

**TRAFFIC IMPACT STUDY
FOR
HUGH HOWELL ROAD RETAIL CENTER
TUCKER, GEORGIA**



Prepared for:

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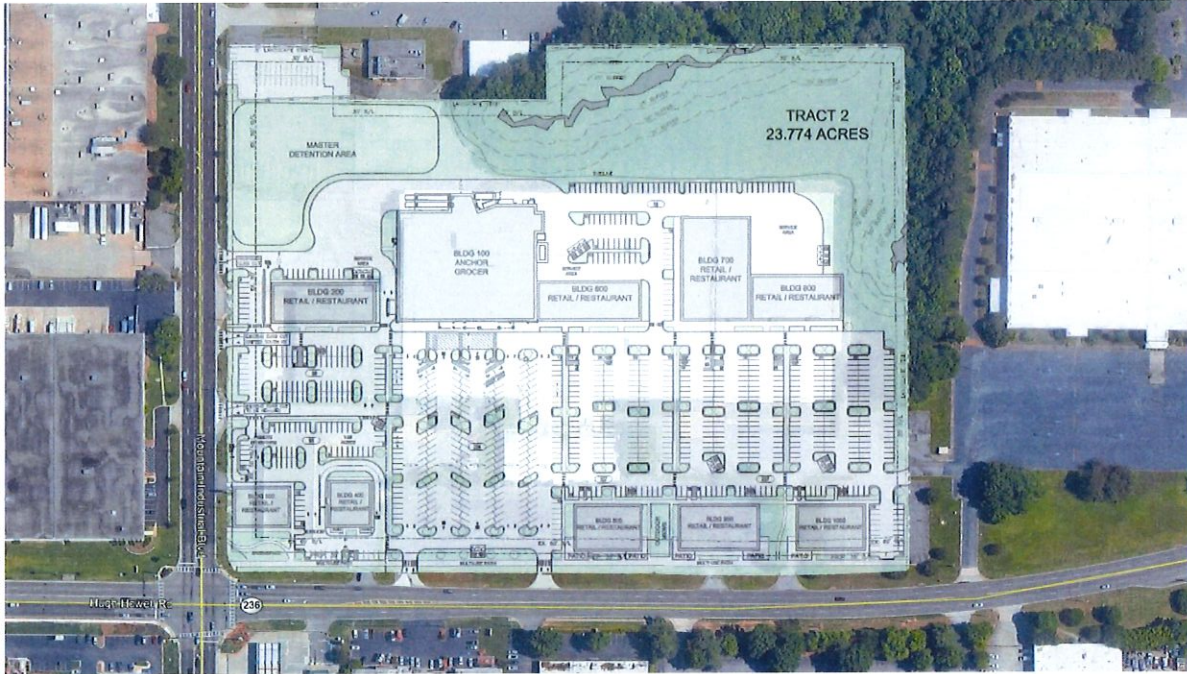
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1.0 INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the proposed retail development located in the northeast corner of the intersection of SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard in Tucker, Georgia. The traffic analysis evaluates the current operations compared to the future conditions with the traffic generated by the development. The proposed development will consist of a 48,848 square foot supermarket and 105,152 square feet of retail/restaurant space.



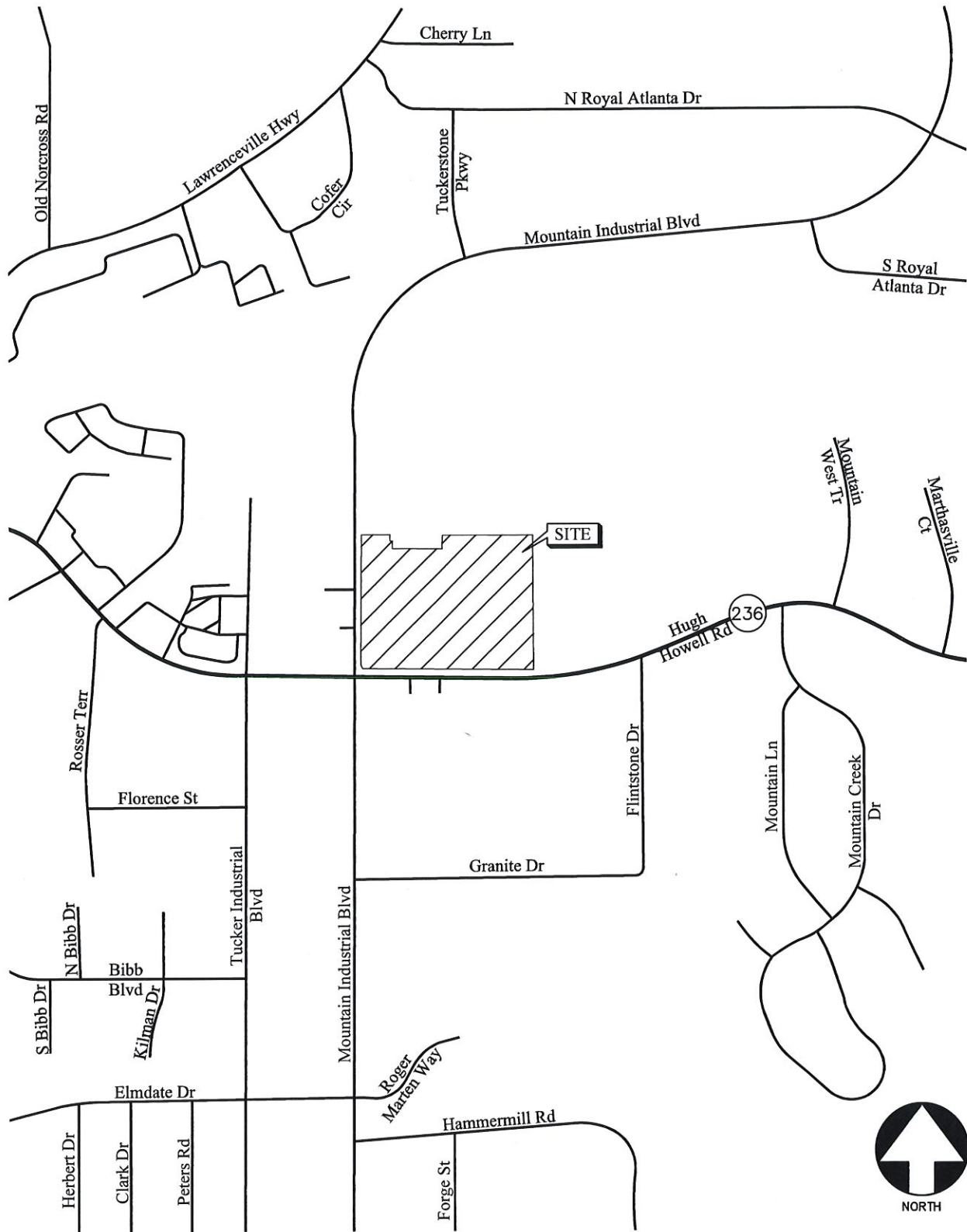
The development proposes access at the following locations:

- Site Driveway 1: Northern full-access driveway on Mountain Industrial Boulevard
- Site Driveway 2: Middle full-access driveway on Mountain Industrial Boulevard
- Site Driveway 3: Southern full-access driveway on Mountain Industrial Boulevard, aligned with the southern CubeSmart driveway
- Site Driveway 4: Western full-access driveway on SR 236 (Hugh Howell Road)
- Site Driveway 5: Eastern full-access driveway on SR 236 (Hugh Howell Road)

The AM and PM peak hours have been analyzed in this study. In addition to the site access points, this study includes the evaluation of traffic operations at the intersections of:

- SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard
- Mountain Industrial Boulevard at CubeSmart Driveway (S)
- Mountain Industrial Boulevard at CubeSmart Driveway (N)
- SR 236 (Hugh Howell Road) at MVP Auto Driveway
- SR 236 (Hugh Howell Road) at ProBrands Driveway
- SR 236 (Hugh Howell Road) at Tucker Industrial Road
- SR 236 (Hugh Howell Road) at Flintstone Drive

Recommendations to improve traffic operations have been identified as appropriate and are discussed in detail in the following sections of the report. The location of the development and the surrounding roadway network is shown in Figure 1.



