



**Dresden Drive Intersection Improvement Study - Update
Traffic Study Technical Memorandum**

Prepared by



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Introduction

As a part of the Dresden Drive Intersection Improvement Analysis, a traffic evaluation was conducted in July 2021 at intersection locations along Dresden Drive within the City of Brookhaven, located in DeKalb County, GA. The traffic evaluation included capacity, operational, and safety analyses of these intersections to aide in the recommendation of potential improvement projects along the study corridor. Based on further input from the City, the scope of the traffic study has been expanded to include additional and updated intersection analysis, as well as roadway segment analysis, under multiple growth scenarios. This memorandum details the updated traffic conditions, evaluation methodology, and analysis results.

The study area has been updated to include 21 intersection locations along Dresden Drive and the surrounding area. These locations are listed below and shown in **Figure 1**. Additionally, 22 roadway segments, including Dresden Drive, are included in the analysis. These locations are listed below and shown in **Figure 2**.

Study Intersections:

- Dresden Drive @ Peachtree Road
- Dresden Drive @ Apple Valley Road
- Dresden Drive @ Fernwood Circle
- Dresden Drive @ Ellijay Drive
- Dresden Drive @ Caldwell Road
- Dresden Drive @ Appalachian Drive
- Dresden Drive @ Camille Drive
- Dresden Drive @ Conasauga Avenue
- Dresden Drive @ North Thompson Road
- Dresden Drive @ Ashford Road
- Dresden Drive @ Winding Lane
- Dresden Drive @ Clairmont Road
- Redding Road @ Caldwell Road
- Redding Road @ Peachtree Road
- North Druid Hills Road @ Peachtree Road
- North Druid Hills Road @ Apple Valley Road
- North Druid Hills Road @ Sylvan Circle (N)
- North Druid Hills Road @ Star Drive
- North Druid Hills Road @ Sylvan Circle (S)
- Briarwood Road @ Briarwood Hills Drive
- Briarwood Road @ Coosawattee Drive

Study Roadway Segments:

- Dresden Drive between Peachtree Road and Clairmont Road
- Apple Valley Road between Parkside Drive and Sunland Drive
- Caldwell Road between Sunland Drive and Oaklawn Avenue
- Green Meadows Lane between Wilford Drive and East Osborne Road
- Camille Drive between Wilford Drive and E Osborne Road
- North Thompson Road between Dresden Drive and Trentwood Place
- Ashford Road between Dresden Drive and Trentwood Place
- Winding Lane between Dresden Drive and Redding Way
- Caldwell Road between Ashford Road and Redding Road
- Caldwell Road between Cynthia Drive and Redding Road
- Redding Road between Caldwell Road and Peachtree Road
- Redding Road between Caldwell Road and Redding Way
- Apple Valley Road between North Druid Hills Road and Fernwood Circle
- Sylvan Circle (N) between North Druid Hills Road and Fernwood Circle
- Star Drive between North Druid Hills Road and Sylvan Circle
- Sylvan Circle (S) between North Druid Hills Road and Star Drive
- Ellijay Drive between Towne Estates Drive and Canoochee Drive
- Appalachian Drive between Dresden Drive and Canoochee Drive
- Conasauga Avenue between Dresden Drive and Oostanaula Drive
- Coosawattee Drive between Tugaloo Drive and Noel Drive
- Briarwood Hills Drive between Briarwood Road and Telford Drive
- Coosawattee Drive between Briarwood Road and Wayside Drive

