DEVELOPMENT OF REGIONAL IMPACT
(DRI #2580)
TRAFFIC STUDY
FOR
FULTON INDUSTRIAL TRUCK STOP

FULTON COUNTY, GEORGIA

Prepared for:

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A & R Project # 16-057

EXECUTIVE SUMMARY

Traffic impacts were evaluated for the added traffic from the proposed truck stop that will be located in the northern corner of the intersection of SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps in Fulton County, Georgia. The property is located within the "I-20 Gateway District" as defined by the Boulevard CID Master Plan Framework Map. The development will consist of:

- 14,900 square foot convenience store
- 20 passenger car fueling positions
- 6 truck fueling positions

The development proposes one right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard) and one full-access driveway for trucks on Wendell Drive. Existing and future operations after completion of the project were analyzed at the intersections of:

- SR 70 (Fulton Industrial Boulevard) at I-20 Eastbound Ramps
- SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps
- SR 70 (Fulton Industrial Boulevard) at Wendell 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:

System Recommendations and Improvements

Improvements that are identified as "System Improvements" address deficiencies that are found within the existing road network prior to any impacts from the proposed development's added traffic. Because all the study intersections will operate at acceptable level-of-service ("D" or better by local standards) in the future year before construction of the proposed development, no system improvements have been identified.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway for trucks on Wendell Drive
    - This driveway will consist of one entering and one exiting lanes. The northbound (driveway) approach will have a shared left/right turn lane for exiting traffic.
    - The intersection will be unsignalized with a STOP sign on the northbound approach.
    - Entering left turn movements will be made from the westbound through lane. No dedicated turn bay is planned.
    - Entering right turn movements will be made from the eastbound through lane. No deceleration lane is planned.
- Site Driveway #2: Right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard)
    - This driveway will consist of one entering and one exiting lanes.
    - The intersection will be unsignalized with a YIELD sign on the eastbound approach.

- Entering right turn movements will be made from a southbound deceleration lane on SR 70 (Fulton Industrial Boulevard) (See Appendix).

Site Mitigation Improvements

Improvements that are identified as "Site Mitigation Improvements" address further impacts that are a result of the proposed development's added traffic. A summary of the site mitigation improvements is provided below.

Summary of Site Mitigation Improvements

- It is recommended that a dedicated eastbound left turn lane be installed on Wendell Drive at the intersection of SR 70 (Fulton Industrial Boulevard) at Wendell Drive.

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INTRODUCTION

The purpose of this study is to determine the traffic impact that will result from the proposed truck stop located in the northern corner of the intersection of SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps in Fulton County, Georgia. The property is located within the "I-20 Gateway District" as defined by the Boulevard CID Master Plan Framework Map. 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:

- 14,900 square foot convenience store
- 20 passenger car fueling positions
- 6 truck fueling positions

The development proposes one right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard) and one full-access driveway for trucks on Wendell Drive.

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 70 (Fulton Industrial Boulevard) at I-20 Eastbound Ramps
- SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps
- SR 70 (Fulton Industrial Boulevard) at Wendell Drive

Recommendations to improve traffic operations have been identified as appropriate and are discussed in detail in the following sections of the report.

STUDY NETWORK DETERMINATION

The study network was determined by evaluating the amount of traffic that the proposed development will add to each roadway segment in the area. According to GRTA requirements, a roadway segment carries a "significant" amount of traffic if the project contributes 7% or more trips to the two-way daily service volumes of the roadway at the appropriate level of service standard. Upon agreement with GRTA a level of service standard of "D" was used for determining the study area network.

The traffic generated by the proposed project was then assigned to the area roadways using the trip distribution to determine the site-generated traffic on each roadway segment. The boundaries of the study network extend to the most distant intersections where at least 7% of the service volumes on the segment are attributed to project traffic. The following study intersections fell within the 7% rule and/or have been selected as being suitable for evaluation in discussions with GRTA, GDOT and Fulton County:

1. SR 70 (Fulton Industrial Boulevard) at I-20 Eastbound Ramps
2. SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps
3. SR 70 (Fulton Industrial Boulevard) at Wendell Drive

The location of the development and the surrounding study network is shown in Figure 1. Other intersections within this corridor, such as unsignalized side streets, right-in/right-out driveways or private driveways have not been included in the study network.

Existing Roadway Facilities

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

SR 70 (Fulton Industrial Boulevard)

SR 70 (Fulton Industrial Boulevard) is a north-south, six-lane, median-divided roadway with a posted speed limit of 35 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1215266 & 1215268) indicate that the daily traffic volume on SR 70 (Fulton Industrial Boulevard) is 37,200 south of Commerce Circle and 32,500 vehicles per day north of Wendell Drive. GDOT classifies SR 70 (Fulton Industrial Boulevard) as a Minor Arterial roadway.

Interstate 20

Interstate 20 is an east-west, six-lane, divided roadway with a posted speed limit of 60 mph in the vicinity of the site. GDOT traffic counts (Station IDs 1215496 & 1215495) indicate that the daily traffic volume on Interstate 20 is 82,400 vehicles per day east of SR 70 (Fulton Industrial Boulevard) and 102,900 vehicles per day west of SR 70 (Fulton Industrial Boulevard).

Wendell Drive

Wendell Drive is an east-west, two-lane, undivided roadway with a posted speed limit of 30 mph in the vicinity of the site.

Existing Bicycle and Pedestrian Facilities

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

Nearby local or regional trails

There is no trail located in the study area.

Bicycle paths or sidewalks

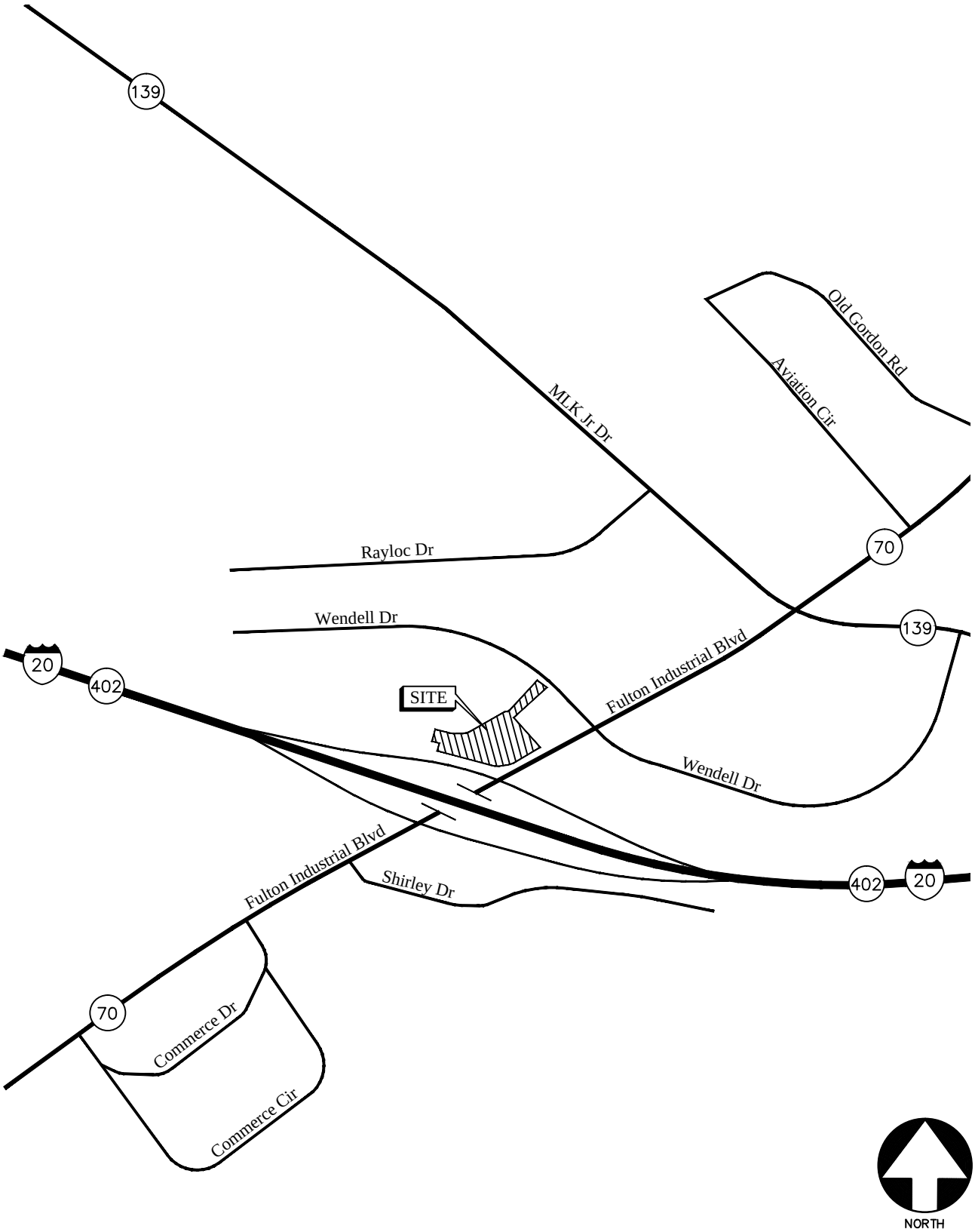
Sidewalks and pedestrian facilities are present along the following roadways in the study network:

- SR 70 (Fulton Industrial Boulevard): west side of the road, between Old Gordon Road and Frederick Drive and east side of the road, between SR 8 (Donald Lee Hollowell Parkway) and Shirley Drive

Bike paths are not present in the study area.

Existing Transit Facilities

The study area is located on MARTA bus line #73, which runs between the Hamilton E. Holmes MARTA station and the Atlanta Gateway Park.



LOCATION MAP FIGURE 1

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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, 2000 edition (HCM 2000). Synchro software, which utilizes the HCM 2000 methodology, was used for the analysis. The following is a description of the methodology employed for the analysis of unsignalized and signalized intersections.

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.

TABLE 1 – LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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: 2000 Highway Capacity Manual

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: 2000 Highway Capacity Manual

EXISTING TRAFFIC ANALYSIS

Existing traffic counts and intersection geometric data were obtained at the following study intersections:

- SR 70 (Fulton Industrial Boulevard) at I-20 Eastbound Ramps
- SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps
- SR 70 (Fulton Industrial Boulevard) at Wendell Drive

Turning movement counts were collected on Tuesday, May 17, 2016. Multi-unit trucks class-8 and above were counted separately from passenger vehicles. All turning movement counts were recorded during the AM and PM peak hours between 7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m., 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.

