Rd	2.1	2.9	2.7	2.5	2.1	2.9	2.7	2.5	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9	-3.0	-5.9	-3.7	-10.9
SR 400 SB between McGinnis Ferry Rd and Windward Pkwy	2.4	2.4	2.0	3.2	2.4	2.4	2.0	3.2	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1	-5.8	-3.2	-10.7	-4.1
SR 400 NB Between SR 120 and Windward Pkwy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.3	-8.5	0.0	0.0	0.0	0.0	0.0	0.0	-8.3	-8.5	0.0	0.0	-8.3	-8.5	0.0	0.0
SR 400 SB between Windward Pkwy and SR 120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.2	-5.0	-13.8	-7.3	0.0	0.0	0.0	0.0	-8.2	-5.0	-13.8	-7.3	-8.2	-5.0	-13.8	-7.3
SR 400 NB between Haynes Bridge Rd and SR 120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 SB between SR 120 and Haynes Bridge Rd	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

* Density measures in over-capacity conditions are not reported. This is an assumption of the Highway Capacity Manual method. This represents a volume to capacity ratio of greater than 1.0.

Cells marked with an asterisk had no density measure to allow for quantitative comparison.

Source: Moreland Altobelli Associates, Inc.

6.2.2 Ramp Junctions

As shown in Table 27 and Table 28, Alternatives 4, 5, and 6 have the greatest level of improvements on the ramp junctions in the study area. Alternative 3 shows a slight decrease in LOS at McFarland Parkway and Windward Parkway for northbound traffic in the 2020 AM and PM peak hours, respectively. This is due to traffic which is now using the freeway as opposed to the respective ramp junction. For example, traffic that previously exited Windward Parkway northbound in the PM peak hour is now remaining on the freeway and interacting with the ramp volume that is entering the freeway. This raises the measure of effectiveness (vehicular density in passenger car equivalents per lane per mile) for these ramp junctions. Note that LOS D is considered acceptable within an urban area, which this study area is. Note also that Table 28 shows the ramp junctions in question have increased in density only a small amount (1.5 pc/mi/ln and 2.5 pc/mi/ln, respectively) indicating that the Alternative 1, No Build LOS was immediately on the cusp of the LOS C/LOS D interface.

The 2040 condition for Alternative 3 shows a reduction in LOS at the southbound off ramp to Windward Parkway for the precise same reasons. The LOS remains at D or better and the increase in density is small (2.2 pc/mi/ln).

Table 27: Ramp Junctions LOS Comparison

RAMP JUNCTIONS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SR 400 SB Off-Ramp to McFarland Rd	E	B	F	C	B	A	B	B	E	B	F	C	E	B	F	C	B	A	D	A	B	A	D	A
SR 400 SB On-Ramp from McFarland Rd	D	B	E	C	B	B	B	C	D	B	E	C	C	B	C	B	C	B	C	B	C	B	C	B
SR 400 SB Off-Ramp to McGinnis Ferry Rd	n/a	n/a	n/a	n/a	B	B	B	C	D	B	E	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 SB On-Ramp from McGinnis Ferry Rd	n/a	n/a	n/a	n/a	B	B	B	C	C	E	D	D	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 SB Off-Ramp to Windward Pkwy	D	C	E	C	C	B	D	C	D	C	E	D	C	B	C	B	C	B	C	B	C	B	C	B
SR 400 SB On-Ramp from Windward Pkwy	E	D	E	E	E	C	E	E	E	C	E	E	C	B	D	C	E	D	E	E	C	B	D	C
SR 400 SB Off-Ramp to SR 120	E	D	F	E	E	D	F	E	E	D	F	E	C	B	D	C	E	D	F	E	C	B	D	C
SR 400 SB On-Ramp from SR 120	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E	D	D	D	E
SR 400 NB Off-Ramp to SR 120	D	E	E	F	D	E	E	F	D	E	E	F	D	E	E	F	D	E	E	F	D	E	E	F
SR 400 NB On-Ramp from SR 120	C	D	D	E	C	D	D	E	C	D	D	E	C	C	C	D	C	D	D	E	C	C	C	D
SR 400 NB Off-Ramp to Windward Pkwy	D	E	E	F	D	E	E	F	D	E	E	F	B	C	C	D	D	E	E	F	B	C	C	D
SR 400 NB On-Ramp from Windward Pkwy	B	C	C	D	B	C	B	C	B	D	C	D	B	C	B	C	B	C	B	C	B	C	B	C
SR 400 NB Off-Ramp to McFarland Rd	B	D	C	E	B	B	B	C	C	D	C	E	B	C	B	C	B	C	B	C	B	C	B	C
SR 400 NB Off-Ramp to McGinnis Ferry Rd	n/a	n/a	n/a	n/a	B	B	C	C	B	C	C	E	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 NB On-Ramp from McGinnis Ferry Rd	n/a	n/a	n/a	n/a	B	B	C	C	B	C	C	E	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 NB Loop Off-Ramp to McFarland Rd	B	C	B	D	A	A	B	B	B	C	B	D	B	C	B	D	B	C	B	D	B	C	B	D
SR 400 NB On-Ramp from McFarland Rd	B	E	C	F	A	B	B	C	B	E	C	F	B	E	C	F	B	E	C	F	B	E	C	F

For the purposes of this comparison table, the LOS values of the McGinnis Ferry at SR 400 ramps are entered for reference. No comparisons are possible with the no-build condition due to no ramps being present in the no build (Alternative 1)

Source: Moreland Altobelli Associates, Inc.

Table 28: Ramp Junctions Density Comparison

Location	Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SR 400 SB Off-Ramp to McFarland Rd	-30.2	-7.4	-41.8	-9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-23.2	-13.4	-23.2	-16.4	-23.2	-13.4	-23.2	-16.4
SR 400 SB On-Ramp from McFarland Rd	-13.5	-2.6	-19.6	-1.9	0.6	0.0	2.3	-0.6	-5.7	-3.4	-9.4	-4.3	-5.7	-3.4	-9.4	-4.3	-5.7	-3.4	-9.4	-4.3
SR 400 SB Off-Ramp to McGinnis Ferry Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 SB On-Ramp from McGinnis Ferry Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 SB Off-Ramp to Windward Pkwy	-8.8	-6.8	-9.9	-7.3	-2.9	1.6	1.4	2.2	-9.4	-7.7	-10.9	-8.7	-9.4	-7.7	-10.9	-8.7	-9.4	-7.7	-10.9	-8.7
SR 400 SB On-Ramp from Windward Pkwy	-0.3	-6.0	-0.7	-1.4	-0.3	-6.0	-0.7	-1.4	-11.1	-13.6	-10.6	-16.2	0.0	0.0	0.0	0.0	-11.1	-13.6	-10.6	-16.2
SR 400 SB Off-Ramp to SR 120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-17.1	-10.5	-18.4	-12.0	0.0	0.0	0.0	0.0	-17.1	-10.5	-18.4	-12.0
SR 400 SB On-Ramp from SR 120	-4.5	4.5	0.0	0.0	-4.5	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 NB Off-Ramp to SR 120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 NB On-Ramp from SR 120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-4.6	-12.7	-7.7	-9.2	0.0	0.0	0.0	0.0	-4.6	-12.7	-7.7	-9.2
SR 400 NB Off-Ramp to Windward Pkwy	-0.9	-0.9	-1.2	-1.1	-0.9	-0.9	-1.2	-1.1	-14.6	-15.7	-16.3	-15.8	0.0	0.0	0.0	0.0	-14.6	-15.7	-16.3	-15.8
SR 400 NB On-Ramp from Windward Pkwy	-4.5	-5.8	-4.6	-5.8	1.0	1.5	1.3	1.4	-5.2	-6.8	-5.6	-7.1	-5.2	-6.8	-5.6	-7.1	-5.2	-6.8	-5.6	-7.1
SR 400 NB Off-Ramp to McFarland Rd	-3.8	-13.5	-6.5	-17.4	2.5	2.9	0.0	-0.2	-6.2	-7.8	-9.8	-12.7	-6.2	-7.8	-9.8	-12.7	-6.2	-7.8	-9.8	-12.7
SR 400 NB Off-Ramp to McGinnis Ferry Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 NB On-Ramp from McGinnis Ferry Rd	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SR 400 NB Loop Off-Ramp to McFarland Rd	-4.2	-12.5	-3.7	-12.9	1.5	2.9	1.9	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 400 NB On-Ramp from McFarland Rd	-10.9	-23.4	-12.8	-26.5	-1.0	-1.8	-1.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

For the purposes of this comparison table, the McGinnis Ferry at SR 400 ramps are marked as n/a to denote that no differential density calculation is possible where the no-build condition (Alternative 1) has no ramps to measure delay at.
 Source: Moreland Altobelli Associates, Inc.

6.2.3 Intersections

As shown in Table 29 and Table 30, Alternatives 2 and 3 have the greatest overall positive impact on the operations of the intersections within the study area. The notable exception is the intersection of Union Hill Road at Tidwell Drive. This is a two-way stop-controlled intersection which will be affected by the re-routing of traffic onto both Union Hill Road and Tidwell Drive by the proposed interchange that is a part of both Alternative 2 and 3. Consideration was given to improvements to alleviate the effects of this traffic diversion. There is no programmed project at this time, but Union Hill Road is on the plan for Forsyth County to include as a widening project. Any project such as that will be incorporated into the project concept, or an improvement project for the intersection will be included.

Table 29: Intersections LOS Comparison

INTERSECTIONS	Alternative #1 (No-Build)				Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Windward Pkwy @ Deerfield/Westside Pkwy	F	F	F	F	F	F	F	F	F	F	F	F	F	D	F	F	F	F	F	F	F	D	F	F
Windward Pkwy @ Deerfield Plaza Driveway	B	F	B	F	A	F	B	F	A	F	B	F	A	C	A	C	B	F	B	F	A	C	A	C
Windward Pkwy @ SR 400 Southbound Ramps	C	E	C	F	C	E	C	E	C	E	C	E	B	D	C	F	C	E	C	F	B	D	C	F
Windward Pkwy @ SR 400 Northbound Ramps	D	F	F	F	D	D	E	F	D	D	E	F	C	C	E	E	D	F	F	F	C	C	E	E
Windward Pkwy @ North Point Pkwy	E	F	F	F	E	F	F	F	E	F	F	F	D	D	F	F	E	F	F	F	D	D	F	F
Windward Pkwy @ Edison Drive	A	B	A	F	A	B	A	D	A	B	A	D	A	C	A	F	A	B	A	F	A	C	A	F
Windward Pkwy @ Marconi Drive	C	E	E	F	C	C	D	F	C	C	D	F	B	E	E	F	C	E	E	F	B	E	E	F
Windward Pkwy @ Windward Plaza/Alderman Dr	C	F	C	F	C	F	C	F	C	F	C	F	C	D	E	F	C	F	C	F	C	D	E	F
Windward Pkwy @ Windward Plaza/Windward Concourse	F	F	F	F	F	F	F	F	F	F	F	F	C	C	F	D	F	F	F	F	C	C	F	D
Windward Pkwy @ Market Pl/Union Hill Rd	D	B	F	B	D	B	F	B	D	B	F	B	C	B	F	C	D	B	F	B	C	B	F	C
McGinnis Ferry Road @ Bethany Bend	B	F	D	F	B	A	B	B	B	A	B	B	A	A	A	A	B	F	D	F	A	A	A	A
McGinnis Ferry Road @ Deerfield Point Dr.	F	A	F	A	B	B	B	B	B	B	B	B	F	A	F	A	F	A	F	A	F	A	F	A
McGinnis Ferry Road @ Tidwell Drive	F	F	F	F	B	D	B	C	B	D	B	C	D	D	E	F	D	D	E	F	D	D	E	F
McGinnis Ferry Road @ GA400 SB Ramps	n/a	n/a	n/a	n/a	B	B	B	C	B	B	B	C	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ GA400 NB Ramps	n/a	n/a	n/a	n/a	B	B	B	D	B	B	B	D	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
McGinnis Ferry Road @ Windward Concourse`	F	F	F	F	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C	B	C
McGinnis Ferry Road @ Union Hill Road South/Ronald Reagan Blvd.	D	F	D	F	B	C	B	D	B	C	B	D	C	C	C	E	C	C	C	E	C	C	C	E
McFarland Parkway @ Bluegrass Lakes Pkwy	A	B	C	C	A	B	B	C	A	B	B	C	A	B	C	C	A	B	C	C	A	B	C	C
McFarland Parkway @ SR 400 Southbound Ramps	C	F	E	F	B	B	B	E	B	B	B	E	C	F	E	F	C	F	E	F	C	F	E	F
McFarland Parkway @ SR 400 Northbound Ramps	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
McFarland Parkway @ Ronald Reagan Blvd./Bluegrass Valley Pkwy	D	F	F	F	C	D	C	F	C	D	C	F	D	F	F	F	C	F	D	F	C	F	D	F
McFarland Parkway @ Shiloh Road	B	A	F	A	B	A	C	B	B	A	C	B	B	A	F	A	B	A	B	A	B	A	B	A
McFarland Parkway @ McGinnis Ferry Rd.	D	F	F	F	C	C	C	F	C	C	C	F	D	F	F	F	B	B	C	F	B	B	C	F
SR 120 at SR 400 Southbound Ramps	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
SR 120 at SR 400 Northbound Ramps	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F	B	F	C	F
Union Hill Rd at Tidwell Drive	B	E	C	F	C	F	D	F	C	F	D	F	B	E	C	F	B	E	C	F	B	E	C	F

Source: Moreland Altobelli Associates, Inc.

Table 30: Intersections Delay Comparison

Location	Alternative #2 (Interchange + CD)				Alternative #3 (Interchange)				Alternative #4 (Impr. @ Windward)				Alternative #5 (Imp. @ McFarland)				Alternative #6 (#4 + #5)			
	2020		2040		2020		2040		2020		2040		2020		2040		2020		2040	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Windward Pkwy @ Deerfield/Westside Pkwy	-47.9	-28.6	-95.5	28.5	-47.9	-28.6	-95.5	28.5	-299.0	-168.2	-382.1	-143.6	0.0	0.0	0.0	0.0	-299.0	-168.2	-382.1	-143.6
Windward Pkwy @ Deerfield Plaza Driveway	-1.4	9.4	-1.1	20.0	-1.4	9.4	-1.1	20.0	-3.4	-62.6	-3.9	-89.7	0.0	0.0	0.0	0.0	-3.4	-62.6	-3.9	-89.7
Windward Pkwy @ SR 400 Southbound Ramps	-0.6	5.7	-5.0	-120.4	-0.6	5.7	-5.0	-120.4	-4.4	-27.8	-8.6	-69.4	0.0	0.0	0.0	0.0	-4.4	-27.8	-8.6	-69.4
Windward Pkwy @ SR 400 Northbound Ramps	-10.1	-78.4	-245.0	-41.4	-10.1	-78.4	-245.0	-41.4	-24.3	-98.8	-256.8	-224.9	0.0	0.0	0.0	0.0	-24.3	-98.8	-256.8	-224.9
Windward Pkwy @ North Point Pkwy	-21.3	-73.2	-83.8	-27.4	-21.3	-73.2	-83.8	-27.4	-33.8	-204.9	-3.3	-152.5	0.0	0.0	0.0	0.0	-33.8	-204.9	-3.3	-152.5
Windward Pkwy @ Edison Drive	0.1	0.6	1.2	-51.3	0.1	0.6	1.2	-51.3	-2.7	3.0	0.0	3.3	0.0	0.0	0.0	0.0	-2.7	3.0	0.0	3.3
Windward Pkwy @ Marconi Drive	-1.9	-39.8	-10.1	-167.7	-1.9	-39.8	-10.1	-167.7	-11.5	-0.6	0.1	-0.9	0.0	0.0	0.0	0.0	-11.5	-0.6	0.1	-0.9
Windward Pkwy @ Windward Plaza/Alderman Dr	1.9	-58.7	-0.7	-82.3	1.9	-58.7	-0.7	-82.3	-0.5	-87.8	37.9	-131.0	0.0	0.0	0.0	0.0	-0.5	-87.8	37.9	-131.0
Windward Pkwy @ Windward Plaza/Windward Concourse	-169.2	-225.3	-565.3	-517.5	-169.2	-225.3	-565.3	-517.5	-284.1	-313.0	-700.7	-638.0	0.0	0.0	0.0	0.0	-284.1	-313.0	-700.7	-638.0
Windward Pkwy @ Market Pl/Union Hill Rd	0.3	-2.7	-3.2	3.6	0.3	-2.7	-3.2	3.6	-25.4	2.7	-37.6	10.4	0.0	0.0	0.0	0.0	-25.4	2.7	-37.6	10.4
McGinnis Ferry Road @ Bethany Bend	-0.5	-421.8	-21.7	-1599.2	-0.5	-421.8	-21.7	-1599.2	-5.7	-424.3	-27.2	-1605.2	0.0	0.0	0.0	0.0	-5.7	-424.3	-27.2	-1605.2
McGinnis Ferry Road @ Deerfield Point Dr.	-503.2	3.8	-1086.8	5.6	-503.2	3.8	-1086.8	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
McGinnis Ferry Road @ Tidwell Drive	-97.0	-163.4	-613.5	-1377.2	-97.0	-163.4	-613.5	-1377.2	-81.3	-157.6	-582.2	-1299.4	-81.3	-157.6	-582.2	-1299.4	-81.3	-157.6	-582.2	-1299.4
McGinnis Ferry Road @ Windward Concourse	-982.1	-975.7	-979.8	-964.3	-982.1	-975.7	-979.8	-964.3	-982.0	-976.2	-979.8	-971.9	-982.0	-976.2	-979.8	-971.9	-982.0	-976.2	-979.8	-971.9
McGinnis Ferry Road @ Union Hill Road South/Ronald Reagan Blvd.	-18.6	-322.1	-33.1	-908.6	-18.6	-322.1	-33.1	-908.6	-15.2	-318.1	-28.0	-878.8	-15.2	-318.1	-28.0	-878.8	-15.2	-318.1	-28.0	-878.8
McFarland Parkway @ Bluegrass Lakes Pkwy	0.6	-0.7	-3.7	-3.4	0.6	-0.7	-3.7	-3.4	0.0	0.0	0.0	0.0	0.1	0.9	-0.6	2.1	0.1	0.9	-0.6	2.1
McFarland Parkway @ SR 400 Southbound Ramps	-14.4	-158.8	-62.3	-217.4	-14.4	-158.8	-62.3	-217.4	0.0	0.0	0.0	0.0	1.5	-2.7	-2.8	111.2	1.5	-2.7	-2.8	111.2
McFarland Parkway @ SR 400 Northbound Ramps	0.1	0.7	0.2	2.6	0.1	0.7	0.2	2.6	0.0	0.0	0.0	0.0	-0.3	-1.0	0.1	-0.3	-0.3	-1.0	0.1	-0.3
McFarland Parkway @ Ronald Reagan Blvd./Bluegrass Valley Pkwy	-12.3	-204.6	-50.5	-548.4	-12.3	-204.6	-50.5	-548.4	0.0	0.0	0.0	0.0	-5.1	-0.2	-38.5	-404.2	-5.1	-0.2	-38.5	-404.2
McFarland Parkway @ Shiloh Road	0.1	0.0	-481.7	6.0	0.1	0.0	-481.7	6.0	0.0	0.0	0.0	0.0	-5.1	-2.6	-493.9	-3.5	-5.1	-2.6	-493.9	-3.5
McFarland Parkway @ McGinnis Ferry Rd.	-21.7	-83.2	-433.4	-476.1	-21.7	-83.2	-433.4	-476.1	0.0	0.0	0.0	0.0	-26.5	-93.1	-434.8	-497.5	-26.5	-93.1	-434.8	-497.5
SR 120 at SR 400 Southbound Ramps	0.0	-4.0	0.0	0.0	0.0	-4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SR 120 at SR 400 Northbound Ramps	0.0	11.2	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Union Hill Rd at Tidwell Drive	1.4	848.5	9.1	3288.0	1.4	848.5	9.1	3288.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Moreland Altobelli Associates, Inc.

6.3 Benefit Cost Analysis

The benefit cost ratios for all alternatives were analyzed using standard GDOT methods. The benefits associated with each alternative were derived from the delay differences between the No Build and the alternative being evaluated. A conceptual cost estimate of each alternative was determined considering professional engineering, right-of-way, utility, construction and, if applicable, mitigation cost. Conceptual quantities were developed for each alternative and rounded unit costs representing labor and materials were applied to the estimated quantities. The cost summaries and the breakdown of quantities and costs are contained in Appendix D. The total costs and B/C ratio for each alternative is shown in Table 31: Benefit/Cost Ratios of Analyzed Alternatives.

Table 31: Benefit/Cost Ratios of Analyzed Alternatives

Alternative	Total Cost	B/C Ratio
Alternative 1 (No Build)	n/a	n/a
Alternative 2 (Interchange + CD)	\$ 48,727,732	2.78
Alternative 3 (Interchange)	\$ 29,777,675	3.45
Alternative 4 (Windward Improvements)	\$ 35,742,829	2.30
Alternative 5 (McFarland Improvements)	\$ 30,571,035	0.97
Alternative 6 (Windward + McFarland Improvements)	\$ 38,130,773	2.16

Source: Moreland Altobelli Associates, Inc.

6.4 Preferred Alternative

The traffic operations comparisons show that each build alternative (Alternative 2 through 6) has positives and negatives when it comes to their individual effects on the traffic operations of the study area. Alternatives 2 and 3 have the best overall positive impacts on the intersections within the study area while alternatives 2 and 5 have the best positive impacts on the freeway system of SR 400.

The preferred alternative, however, must go beyond the traffic operations analysis and meet the needs identified within the document.

The conclusion of the Comparisons Section of the IJR is that Alternative 3, a new interchange at SR 400 and McGinnis Ferry Road will best serve the identified needs of the study area.

6.4.1 Reduction in Congestion

The projected traffic for the base year 2020 was determined from the Atlanta Regional Commission (ARC) *Plan 2040* travel-demand model. The model assigns vehicle trips based on a large number of factors including travel time, distance, congestion, and land use. Based on these factors, the travel demand model predicts that after the opening of a proposed SR 400/McGinnis Ferry Road interchange traffic would be redirected from both the Windward Parkway and McFarland Parkway interchanges to the new interchange. This would result in lower traffic volumes using McFarland Parkway and reduce traffic congestion at its interchange with SR 400. Windward Parkway has 44,500 vehicles per day (vpd) at the interchange and is predicted to have 46,600 in the year 2020. While the proposed McGinnis Ferry Road interchange cannot solely improve the Windward Parkway interchange, traffic would be reduced on Windward Parkway thereby improving the level of service at major intersections along the corridor. On McFarland Parkway, traffic generated from expanding phases of the regional mixed-used development

will create traffic congestion at the McFarland Parkway interchange that will cause McFarland Parkway from SR 400 to Ronald Reagan Boulevard to fail. Additional operational improvements to existing roadways, such as turn lanes, would not eliminate this traffic congestion under the no-build condition.

6.4.2 Reduction in Severity and Frequency of Collisions

An analysis of traffic operations for the build condition of the Alternative 3 has shown that the overall level of service of Windward Parkway and McFarland Parkway would be improved and that traffic volumes would be reduced. Therefore, it is anticipated that the proposed interchange would reduce the frequency and severity of collisions along these two main corridors and their associated ramp junctions. Alternative 2 would accomplish this goal also, but at a lower benefit cost ratio.

6.4.3 Increase Potential for Economic Development

The major driver of economic development in the study area is the planned multi-use developments and regional mall which is situated in the immediate vicinity of the McGinnis Ferry crossroad over SR 400. As the traffic analysis shows, without an additional freeway access point, the existing ramp junctions and intersections will become over capacity by the year 2020 and worsen by 2040. Alternatives 2 and 3 both address the core issues surrounding these problems by adding additional ramp and roadway capacity to the study area, however Alternative 3 has a much better benefit cost ratio.

In summary, the need for the new interchange access to SR 400 at McGinnis Ferry Road is necessary infrastructure for the continued future economic development of North Fulton and Forsyth Counties. Future development of the regional mixed-use center would create significant employment opportunities and thereby bring new economic revenues to Forsyth County. Alternative 3, a new diamond interchange at SR 400 and McGinnis Ferry is recommended as the preferred alternative.

7.0 PROPOSED PROJECT

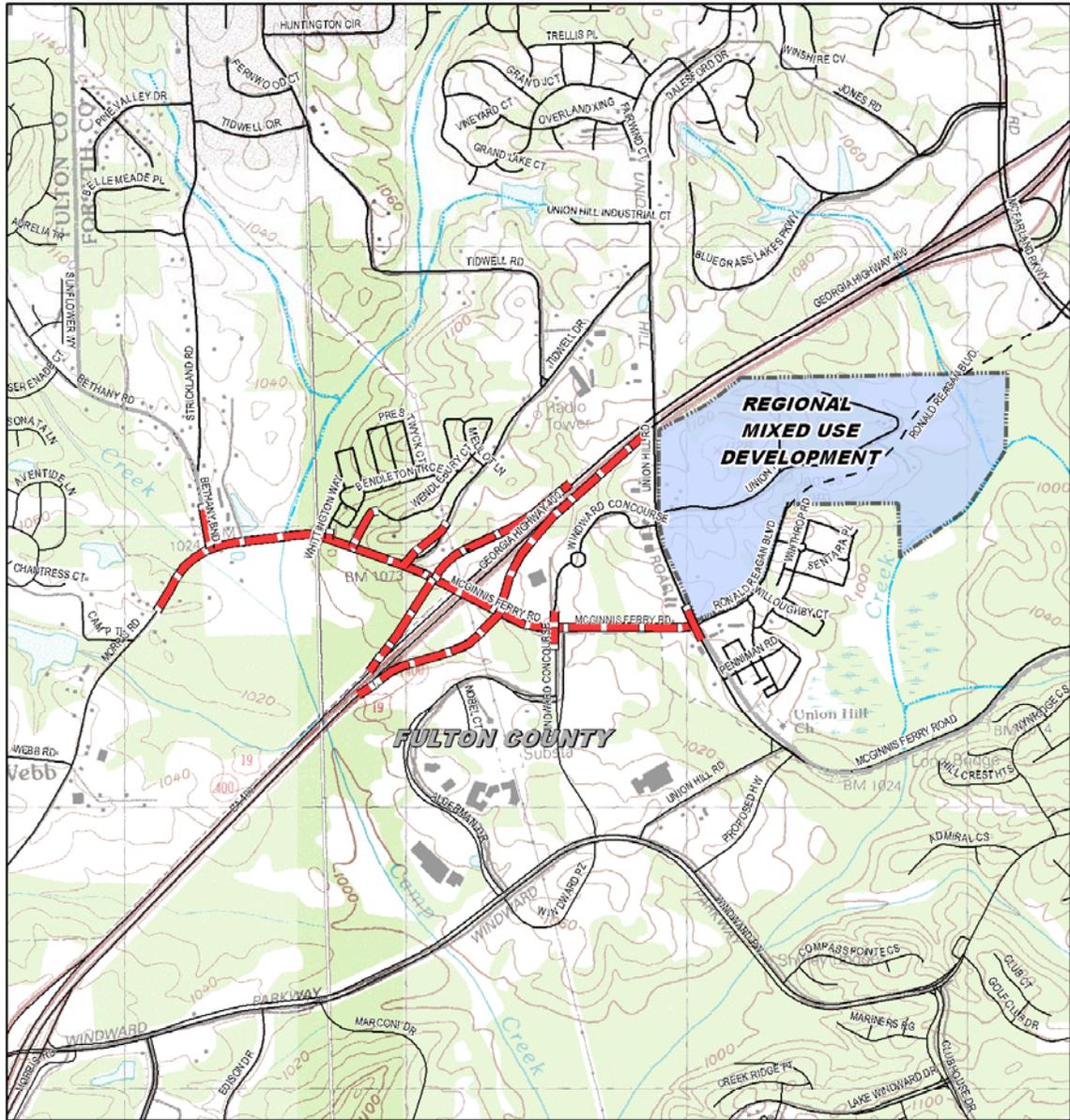
The proposed new interchange (Alternative 3) would consist of the construction of a full diamond interchange on SR 400 at McGinnis Ferry Road in Forsyth County. SR 400 generally runs in a northeast-southwest direction in the project vicinity, and is part of the Appalachian Development Highway System. 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 (Figure 33: SR 400 at McGinnis Ferry Road Interchange Project Location). It should be noted that McFarland Parkway was previously known as McFarland Road.

The overall project length is estimated at 2.62 miles which includes the project length along SR 400 which is 0.92 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.

The proposed interchange project completes the widening of the crossroad over SR 400 to serve its current capacity demands and would also provide direct access to and from SR 400 for all travelers using McGinnis Ferry Road, which is classified as an urban minor arterial. McGinnis Ferry Road would be widened to four lanes from Bethany Bend Road to SR 400 and to six lanes from SR 400 to Union Hill Road. The typical section would include curb and gutter and five-foot wide sidewalks on both sides of McGinnis Ferry Road through the entire length of the project. Dual left-turn lanes and a right-turn lane would be constructed at its intersection with the SR 400 on-ramps. The proposed bridge would be designed to span potential future managed lanes on SR 400. The SR 400/McGinnis Ferry Road interchange project would provide horizontal and vertical geometry meeting current GDOT and American Association of State Highway and Transportation Officials (AASHTO) design requirements and standards.

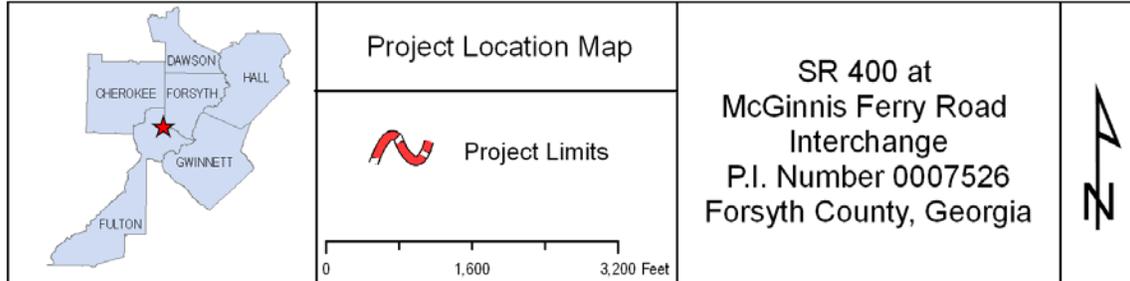
A future, unprogrammed project is anticipated to connect the end point of the proposed interchange project at Union Hill Road to the constructed GDOT Project MSL-0004-00(429). This completed project widened and reconstructed McGinnis Ferry Road from approximately 1,000 feet north of the McGinnis Ferry Road/Sargent Road intersection to approximately 50 feet west of the Chattahoochee River bridge (approximately 5.27 miles) within Forsyth and Fulton Counties, Georgia. Two typical sections were utilized for that project and reconstructed McGinnis Ferry Road from a rural 2-lane section to a 4-lane, divided, urban section. From the project begin point to Johns Creek Parkway East, the typical section included paved auxiliary left-turn lanes with a raised, variable width median between 8 feet and 20 feet in width separating opposing traffic streams. From Johns Creek Parkway East continuing to the project end point, the typical section included a 44-foot depressed, grassed median.

Figure 33: SR 400 at McGinnis Ferry Road Interchange Project Location



Source: GAGIS DATA CLEARINGHOUSE & ARC

4-13-09



8.0 CONSISTENCY WITH FHWA POLICY GUIDELINES

This IJR is in accordance with policy published in U.S. Code, Title 23, Section 111, dealing with Highways. The policy consists of eight criteria upon which new or revised access points to the existing Interstate System must comply. GDOT applies this policy to all freeways as well as Interstates. The following items state the criteria used to prepare the IJR with a brief discussion as to how they relate to the proposed project.

1. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design-year traffic demands while at the same time providing the access intended by the proposal.

Improvements to the existing interchanges and local street improvements cannot address the needs identified in this report.

The need for additional vehicular access to SR 400 at McGinnis Ferry Road is to:

- Relieve traffic congestion on the existing interchanges at SR 400/Windward Parkway and SR 400/McFarland Parkway interchanges;
- Provide additional freeway access to facilitate the economic development of a regional mixed-used development planned in South Forsyth County, and;
- Reduce the severity and frequency of collisions in the study area.

Six alternatives were analyzed: Alternative 1 – No-Build Alternative, Alternative 2 – New Interchange At McGinnis Ferry road With CD System, Alternative 3 – New Interchange at McGinnis Ferry Road, Alternative 4 – Road Improvements on Windward Parkway and Area Roads, Alternative 5 – Road Improvements on McFarland Parkway and Area Roads, and Alternative 6 – Road Improvements on Windward Parkway, McFarland Parkway, and Area Roads.

SR 400 freeway segments and ramp junctions would exhibit capacity (LOS E) or failing (LOS F) conditions for one or both AM and PM peak hours under Alternative 1 - (No-Build) by the Year 2040. Alternative 3 results show that the freeway would operate in 2040 at equivalent or improved levels of service from SR 120 to McFarland Parkway. All ramp junctions which are currently operating at E or F will be improved marginally; none will deteriorate. One 2040 ramp junction, the PM southbound off ramp to Windward Parkway would drop to a LOS D, while the AM LOS would remain the same.

Assuming the improvements of Alternative 3, the new interchange would redistribute traffic and allow the levels of service to either remain the same as Alternative 1 or improve. Only one ramp junction would deteriorate, as noted. The newly constructed northbound on-ramp from McGinnis Ferry to SR 400 would open at a level of service E, however that is constrained by the LOS of the adjacent SR 400 mainline, which is LOS E.¹

Even with the significant amount of growth and higher traffic volumes, the interchange would have no adverse effect upon SR 400 within the study area.

The regional mixed-used development is located on approximately 160 acres of land at the intersection of McGinnis Ferry Road and Union Hill Road. 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

¹ By Highway Capacity Manual methods, the ramp cannot have a better LOS than the adjacent mainline.

combination with retail space. This development alone will add 52,618 vehicle trips a day to the area, 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 currently under construction. 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 build out is expected to continue after completion of the mall.

The Forsyth County Board of Commissioners has taken the first steps of facilitating this development by approving 10-years of tax breaks and discounted sewer rates to support the luxury retail mall. Much of the deal is contingent on the mall opening no later than Dec. 1, 2020, with at least two high-end anchor stores, such as Neiman-Marcus or Saks Fifth Avenue. A Georgia Tech Fiscal Impact Analysis study comparing premium and standard development options for the Taubman development (TRG Forsyth LLC), commissioned by Forsyth County, estimates that the project, at build-out, could bring 7,842 new jobs, \$1.1 billion in capital investments, and \$38.2 million-a-year in sales and property taxes into Forsyth County.

Additionally, the Windward Parkway Business Park and commercial community is developing on both sides of Windward Parkway from Webb Bridge Road to McGinnis Ferry Road. The Windward Parkway Business Park also has a residential component that provides a combination of single family, townhomes, and apartments along several roadways that feed into Windward Parkway. Commuter traffic, traveling east-west to and from SR 400 originating from surrounding new residential and commercial developments in Forsyth and Fulton Counties, is growing in this area. The combination of all the new traffic generated by the pending developments with travel destinations to and from SR 400 would create congested conditions in the area on a daily basis. The internal roadway system in north Fulton County and south Forsyth County and the existing interchanges of SR 400 at Windward Parkway and McFarland Parkway would no longer be able to handle future traffic. The proposed project would provide an alternative access point to the freeway system and would better distribute growing traffic volumes onto the area roadway network.

An analysis of traffic operations for the build condition of the Alternative 3 has shown that the overall level of service of Windward Parkway and McFarland Parkway would be improved and that traffic volumes would be reduced. Therefore, it is anticipated that the proposed interchange would reduce the frequency and severity of collisions along these two main corridors and their associated ramp junctions.

Any improvements to the existing interchanges and local street improvements cannot address these points, as evidenced by the traffic analysis

2. All reasonable alternatives for design options, location and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.

All reasonable alternatives for design options including transportation system management (TSM) have been considered. They do not serve to meet the needs of the study area. Provisions for the future inclusion of TSM projects have been included in the proposed project.

A TSM-type project that was completed in fiscal year 2006 was Project CSNHS-0006-00(398), SR 400 ATMS Ramp Meters from I-285 to SR 120 (Old Milton Parkway), P.I. No. 0006398, Fulton County. This project installed ramp meters along SR 400 from the I-285 in Fulton County to Old Milton Parkway in

Fulton County. The project increased the efficiency and safety of the corridor by controlling the release of vehicles onto SR 400 during peak hours; thereby reducing congestion and stabilizing the flow of traffic that typically occurs at heavy volume merge locations. This project was part of the Governor's Fast Forward Program. The project length was 12.54 miles. The ARC's previous TIP project reference number was AR-440.

Another TSM-type project that was completed in fiscal year 2007 was Project CSNHS-0006-00(335), SR 400 from South of SR 120 (Old Milton Parkway) to North of CR 458 (McFarland Parkway) – ATMS Communications/Surveillance, P.I. No. 0006335, Forsyth & Fulton Counties. This project installed ATMS devices (CCTV, VDS, and CMS) along SR 400 from 3,600 feet south of SR 120 (Old Milton Parkway) to 6,800 feet north of CR 458 (McFarland Parkway). Cables and conduit were also installed to communicate with the ATMS devices installed as part of this project. This project also included three (3) ramp meters at Windward Parkway southbound, Windward Parkway northbound, and McFarland Parkway southbound. The project length was 6.27 miles. The ARC's previous TIP project reference number was AR-435.

Ramp metering would address the traffic congestion on SR 400 but would not address the congestion on McFarland Parkway and on the ramps themselves. Mass transit and HOV facilities proposed for construction would assist in reducing traffic congestion on SR 400 but not at the interchanges.

Currently, GRTA has express bus service in Forsyth County. There is the potential to provide a park & ride facility at the proposed regional mixed-use development planned by TRG Forsyth LCC that the new SR 400/McGinnis Ferry Road interchange would serve.

3. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on either side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with new or revised access points.

The proposed access point does not have a significant adverse impact on the existing freeway facility.

Traffic conditions were analyzed for the Opening Year (2020) and Design Year (2040) alternatives with and without the interchange for the freeway system, roadways and intersections in the study area. Two current interchanges to the north and south of the proposed interchange were included in this analysis. The freeway traffic analysis indicates that the proposed interchange would not adversely impact operations on SR 400. Additionally, the level of service of the freeway segments and ramp junction of SR 400 between Windward Parkway and McFarland Parkway would be maintained with the exception of southbound off ramp to Windward Parkway which would drop to LOS D. LOS D, however, is considered an acceptable LOS within an urban area.

The alternative access provided by the new SR 400 at McGinnis Ferry Road interchange would better distribute growing traffic volumes onto the area roadway network as follows:

Windward Parkway would have a reduction in traffic volumes under the preferred alternative.

McGinnis Ferry Road from Bethany Bend/Morris Road to Union Hill Road would have an increase in traffic volume, but would have an improved LOS with the new interchange and its associated improvements.

McFarland Parkway would show improved LOS at all studied intersections.

4. The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" for special purpose access for transit vehicles, for HOV's, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for Federal-aid projects on the Interstate System.

The proposed access would be constructed at an existing public road and would consist of a full diamond interchange at the improved roadway and bridge of McGinnis Ferry Road. The proposed interchange would be constructed to meet or exceed current design standards in order to provide safe and efficient traffic operations with minimal impacts to the surrounding environment.

5. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR Part 450 and the transportation conformity requirements of 40 CFR parts 51 and 93.

The proposed project is consistent with local and regional land use and transportation plans.

The importance of this proposed project has been recognized in Fulton and Forsyth Counties, and the Cities of Alpharetta, Johns Creek, and Milton. Furthermore, the North Fulton Community Improvement District (CID) has recognized the need for an additional SR 400 interchange due to decreasing levels of service and congestion in the areas of existing SR 400 interchanges. The proposed SR 400/McGinnis Ferry Road interchange is included within the latest adopted Comprehensive Plan of Forsyth County, and referred to by the Cities of Alpharetta, and Milton.

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.

The Sponsor will be submitting the proposed project for inclusion within the Atlanta Regional Commission conformity update regarding the air-quality non-attainment area and will be incorporated into the Atlanta Regional Commission (ARC) planning model upon approval of the IJR.

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.

6. In areas where the potential exists for future multiple interchange additions; all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.

This report analyzed operations at the interchanges immediately to the north and south of the proposed project. The interchange of Windward Parkway is located approximately 1.4 miles south of the proposed project. The interchange of McFarland Parkway is located approximately 1.5 miles north of the proposed

project. No other interchanges are proposed along SR 400 in this area. There is a managed lanes study covering this area of SR 400. A managed lane interchange is included in the 2040 travel demand model and the 2040 No Build alternative (Alternative 1).

The proposed interchange location was studied with committed and long-range planned projects of the area and it was determined that the new access interchange would not have a significant adverse impact on the operation of the adjacent interchanges or the freeway facility.

7. The request for a new or revised access generated by a new or expanded development demonstrates appropriate coordination between the development and the related or otherwise required transportation system improvements.

ARC's latest travel demand model (*Plan 2040*) was used to determine the year 2020 and 2040 traffic projections. The model included socio-economic data in both Forsyth and Fulton counties. The travel demand model included the large regional mixed-used development proposed in South Forsyth County. The traffic generated by the new development would be accommodated on the local roadway system through a series of committed improvements to roadways in the area. Forsyth County recently completed the Ronald Reagan Parkway extension from Union Hill Road to McFarland Parkway. McGinnis Ferry Road is proposed for widening from two to four lanes from Sargent Road to McFarland Parkway.

8. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.

As part of the planning process, Forsyth County as well as the Cities of Alpharetta, Johns Creek, and Milton were requested to provide planning information for their respective jurisdictions. The information received is presented in Section 2.0 of this IFR. The planning information confirmed that the existing study area is urbanized and has sufficient infrastructure to accommodate the forecasted growth and development.

A preliminary environmental inventory was prepared to assess the environmental impacts at the proposed location of the new interchange. The preliminary findings indicate that the proposed location of the interchange is in an area that would potentially have no significant environmental impacts. However, it is anticipated that an Environmental Assessment (EA) or Categorical Exclusion (CE) document will be prepared during future project development stages that would include final determination as to the extent of primary and secondary project impacts.

In summary, the proposed new interchange project in combination with arterial improvements on McGinnis Ferry Road would improve mobility of the roadway network and would not adversely impact freeway operations. The proposed project would reduce traffic congestion at the ramp junctions of Windward Parkway and McFarland Parkway interchange with SR 400. Improvements to McGinnis Ferry Road alone would not improve traffic enough to facilitate the future traffic growth in the area.

9.0 REPORT CONCLUSION

The new interchange is proposed as a full diamond interchange with access ramps to and from State Route 400 (SR 400). This IJR demonstrates that construction of the additional access to SR 400 would be beneficial to the existing transportation systems of North Fulton and South Forsyth counties in terms of traffic mobility, while not adversely impacting the traffic operations of SR 400.

The major finding of this IJR traffic analysis support 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. 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.

Forsyth, Fulton, and Gwinnett counties are currently experiencing a high rate of growth in residential and office/commercial development in the region. McGinnis Ferry Road is a regional east-west oriented minor arterial that extends from Morris Road in Fulton County and borders Fulton and Forsyth counties and then continues over the Chattahoochee River into Gwinnett County and currently ends at Satellite Boulevard near Interstate 85 (I-85). For many years, the suburban counties have studied McGinnis Ferry Road. Planning studies have identified the need for this regional arterial to be improved to a four/six lane divided highway from SR 400 to I-85. With this objective, McGinnis Ferry Road from Sargent Road to the Chattahoochee River Bridge has been widened to four lanes. Also, the Chattahoochee River Bridge widening to four lanes is under construction. McGinnis Ferry Road from the Chattahoochee River Bridge to Satellite Boulevard is already four lanes wide; and the last section of McGinnis Ferry Road is currently under construction to continue the four-lane construction from Satellite Boulevard, across I-85 and end at Lawrenceville-Suwannee Road. The bridge design on McGinnis Ferry Road over I-85 accommodates a possible future interchange with I-85.

McGinnis Ferry Road in the study area would be widened from Morris Road to Union Hill Road as part of the proposed interchange project at SR 400. McGinnis Ferry Road from McFarland Parkway to Sargent Road is planned to be widened to four lanes for network year 2016; however, it has been placed in long-range construction status. This leaves the only section of McGinnis Ferry Road that is not currently programmed, from Union Hill Road to McFarland Parkway.

Improvement of this commuter corridor by providing access to SR 400 and widening McGinnis Ferry Road on each side of SR 400 will facilitate the economic growth and reduce existing and future traffic congestion.

Forsyth County's largest regional mixed-used development is planned on approximately 160 acres at the intersection of McGinnis Ferry Road and Union Hill Road. The master plan of that development includes a luxury 650,000 square-foot retail regional 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 52,618 vehicle trips a day to the area, 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 currently under construction. 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 build out is expected to continue after completion of the mall.

The Forsyth Board of Commissioners approved 10-year tax breaks and discounted sewer rates to support the luxury retail mall. Much of the deal is contingent on the mall opening no later than December 1, 2020 with at least two high-end anchor stores, such as Neiman-Marcus or Saks Fifth Avenue. A Georgia Tech Fiscal Impact Analysis study comparing premium and standard development options for the Taubman development (TRG Forsyth LLC), commissioned by Forsyth County, estimates that the project, at build-out, could bring 7,842 new jobs, \$1.1 billion in capital investments, and \$38.2 million-a-year in sales and property taxes into Forsyth County.

The additional access to SR 400 at McGinnis Ferry Road would accommodate future 2040 traffic and relieve congestion at the interchanges of Windward Parkway and McFarland Parkway. Six alternatives were analyzed: Alternative 1 – No-Build Alternative, Alternative 2 – New Interchange At McGinnis Ferry road With CD System, Alternative 3 – New Interchange at McGinnis Ferry Road, Alternative 4 – Road Improvements on Windward Parkway and Area Roads, Alternative 5 – Road Improvements on McFarland Parkway and Area Roads, and Alternative 6 – Road Improvements on Windward Parkway, McFarland Parkway, and Area Roads.

SR 400 freeway segments and ramp junctions would exhibit capacity (LOS E) or failing (LOS F) conditions for one or both AM and PM peak hours under Alternative 1 - (No-Build) by the Year 2040. Alternative 3 results show that the freeway would operate at equivalent levels of service throughout the study area. All ramp junctions which are currently operating at E or F will be improved marginally; none will deteriorate. Assuming the improvements of Alternative 3, the new interchange would redistribute traffic and allow the levels of service to either remain the same as Alternative 1 or improve. Even with the significant amount of growth and higher traffic volumes, the interchange would have no adverse effect upon SR 400 within the study area.

The major finding of this report is that the new interchange access to SR 400 is needed to provide the necessary infrastructure for future economic development in the study area, 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 would not have the supportive infrastructure to market the location and create employment opportunities.

This IJR addresses all of the Georgia Department of Transportation and Federal Highway Administration guidelines for adding access points to limited access facilities. Satisfaction of these guidelines is documented in the report.

APPENDIX A - CORRESPONDENCE

APPENDIX B - TRAFFIC DIAGRAMS

APPENDIX C - OTHER SUPPORTING DOCUMENTS

Development Agreement between Forsyth County, Georgia and TRG Forsyth LCC

Fiscal Impact Analysis, Comparison of Premium and Standard Development Options for the Taubman Development in Forsyth County

Article IX, Ronald Reagan/Union Hill Overlay District

APPENDIX D - BENEFIT COST RATIOS

***Interchange Justification Report
SR 400 at McGinnis Ferry Road***

APPENDICES

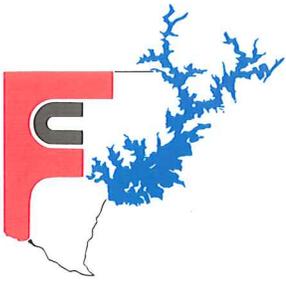
***Georgia Department of Transportation,
Forsyth County***

***Prepared for:
Georgia Department of Transportation***

***Prepared by:
Moreland Altobelli Associates, Inc.***

August 2, 2012

APPENDIX A - CORRESPONDENCE



Forsyth County Department of Engineering

March 30, 2009

Ms. Angela T. Alexander, Director
Division of Transportation Data and Planning
Georgia Department of Transportation
One Georgia Center
600 West Peachtree NW
Atlanta, Georgia 30308

Re: Proposed Interchange of McGinnis Ferry Road and SR 400

Dear Ms. Alexander:

The Forsyth County Board of Commissioners fully supports the development of the proposed interchange. We have developed an overlay zoning district and entered into a development services agreement with the developer of a regional mixed-use development adjacent to the proposed improvement. The overlay ordinance expresses the Board's desire for the Union Hill Road/Ronald Reagan Boulevard area to support regionally significant mixed use developments as reflected in the county's adopted future land use policies. The district encourages flexibility and innovation concerning mixed use projects blending residential, retail, office, commercial and recreational land uses in an approximately 160 acre area that would be in the northeast quadrant of the proposed interchange.

The development services agreement between the Forsyth County Board of Commissioners and the developer of one of the largest mixed projects in the district, TRG Forsyth LLC (Taubman), outlines the funding of infrastructure improvements and services required to support their proposed development. In order to access the approximately two million square feet of retail and commercial development, as well as nearly 1,000 residential units, the developer has agreed for Forsyth County to defer payment of \$2.75 million for property for public rights-of-way. Forsyth County has also agreed to reimburse the developer over \$1 million worth of engineering fees for water, sewer and transportation projects. Forsyth County has also contracted over \$12 million dollars of road improvements funded from our SPOLST VI Transportation Program and insuring adequate water and sewer services. The scheduled completion for this project is in September of 2009. These public and private sector projects are viewed as catalyst for future growth in south Forsyth adjacent to the SR 400 corridor.

Please do not hesitate to call with any questions you may have, or if you need additional information.

Sincerely,

John V. Cunard
Director



MEETING MINUTES

Project: McGinnis Ferry/SR 400 IJR
Project No. CSHPP-0007-00(526)
P.I. No. 0007526

Meeting: GDOT Review Meeting

Location: GDOT Planning Conference Room

Prepared By: William Ruhsam

Prepared On: 07 February 2012

Meeting Date	07 February 2012
MA Project No.	FOR081-IJR
CC:	Jason McCook (MA)

ATTENDEES	PHONE	E-MAIL
Bill Ruhsam	770 263 5945	bruhsam@maai.net
LN Manchi	770 263 5945	lmanchi@maai.net
Ulysses Mitchell	404 631 1746	umitchell@dot.ga.gov
Kyle Mote		kmote@dot.ga.gov
Katrina Lawrence		klawrence@dot.ga.gov
David Fairlie	770 263 5945	dfairlie@maai.net
Karla Posedly	770 263 5945	kposedly@maai.net

1. The meeting began with introductions.
2. Bill Ruhsam discussed the project status. The Interchange Feasibility Report (IFR) was approved by the Georgia Department of Transportation (GDOT) on March 7, 2010. The IFR dealt with a comparison of the No Build scenario to a new access point at McGinnis Ferry Road at SR 400. Since then, a new project framework agreement between GDOT and Forsyth County was executed in order to produce an approved Interchange Justification Report (IJR) and a Concept Report.
3. The project team has been reviewing and updating the information contained within the IFR related to development agreements.
4. The project team has reviewed the IFR study area and feels that it represents the area required to fully analyze the area needs and provide full planning and traffic analysis of IJR alternatives.
5. Ulysses Mitchell commented that the study area should include the entirety of the ramps on the downstream and upstream interchanges at SR 120 and SR 141. Bill Ruhsam responded that the study area maps would be altered to explicitly include the ramps, but that all operational analysis conducted in the IFR had included them and the IJR would also.
6. Bill Ruhsam said that the project team was analyzing the differences between the IFR No Build alternative—which used *Envision6*—and the IJR No Build alternative which will incorporate Plan 2040. The Regional Transportation Plan (RTP) and Transportation Improvement Program (TIP) were being examined with respect to the Atlanta Regional Commission travel demand model. The work was not complete at the time of the meeting.
7. The open to traffic date for the interchange was discussed. Bill Ruhsam proposed a 2018 open to traffic date as an appropriate time frame for a 2016 letting with two years of construction. Kyle Mote reminded the project team that the project was not in the RTP and therefore did not have a network year as yet; that the project team needed to ensure that whatever the open to



traffic year ended up being, it needed to be the network year or earlier. Ulysses Mitchell concurred with this. 2020 was selected as the network year for the interchange, with 2040 as the design year.

8. The potential funding of the final construction project was discussed. A project is included in the unfunded aspirations plan. In order to be entered into the RTP the IJR must be approved, the funding must be identified, and the project included in the next conformity update. The next update will take place in August. Moreland Altobelli (MA) will coordinate with the sponsor, Forsyth County, to achieve this goal. Bill Ruhsam said that if the project framework agreement schedule is maintained, it will be possible to deliver an approved concept report about the same time that the RTP is updated to include the project.
9. The needs of the study area were discussed. The two from the IFR are being included in the IJR: Economic Development and Additional Access to the Freeway System. An additional need is being investigated, dealing with the crash statistics of the area. All system roads are showing higher than average crash rates. The compilation of crash statistics was not complete as of the meeting date because McGinnis Ferry Road has missing data. The project team was liaising with Forsyth County to get crash reports on the segments missing data.
10. Kyle Mote requested that the functional classification of the roadways be included in the analysis tables.
11. LN Manchi discussed the level of stakeholder involvement that would be completed during the IJR. Contacts will be made with the local jurisdictions and the North Fulton Community Improvement District. There will also be a contact with the Atlanta Regional Commission to ensure they are aware of project progress.
12. Bill Ruhsam will confirm that the McGinnis Ferry interchange is contained within the North Fulton Comprehensive Transportation Plan.

