Bandy Locust Grove Mixed-Use Development

DRI No. 1610

Locust Grove, Georgia

GRTA DRI Review Package

Site Plan Elements
Traffic Impact Analysis
Area of Influence Analysis
DRI Review Criteria
Air Quality Benchmark Statement

Prepared for:

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May 2008

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EXECUTIVE SUMMARY

SITE INFORMATION: This report presents a variety of analyses and documentation for submittal as the major portion of the Georgia Regional Transportation Authority (GRTA) Development of Regional Impact (DRI) Review Package. This study presents an analysis of the traffic impact expected to result from a mixed-use development located on the south side of Bill Gardner Parkway between I-75 and Lester Mill Road in Locust Grove, Georgia. The Site is called Locust Grove Retail, or Locust Grove Mixed-Use. Build-Out of the site was analyzed, and this report addresses the analyses and findings at Site Build-Out. The Build-Out Year for the Site is 2016, and the proposed development consists of 1.195 million square feet of retail, a 120 room hotel, 20 single-family detached units, and 342 apartment units on 236 acres. The Site has six (6) access points.

The Site will be built under the City of Locust Grove Future Land Use Plan. The current zoning for the 155 acres of the site on the east side of Strong Rock Boulevard is C-3 (Heavy Commercial). The 107 acres to the west of Strong Rock Boulevard is zoned as R-A (residential-agricultural). The proposed rezoning west of Strong Rock Boulevard is PD (Planned Development), which will include R-3 (Large Lot Residential Subdivision) next to Bill Gardner Reservoir, RM (Multi-family) and C-3 (Heavy Commercial). According to the current Locust Grove Land Use Plan (Adopted May 2005), the site is currently designated as Agriculture/Timber/Undeveloped. The City of Locust Grove Future Land Use Plan shows the land use to be Regional Commercial, Mixed-Use District, and Low Density Residential.

SITE TRIPS: At Site Build-Out (Year 2016), the Site is expected to generate approximately 36,850 new vehicle trips per day (gross), but after internal capture and pass-by trips are considered, it will generate approximately 33,650 new external trips (to/from the site) per day. Approximately 810 new external trips (440 in and 370 out) will be generated during the AM peak hour, approximately 3,170 new external trips (1,550 in and 1,620 out) will be generated during the PM peak hour, and 4,180 new external trips (2,190 in and 1,990 out) will be generated during the Saturday mid-day peak hour. [Numbers are rounded, see text, tables, and worksheets for specific numbers analyzed.]

Approximately 40% of the retail trips (and 46% of the residential trips) are expected to use I-75 oriented to the north, and about 21% of the retail trips (and 18% of the residential trips) are expected to use I-75 oriented to the south. Approximately 18% of the retail trips (and 15% of the residential trips) are expected to use Bill Gardner Parkway to the east, and about 21% of the retail trips (and 21% of the residential trips) are expected to use Bill Gardner Parkway oriented to the west.

AREA OF INFLUENCE: The Site is located within an Area of Influence with housing opportunities such that approximately 100% of the persons who are reasonably anticipated to work at the Site will have an opportunity to find housing within the Area of Influence.

FINDINGS AND CONCLUSIONS: The Site is NOT located in an area where the anticipated level of development and availability of infrastructure within the study network is such that the Site is

reasonably anticipated to result in unplanned and poorly served development. As shown in the traffic impact analysis, the roadways and intersections serving the Site can be reasonably expected to operate at adequate Levels of Service (LOS), and/or may be mitigated and improved readily so that they will operate at adequate LOS. The required improvements are shown in the following tables.

PROJECT SUMMARY

Name and Number of DRI	Bandy - Locust Grove Mixed-Use (DRI No.1610)
Jurisdiction	City of Locust Grove
Local Development Approval Sought	Re-Zoning
Location	South of Bill Gardner Parkway West of I-75
Uses and Intensities of Uses	1,194,500 square feet Retail proposed Hotel with 120 rooms proposed 20 Single-family homes proposed 342 Apartment units proposed
Project Phasing and Build-Out	2016
Trip Generation (ADT / AM / PM / Sat Peak) Net External Trips	33,704 / 810 / 3,164 / 4,172

REQUIRED IMPROVEMENTS WITHOUT PROGRAMMED IMPROVEMENTS

Intersection	Existing Conditions	Future Background Conditions	Future Year Total Conditions
No. 1 – Bill Gardner Parkway at SR 155	N.A.	Add NB Right Turn Lane, and Optimize Signal Timing	Add EB Right Turn Lane, NB Right Turn Lane, and SB Right Turn Lane, Optimize Signal Timing
No. 3 – Bill Gardner Parkway at Strong Rock Parkway	N.A.	N.A.	Add a Traffic Signal, add 2nd EB Through Lane, 2nd WB Left Turn Lane, 2nd WB Through Lane, 2nd NB Left Turn Lane, Coordinate with Nos. 5, 6, 7, and 15, and Optimize Signal Timing
No. 4 – Bill Gardner Parkway at Price Drive	N.A.	N.A.	Add 2 EB Through Lanes and 2 WB Through Lanes
No. 5 – Bill Gardner Parkway at I-75 SB Ramp	Interconnect with Intersections Nos. 6 and 7, Optimize timing, Coordinate Signals	Interconnect with Intersections Nos. 6 and 7, Optimize timing, Coordinate Signals	Add 3rd EB Through Lane, add 2nd and 3rd WB Through Lanes, add EB Right Turn Lane, Add Free SB Right Turn Lane, Coordinate with Nos. 3, 6, 7, and 15, and Optimize Signal Timing
No. 6 – Bill Gardner Parkway at I-75 NB Ramp	Interconnect with Intersections Nos. 5 and 7, Optimize Timing, Coordinate Signals	Interconnect with Intersections Nos. 5 and 7, Optimize Timing, Coordinate Signals	Add a 2nd EB Left Turn Lane, add a 3rd EB Through Lane and add 2nd and 3rd WB Through Lanes, add 2nd and 3rd NB Left Turn Lanes, Coordinate with Nos. 3, 5, 7, and 15, and Optimize Signal Timing
No. 7 – Bill Gardner Parkway at Tanger Blvd.	Add EB Right Turn Lane and Optimize Signal Timing, and Interconnect / Coordinate with Nos. 5 and 6	Add EB Right Turn Lane; NB Dual Left Turn Lane; Interconnect / Coordinate with Nos. 5 and 6, and Optimize Signal Timing	Add EB Through Lane and convert EB Left Turn Lane to a Left-Through Lane, add EB Right Turn Lane, add WB Through Lane, convert left-most WB Through Lane to a Left-Through Lane, add 2nd and 3rd NB Left Turn Lanes, convert NB LTR Lane to NB Through Lane, add NB Right Turn Lane, Coordinate with Nos. 3, 5, 6, and 15, and Optimize Signal Timing
No. 8 – Bill Gardner Parkway at US 23 / SR 42	EB Right Turn Phase 5 Overlap, Optimize signal timing	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EBR; Remove Free SBR; Optimize Signal Timing	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EB Right Turn; Remove Free SB Right; Optimize Signal Timing
No. 13 – Bill Gardner Parkway at Site Driveway 3	N.A.	N.A.	Widen to 2 EB Through Lanes and 2 WB Through Lanes
No. 14 – Bill Gardner Parkway at Site Driveway 5	N.A.	N.A.	Add EB Right Turn Lane, Widen to 2 EB Through Lanes and 3 WB Through Lanes
No. 15 – Bill Gardner Parkway at J. Bandy Parkway	N.A.	N.A.	Add Traffic Signal, Widen to 3 EB Through Lanes and 3 WB Through Lanes, Remove Exclusive EB Right Turn Lane, Coordinate with Nos. 3, 5, 6, and 7, and Optimize Signal Timing

PROGRAMMED PLUS OTHER REQUIRED IMPROVEMENTS

Intersection	Existing Conditions	Future Background Conditions	Future Year Total Conditions
No. 1 – Bill Gardner Parkway at SR 155	N.A.	Add NB Right Turn Lane and Optimize Signal Timing	Add NB Right Turn Lane, EB Right Turn Lane, and SB Right Turn Lane; and Optimize Signal Timing
No. 3 – Bill Gardner Parkway at Strong Rock Parkway	N.A.	N.A.	Install Traffic Signal with Prot/Perm WB Left Operation, Add 2nd WB Left Turn Lane; add Free NB Right Turn Lane; Re-stripe EB direction for Right Turn Lane; Re-stripe NB direction for Dual Left; and Optimize Signal Timing
No. 4 – Bill Gardner Parkway at Price Drive	N.A.	N.A.	N.A.
No. 5 – Bill Gardner Parkway at I-75 SB Ramp	Interconnect with Intersections Nos. 6 and 7, Optimize timing, Coordinate Signals	Interconnect with Intersections Nos. 6 and 7, Optimize timing, Coordinate Signals	Add 3rd EB Through Lane, add 2nd and 3rd WB Through Lanes, add EB Right Turn Lane, Add Free SB Right Turn Lane, Coordinate with Nos. 3, 6, 7, and 15, and Optimize Signal Timing
No. 6 – Bill Gardner Parkway at I-75 NB Ramp	Interconnect with Intersections Nos. 5 and 7, Optimize Timing, Coordinate Signals	Interconnect with Intersections Nos. 5 and 7, Optimize Timing, Coordinate Signals	Add a 2nd EB Left Turn Lane, add a 3rd EB Through Lane and add 2nd and 3rd WB Through Lanes, add 2nd and 3rd NB Left Turn Lanes, Coordinate with Nos. 3, 5, 7, and 15, and Optimize Signal Timing
No. 7 – Bill Gardner Parkway at Tanger Blvd.	EB Right Turn Lane and Optimize Signal Timing, and Interconnect / Coordinate with Nos. 5 and 6	Add EB Right Turn Lane; NB Dual Left Turn Lane; Interconnect / Coordinate with Nos. 5 and 6, and Optimize Signal Timing	Add EB Through Lane and convert EB Left Turn Lane to a Left-Through Lane, add EB Right Turn Lane, add WB Through Lane, convert left-most WB Through Lane to a Left-Through Lane, add 2nd and 3rd NB Left Turn Lanes, convert NB LTR Lane to NB Through Lane, add NB Right Turn Lane, Coordinate with Nos. 3, 5, 6, and 15, and Optimize Signal Timing
No. 8 – Bill Gardner Parkway at US 23 / SR 42	EB Right Turn Phase 5 Overlap, Optimize signal timing	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EBR; Remove Free SBR; Optimize Signal Timing	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EB Right Turn; Remove Free SB Right; Optimize Signal Timing
No. 13 – Bill Gardner Parkway at Site Driveway 3	N.A.	N.A.	N.A.
No. 14 – Bill Gardner Parkway at Site Driveway 5	N.A.	N.A.	N.A.
No. 15 – Bill Gardner Parkway at J. Bandy Parkway	N.A.	N.A.	Install Traffic Signal with Prot/Perm Operation for WB Left; Optimize Signal Timing

1. INTRODUCTION

This report presents a variety of analyses and documentation for submittal as the major portion of the Georgia Regional Transportation Authority (GRTA) Development of Regional Impact (DRI) Review Package for the proposed Locust Grove Retail development, generally referred to as the Locust Grove Mixed-Use development in this report. The Locust Grove Mixed-Use development is a mixed-use development located on the south side of Bill Gardner Parkway between I-75 and Lester Mill Road in Locust Grove, Georgia. The current zoning for the 155 acres of the site on the east side of Strong Rock Boulevard is C-3 (Heavy Commercial). The 107 acres to the west of Strong Rock Boulevard is zoned as R-A (residential-agricultural). These analyses have been initiated in response to a proposed rezoning of the western portion of the site, west of Strong Rock Boulevard, to PD (Planned Development), which will include R-3 (Large Lot Residential Subdivision) next to Bill Gardner Reservoir, RM (Multi-family), and C-3 (Heavy Commercial). Due to the size and characteristics of the Site, it qualifies for a DRI level of review and analysis per rules and guidelines established by GRTA, the Atlanta Regional Commission (ARC), and the Georgia Department of Community Affairs (DCA). The Applicant has elicited to undertake the GRTA review via the Non-Expedited Review Process.

The Site will be developed in five (5) Phases for marketing purposes, but only Build-Out was analyzed, and this report addresses the analyses and findings at Site Build-Out. The Build-Out Year for the Site is 2016, and the proposed development consists of 1,194,500 square feet of retail, a 120 room hotel, 20 single-family detached units, and 342 apartment units on 236 acres. The Site has six (6) access points.

2. SITE DESCRIPTION / SITE PLAN ELEMENTS

2.1 Project Description

The Site is located on the south side of Bill Gardner Parkway between I-75 and Lester Mill Road in Locust Grove, Georgia. Figure 2-1 shows the Site Orientation with respect to the surrounding communities and interstates and provides a more detailed Site Location Map showing the roadways in the immediate vicinity of the Site. Figure 2-2 shows an aerial photograph of the near vicinity of the Site.

2.2 Site Plan – Types and Amounts of Development

The Site is proposed to consist of 1,194,500 square feet of retail, a 120 room hotel, 20 single-family detached units, and 342 apartment units on 236 acres. The Build-Out Year for the Site is 2016. The Site Plan is shown in Figure 2-3.

Most of the land use around the site is undeveloped. Bill Gardner Reservoir currently borders the proposed site location on the west side. The Strong Rock Christian School campus borders the south side of the site. I-75 borders the site to the east and does not have any existing or proposed access points directly into the site. There is a discount shopping center to the east of the site on the east side of I-75. Bill Gardner Parkway borders the site to the north and will provide all of the proposed access points to the site. Super 8 Motel and Horse Town are located across from the site on Bill Gardner Pkwy.

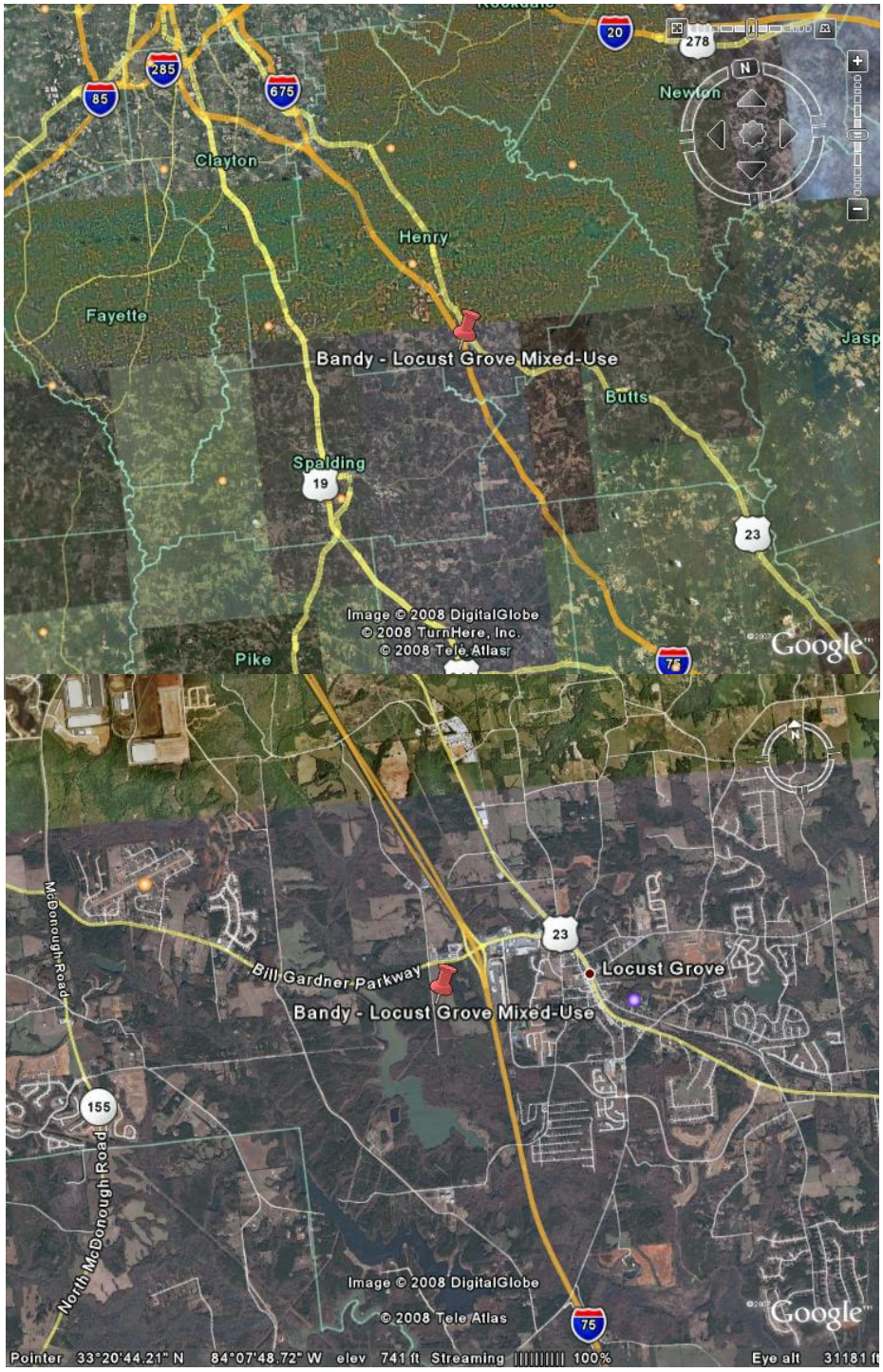
2.3 Consistency with Adopted Comprehensive Plans

The eastern portion of the site recently underwent re-zoning. The current zoning for the eastern 155 acres of the site is C-3 (Heavy Commercial) (east side of Strong Rock Boulevard). The 107 acres to the west of Strong Rock Boulevard is presently zoned as R-A (residential-agricultural).