Existing Traffic Operations

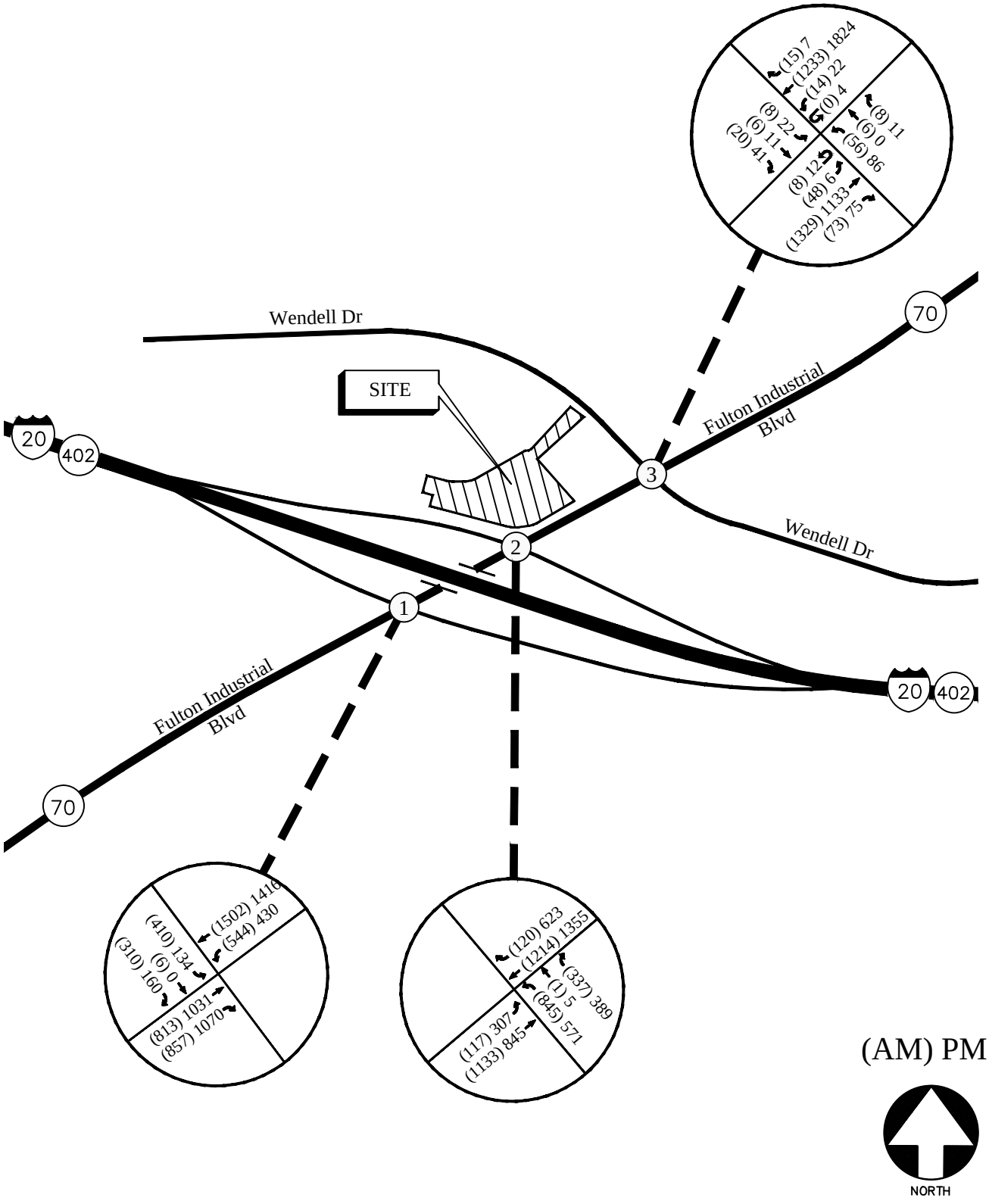
Existing traffic operations were analyzed at the study intersections in accordance with the HCM methodology. A queue length analysis was also performed. The results of the analyses are shown in Tables 3 and 4. The existing traffic control and lane geometry for the intersections are shown in Figure 3.

TABLE 3 – EXISTING INTERSECTION OPERATIONS

	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			LOS (Delay)	v/c ratio	LOS (Delay)	v/c ratio
1	**Fulton Industrial Blvd @ I-20 EB Ramps**	Signalized	**C (24.7)**	**0.83**	**B (16.1)**	**0.82**
	-Eastbound Approach		D (53.1)	-	E (59.5)	-
	-Northbound Approach		C (23.7)	-	B (16.6)	-
	-Southbound Approach		B (15.2)	-	A (7.4)	-
2	**Fulton Industrial Blvd @ I-20 WB Ramps**	Signalized	**C (25.0)**	**0.64**	**C (28.9)**	**0.90**
	-Westbound Approach		D (48.5)	-	D (54.8)	-
	-Northbound Approach		B (14.7)	-	C (24.0)	-
	-Southbound Approach		B (13.7)	-	B (18.9)	-
3	**Fulton Industrial Blvd @ Wendell Dr**	Signalized	**A (6.8)**	**0.42**	**A (9.2)**	**0.54**
	-Eastbound Approach		D (48.6)	-	E (56.9)	-
	-Westbound Approach		E (55.6)	-	D (51.0)	-
	-Northbound Approach		A (0.8)	-	A (1.1)	-
	-Southbound Approach		A (8.7)	-	A (8.6)	-

TABLE 4 – EXISTING INTERSECTION 95TH PERCENTILE QUEUES				
	Intersection	Available Storage	AM Peak: feet	PM Peak: feet
1	**Fulton Industrial Blvd @ I-20 EB Ramps**			
	-Eastbound Left	-	303	140
	-Eastbound Through/Left	-	141	27
	-Eastbound Right	400’	213	64
	-Northbound Through	-	200	214
	-Northbound Right	310’	50	114
	-Southbound Left	-	273	167
	-Southbound Through/Left	-	362	107
2	**Fulton Industrial Blvd @ I-20 WB Ramps**			
	-Westbound Left	500’	273	201
	-Westbound Through/Left	-	68	145
	-Westbound Right	-	294	327
	-Northbound Left	-	116	197
	-Northbound Through/Left	-	298	337
	-Southbound Through/Right	-	304	440
3	**Fulton Industrial Blvd @ Wendell Dr**			
	-Eastbound Approach	-	38	72
	-Westbound Approach	-	61	20
	-Northbound Left	120’	3	2
	-Northbound Through/Right	-	17	30
	-Southbound Left	150’	12	22
	-Southbound Through/Right	-	212	344

The results of existing traffic operations analysis indicates that all the study intersections are operating at an acceptable level-of-service (“D” or better by local standards) in both the AM and PM peak hours.



EXISTING WEEKDAY PEAK HOUR VOLUMES FIGURE 2

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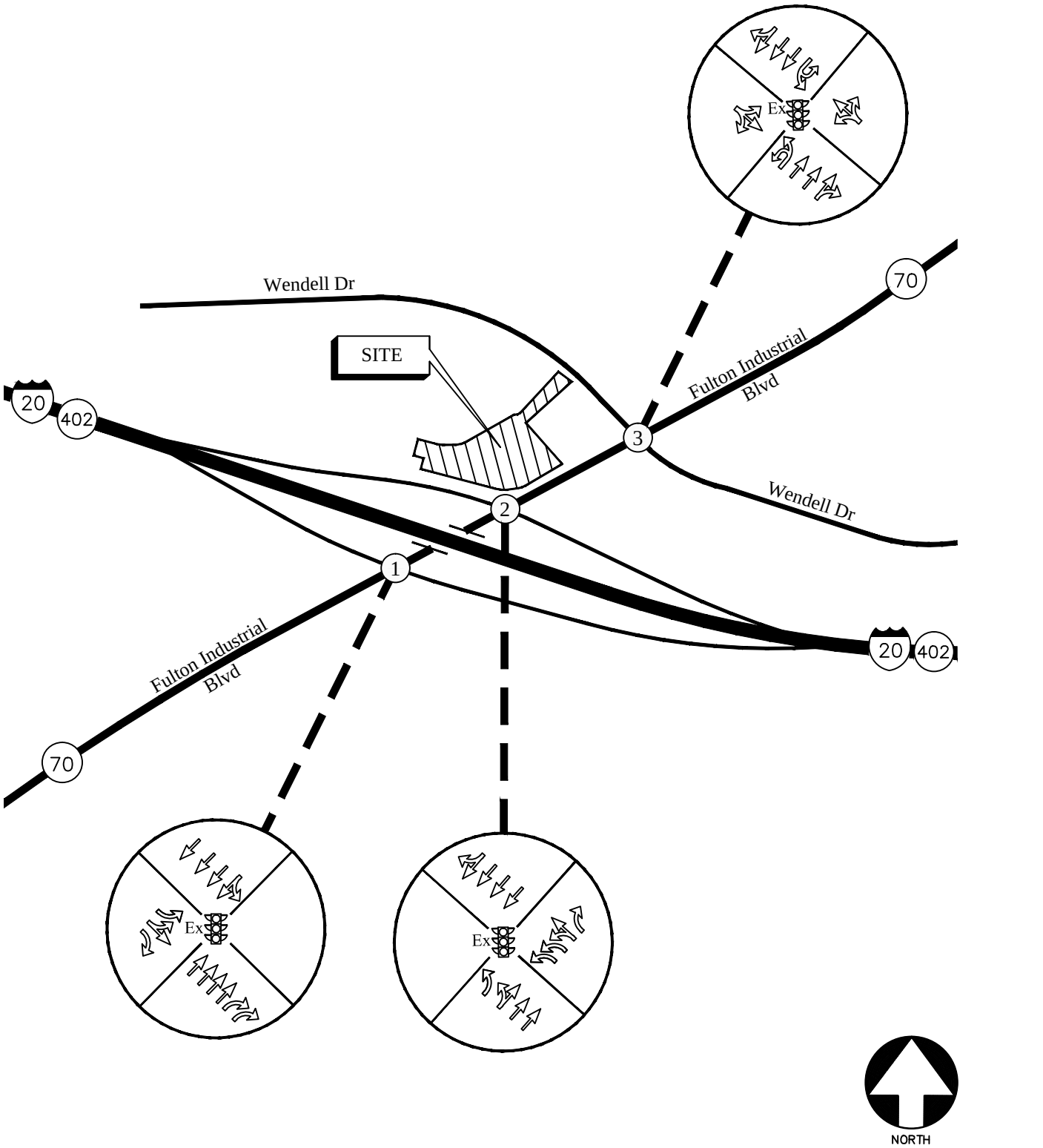

EXISTING TRAFFIC CONTROL AND LANE GEOMETRY FIGURE 3

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PROJECT DESCRIPTION

The proposed truck stop development will be located in the northern corner of the intersection of SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps in Fulton County, Georgia. The property is located within the "I-20 Gateway District" as defined by the Boulevard CID Master Plan Framework Map. The development will consist of:

- 14,900 square foot convenience store
- 20 passenger car fueling positions
- 6 truck fueling positions

The development proposes one right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard) and one full-access driveway for trucks on Wendell Drive.

Site Plan

A site plan is shown in Figure 4. A larger size drawing and a digital copy of the site plan are also provided with this report.

Planned Bicycle and Pedestrian Facilities

The on and/or off-site provisions for non-motorized travel included in the planned construction of the proposed development are as follows:

- Sidewalks are present on either side of SR 70 (Fulton Industrial Boulevard) in the vicinity of the site.

Planned Transit Facilities

The site is not directly served by transit. However, the nearest corridor that is served by MARTA is SR 70 (Fulton Industrial Boulevard), bus line #73, with a bus stop located on the site frontage, approximately 354 feet north of the I-20 Westbound Ramps.

Consistency with Adopted Comprehensive Plan

The following is an explanation as to how the proposed DRI relates to the local government's Comprehensive Plan in particular the transportation and capital improvements element, and any transportation improvements listed in the Short-Term Work Program(s) within the vicinity of the DRI. The proposed development is currently located within the Industrial Marketplace Business District as shown in the Future Development Map of the Fulton County 2030 Comprehensive Plan.