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

Enc: AGENDA and SUPPORTING DOCUMENTS

Agenda

McGinnis Ferry at SR 400 Interchange Justification Report

February 7, 2012
GDOT Office of Planning

I. Introductions

II. Project Status

- Interchange Feasibility Report
- Project Framework Agreement

III. Project Update and IJR Preparation

- Review of Agreements
- Study Area
- Traffic Update with Plan 2040
- Build Year (2018)
- Environmental Scan

IV. Study Area Needs

1. Additional Access to Freeway (From IFR)
2. Economic Development (From IFR)
3. Safety (New for IJR)

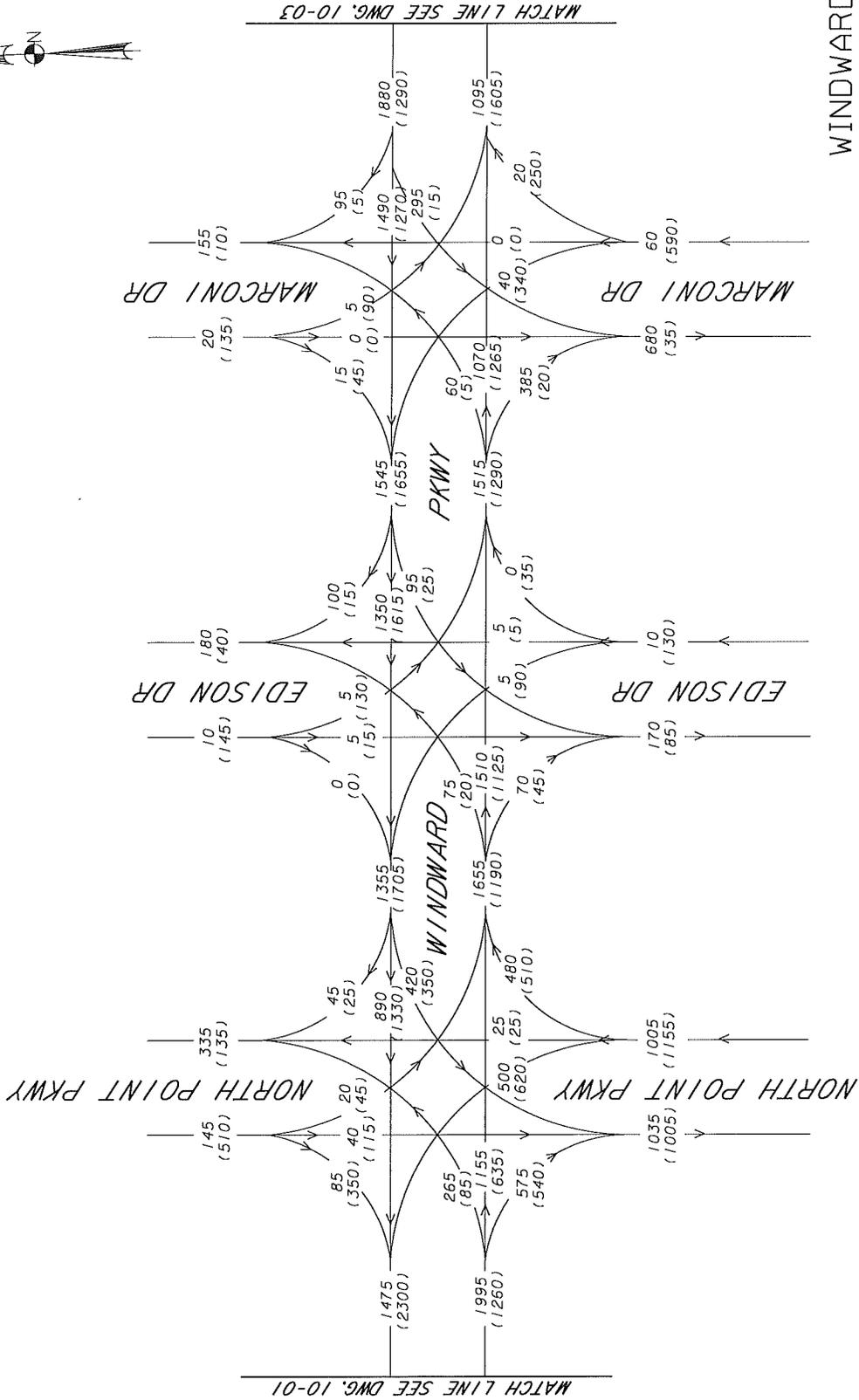
V. Alternatives Analysis

1. No Build
2. Diamond Interchange at McGinnis Ferry + CD System to McFarland
3. Diamond Interchange at McGinnis Ferry
4. Improvements to Windward Parkway and Area Roads
5. Improvements to McFarland Parkway and Area Roads
6. Combination of 4 & 5

VI. Anticipated Schedule

- March 9th delivery to Forsyth for review
- March 19th delivery to GDOT for review

APPENDIX B - TRAFFIC DIAGRAMS



WINDWARD PKWY

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 SU = 4%
 COMB = 1%

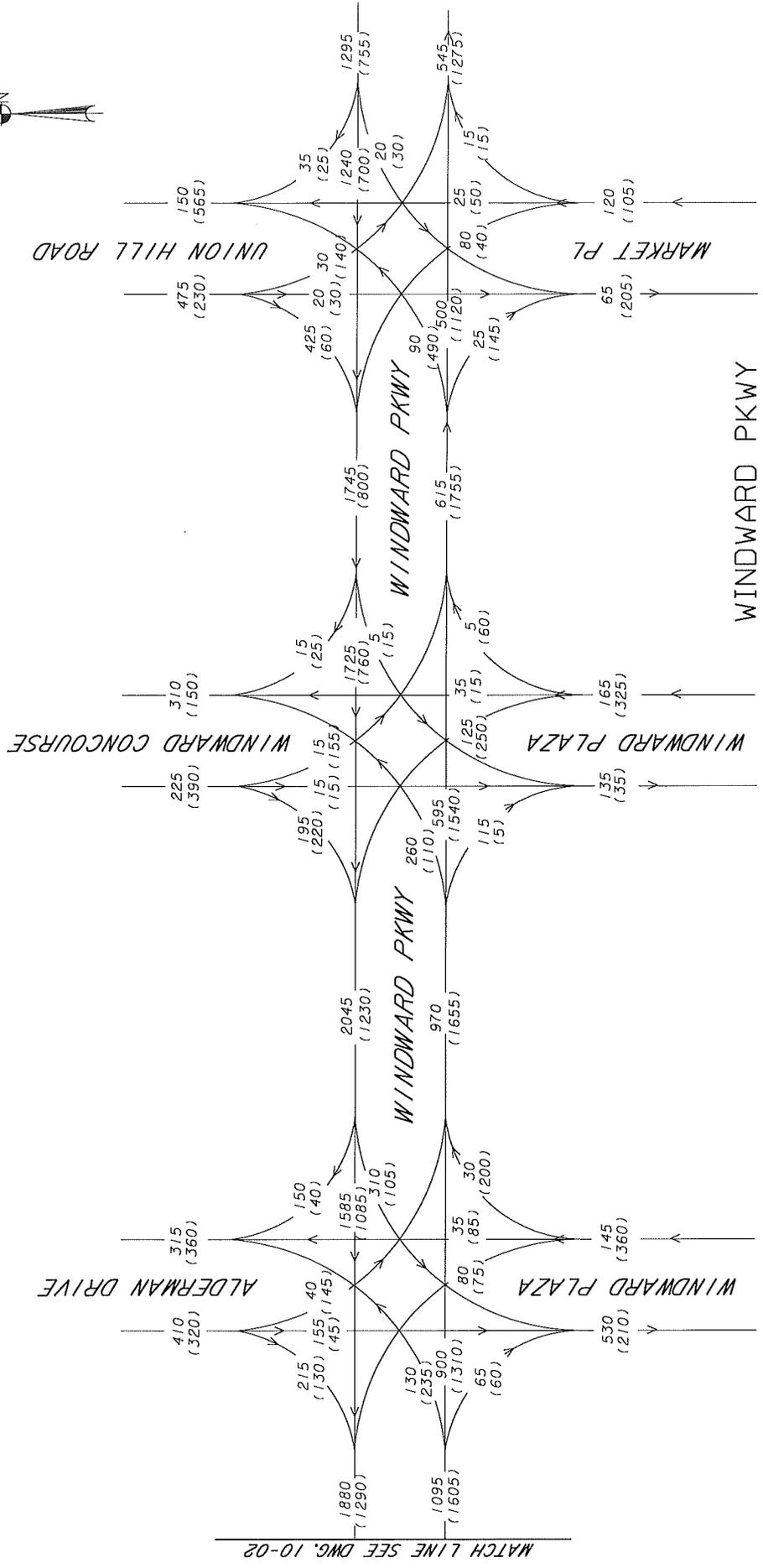
WINDWARD PKWY @ GA 400
 2011 EXISTING PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 (0) AM PEAK HOUR
 (00) PM PEAK HOUR

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 Associates, Inc.
 2211 Beaver Run Road
 Suite 190
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 Telephone (770) 263-5945



DRAWING NO.
 10-02



MATCH LINE SEE DWG. 10-02

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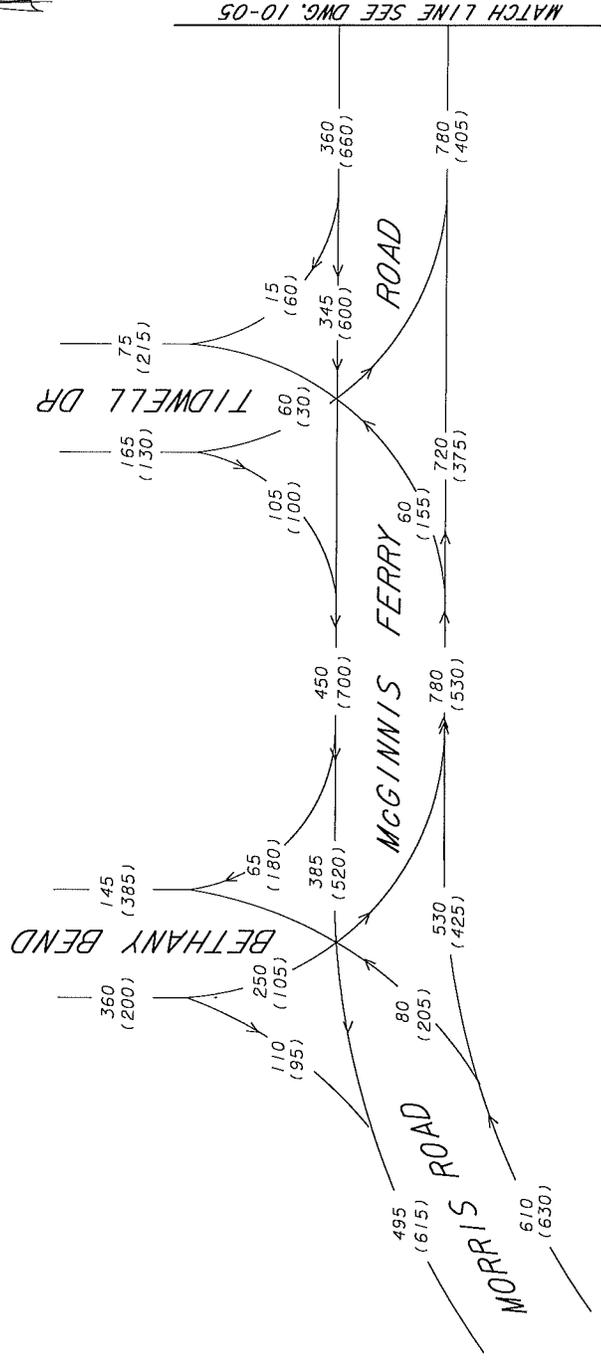
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McGINNIS FERRY RD

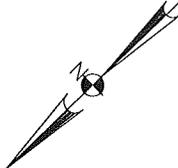
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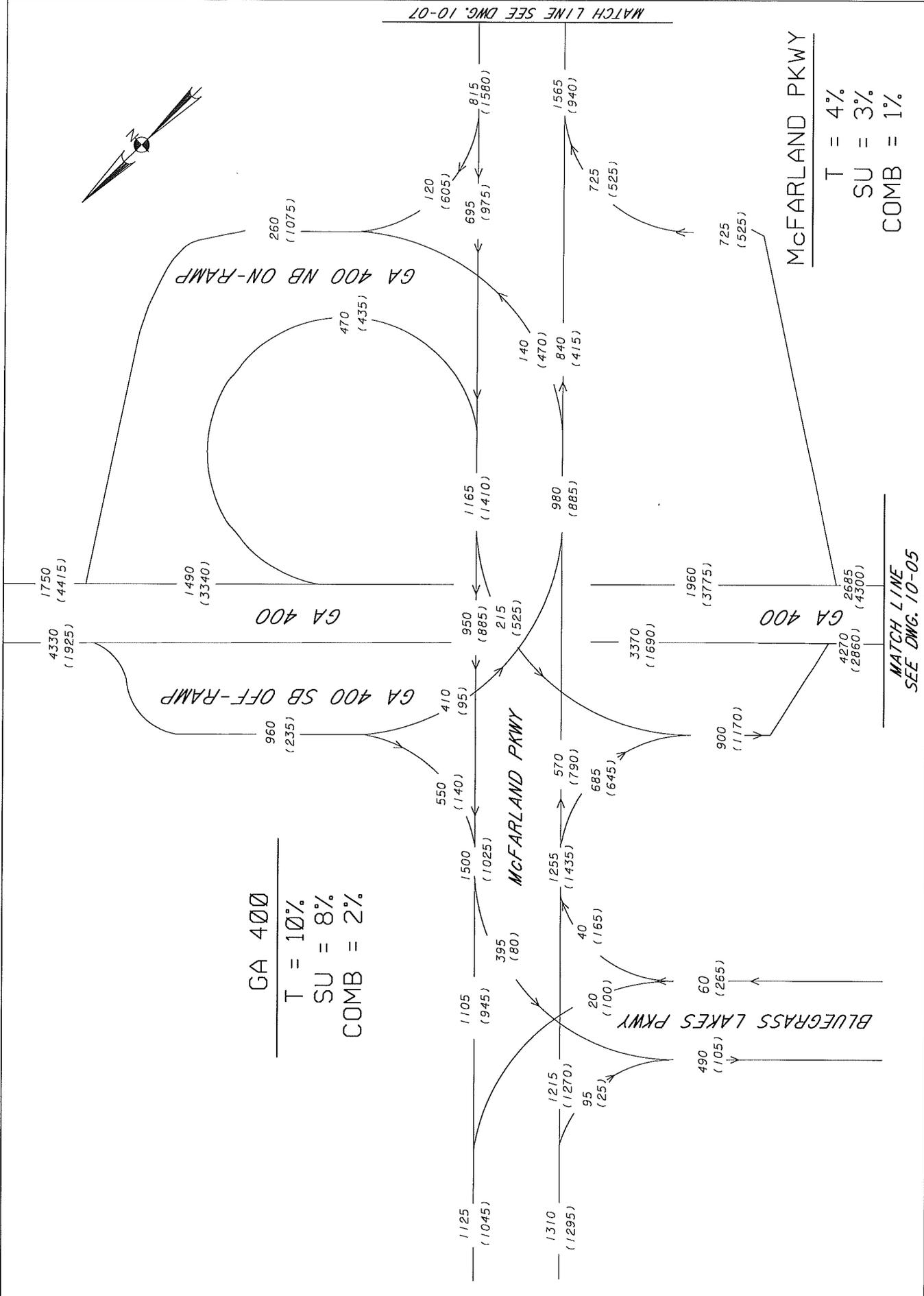
McGINNIS FERRY RD @ GA 400
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 TRAFFIC FLOW DIAGRAM

LEGEND
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 (00) PM PEAK HOUR

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GA 400
 T = 10%
 SU = 8%
 COMB = 2%



T = 4%
 SU = 3%
 COMB = 1%

MCFARLAND PKWY @ GA 400
 2011 EXISTING PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

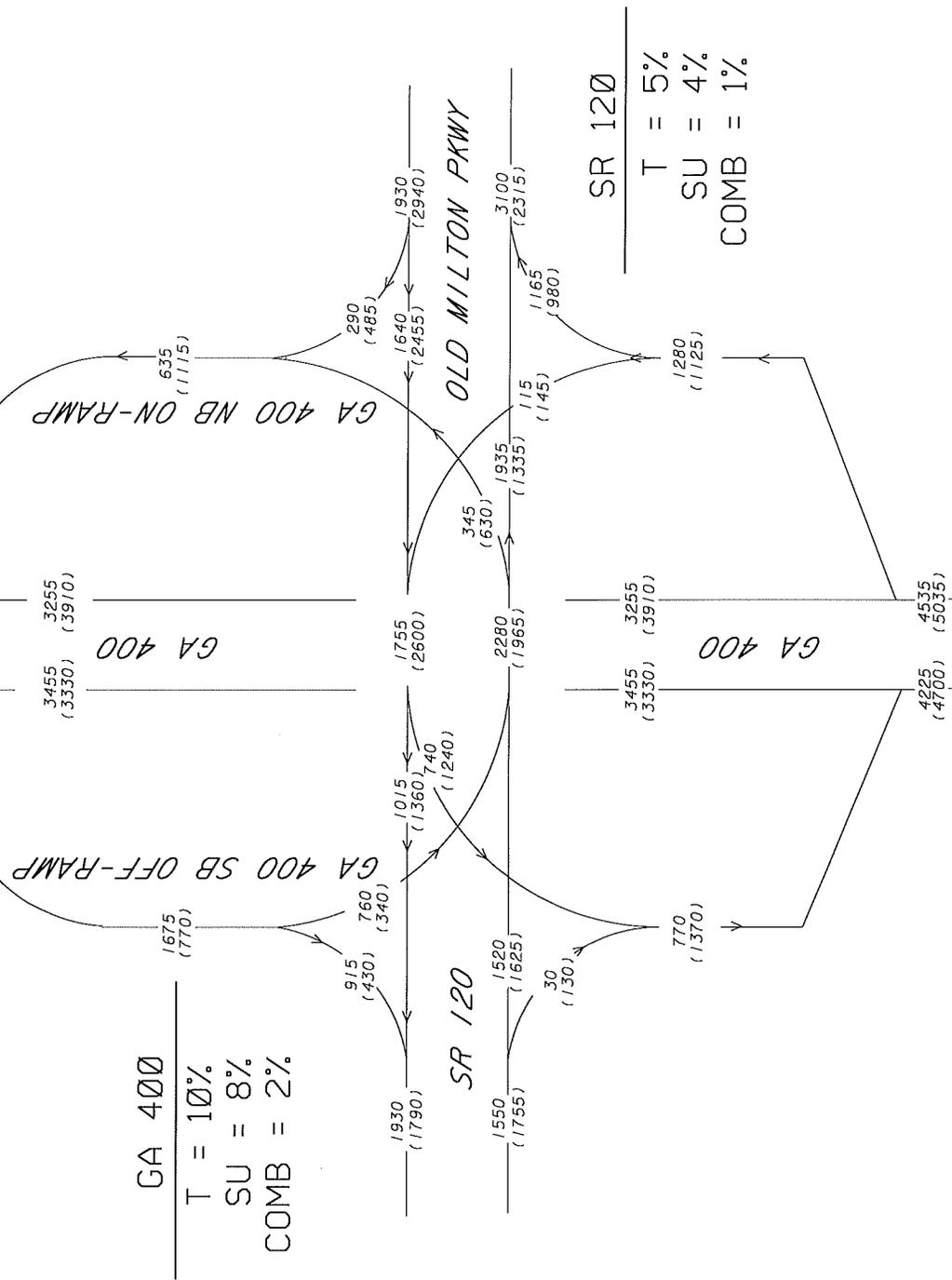
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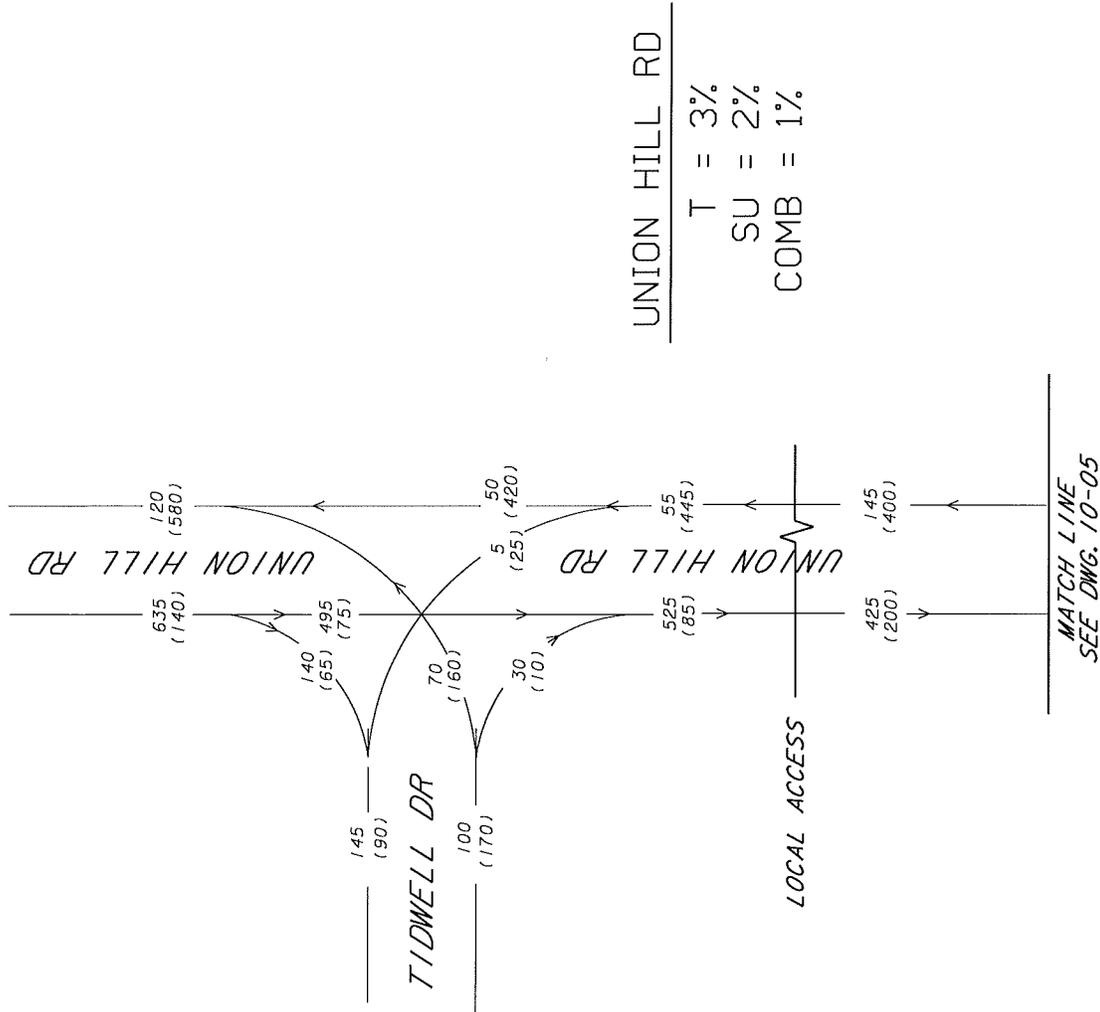
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10-08



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UNION HILL RD AT TIDWELL DR
 2011 EXISTING PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

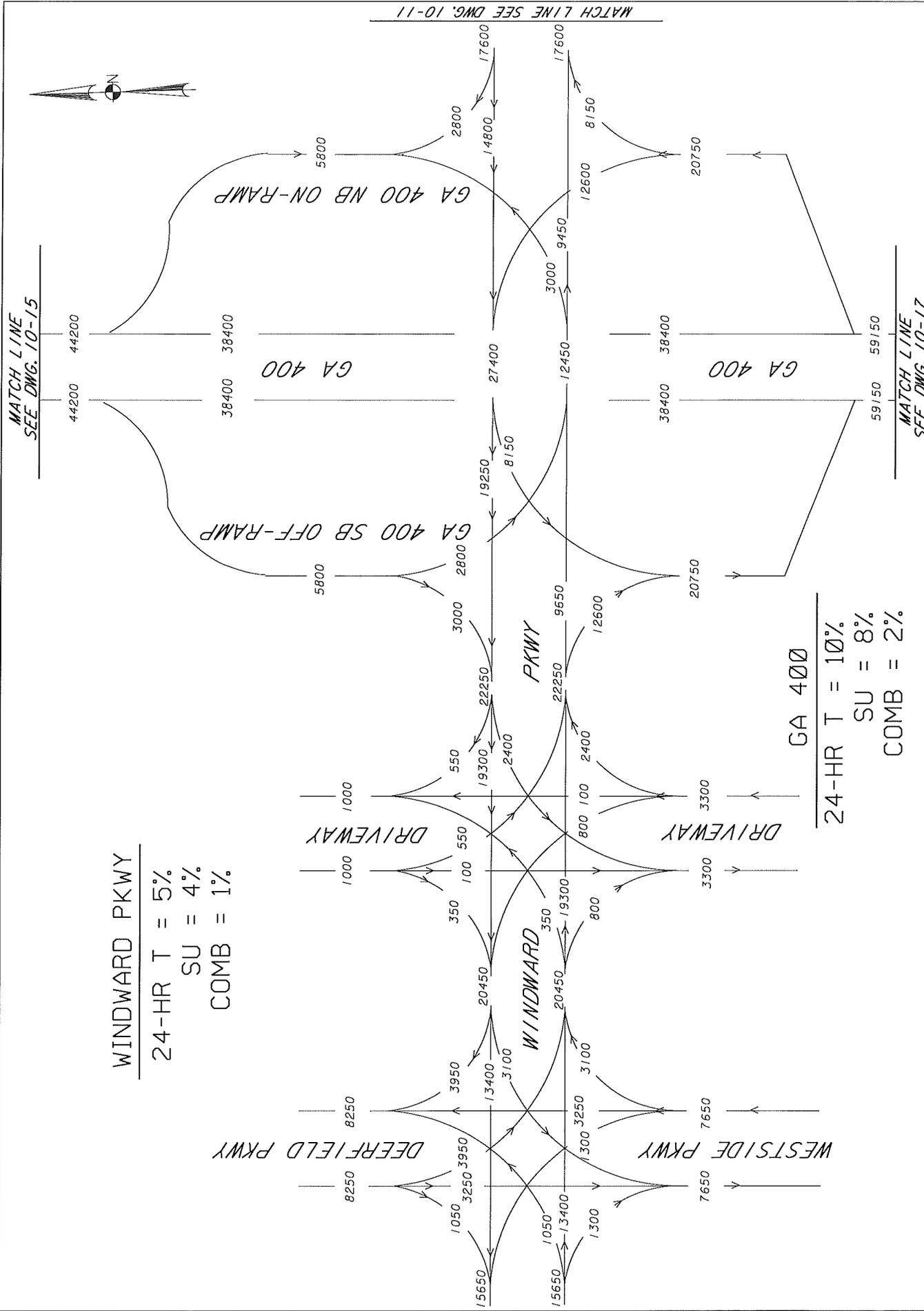
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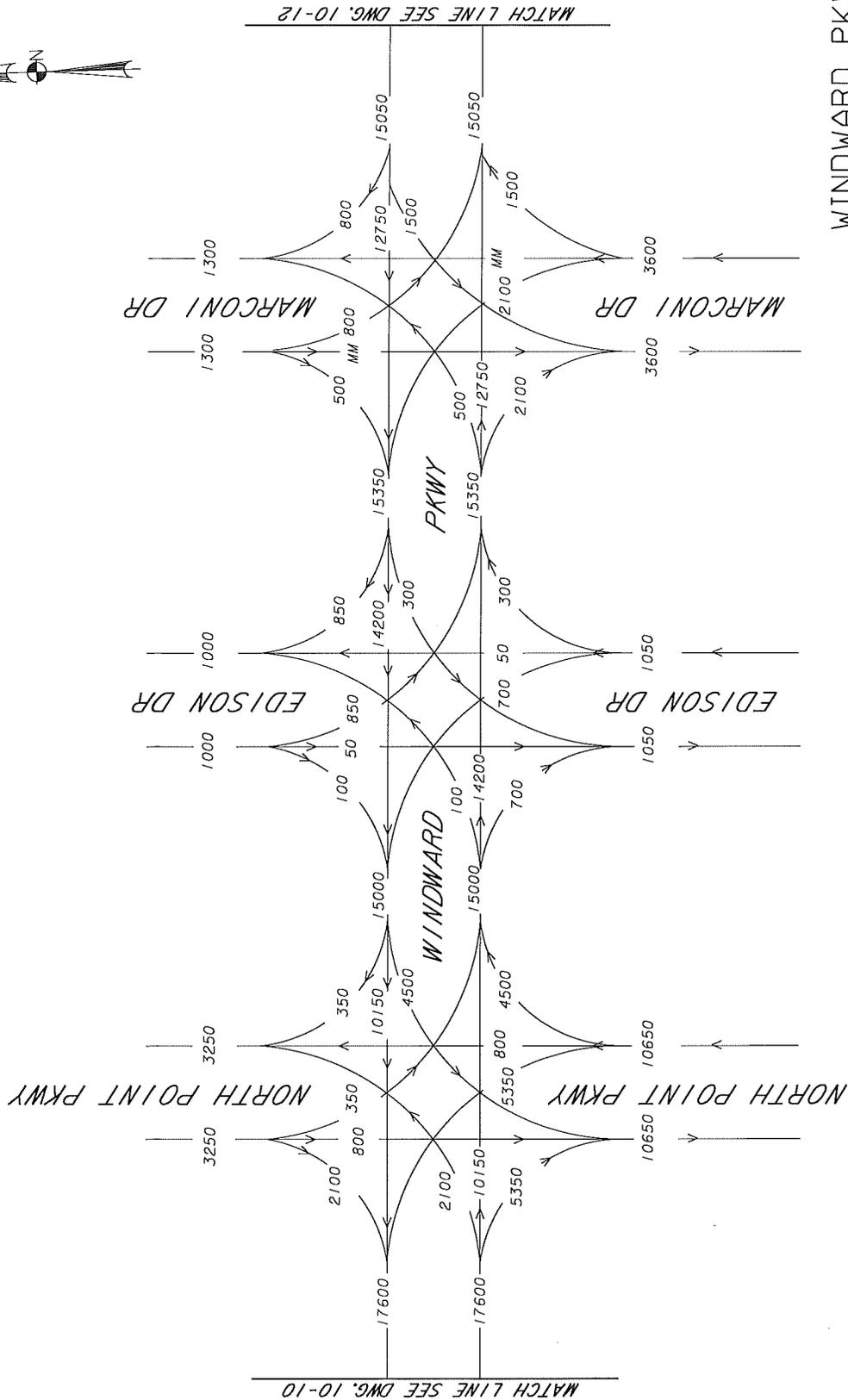
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<p>DRAWING NO. 10-10</p>	<p>WINDWARD PKWY @ GA 400 2011 AVERAGE DAILY TRAFFIC TRAFFIC FLOW DIAGRAM</p>	<p>LEGEND ØØ AVERAGE DAILY TRAFFIC</p>	<p>MA Moreland Altabelli Associates, Inc. 2211 Beaver Run Road Suite 190 Norcross, Georgia 30071 Telephone (770) 263-5945</p>
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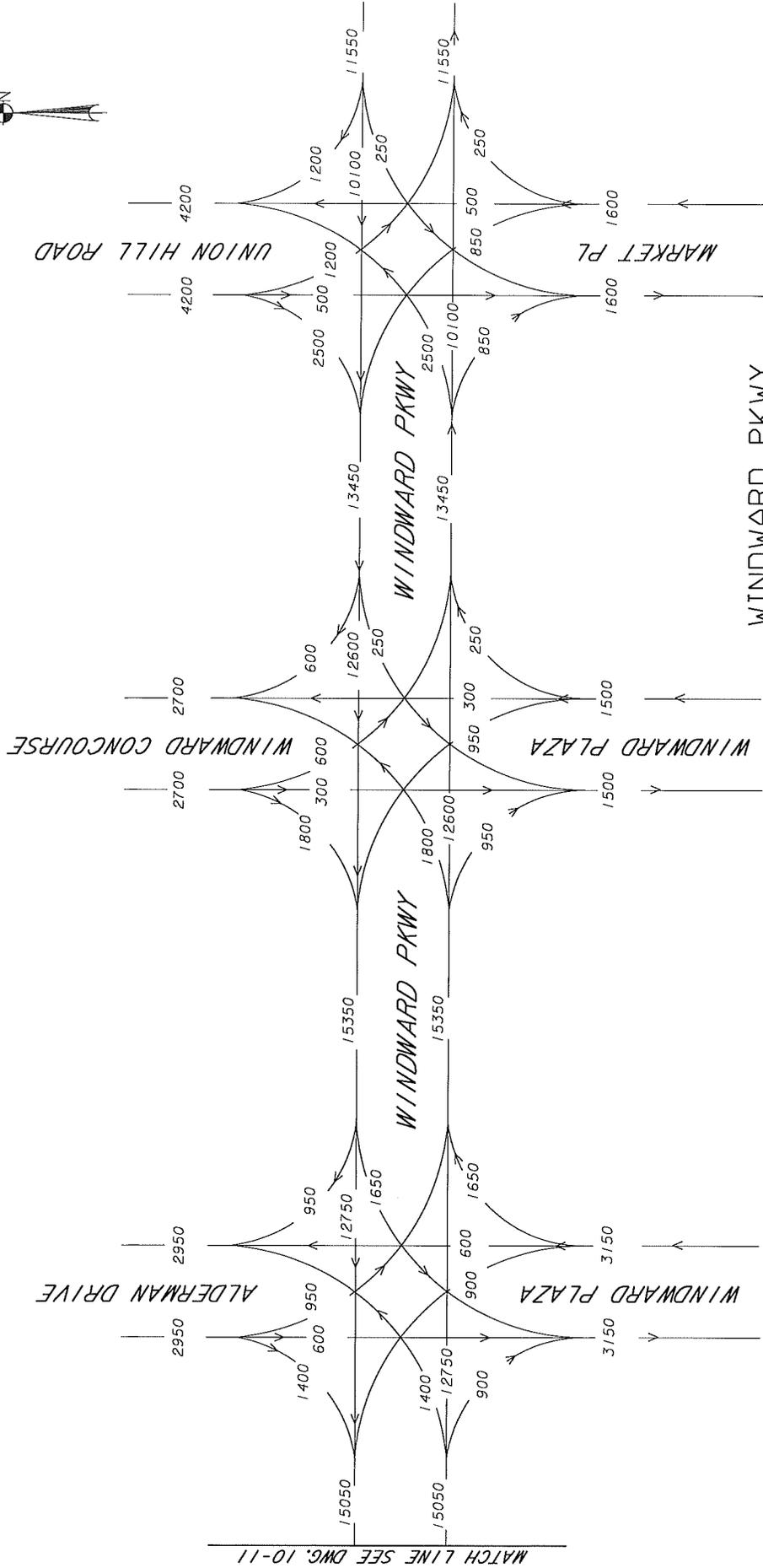
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LEGEND
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WINDWARD PKWY @ GA 400
 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

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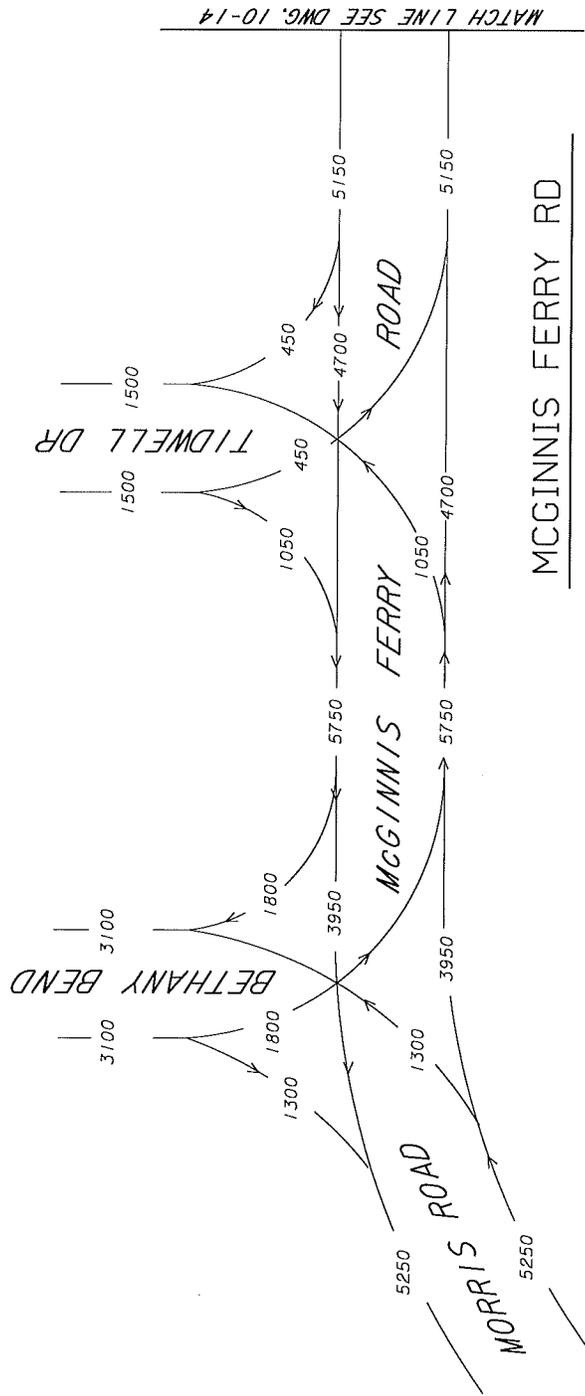
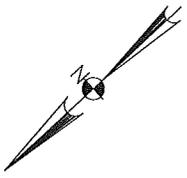
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WINDWARD PKWY @ GA 400
 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

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LEGEND
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MCGINNIS FERRY RD @ GA 400
 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-13

MATCH LINE B
SEE DWG. 10-15

44200

GEORGIA 400

GA 400

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SU = 8%

COMB = 2%

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MATCH LINE SEE DWG. 10-13

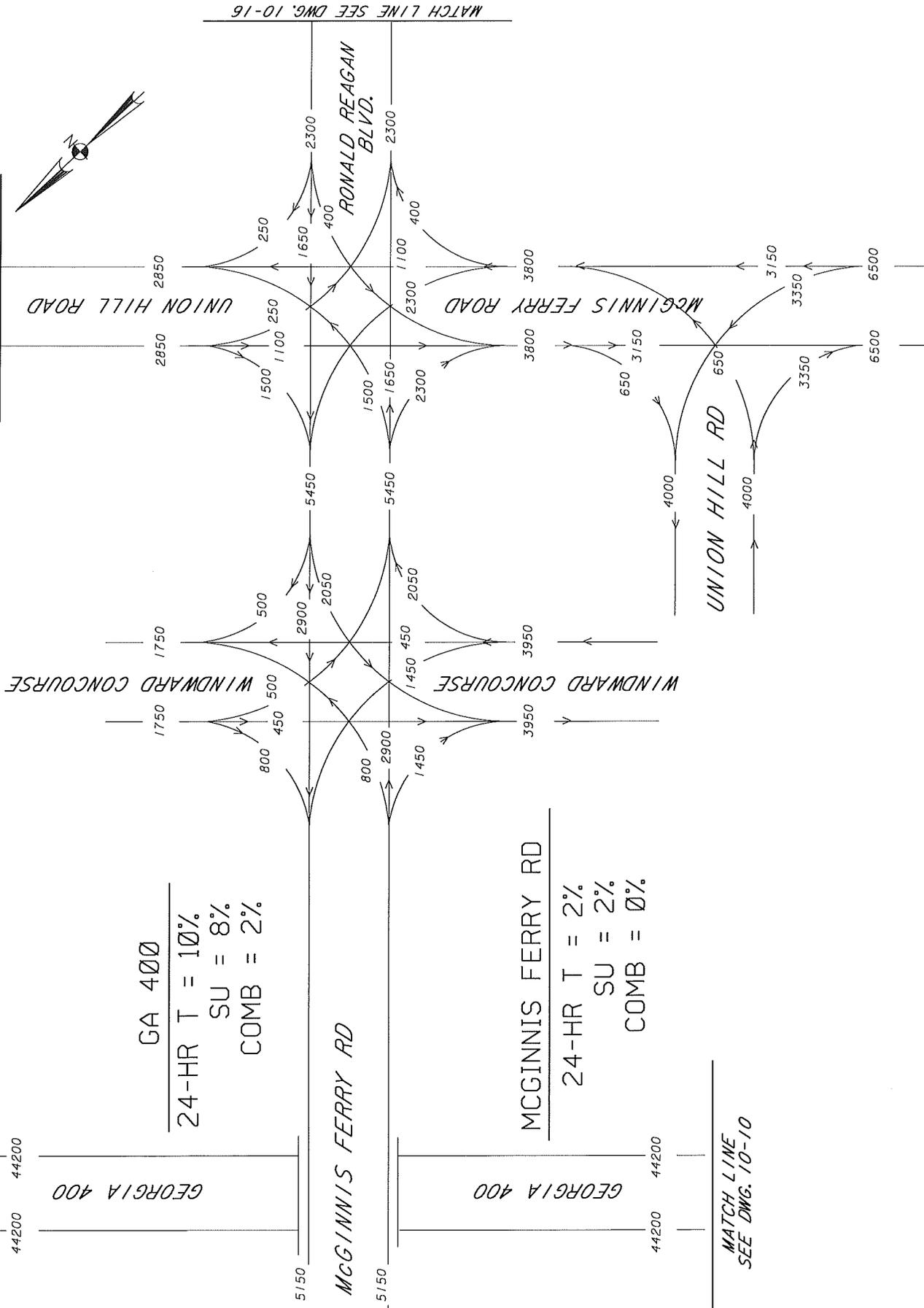
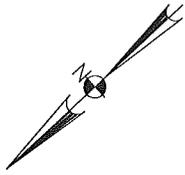
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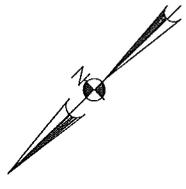
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MCGINNIS FERRY RD @ GA 400
2011 AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

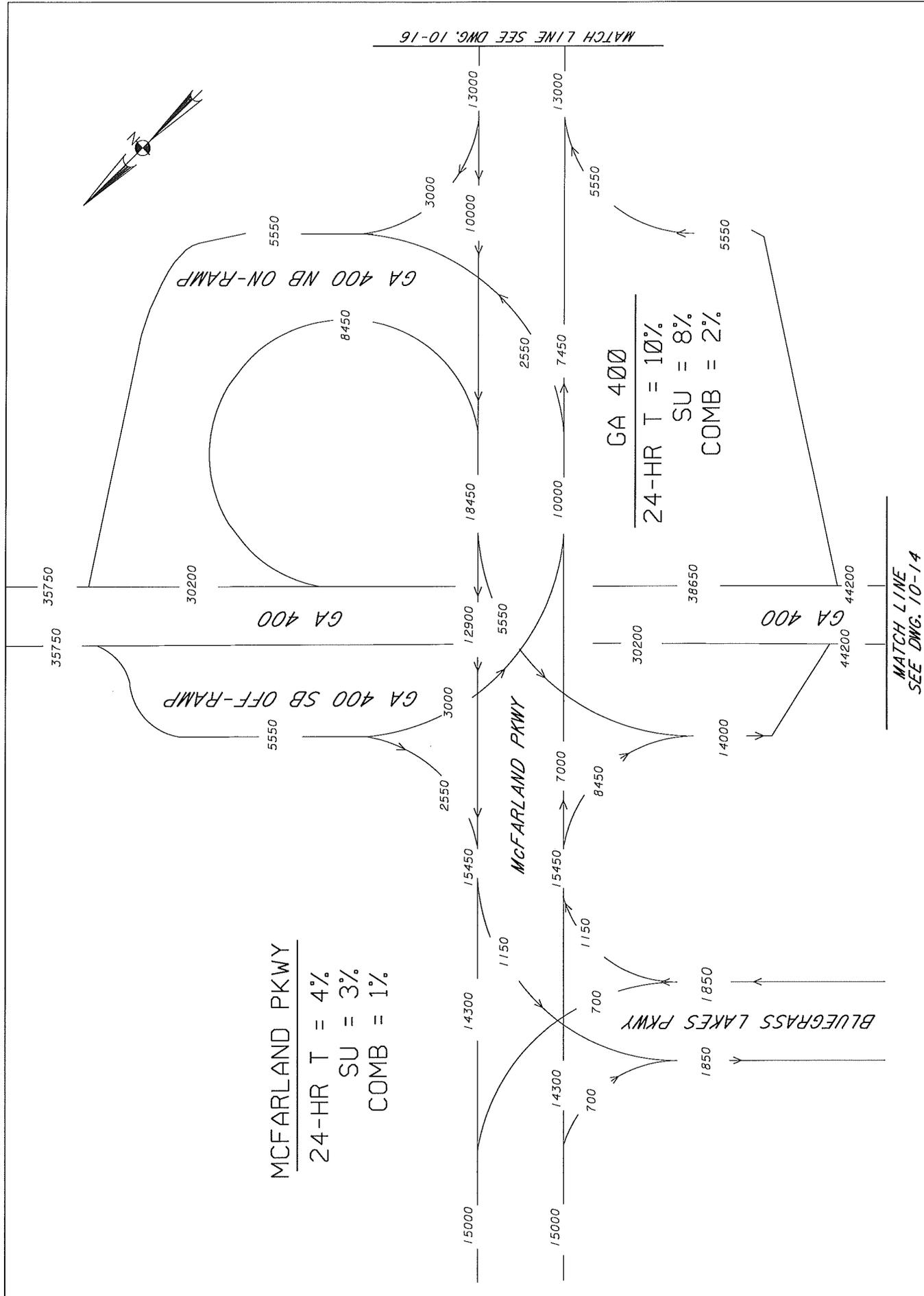
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 COMB = 1%

GA 400
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 SU = 8%
 COMB = 2%

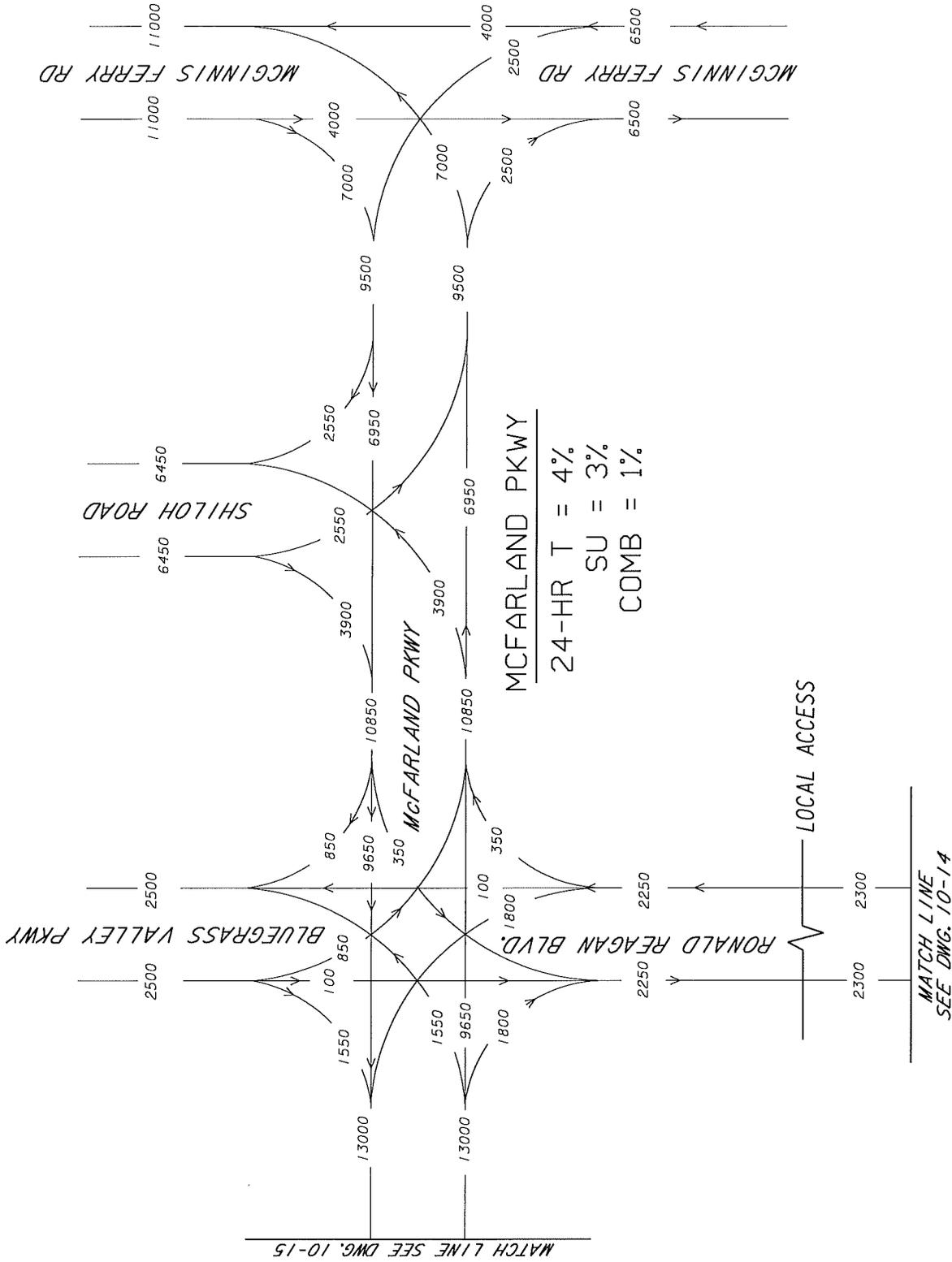
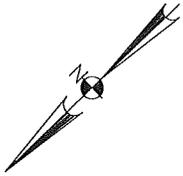


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MCFARLAND PKWY @ GA 400
 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
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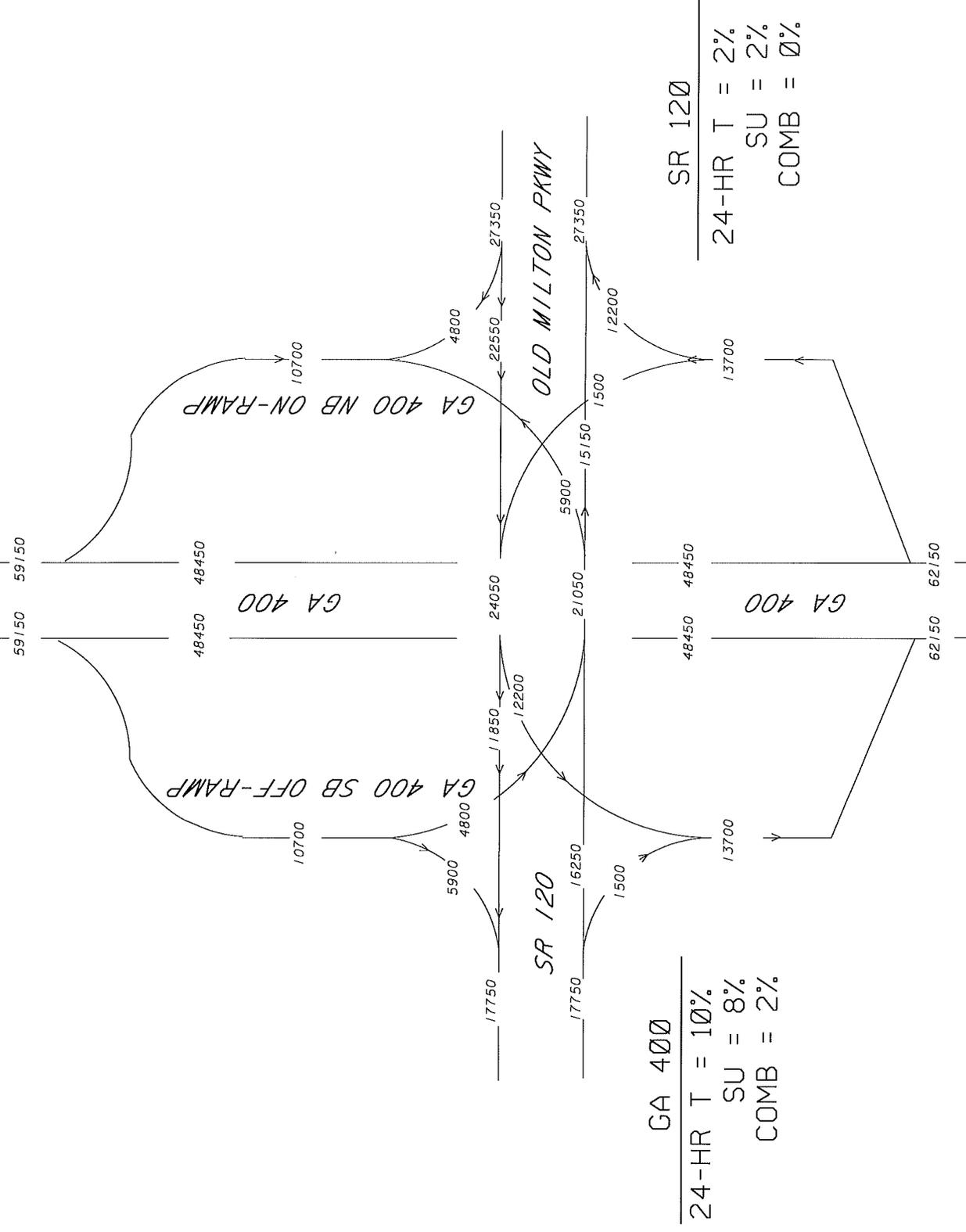
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 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
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MATCH LINE
SEE DWG. 10-10



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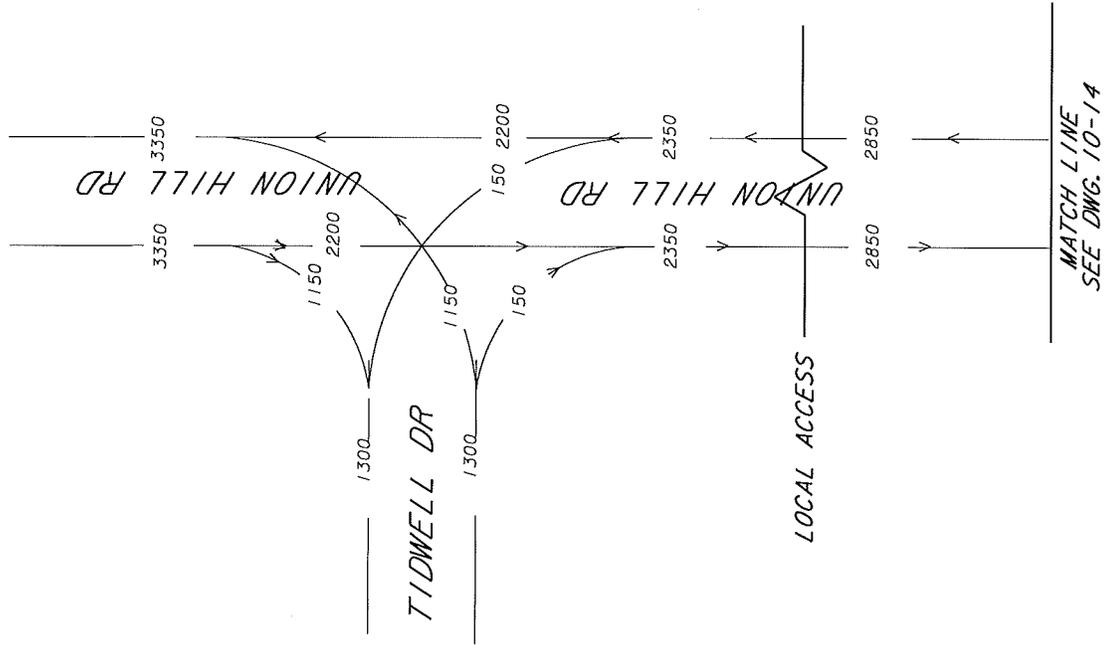
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LEGEND
00 AVERAGE DAILY TRAFFIC

SR 120 @ GA 400
2011 AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-17



UNION HILL RD
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 COMB = 0%

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LEGEND
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UNION HILL RD AT TIDWELL DR
 2011 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

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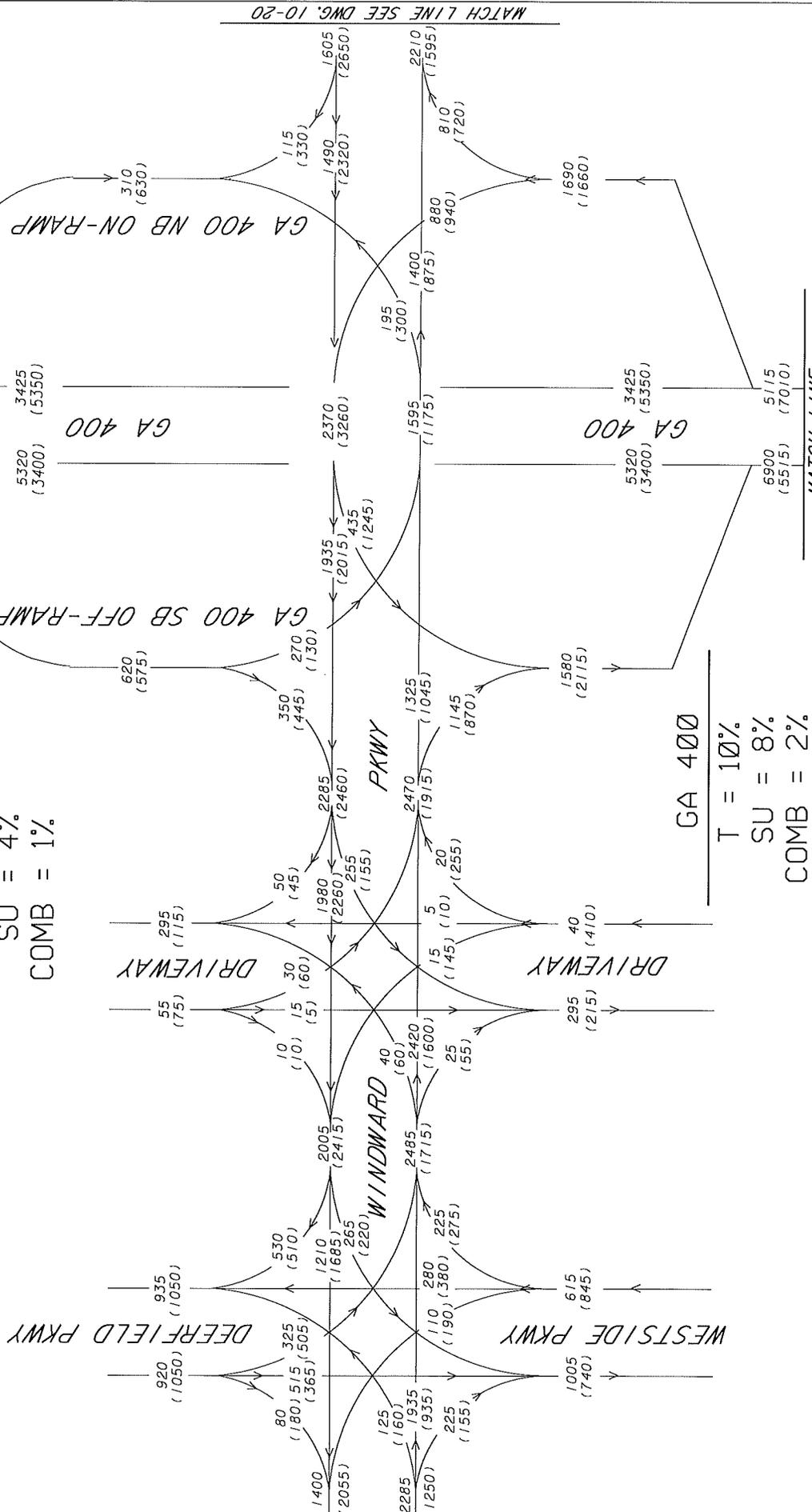
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MATCH LINE SEE DWG. 10-20