LOCATION MAP

FIGURE 1

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2.0 EXISTING FACILITIES / CONDITIONS

The following is a brief description of each of the roadway facilities located in proximity to the site:

2.1 SR 236 (Hugh Howell Road)

SR 236 (Hugh Howell Road) is an east-west, four-lane, undivided roadway with a posted speed limit of 45 mph in the vicinity of the site. To the west of Mountain Industrial Boulevard, SR 236 (Hugh Howell Road) is a five-lane roadway with a two-way left-turn lane. GDOT traffic counts (Station IDs 089-3274 & 089-3276) indicate that the daily traffic volume on SR 236 (Hugh Howell Road) in 2018 was 25,600 vehicles per day west of Tucker Industrial Road and 13,300 vehicles per day east of Rosser Place. GDOT classifies SR 236 (Hugh Howell Road) as a Minor Arterial roadway.

2.2 Mountain Industrial Boulevard

Mountain Industrial Boulevard is a north-south, five-lane roadway with a two-way left-turn lane and posted speed limit of 45 mph. GDOT traffic counts (Station IDs 089-3536 & 089-3538) indicate that the daily traffic volume on Mountain Industrial Boulevard in 2018 was 40,200 vehicles per day south of SR 236 (Hugh Howell Road) and 29,500 vehicles per day north of SR 236 (Hugh Howell Road). GDOT classifies Mountain Industrial Boulevard as a Minor Arterial roadway.

2.3 Tucker Industrial Road

Tucker Industrial Road is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site.

2.4 Flintstone Drive

Flintstone Drive is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph in the vicinity of the site.

3.0 STUDY METHODOLOGY

In this study, the methodology used for evaluating traffic operations at each of the subject intersections is based on the criteria set forth in the Transportation Research Board's Highway Capacity Manual, 6th edition (HCM 6). At specific intersections in which HCM 6 is unable to report results, HCM 2000 will be used instead. Synchro software, which utilizes the HCM methodology, was used for the analysis. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

3.1 Unsignalized Intersections

For unsignalized intersections at which the side street or minor street is controlled by a stop sign, the criteria for evaluating traffic operations are the level-of-service (LOS) for the turning movements at the intersection and the level-of-service for the overall intersection. Level-of-service is based on the average controlled delay incurred at the intersection. Controlled delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Several factors affect the controlled delay for unsignalized intersections, such as the availability and distribution of gaps in the conflicting traffic stream, critical gaps, and follow-up time for a vehicle in the queue.

Level-of-service is assigned a letter designation from "A" through "F". Level-of-service "A" indicates excellent operations with little delay to motorists, while level-of-service "F" exists when there are insufficient gaps of acceptable size to allow vehicles on the side street to cross safely, resulting in extremely long total delays and long queues. The level-of-service criteria for two-way stop-controlled and all-way stop-controlled (unsignalized) intersections are given in Table 1.

Level-of-service	Average Delay (sec)
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Source: Highway Capacity Manual

3.2 Signalized Intersections

For signalized intersections, it is necessary to evaluate both capacity and level-of-service in order to evaluate the overall operation of the intersection. The capacity analysis of an intersection is performed by comparing the volume of traffic using the various lane groups at the intersection to the capacity of those lane groups. This results in a volume/capacity (v/c) ratio for each lane group. A v/c ratio greater than 1.0 indicates that the volume of traffic has exceeded the capacity available, resulting in a temporary excess of demand. Although the capacity of the entire intersection is not defined, a composite v/c ratio for the sum of the critical lane groups within the intersection is computed. This composite v/c ratio is an indication of the overall intersection sufficiency.

Level-of-service for a signalized intersection is defined in terms of average controlled delay per vehicle, which is composed of initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for signalized intersections, based on average controlled delay, are shown in Table 2. Level-of-service "A" indicates operations with very low controlled delay, while level-of-service "F" describes operations with extremely high average controlled delay. Level-of-service "E" is typically considered to be the limit of acceptable delay, and level-of-service "F" is considered unacceptable by most drivers.

TABLE 2 – LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS	
Level-of-service	Average Control Delay (sec)
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Source: Highway Capacity Manual

4.0 EXISTING TRAFFIC ANALYSIS

Existing traffic counts were obtained at the following study intersections:

- SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard
- Mountain Industrial Boulevard at CubeSmart Driveway (S)
- Mountain Industrial Boulevard at CubeSmart Driveway (N)
- SR 236 (Hugh Howell Road) at MVP Auto Driveway
- SR 236 (Hugh Howell Road) at ProBrands Driveway
- SR 236 (Hugh Howell Road) at Tucker Industrial Road
- SR 236 (Hugh Howell Road) at Flintstone Drive

Turning movement counts including trucks and buses were collected on Tuesday, August 20, 2019. All turning movement counts were recorded during the AM and PM peak hours between 7:00am to 9:00am and 4:00pm to 6:00pm, respectively. The four consecutive 15-minute interval volumes that summed to produce the highest volume at the intersections were then determined. These volumes make up the peak hour traffic volumes for the intersections counted and are shown in Figure 2.