Project Phasing

A phasing schedule shall be provided for any proposed DRIs involving multiple phases. The phasing schedule shall include the types and amounts of land uses to be developed and should be identified by phase, the site location of each land use by phase, the amenities to be developed with each phase, and all transportation elements. The transportation elements shall focus upon infrastructure in place, access to the development, and internal mobility during each phase analyzed. This project has been evaluated for the complete build-out of the development in 2017.

Trip Generation

Trip generation estimates for the passenger car fueling stations and convenience store were based on the rates and equations published in the 9th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. The trip generation was based on the following ITE Land Use: *945 Gasoline/Service Station with Convenience Market*. Because there is limited data provided by ITE for Land Use *950 – Truck Stop*, field data collected at a truck stop facility in Ellenwood, Georgia with 8 truck fueling positions was used in this analysis. To account for the amenities for truck drivers provided by the development as well as the six fueling stations, traffic was generated for an 8-pump truck fueling station. Due to the nature of the development, pass-by reductions have been applied for the passenger car fueling stations. The calculated total trip generation for the proposed development is shown in Table 5.

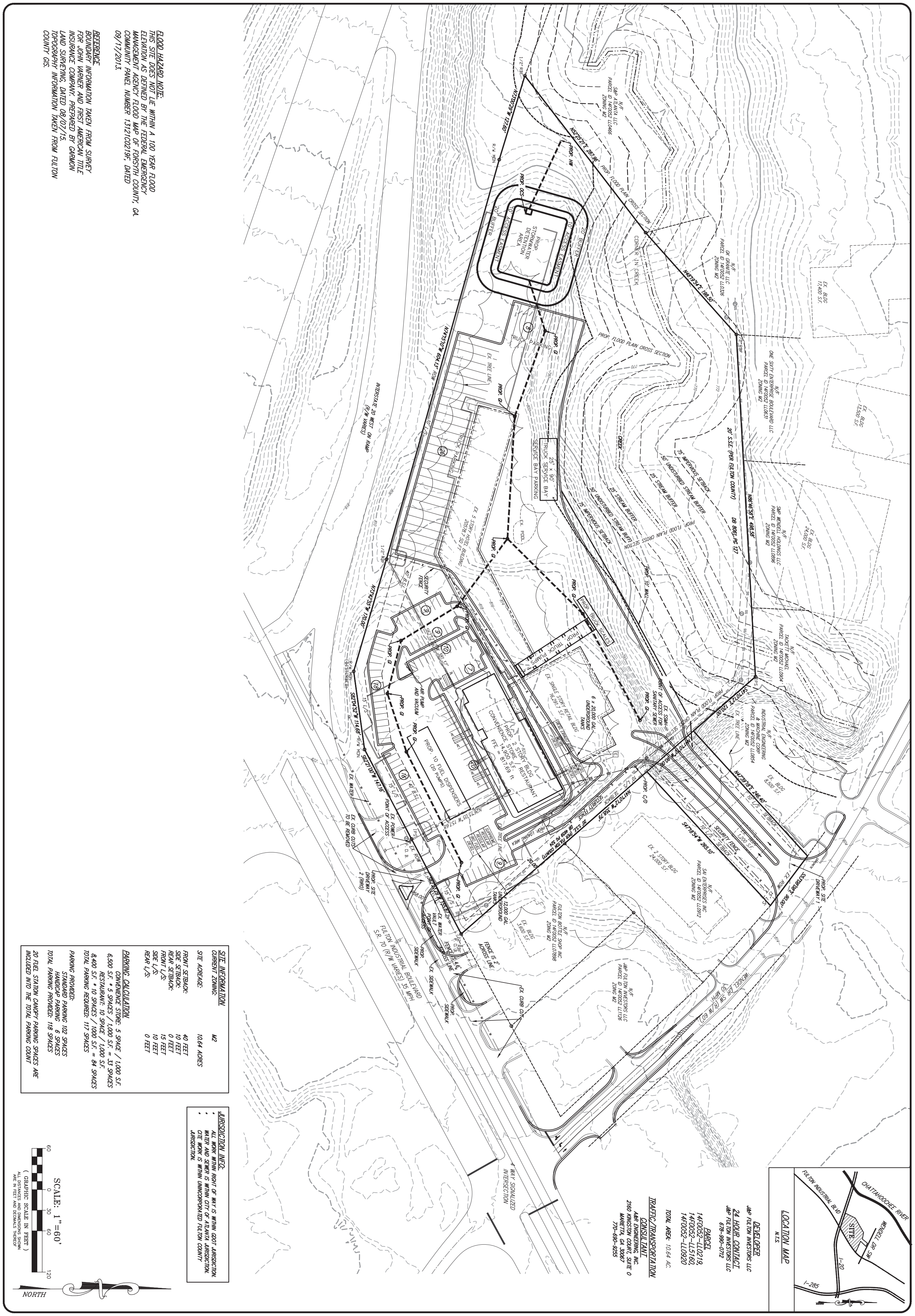
TABLE 5 – TRIP GENERATION

Land Use	Size	AM Peak Hour			PM Peak Hour			24-Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
ITE 945 – Gasoline/Service Station with Convenience Market	20 pumps	102	101	203	135	135	270	3,256
Truck Fueling Station with Convenience Market	8 pumps	73	69	142	37	39	76	1,805
Total Trips (without Reductions)		175	170	345	172	174	346	5,061
*Pass-by Trips (62%) 56%**		*-63*	*-63*	*-126*	*-76*	*-76*	*-152*	*-1,520*
Total with Reductions		**112**	**107**	**219**	**96**	**98**	**194**	**3,541**

**pass-by trips (AM) PM; 24-Hour pass-by trips estimated by considering PM pass-by as 10% of daily*

Trip Distribution

The trip distribution describes how traffic arrives and departs from the site. Separate trip distributions were developed for passenger vehicles and trucks classified as class-8 and over 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 5, were assigned to the study area intersections based on the separate distributions. The separate outer-leg distributions and AM and PM peak hour new traffic generated by the site are shown in Figure 5 and Figure 6, respectively. Pass-by volumes have also been distributed based on existing travel patterns and are shown in Figure 7.



SHEET NO.	1
OF	1
JOB NO.	2015-003

DRAWN BY:	AB	REVISION	DATE	DESCRIPTION
CHECKED BY:	BC	0	3/22/16	INITIAL SUBMITTAL
DATE:	03/31/16	1	3/24/16	REVISED PER CLIENT
SCALE:	AS SHOWN	2	4/11/16	REVISED PER CLIENT
LAND LOTS:	52	3	5/3/16	REVISED PARKING
DISTRICT:	14TH			
SECTION:				

GEORGIA REGISTERED PROFESSIONAL ENGINEER NO. 32093 BRIAN W. COLE 5/3/16

GRTA DRI SITE PLAN

4225 FULTON INDUSTRIAL
LAND LOTS 52
14TH DISTRICT
FULTON CO., GEORGIA
PREPARED FOR
J&P FULTON INVESTORS LLC

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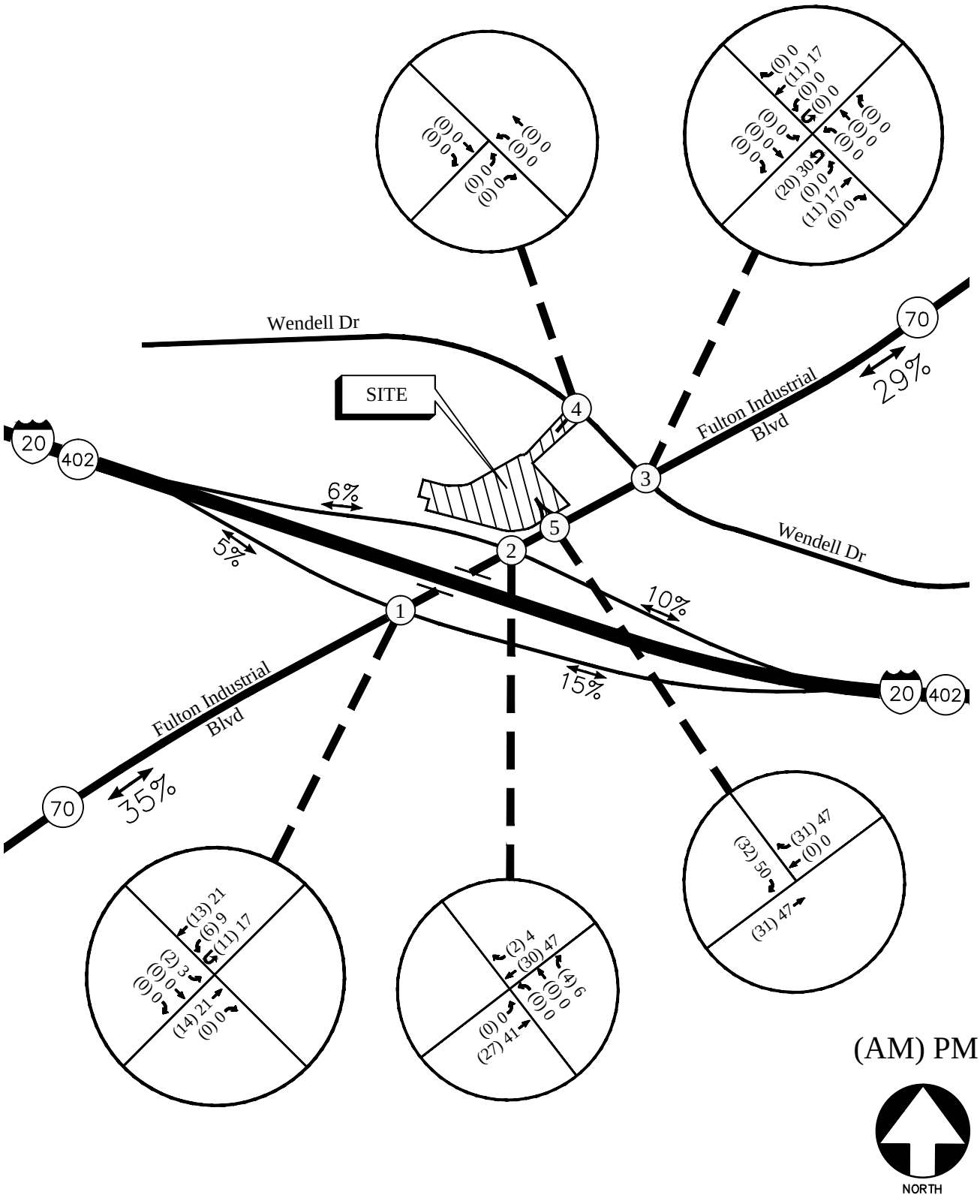

OUTER LEG TRIP DISTRIBUTION AND SITE-GENERATED PEAK HOUR VOLUMES (PASSENGER VEHICLES)