The proposed rezoning west of Strong Rock Boulevard is to PD (Planned Development), and will include R-3 (Large Lot Residential Subdivision) next to Bill Gardner Reservoir, RM (Multi-family), and C-3 (Heavy Commercial).

According to the current Locust Grove Land Use Plan (Adopted May 2005), the site is currently designated as Agriculture/Timber/Undeveloped. The City of Locust Grove Future Land Use Plan shows the land use to be Regional Commercial, Mixed-Use District, and Low Density Residential. The present re-zoning effort will bring the site into compatibility with the future land use plan.

Figure 2-1. Site Orientation and Site Location Maps

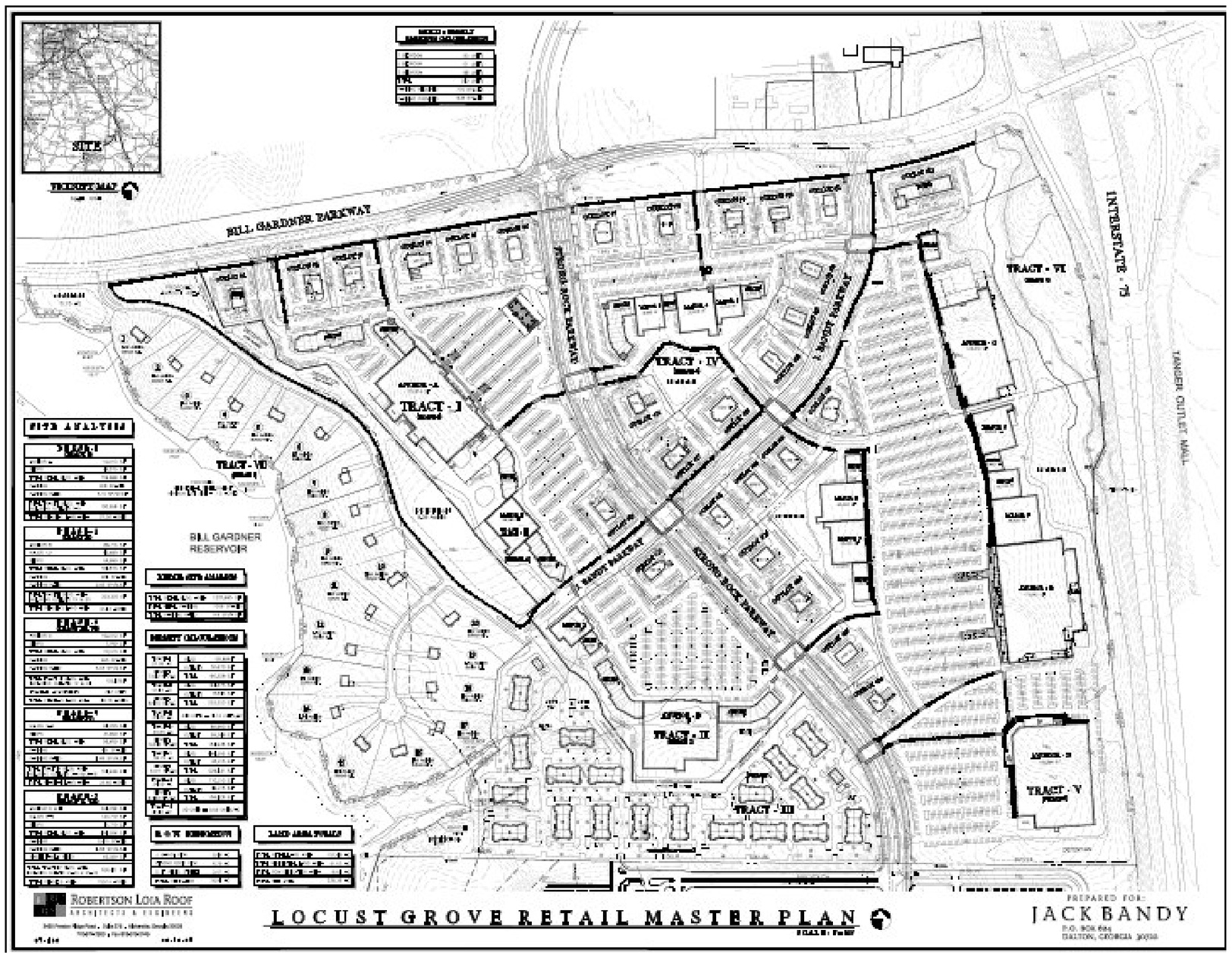


Source: Google Earth

Figure 2-2. Site Aerial

Source: Google Earth

Figure 2-3. Site Plan



2.4 Project Phasing Schedule

The Site will be developed in five (5) Phases for marketing purposes, however the analyses and report focus only upon the conditions at Site Build-Out. The Build-Out Year for the Site is 2016.

2.5 Site Parking Requirements

The parking requirements for the Site, per City of Locust Grove standards, are described below. The parking that the Site will be providing is also described below. The parking ratios and total numbers of parking spaces are likewise below:

Required Parking:

- the required parking spaces for retail are 5 spaces per 1000 gross square feet of space, or 5972 spaces;
- the required parking spaces for the hotel are one space per room, plus one space for each employee – largest shift, or 130 spaces; and
- the required parking spaces for the residential units are two (2) spaces per unit (for the first two bedrooms), plus an additional space for each additional bedroom, or 770 spaces.

Proposed Parking:

- the proposed parking spaces for retail (including outlots) are 5.99 spaces per 1000 gross square feet of space, or 7152 spaces;
- the proposed parking spaces for the hotel are 1.23 spaces per room, plus one space each for ten employees, or 157 spaces; and
- the proposed parking spaces for the residential units are 938 spaces, or on average, 2.59 spaces per unit.

2.6 Site Access Points and Driveways

The Site is proposed to have six (6) access points which are all located on Bill Gardner Parkway. The main access point will be Strong Rock Parkway. A second major access point will be the proposed J. Bandy Parkway. Ultimately, when Strong Rock Parkway is extended further to the south, this will give the site an additional significant access point directly to the south. Briefly, the access drives are as follows:

- **Access Drive No. 1 (Study Intersection No. 11)** – to the far west of the property along Bill Gardner Parkway, a two lane roadway, primarily serving the residential portion of the site.

- **Access Drive No. 2 (Study Intersection No. 12)** – east of Access Drive No. 1, a full-movement intersection, with Access Drive No. 2 being a short four lane divided roadway, primarily serving the retail portion of the site.

- **Access Drive No. 3 (Study Intersection No. 13)** – east of Access Drive No. 2, west of Strong Rock Parkway, an access drive limited to right-in, right-out, primarily serving the retail portion of the site.

- **Access Drive No. 4 (Strong Rock Parkway) (Study Intersection No. 3)** – east of Access Drive No. 3, a full-movement intersection, with Strong Rock Parkway being a four lane divided roadway with turning lanes at key intersections, primarily serving the retail portion of the site.

- **Access Drive No. 5 (Study Intersection No. 14)** – east of Strong Rock Parkway, an access drive limited to right-in, right-out, serving the retail portion of the site.

- **Access Drive No. 6 (J. Bandy Parkway) (Study Intersection No. 15)** – east of Access Drive No. 5, west of I-75, a full-movement intersection, with J. Bandy Parkway being a four lane divided roadway with turning lanes at key intersections, primarily serving the retail portion of the site.

- **Future Access Point No. 7 (not studied, not yet an access point)** – Strong Rock Parkway connecting to the development to the south of the Subject Site, once Strong Rock Parkway is extended further south to Indian Creek Road (and indirectly to Lester Mill Road), this will add a significant additional access point for the site.

2.7 Pedestrian and Transit Facilities

External to and adjacent to the Site, there are no existing sidewalks along Bill Gardner Parkway. The developer is proposing to install a sidewalk on the south side of Bill Gardner Parkway.

There are "existing" bike and pedestrian paths planned along Strong Rock Parkway, with lies within the site. DRA Development is presently completing that work. In terms of new bicycle facilities off-site, other than continuation of the bike / ped lanes through the Strong Rock area to the south (towards Indian Creek Road), there are no other bicycle/pedestrian paths in the current plans of the City of Locust Grove.

The developer is proposing sidewalks in many areas, as shown in the site plan. Sidewalks will also lead from parking facilities to the entrance of every major building. The developer will also connect the on-site sidewalk system to all existing sidewalks abutting the site.

There are currently no planned or existing transit facilities within ½ mile of the site. It may be desirable to provide for GRTA Express service in the future. There are no current plan documents to that effect.

3.1 Trip Generation

As noted above, the Site will consist of 1,194,500 square feet of retail, a 120 room hotel, 20 single-family detached units, and 342 apartment units on 236 acres.

The number of vehicle trips expected from the Site was estimated. The trip generation was based on the Site Plan and information provided by the developer/owner.

The typical procedure for determining the traffic generated by a new development is to apply the rates or equations developed by the Institute of Transportation Engineers (ITE) as published in *Trip Generation, 7th Edition*, 2003, an ITE Informational Report, and related information in the *Trip Generation Handbook*, an ITE Recommended Practice, June 2004. The rates and equations in these documents are calculated from nationally collected data. The rates and equations were used to estimate the number of trips expected for the Site. The ITE Land Use Codes used in the analyses are shown in Table 3-1.

Internal capture rates, published in ITE's *Trip Generation Handbook*, June 2004, between retail and other Site land uses were used to reduce trips based on the mixed-use nature of the Site.

Pass-by trips were also reduced from the trip generation for the shopping center. The pass-by rate was calculated using ITE's *Trip Generation Handbook*, June 2004. The pass-by rate was found to be 19% for the weekday PM peak (and 15% for the Saturday peak). GRTA caps pass-by trips at 10% of the average daily traffic (ADT) on the adjacent roadway. The limits test was performed to determine whether the pass-by trips that would be expected based on the rates given in ITE's *Trip Generation Handbook* would be more than 10% of the ADT for the adjacent roadway. It was determined that the pass-by trips were expected to be 42% of the Year 2016 projected ADT for Bill Gardner Parkway for. Pass-by trips were reduced accordingly (to 5% / 4% from 19% / 15%).

Trip Generation has been determined for the Site Build-Out (Year 2016). The results of the trip generation are shown in Table 3-1. The Trip Generation and Internal Capture Worksheets are included in Appendix B.

Table 3-1. Site Build-Out Trip Generation

Land Use	(ITE Code)	Intensity	Daily		AM Peak Hr		PM Peak Hr		Saturday	
			In	Out	In	Out	In	Out	In	Out
Retail Shopping Center (820)	**820**	**1118 ksf**	**17,025**	**17,025**	**423**	**270**	**1,545**	**1,673**	**2,257**	**2,083**
Internal			419	364	21	19	46	42	33	30
External	Pass-by		16,606	16,661	402	251	1,499	1,631	2,224	2,053
Passby	Daily, PM= 5%		787	787	68	43	71	77	104	96
New External Retail Trips	AM, SAT=		15,819	15,874	334	208	1,428	1,554	2,120	1,957
Residential Apartments (220)	**220**	**345 DU**	**1,103**	**1,103**	**54**	**131**	**136**	**87**	**97**	**62**
Internal			364	419	19	21	42	46	30	33
External			739	684	35	110	94	41	67	29
Residential Single Family Detached (210)	**210**	**20 DU**	**119**	**118**	**6**	**17**	**16**	**9**	**16**	**13**
Internal			39	45	2	6	5	5	5	7
External			80	73	4	11	11	4	11	6
All Suites Hotel (311)	**311**	**120 rooms**	**294**	**294**	**65**	**53**	**22**	**26**		
Internal			0	0	0	0	0	0		
External			294	294	65	53	22	26		
TOTAL			**18,422**	**18,422**	**542**	**454**	**1,703**	**1,786**	**2,354**	**2,145**
TOTAL INTERNAL			783	783	40	40	88	88	63	63
TOTAL EXTERNAL			17,639	17,639	502	414	1,615	1,698	2,291	2,082
TOTAL PASSBY			787	787	68	43	71	77	104	96
TOTAL NEW EXTERNAL			**16,852**	**16,852**	**434**	**371**	**1,544**	**1,621**	**2,187**	**1,986**

3.2 Trip Distribution and Traffic Assignment

For the purposes of developing trip distribution, a radius of twenty (20) miles was used for residential land uses (with the assumption that the vast majority of home to work trips will be satisfied within that twenty mile radius). A fifteen (15) mile radius was used for retail related trips (due to the regional nature of the retail center).

The trip distribution for the Site was calculated using Census data with the GIS software *Maptitude*.

The trip distribution for the Site, in its simplest terms, is as follows:

- Approximately 40% of the retail trips (and 46% of the residential trips) are expected to use I-75 oriented to the north;
- About 21% of the retail trips (and 18% of the residential trips) are expected to use I-75 oriented to the south;
- Approximately 18% of the retail trips (and 15% of the residential trips) are expected to use Bill Gardner Parkway to the east; and,
- About 21% of the retail trips (and 21% of the residential trips) are expected to use Bill Gardner Parkway oriented to the west

The trip distributions developed for the Site are shown in Figure 3-1 for Site Build-Out (Year 2016). The appropriate distribution percentages were applied to the trips generated by the Site as shown in Table 3-1 for Site Build-Out (Year 2016), and the traffic volumes were assigned to the road network. The weekday AM, weekday PM, and Saturday peak hour turning volumes expected at the study intersections from the Site are shown in Figure 3-2 for Site Build-Out (Year 2016).