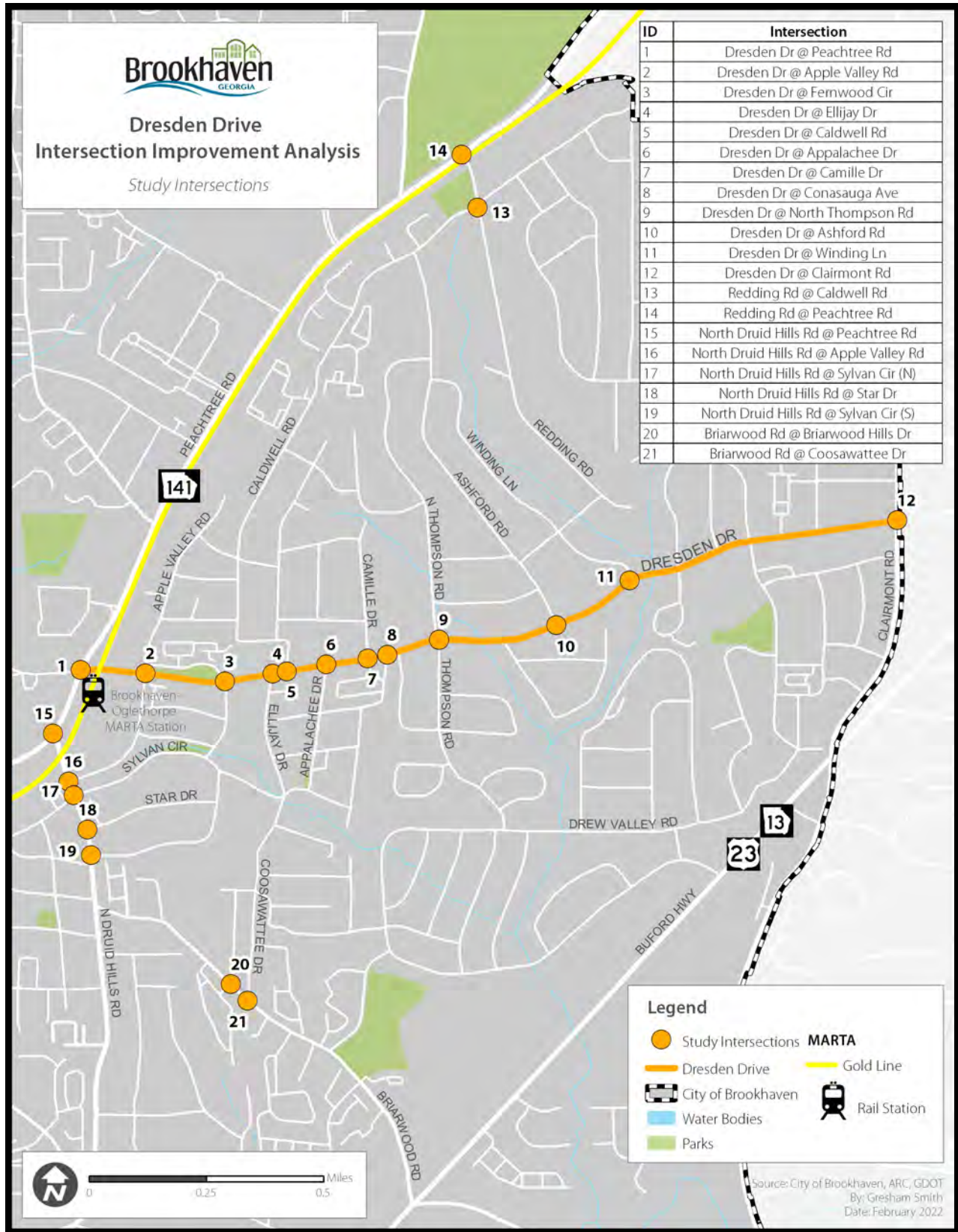


FIGURE 1: STUDY INTERSECTIONS

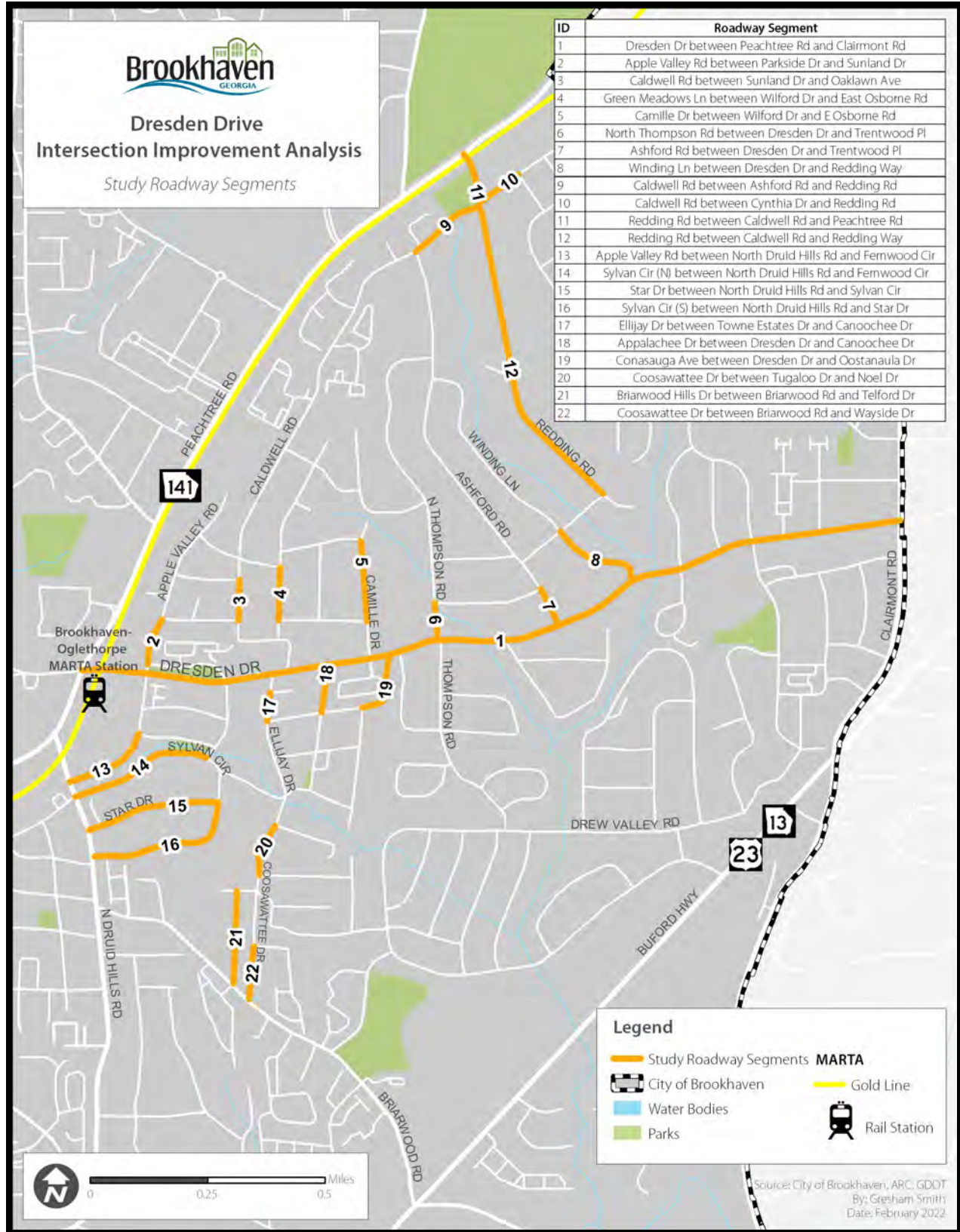


FIGURE 2: STUDY ROADWAY SEGMENTS

Existing Conditions

The following sections summarize the existing traffic conditions at each study location, including traffic volumes and capacity analysis at critical intersections along Dresden Drive.

Traffic Volumes

For the purposes of this study, new traffic count data was collected by Marr Traffic Data Collection on January 20th of 2022. Peak hour turning movement counts were collected at each of the 21 study intersections, and 24-hour bi-directional counts were collected on all 22 study roadway segments. The raw count data collected is provided in **Appendix A**.

HISTORICAL TRAFFIC DATA

Given the ongoing effects of COVID-19, historical traffic count data from other sources and studies were also obtained and reviewed to determine the accuracy of the traffic data collected during the pandemic. The historical data reviewed are summarized below.

- Dresden Drive Intersection Improvement Analysis – As part of the initial traffic evaluation, traffic count data was collected on May 11th and 12th of 2021. 48-hour bi-directional counts were collected on Dresden Drive and on Clairmont Road just south of Dresden Drive. Peak hour turning movement counts were collected at the Apple Valley Road, Ellijay Drive, Caldwell Drive and Clairmont Road intersections with Dresden Drive.
- Dresden Village Traffic Study – Turning movement counts are available at the Apple Valley Road and Ellijay Drive/Caldwell Road intersections. The counts were collected on January 20th, 2016 at the Ellijay Drive/Caldwell Road intersection, and on March 8th, 2016 at the Apple Valley Road intersection. All turning movement counts were recorded during the AM and PM peak hours between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively.
- City of Brookhaven Transportation Streetscape Improvements – Turning movement counts are available at Apple Valley Road, Ellijay Drive and Clairmont Road intersections. The counts were collected on November 10th, 2016. All turning movement counts were recorded during the AM and PM peak hours between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively.
- GDOT’s Traffic Analysis & Data Application (TADA) – 48-hour bi-directional counts are available on Dresden Drive east of Thompson Road (Station ID 089-3625), and on Clairmont Road south of Dresden Drive (Station ID 089-3445). The counts were collected over a 48-hour period on May 1st, 2nd and 3rd of 2017 on Dresden Drive, and August 26th, 27th and 28th of 2019 on Clairmont Road.