FIGURE 5

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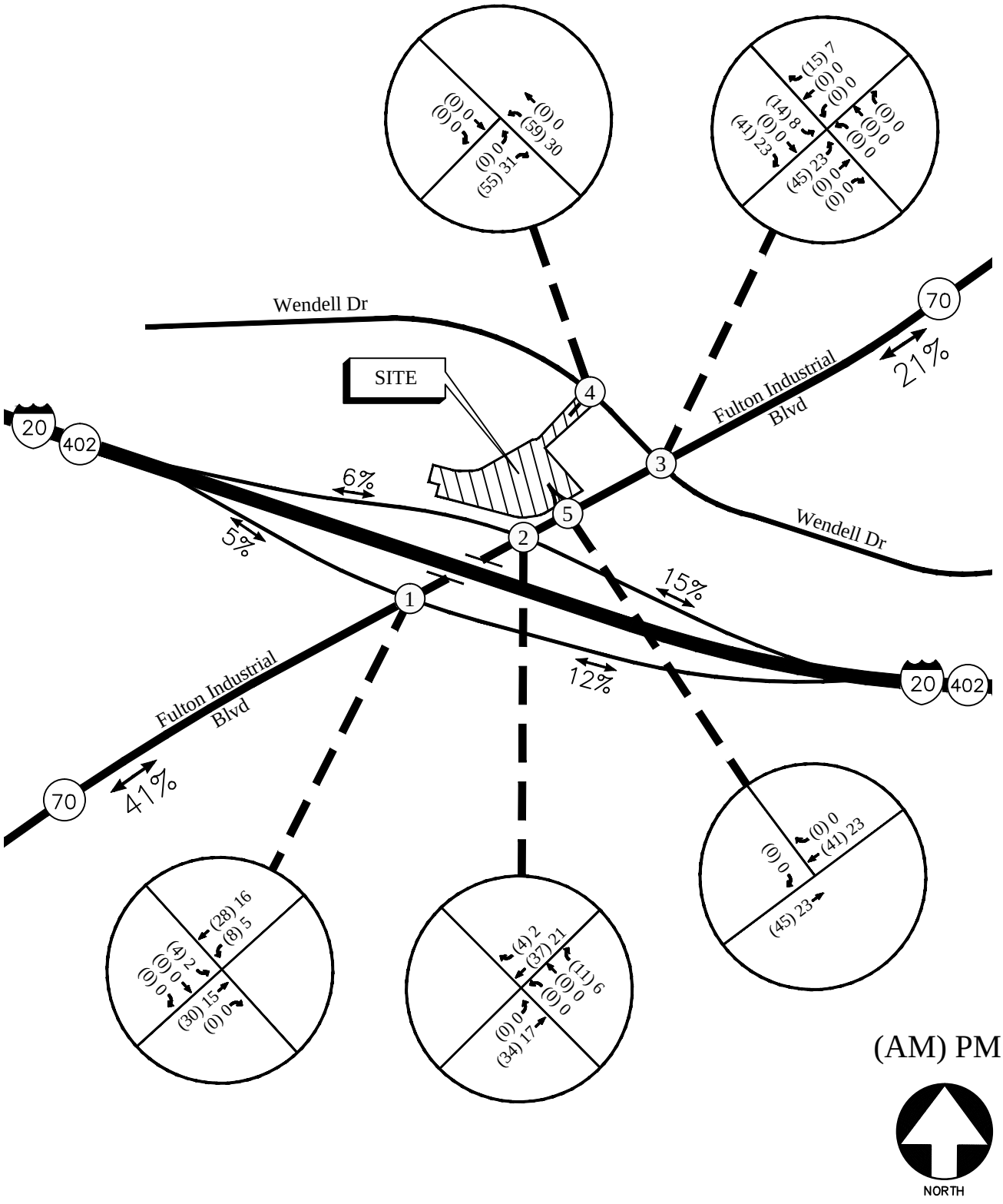

OUTER LEG TRIP DISTRIBUTION AND SITE-GENERATED PEAK HOUR VOLUMES (TRUCKS)

FIGURE 6

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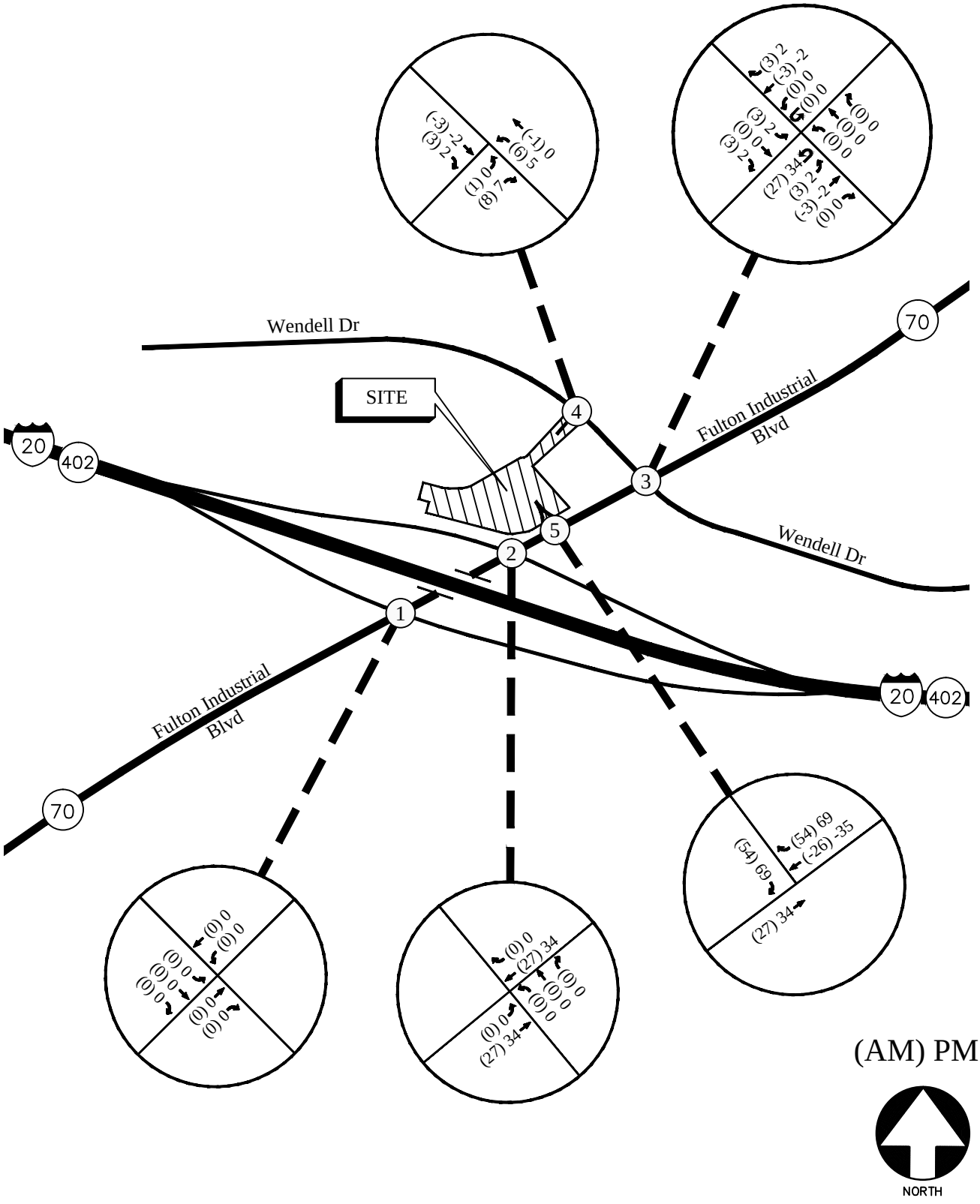

SITE PEAK HOUR PASS-BY VOLUMES

FIGURE 7

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FUTURE TRAFFIC ANALYSIS

The future traffic operations are analyzed for the "Build" and "No-Build" conditions. 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. Note that survey and construction drawings would be needed to verify the feasibility and extent of additional right-of-way required for any recommended improvements.

Improvements that are identified as "System Improvements" address deficiencies that are found within the existing road network prior to any impacts from the proposed development's added traffic. Improvements that are identified as "Site Mitigation Improvements" address further impacts that are a result of the proposed development's added traffic.

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.

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. The Georgia Department of Transportation recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last several years revealed no consistent positive growth of through traffic; therefore, a growth rate of 1% was used in the analysis. 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. The resulting Future "No-Build" volumes on the roadway are shown in Figure 8.

Planned and Programmed Improvements in Study Area

The following improvements have been identified in the Regional Transportation Plan (Plan 2040), GDOT TransPi, and/or the local comprehensive transportation plan. These improvements are within the vicinity of the proposed development.

TABLE 6 – PLANNED AND PROGRAMMED IMPROVEMENTS				
ARC # / GDOT # / Local #	Project	Type of Improvement	Network Year	Source
M004931	SR 70 from SR 139 to Campbelton Rd	Resurface & Maintenance (Resurfacing)	2016	TFA Federal
0013863	I-20 west of Atlanta	Operational Improvement (Ramp Meter Installation at 7 interchanges)	Let 2016	GDOT TransPi
0013640	-	Operational Improvement (replace existing BCT (Breakaway Cable Terminal) anchors on guardrail.)	2016	GDOT TransPi
0013916/AR-ML 800	I-20 West from I-285 to SR 92	Roadway / Managed Lanes	2040 / Long Range	ARC RTP (2016)
FS-003/720960	SR 70 from SR 6 to James Aldredge Boulevard	General Purpose Capacity (2 to 4 Lanes)	2030 / Long Range	ARC RTP (2016)
0013226	I-20 FROM SR 5 TO SR 7	Georgia HOV Extension	9/2016	GDOT TransPi
M004583	SR 139 from Cobb to Cascade Ave.	Resurface & Maintenance	2016	GDOT TransPi

It should be noted that GDOT Project 0013863 is slated to be completed by build out of the proposed development. However, as the details needed in order to model the improvements are unknown, the proposed improvement was not included in the "No-Build" or "Build" analyses.

Recommendations for System Improvements

Improvements that are identified as "System Improvements" address deficiencies that are found within the existing road network prior to any impacts from the proposed development's added traffic. Because all the study intersections will operate at acceptable level-of-service ("D" or better by local standards) in the future year before construction of the proposed development, no system improvements have been identified.