Figure 3-1. Site Build-Out Trip Distribution

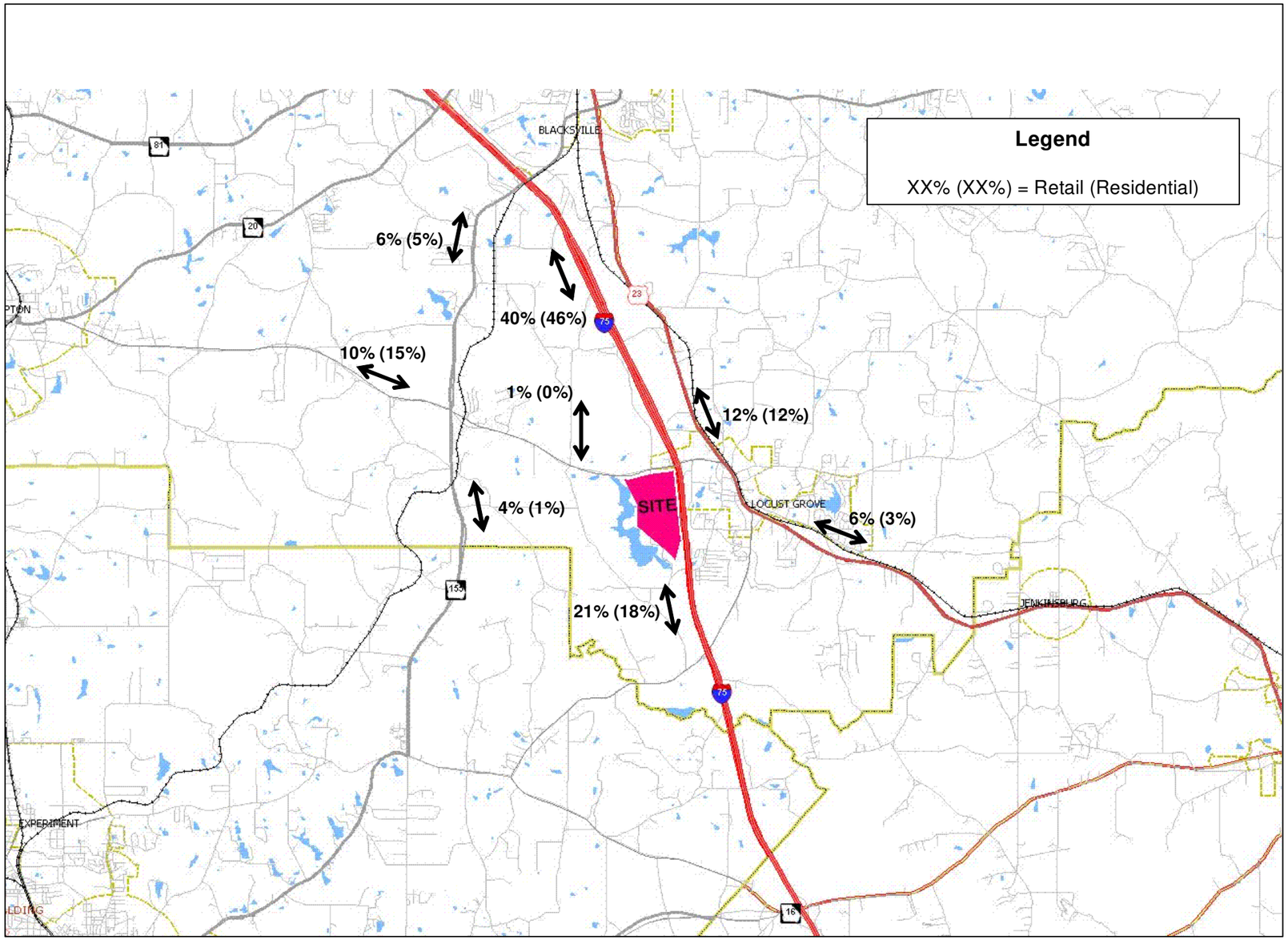
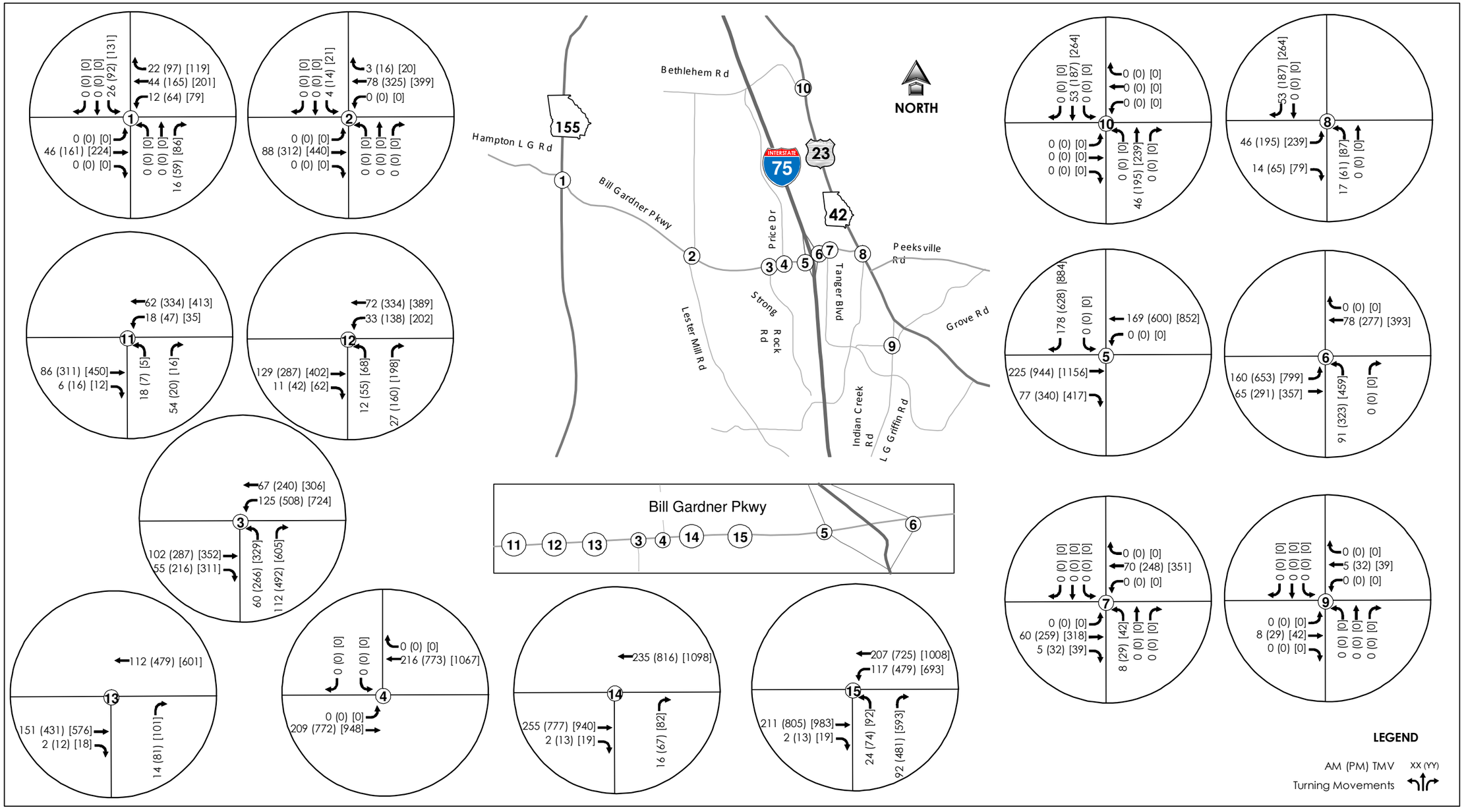


Figure 3-2. Site Build-Out Traffic Volumes



4. IDENTIFICATION OF THE STUDY NETWORK

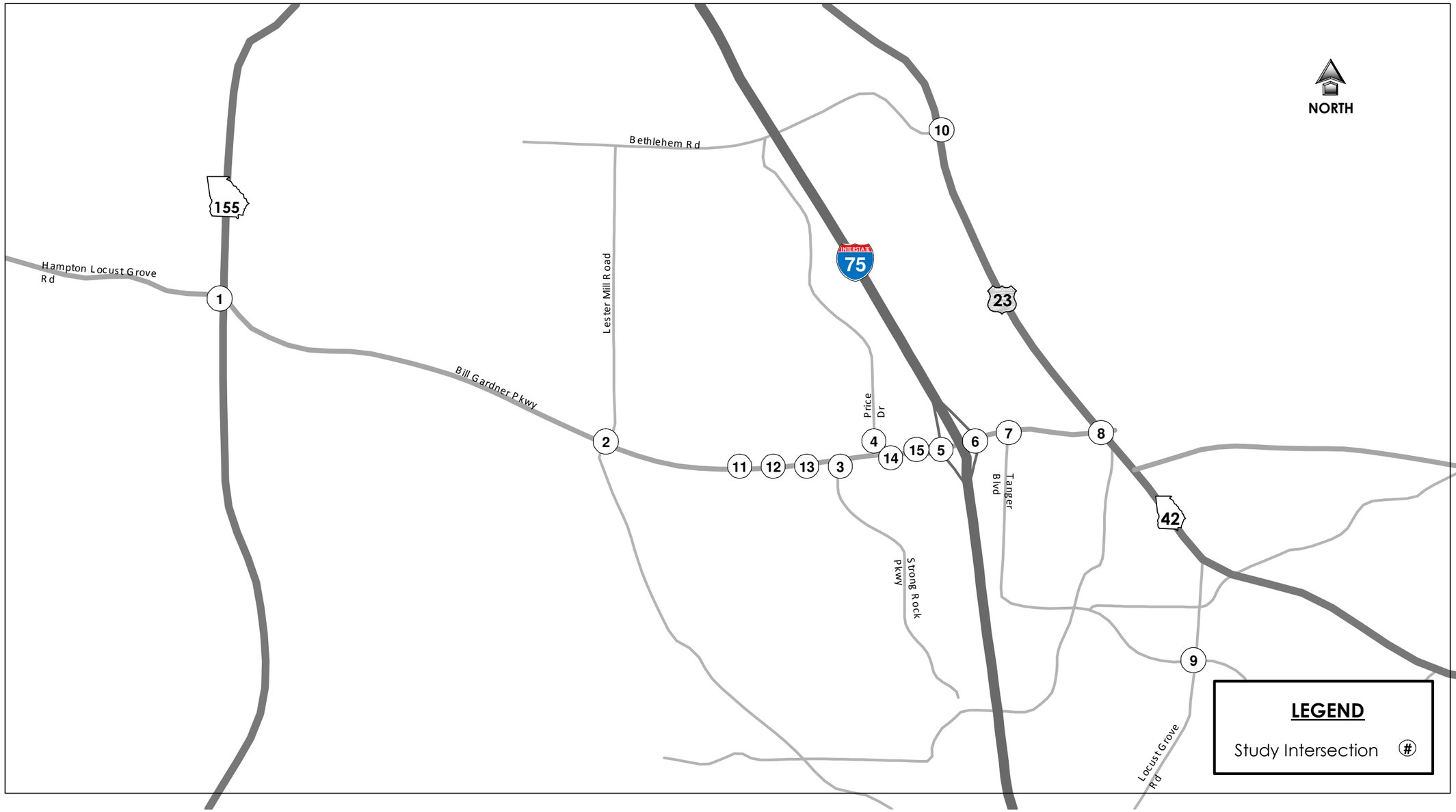
An early step in the GRTA DRI Non-Expedited Review Process is the determination of the Study Network utilizing the 7% Rule. The 7% Rule requires study of each roadway segment that is impacted to determine if traffic from the Site consumes 7% or more of the Service Volume (traffic volume at a specific Level of Service (LOS)) of that roadway segment. LOS D is generally used as a default value for urban areas (and LOS C may be used as a default in more rural areas). The LOS standard for the City of Locust Grove was assumed to be LOS D.

After consultation with GRTA and the City of Locust Grove, the following intersections were agreed upon for investigation as part of the Traffic Impact Analysis.

- Bill Gardner Parkway at SR 155;
- Bill Gardner Parkway at Lester Mill Road;
- Bill Gardner Parkway at Strong Rock Parkway (relocated Price Road on the south side of Bill Gardner Pkwy);
- Bill Gardner Parkway at Price Road (north side of Bill Gardner Parkway) (added by Consultant);
- Bill Gardner Parkway at I-75 Southbound Ramps;
- Bill Gardner Parkway at I-75 Northbound Ramps;
- Bill Gardner Parkway at Tanger Boulevard;
- Bill Gardner Parkway at SR 42 / US 23;
- SR 42 / US 23 at Bethlehem Road;
- Tanger Boulevard and LG Griffin Road (also called Locust Grove Road, or Locust Grove Griffin Road); and,
- All site access drives.

Figure 4-1 shows the location of the study intersections.

Figure 4-1. Location of Study Intersections



5. CAPACITY ANALYSIS METHODOLOGY

5.1 Level of Service Standards

Operating conditions at intersections and roadway segments are evaluated in terms of Levels of Service (LOS). For the GRTA DRI process, the City of Locust Grove's LOS Standards for the roadways in the Study Area are assumed to be LOS D. Therefore, LOS A through D are considered to be adequate peak hour operations, and LOS E and F are considered inadequate peak hour conditions. It is desirable, after new development has been put in place, that no less than an LOS D be maintained. However, if a specific location operates at LOS E or F under existing traffic conditions, then GRTA finds as acceptable, after background traffic, and also after the Site's traffic, has been added to the specific location, a return to LOS E.

5.2 Intersection Capacity Analysis Methodology

Capacity analyses of the study intersections were completed using procedures in the *Highway Capacity Manual (HCM), Millennium Edition*. This is the usual methodology for the analysis of traffic conditions. The software program *Synchro 7* (a nationally recognized computer software package for analyzing capacities and Levels of Service) was used to perform the capacity analyses for the study intersections.

Levels of Service for signalized intersections are reported in composite fashion, i.e., one LOS for the entire intersection, and are presented in terms of average control delay. Individual turning movements at signalized intersections may experience inadequate LOS, even when those volumes are relatively low, while the intersection as a whole has an adequate LOS. This is because the major movements on the major roadway are given priority in assigning signal green time.

Traffic conditions at unsignalized intersections, with stop sign control on the minor street only, are evaluated for the minor street approach(es) and for the left turns from the major street. This is because the major street traffic is assumed to have no delay since there is no control (no stop sign). Inadequate Levels of Service for minor street approaches to unsignalized intersections are not uncommon, as the continuous flow traffic will always get the priority. For two-way stop controlled intersections, the *Highway Capacity Manual* does not calculate a composite Level of Service for the entire intersection.

Levels of Service for all-way STOP controlled intersections are reported both for study intersection movements, and in composite fashion, i.e., one LOS for the entire intersection, and are based on average control delay.

The *Highway Capacity Manual* Level of Service criteria for signalized and unsignalized intersections are shown in Table 5-1.

Table 5-1. Highway Capacity Manual Intersection LOS Criteria

Level of Service	Control Delay (seconds per vehicle)	
	Signalized Intersection	Unsignalized Intersection
A	≤ 10	≤ 10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	> 80	> 50

Source: Highway Capacity Manual, Millennium Edition.

6. EXISTING CONDITIONS

6.1 Existing Roadway Facilities

To determine existing traffic conditions of the identified study roadway segments and study intersections in the area, an inventory was made of the major roads surrounding the Site. The physical and traffic control elements of each of the roadways, as well as the functional classification and other important elements for the study roadways, follows:

- **Bill Gardner Parkway.** This roadway is a two-lane, undivided roadway west of I-75, and both a four-lane divided highway with turning lanes at most intersections, and a five-lane highway, two lanes in each direction plus a two-way left turn lane (TWLTL), east of I-75. Bill Gardner Parkway has a speed limit of 35 mph and travels east-west. The primary function of the roadway is a feeder for I-75 to the west, and serves as a connection for the cities of Hampton and Locust Grove. There are plans to widen Bill Gardner: (a) to a four-lane divided highway from SR 155 to Lester Mill Road, and (b) to a six-lane divided highway from Lester Mill Road to I-75. Right-of-way acquisition is expected in 2009, construction is to begin in 2010, and completion and opening to traffic is expected in 2012 (four years before the build-out of this project).

- **I 75.** This roadway is a six-lane interstate principal arterial and is median-divided with a speed limit of 70 mph. The primary function of I-75 is to provide vehicles high speed access between major cities. I-75 primarily runs north-south, with Atlanta to the North and Macon to the South.

- **SR 42 / US 23**. The roadway is a two-lane undivided roadway with a speed limit of 45 mph around the site. The primary function of the roadway is to serve as an arterial between several towns east of I-75 and provides vehicles quick access to I-75 in the city of Locust Grove. US 23 primarily runs north-south, parallel to I-75 at certain points.

- **SR 155.** The roadway is a two-lane undivided roadway with a speed limit of 45 mph. The primary function of the roadway is to serve as a collector for various neighborhoods up and down SR 155, which can then distribute to I-75 or Bill Gardner Parkway. SR 155 primarily runs north-south and is located approximately 2.9 miles west of the site.

- **Tanger Boulevard.** This is four-lane roadway (with turning lanes) between Bill Gardner Parkway and Tanger Drive, and then a two-lane roadway (with turning lanes) from Tanger Drive to SR 42 / US 23. It serves both retail properties and undeveloped land, and provides additional circulation needs for the City of Locust Grove.

Figure 6-1 shows the existing traffic controls and lane configurations at the study intersections.

6.2 Existing Traffic Volumes

After consultation with GRTA, ARC, and Locust Grove, it was determined that capacity analyses would be performed at the study intersections for the weekday AM and PM peak hours, and for the Saturday peak hour. For these three peak periods, turning movement counts were collected on Thursday (April 3 and 17, 2008) and Saturday (April 5 and 19, 2008) at the following intersections:

- Bill Gardner Parkway at SR 155;
- Bill Gardner Parkway at Lester Mill Road;
- Bill Gardner Parkway at Strong Rock Parkway (relocated Price Road on the south side of Bill Gardner Pkwy);
- Bill Gardner Parkway at Price Road (added by Consultant);
- Bill Gardner Parkway at I-75 Southbound Ramps;
- Bill Gardner Parkway at I-75 Northbound Ramps;
- Bill Gardner Parkway at Tanger Boulevard;
- Bill Gardner Parkway at SR 42 / US 23;
- SR 42 / US 23 at Bethlehem Road; and,
- Tanger Boulevard and LG Griffin Road (also called Locust Grove Road, or Locust Grove Griffin Road).

Figure 6-2 shows the existing volumes at the study intersections for the weekday AM and PM peak hours, and the Saturday mid-day peak hour.

Forty-eight hour directional traffic volume machine counts were collected on Bill Gardner Parkway in front of the site on Thursday – Friday (April 3 and 4, 2008). Average Daily Traffic (ADT) volumes were acquired from GDOT permanent counting stations located in the study area for the six year period 2001 to 2006.

The count data is included in Appendix B.