HISTORICAL GROWTH ANALYSIS

To compare the turning movement counts collected during the ongoing effects of COVID-19 with pre-pandemic data, recent historical growth in traffic in the study area was reviewed. For the purposes of this study, three (3) GDOT historical count stations were identified to determine the recent rate of traffic growth. Based on the pre-pandemic count data available over the past 15 years, growth rates were calculated at each of count station. As shown in **Table 1**, the average annual historical growth rate in the study area was 1.3%.

TABLE 1: HISTORICAL GROWTH RATES

GDOT Count Location	Location Description	Growth Rate
0893445	Clairmont Rd S/O Dresden Dr	1.3%
0893625	Dresden Dr E/O Thompson Rd	1.8%
0893627	Dresden Dr E/O Clairmont Rd	0.9%
Average		1.3%

COVID-19 ADJUSTMENTS

COVID-19 factors were developed to adjust the traffic counts collected to account for the effect of the ongoing pandemic on traffic volumes. The historical count data was grown using an annual growth rate of 1.5%, based on the historical traffic growth analysis. The turning movement counts collected during the ongoing pandemic were then compared to the grown historical counts. After reviewing the traffic patterns reflected in the 2021 collected counts versus the grown historical data, the following COVID-19 adjustment factors shown in **Table 2** were developed.

TABLE 2: COVID-19 ADJUSTMENT FACTORS

Time Period	Adjustment Factor
AM Peak Hour	1.25
PM Peak Hour	1.15
24 Hours	1.20

The AM and PM peak hour COVID-19 adjustment factors were applied to the latest turning movement counts collected at each study intersection to develop the Existing Year (2022) AM and PM peak hour turning movement volumes used for analysis. These volumes are provided in **Appendix B**. The 24-hour COVID-19 adjustment factor was applied to the 24-hour traffic counts collected on each study roadway segment to develop the Existing Year (2022) daily volumes used for analysis. These volumes are provided in **Appendix C**.

Intersection Capacity Analysis

Based on input from the City, the following five (5) critical study intersections were identified along the Dresden Drive corridor:

- Dresden Drive at Peachtree Road
- Dresden Drive at Apple Valley Road
- Dresden Drive at Ellijay Drive
- Dresden Drive at Caldwell Road
- Dresden Drive at Clairmont Road

Based on the Existing Year (2022) AM and PM peak hour turning movement traffic volumes, the existing traffic controls, and existing lane configurations, AM and PM peak hour traffic operations were analyzed at each of the five (5) critical study intersections along Dresden Drive. The methodologies outlined in the Highway Capacity Manual (HCM) 6th Edition, and the Synchro 11.0 software program were utilized for this analysis. According to the HCM, there are six levels of service (LOS) by which the operational performance of an intersection may be described. These levels of service range between LOS A, which indicates a relatively free-flowing condition, and LOS F, which indicates operational breakdown.

For signalized intersections, LOS is defined in terms of a weighted average control delay for all traffic movements at the intersection. Control delay is a complex measure that quantifies the increase in travel time that a vehicle experiences due to the traffic signal control, which is based on multiple variables, including signal phasing and coordination (i.e., progression of movements through the intersection and along the corridor), signal cycle length, and traffic volumes with respect to intersection capacity and resulting queues. Signalized intersection LOS is stated in terms of average control delay per vehicle (in seconds) during a specified time period (e.g., weekday PM peak hour). **Table 3** summarizes the LOS criteria for signalized intersections, as described in the HCM (Transportation Research Board, 2016).

TABLE 3: LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service	Control Delay (sec/veh)	General Description
A	≤ 10 seconds	Free flow
B	> 10 seconds and ≤ 20 seconds	Stable flow (slight delays)
C	> 20 seconds and ≤ 35 seconds	Stable flow (acceptable delays)
D	> 35 seconds and ≤ 55 seconds	Approaching unstable flow
E	> 55 seconds and ≤ 80 seconds	Approaching intersection capacity unstable flow, unfavorable progression
F*	> 80 seconds	Forced flow, poor progression

Source: Highway Capacity Manual, 6th Edition, Transportation Research Board, 2016.

*If the volume-to-capacity (v/c) ratio exceeds 1.0, LOS F is assigned.

The results of the intersection LOS and delay analysis for the Existing Year (2022) conditions are summarized in **Table 4**. As shown, four (4) intersections operate at LOS D or better in the AM and PM peak hours, and one intersection (Peachtree Road at Dresden Drive and Brookhaven Drive) operates at LOS E or worse during both the AM and PM peaks. Detailed HCM analyses, including capacity analysis worksheets that summarize queueing and detailed delay and LOS data by approach and movement, can be found in **Appendix D**.

While the capacity analysis reflects a LOS D or better for four critical study intersections, heavy congestion does exist due to multiple operational issues, such as closely spaced intersections, on-street parking, and weaving patterns. While it appears that this section of Dresden Drive has the capacity to accommodate the existing traffic volumes, these issues have been observed to impact operations along the corridor.

TABLE 4: EXISTING YEAR (2022) INTERSECTION CAPACITY ANALYSIS

ID	Intersection Name	Intersection Control Type	AM LOS Delay (s)	PM LOS Delay (s)
1	Dresden Dr @ Peachtree Rd	Signal	E 59.1	F 85.2
2	Dresden Dr @ Apple Valley Rd	Signal	B 10.8	B 13.2
3	Dresden Dr @ Ellijay Dr	Signal	A 6.1	A 6.9
4	Dresden Dr @ Caldwell Rd	Signal	A 6.8	A 7.4
5	Dresden Dr @ Clairmont Rd	Signal	D 35.7	D 36.3

Future Conditions

Future conditions were analyzed at all the study intersections and study roadway segments based on projected traffic volumes. The years 2027, 2037 and 2047 were chosen as the 5-year, 15-year, and 25-year horizons to conduct the traffic analysis for future conditions. To perform the future analysis, anticipated traffic volumes were developed at each of the 21 study intersections and 22 roadway segments for low-, medium-, and high-growth scenarios.

The future condition traffic is defined as the existing condition traffic, plus the anticipated background growth in traffic along the corridor, plus any anticipated traffic due to planned development near the study area. Hence, the following formula was used to calculate the future condition traffic volumes.

$$F = P(1 + r)^n + \text{Development Traffic}$$

Where:

F = future projected traffic volume (vehicles per hour)

P = existing traffic volume (vehicles per hour)

r = annual background growth rate

n = number of projection years = future projection year – existing year

Projected Growth Analysis

The anticipated future background growth in traffic was based on traffic and population predictions in the vicinity of the study area. Projected annual growth rates were calculated based on data obtained from the Atlanta Regional Commission (ARC).

