TUCKER SUMMIT COMMUNITY IMPROVEMENT DISTRICT FREIGHT CLUSTER PLAN

DRAFT Traffic Study Report

September 16th 2020

PREPARED FOR:

TUCKER SUMMIT
Community Improvement District
CONNECTIVITY, CONVENIENCE & ACCESSIBILITY

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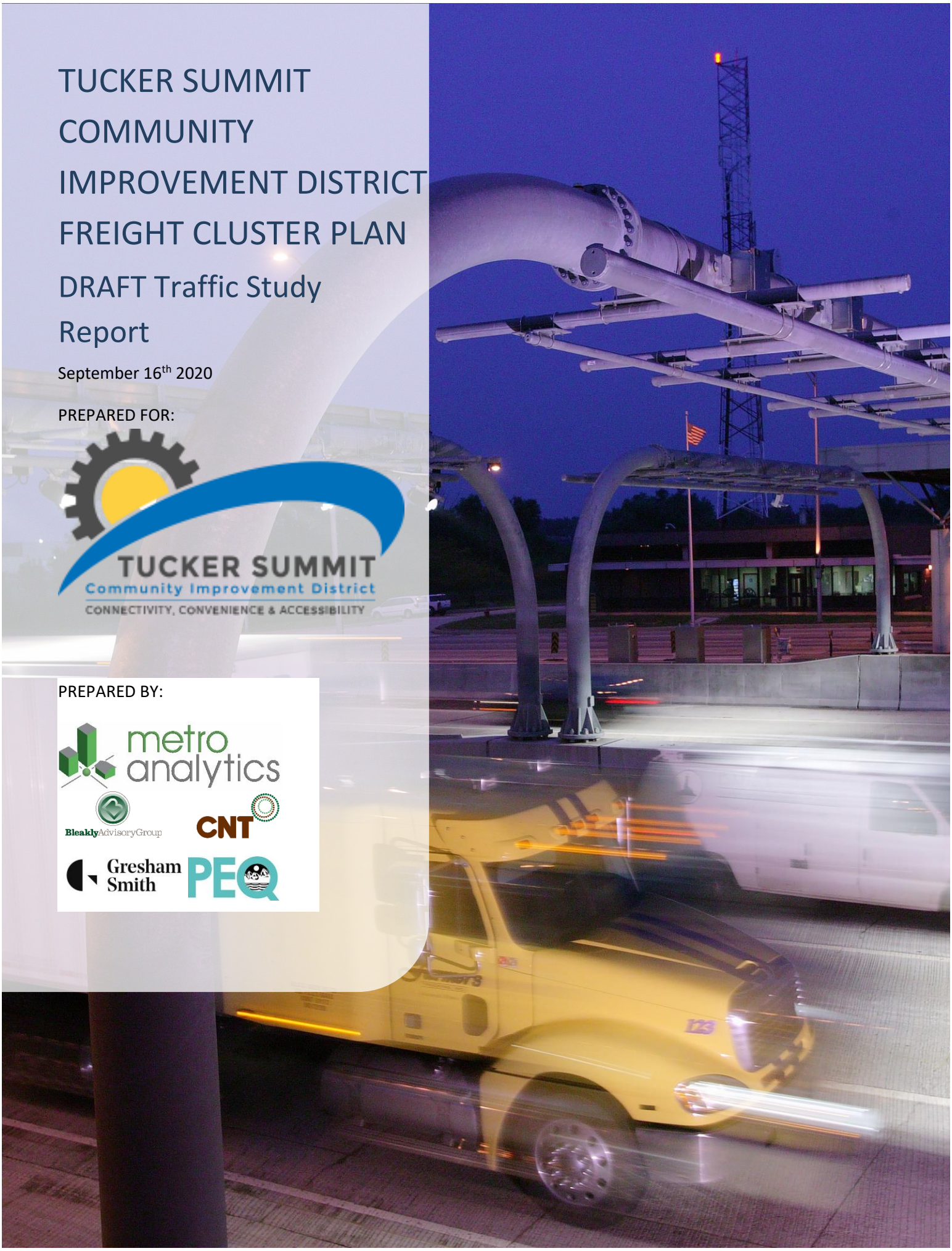

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1 Introduction and Overview

As part of this freight cluster plan, a detailed traffic study was conducted at several key intersections within the study area. The traffic study included capacity, operational and safety analyses of these intersections to identify deficiencies and recommend potential improvement projects to mitigate the deficiencies. The following sections of this technical memorandum detail the selection of the intersections, the traffic analysis methodology and results, and description of proposed improvements.

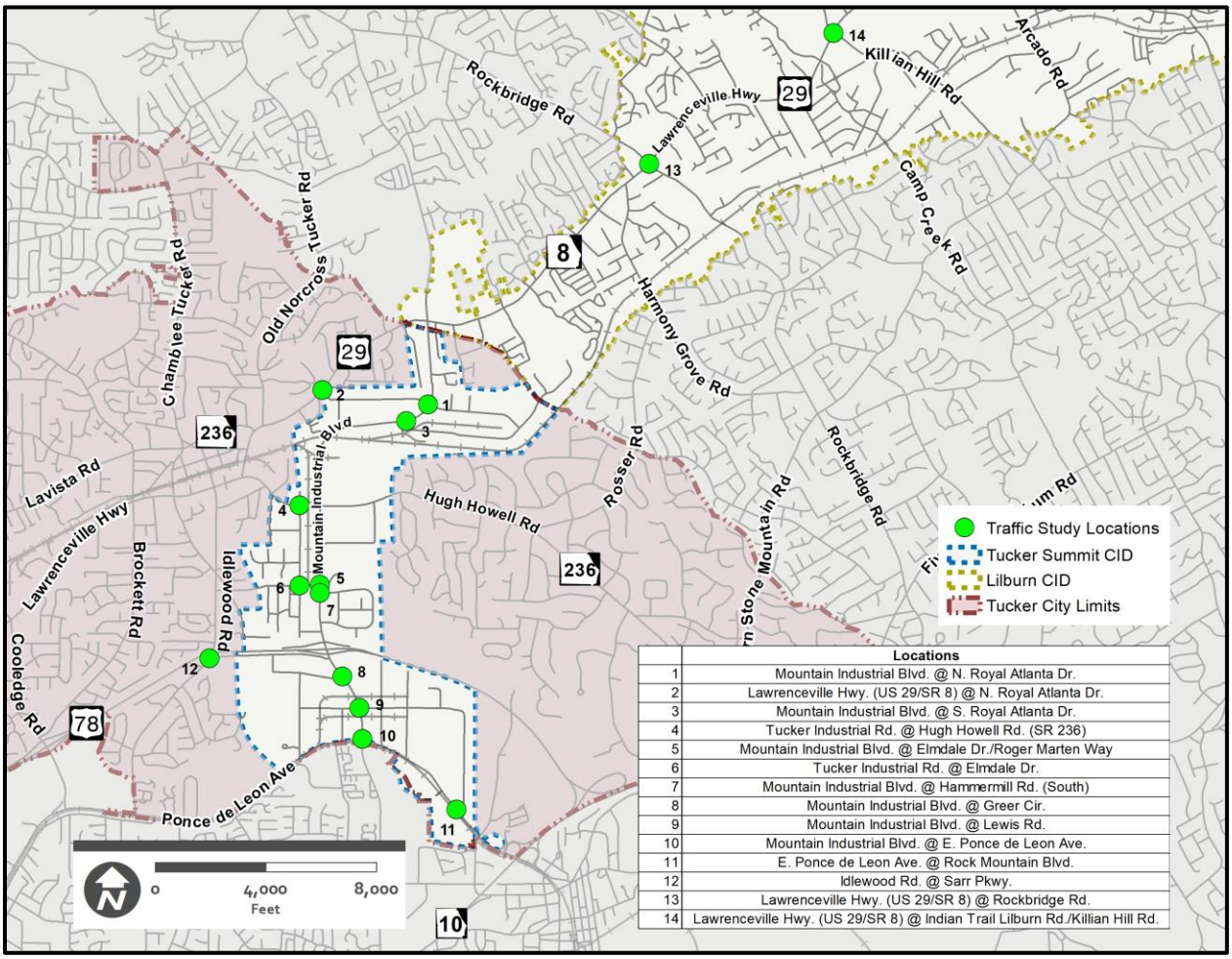
2 Selection of Intersections for Traffic Study

Fourteen intersections were selected based on input from this freight cluster plan's project management team. These fourteen intersections are as follows:

1. Mountain Industrial Blvd. @ N. Royal Atlanta Dr.
2. Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.
3. Mountain Industrial Blvd. @ S. Royal Atlanta Dr.
4. Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)
5. Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way
6. Tucker Industrial Rd. @ Elmdale Dr.
7. Mountain Industrial Blvd. @ Hammermill Rd. (South)
8. Mountain Industrial Blvd. @ Greer Cir.
9. Mountain Industrial Blvd. @ Lewis Rd.
10. Mountain Industrial Blvd. @ E. Ponce de Leon Ave.
11. E. Ponce de Leon Ave. @ Rock Mountain Blvd.
12. Idlewood Rd. @ Sarr Pkwy.
13. Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.
14. Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.

The fourteen intersections selected for the traffic study are shown in Figure 1. Intersections one through eleven are within the Tucker Summit Community Improvement District (TSCID) boundary. The Idlewood Rd. @ Sarr Pkwy. intersection (#12) is just west of the TSCID boundary but within the City of Tucker. The Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd. intersection (#13) and the Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd. intersection (#14) are within the Lilburn CID (LCID) boundary.

Figure 1: Traffic Study Locations



	Locations
1	Mountain Industrial Blvd. @ N. Royal Atlanta Dr.
2	Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.
3	Mountain Industrial Blvd. @ S. Royal Atlanta Dr.
4	Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)
5	Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way
6	Tucker Industrial Rd. @ Elmdale Dr.
7	Mountain Industrial Blvd. @ Hammermill Rd. (South)
8	Mountain Industrial Blvd. @ Greer Cir.
9	Mountain Industrial Blvd. @ Lewis Rd.
10	Mountain Industrial Blvd. @ E. Ponce de Leon Ave.
11	E. Ponce de Leon Ave. @ Rock Mountain Blvd.
12	Idlewood Rd. @ Sarr Pkwy.
13	Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.
14	Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.

3 Existing Conditions

3.1 Traffic Volumes

Due to the ongoing COVID-19 pandemic and consequently the overall reduced levels of traffic volumes on the study area roadways, AM and PM peak period turning movement counts were not able to be collected at this time at the fourteen traffic study intersections. Therefore, to proceed with the traffic study portion of this freight cluster plan, several recently completed traffic studies were reviewed to determine if traffic counts have been collected at these fourteen intersections. The following studies were reviewed as part of this effort:

- Jimmy Carter Boulevard/Mountain Industrial Boulevard Preliminary Timing Report (2016)
- Traffic Engineering Study for Mountain Industrial Blvd. at US 78 (2019)
- RZ-19-0006 Traffic Impact Study for Burch Rezoning (2019)
- DRI 2576 – Township Tucker (2016)
- Traffic Engineering Study for Hugh Howell Rd. at Mountain Industrial Blvd. (2016)
- Traffic Engineering Study for Mountain Industrial Blvd./Jimmy Carter Blvd at Lawrenceville Highway Intersection Analyses (2016)

As shown in Table 1, turning movement counts were available from the above recently completed traffic studies at ten out of fourteen traffic study intersections. These raw counts are included in Appendix A.

Table 1. Available Counts at Traffic Study Intersections

`	Traffic Count Year
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	2016
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	Not Available
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	2016
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	2019
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	2016
Tucker Industrial Rd. @ Elmdale Dr.	Not Available
Mountain Industrial Blvd. @ Hammermill Rd. (South)	2019
Mountain Industrial Blvd. @ Greer Cir.	2019
Mountain Industrial Blvd. @ Lewis Rd.	2016
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	2016
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	Not Available
Idlewood Rd. @ Sarr Pkwy.	Not Available
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	2017
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	2017

For the four traffic study intersections with no available data, traffic counts were collected on Tuesday, August 25th, 2020 from 7 AM – 9 AM and 4 PM – 6 PM by National Data & Surveying Services. These are also included in Appendix A. Because of the ongoing pandemic, these raw counts were normalized using adjustment factors obtained from GDOT's Automated Traffic Signal Performance Measures (ATSPM) website. The ATSPM website archives traffic volumes at signalized intersections based on vehicle detector

data. Traffic volumes obtained from the ATSPM website for an average normal day (average of Tuesday, February 4th, 2020; Wednesday, February 5th, 2020; and Thursday, February 6th, 2020) and for Tuesday, August 25th, 2020 (day of traffic data collection at the four traffic study intersections) were compared to calculate the adjustment factors that were applied to the raw turning movement counts collected to generate the normalized 2020 traffic counts. For three signalized intersections (Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr., E. Ponce de Leon Ave. @ Rock Mountain Blvd., and Idlewood Rd. @ Sarr Pkwy.) the traffic volume data was readily available from the ATSPM website. For the unsignalized Tucker Industrial Rd. @ Elmdale Dr. intersection, the ATSPM data from the adjacent signalized intersections (Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236), and Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way) were used to calculate the adjustment factors.

As shown in Table 1, where counts are available, five out of the eight counts were collected in year 2016, two were collected in 2017, and the remaining three were collected in year 2019. To establish a common baseline for analysis, these counts were extrapolated to a common "current" year to conduct the existing year analysis. The year 2020 was chosen to be this common "current" year to conduct the existing year analysis.

The extrapolation of the 2016 and the 2019 counts were based on the recently observed historical growth rates in the study area. The historical growth rates (recent five-year) were calculated based on historical traffic count data obtained from GDOT's Traffic Analysis and Data Application (TADA) at multiple count stations in the vicinity of the study intersections. Several TADA locations were selected in this analysis to review growth rate trends in the vicinity of the study intersections over a wide area. It should be noted that even though some locations indicate recent low negative growth or high positive growth, a rate closer to the average of these growth rates would be representative of the recent growth in traffic at the study intersections. The TADA locations where the low negative growth was calculated were reviewed in detail to understand the negative trend. These locations showed a plateauing level of recent historical traffic with minimal annual fluctuations, with no apparent reason for the recent negative growth.

Table 2. 5-Yr Historical Growth Rates

GDOT TADA Count Station ID	Location Description	5-Yr Growth Rate
TC# 089-3025	Lawrenceville Highway (US 29) North of Fellowship Road	0.7%
TC# 089-3027	Lawrenceville Highway (US 29) North of Lynburn Drive	2.3%
TC# 089-3029	Lawrenceville Highway (US 29) North of Oswood Drive	-0.2%
TC# 089-3274	Hugh Howell Road (GA 236) West of Tucker Industrial Road	0.9%
TC# 089-3536	Mountain Industrial Boulevard South of Hugh Howell Road	0.1%
TC# 089-3538	Mountain Industrial Boulevard West of S Royal Atlanta Drive	-0.7%
TC# 135-6001	Lawrenceville Highway (US 29) North of Linda Drive	1.6%
TC# 135-7374	Jimmy Carter Boulevard South of Lawrenceville Highway	2.2%
TC# 135-6003	Lawrenceville Highway (US 29) East of Rockbridge Road	0.3%
TC# 135-6005	Lawrenceville Highway (US 29) West of Beaver Ruin Road	2.9%

Based on the recent five-year historical growth rates at multiple count stations in the vicinity of the study intersections, a 1.0% growth rate appears to be representative of the recent growth in traffic at the study intersections and is proposed to be used to extrapolate the 2016 and 2019 counts for the 2020 existing year analysis. The existing year (2020) AM and PM peak hour traffic volumes based on the available 2016 and 2019 counts and the proposed extrapolation methodology and based on the newly obtained traffic counts normalized to account for the ongoing pandemic using GDOT's ATSPM data are shown in Figures 2, 3, 4, and 5.

Figure 2: Existing Year (2020) AM and PM Peak Hour Traffic Volumes

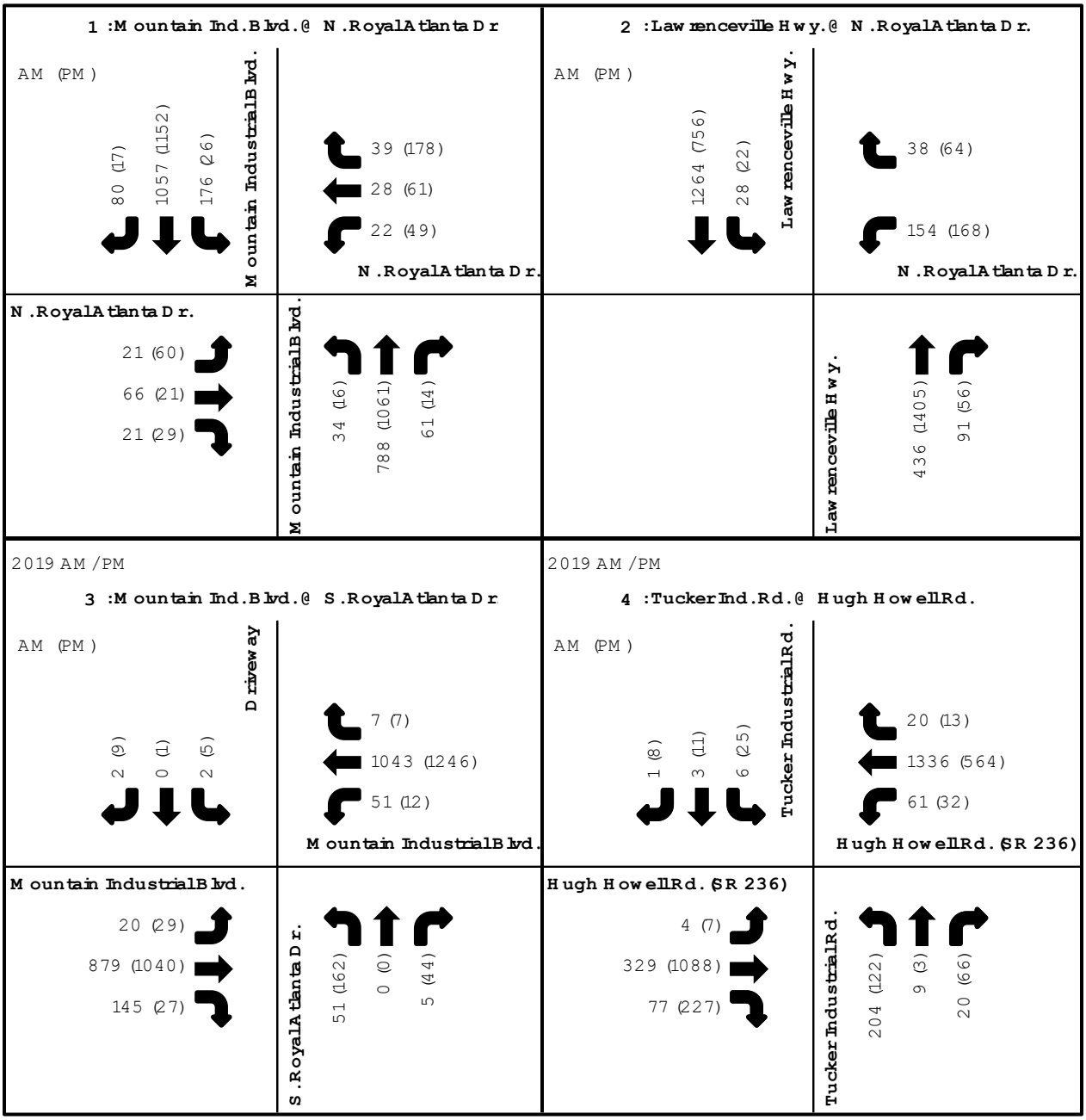


Figure 3: Existing Year (2020) AM and PM Peak Hour Traffic Volumes (Continued)

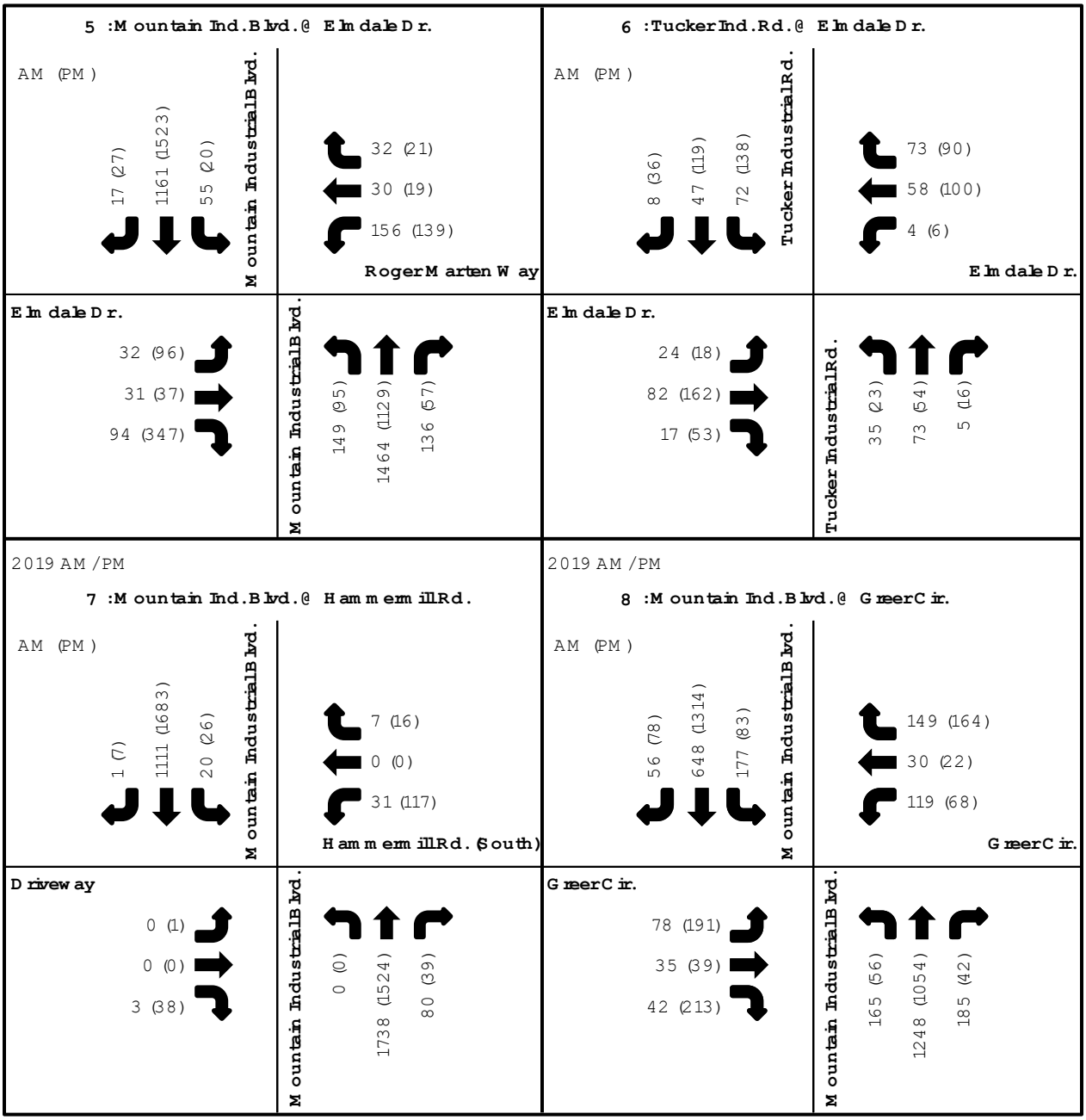


Figure 4: Existing Year (2020) AM and PM Peak Hour Traffic Volumes (Continued)