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GA 400

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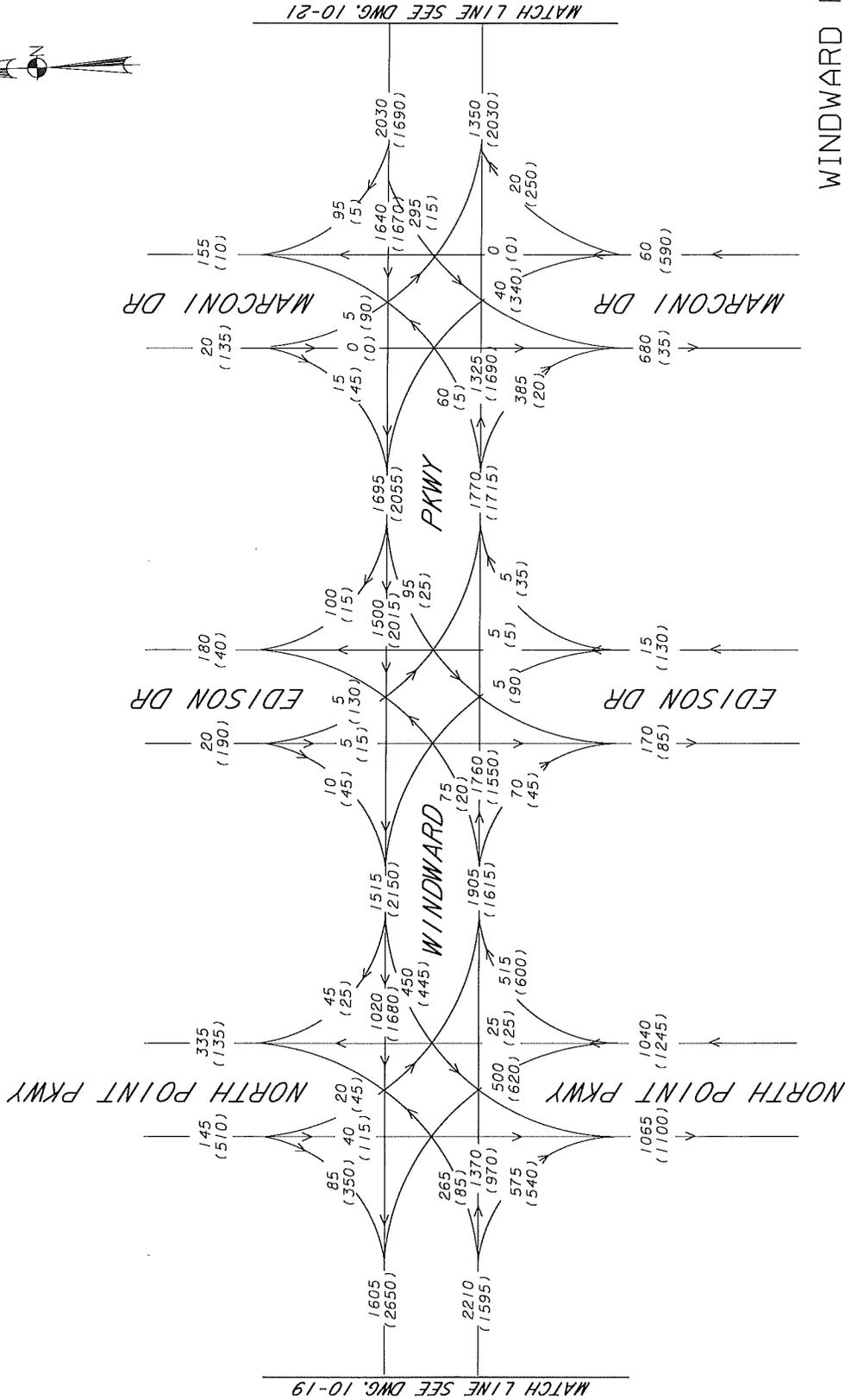
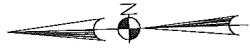
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WINDWARD PKWY @ GA 400
2020 NO-BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-19

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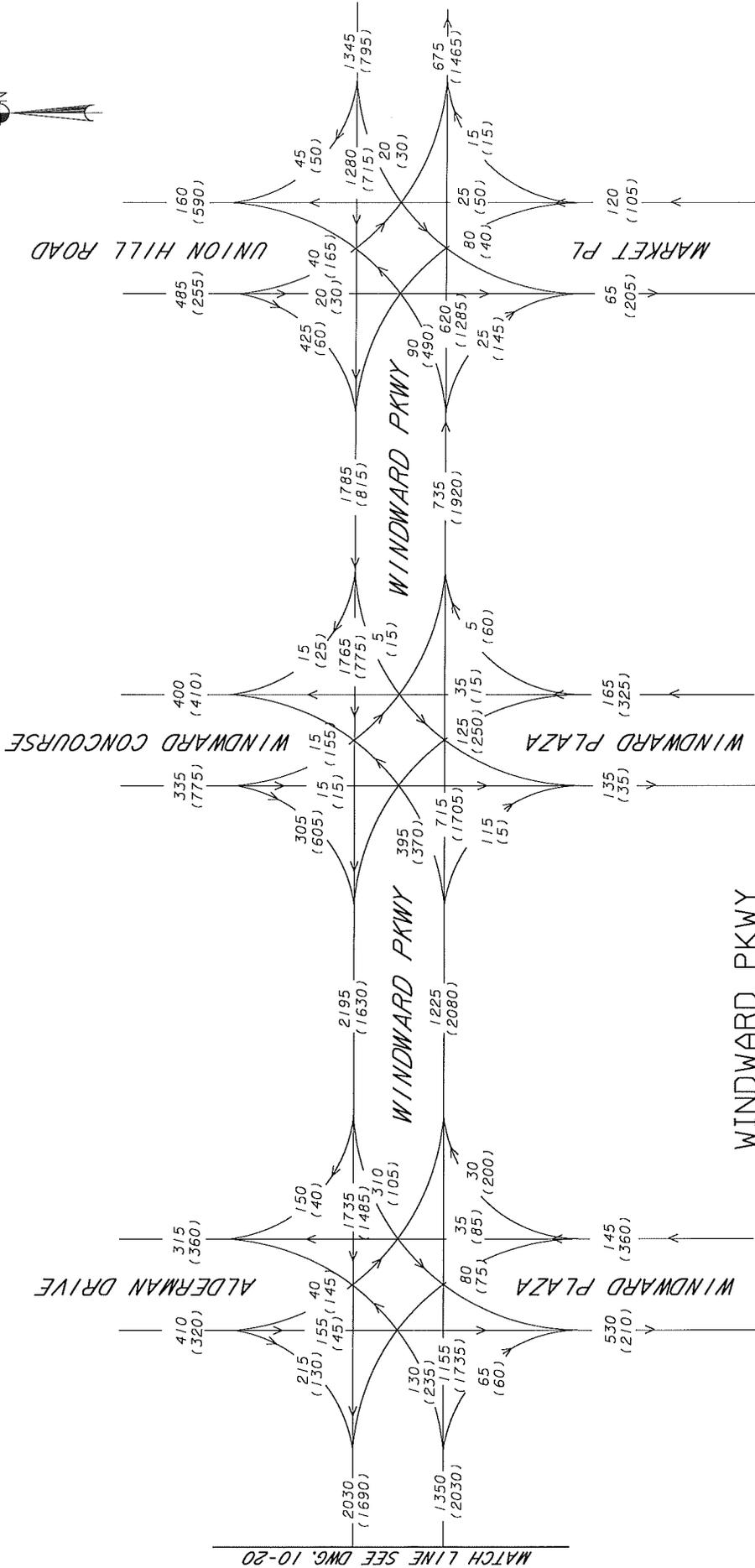
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LEGEND

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WINDWARD PKWY @ GA 400
 2020 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-20



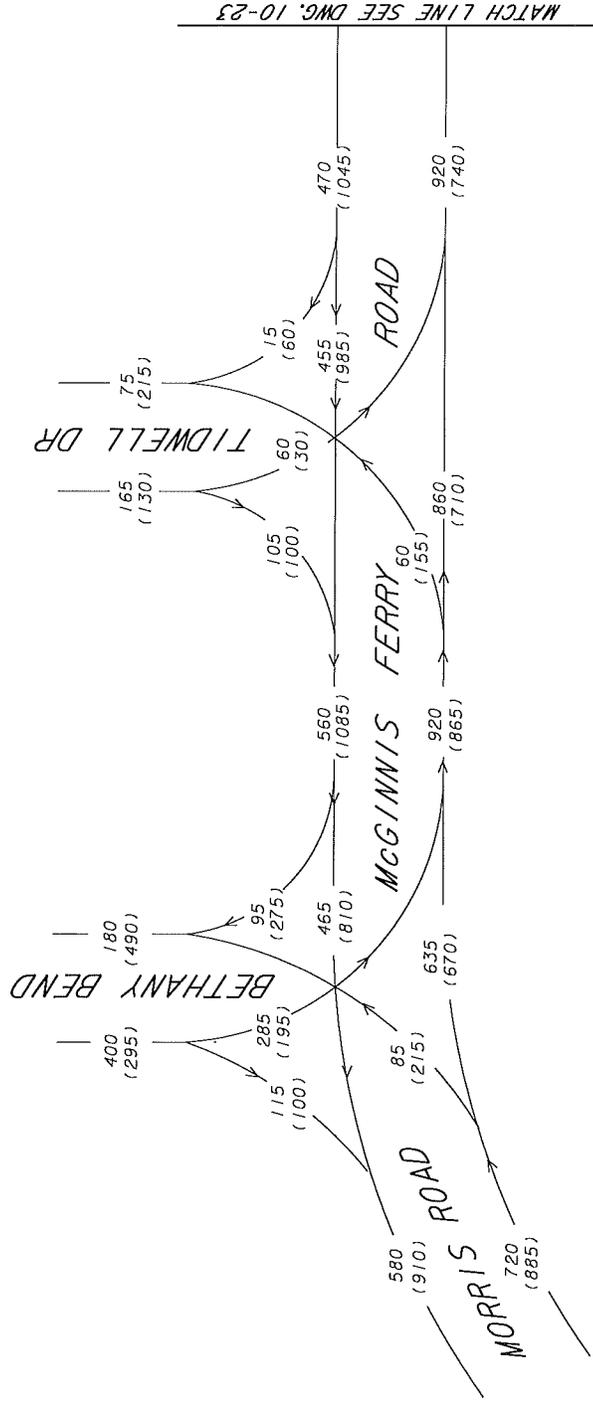
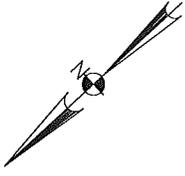
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LEGEND
 ∅∅ AM PEAK HOUR
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WINDWARD PKWY @ GA 400
 2020 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
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McGINNIS FERRY RD

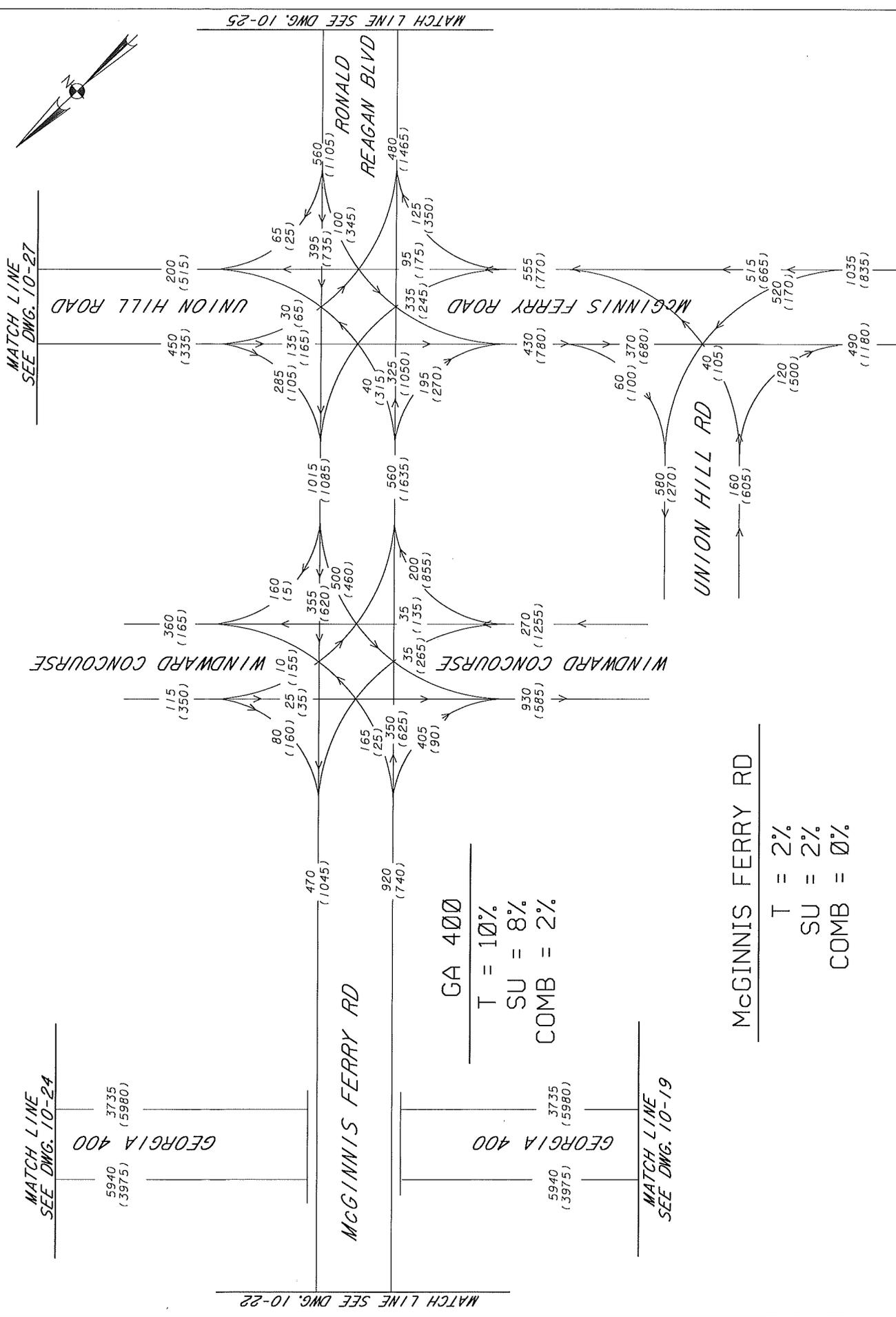
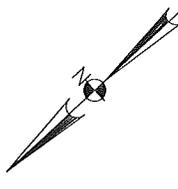
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 Associates, Inc.
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 Suite 190
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LEGEND
 00 AM PEAK HOUR
 (00) PM PEAK HOUR

McGINNIS FERRY RD @ GA 400
 2020 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-22



MATCH LINE
SEE DWG. 10-27

MATCH LINE SEE DWG. 10-25

MATCH LINE
SEE DWG. 10-24

5940 (3975)
3735 (5980)
GEORGIA 400

McGINNIS FERRY RD

GA 400
T = 10%
SU = 8%
COMB = 2%

5940 (3975)
3735 (5980)
GEORGIA 400

MATCH LINE
SEE DWG. 10-19

McGINNIS FERRY RD

T = 2%
SU = 2%
COMB = 0%

DRAWING NO.
10-23

McGINNIS FERRY RD @ GA 400
2020 NO-BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

LEGEND
ØØ AM PEAK HOUR
(ØØ) PM PEAK HOUR

NA

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Morgansville, Georgia 30071
Telephone (770) 263-5945

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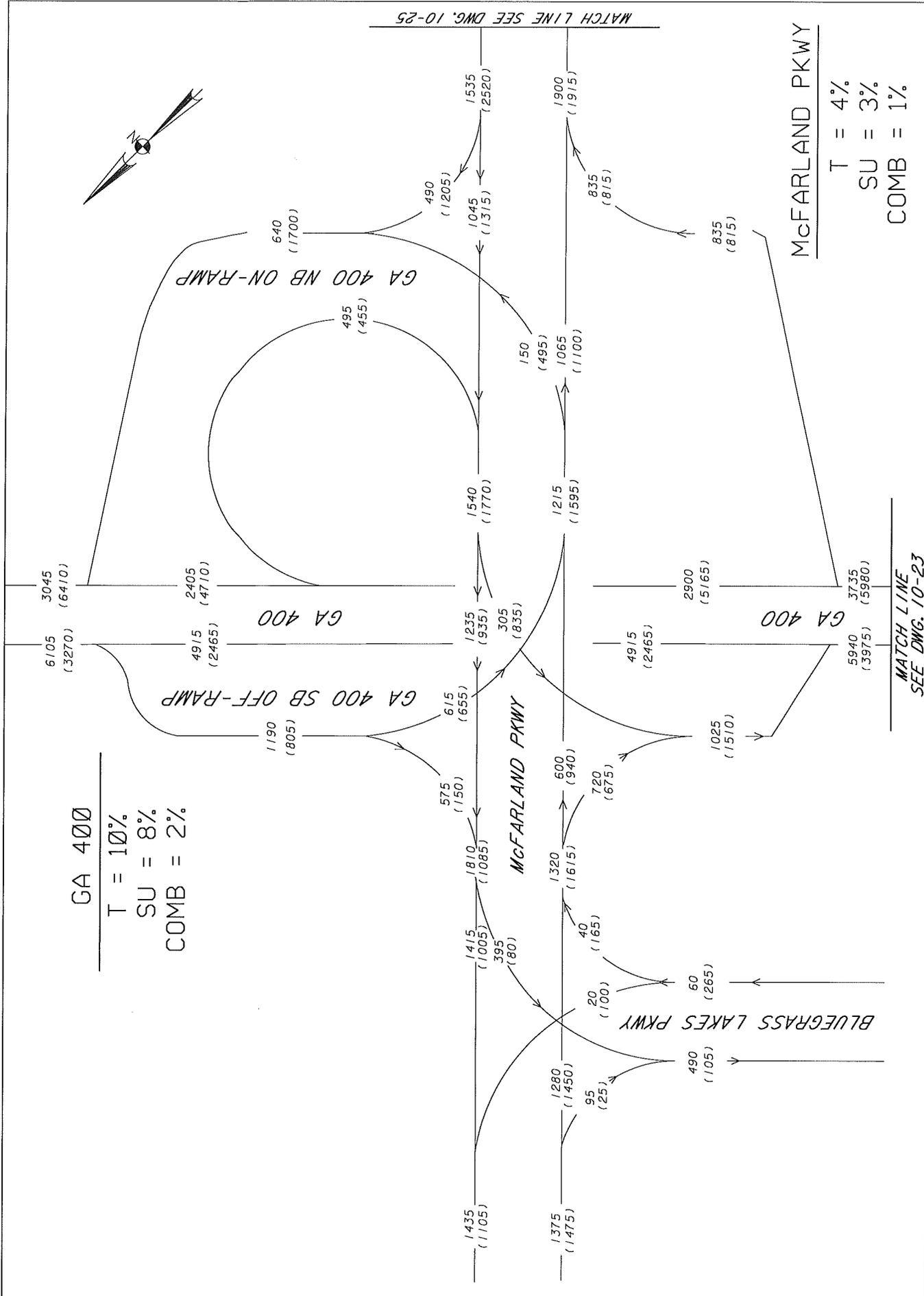
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(ØØ) PM PEAK HOUR

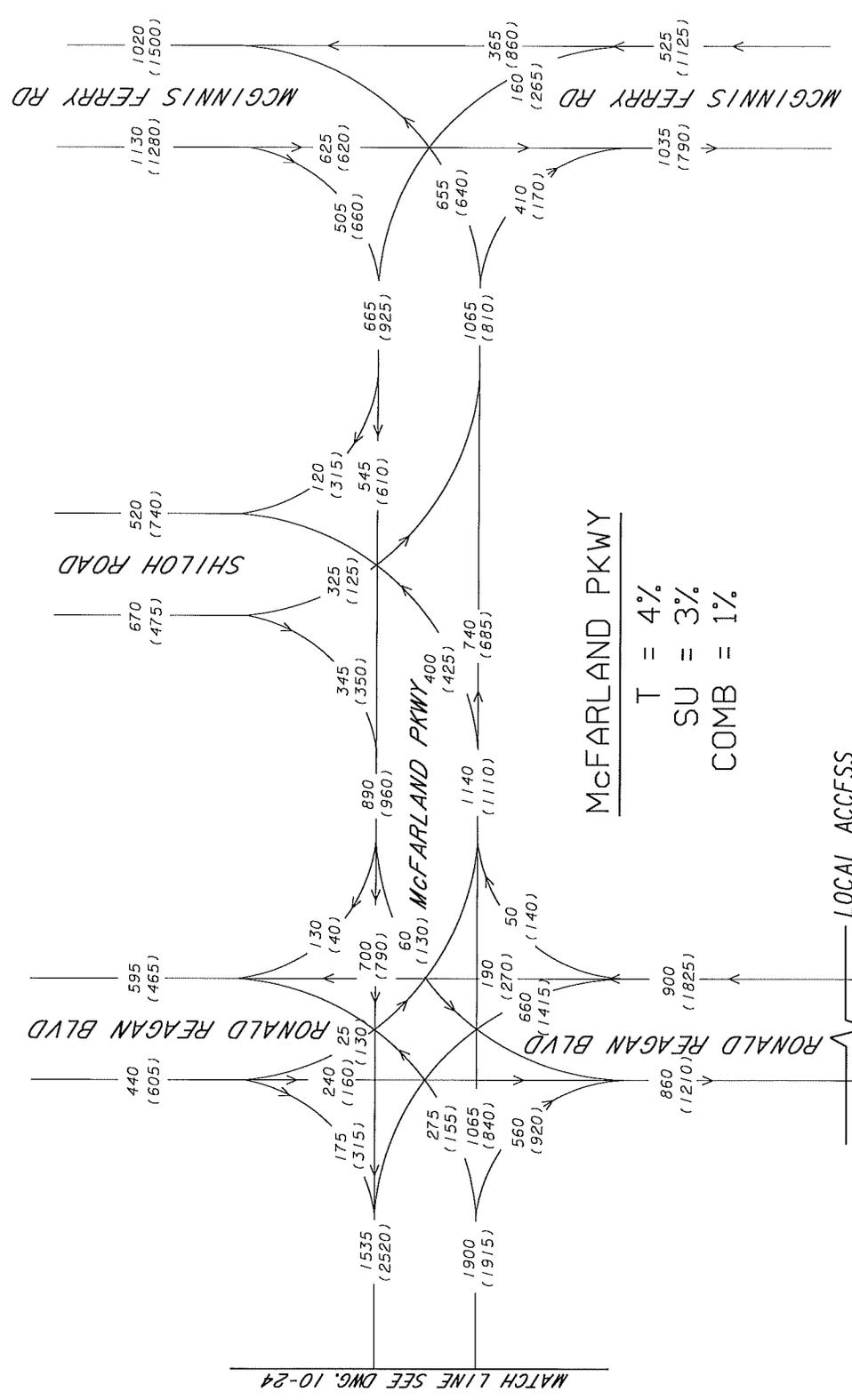
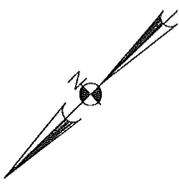
McFARLAND PKWY @ GA 400
2020 NO-BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-24

GA 400

T = 10%
SU = 8%
COMB = 2%



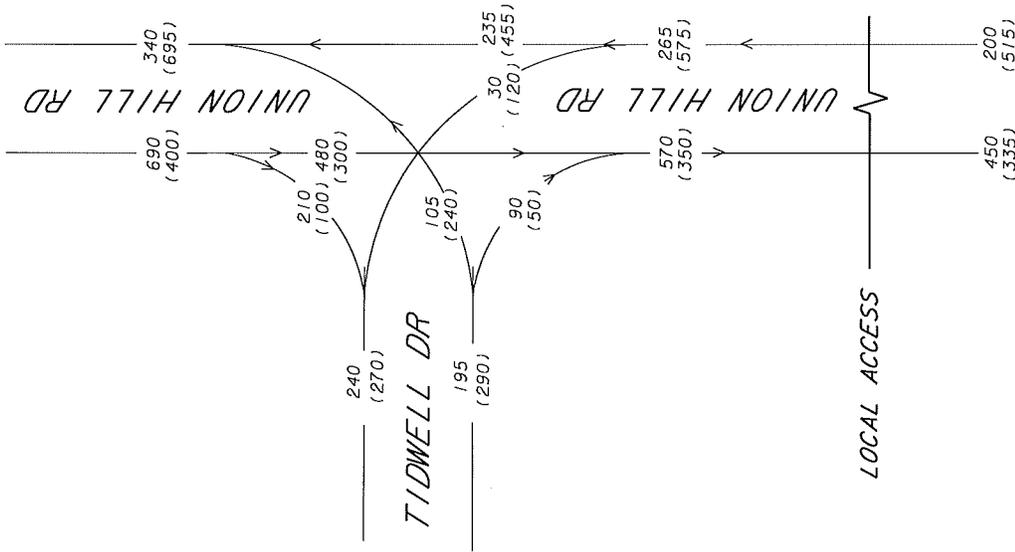


DRAWING NO.
10-25

McFARLAND PKWY @ GA 400
2020 NO-BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

LEGEND
∅∅ AM PEAK HOUR
(∅∅) PM PEAK HOUR

MA
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UNION HILL RD

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

LOCAL ACCESS

MATCH LINE
 SEE DWG. 10-23

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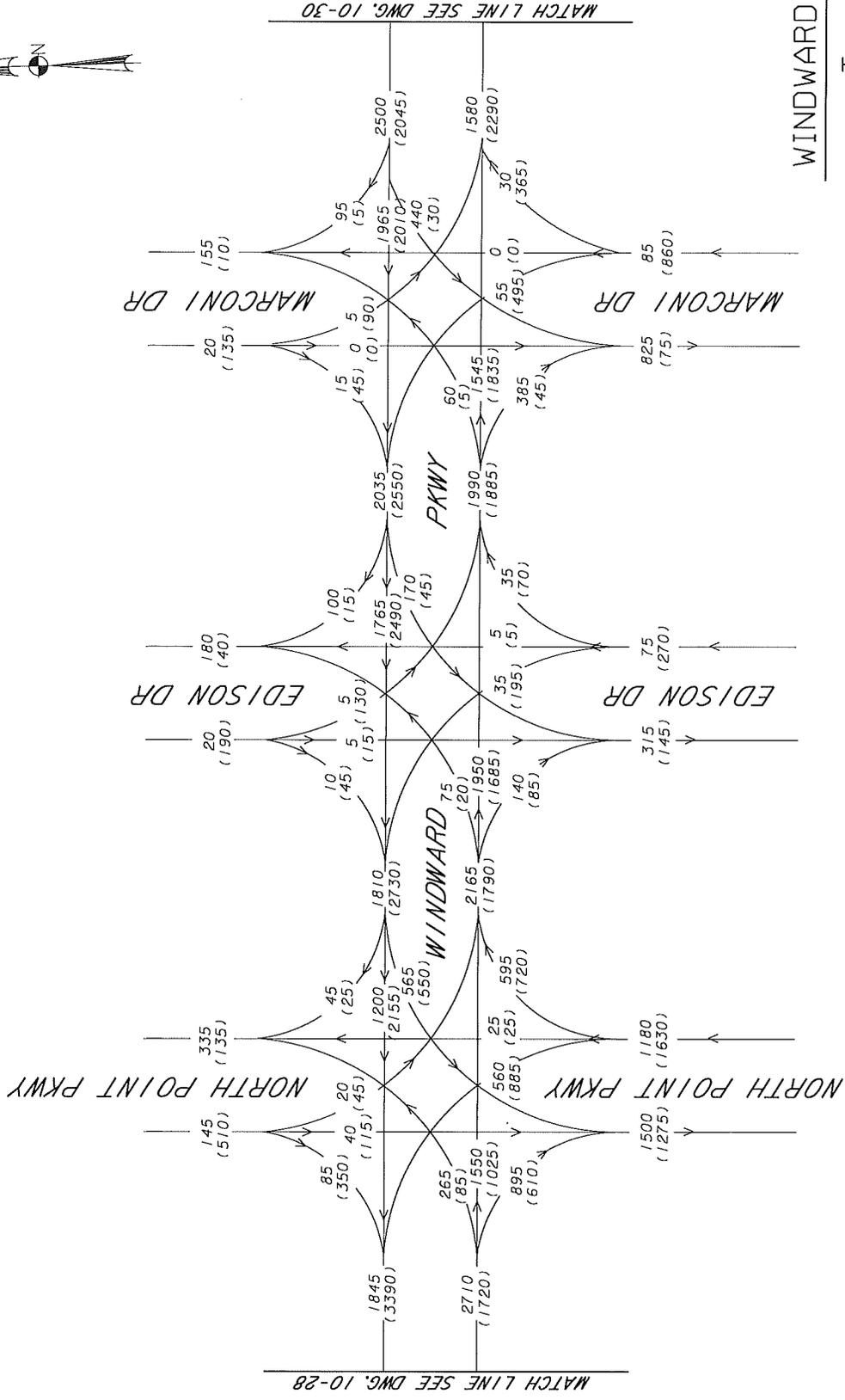


LEGEND

∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

UNION HILL RD AT TIDWELL DR
 2020 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-27



WINDWARD PKWY

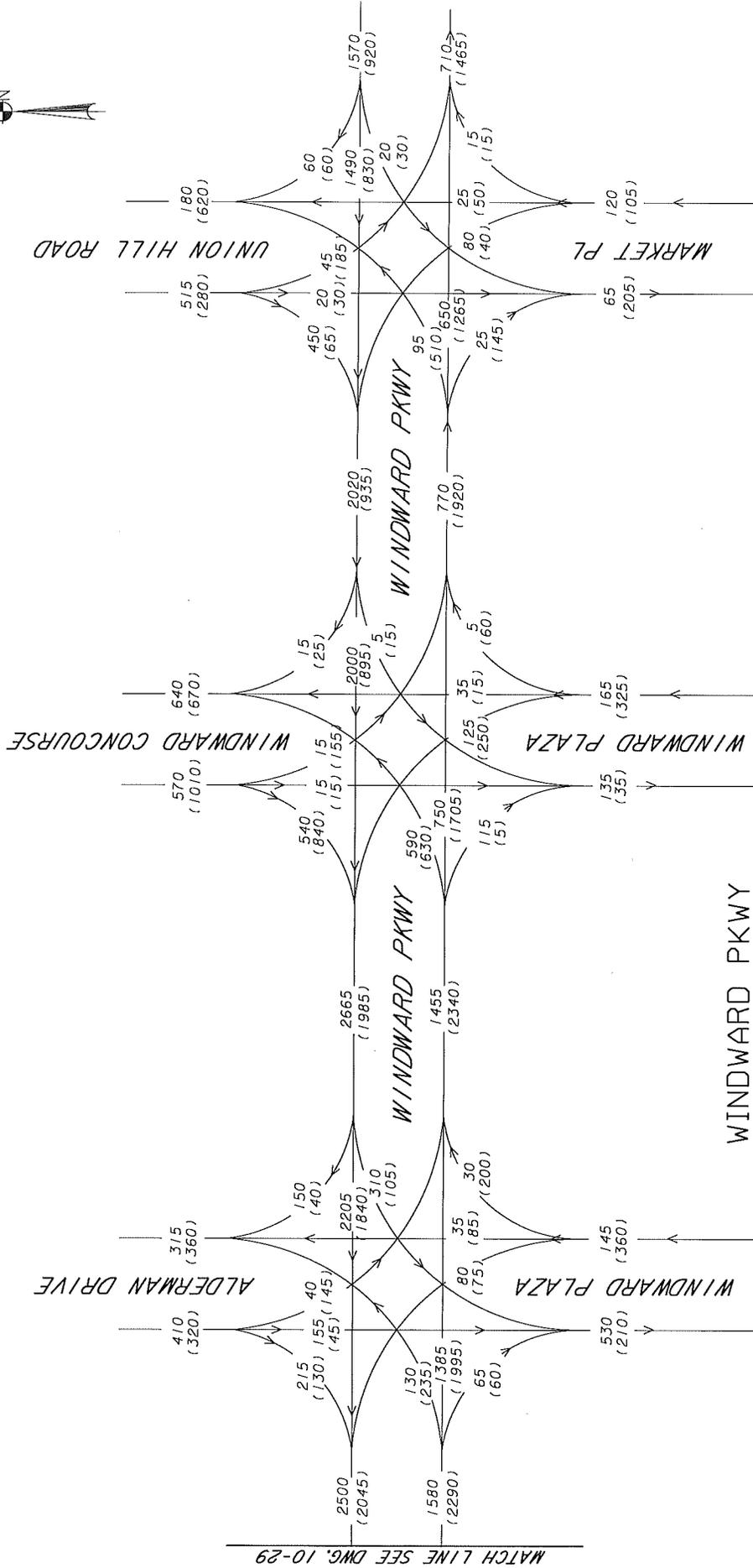
T = 5%
 SU = 4%
 COMB = 1%

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LEGEND
 () AM PEAK HOUR
 () PM PEAK HOUR

WINDWARD PKWY @ GA 400
 2040 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-29

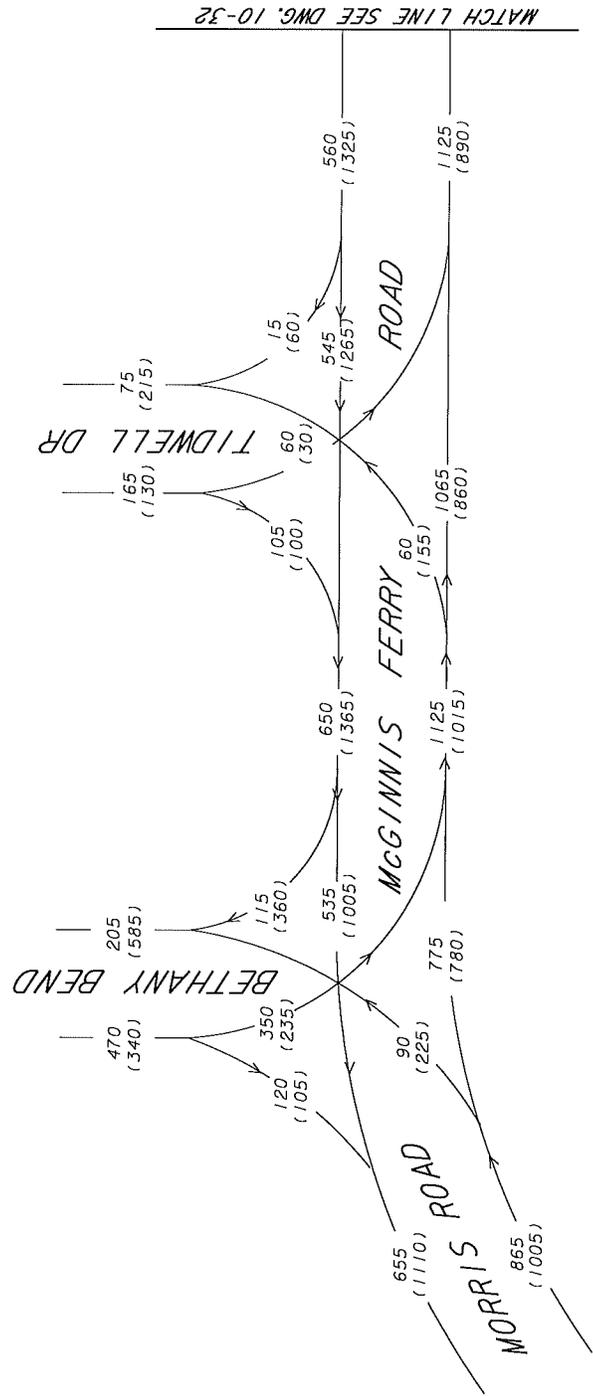
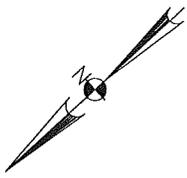


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LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

WINDWARD PKWY @ GA 400
 2040 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-30



McGINNIS FERRY RD

T = 2%
 SU = 2%
 COMB = 0%

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LEGEND
 00 AM PEAK HOUR
 (00) PM PEAK HOUR

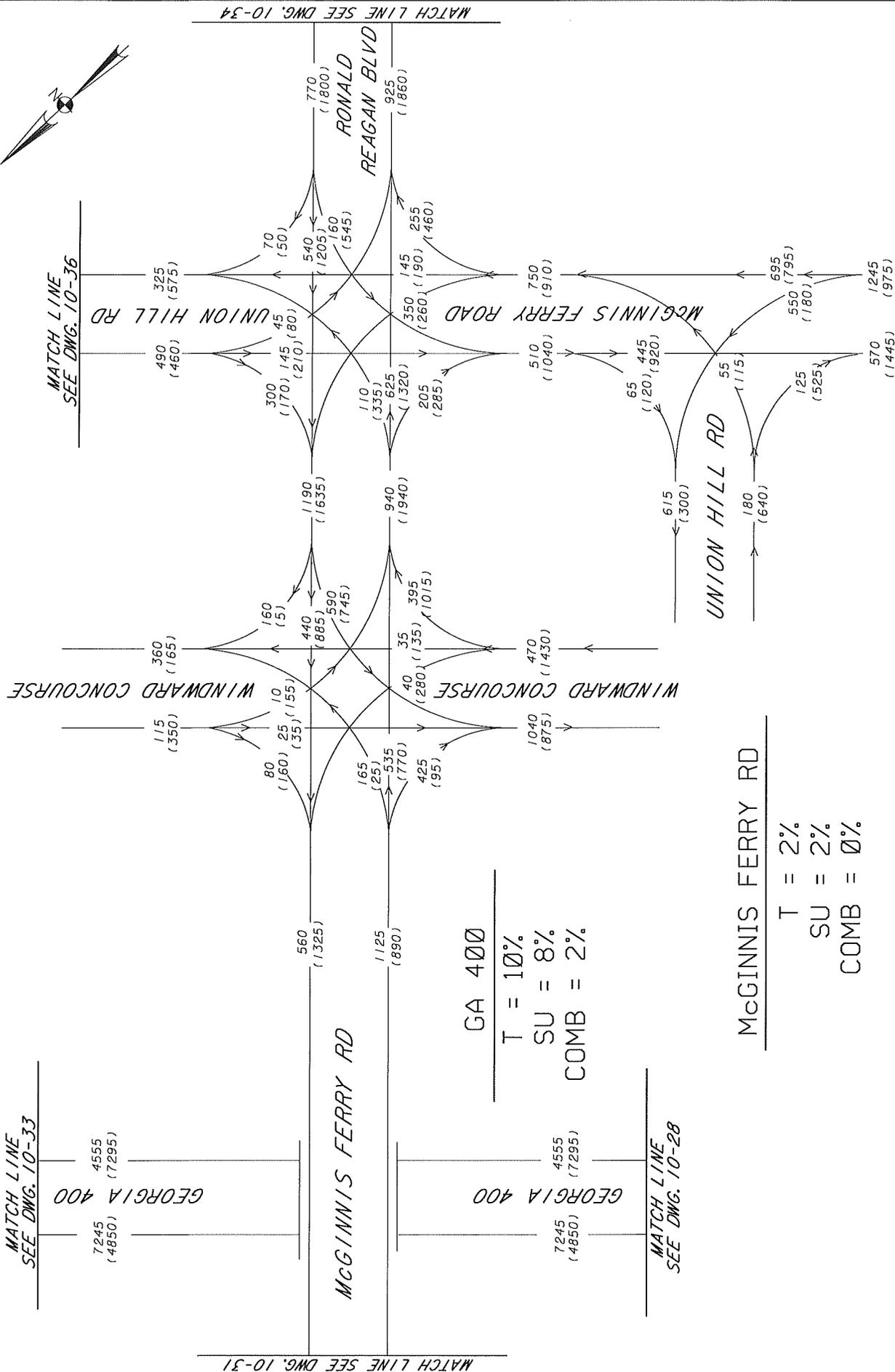
McGINNIS FERRY RD @ GA 400
 2040 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

MATCH LINE
SEE DWG. 10-33

7245
(4850)

4555
(7295)

GEORGIA 400



McGINNIS FERRY RD

GA 400

T = 10%

SU = 8%

COMB = 2%

McGINNIS FERRY RD

T = 2%

SU = 2%

COMB = 0%

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LEGEND

00 AM PEAK HOUR

(00) PM PEAK HOUR

McGINNIS FERRY RD @ GA 400

2040 NO-BUILD PEAK HOUR TRAFFIC

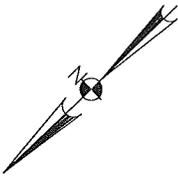
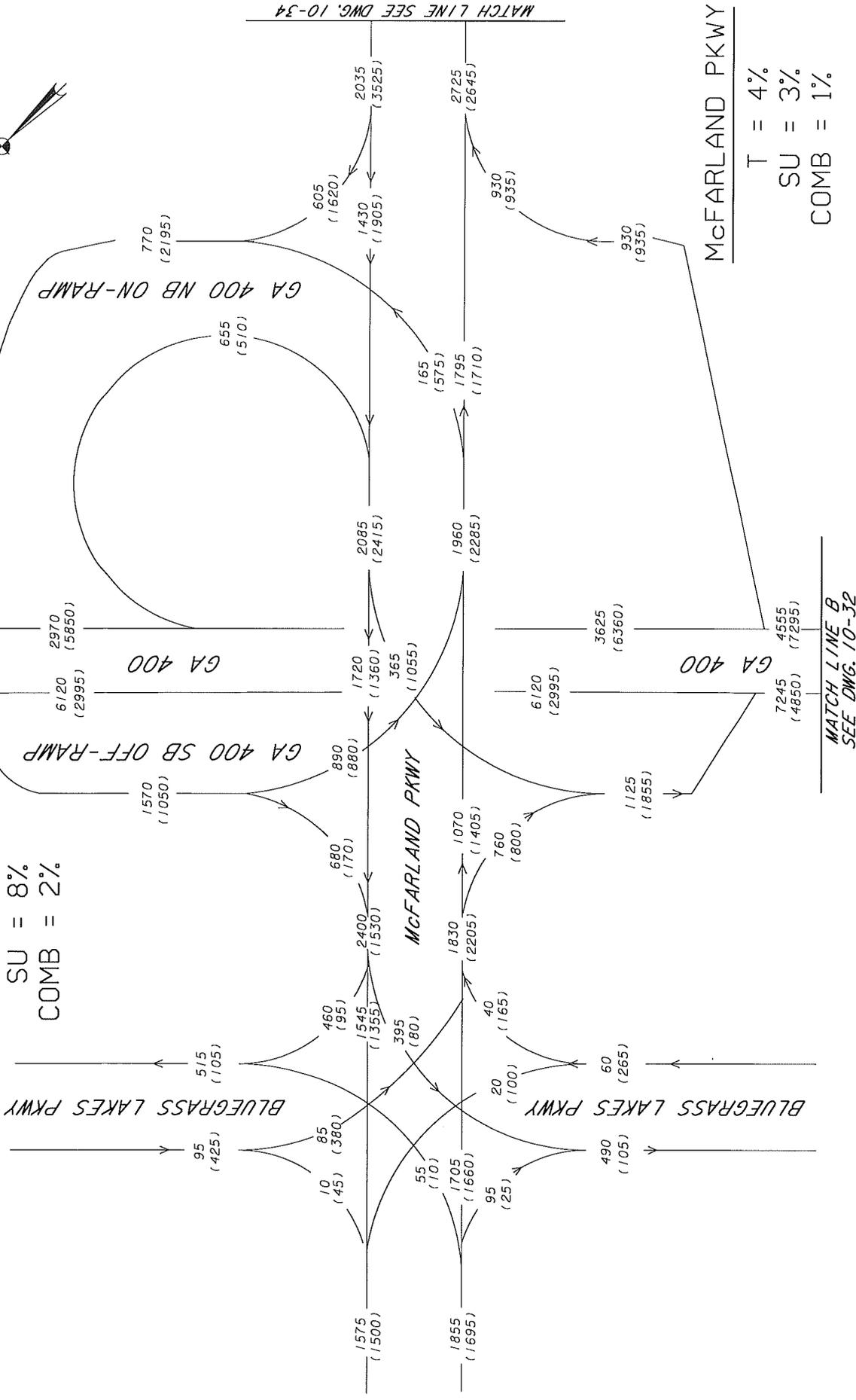
TRAFFIC FLOW DIAGRAM

DRAWING NO.

10-32

GA 400

T = 10%
 SU = 8%
 COMB = 2%



MATCH LINE SEE DWG. 10-34

McFARLAND PKWY

T = 4%
 SU = 3%
 COMB = 1%

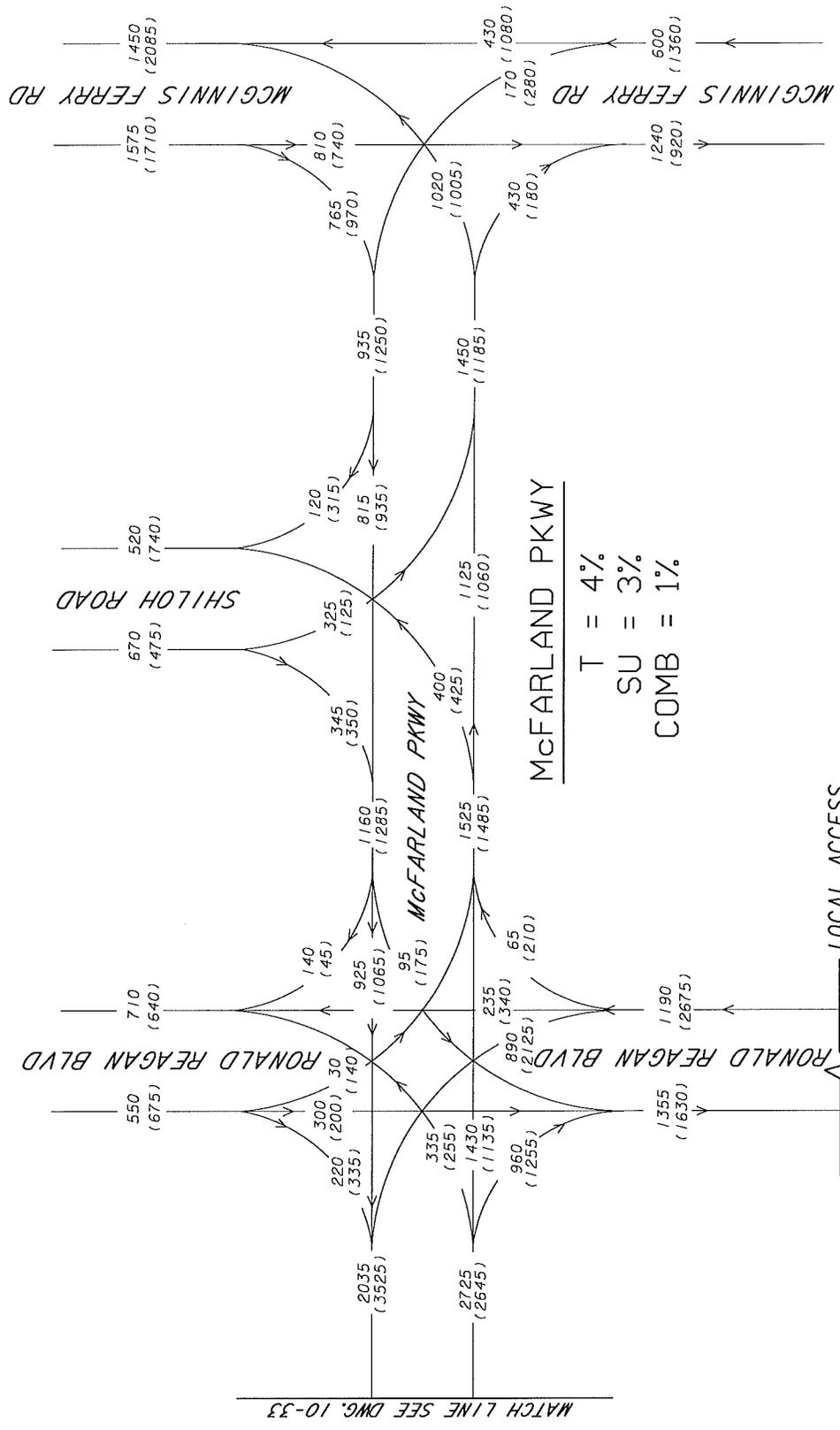
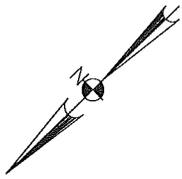
MATCH LINE B
 SEE DWG. 10-32

DRAWING NO.
 10-33

McFARLAND PKWY @ GA 400
 2040 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ØØ AM PEAK HOUR
 (ØØ) PM PEAK HOUR

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DRAWING NO.
10-34

LEGEND
00 AM PEAK HOUR
(00) PM PEAK HOUR

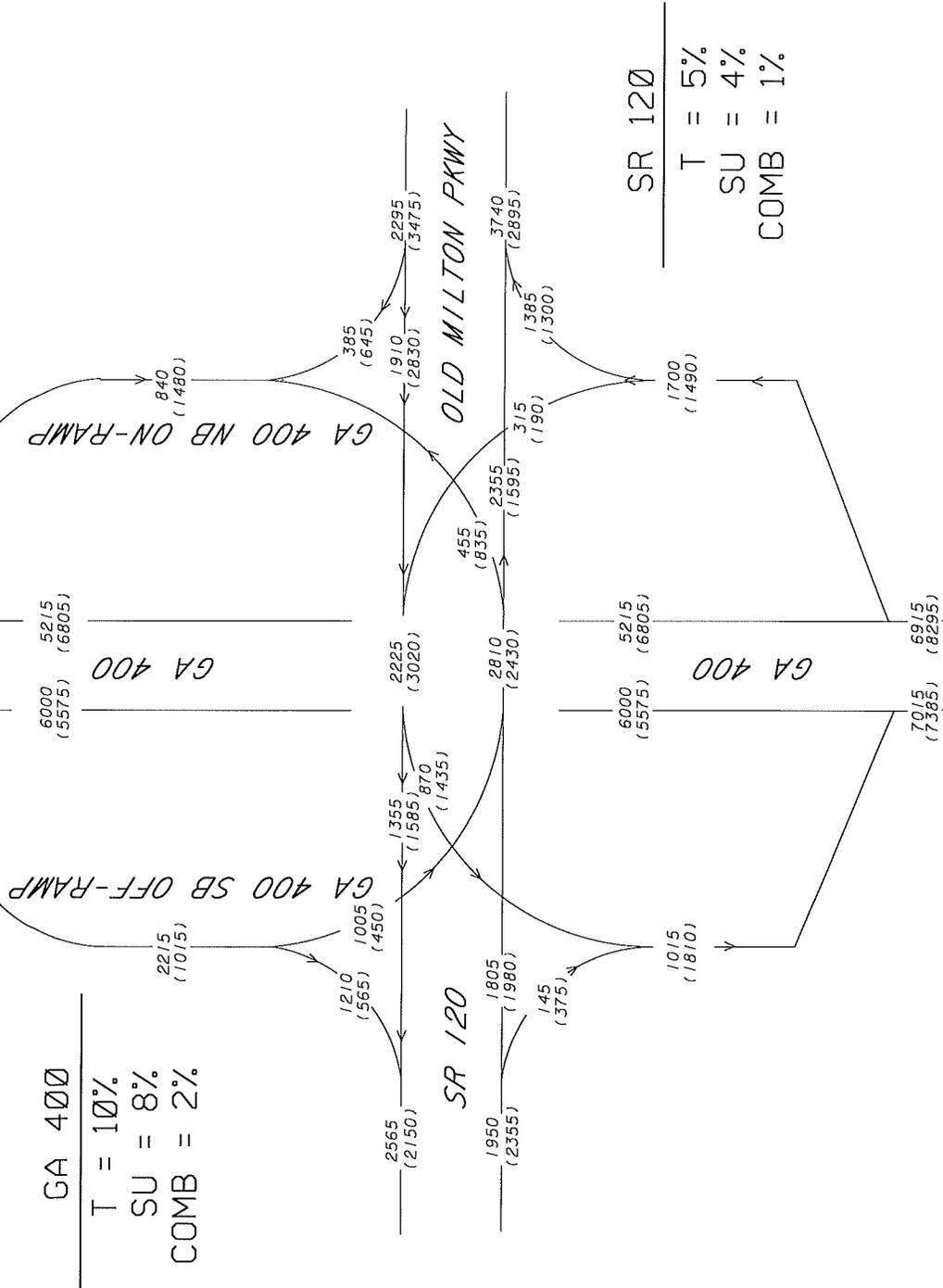
MORELAND ALFABELLI
ASSOCIATES, INC.
2211 BEAVER RUN ROAD
SUITE 190
NORCROSS, GEORGIA 30071
TELEPHONE (770) 263-5945

MATCH LINE
SEE DWG. 10-32

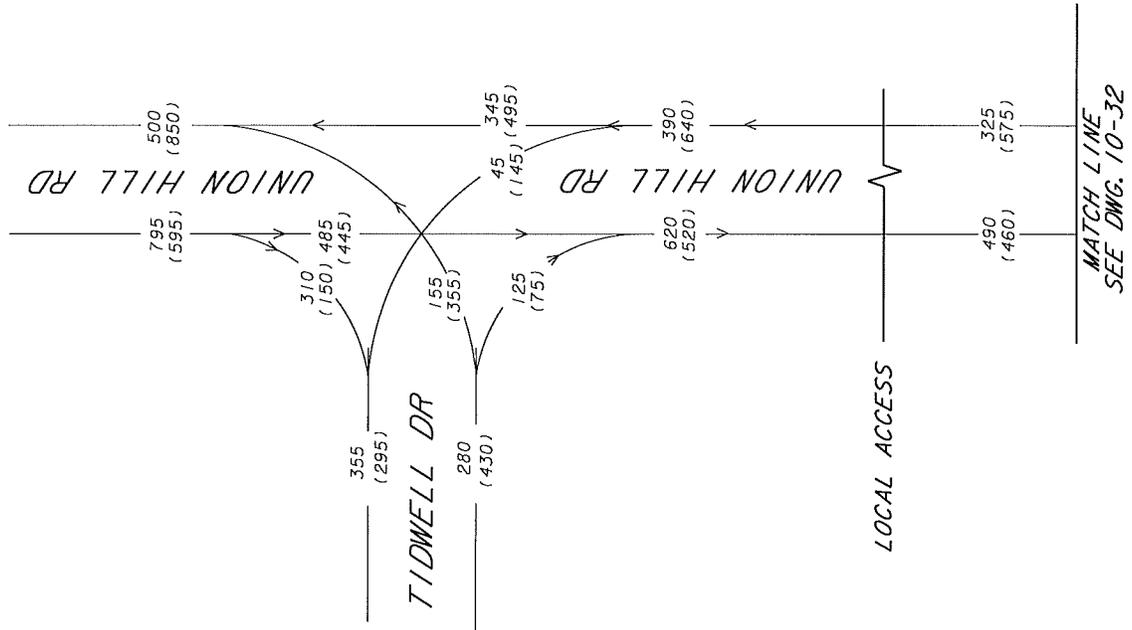


MATCH LINE SEE DWG. 10-33

MATCH LINE
SEE DMG. 10-28



DRAWING NO.
10-35



UNION HILL RD

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

DRAWING NO.
10-36

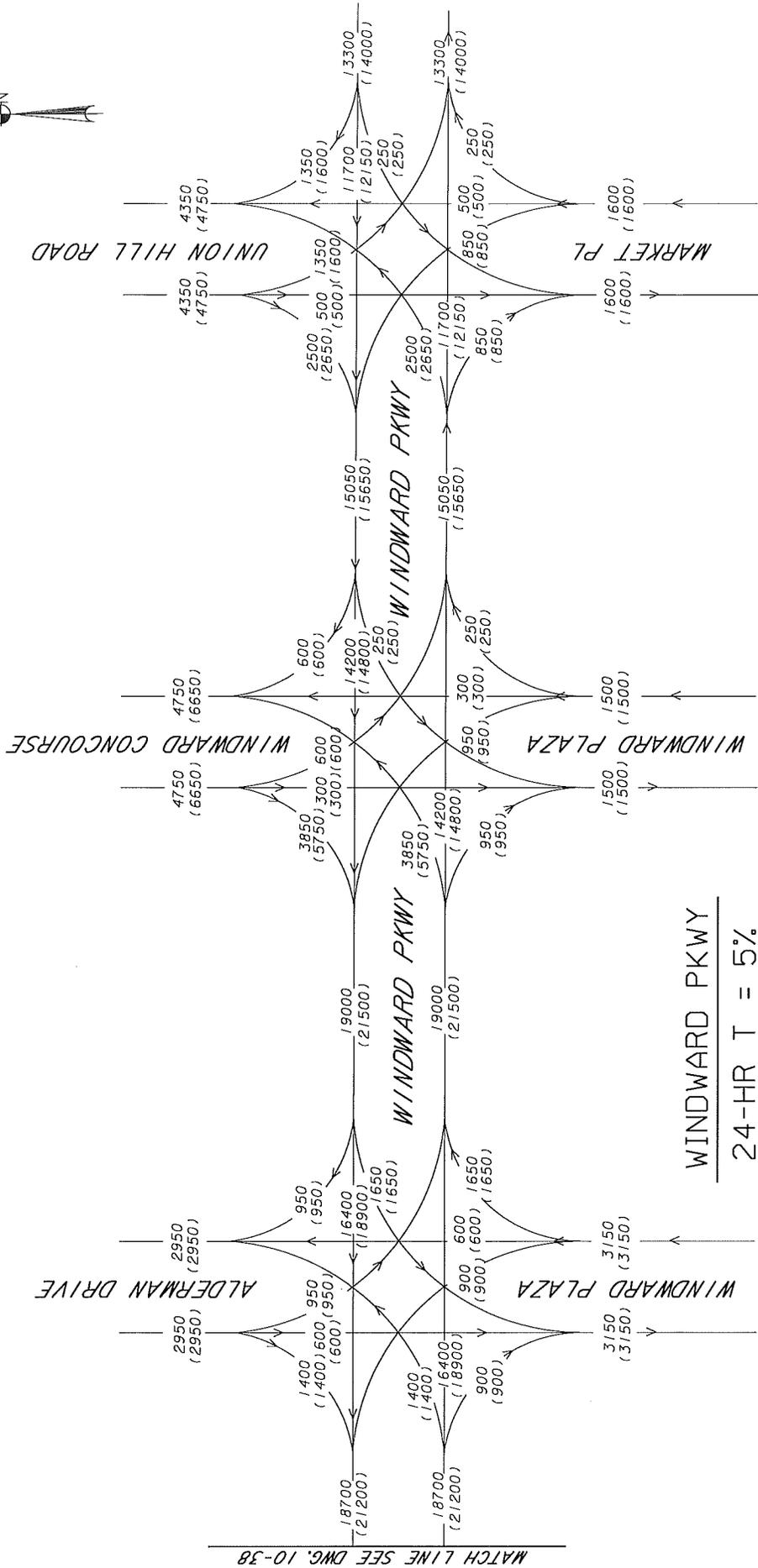
UNION HILL RD AT TIDWELL DR
 2040 NO-BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND

∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

MA

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MATCH LINE SEE DWG. 10-38

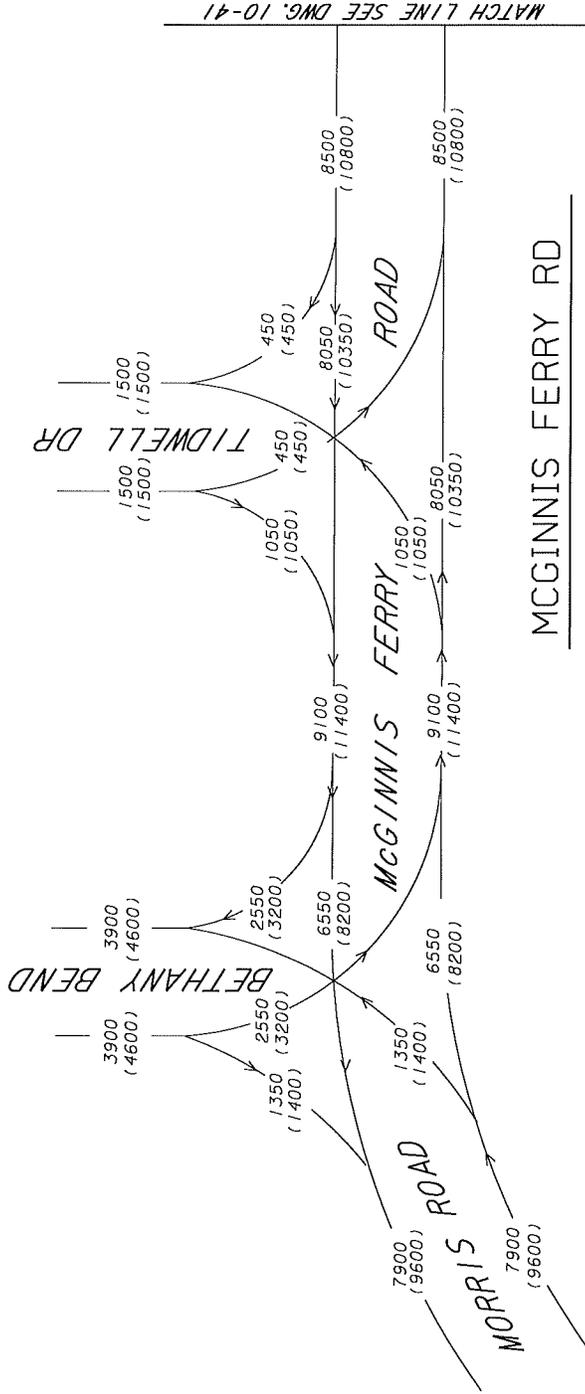
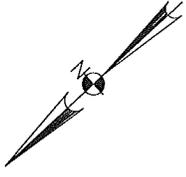
WINDWARD PKWY
 24-HR T = 5%
 SU = 4%
 COMB = 1%

MA
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LEGEND
 00 2020 ADT
 (00) 2040 ADT

WINDWARD PKWY @ GA 400
 2020/2040 NO-BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-39



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LEGEND
 00 2020 ADT
 (00) 2040 ADT

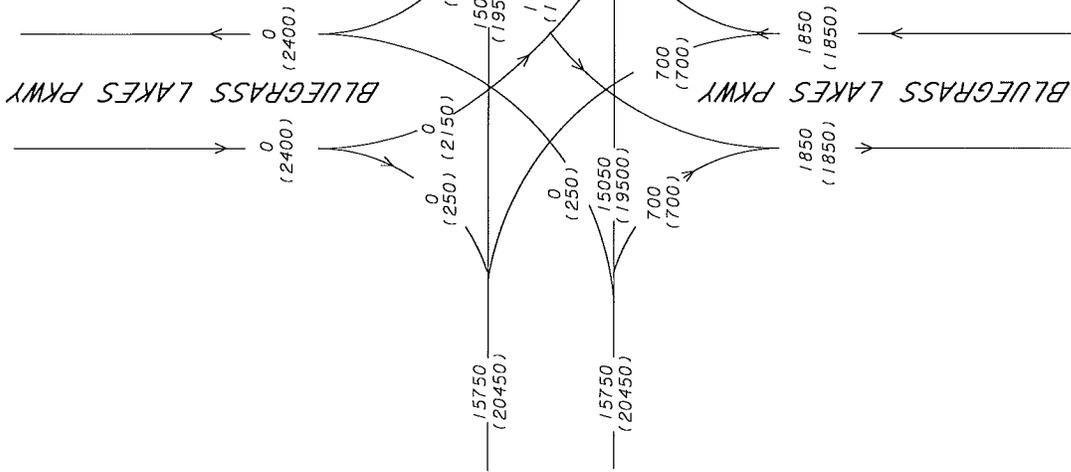
MCGINNIS FERRY RD @ GA 400
 2020/2040 NO-BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-40

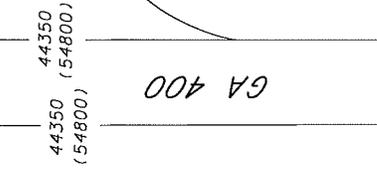
MCFARLAND PKWY

24-HR T = 4%
 SU = 3%
 COMB = 1%

BLUEGRASS LAKES PKWY



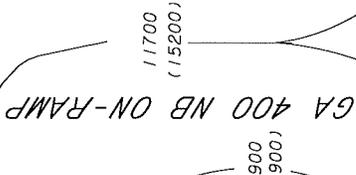
GA 400 SB OFF-RAMP



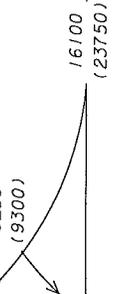
GA 400



GA 400 NB ON-RAMP



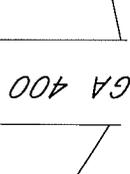
MCFARLAND PKWY



GA 400

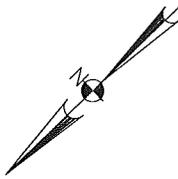
24-HR T = 10%
 SU = 8%
 COMB = 2%

GA 400



MATCH LINE
 SEE DWG. 10-41

MATCH LINE SEE DWG. 10-43



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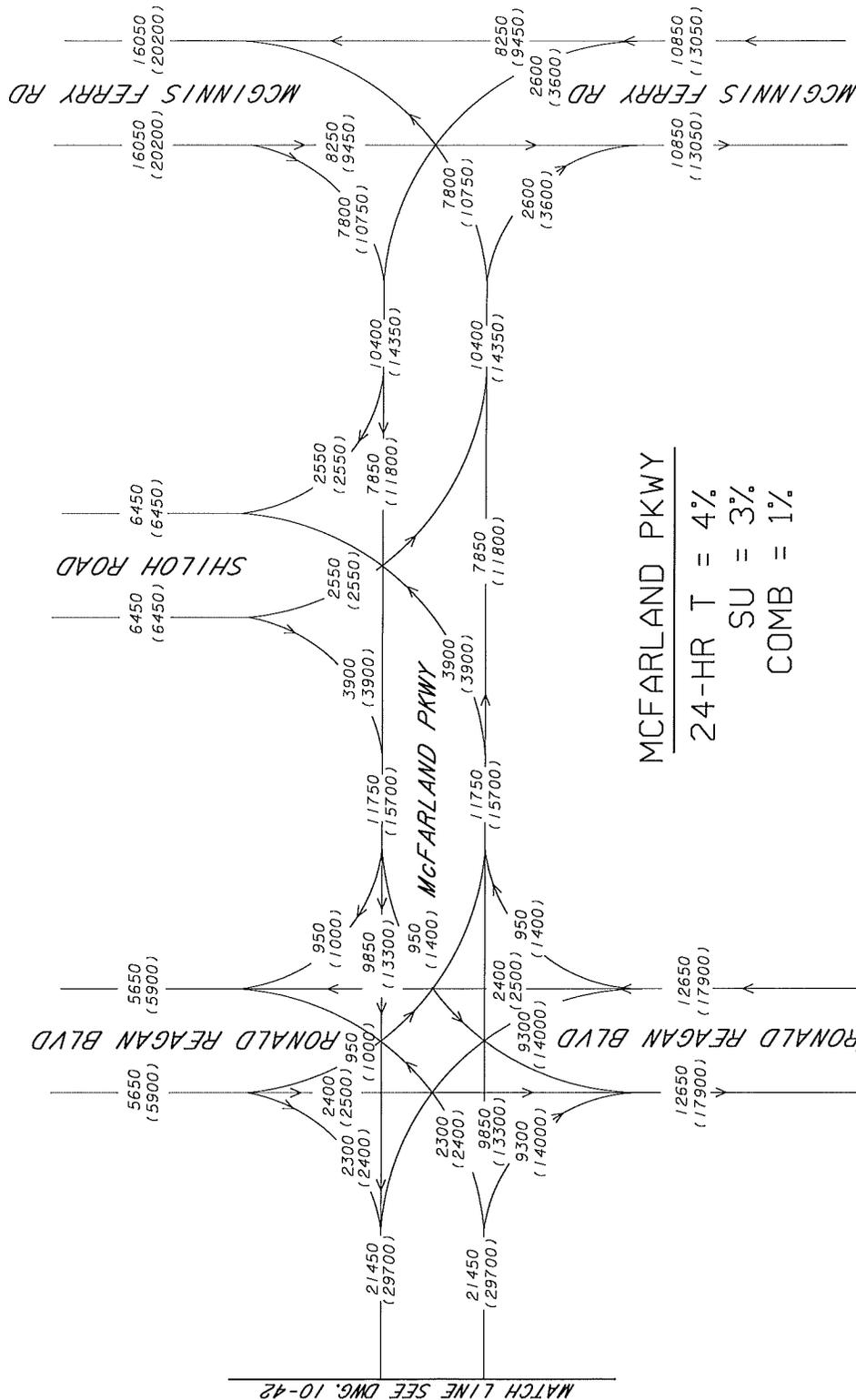
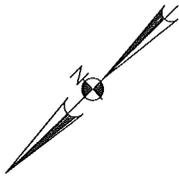


LEGEND

- 00 2020 ADT
- (00) 2040 ADT

MCFARLAND PKWY @ GA 400
 2020/2040 NO-BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-42

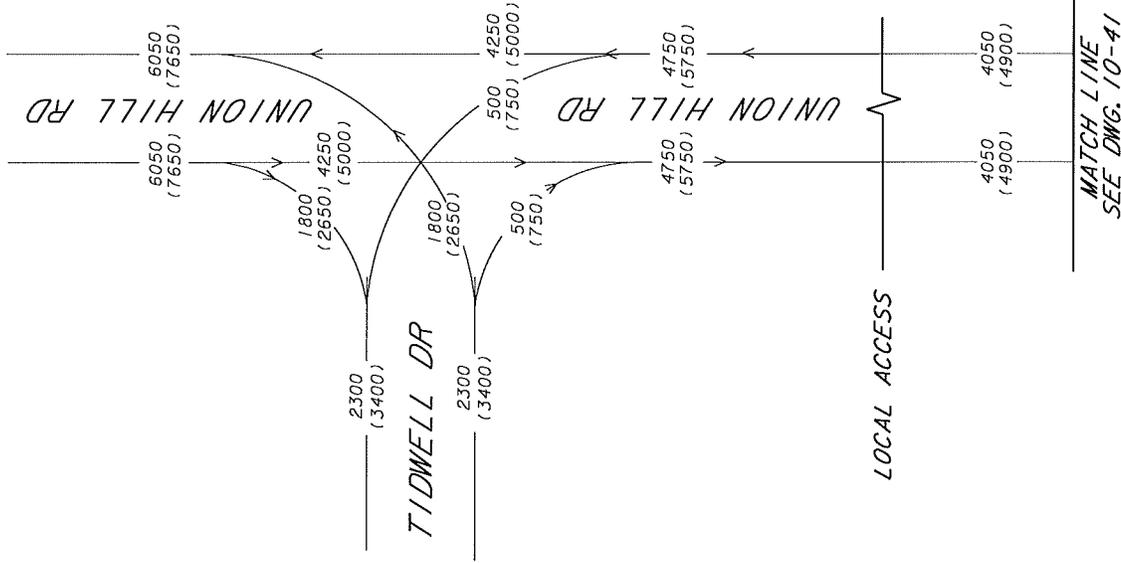


DRAWING NO.
10-43

MCFARLAND PKWY @ GA 400
 2020/2040 NO-BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ∅∅ 2020 ADT
 (∅∅) 2040 ADT

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UNION HILL RD
24-HR T = 2%
SU = 2%
COMB = 0%

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LEGEND
00 2020 ADT
(00) 2040 ADT

UNION HILL RD AT TIDWELL DR
2020/2040 NO-BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

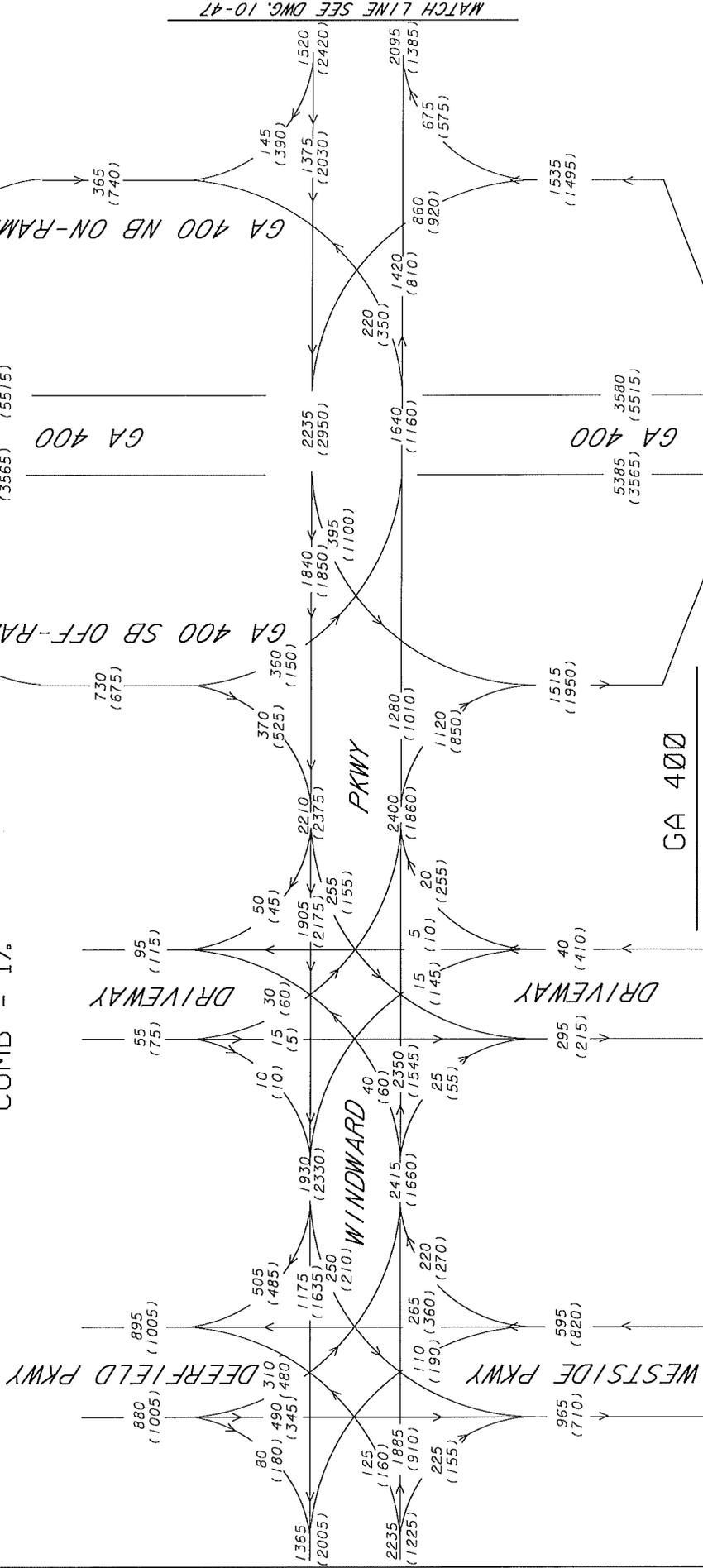
DRAWING NO.
10-45

MATCH LINE
SEE DWG. 10-50



WINDWARD PKWY

T = 5%
SU = 4%
COMB = 1%



MATCH LINE SEE DWG. 10-47

MATCH LINE
SEE DWG. 10-53

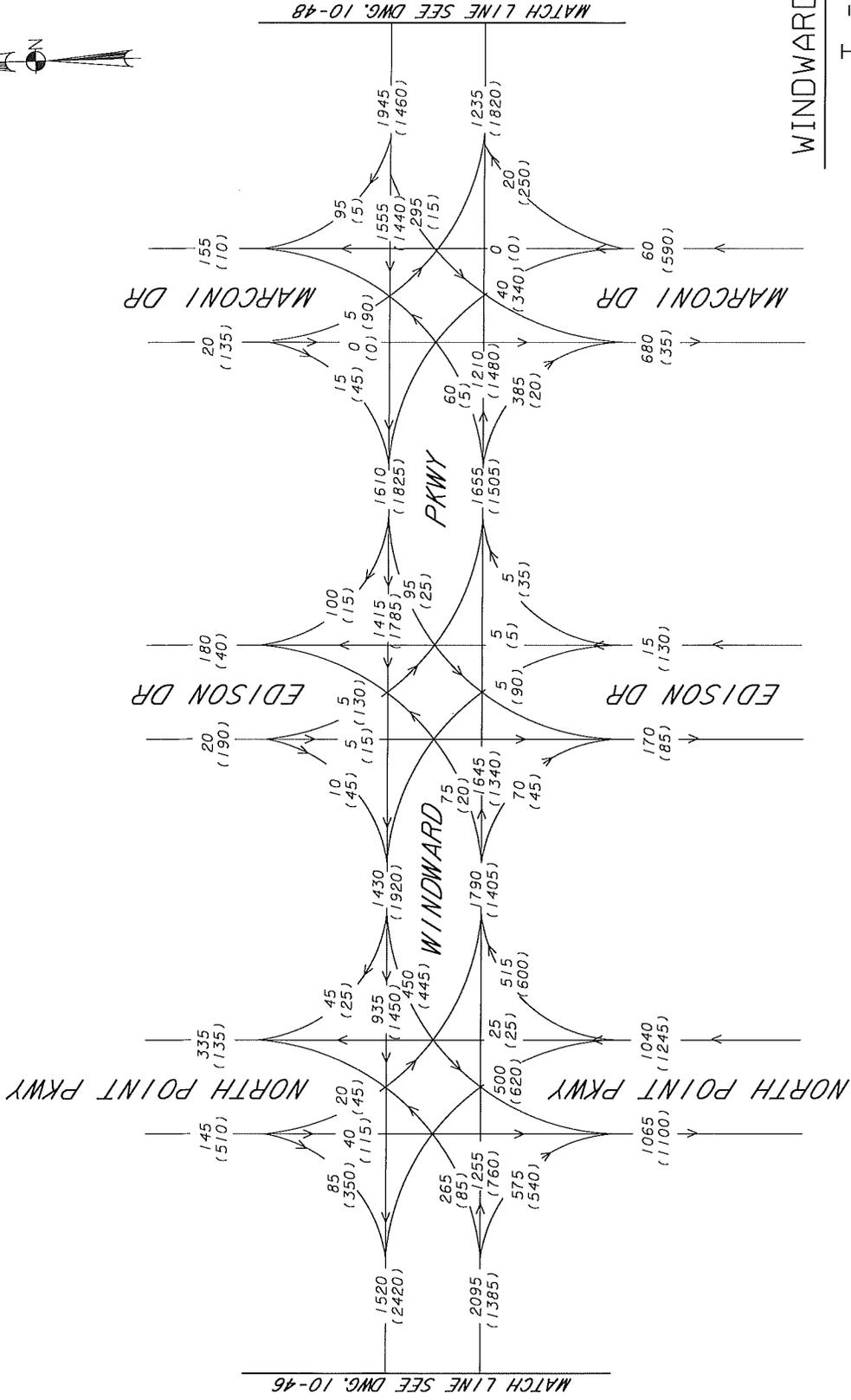
GA 400
T = 10%
SU = 8%
COMB = 2%

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LEGEND
ØØ AM PEAK HOUR
(ØØ) PM PEAK HOUR

WINDWARD PKWY @ GA 400
2020 BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-46



WINDWARD PKWY

T = 5%

SU = 4%

COMB = 1%

NA

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LEGEND

ØØ AM PEAK HOUR

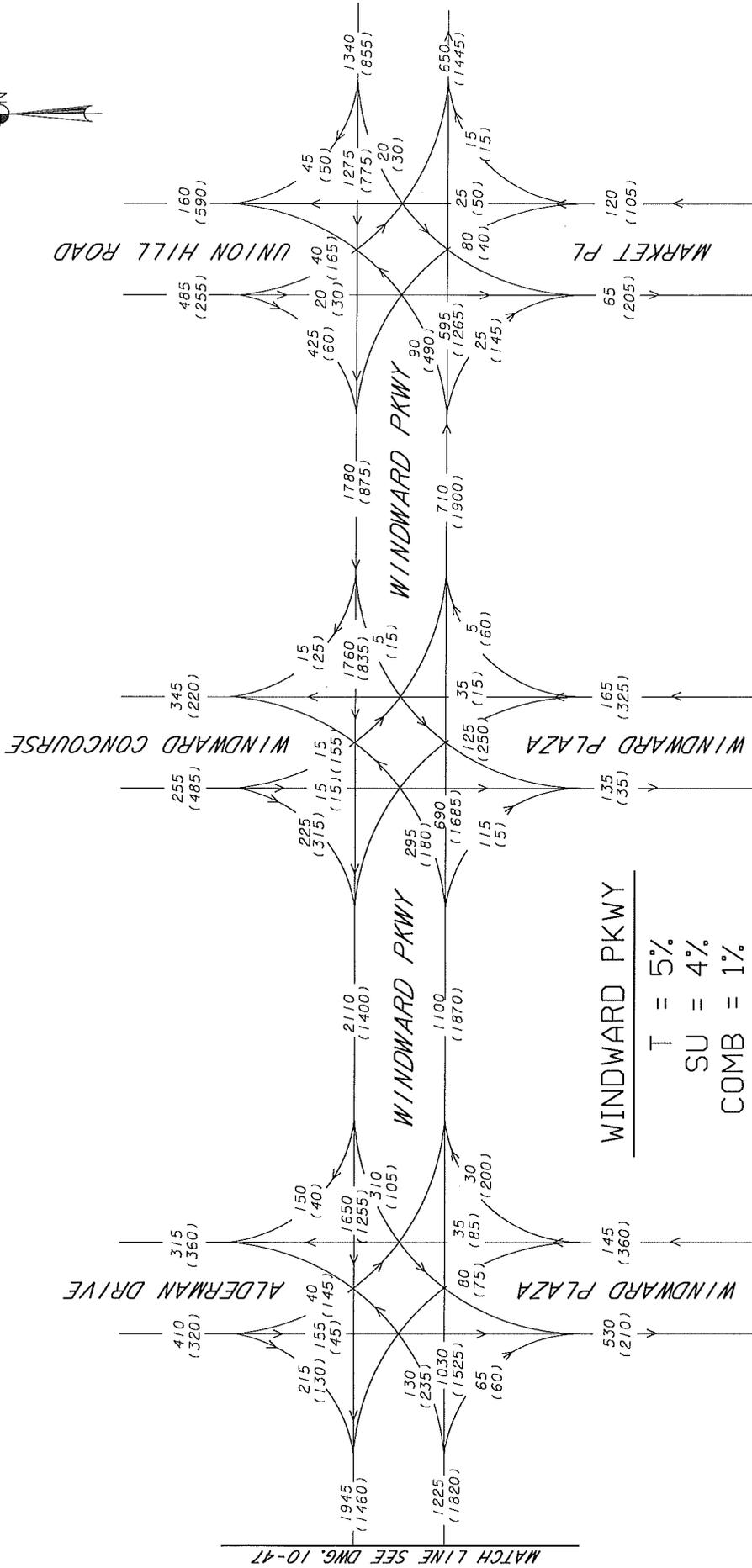
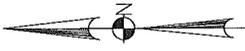
(ØØ) PM PEAK HOUR

WINDWARD PKWY @ GA 400

2020 BUILD PEAK HOUR TRAFFIC

TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-47



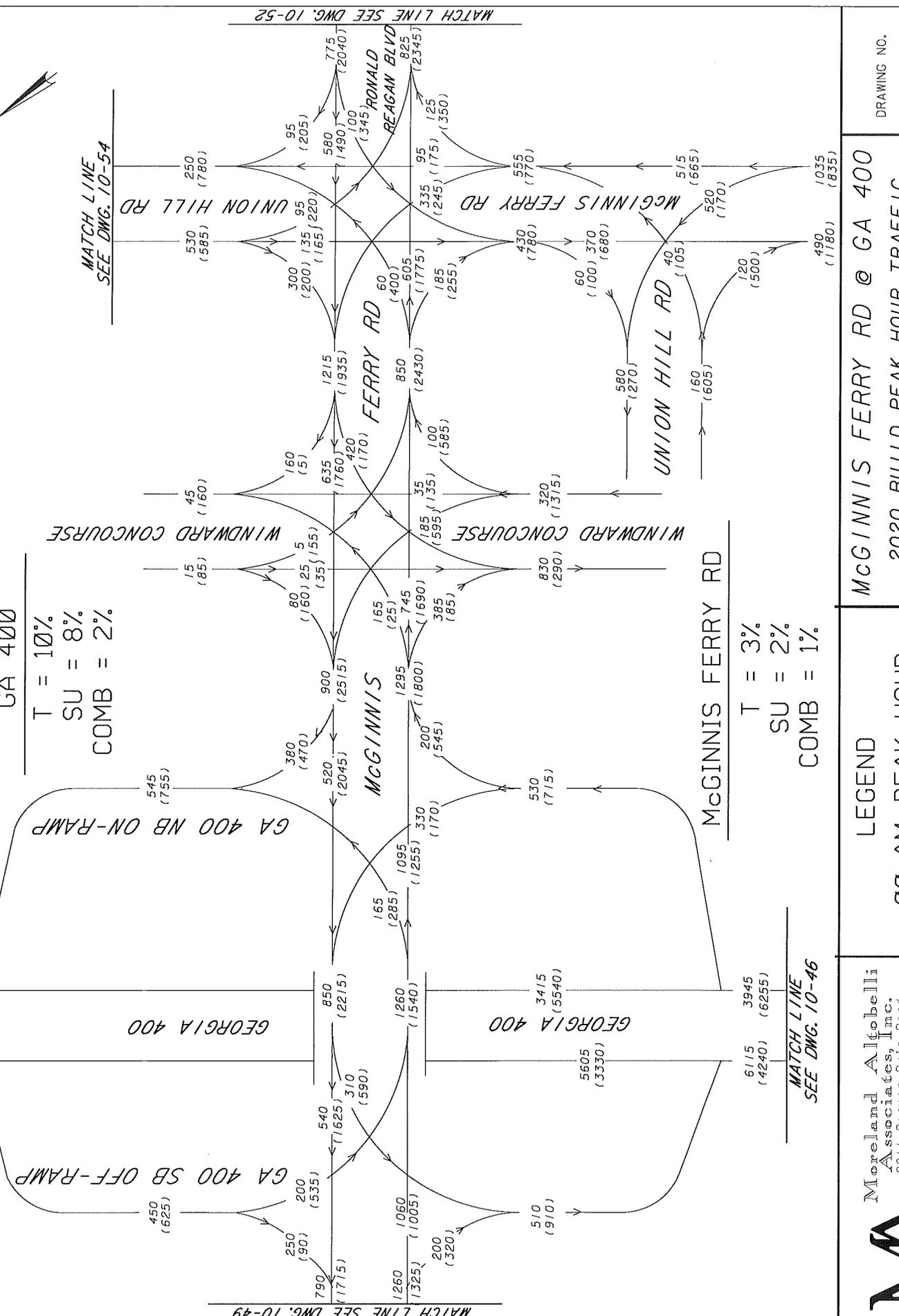
MA
 Moreland Atbelli
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WINDWARD PKWY @ GA 400
 2020 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-48

MATCH LINE
SEE DWG. 10-51

MATCH LINE SEE DWG. 10-49

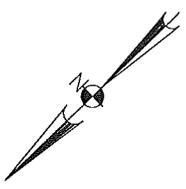


DRAWING NO.
10-50

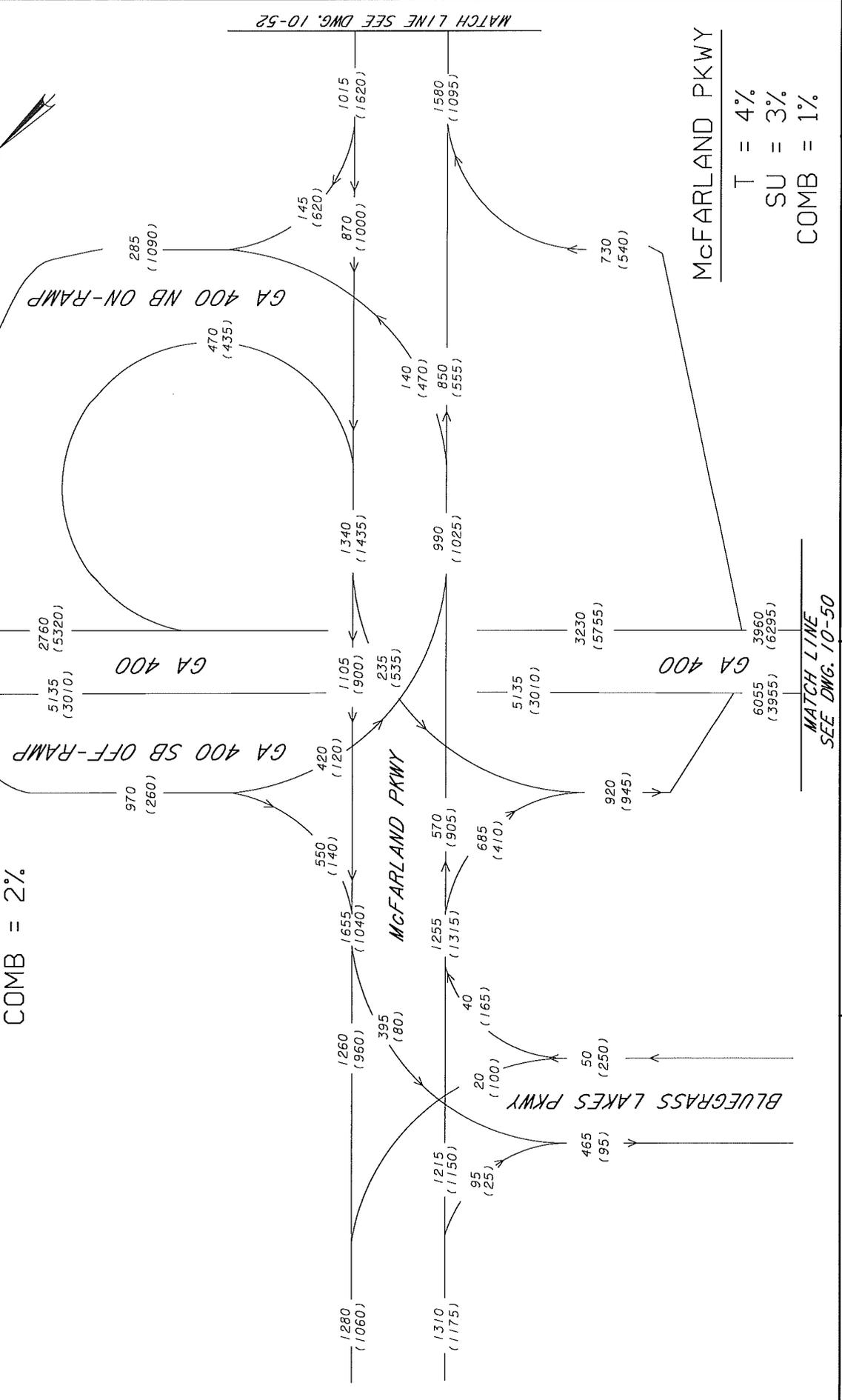
McGINNIS FERRY RD @ GA 400
 2020 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ØØ AM PEAK HOUR
 (ØØ) PM PEAK HOUR

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GA 400
 T = 10%
 SU = 8%
 COMB = 2%



MATCH LINE SEE DWG. 10-52

MATCH LINE
 SEE DWG. 10-50

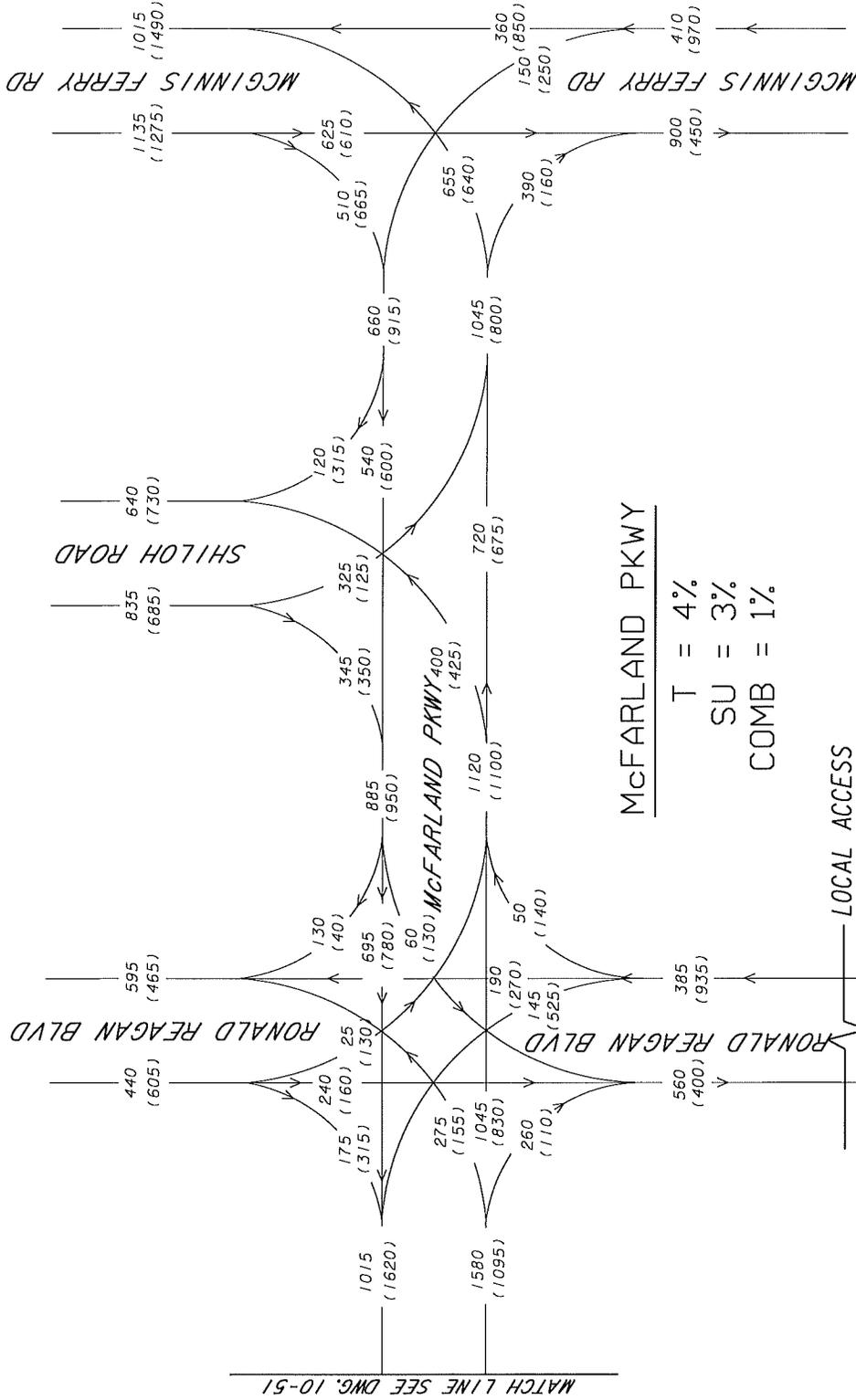
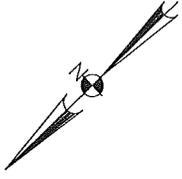
T = 4%
 SU = 3%
 COMB = 1%

McFARLAND PKWY @ GA 400
 2020 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ØØ AM PEAK HOUR
 (ØØ) PM PEAK HOUR

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DRAWING NO.
 10-51



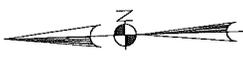
DRAWING NO.
10-52

McFARLAND PKWY @ GA 400
 2020 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

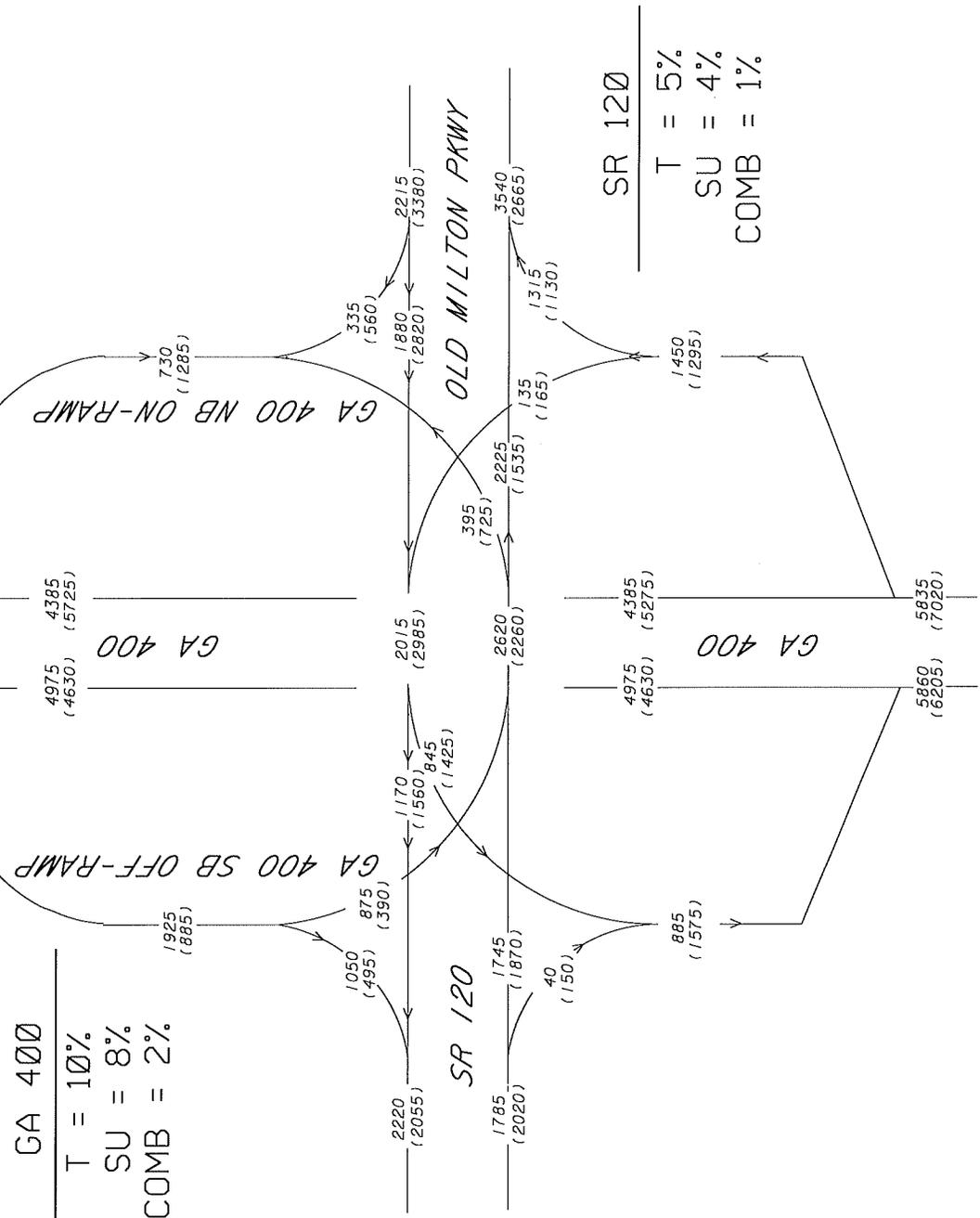
Moreland Altabelli
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MATCH LINE
SEE DWG. 10-46

GA 400
T = 10%
SU = 8%
COMB = 2%



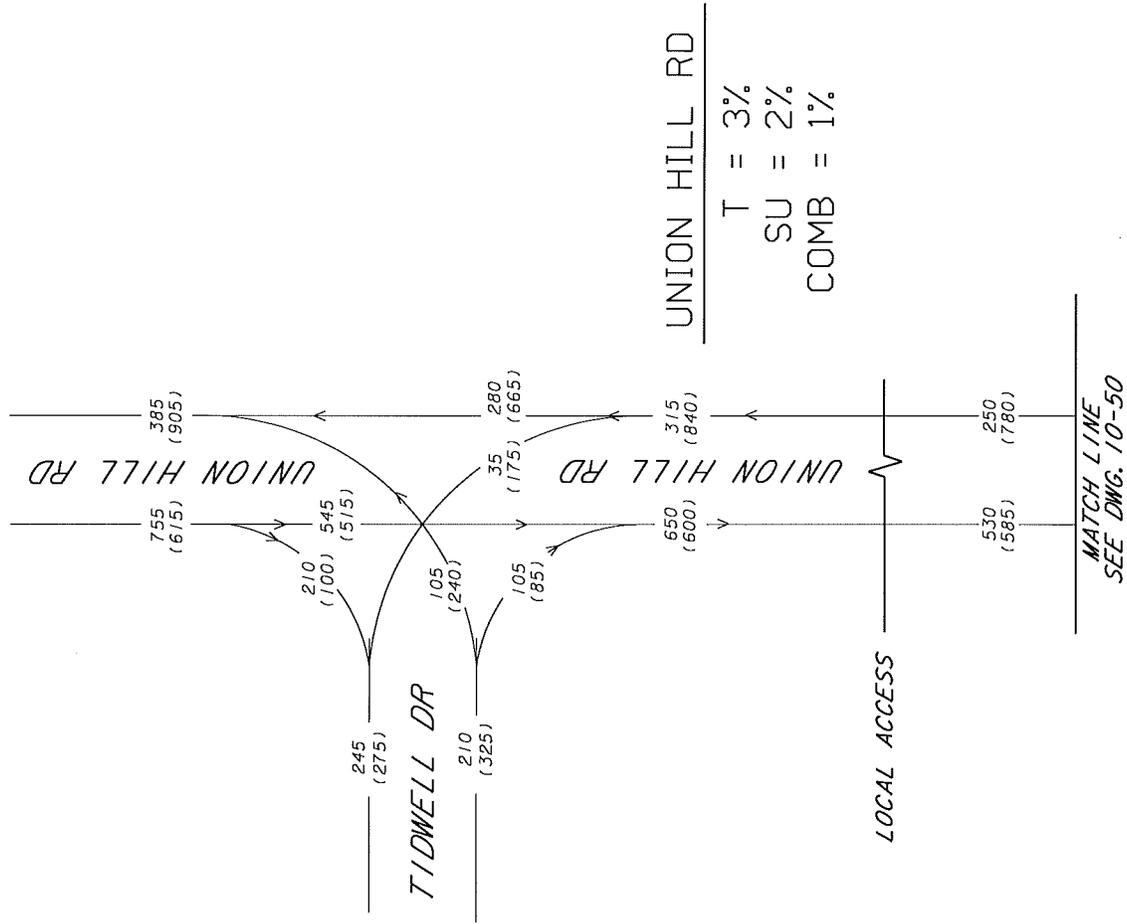
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LEGEND
ØØ AM PEAK HOUR
(ØØ) PM PEAK HOUR

SR 120 @ GA 400
2020 BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-53



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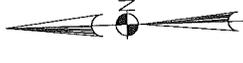
LEGEND

- ∅∅ AM PEAK HOUR
- (∅∅) PM PEAK HOUR

UNION HILL RD AT TIDWELL DR
 2020 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

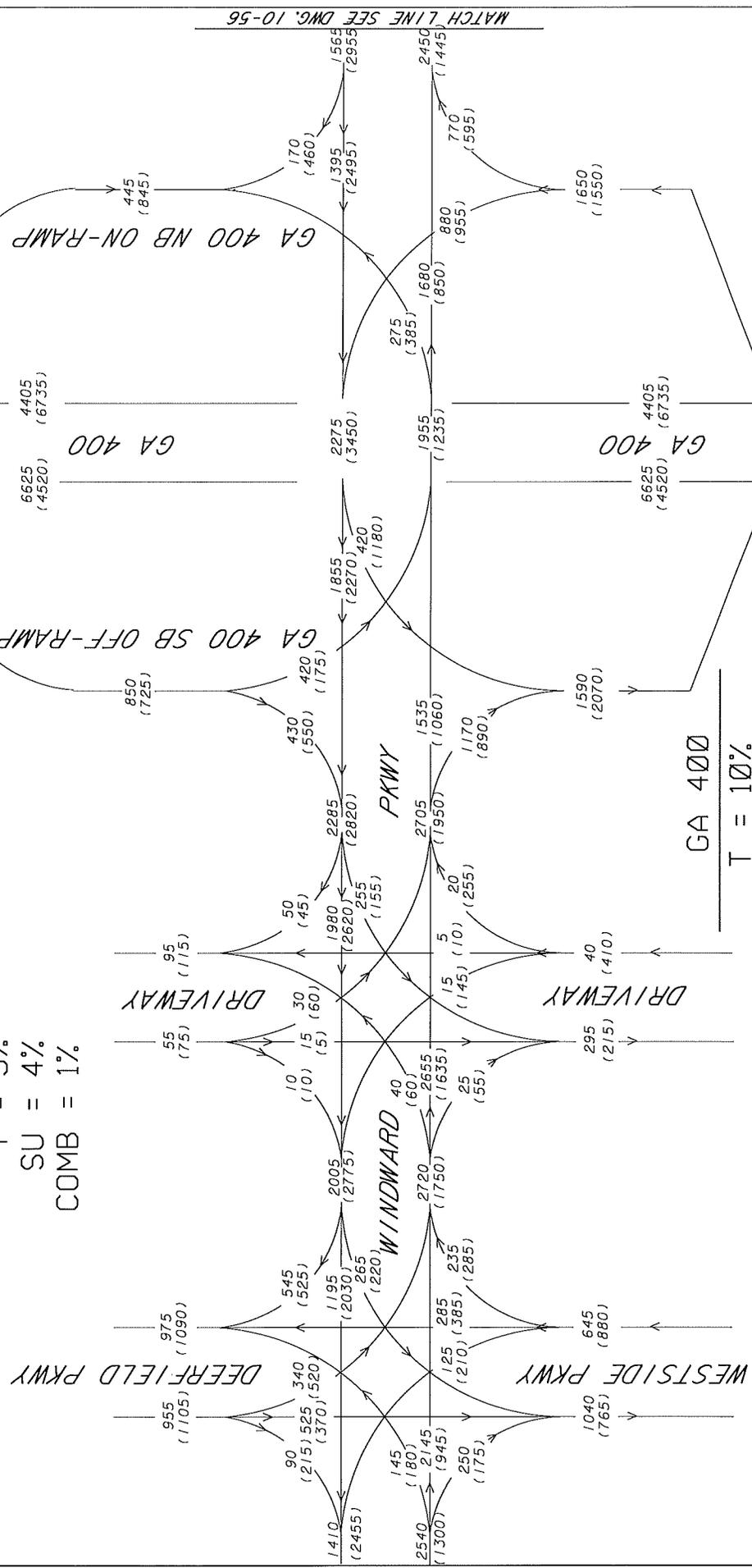
DRAWING NO.
 10-54

MATCH LINE
SEE DWG. 10-59



WINDWARD PKWY

T = 5%
SU = 4%
COMB = 1%



GA 400
T = 10%
SU = 8%
COMB = 2%

MATCH LINE
SEE DWG. 10-62

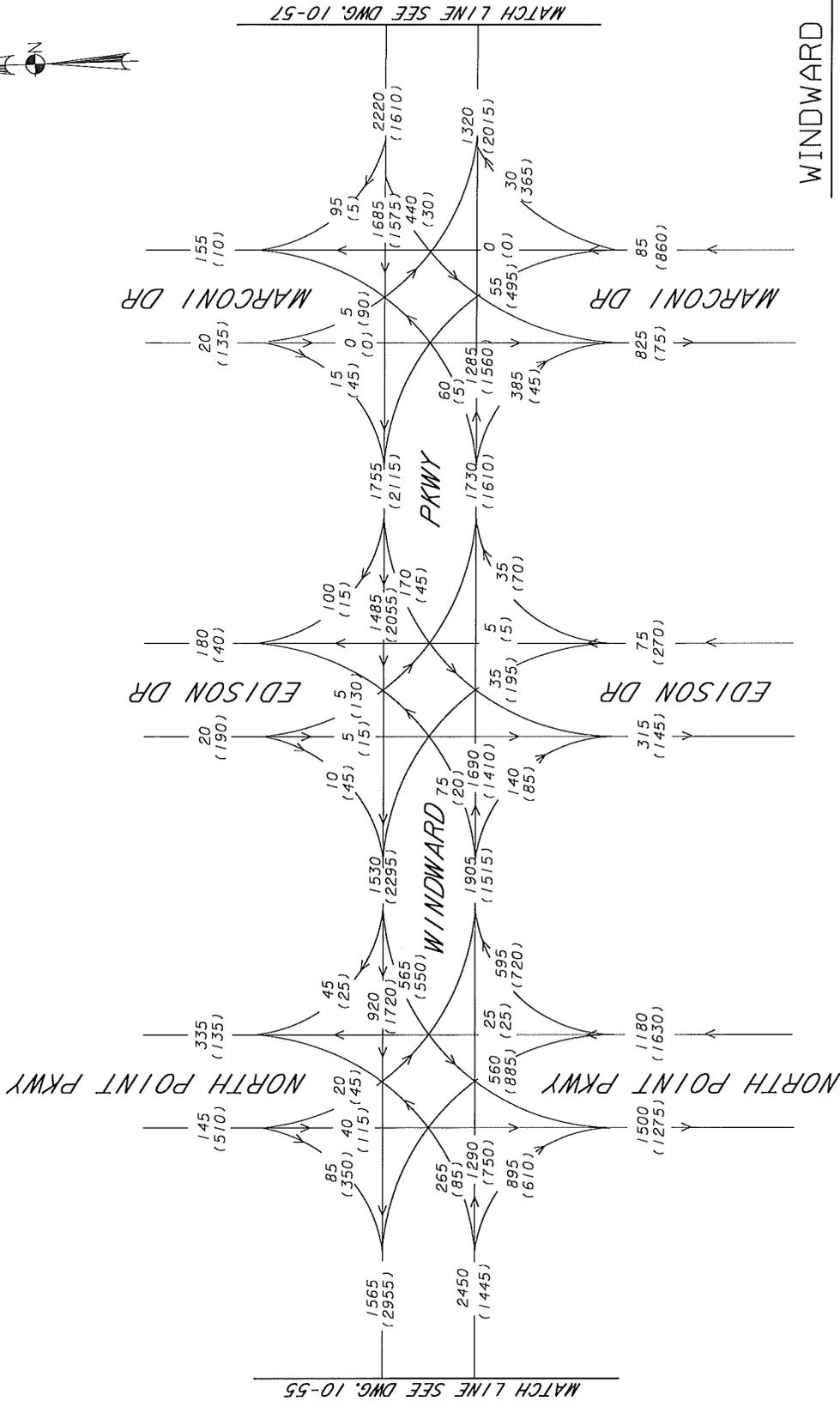
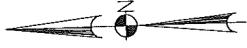
WINDWARD PKWY @ GA 400
2040 BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

LEGEND
∅∅ AM PEAK HOUR
(∅∅) PM PEAK HOUR

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Telephone (770) 263-5945



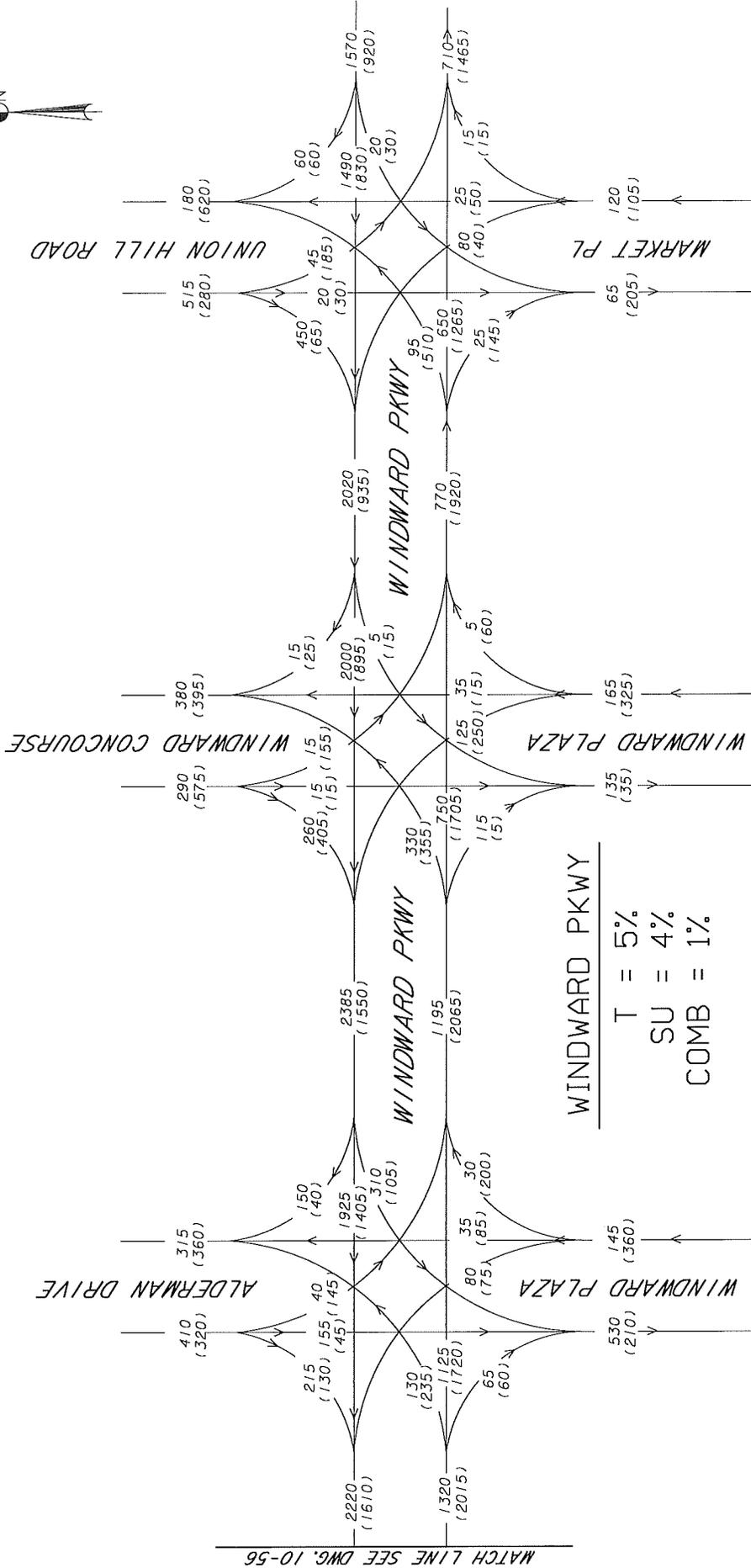
DRAWING NO.
10-55



MA
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WINDWARD PKWY @ GA 400
 2040 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-56

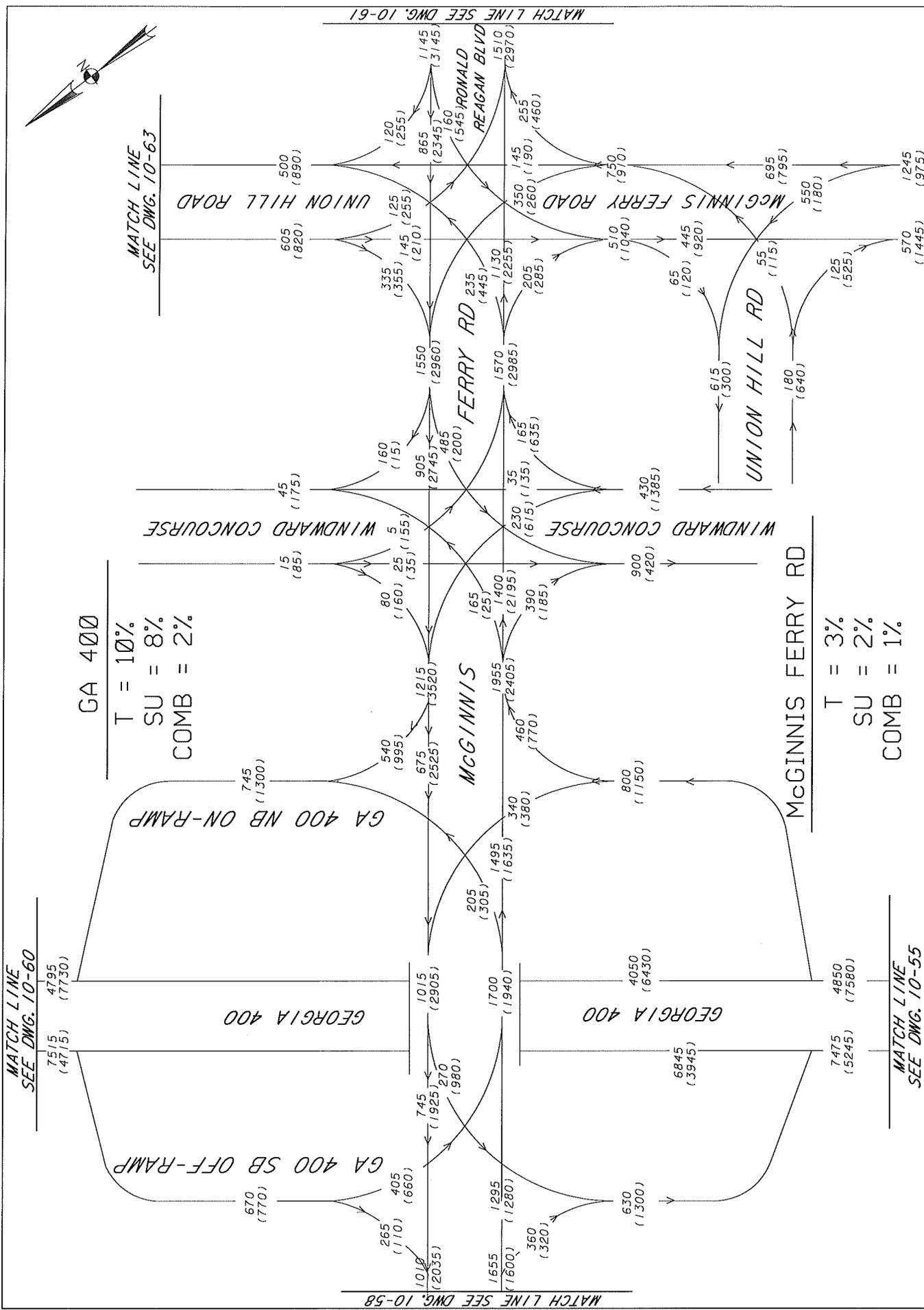


DRAWING NO.
 10-57

WINDWARD PKWY @ GA 400
 2040 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