The projected annual growth in traffic was calculated based on traffic assignments from the ARC’s Travel Demand Model (TDM) over several roadway links throughout the study area. As shown in **Table 5**, the average annual projected traffic growth rate was calculated to be 0.6%.

TABLE 5: PROJECTED TRAFFIC GROWTH RATES

Model Link	ARC Travel Demand Model Output - Daily Volume		
	2015	2050	Growth Rate
Dresden Dr E/O Apple Valley Rd	20,012	23,127	0.4%
Dresden Dr E/O Thompson Rd	12,158	16,123	0.8%
Dresden Dr W/O Thompson Rd	11,396	13,512	0.5%
Dresden Dr E/O Winding Ln	16,910	20,058	0.5%
Dresden Dr W/O Winding Ln	15,306	18,794	0.6%
Dresden Dr E/O Clairmont Rd	15,412	19,261	0.6%
Dresden Dr W/O Clairmont Rd	12,912	15,791	0.6%
Clairmont Rd S/O Dresden Dr	14,395	19,266	0.8%
Clairmont Rd N/O Dresden Dr	17,327	23,547	0.9%
Average			0.6%

Annual growth rates were also calculated based on the ARC’s future population predictions for DeKalb County and the Chamblee Super District (SD), which includes the City of Brookhaven. The population forecasts and calculated annual growth rates for the region are shown in **Table 6**. The average annual projected population growth rate was calculated to be 0.8%.

TABLE 6: PROJECTED POPULATION GROWTH RATES

Location	2020	2030	2040	2050	Growth Rate		
					2020-2030	2020-2040	2020-2050
DeKalb	809,802	889,371	941,158	1,012,022	0.9%	0.8%	0.7%
Chamblee SD	156,996	175,482	187,671	200,650	1.1%	0.9%	0.8%
Average							0.8%

Growth Scenarios

Based on the projected growth analyses, three (3) different growth scenarios were developed to be representative of the possible future traffic volumes along Dresden Drive and other roadways within the study area. The three (3) growth scenarios are as follows:

Low-Growth Scenario – An applied annual background growth rate of 0.5% plus anticipated development traffic

Medium-Growth Scenario – An applied average annual background growth rate of 0.75% plus anticipated development traffic

High-Growth Scenario – An applied average annual background growth rate of 1.0% plus anticipated development traffic

The three (3) growth scenarios were applied at each study intersection and roadway segment to develop projected traffic volumes for the 5-year, 15-year and 25-year horizons and to conduct the traffic analysis for all future conditions.

Future Developments

Several planned and potential development projects in the vicinity of Dresden Drive were identified by the City of Brookhaven. Based on information provided by the City, an updated list of developments and their planned land uses is provided in **Table 7**. The location of each development is shown in **Figure 3**.

TABLE 7: FUTURE DEVELOPMENT LAND USES

Property	Acres	Built By (Year)	Apartments/Condos	Townhomes	Retail (Sq.ft)	Office (Sq.ft)	Hotel Rooms
MARTA	17.76	2026	196	32	140,000	936,000	225
North of Apple Valley Rd	20.84	2026	250		101,700	31,500	70
Pappas-Terwilliger	2.03	2026	50		25,054		
Dresden Village	4.00	2026	177	7	26,601		
University Baptist Church	1.48	2026	36		18,266		
Total	46.11		709	39	311,621	967,500	295

Based on the anticipated land uses, generated development trips were derived using the methodologies outlined in the Trip Generation Manual, 11th Edition (Institute of Transportation Engineers). Mixed-use, internal trip reductions were applied per the ITE Trip Generation Handbook, 3rd Edition (Institute of Transportation Engineers) to account for the anticipated interaction between the residential, office and/or retail land uses within each development. An alternative transportation mode reduction of 25%, consistent with guidance from the Georgia Road and Toll Authority (GRTA), was applied to all land uses for each development to account for the use of alternative modes of transportation in the area, such as walking, biking, and transit. The net external trips generated by each development were distributed throughout the study area based on surrounding traffic patterns to identify the vehicle trips traversing through each study intersection and roadway segment. The total number of estimated vehicle trips generated by each development, as well as the net external vehicle trips generated, are included in **Appendix E**.