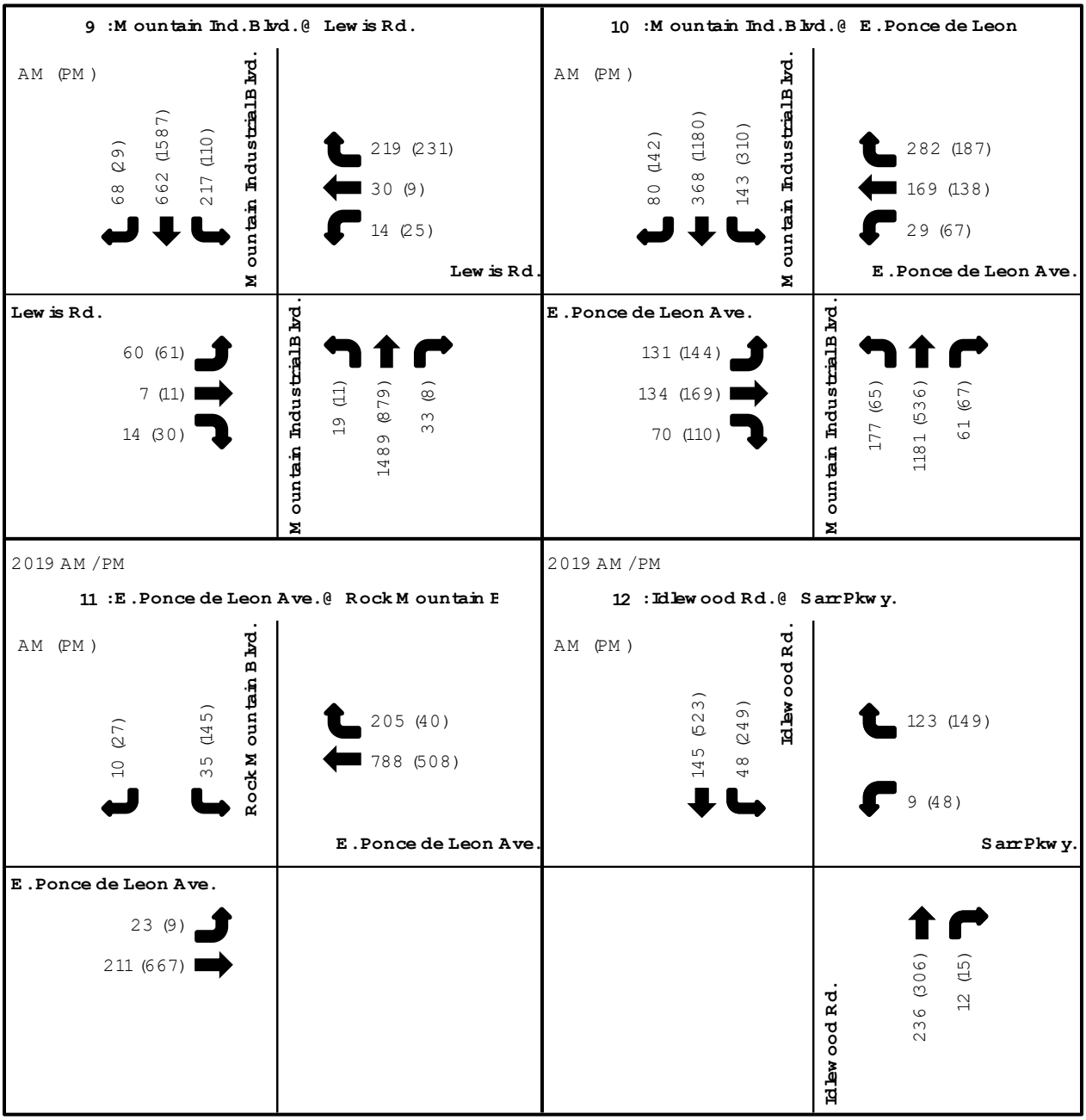
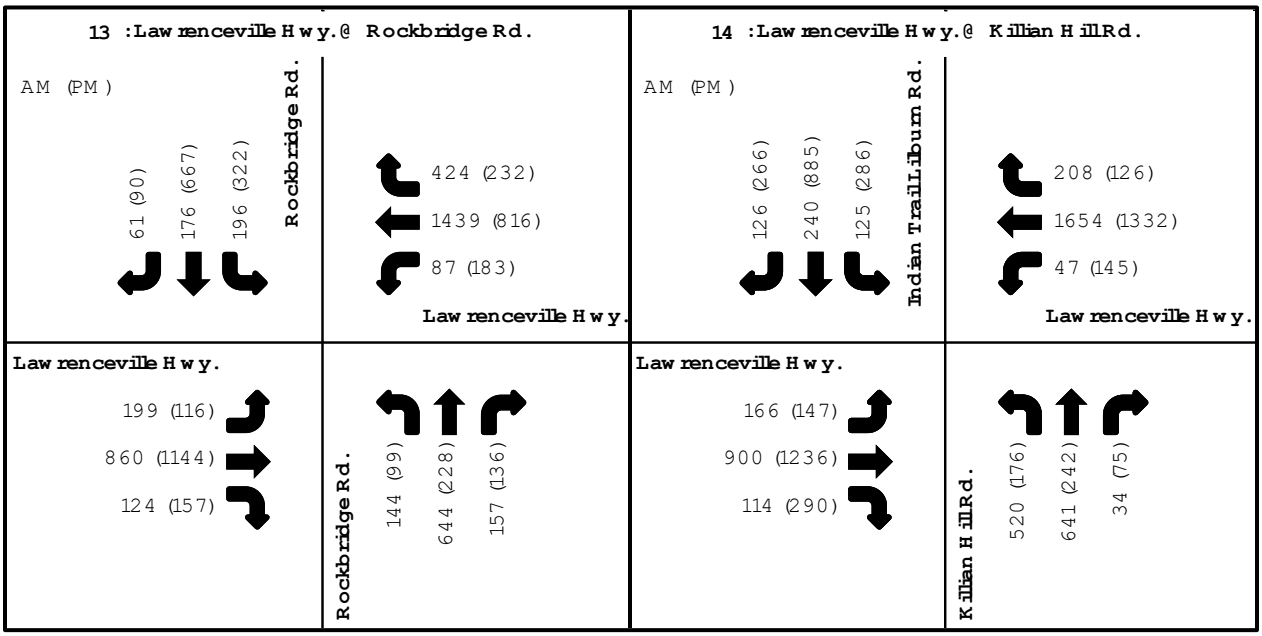


Figure 5: Existing Year (2020) AM and PM Peak Hour Traffic Volumes (Continued)



3.2 Crash History

Crash data at the fourteen traffic study intersections was obtained from the Georgia Electronic Accident Reporting System (GEARS) for the five-year period between January 1, 2014 and December 31, 2018. A summary of this reported crash history is shown in Table 3. Detailed analysis of the crash data at the study intersections is included in Appendix B.

Table 3. Summary of Crash History at Study Intersections

Study Intersection	Av. Crashes per Year	% injury Crashes	Fatal Crashes	Frequent Crash Type
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	10	15%	0	48% rear-end 27% angle
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	7	39%	0	58% rear-end 14% angle
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	11	11%	0	49% rear end 20% angle
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	6	23%	0	57% rear-end 33% angle
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	22	20%	0	62% rear-end 23% angle
Tucker Industrial Rd. @ Elmdale Dr.	4	22%	0	61% angle 28% rear-end
Mountain Industrial Blvd. @ Hammermill Rd. (South)	5	31%	0	54% rear-end 35% angle
Mountain Industrial Blvd. @ Greer Cir.	25	29%	0	34% rear-end 23% angle
Mountain Industrial Blvd. @ Lewis Rd.	13	22%	0	48% rear-end 30% angle
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	30	34%	0	46% rear-end 38% angle
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	4	17%	0	67% rear-end 17% single vehicle
Idlewood Rd. @ Sarr Pkwy.	7	21%	0	56% rear-end 18% angle
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	39	34%	0	49% rear-end 38% angle
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	36	25%	0	61% rear-end 22% angle

The crash data was analyzed in detail by examining crash attributes to identify patterns and contributing factors. The factors considered in this analysis included:

- Time of day and season of the year – to identify diurnal factors and sun-glare related crashes

- Manner of collision – to identify crash patterns related to intersection geometry or traffic control
- Injuries and fatalities – to identify severity of crashes
- Lighting – to identify whether lack of lighting was a contributing factor to the crashes
- Pavement condition – to identify whether wet or slick pavement was a contributing factor to the crashes
- Location of the crash with respect to the roadway
- Direction of vehicles involved – to identify crash patterns related to intersection geometry or traffic control
- Maneuvers of vehicles involved – to identify crash patterns related to intersection geometry or traffic control
- Involvement of pedestrians, bikes, or transit vehicles – to identify the frequency of crashes for those who choose not to use a personal vehicle or who are unable to, and are more vulnerable to injuries and fatalities

A brief summary of this exercise is included in the following sections.

3.2.1 Mountain Industrial Blvd. @ N. Royal Atlanta Dr.

An average of ten crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 48% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in both the northbound and southbound directions, most likely due to the horizontal curvature along the roadway resulting in restricted sight distance. There were also four crashes in the five-year period associated with the northbound Mountain Industrial Blvd. left-turning vehicles colliding with the southbound through-vehicles on Mountain Industrial Blvd.

3.2.2 Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.

An average of seven crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 58% of total crashes. Most of the rear-end crashes occurred along Lawrenceville Hwy. in the southbound direction, most likely due to the conflicts involving vehicles entering and exiting driveways near the intersection.

3.2.3 Mountain Industrial Blvd. @ S. Royal Atlanta Dr.

An average of 11 crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 66% of total crashes. Mountain Industrial Blvd. runs east-west at this intersection. Most of the rear end crashes occurred along Mountain Industrial Blvd. in both eastbound and westbound directions, most likely due to the horizontal curvature along the westbound approach resulting in restricted sight distance and the lack of a right-turn lane along the eastbound approach of Mountain Industrial Blvd. Operating speeds of turning vehicles and through vehicles are often different and when these movements with a speed differential are not separated by the provision of turn lanes could lead to rear-end crashes.

3.2.4 Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)

An average of six crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 57% of total crashes. Most of the rear-end crashes occurred along Hugh Howell Rd. in the eastbound direction, attributable to traffic congestion, lack of a right-turn lane and several closely spaced commercial driveways along the eastbound approach of Hugh Howell Rd. (SR 236). In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes. Operating speeds of turning vehicles and through vehicles are often different and when these movements with a speed differential are not separated by the provision of turn lanes could lead to rear-end crashes.

3.2.5 Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way

An average of 22 crashes per year were reported at this intersection with rear-end crashes being the most frequent, accounting for 62% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in both the northbound and southbound directions, attributable to traffic congestion. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes.

3.2.6 Tucker Industrial Rd. @ Elmdale Dr.

An average of four crashes per year were reported at this intersection with angle crashes being the most frequent, accounting for 61% of total crashes. Most of the angle crashes are attributable to vehicles not yielding right-of-way at this all-way stop controlled intersection.

3.2.7 Mountain Industrial Blvd. @ Hammermill Rd. (South)

An average of five crashes per year were reported at this intersection with rear-end crashes being the most frequent, accounting for 54% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in the northbound direction, attributable to traffic congestion and the lack of a right-turn lane along the northbound approach of Mountain Industrial Blvd. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes. Operating speeds of turning vehicles and through vehicles are often different and when these movements with a speed differential are not separated by the provision of turn lanes could lead to rear-end crashes.

3.2.8 Mountain Industrial Blvd. @ Greer Cir.

An average of 25 crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 34% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in both the northbound and southbound directions, attributable to traffic congestion. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes. There were also five crashes in the five-year period associated with the northbound Mountain Industrial Blvd. left-turning vehicles colliding with the

southbound through-vehicles on Mountain Industrial Blvd. All five crashes were the result of vehicles failing to yield to oncoming traffic; intersection geometry does not appear to be a contributing factor. There was also one reported crash involving a pedestrian, where a pedestrian crossing the south leg of the intersection (Mountain Industrial Blvd.) at the crosswalk was hit by a motorist turning left from Greer Circle.

3.2.9 Mountain Industrial Blvd. @ Lewis Rd.

An average of 13 crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 48% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in both the northbound and southbound directions, most likely due to traffic congestion and lack of right-turn lanes. About a third of the rear-end crashes were reported on the westbound Lewis Rd. approach. These may be due to the lack of turn lanes at the intersection approach and heavy westbound right-turn volume from Lewis Rd. to northbound Mountain Industrial Blvd. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes. Operating speeds of turning vehicles and through vehicles are often different and when these movements with a speed differential are not separated by the provision of turn lanes could lead to rear-end crashes. There was also one reported crash involving a bicyclist, where a bicyclist crossing the south leg of the intersection (Mountain Industrial Blvd.) at the crosswalk was hit by a motorist turning left from Lewis Road.

3.2.10 Mountain Industrial Blvd. @ E. Ponce de Leon Ave.

An average of 30 crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 46% of total crashes. Most of the rear-end crashes occurred along Mountain Industrial Blvd. in the northbound direction, attributable to traffic congestion. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes. There were three crashes involving a pedestrian. Two of these crashes occurred at the crosswalk across the north leg of the intersection (Mountain Industrial Blvd.); in each crash, a pedestrian was hit by a motorist turning left from E. Ponce de Leon Ave. The third occurred at the sidewalk along the east side of Mountain Industrial Blvd. north of the intersection where a motorist exiting the Texaco driveway hit a pedestrian walking southbound along Mountain Industrial Boulevard.

3.2.11 E. Ponce de Leon Ave. @ Rock Mountain Blvd.

An average of four crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 67% of total crashes. The crash history does not indicate a significant safety issue at this intersection.

3.2.12 Idlewood Rd. @ Sarr Pkwy.

An average of seven crashes per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 56% of total crashes. Most of the rear-end crashes occurred on

Idlewood Rd. in the southbound direction, which may be due to restricted sight distance at the intersection approach, or due to the lack of a left-turn lane.

3.2.13 Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.

An average of 39 crash per year were reported at this intersection with rear-end type crashes being the most frequent, accounting for 49% of total crashes. Angle crashes accounted for approximately 39% of total crashes. Left turning vehicles and those especially along Lawrenceville Hwy. in the eastbound direction contributed to a large portion of these angle type crashes. This maneuver is a protected plus permissive operation. The crashes at this intersection exhibited high severity with almost a third of the crashes resulting in an injury.

3.2.14 Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.

An average of 36 crashes per year were reported at this intersection with almost 61% of the crashes being rear-end type crashes evenly distributed along all legs of the intersection and attributable to traffic congestion. In congested conditions, traffic moves in a stop and go fashion and is often operating under short headways increasing the chances of rear-end crashes.

3.3 Operations Review

On April 24, 2020, an operations review was conducted to observe traffic operations at the fourteen intersections that are part of this traffic study. Observations were made throughout the course of the day with a particular emphasis on intersection operations including truck turning movements, and condition of sidewalks, curb radii, and other intersection elements.

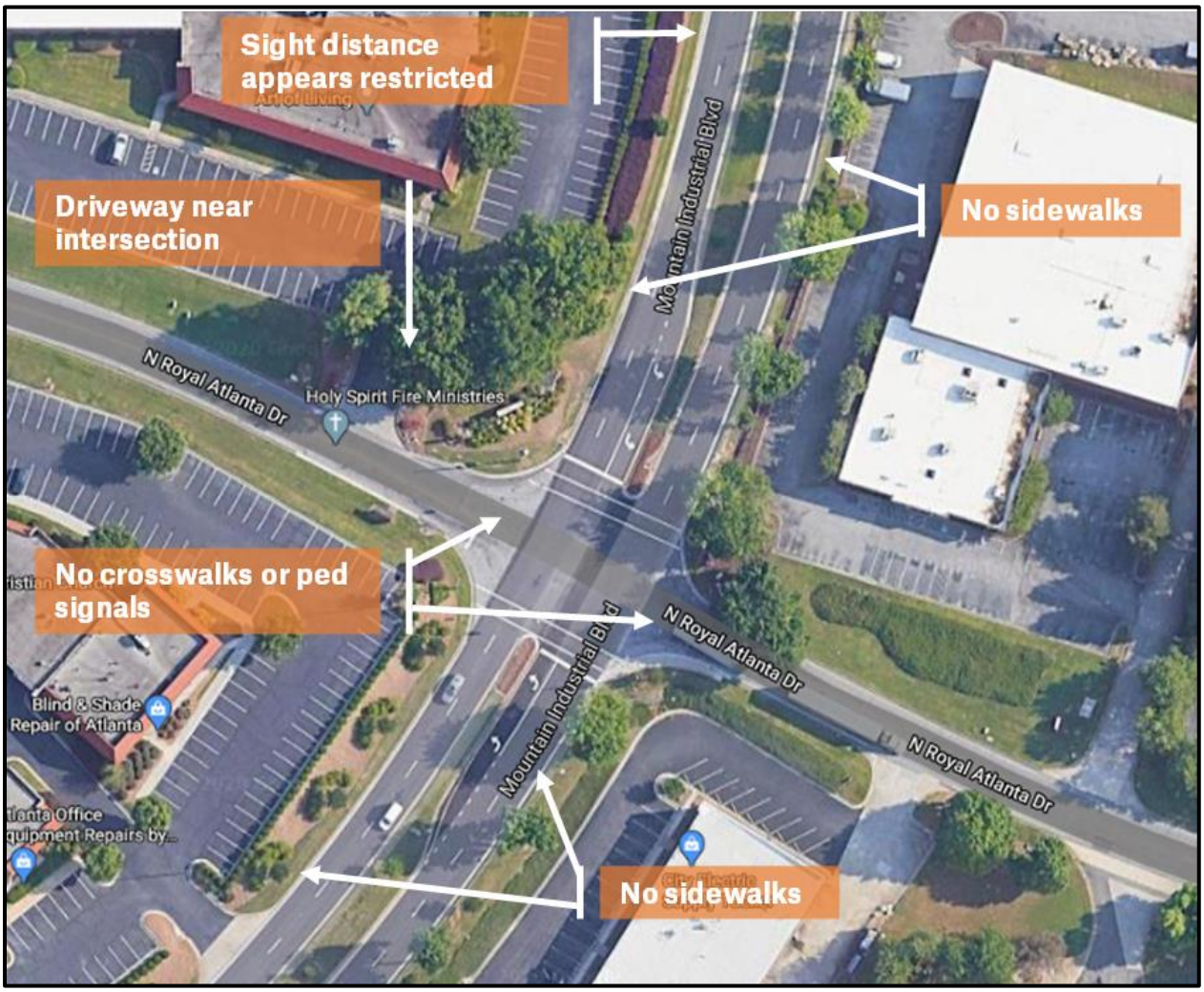
3.3.1 Mountain Industrial Blvd. @ N. Royal Atlanta Dr.

Figure 6: Mountain Industrial Blvd. at N. Royal Atlanta Dr. Looking South

Figure 7: Pedestrian Crossing West Leg of Mountain Industrial Blvd. at N. Royal Atlanta Dr.

- There is a horizontal curve along Mountain Industrial Blvd. at the intersection. Sight distance appears to be restricted for the eastbound right-turning traffic from N. Royal Atlanta Dr. to southbound Mountain Industrial Blvd.
- Crosswalks and pedestrian signals are present across the north and south legs of the intersection. There are no pedestrian accommodations to cross N. Royal Atlanta Dr. on either side of the intersection. The intersection is also not equipped with curb ramps.
- There are no sidewalks along Mountain Industrial Blvd. or along N. Royal Atlanta Dr. at the intersection with the exception of a short section on the southwest corner of the intersection.
- There are existing MARTA bus routes along both Mountain Industrial Blvd. and N. Royal Atlanta Dr. at the intersection. There is a bus shelter along N. Royal Atlanta Dr. just west of the intersection, but there are no sidewalks connecting to it.
- The intersection has faded pavement markings and potholes on the N. Royal Atlanta Dr. legs.
- There is a driveway very close to the intersection along N. Royal Atlanta Dr. west of the intersection.

Figure 8: Intersection Operations Review on an Aerial View

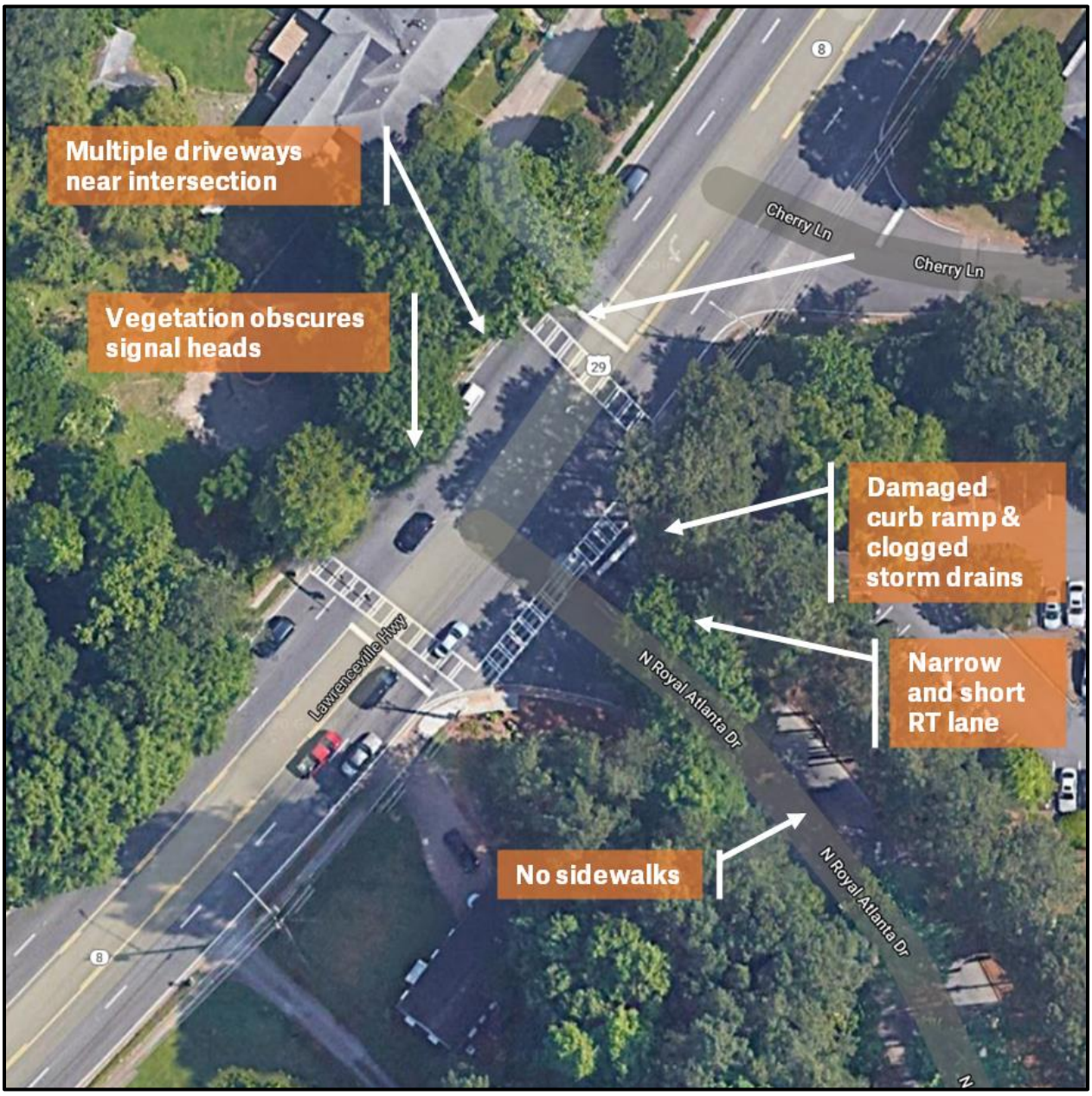


3.3.2 Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.