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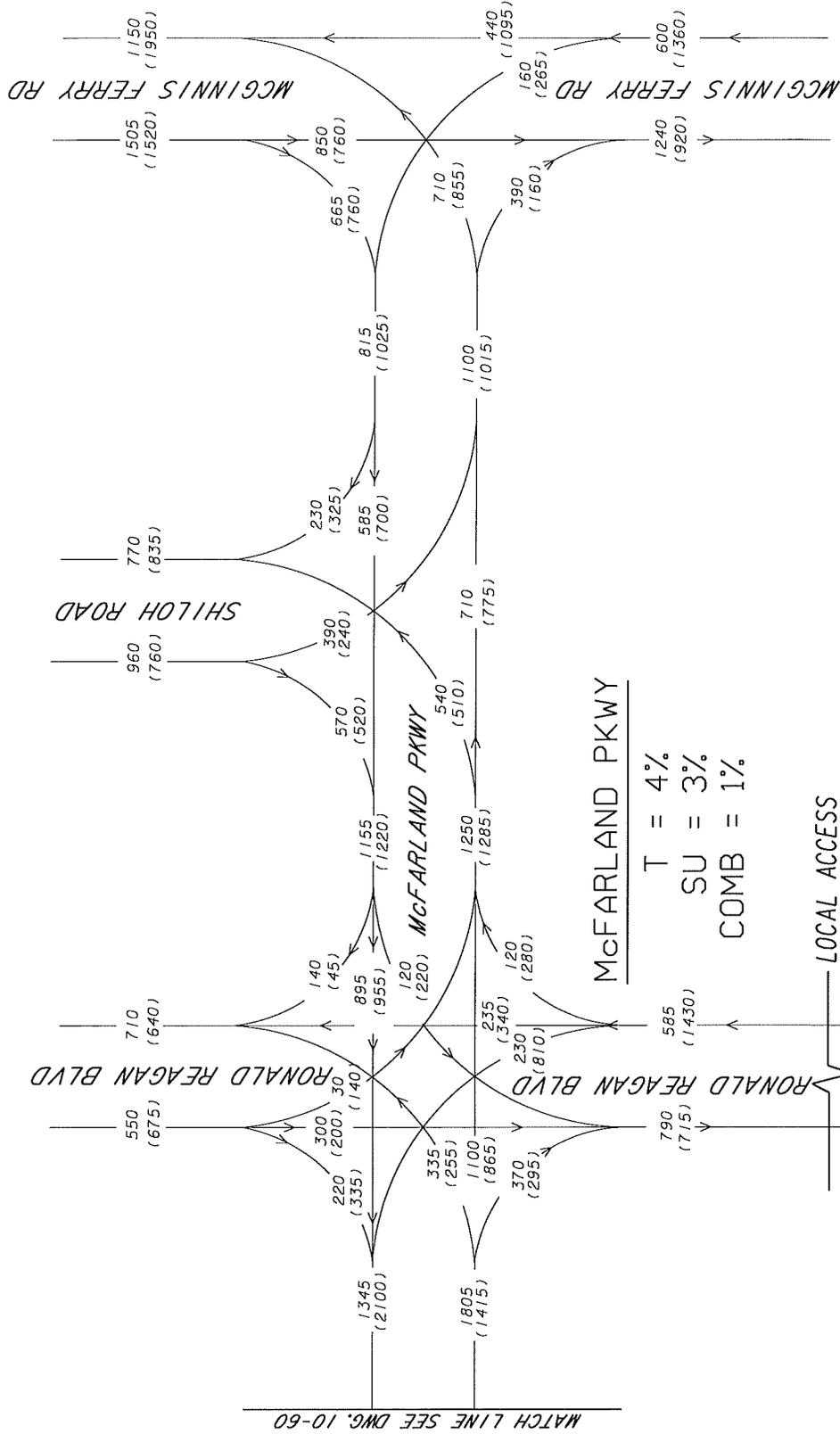
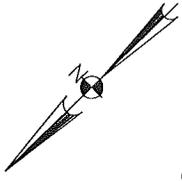


DRAWING NO.
 10-59

McGINNIS FERRY RD @ GA 400
 2040 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

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McFARLAND PKWY
 T = 4%
 SU = 3%
 COMB = 1%

LOCAL ACCESS

MATCH LINE
 SEE DWG. 10-59

MATCH LINE SEE DWG. 10-60

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 Suife 190
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 Telephone (770) 263-5945



LEGEND

∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

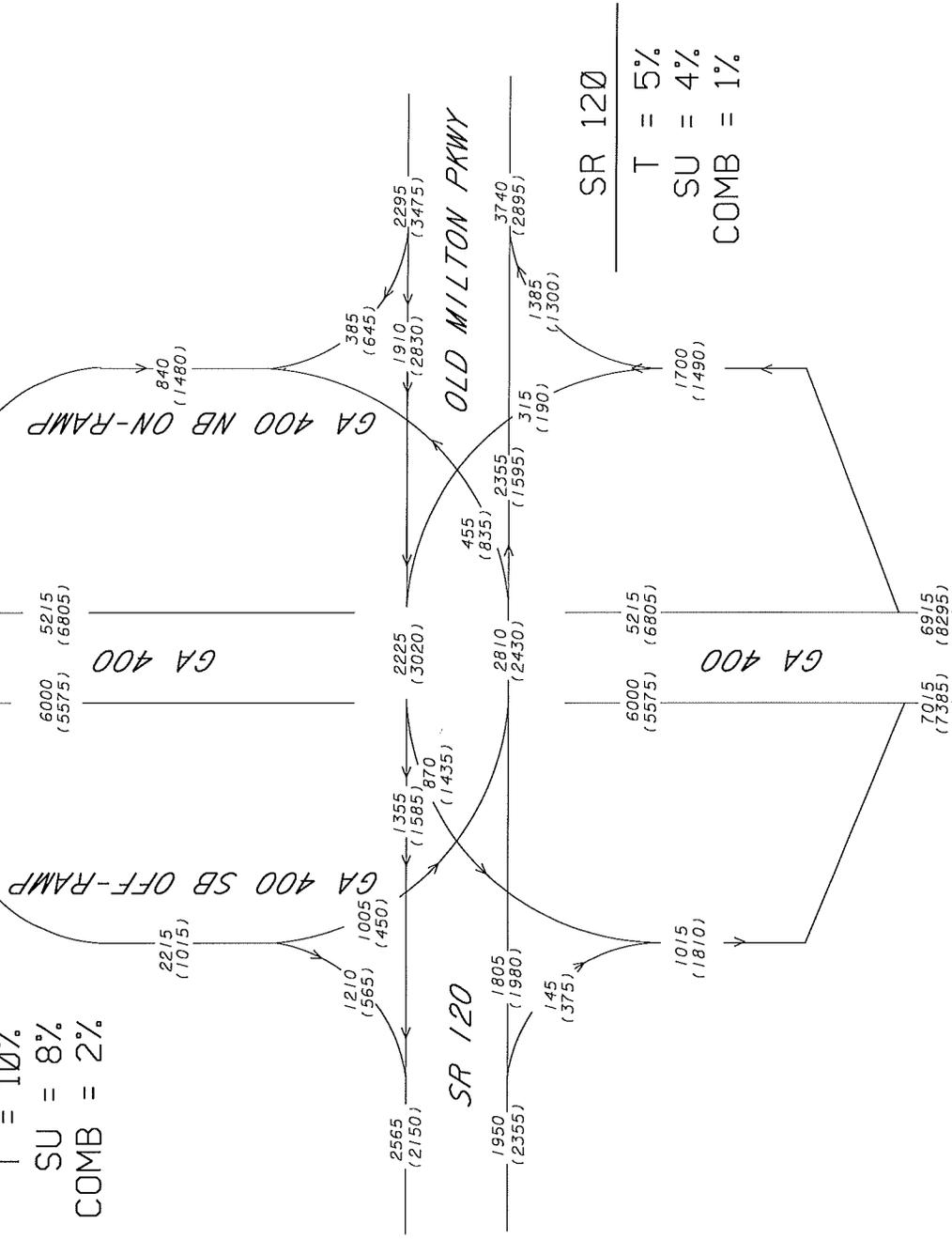
McFARLAND PKWY @ GA 400
 2040 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-61

MATCH LINE
SEE DWG. 10-55



GA 400
T = 10%
SU = 8%
COMB = 2%

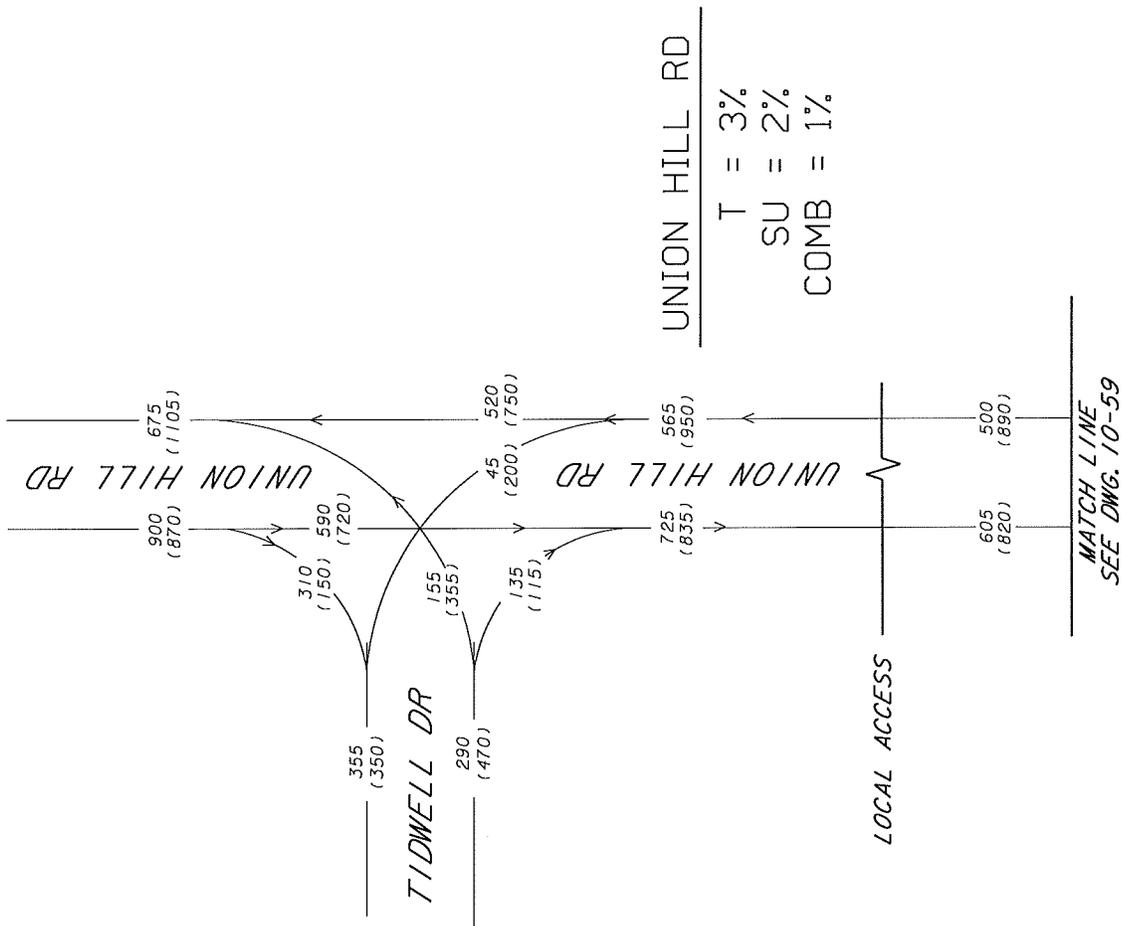


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Telephone (770) 263-5945

LEGEND
∅∅ AM PEAK HOUR
(∅∅) PM PEAK HOUR

SR 120 @ GA 400
2040 BUILD PEAK HOUR TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-62



MA
 Moreland, Alibelli
 Associates, Inc.
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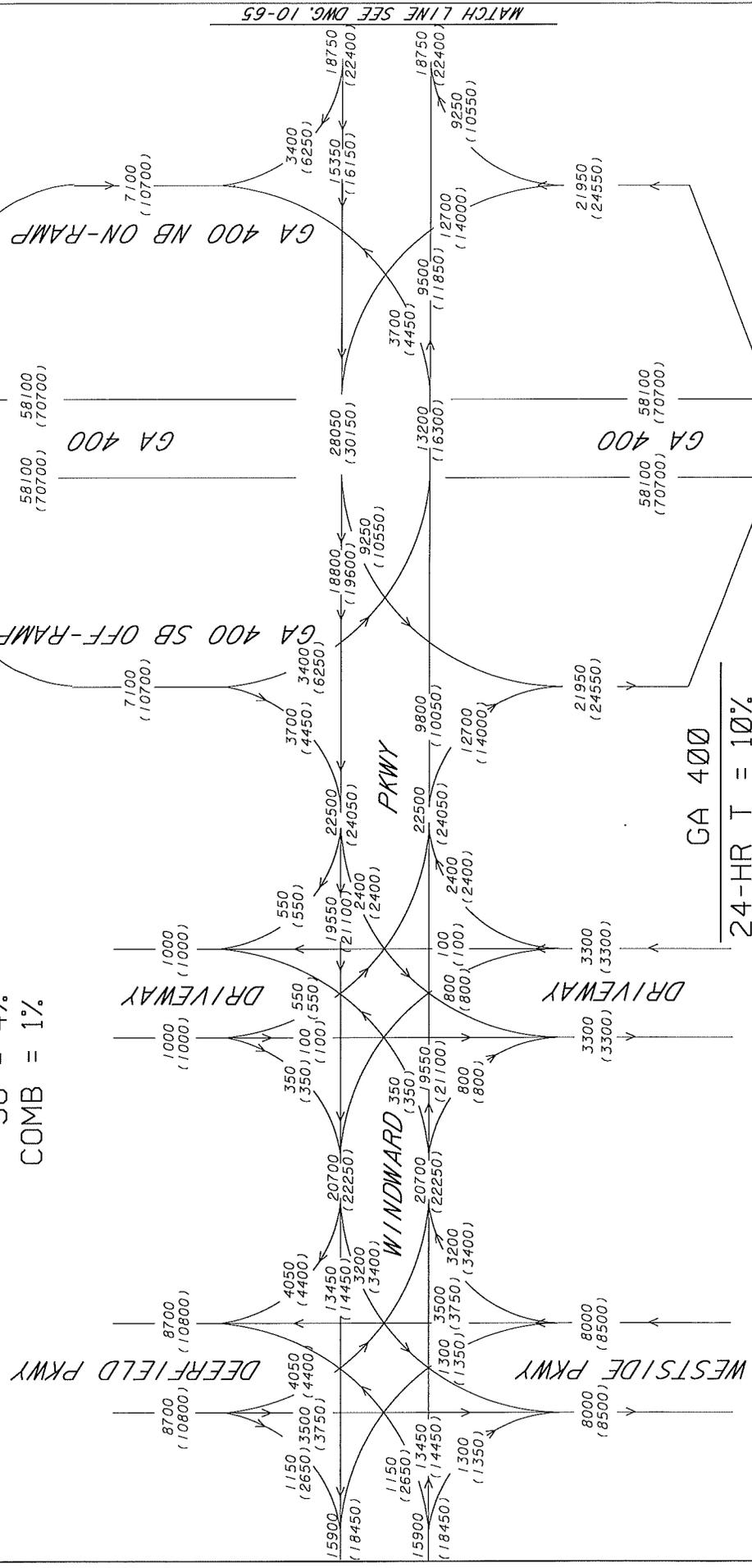
LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

UNION HILL RD AT TIDWELL DR
 2040 BUILD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-63

MATCH LINE
SEE DWG. 10-68

WINDWARD PKWY
24-HR T = 5%
SU = 4%
COMB = 1%



MATCH LINE SEE DWG. 10-65

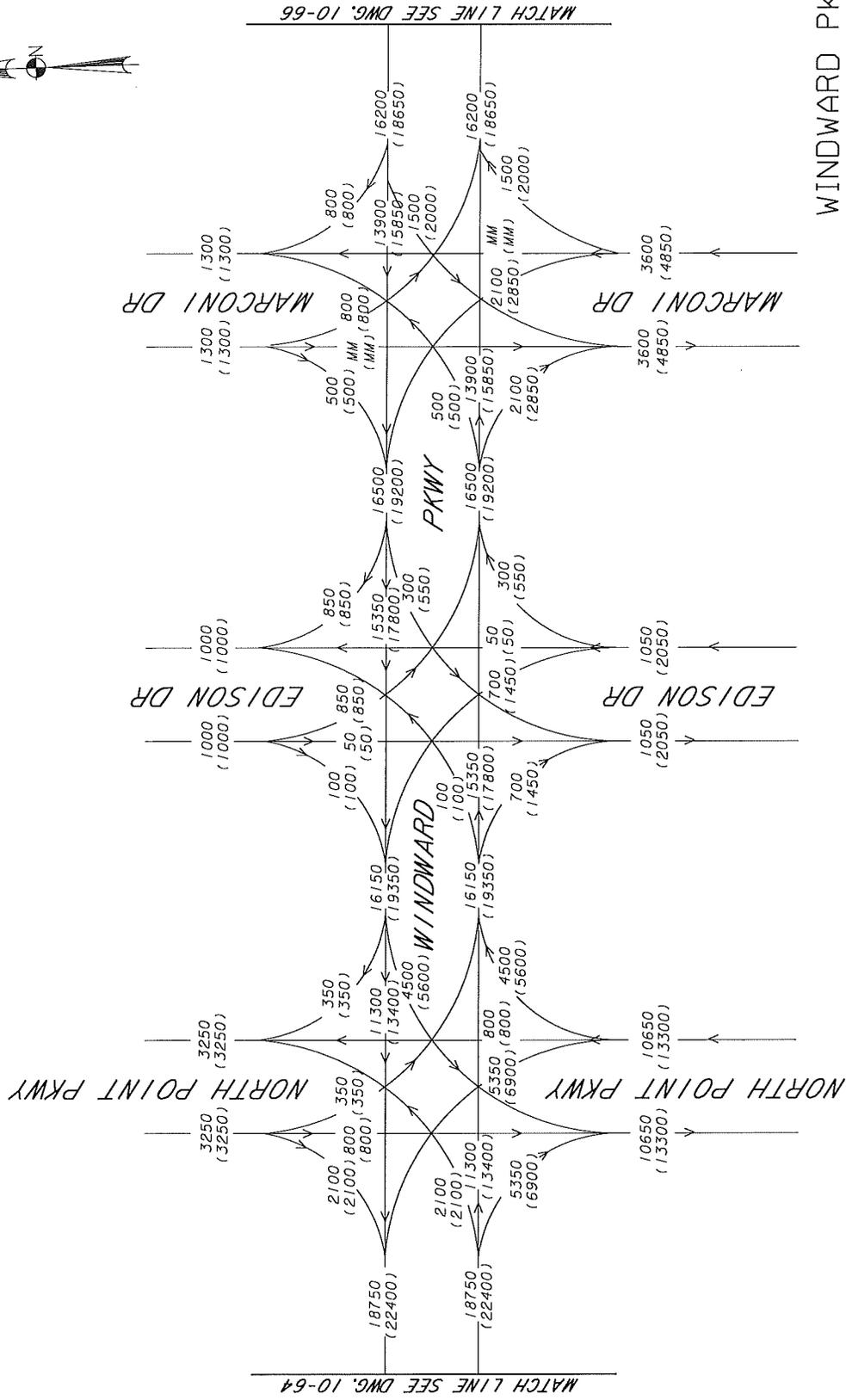
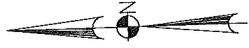


MA
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LEGEND
00 2020 ADT
(00) 2040 ADT

WINDWARD PKWY @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-64

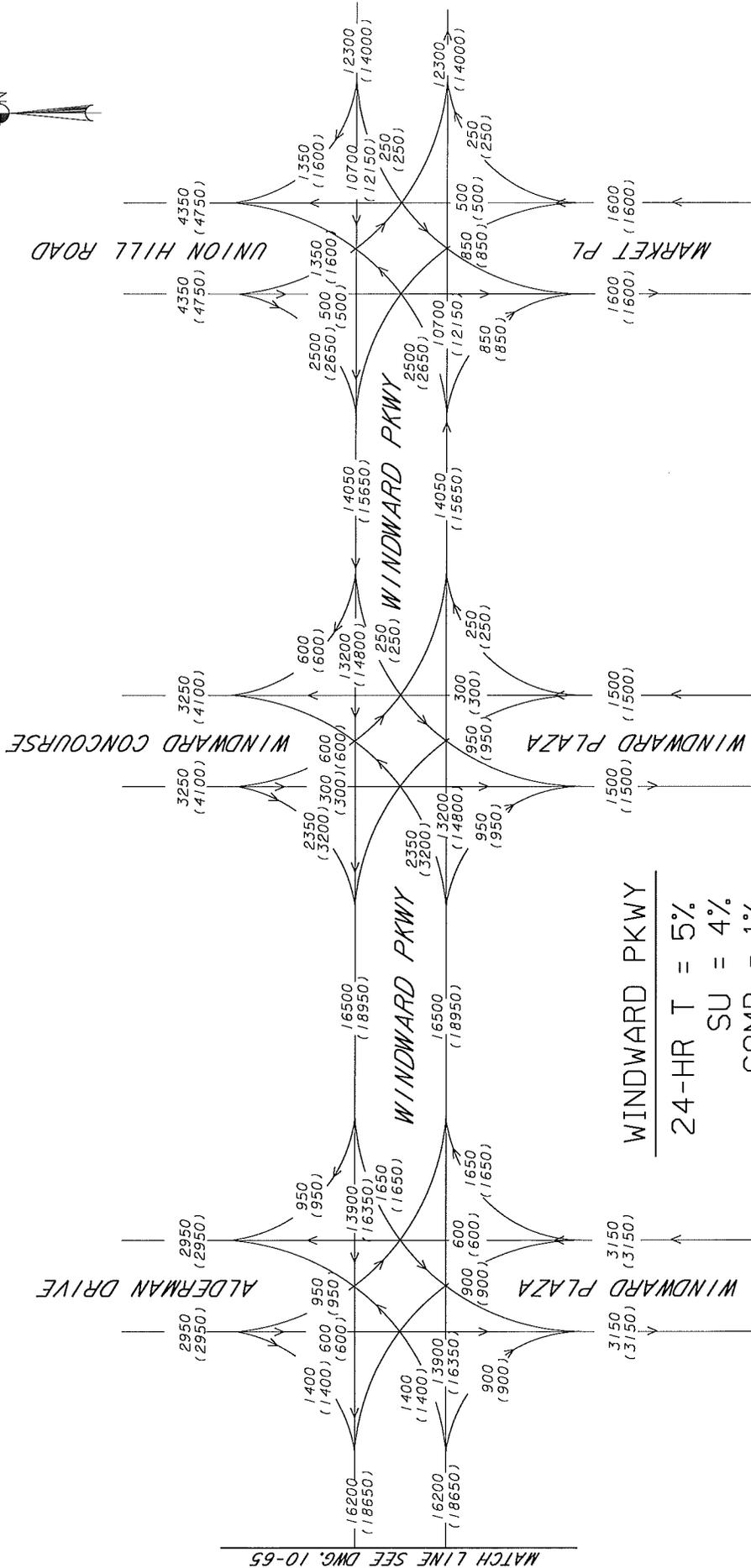


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LEGEND
 ∅∅ 2020 ADT
 (∅∅) 2040 ADT

WINDWARD PKWY @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-65

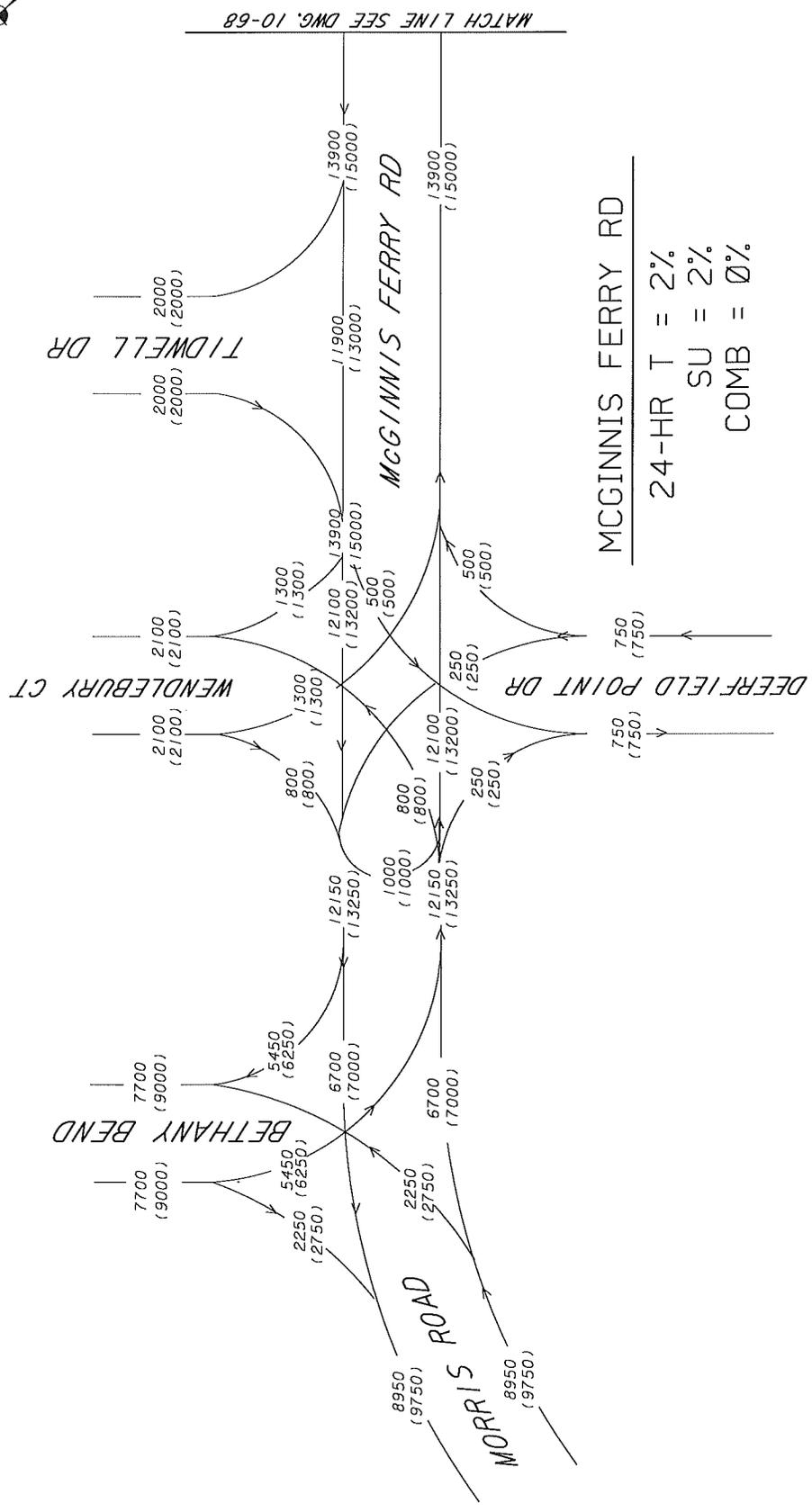
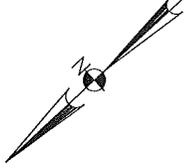


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LEGEND
 ∅ 2020 ADT
 (∅) 2040 ADT

WINDWARD PKWY @ GA 400
 2020/2040 BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-66



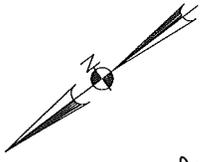
DRAWING NO.
10-67

MCGINNIS FERRY RD @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

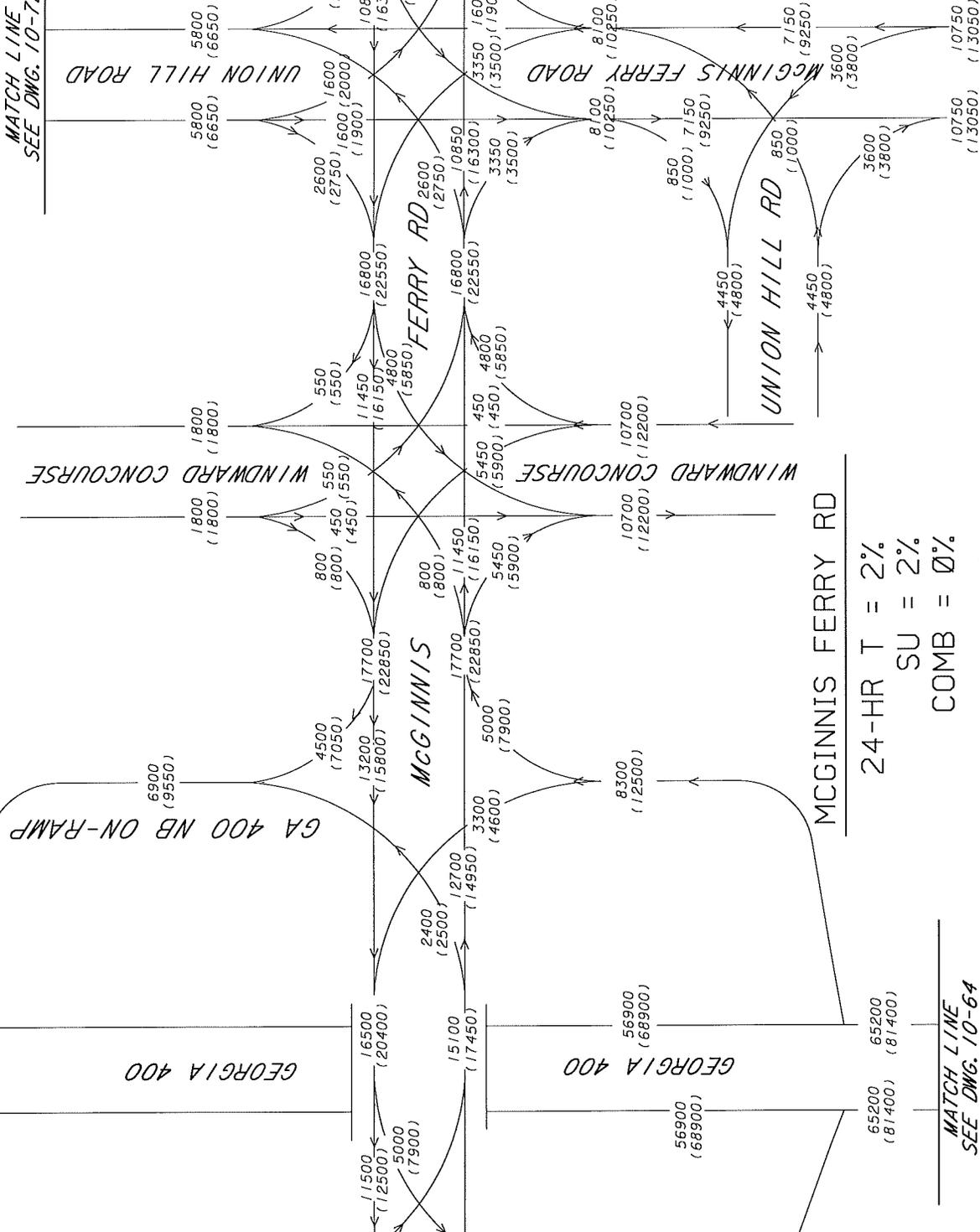
LEGEND
00 2020 ADT
(00) 2040 ADT

MA

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MATCH LINE
SEE DWG. 10-72



MATCH LINE
SEE DWG. 10-69

24-HR T = 2%
SU = 2%
COMB = 0%

MCGINNIS FERRY RD @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-68

LEGEND
00 2020 ADT
(00) 2040 ADT

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MATCH LINE
SEE DWG. 10-64

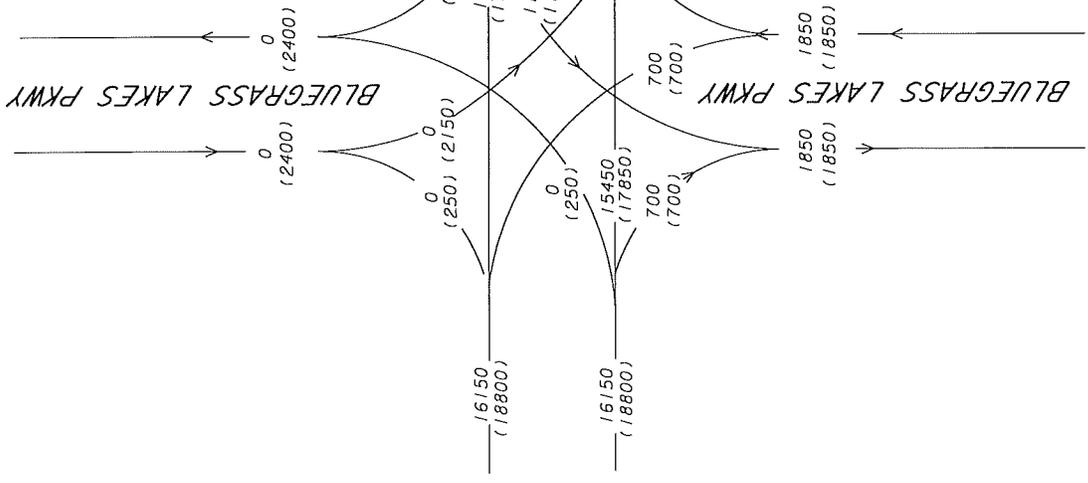
MATCH LINE SEE DWG. 10-67

MATCH LINE SEE DWG. 10-70

MCFARLAND PKWY

24-HR T = 4%
 SU = 3%
 COMB = 1%

BLUEGRASS LAKES PKWY



GA 400 SB OFF-RAMP

GA 400 NB ON-RAMP

GA 400

GA 400

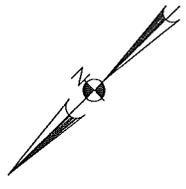
MCFARLAND PKWY

GA 400

24-HR T = 10%
 SU = 8%
 COMB = 2%

MATCH LINE
 SEE DWG. 10-68

MATCH LINE SEE DWG. 10-70



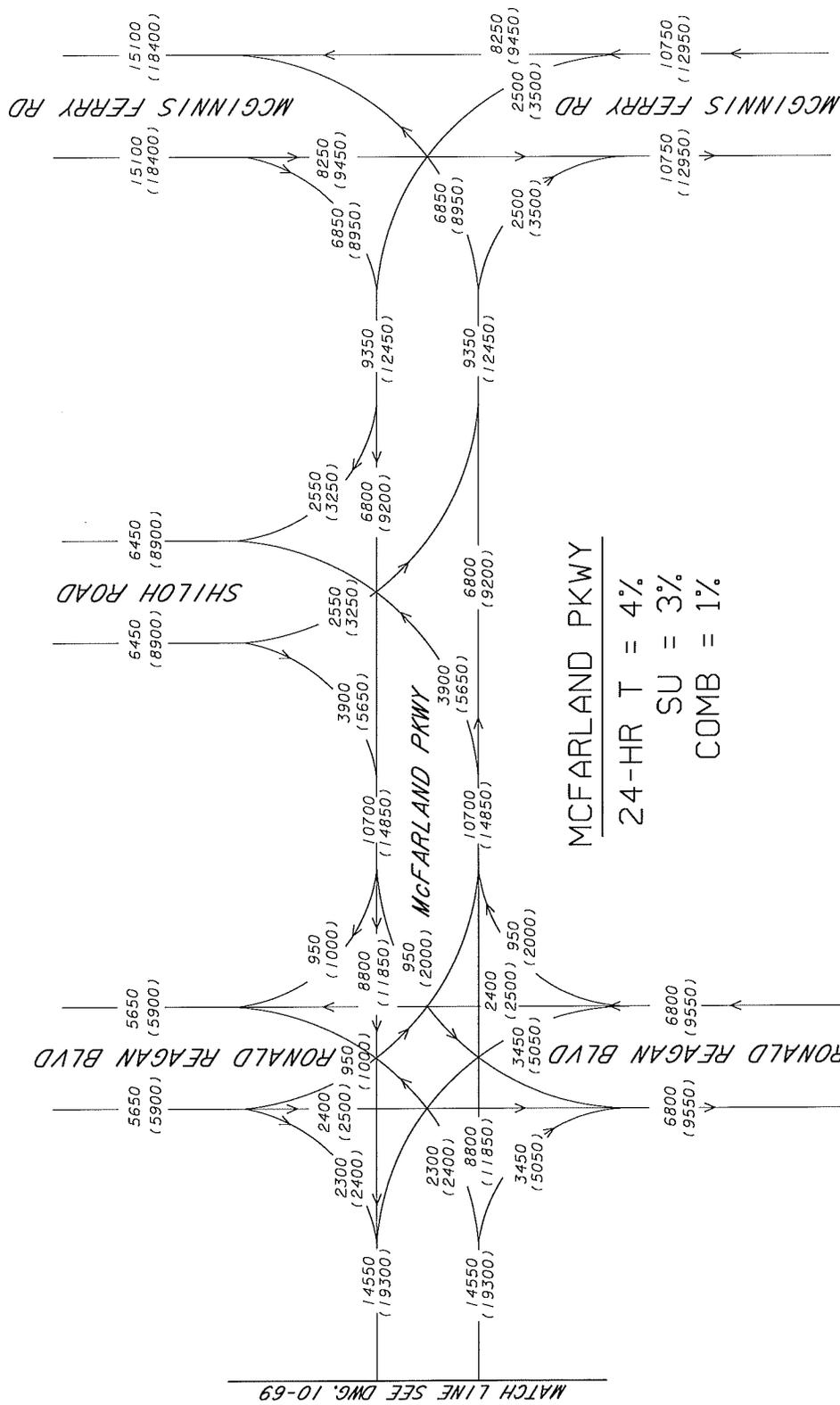
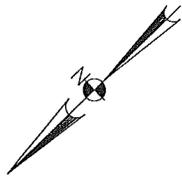
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LEGEND
 00 2020 ADT
 (00) 2040 ADT

MCFARLAND PKWY @ GA 400
 2020/2040 BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

DRAWING NO.
 10-69



MATCH LINE
SEE DWG. 10-68

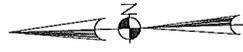
LEGEND
 00 2020 ADT
 (00) 2040 ADT

McFARLAND PKWY @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-70

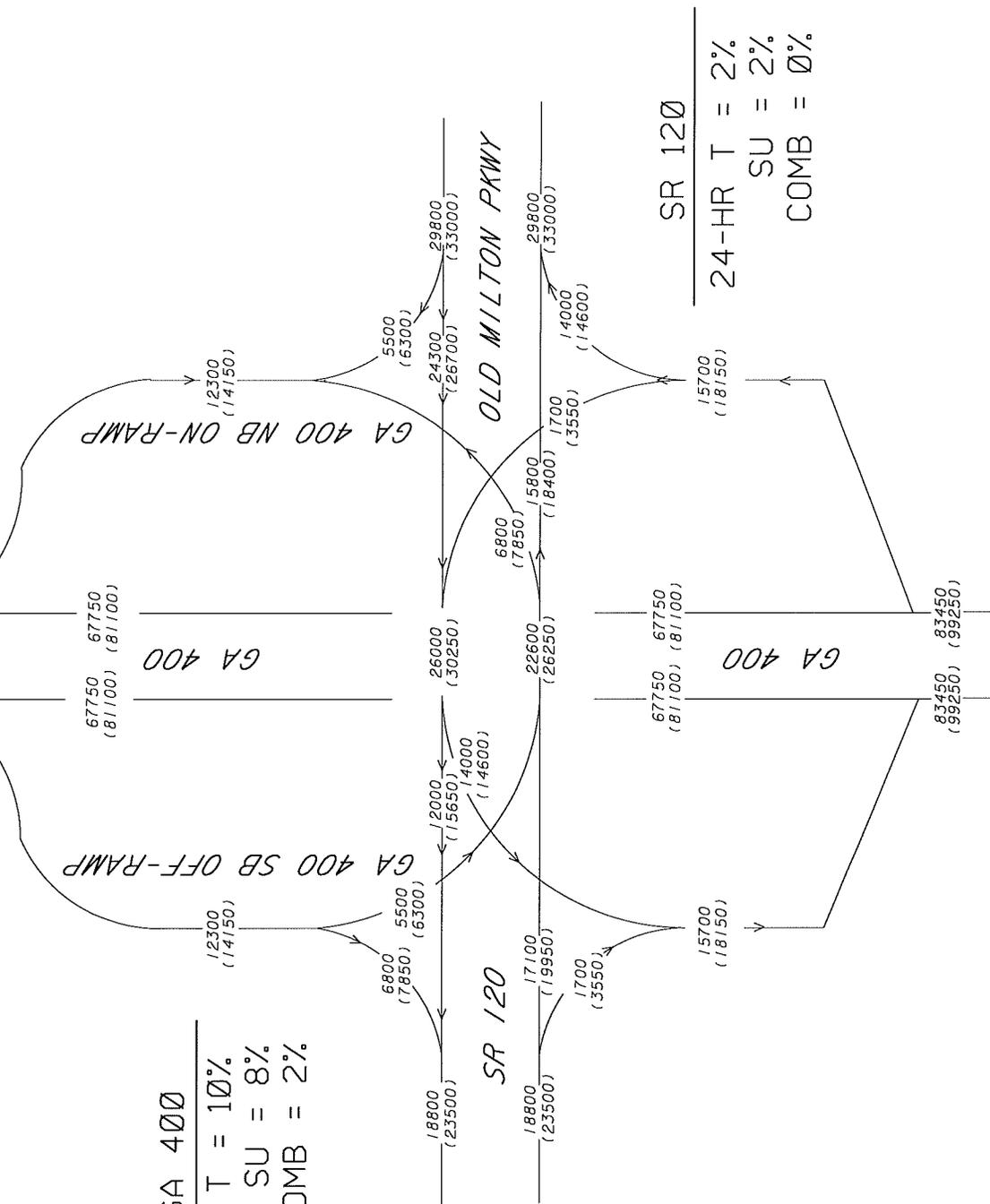
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MATCH LINE
SEE DWG. 10-64



GA 400
24-HR T = 10%
SU = 8%
COMB = 2%

SR 120
24-HR T = 2%
SU = 2%
COMB = 0%

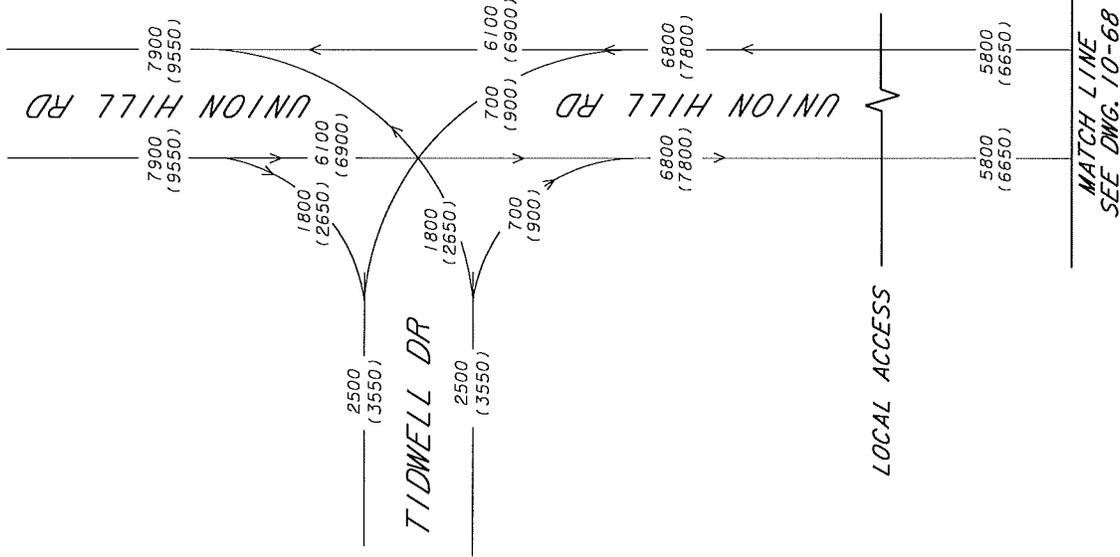


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LEGEND
00 2020 ADT
(00) 2040 ADT

SR 120 @ GA 400
2020/2040 BUILD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-71



UNION HILL RD
 24-HR T = 2%
 SU = 2%
 COMB = 0%

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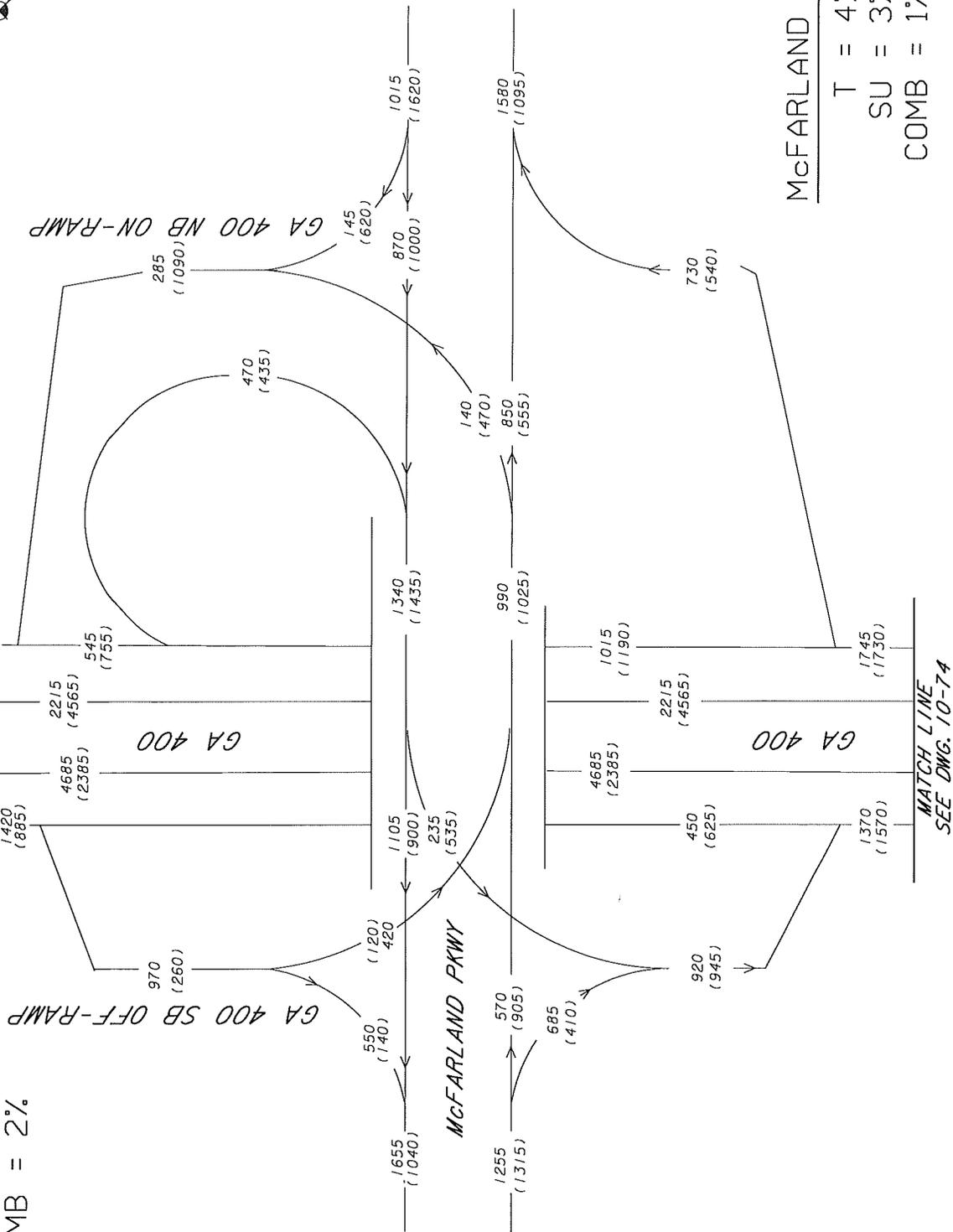
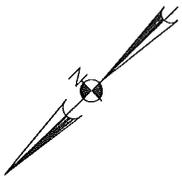


LEGEND
 ∅ 2020 ADT
 (∅) 2040 ADT

UNION HILL RD AT TIDWELL DR
 2020/2040 BUILD
 AVERAGE DAILY TRAFFIC
 TRAFFIC FLOW DIAGRAM

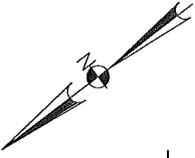
DRAWING NO.
 10-72

GA 400
 T = 10%
 SU = 8%
 COMB = 2%



McFARLAND PKWY
 T = 4%
 SU = 3%
 COMB = 1%

<p>DRAWING NO. 10-73</p>	<p>McFARLAND PKWY @ GA 400 2020 BUILD-CD PEAK HOUR TRAFFIC TRAFFIC FLOW DIAGRAM</p>	<p>LEGEND ∅∅ AM PEAK HOUR (∅∅) PM PEAK HOUR</p>	<p>Moreland Altabelli Associates, Inc. 2211 Beaver Run Road Suite 190 Norcross, Georgia 30071 Telephone (770) 263-5945</p> 
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GA 400
 T = 10%
 SU = 8%
 COMB = 2%

GA 400 NB ON-RAMP

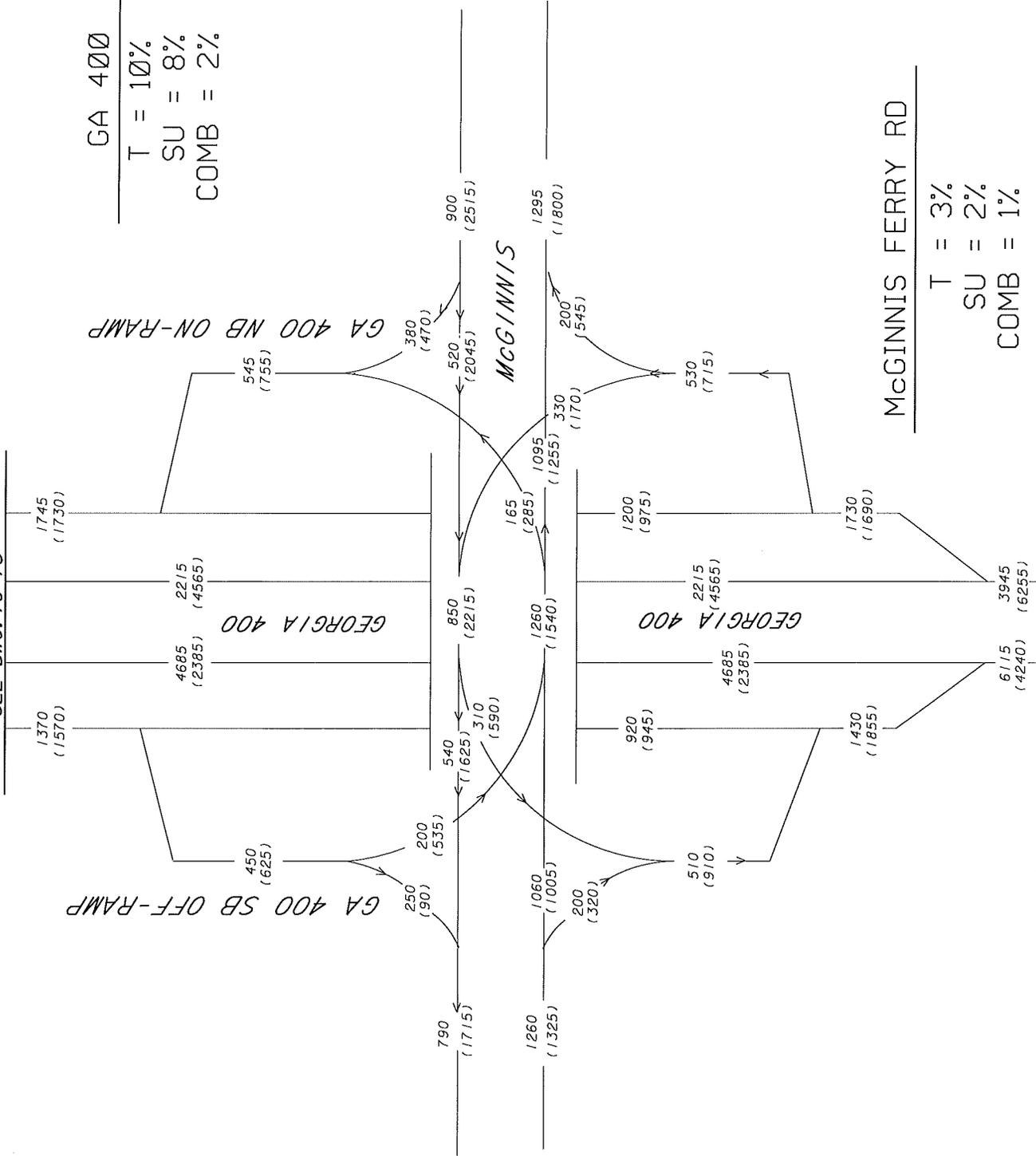
GA 400 SB OFF-RAMP

MCGINNIS

MCGINNIS FERRY RD

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

MATCH LINE
 SEE DWG. 10-73

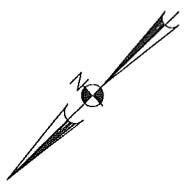


LEGEND
 00 AM PEAK HOUR
 (00) PM PEAK HOUR

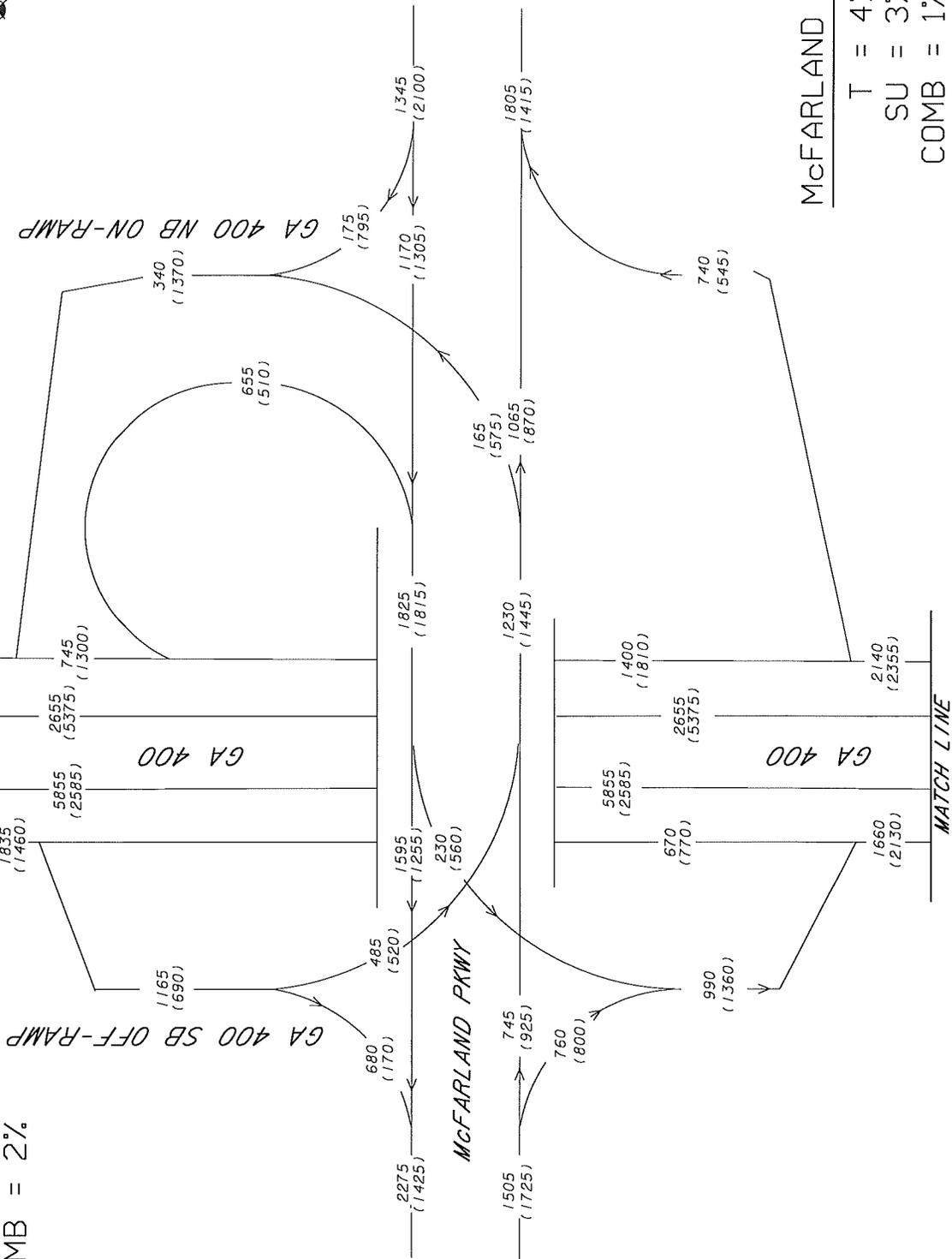
MCGINNIS FERRY RD @ GA 400
 2020 BUILD-CD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