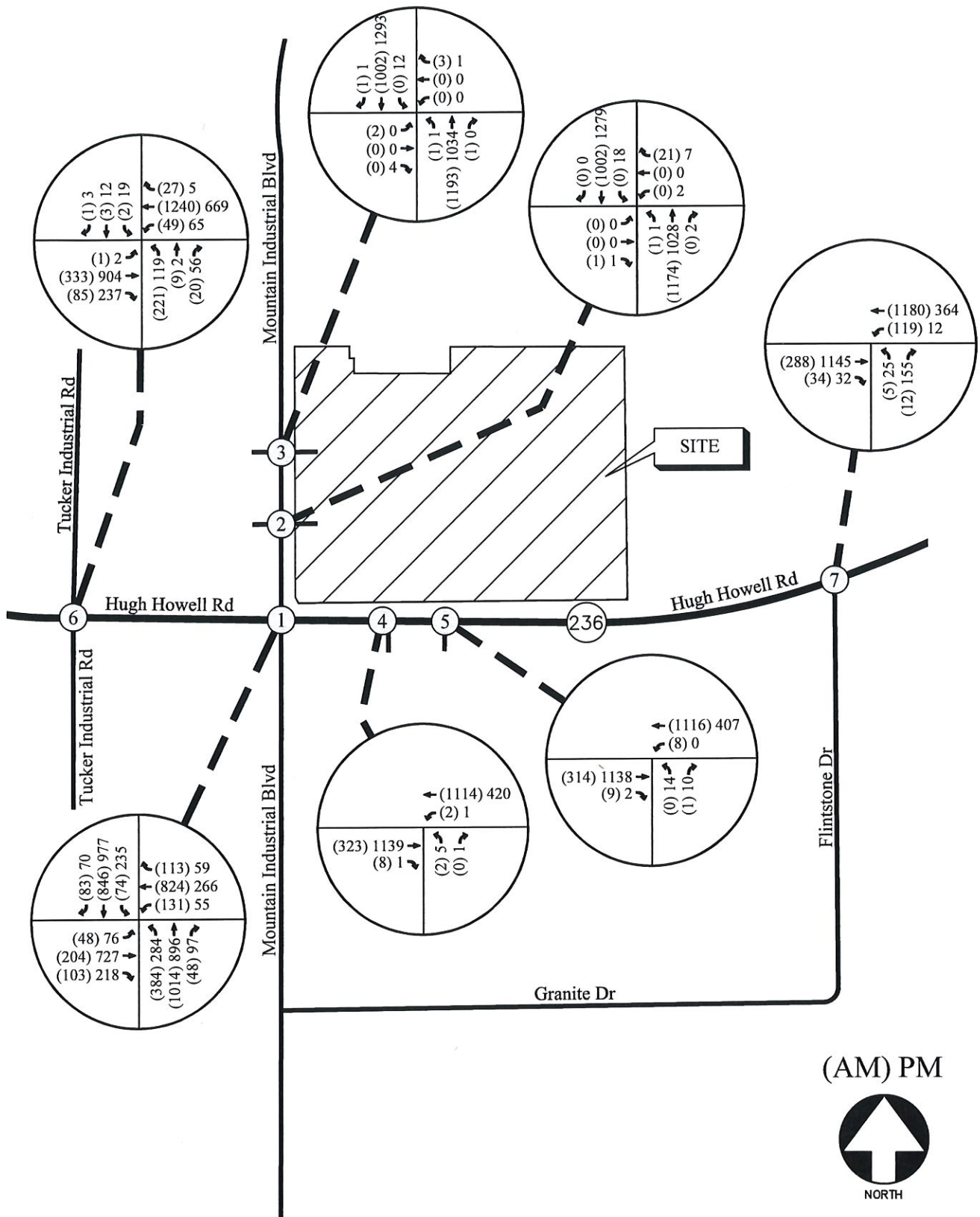
4.1 Existing Traffic Operations

Existing traffic operations were analyzed at the study intersections in accordance with the HCM methodology, and the results of the analysis are shown below in Table 3. The existing traffic control and lane geometry for the intersections are shown in Figure 3.

TABLE 3 – EXISTING INTERSECTION OPERATIONS				
	Intersection	Traffic Control	LOS (Delay)	
			AM Peak Hour	PM Peak Hour
1	<u>SR 236 @ Mountain Industrial Blvd</u>	Signalized	F (151.0)	F (141.0)
	-Eastbound Approach		A (7.8)	C (27.7)
	-Westbound Approach		C (31.2)	C (32.1)
	-Northbound Approach		F (310.8)	F (278.7)
	-Southbound Approach		F (98.6)	F (98.5)
2	<u>Mountain Industrial Blvd @ CubeSmart (S)</u>	Stop Controlled on EB/WB Approaches	B (12.1)	B (12.4)
	-Eastbound Approach		B (13.5)	B (14.0)
	-Westbound Approach		B (10.3)	B (10.6)
	-Northbound Left		A (0.0)	A (0.0)
	-Southbound Left			
3	<u>Mountain Industrial Blvd @ CubeSmart (N)</u>	Stop Controlled on EB/WB Approaches	E (35.0)	D (27.8)
	-Eastbound Approach		B (13.3)	B (13.7)
	-Westbound Approach		B (10.3)	B (10.6)
	-Northbound Left		A (0.0)	A (0.0)
	-Southbound Left			
4	<u>SR 236 @ MVP Auto Drwy</u>	Stop Controlled on NB Approach	A (8.0)	A (8.0)
	-Westbound Left		C (19.2)	C (19.2)
	-Northbound Approach			
5	<u>SR 236 @ ProBrands Drwy</u>	Stop Controlled on NB Approach	A (8.0)	A (8.0)
	-Westbound Left		B (11.0)	A (9.3)
	-Northbound Approach			

6	<u>SR 236 @ Tucker Industrial Rd</u>	Signalized	<u>A (7.2)</u>	<u>B (17.3)</u>
	-Eastbound Approach		B (11.2)	B (10.4)
	-Westbound Approach		A (0.6)	B (11.6)
	-Northbound Approach		D (35.1)	E (58.2)
7	<u>SR 236 @ Flintstone Dr</u>	Stop Controlled on NB Approach	C (25.4)	D (42.6)
	-Westbound Left		A (8.2)	A (8.3)
	-Northbound Approach		C (20.8)	C (18.1)

The results of the existing operations analysis indicate that the signalized intersection of SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard is currently operating at an overall level-of-service "F" during the AM and PM peak hours. These areas are addressed in the Future Traffic Operations section.



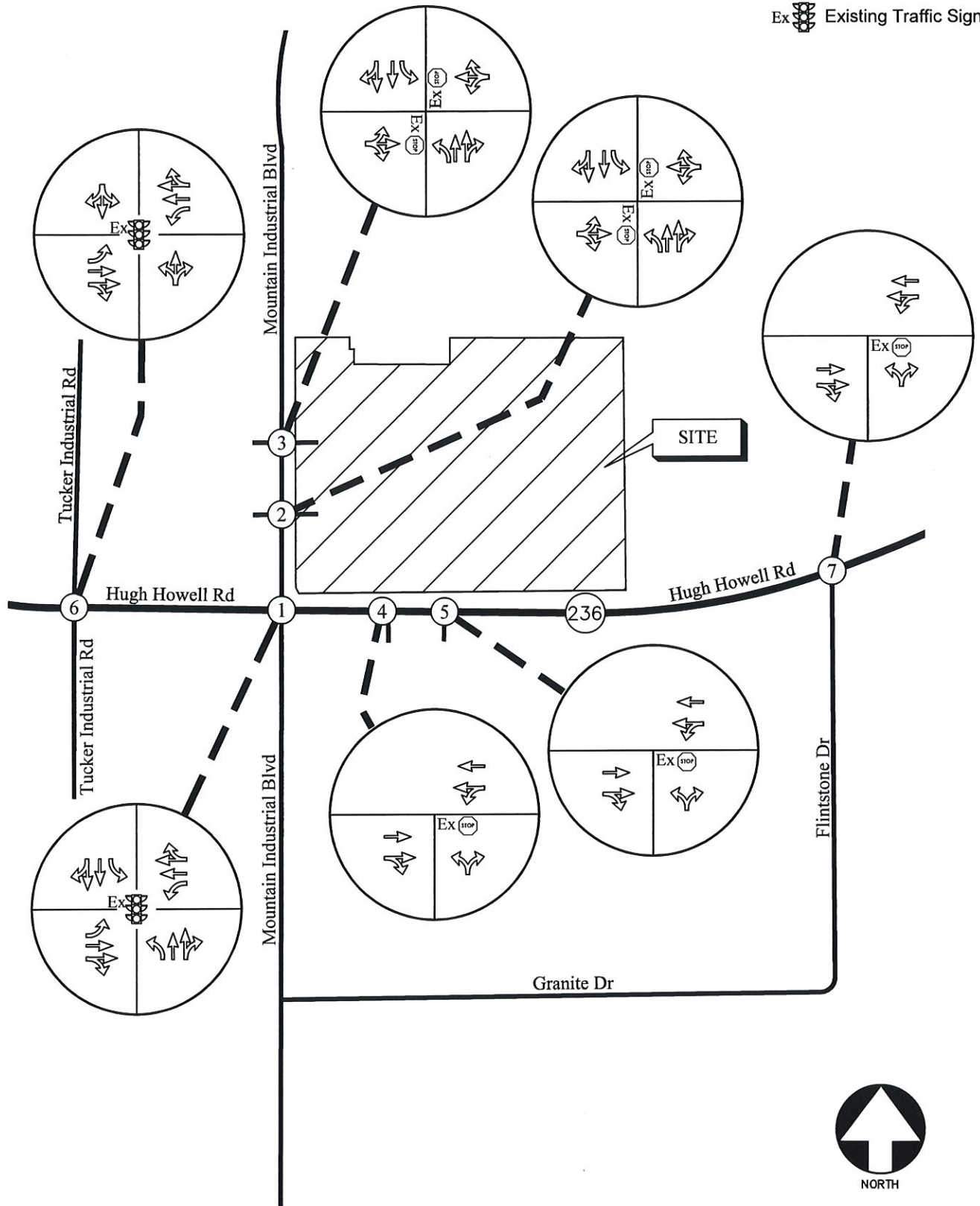
EXISTING WEEKDAY PEAK HOUR VOLUMES

FIGURE 2

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LEGEND

- Ex  Existing Signed Approach
-  Existing Lane Geometry
- Ex  Existing Traffic Signal



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 3

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5.0 PROPOSED DEVELOPMENT

The proposed retail development will be located in the northeast corner of the intersection of SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard in Tucker, Georgia. The development will consist of a 48,848 square foot supermarket and 105,152 square feet of retail/restaurant space.