Future "No-Build" Traffic Operations

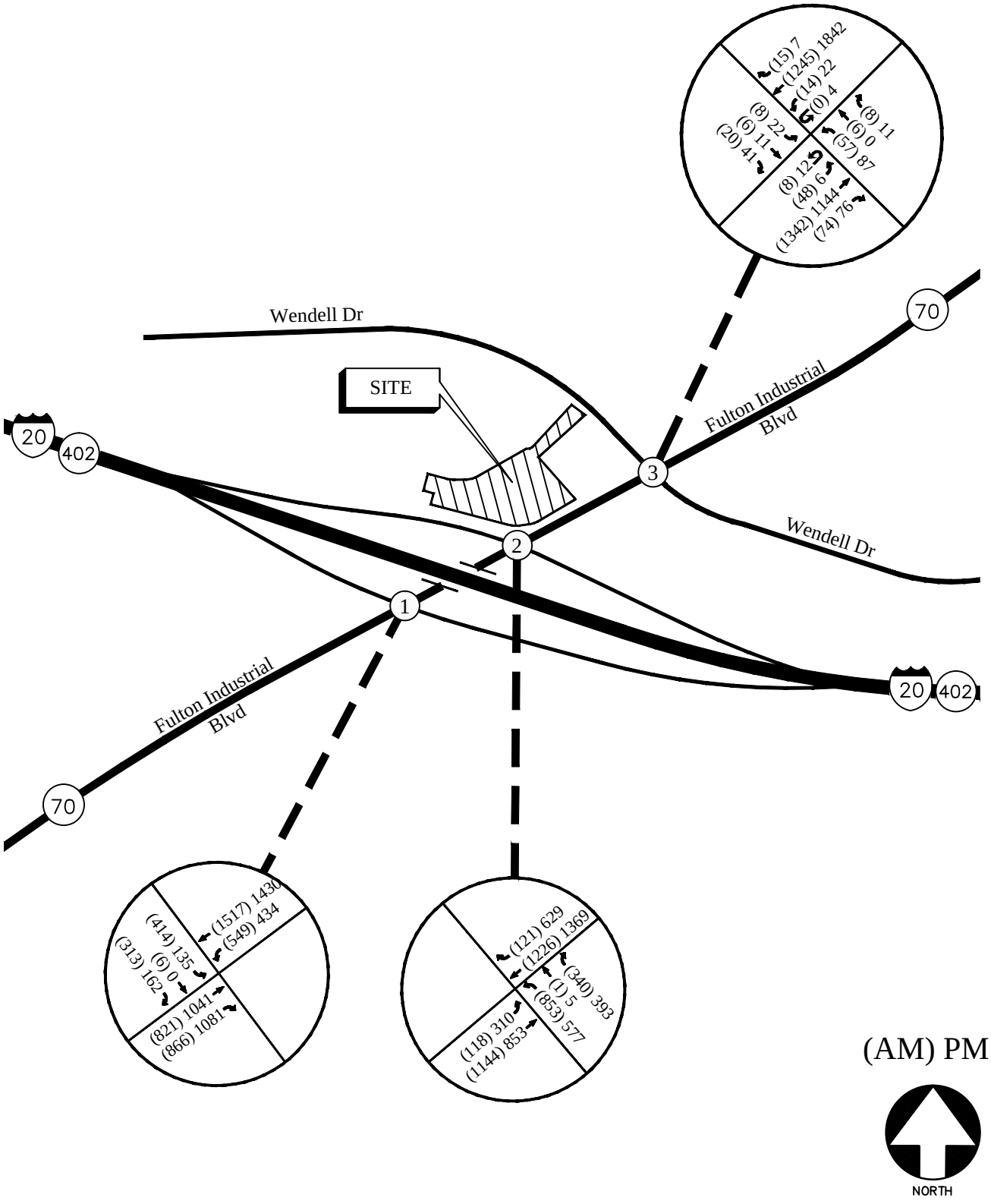
The future "No-Build" traffic operations were analyzed using the volumes in Figure 8 and the results are shown in Tables 7 and 8 below.

Table 7 – Future "No-Build" Intersection Operations

	Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
			LOS (Delay)	v/c ratio	LOS (Delay)	v/c ratio
1	**Fulton Industrial Blvd @ I-20 EB Ramps**	Signalized	**C (24.9)**	**0.84**	**B (16.6)**	**0.82**
	-Eastbound Approach		D (53.4)	-	E (59.5)	-
	-Northbound Approach		C (24.0)	-	B (17.0)	-
	-Southbound Approach		B (15.1)	-	A (8.1)	-
2	**Fulton Industrial Blvd @ I-20 WB Ramps**	Signalized	**C (25.3)**	**0.65**	**C (29.1)**	**0.90**
	-Westbound Approach		D (48.7)	-	D (54.9)	-
	-Northbound Approach		B (15.2)	-	C (23.5)	-
	-Southbound Approach		B (13.9)	-	B (19.6)	-
3	**Fulton Industrial Blvd @ Wendell Dr**	Signalized	**A (6.9)**	**0.43**	**A (9.2)**	**0.55**
	-Eastbound Approach		D (48.5)	-	E (56.9)	-
	-Westbound Approach		E (55.6)	-	D (51.1)	-
	-Northbound Approach		A (0.9)	-	A (0.9)	-
	-Southbound Approach		A (8.7)	-	A (8.6)	-

Table 8 – Future "No-Build" Intersection 95th Percentile Queues

	Intersection	Available Storage	AM Peak: feet	PM Peak: feet
1	**Fulton Industrial Blvd @ I-20 EB Ramps**			
	-Eastbound Left	-	310	140
	-Eastbound Through/Left	-	145	27
	-Eastbound Right	400'	220	66
	-Northbound Through	-	199	216
	-Northbound Right	310'	50	125
	-Southbound Left	-	246	182
	-Southbound Through/Left	-	361	136
2	**Fulton Industrial Blvd @ I-20 WB Ramps**			
	-Westbound Left	500'	275	203
	-Westbound Through/Left	-	69	147
	-Westbound Right	-	298	347
	-Northbound Left	-	116	200
	-Northbound Through/Left	-	310	333
	-Southbound Through/Right	-	308	452
3	**Fulton Industrial Blvd @ Wendell Dr**			
	-Eastbound Approach	-	38	72
	-Westbound Approach	-	62	21
	-Northbound Left	120'	3	2
	-Northbound Through/Right	-	17	30
	-Southbound Left	150'	12	22
	-Southbound Through/Right	-	215	349



FUTURE (NO-BUILD) PEAK HOUR VOLUMES FIGURE 8

A&R Engineering Inc.

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 (Figures 5&6) and pass-by volumes (Figure 7) were added to base traffic volumes (Figure 8) to calculate the future traffic volumes after the construction of the development. These total future traffic volumes are shown in Figure 9.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway for trucks on Wendell Drive
    - This driveway will consist of one entering and one exiting lanes. The northbound (driveway) approach will have a shared left/right turn lane for exiting traffic.
    - The intersection will be unsignalized with a STOP sign on the northbound approach.
    - Entering left turn movements will be made from the westbound through lane. No dedicated turn bay is planned.
    - Entering right turn movements will be made from the eastbound through lane. No deceleration lane is planned.
- Site Driveway #2: Right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard)
    - This driveway will consist of one entering and one exiting lanes.
    - The intersection will be unsignalized with a YIELD sign on the eastbound approach.
    - Entering right turn movements will be made from a southbound deceleration lane on SR 70 (Fulton Industrial Boulevard) (See Appendix).

Recommendations for Site Mitigation Improvements

Improvements that are identified as mitigation improvements address deficiencies that are caused by site traffic and can be identified as related to the proposed development. A summary of the site mitigation improvements is provided below.

Summary of Site Mitigation Improvements

- It is recommended that a dedicated eastbound left turn lane be installed on Wendell Drive at the intersection of SR 70 (Fulton Industrial Boulevard) at Wendell Drive.

Future Traffic Operations

The future "No-Build" traffic operations were analyzed using the volumes in Figure 8 and the future traffic volumes in Figure 9 were used to evaluate the "Build" condition, which includes the projected site traffic. The results of the "No-Build" and "Build" operations analyses with the assumed site access configuration are shown in Tables 9 and 10. Recommendations on traffic control and lane geometry are shown graphically in Figure 10.

TABLE 9 – FUTURE "BUILD" INTERSECTION OPERATIONS

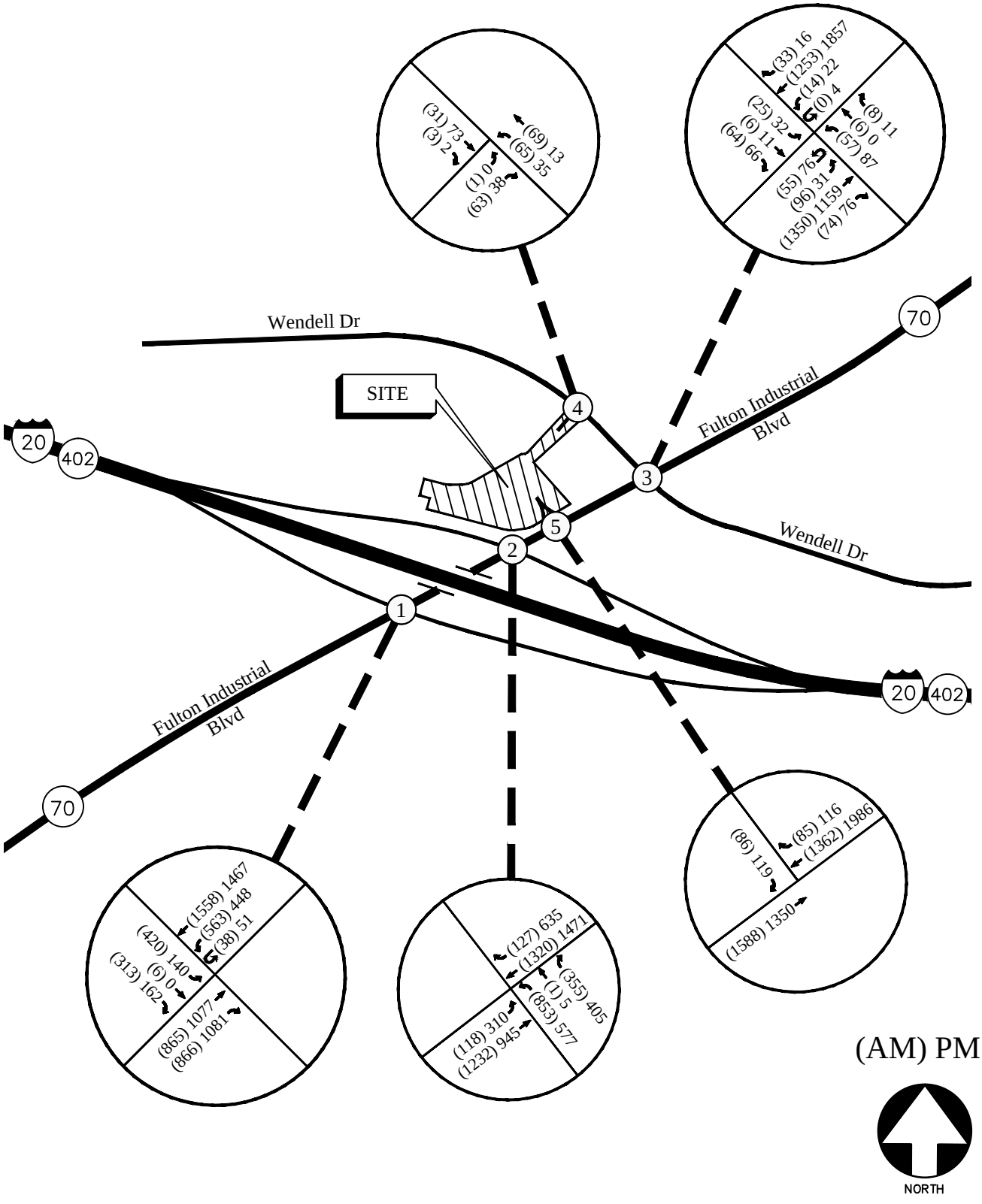
	Intersection	Future Condition: LOS (Delay)			
		NO IMPROVEMENTS		SITE IMPROVEMENTS	
		AM Peak	PM Peak	AM Peak	PM Peak
1	**Fulton Industrial Blvd @ I-20 EB Ramps**	**C (21.6)**	**B (14.8)**	**C (21.7)**	**B (14.8)**
	-Eastbound Approach	D (45.1)	C (33.1)	D (45.1)	C (33.1)
	-Northbound Approach	C (21.3)	B (17.2)	C (21.3)	B (17.2)
	-Southbound Approach	B (13.6)	A (8.7)	B (13.7)	A (8.7)
2	**Fulton Industrial Blvd @ I-20 WB Ramps**	**C (23.7)**	**C (27.6)**	**C (24.0)**	**C (29.3)**
	-Westbound Approach	D (48.0)	E (55.9)	D (48.0)	E (55.9)
	-Northbound Approach	B (16.3)	C (25.2)	B (16.3)	C (25.2)
	-Southbound Approach	A (10.0)	B (15.2)	B (10.8)	B (18.9)
3	**Fulton Industrial Blvd @ Wendell Dr**	**B (14.2)**	**B (16.5)**	**B (13.0)**	**B (12.6)**
	-Eastbound Approach	E (55.3)	E (64.3)	D (49.4)	D (52.3)
	-Westbound Approach	E (64.4)	D (43.0)	E (58.7)	D (51.2)
	-Northbound Approach	A (6.3)	A (5.0)	A (5.9)	A (3.3)
	-Southbound Approach	B (16.4)	B (18.3)	B (14.9)	B (12.9)
4	**Wendell Dr @ Site Drwy 1**				
	-Westbound Approach	A (3.3)	A (3.9)	A (3.3)	A (3.9)
	-Northbound Approach	A (9.9)	B (10.4)	A (9.9)	B (10.4)
5	**Fulton Industrial Blvd @ Site Drwy 2 (RIRO)**				
	-Eastbound Approach	***	***	***	***