Figure 6-1. Existing Traffic Controls and Lane Configurations

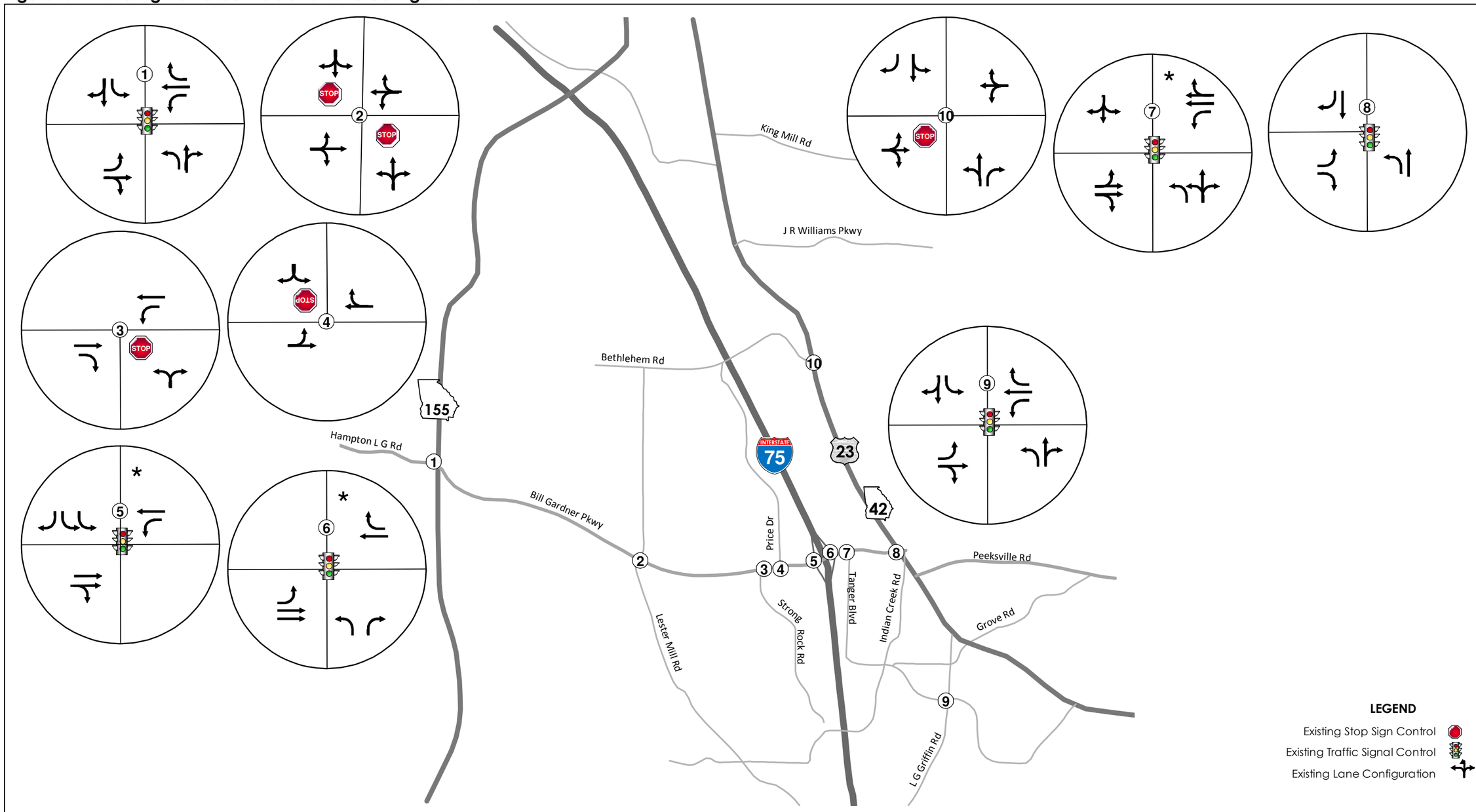
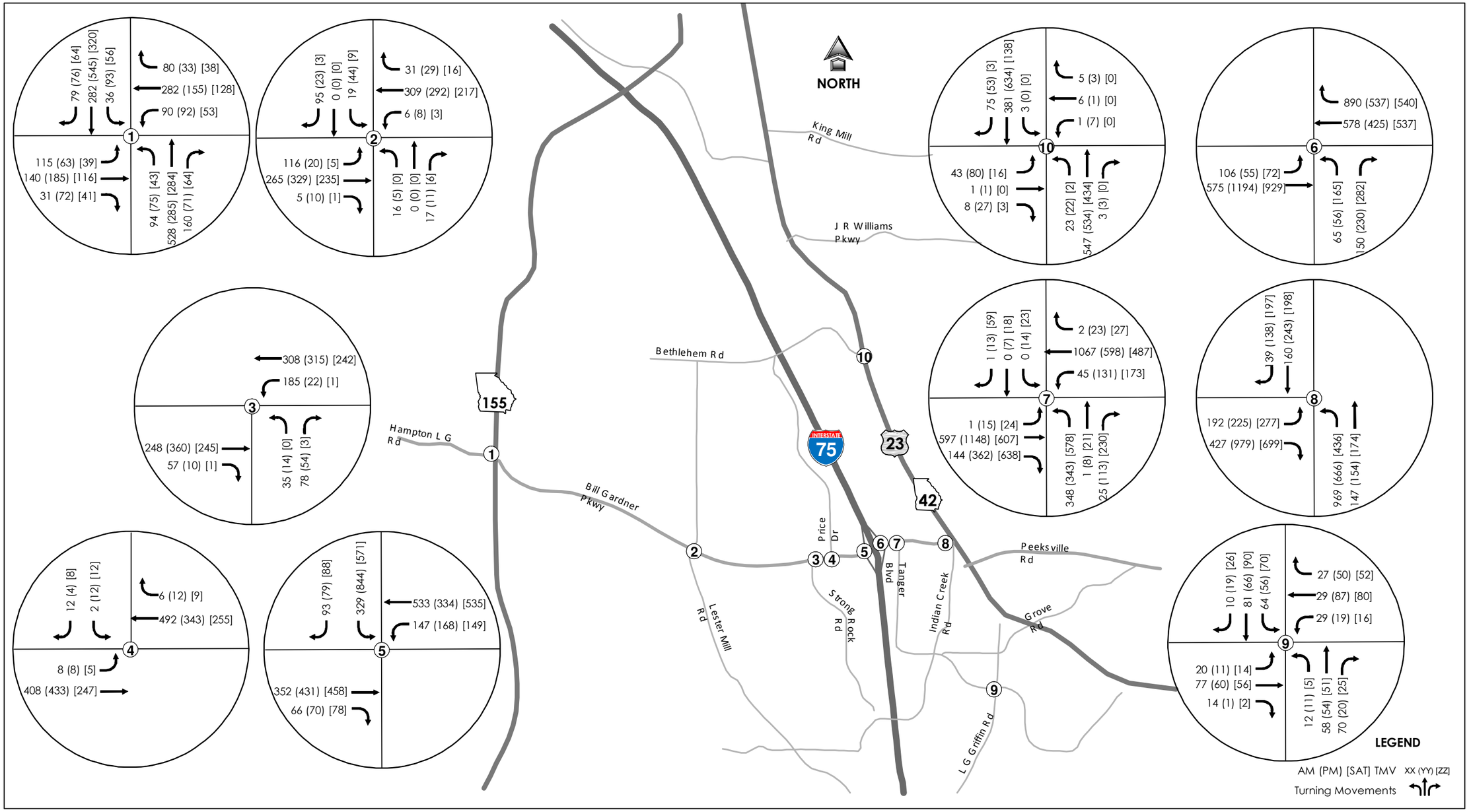


Figure 6-2. Existing Traffic Volumes



6.3 Intersection Capacity Analysis – Existing Conditions

Using the methodologies previously described, intersection Levels of Service were determined for the study intersections for Existing conditions. Table 6-1 presents the results of the intersection capacity analysis for Existing conditions. Printouts of these analyses are included in Appendix C.

As can be seen from Table 6-1, all of the movements, and all of the overall intersection operations, function at adequate Levels of Service for Existing conditions, except at the following locations:

- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, which operates at LOS "E" for the northbound movements during the AM peak hour;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, which operates at a LOS "E" during the Saturday peak hour;
- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, which operates at LOS "F" during the PM peak hour; and,
- Intersection No. 10 – SR 42/US 23 at Bethlehem Road, which operates at a LOS "F" for the eastbound movements during the AM and PM peak hours, and at a LOS "E" for the westbound movement for the PM peak hour.

6.3.1 Required Improvements

Table 6-1 identifies deficiencies that already exist at the study intersections. Improvements have been identified, that if implemented immediately, could correct the Existing deficiencies. Their impacts on the Existing deficiencies are shown in Table 6-2. Printouts of these analyses are included in Appendix D.

As can be seen from Table 6-2, the following required improvements are expected to bring the intersections back into adequacy for Existing conditions:

- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection Nos. 5 and 6 – Bill Gardner Parkway at I-75, interconnect and coordinate with intersection no. 7, optimize traffic signal timing;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, provide an eastbound right turn lane, interconnect and coordinate with Nos. 5 and 6, and optimize signal timing;
- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, provide an eastbound right turn phase 5 overlap, optimize traffic signal timing; and,
- Intersection No. 10 – SR 42/US 23 at Bethlehem Road, there are too few vehicles involved in this problem to warrant an improvement.

Figure 6-3 shows the lane configurations and traffic control that would be required to mitigate the Existing intersection deficiencies.

Table 6-1. Intersection LOS – Existing

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
Number	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	D	*	C	*	B
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	E	N/A	B	N/A	A	N/A
			SBL+R	C		C		B	
			EBL	A		A		A	
			WBL	A		A		A	
3	Bill Gardner Parkway at Strong Rock Parkway	STOP Sign on Side Street	NBL+R	D	N/A	B	N/A	A	N/A
			WBL	A		A		A	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	B	N/A	C	N/A	B	N/A
			EBL	A		A		A	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	B	*	C	*	C
6	Bill Gardner Parkway at I-75 NB Ramp	Traffic Signal	Overall	*	C	*	B	*	B
7	Bill Gardner Parkway at Tanger Boulevard	Traffic Signal	Overall	*	C	*	D	*	E
8	Bill Gardner Parkway at US 23/SR 42	Traffic Signal	Overall	*	D	*	F	*	C
9	Tanger Boulevard at LG Griffin Road	Traffic Signal	Overall	*	B	*	B	*	B
10	US 23/SR 42 at Bethlehem Road	STOP Sign on Side Street	NBL	A	N/A	A	N/A	A	N/A
			SBL	A		A		A	
			EBL+R	F		F		C	
			WBL+R	D		E		A	

Table 6-2. Intersection LOS – Existing with Required Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
5	Bill Gardner Parkway at I-75 SB Ramp	Interconnect with Intersections Nos. 6 and 7, Optimize timing, Coordinate Signals	Overall	*	B	*	C	*	C
6	Bill Gardner Parkway at I-75 NB Ramp	Interconnect with Intersections Nos. 5 and 7, Optimize Timing, Coordinate Signals	Overall	*	C	*	B	*	B
7	Bill Gardner Parkway at Tanger Blvd	EB Right Turn Lane and Optimize Signal Timing, and Interconnect / Coordinate with Nos. 5 and 6	Overall	*	C	*	C	*	C
8	Bill Gardner Parkway at US 23 / SR 42	EB Right Turn Phase 5 Overlap, Optimize signal timing	Overall	*	D	*	D	*	B

No improvements were attempted at Intersection No. 2 or Intersection No. 10, where the LOS was worse than LOS "D". There are simply too few vehicles in the queue to warrant an improvement of any kind. Intersection Nos. 5 and 6 don't require the above improvements of their own accord, but are recommended to improve both Intersection No. 7, and overall corridor operations.

6.5 Calculated Level of Service Standards

Based upon the results of the analysis of the Existing conditions, Table 6-3 presents the calculated Level of Service Standards for intersections that must be met when considering Future Background and Future Year Total conditions.

Figure 6-3. Existing – Required Intersection Improvements

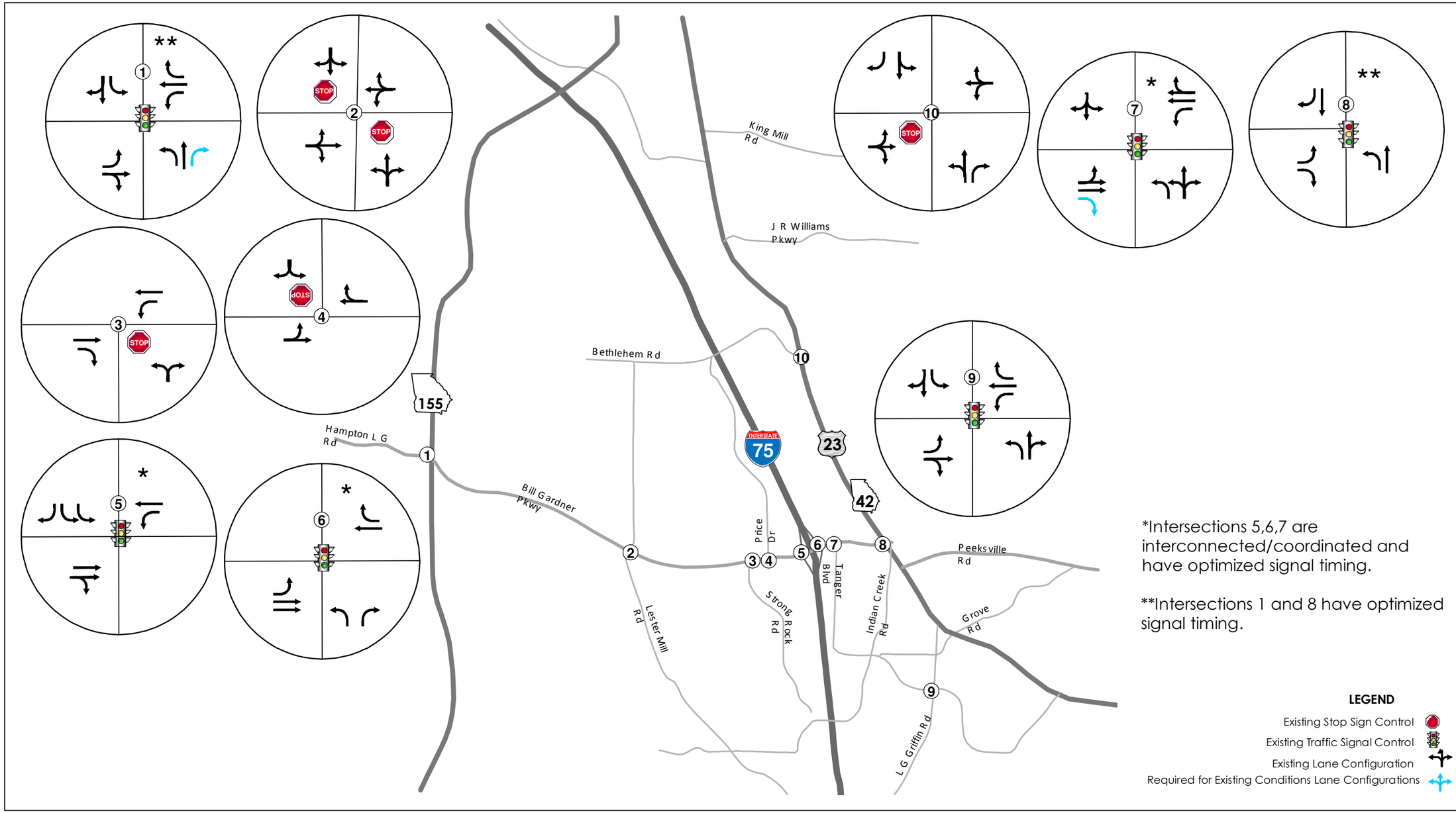


Table 6-3. Calculated Intersection LOS Standards

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	D	*	D	*	D
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	E	N/A	D	N/A	D	N/A
			SBL+R	D		D		D	
			EBL	D		D		D	
			WBL	D		D		D	
3	Bill Gardner Parkway at Strong Rock Parkway	STOP Sign on Side Street	NBL+R	D	N/A	D	N/A	D	N/A
			WBL	D		D		D	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	D	N/A	D	N/A	D	N/A
			EBL	D		D		D	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	D	*	D	*	D
6	Bill Gardner Parkway at I-75 NB Ramp	Traffic Signal	Overall	*	D	*	D	*	D
7	Bill Gardner Parkway at Tanger Boulevard	Traffic Signal	Overall	*	D	*	D	*	E
8	Bill Gardner Parkway at US 23/SR 42	Traffic Signal	Overall	*	D	*	E	*	D
9	Tanger Boulevard at LG Griffin Road	Traffic Signal	Overall	*	D	*	D	*	D
10	US 23/SR 42 at Bethlehem Road	STOP Sign on Side Street	NBL	D	N/A	D	N/A	D	N/A
			SBL	D		D		D	
			EBL+R	E		E		D	
			WBL+R	D		E		D	

7. PLANNED AND PROGRAMMED IMPROVEMENTS

The local Transportation Improvement Program (TIP), the State Transportation Improvement Program (STIP), the Regional Transportation Plan (RTP), and the GDOT Construction Work Program have been researched to determine if there are any proposed transportation improvements, either programmed or planned, that would impact the Site. For identified projects, the opening-to-traffic dates, sponsors, costs of projects, funding sources, and logical termini are usually also identified. Detailed information about the programmed improvements is included in Appendix E.

There are a number of transportation improvements that are programmed within the study area. These include Bill Gardner Parkway, SR 42, Locust Grove, and SR 155. Please see the attachments, excerpted from the Jurisdictional Project Listing for STIP, TIP FY 08-13, and ARC's Envision 6 Regional Transportation Plan.

- **STP-0000-00(562), GDOT Project No.-0000562, HE-126B** – Roadway Operation Upgrades on Bill Gardner Parkway: widen to a four-lane divided highway from SR 155 to Lester mill Road, and widen to a six-lane divided highway from Lester Mill Road to I-75 southbound ramp; Est. $11,500,000; Local Funding Sources; Completion Date 2012;

- **GDOT Project No. 0007546, HE-168** – Roadway Operation Upgrades on SR 42 at Harris Drive. Est. $15,000 in Federal Funding Sources; $245,000 in Local Funding Sources; Completion Date 2010; and,

- **CSSTP-0006-00(840), GDOT Project No. 000684, HE-AR-BP020** – Multi-Use Bike/Ped Facility along Locust Grove Sidewalks. Est. $750,000 in Federal Funding Sources and $457,500 in Local Funding Sources; Completion Date 2010.

There are other relevant transportation improvements that are programmed just beyond the Site Build-Out (Year 2016), or are identified as long range. These have been identified as:

- **STP-0000-00(343265), GDOT Project No.-343265, HE-126A1** – Roadway Operation Upgrades on Hampton Locust Grove Road: from SR 20 to SR 155; Est. $5,995,600; Local Funding Sources; Completion Date 2020; and,

- **CSSTP-0007-00(870), GDOT Project No. 0007870, SP-048** – General Purpose Roadway Capacity improvements on SR 155 from North 2nd Street to Henry County Line. Est. $7,248,000 in Federal Funding, $1,812,000 in State Funding; Completion Date 2020.