The development proposes access at the following locations:

- Site Driveway 1: Northern full-access driveway on Mountain Industrial Boulevard
- Site Driveway 2: Middle full-access driveway on Mountain Industrial Boulevard
- Site Driveway 3: Southern full-access driveway on Mountain Industrial Boulevard, aligned with the southern CubeSmart driveway
- Site Driveway 4: Western full-access driveway on SR 236 (Hugh Howell Road)
- Site Driveway 5: Eastern full-access driveway on SR 236 (Hugh Howell Road)

A site plan is shown in Figure 4.

5.1 Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 10th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. This reference contains traffic volume count data collected at similar facilities nationwide. The trip generation was based on the following ITE Land Uses: 820 – *Shopping Center* and 850 – *Supermarket*. Due to the nature of the development, pass-by reductions have been applied per ITE standards. The calculated total trip generation for the proposed development is shown in Table 4.

Land Use	Size	AM Peak Hour			PM Peak Hour			24-Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
Supermarket	48,848 sf	112	75	187	234	224	458	4,675
	<i>Pass-by Trips (0%) 36%</i>	0	0	0	-84	-81	-165	-1,650
Shopping Center	105,152 sf	61	38	99	192	209	401	3,969
	<i>Pass-by Trips (0%) 34%</i>	0	0	0	-65	-71	-136	-1,349
Total Trips (without Reductions)		173	113	286	426	433	859	8,644
New External Trips (with Reductions)		173	113	286	277	281	558	5,645

**Pass-by trips (AM) PM; Daily pass-by reduction est. to be least of PM peak pass-by rate or 10x PM pass-by volume*

5.2 Trip Distribution

The trip distribution describes how traffic arrives and departs from the site. An overall trip distribution was developed for the site based on a review of the existing travel patterns in the area and the locations of major roadways and highways that will serve the development. The site-generated peak hour traffic volumes, shown in Table 4, were assigned to the study area intersections based on this distribution. The outer-leg distribution and AM and PM peak hour new traffic generated by the site are shown in Figure 5.



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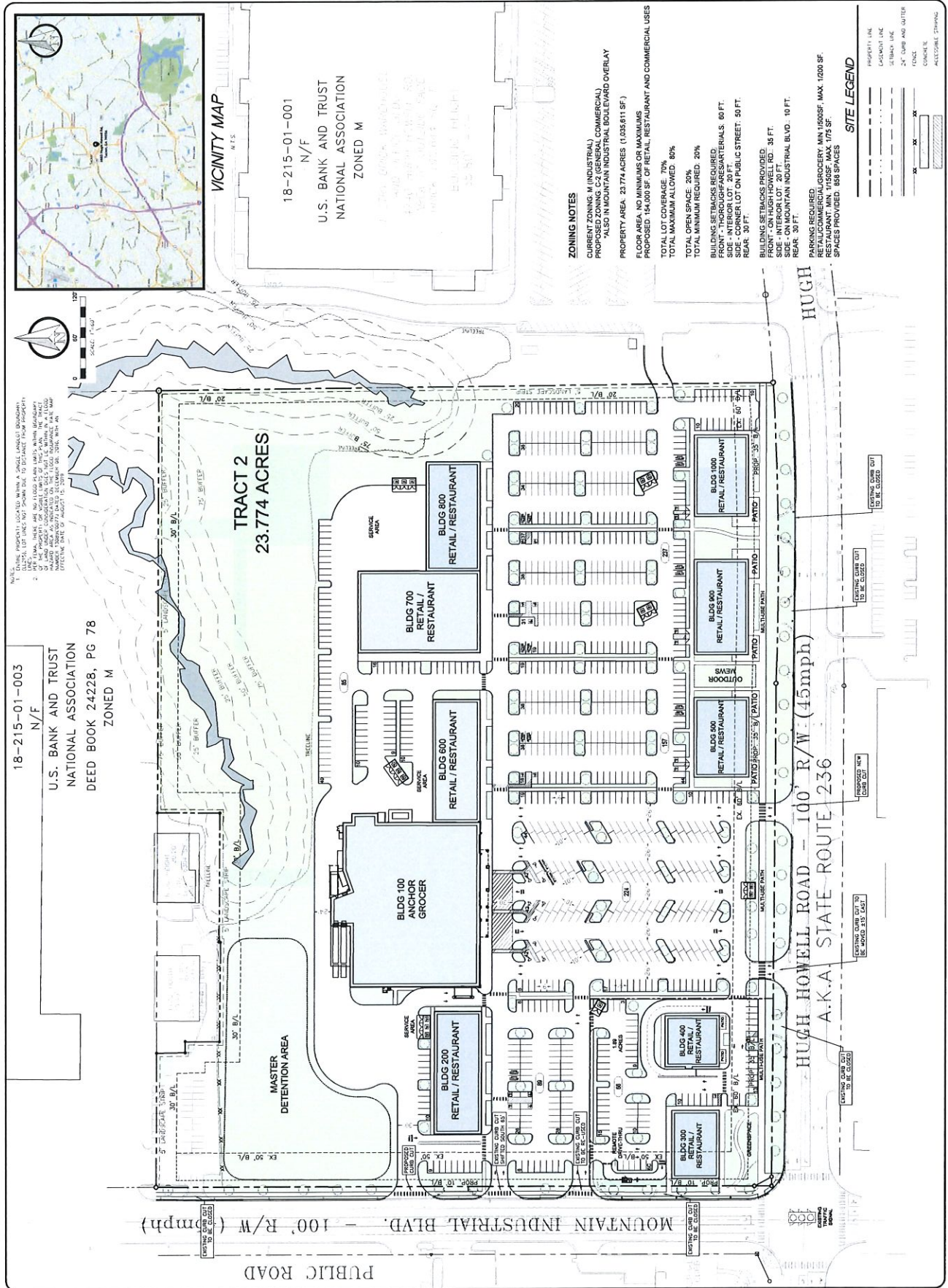
BRANCH ACQUISITION
 COMPANY, LLC
 1540 PEARSON STREET, NE, SUITE 2775
 ATLANTA, GA 30328
 404.815.8955

BRANCH
 HUGH HOWELL ROAD
 ZONING PACKAGE
 ISSUED FOR:
 HUGH HOWELL ROAD
 JURISDICTION: CITY OF TUCKER
 LOCATION: 4650 HUGH HOWELL RD
 TUCKER, GA 30084

#	DATE	REVISIONS

DRAWN: RHC
 CHECK: RHC
 DATE: 09/19/19
 JOB NO: 19-142

ZONING
 SITE PLAN
 SHEET 7-2



18-215-01-003
 N/F
 U.S. BANK AND TRUST
 NATIONAL ASSOCIATION
 DEED BOOK 24228, PG 78
 ZONED M

TRACT 2
 23.774 ACRES

18-215-01-001
 N/F
 U.S. BANK AND TRUST
 NATIONAL ASSOCIATION
 ZONED M

ZONING NOTES

CURRENT ZONING: M (INDUSTRIAL)
 PROPOSED ZONING: C2 (GENERAL COMMERCIAL)
 ALSO IN MOUNTAIN INDUSTRIAL BOULEVARD OVERLAY

PROPERTY AREA: 23.774 ACRES (1,035,611 SF)
 FLOOR AREA: NO MINIMUMS OR MAXIMUMS
 PROPOSED: 154,000 SF OF RETAIL, RESTAURANT AND COMMERCIAL USES

TOTAL LOT COVERAGE: 72%
 TOTAL MAXIMUM ALLOWED: 80%

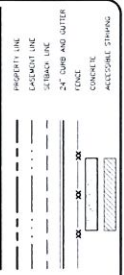
TOTAL OPEN SPACES: 25%
 TOTAL MINIMUM REQUIRED: 20%

PARKING SPACES REQUIRED:
 PROPOSED: 1,000 SPACES
 SIDE - INTERIOR LOT: 20 FT.
 SIDE - CORNER LOT ON PUBLIC STREET: 50 FT.
 REAR: 30 FT.