Figure 9: Lawrenceville Hwy. (US 29/SR 8) at N. Royal Atlanta Dr. Looking South

- Overgrown vegetation along Lawrenceville Hwy. (US 29/SR 8) to the immediate west of the intersection obscures signal heads and pedestrian crossing signals.
- The westbound N. Royal Atlanta Dr. approach has a short and narrow dedicated right-turn lane. The right-turn lane striping is barely visible.
- There are several residential driveways in close proximity to the intersection.
- The curb ramp on the northeast corner is in poor condition due to encroachment by westbound right-turning vehicles from N. Royal Atlanta Dr. to northbound Lawrenceville Hwy. (US 29/SR 8).
- Sidewalks are present along Lawrenceville Hwy. (US 29/SR 8) on both sides. There are no sidewalks along N. Royal Atlanta Dr.
- There are existing MARTA bus routes along the south leg of Lawrenceville Highway (US 29/SR 8) and along N. Royal Atlanta Dr. at the intersection
- Drainage grates at the northeast corner of the intersection are clogged, and storm drains along the west side of Lawrenceville Hwy. (US 29/SR 8) have overgrown vegetation.

Figure 10: Intersection Operations Review on an Aerial View



3.3.3 Mountain Industrial Blvd. @ S. Royal Atlanta Dr.

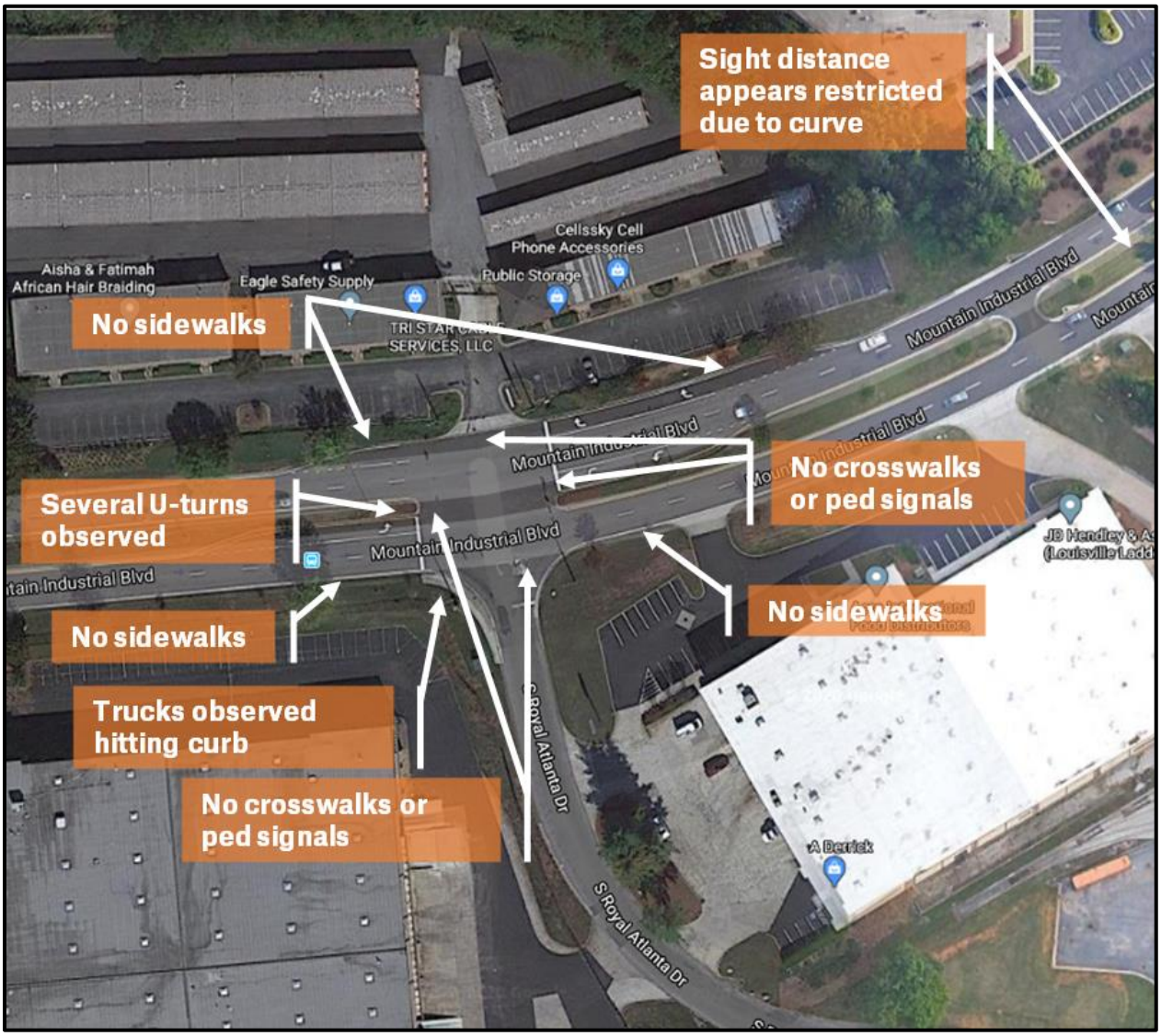
Figure 11: Mountain Industrial Blvd. at S. Royal Atlanta Dr. Looking towards S. Royal Atlanta Dr.

Figure 12: Truck Turning Right onto S. Royal Atlanta Dr.

- Mountain Industrial Blvd. runs east-west at this intersection. The north leg of this intersection is a steep uphill driveway to a public storage facility. There is a horizontal curve along the east leg of Mountain Industrial Blvd. approaching the intersection where the sight distance appears to be restricted for vehicles exiting the public storage driveway. There is a supplemental signal head at the intersection for vehicles along Mountain Industrial Blvd. approaching the intersection from the east.
- There are no pedestrian accommodations at this intersection. The short section of concrete that exists at the southwest quadrant of the intersection does not serve the pedestrian community but instead exists to eliminate the "rutting of the shoulders" from trucks tracking over the curb and the roadway shoulder due to inadequate turning radii.

- Eastbound right-turning trucks from Mountain Industrial Blvd. to southbound S. Royal Atlanta Dr. were observed tracking over the southwest curb and also encroaching onto the northbound approach lane on S. Royal Atlanta Dr. Similarly, northbound right turning trucks from S. Royal Atlanta Dr. to eastbound Mountain Industrial Blvd. were also observed tracking over the curb on the southeast quadrant. These intersection curb radii appear to be designed based on older design standards and design vehicles with shorter wheel bases and doesn't appear to be able to accommodate the newer trucks on the roadways currently with longer wheel bases.
- Several eastbound vehicles on Mountain Industrial Blvd. were observed making U-turns at this intersection to proceed westbound on Mountain Industrial Blvd.
- There are existing MARTA bus routes along both Mountain Industrial Blvd. and S. Royal Atlanta Dr. at the intersection.

Figure 13: Intersection Operations Review on an Aerial View



3.3.4 Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)

Figure 14: Truck Turning Right onto Hugh Howell Rd. from Northbound Tucker Industrial Rd.

Figure 15: Truck Preparing To Turn Left onto Hugh Howell Rd. from NB Tucker Industrial Rd.

- Northbound trucks from Tucker Industrial Rd. turning right onto eastbound Hugh Howell Rd. (SR 236) frequently encroach onto the westbound lanes on Hugh Howell Rd. (SR 236).
- Curb ramps and crosswalks are present on all four corners, but sidewalks are present only along the southeast quadrant of the intersection.
- There is an existing MARTA bus route along Hugh Howell Rd. (SR 236) at this intersection.
- There are several closely spaced driveways along the south side of Hugh Howell Rd. (SR 236) near the intersection.

Figure 16: Intersection Operations Review on an Aerial View

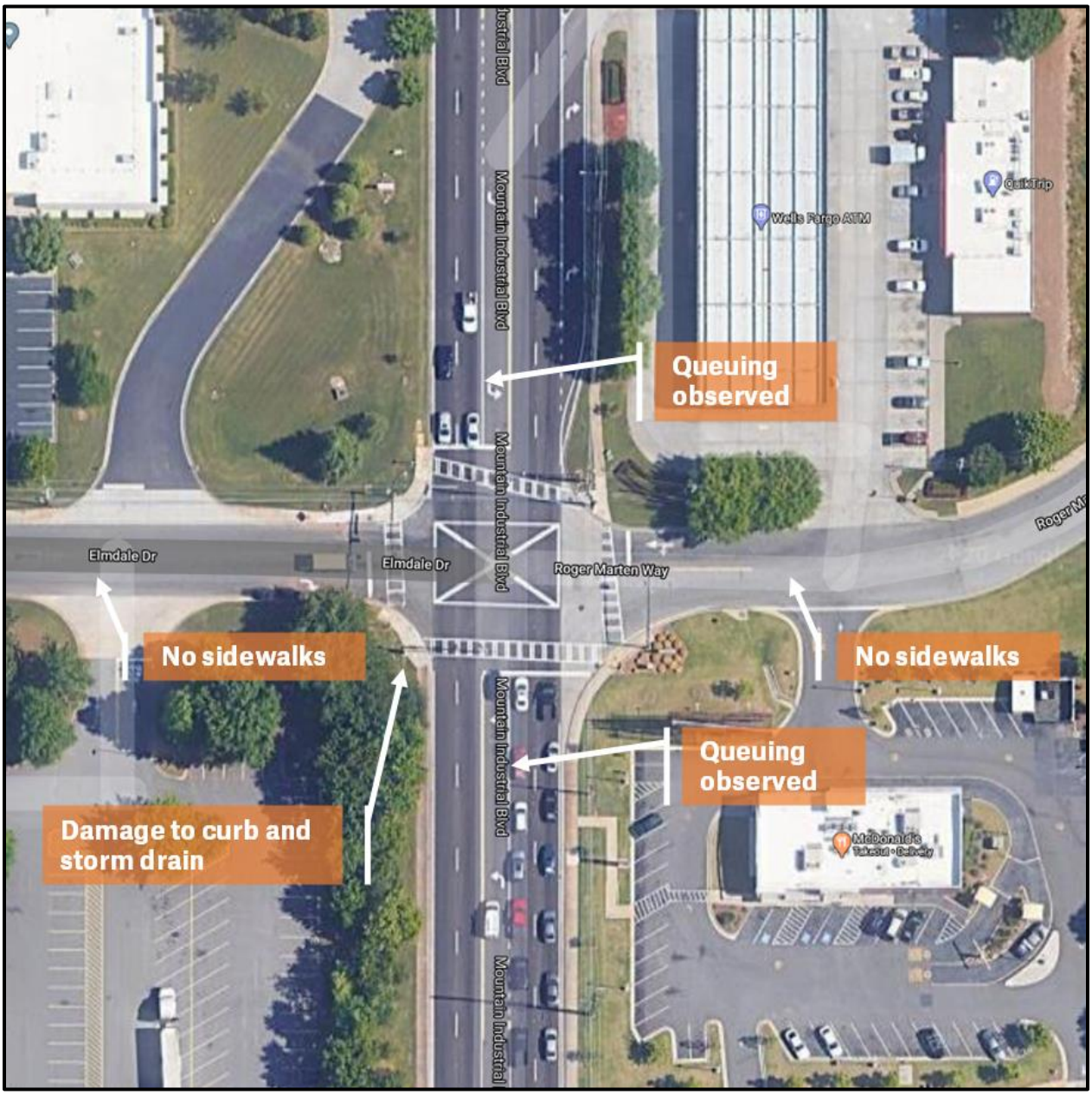
3.3.5 Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way

Figure 17: Looking North on Mountain Industrial Blvd. at Elmdale Dr.

Figure 18: Curb and Storm Drain Damage at the Southwest Corner of the Intersection

- The side-streets (Roger Marten Way and Elmdale Dr.) are split phased – where all movements along Roger Marten Way (left, through, and right) are served by a phase followed by a phase for all movements along Elmdale Dr. (left, through, and right).
- Curb and storm drain damage are present on the southwest quadrant of the intersection. This intersection curb radii appears to be designed based on older design standards and design vehicles with shorter wheel bases and doesn't appear to be able to accommodate the newer trucks on the roadways currently with longer wheel bases.
- Queuing was observed on Mountain Industrial Blvd. in both directions. There is a "DO NOT BLOCK THE BOX" striping at the intersection.
- No sidewalks are present along Roger Marten Way at the intersection. No sidewalks exist along the west side of Mountain Industrial Blvd. north of the intersection.
- There is an existing MARTA bus route along Mountain Industrial Blvd. at this intersection.

Figure 19: Intersection Operations Review on an Aerial View



3.3.6 Tucker Industrial Rd. @ Elmdale Dr.

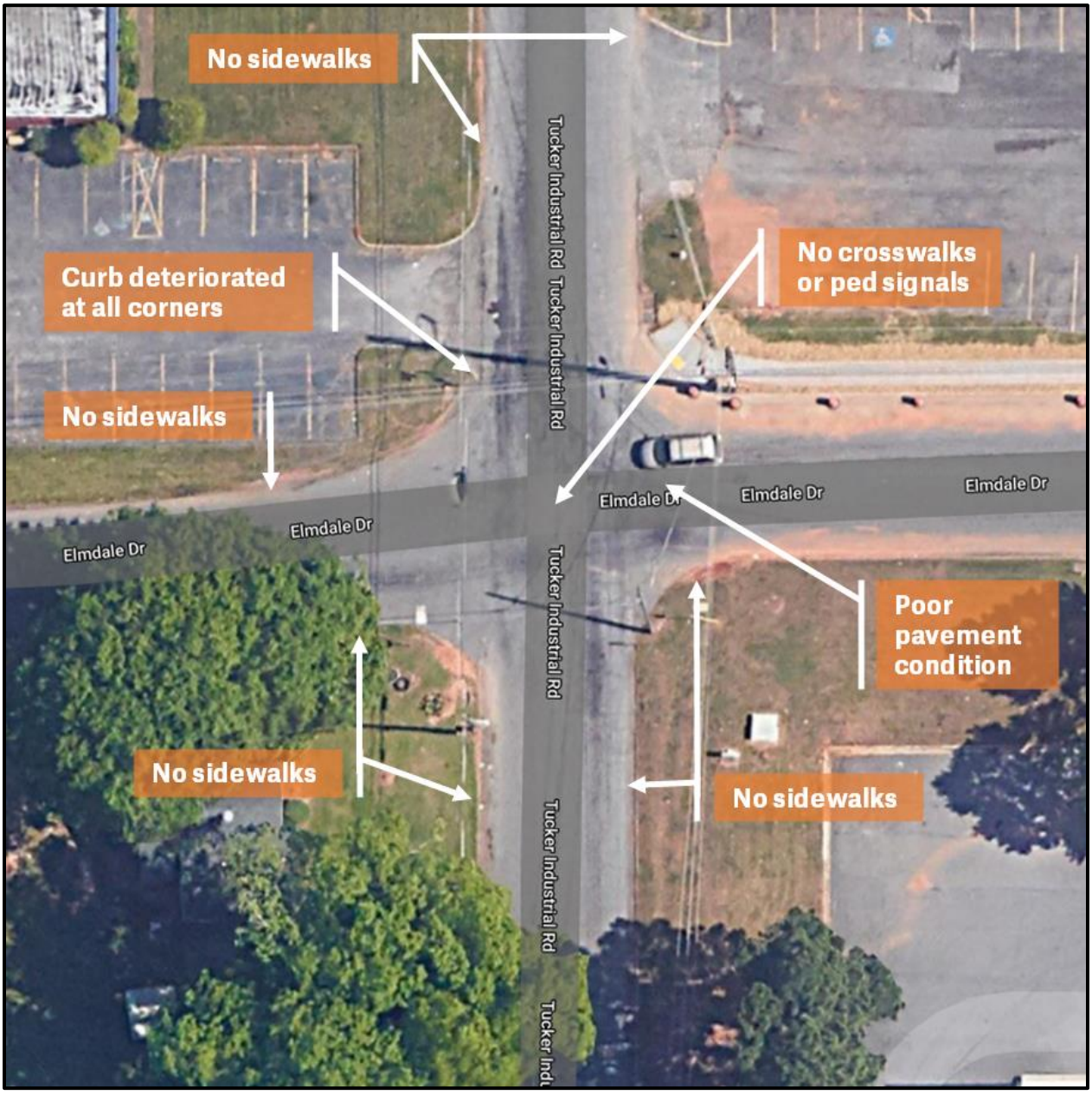
Figure 20: Truck Turning Right from Westbound Elmdale Dr. to Northbound Tucker Industrial Rd.

Figure 21: Drainage Issues at Tucker Industrial Rd. and Elmdale Rd.

- There is sidewalk along the north side of Elmdale Dr. east of the intersection, and there is a curb ramp on the northeast quadrant of the intersection. No crosswalks exist at this intersection.
- Curbs are deteriorated at all corners of the intersection likely from over tracking of cars and trucks.
- There is moderate amount of truck turning movements at the all-way stop controlled intersection.

- The pavement is in poor condition with potholes and pooled water due to the lack of positive drainage and inadequate storm water infrastructure.

Figure 22: Intersection Operations Review on an Aerial View



3.3.7 Mountain Industrial Blvd. @ Hammermill Rd. (South)

Figure 23: Pedestrian Crossing and Trucks Queuing at Mountain Industrial Blvd. at Hammermill Rd.

Figure 24: Truck Turning Left from Southbound Mountain Industrial Blvd. onto Hammermill Rd.

- This is a four-legged, signalized intersection; the west leg is one-way and has one westbound lane (going away from the intersection) to provide access to a restaurant and continues to connect to Tucker Industrial Rd. However, some vehicles were observed traveling the wrong way on this intersection approach (exiting the restaurant) to make a right and proceed southbound on Mountain Industrial Blvd. There did not appear to be adequate signage or pavement markings at the west leg of the intersection to indicate that the leg is one-way only in the westbound direction. There is a "DO NOT ENTER" sign on this leg at the intersection facing traffic from the east and the south.

- Pedestrian accommodations including crosswalks, pedestrian signals and curb ramps are present on all four corners of the intersection. There are no sidewalks along the west side of Mountain Industrial Blvd. south of the intersection.
- There is an existing MARTA bus route along Mountain Industrial Blvd. at this intersection.
- Trucks turning right from northbound Mountain Industrial Blvd. to eastbound Hammermill Rd. were observed to have difficulty in maneuvering the southeast corner of the intersection due to the lack of a northbound right turn lane and narrow receiving lane on Hammermill Rd.

Figure 25: Intersection Operations Review on an Aerial View

3.3.8 Mountain Industrial Blvd. @ Greer Cir.

Figure 26: Looking North on Mountain Industrial Blvd. at Greer Cir.

Figure 27: Looking South from East Leg of Intersection of Mountain Industrial Blvd. at Greer Cir.

- Pedestrian accommodations, including crosswalks, pedestrian signals and curb ramps, are present on all four corners of the intersection. There are no sidewalks along the west side of Mountain Industrial Blvd. south of the intersection or along Greer Cir. west of the intersection.
- There are existing MARTA bus routes along both Mountain Industrial Blvd. and Greer Cir. at this intersection.
- This intersection is oriented at a skewed angle, which causes southbound right-turning trucks from Mountain Industrial Blvd. to track over the curb and also to encroach onto the eastbound approach lanes on Greer Circle. This intersection curb radii appears to be designed based on older design standards and design vehicles with shorter wheel bases and doesn't appear to be able to

accommodate the newer trucks on the roadways currently with longer wheel bases. The intersection skew does not appear to restrict sight distance along Mountain Industrial Blvd.

- The pavement is in good condition on all legs except the east leg of Greer Cir., which is showing some signs of distress but is in fair condition overall.