TABLE 10 – FUTURE "BUILD" INTERSECTION 95TH PERCENTILE QUEUES

	Intersection	Available Storage	Future Condition: queue length (feet)			
			NO IMPROVEMENTS		SITE IMPROVEMENTS	
			AM Peak	PM Peak	AM Peak	PM Peak
1	**Fulton Industrial Blvd @ I-20 EB Ramps**					
	-Eastbound Left	-	274	106	274	106
	-Eastbound Through/Left	-	143	71	143	71
	-Eastbound Right	400'	0	0	0	0
	-Northbound Through	-	198	221	198	221
	-Northbound Right	310'	77	127	77	127
	-Southbound Left	-	219	203	218	203
	-Southbound Through/Left	-	147	189	148	190
2	**Fulton Industrial Blvd @ I-20 WB Ramps**					
	-Westbound Left	500'	271	205	271	205
	-Westbound Through/Left	-	68	149	68	149
	-Westbound Right	-	316	432	316	432
	-Northbound Left	-	118	212	118	212
	-Northbound Through/Left	-	329	337	329	337
	-Southbound Through/Right	-	81	191	150	381
3	**Fulton Industrial Blvd @ Wendell Dr**					
	-Eastbound Approach	-	76	96	-	-
	-Eastbound Left	*200'*	-	-	*44*	*44*
	-Eastbound Right	-	-	-	*34*	*13*
	-Westbound Approach	120'	60	18	60	21
	-Northbound Left	-	86	78	86	60
	-Northbound Through/Right	150'	23	56	23	24
	-Southbound Left	-	20	32	20	27
	-Southbound Through/Right	-	371	519	371	445

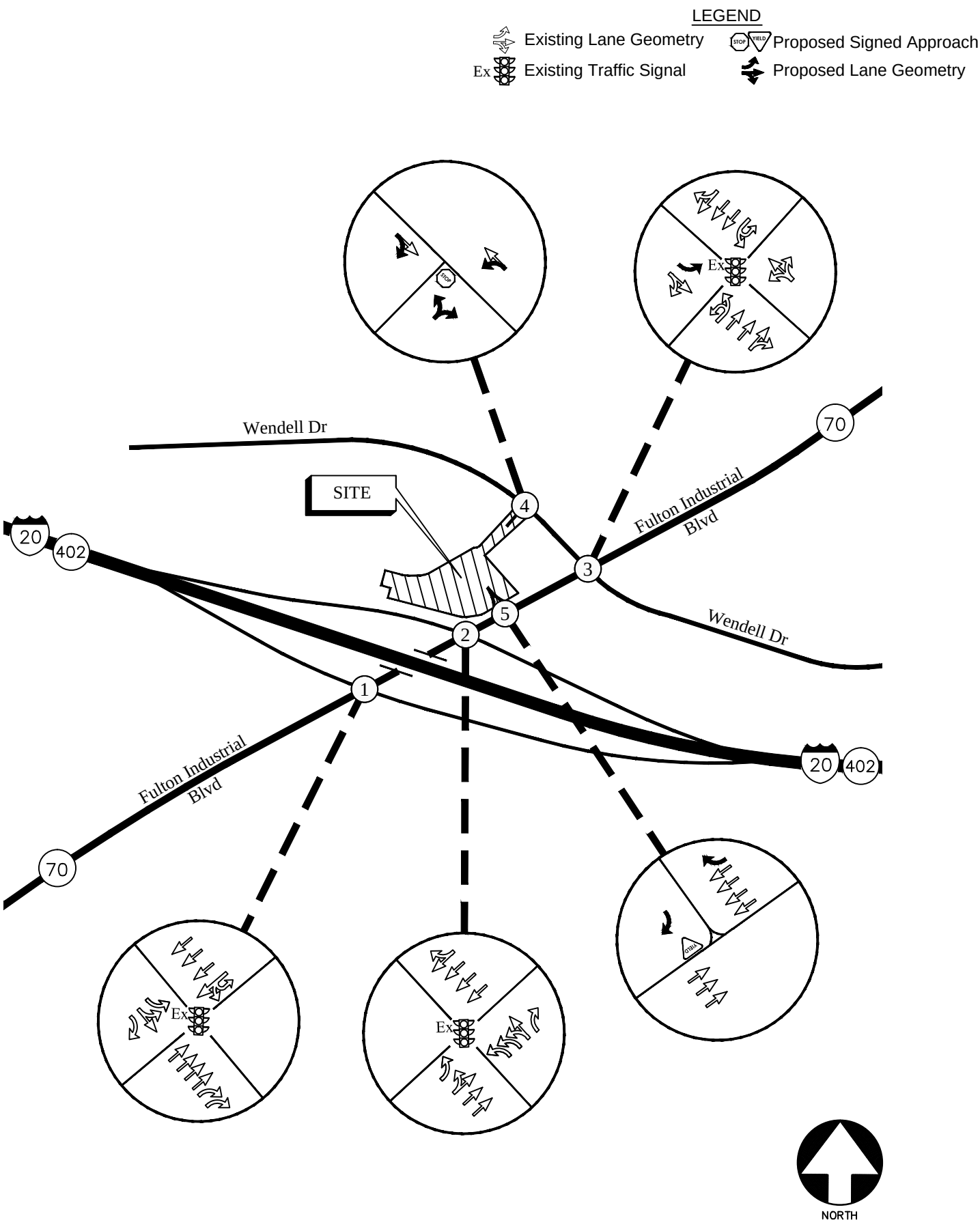
4	**Wendell Dr @ Site Drwy 1** -Westbound Through/Left -Northbound Approach	 - -	 5 7	 3 5	 5 7	 3 5
5	**Fulton Industrial Blvd @ Site Drwy 2 (RIRO)** -Eastbound Right	 -	 ***	 ***	 ***	 ***

****HCM 2000 does not analyze stop-controlled intersections with more than two lanes on any approach*



FUTURE (BUILD) PEAK HOUR VOLUMES FIGURE 9

A&R Engineering Inc.



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY FIGURE 10

A&R Engineering Inc.

CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed truck stop that will be located in the northern corner of the intersection of SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps in Fulton County, Georgia. The property is located within the "I-20 Gateway District" as defined by the Boulevard CID Master Plan Framework Map. The development will consist of:

- 14,900 square foot convenience store
- 20 passenger car fueling positions
- 6 truck fueling positions

The development proposes one right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard) and one full-access driveway for trucks on Wendell Drive. Existing and future operations after completion of the project were analyzed at the intersections of:

- SR 70 (Fulton Industrial Boulevard) at I-20 Eastbound Ramps
- SR 70 (Fulton Industrial Boulevard) at I-20 Westbound Ramps
- SR 70 (Fulton Industrial Boulevard) at Wendell 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:

System Recommendations and Improvements

Improvements that are identified as "System Improvements" address deficiencies that are found within the existing road network prior to any impacts from the proposed development's added traffic. Because all the study intersections will operate at acceptable level-of-service ("D" or better by local standards) in the future year before construction of the proposed development, no system improvements have been identified.

Site Access Configuration

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

- Site Driveway #1: Full-access driveway for trucks on Wendell Drive
    - This driveway will consist of one entering and one exiting lanes. The northbound (driveway) approach will have a shared left/right turn lane for exiting traffic.
    - The intersection will be unsignalized with a STOP sign on the northbound approach.
    - Entering left turn movements will be made from the westbound through lane. No dedicated turn bay is planned.
    - Entering right turn movements will be made from the eastbound through lane. No deceleration lane is planned.
- Site Driveway #2: Right-in/right-out driveway for passenger vehicles on SR 70 (Fulton Industrial Boulevard)
    - This driveway will consist of one entering and one exiting lanes.

- The intersection will be unsignalized with a YIELD sign on the eastbound approach.
- Entering right turn movements will be made from a southbound deceleration lane on SR 70 (Fulton Industrial Boulevard) (See Appendix).

Site Mitigation Improvements

Improvements that are identified as "Site Mitigation Improvements" address further impacts that are a result of the proposed development's added traffic. A summary of the site mitigation improvements is provided below.

Summary of Site Mitigation Improvements

- It is recommended that a dedicated eastbound left turn lane be installed on Wendell Drive at the intersection of SR 70 (Fulton Industrial Boulevard) at Wendell Drive.