BUILDING SETBACKS PROVIDED:
 SIDE - INTERIOR LOT: 30 FT.
 SIDE - INTERIOR LOT: 20 FT.
 SIDE - ON MOUNTAIN INDUSTRIAL BLVD.: 10 FT.
 REAR: 30 FT.

PARKING REQUIRED:
 RETAIL COMMERCIAL GROCERY: MIN 1000SF, MAX 1200 SF.
 RESTAURANT: MIN 500 SF, MAX 700 SF.
 SPACES PROVIDED: 185 SPACES

SITE LEGEND



18-215-01-003
 N/F
 U.S. BANK AND TRUST
 NATIONAL ASSOCIATION
 DEED BOOK 24228, PG 78
 ZONED M

TRACT 2
 23.774 ACRES

18-215-01-001
 N/F
 U.S. BANK AND TRUST
 NATIONAL ASSOCIATION
 ZONED M

ZONING NOTES

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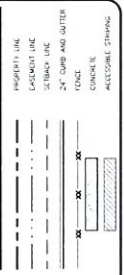
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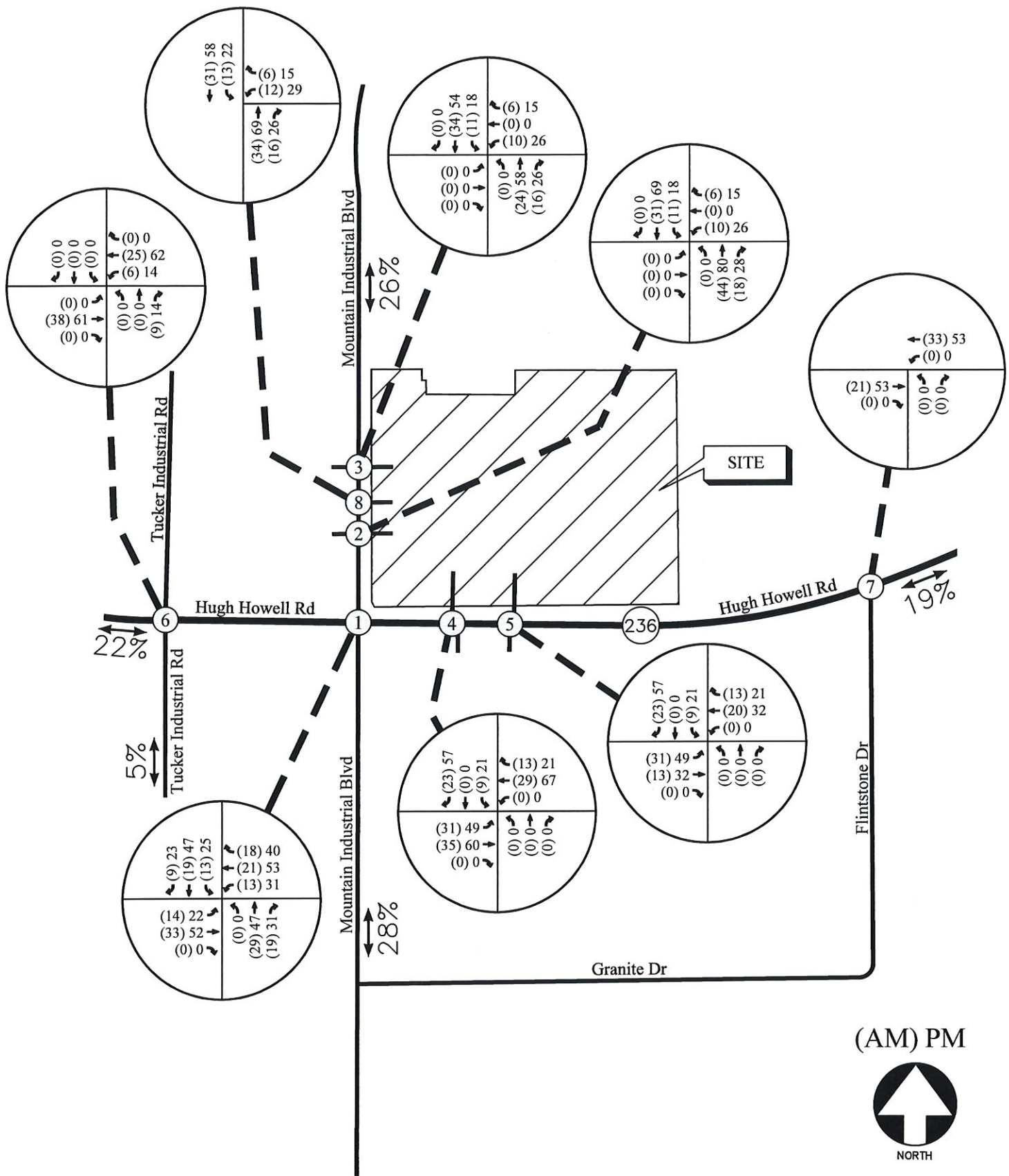
PARKING SPACES REQUIRED:
 PROPOSED: 1,000 SPACES
 SIDE - INTERIOR LOT: 20 FT.
 SIDE - CORNER LOT ON PUBLIC STREET: 50 FT.
 REAR: 30 FT.

BUILDING SETBACKS PROVIDED:
 SIDE - INTERIOR LOT: 30 FT.
 SIDE - INTERIOR LOT: 20 FT.
 SIDE - ON MOUNTAIN INDUSTRIAL BLVD.: 10 FT.
 REAR: 30 FT.

PARKING REQUIRED:
 RETAIL COMMERCIAL GROCERY: MIN 1000SF, MAX 1200 SF.
 RESTAURANT: MIN 500 SF, MAX 700 SF.
 SPACES PROVIDED: 185 SPACES

SITE LEGEND





OUTER LEG TRIP DISTRIBUTION AND SITE-GENERATED PEAK HOUR VOLUMES

FIGURE 5
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6.0 FUTURE 2021 TRAFFIC ANALYSIS

The future traffic operations are analyzed for the “No-Build” and “Build” conditions at full build out of the development in the year 2021. This provides a basis of reference for determining both the contribution of the site to overall traffic conditions and the additional improvements needed to provide sufficient site access and capacity for passing traffic.

Improvements that are identified as “System Improvements” are recommended to address deficiencies in the roadway network and can be considered as benefitting traffic that may or may not include site-generated traffic. These improvements are recommended for the local municipality to use/consider in the future transportation planning efforts. “Site Mitigation Improvements” are recommended as directly benefitting proposed site-generated traffic.