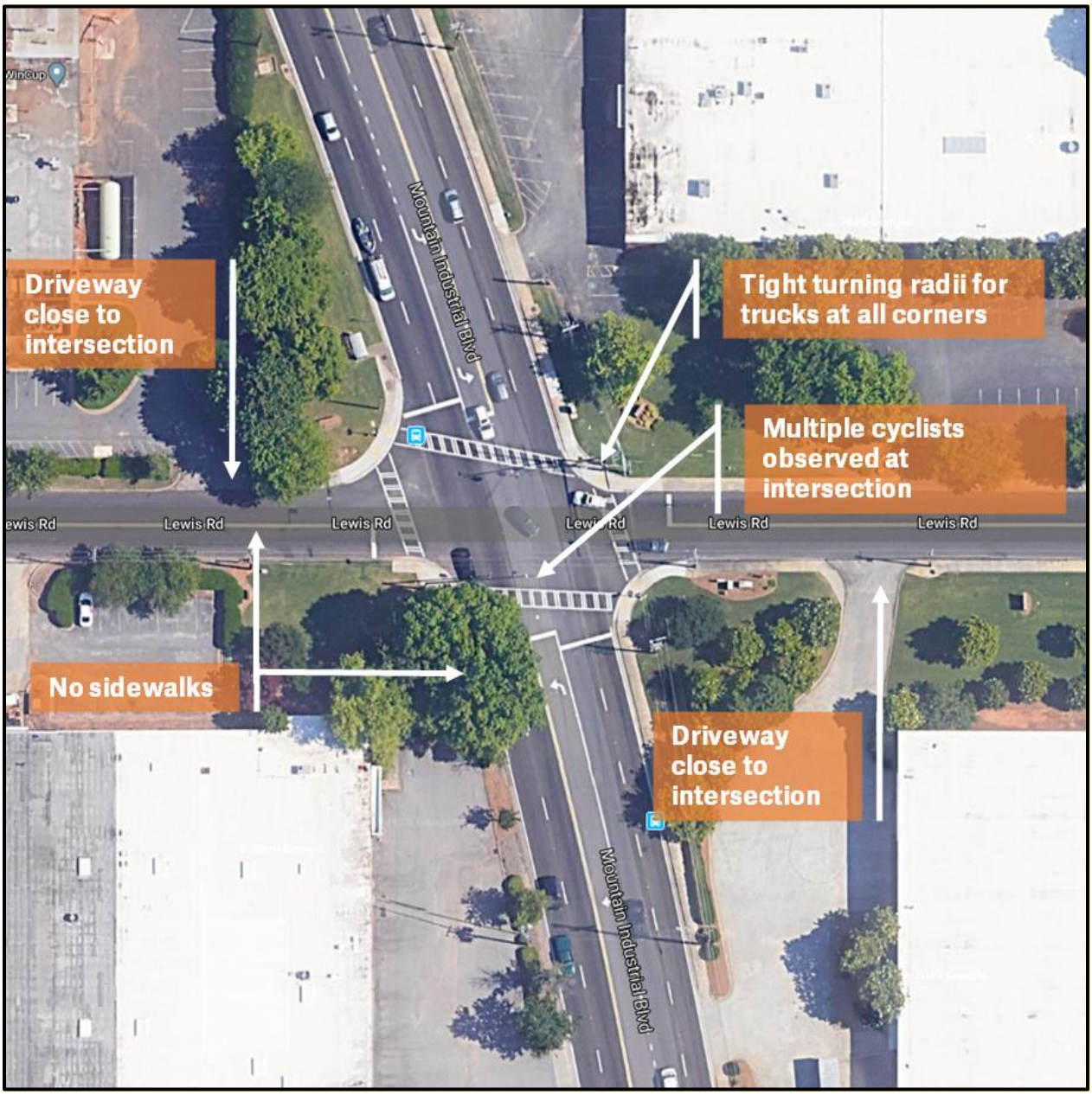
Figure 28: Intersection Operations Review on an Aerial View

3.3.9 Mountain Industrial Blvd. @ Lewis Rd.

Figure 29: Trucks and Bicyclists Observed at Mountain Industrial Blvd. at Lewis Rd.

- Pedestrian accommodations, including crosswalks, pedestrian signals and curb ramps, are present on all four corners of the intersection. There are no sidewalks along the west side of Mountain Industrial Blvd. south of the intersection or along Lewis Rd. west of the intersection.
- There is an existing MARTA bus route along Mountain Industrial Blvd. at this intersection.
- Right-turning trucks were observed to have difficulty maneuvering the intersection at all four quadrants of the intersection.
- Multiple bicyclists were observed using Lewis Rd. at this intersection.
- There is a driveway very close to the intersection along Lewis Rd. west of the intersection.

Figure 30: Intersection Operations Review on an Aerial View



3.3.10 Mountain Industrial Blvd./N. Hairston Rd. @ E. Ponce de Leon Ave.

Figure 31: View of Mountain Industrial Blvd. at E. Ponce de Leon Ave. Looking East

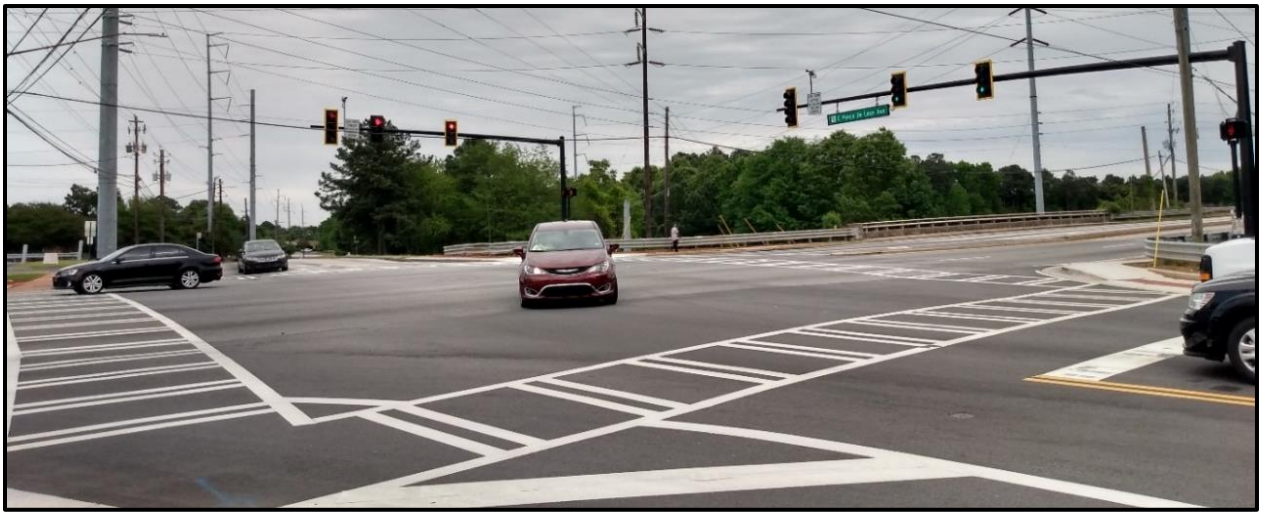
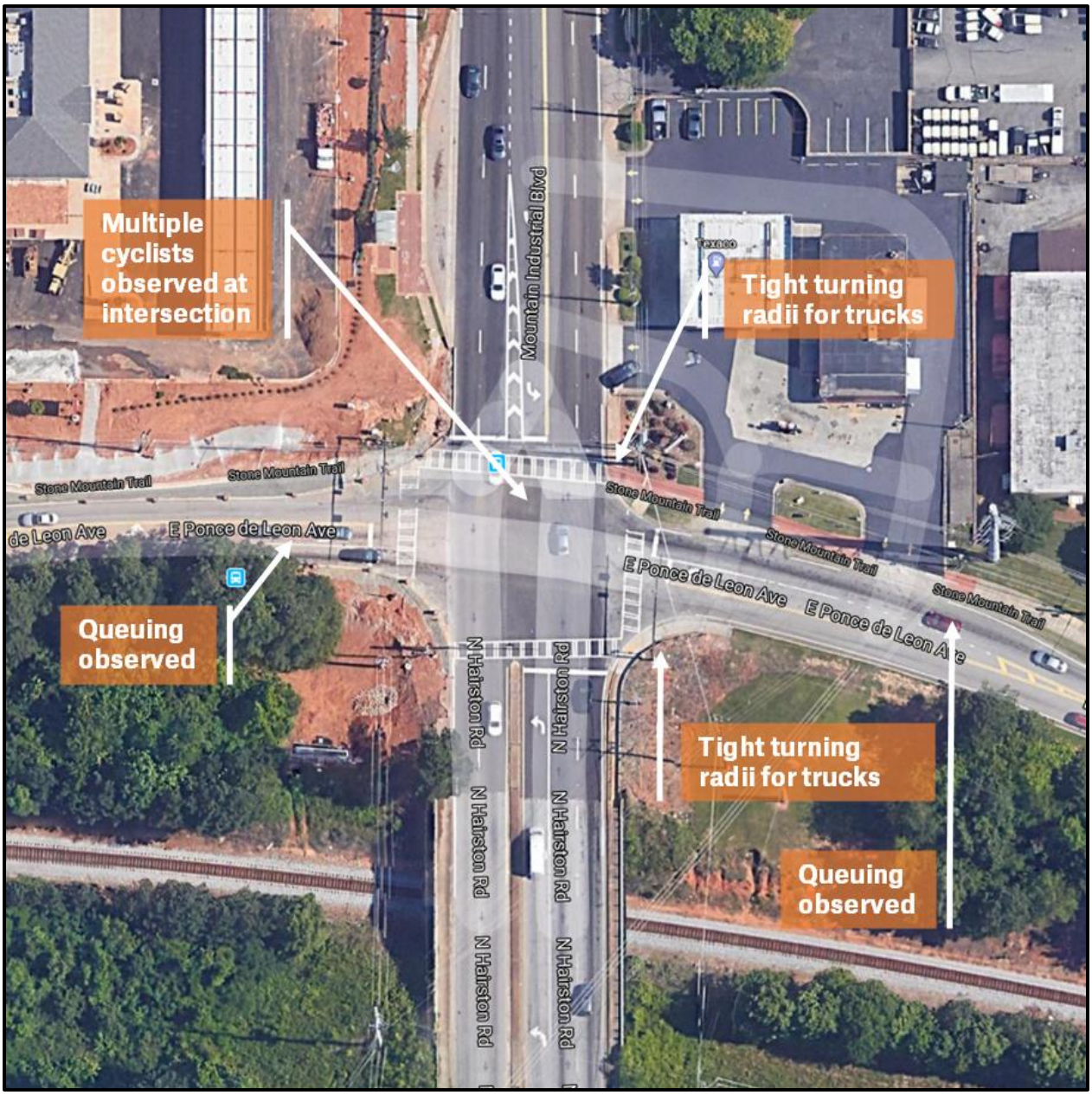


Figure 32: Traffic Queuing on E. Ponce de Leon Ave. (East Leg of Intersection)

- Queuing was observed on E. Ponce de Leon Ave. in both directions during the afternoon peak, and not all traffic could make it through the signal in one cycle.
- There are driveways very close to the intersection at the northeast corner of the intersection associated with the Texaco gas station.
- Pedestrian accommodations, including crosswalks, pedestrian signals and curb ramps, are present on all four corners of the intersection. There are sidewalks along both sides of Mountain Industrial Blvd./N. Hairston Rd. Stone Mountain Trail is located along the north side of E. Ponce de Leon Avenue. A short section of sidewalk exists on the south west corner of E. Ponce de Leon Ave. at Mountain Industrial Blvd. that ends at a MARTA bus stop.

- There are existing MARTA bus routes along both Mountain Industrial Blvd. and E. Ponce de Leon Ave. at this intersection.
- The bus stop on the northwest corner has a dedicated pull-out and large bus shelter, serving MARTA Bus Route 121.
- There is a damaged guardrail at the southeast corner of the intersection.
- The NE, SE and SW corners of the intersection do not meet the min. design truck turning radius of 45 ft. for the typical truck type in the district – which is a WB-50.

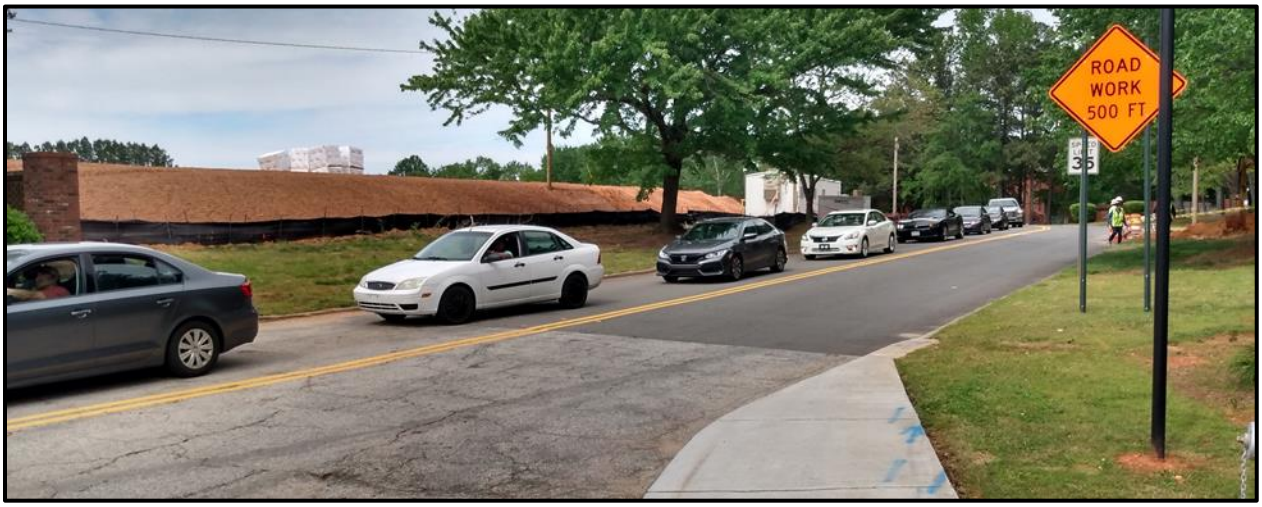
Figure 33: Intersection Operations Review on an Aerial View



3.3.11 E. Ponce de Leon Ave. @ Rock Mountain Blvd.

Figure 34: View of E. Ponce de Leon Ave. at Rock Mountain Blvd. from West Leg of Intersection

Figure 35: Traffic Queuing on Rock Mountain Blvd. (North Leg of Intersection)



- There is a horizontal curve along the Rock Mountain Blvd. approach.
- Queuing was observed on the southbound Rock Mountain Blvd. approach.
- Stone Mountain Trail is located along the north side of E. Ponce de Leon Ave. Pedestrian accommodations, including a marked crosswalk, pedestrian signals and curb ramps, are present along the north side of E. Ponce de Leon Ave. The marked crosswalk is fairly worn and faded.
- There are no sidewalks along the south side of E. Ponce de Leon Ave. There are no crosswalks to cross E. Ponce de Leon Ave. at the intersection.

- There is an existing MARTA bus route along E. Ponce de Leon Ave. at this intersection, and there is a MARTA bus stop shelter on the north side of E. Ponce de Leon Ave.
- Pepisco semi-trailer intermediate (WB 40) and semi-tractor combination (WB 50) trucks are the prevalent truck types at this intersection. Pepisco trucks enter Rock Mountain Blvd. from the east and due to the deficient radii track across the catch basin, C&G and storm line infrastructure. This has resulted in a long history of repetitive damage and subsequent repairs at the northeast corner of the intersection.

Figure 36: Intersection Operations Review on an Aerial View

3.3.12 Idlewood Rd. @ Sarr Pkwy.

Figure 37: View of Idlewood Rd. at Sarr Pkwy. from North Leg of Intersection

- Sight distance appears to be restricted on the north leg of the intersection due to a horizontal curve and the bridge over Stone Mountain Freeway (US 78). There are supplemental signals at the intersection to aid motorists approaching the intersection from the north.
- The intersection has a skewed angle, which makes it difficult for commercial vehicles and buses to maneuver turns without intruding in other travel lanes. Both the southbound left turn from Idlewood Rd. to eastbound Sarr Pkwy. and the westbound channelized right turn from Sarr Pkwy. to northbound Idlewood Rd. were observed to be difficult maneuvers for MARTA buses.
- There are worn pavement markings at this intersection on Sarr Parkway as well as a large pothole on Sarr Parkway.
- Debris, including several hubcaps and broken guardrails, and damaged curbs were observed, particularly at the northeast corner of the intersection. This intersection curb radii appears to be designed based on older design standards and design vehicles with shorter wheel bases and doesn't appear to be able to accommodate the newer trucks on the roadways currently with longer wheel bases.

- Pedestrian accommodations, including a marked crosswalk, pedestrian signals and curb ramps, are present to cross Idlewood Rd. south of the intersection. However, there are no sidewalks on the west side of Idlewood Road. There are no pedestrian accommodations across the other legs of the intersection.
- There is an existing MARTA bus route along the north leg of Idlewood Rd. and Sarr Pkwy. at this intersection.

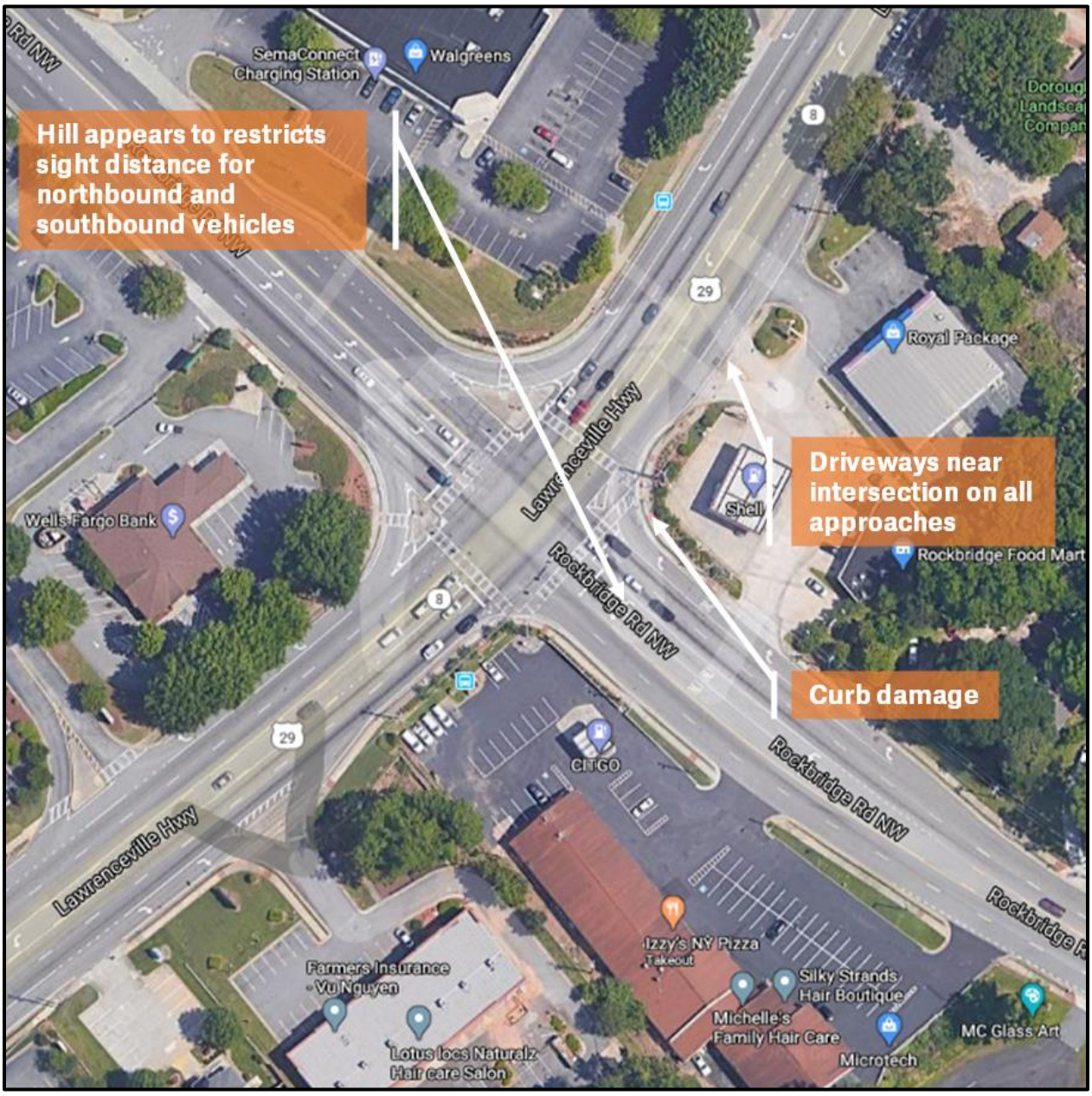
Figure 38: Intersection Operations Review on an Aerial View

3.3.13 Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.

Figure 39: Lawrenceville Hwy. (US 29/SR 8) at Rockbridge Rd. Looking West from the NE Corner

- There is a vertical curve along the south leg (Rockbridge Rd.) approaching the intersection where the sight distance appears to be restricted along Rockbridge Rd. both in the northbound and southbound approaches.
- Crosswalks and pedestrian signals are present across all legs of the intersection.
- The intersection has faded pavement markings on all legs with crosswalks and stop bars especially in poor condition.
- Commercial driveways within 50 yards on both sides of all legs of the intersection.
- Minor curb damage along the southeast corner of the intersection

Figure 40: Intersection Operations Review on an Aerial View



3.3.14 Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.

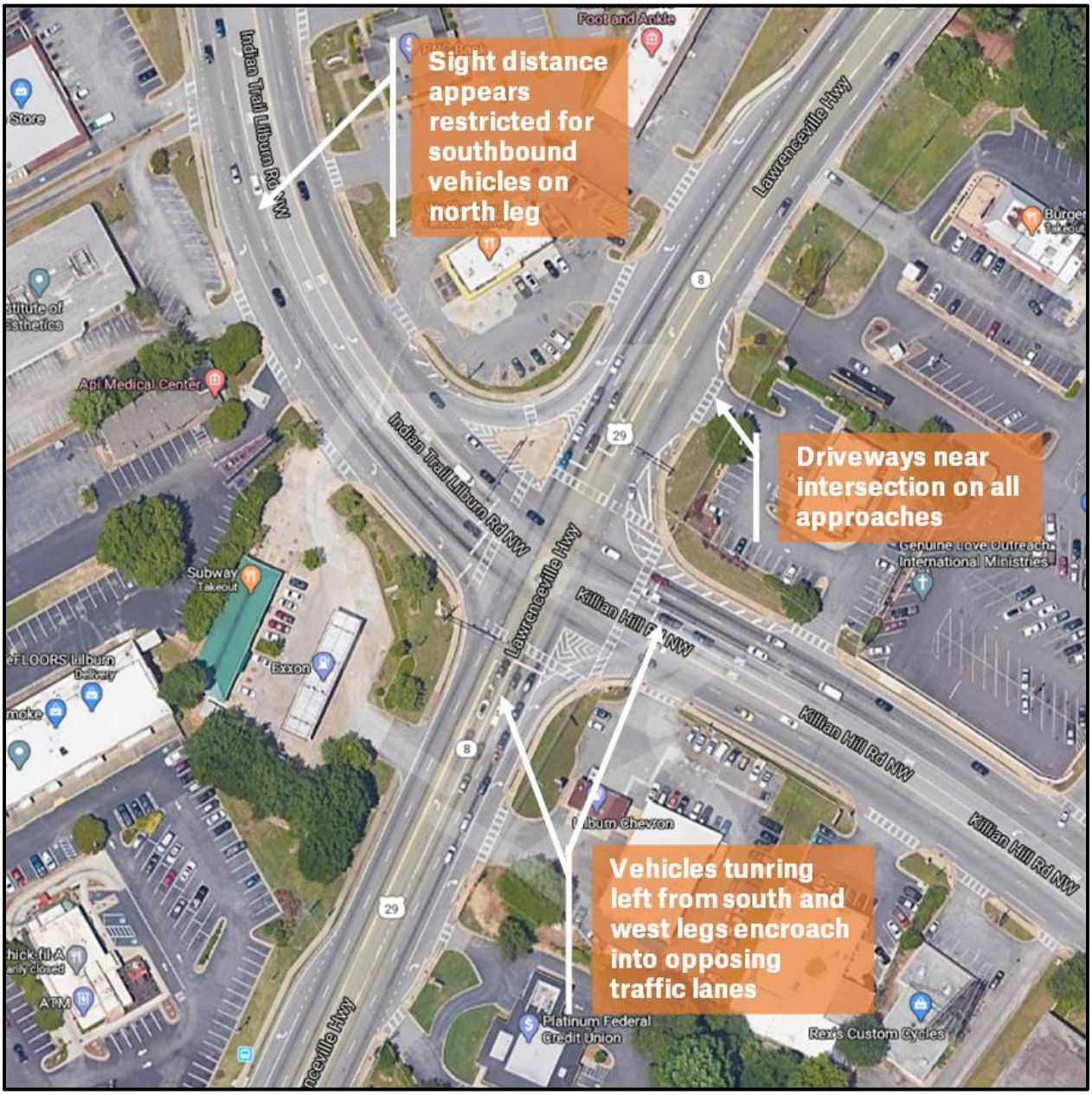
Figure 41: Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd. Looking North

Figure 42: Truck Turning Right from Indian Trail Lilburn Rd. onto Lawrenceville Hwy. WB

- Sight distance appears to be restricted along the north leg (Indian Trail Lilburn Rd.) approaching the intersection due to a horizontal curve; supplemental signal head present for the southbound approach.
- Crosswalks and pedestrian signals are present across all legs of the intersection.
- Commercial driveways within 50 yards on both sides of all legs of the intersection.