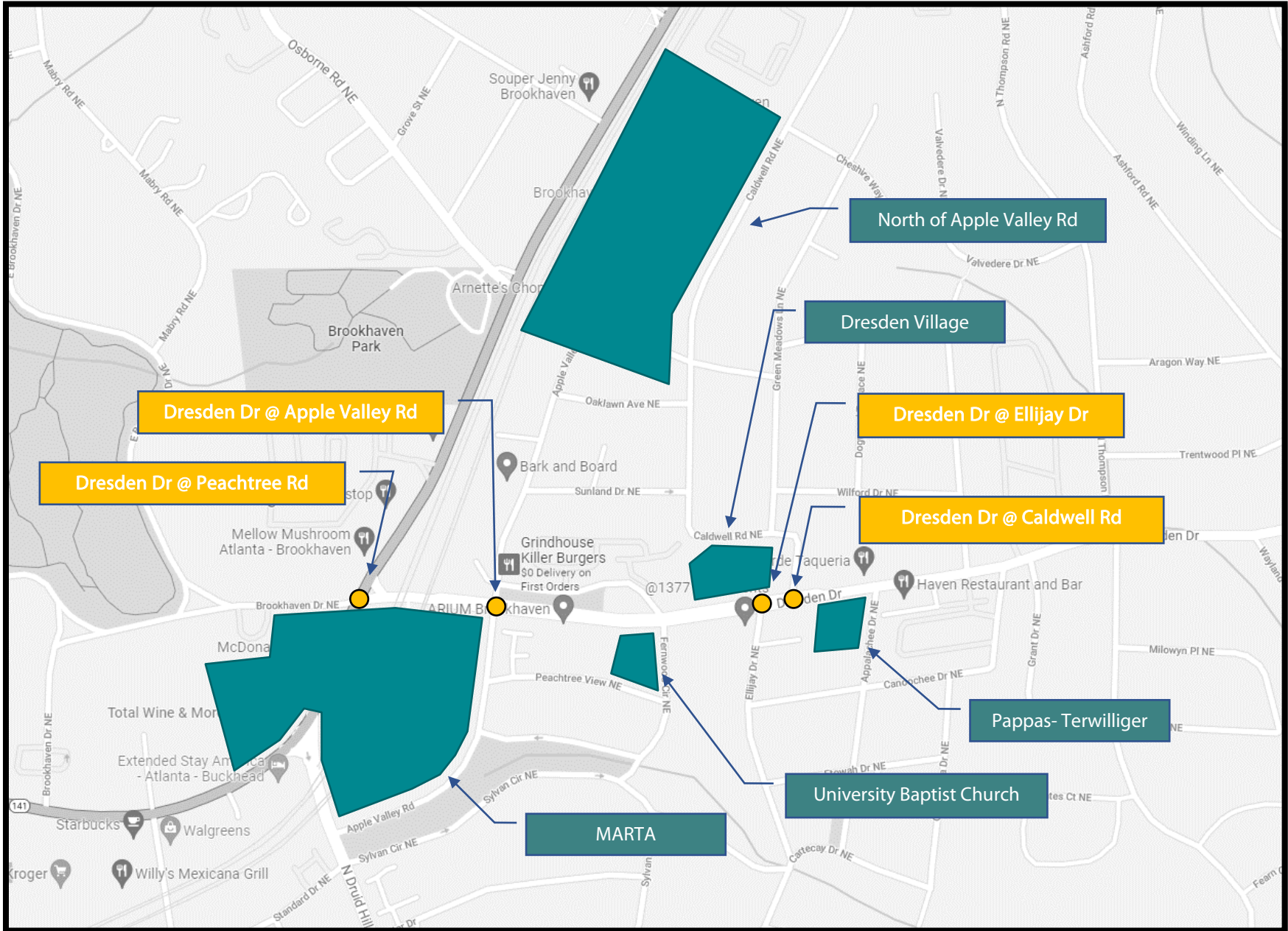


FIGURE 3: FUTURE DEVELOPMENT SITES

Future Traffic Volumes

Future Year traffic volumes were developed for the low-, medium-, and high-growth scenarios for each of the 21 study intersections and 22 roadway segments for the 5-year, 15-year, and 25-year horizons. The projected Future Year AM and PM peak hour turning movement volumes are provided in **Appendix B**. The projected Future Year daily roadway segment volumes are provided in **Appendix C**.

INCREASE IN TRAFFIC VOLUMES – INTERSECTION ANALYSIS

The anticipated increase in traffic based on the Future Year traffic volumes projected for the low-, medium-, and high-growth scenarios for the 5-year, 15-year, and 25-year horizons at each of the 21 study intersections was reviewed. The percent increase in total traffic at each study intersection for the 2027, 2037 and 2047 Future Years are provided in **Table 8**, **Table 9** and **Table 10**, respectively. As shown, the largest percent increase in traffic is anticipated at the Dresden Drive at Apple Valley Road intersection under each growth scenario.

TABLE 8: FUTURE YEAR (2027) INCREASE IN INTERSECTION TRAFFIC VOLUMES

ID	Intersection Name	AM Peak Hour			PM Peak Hour		
		Low-Growth	Medium-Growth	High-Growth	Low-Growth	Medium-Growth	High-Growth
1	Dresden Dr @ Peachtree Rd	20%	20%	20%	25%	25%	25%
2	Dresden Dr @ Apple Valley Rd	40%	45%	45%	60%	60%	60%
3	Dresden Dr @ Fernwood Cir	35%	35%	40%	50%	50%	50%
4	Dresden Dr @ Ellijay Dr	30%	35%	35%	40%	45%	45%
5	Dresden Dr @ Caldwell Rd	35%	35%	35%	40%	45%	45%
6	Dresden Dr @ Appalachian Dr	30%	30%	35%	40%	40%	40%
7	Dresden Dr @ Camille Dr	30%	30%	35%	40%	40%	45%
8	Dresden Dr @ Conasauga Ave	30%	30%	30%	40%	40%	40%
9	Dresden Dr @ North Thompson Rd	30%	30%	30%	35%	40%	40%
10	Dresden Dr @ Ashford Rd	30%	30%	30%	40%	40%	40%
11	Dresden Dr @ Winding Ln	25%	30%	30%	35%	40%	40%
12	Dresden Dr @ Clairmont Rd	10%	10%	15%	15%	15%	15%
13	Redding Rd @ Caldwell Rd	15%	15%	15%	25%	25%	30%
14	Redding Rd @ Peachtree Rd	20%	20%	20%	25%	25%	25%
15	North Druid Hills Rd @ Peachtree Rd	30%	30%	30%	35%	35%	35%
16	North Druid Hills Rd @ Apple Valley Rd	40%	40%	40%	40%	40%	45%
17	North Druid Hills Rd @ Sylvan Cir (N)	25%	30%	30%	30%	30%	30%
18	North Druid Hills Rd @ Star Dr	25%	30%	30%	30%	30%	30%
19	North Druid Hills Rd @ Sylvan Cir (S)	30%	30%	30%	30%	30%	30%
20	Briarwood Rd @ Briarwood Hills Dr	30%	35%	35%	35%	35%	40%
21	Briarwood Rd @ Coosawattee Dr	30%	35%	35%	35%	40%	40%

TABLE 9: FUTURE YEAR (2037) INCREASE IN INTERSECTION TRAFFIC VOLUMES

ID	Intersection Name	AM Peak Hour			PM Peak Hour		
		Low-Growth	Medium-Growth	High-Growth	Low-Growth	Medium-Growth	High-Growth
1	Dresden Dr @ Peachtree Rd	25%	25%	30%	30%	30%	35%
2	Dresden Dr @ Apple Valley Rd	45%	50%	55%	65%	65%	70%
3	Dresden Dr @ Fernwood Cir	40%	45%	50%	55%	60%	60%
4	Dresden Dr @ Ellijay Dr	35%	40%	45%	45%	50%	55%
5	Dresden Dr @ Caldwell Rd	40%	40%	45%	45%	50%	55%
6	Dresden Dr @ Appalachian Dr	35%	40%	45%	45%	50%	55%
7	Dresden Dr @ Camille Dr	35%	40%	45%	45%	50%	55%
8	Dresden Dr @ Conasauga Ave	35%	40%	45%	45%	50%	55%
9	Dresden Dr @ North Thompson Rd	35%	40%	40%	45%	45%	50%
10	Dresden Dr @ Ashford Rd	35%	40%	45%	45%	50%	50%
11	Dresden Dr @ Winding Ln	35%	35%	40%	40%	45%	50%
12	Dresden Dr @ Clairmont Rd	15%	20%	25%	20%	25%	30%
13	Redding Rd @ Caldwell Rd	20%	25%	30%	30%	35%	40%
14	Redding Rd @ Peachtree Rd	25%	25%	30%	30%	30%	35%
15	North Druid Hills Rd @ Peachtree Rd	35%	40%	45%	40%	40%	45%
16	North Druid Hills Rd @ Apple Valley Rd	45%	45%	50%	45%	50%	55%
17	North Druid Hills Rd @ Sylvan Cir (N)	30%	35%	40%	35%	35%	40%
18	North Druid Hills Rd @ Star Dr	35%	35%	40%	35%	40%	40%
19	North Druid Hills Rd @ Sylvan Cir (S)	35%	35%	40%	35%	40%	40%
20	Briarwood Rd @ Briarwood Hills Dr	40%	45%	50%	40%	45%	50%
21	Briarwood Rd @ Coosawattee Dr	35%	40%	45%	40%	45%	50%