6.1 Future “No-Build” Conditions

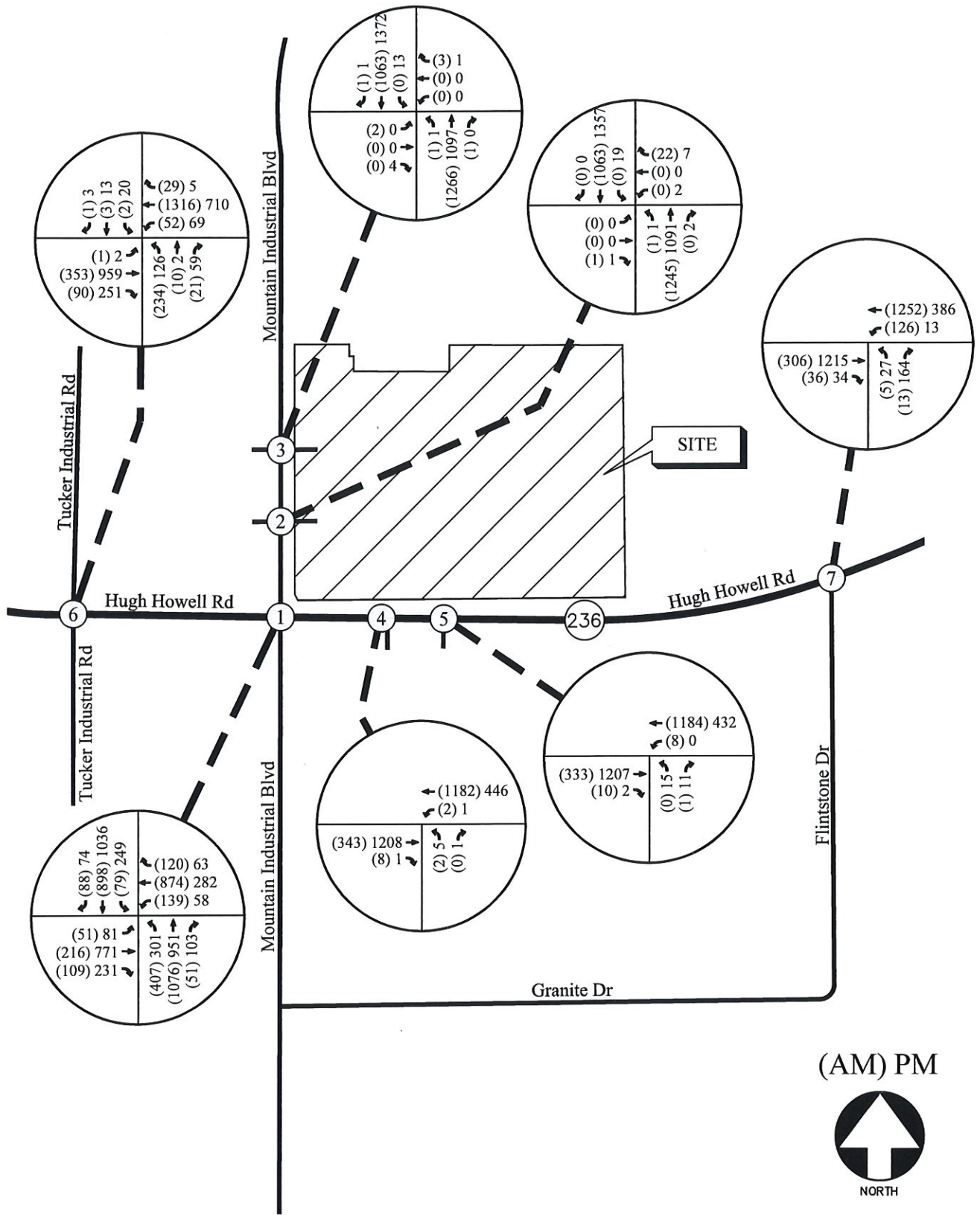
The “No-Build” (or background) conditions provide an assessment of how traffic will operate in the study horizon year without the study site being developed as proposed, with projected increases in through traffic volumes due to normal annual growth. The Future “No-Build” volumes consist of the existing traffic volumes (Figure 2) plus increases for annual growth of through traffic and added traffic from adjacent developments.

6.1.1 Annual Traffic Growth

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the existing volumes. This growth factor was applied to the existing traffic volumes between collector and arterial roadways in order to estimate the future year traffic volumes prior to the addition of site-generated traffic.

6.1.2 Nearby Planned Development – Smoke Rise Elementary School

The new location of the Smoke Rise Elementary School will be located on the north side of SR 236 (Hugh Howell Road) adjacent to the Mountain West Church of God and will have access via one full-access driveway on SR 236 (Hugh Howell Road). To account for the added traffic due to the school’s new location, an increased growth factor of 3% was used in the analysis. The resulting Future “No-Build” volumes on the roadway are shown in Figure 6.



FUTURE (NO-BUILD) PEAK HOUR VOLUMES

FIGURE 6

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6.1.3 Future “No-Build” Traffic Operations

The future “No-Build” traffic operations were analyzed using the volumes in Figure 6 and the results are shown below in Table 5. The results of the analysis, including the recommended system improvements, are discussed in detail in Section 6.1.4.

TABLE 5 – FUTURE “NO-BUILD” INTERSECTION OPERATIONS					
Intersection		No-Build Condition: LOS (Delay)			
		NO IMPROVEMENTS		SYSTEM IMPROVEMENTS	
		AM Peak	PM Peak	AM Peak	PM Peak
1	SR 236 @ Mountain Industrial Blvd*	F (170.4)	F (149.9)	E (78.4)	E (64.2)
	-Eastbound Approach	A (8.2)	C (33.6)	D (42.7)	D (53.2)
	-Westbound Approach	C (32.2)	C (26.4)	D (53.4)	D (44.2)
	-Northbound Approach	F (350.2)	F (220.0)	F (119.2)	E (74.7)
	-Southbound Approach	F (115.9)	F (209.3)	E (58.8)	E (68.6)
2	Mountain Industrial Blvd @ CubeSmart (S)				
	-Eastbound Approach	B (12.4)	B (14.9)	B (12.4)	B (14.9)
	-Westbound Approach	B (14.0)	C (18.2)	B (14.0)	C (18.2)
	-Northbound Left	B (10.6)	B (12.8)	B (10.6)	B (12.8)
	-Southbound Left	A (0.0)	B (11.3)	A (0.0)	B (11.3)
3	Mountain Industrial Blvd @ CubeSmart (N)				
	-Eastbound Approach	E (38.4)	C (16.8)	E (38.4)	C (16.8)
	-Westbound Approach	B (13.7)	B (13.0)	B (13.7)	B (13.0)
	-Northbound Left	B (10.6)	B (12.9)	B (10.6)	B (12.9)
	-Southbound Left	A (0.0)	B (11.4)	A (0.0)	B (11.4)
4	SR 236 @ MVP Auto Drwy				
	-Westbound Left	A (8.0)	B (11.8)	A (8.0)	B (11.8)
	-Northbound Approach	C (20.6)	E (36.7)	C (20.6)	E (36.7)
5	SR 236 @ ProBrands Drwy				
	-Westbound Left	A (8.0)	A (0.0)	A (8.0)	A (0.0)
	-Northbound Approach	B (11.2)	D (33.1)	B (11.2)	D (33.1)
6	SR 236 @ Tucker Industrial Rd*	A (7.5)	B (14.7)	B (17.9)	B (17.1)
	-Eastbound Approach	B (12.0)	B (12.0)	B (13.8)	B (14.1)
	-Westbound Approach	A (0.7)	A (7.0)	B (13.0)	A (8.8)
	-Northbound Approach	D (35.4)	E (58.2)	D (50.5)	E (65.6)
	-Southbound Approach	C (24.8)	D (49.0)	C (26.2)	D (46.2)
7	SR 236 @ Flintstone Dr				
	-Westbound Left	A (8.3)	B (12.0)	A (8.3)	B (12.0)
	-Northbound Approach	E (35.7)	F (54.5)	E (35.7)	F (54.5)

*Results reported via HCM 2000 in improvement scenario

6.1.4 Recommendations for System Improvements

A summary of the system improvements, which address deficiencies that are found within the existing road network for the “No-Build” conditions, is provided below. These are recommended for the local municipality to use/consider in the future transportation planning efforts.

Summary of Recommended System Improvements

- Install a dedicated eastbound and westbound channelized right turn lane on SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard.

- Add a second “lagging” permissive + protected left turn phase for the northbound approach (Mountain Industrial Boulevard) by increasing the signal cycle length.