- The intersection has faded pavement markings on all legs with crosswalks and stop bars especially in poor condition.
- The eastbound left turning vehicles along Lawrenceville Hwy. (US 29/SR 8) and the northbound left turning vehicles along Killian Hill Rd. were observed encroaching into opposing through lanes.

Figure 43: Intersection Operations Review on an Aerial View



3.4 Intersection Capacity Analysis

Based on the existing year (2020) AM and PM peak hour turning movement traffic volumes, and the existing traffic control and lane configurations, AM and PM peak hour traffic operations were analyzed at the study intersections using the methodologies outlined in the Highway Capacity Manual (HCM), and the Synchro 9.2 software program. 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 4 summarizes the LOS criteria for signalized intersections, as described in the HCM (Transportation Research Board, 2016).

Table 4. 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[1]	> 80 seconds	Forced flow, poor progression

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

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

For unsignalized intersections (i.e., minor street stop-controlled intersections) LOS criteria are defined in terms of the average control delay for each minor-street movement as well as major-street left-turns. Major-street through vehicles are assumed to experience zero delay, because of minimal conflicts in operation. Several factors affect the control delay for unsignalized intersections, such as availability and distribution of gaps in the conflicting traffic stream. LOS A indicates excellent operations with minimal delay to motorists, while LOS F indicates insufficient gaps of acceptable size to allow vehicles on the minor street to cross safely, resulting in long delays and long queues. Table 5 shows LOS criteria for unsignalized intersections.

Table 5. Level of Service Criteria for Unsignalized Intersections

Level of Service	Control Delay (sec/veh)	General Description
A	≤ 10 seconds	Minimal Delay
B	> 10 seconds and ≤ 15 seconds	Occasional Delay
C	> 15 seconds and ≤ 25 seconds	Moderate Delay
D	> 25 seconds and ≤ 35 seconds	Noticeable Delay
E	> 35 seconds and ≤ 50 seconds	Delay approaching tolerance
F[1]	> 50 seconds	Delay exceeding tolerance

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

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

For the purposes of this traffic study and based on the Atlanta Regional Commission (ARC) guidelines all intersections were evaluated at a LOS standard of D. The results of the intersection LOS and delay analysis for the existing year (2020) conditions are summarized in Table 6. As shown, all study intersections operate at LOS D or better in the AM and PM peak hours with one exception. The Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd. intersection operates at LOS E in the AM peak hour. Detailed HCM analyses, including capacity analysis worksheets, can be found in Appendix C. A summary of other findings from the detailed capacity analysis is listed below.

Table 6. Existing Year (2020) Intersection Level of Service

Study Intersection	Intersection Control Type	Existing Year (2020)	
		AM LOS *Delay (s)*	PM LOS *Delay (s)*
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	Signal	B *10.8*	C *20.6*
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	Signal	A *9.4*	B *11.8*
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	Signal	A *4.3*	B *15.8*
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	Signal	B *15.8*	B *14.6*
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	Signal	C *21.5*	D *47.2*
Tucker Industrial Rd. @ Elmdale Dr.	All Way Stop	A *9.4*	B *11.6*
Mountain Industrial Blvd. @ Hammermill Rd. (South)	Signal	A *6.4*	A *8.0*
Mountain Industrial Blvd. @ Greer Cir.	Signal	A *9.7*	B *16.0*
Mountain Industrial Blvd. @ Lewis Rd.	Signal	A *8.3*	A *8.5*
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	Signal	D *44.9*	C *24.2*
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	Signal	B *12.6*	B *11.8*
Idlewood Rd. @ Sarr Pkwy.	Signal	A *2.1*	A *6.3*
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	Signal	D *44.9*	D *40.7*
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	Signal	**E** ***62.9***	D *49.2*

4 Future Conditions

4.1 Traffic Volumes

To determine the appropriate improvements at the study intersections, future conditions were analyzed at each of the study intersections based on projected traffic volumes. The year 2030 was chosen as the horizon year to conduct the future conditions traffic analysis. To perform the future analysis, anticipated future traffic volumes were developed at each of the study intersections. The future conditions are defined as the existing condition traffic, plus the anticipated background growth in traffic at the study intersections including any anticipated traffic due to major developments near the study intersections. Hence, the following formula was used to calculate the future condition traffic volumes.

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

Where:

F = future projected traffic volume (vehicles per hour)
P = existing traffic volume (vehicles per hour)
r = annual growth rate
n = number of projection years = future projection year – existing year

4.1.1 Growth Rate Analysis

The anticipated annual background growth in traffic was based on traffic assignments from the ARC's activity-based travel demand model (ABM). The total entering volumes at each of the study intersections from the 2015 and 2040 model were compared to calculate annual growth in traffic at each of the study intersections. Based on this analysis, the average annual growth rates proposed at each of the study intersections is shown in Table 7. Proposed Average Annual Future Traffic Growth Rate at Study IntersectionsTable 7. Detailed growth rate analysis worksheets are included in Appendix D.

Table 7. Proposed Average Annual Future Traffic Growth Rate at Study Intersections

Study Intersection	Growth Rate
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	1.25%
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	1.50%
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	1.25%
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	1.50%
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	1.25%
Tucker Industrial Rd. @ Elmdale Dr.	1.50%
Mountain Industrial Blvd. @ Hammermill Rd. (South)	1.25%
Mountain Industrial Blvd. @ Greer Cir.	1.25%
Mountain Industrial Blvd. @ Lewis Rd.	1.25%
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	1.25%
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	0.75%
Idlewood Rd. @ Sarr Pkwy.	1.75%
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	1.00%
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	1.00%

4.1.2 Other Developments

The traffic generated by the following developments were also accounted for in developing the projected traffic volumes. Information for each development, including traffic studies, size of development and anticipated opening years was obtained from the Atlanta Regional Commission and TSCID staff. Anticipated net trips generated by each development were added to the study intersections, according to the information provided. The information related to these developments are included in Appendix E.

1. DRI 2807 – Project Rocket

This is the site of a future Amazon Fulfillment Center to the east of the TSCID study area in Gwinnett County along West Park Place Blvd. The project proposal consists of a 2,560,000 SF, four-story distribution facility with associated truck courts/drives and 1,800 employee parking spaces. Two driveways on West Park Place Blvd. and one on Bermuda Rd. are proposed to provide access to the site. The buildout year is 2020. Because the development is located near five miles from TSCID, the traffic impacts on Mountain Industrial Boulevard, particularly with regard to truck traffic, are difficult to predict. TCSID will monitor traffic within the district once the fulfillment center opens to assess the impact on local traffic operations and the need for potential improvements.

2. DRI 2576 – Township Tucker

Township Tucker is on the northeast quadrant of the intersection of Mountain Industrial Blvd. and Hugh Howell Rd. at the same site where the present 4650 Hugh Howell Rd. development is proposed. The mixed-use project consisted of 89 acres including a 450,000 square foot movie studio, 28,000 square feet of office space, 113,000 square feet of commercial space, 976 residential units, and a continuing care retirement community with 360 units, a 140-room hotel, a 20,000 square foot daycare facility, a 500-seat amphitheater, and an urban farm. The buildout year for this DRI was 2022.

Additionally, several parcels in the vicinity of the study intersections were identified as having potential for development. The anticipated traffic generated by developing the following four parcels as typical industrial uses is accounted for in this traffic study. Based on trip generation using rates published in the ITE Trip Generation Handbook, these developments are expected to add minimal traffic to the study intersections and therefore the traffic generated would be captured by the use of the background traffic growth rate.

1. 2460 Mountain Industrial Boulevard (6.96 Acres)
2. 2019 Mountain Industrial Boulevard (5.17 Acres)
3. 2019 Mountain Industrial Boulevard (2.08 Acres)
4. 4670 Granite Drive (5.39 Acres)

The future year (2030) AM and PM peak hour traffic volumes based on the background growth in traffic and the added trips due to the proposed developments are shown in Figure 44: Future Year (2030) AM and PM Peak Hour Traffic VolumesFigures 44, 45, 46, and 47.

4.1.3 Other Projects

TSCID completed a traffic engineering study of the US 78 @ Mountain Industrial Blvd. interchange based on a safety analysis of Mountain Industrial Blvd. from Greer Cir. to Elmdale Dr./Roger Marten Way in December 2019. This 2019 traffic engineering study recommends a narrow raised median and intersection improvements along Mountain Industrial Blvd. within these limits. The proposed design sketches from this 2019 traffic engineering study is included in the Appendix E. These improvements are programmed as a GDOT Project (P.I. #0017399) for which preliminary engineering is expected to start in 2020 and construction to start in 2023. These improvements are considered as part of this freight cluster plan traffic study.

1. At the Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way intersection, this project installs a narrow-raised median along the south leg of the intersection (Mountain Industrial Blvd.) and accommodates northbound U-turns along Mountain Industrial Blvd. which are expected due to the installation of the raised median along Mountain Industrial Blvd.
2. At the Mountain Industrial Blvd. @ Hammermill Rd. (South) intersection, this project installs a narrow-raised median along the south leg of the intersection (Mountain Industrial Blvd.) and an additional southbound lane along the south leg to the US 78 Westbound Ramp intersection.
3. At the Mountain Industrial Blvd. @ Greer Cir. intersection, this project installs a narrow-raised median along the north leg of the intersection (Mountain Industrial Blvd.).

Figure 44: Future Year (2030) AM and PM Peak Hour Traffic Volumes

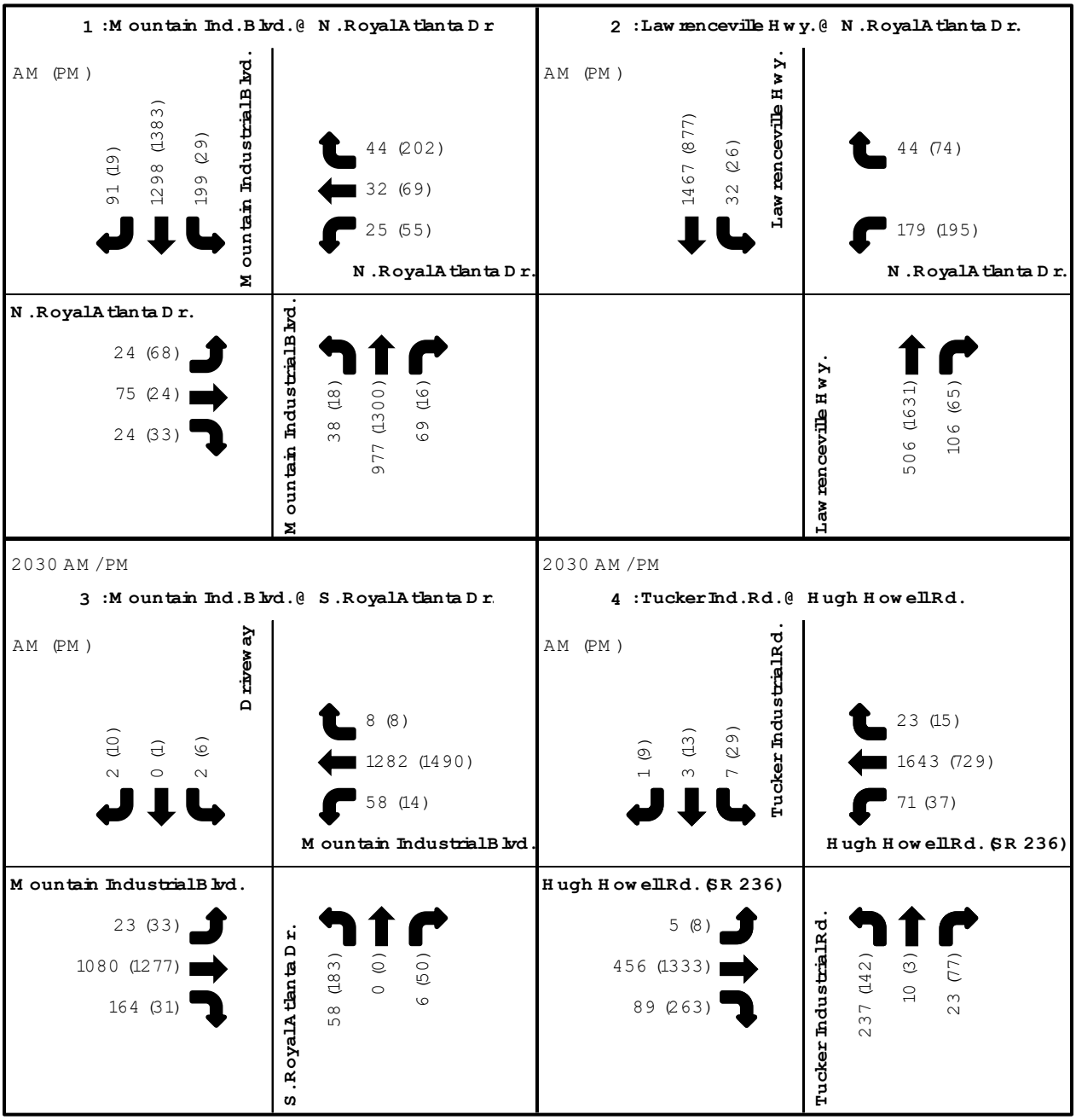


Figure 45: Future Year (2030) AM and PM Peak Hour Traffic Volumes (Continued)

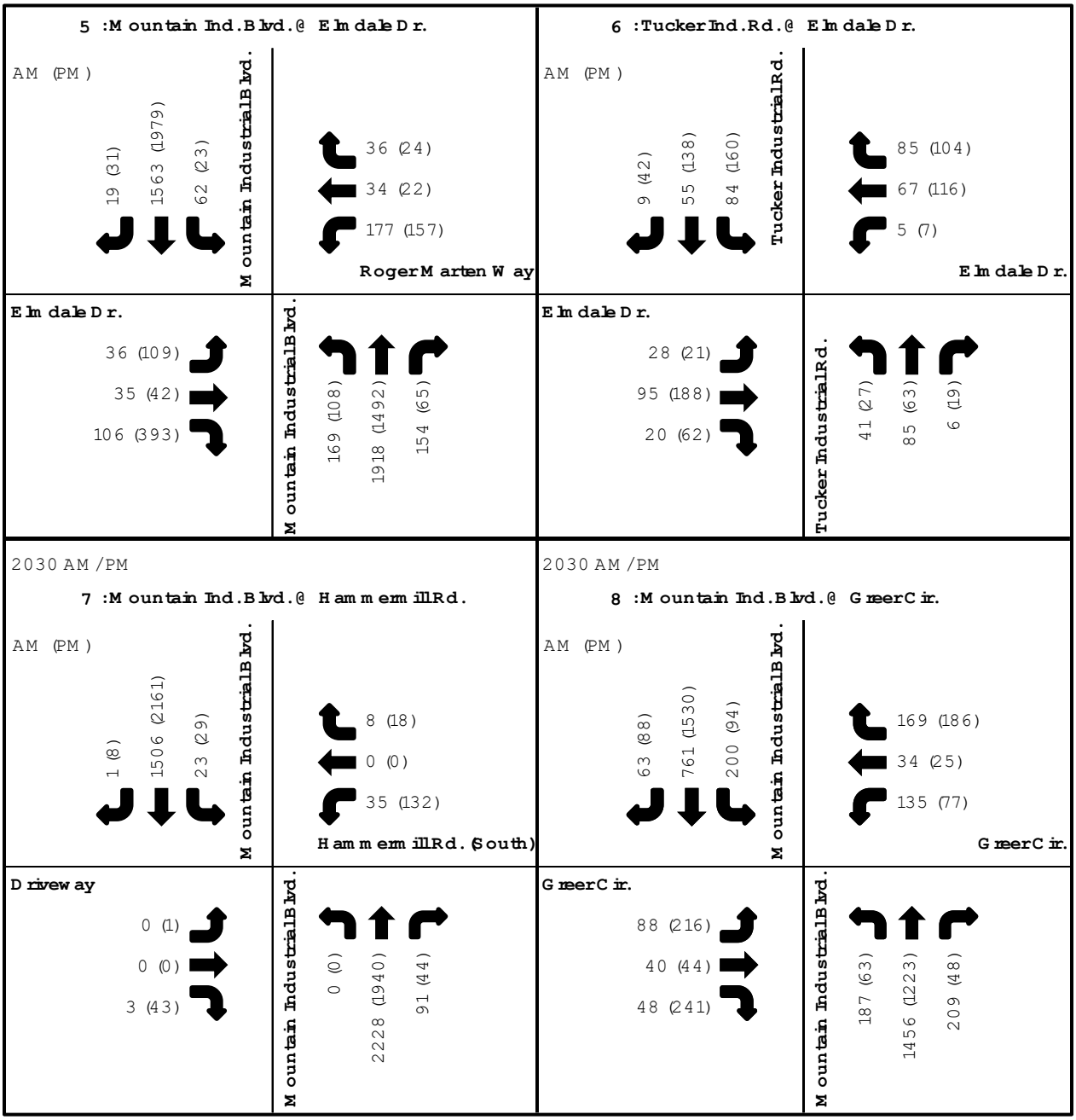


Figure 46: Future Year (2030) AM and PM Peak Hour Traffic Volumes (Continued)

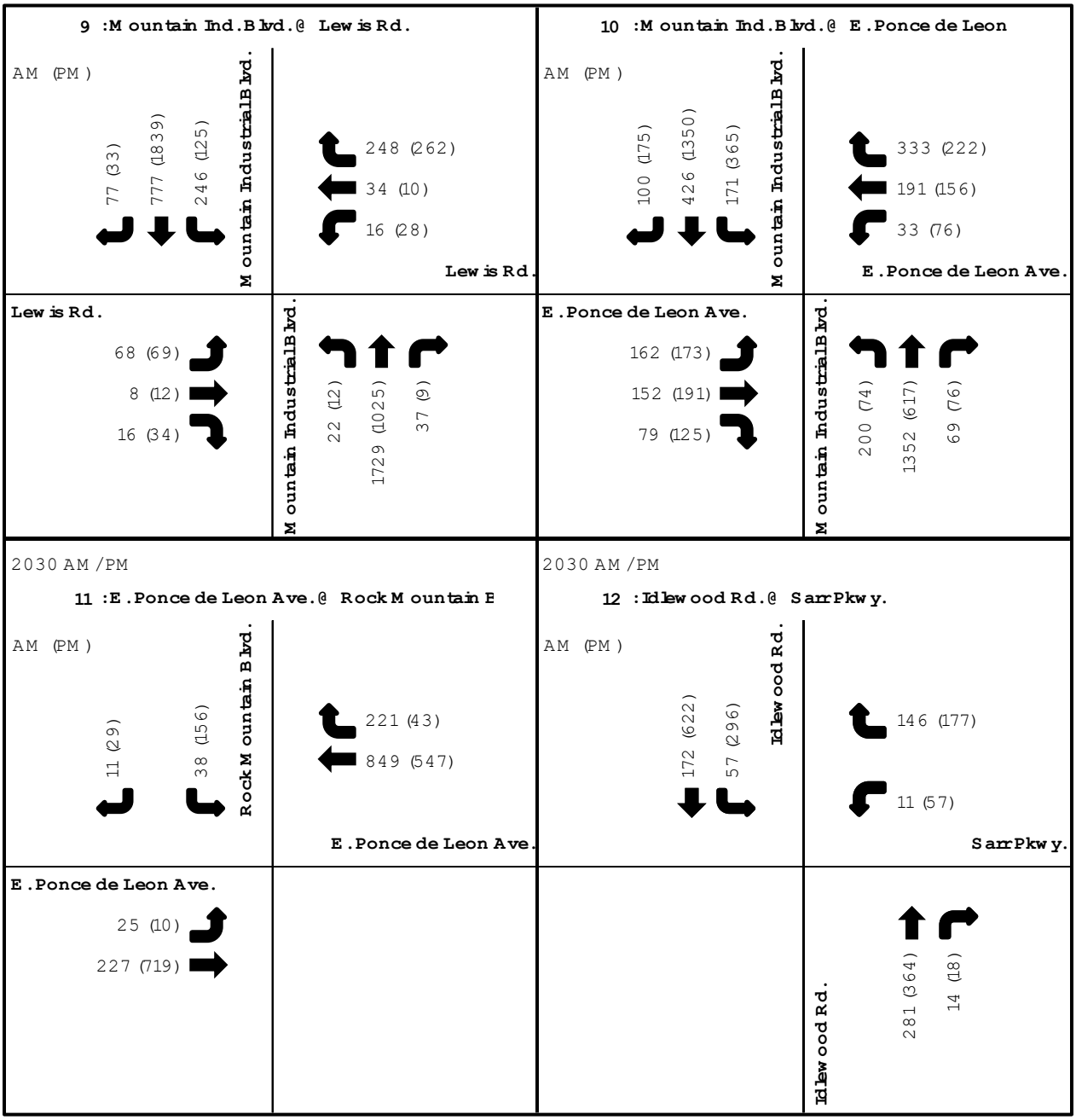
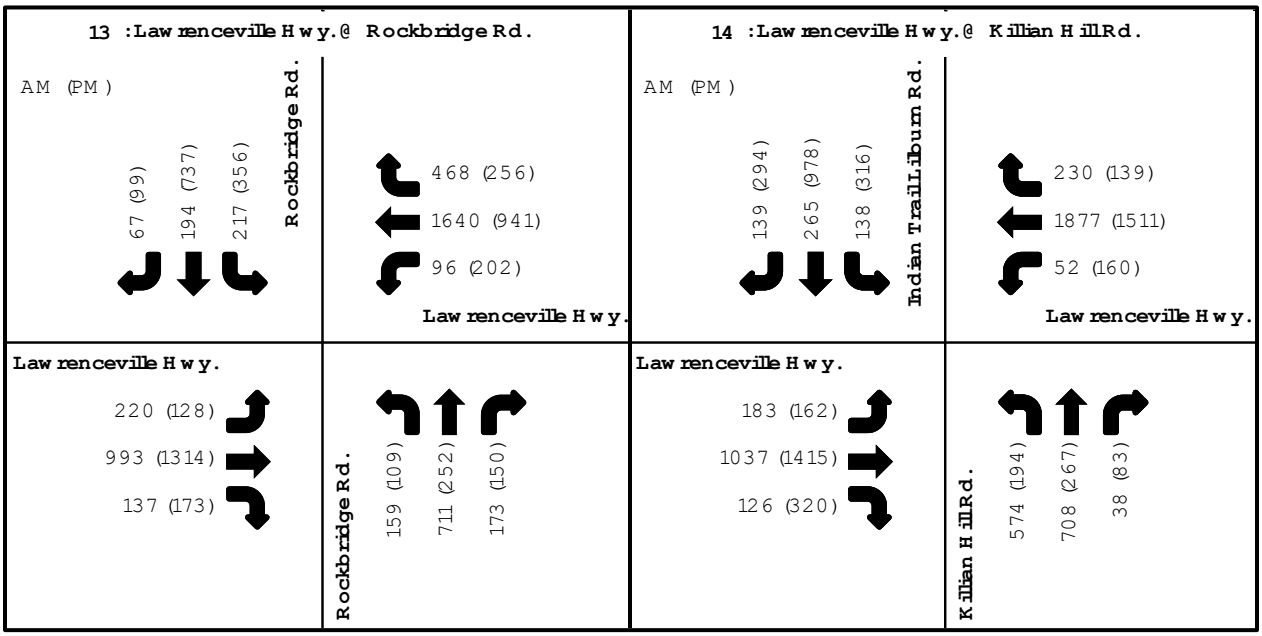


Figure 47: Future Year (2030) AM and PM Peak Hour Traffic Volumes (Continued)



4.2 Intersection Capacity Analysis – Without Improvements

Based on the future year (2030) AM and PM peak hour turning movement traffic volumes, and the existing traffic control and lane configurations, AM and PM peak hour traffic operations were analyzed at the study intersections to determine the future condition intersection operations if no improvements were to be made. The results of the intersection LOS and delay analysis for the future year (2030) conditions with no improvements made are summarized in Table 8. Detailed HCM analyses, including capacity analysis worksheets, are included in Appendix C.