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DRAWING NO.
 10-74



GA 400
 T = 10%
 SU = 8%
 COMB = 2%



McFARLAND PKWY
 T = 4%
 SU = 3%
 COMB = 1%

MATCH LINE
 SEE DWG. 10-76

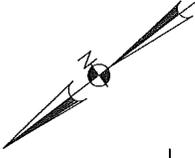
DRAWING NO.
 10-75

McFARLAND PKWY @ GA 400
 2040 BUILD-CD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

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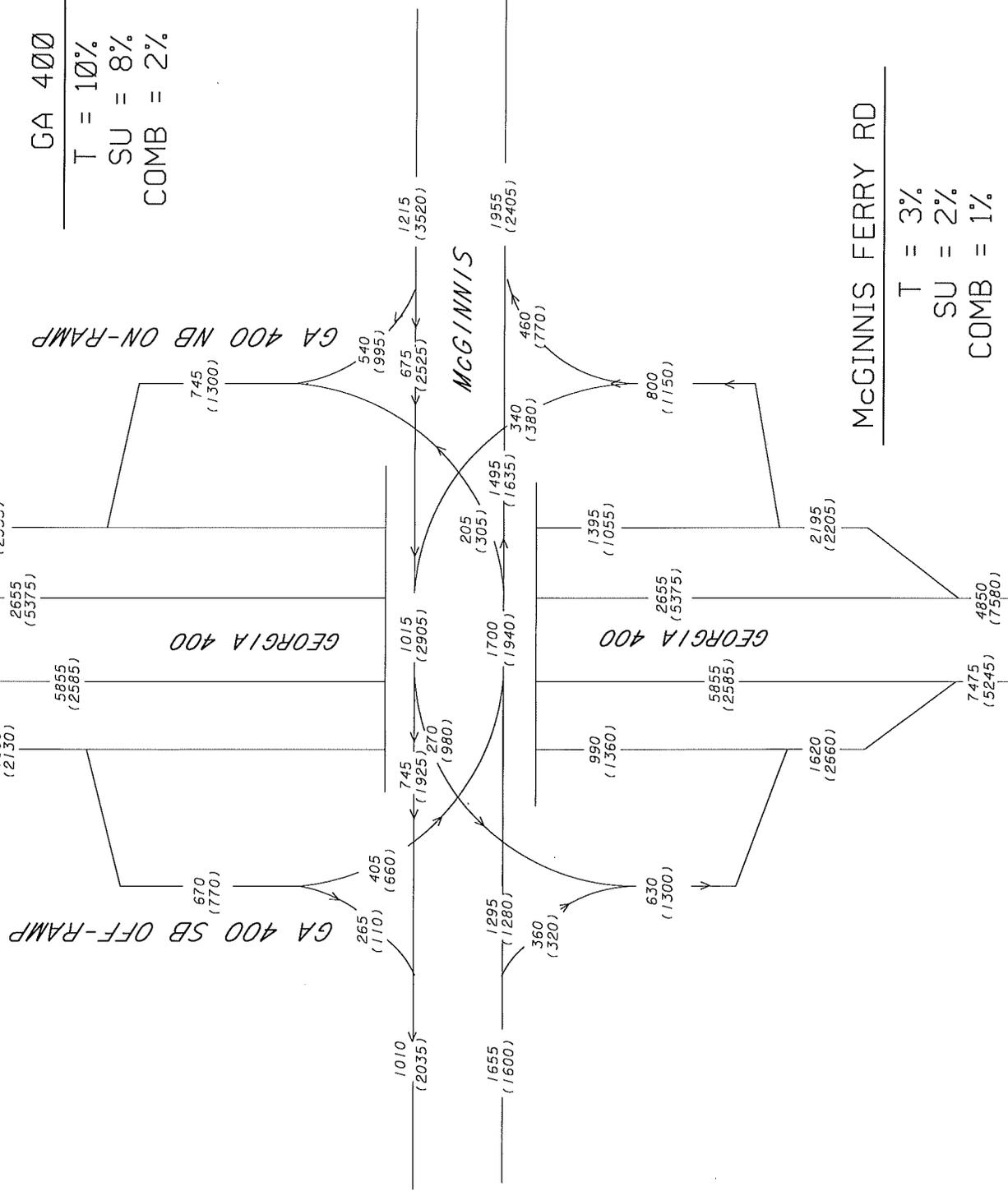




GA 400
 T = 10%
 SU = 8%
 COMB = 2%

McGINNIS FERRY RD
 T = 3%
 SU = 2%
 COMB = 1%

MATCH LINE
 SEE DWG. 10-75

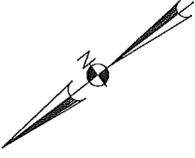


McGINNIS FERRY RD @ GA 400
 2040 BUILD-CD PEAK HOUR TRAFFIC
 TRAFFIC FLOW DIAGRAM

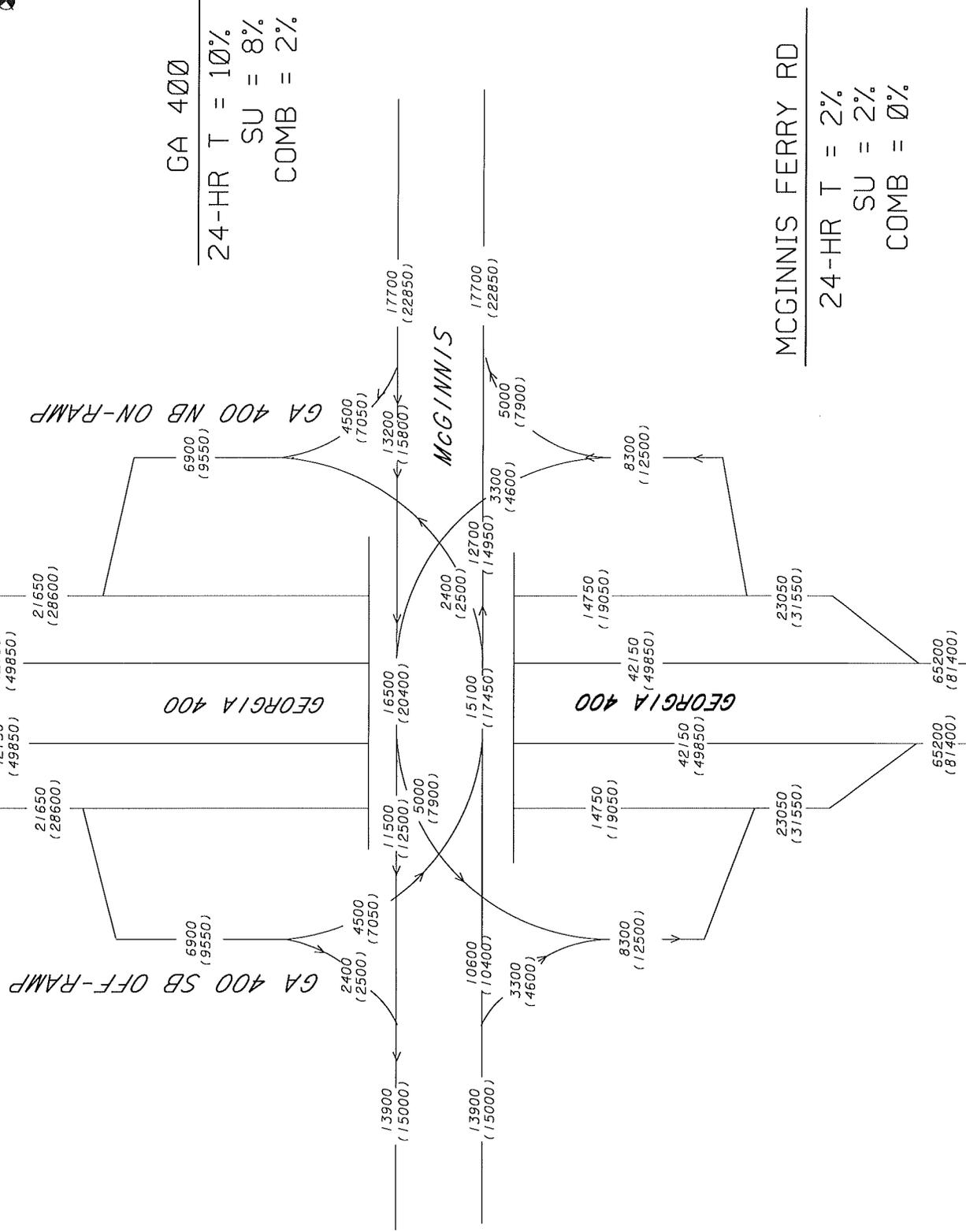
LEGEND
 ∅∅ AM PEAK HOUR
 (∅∅) PM PEAK HOUR

MA
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DRAWING NO.
 10-76



MATCH LINE
SEE DWG. 10-77



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LEGEND
00 2020 ADT
(00) 2040 ADT

MCGINNIS FERRY RD @ GA 400
2020/2040 BUILD-CD
AVERAGE DAILY TRAFFIC
TRAFFIC FLOW DIAGRAM

DRAWING NO.
10-78

APPENDIX C - OTHER SUPPORTING DOCUMENTS

Development Agreement between Forsyth County, Georgia and TRG Forsyth LCC

Fiscal Impact Analysis, Comparison of Premium and Standard Development Options for the Taubman Development in Forsyth County

Article IX, Ronald Reagan/Union Hill Overlay District

DEVELOPMENT AGREEMENT

between

FORSYTH COUNTY, GEORGIA

and

TRG FORSYTH LLC

December 4, 2008

Project: Ronald Reagan/Union Hill Overlay District Development

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DEVELOPMENT AGREEMENT

THIS DEVELOPMENT AGREEMENT (this "Agreement"), dated as the 4th day of December, 2008, is made between **TRG Forsyth LLC**, a Delaware limited liability company ("Taubman") and Forsyth County, Georgia, a public body corporate and politic of the State of Georgia ("Forsyth County"), collectively the ("Parties").

ARTICLE I RECITALS

WHEREAS, Taubman currently owns, or is under contract to purchase, certain property located within an approximately 160-acre tract in Forsyth County, as more particularly described in **Exhibit A** (the "Site"); and

WHEREAS, Taubman intends to develop or cause the development of a regional retail mixed-use development generally in accordance with the Ronald Reagan/Union Hill Overlay District, which development shall integrate mutually supporting retail, office, hotel, residential and recreational components; and

WHEREAS, Taubman intends to develop or cause to be developed within that portion of the Site identified as Sub-Area 1 in the Ronald Reagan/Union Hill Overlay District (the "Overlay") with a Regional Retail Component; and

WHEREAS, the Forsyth County Board of Commissioners (the "Board") finds that the construction of the Regional Retail Component will result in substantial benefits to the welfare of Forsyth County and its inhabitants, and in the public purposes and governmental interests served, including, but not limited to, the real estate tax benefits, the sales tax benefits, the personal property tax benefits, and the employment benefits to the County, both during construction and on an on-going basis; and

WHEREAS, the feasibility of the Regional Retail Component is predicated on Forsyth County performing various public infrastructure systems improvements and providing certain economic incentives, including but not limited to constructing the Road Improvement (with related Utility Improvements) and reducing Taubman's sewer reservation fees, all as more particularly described herein; and

WHEREAS, in order to induce and further facilitate the successful construction of the Regional Retail Component, the Board wishes for Forsyth County to bear the costs associated with such public infrastructure system improvements and economic incentives required for construction of the Project;

AGREEMENT

NOW, THEREFORE, Forsyth County and Taubman, for and in consideration of the mutual promises, covenants, obligations and benefits of this Agreement, hereby agree as follows:

ARTICLE II GENERAL TERMS

Section 2.1 Definitions. Unless the context clearly requires a different meaning, the following terms are used herein with the following meanings:

“Board” means the Board of Commissioners of Forsyth County, Georgia.

“Build-Out Sewer Capacity” means the capacity of sewer service that the Project will require at build-out, which is anticipated to equal approximately 620,000 gallons of sewer service.

“County” means Forsyth County, Georgia, a political subdivision of the State of Georgia.

“Effective Date” means December 4, 2008, the effective date of this Agreement.

“Engineering Costs” means costs paid by Taubman for Engineering Design Services, which amount Taubman and Forsyth County agree is equal to One Million Dollars (\$1,000,000.00) for the purposes of this Agreement.

“Engineering Design Services” means technical consulting services related to the Forsyth County Bid 08-52-3150 Ronald Reagan Boulevard, a copy of the bid specifications for same is incorporated herein by reference, including but not limited to surveying, geotechnical analysis, drainage studies, utility studies, environmental evaluations, construction program planning and management, infrastructure studies, roadway and utility designs and associated construction documents. The Engineering Design Services resulted in creation of the Improvement Plans, as defined in this Agreement.

“Force Majeure” means any event or circumstance which is: (1) beyond the reasonable control of the party whose performance is required by this Agreement, and (2) not due to any act or omission of the party whose performance is required by this Agreement, and (3) orders or restraints of any kind of the governments of the United States or of the State of Georgia or any of their departments, agencies, officials, or authorities, and (4) caused by fire, earthquake, flood, explosion, war, acts of public enemies, invasion, mob violence, sabotage, lockouts, litigation, condemnation, riots or other civil disorder, national or local emergency, acts of God, unusual and unanticipated delays in transportation, unusual and unanticipated delays in obtaining lawful permits or consents to which the party is legally entitled, strike or labor dispute, severe unanticipated weather conditions (beyond normal occurrences) , or unanticipated unavailability of manufactured materials. Inability to fund a party’s obligations shall not be deemed to be within the definition of Force Majeure.

“Forsyth County” means Forsyth County, Georgia, a political subdivision of the State of Georgia.

“Gross Leasable Area” means the floor area of retail facilities as calculated in accordance with Section 21-9.8(M) of the Overlay. Impact fees shall be calculated pursuant to the Forsyth County Impact Fee Ordinance in place on the Effective Date. Forsyth County’s accommodation

with respect to Impact Fees is based upon Taubman's agreement to pay those amounts identified in Section 4.3(C) of this Agreement.

"Improvement Construction" means construction activities contemplated and controlled by Forsyth County Bid 08-52-3150 Ronald Reagan Boulevard, including change orders, revisions and addenda thereto including but not limited to the acquisition of easements for, and the construction of, the Jolly and Tharaldson sewer improvements as set forth in Exhibit C of the Temporary Easement Agreement.

"Improvement Plans" means those plans and specifications by PBS&J titled "Plan and Profile of Proposed Ronald Reagan Boulevard" and dated March 21, 2008, which plans have been reviewed and approved by Forsyth County and are incorporated herein by reference, for construction of the Improvement Construction.

"Latest Opening Date" means December 1, 2015.

"Law" means any local, state or federal legal requirement, including any statute, law, ordinance, rule, order, code or regulation, now or hereafter in effect.

"Loss" means any and all direct or indirect damages, demands, claims, payments, obligations, actions or causes of action, assessments, losses, liabilities, costs and expenses, including without limitation, penalties, interest on any amount payable to a third party, lost income and profits, and any legal or other expenses (including, without limitation, reasonable attorneys' fees and expenses) reasonably incurred in connection with investigating or defending any claims or actions, whether or not resulting in any liability.

"Mall Permit Application" means an application submitted to Forsyth County for a development permit for the Regional Retail Component, as that term is defined herein.

"Overlay" means the Ronald Reagan/Union Hill Overlay District, as adopted by the Board on April 3, 2008.

"Project" means the regional mixed-use development generally as depicted in the master plan attached to the Overlay.

"Project Right-of-Way" means Right-of-Way located on the Site owned by Taubman as of the date of this Agreement for the portion of the Improvement Construction associated with the physical extension of Ronald Reagan Boulevard between McFarland Parkway and its intersection with Georgia State Route 400, and the intersection of Union Hill Road and McGinnis Ferry Road in accordance with the Improvement Plans.

"Project Right-of-Way Costs" means the costs of purchasing Project Right-of-Way, fill dirt, temporary construction easements and permanent easements for the Project Road Improvement, which amount Taubman and Forsyth County agree is equal to Two Million Five Hundred Seventy Five Thousand Dollars (\$2,575,000.00).

"Project Road Improvement" means the portion of the Improvement Construction to be constructed on the Project Right-of-Way.

“Recreational Area” means an area of the Site that consists of approximately 22 acres of wetland; stream, floodplain and green space, as more particularly described in Exhibit B.

“Regional Retail Component” means a retail shopping center consisting of not less than 650,000 square feet of Gross Leasable Area including at least two anchor stores of comparable type and quality to Bloomingdales’, Nordstrom, Macy’s, Dillard’s, Neiman Marcus, or Saks Fifth Avenue. For the purposes of this Agreement, the Regional Retail Component shall be designed and constructed substantially in accordance with the Overlay.

“Right-of-Way” means an area of land acquired, or to be acquired, by Forsyth County to be improved with roads, sidewalks, landscaping, signage, utilities and other similar uses to be utilized by the public.

“Roadway Plans” means plans for the initial landscaping, street lighting, decorative landscaping, landscape irrigation systems and signage within the Right-of-Way for the Improvement Construction.

“Site” means the real property on which the Project will be located, as more particularly described in Exhibit A and as contemplated under the Overlay.

“SPLOST VI” means the Special Purpose Local Option Sales Tax that was approved by Forsyth County voters on February 5, 2008, and for which collections commenced July 1, 2008.

“Sub-Area 3 Multi-Family” means a multi-family residential development within Sub-Area 3 of the Overlay consisting of not more than 375 residential units.

“Temporary Easement Agreement” means the temporary easement agreement executed by TRG Forsyth LLC and Forsyth County, dated August 29, 2008, which has been recorded in book 5228, pages 121 – 136 of Forsyth County’s records.

“UDC” means the Unified Development Code of Forsyth County, Georgia.

Section 2.2 *Singular and Plural.* Words used herein in the singular, where the context so permits, also include the plural and vice versa. The definitions of words in the singular herein also apply to such words when used in the plural where the context so permits and vice versa.

ARTICLE III REPRESENTATIONS AND WARRANTIES

Section 3.1 *Representations and Warranties of Taubman.* Taubman hereby represents and warrants to Forsyth County that:

(A) Taubman has the requisite power and authority to execute and deliver this Agreement, to incur and perform its obligations hereunder, and to carry out the transactions contemplated by this Agreement.

(B) The execution, delivery, and performance of this Agreement has been duly authorized by all necessary action and proceedings by or on behalf of Taubman, and no

further corporate approvals or filings of any kind are required by or on behalf of Taubman as a condition to the valid execution, delivery, and performance by Taubman of this Agreement. This Agreement, when duly executed and delivered by each party hereto, will be a valid, binding and enforceable obligation of Taubman in accordance with its terms.

(C) Taubman will at all times possess (and will cause its contractors, subcontractors, agents and other Persons performing any activities relating to the Regional Retail Component by contract with or under Taubman's direction), all franchises, patents, copyrights, trademarks, trade names, licenses and permits, and rights in respect of the foregoing, adequate for the conduct of its business substantially as now conducted or as it is intended to be conducted with respect to the Regional Retail Component and as required by this Agreement, without known conflict with any rights of others.

(D) Taubman will obtain or cause to be obtained all necessary government approvals for all of its development activities at the Site, specifically including the Regional Retail Component, and will comply with all applicable laws. Taubman does, however, maintain and preserve all of its rights under law to contest any law or administrative action in the appropriate forum by an appropriate proceeding diligently prosecuted, provided that Taubman gives Forsyth County written notice of its intent to contest same. Any approval or obligation granted herein by Forsyth County is for the purposes of this Agreement only and does not affect or constitute a development approval required pursuant to any Law or ordinance.

Section 3.2 *Representations and Warranties of Forsyth County.* Forsyth County hereby represents and warrants to Taubman that:

(A) Forsyth County has the requisite power and authority to execute and deliver this Agreement, to incur and perform its obligations hereunder, and to carry out the transactions contemplated by this Agreement.

(B) The execution, delivery, and performance of this Agreement has been duly authorized by all necessary action and proceedings by or on behalf of Forsyth County, and no further approvals or filings of any kind, including any approval of or filing with any governmental authority, are required by or on behalf of Forsyth County as a condition to the valid execution, delivery, and performance by Forsyth County of this Agreement. This Agreement, when duly executed and delivered by each party hereto, will be a valid, binding and enforceable obligation of Forsyth County in accordance with its terms.

(C) The voters of Forsyth County approved SPLOST VI, and the SPLOST VI Resolution, which included funding for the Ronald Reagan Boulevard Extension.

Section 3.3 *Survival.* The parties agree that each separate representation and warranty in this Agreement shall survive the execution and delivery of this Agreement and the consummation of the transactions contemplated herein to the extent allowed by law.

**ARTICLE IV
SYSTEMS IMPROVEMENTS AND ECONOMIC INCENTIVES**

Section 4.1 Description. To facilitate the construction of the Project, Forsyth County agrees to: (A) purchase the Project Right-of-Way, the Engineering Costs and undertake the Improvement Construction in accord with Forsyth County Bid 08-52-3150 Ronald Reagan Boulevard as amended to include the Jolly and Tharaldson sewer improvements as set forth in Exhibit C of the Temporary Easement Agreement, (B) provide approval for that certain Ad Valorem Tax Abatement Agreement that will be consummated between Taubman, the Forsyth County Board of Assessors and the Forsyth County Development Authority, and (C) reduce the sewer reservation fees applicable to the Project, as more particularly described herein.

Section 4.2 Improvement Construction.

(A) Construction.

(i) Not later than December 1, 2009, Forsyth County shall pay to Taubman the Engineering Costs, subject to the reimbursement provisions of Section 4.6 herein. Taubman shall be responsible for any design-related change orders necessitated by deficiencies, errors, or omissions in the Improvement Plans. Taubman shall not be responsible for design-related change orders unassociated with deficiencies, errors, or omissions in the Improvement Plans.

(ii) Within thirty (30) days of the issuance of a building permit for the Sub-Area 3 Multi-Family or December 15, 2010, whichever occurs earlier, Forsyth County shall pay to Taubman the Project Right-of-Way Costs. In the event that that no less than three Forsyth County Board members, with terms extending until December 31, 2012, ratify this Agreement in January 2009, the December 15 date referenced in the preceding sentence shall be extended until December 15, 2012.

(iii) Forsyth County shall pay all acquisition and construction costs associated with the Improvement Construction as defined herein, subject to the reimbursement provisions of Section 4.6 herein relative to Project Right-of-Way Costs.

(iv) Forsyth County agrees to take all action that may be necessary to support Taubman's Letter of Map Revision request ("LOMR"), which shall be submitted to the Federal Emergency Management Agency ("FEMA"), with Forsyth County as the applicant, for removing lands from the floodplain as identified by Taubman and in accordance with the Improvement Plans. Taubman will pay all resulting engineering, design costs and FEMA fees associated therewith, and will process, with Forsyth County's reasonable assistance, the LOMR documentation in order to expedite FEMA approval within a reasonable timeframe estimated to be within six (6) months of submission. Taubman shall provide Forsyth County with a reasonable opportunity to review all LOMR documentation prior to the submittal of such documentation to FEMA.

(v) Subsequent to completion of the Improvement Construction Taubman may, but shall not be obligated to, install and maintain at its own expense, supplemental street lighting, decorative landscaping, landscape irrigation systems, and signage (the "Supplemental Improvements") within the Right-of-Way of the Improvement Construction. Taubman shall obtain all required development permits prior to commencing any such installations, and otherwise comply with pertinent Forsyth County codes. In no event shall the Supplemental Improvements interfere with or damage any of the improvements and upgrades installed by Forsyth County. The Parties shall cooperatively integrate the designs of the Roadway Plans, if any, and the Supplemental Improvements.

(vi) Acting in good faith and in accordance with paragraph 2 of the Temporary Easement Agreement between the Parties and Sections 6.5(C) and 7.9 of this Agreement, Forsyth County shall provide Taubman with reasonable notice of, and reasonable opportunity to participate in (should Taubman choose to participate), all construction meetings and status report communications regarding Improvement Construction.

(vii) Forsyth County and Taubman recognize the importance to the Project's success of improvements to McGinnis Ferry Road, including the construction of a new interchange and improvements at Georgia State Route 400 and road improvements from Georgia State Route 400 to Union Hill Road/McGinnis Ferry Road, and ultimately to Sargent Road (the "Interchange and Improvements"). Forsyth County and Taubman shall cooperatively work toward achieving completion of the Interchange and Improvements at no cost to Taubman or Forsyth County.

(viii) Taubman understands and agrees that the Improvement Construction, including the Jolly and Tharaldson Sewer Improvements, is a Forsyth County project, and Forsyth County shall retain all discretion with respect to construction of the same, subject to the terms of the license agreement between the Parties, dated September 3, 2008, and the Temporary Easement Agreement between the Parties, dated August 29, 2008. Any dispute as to the reasonableness of any proposed change orders, revisions or addenda shall be resolved in accord with Section 7.11 of this Agreement.

(B) Road Capacity.

(i) During the term of this Agreement, in conjunction with submission of an application for zoning approval to the Forsyth County staff (a "Proposed Development") on any parcel which is not within the Site (an "Off-Site Parcel") but which is located within an off-site area of traffic influence ("Area of Influence") as shown in **Exhibit C**, Forsyth County agrees that it will provide Taubman with: (1) reasonable written notice of the submittal of such application for Proposed Developments within Off-Site Parcels and (2) a reasonable opportunity to provide Forsyth County with comments prior to the approval of such application. In no event shall Taubman's opportunity to provide comment with respect to a Proposed Development serve as a basis to deny, postpone,

defer, or otherwise delay any application for zoning from proceeding in the ordinary course.

(ii) Notice to Taubman shall not be required for any new development or redevelopment of an Off-Site Parcel where the Proposed Development adds less than: (1) forty thousand square feet (40,000 sf) of new or additional occupiable retail commercial building area, (2) eighty five thousand square feet (85,000 sf) of new or additional office building area, (3) one hundred seventy thousand square feet (170,000 sf) of new or additional light industrial building area, (4) 165 single family dwelling units, (5) 270 multi-family dwelling units, or (6) 250 additional hotel rooms, and such development or redevelopment is under the DRI thresholds in the aggregate. For mixed use development, the percent of the above thresholds shall be determined for each proposed land use. If the sum of the percentages is less than 100, notice to Taubman is not required.

(C) Public Safety Fees.

In addition to the Overlay regulations, the Site is governed by the requirements of two zoning actions previously approved by Forsyth County, ZA 2605 and ZA 3050. One of the zoning conditions attached to ZA 2605 (the "Public Safety Condition") requires Taubman to pay to three hundred thousand dollars (\$300,000) to Forsyth County in three equal installments based on development phasing (the "Public Safety Fee"). The Parties agree that the Public Safety Fee shall become due and payable in full upon the issuance of a permit for the Regional Retail Component. In the event that Taubman does not build the Regional Retail Component, or if Taubman takes any of the actions contemplated in Section 4.6 that will trigger Forsyth County's right to receive reimbursement, the Parties agree that the Public Safety Fee requirement will revert to that contemplated by the Public Safety Condition

Section 4.3 Tax Abatement Incentives. The Development Authority of Forsyth County (the "Authority") is hereby authorized to execute and deliver an inducement agreement between itself and Taubman, upon such terms and conditions as are negotiated and agreed upon between the Authority and Taubman, for a Tier 3 property tax abatement applicable to the Site and each separate development phase of the Project. This grant of authority notwithstanding, Forsyth County authorizes the abatement subject to the following limitations and conditions. For the ten year period following Taubman's submittal of a Mall Permit Application (the "Abatement Period"), each separate non-residential building and/or development unit within the Overlay ("Commercial Development") shall be eligible for a Tier 2 tax abatement as set forth in the Authority's current location/expansion incentive program. The tax abatement schedule for each Commercial Development may commence only after Forsyth County has issued a certificate of occupancy for that Commercial Development for which the abatement is sought. Tax abatement schedules may not commence prior to the submittal of a Mall Permit Application or after the expiration of the Abatement Period.

Section 4.4 Sewer Reservation Discount. Taubman shall reserve the Build-Out Sewer Capacity from Forsyth County. On or before December 31, 2009, Taubman or Taubman's designee may purchase up to 101,250 gallons of the Build-Out Sewer Capacity at \$19 per-gallon ("Full Price Capacity") for the development of the Sub-Area 3 Multi-Family. After December

31, 2009, the price for sewer to serve the Sub-Area 3 Multi-Family shall be Forsyth County's then-prevailing market rate. Within one hundred fifty (150) days of the execution of a sewer reservation agreement with Forsyth County, Taubman shall pay Forsyth County the amount of Four Hundred Fifty Thousand Dollars (\$450,000.00) in exchange for 30,000 gallons of sewer capacity (the "Initial Sewer Payment"), subject to the reimbursement provisions of Section 4.6 herein. Upon the submittal of a Mall Permit Application, Forsyth County shall provide Taubman with a \$4 per gallon rate discount for the remaining 488,750 gallons of sewer (the "Sewer Discount Rate"), which shall be more particularly set forth in the sewer reservation agreement attached hereto as Exhibit D. With the exception of the Initial Sewer Payment, the Sewer Discount Rate shall not apply to any sewer capacity purchase that precedes the submittal of a Mall Permit Application. The Sewer Discount Rate shall expire eight (8) years after the date of the Initial Sewer Payment. Taubman and Forsyth County shall execute said sewer reservation agreement within sixty (60) days of the Effective Date in a form substantially the same as that in Exhibit D.

Section 4.5 *Conveyance of Recreational Area.* Taubman shall convey the Recreational Area to Forsyth County by executing the deed attached hereto as Exhibit B either: (i) 30 days after it receives from Forsyth County all funds set forth in section 4.2(A) or (ii) December 1, 2009, whichever is earlier.

Section 4.6 *Reimbursement of Economic Incentives.* In reliance on the promises in this Agreement made by Forsyth County, Taubman agrees to perform or contract for, and oversee, the design and construction of the Regional Retail Component upon the portion of the Site depicted as Sub-Area 1 in the Overlay (the "Mall Site"). Not later than December 1, 2009, Taubman shall deliver to Forsyth County an irrevocable letter of credit, issued by a recognized financial institution of no less than \$1,120,000.00. In addition, upon Forsyth County's payment of the Project Right-of-Way Costs pursuant to Section 4.2(A)(ii) of this Agreement, but no earlier than December 1, 2009, Taubman shall provide Forsyth County with either a letter of credit reflecting a cumulative total of \$3,695,000.00 or a supplemental letter of credit equivalent in value to the Project Right-of-Way Costs. All letters of credit identified in this paragraph shall be subject to the following specific conditions: If: (a) Taubman does not open the Regional Retail Component to the public by the Latest Opening Date, (b) an application is submitted to rezone the Mall Site where said application thwarts Taubman's ability to construct the Regional Retail Component, (c) Taubman sells the Mall Site, or any portion thereof, to any third party where said conveyance thwarts Taubman's ability to perform its obligation to construct the Regional Retail Component, or (d) Taubman submits permit requests to Forsyth County that are not in substantial compliance with the Overlay's standards for the Mall Site, then Forsyth County's right to draw down the letter of credit shall immediately accrue, subject to the notice requirement set forth in this section. If Taubman's conduct triggers the right to draw down the letter of credit, Forsyth County shall be required to issue to Taubman a written demand for payment of \$1,120,000.00 (or \$3,695,000, if then applicable) and, if Taubman does not remit payment within 60 days of delivery of said written demand, Forsyth County shall be immediately entitled to present and draw down the full value of the letter of credit. In addition, upon the triggering of items (a), (b), (c) or (d), above, Taubman shall immediately forfeit the Sewer Discount Rate for any unpurchased sewer capacity and shall forfeit any uncommitted, previously reserved sewer as provided for in Exhibit D. If Taubman opens the Regional Retail Component to the public by or before the Latest Opening Date ("Grand Opening") or remits payment upon

demand equivalent to the value of the letter of credit to Forsyth County as required by this Section 4.6, Forsyth County shall issue a forfeiture letter to Taubman relinquishing its claim upon the letter of credit and return the letter of credit to the issuer within 60 days of the Grand Opening. The Parties may reset the Latest Opening Date to a later calendar date in a written amendment to this Agreement executed by both parties with the same formalities as are present in the execution of this Agreement.

ARTICLE V NOTICE

Section 5.1 *Delivery of Notices.* All notices, consents, approvals and other communications which may be or are required to be given by Taubman or Forsyth County under this Agreement shall be properly given only if made in writing and sent by (a) hand delivery, or (b) certified mail, return receipt requested, or (c) a nationally recognized overnight delivery service (such as Federal Express, UPS Next Day Air or DHL), or (d) by facsimile to the facsimile number listed below (provided that a copy of such notice is also delivered within 24 hours to the party by one of the other methods listed herein), with all postage and delivery charges paid by the sender and addressed to the other parties as applicable as set forth below. Said notice addresses are as follows:

If to Taubman:

TRG Forsyth LLC
Attention: Chris B. Heaphy, Esq.
200 E. Long Lake Road
PO Box 200
Bloomfield Hills, MI 48303-0200
Facsimile: 248-258-7586

With a copy to:

Alston & Bird LLP
Attention: Harold Buckley, Jr., Esq.
One Atlantic Center
1201 W. Peachtree Street
Atlanta, GA 30309
Facsimile: 404-253-8498

With a copy to:

Richard J. Burstein, Esq.
Honigman Miller Schwartz and Cohn LLP
38500 Woodward Avenue, Suite 100
Bloomfield Hills, MI 48304-5048
Facsimile: 248-566-8431

If to Forsyth County:

Forsyth County Office of the County Manager
Attention: County Manager
110 East Main Street
Cumming, Georgia 30040
Facsimile: 770-781-2199

With a copy to:

Jarrard & Davis, LLP
Attention: Kenneth E. Jarrard, Esq.
105 Pilgrim Village Drive, Suite 200
Cumming, GA 30040
Facsimile: 678-455-7149

Section 5.2 *Changes to Notified Parties.* Each party to this Agreement may change its address or notified parties by written notice in accordance with the delivery methods specified in Section 4.1 of this Agreement (effective five (5) days after the delivery of written notice thereof). Any communication of notice changes addressed and mailed in accordance with Section 4.1 will be deemed to be given when received. Any notice sent by electronic or facsimile transmission will be deemed to be given when receipt of such transmission is acknowledged via delivery report generated by the sender's facsimile machine. Any communication delivered in person will be deemed to be given when receipted for, or actually received, by the receiving party.

ARTICLE VI DEFAULT

Section 6.1 *Event of Default.* The term "Event of Default", wherever used in this Agreement, shall mean any one or more of the following events, without regard to any grace period or notice and cure period provided or referenced below with respect to any such events:

(A) Any representation or warranty made by any party in this Agreement or in any written statement or document related to the transactions contemplated by this Agreement is false in any material respect; or

(B) Any report, certificate or other document or instrument furnished by any party in relation to the transactions contemplated by this Agreement is false in any material respect, and the party knows such document is false, and fails to promptly report and correct such discrepancy; or

(C) Any failure of a party to this Agreement to comply with any material obligation set forth herein that is not cured within any applicable grace and/or notice and cure periods hereunder.

Section 6.2 *Notice of Default.* Upon the occurrence of an Event of Default, the non-defaulting party shall provide the defaulting party with written notice of such Event of Default pursuant to the provisions of Section 5.1 herein.

Section 6.3 *Default.* Unless the parties have executed a written agreement for the cure of an Event of Default, a party shall be in default under this Agreement (“Default”) if it has not cured an Event of Default within One Hundred Twenty (120) days after receiving notice of the Event of Default pursuant to the provisions of Section 5.1 herein.

Section 6.4 *Forsyth County’s Remedies.* If a Default occurs and is continuing, Forsyth County will be entitled to exercise any and all rights and remedies available under applicable law, including, by way of illustration and not of limitation, the following:

(A) To terminate this Agreement and, without limiting the foregoing, to discontinue funding hereunder; and

(B) To enter upon the Site or any portion thereof without thereby becoming liable to Taubman or any person in possession thereof holding under or claiming under or through Taubman, and achieve Road Completion.

Section 6.5 *Taubman’s Remedies.*

(A) If a Default occurs and is continuing, Taubman will be entitled to exercise any and all rights and remedies available under applicable law, including, by way of illustration and not of limitation, the following:

(i) To terminate this Agreement;

(ii) To obtain specific performance of this Agreement or any element thereof;

(iii) To obtain injunctive relief relating to this Agreement or any element thereof; and

(B) To enter upon the Right-of-Way, or any portion thereof, without thereby becoming liable to Forsyth County and complete the Improvement Construction, or any portion thereof.

(C) Timely completion of the Improvement Construction is critical to the Project’s financial feasibility; and the failure by the County’s contractor to achieve completion of the Improvement Construction by September 22, 2009, shall result in substantial Losses to Taubman. Therefore, Forsyth County agrees to convey all liquidated damages it receives as a result of any delays in completion of the Improvement Construction to Taubman within thirty (30) days of such liquidated damages becoming due and final. Forsyth County will notify Taubman within ten (10) days of its having actual knowledge that the completion of the Improvement Construction may be delayed past September 22, 2009. In the event of a delay in such timely completion of the Improvement Construction, Taubman shall be allowed but not required to participate in all Forsyth County meetings that are scheduled to discuss strategies for timely completion of the Improvement Construction and the parties shall cooperatively create a plan for prompt completion of the Improvement Construction. Forsyth County shall provide Taubman with reasonable advance notification of such meetings. Taubman agrees that its sole financial remedy shall be in liquidated damages as set forth in this Paragraph for any losses occasioned by any failure to meet the September 22, 2009 substantial completion date.

ARTICLE VII MISCELLANEOUS

Section 7.1 *Term of Agreement.* This Agreement will expire on December 31, 2018 or the termination of the Agreement by either of the parties pursuant to a Default, whichever is earlier.

Section 7.2 *Invalidity.* In the event that any provision of this Agreement is held unenforceable in any respect, such unenforceability will not affect any other provision of this Agreement, provided, however, in the event the provision that is deemed to be unenforceable contains a material inducement or material consideration for the remaining terms of this Agreement, the entire Agreement shall be deemed null and void.

Section 7.3 *No Personal Liability.* It is understood and agreed that no present or future consultant, member, agent, partner, director, commissioner, officer or employee of the parties shall be personally liable hereunder or pursuant to any other agreement executed in connection herewith.

Section 7.4 *Governing Law.* This Agreement shall be governed by, and construed in accordance with, the laws of the State of Georgia. Any litigation or action between Taubman and Forsyth County, related to or arising under this Development Agreement shall be brought in the Superior Court of Forsyth County.

Section 7.5 *Amendments.* This Agreement may only be modified or amended in a writing executed by both of the parties hereto.

Section 7.6 *Prior Agreements.* This Agreement supersedes all prior discussions and agreements between Forsyth County and Taubman with respect to the economic incentives described herein, and constitutes the sole and entire agreement between the parties with respect thereto.

Section 7.7 *Successors and Assigns.* This Agreement shall be binding upon, and inure to the benefit of, Taubman and its successors-in-interest to the portion of the Site identified as Sub-Area 1 in the Overlay and assigns. Taubman may assign this Agreement to any entity in which Taubman or any organization in the Taubman family of organizations holds the majority of interests, directly or indirectly, without Forsyth County's consent. No other assignment of this Agreement may occur.

Section 7.8 *Force Majeure.* The obligations of the parties hereto shall be subject to extension by virtue of Force Majeure.

Section 7.9 *Additional Actions.* The parties agree to take all actions, including the execution and delivery of such documents, instruments, petitions, Project approvals and certifications that may be necessary or appropriate, from time to time, to carry out the terms, provisions and intent of this Agreement and to aid and assist each other in carrying out said terms, provisions and intent.

Section 7.10 *Change in Law.* In the event that state or federal laws or regulations enacted subsequent to the effective date of this Agreement and modifying such Agreement or the action or inaction of any other affected governmental jurisdiction to prevent or preclude compliance with one or more provisions of this Agreement or to require changes in plans, maps or permits approved by the County, the parties shall: (1) provide the other party with written notice of such state or federal restriction, provide a copy of such regulation or policy and a statement of conflict with the provisions of this Agreement, and (2) promptly meet and confer with the other party in a good faith and reasonable attempt to modify or suspend this Agreement to comply with such federal or state law or regulation.

Section 7.11 *Dispute Negotiation & Non-Binding Mediation.* If there is a Default by either party or any dispute or disagreement arises in connection with any interpretation of this Agreement, its performance or nonperformance, Taubman and Forsyth County shall make every effort to meet and settle the matter in good faith informally. If Taubman and Forsyth County are unable to achieve an amicable resolution to said dispute or disagreement, the matter will, upon written request of either party, be submitted to non-binding mediation before a mediator acceptable to both parties. The costs of mediation shall be shared equally by Forsyth County and Taubman. If the parties are unable to resolve the dispute during the course of mediation, each shall have the right to pursue the legal remedies set forth in this Agreement.

Section 7.12 *Non-Waiver.* The failure, delay or omission of any party to insist upon strict performance of any term of this Agreement shall not be deemed to be a waiver of any term of this Agreement.

Section 7.13 *Facsimile Signatures.* Signatures to this Agreement transmitted by telecopy shall be valid and effective to bind the party so signing. Each party agrees to promptly deliver an execution original to this Agreement with its actual signature to the other party, but a failure to do so shall not affect the enforceability of this Agreement, it being expressly agreed that each party to this Agreement shall be bound by its own telecopied signature and shall accept the telecopied signature of the other party to this Agreement.

Section 7.14 *Counterparts.* This Agreement may be executed in separate counterparts. It shall be fully executed when each party whose signature is required has signed at least one counterpart even though no one counterpart contains the signatures of all of the parties to this Agreement.

Section 7.15 *Headings.* Headings and captions are for convenience or reference only and shall not affect the construction or interpretation of any provision of this Agreement.

In Witness Whereof, the parties hereto have signed this Agreement under seal the day and year first above written.

TRG FORSYTH LLC, a Delaware limited liability company

By: *Steven Eder*

Name: STEVEN EDER

Title: AUTHORIZED SIGNATORY

Attest: *Jessie K. Miller*

Title: S.R. ASSISTANT

[CORPORATE SEAL]

Sworn to and subscribed before me this 29th day of December, 2008

Katherine A. Beale

NOTARY PUBLIC

My commission expires: 10-13-2012

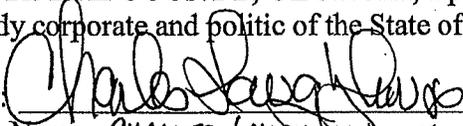
[SEAL]

KATHERINE A. BEALE
NOTARY PUBLIC, STATE OF MI
COUNTY OF OAKLAND
MY COMMISSION EXPIRES Oct 13, 2012
ACTING IN COUNTY OF

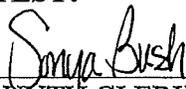
Signatures continued on following page

Signatures continued from preceding page

FORSYTH COUNTY, GEORGIA, a public
body corporate and politic of the State of Georgia

By: 
Name: CHARLES LAUGHLIN HOUSE
Title: CHAIRMAN

ATTEST:


COUNTY CLERK (Seal)

APPROVED AS TO FORM:


FORSYTH COUNTY ATTORNEY

Sworn to and subscribed before
me this 22 day of NOVEMBER 2008

NOTARY PUBLIC
My commission expires

[SEAL]

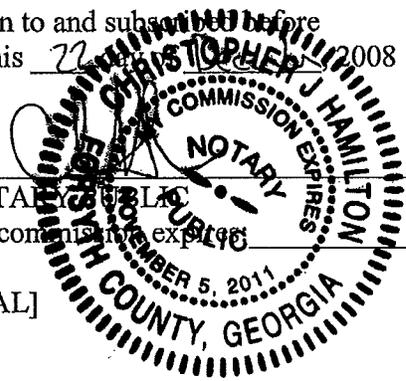


EXHIBIT A (1 of 2)

Site Description
Forsyth County, Georgia

All that tract or parcel of land lying and being in land lots 965, 966, 967, 978, 979, and 980 of the 2nd District, 1st Section, Forsyth County, Georgia, and being more particularly described as follows:

Beginning at a 1-inch crimp top pipe found at the corner common to land lots 907, 908, 965, and 966; Thence continuing with the north line of land lot 965, South 86 degrees 57 minutes 23 seconds East, a distance of 1260.59 feet to a point located at the corner common to land lots 908, 909, 964, and 965; Thence continuing with the east line of land lot 965, South 01 degrees 54 minutes 40 seconds West, a distance of 730.03 feet to a point located in the centerline of Big Creek; Thence departing said land lot line and continuing with said creek centerline the following ten courses:

South 33 degrees 02 minutes 37 seconds West, a distance of 220.95 feet to a point;
South 06 degrees 34 minutes 23 seconds West, a distance of 50.44 feet to a point;
South 42 degrees 11 minutes 33 seconds West, a distance of 189.08 feet to a point;
South 33 degrees 25 minutes 32 seconds West, a distance of 228.00 feet to a point;
South 31 degrees 27 minutes 36 seconds West, a distance of 155.12 feet to a point;
South 39 degrees 12 minutes 22 seconds West, a distance of 114.93 feet to a point;
South 55 degrees 34 minutes 36 seconds West, a distance of 290.29 feet to a point;
South 59 degrees 49 minutes 41 seconds West, a distance of 272.12 feet to a point;
South 60 degrees 26 minutes 46 seconds West, a distance of 267.42 feet to a point;
South 52 degrees 01 minutes 16 seconds West, a distance of 104.03 feet to a point;

Thence departing said creek centerline, North 07 degrees 50 minutes 50 seconds East, a distance of 552.44 feet to a point; Thence North 86 degrees 48 minutes 42 seconds West, a distance of 175.16 feet to a point; Thence North 88 degrees 42 minutes 59 seconds West, a distance of 117.38 feet to a point; Thence North 80 degrees 28 minutes 24 seconds West, a distance of 88.48 feet to a point; Thence North 82 degrees 54 minutes 12 seconds West, a distance of 377.35 feet to a point; Thence North 80 degrees 35 minutes 05 seconds West, a distance of 104.55 feet to a point; Thence North 79 degrees 49 minutes 46 seconds West, a distance of 126.89 feet to a point; Thence North 86 degrees 06 minutes 26 seconds West, a distance of 99.68 feet to a point; thence South 85 degrees 39 minutes 19 seconds West, a distance of 116.62 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 44.47 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 16.99 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 62.89 feet to a point; thence South 89 degrees 26 minutes 36 seconds West, a distance of 16.45 feet to a point; thence South 89 degrees 26 minutes 36 seconds West, a distance of 40.66 feet to a point; thence along a curve to the left, an arc length of 128.21 feet, said curve having a radius of 800.00 feet, with a chord distance of 128.07 feet, at South 24 degrees 00 minutes 17 seconds West; thence South 25 degrees 09 minutes 24 seconds West, a distance of 101.70 feet to a point; thence

EXHIBIT B

Prepared by and when recorded return to:

Joel M. Krugel, Esq.
Honigman Miller Schwartz and Cohn LLP
38500 Woodward Avenue, Suite 100
Bloomfield Hills, MI 48304-5048

STATE OF GEORGIA

COUNTY OF FORSYTH

LIMITED WARRANTY DEED

THIS INDENTURE is made as of the ____ day of _____, 2009, by and between TRG FORSYTH LLC, a Delaware limited liability company ("Grantor"), and FORSYTH COUNTY, a political subdivision of the State of Georgia ("Grantee") ("Grantor" and "Grantee" to include their respective successors, legal representatives and assigns where the context requires or permits).

WITNESSETH:

GRANTOR has granted, bargained, aliened, conveyed and confirmed and does hereby grant, bargain, sell, alien, convey and confirm unto Grantee the following described real property:

ALL THAT TRACT OR PARCEL OR PARCEL of land being more particularly described on Exhibit "B-1" attached hereto and by this reference made a part hereof (the "Land"), together with any and all plants, trees, shrubbery, buildings, structures and improvements thereon (hereinafter collectively referred to as the "Property").

TO HAVE AND TO HOLD the Property, together with all and singular the rights, members and appurtenances thereto, to the same being, belonging, or in anywise appertaining, to the only proper use, benefit and behoof of Grantee forever in FEE SIMPLE, but subject to the following:

- (a) State or Federal regulations affecting the Property, its use or occupancy;
- (b) private, public and utility easements of record or that would be revealed by an accurate survey of the Property or inquiry of the utility companies servicing the Property, and roads and highways;
- (c) covenants, conditions, restrictions, reservations and exceptions of record; and
- (d) such taxes and assessments as may be a lien upon the Property but not due and payable as of the date of this Deed, and taxes and assessments which may be assessed or accrue subsequent to the date of this Deed.

Notwithstanding any warranty which may otherwise be implied from the use of any word, phrase, or clause herein, Grantor warrants title to the Property, subject to the matters referred to above, only against the lawful claims of any person claiming by, through or under Grantor, but not otherwise.

In addition, Grantee, by its receipt and acceptance of this Deed, covenants, agrees, and acknowledges that it takes title to the Property subject to the following restrictions relating to the use, occupancy, and improvement of the Property, which restrictions shall be effective from the date of this Deed, shall run with the land, and shall be enforceable against Grantee, its successors and assigns, as owner of the Property, and shall inure to the benefit of, and be enforceable by, Grantor, its successors and assigns:

- (1) Grantee agrees that the Property may be used for any governmental activity that Forsyth County may lawfully conduct, so long as the Property, irrespective of the use proposed by Forsyth County, shall be deemed by Forsyth County to satisfy all "open space" requirements under the Ronald Reagan/Union Hill Overlay District, as adopted by the Forsyth County Board of Commissioners on April 3, 2008 (the "Overlay") and that no additional areas of "open space" shall be required in connection with the Overlay, now or in the future – so long as the Forsyth County Ronald Reagan/Union Hill Overlay District remains in effect.
- (2) Grantee agrees that the Property shall be included in drainage plans for, and may be improved by Grantor with subsurface drainage facilities (excluding manholes, which may be above ground, and natural drainage swales) to facilitate stormwater runoff from the Overlay. Grantor and Grantee may execute easements to accommodate such drainage facilities, so long as said easements provide Grantee the right to encroach thereon to the fullest extent possible without interfering with the installation, maintenance or operation of the drainage facilities. Grantor shall be responsible for the maintenance, repair, replacement and reconstruction of any such drainage facilities. Grantor and Grantee agree to work together in good faith to minimize as much as possible the physical impact of the drainage facilities on the Property and Grantee's use thereof.
- (3) Grantee agrees that the Property shall be included in stormwater master plans for the Overlay, calculations of credits for on-site stormwater treatment within the Overlay, and calculations of post-development total suspended solids generated within the Overlay.
- (4) Grantee agrees that trees on the Property shall be included in calculations of tree units per acre as required by the Overlay, and in the event that Grantee engages in any tree removal that would conflict with the requirement of tree units per acre under the Overlay, that such action shall have no effect as to the compliance with tree units per acre requirement under the Overlay.

IN WITNESS WHEREOF, Grantor has signed and sealed this Deed, the day and year first above written.

GRANTOR:

Signed, sealed and delivered
in the presence of:

TRG FORSYTH LLC,
a Delaware limited liability company

Witness

By: _____

Its: Authorized Signatory

Notary Public
Commission Expiration Date:

(COMPANY SEAL)

(NOTARY SEAL)

EXHIBIT B-1

Property Description
Proposed Lot, 22.154 Acres
Forsyth County, Georgia

All that tract or parcel of land lying and being in land lots 965, 979, and 980 of the 2nd District, 1st Section, Forsyth County, Georgia, and being more particularly described as follows:

Commencing at a 1-inch crimp top pipe found at the corner common to land lots 907, 908, 965, and 966; Thence continuing with the north line of land lot 965, South 86 degrees 57 minutes 23 seconds East, a distance of 989.70 feet to a point located on the northwesterly proposed right-of-way of Ronald Reagan Boulevard (proposed variable right-of-way); Thence departing said proposed northwesterly right-of-way and continuing with said north line of land lot 965, South 86 degrees 57 minutes 23 seconds East, a distance of 149.93 feet to a point located on the southeasterly proposed right-of-way of Ronald Reagan Boulevard, said point being the **TRUE POINT OF BEGINNING**;

Thence departing said proposed southeasterly right-of-way and continuing with said north line of land lot 965, South 86 degrees 57 minutes 23 seconds East, a distance of 120.97 feet to a point located at the corner common to land lots 908, 909, 964, and 965; Thence continuing with the east line of land lot 965, South 01 degrees 54 minutes 40 seconds West, a distance of 730.03 feet to a point located in the centerline of Big Creek; Thence departing said land lot line and continuing with said creek centerline the following ten courses:

South 33 degrees 02 minutes 37 seconds West, a distance of 220.95 feet to a point;

South 06 degrees 34 minutes 23 seconds West, a distance of 50.44 feet to a point;

South 42 degrees 11 minutes 33 seconds West, a distance of 189.08 feet to a point;

South 33 degrees 25 minutes 32 seconds West, a distance of 228.00 feet to a point;

South 31 degrees 27 minutes 36 seconds West, a distance of 155.12 feet to a point;

South 39 degrees 12 minutes 22 seconds West, a distance of 114.93 feet to a point;

South 55 degrees 34 minutes 36 seconds West, a distance of 290.29 feet to a point;

South 59 degrees 49 minutes 41 seconds West, a distance of 272.12 feet to a point;

South 60 degrees 26 minutes 46 seconds West, a distance of 267.42 feet to a point;

South 52 degrees 01 minutes 16 seconds West, a distance of 104.03 feet to a point;

Thence departing said creek centerline,

North 07 degrees 50 minutes 50 seconds East, a distance of 552.44 feet to a point; Thence

North 07 degrees 40 minutes 33 seconds East, a distance of 240.66 feet to a point; Thence North

53 degrees 39 minutes 35 seconds East, a distance of 188.43 feet to a point; Thence North 40

degrees 43 minutes 28 seconds East, a distance of 100.61 feet to a point; Thence North 13

degrees 20 minutes 39 seconds East, a distance of 122.29 feet to a point; Thence North 87

degrees 25 minutes 32 seconds East, a distance of 202.23 feet to a point; Thence South 82

degrees 19 minutes 27 seconds East, a distance of 324.52 feet to a point; Thence North 50

degrees 48 minutes 56 seconds East, a distance of 241.03 feet to a point; Thence North 27

degrees 14 minutes 43 seconds West, a distance of 170.36 feet to a point; Thence North 13

degrees 24 minutes 24 seconds West, a distance of 39.13 feet to a point; Thence North 20

degrees 08 minutes 44 seconds West, a distance of 65.69 feet to a point; Thence North 22

degrees 51 minutes 24 seconds West, a distance of 52.02 feet to a point; Thence North 22

degrees 02 minutes 27 seconds West, a distance of 33.24 feet to a point; Thence North 17

degrees 13 minutes 09 seconds West, a distance of 31.40 feet to a point; Thence North 25 degrees 49 minutes 18 seconds West, a distance of 37.38 feet to a point; Thence North 14 degrees 43 minutes 31 seconds West, a distance of 36.62 feet to a point; Thence North 24 degrees 32 minutes 45 seconds West, a distance of 16.69 feet to a point located on the southeasterly proposed right-of-way of Ronald Reagan Boulevard;
Thence continuing with said southeasterly proposed right-of-way the following seven courses:
North 48 degrees 35 minutes 16 seconds East, a distance of 41.62 feet to a point;
North 41 degrees 24 minutes 44 seconds West, a distance of 45.00 feet to a point;
North 48 degrees 35 minutes 16 seconds East, a distance of 215.00 feet to a point;
South 41 degrees 24 minutes 44 seconds East, a distance of 45.00 feet to a point;
North 48 degrees 35 minutes 16 seconds East, a distance of 21.00 feet to a point;
North 41 degrees 24 minutes 44 seconds West, a distance of 45.00 feet to a point;
North 48 degrees 35 minutes 16 seconds East, a distance of 223.21 feet to a point,
said point being the TRUE POINT OF BEGINNING.

Said tract of land contains 22.154 acres, more or less, and is the southeasterly portion of Lot Number 2, on the south side of Ronald Reagan Boulevard as depicted on the minor plat for Ronald Reagan / Union Hill Overlay District, Phase I, prepared by GeoSurvey dated April 18, 2008 and recorded November 19, 2008 in Forsyth County Book 124, Pages 79 - 85.

EXHIBIT D

AGREEMENT FOR RESERVED SEWER CAPACITY

THIS AGREEMENT FOR RESERVED SEWER SERVICE, made as of the ____ day of November, 2008 (the "Effective Date"), by and between FORSYTH COUNTY, a political subdivision of the State of Georgia, (herein called "Forsyth") and TRG FORSYTH LLC, a Delaware limited liability company, General Partner (herein called "Developer"); its successors and assigns.

WITNESSETH

WHEREAS, the parties hereto have entered into that Development Agreement Between Forsyth County, Georgia and TRG Forsyth LLC, dated November 20, 2008 (the "Development Agreement"); and

WHEREAS, Developer owns or controls certain property (herein called the "Developer Property") which is shown on Exhibit "D-1" attached hereto and which is located so as to be serviceable by sewer capacity to be supplied by Forsyth; and

WHEREAS, Forsyth desires to sell and reserve to Developer, and Developer desires to purchase and reserve from Forsyth 620,000 gallons per day of sewage treatment capacity subject to various price constraints as further detailed in the Development Agreement; and

WHEREAS, Forsyth has authority to enter into this Agreement under the provisions of Paragraph III of Section 11 of Article IX of the Constitution of Georgia.