8. FUTURE BACKGROUND CONDITIONS

8.1 Future Background Traffic Volumes

Between the time this study is performed and the Site is built out in Year 2016, the traffic volumes on the adjacent roadways are expected to increase. This is due to other development which will take place both in the study area by the Year 2016, as well as growth outside of it, whether or not the Site being studied is built. This growth is called background traffic growth. There are generally two components to background traffic growth:

(a) growth close to the Site due to specific, identified developments already in the "pipeline" (that is, actual nearby developments already approved, or further along in the approval process, that can reasonably be expected to be built by Site Build-Out (Year 2016)), sometimes called "background development"; and

(b) general traffic growth along major roadways due to the expanding nature of the region, and to other non-specific development further from the Site, often simply referred to as "background growth". Growth of this nature can generally be determined by examining historic trends in the vicinity of the Site, and by applying those trends to the appropriate roadways.

Historical traffic volume trends on the study network were taken into account. Where available, the last six years (2001 – 2006) of historical Annual Average Daily Traffic (AADT) collected by GDOT were used to help develop traffic volume trends on the study area roadways.

Based on the historical traffic volumes collected in the vicinity of the Site and after discussion with GRTA and City of Locust Grove staff, a 2.0% annual traffic growth percentage was used.

The Future Background traffic volumes were developed by adding the background growth out to the Year 2016, to existing traffic. The Future Background traffic volumes are shown in Figure 8-1.

8.2 Intersection Capacity Analysis – Future Background Conditions

Using the methodologies previously described, intersection Levels of Service were determined for the study intersections for Future Background conditions. Table 8-1 presents the results of the intersection capacity analyses for Future Background traffic conditions, assuming existing lane configurations and traffic control. Printouts of these analyses are included in Appendix F.

Figure 8-1. Future Background Traffic Volumes

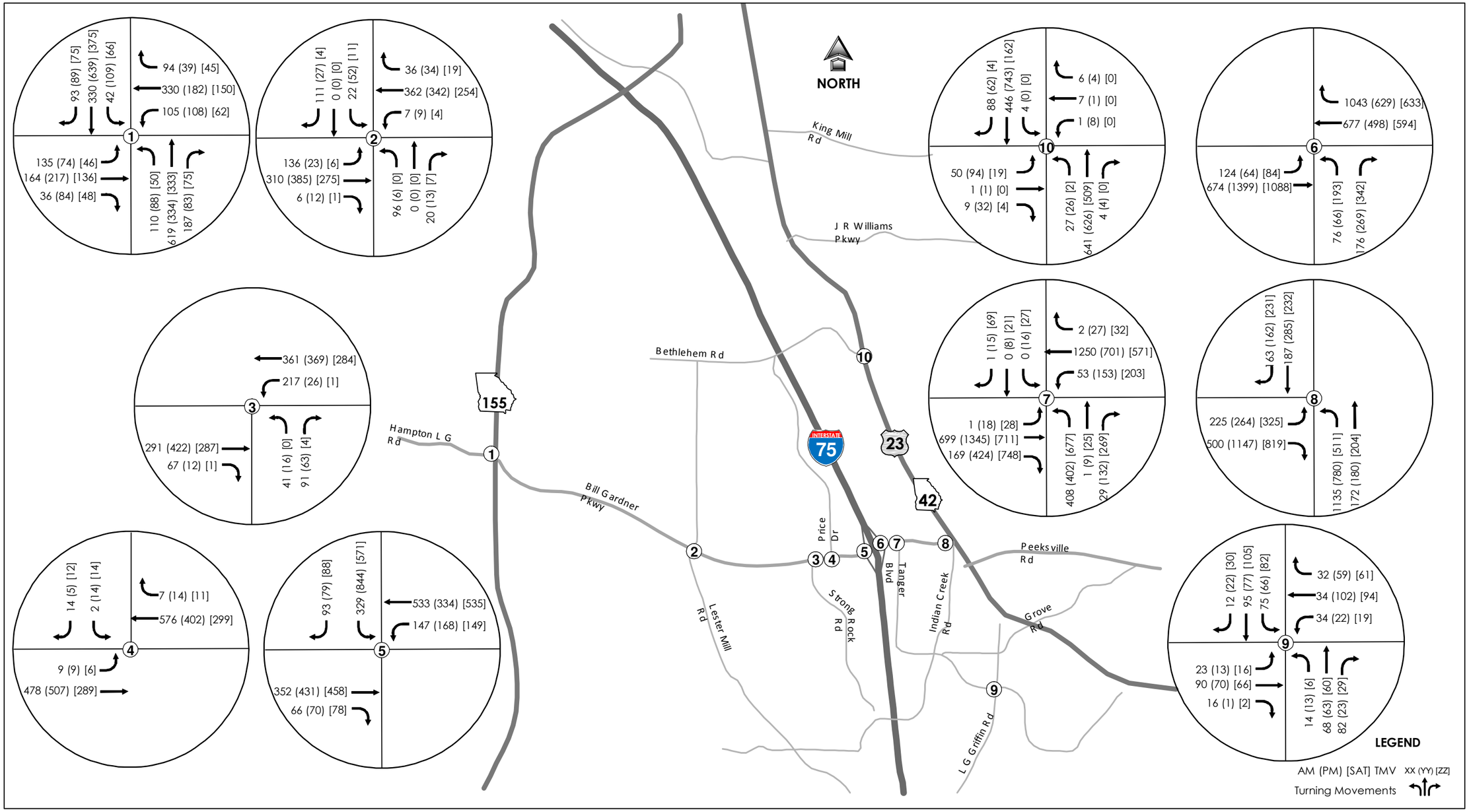


Table 8-1. Intersection LOS – Future Background

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	F	*	D	*	B
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	F	N/A	C	N/A	B	N/A
			SBL+R	E		C		B	
			EBL	A		A		A	
			WBL	A		A		A	
3	Bill Gardner Parkway at Strong Rock Parkway	STOP Sign on Side Street	NBL+R	F	N/A	C	N/A	B	N/A
			WBL	A		A		A	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	C	N/A	C	N/A	B	N/A
			EBL	A		A		A	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	B	*	C	*	C
6	Bill Gardner Parkway at I-75 NB Ramp	Traffic Signal	Overall	*	C	*	B	*	C
7	Bill Gardner Parkway at Tanger Boulevard	Traffic Signal	Overall	*	C	*	F	*	F
8	Bill Gardner Parkway at US 23/SR 42	Traffic Signal	Overall	*	F	*	F	*	C
9	Tanger Boulevard at LG Griffin Road	Traffic Signal	Overall	*	B	*	B	*	B
10	US 23/SR 42 at Bethlehem Road	STOP Sign on Side Street	NBL	A	N/A	A	N/A	A	N/A
			SBL	A		A		A	
			EBL+R	F		F		C	
			WBL+R	D		F		A	

As can be seen from Table 8-1, all of the movements, and all of the overall intersection operations, are expected to function at adequate Levels of Service for Future Background conditions, except at the following locations:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, which operates at LOS "F" during the AM peak hour;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, which operates at LOS "F" for the northbound and LOS "E" for the southbound movements during the AM peak hour;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, which operates at LOS "F" for the northbound movements during the AM peak hour;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, which operates at a LOS "F" during the weekday PM and Saturday peak hours;
- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, which operates at LOS "F" during the AM and PM peak hours; and,
- Intersection No. 10 – SR 42/US 23 at Bethlehem Road, which operates at a LOS "F" for the eastbound movements during the AM and PM peak hours, and at a LOS "F" for the westbound movement for the PM peak hour.

8.2.1 Required Improvements

Table 8-1 identifies deficiencies that are expected to exist at the study intersections for Future Background conditions. Improvements have been identified that would be expected to correct the Future Background deficiencies. Their impacts on the Future Background deficiencies are shown in Table 8-2. Printouts of these analyses are included in Appendix G.

As can be seen from Table 8-2, the following required improvements would be expected to bring the intersections back into adequacy for Future Background conditions:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, provide a northbound right turn lane, and optimize traffic signal timing;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, there are too few vehicles involved in this problem to warrant an improvement;
- Intersections Nos. 5 & 6 – Bill Gardner Parkway at I-75 Interchange, interconnect and coordinate with Intersection No. 7; optimize traffic signal timing;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, provide an eastbound right turn lane, provide dual northbound left turn lanes, interconnect and coordinate with Intersection Nos. 5 and 6, optimize traffic signal timing;
- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, provide dual northbound left turn lanes, overlap Phase 5 for the eastbound rights, remove the free southbound right, optimize traffic signal timing; and,
- Intersection No. 10 – Us 23 / SR 42 at Bethlehem Road, there are too few vehicles involved in this problem to warrant an improvement.

Figure 8-2 shows the intersection lane configurations and traffic control that would be required to mitigate the Future Background deficiencies.

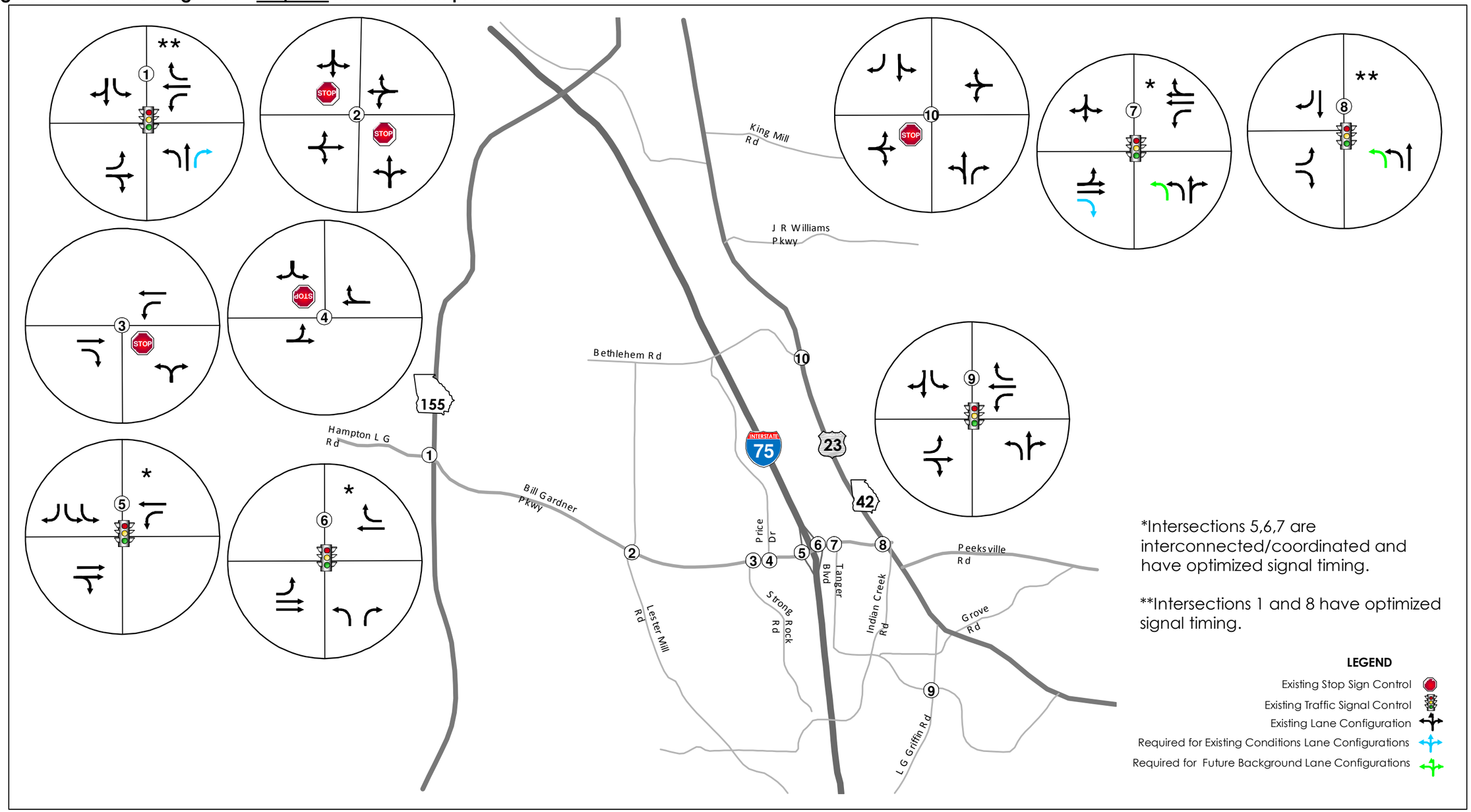
Table 8-2. Intersection LOS – Future Background with Required Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Add NB Right Turn Lane, and Optimize Signal Timing	Overall	*	D	*	D	*	B
5	Bill Gardner Parkway at I-75 SB Ramp	Interconnect / Coordinate with Intersections Nos. 6 and 7, Optimize Signal Timing	Overall	*	B	*	C	*	C
6	Bill Gardner Parkway at I-75 NB Ramp	Optimize Signal Timing, and Interconnect / Coordinate with Nos. 5 and 7	Overall	*	C	*	B	*	C
7	Bill Gardner Parkway at Tanger Blvd	Add EB Right Turn Lane; NB Dual Left Turn Lane; Interconnect / Coordinate with Nos. 5 and 6, and Optimize Signal Timing	Overall	*	C	*	D	*	D
8	Bill Gardner Parkway at US 23 / SR 42	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EBR; Remove Free SBR; Optimize Signal Timing	Overall	*	B	*	D	*	B

No improvements were attempted at Intersection Nos. 2, 3, or 10, where the LOS was worse than LOS "D". There are simply too few vehicles in the queue to warrant an improvement of any kind. Intersection Nos. 5 and 6 don't require the above improvements of their own accord, but are recommended to improve both Intersection No. 7, and overall corridor operations.

NOTE: For intersection 7 and 8, failure to add a dual left by 2016 will result in a LOS "E" very near the LOS "F" boundary in terms of delay.

Figure 8-2. Future Background – <u>Required</u> Intersection Improvements



8.2.2 Programmed Improvements

Table 8-1 identifies deficiencies that are expected to exist at the study intersections for Future Background conditions. Table 8-3 identifies the impact of the improvements that have been programmed by Henry County (widening and dualization of Bill Gardner Parkway from SR 155 to the southbound ramp of I-75, as described above) on the Future Background deficiencies. Printouts of these analyses are included in Appendix H.

The following assumptions were made in analyzing this scenario:

- 2 lanes in each direction from SR 155 to Lester Mills Road;
- 3 lanes in each direction from Lester Mills Road to I-75 SB Ramp;
- Left turn lanes with short turn bays installed at intersections;
- Right turn lanes at the following locations:
    - Bill Gardner Parkway westbound at SR 155,
    - Bill Gardner Parkway westbound at Lester Mills Road,
    - Bill Gardner Parkway eastbound at I-75 SB Ramp; and,
- Free right at the following locations based on lane alignment:
    - SR 155 northbound; and,
    - I-75 SB Ramp.

As can be seen from Table 8-3, the following programmed improvements would be expected to have the noted impacts upon the study intersections for Future Background conditions:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, would operate at LOS "E" during the AM peak hour;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, would operate at LOS "E" for the northbound movements during the AM peak hour;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, would operate at LOS "E" for the northbound movements during the AM peak hour;
- Intersection No. 4 – Bill Gardner Parkway at Price Drive, would operate acceptably; and,
- Intersection No. 5 – Bill Gardner Parkway at I-75 Southbound Ramp, would operate acceptably.

8.2.3 Programmed and Additional Necessary Improvements

Table 8-3 identifies deficiencies that are expected to exist at the study intersections for Future Background conditions with Programmed Improvements. Table 8-4 identifies the impact that additional necessary improvements would have on the identified deficiencies. Printouts of these analyses are included in Appendix I.

Table 8-3. Intersection LOS – Future Background with Programmed Improvements

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
Number	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	E	*	D	*	B
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	E	N/A	B	N/A	A	N/A
			SBL+R	C		C		B	
			EBL	A		A		A	
			WBL	A		A		A	
3	Bill Gardner Parkway at Strong Rock Parkway	STOP Sign on Side Street	NBL+R	E	N/A	B	N/A	A	N/A
			WBL	A		A		A	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	B	N/A	B	N/A	B	N/A
			EBL	A		A		A	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	B	*	C	*	C

Table 8-4. Intersection LOS – Future Background w/ Programmed and Additional Necessary Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Add NB Right Turn Lane and Optimize Signal Timing	Overall	*	D	*	D	*	B

Low volumes and delays on Lester Mills and Strong Rock do not warrant a signal to be installed at these intersections even with a LOS of E or greater in the AM peak.

9. FUTURE YEAR TOTAL CONDITIONS

The projected volumes for Site Build-Out were added to the Future Background traffic volumes to represent the total traffic expected in the area when the Site is complete. The Future Year Total traffic volumes are shown in Figure 9-1.

9.1 Intersection Capacity Analysis – Future Year Total Conditions

Using the methodologies previously described, intersection Levels of Service were determined for the study intersections for Future Year Total traffic conditions. Table 9-1 presents the results of the intersection capacity analysis for Future Year Total traffic conditions, but still assuming the existing lane configurations and traffic control. Printouts of these analyses are included in Appendix J.