Table 8. Future Year (2030) Intersection Level of Service – without Improvements

Study Intersection	Intersection Control Type	Future Year (2030)	
		AM LOS *Delay (s)*	PM LOS *Delay (s)*
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	Signal	B *12.3*	C *25.4*
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	Signal	B *11.4*	B *15.2*
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	Signal	A *4.8*	B *19.5*
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	Signal	B *19.2*	B *18.0*
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	Signal	D *44.8*	**F** ***88.2***
Tucker Industrial Rd. @ Elmdale Dr.	All Way Stop	A *9.9*	B *13.6*
Mountain Industrial Blvd. @ Hammermill Rd. (South)	Signal	B *11.9*	B *11.8*
Mountain Industrial Blvd. @ Greer Cir.	Signal	B *10.0*	B *17.1*
Mountain Industrial Blvd. @ Lewis Rd.	Signal	B *18.8*	A *9.7*
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	Signal	**E** ***71.8***	D *35.4*
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	Signal	B *17.4*	C *23.2*
Idlewood Rd. @ Sarr Pkwy.	Signal	A *2.3*	B *13.5*
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	Signal	**E** ***62.1***	D *54.7*
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	Signal	**F** ***88.7***	**E** ***65.0***

As shown in Table 8, all study intersections operate at LOS D or better in the AM and PM peak hours with four exceptions. The Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way intersection operates

at LOS F during the PM peak hour. The Mountain Industrial Blvd. @ E. Ponce de Leon Ave. intersection operates at LOS E during the AM peak hour. The Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd. intersection operates at LOS E during the AM peak hour. The Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd. intersection operates at LOS F and LOS E during the AM and PM peak hours respectively.

4.3 Proposed Improvements

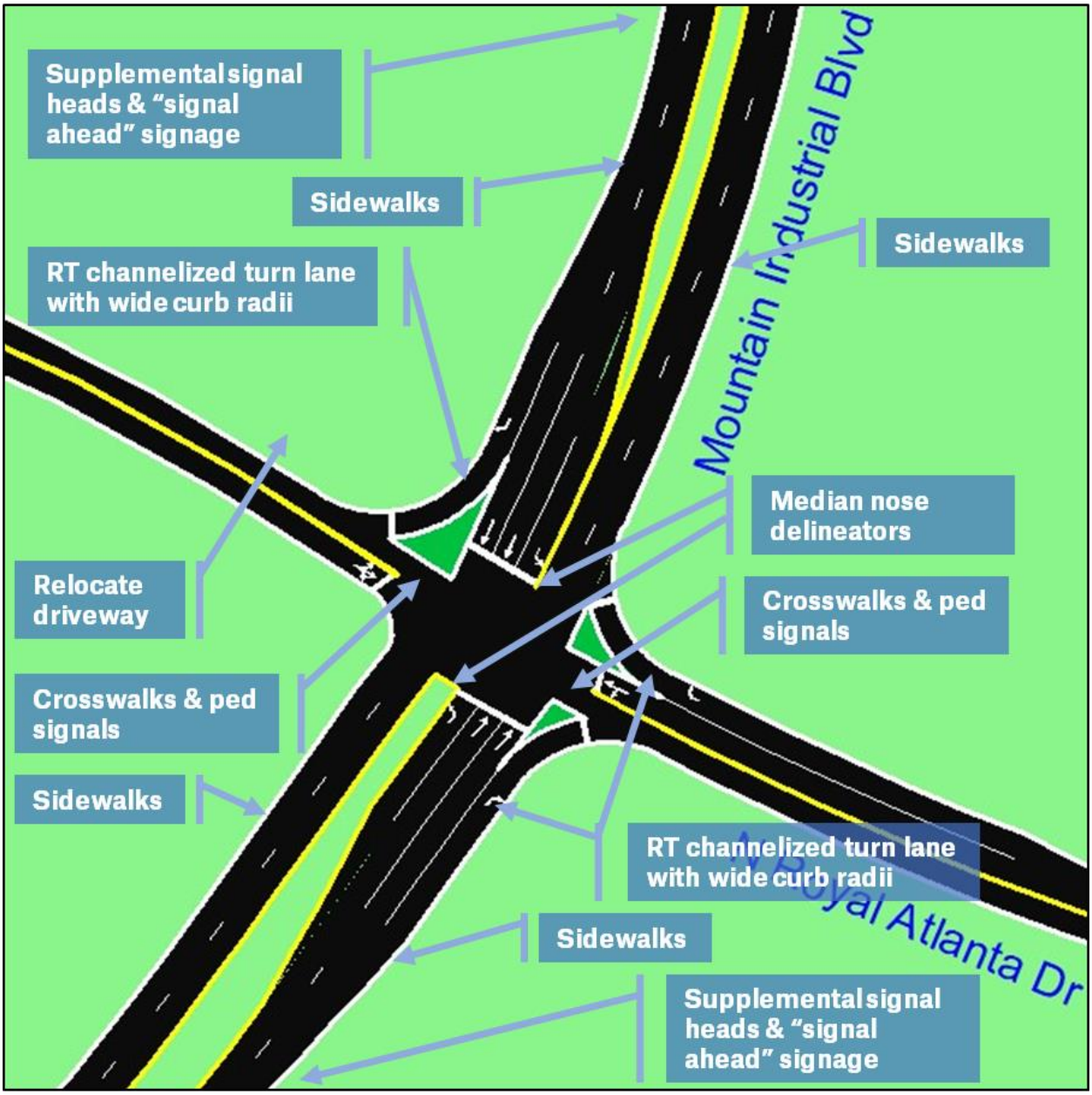
Based on the future year traffic volumes, future year intersection capacity analysis, field observations, and the crash history at the study intersections, the following improvements are proposed to address and mitigate the safety, operational and capacity deficiencies at the study intersections.

4.3.1 Mountain Industrial Blvd. @ N. Royal Atlanta Dr.

- Repave and restripe N. Royal Atlanta Dr. at the intersection, and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install median nose delineators at the median along Mountain Industrial Blvd.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the southbound Mountain Industrial Blvd. and eastbound and westbound N. Royal Atlanta Dr. left-turns.
- Convert northbound Mountain Industrial Blvd. left-turn to a protected-only movement. A protected-only movement provides an exclusive phase for the left-turn maneuvers in the form of a left-turn arrow indication such that the left-turn movement can be made only under the green left-turn indication. This will make this northbound Mountain Industrial Blvd. left-turn movement safer by allowing the movement to be made without any conflicting traffic maneuvers. Currently this left-turn movement is allowed during the permissive phase (circular green indication) where the sight distance for this maneuver to yield to the southbound through movement appears to be restricted due to the horizontal curve along the north leg of Mountain Industrial Blvd.
- Install supplemental signal heads and “traffic signal ahead” signage along the northbound and southbound Mountain Industrial Blvd. approaches.
- Install single right-turn lanes with channelization and wide curb radii accommodating truck turning movements along the northbound and southbound Mountain Industrial Blvd. approaches and along the westbound N. Royal Atlanta Dr. approach.
- Install pedestrian crosswalks and pedestrian signals along the northbound and southbound Mountain Industrial Blvd. approaches.
- Install sidewalks along Mountain Industrial Blvd. and N. Royal Atlanta Dr. at the intersection. The sidewalks along Mountain Industrial Blvd. should be extended to the Gwinnett County line. The sidewalks, specifically on the west side of Mountain Industrial Blvd. from N. Royal Atlanta Dr. to the Gwinnett County line, will serve those that live in Gwinnett County and yet use the MARTA system for work in DeKalb County.
- Install ADA curb ramps at all four corners of the intersection.

- Relocate the driveway along N. Royal Atlanta Dr. west of the intersection further away from the intersection.

Figure 48: Proposed Improvement Schematic



4.3.2 Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.

- Repave and restripe N. Royal Atlanta Dr. at the intersection, and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install median nose delineators at the median along N. Royal Atlanta Dr.

- Install flashing yellow arrow signal head indications for the southbound Lawrenceville Hwy. (US 29/SR 8) left-turn.
- Install a single right-turn lane with a wide curb radii accommodating truck turning movements along the northbound Lawrenceville Hwy. (US 29/SR 8) approach.
- Cul-de-sac Cherry Ln. (north of the intersection) and remove its access to Lawrenceville Hwy. (US 29/SR 8).
- Reconstruct the northeast quadrant of the intersection to widen the curb radius in order to accommodate wider right-turning truck movements along the westbound N. Royal Atlanta Dr. approach.
- Install sidewalk along the south side of N. Royal Atlanta Dr. from the intersection curb radius to the existing sidewalk east of the intersection.
- Install sidewalk along the north side of N. Royal Atlanta Dr. from the intersection curb radius to the existing MARTA bus stop east of the intersection.
- Reconstruct the existing sidewalks along both sides of Lawrenceville Hwy. (US 29/SR 8) at the intersection.
- Cut trees back along the west side of Lawrenceville Hwy. (US 29/SR 8) at the intersection.

Figure 49: Proposed Improvement Schematic

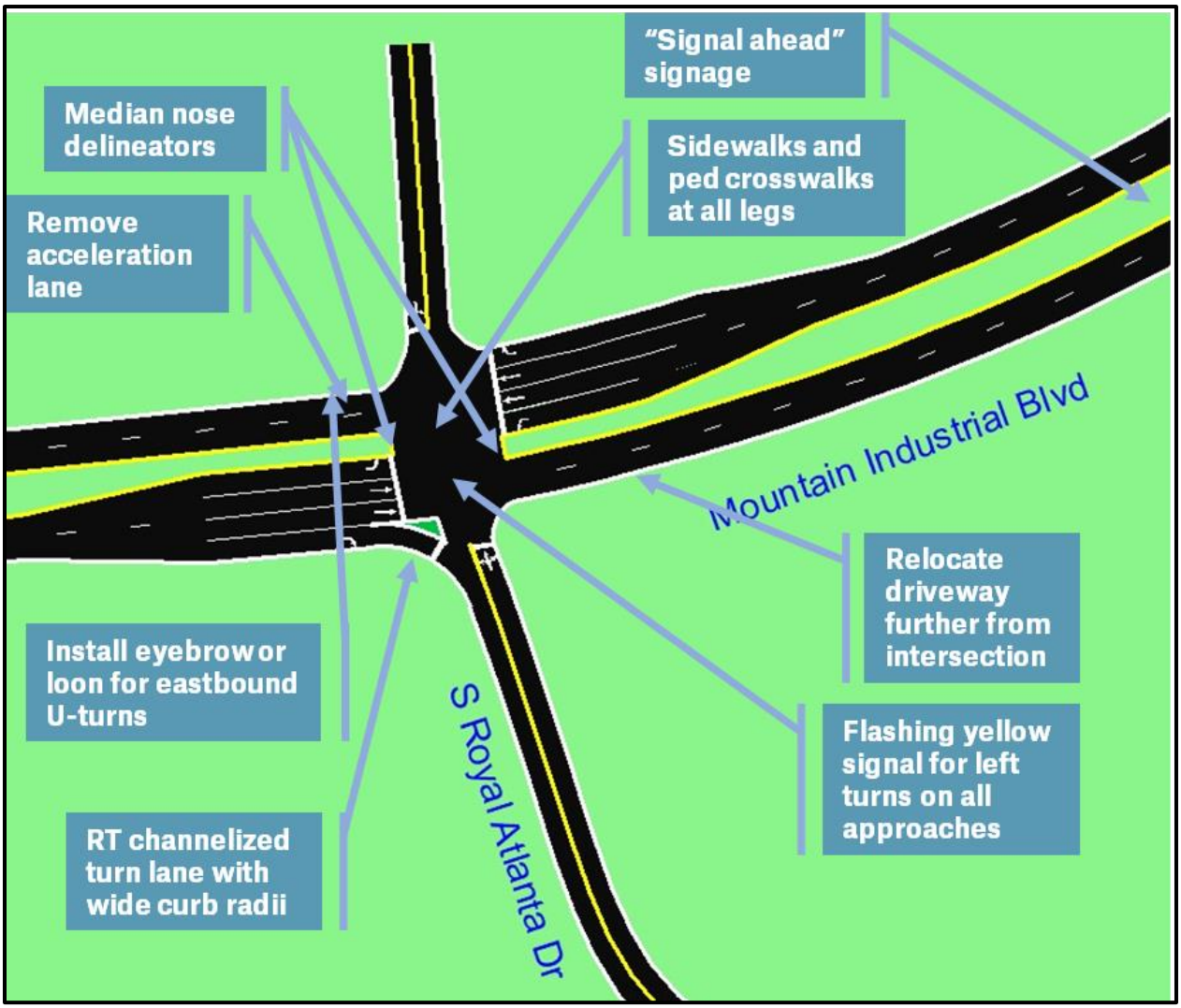
4.3.3 Mountain Industrial Blvd. @ S. Royal Atlanta Dr.

Mountain Industrial Blvd. runs east-west at this intersection.

- Install median nose delineators at the median along Mountain Industrial Blvd.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns on all four approaches.
- Install “traffic signal ahead” signage along the westbound Mountain Industrial Blvd. approach.
- Install a single right-turn lane with channelization and wide curb radius accommodating truck turning movements along the eastbound Mountain Industrial Blvd. approach.

- Remove the acceleration lane on the west leg of the intersection and install an eyebrow or loon to accommodate eastbound U-turns along Mountain Industrial Blvd.
- Install pedestrian crosswalks across all four legs of the intersection with ADA curb ramps and pedestrian signals.
- Install sidewalks along Mountain Industrial Blvd. and S. Royal Atlanta Dr. at the intersection.
- Install ADA curb ramps at all four corners of the intersection.
- Relocate the driveway along Mountain Industrial Blvd. east of the intersection further away from the intersection.

Figure 50: Proposed Improvement Schematic

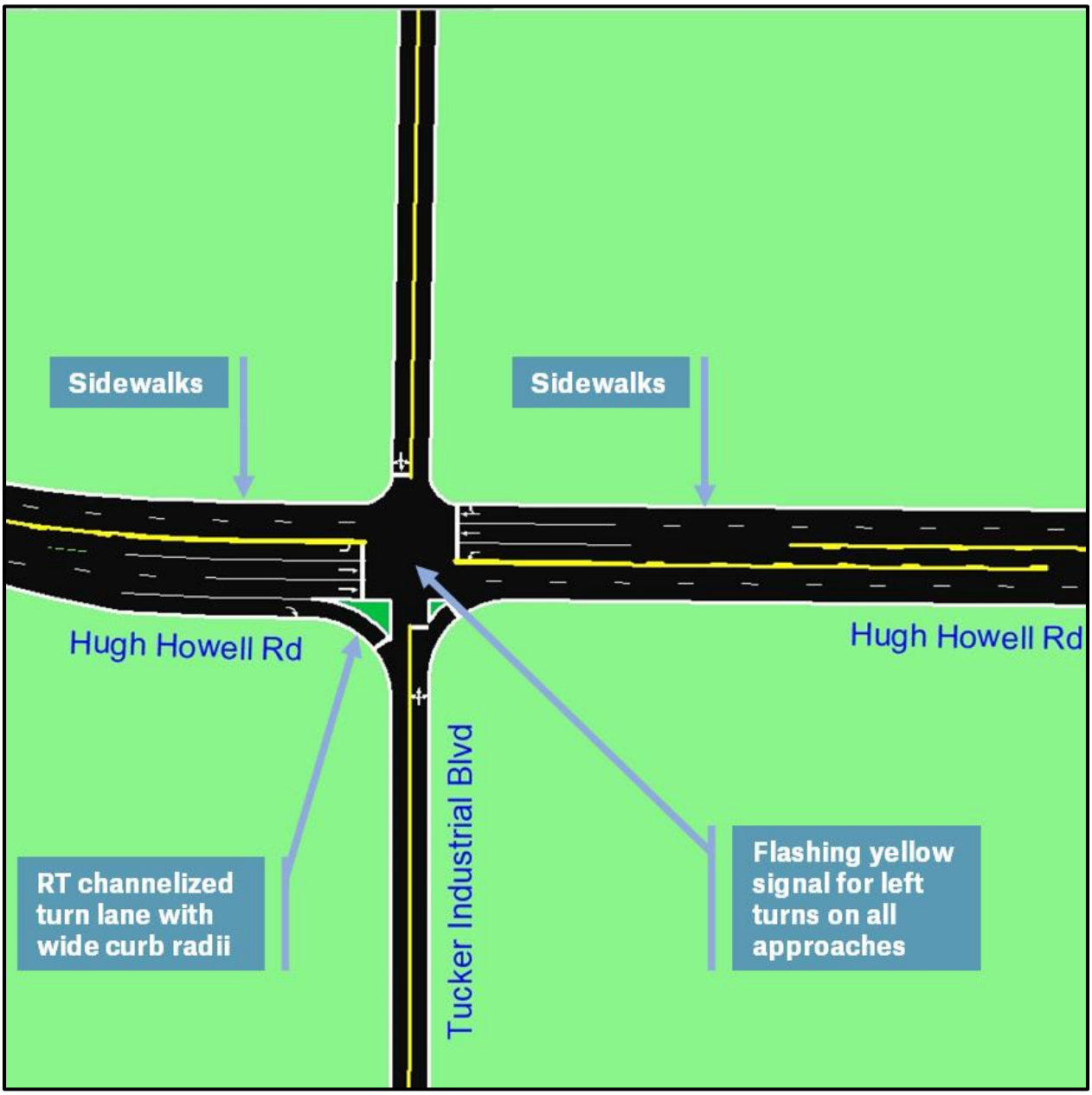


4.3.4 Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)

- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns on all four approaches.

- Install a single right-turn lane with channelization and wide curb radius accommodating truck turning movements along the eastbound Hugh Howell Rd. (SR 236) approach.
- Reconstruct the southeast quadrant of the intersection to widen the curb radius in order to accommodate wider right-turn movements by trucks.
- Install sidewalks along Tucker Industrial Rd. and Hugh Howell Rd. (SR 236) at the intersection.

Figure 51: Proposed Improvement Schematic

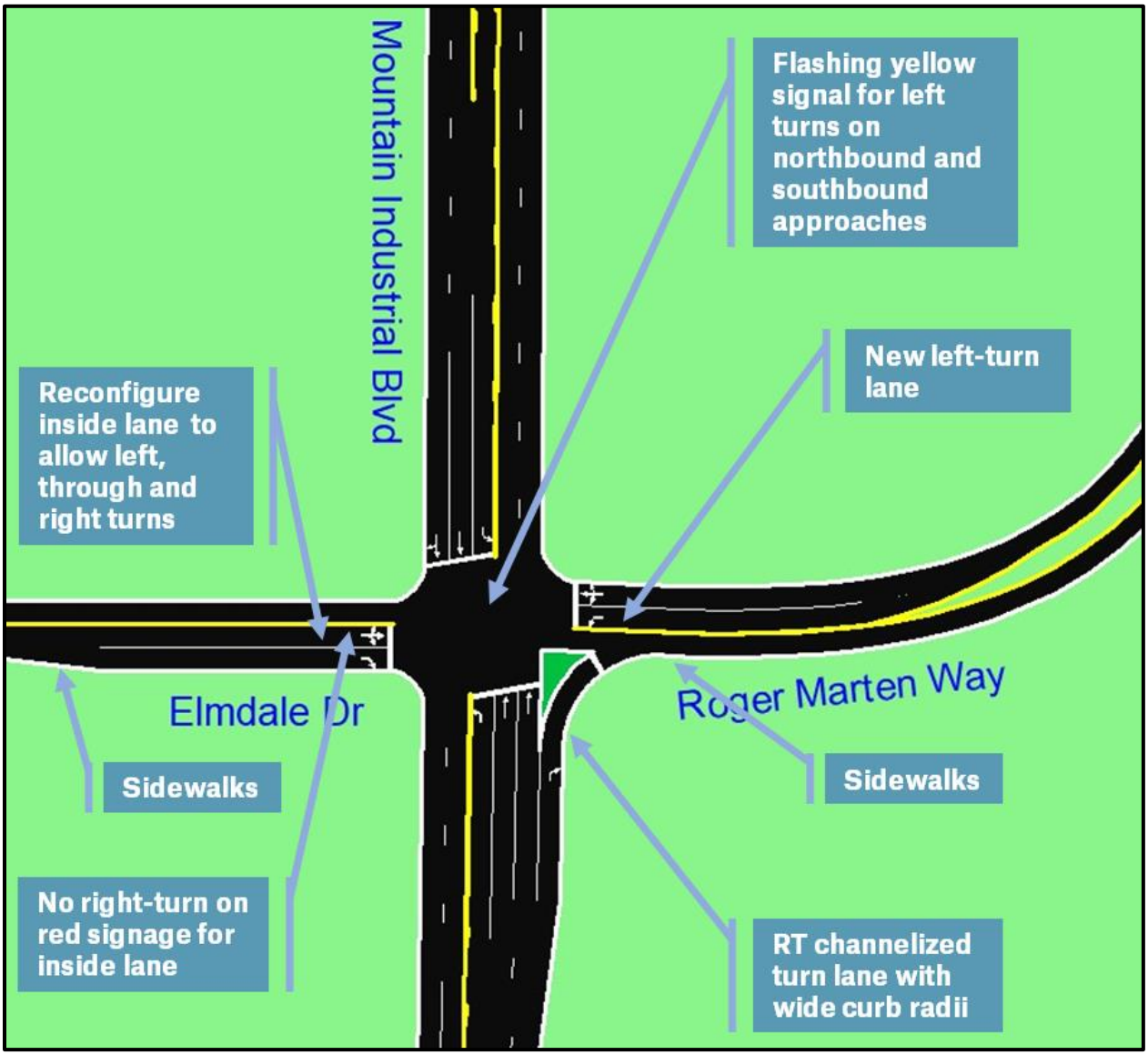


4.3.5 Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way

- Install backplates with retroreflective borders to all traffic signal head indications.