NOW, THEREFORE, for mutual consideration and the covenants hereinafter set forth, Forsyth and Developer, intending to be legally bound hereby agree as follows:

1. In consideration of Developer's payment of \$10.00 and future guarantee and promise to pay to Forsyth Four Hundred Fifty Thousand Dollars (\$450,000.00) (the "Advance Payment"), Forsyth does hereby reserve to Developer 620,000 gallons per day of sewage treatment capacity (herein called the "Developer Reserved Capacity"). The Advance Payment also represents a tap-on fee for 30,000 gallons per day (GPD) of the Developer Reserved Capacity, thereby resulting in the Developer having 590,000 GPD of reserved but unpurchased sewer capacity. The terms of this Sewer Reservation shall be in accordance with and

subject to the terms of the Development Agreement, which is incorporated herein by reference, and to the extent any provision within this Sewer Reservation Agreement conflicts with the Development Agreement, the Development Agreement shall control. The right of the Developer to purchase additional allotments of the Developer Reserved Capacity is controlled by, and shall be subject to the financial terms and conditions of the Development Agreement. Developer shall have the right to assign portions of the Developer Reserved Capacity to owners, users and/or developers of parcels within the Developer Property.

2. Upon payment by Developer of the Advance Payment, Developer shall be entitled to tap onto and connect to, and Forsyth shall permit Developer's connection to Forsyth's sewage collection and treatment system for the treatment of 30,000 GPD of sewer. In addition, Forsyth shall ensure that there is sufficient capacity in its sewer treatment plants, sewer pump stations, and sewer lines to accommodate and reserve the Developer Reserved Capacity. Forsyth shall take no action, either affirmatively or by failing to act, that would prevent the Developer from using the full Developer Reserved Capacity at any time after the Developer, or its assignee, has paid the Advance Payment.

3. Forsyth shall construct and pay all costs for sewer system improvements required under the Development Agreement and the temporary easement agreement, dated August 29, 2008, executed by the parties to this Agreement. Developer shall pay, or cause to be paid, all costs associated with private party connections to the sewer improvements required under the Development Agreement. Any public sanitary sewer systems installed, or caused to be installed by the Developer shall be constructed in accordance with all applicable state and local laws, ordinances, regulations and rules and shall be subject to the review and approval of the plans and specifications by Forsyth and subject to inspection and approval by Forsyth of the installation of said systems. Upon completion by the Developer and approval by Forsyth of said sanitary sewer systems and easements according to Forsyth's requirements, such sewer systems and easements shall, within six (6) months after approval, be submitted to Forsyth for dedication and, upon acceptance by Forsyth, (which shall not be unreasonably withheld), shall become part of Forsyth's sewer system.

4. Forsyth acknowledges and agrees that Developer shall have no liability to Forsyth for the failure of any third party to do or perform any act, including, without limitation, any failure by a third party to pay the cost of Sewer Construction.

5. Forsyth and Developer understand and agree that there is presently a limited amount of sewer capacity available to Forsyth. Forsyth and Developer understand and agree that so long as the present sewer capacity shortfall exists, Developer will furnish status reports to Forsyth at the end of forty-eight (48) months from the date hereof and at twelve (12) month intervals thereafter which show the status of utilization of the Developer Reserved Capacity. These reports shall be in sufficient detail to show the status of contracts, closings, construction and occupancy dates. In the event that the reimbursement provisions of Section 4.6 of the Development Agreement are triggered, the Developer acknowledges that any reserved, but uncommitted sewer capacity under this Sewer Reservation Agreement shall be forfeit, and shall immediately revert to the ownership and control of Forsyth County with no affirmative action required by either Party.

6. If any phrase, clause, sentence, paragraph or section of this Agreement shall be declared or judged invalid or unconstitutional, such adjudication shall in no manner affect the other phrases, clauses, sentences, paragraphs or sections of this Agreement, which shall remain in full force and effect as if the phrase, clause, sentence, paragraph or section of the Agreement so declared or adjudicated invalid or unconstitutional was not originally a part hereof.

7. In the event that re-use water becomes available the Developer agrees to use re-use water on any common areas needing irrigation. The Developer also agrees to allow Forsyth to irrigate on any unused property within the Development provided that it does not interfere with the Development. The Developer may install re-use lines and take flow back for irrigation where appropriate as a condition of this sewer agreement.

Signatures begin on following page

IN WITNESS WHEREOF, the fully authorized officials of Forsyth County and the fully authorized officers of the Developer have respectively caused this Agreement to be entered into on behalf of Forsyth County and Developer and the seals of Forsyth County and Developer to be affixed hereto on the date and year first above written.

TRG FORSYTH LLC, a Delaware limited liability company

By: _____

Name: _____

Title: _____

Attest: _____

Title: _____

[CORPORATE SEAL]

Sworn to and subscribed before
me this ____ day of _____, 2008

NOTARY PUBLIC

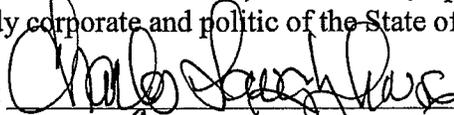
My commission expires: _____

[SEAL]

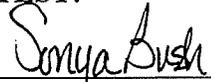
Signatures continued on following page

Signatures continued from preceding page

FORSYTH COUNTY, GEORGIA, a public
body corporate and politic of the State of Georgia

By: 
Name: CHARLES LAUGHINGHOUSE
Title: CHAIRMAN

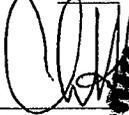
ATTEST:


COUNTY CLERK (Seal)

APPROVED AS TO FORM:


FORSYTH COUNTY ATTORNEY

Sworn to and subscribed before
me this 22 day of October, 2008


NOTARY PUBLIC
My commission expires _____

[SEAL]

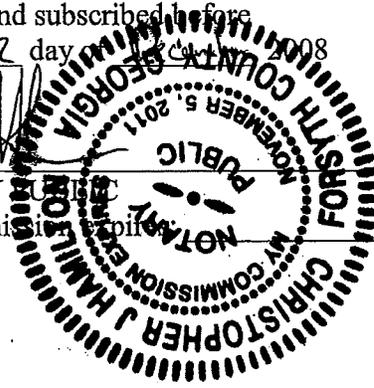


Exhibit D-1

Site Description Forsyth County, Georgia

All that tract or parcel of land lying and being in land lots 965, 966, 967, 978, 979, and 980 of the 2nd District, 1st Section, Forsyth County, Georgia, and being more particularly described as follows:

Beginning at a 1-inch crimp top pipe found at the corner common to land lots 907, 908, 965, and 966; Thence continuing with the north line of land lot 965, South 86 degrees 57 minutes 23 seconds East, a distance of 1260.59 feet to a point located at the corner common to land lots 908, 909, 964, and 965; Thence continuing with the east line of land lot 965, South 01 degrees 54 minutes 40 seconds West, a distance of 730.03 feet to a point located in the centerline of Big Creek; Thence departing said land lot line and continuing with said creek centerline the following ten courses:

South 33 degrees 02 minutes 37 seconds West, a distance of 220.95 feet to a point;
South 06 degrees 34 minutes 23 seconds West, a distance of 50.44 feet to a point;
South 42 degrees 11 minutes 33 seconds West, a distance of 189.08 feet to a point;
South 33 degrees 25 minutes 32 seconds West, a distance of 228.00 feet to a point;
South 31 degrees 27 minutes 36 seconds West, a distance of 155.12 feet to a point;
South 39 degrees 12 minutes 22 seconds West, a distance of 114.93 feet to a point;
South 55 degrees 34 minutes 36 seconds West, a distance of 290.29 feet to a point;
South 59 degrees 49 minutes 41 seconds West, a distance of 272.12 feet to a point;
South 60 degrees 26 minutes 46 seconds West, a distance of 267.42 feet to a point;
South 52 degrees 01 minutes 16 seconds West, a distance of 104.03 feet to a point;

Thence departing said creek centerline, North 07 degrees 50 minutes 50 seconds East, a distance of 552.44 feet to a point; Thence North 86 degrees 48 minutes 42 seconds West, a distance of 175.16 feet to a point; Thence North 88 degrees 42 minutes 59 seconds West, a distance of 117.38 feet to a point; Thence North 80 degrees 28 minutes 24 seconds West, a distance of 88.48 feet to a point; Thence North 82 degrees 54 minutes 12 seconds West, a distance of 377.35 feet to a point; Thence North 80 degrees 35 minutes 05 seconds West, a distance of 104.55 feet to a point; Thence North 79 degrees 49 minutes 46 seconds West, a distance of 126.89 feet to a point; Thence North 86 degrees 06 minutes 26 seconds West, a distance of 99.68 feet to a point; thence South 85 degrees 39 minutes 19 seconds West, a distance of 116.62 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 44.47 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 16.99 feet to a point; thence South 85 degrees 47 minutes 05 seconds West, a distance of 62.89 feet to a point; thence South 89 degrees 26 minutes 36 seconds West, a distance of 16.45 feet to a point; thence South 89 degrees 26 minutes 36 seconds West, a distance of 40.66 feet to a point; thence along a curve to the left, an arc length of 128.21 feet, said curve having a radius of 800.00 feet, with a chord distance of 128.07 feet, at South 24 degrees 00 minutes 17 seconds West; thence South 25 degrees 09 minutes 24 seconds West, a distance of 101.70 feet to a point; thence South 18 degrees 39 minutes 49 seconds West, a distance of 98.06 feet to a point; thence South 18 degrees 39 minutes 55 seconds West, a

distance of 15.43 feet to a point; thence South 61 degrees 23 minutes 40 seconds West, a distance of 61.86 feet to a point; thence South 18 degrees 17 minutes 38 seconds West, a distance of 100.00 feet to a point; thence South 25 degrees 55 minutes 59 seconds East, a distance of 62.90 feet to a point; thence South 14 degrees 04 minutes 29 seconds West, a distance of 110.51 feet to a point; thence South 18 degrees 17 minutes 38 seconds West, a distance of 140.62 feet to a point; thence along a curve to the right, an arc length of 144.46 feet, said curve having a radius of 697.00 feet, with a chord distance of 144.21 feet, at South 24 degrees 13 minutes 54 seconds West; thence South 40 degrees 46 minutes 58 seconds West, a distance of 92.78 feet to a point; thence along a curve to the right, an arc length of 72.26 feet, said curve having a radius of 686.00 feet, with a chord distance of 72.22 feet, at South 40 degrees 49 minutes 35 seconds West; thence North 78 degrees 09 minutes 01 seconds West, a distance of 79.51 feet to a point; thence South 52 degrees 21 minutes 43 seconds West, a distance of 99.92 feet to a point; thence South 15 degrees 04 minutes 51 seconds West, a distance of 93.52 feet to a point; thence along a curve to the right, an arc length of 58.46 feet, said curve having a radius of 686.00 feet, with a chord distance of 58.44 feet, at South 65 degrees 14 minutes 55 seconds West; thence South 67 degrees 41 minutes 23 seconds West, a distance of 123.86 feet to a point; thence South 73 degrees 58 minutes 01 seconds West, a distance of 100.60 feet to a point; thence South 67 degrees 41 minutes 23 seconds West, a distance of 120.00 feet to a point; thence North 72 degrees 34 minutes 00 seconds West, a distance of 87.02 feet to a point on the easterly right-of-way of Union Hill Road; thence along said easterly line, North 30 degrees 24 minutes 40 seconds West, a distance of 96.18 feet to a point; thence North 68 degrees 33 minutes 41 seconds East, a distance of 15.00 feet to a point; thence North 21 degrees 26 minutes 19 seconds West, a distance of 20.00 feet to a point; thence South 68 degrees 33 minutes 41 seconds West, a distance of 15.00 feet to a point; thence North 21 degrees 26 minutes 19 seconds West, a distance of 66.00 feet to a point; thence North 14 degrees 35 minutes 47 seconds West, a distance of 100.71 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 125.60 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 53.39 feet to a point; thence North 21 degrees 26 minutes 20 seconds West, a distance of 77.87 feet to a point; thence South 68 degrees 33 minutes 40 seconds West, a distance of 12.00 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 127.13 feet to a point; thence North 13 degrees 36 minutes 36 seconds West, a distance of 31.22 feet to a point; thence North 13 degrees 35 minutes 30 seconds West, a distance of 101.38 feet to a point; thence along a curve to the right, an arc length of 408.93 feet, said curve having a radius of 1740.00 feet, with a chord distance of 407.99 feet, at North 11 degrees 17 minutes 18 seconds West; thence with a compound curve to the right, an arc length of 103.41 feet, said curve having a radius of 1740.00 feet, with a chord distance of 103.39 feet, at North 02 degrees 51 minutes 12 seconds West; thence South 88 degrees 50 minutes 57 seconds West, a distance of 9.58 feet to a point; thence North 00 degrees 11 minutes 13 seconds East, a distance of 250.49 feet to a point; thence North 03 degrees 24 minutes 04 seconds East, a distance of 198.20 feet to a point; thence North 12 degrees 10 minutes 22 seconds East, a distance of 204.15 feet to a point; thence North 05 degrees 28 minutes 21 seconds East, a distance of 176.84 feet to a point; thence North 20 degrees 46 minutes 52 seconds East, a distance of 108.76 feet to a concrete monument found, located at the intersection of the easterly right-of-way of said Union Hill road with the southeasterly right-of-way of Georgia Highway 400 (variable right-of-way); Thence departing said right-of-way of Union Hill Road and continuing with said southeasterly

right-of-way of Georgia Highway 400 the following three courses: North 62 degrees 45 minutes 18 seconds East, a distance of 594.71 feet to a concrete monument found; North 54 degrees 05 minutes 13 seconds East, a distance of 293.98 feet to a concrete monument found; North 52 degrees 32 minutes 39 seconds East, a distance of 128.18 feet to a 1/2-inch rebar found located on the north line of land lot 967; Thence departing said right-of-way of Georgia Highway 400 and continuing with said north line of land lot 967, South 89 degrees 21 minutes 04 seconds East, a distance of 394.24 feet to a 1-inch iron pin found at the corner common to land lots 906, 907, 966, and 967; Thence continuing with the north line of land lot 966, South 89 degrees 38 minutes 53 seconds East, a distance of 570.00 feet to a 1/2-inch rebar found; Thence South 89 degrees 38 minutes 53 seconds East, a distance of 897.22 feet to a 1-inch crimp top pipe found, said 1-inch crimp top pipe found being the **TRUE POINT OF BEGINNING**.

Said tract of land contains 160.00 Acres.

South 18 degrees 39 minutes 49 seconds West, a distance of 98.06 feet to a point; thence South 18 degrees 39 minutes 55 seconds West, a distance of 15.43 feet to a point; thence South 61 degrees 23 minutes 40 seconds West, a distance of 61.86 feet to a point; thence South 18 degrees 17 minutes 38 seconds West, a distance of 100.00 feet to a point; thence South 25 degrees 55 minutes 59 seconds East, a distance of 62.90 feet to a point; thence South 14 degrees 04 minutes 29 seconds West, a distance of 110.51 feet to a point; thence South 18 degrees 17 minutes 38 seconds West, a distance of 140.62 feet to a point; thence along a curve to the right, an arc length of 144.46 feet, said curve having a radius of 697.00 feet, with a chord distance of 144.21 feet, at South 24 degrees 13 minutes 54 seconds West; thence South 40 degrees 46 minutes 58 seconds West, a distance of 92.78 feet to a point; thence along a curve to the right, an arc length of 72.26 feet, said curve having a radius of 686.00 feet, with a chord distance of 72.22 feet, at South 40 degrees 49 minutes 35 seconds West; thence North 78 degrees 09 minutes 01 seconds West, a distance of 79.51 feet to a point; thence South 52 degrees 21 minutes 43 seconds West, a distance of 99.92 feet to a point; thence South 15 degrees 04 minutes 51 seconds West, a distance of 93.52 feet to a point; thence along a curve to the right, an arc length of 58.46 feet, said curve having a radius of 686.00 feet, with a chord distance of 58.44 feet, at South 65 degrees 14 minutes 55 seconds West; thence South 67 degrees 41 minutes 23 seconds West, a distance of 123.86 feet to a point; thence South 73 degrees 58 minutes 01 seconds West, a distance of 100.60 feet to a point; thence South 67 degrees 41 minutes 23 seconds West, a distance of 120.00 feet to a point; thence North 72 degrees 34 minutes 00 seconds West, a distance of 87.02 feet to a point on the easterly right-of-way of Union Hill Road; thence along said easterly line, North 30 degrees 24 minutes 40 seconds West, a distance of 96.18 feet to a point; thence North 68 degrees 33 minutes 41 seconds East, a distance of 15.00 feet to a point; thence North 21 degrees 26 minutes 19 seconds West, a distance of 20.00 feet to a point; thence South 68 degrees 33 minutes 41 seconds West, a distance of 15.00 feet to a point; thence North 21 degrees 26 minutes 19 seconds West, a distance of 66.00 feet to a point; thence North 14 degrees 35 minutes 47 seconds West, a distance of 100.71 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 125.60 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 53.39 feet to a point; thence North 21 degrees 26 minutes 20 seconds West, a distance of 77.87 feet to a point; thence South 68 degrees 33 minutes 40 seconds West, a distance of 12.00 feet to a point; thence North 21 degrees 26 minutes 21 seconds West, a distance of 127.13 feet to a point; thence North 13 degrees 36 minutes 36 seconds West, a distance of 31.22 feet to a point; thence North 13 degrees 35 minutes 30 seconds West, a distance of 101.38 feet to a point; thence along a curve to the right, an arc length of 408.93 feet, said curve having a radius of 1740.00 feet, with a chord distance of 407.99 feet, at North 11 degrees 17 minutes 18 seconds West; thence with a compound curve to the right, an arc length of 103.41 feet, said curve having a radius of 1740.00 feet, with a chord distance of 103.39 feet, at North 02 degrees 51 minutes 12 seconds West; thence South 88 degrees 50 minutes 57 seconds West, a distance of 9.58 feet to a point; thence North 00 degrees 11 minutes 13 seconds East, a distance of 250.49 feet to a point; thence North 03 degrees 24 minutes 04 seconds East, a distance of 198.20 feet to a point; thence North 12 degrees 10 minutes 22 seconds East, a distance of 204.15

feet to a point; thence North 05 degrees 28 minutes 21 seconds East, a distance of 176.84 feet to a point; thence North 20 degrees 46 minutes 52 seconds East, a distance of 108.76 feet to a concrete monument found, located at the intersection of the easterly right-of-way of said Union Hill road with the southeasterly right-of-way of Georgia Highway 400 (variable right-of-way); Thence departing said right-of-way of Union Hill Road and continuing with said southeasterly right-of-way of Georgia Highway 400 the following three courses: North 62 degrees 45 minutes 18 seconds East, a distance of 594.71 feet to a concrete monument found; North 54 degrees 05 minutes 13 seconds East, a distance of 293.98 feet to a concrete monument found; North 52 degrees 32 minutes 39 seconds East, a distance of 128.18 feet to a 1/2-inch rebar found located on the north line of land lot 967; Thence departing said right-of-way of Georgia Highway 400 and continuing with said north line of land lot 967, South 89 degrees 21 minutes 04 seconds East, a distance of 394.24 feet to a 1-inch iron pin found at the corner common to land lots 906, 907, 966, and 967; Thence continuing with the north line of land lot 966, South 89 degrees 38 minutes 53 seconds East, a distance of 570.00 feet to a 1/2-inch rebar found; Thence South 89 degrees 38 minutes 53 seconds East, a distance of 897.22 feet to a 1-inch crimp top pipe found, said 1-inch crimp top pipe found being the **TRUE POINT OF BEGINNING.**

Said tract of land contains 160.00 Acres.

Comparison of Premium and Standard Development Options for the
Taubman Development in Forsyth County

Fiscal Impact Analysis

Study Objectives

- Review key assumptions and methodology of Economic Research Associates' (ERA) projections of impact
- Expand ERA analysis to include:
 - All costs and revenues relevant to Forsyth County
 - Impacts associated with new population from employment and new residential construction

Review of Assumptions

- Critical assumptions:
 - Retail sales per square foot
 - Assessed values of constructed property
 - Continuation of SPLOST
- Non-critical assumptions
 - Persons per new household
 - New employee commuting patterns
 - New students per new household

Review of Assumptions

- Scenarios to investigate sensitivity to critical assumptions
 - SPLOST not re-authorized in 2012
 - Higher standard development sales per sq. ft.
 - Lower premium development sales per sq. ft.
- Verified that results are not critical to other assumptions

Fiscal Impact Methodology

- Examine fiscal structure of Forsyth County
- Estimate demographic impacts
- Estimate drivers for “standard” and “premium” development

Fiscal Impact Methodology

- Calculate fiscal impacts for **standard** and **premium** using 2006 for base year
- Using ERA-supplied phasing schedule, develop 10- and 20-year projections
- Calculate present values for each scenario and time horizon
- Some results in terms of difference between **standard** and **premium** developments

Results

- Demographics in terms of:
 - Income
 - Employment
 - Population
- Fiscal impact summary by scenario:
 - Base Case (ERA assumptions)
 - SPLOST not re-authorized
 - Worst case

Elements of Each Scenario

- Base Case (ERA assumptions)
 - SPLOST is re-authorized continually
- SPLOST not re-authorized
 - Sales per square foot as specified by ERA
- Worst Case Scenario
 - No SPLOST re-authorization
 - Higher “Standard Development” retail sales
 - Lower (by 20%) “Premium Development” sales
 - Presented as a lower-bound of possible

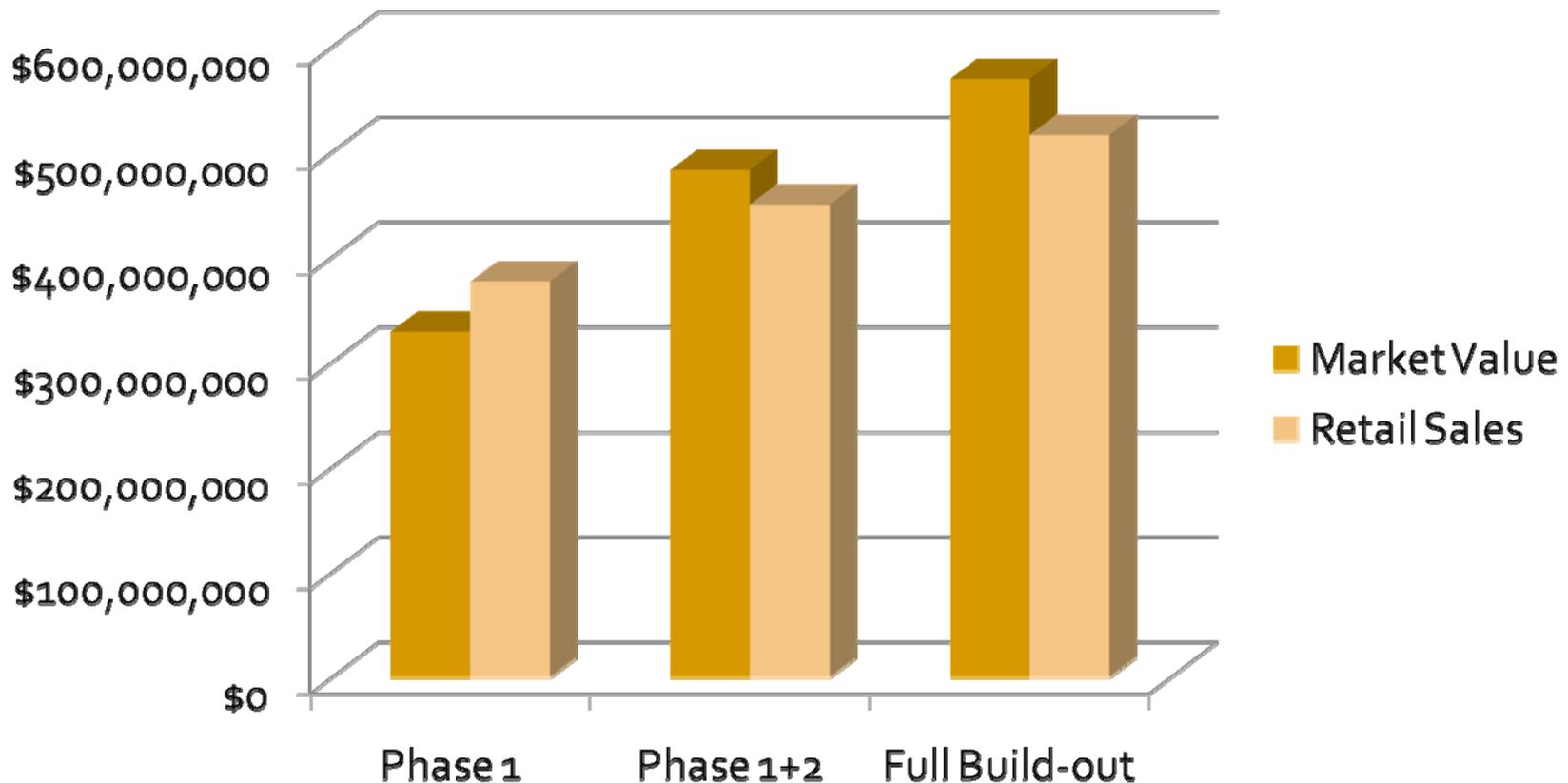
Demographics: Premium Only

	Phase I	Phase II	Phase III	Total
Employment	4,178	2,275	1,389	7,842
Population				
From Employment	3,913	2,130	1,301	7,344
From Residential Development	<u>750</u>	<u>600</u>	<u>400</u>	<u>1,750</u>
Total				
Population	4,663	2,730	1,701	9,094
Income				
To Resident Employees	\$148,440,643	\$107,971,929	\$73,374,250	\$329,786,821
To Residents of Development	<u>\$ 25,143,211</u>	<u>\$ 20,114,569</u>	<u>\$13,409,713</u>	<u>\$ 58,667,493</u>
Total Income	\$173,583,854	\$128,086,498	\$86,783,963	\$388,454,315

Demographics: Premium - Standard

	Phase I	Phase II	Phase III	Total
Employment	2,838	192	189	3,219
Population				
From Employment	2,658	180	177	3,015
From Residential Development	<u>0</u>	<u>600</u>	<u>400</u>	<u>1,000</u>
Total Population	2,658	780	577	4,015
Income				
To Resident Employees	\$99,259,100	\$22,693,371	\$8,214,250	\$130,166,721
To Residents of Development	<u>\$0</u>	<u>\$20,114,569</u>	<u>\$13,409,713</u>	<u>\$33,524,282</u>
Total Income	\$94,259,100	\$42,807,940	\$21,623,963	\$163,691,003

Base Case – Market Value & Retail Sales (Premium – Standard)



Project Overview: Base Case

Full Build

	Phase I	Phase I + II	out
Standard Development			
Market Value	\$111,349,500	\$255,805,000	\$345,157,500
Retail Sales	\$39,584,440	\$90,943,236	\$94,412,986
Premium Development			
Market Value	\$440,592,000	\$739,028,000	\$914,860,000
Retail Sales	\$416,693,760	\$541,199,400	\$610,793,610
Net (Premium – Standard)			
Market Value	\$329,242,500	\$483,223,000	\$569,702,500
Retail Sales	\$377,109,320	\$450,256,164	\$516,380,624

Project Overview: Property Taxes

Full Build

	Phase I	Phase I + II	out
Standard Development (Total)	2,809,571	6,258,834	8,073,662
County	727,468	1,620,568	2,090,473
School	2,082,103	4,638,265	5,983,189
Premium Development (Total)	11,183,993	16,668,304	19,758,853
County	2,895,815	4,315,840	5,116,061
School	8,288,178	12,352,464	14,642,792
Net (Premium – Standard Total)	8,374,422	10,409,470	11,685,190
County	2,168,347	2,695,272	3,025,588
School	6,206,075	7,714,198	8,659,603

Project Overview: Sales Taxes

Full Build

	Phase I	Phase I + II	out
Standard Development			
Total Sales			
Taxes	\$1,409,501	\$3,496,414	\$4,678,443
County Gov	\$914,940	\$2,012,651	\$2,189,599
School System	\$494,562	\$1,483,764	\$2,488,844
Premium Development			
Total Sales			
Taxes	\$12,414,814	\$16,365,718	\$18,598,399
Sales Taxes	\$8,058,739	\$10,623,361	\$12,064,646
School System	\$4,356,075	\$5,742,357	\$6,533,753
Net (Premium – Standard)			
Total Sales			
Taxes	\$11,005,312	\$12,869,304	\$13,919,956
Sales Taxes	\$7,143,799	\$8,610,710	\$9,875,047
School System	\$3,861,513	\$4,258,594	\$4,044,909

Focus on Education – Base Case

Full Build-out

	Standard	Premium	Net
New Students	771	1,349	578
Educational Costs	\$3,279,122	\$5,738,805	\$2,459,683
Property Taxes	\$6,086,402	\$14,759,016	\$8,672,614
ELOST	<u>\$2,488,844</u>	<u>\$6,533,753</u>	<u>\$4,044,909</u>
Total	\$8,575,246	\$21,292,768	\$12,717,523

Fiscal Impact Summary: Present Values (Premium – Standard)

Base Case		10-Year	20-Year
Forsyth County Government		\$96,645,866	\$179,361,633
Forsyth County School System		\$86,748,096	\$153,674,647
SPLOST Ends	Total	\$183,393,962	\$333,036,280
2013		10-Year	20-Year
Forsyth County Government		\$61,459,071	\$109,181,116
Forsyth County School System		\$86,748,096	\$153,674,647
Total		\$148,207,167	\$262,855,763
Worst Case		10-Year	20-Year
Forsyth County Government		\$48,993,873	\$88,241,518
Forsyth County School System		\$71,211,590	\$124,370,938
Total		\$120,205,463	\$212,612,456

Fiscal Impact Summary: Present Values (Premium)

Base Case		10-Year	20-Year
Forsyth County Government		\$155,408,216	\$340,811,078
		<u>\$121,950,733</u>	<u>\$223,637,725</u>
		\$277,358,949	\$564,448,804
Forsyth County School System			
SPLOST Ends	Total	10-Year	20-Year
2013		\$63,620,982	\$117,348,702
Forsyth County Government		<u>\$121,950,733</u>	<u>\$223,637,725</u>
Forsyth County School System		\$185,571,715	\$340,986,427
Total			
Worst Case		10-Year	20-Year
Forsyth County Government		\$53,799,491	\$98,814,566
Forsyth County School System		<u>\$110,396,038</u>	<u>\$201,832,861</u>
Total		\$164,195,530	\$300,647,426

Scenario Results – County

Difference between Premium and Standard Development



Scenario Results – School System

Difference between Premium and Standard Development



Some Considerations

- No scenarios are meant to imply that large surpluses will accumulate in Forsyth County budget
 - Some (LOST) will reduce resident's property taxes
 - Some (SPLOST) are earmarked for capital projects
- Assumes displacement is minimal

lot corrals are allowed.

- (6) Walls or fences, required or otherwise, when visible from the right-of-way shall complement the exterior materials of the primary structure on site. Tarps and banner signs shall not be attached to fencing material.
- (7) Chain link fencing is prohibited on SR 141/Peachtree Parkway frontage. Chain link fencing may be allowed along the sides and rear of property fronting SR 141/Peachtree Parkway if it is screened with evergreen trees, shrubs, and/or decorative fencing for the full length and height of the fence.

21.8-7 **Signage.** This section establishes minimum standards to promote and ensure a cohesive and unified identification program within the overlay district. A detailed signage plan is required to be submitted that addresses and conforms to all provisions set forth in this section. The signage plan shall address sign dimensions, materials, height, color scheme, lighting, and location of each sign on the building and on the ground. In addition to Ordinance 74 (Sign Ordinance), the following shall apply:

- (A) Freestanding sign structure/base materials shall match the principal building material.
- (B) Wall signs shall not cover architectural features or details, and not extend beyond the roof line or outer edges of the building.
- (C) Where there is more than one sign on a site, signs shall be complementary to each other in shape and related components and type of construction materials.
- (D) Any exterior light source shall be completely shielded and directed solely on the sign and not upon any other object or adjacent properties.
- (E) Wall mounted raceways shall be painted to match the adjoining wall surface.

ARTICLE IX, RONALD REAGAN/UNION HILL OVERLAY DISTRICT

21-9.1 **Purpose.** The purpose and intent of the Forsyth County Board of Commissioners (the "Commission") in establishing this overlay district is as follows:

- (A) To support flexibility and innovation for regional mixed-use developments encompassing more than 150 acres of land through the complementary integration of office, retail, restaurants, commercial, entertainment, hotel, residential, and recreational land uses;
- (B) To encourage pedestrian circulation, integrate open space, and create a regional retail and mixed-use development.
- (C) To enhance the long term economic viability of the southern portion of Forsyth County by encouraging regional retail and mixed-use development that increases the tax base and generates a substantial employment base;
- (D) To foster a more balanced relationship between commercial and residential growth to ensure a stable and healthy tax base in Forsyth County, and
- (E) To encourage an efficient and sustainable community development plan.

21-9.2 **Boundaries and Description of Area.** The boundaries of the approximate 164-acre Ronald Reagan/Union Hill Overlay District (the "Overlay") shall be as shown on the Official Overlay District Map of Forsyth County, as established and adopted pursuant to Section 9-1.4 of the Forsyth County Unified Development Code (the "UDC"). All property within the Overlay shall be developed simultaneously or in phases in accordance with this Article and generally in accordance with the master development plan for the Overlay attached hereto and incorporated herein by reference (the "Plan"). The Plan is intended to provide a conceptual context in which property within the Overlay may be developed in accordance with this Article. The reassignment of land uses for buildings depicted on the Plan shall not require a formal plan amendment unless such land use reassignment constitutes a major plan amendment, as set forth in Section 21-9.10 of this Article. Approval of a sketch plat, as set forth in Chapter 8, Article V of the UDC, or any other similar site plan approval shall not be required for new development within the Overlay.

21-9.3 **Relationship to Underlying Zoning and Other Regulations.** The provisions of this Article are supplemental to the zoning district in which the property is located. All properties within the boundaries of the Overlay shall meet the development requirements of the underlying CBD zoning district, or other zoning district if the CBD zoning district is changed for the property, or zoning conditions specific to the property or as such may be amended, and in addition shall meet all of the provisions of this Article. The provisions of this Article shall be the only overlay provisions applicable within the boundaries of the Overlay. In the event of a conflict or inconsistency between the provisions of this Article and any other provision of the UDC, applicable conditional use permits, the Forsyth County Tree Protection and Replacement Ordinance (the "Tree Ordinance"), the Forsyth County Sign

Ordinance (the “Sign Ordinance”) or applicable site-specific zoning conditions, this Article shall govern the development of the property within the boundaries of the Overlay.

21-9.4 **Sub-Area 1 (Regional Mixed-Use).** This sub-area is intended to provide a high density, regionally-marketed retail and mixed-use development as identified on the Plan.

(A) Permitted Uses

- (1) All uses permitted under CBD (Commercial Business District) zoning, subject to Section 21-9.8(O) of this Article.
- (2) Multi-family dwelling units, not to exceed 400 units, subject to the aggregate residential density restrictions set forth in section 21-9.8 of this Article. Each unit shall contain a minimum heated floor space of 900 square feet, except the one-bedroom units shall contain a minimum heated floor space of 600 square feet.
- (3) Ground level retail trade establishments in multi-story buildings otherwise occupied by residential or office uses.

(B) Building Height Limits

- (1) Buildings containing office, hotel and/or residential uses may also include parking uses and shall be limited to a maximum of twelve (12) occupiable stories, not to exceed a maximum height of 180 feet.
- (2) Parking decks shall be limited to a maximum height of eight (8) levels.

(C) Buffers and Setbacks

- (1) Setback and Visual Buffer from Georgia Highway 400.
A minimum building setback of sixty (60) feet from the right-of-way from Georgia Highway 400 must be maintained with the first forty (40) feet being a visual buffer. Grading, drainage, and tree plantings may be performed within the visual buffer as long as the disturbed area is replanted to Forsyth County Buffer Standards.
- (2) Minimum landscape strips and frontage planting strips required by the UDC shall not be required along or adjacent to property lines or lease lines. Landscape strips and frontage planting strips shall not be required along any property line or lease line where existing or proposed buildings are, or will be, constructed directly abutting both sides of a common property line or lease line. The purpose of this provision is to allow for a continuous building façade across property lines that would otherwise be interrupted by a landscape strip.
- (3) Minimum building setbacks required by the UDC shall not be required along or adjacent to property lines or lease lines. Building setbacks shall not be required along any property line or lease line where existing or proposed buildings are, or will be, constructed directly abutting both sides of a common property line or lease line. The purpose of this provision is to allow for a continuous building façade across property lines that would otherwise be interrupted by a building setback.

21-9.5 **Sub-Area 2 (Village Commercial and Mixed-Use).** This sub-area is intended to provide for a mix of community scale uses that may include office, hotel, commercial, retail, drug store, bank, restaurant, residential, and recreational land uses as identified on the Plan.

(A) Permitted Uses

- (1) All uses permitted under CBD (Commercial Business District) zoning, subject to Section 21-9.8(O) of this Article.
- (2) Ground level retail trade establishments in multi-story buildings otherwise occupied by residential or office uses.
- (3) Multi-family dwelling units, not to exceed 300 units, subject to the aggregate residential density restrictions set forth in section 21-9.8 of this Article. Each unit shall contain a minimum heated floor space of 900 square feet, except the one-bedroom units shall contain a minimum heated floor space of 600 square feet.

(B) Building Height Limits

- (1) Hotels on parcels located within 600 feet of Union Hill Road shall be limited to a maximum height of eight (8) occupiable stories, not to exceed a maximum height of 130 feet. All other buildings may include parking facilities and shall be limited to a maximum of six (6) occupiable stories, not to exceed a maximum height above grade of 90 feet, exclusive of any integrated parking levels.
- (2) Parking decks shall be limited to a maximum height of four (4) levels.

21-9.6 **Sub-Area 3 (Residential with Limited Commercial).** This sub-area is intended to maximize the diversity of housing choices within the Overlay by providing a more traditional multi-family residential community node with limited commercial to include retail, bank, drug store, restaurant, and/or office uses, as identified on the Plan.

(A) Permitted Uses

- (1) All uses permitted under CBD (Commercial Business District) zoning, subject to Section 21-9.8(O) of this Article.
- (2) Multi-family dwelling units, not to exceed 375 units, subject to the aggregate residential density restrictions set forth in section 21-9.8 of this Article. Each unit shall contain a minimum heated floor space of 900 square feet, except the one-bedroom units shall contain a minimum heated floor space of 600 square feet.

21-9.7 **Architectural Design Standards.** The architectural design standards established herein apply to all commercial development requiring a land disturbance permit. They are intended to achieve a base level of quality for architectural and landscape design that is responsive to its context and contributes to the overall character of the overlay district. The architectural criteria listed below establish minimum design standards for buildings within the overlay district in order to reduce the impacts of commercial development on adjacent properties. The highest quality of architectural design and innovation is encouraged. These standards replace the design criteria contained in UDC Chapters 11 and 12.

(A) Facades and Exterior Walls.

- (1) Front facades greater than one hundred (100) feet in length, measured horizontally, shall incorporate wall plane projections or recesses having a depth of at least two (2) percent of the length of the facade. No uninterrupted length of any facade shall exceed two hundred (200) horizontal feet.
- (2) Minimum Wall Articulation. Front facade design shall provide varying wall offsets and other architectural features to create horizontal (wall) and vertical building articulation. Along with the wall plane requirements in (1) above, at least one of the following treatments shall be incorporated:
 - (a) Change in texture or color.
 - (b) Change in pattern or material.
 - (c) An equivalent element that subdivides the wall into pedestrian scale proportions.

(B) Building Materials and Architectural Treatments. The following design standards, guidelines, and enhancements are established to create a sense of architectural consistency throughout the overlay district and to ensure high quality architectural design.

- (1) Exterior building materials on all commercial development shall consist of a minimum of twenty-five (25) percent per vertical wall plane of brick, natural or a decorative masonry unit pre-cast stone, and/or glass. If multiple establishments are contained within one contiguous structure, the percentage pertains to the entire facade rather than individual facade fronts.
- (2) Accent wall materials on all commercial development shall not exceed seventy-five (75) percent per vertical wall plane. Accent building materials include, but are not limited to, exterior finish insulation systems, stucco, and painted dimension wood. If multiple establishments are contained within one contiguous structure, the percentage pertains to the entire facade rather than individual facade fronts. Smooth and/or rib faced concrete masonry units, aluminum siding, vinyl siding, and corrugated steel are prohibited.
- (3) The principle entry area of a building, or if in a shopping center the mall entrances, shall be articulated and should express greater architectural detail than other portions of the building. Entries shall include at least one of the following or similar architectural elements:
 - (a) Overhangs
 - (b) Canopies
 - (c) Recesses/projections
 - (d) Columns
 - (e) Arcades
 - (f) Corniced parapets over the door
 - (g) Peaked roof forms
 - (h) Arches
 - (i) Glass entry

- (j) Integral planters or wing walls that incorporate landscaped areas and/or places for sitting
- (4) Freestanding accessory structures shall have architectural detailing and design elements consistent with the primary buildings of the development complex to provide a cohesive design.
- (5) Burglar bars, fiberglass awnings, and steel-roll down curtains are prohibited except at the structure's rear. Burglar bars are prohibited on the rear if visible from a public street. Burglar bars are also prohibited on the rear of an outparcel building if visible from the main structure.
- (C) Color. All exterior painted surfaces on commercial structures visible from the public right-of-way shall be painted in neutrals and earth tones. Neutrals refer to blacks, whites, beiges or grays while earth tones refer to browns, umbers, sienna, terracotta and brick tones. Fluorescent colors and those bright in intensity are prohibited. Glass, metal, natural stones, and sign faces are excluded from the color requirements.
- (D) Exterior Lighting. All lighting for commercial development shall be designed to integrate with the overall development character. Parking lot lighting shall be no more than thirty-five (35) feet in height.
 - (1) Lighting shall be architecturally integrated with neutral or earth tone colors.
 - (2) Lighting shall be unobtrusive and refrain from adverse impact of adjacent properties outside of the overlay district and public right-of-ways. See UDC 16-4.21 for fixture type and light spillage.
 - (3) Exposed neon and fluorescent lighting is not permitted except for open and closed signs.
 - (4) For drive-under canopies, the luminaries shall be recessed into the canopy ceiling so that the bottom of the luminaries does not extend below the ceiling.
 - (5) Promotional beacons, search lights, laser source lights, strobe lights or any similar light when projected above the horizon, and lighting used for causing sky glow to attract attention in excess of the lighting used to provide safety, security and utility are prohibited. Projects that want to integrate lines or rows of lights within a defined pedestrian plaza may seek administrative approval upon submission of lighting specifications. Such lights shall not be placed permanently on building exteriors.
- (E) Screening. The following standards shall apply:
 - (1) Accessory site features including, but not limited to, meters, meter boxes, electrical transformers, and other equipment located on the ground shall be screened from view from public rights-of-way or residential uses by placement behind the main building, 60% opaque fencing, berm and/or a vegetative screen planted according to County buffer standards.
 - (2) Flat roofs, roof mounted equipment and other accessories shall be screened from view from the public rights-of-way or residential uses by a parapet, gable roof, roof screen, or other architectural feature. Roof equipment and roof screens shall be finished to match the roof or parapet wall. When the relationship between building roofs and adjoining public streets and/or residential developments make screening of roof equipment impossible (e.g. road higher than roof), a parapet of no less than four feet in height shall be installed.
 - (3) Loading areas shall be screened from the public rights-of-way or residential uses by placement behind the main building or appropriately scaled wall or the use of landscape buffer that is no less than 5 feet in height.
 - (4) Walls or fences, required or otherwise, when visible from the public right-of-way shall complement the exterior materials of the primary structure on site. Tarps and banner signs shall not be attached to fencing material.
 - (5) Chain link fencing is prohibited on Ronald Reagan Boulevard and Union Hill Road frontage. Chain link fencing may be allowed along the sides and rear of property fronting Ronald Reagan Boulevard if it is screened with evergreen trees, shrubs, and/or decorative fencing for the full length and height of the fence.
- (F) Exemptions. The Planning Director may exempt all or parts of the design standards in this section for commissioned buildings by an architect for a site when the design constitutes a unique, one of a kind building that meets or exceeds the intent of these design standards, as demonstrated by architectural elevations.

21-9.8 **General Regulations**

- (A) At least fifteen percent (15%) of the area within the Overlay, exclusive of public roads, public rights-of-way, and interparcel access easements, shall be set aside as open space.
- (B) The following elements may be included in the calculations of open space within the Overlay:
 - (1) Any combination of primary and secondary conservation areas that together form a permanent, undivided or relatively undivided, undeveloped area.
 - (2) All buffers, setbacks and other areas not containing any buildings or pavements.
 - (3) Plazas, fountains, squares and other similar pedestrian amenities.
 - (4) Wetlands, creeks, streams and tributaries, drainage areas, detention ponds, and floodplain.
 - (5) Areas within multi-family residential developments designed and intended for the use and enjoyment of all residents or the use and enjoyment of the public.
- (C) Calculation of Minimum Parking and Loading Spaces
 - (1) All minimum parking and loading requirements for retail uses based on building floor area shall be calculated using Gross Leasable Area, as hereinafter defined.
 - (2) One off-street loading space shall be provided for the first 5,000 square feet of Gross Leasable Area or fractional part thereof for retail uses for which a loading space is required. One additional space shall be required for each additional 75,000 square feet of Gross Leasable Area or fractional part thereof for retail uses.
 - (3) All minimum parking and loading requirements for office uses based on building floor area shall be calculated using Gross Building Area, as hereinafter defined.
 - (4) One off-street loading space shall be provided for the first 5,000 square feet of Gross Building Area or fractional part thereof for office uses for which a loading space is required. One additional space shall be required for each additional 100,000 square feet of Gross Building Area or fractional part thereof for office uses.
 - (5) Unless otherwise approved by the Forsyth County planning director, loading spaces shall be a minimum of ten (10) feet wide, thirty (30) feet long, with fourteen (14) feet of height clearance.
 - (6) Shared parking may be provided at 3.5 spaces per 1,000 square feet of Gross Leasable Area or Gross Building Area, for retail or office uses, respectfully, as hereinafter defined, for any combination of different office and retail land uses within the Overlay (or any sub-area thereof) when such parking arrangement is supported by:
 - (a) Documentation from an acceptable industry publication (e.g., Institute of Transportation Engineers, Urban Land Institute, American Planning Association, etc.); or
 - (b) A study prepared by a traffic engineering firm that documents parking requirements and supports the use of shared parking.
- (D) Surface Parking Standards
 - (1) Any parking area exceeding twenty-five (25) spaces shall provide a minimum of ten percent (10%) of the total parking area as landscape islands. Landscape strips located between a parking area and a private street, driveway or public road shall count toward meeting this requirement
 - (2) At minimum, landscape islands shall be located at the end of every other Parking Bay and, on average, every 150 linear feet of continuous parking space width.
 - (3) Landscape islands for single parking bays shall contain a minimum of 150 square feet. Landscape islands for double parking bays shall require a minimum of 150-square-foot islands on each side or one continuous landscape island of 300 square feet on one side.
 - (4) Each parking landscape area shall contain turf grasses, shrubs, trees, or other landscape material in any combination, but must consist of at least two plant types. Landscape islands shall be located to effectively avoid large expanses of paving and contribute to orderly circulation of vehicular and pedestrian traffic.
 - (5) All trees planted in landscape islands and landscape areas shall be a minimum of three and one-half inches in caliper measured 36 inches above ground, shall be a minimum of ten feet in height, and shall be drought tolerant
- (E) Physical Relationships Between Buildings and Uses.
 - (1) Buffers shall not be required between non-residential uses (including multi-family residential uses) and single-family or multi-family residential uses internal or external

to the Overlay.

- (2) Minimum setbacks or other spatial separations required by the UDC shall not be required between buildings within the boundaries of the Overlay.
 - (3) Minimum building setbacks shall be 10 feet from a public road.
 - (4) Minimum building setbacks shall be 10 feet from common property lines shared with abutting properties that are zoned for residential development, which are outside of the boundaries of the Overlay with the exception of Sub-Area 3 in which the minimum building setbacks shall be 20 feet.
 - (5) Building setbacks shall not be required from private streets or driveways.
 - (6) Condominium developments and townhouse developments may be located on public roads or private streets. The developer shall build private streets to Forsyth County standards. Private streets built to county standards may be dedicated to the public at the developer's option.
- (F) Residential Density
- (1) Residential density within the Overlay shall not be calculated on a per acre basis. Notwithstanding any other provisions within this Article, residential development within the Overlay shall not exceed an aggregate total of 875 dwelling units.
 - (2) Buildings containing condominiums or apartments may include more than six (6) residential units.
- (G) Tree Replacement
- (1) To be consistent with section 2.11 of the Tree Ordinance, because the Plan exceeds the floor area threshold for Developments of Regional Impact:
 - (a) Eighteen (18) tree units per acre shall be provided within the Overlay;
 - (b) Developers shall not be required to replace Specimen Trees (as defined in the Tree Ordinance) that are removed during the initial development of a parcel within the Overlay.
 - (2) Calculations of tree units provided per acre shall include Specimen Trees, and non-specimen trees with a diameter at breast height of at least 18 inches, that are planted or preserved within the Overlay, including those within required buffers or open spaces.
 - (3) In order to provide sufficient growing area for planted trees, a minimum of 300 square feet of pervious root zone shall be provided for every large tree.
- (H) Stream Buffers
- (1) Unless a stream buffer encroachment is approved by the State of Georgia Environmental Protection Division and Forsyth County, a natural vegetative buffer shall be maintained for 50 feet, measured horizontally, on both banks (as applicable) of State waters as measured from the top of bank. With the exception of new tree plantings, this 50-foot vegetative buffer shall remain undisturbed.
 - (2) Unless a stream buffer encroachment is approved by the State of Georgia Environmental Protection Division and Forsyth County, an additional setback shall be maintained for an average of 30 feet, measured horizontally, beyond the undisturbed natural vegetative buffer. Land disturbance activities, including but not limited to grading, drainage, retaining walls, utilities, pervious trails, tree planting and landscaping shall be allowed within this additional setback so long as any disturbed area is stabilized. Stormwater shall not be discharged across any portion of the additional stream buffer setback with a width of less than 25 feet.
- (I) Wetland Buffers
- A 10-foot vegetative buffer shall be maintained adjacent to wetlands within the Overlay. Land disturbance activities, including but not limited to grading and tree planting, shall be Allowed within required wetland buffers so long as any disturbed area is replanted to Forsyth County Buffer Standards.
- (J) Specialized UDC Requirements for Large Retail Developments
- Requirements set forth in Chapter 12 and Chapter 18, Articles of the UDC specifically for individual retail establishments encompassing 40,000 square feet of floor area or greater, or encompassing 75,000 square feet or greater, shall not apply within the Overlay.
- (K) Maintenance Requirements
- (1) During any time a retail building exceeding 40,000 square feet is vacant after its initial opening (a "Vacant Retail Building") for a period of at least 90 days ("Vacancy

- Period”), the owner of the building shall:
- (a) Maintain all on-site parking areas and landscaping in the same condition as they had been maintained prior to the vacancy;
 - (b) Operate all lighting in the parking lot and other external areas, exclusive of identification signs, in the same manner as they had been prior to the vacancy period;
 - (c) Remove all outdoor identification signs from the site;
 - (d) Keep the building free of graffiti and repair all other acts of vandalism; and
 - (e) Provide security patrols on the site to deter vandalism or other illegal activities.
- (2) The owner of a retail building exceeding 40,000 square feet, regardless of the building’s occupancy status, shall be responsible for:
- (a) Maintaining cleanliness of entire site by removing any trash, rubbish, or other debris from the premises;
 - (b) Maintaining landscaping and replacing dead or damaged plants; and
 - (c) Repair or replace building elements that are damaged, dilapidated or in disrepair (such as but not limited to broken windows).
- (3) Should the owner of a Vacant Retail Building fail to maintain the building and premises during the Vacancy Period in accordance with the requirements of this Article, the owner shall be subject to citation by the appropriate County Code Enforcement Office and shall be subject to the maximum fine permitted for ordinance violations for each such violation.
- (L) Adaptive Reuse.
- (1) If an individual retail establishment 75,000 square feet or greater (“Establishment”) is vacated, the owner and/or lessee (the “Owner”) shall submit a written adaptive reuse and marketing plan (a “Reuse Plan”) to the planning director no later than the end of the 25th consecutive month of vacancy, unless events or circumstances beyond the Owner’s control prevent the submittal of the Reuse Plan.
 - (2) The Reuse Plan shall include the reason(s) for the continued vacancy, potential use types for the vacant Retail Establishment, a marketing plan to be executed for the facility and a schedule for the implementation of the marketing plan (a “Schedule”). The Owner shall execute the Reuse Plan in accordance with the Schedule, unless events or circumstances beyond the Owner’s control prevent adherence to the Schedule.
 - (3) If the Establishment remains vacant for 12 consecutive months after the Reuse Plan’s submittal date, the Owner shall provide the planning director with annual written status reports regarding its plans to redevelop and/or reuse the property and the reason(s) for the property’s continuing vacancy.
- (M) Calculation of Area for Retail and Office Uses
- (1) The area of retail uses within the Overlay shall be calculated using “Gross Leasable Area”, which shall mean the sum of the total horizontal areas of the several floors of all buildings on a lot, measured from the interior faces of exterior walls and from the center line of joint partitions and walls separating two (2) or more buildings. The term Gross Leasable Area shall exclude all outdoor dining areas, outdoor display areas that are accessory to enclosed retail stores, areas designed for permanent accessory uses such as public toilets, utility closets, mall food courts, mall management and security offices, mail distribution or delivery facilities, truck tunnels, enclosed parking areas, meter rooms, mall concourses, corridors not open to the public, rooftop mechanical structures, mechanical and equipment rooms and facilities, public and fire corridors, stairwells, elevators and escalators.
 - (2) The area of office uses within the Overlay shall be calculated using net rentable area in accordance with the “Standard Method of Measuring Floor Areas in Office Buildings ANSI/BOMA Z65.1 – 1996”, as adopted by The Building Owners and Managers Association (BOMA) International.
- (N) Signage.
- (1) A comprehensive signage plan setting forth details relative to sign types, numbers, materials, construction, lighting, heights, and areas shall be submitted to the planning director for review and approval prior to the issuance of sign permits for each development within the Overlay (or each phase thereof).
 - (2) Commercial Signs.

- (a) Wall Signs.
 - (i) Department store anchors over 80,000 square feet shall be allowed 3 signs (one per facade) up to 5% of the overall façade or a maximum of 600 square feet per sign.
 - (ii) The retail building connecting the department store anchors shall be allowed up to 8 signs up to 200 square feet per sign.
 - (iii) Office and hotel buildings over 5 stories are allowed 4 signs (one per façade) up to 5% of the overall façade area or a maximum of 600 square feet per sign, whichever is greater.
 - (b) Marquee Signs. Signs within the Overlay are allowed a maximum projection of 12 feet from the building wall.
 - (c) Monument Signs (fronting freeways and arterial/collector streets). No more than 2 signs may be located per entrance to a public street. Maximum sign area shall be limited to 300 square feet per side, not including wing walls. Signs shall be limited to a maximum height of 12 feet.
 - (d) Monument Signs (fronting local roads and private streets). No more than 12 signs may be permitted within the Overlay. Maximum sign area shall be limited to 72 square feet per side. Signs shall be limited to a maximum height of 10 feet.
 - (e) Pole Directional Signage. No more than 24 signs may be located within the Overlay. Maximum sign area shall be limited to 60 square feet per side. Signs shall be limited to a maximum height of 10 feet.
 - (f) Light Pole Graphics. Four-sided signs may be located on poles to serve as directional aids. Maximum sign area shall be limited to 15 square feet per side. Signs shall be limited to a maximum height of 12 feet.
 - (g) Georgia 400 Corridor Signage. A single pylon sign may be located along GA400. Maximum sign area shall be limited to 400 square feet. The sign shall be limited to a maximum height of 50 feet.
- (3) Residential. All residential development within the Overlay shall be allowed separate signage as permitted per the Residential Zoning Standards of the Sign Ordinance.
- (4) Notwithstanding any other provisions within this Article, the Office Residential Zoning Districts Performance Standards and Commercial or Industrial Zoning Districts in the Sign Ordinance shall not apply to the Overlay.
- (O) Prohibited Uses.
The following uses shall be prohibited within the Overlay.
- (a) Convenience stores, with or without gasoline pumps.
 - (b) Gas stations.
 - (c) Adult novelty stores.
 - (d) Adult entertainment centers.
 - (e) Pawn shops.
 - (f) Tattoo parlors

21-9.9 **Applicability.** All properties within the boundaries of the Overlay shall be subject to the requirements of the UDC, the Sign Ordinance and the Tree Ordinance. Properties within Sub-Area 2 and Sub-Area 3 of the Overlay shall be subject to all requirements of this Article and the Plan. Sub-Area 1 may be developed in accordance with the Article and this Plan. The following provisions of this Article shall not apply to Sub-Area 1 of the Overlay if Sub-Area 1 does not conform to the Plan: Sections 21-.4(A)(2), 21-.4(B), 21-.4(C)(2), 21-.8(C)(6), 21-.8(D)(1), 21-.8(D)(2), 21-.8(D)(3), 21-.8(D)(4), 21-.8(E)(1), 21-.8(E)(3), 21-.8(E)(4), 21-.8(E)(5), 21-.8(E)(6), 21-.8(F), 21-.8(N), 21-.10(A), 21-.10(B) and 21-.10(C). Section 21-.8(F)(1) shall not apply to Sub-Area 1 if Sub-Area 1 does not conform to the Plan; and the maximum residential density on the balance of the Overlay shall be reduced to 675 units. The requirements of the UDC, this Article and the Tree Ordinance shall apply cumulatively to all properties within the Overlay so that each requirement is interpreted against the overall Plan, not any individual parcel or property.