TABLE 10: FUTURE YEAR (2047) INCREASE IN INTERSECTION TRAFFIC VOLUMES

ID	Intersection Name	AM Peak Hour			PM Peak Hour		
		Low-Growth	Medium-Growth	High-Growth	Low-Growth	Medium-Growth	High-Growth
1	Dresden Dr @ Peachtree Rd	30%	35%	45%	35%	40%	50%
2	Dresden Dr @ Apple Valley Rd	50%	60%	65%	70%	75%	85%
3	Dresden Dr @ Fernwood Cir	45%	55%	60%	60%	65%	75%
4	Dresden Dr @ Ellijay Dr	40%	50%	55%	55%	60%	70%
5	Dresden Dr @ Caldwell Rd	45%	50%	60%	55%	60%	70%
6	Dresden Dr @ Appalachian Dr	40%	50%	55%	50%	60%	65%
7	Dresden Dr @ Camille Dr	40%	50%	55%	50%	60%	65%
8	Dresden Dr @ Conasauga Ave	40%	50%	55%	50%	55%	65%
9	Dresden Dr @ North Thompson Rd	40%	45%	55%	50%	55%	65%
10	Dresden Dr @ Ashford Rd	40%	45%	55%	50%	55%	65%
11	Dresden Dr @ Winding Ln	40%	45%	55%	45%	55%	60%
12	Dresden Dr @ Clairmont Rd	20%	30%	35%	25%	30%	40%
13	Redding Rd @ Caldwell Rd	25%	30%	40%	35%	45%	50%
14	Redding Rd @ Peachtree Rd	30%	35%	45%	35%	40%	50%
15	North Druid Hills Rd @ Peachtree Rd	40%	45%	55%	45%	50%	60%
16	North Druid Hills Rd @ Apple Valley Rd	50%	55%	65%	50%	60%	65%
17	North Druid Hills Rd @ Sylvan Cir (N)	35%	45%	50%	40%	45%	55%
18	North Druid Hills Rd @ Star Dr	40%	45%	55%	40%	45%	55%
19	North Druid Hills Rd @ Sylvan Cir (S)	40%	45%	55%	40%	45%	55%
20	Briarwood Rd @ Briarwood Hills Dr	45%	50%	60%	45%	55%	60%
21	Briarwood Rd @ Coosawattee Dr	45%	50%	60%	50%	55%	65%

INCREASE IN TRAFFIC VOLUMES – ROADWAY SEGMENT ANALYSIS

The anticipated increase in traffic based on the Future Year traffic volumes projected for the low-, medium-, and high-growth scenarios for the 5-year, 15-year, and 25-year horizons on each of the 22 study roadway segments was reviewed. The percent increase in total traffic on each study roadway segment for the 2027, 2037 and 2047 Future Years are provided in **Table 11**. As shown, the largest percent increase in traffic is anticipated on Apple Valley Road under each growth scenario.

TABLE 11: FUTURE YEAR INCREASE IN ROADWAY SEGMENT TRAFFIC VOLUMES

ID	Roadway Segment	2027			2037			2047		
		Low-Growth	Medium-Growth	High-Growth	Low-Growth	Medium-Growth	High-Growth	Low-Growth	Medium-Growth	High-Growth
1	Dresden Dr, east of Ashford Rd NE	40%	40%	40%	45%	45%	50%	50%	55%	65%
2	Apple Valley Rd NE, south of Sunland Dr NE	220%	220%	220%	225%	225%	230%	230%	235%	245%
3	Caldwell Rd NE, south of Oaklawn Ave NE	15%	20%	20%	20%	25%	30%	25%	35%	40%
4	Green Meadows Ln NE, south of E Osborne Rd NE	50%	50%	55%	55%	60%	65%	60%	70%	75%
5	Camille Dr NE, north of Wilford Dr NE	90%	90%	90%	95%	95%	100%	100%	105%	115%
6	N Thompson Rd NE, north of Trentwood Pl NE	25%	30%	30%	30%	35%	40%	40%	45%	55%
7	Ashford Rd NE, south of Trentwood Pl NE	40%	45%	45%	45%	50%	55%	55%	60%	70%
8	Winding Ln NE, west of Dresden Dr	40%	40%	40%	45%	50%	50%	50%	55%	65%
9	Caldwell Rd NE, west of Redding Rd NE	40%	40%	40%	45%	50%	50%	50%	55%	65%
10	Caldwell Rd NE, west of Cynthia Dr NE	10%	10%	10%	15%	15%	20%	20%	25%	35%
11	Redding Rd NE, north of Caldwell Rd NE	25%	25%	25%	30%	30%	35%	35%	40%	50%
12	Redding Rd NE, north of Redding Way NE	15%	15%	20%	20%	25%	30%	25%	35%	40%
13	Apple Valley Rd, south of Fernwood Cir NE	90%	90%	90%	95%	100%	100%	100%	105%	115%
14	Sylvan Cir NE, east of Fernwood Cir NE	115%	120%	120%	120%	125%	130%	125%	135%	140%
15	Star Dr, east of N Druid Hills Rd	60%	65%	65%	65%	70%	75%	70%	80%	85%
16	Sylvan Cir NE, east of Brissett Ln	75%	75%	75%	80%	85%	90%	85%	90%	100%
17	Elijay Dr NE, north of Canoochee Dr NE	20%	20%	20%	25%	30%	35%	30%	40%	45%
18	Appalachee Dr NE, south of Dresden Dr	45%	45%	45%	50%	55%	60%	55%	60%	70%
19	Conasauga Ave NE, south of Dresden Dr	45%	50%	50%	50%	55%	60%	60%	65%	75%
20	Coosawattee Dr NE, north of Noel Dr NE	20%	20%	25%	25%	30%	35%	30%	40%	45%
21	Briarwood Hills Dr NE, north of Briarwood Rd NE	115%	115%	115%	120%	125%	130%	125%	135%	140%
22	Coosawattee Dr NE, north of Briarwood Rd NE	35%	35%	35%	40%	45%	50%	45%	55%	60%

Intersection Capacity Analysis (Without Recommendations)

Based on the Future Year AM and PM peak hour turning movement traffic volumes provided in **Appendix B**, AM and PM peak hour traffic operations were analyzed at the five (5) critical study intersections along Dresden Drive for the 5-year, 15-year, and 25-year horizons for low-, medium-, and high-growth scenarios to determine the future operations if no changes are made. It should be noted that existing signal phasings were retained in this analysis, with only minor changes to phase splits to accommodate changes in volume. Detailed HCM analyses, including capacity analysis worksheets that summarize queuing, delay, and LOS data by approach and movement, can be found in **Appendix D**.