- Install flashing yellow arrow signal head indications for the left-turns on the northbound and southbound approaches of Mountain Industrial Blvd.
- Install a single right-turn lane with channelization and wide curb radius accommodating truck turning movements along the northbound Mountain Industrial Blvd. approach. (This is in addition to the improvements recommended by the TSCID's December 2019 traffic engineering study.)
- Repave and restripe Elmdale Dr. and Roger Marten Way at the intersection, and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Reconstruct the southwest quadrant of the intersection to widen the curb radius in order to accommodate wider right-turn movements by trucks (TSCID's December 2019 traffic engineering study stops short of the Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way intersection and does not recommend any improvements to the Elmdale Dr. approach). Install a Permissive-Plus-Overlap phase for the right-turn movement along the Elmdale Dr. approach.
- Reconfigure the westbound Roger Marten Way at the intersection to add a separate left-turn lane, in addition to the existing left-through-right lane. (TSCID's December 2019 traffic engineering study stops short of the Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way intersection and does not recommend any improvements to the Roger Marten Way approach)
- Install sidewalks along the west side of Mountain Industrial Blvd. and along Roger Marten Way at the intersection.

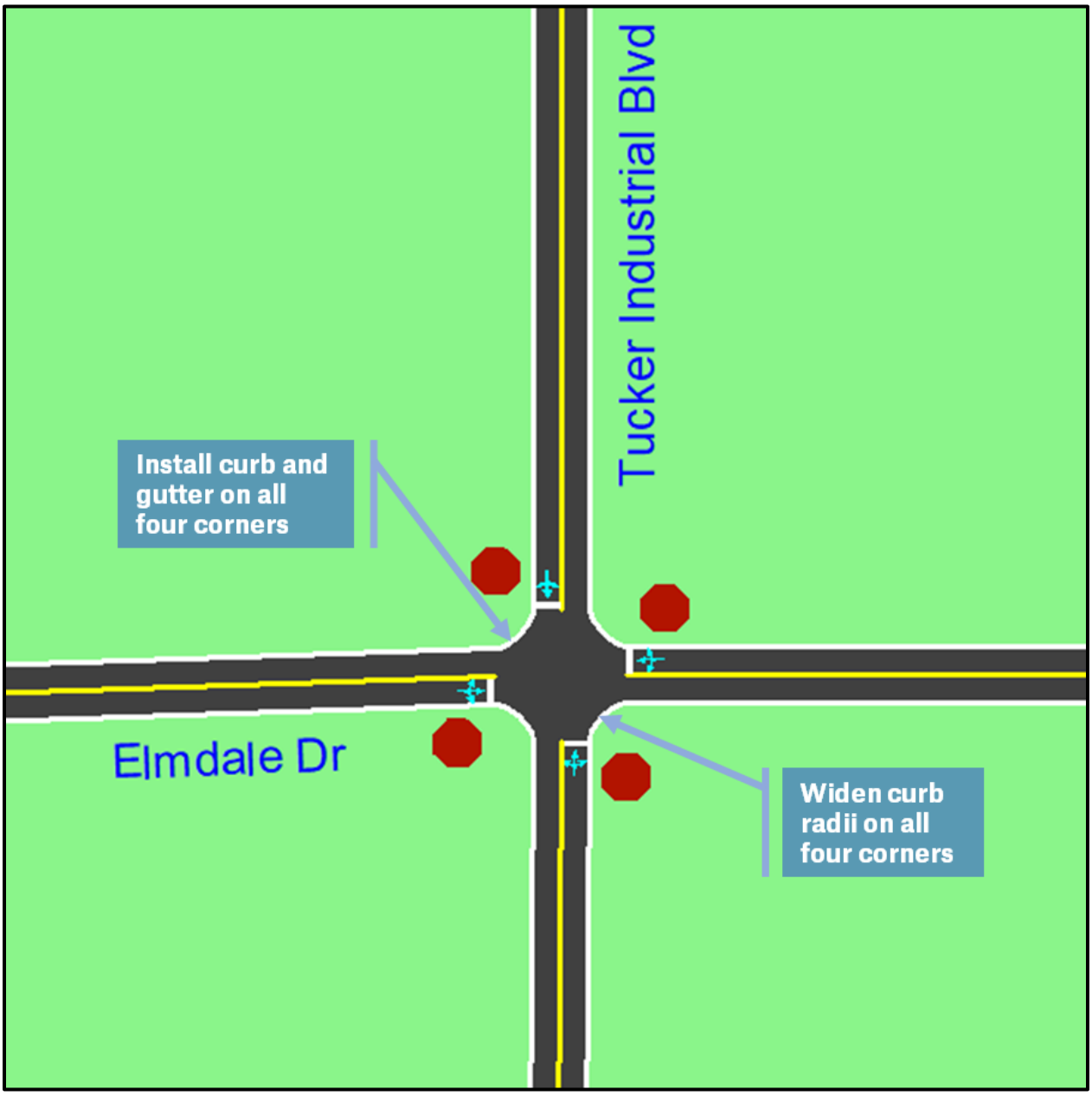
Figure 52: Proposed Improvement Schematic



4.3.6 Tucker Industrial Rd. @ Elmdale Dr.

- Repave and restripe the intersection, and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install raised curb and gutter on all four corners of the intersection with wide curb radii to accommodate right-turn movements by trucks. Install drainage structures at the intersection to ensure positive drainage at the intersection and along all four approaches.

Figure 53: Proposed Improvement Schematic

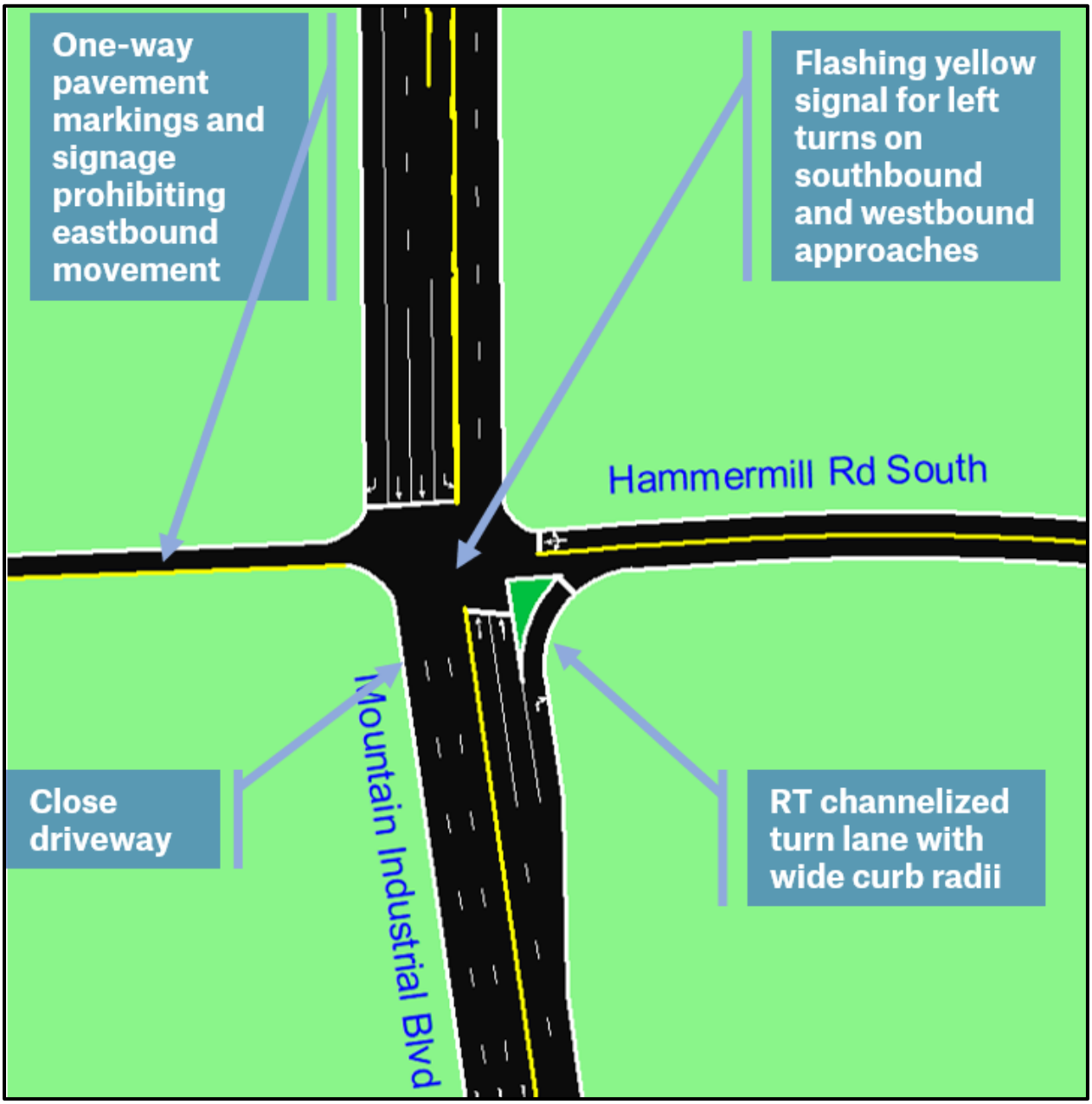


4.3.7 Mountain Industrial Blvd. @ Hammermill Rd. (South)

- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns on the southbound Mountain Industrial Blvd. approach and the westbound Hammermill Rd. (South) approach.
- Install a single right-turn lane with channelization and wide curb radius accommodating truck turning movements along the northbound Mountain Industrial Blvd. approach. (This is in addition to the improvements recommended by the TSCID's December 2019 traffic engineering study.)

- Install one-way pavement markings along the west leg of the intersection. Install signage at the Waffle House driveway on the west leg of the intersection prohibit vehicles entering the west leg of the intersection from Waffle House to get to Mountain Industrial Blvd.
- Remove “DO NOT ENTER” sign at the southwest corner of the intersection to allow westbound through-traffic at the intersection to access the Waffle House lot.
- Install a “NO LEFT TURN” sign to prohibit left-turns along the northbound Mountain Industrial Blvd. approach.
- As a long-term measure, consider converting the west leg of this intersection into a bidirectional street to connect Mountain Industrial Blvd. to Tucker Industrial Rd. With this improvement, also consider a left-turn lane along the northbound Mountain Industrial Blvd. approach and allow northbound left-turn traffic from Mountain Industrial Blvd.
- Close driveway to “Public Storage” parcel along the west side of Mountain Industrial Blvd. south of the intersection. Provide access to the “Public Storage” parcel via inter-parcel access from the Valero gas station parcel.
- Install sidewalks along the west side of Mountain Industrial Blvd. south of the intersection. Extend the sidewalks to the US 78 interchange.

Figure 54: Proposed Improvement Schematic

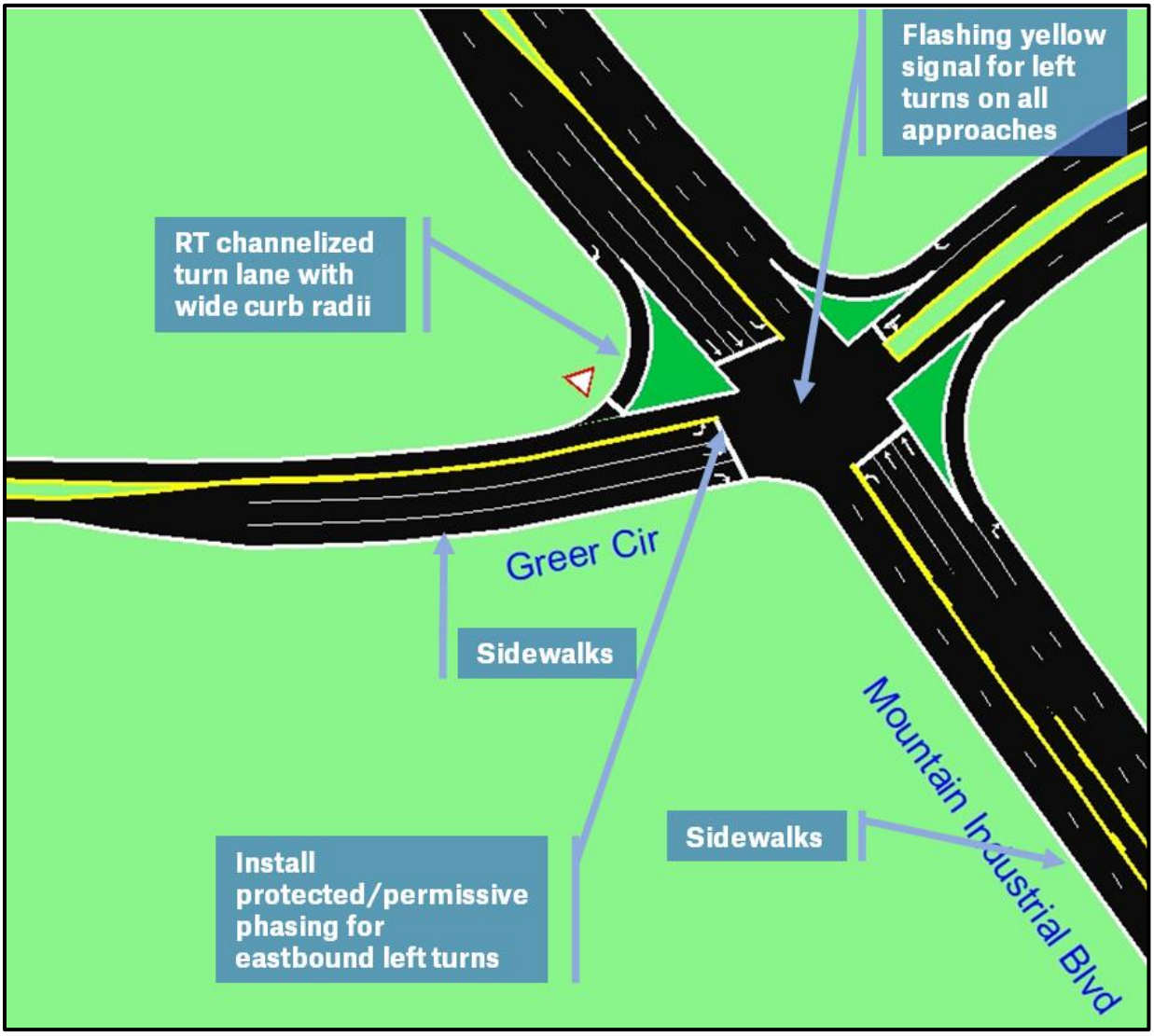


4.3.8 Mountain Industrial Blvd. @ Greer Cir.

- Repave and restripe Greer Cir. east of the intersection, and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install protected/permissive phasing for the eastbound Greer Cir. left-turn movement.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns on all four approaches.

- Install a single right-turn lane with channelization and wide curb radius to accommodate truck turning movements along the southbound Mountain Industrial Blvd. approach. (This is in addition to the improvements recommended by the TSCID's December 2019 traffic engineering study.)
- Install sidewalks along the west side of Mountain Industrial Blvd. and along Greer Cir. west of the intersection.

Figure 55: Proposed Improvement Schematic

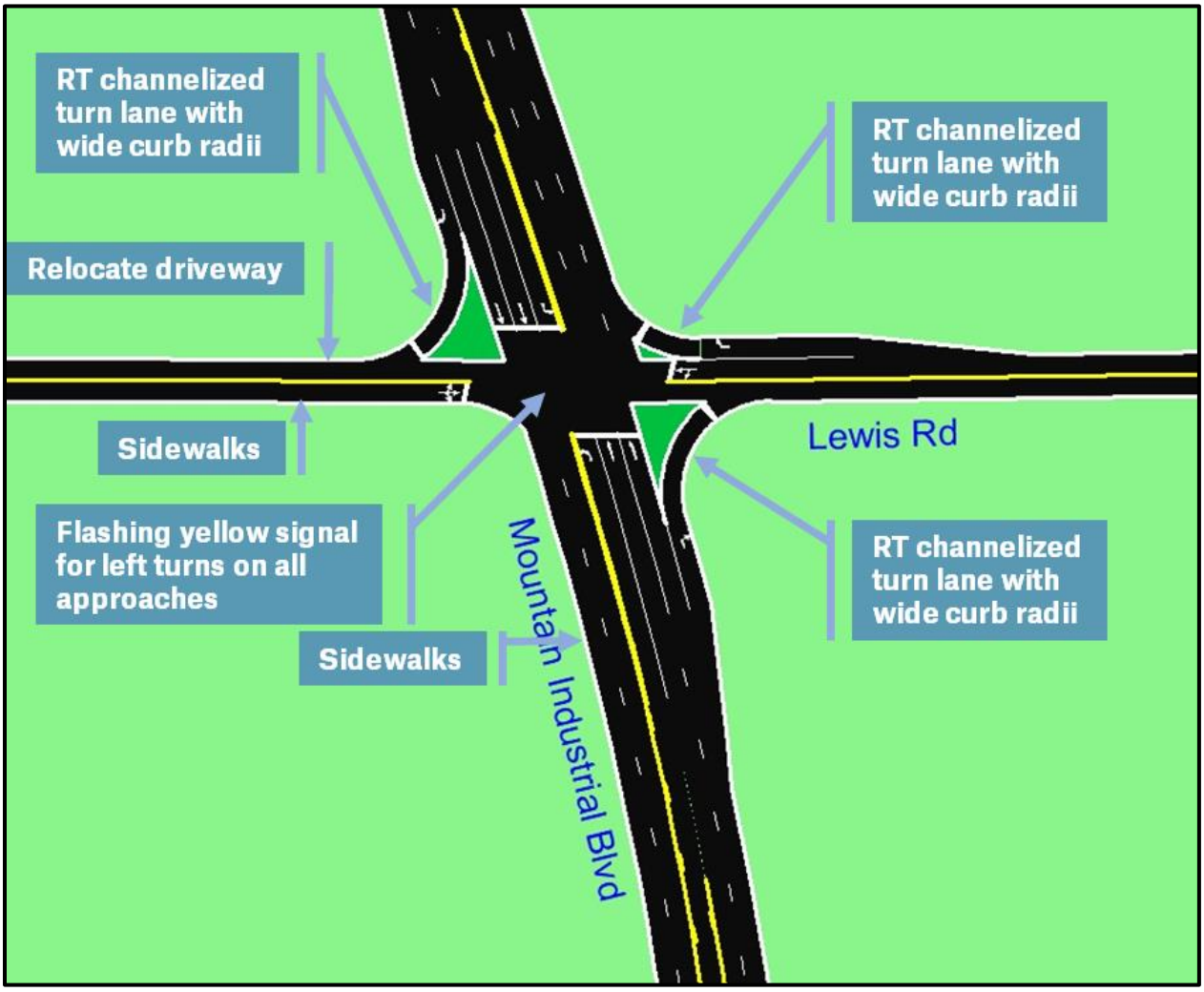


4.3.9 Mountain Industrial Blvd. @ Lewis Rd.

- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns on all four approaches.
- Install single right-turn lanes with channelization and wide curb radii accommodating truck turning movements along the northbound and southbound Mountain Industrial Blvd. approaches and along the westbound Lewis Rd. approach.

- Install sidewalks along the west side of Mountain Industrial Blvd. and along Lewis Rd. west of the intersection.
- Relocate the driveway along Lewis Rd. west of the intersection further away from the intersection.

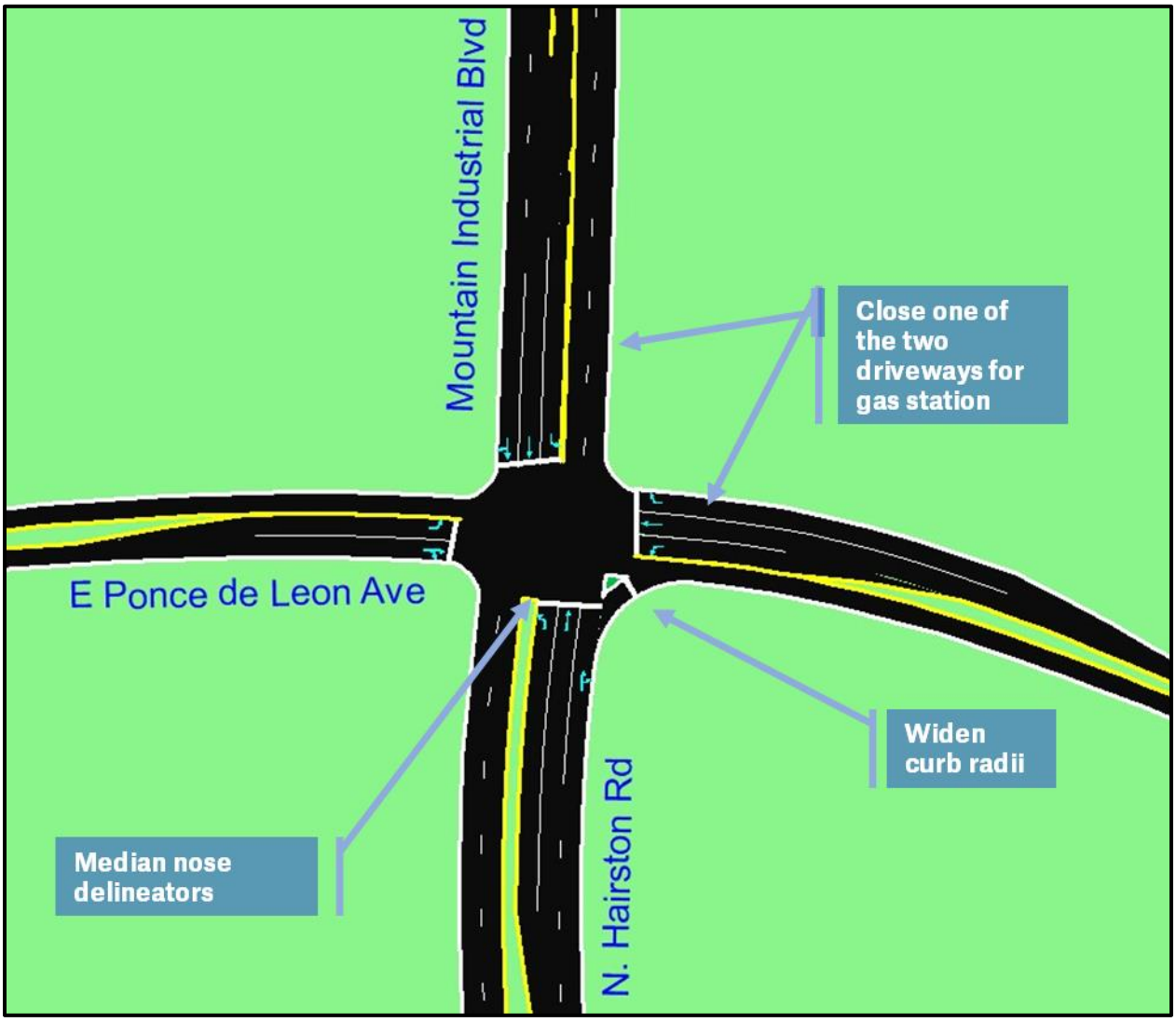
Figure 56: Proposed Improvement Schematic



4.3.10 Mountain Industrial Blvd. @ E. Ponce de Leon Ave.

- Install median nose delineators at the median along the south leg of the intersection (N. Hairston Rd.)
- Reconstruct the southeast quadrant of the intersection to widen the curb radius in order to accommodate wider right-turn movements by trucks.
- Close one of the two (the one closest to the intersection) Texaco driveways along each Mountain Industrial Blvd. and E. Ponce de Leon Ave. at the northeast corner of the intersection.