As can be seen from Table 9-1, many of the movements, and many of the overall intersection operations, are not expected to function at adequate Levels of Service for Future Year Total traffic conditions:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, which is predicted to operate at LOS "F" during the AM and PM peak hours, and LOS "E" during the Saturday peak hour;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, which is predicted to operate at LOS "F" for the northbound movements during the AM and PM peak hours, and LOS "F" for the southbound movements during the AM, PM, and Saturday peak hours;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, which is predicted to operate at LOS "F" for all movements and peak hours, except for the westbound movements during the AM peak hour;
- Intersection No. 4 – Bill Gardner Parkway at Price Road, which is predicted to operate at LOS "F" for the southbound movements during the PM and Saturday peak hours;
- Intersection No. 5 – Bill Gardner Parkway at I-75 Southbound Ramps, which is predicted to operate at LOS "E" during the AM peak hour, and at LOS "F" during the PM and Saturday peak hours;
- Intersection No. 6 – Bill Gardner Parkway at I-75 Northbound Ramps, which is predicted to operate at LOS "F" during the AM, PM and Saturday peak hours;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, which is predicted to operate at a LOS "F" during the weekday PM and Saturday peak hours;
- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, which is predicted to operate at LOS "F" during the AM and PM peak hours, and at LOS "E" during the Saturday peak hour;
- Intersection No. 10 – SR 42/US 23 at Bethlehem Road, which is predicted to operate at a LOS "F" for the eastbound movements during the AM and PM peak hours, and for the westbound movements during the PM peak hour, and will operate at a LOS "E" for the eastbound movement during the Saturday peak hour, and for the westbound

movement during the AM peak hour;
- Intersection No. 12 – Bill Gardner Parkway at Driveway No. 2, which is predicted to operate at LOS "F" during the PM and Saturday peak hours;
- Intersection No. 14 – Bill Gardner Parkway at Driveway No. 5, which is predicted to operate at LOS "E" during the PM and Saturday peak hours; and,
- Intersection No. 15 – Bill Gardner Parkway at J. Bandy Parkway, which is predicted to operate at LOS "F" during the AM, PM, and Saturday peak hours.

9.1.1 Required Improvements

Table 9-1 identifies deficiencies that are expected to exist at the study intersections for Future Year Total traffic conditions. Improvements have been identified that would be expected to correct the Future Year Total deficiencies. Their impacts on the Future Year Total deficiencies are shown in Table 9-2. Printouts of these analyses are included in Appendix K.

As can be seen from Table 9-2, the following required improvements are expected to bring the intersections back into adequacy for Future Year Total conditions:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, add an eastbound right turn lane, a northbound right turn lane, and a southbound right turn lane, and optimize traffic signal timing;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, add a traffic signal, add a second eastbound through lane, a second westbound left turn lane, a second westbound through lane, a second northbound left turn lane, interconnect / coordinate with Intersection Nos. 5, 6, 7, and 15, and optimize signal timing;
- Intersection No. 4 – Bill Gardner Parkway at Price Road, add two eastbound and two westbound through lanes;
- Intersection No. 5 – Bill Gardner Parkway at I-75 Southbound Ramps, add a third eastbound through lane, add two additional westbound through lanes, add an eastbound right turn lane, add a free southbound right turn lane, interconnect / coordinate with Intersection Nos. 3, 6, 7, and 15, and optimize signal timing;
- Intersection No. 6 – Bill Gardner Parkway at I-75 Northbound Ramps, add a second eastbound left turn lane, add a third eastbound through lane and add two additional westbound through lanes, add two additional northbound left turn lanes, interconnect / coordinate with Intersection Nos. 3, 5, 7, and 15, and optimize signal timing;
- Intersection No. 7 – Bill Gardner Parkway at Tanger Boulevard, add an eastbound through lane and convert the eastbound exclusive left turn lane to a combined left-through lane, add an eastbound right turn lane, add a westbound through lane, convert the left-most westbound through lane to a combined left-through lane, add two additional left turn lanes, convert the combined northbound left-through-right lane to an exclusive through lane, add northbound right turn lane, interconnect / coordinate with Intersection Nos. 3, 5, 6, and 15, and optimize signal timing;

- Intersection No. 8 – Bill Gardner Parkway at SR 42/US23, add a second northbound left turn lane; overlap Phase 5 for the eastbound right turn; remove the free southbound right; and optimize signal timing;
- Intersection No. 10 – SR 42/US 23 at Bethlehem Road, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 12 – Bill Gardner Parkway at Driveway No. 2, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 13 – Bill Gardner Parkway at Driveway No. 3, widen to two eastbound and two westbound through lanes (see note below);
- Intersection No. 14 – Bill Gardner Parkway at Driveway No. 5, add an eastbound right turn lane, and widen to two eastbound through lanes and three westbound through lanes; and,
- Intersection No. 15 – Bill Gardner Parkway at J. Bandy Parkway, add a traffic signal, widen to three eastbound and three westbound through lanes, remove the exclusive eastbound right turn lane (unless right-of-way and cost considerations are not significant), interconnect / coordinate with Intersection Nos. 3, 5, 6, and 7, and optimize signal timing.

Further Explanation of Recommendations: added an additional through lane between Intersection No. 13 and Intersection No. 15 to allow through traffic to proceed and side street traffic to merge without causing delays to through traffic movements due to high traffic volumes. This also helped to reduce the queue length of traffic entering and exiting the site at these driveways. Though widening of Bill Gardner Pkwy at I-75 SB Ramp and I-75 NB Ramp may constitute a major interstate bridge improvement (and therefore be very impractical to do), it is the only solution that will allow for an adequate LOS along this corridor near the project site. Serious consideration should be given to programming this major interchange upgrade.

Figure 9-2 shows the intersection lane configurations and traffic control that would be required to mitigate the Future Year Total traffic deficiencies.

Figure 9-1. Future Year Total Traffic Volumes

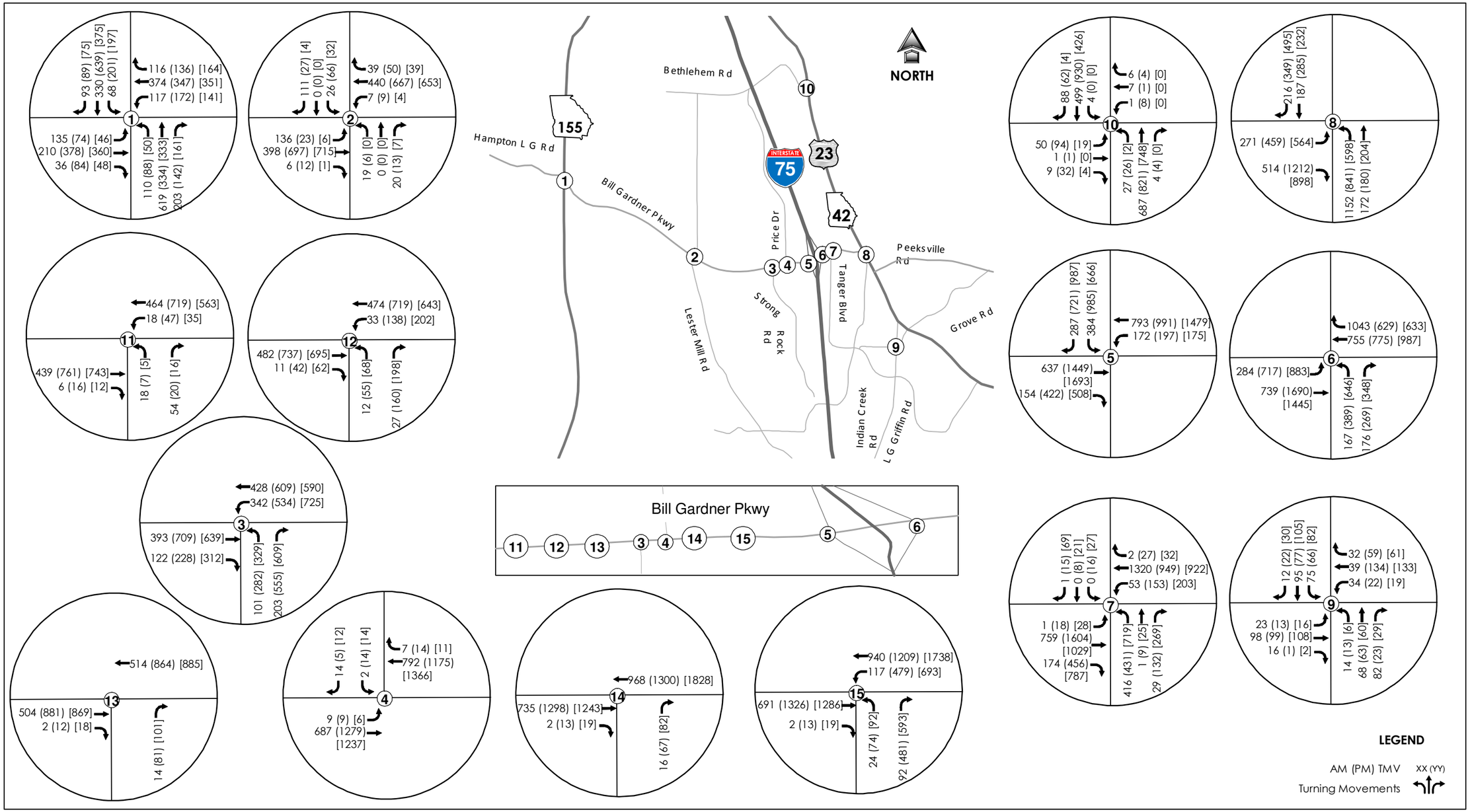


Table 9-1. Intersection LOS – Future Year Total

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	F	*	F	*	E
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	F	N/A	F	N/A	C	N/A
			SBL+R	F		F		F	
			EBL	A		A		A	
			WBL	A		A		A	
3	Bill Gardner Parkway at Strong Rock Parkway (Driveway 4)	STOP Sign on Side Street	NBL+R	F	N/A	F	N/A	F	N/A
			WBL	B		F		F	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	C	N/A	F	N/A	F	N/A
			EBL	A		A		A	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	E	*	F	*	F
6	Bill Gardner Parkway at I-75 NB Ramp	Traffic Signal	Overall	*	F	*	F	*	F
7	Bill Gardner Parkway at Tanger Boulevard	Traffic Signal	Overall	*	C	*	F	*	F
8	Bill Gardner Parkway at US 23/SR 42	Traffic Signal	Overall	*	F	*	F	*	E
9	Tanger Boulevard at LG Griffin Road	Traffic Signal	Overall	*	B	*	B	*	B
10	US 23/SR 42 at Bethlehem Road	STOP Sign on Side Street	NBL+T	A	N/A	A	N/A	A	N/A
			SBL+T	A		A		A	
			EBL+R	F		F		E	
			WBL+R	E		F		A	

Table 9-1. Intersection LOS – Future Year Total (continued)

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
11	Bill Gardner Parkway at Driveway 1	STOP Sign on Side Street	NBL+R	B	N/A	D	N/A	C	N/A
			WBL+T	A		A		A	
12	Bill Gardner Parkway at Driveway 2	STOP Sign on Side Street	NBL+R	C	N/A	F	N/A	F	N/A
			WBL	A		B		B	
13	Bill Gardner Parkway at Driveway 3	STOP Sign on Side Street	NBR	B	N/A	C	N/A	C	N/A
14	Bill Gardner Parkway at Driveway 5	STOP Sign on Side Street	NBR	B	N/A	E	N/A	E	N/A
15	Bill Gardner Parkway at J. Bandy Parkway (Driveway 6)	STOP Sign on Side Street	NBL+R	F	N/A	F	N/A	F	N/A

Table 9-2. Intersection LOS – Future Year Total with Required Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Add EB Right Turn Lane, NB Right Turn Lane, and SB Right Turn Lane, Optimize Signal Timing	Overall	*	D	*	D	*	C
3	Bill Gardner Parkway at Strong Rock Parkway (Driveway 4)	Add a Traffic Signal, add 2nd EB Through Lane, 2nd WB Left Turn Lane, 2nd WB Through Lane, 2nd NB Left Turn Lane, Coordinate with Nos. 5, 6, 7, and 15, and Optimize Signal Timing	Overall	*	D	*	C	*	C
4	Bill Gardner Parkway at Price Road	Add 2 EB Through Lanes and 2 WB Through Lanes	EBL	A	*	A	*	A	
			SBL+R	A		E		E	
5	Bill Gardner Parkway at I-75 SB Ramp	Add 3rd EB Through Lane, add 2nd and 3rd WB Through Lanes, add EB Right Turn Lane, Add Free SB Right Turn Lane, Coordinate with Nos. 3, 6, 7, and 15, and Optimize Signal Timing	Overall	*	B	*	C	*	B

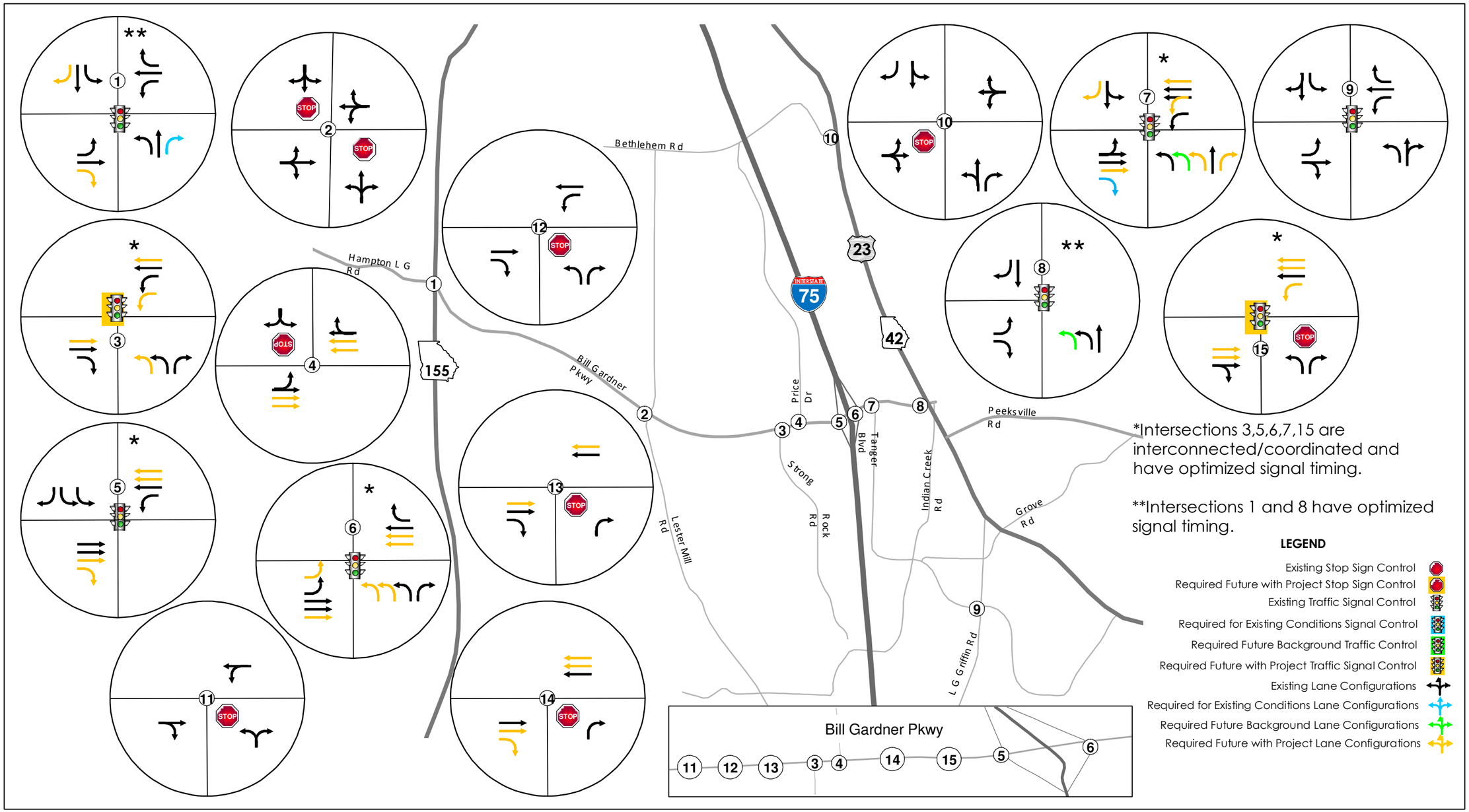
Table 9-2. Intersection LOS – Future Year Total with Required Improvements (continued)

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
6	Bill Gardner Parkway at I-75 NB Ramp	Add a 2nd EB Left Turn Lane, add a 3rd EB Through Lane and add 2nd and 3rd WB Through Lanes, add 2nd and 3rd NB Left Turn Lanes, Coordinate with Nos. 3, 5, 7, and 15, and Optimize Signal Timing	Overall	*	C	*	D	*	E
7	Bill Gardner Parkway at Tanger Boulevard	Add EB Through Lane and convert EB Left Turn Lane to a Left-Through Lane, add EB Right Turn Lane, add WB Through Lane, convert left-most WB Through Lane to a Left-Through Lane, add 2nd and 3rd NB Left Turn Lanes, convert NB LTR Lane to NB Through Lane, add NB Right Turn Lane, Coordinate with Nos. 3, 5, 6, and 15, and Optimize Signal Timing	Overall	*	B	*	E	*	E

Table 9-2. Intersection LOS – Future Year Total with Required Improvements (continued further)

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
8	Bill Gardner Parkway at US 23 / SR 42	Add 2nd NB Left Turn Lane; Overlap Phase 5 for EB Right Turn; Remove Free SB Right; Optimize Signal Timing	Overall	*	C	*	C	*	D
13	Bill Gardner Parkway at Driveway 3	Widen to 2 EB Through Lanes and 2 WB Through Lanes	NBR	B	*	B	*	B	*
14	Bill Gardner Parkway at Driveway 5	Add EB Right Turn Lane, Widen to 2 EB Through Lanes and 3 WB Through Lanes	NBR	A	*	B	*	B	*
15	Bill Gardner Parkway at J. Bandy Parkway (Driveway 6)	Add Traffic Signal, Widen to 3 EB Through Lanes and 3 WB Through Lanes, Remove Exclusive EB Right Turn Lane, Coordinate with Nos. 3, 5, 6, and 7, and Optimize Signal Timing	Overall	*	D	*	C	*	C

Figure 9-2. Future Year Total – Required Intersection Improvements



9.1.2 Programmed Improvements

Table 9-1 identifies deficiencies that are expected to exist at the study intersections for Future Year Total traffic conditions. Table 9-3 identifies the impacts of the widening and dualization of Bill Gardner Parkway that has been programmed by Henry County on Future Year Total deficiencies. The same assumptions about that improvement that were described above were again used in these analyses. Printouts of these analyses are included in Appendix L.