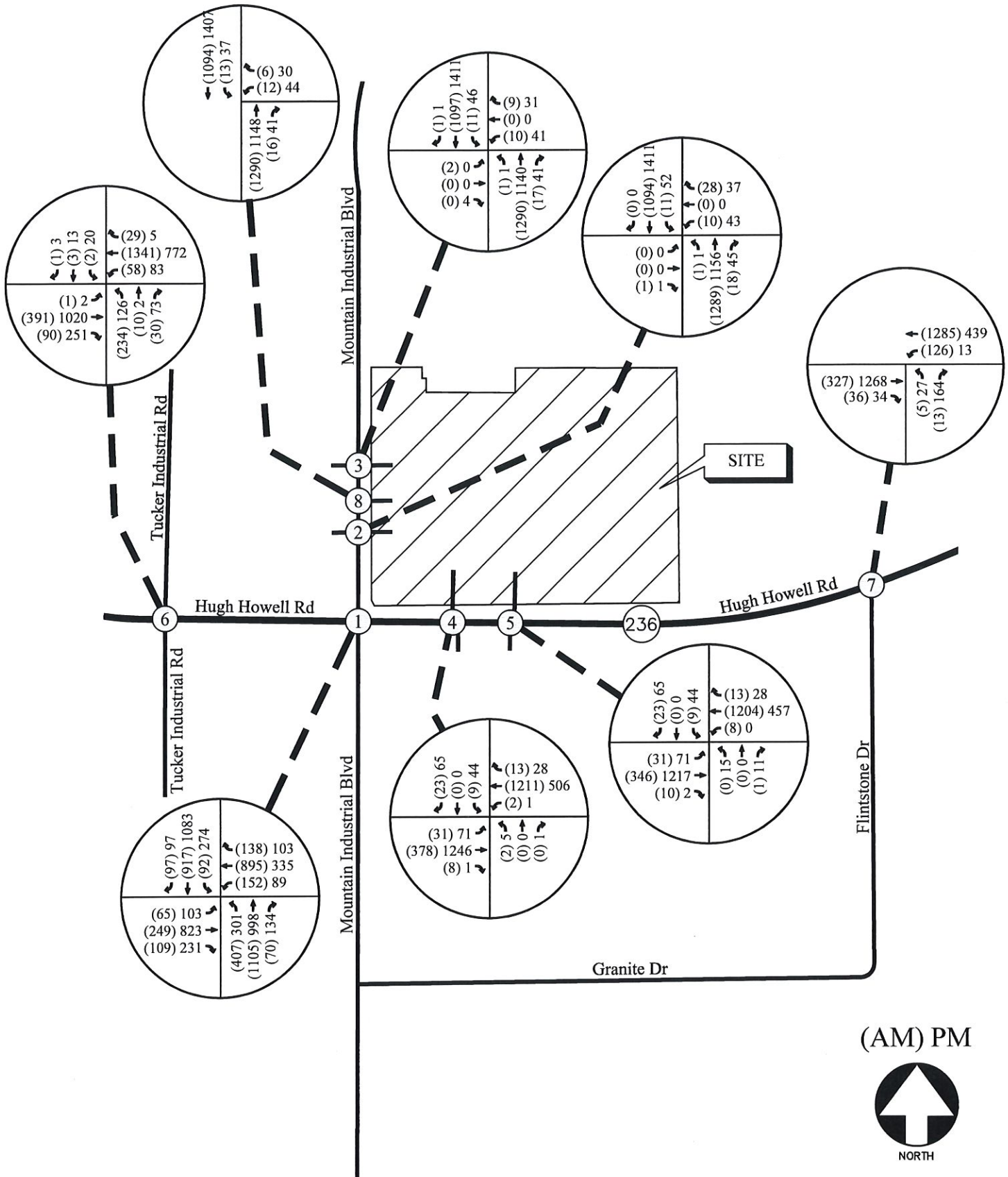
6.2 Future “Build” Conditions

The “Build” or development conditions include the estimated background traffic from the “No-Build” conditions plus the added traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site (Figure 5) and pass-by volumes were added to base traffic volumes (Figure 6) to calculate the future traffic volumes after the construction of the development. These total future traffic volumes (Figure 7) were used to evaluate the “Build” condition, which includes the projected site traffic. The results of the “Build” operations analyses with the assumed site access configuration are shown in Table 6.

6.2.1 Site Access Configuration

The following access configuration was utilized when modeling the proposed site driveway intersections:

- All site driveways should consist of one entering lane and one exiting lane with a channelized right turn flare constructed for exiting traffic.
- It is recommended a dedicated right turn deceleration lane be installed for entering site traffic at each driveway on SR 236 (Hugh Howell Road).
- Entering and exiting left turn traffic will be able to make use of the existing two-way left turn lane on Mountain Industrial Boulevard.
- It is recommended a dedicated left turn lane be installed for entering site traffic at each driveway on SR 236 (Hugh Howell Road).



FUTURE (BUILD) PEAK HOUR VOLUMES

(AM) PM



FIGURE 7

A&R Engineering Inc.

6.2.2 Future “Build” Traffic Operations

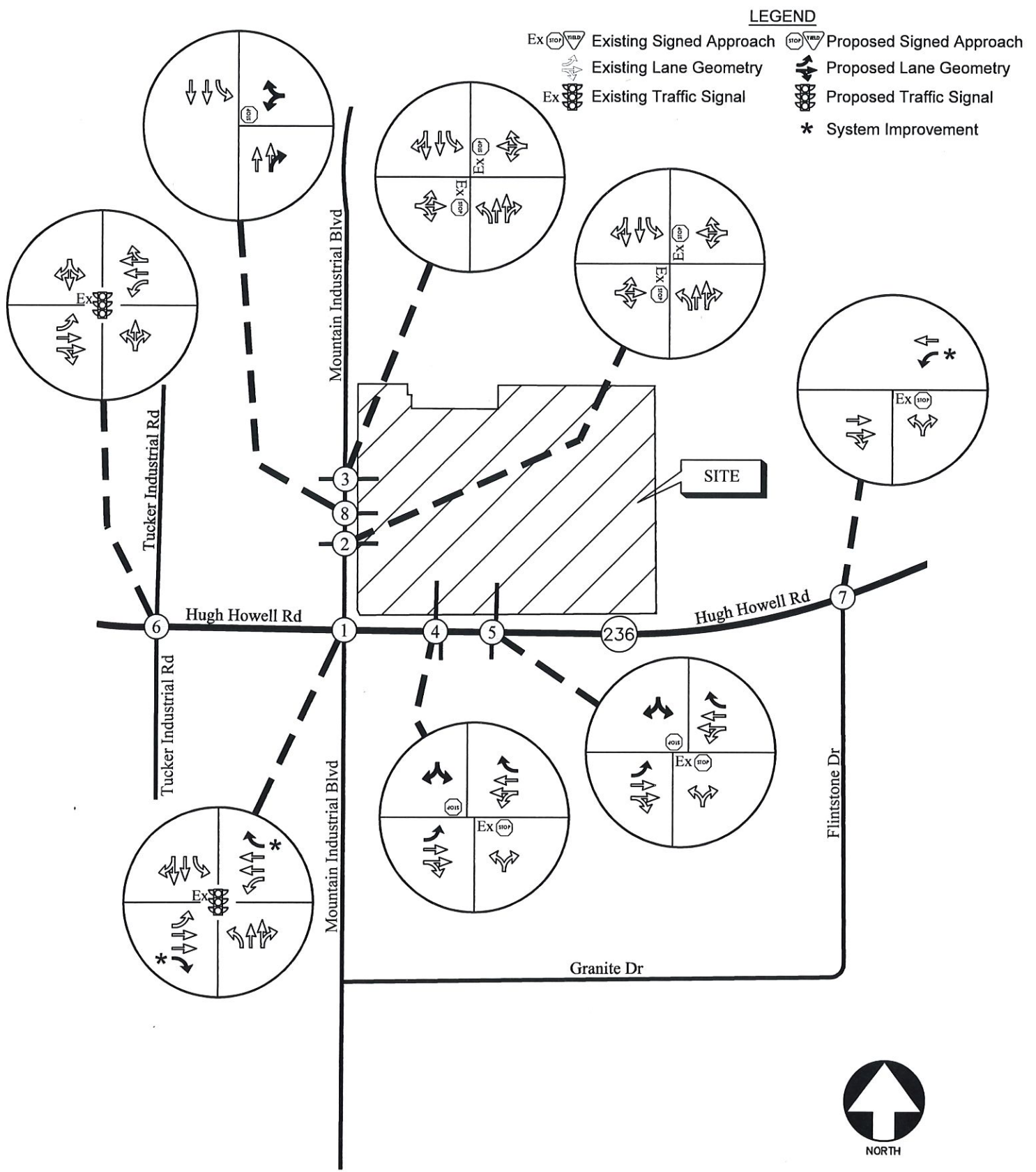
The “Build” conditions are evaluated to determine effectiveness of the recommended system and site mitigation improvements. Recommendations on traffic control and lane geometry are shown graphically in Figure 8. The results of the analyses, including the recommended improvements, are discussed in detail in Section 6.2.3.