Figure 57: Proposed Improvement Schematic

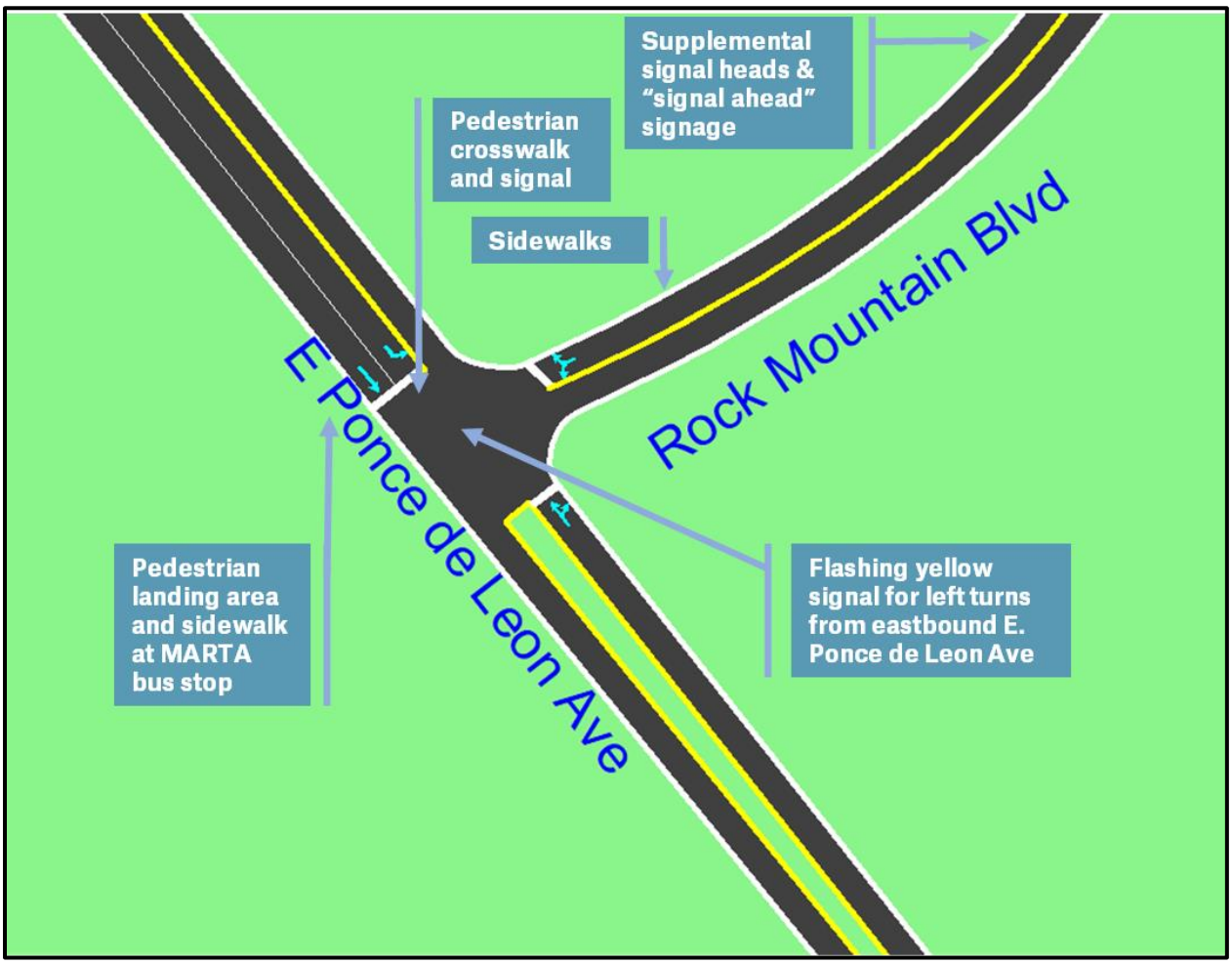


4.3.11 E. Ponce de Leon Ave. @ Rock Mountain Blvd.

- Restripe the intersection and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install flashing yellow arrow signal head indications for the left-turns along the eastbound E. Ponce de Leon Ave. approach.
- Install a pedestrian crosswalk and pedestrian signals west of the intersection to cross E. Ponce de Leon Ave. Install pedestrian landing area at the MARTA stop on the southwest corner of the intersection and install sidewalks from the landing area to the crosswalk across E. Ponce de Leon Ave.

- Install supplemental signal heads and advance signal ahead sign for the southbound Rock Mountain Blvd. approach to the intersection.
- Install sidewalk along the west side of Rock Mountain Blvd. from the intersection curb radius to the existing sidewalk approximately 1500' north of the intersection.

Figure 58: Proposed Improvement Schematic

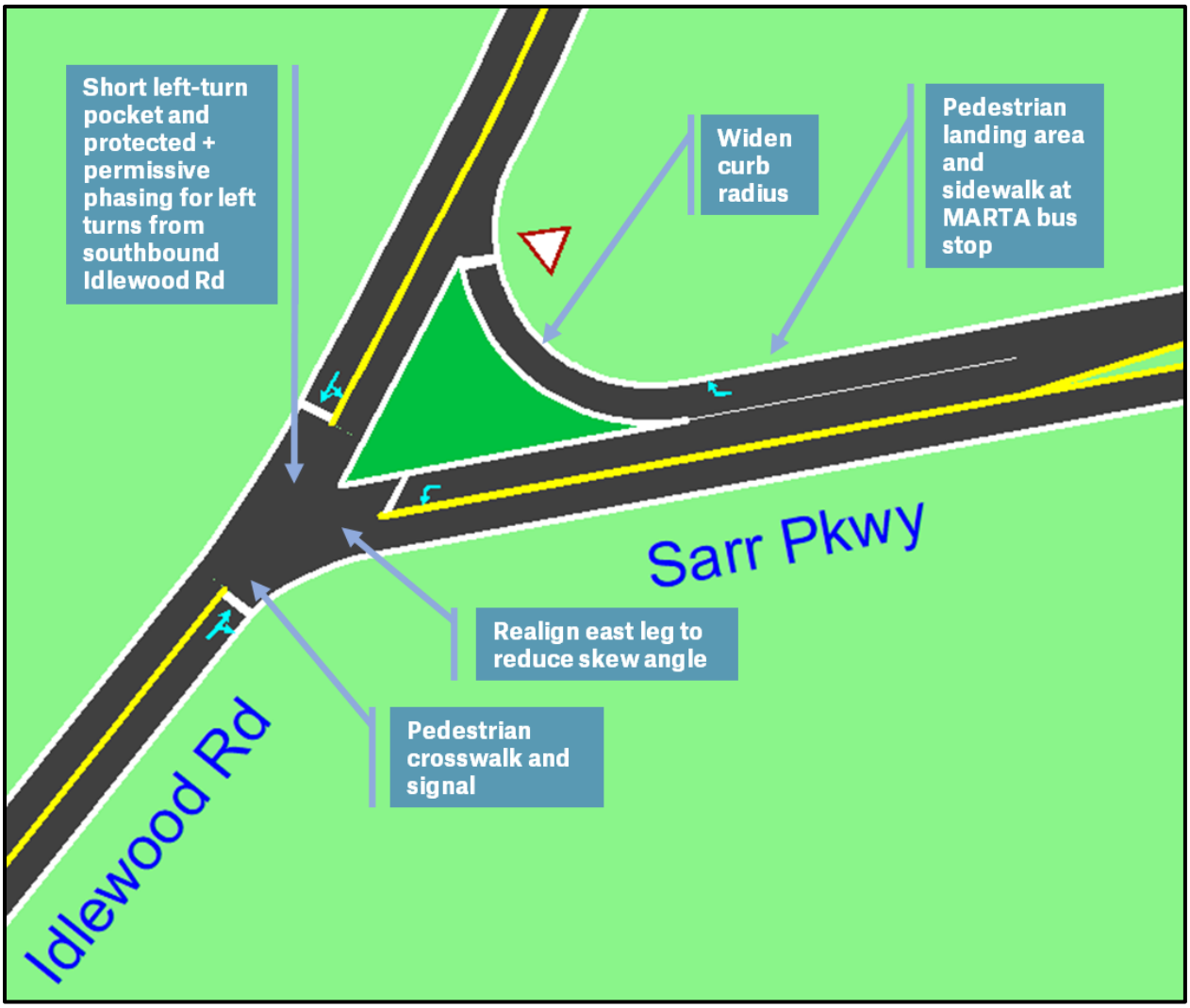


4.3.12 Idlewood Rd. @ Sarr Pkwy.

- Restripe the intersection and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install protected + permissive phasing for the left-turns along the southbound Idlewood Rd. approach to the intersection.
- Install a short left-turn pocket for the left-turns along the southbound Idlewood Rd. approach to the intersection.

- Reconstruct the northeast quadrant of the intersection to widen the curb radius in order to accommodate wider right-turning truck movements along the westbound Sarr Pkwy. approach.
- Realign the Sarr Pkwy. approach to the intersection to reduce the intersection skew angle.
- Install a pedestrian crosswalk and pedestrian signals east of the intersection to cross Sarr Pkwy. Install pedestrian landing area at the MARTA stop on the northeast corner of the intersection and install sidewalks from the landing area to the crosswalk across Sarr Pkwy.

Figure 59: Proposed Improvement Schematic

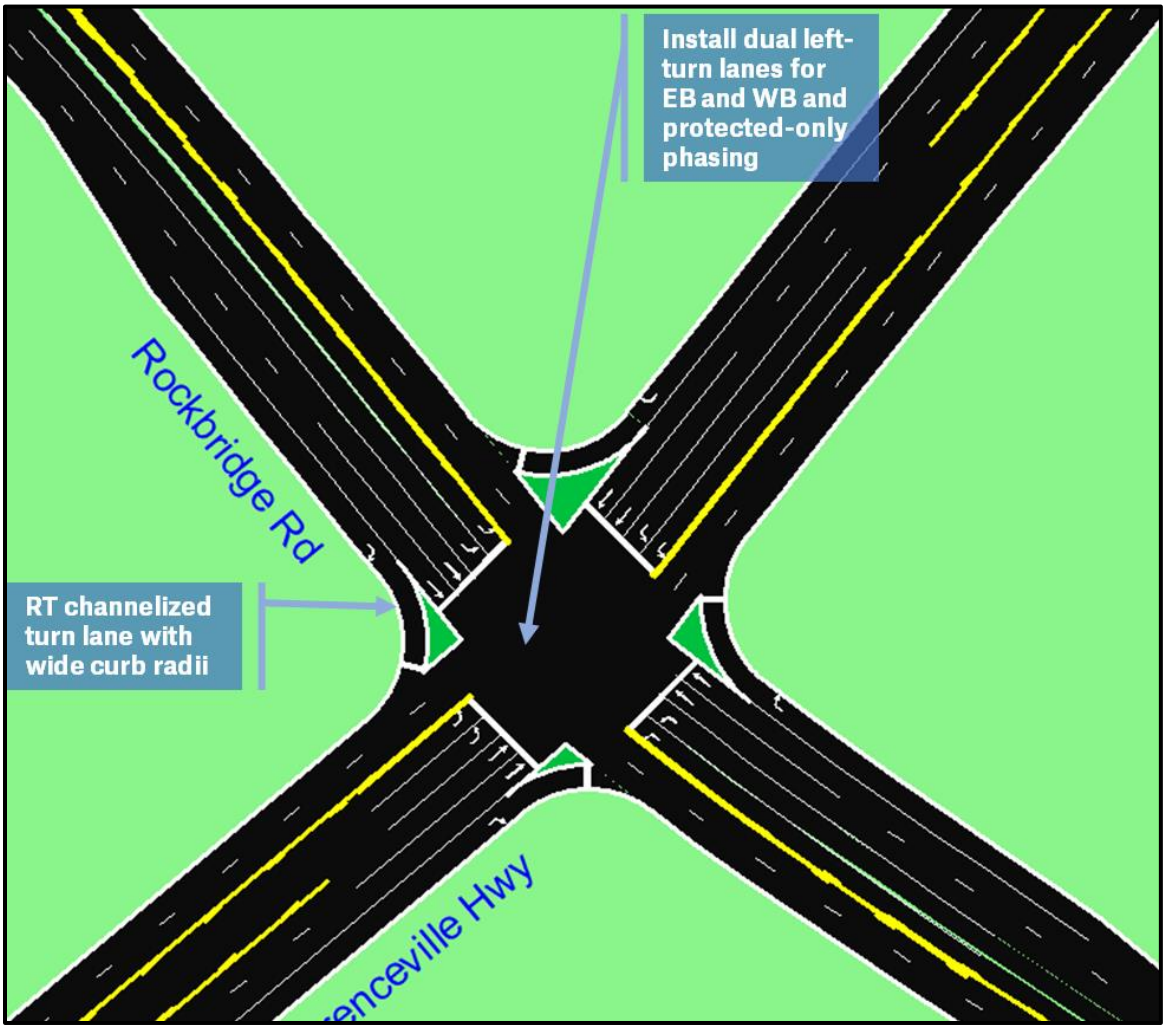


4.3.13 Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.

- Restripe the intersection and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install backplates with retroreflective borders to all traffic signal head indications.

- Install a second left-turn lane along the eastbound and westbound Lawrenceville Hwy. (US 29/SR 8) approaches and convert these left-turns to protected-only movements.
- Install single right-turn lanes with channelization and wide curb radii accommodating truck turning movements along the southbound Rockbridge Rd. approach and along the eastbound Lawrenceville Hwy. (US 29/SR 8) approach.
- Repair the minor damage to the southeast curb radii of the intersection.

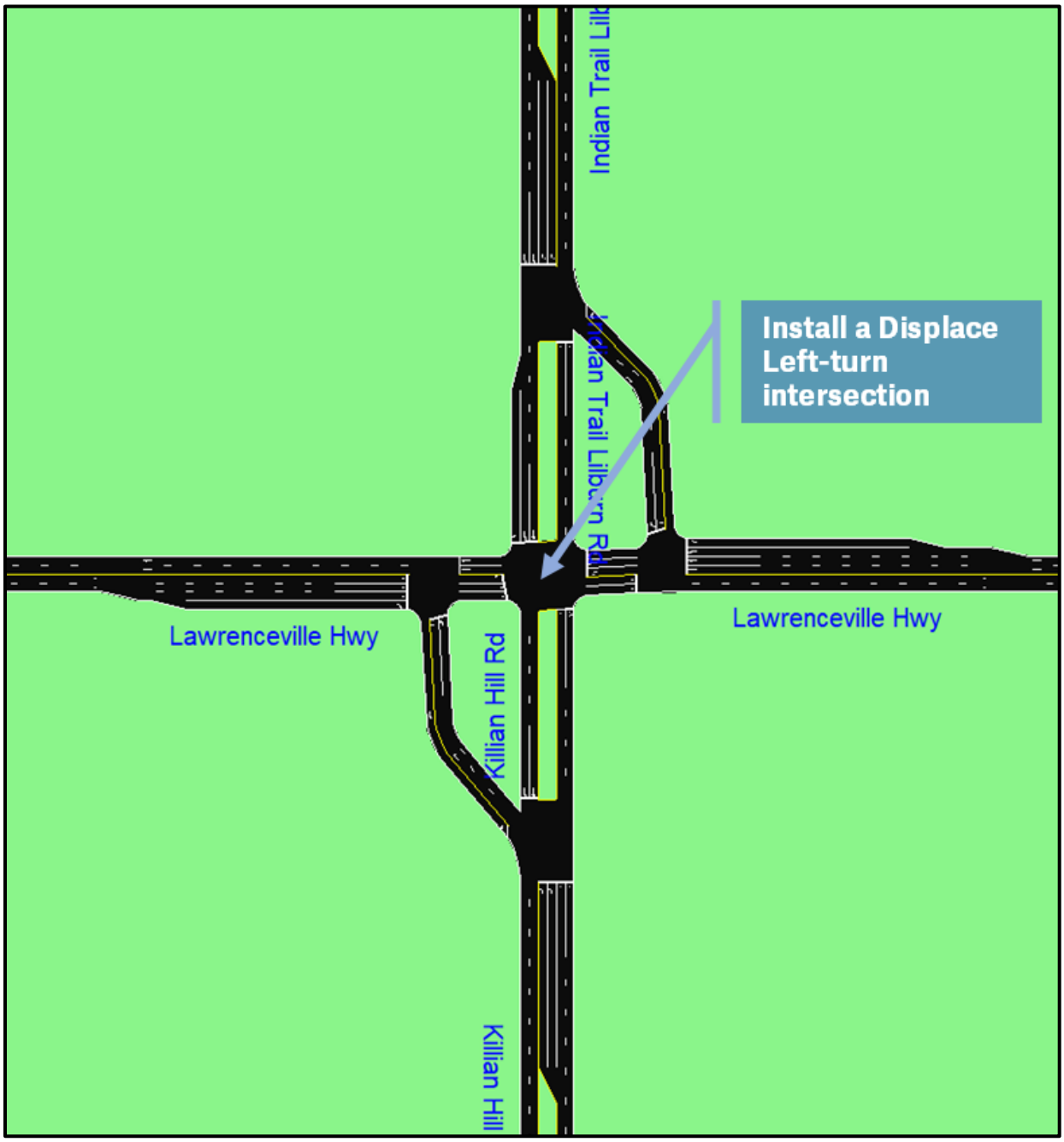
Figure 60: Proposed Improvement Schematic



4.3.14 Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.

- Restripe the intersection and install raised pavement markers. Raised pavement markers improve the intersection safety by enhancing delineation and driver awareness and by providing positive guidance for motorists, especially in low visibility conditions.
- Install backplates with retroreflective borders to all traffic signal head indications.
- Install a two-legged Displaced Left-Turn (DLT) intersection by crossing over the northbound left-turn along Killian Hill Rd. and the southbound left-turn along Indian Trail Lilburn Rd.

Figure 61: Proposed Improvement Schematic



4.4 Intersection Capacity Analysis – With Improvements

Based on the future year (2030) AM and PM peak hour turning movement traffic volumes, and the proposed traffic control and lane configurations, AM and PM peak hour traffic operations were analyzed at the study intersections to determine the benefits of the proposed improvements in the future condition. The results of the intersection LOS and delay analysis for the future year (2030) conditions with the proposed improvements are summarized in Table 9. There are several intersections where the

proposed improvements are aimed at enhancing safety and operations at those intersection and are not expected to explicitly increase the capacity of these intersections. Therefore, the LOS and delay at these intersections are not reported in Table 9. Detailed HCM analyses, including capacity analysis worksheets, is included in Appendix C.

Table 9. Future Year (2030) Intersection Level of Service – with Improvements

Study Intersection	Intersection Control Type	Future Year (2030)	
		AM LOS *Delay (s)*	PM LOS *Delay (s)*
Mountain Industrial Blvd. @ N. Royal Atlanta Dr.	Signal	A *9.4*	B *18.9*
Lawrenceville Hwy. (US 29/SR 8) @ N. Royal Atlanta Dr.	Signal	B *11.4*	B *13.6*
Mountain Industrial Blvd. @ S. Royal Atlanta Dr.	Signal	A *4.2*	B *19.0*
Tucker Industrial Rd. @ Hugh Howell Rd. (SR 236)	Signal	B *19.1*	B *15.1*
Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way	Signal	B *19.4*	D *47.3*
Tucker Industrial Rd. @ Elmdale Dr.	All Way Stop	A *9.9*	B *13.6*
Mountain Industrial Blvd. @ Hammermill Rd. (South)	Signal	A *8.7*	B *13.8*
Mountain Industrial Blvd. @ Greer Cir.	Signal	B *12.2*	B *20.0*
Mountain Industrial Blvd. @ Lewis Rd.	Signal	A *7.1*	A *6.3*
Mountain Industrial Blvd. @ E. Ponce de Leon Ave.	Signal	C *29.2*	C *21.7*
E. Ponce de Leon Ave. @ Rock Mountain Blvd.	Signal	B *17.4*	C *23.2*
Idlewood Rd. @ Sarr Pkwy.	Signal	A *2.3*	B *13.5*
Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd.	Signal	D *53.7*	D *40.2*
Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd.	Displaced Left-Turn Intersection	D *51.4*	D *35.2*

5 Conclusion and Summary of Findings

1. Under the existing year (2020) conditions, all study intersections operate at LOS D or better in the AM and PM peak hours with one exception. The Lawrenceville Hwy. (US 29/SR 8) @ Indian Trail Lilburn Rd./Killian Hill Rd. intersection operates at LOS E in the AM peak hour.
2. Based on the expected growth in traffic at the study intersections, if no improvements are made, four intersections are projected to operate at LOS D or worse in at least one of the AM and PM

peak hours during the future year (2030). The Mountain Industrial Blvd. @ Elmdale Dr./Roger Marten Way intersection operates at LOS F during the PM peak hour. The Mountain Industrial Blvd. @ E. Ponce de Leon Ave. intersection operates at LOS E during the AM peak hour. The Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd. intersection operates at LOS E during the AM peak hour. The Lawrenceville Hwy. (US 29/SR 8) @ Rockbridge Rd. intersection operates at LOS F and LOS E during the AM and PM peak hours respectively.

3. Based on the future year (2030) traffic volumes, future year intersection capacity analysis, field observations, and the crash history at the study intersections, several improvements are proposed to address and mitigate the safety, operational and capacity deficiencies at the study intersections.
4. With the proposed improvements, all study intersections are projected to operate at LOS D or better in the AM and PM peak hours during the future year (2030).