FUTURE YEAR (2027) CAPACITY ANALYSIS

The results of the intersection LOS and delay analysis for the Future Year (2027) conditions are summarized in **Table 12**. As shown, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) for each growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS E or worse during both the AM and PM peaks for each growth scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak under each growth scenario. Detailed HCM analyses, including capacity analysis worksheets that summarize queuing and detailed delay and LOS data by approach and movement, can be found in **Appendix D**.

TABLE 12: FUTURE YEAR (2027) INTERSECTION CAPACITY ANALYSIS (WITHOUT RECOMMENDATIONS)

ID	Intersection Name	Low-Growth Scenario		Medium-Growth Scenario		High-Growth Scenario	
		AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)
1	Dresden Dr @ Peachtree Rd	E 70.9	F >100	E 74.4	F >100	E 77.0	F >100
2	Dresden Dr @ Apple Valley Rd	B 13.0	E 63.8	B 15.9	E 65.5	B 13.7	E 67.7
3	Dresden Dr @ Ellijay Dr	A 6.0	B 10.5	A 6.0	B 10.3	A 6.2	B 10.6
4	Dresden Dr @ Caldwell Rd	A 9.4	A 8.2	A 9.5	A 8.6	A 9.5	A 8.7
5	Dresden Dr @ Clairmont Rd	C 38.8	D 45.3	D 39.0	D 45.7	D 39.2	D 46.6

FUTURE YEAR (2037) CAPACITY ANALYSIS

The results of the intersection LOS and delay analysis for the Future Year (2037) conditions are summarized in **Table 13**. As shown, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) for each growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS F during both the AM and PM peaks, and the Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak for the low-growth scenario and falls to LOS F under the medium- and high-growth scenarios. Detailed HCM analyses, including capacity analysis worksheets that summarize queuing and detailed delay and LOS data by approach and movement, can be found in **Appendix D**.

TABLE 13: FUTURE YEAR (2037) INTERSECTION CAPACITY ANALYSIS (WITHOUT RECOMMENDATIONS)

ID	Intersection Name	Low-Growth Scenario		Medium-Growth Scenario		High-Growth Scenario	
		AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)
1	Dresden Dr @ Peachtree Rd	F 81.2	F >100	F 94.1	F >100	F >100	F >100
2	Dresden Dr @ Apple Valley Rd	B 18.0	E 72.2	C 29.9	F 81.4	C 34.3	F 93.5
3	Dresden Dr @ Ellijay Dr	A 6.3	B 11.3	A 6.4	B 12.1	A 6.4	B 13.3
4	Dresden Dr @ Caldwell Rd	A 9.8	A 8.9	B 10.2	A 9.5	B 10.7	B 10.8
5	Dresden Dr @ Clairmont Rd	D 39.9	D 47.6	D 40.8	D 49.2	D 41.8	D 51.4

FUTURE YEAR (2047) CAPACITY ANALYSIS

The results of the intersection LOS and delay analysis for the Future Year (2047) conditions are summarized in **Table 14**. As shown, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) under the low- and medium-growth scenarios. Two (2) intersections operate at LOS D or better in the AM and PM peak hours (two less than in the existing year) under the high-growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS F during both the AM and PM peaks for each growth scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS F during the PM peak under each growth scenario and falls to LOS E during the AM peak only under the high-growth scenario. The Dresden Drive at Clairmont Road intersection operates at LOS E during the PM peak only under the high-growth scenario. Detailed HCM analyses, including capacity analysis worksheets that summarize queuing and detailed delay and LOS data by approach and movement, can be found in **Appendix D**.

TABLE 14: FUTURE YEAR (2047) INTERSECTION CAPACITY ANALYSIS (WITHOUT RECOMMENDATIONS)

ID	Intersection Name	Low-Growth Scenario		Medium-Growth Scenario		High-Growth Scenario	
		AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)	AM LOS Delay (s)	PM LOS Delay (s)
1	Dresden Dr @ Peachtree Rd	F 97.2	F >100	F >100	F >100	F >100	F >100
2	Dresden Dr @ Apple Valley Rd	C 31.4	F 85.0	D 39.0	F >100	E 59.6	F >100
3	Dresden Dr @ Ellijay Dr	A 6.4	B 12.8	A 6.6	B 15.0	A 6.9	C 21.4
4	Dresden Dr @ Caldwell Rd	B 10.3	A 9.6	B 11.3	B 13.5	B 12.9	B 16.8
5	Dresden Dr @ Clairmont Rd	D 41.1	D 49.9	D 42.9	D 54.4	D 45.1	E 61.7

Intersection Capacity Analysis (With Recommendations)

Of the different analysis years, under the various growth scenarios discussed in the previous sections, recommendations were developed based on the 25-year horizon under the medium-growth scenario for the Future Year (2047). Based on the Future Year (2047) conditions under the medium-growth scenario, field observations, and input from the City and local community, several recommendations are proposed to address operational deficiencies at the five (5) critical study intersections along Dresden Drive and implement traffic calming measures throughout the surrounding Brookhaven Fields and Ashford Park neighborhoods on the north and south sides of Dresden Drive. These recommendations are provided in the following section.

PROPOSED RECOMMENDATIONS

Intersection Improvements – Dresden Drive at Peachtree Road

- Widen Peachtree Road to 6-lanes with 3 through lanes on the northbound and southbound approaches
- Install a second right-turn-only lane for westbound right turns; change signal phasing to protected only and add a right-turn overlap phase
- Install a second right-turn-only lane for northbound right turns; change signal phasing to protected only and add a right-turn overlap phase
- Install a dedicated right-turn-only lane for southbound right turns and add a right-turn overlap phase
- Install a second left-turn-only lane for southbound left turns; change signal phrasing to protected only
- Install a dedicated eastbound left-turn lane, so the eastbound approach consists of one right-turn lane, one through lane, and one left-turn lane, and add a right-turn overlap phase

Intersection Improvements – Dresden Drive at Apple Valley Road

- Install a second left-turn-only lane for northbound left turns; change signal phasing to protected only
- Shift eastbound approach lanes south to accommodate additional receiving lane on Dresden Drive west of Apple Valley Road
- Provide a protected left-turn signal phase and change signal phasing to protected-only for eastbound left-turns (to address limited sight distance caused by vehicles in the opposing left-turn lane)
- Add a protected left-turn signal phase for westbound left turns
- Lengthen the southbound right-turn lane and install a dedicated southbound left-turn lane, so the southbound approach consists of one right-turn lane, one through lane, and one left-turn lane
- Add flashing yellow arrows (FYAs) for westbound and southbound permissive left-turn phases
- Add a right-turn overlap signal phase for eastbound and southbound right turns