Appendix

Existing Intersection Traffic Counts ..... **A**
GRTA Letter of Understanding ..... **B**
Linear Regression of Daily Traffic ..... **C**
Fact Sheets for Planned and Programmed Improvements ..... **D**
Existing Intersection Analysis ..... **E**
AASHTO Left Turn Lane Analysis ..... **F**
GDOT Right Turn Lane Analysis ..... **G**
Future "No-Build" Intersection Analysis ..... **H**
Future "Build" Intersections Analysis ..... **I**
Future "Build" Improved Intersections Analysis ..... **J**
Traffic Volume Worksheets ..... **K**

Appendix A:
Existing Intersection Traffic Counts

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TMC Data
Fulton Industrial Blvd @
I-20 EB Off-Ramp
7-9am I 4-6pm

File Name : 38510001
Site Code : 38510001
Start Date : 5/17/2016
Page No : 1

Groups Printed- Cars, Buses, Small Trucks - Multi Unit Trucks

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					I-20 EB Off-Ramp Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	0	233	244	0	477	105	292	0	0	397	113	1	67	0	181	0	0	0	0	0	1055
07:15 AM	0	217	238	0	455	123	283	0	0	406	108	0	57	0	165	0	0	0	0	0	1026
07:30 AM	0	229	239	0	468	171	393	0	0	564	117	3	71	0	191	0	0	0	0	0	1223
07:45 AM	0	156	192	0	348	109	383	0	0	492	104	1	80	0	185	0	0	0	0	0	1025
Total	0	835	913	0	1748	508	1351	0	0	1859	442	5	275	0	722	0	0	0	0	0	4329
08:00 AM	0	214	232	0	446	144	365	0	0	509	106	1	88	0	195	0	0	0	0	0	1150
08:15 AM	0	214	194	0	408	120	361	0	0	481	83	1	71	0	155	0	0	0	0	0	1044
08:30 AM	0	189	201	0	390	119	313	0	0	432	78	0	66	0	144	0	0	0	0	0	966
08:45 AM	0	200	174	0	374	101	308	0	0	409	113	1	64	0	178	0	0	0	0	0	961
Total	0	817	801	0	1618	484	1347	0	0	1831	380	3	289	0	672	0	0	0	0	0	4121
*** BREAK ***																					
04:00 PM	0	281	297	0	578	94	308	0	0	402	40	0	32	0	72	0	0	0	0	0	1052
04:15 PM	0	179	235	0	414	97	311	0	0	408	36	0	37	0	73	0	0	0	0	0	895
04:30 PM	0	230	278	0	508	103	317	0	0	420	31	0	42	0	73	0	0	0	0	0	1001
04:45 PM	0	256	246	0	502	106	319	0	0	425	31	0	54	0	85	0	0	0	0	0	1012
Total	0	946	1056	0	2002	400	1255	0	0	1655	138	0	165	0	303	0	0	0	0	0	3960
05:00 PM	0	310	317	0	627	116	342	0	0	458	31	0	36	0	67	0	0	0	0	0	1152
05:15 PM	0	223	259	0	482	103	337	0	0	440	26	0	34	0	60	0	0	0	0	0	982
05:30 PM	0	242	248	0	490	105	418	0	0	523	46	0	36	0	82	0	0	0	0	0	1095
05:45 PM	0	214	231	0	445	115	346	0	0	461	31	0	45	0	76	0	0	0	0	0	982
Total	0	989	1055	0	2044	439	1443	0	0	1882	134	0	151	0	285	0	0	0	0	0	4211
Grand Total	0	3587	3825	0	7412	1831	5396	0	0	7227	1094	8	880	0	1982	0	0	0	0	0	16621
Apprch %	0	48.4	51.6	0		25.3	74.7	0	0		55.2	0.4	44.4	0		0	0	0	0		
Total %	0	21.6	23	0	44.6	11	32.5	0	0	43.5	6.6	0	5.3	0	11.9	0	0	0	0	0	
Cars, Buses, Small Trucks	0	3429	3580	0	7009	1793	5008	0	0	6801	1058	8	808	0	1874	0	0	0	0	0	15684
% Cars, Buses, Small Trucks	0	95.6	93.6	0	94.6	97.9	92.8	0	0	94.1	96.7	100	91.8	0	94.6	0	0	0	0	0	94.4
Multi Unit Trucks	0	158	245	0	403	38	388	0	0	426	36	0	72	0	108	0	0	0	0	0	937
% Multi Unit Trucks	0	4.4	6.4	0	5.4	2.1	7.2	0	0	5.9	3.3	0	8.2	0	5.4	0	0	0	0	0	5.6

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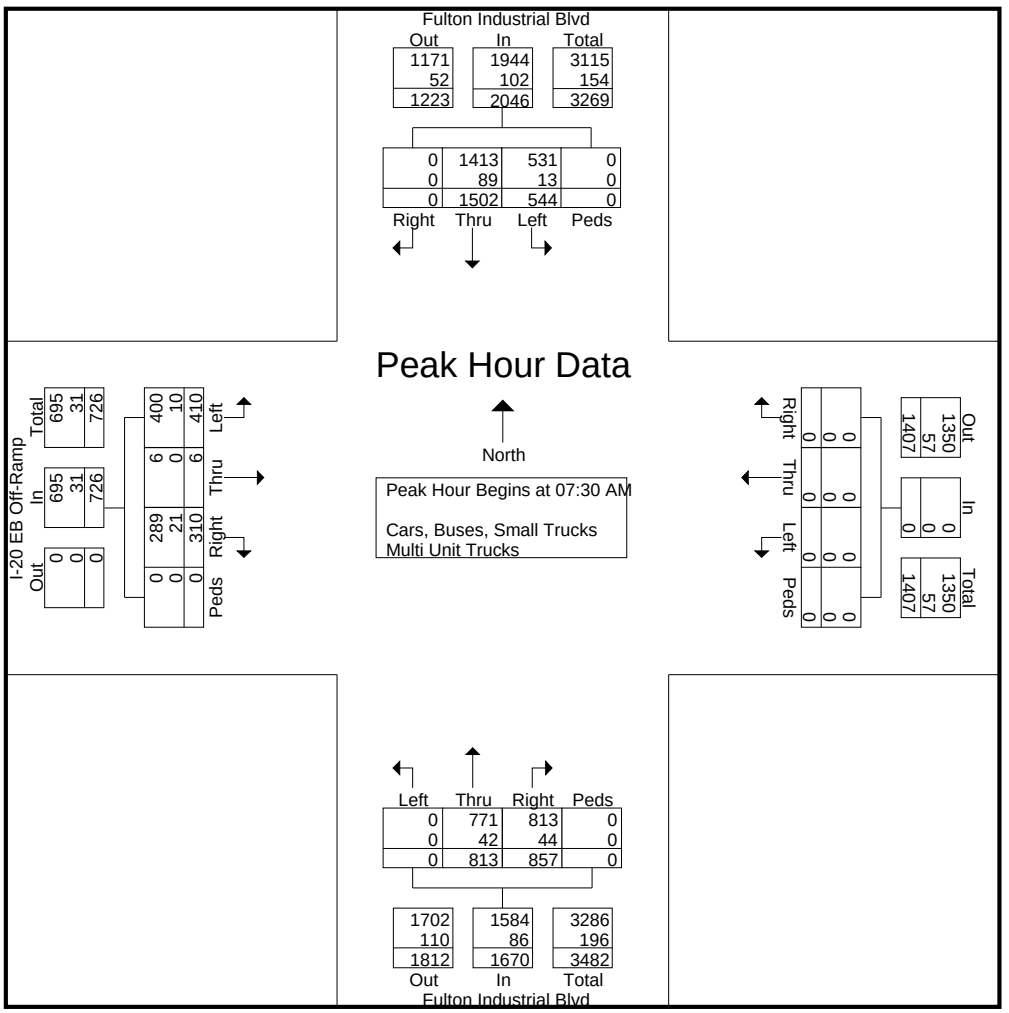
TMC Data
Fulton Industrial Blvd @
I-20 EB Off-Ramp
7-9am I 4-6pm

File Name : 38510001
Site Code : 38510001
Start Date : 5/17/2016
Page No : 2

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					I-20 EB Off-Ramp Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	**229**	**239**	0	**468**	**171**	**393**	0	0	**564**	**117**	**3**	71	0	191	0	0	0	0	0	**1223**
07:45 AM	0	156	192	0	348	109	383	0	0	492	104	1	80	0	185	0	0	0	0	0	1025
08:00 AM	0	214	232	0	446	144	365	0	0	509	106	1	**88**	0	**195**	0	0	0	0	0	1150
08:15 AM	0	214	194	0	408	120	361	0	0	481	83	1	71	0	155	0	0	0	0	0	1044
Total Volume	0	813	857	0	1670	544	1502	0	0	2046	410	6	310	0	726	0	0	0	0	0	4442
% App. Total	0	48.7	51.3	0		26.6	73.4	0	0		56.5	0.8	42.7	0		0	0	0	0		
PHF	.000	.888	.896	.000	.892	.795	.955	.000	.000	.907	.876	.500	.881	.000	.931	.000	.000	.000	.000	.000	.908
Cars, Buses, Small Trucks	0	771	813	0	1584	531	1413	0	0	1944	400	6	289	0	695	0	0	0	0	0	4223
% Cars, Buses, Small Trucks	0	94.8	94.9	0	94.9	97.6	94.1	0	0	95.0	97.6	100	93.2	0	95.7	0	0	0	0	0	95.1
Multi Unit Trucks	0	42	44	0	86	13	89	0	0	102	10	0	21	0	31	0	0	0	0	0	219
% Multi Unit Trucks	0	5.2	5.1	0	5.1	2.4	5.9	0	0	5.0	2.4	0	6.8	0	4.3	0	0	0	0	0	4.9



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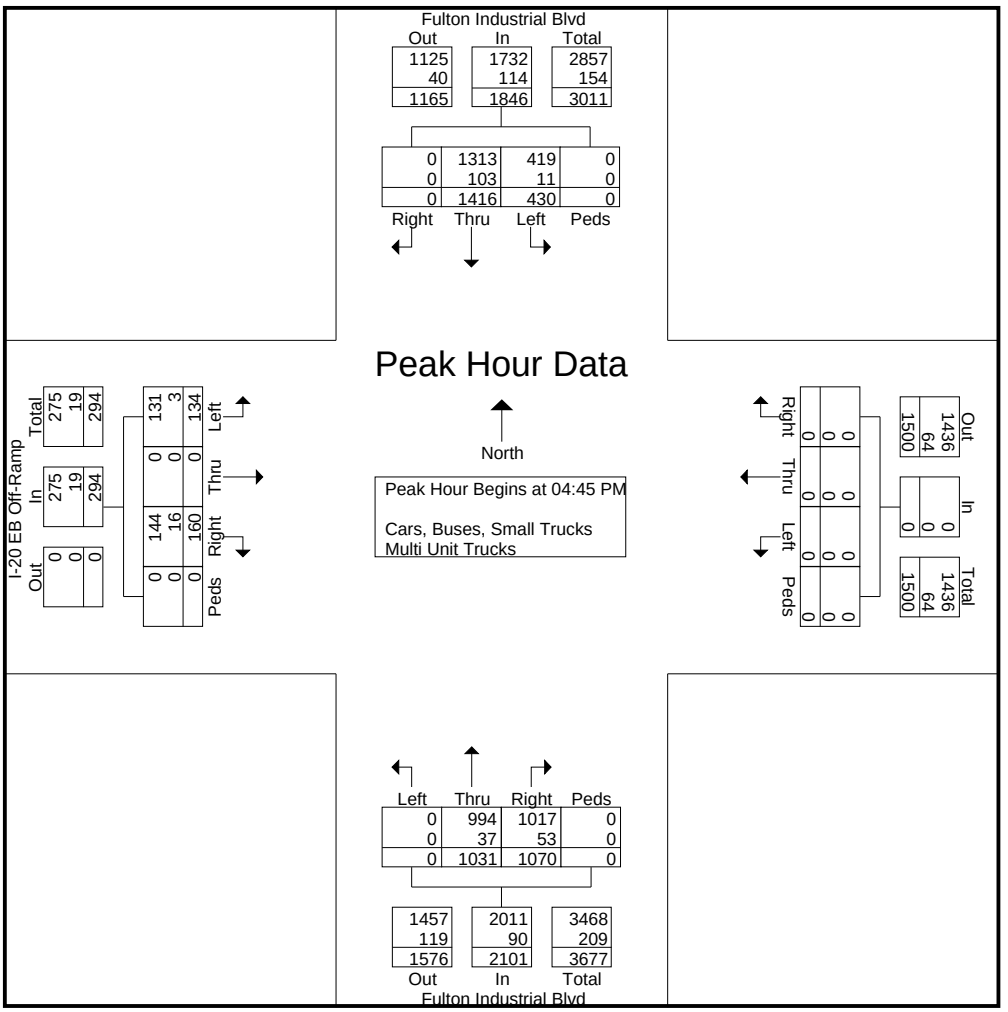
TMC Data
Fulton Industrial Blvd @
I-20 EB Off-Ramp
7-9am I 4-6pm