As can be seen from Table 9-3, the programmed improvements are expected to have the noted impacts upon the study intersections for Future Year Total traffic conditions:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, which is predicted to operate at LOS "F" during the AM and PM peak hours, and LOS "E" during the Saturday peak hour;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, which is predicted to operate at LOS "F" for the northbound movements during the AM peak hour, LOS "F" for the southbound movements during the PM and Saturday peak hours, and LOS "E" for the southbound movements for the AM peak hour;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, which is predicted to operate at LOS "F" for all movements and peak hours, except for the westbound movements during the AM peak hour;
- Intersection No. 4 – Bill Gardner Parkway at Price Road, which is predicted to operate at LOS "F" for the southbound movements during the PM and Saturday peak hours;
- Intersection No. 5 – Bill Gardner Parkway at I-75 Southbound Ramps, which is predicted to operate at LOS "F" during the PM and Saturday peak hours;
- Intersection No. 12 – Bill Gardner Parkway at Driveway No. 2, which is predicted to operate at LOS "E" during the Saturday peak hour; and,
- Intersection No. 15 – Bill Gardner Parkway at J. Bandy Parkway, which is predicted to operate at LOS "F" during the PM and Saturday peak hours.

Table 9-3 identifies deficiencies that are expected to exist at the study intersections for Future Year Total traffic conditions when Programmed Improvements are taken into consideration. Programmed Improvements do NOT address all of the identified deficiencies. Additional improvements have been identified that would be expected to correct these deficiencies. Their impacts on the Future Year Total With Programmed Improvements deficiencies are shown in Table 9-4. Printouts of these analyses are included in Appendix M.

Table 9-3. Intersection LOS – Future Year Total with Programmed Improvements

Intersection		Control	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Traffic Signal	Overall	*	F	*	F	*	E
2	Bill Gardner Parkway at Lester Mill Road	STOP Sign on Side Street	NBL+R	F	N/A	D	N/A	B	N/A
			SBL+R	E		F		F	
			EBL	A		B		A	
			WBL	A		B		B	
3	Bill Gardner Parkway at Strong Rock Parkway (Driveway 4)	STOP Sign on Side Street	NBL+R	F	N/A	F	N/A	F	N/A
			WBL	A		F		F	
4	Bill Gardner Parkway at Price Drive	STOP Sign on Side Street	SBL+R	B	N/A	F	N/A	F	N/A
			EBL	A		B		B	
5	Bill Gardner Parkway at I-75 SB Ramp	Traffic Signal	Overall	*	C	*	F	*	F
11	Bill Gardner Parkway at Driveway 1	STOP Sign on Side Street	NBL+R	B	N/A	C	N/A	B	N/A
			WBL	A		A		A	
12	Bill Gardner Parkway at Driveway 2	STOP Sign on Side Street	NBL+R	B	N/A	D	N/A	E	N/A
			WBL	A		B		B	
13	Bill Gardner Parkway at Driveway 3	STOP Sign on Side Street	NBR	A	N/A	B	N/A	B	N/A
14	Bill Gardner Parkway at Driveway 5	STOP Sign on Side Street	NBR	B	N/A	B	N/A	B	N/A
15	Bill Gardner Parkway at J. Bandy Parkway	STOP Sign on Side Street	NBL+R	C	N/A	F	N/A	F	N/A
			WBL	A		F		F	

Table 9-4. Intersection LOS – Future Year Total with Programmed Improvements and Other Necessary Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
1	Bill Gardner Parkway at SR 155	Add NB Right Turn Lane, EB Right Turn Lane, and SB Right Turn Lane; and Optimize Signal Timing	Overall	*	D	*	D	*	C
3	Bill Gardner Parkway at Strong Rock Parkway (Driveway 4)	Install Traffic Signal with Prot/Perm WB Left Operation, Add 2nd WB Left Turn Lane; add Free NB Right Turn Lane; Re-stripe EB direction for Right Turn Lane; Re-stripe NB direction for Dual Left; and Optimize Signal Timing	Overall	*	B	*	B	*	C
5*	Bill Gardner Parkway at I-75 SB Ramp	MUST IMPROVE BRIDGE TO WIDEN ROADWAY	Overall	*		*		*	
15	Bill Gardner Parkway at J. Bandy Parkway (Driveway 6)	Install Traffic Signal with Prot/Perm Operation for WB Left; Optimize Signal Timing	Overall	*	B	*	B	*	C

As can be seen from Table 9-4, the following required improvements are expected to bring the intersections back into adequacy for Future Year Total conditions, and are in addition to the programmed Improvements:

- Intersection No. 1 – Bill Gardner Parkway at SR 155, add a northbound right turn lane an eastbound right turn lane; and a southbound right turn lane, and optimize signal timing;
- Intersection No. 2 – Bill Gardner Parkway at Lester Mill Road, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 3 – Bill Gardner Parkway at Strong Rock Parkway, install a traffic signal with Protected/Permissive westbound left operation, add a second westbound left turn lane; add a free northbound right turn lane; re-stripe the eastbound direction for an exclusive right turn lane; re-stripe the northbound direction for a two left turn lanes; and optimize signal timing;
- Intersection No. 4 – Bill Gardner Parkway at Price Drive, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection Nos. 5 and 6 – Bill Gardner Parkway at I-75 Southbound Ramps, continue the Bill Gardner Parkway roadway widening and dualization project entirely through the interchange with I-75;
- Intersection No. 11 – Bill Gardner Parkway at Driveway No. 1, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 12 – Bill Gardner Parkway at Driveway No. 2, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 13 – Bill Gardner Parkway at Driveway No. 3, there are too few vehicles involved in this problem to warrant an improvement;
- Intersection No. 14 – Bill Gardner Parkway at Driveway No. 5, there are too few vehicles involved in this problem to warrant an improvement; and,
- Intersection No. 15 – Bill Gardner Parkway at J. Bandy Parkway, install a traffic signal with Protected/Permissive Operation for the westbound left movement; and optimize signal timing.

Low volumes and delays at Intersection Numbers 2, 4, 11, 12, 13, and 14 do not warrant a signal to be installed at these intersections even with a LOS "E" or greater during any time period. No additional and reasonable improvements have been identified for these locations, for the most part due to low volumes and moderate delays. Figure 9-3 shows the required improvements when one considers that the programmed improvement is already in place.

9.2 Programmed and Other Practical Improvements

As can be seen from Table 9-4 and Figure 9-3, a number of the improvements required to mitigate expected impacts are not very practical, and may become difficult or impossible to actually implement. Certainly, the upgrade to the interchange of I-75 at Bill Gardner Parkway that will be needed to match existing and proposed cross sections on Bill Gardner

through the interchange area, will be a major interstate interchange rehabilitation project that must be sponsored by the Georgia Department of transportation, and may not come to fruition for quite some time. In the meantime, more practical improvements should be considered, even if they don't necessarily return the roadways to the desired levels of service. Table 9-5 and Figure 9-4 provide this information. Only Intersection Nos. 5, 6, and 7 are affected.

9.3 Site Access Analysis

As can be seen in Tables 9-1 through 9-5, the site access driveways operate at acceptable Levels of Service, if they Bill Gardner Parkway is upgraded (widened and dualized as programmed), and as long as additional appropriate improvements are made at the access drives – as indicated in Table 9-4. See Figure 9-2 for the desired site access lane configurations and traffic control.

Table 9-5. Intersection LOS – Future Year Total with Programmed Improvements and Other Practical Improvements

Intersection		Improvement	Mvmt	A.M. Peak Hour		P.M. Peak Hour		SAT Peak Hour	
No.	Name			Mvmt	Overall	Mvmt	Overall	Mvmt	Overall
5	Bill Gardner Parkway at I-75 SB Ramp	Add NB Right Turn Lane; Add WB Thru Lane	Overall	*	A	*	E	*	F
6	Bill Gardner Parkway at I-75 NB Ramp	Add EB Left Turn Lane; Add NB Left Turn Lane; Add WB Thru Lane	Overall	*	C	*	D	*	F
7	Bill Gardner Parkway at Tanger Boulevard	Add SB Right Turn Lane	Overall	*	C	*	F	*	F

Figure 9-3. Future Year Total – Programmed Plus Other Necessary Intersection Improvements

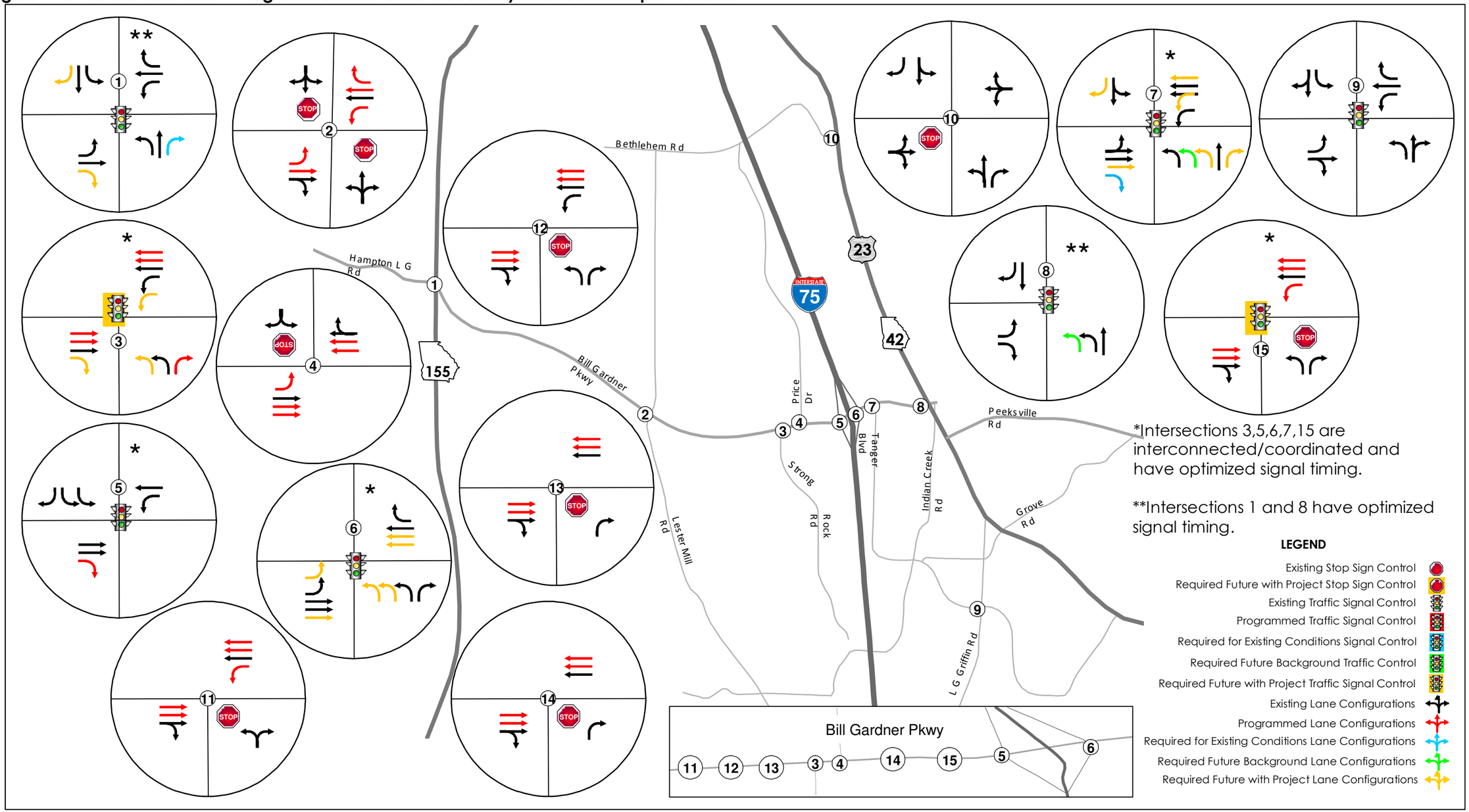
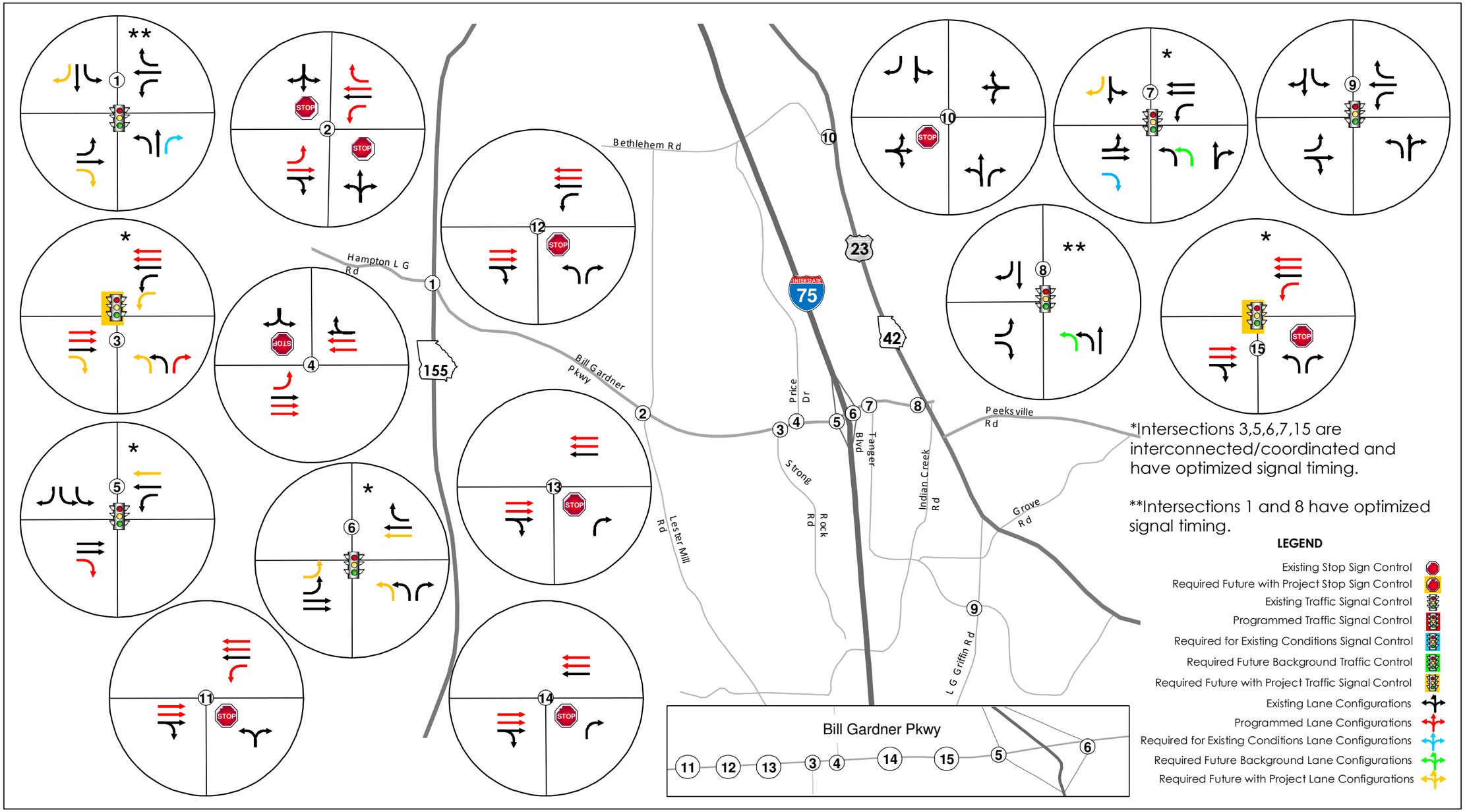


Figure 9-4. Future Year Total – Programmed Plus Other Practical Improvements



10. AREA OF INFLUENCE ANALYSIS

10.1 Introduction

The Area of Influence (AOI) is the area within six road miles of the Site. This section of the study presents an analysis of the opportunities for the retail workers at the Site to live within the AOI. The Site is classified as predominantly employment for the purpose of the AOI analysis. This analysis will focus on comparing the 2,236 retail workers at the Site to the 6,060 owner-occupied housing units in the AOI. This section will describe the study parameters and methodologies, the sources of data used for the analysis, and information concerning the demographics and economic conditions in the Site and the AOI.