21-9.10 **Administrative Interpretations.**

- (A) The planning director is hereby authorized to administratively grant minor Plan amendments for individual parcels within the Overlay. A minor Plan amendment shall be effective only for the parcel(s) for which the amendment was requested and shall not affect any other parcel within the Overlay.

- (B) Minor Plan amendments shall include, but are not limited to, adjusting lot lines and lease lines, reducing the size of individual uses, removing approved uses, modifying the layout of internal roads, relocating open space, reconfiguring building footprints and relocating buildings depicted on the Plan. Any proposed amendment to the Plan that is determined by the planning director to constitute a public interest that decreases the public open space by ten (10) percent or more, increases the density by ten (10) percent or more, or changes the Overlay boundaries shall be deemed a major amendment. The addition of proposed uses or the relocation of active amenities to a location closer to the Overlay boundaries than as shown on the Plan shall constitute major amendments. For all amendments to the Plan that are determined to be major amendments, the Board of Commissioners shall be required to hold a public hearing, but such hearing shall be limited specifically to testimony regarding whether the proposed amendment should or should not be approved.
- (C) The planning director may approve requests for minor Plan amendments based on the following considerations:
 - (1) Whether the amendment conforms to the policy and intent of the Forsyth County Comprehensive Plan;
 - (2) Whether the amendment would be suitable in view of the use and development of adjacent and nearby properties;
 - (3) Whether the amendment would have an adverse affect on the usability of adjacent and nearby property
 - (4) Whether the amendment would impose an excessive burden on streets, transportation facilities or utilities;
 - (6) Whether there are existing or changing conditions affecting the use and development of the property that support the approval of the amendment.
- (D) The planning director is not authorized to grant variances from the provisions of the underlying CBD zoning district. Deviations from the underlying CBD zoning district shall require the issuance of a variance pursuant to Article V and Article VI of the UDC.
- (E) In the event of a conflict or inconsistency between this Overlay, as interpreted by the planning director, and (1) any other provision of the UDC, (2) the Sign Ordinance, or (3) the Tree ordinance, this Article shall govern the development within the Overlay.

TABLE 21.3
 PERFORMANCE STANDARDS SUMMARY

Performance Standard	Sub-Area 1	Sub-Area 2	Sub-Area 3
Minimum dwelling unit size	600 sf (1 bedroom) 900 sf (all other units)	600 sf (1 bedroom) 900 sf (all other units)	600 sf (1 bedroom) 900 sf (all other units)
Maximum building height	12 stories or 180 feet	6 stories or 90 feet (office/res.) 8 stories or 130 feet (hotels)	As set forth in UDC.
Maximum parking deck height	8 levels	4 levels	As set forth in UDC.
Max. residential density. (Note 1)	400 units	300 units	375 units
GA 400 buffer	60 feet (includes 40-foot visual buffer)	n/a	n/a
Loading Spaces (retail)	1 space for first 5,000 sf 1 space for each additional 75,000 sf.	1 space for first 5,000 sf 1 space for each additional 75,000 sf.	1 space for first 5,000 sf 1 space for each additional 75,000 sf.
Loading Spaces (office)	1 space for first 5,000 sf 1 space for each additional 100,000 sf.	1 space for first 5,000 sf 1 space for each additional 100,000 sf.	1 space for first 5,000 sf 1 space for each additional 100,000 sf.
Loading Space Size	10 ft x 30 ft Min. 14-foot clearance	10 ft x 30 ft Min. 14-foot clearance	10 ft x 30 ft Min. 14-foot clearance
Pervious Root Zone (Large Trees)	300 sf	300 sf	300 sf

Performance Standard	Sub-Area 1	Sub-Area 2	Sub-Area 3
Min. Landscape Island size (Single Bay)	150 sf	150 sf	150 sf
Min. Landscape Island size (Double Bay)	300 sf	300 sf	300 sf
Landscape Island Location	Every other parking bay and avg. every 150 linear feet of parking width	Every other parking bay and avg. every 150 linear feet of parking width	Every other parking bay and avg. every 150 linear feet of parking width
Building Setbacks (Note 3)	10 feet from public road and residential development outside Overlay	10 feet from public road and residential development outside Overlay	10 feet from public road and residential development outside Overlay
Stream Buffer	50-ft vegetative buffer Avg. 30-ft additional setback	50-ft vegetative buffer Avg. 30-ft additional setback	50-ft vegetative buffer Avg. 30-ft additional setback
Wetland Buffer	10 feet	10 feet	10 feet
Shared Parking for Mixed-Uses of Retail and Office	3.5 spaces per 1,000 sf	3.5 spaces per 1,000 sf	3.5 spaces per 1,000 sf

Note 1 – Residential density within the Overlay shall not exceed a total of 875 units.

Note 2 –Setbacks and buffers do not apply to private streets, driveways, or lease lines/property lines within the Overlay.

Note 3 – The applicability of standards summarized in this table are subject to the provisions of section 21-9.10 of the Ronald Reagan/Union Hill Overlay District regulations.

APPENDIX D - BENEFIT COST RATIOS

GDOT Benefit-Cost Calculator

enter information in green cells

Project Information

ID	
Description	GA 400/McGinnis Ferry Road IJR - Alternative 2

Cost Estimate

Date of estimate	3/26/12
PE cost	\$ 2,406,907
ROW cost	\$ 11,236,438
UTILITY cost	\$ 700,000
CST cost	\$ 34,384,387
MITIGATION cost	\$ -
Total	\$ 48,727,732

Traffic in 2040

Source of traffic data	
Without project (nobuild)	
Annual VMT	55,604,875
Annual VHT	1,922,140
Average speed (mph)	29
With project (build)	
Annual VMT	66,058,375
Annual VHT	1,243,265
Average speed (mph)	53

Parameters	Default	Override	Used
Analysis year	2035	2040	2040
Discount rate	7.0%		7%
Design life (years)	25	20	20
Base year of cost estimate	N/A	2012	2012
Current CST program year	N/A	2020	2020
Fuel price (\$/gallon)	3.22		3.22
Fuel economy (mpg)	18.03		18.03
Value of auto travel (\$/hr)	13.75		13.75
Value of truck travel (\$/hr)	72.65		72.65
Percent trucks	12%	4%	4%
Include GSP benefits	No	No	No

Costs	
Total cost	\$ 48,727,732
Annualized cost	\$ 3,264,130
Auto Delay Costs	
Nobuild	\$ 25,372,248
Build	\$ 16,411,098
Auto delay savings	\$ 8,961,150
Truck Delay Costs	
Nobuild	\$ 5,585,739
Build	\$ 3,612,928
Truck delay savings	\$ 1,972,811
Fuel Costs	
Nobuild	\$ 9,930,543
Build	\$ 11,797,447
Fuel cost savings	\$ (1,866,903)
Change in GSP	
Auto delay cost adjustment	NA
Truck delay cost adjustment	NA
Fuel cost adjustment	NA
Total benefit adjustment	NA
Benefits in 2040	\$ 9,067,057
Benefit-Cost Ratio	2.78

Notes

Project evaluation is based on termini in proposed concept report; Cost estimate was prepared for concept report.

Benefit Input Calculations for Alternative 2			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT with Project			
Corridor Description of ALT 2-McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy	1.61	0.41	95250
GA 400 from Windward Pkwy to NBCD	0.63	0.16	81400
NBCD from GA 400 to McGinnis Ferry Rd	0.34	0.09	31550
McGinnis Ferry Rd Exit Ramp	0.40	0.10	12500
McGinnis Ferry Rd to Mall	0.96	0.24	45700
		0.00	
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			67064
Corridor Length with Project (A to B in Miles)			3.94
Annual VMT With Project	Vehicles per day x 250	Travel Distance	VMT
	16,766,085	3.94	66,058,375
Calculations of Annual VHT with Project			
Corridor Description of ALT 2-McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy	1.61	0.41	54.30
GA 400 from Windward Pkwy to NBCD	0.63	0.16	66.70
NBCD from GA 400 to McGinnis Ferry Rd	0.34	0.09	55.00
McGinnis Ferry Rd Exit Ramp	0.40	0.10	45.00
McGinnis Ferry Rd to Mall	0.96	0.24	45.00
		0.00	
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under Build Scenario			53.13
Peak Travel Time through Corridor in Hours With Project (Total Length / Average Travel Speed)			0.07
Annual VHT With Project	Vehicles per day x 250	Peak Travel Time	VHT
	16,766,085	0.07	1,243,265

Benefit Input Calculations for No-Build Scenario			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT without Project			
Corridor Description of McGinnis Ferry Rd IJR (No-Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length without Project (A to B in Miles)			4.09
Annual VMT Without Project	Vehicles per day x 250	Travel Distance	VMT
	13,595,324	4.09	55,604,875
Calculations of Annual VHT without Project			
Corridor Description of Sugarloaf Pkwy (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	18.13
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	18.13
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	12.20
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under No-Build Scenario			28.93
Peak Travel Time through Corridor in Hours Without Project (Total Length / Average Travel Speed)			0.14
Annual VHT Without Project	Vehicles per day x 250	Peak Travel Time	VHT
	13,595,324	0.14	1,922,140

SUMMARY OF PROJECT COSTS

Alt. 2 - McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

Non-Construction Costs

A.	Right-of-Way	\$11,236,438
B.	Reimbursable Utilities	\$700,000

Construction Costs

C.	Major Structures	\$7,598,872
D.	Grading and Earthwork	\$3,133,704
E.	Drainage	\$727,909
F..	Base and Paving	\$7,777,606
G.	Concrete Work	\$8,573,661
H.	Signing and Striping	\$1,185,308
I.	Guardrail	\$24,000
J.	Traffic Control & Mobilization	\$200,000
K.	Landscaping and Erosion Control	\$1,959,474
L.	Miscellaneous Construction Items	\$78,000
	Construction Cost Subtotal	\$31,258,534

Engineering & Construction; 10% \$3,125,853

	Total Construction Cost	\$34,384,387
	Professional Engineering	\$2,406,907
Total Project Costs		\$48,727,733

Forsyth & Fulton Counties

Detailed Cost Estimate - Alternative 2
 McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

A.	Right-of-Way			\$11,236,438
B.	Reimbursable Utilities			\$700,000
C.	Major Structures			
	1. Class A Concrete	400 CY @	\$600.00	\$240,000
	2. MSE Wall face 0-10 FT HT, Wall No. - 1	4,300 SF @	\$55.04	\$236,672
	3. Bridge over GA 400	71,222 SF @	\$100.00	\$7,122,200
			Subtotal	\$7,598,872
D.	Grading and Earthwork			
	1. Unclassified Excavation & Borrow	156,685 CY @	\$20.00	\$3,133,704
			Subtotal	\$3,133,704
E.	Drainage			
	1. Pipe 54" H20'-25'	700 LF @	\$120.00	\$84,000
	2. Pipe 36" H10'-15'	1,200 LF @	\$64.00	\$76,800
	3. Pipe 48" H0-10"	700 LF @	\$64.00	\$44,800
	4. Pipe 30" H 0'-10'	2,100 LF @	\$64.00	\$134,400
	5. Pipe 30" H10'-15'	2,000 LF @	\$43.50	\$87,000
	6. Catch Basins	45 EA	\$2,000.00	\$89,333
	7. Class A concrete (Headwalls)	30 CY @	\$500.00	\$15,000
	8. Riprap TP1 36"	100 SY @	\$56.00	\$5,600
	9. Rural Drainage		Lump	\$190,975
			Subtotal	\$727,909
F.	Base & Paving			
	1. Graded Aggregate Base 12"	161,118 TN @	\$20.00	\$3,222,362
	2. Graded Aggregate Base 6"	0 TN @	\$20.00	\$0
	3. Asphalt Concrete 12.5 mm Superpave 165#/SY (1-1/2")	7,979 TN @	\$75.00	\$598,413
	4. Asphalt Concrete 19.0 mm Superpave 220#/SY (2")	6,000 TN @	\$75.00	\$449,980
	5. Asphalt Concrete 25 mm Superpave 330#/SY (3")	32,171 TN @	\$75.00	\$2,412,856
	6. Asphalt Concrete 25 mm Superpave 440#/SY (4")	11,995 TN @	\$75.00	\$899,588
	7. Asphalt Leveling	1,740 TN @	\$82.00	\$142,641
	8. Bitum Tack Coat	34,512 GL @	\$1.50	\$51,767
			Subtotal	\$7,777,606
G.	Concrete Work			
	1. Plain Portland Cement, Class 3 Conc. 12"	177,644 SY @	\$38.00	\$6,750,489
	2. Concrete Median Paving 7.5"	6,300 SY @	\$38.00	\$239,400
	3. Driveways	100 SY @	\$30.00	\$3,000
	4. Concrete Barrier	27,340 LF @	\$39.86	\$1,089,772
	5. Concrete Curb & Gutter, 8" x 30" TP 2	16,700 LF @	\$10.00	\$167,000
	6. Concrete Curb & Gutter, 8" x 30" TP 7	14,900 LF @	\$10.00	\$149,000
	7. Sidewalk - 4"	7,000 SY @	\$25.00	\$175,000
			Subtotal	\$8,573,661
H.	Signing and Striping			
	1. Interstate signs	6 EA @	\$62,000.00	\$372,000
	2. Signs	150 EA @	\$100.00	\$15,000
	3. Striping	29,550 LF @	\$2.65	\$78,308
	4. Signals with Interconnect	6 EA @	\$120,000.00	\$720,000
			Subtotal	\$1,185,308

L.	Guardrail			
	1. Guardrail, W Beam	800 LF @	\$15.00	\$12,000
	2. Guardrail, T Beam	200 LF @	\$38.50	\$7,700
	2. Anchors TP 12	2 EA @	\$1,650.00	\$3,300
	3. Anchors TP 1	2 EA @	\$500.00	\$1,000
			Subtotal	\$24,000
J.	Traffic Control			
	1. Traffic Control		Lump Sum	\$200,000
			Subtotal	\$200,000
K.	Landscaping and Erosion Control			
	1. Clearing & Grubbing	48.1 ac @	\$30,000.00	\$1,442,562
	2. Grassing	26.6 ac @	\$2,500.00	\$66,607
	3. Erosion Control			
	a. Temporary Grass	216 lbs @	\$1.00	\$216
	b. Temporary Mulch	144 TN @	\$150.00	\$21,638
	c. Silt Fence, TP A	12,873 LF @	\$3.00	\$38,619
	d. Silt Fence, TP C	30,037 LF @	\$4.00	\$120,148
	e. Maint. of Temp. Silt Fence, TP A	12,873 LF @	\$1.50	\$19,310
	f. Maint. of Temp. Silt Fence, TP C	30,037 LF @	\$1.50	\$45,056
	g. Sediment Basin, TP 1	1 EA @	\$6,000.00	\$6,000
	h. Maint. of Temp. Sediment Basin	1 EA @	\$3,500.00	\$3,500
	i. Permanent Grass Seed	541 lbs @	\$2.00	\$1,082
	j. Construction Exit	6 EA @	\$1,500.00	\$9,000
	k. Water Quality Sampling	18 mon.	\$100.00	\$1,800
	l. Water Quality Monitoring	18 mon.	\$1,000.00	\$18,000
	m. Erosion Control mats	50,000 SY @	\$2.50	\$125,000
	n. Miscellaneous Items		Lump Sum	\$40,937
			Subtotal	\$1,959,474
L.	Miscellaneous Items			
	1. Field Office TP 3	1 EA @	\$78,000.00	\$78,000
			Subtotal	\$78,000

GDOT Benefit-Cost Calculator

enter information in green cells

Project Information

ID	
Description	GA 400/McGinnis Ferry Road IJR - Alternative 3

Cost Estimate

Date of estimate	3/26/12
PE cost	\$ 1,167,184
ROW cost	\$ 11,236,438
UTILITY cost	\$ 700,000
CST cost	\$ 16,674,053
MITIGATION cost	\$ -
Total	\$ 29,777,675

Traffic in 2040

Source of traffic data	
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Without project (nobuild)	
Annual VMT	55,604,875
Annual VHT	1,922,140
Average speed (mph)	29

With project (build)	
Annual VMT	70,295,625
Annual VHT	1,332,061
Average speed (mph)	53

Parameters	Default	Override	Used
Analysis year	2035	2040	2040
Discount rate	7.0%		7%
Design life (years)	25	20	20
Base year of cost estimate	N/A	2012	2012
Current CST program year	N/A	2020	2020
Fuel price (\$/gallon)	3.22		3.22
Fuel economy (mpg)	18.03		18.03
Value of auto travel (\$/hr)	13.75		13.75
Value of truck travel (\$/hr)	72.65		72.65
Percent trucks	12%	4%	4%
Include GSP benefits	No	No	No

Costs	
Total cost	\$ 29,777,675
Annualized cost	\$ 1,994,720
Auto Delay Costs	
Nobuild	\$ 25,372,248
Build	\$ 17,583,205
Auto delay savings	\$ 7,789,043
Truck Delay Costs	
Nobuild	\$ 5,585,739
Build	\$ 3,870,969
Truck delay savings	\$ 1,714,770
Fuel Costs	
Nobuild	\$ 9,930,543
Build	\$ 12,554,183
Fuel cost savings	\$ (2,623,639)
Change in GSP	
Auto delay cost adjustment	NA
Truck delay cost adjustment	NA
Fuel cost adjustment	NA
Total benefit adjustment	NA
Benefits in 2040	\$ 6,880,173
Benefit-Cost Ratio	3.45

Notes
 Project evaluation is based on termini in proposed concept report; Cost estimate was prepared for concept report.

Benefit Input Calculations for Alternative 3			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT with Project			
Corridor Description of ALT 2-McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy	1.61	0.41	95250
GA 400 from Windward Pkwy to McGinnis Ferry Rd	0.97	0.25	81400
McGinnis Ferry Rd Exit Ramp	0.40	0.10	12500
McGinnis Ferry Rd to Mall	0.96	0.24	45700
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			71366
Corridor Length with Project (A to B in Miles)			3.94
Annual VMT With Project	Vehicles per day x 250	Travel Distance	VMT
	17,841,529	3.94	70,295,625
Calculations of Annual VHT with Project			
Corridor Description of ALT 2-McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy	1.61	0.41	54.30
GA 400 from Windward Pkwy to McGinnis Ferry Road	0.97	0.25	66.70
McGinnis Ferry Rd Exit Ramp	0.28	0.07	45.00
McGinnis Ferry Rd to Mall	0.96	0.24	45.00
		0.00	
		0.00	
		0.00	
		0.00	
		0.00	
<i>* Travel Speed Determined from HCS analysis</i>			
Average Travel Speed under Build Scenario			52.77
Peak Travel Time through Corridor in Hours With Project (Total Length / Average Travel Speed)			0.07
Annual VHT With Project	Vehicles per day x 250	Peak Travel Time	VHT
	17,841,529	0.07	1,332,061

Benefit Input Calculations for No-Build Scenario			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT without Project			
Corridor Description of McGinnis Ferry Rd IJR (No-Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length without Project (A to B in Miles)			4.09
Annual VMT Without Project	Vehicles per day x 250	Travel Distance	VMT
	13,595,324	4.09	55,604,875
Calculations of Annual VHT without Project			
Corridor Description of Sugarloaf Pkwy (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	18.13
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	18.13
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	12.20
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under No-Build Scenario			28.93
Peak Travel Time through Corridor in Hours Without Project (Total Length / Average Travel Speed)			0.14
Annual VHT Without Project	Vehicles per day x 250	Peak Travel Time	VHT
	13,595,324	0.14	1,922,140

SUMMARY OF PROJECT COSTS

Alt. 3 - McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

Non-Construction Costs

A.	Right-of-Way	\$11,236,438
B.	Reimbursable Utilities	\$700,000

Construction Costs

C.	Major Structures	\$4,896,672
D.	Grading and Earthwork	\$1,426,296
E.	Drainage	\$735,797
F..	Base and Paving	\$3,525,151
G.	Concrete Work	\$1,706,200
H.	Signing and Striping	\$1,185,308
I.	Guardrail	\$24,000
J.	Traffic Control & Mobilization	\$200,000
K.	Landscaping and Erosion Control	\$1,380,806
L.	Miscellaneous Construction Items	\$78,000
	Construction Cost Subtotal	\$15,158,230

Engineering & Construction; 10% \$1,515,823

	Total Construction Cost	\$16,674,053
	Professional Engineering	\$1,167,184
Total Project Costs		\$29,777,675

Forsyth & Fulton Counties

Detailed Cost Estimate - Alternative 3
 McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

A.	Right-of-Way			\$11,236,438
B.	Reimbursable Utilities			\$700,000
C.	Major Structures			
	1. Class A Concrete	400 CY @	\$600.00	\$240,000
	2. MSE Wall face 0-10 FT HT, Wall No. - 1	4,300 SF @	\$55.04	\$236,672
	3. Bridge over GA 400	44,200 SF @	\$100.00	\$4,420,000
			Subtotal	\$4,896,672
D.	Grading and Earthwork			
	1. Unclassified Excavation & Borrow	71,315 CY @	\$20.00	\$1,426,296
			Subtotal	\$1,426,296
E.	Drainage			
	1. Pipe 54" H20'-25'	700 LF @	\$120.00	\$84,000
	2. Pipe 36" H10'-15'	1,200 LF @	\$64.00	\$76,800
	3. Pipe 48" H0-10"	700 LF @	\$64.00	\$44,800
	4. Pipe 30" H 0'-10'	2,100 LF @	\$64.00	\$134,400
	5. Pipe 30" H10'-15'	2,000 LF @	\$43.50	\$87,000
	6. Catch Basins	45 EA	\$2,000.00	\$89,333
	7. Class A concrete (Headwalls)	30 CY@	\$500.00	\$15,000
	8. Riprap TP1 36"	100 SY @	\$56.00	\$5,600
	9. Rural Drainage		Lump	\$198,864
			Subtotal	\$735,797
F.	Base & Paving			
	1. Graded Aggregate Base 12"	53,349 TN @	\$20.00	\$1,066,980
	2. Graded Aggregate Base 6"	0 TN @	\$20.00	\$0
	3. Asphalt Concrete 12.5 mm Superpave 165#/SY (1-1/2")	7,979 TN @	\$75.00	\$598,413
	4. Asphalt Concrete 19.0 mm Superpave 220#/SY (2")	6,000 TN @	\$75.00	\$449,980
	5. Asphalt Concrete 25 mm Superpave 330#/SY (3")	4,636 TN @	\$75.00	\$347,712
	6. Asphalt Concrete 25 mm Superpave 440#/SY (4")	11,995 TN @	\$75.00	\$899,588
	7. Asphalt Leveling	1,740 TN @	\$82.00	\$142,641
	8. Bitum Tack Coat	13,225 GL @	\$1.50	\$19,838
			Subtotal	\$3,525,151
G.	Concrete Work			
	1. Plain Portland Cement, Class 3 Conc. 12"	25,600 SY @	\$38.00	\$972,800
	2. Concrete Median Paving 7.5"	6,300 SY @	\$38.00	\$239,400
	3. Driveways	100 SY @	\$30.00	\$3,000
	4. Concrete Curb & Gutter, 8" x 30" TP 2	16,700 LF @	\$10.00	\$167,000
	5. Concrete Curb & Gutter, 8" x 30" TP 7	14,900 LF @	\$10.00	\$149,000
	6. Sidewalk - 4"	7,000 SY @	\$25.00	\$175,000
			Subtotal	\$1,706,200
H.	Signing and Striping			
	1. Interstate Signs	6 EA @	\$62,000.00	\$372,000
	2. Signs	150 EA @	\$100.00	\$15,000
	3. Striping	29,550 LF @	\$2.65	\$78,308
	4. Signals with Interconnect	6 EA @	\$120,000.00	\$720,000
			Subtotal	\$1,185,308

L.	Guardrail			
	1. Guardrail, W Beam	800 LF @	\$15.00	\$12,000
	2. Guardrail, T Beam	200 LF @	\$38.50	\$7,700
	2. Anchors TP 12	2 EA @	\$1,650.00	\$3,300
	3. Anchors TP 1	2 EA @	\$500.00	\$1,000
			Subtotal	\$24,000
J.	Traffic Control			
	1. Traffic Control		Lump Sum	\$200,000
			Subtotal	\$200,000
K.	Landscaping and Erosion Control			
	1. Clearing & Grubbing	33.9 ac @	\$30,000.00	\$1,018,320
	2. Grassing	19.6 ac @	\$2,500.00	\$48,930
	3. Erosion Control			
	a. Temporary Grass	153 lbs @	\$1.00	\$153
	b. Temporary Mulch	102 TN @	\$150.00	\$15,275
	c. Silt Fence, TP A	6,090 LF @	\$3.00	\$18,270
	d. Silt Fence, TP C	14,210 LF @	\$4.00	\$56,840
	e. Maint. of Temp. Silt Fence, TP A	6,090 LF @	\$1.50	\$9,135
	f. Maint. of Temp. Silt Fence, TP C	14,210 LF @	\$1.50	\$21,315
	g. Sediment Basin, TP 1	1 EA @	\$6,000.00	\$6,000
	h. Maint. of Temp. Sediment Basin	1 EA @	\$3,500.00	\$3,500
	i. Permanent Grass Seed	382 lbs @	\$2.00	\$764
	j. Construction Exit	6 EA @	\$1,500.00	\$9,000
	k. Water Quality Sampling	18 mon.	\$100.00	\$1,800
	l. Water Quality Monitoring	18 mon.	\$1,000.00	\$18,000
	m. Erosion Control mats	50,000 SY @	\$2.50	\$125,000
	n. Miscellaneous Items		Lump Sum	\$28,505
			Subtotal	\$1,380,806
L.	Miscellaneous Items			
	1. Field Office TP 3	1 EA @	\$78,000.00	\$78,000
			Subtotal	\$78,000

GDOT Benefit-Cost Calculator

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Project Information

ID	
Description	GA 400/McGinnis Ferry Road IJR - Alternative 4

Cost Estimate

Date of estimate	3/26/12
PE cost	\$ 1,692,768
ROW cost	\$ 8,117,667
UTILITY cost	\$ 1,750,000
CST cost	\$ 24,182,394
MITIGATION cost	\$ -
Total	\$ 35,742,829

Traffic in 2040

Source of traffic data	
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Without project (nobuild)	
Annual VMT	55,604,875
Annual VHT	1,922,140
Average speed (mph)	29

With project (build)	
Annual VMT	55,604,875
Annual VHT	1,580,244
Average speed (mph)	35

Parameters	Default	Override	Used
Analysis year	2035	2040	2040
Discount rate	7.0%		7%
Design life (years)	25	20	20
Base year of cost estimate	N/A	2012	2012
Current CST program year	N/A	2020	2020
Fuel price (\$/gallon)	3.22		3.22
Fuel economy (mpg)	18.03		18.03
Value of auto travel (\$/hr)	13.75		13.75
Value of truck travel (\$/hr)	72.65		72.65
Percent trucks	12%	4%	4%
Include GSP benefits	No	No	No

Costs	
Total cost	\$ 35,742,829
Annualized cost	\$ 2,394,309
Auto Delay Costs	
Nobuild	\$ 25,372,248
Build	\$ 20,859,221
Auto delay savings	\$ 4,513,027
Truck Delay Costs	
Nobuild	\$ 5,585,739
Build	\$ 4,592,189
Truck delay savings	\$ 993,550
Fuel Costs	
Nobuild	\$ 9,930,543
Build	\$ 9,930,543
Fuel cost savings	\$ -
Change in GSP	
Auto delay cost adjustment	NA
Truck delay cost adjustment	NA
Fuel cost adjustment	NA
Total benefit adjustment	NA
Benefits in 2040	\$ 5,506,577
Benefit-Cost Ratio	2.30

Notes
 Project evaluation is based on termini in proposed concept report; Cost estimate was prepared for concept report.

Benefit Input Calculations for Alternative 4			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT with Project			
Corridor Description of ALT 4- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
<i>GA 400 from SR 120 to Windward Pkwy Ramp</i>	1.13	0.28	95250
<i>Windward Pkwy Exit Ramp</i>	0.32	0.08	27500
<i>Windward Pkwy from GA 400 to Windward Concourse</i>	1.35	0.33	49900
<i>Windward Concourse from Windward Parkway to McGinnis Ferry Road</i>	0.48	0.12	13300
<i>McGinnis Ferry Rd from Windward Pkwy to Mall</i>	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length with Project (A to B in Miles)			4.09
Annual VMT With Project	Vehicles per day x 250 13,595,324	Travel Distance 4.09	VMT 55,604,875
Calculations of Annual VHT with Project			
Corridor Description of ALT 2- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Travel Speed*
<i>GA 400 from SR 120 to Windward Pkwy Ramp</i>	1.13	0.28	54.30
<i>Windward Pkwy Exit Ramp</i>	0.32	0.08	22.40
<i>Windward Pkwy from GA 400 to Windward Concourse</i>	1.35	0.33	22.40
<i>Windward Concourse from Windward Parkway to McGinnis Ferry Road</i>	0.48	0.12	35.00
<i>McGinnis Ferry Rd from Windward Pkwy to Mall</i>	0.81	0.20	35.00
		0.00	
		0.00	
		0.00	
		0.00	
<i>* Travel Speed Determined from HCS analysis</i>			
Average Travel Speed under Build Scenario			35.19
Peak Travel Time through Corridor in Hours With Project (Total Length / Average Travel Speed)			0.12
Annual VHT With Project	Vehicles per day x 250 13,595,324	Peak Travel Time 0.12	VHT 1,580,244

Benefit Input Calculations for No-Build Scenario			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT without Project			
Corridor Description of McGinnis Ferry Rd IJR (No-Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length without Project (A to B in Miles)			4.09
Annual VMT Without Project	Vehicles per day x 250	Travel Distance	VMT
	13,595,324	4.09	55,604,875
Calculations of Annual VHT without Project			
Corridor Description of Sugarloaf Pkwy (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	18.13
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	18.13
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	12.20
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under No-Build Scenario			28.93
Peak Travel Time through Corridor in Hours Without Project (Total Length / Average Travel Speed)			0.14
Annual VHT Without Project	Vehicles per day x 250	Peak Travel Time	VHT
	13,595,324	0.14	1,922,140

SUMMARY OF PROJECT COSTS

Alt. 4- McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

Non-Construction Costs

A.	Right-of-Way	\$8,117,667
B.	Reimbursable Utilities	\$1,750,000

Construction Costs

C.	Major Structures	\$4,896,672
D.	Grading and Earthwork	\$2,873,007
E.	Drainage	\$611,892
F..	Base and Paving	\$6,237,793
G.	Concrete Work	\$4,473,613
H.	Signing and Striping	\$813,308
I.	Guardrail	\$24,000
J.	Traffic Control & Mobilization	\$200,000
K.	Landscaping and Erosion Control	\$1,775,710
L.	Miscellaneous Construction Items	\$78,000
	Construction Cost Subtotal	\$21,983,995

Engineering & Construction; 10% \$2,198,399

	Total Construction Cost	\$24,182,394
	Professional Engineering	\$1,692,768
Total Project Costs		\$35,742,829

Forsyth & Fulton Counties

Detailed Cost Estimate - Alternative 4
 McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

A.	Right-of-Way			\$8,117,667
B.	Reimbursable Utilities			\$1,750,000
C.	Major Structures			
	1. Class A Concrete	400 CY @	\$600.00	\$240,000
	2. MSE Wall face 0-10 FT HT, Wall No. - 1	4,300 SF @	\$55.04	\$236,672
	3. Bridge over GA 400	44,200 SF @	\$100.00	\$4,420,000
			Subtotal	\$4,896,672
D.	Grading and Earthwork			
	1. Unclassified Excavation & Borrow	143,650 CY @	\$20.00	\$2,873,007
			Subtotal	\$2,873,007
E.	Drainage			
	1. Pipe 54" H20'-25'	700 LF @	\$120.00	\$84,000
	2. Pipe 36" H10'-15'	1,200 LF @	\$64.00	\$76,800
	3. Pipe 48" H0-10"	700 LF @	\$64.00	\$44,800
	4. Pipe 30" H 0'-10'	2,100 LF @	\$64.00	\$134,400
	5. Pipe 30" H10'-15'	2,000 LF @	\$43.50	\$87,000
	6. Catch Basins	45 EA	\$2,000.00	\$89,333
	7. Class A concrete (Headwalls)	30 CY@	\$500.00	\$15,000
	8. Riprap TP1 36"	100 SY @	\$56.00	\$5,600
	9. Rural Drainage		Lump	\$74,958
			Subtotal	\$611,892
F.	Base & Paving			
	1. Graded Aggregate Base 12"	114,875 TN @	\$20.00	\$2,297,495
	2. Graded Aggregate Base 6"	0 TN @	\$20.00	\$0
	3. Asphalt Concrete 12.5 mm Superpave 165#/SY (1-1/2")	9,245 TN @	\$75.00	\$693,380
	4. Asphalt Concrete 19.0 mm Superpave 220#/SY (2")	7,688 TN @	\$75.00	\$576,603
	5. Asphalt Concrete 25 mm Superpave 330#/SY (3")	17,825 TN @	\$75.00	\$1,336,880
	6. Asphalt Concrete 25 mm Superpave 440#/SY (4")	15,370 TN @	\$75.00	\$1,152,728
	7. Asphalt Leveling	1,740 TN @	\$82.00	\$142,641
	8. Bitum Tack Coat	25,378 GL @	\$1.50	\$38,067
			Subtotal	\$6,237,793
G.	Concrete Work			
	1. Plain Portland Cement, Class 3 Conc. 12"	98,427 SY @	\$38.00	\$3,740,213
	2. Concrete Median Paving 7.5"	6,300 SY @	\$38.00	\$239,400
	3. Driveways	100 SY @	\$30.00	\$3,000
	4. Concrete Curb & Gutter, 8" x 30" TP 2	16,700 LF @	\$10.00	\$167,000
	5. Concrete Curb & Gutter, 8" x 30" TP 7	14,900 LF @	\$10.00	\$149,000
	6. Sidewalk - 4"	7,000 SY @	\$25.00	\$175,000
			Subtotal	\$4,473,613
H.	Signing and Striping			
	1. Interstate Signs	0 EA @	\$62,000.00	\$0
	2. Signs	150 EA @	\$100.00	\$15,000
	3. Striping	29,550 LF @	\$2.65	\$78,308
	4. Signals with Interconnect	6 EA @	\$120,000.00	\$720,000
			Subtotal	\$813,308

L.	Guardrail			
	1. Guardrail, W Beam	800 LF @	\$15.00	\$12,000
	2. Guardrail, T Beam	200 LF @	\$38.50	\$7,700
	2. Anchors TP 12	2 EA @	\$1,650.00	\$3,300
	3. Anchors TP 1	2 EA @	\$500.00	\$1,000
			Subtotal	\$24,000
J.	Traffic Control			
	1. Traffic Control		Lump Sum	\$200,000
			Subtotal	\$200,000
K.	Landscaping and Erosion Control			
	1. Clearing & Grubbing	53.8 ac @	\$30,000.00	\$1,613,634
	2. Grassing	29.5 ac @	\$2,500.00	\$73,735
	3. Erosion Control			
	a. Temporary Grass	242 lbs @	\$1.00	\$242
	b. Temporary Mulch	161 TN @	\$150.00	\$24,205
	c. Silt Fence, TP A	5,451 LF @	\$3.00	\$16,354
	d. Silt Fence, TP C	0 LF @	\$4.00	\$0
	e. Maint. of Temp. Silt Fence, TP A	0 LF @	\$1.50	\$0
	f. Maint. of Temp. Silt Fence, TP C	0 LF @	\$1.50	\$0
	g. Sediment Basin, TP 1	1 EA @	\$6,000.00	\$6,000
	h. Maint. of Temp. Sediment Basin	1 EA @	\$3,500.00	\$3,500
	i. Permanent Grass Seed	605 lbs @	\$2.00	\$1,210
	j. Construction Exit	6 EA @	\$1,500.00	\$9,000
	k. Water Quality Sampling	18 mon.	\$100.00	\$1,800
	l. Water Quality Monitoring	18 mon.	\$1,000.00	\$18,000
	m. Erosion Control mats	0 SY @	\$2.50	\$0
	n. Miscellaneous Items		Lump Sum	\$8,031
			Subtotal	\$1,775,710
L.	Miscellaneous Items			
	1. Field Office TP 3	1 EA @	\$78,000.00	\$78,000
			Subtotal	\$78,000

GDOT Benefit-Cost Calculator

enter information in green cells

Project Information

ID	
Description	GA 400/McGinnis Ferry Road IJR - Alternative 5

Cost Estimate

Date of estimate	3/26/12
PE cost	\$ 1,491,576
ROW cost	\$ 6,671,232
UTILITY cost	\$ 1,100,000
CST cost	\$ 21,308,227
MITIGATION cost	\$ -
Total	\$ 30,571,035

Traffic in 2040

Source of traffic data	
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Without project (nobuild)	
Annual VMT	55,604,875
Annual VHT	1,922,140
Average speed (mph)	29

With project (build)	
Annual VMT	94,579,875
Annual VHT	1,613,287
Average speed (mph)	59

Parameters	Default	Override	Used
Analysis year	2035	2040	2040
Discount rate	7.0%		7%
Design life (years)	25	20	20
Base year of cost estimate	N/A	2012	2012
Current CST program year	N/A	2020	2020
Fuel price (\$/gallon)	3.22		3.22
Fuel economy (mpg)	18.03		18.03
Value of auto travel (\$/hr)	13.75		13.75
Value of truck travel (\$/hr)	72.65		72.65
Percent trucks	12%	4%	4%
Include GSP benefits	No	No	No

Costs	
Total cost	\$ 30,571,035
Annualized cost	\$ 2,047,865
Auto Delay Costs	
Nobuild	\$ 25,372,248
Build	\$ 21,295,388
Auto delay savings	\$ 4,076,860
Truck Delay Costs	
Nobuild	\$ 5,585,739
Build	\$ 4,688,212
Truck delay savings	\$ 897,527
Fuel Costs	
Nobuild	\$ 9,930,543
Build	\$ 16,891,137
Fuel cost savings	\$ (6,960,593)
Change in GSP	
Auto delay cost adjustment	NA
Truck delay cost adjustment	NA
Fuel cost adjustment	NA
Total benefit adjustment	NA
Benefits in 2040	\$ (1,986,207)
Benefit-Cost Ratio	(0.97)

Notes
 Project evaluation is based on termini in proposed concept report; Cost estimate was prepared for concept report.

Benefit Input Calculations for Alternative 5			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT with Project			
Corridor Description of ALT 5- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
<i>GA 400 from SR 120 to Windward Pkwy Ramp</i>	1.61	0.31	95250
<i>GA 400 from Windward Pkwy to McFarland Ramp</i>	2.55	0.49	75000
<i>McFarland Road Ramp</i>	0.23	0.04	9300
<i>McFarland Rd from GA 400 to Ronald Reagan Blvd</i>	0.17	0.03	59400
<i>Ronald Reagan Blvd from McFarland Road to Mall</i>	0.60	0.12	35800
		0.00	
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			73318
Corridor Length with Project (A to B in Miles)			5.16
Annual VMT With Project	Vehicles per day x 250 18,329,433	Travel Distance 5.16	VMT 94,579,875
Calculations of Annual VHT with Project			
Corridor Description of ALT 2- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Travel Speed*
<i>GA 400 from SR 120 to Windward Pkwy Ramp</i>	1.61	0.31	54.30
<i>GA 400 from Windward Pkwy to McFarland Ramp</i>	2.55	0.49	66.70
<i>McFarland Road Ramp</i>	0.23	0.04	45.00
<i>McFarland Rd from GA 400 to Ronald Reagan Blvd</i>	0.17	0.03	45.00
<i>Ronald Reagan Blvd from McFarland Road to Mall</i>	0.60	0.12	45.00
		0.00	
		0.00	
		0.00	
		0.00	
<i>* Travel Speed Determined from HCS analysis</i>			
Average Travel Speed under Build Scenario			58.63
Peak Travel Time through Corridor in Hours With Project (Total Length / Average Travel Speed)			0.09
Annual VHT With Project	Vehicles per day x 250 18,329,433	Peak Travel Time 0.09	VHT 1,613,287

Benefit Input Calculations for No-Build Scenario			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT without Project			
Corridor Description of McGinnis Ferry Rd IJR (No-Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length without Project (A to B in Miles)			4.09
Annual VMT Without Project	Vehicles per day x 250	Travel Distance	VMT
	13,595,324	4.09	55,604,875
Calculations of Annual VHT without Project			
Corridor Description of Sugarloaf Pkwy (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	18.13
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	18.13
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	12.20
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under No-Build Scenario			28.93
Peak Travel Time through Corridor in Hours Without Project (Total Length / Average Travel Speed)			0.14
Annual VHT Without Project	Vehicles per day x 250	Peak Travel Time	VHT
	13,595,324	0.14	1,922,140

SUMMARY OF PROJECT COSTS

Alt. 5 - McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

Non-Construction Costs

A.	Right-of-Way	\$6,671,232
B.	Reimbursable Utilities	\$1,750,000

Construction Costs

C.	Major Structures	\$4,896,672
D.	Grading and Earthwork	\$2,357,985
E.	Drainage	\$726,537
F..	Base and Paving	\$5,195,228
G.	Concrete Work	\$3,631,736
H.	Signing and Striping	\$813,308
I.	Guardrail	\$24,000
J.	Traffic Control & Mobilization	\$200,000
K.	Landscaping and Erosion Control	\$1,447,650
L.	Miscellaneous Construction Items	\$78,000
	Construction Cost Subtotal	\$19,371,116

Engineering & Construction; 10% \$1,937,112

	Total Construction Cost	\$21,308,227
	Professional Engineering	\$1,491,576
Total Project Costs		\$31,221,035

Forsyth & Fulton Counties

Detailed Cost Estimate - Alternative 5
 McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

A.	Right-of-Way			\$6,671,232
B.	Reimbursable Utilities			\$1,750,000
C.	Major Structures			
	1. Class A Concrete	400 CY @	\$600.00	\$240,000
	2. MSE Wall face 0-10 FT HT, Wall No. - 1	4,300 SF @	\$55.04	\$236,672
	3. Bridge over GA 400	44,200 SF @	\$100.00	\$4,420,000
			Subtotal	\$4,896,672
D.	Grading and Earthwork			
	1. Unclassified Excavation & Borrow	117,899 CY @	\$20.00	\$2,357,985
			Subtotal	\$2,357,985
E.	Drainage			
	1. Pipe 54" H20'-25'	700 LF @	\$120.00	\$84,000
	2. Pipe 36" H10'-15'	1,200 LF @	\$64.00	\$76,800
	3. Pipe 48" H0-10"	700 LF @	\$64.00	\$44,800
	4. Pipe 30" H 0'-10'	2,100 LF @	\$64.00	\$134,400
	5. Pipe 30" H10'-15'	2,000 LF @	\$43.50	\$87,000
	6. Catch Basins	45 EA	\$2,000.00	\$89,333
	7. Class A concrete (Headwalls)	30 CY@	\$500.00	\$15,000
	8. Riprap TP1 36"	100 SY @	\$56.00	\$5,600
	9. Rural Drainage		Lump	\$189,603
			Subtotal	\$726,537
F.	Base & Paving			
	1. Graded Aggregate Base 12"	92,972 TN @	\$20.00	\$1,859,438
	2. Graded Aggregate Base 6"	0 TN @	\$20.00	\$0
	3. Asphalt Concrete 12.5 mm Superpave 165#/SY (1-1/2")	8,453 TN @	\$75.00	\$633,946
	4. Asphalt Concrete 19.0 mm Superpave 220#/SY (2")	6,631 TN @	\$75.00	\$497,358
	5. Asphalt Concrete 25 mm Superpave 330#/SY (3")	13,813 TN @	\$75.00	\$1,035,964
	6. Asphalt Concrete 25 mm Superpave 440#/SY (4")	13,257 TN @	\$75.00	\$994,304
	7. Asphalt Leveling	1,740 TN @	\$82.00	\$142,641
	8. Bitum Tack Coat	21,052 GL @	\$1.50	\$31,577
			Subtotal	\$5,195,228
G.	Concrete Work			
	1. Plain Portland Cement, Class 3 Conc. 12"	76,272 SY @	\$38.00	\$2,898,336
	2. Concrete Median Paving 7.5"	6,300 SY @	\$38.00	\$239,400
	3. Driveways	100 SY @	\$30.00	\$3,000
	4. Concrete Curb & Gutter, 8" x 30" TP 2	16,700 LF @	\$10.00	\$167,000
	5. Concrete Curb & Gutter, 8" x 30" TP 7	14,900 LF @	\$10.00	\$149,000
	6. Sidewalk - 4"	7,000 SY @	\$25.00	\$175,000
			Subtotal	\$3,631,736
H.	Signing and Striping			
	1. Interstate Signs	0 EA @	\$62,000.00	\$0
	2. Signs	150 EA @	\$100.00	\$15,000
	3. Striping	29,550 LF @	\$2.65	\$78,308
	4. Signals with Interconnect	6 EA @	\$120,000.00	\$720,000
			Subtotal	\$813,308

L.	Guardrail			
	1. Guardrail, W Beam	800 LF @	\$15.00	\$12,000
	2. Guardrail, T Beam	200 LF @	\$38.50	\$7,700
	2. Anchors TP 12	2 EA @	\$1,650.00	\$3,300
	3. Anchors TP 1	2 EA @	\$500.00	\$1,000
			Subtotal	\$24,000
J.	Traffic Control			
	1. Traffic Control		Lump Sum	\$200,000
			Subtotal	\$200,000
K.	Landscaping and Erosion Control			
	1. Clearing & Grubbing	44.0 ac @	\$30,000.00	\$1,320,882
	2. Grassing	24.6 ac @	\$2,500.00	\$61,537
	3. Erosion Control			
	a. Temporary Grass	198 lbs @	\$1.00	\$198
	b. Temporary Mulch	132 TN @	\$150.00	\$19,813
	c. Silt Fence, TP A	0 LF @	\$3.00	\$0
	d. Silt Fence, TP C	0 LF @	\$4.00	\$0
	e. Maint. of Temp. Silt Fence, TP A	0 LF @	\$1.50	\$0
	f. Maint. of Temp. Silt Fence, TP C	0 LF @	\$1.50	\$0
	g. Sediment Basin, TP 1	1 EA @	\$6,000.00	\$6,000
	h. Maint. of Temp. Sediment Basin	1 EA @	\$3,500.00	\$3,500
	i. Permanent Grass Seed	495 lbs @	\$2.00	\$991
	j. Construction Exit	6 EA @	\$1,500.00	\$9,000
	k. Water Quality Sampling	18 mon.	\$100.00	\$1,800
	l. Water Quality Monitoring	18 mon.	\$1,000.00	\$18,000
	m. Erosion Control mats	0 SY @	\$2.50	\$0
	n. Miscellaneous Items		Lump Sum	\$5,930
			Subtotal	\$1,447,650
L.	Miscellaneous Items			
	1. Field Office TP 3	1 EA @	\$78,000.00	\$78,000
			Subtotal	\$78,000

GDOT Benefit-Cost Calculator

enter information in green cells

Project Information

ID
Description GA 400/McGinnis Ferry Road IJR - Alternative 6 - use Windward Pkwy

Cost Estimate

Date of estimate 3/26/12
PE cost \$ 1,794,376
ROW cost \$ 8,552,461
UTILITY cost \$ 2,150,000
CST cost \$ 25,633,936
MITIGATION cost \$ -
Total \$ 38,130,773

Traffic in 2040

Source of traffic data

Without project (nobuild)
Annual VMT 55,604,875
Annual VHT 1,922,140
Average speed (mph) 29

With project (build)
Annual VMT 55,604,875
Annual VHT 1,580,244
Average speed (mph) 35

Parameters	Default	Override	Used
Analysis year	2035	2040	2040
Discount rate	7.0%		7%
Design life (years)	25	20	20
Base year of cost estimate	N/A	2012	2012
Current CST program year	N/A	2020	2020
Fuel price (\$/gallon)	3.22		3.22
Fuel economy (mpg)	18.03		18.03
Value of auto travel (\$/hr)	13.75		13.75
Value of truck travel (\$/hr)	72.65		72.65
Percent trucks	12%	4%	4%
Include GSP benefits	No	No	No

Costs

Total cost \$ 38,130,773
Annualized cost \$ 2,554,270

Auto Delay Costs

Nobuild \$ 25,372,248
Build \$ 20,859,221
Auto delay savings \$ 4,513,027

Truck Delay Costs

Nobuild \$ 5,585,739
Build \$ 4,592,189
Truck delay savings \$ 993,550

Fuel Costs

Nobuild \$ 9,930,543
Build \$ 9,930,543
Fuel cost savings \$ -

Change in GSP

Auto delay cost adjustment NA
Truck delay cost adjustment NA
Fuel cost adjustment NA
Total benefit adjustment NA

Benefits in 2040 \$ 5,506,577

Benefit-Cost Ratio 2.16

Notes

Project evaluation is based on termini in proposed concept report; Cost estimate was prepared for concept report.

Benefit Input Calculations for Alternative 6			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT with Project			
Corridor Description of ALT 6- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length with Project (A to B in Miles)			4.09
Annual VMT With Project	Vehicles per day x 250 13,595,324	Travel Distance 4.09	VMT 55,604,875
Calculations of Annual VHT with Project			
Corridor Description of ALT 2- McGinnis Ferry IJR (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	22.40
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	22.40
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	35.00
		0.00	
		0.00	
		0.00	
		0.00	
<i>* Travel Speed Determined from HCS analysis</i>			
Average Travel Speed under Build Scenario			35.19
Peak Travel Time through Corridor in Hours With Project (Total Length / Average Travel Speed)			0.12
Annual VHT With Project	Vehicles per day x 250 13,595,324	Peak Travel Time 0.12	VHT 1,580,244

Benefit Input Calculations for No-Build Scenario			
Project Name: McGinnis Ferry Rd IJR			
Calculations of Annual VMT without Project			
Corridor Description of McGinnis Ferry Rd IJR (No-Build Scenario)	Length (miles)	Proportions	Year 2040 Build ADT
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	95250
Windward Pkwy Exit Ramp	0.32	0.08	27500
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	49900
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	13300
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	39800
		0.00	
		0.00	
		0.00	
Year 2040 Design Year ADT for Corridor			54381
Corridor Length without Project (A to B in Miles)			4.09
Annual VMT Without Project	Vehicles per day x 250	Travel Distance	VMT
	13,595,324	4.09	55,604,875
Calculations of Annual VHT without Project			
Corridor Description of Sugarloaf Pkwy (Build Scenario)	Length (miles)	Proportions	Travel Speed*
GA 400 from SR 120 to Windward Pkwy Ramp	1.13	0.28	54.30
Windward Pkwy Exit Ramp	0.32	0.08	18.13
Windward Pkwy from GA 400 to Windward Concourse	1.35	0.33	18.13
Windward Concourse from Windward Parkway to McGinnis Ferry Road	0.48	0.12	35.00
McGinnis Ferry Rd from Windward Pkwy to Mall	0.81	0.20	12.20
		0.00	
		0.00	
		0.00	
* Travel Speed Determined from HCS analysis			
Average Travel Speed under No-Build Scenario			28.93
Peak Travel Time through Corridor in Hours Without Project (Total Length / Average Travel Speed)			0.14
Annual VHT Without Project	Vehicles per day x 250	Peak Travel Time	VHT
	13,595,324	0.14	1,922,140

SUMMARY OF PROJECT COSTS

Alt. 6 - McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

Non-Construction Costs

A.	Right-of-Way	\$8,552,461
B.	Reimbursable Utilities	\$2,150,000

Construction Costs

C.	Major Structures	\$4,896,672
D.	Grading and Earthwork	\$3,093,496
E.	Drainage	\$781,602
F..	Base and Paving	\$6,714,397
G.	Concrete Work	\$4,777,613
H.	Signing and Striping	\$813,308
I.	Guardrail	\$24,000
J.	Traffic Control & Mobilization	\$200,000
K.	Landscaping and Erosion Control	\$1,924,490
L.	Miscellaneous Construction Items	\$78,000
	Construction Cost Subtotal	\$23,303,578

Engineering & Construction; 10% \$2,330,358

	Total Construction Cost	\$25,633,936
	Professional Engineering	\$1,794,376
Total Project Costs		\$38,130,772

Forsyth & Fulton Counties

Detailed Cost Estimate - Alternative 6
 McGinnis Ferry Rd from Bethany Bend to Ronald Reagan Blvd

A.	Right-of-Way			\$8,552,461
B.	Reimbursable Utilities			\$2,150,000
C.	Major Structures			
	1. Class A Concrete	400 CY @	\$600.00	\$240,000
	2. MSE Wall face 0-10 FT HT, Wall No. - 1	4,300 SF @	\$55.04	\$236,672
	3. Bridge over GA 400	44,200 SF @	\$100.00	\$4,420,000
			Subtotal	\$4,896,672
D.	Grading and Earthwork			
	1. Unclassified Excavation & Borrow	154,675 CY @	\$20.00	\$3,093,496
			Subtotal	\$3,093,496
E.	Drainage			
	1. Pipe 54" H20'-25'	700 LF @	\$120.00	\$84,000
	2. Pipe 36" H10'-15'	1,200 LF @	\$64.00	\$76,800
	3. Pipe 48" H0-10"	700 LF @	\$64.00	\$44,800
	4. Pipe 30" H 0'-10'	2,100 LF @	\$64.00	\$134,400
	5. Pipe 30" H10'-15'	2,000 LF @	\$43.50	\$87,000
	6. Catch Basins	45 EA	\$2,000.00	\$89,333
	7. Class A concrete (Headwalls)	30 CY@	\$500.00	\$15,000
	8. Riprap TP1 36"	100 SY @	\$56.00	\$5,600
	9. Rural Drainage		Lump	\$244,669
			Subtotal	\$781,602
F.	Base & Paving			
	1. Graded Aggregate Base 12"	124,252 TN @	\$20.00	\$2,485,034
	2. Graded Aggregate Base 6"	0 TN @	\$20.00	\$0
	3. Asphalt Concrete 12.5 mm Superpave 165#/SY (1-1/2")	9,719 TN @	\$75.00	\$728,913
	4. Asphalt Concrete 19.0 mm Superpave 220#/SY (2")	8,320 TN @	\$75.00	\$623,980
	5. Asphalt Concrete 25 mm Superpave 330#/SY (3")	19,274 TN @	\$75.00	\$1,445,540
	6. Asphalt Concrete 25 mm Superpave 440#/SY (4")	16,633 TN @	\$75.00	\$1,247,444
	7. Asphalt Leveling	1,740 TN @	\$82.00	\$142,641
	8. Bitum Tack Coat	27,230 GL @	\$1.50	\$40,845
			Subtotal	\$6,714,397
G.	Concrete Work			
	1. Plain Portland Cement, Class 3 Conc. 12"	106,427 SY @	\$38.00	\$4,044,213
	2. Concrete Median Paving 7.5"	6,300 SY @	\$38.00	\$239,400
	3. Driveways	100 SY @	\$30.00	\$3,000
	4. Concrete Curb & Gutter, 8" x 30" TP 2	16,700 LF @	\$10.00	\$167,000
	5. Concrete Curb & Gutter, 8" x 30" TP 7	14,900 LF @	\$10.00	\$149,000
	6. Sidewalk - 4"	7,000 SY @	\$25.00	\$175,000
			Subtotal	\$4,777,613
H.	Signing and Striping			
	1. Interstate Signs	0 EA @	\$62,000.00	\$0
	2. Signs	150 EA @	\$100.00	\$15,000
	3. Striping	29,550 LF @	\$2.65	\$78,308
	4. Signals with Interconnect	6 EA @	\$120,000.00	\$720,000
			Subtotal	\$813,308

L.	Guardrail			
	1. Guardrail, W Beam	800 LF @	\$15.00	\$12,000
	2. Guardrail, T Beam	200 LF @	\$38.50	\$7,700
	2. Anchors TP 12	2 EA @	\$1,650.00	\$3,300
	3. Anchors TP 1	2 EA @	\$500.00	\$1,000
			Subtotal	\$24,000
J.	Traffic Control			
	1. Traffic Control		Lump Sum	\$200,000
			Subtotal	\$200,000
K.	Landscaping and Erosion Control			
	1. Clearing & Grubbing	59.0 ac @	\$30,000.00	\$1,771,088
	2. Grassing	32.1 ac @	\$2,500.00	\$80,295
	3. Erosion Control			
	a. Temporary Grass	266 lbs @	\$1.00	\$266
	b. Temporary Mulch	177 TN @	\$150.00	\$26,566
	c. Silt Fence, TP A	0 LF @	\$3.00	\$0
	d. Silt Fence, TP C	0 LF @	\$4.00	\$0
	e. Maint. of Temp. Silt Fence, TP A	0 LF @	\$1.50	\$0
	f. Maint. of Temp. Silt Fence, TP C	0 LF @	\$1.50	\$0
	g. Sediment Basin, TP 1	1 EA @	\$6,000.00	\$6,000
	h. Maint. of Temp. Sediment Basin	1 EA @	\$3,500.00	\$3,500
	i. Permanent Grass Seed	664 lbs @	\$2.00	\$1,328
	j. Construction Exit	6 EA @	\$1,500.00	\$9,000
	k. Water Quality Sampling	18 mon.	\$100.00	\$1,800
	l. Water Quality Monitoring	18 mon.	\$1,000.00	\$18,000
	m. Erosion Control mats	0 SY @	\$2.50	\$0
	n. Miscellaneous Items		Lump Sum	\$6,646
			Subtotal	\$1,924,490
L.	Miscellaneous Items			
	1. Field Office TP 3	1 EA @	\$78,000.00	\$78,000
			Subtotal	\$78,000