TABLE 6 – FUTURE “BUILD” INTERSECTION OPERATIONS					
Intersection		Build Condition: LOS (Delay)			
		NO IMPROVEMENTS		WITH SYSTEM AND SITE IMPROVEMENTS	
		AM Peak	PM Peak	AM Peak	PM Peak
1	<u>SR 236 @ Mountain Industrial Blvd*</u>	<u>F (178.0)</u>	<u>F (168.3)</u>	<u>E (72.6)</u>	<u>E (74.2)</u>
	-Eastbound Approach	A (9.2)	D (36.0)	D (49.5)	E (61.4)
	-Westbound Approach	C (33.5)	C (28.4)	E (63.2)	D (45.3)
	-Northbound Approach	F (368.0)	F (243.5)	F (94.1)	E (73.6)
	-Southbound Approach	F (125.5)	F (250.3)	E (60.7)	F (95.5)
2	<u>Mountain Industrial Blvd @ CubeSmart (S)</u>				
	-Eastbound Approach	B (12.6)	C (15.3)	B (12.6)	C (15.3)
	-Westbound Approach	B (13.4)	E (35.4)	B (13.4)	E (35.4)
	-Northbound Left	B (10.8)	B (13.2)	B (10.8)	B (13.2)
	-Southbound Left	B (12.1)	B (12.5)	B (12.1)	B (12.5)
3	<u>Mountain Industrial Blvd @ CubeSmart (N)</u>				
	-Eastbound Approach	E (42.1)	C (17.3)	E (42.1)	C (17.3)
	-Westbound Approach	C (21.8)	D (34.8)	C (21.8)	D (34.8)
	-Northbound Left	B (10.8)	B (13.2)	B (10.8)	B (13.2)
	-Southbound Left	B (12.1)	B (12.5)	B (12.1)	B (12.5)
4	<u>SR 236 @ MVP Auto Drwy/Site Drwy (W)</u>				
	-Eastbound Left	B (12.2)	A (8.8)	B (12.2)	A (8.8)
	-Westbound Left	A (8.1)	B (12.0)	A (8.1)	B (12.0)
	-Northbound Approach	D (31.1)	F (83.9)	D (31.1)	F (83.9)
	-Southbound Approach	C (22.1)	D (33.1)	C (22.1)	D (33.1)
5	<u>SR 236 @ ProBrands Drwy/Site Drwy (E)</u>				
	-Eastbound Left	B (12.3)	A (8.6)	B (12.3)	A (8.6)
	-Westbound Left	A (8.1)	A (0.0)	A (8.1)	A (0.0)
	-Northbound Approach	B (11.2)	F (72.8)	B (11.2)	F (72.8)
	-Southbound Approach	C (22.7)	D (28.7)	C (22.7)	D (28.7)
6	<u>SR 236 @ Tucker Industrial Rd*</u>	<u>A (7.8)</u>	<u>B (15.5)</u>	<u>B (19.1)</u>	<u>B (18.3)</u>
	-Eastbound Approach	B (12.6)	B (13.2)	B (14.3)	B (16.1)
	-Westbound Approach	A (0.8)	A (7.7)	B (14.4)	A (9.5)
	-Northbound Approach	D (35.8)	E (57.8)	D (52.5)	E (65.6)
	-Southbound Approach	C (24.4)	D (48.0)	C (26.1)	D (45.5)
7	<u>SR 236 @ Flintstone Dr</u>				
	-Westbound Left	A (8.4)	B (12.4)	A (8.4)	B (12.4)
	-Northbound Approach	E (39.1)	F (53.4)	E (39.1)	F (72.9)
8	<u>Mountain Industrial Blvd @ Site Drwy (M)</u>				
	-Westbound Approach	C (21.3)	D (26.6)	C (21.3)	D (26.6)
	-Southbound Left	B (12.1)	B (12.3)	B (12.1)	B (12.3)

*Results reported via HCM 2000 in improvement scenario

6.2.3 Recommendations for Site Mitigation Improvements

“Site Mitigation Improvements” are recommended as directly benefitting proposed site-generated traffic. No further improvements have been recommended outside of the recommended configuration for the site access points.



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 8

A&R Engineering Inc.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed retail development that will be located in the northeast corner of the intersection of SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard in Tucker, Georgia. The development will consist of a 48,848 square foot supermarket and 105,152 square feet of retail/restaurant space

The development proposes two full-access driveways on SR 236 (Hugh Howell Road) and three full-access driveways on Mountain Industrial Boulevard. Existing and future operations after completion of the project were analyzed at the intersections of:

- SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard
- Mountain Industrial Boulevard at CubeSmart Driveway (S)
- Mountain Industrial Boulevard at CubeSmart Driveway (N)
- SR 236 (Hugh Howell Road) at MVP Auto Driveway
- SR 236 (Hugh Howell Road) at ProBrands Driveway
- SR 236 (Hugh Howell Road) at Tucker Industrial Road
- SR 236 (Hugh Howell Road) at Flintstone Drive

The analysis included the evaluation of Future operations for “No-Build” and “Build” conditions, both of which account for increases in annual growth of through traffic. The results of the analysis are listed below:

7.1 System Recommendations and Improvements

A summary of the system improvements, which address deficiencies that are found within the existing road network for the “No-Build” conditions, is provided below. These are recommended for the local municipality to use/consider in the future transportation planning efforts.

Summary of Recommended System Improvements

- Install a dedicated eastbound and westbound channelized right turn lane on SR 236 (Hugh Howell Road) at Mountain Industrial Boulevard.
- Add a second “lagging” permissive + protected left turn phase for the northbound approach (Mountain Industrial Boulevard) by increasing the signal cycle length.

7.2 Site Access Configuration

The following access configuration was utilized when modeling the proposed site driveway intersections:

- All site driveways should consist of one entering lane and one exiting lane with a channelized right turn flare constructed for exiting traffic.
- It is recommended a dedicated right turn deceleration lane be installed for entering site traffic at each driveway on SR 236 (Hugh Howell Road).
- Entering and exiting left turn traffic will be able to make use of the existing two-way left turn lane on Mountain Industrial Boulevard.

- It is recommended a dedicated left turn lane be installed for entering site traffic at each driveway on SR 236 (Hugh Howell Road).

7.3 Site Mitigation Improvements

“Site Mitigation Improvements” are recommended as directly benefitting proposed site-generated traffic. No further improvements have been recommended outside of the recommended configuration for the site access points.

Appendix

Existing Intersection Traffic Counts	
Existing Intersection Analysis.....	
City of Tucker Left Turn Lane Analysis	
GDOT Left Turn Lane Analysis.....	
GDOT Right Turn Lane Analysis.....	
Future "No-Build" Intersection Analysis	
Future "No-Build" Intersection Analysis (With Improvements)	
Future "Build" Intersection Analysis.....	
Future "Build" Intersection Analysis (With Improvements)	
Traffic Volume Worksheets	

In the interest of saving paper, one complete copy of the 161-page Traffic Study, including all 144 pages of the above Appendices, was provided in print at the time of application submittal. One complete copy of the 161-page Traffic Study with Appendices was also provided electronically. This copy is one of two copies of the Traffic Study provided in print, but not including the Appendices.