Intersection Improvements – Dresden Dr at Ellijay Drive and Caldwell Road

- Install a crosswalk across the east leg of the Ellijay Drive intersection, with pedestrian ramps and signals for crossing in both directions

- Install new sidewalk along the north side of Dresden Drive, from west of Caldwell Road to the edge of the proposed crosswalk on the east leg of the Ellijay Drive intersection

Intersection Improvements – Dresden Dr at Clairmont Rd

- Extend the eastbound right-turn-only lane
- Add FYAs for all permissive left-turn phases
- Convert the outside westbound through/right-turn lane to a dedicated right-turn-only lane, with a single through-lane and a single receiving lane on Dresden Drive west of Clairmont Road
- Prohibit right-turns on red and add right-turn overlap signal phases for eastbound and westbound right-turns

Intersection Turn Restrictions & Roadway Access Restrictions

- Install a diagonal diverter at the intersection of Ashford Road and North Thompson Road to restrict northbound and southbound through and right-turn movements through the intersection
- Install a diagonal diverter at the intersection of Caldwell Road and Cheshire Way to restrict northbound and southbound through and left-turn movements through the intersection
- Close access on Redding Way at the location of the bridge/culvert between Redding Road and Winding Lane.
- As an alternative to the three (3) previous restrictions listed, install a single diagonal diverter between the intersections of Redding Road and Caldwell Road to restrict northbound and southbound through and right-turn movements at the intersection
- As an alternative to a diagonal diverter at the intersection of Ashford Road and North Thompson Road, close access on Ashford Road just north of North Thompson Road (where the power lines cross the roadway).
- Install a diagonal diverter between the intersections of Ellijay Road and Cartecay Drive and Coosawattee Drive and Cartecay Drive to restrict movements between Coosawattee Drive and Ellijay Drive as well as northbound and southbound right turn through the intersections
- Close the segment of Fernwood Cir between Sylvan Cir and Fernwood Cir.

Other Traffic Calming Measures

- Install speed tables along Briarwood Hills Drive
- As an alternative to the proposed diagonal diverters and road closures previously listed, install a series of mini roundabouts at the following intersections:
 - Redding Road at Caldwell Road
 - Ashford Road at North Thompson Road
 - Redding Way at Winding Lane
 - Caldwell Road at Cheshire Way
 - Ellijay Road and Coosawattee Drive at Cartecay Drive
 - Sylvan Circle at Fernwood Circle

FUTURE YEAR (2047) CAPACITY ANALYSIS

The results of the intersection LOS and delay analysis for the Future Year (2047) conditions under the medium-growth scenario with the proposed recommendations are summarized in **Table 15**. Traffic volumes were re-routed based on the recommended closures listed in the previous section. Existing signal phasings were retained, with only minor changes to phase splits to accommodate changes in volume. As shown, three (3) intersections are expected to operate at LOS D or better in the AM and PM peak hours. All five (5) intersections operate at LOS D or better in the AM peak hour, and three (3) intersections operated at LOS D or better in the PM peak hour under this scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak under, but with a significant reduction in delay when compared to the analysis without recommendations. The Dresden Drive at Clairmont Road intersection is also expected to operate at LOS E during the PM peak. Detailed HCM analyses, including capacity analysis worksheets that summarize queueing and detailed delay and LOS data by approach and movement, can be found in **Appendix D**.

TABLE 15: FUTURE YEAR (2047) INTERSECTION CAPACITY ANALYSIS (WITH RECOMMENDATIONS)

ID	Intersection Name	Medium-Growth Scenario	
		AM LOS Delay (s)	PM LOS Delay (s)
1	Dresden Dr @ Peachtree Rd	D 42.0	D 52.9
2	Dresden Dr @ Apple Valley Rd	D 39.8	E 68.5
3	Dresden Dr @ Ellijay Dr	A 5.9	B 10.9
4	Dresden Dr @ Caldwell Rd	B 9.4	B 8.7
5	Dresden Dr @ Clairmont Rd	D 44.2	E 57.1

Conclusions

The following key conclusions were developed from the traffic analysis for the study intersections:

- Under the Existing Year (2022) conditions, four (4) of the five (5) critical study intersections operate at LOS D or better in the AM and PM peak hours, and one intersection (Peachtree Road at Dresden Drive and Brookhaven Drive) operates at LOS E or worse during both the AM and PM peaks.
- The anticipated increase in traffic based on the Future Year traffic volumes projected for the low-, medium-, and high-growth scenarios for the 5-year, 15-year, and 25-year horizons at each of the 21 study intersections and 22 roadway segments was reviewed. The largest percent increase in intersection traffic is anticipated at the Dresden Drive at Apple Valley Road intersection under each growth scenario. The largest percent increase in roadway segment traffic is anticipated on Apple Valley Road under each growth scenario.
- Based on each growth scenario, under the Future Year (2027) conditions, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) for each growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS E or worse during both the AM and PM peaks for each growth scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak under each growth scenario.
- Based on each growth scenario, under the Future Year (2037) conditions, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) for each growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS F during both the AM and PM peaks,

and the Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak for the low-growth scenario and falls to LOS F under the medium- and high-growth scenarios.

- Based on each growth scenario, under the Future Year (2047) conditions, three (3) intersections operate at LOS D or better in the AM and PM peak hours (one less than in the existing year) under the low- and medium-growth scenarios. Two (2) intersections operate at LOS D or better in the AM and PM peak hours (two less than in the existing year) under the high-growth scenario. The Peachtree Road at Dresden Drive and Brookhaven Drive intersection operates at LOS F during both the AM and PM peaks for each growth scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS F during the PM peak under each growth scenario and falls to LOS E during the AM peak only under the high-growth scenario. The Dresden Drive at Clairmont Road intersection operates at LOS E during the PM peak only under the high-growth scenario.
- Recommendations were developed based in the Future Year (2047) conditions under the medium-growth scenario. Based on the Future Year (2047) conditions with the proposed recommendations for this scenario, three (3) intersections are expected to operate at LOS D or better in the AM and PM peak hours. All five (5) intersections operate at LOS D or better in the AM peak hour, and three (3) intersections operated at LOS D or better in the PM peak hour under this scenario. The Dresden Drive at Apple Valley Road intersection operates at LOS E during the PM peak under, but with a significant reduction in delay when compared to the analysis without recommendations. The Dresden Drive at Clairmont Road intersection is also expected to operate at LOS E during the PM peak.