The following sections of the report will address Criterion 7b of Section 3-103 of GRTA's DRI requirements. Criterion 7b states:

7. The proposed DRI:

    (b) Is located in an Area of Influence where the proposed DRI is reasonably anticipated to contribute to a balancing of land uses within the Area of Influence such that twenty-five percent (25%) of the persons who are reasonably anticipated to be employed in the proposed DRI have the opportunity to live within the Area of Influence.

A map of the AOI is provided in Figure 10-1.

10.2 Study Parameters and Methodology

In order to identify the housing and other data for the AOI, the boundaries were created in a geographic information system (GIS) format and were placed over a GIS layer of the census tracts containing the applicable data from the 2000 U.S. Census. Where 2000 U.S. Census data were not available, the analysis incorporated data from other sources, including GRTA, U.S. Bureau of Labor Statistics, and ESRI. The sources and methodologies for obtaining data for various elements of the AOI analysis have been referenced throughout the document.

Figure 10-1. Area of influence

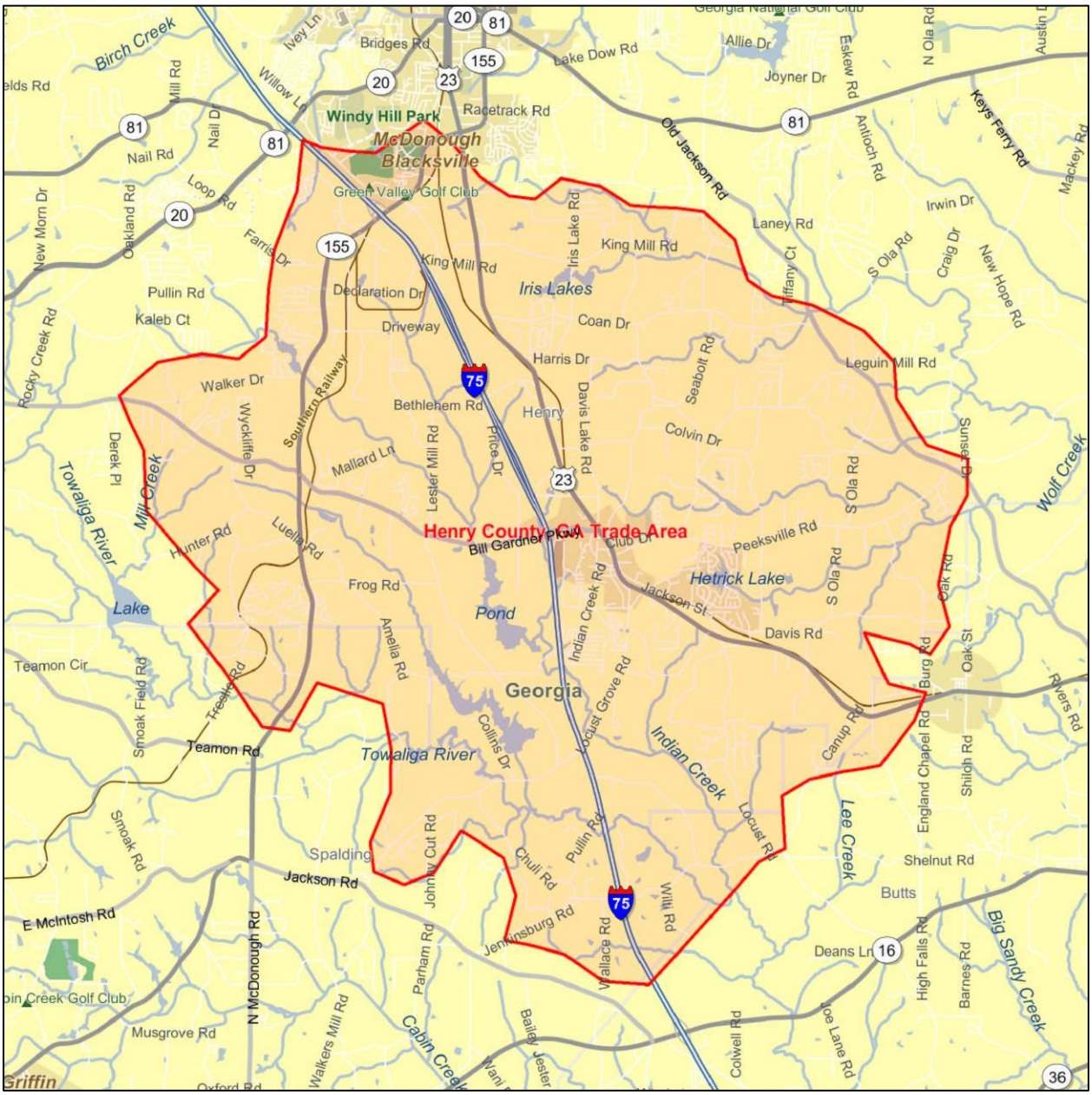


Table 10-1 presents characteristics of the AOI.

Table 10-1. Summary of AOI Characteristics

Characteristic	Year 2012
Size (acres)	45,446 acres
Jurisdiction(s)	Henry County/Butts County/Spalding County/City of Locust Grove/City of McDonough
Population	27,621
Number of Housing Units	10,360
Rental / Owner / Vacant	8.7% / 80.9% / 10.4%
Price of Housing / Rent*	Range of Owner Occupied Housing Units by Value: less than $50,000 to greater than $1,000,000 Average Home Value: $119,403 Average Rent: $484

Source: ESRI and TransCAD
**Year 2000*

10.3 Criterion 7b Evaluation

The Site is proposed to contain 1.1945 million square feet of retail, one hotel of approximately 120 rooms, twenty single family detached housing units, and 342 apartments. The number of workers for the retail land use was based on employment per square foot data contained in GRTA's *Area of Influence Guidebook for Non-Expedited Reviews, April 10, 2003*. The number of retail workers at the Site was calculated to be 2,236.

The wages paid for each job type in were identified from the U.S. Department of Labor, Bureau of Labor Statistics (BLS) website for the Atlanta-Sandy Springs-Gainesville, Georgia Combined Statistical Area for January 2007. Table 10-2 shows the estimated number of Site retail workers and the associated median annual earnings.

Table 10-2. Anticipated DRI Retail Workers' Median Annual Earnings

Occupation	Number of Retail Jobs in DRI	2007 Median Annual Earnings
First-line supervisors/managers of retail sales workers	447	$35,870
Retail sales workers	1,789	$23,920

Source: U.S. Department of Labor, Bureau of Labor Statistics, Atlanta-Sandy Springs-Gainesville, GA-AL National Compensation Survey January 2007

A conservative approach was used for the calculation of household incomes for the DRI retail workers by applying a factor of 1.5 to the monthly earnings to approximate the contributions made by other workers in the households.

To determine an individual's or family's ability to afford the monthly housing costs of the AOI's owner-occupied housing, the recommended ratio of monthly housing costs to monthly household income (30%) was applied to determine the maximum affordable owner-occupied housing unit cost for each category of workers. Table 10-3 shows the affordable monthly housing costs for DRI retail workers' households.

Table 10-3. Affordability of Housing Costs for DRI Retail Workers

Occupation	Number of Retail Jobs in DRI	Monthly Worker Earnings	Monthly Household Earnings	Affordable Housing Payment
First-line supervisors/managers of retail sales workers	447	$2,989	$4,484	$1,345
Retail sales workers	1,789	$1,993	$2,990	$897

Source: GRTA's Area of Influence Guidebook, April 10, 2003

The median home value in the AOI of $101,408 in 2000 was compared to the projected median home value of $152,287 in 2007 to provide an assumed annual increase in home values of 7.2%. The 7.2% annual increase in home values was applied for seven (7) years to the 2000 home value ranges to determine the number of available homes in each applicable purchase price range in 2007.

The affordable maximum monthly housing costs for owner-occupied housing units in the AOI were determined using the Government National Mortgage Association (Ginnie Mae) Loan Estimator Calculator. Ginnie Mae uses this tool to assess an individual's or family's ability to

afford an owner-occupied unit depending on the cost of the home, its geographic location, and the market rates for mortgage loans.

The numbers of DRI retail workers' households for each range of monthly housing costs were compared to the monthly housing costs for the AOI owner-occupied housing, using monthly housing costs calculated as described above. Table 10-4 shows the number of DRI retail workers whose household incomes would be expected to allow them the opportunity to live within the AOI.

Table 10-4. Affordability of AOI Housing for DRI Retail Workers' Households

2007 No. of Units in AOI		2007 Range of Housing Unit Values	2007 Range of Monthly Mortgage Payments	Number of DRI Retail Worker Households per Housing Cost Range	Number of DRI Retail Worker HHs Who Can Be Housed in AOI
1,042		< $75,085	< $543	0	0
1,909		$75,085 to $150,171	$543 to $1,087	1,789	1,789
2,018		$150,171 to $225,257	$1,087 to $1,630	447	447
551		$225,257 to $300,344	$1,630 to $2,174	0	0
327		$300,344 to $450,516	$2,174 to $3,261	0	0
91		$450,516 to $750,861	$3,261 to $5,434	0	0
97		$750,861 to $1,501,724	$5,434 to $10,869	0	0
24		> $1,501,724	> $10,869	0	0
TOTAL	**6,060**	**N/A**	**N/A**	**2,236**	**2,236**

Source: Government National Mortgage Association Loan Estimator Calculator

As can be seen in Table 10-4, 2,236 of the 2,236 Site retail workers have the opportunity to find housing within the AOI. Therefore, the Site is located within an AOI with housing opportunities such that approximately 100% of the persons who are anticipated to work at the retail land use of the Site will have an opportunity to find housing within the AOI. The Site meets GRTA's evaluation Criterion 7b.

11.1 Introduction

This section of the report presents a summary of the data and information that address the GRTA DRI Review Criteria that are contained in Section 3-103(A) of the *Procedures and Principles for GRTA Development of Regional Impact Review*, January 14, 2002.

11.2 Section 3-103(A) Review Criteria

1. *Indicate whether or not the proposed DRI is likely to promote improved regional mobility in terms of the quality, character, convenience and flexibility of transportation options*. The Site is not likely to promote improved regional mobility in terms of the quality, character, convenience, and flexibility of transportation options that exist at this time. The Site is located in an area where at this time there are no practical transportation options other than the personal vehicle. There are planned bicycle and pedestrian facilities that will eventually benefit the site and the surrounding area. The developer will build sidewalks as fully described in Section 2.7. Due to the undeveloped nature of the Site and its vicinity, there are few other sidewalks with which to connect.

2. *Indicate whether or not the proposed DRI is likely to promote improved regional mobility by reducing Vehicle Miles of Travel*. The Site is likely to promote improved regional mobility by reducing Vehicle Miles of Travel (VMT) because 100% of the persons who are reasonably anticipated to work in the retail portion of the Site have an opportunity to live within the Area of Influence, thus potentially reducing the VMT for work. In addition, due to the mixed-use nature of the Site, over 1500 of the Site's trips (4.3%) will be internally captured and will not add traffic to the external roadway system.

3. *Indicate whether or not the proposed DRI is likely to promote improved regional mobility because it is located in an urban core, town center, an activity center previously designated by an RDC, a rail/transit station development or is part of a publicly sponsored redevelopment or infill initiative*. The Site is not located in an urban core, a town center, an activity center previously designated by an RDC, or a rail/transit station development, and it is not part of a publicly sponsored redevelopment or infill initiative.

4. *Indicate whether or not the proposed DRI is located sufficiently close to existing or planned transit facilities to indicate a likelihood of significant use of transit by residents, employees and visitors of the proposed DRI.* There are currently no existing or planned transit facilities within 1/2 mile of the Site. The lack of existing or planned transit facilities is beyond the control of the developer.

5. *Indicate whether or not the proposed DRI is located within an established Transportation Management Area which creates a likelihood that the proposed DRI is reasonably anticipated to result in improved regional mobility as a result of the Transportation Management Area.* The Site is not located within an established Transportation Management Area.

6. *Indicate whether or not off-site trip generation from the proposed DRI is reduced by at least fifteen percent (15%), or, in the event that a proposed DRI is unable to satisfy the trip reduction standard established in this subsection because of other conditions which are beyond the control of the developer or the affected local government, the proposed DRI implements all available trip reduction techniques which are reasonably practical.* Off-site trip reduction from the Site is not reduced by at least 15%. However, the Site plans to implement all available trip reduction techniques that are reasonably practical. There are currently no existing or planned transit facilities within 1/2 mile of the Site, and but there are planned bicycle facilities off-site within 3/4 miles of the Site (other than those that the developer is already committed to building) that would accommodate a reduction for alternative modes of transportation. The lack of existing or planned transit, bicycle, and pedestrian facilities is beyond the control of the developer.

7. *Indicate whether or not the proposed DRI:*
   (a) Contains a mix of uses which are reasonably anticipated to contribute to a balancing of land uses such that it would be affordable for at least ten percent (10%) of the persons who are reasonably anticipated to be employed in the proposed DRI are reasonably anticipated to have an opportunity reside within the DRI; or,
   (b) Is located in an Area of Influence where the proposed DRI is reasonably anticipated to contribute to a balancing of land uses within the Area of Influence such that twenty-five percent (25%) of the persons who are reasonably anticipated to be employed in the proposed DRI have the opportunity to live within the Area of Influence; or,
   (c) Is located in an Area of Influence with employment opportunities which are such that at least twenty-five percent (25%) of the persons who are reasonably anticipated to live in the proposed DRI and are reasonably expected to be employed will have an opportunity to find employment appropriate to such persons' qualifications and experience within the Area of Influence.

   The Site is located within an Area of Influence with housing opportunities such that approximately 100% of the persons who are reasonably anticipated to work in the retail portion of the Site will have an opportunity to find housing within the Area of Influence.

8. *Indicate whether or not the proposed DRI is located in an area where the existing level of development and availability of infrastructure within the Area of Influence of the proposed DRI is such that the proposed DRI is reasonably anticipated to result in*

unplanned and poorly served development which would not otherwise occur until well-planned growth and development and adequate public facilities are available. The Site is not located in an area where the anticipated level of development and availability of infrastructure within the study network is such that the Site is reasonably anticipated to result in unplanned and poorly served development. As shown in the traffic impact analysis, the roadways and intersections serving the Site can be reasonably expected to operate at adequate Levels of Service, and/or may be mitigated and improved readily so that they will operate at adequate LOS.

12. AIR QUALITY BENCHMARK STATEMENT

12.1 Introduction

This section of the study presents an analysis of the site layout for the Site in relation to its compliance with the air quality guidelines established by the Atlanta Regional Commission (ARC). The ARC procedure for reviewing and approving Developments of Regional Impact (DRI) requires the establishment of Air Quality "Performance Benchmarks." These benchmarks are necessary for the region to identify air quality progress in accordance with federal air quality regulations.

Each development must incorporate transportation-related measures that contribute to a 15% reduction in vehicle miles traveled (VMT), which are directly linked to improvements in air quality.

12.2 Evaluation

Employment uses comprise 65.5% of the square footage of the Site, and residential uses comprise 34.5% (using GRTA's standard of 1800 square feet per residential unit). Therefore, the Site qualifies for a –4% reduction for a mix of uses.

The developer is proposing the following on-site sidewalk system. There will be a sidewalk along the Site's frontage on Bill Gardner Parkway. There will be sidewalks along both sides of all internal roadways. There will also be sidewalks making connections between parking facilities and the site's buildings. There will also be connections to any existing sidewalks on the site to the south of the subject site. Therefore, the Site qualifies for a –5% reduction for bike/ped networks in developments that meet a mixed use target and connect to adjoining uses.

12.3 Conclusion

Based on the data and information presented in this study, it is concluded that the layout of the Site coincides with the air quality guidelines set out by the ARC, but does not meet the -15% threshold. The mixed use nature of the Site, and the internal and external sidewalks proposed as part of the Site are expected to contribute to a –9% reduction in the overall VMT for the Site and accelerate air quality improvements.

APPENDICES

Appendix A – Trip Generation Worksheets

Appendix B – Peak Hour Turning Movement Counts

Appendix C – Capacity Analyses: Existing Conditions

Appendix D – Capacity Analyses: Existing Conditions with Improvements

Appendix E – Programmed Improvements

Appendix F – Capacity Analyses: Future Background Conditions

Appendix G – Capacity Analyses: Future Background Conditions with Required Improvements

Appendix H – Capacity Analyses: Future Background Conditions with Programmed Improvements

Appendix I – Capacity Analyses: Future Background Conditions with Programmed Improvements and Other Necessary Improvements

Appendix J – Capacity Analyses: Future Year Total Conditions

Appendix K – Capacity Analyses: Future Year Total Conditions with Required Improvements

Appendix L – Capacity Analyses: Future Year Total Conditions with Programmed Improvements

Appendix M – Capacity Analyses: Future Year Total Conditions with Programmed Improvements and Other Necessary Improvements

Appendix N – Capacity Analyses: Future Year Total Conditions with Programmed Improvements and Other Practical Improvements