File Name : 38510001
Site Code : 38510001
Start Date : 5/17/2016
Page No : 3

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					I-20 EB Off-Ramp Eastbound					Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	256	246	0	502	106	319	0	0	425	31	0	**54**	0	**85**	0	0	0	0	0	1012
05:00 PM	0	**310**	**317**	0	**627**	**116**	342	0	0	458	31	0	36	0	67	0	0	0	0	0	**1152**
05:15 PM	0	223	259	0	482	103	337	0	0	440	26	0	34	0	60	0	0	0	0	0	982
05:30 PM	0	242	248	0	490	105	**418**	0	0	**523**	**46**	0	36	0	82	0	0	0	0	0	1095
Total Volume	0	1031	1070	0	2101	430	1416	0	0	1846	134	0	160	0	294	0	0	0	0	0	4241
% App. Total	0	49.1	50.9	0		23.3	76.7	0	0		45.6	0	54.4	0		0	0	0	0		
PHF	.000	.831	.844	.000	.838	.927	.847	.000	.000	.882	.728	.000	.741	.000	.865	.000	.000	.000	.000	.000	.920
Cars, Buses, Small Trucks	0	994	1017	0	2011	419	1313	0	0	1732	131	0	144	0	275	0	0	0	0	0	4018
% Cars, Buses, Small Trucks	0	96.4	95.0	0	95.7	97.4	92.7	0	0	93.8	97.8	0	90.0	0	93.5	0	0	0	0	0	94.7
Multi Unit Trucks	0	37	53	0	90	11	103	0	0	114	3	0	16	0	19	0	0	0	0	0	223
% Multi Unit Trucks	0	3.6	5.0	0	4.3	2.6	7.3	0	0	6.2	2.2	0	10.0	0	6.5	0	0	0	0	0	5.3



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TMC Data
Fulton Industrial Blvd @
I-20 WB Off-Ramp
7-9am I 4-6pm

File Name : 38510002
Site Code : 38510002
Start Date : 5/17/2016
Page No : 1

Groups Printed- Cars, Buses, Small Trucks - Multi Unit Trucks

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Eastbound					I-20 WB Off-Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	24	268	0	0	292	0	215	17	0	232	0	0	0	0	0	167	2	62	0	231	755
07:15 AM	28	289	0	0	317	0	270	28	0	298	0	0	0	0	0	188	0	90	0	278	893
07:30 AM	26	299	0	0	325	0	318	22	0	340	0	0	0	0	0	224	0	93	0	317	982
07:45 AM	28	296	0	0	324	0	299	36	0	335	0	0	0	0	0	222	0	92	0	314	973
Total	106	1152	0	0	1258	0	1102	103	0	1205	0	0	0	0	0	801	2	337	0	1140	3603
08:00 AM	29	287	0	0	316	0	299	26	0	325	0	0	0	0	0	191	0	79	0	270	911
08:15 AM	34	251	0	0	285	0	298	36	0	334	0	0	0	0	0	208	1	73	0	282	901
08:30 AM	23	264	0	0	287	0	277	29	0	306	0	0	0	0	0	163	0	88	0	251	844
08:45 AM	19	280	0	0	299	0	281	27	0	308	0	0	0	0	0	160	0	90	0	250	857
Total	105	1082	0	0	1187	0	1155	118	0	1273	0	0	0	0	0	722	1	330	0	1053	3513
*** BREAK ***																					
04:00 PM	65	206	0	0	271	0	285	117	0	402	0	0	0	0	0	123	0	96	0	219	892
04:15 PM	66	209	0	0	275	0	290	132	0	422	0	0	0	0	0	134	0	110	0	244	941
04:30 PM	64	219	0	0	283	0	298	151	0	449	0	0	0	0	0	121	0	88	0	209	941
04:45 PM	54	230	0	0	284	0	327	156	0	483	0	0	0	0	0	127	0	74	0	201	968
Total	249	864	0	0	1113	0	1200	556	0	1756	0	0	0	0	0	505	0	368	0	873	3742
05:00 PM	105	230	0	0	335	0	341	162	0	503	0	0	0	0	0	130	1	86	0	217	1055
05:15 PM	72	205	0	0	277	0	334	149	0	483	0	0	0	0	0	143	2	94	0	239	999
05:30 PM	86	208	0	0	294	0	346	157	0	503	0	0	0	0	0	148	1	100	0	249	1046
05:45 PM	44	202	0	0	246	0	334	155	0	489	0	0	0	0	0	150	1	109	0	260	995
Total	307	845	0	0	1152	0	1355	623	0	1978	0	0	0	0	0	571	5	389	0	965	4095
Grand Total	767	3943	0	0	4710	0	4812	1400	0	6212	0	0	0	0	0	2599	8	1424	0	4031	14953
Apprch %	16.3	83.7	0	0		0	77.5	22.5	0		0	0	0	0		64.5	0.2	35.3	0		
Total %	5.1	26.4	0	0	31.5	0	32.2	9.4	0	41.5	0	0	0	0	0	17.4	0.1	9.5	0	27	
Cars, Buses, Small Trucks	702	3792	0	0	4494	0	4639	1340	0	5979	0	0	0	0	0	2341	7	1395	0	3743	14216
% Cars, Buses, Small Trucks	91.5	96.2	0	0	95.4	0	96.4	95.7	0	96.2	0	0	0	0	0	90.1	87.5	98	0	92.9	95.1
Multi Unit Trucks	65	151	0	0	216	0	173	60	0	233	0	0	0	0	0	258	1	29	0	288	737
% Multi Unit Trucks	8.5	3.8	0	0	4.6	0	3.6	4.3	0	3.8	0	0	0	0	0	9.9	12.5	2	0	7.1	4.9

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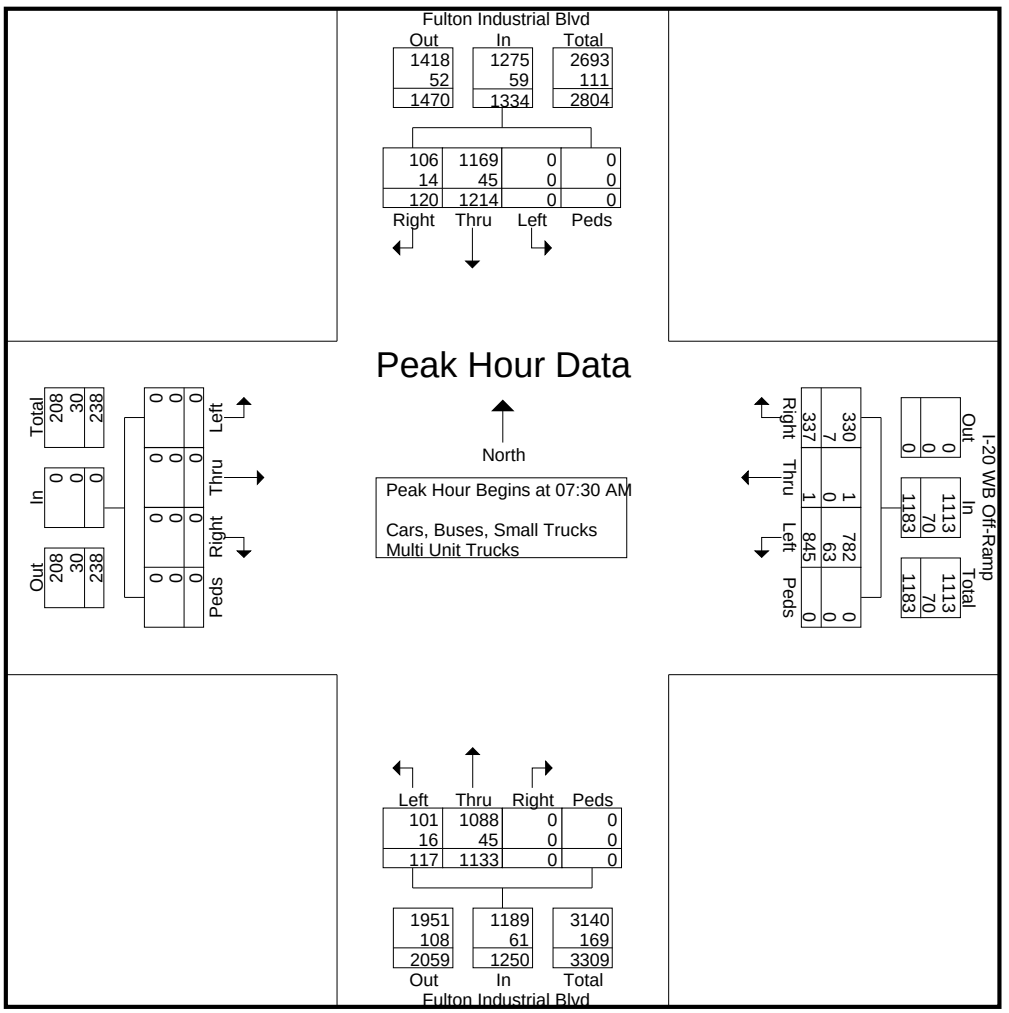
TMC Data
Fulton Industrial Blvd @
I-20 WB Off-Ramp
7-9am I 4-6pm

File Name : 38510002
Site Code : 38510002
Start Date : 5/17/2016
Page No : 2

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Eastbound					I-20 WB Off-Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	26	**299**	0	0	**325**	0	**318**	22	0	**340**	0	0	0	0	0	**224**	0	**93**	0	**317**	**982**
07:45 AM	28	296	0	0	324	0	299	**36**	0	335	0	0	0	0	0	222	0	92	0	314	973
08:00 AM	29	287	0	0	316	0	299	26	0	325	0	0	0	0	0	191	0	79	0	270	911
08:15 AM	**34**	251	0	0	285	0	298	36	0	334	0	0	0	0	0	208	**1**	73	0	282	901
Total Volume	117	1133	0	0	1250	0	1214	120	0	1334	0	0	0	0	0	845	1	337	0	1183	3767
% App. Total	9.4	90.6	0	0		0	91	9	0		0	0	0	0		71.4	0.1	28.5	0		
PHF	.860	.947	.000	.000	.962	.000	.954	.833	.000	.981	.000	.000	.000	.000	.000	.943	.250	.906	.000	.933	.959
Cars, Buses, Small Trucks	101	1088	0	0	1189	0	1169	106	0	1275	0	0	0	0	0	782	1	330	0	1113	3577
% Cars, Buses, Small Trucks	86.3	96.0	0	0	95.1	0	96.3	88.3	0	95.6	0	0	0	0	0	92.5	100	97.9	0	94.1	95.0
Multi Unit Trucks	16	45	0	0	61	0	45	14	0	59	0	0	0	0	0	63	0	7	0	70	190
% Multi Unit Trucks	13.7	4.0	0	0	4.9	0	3.7	11.7	0	4.4	0	0	0	0	0	7.5	0	2.1	0	5.9	5.0



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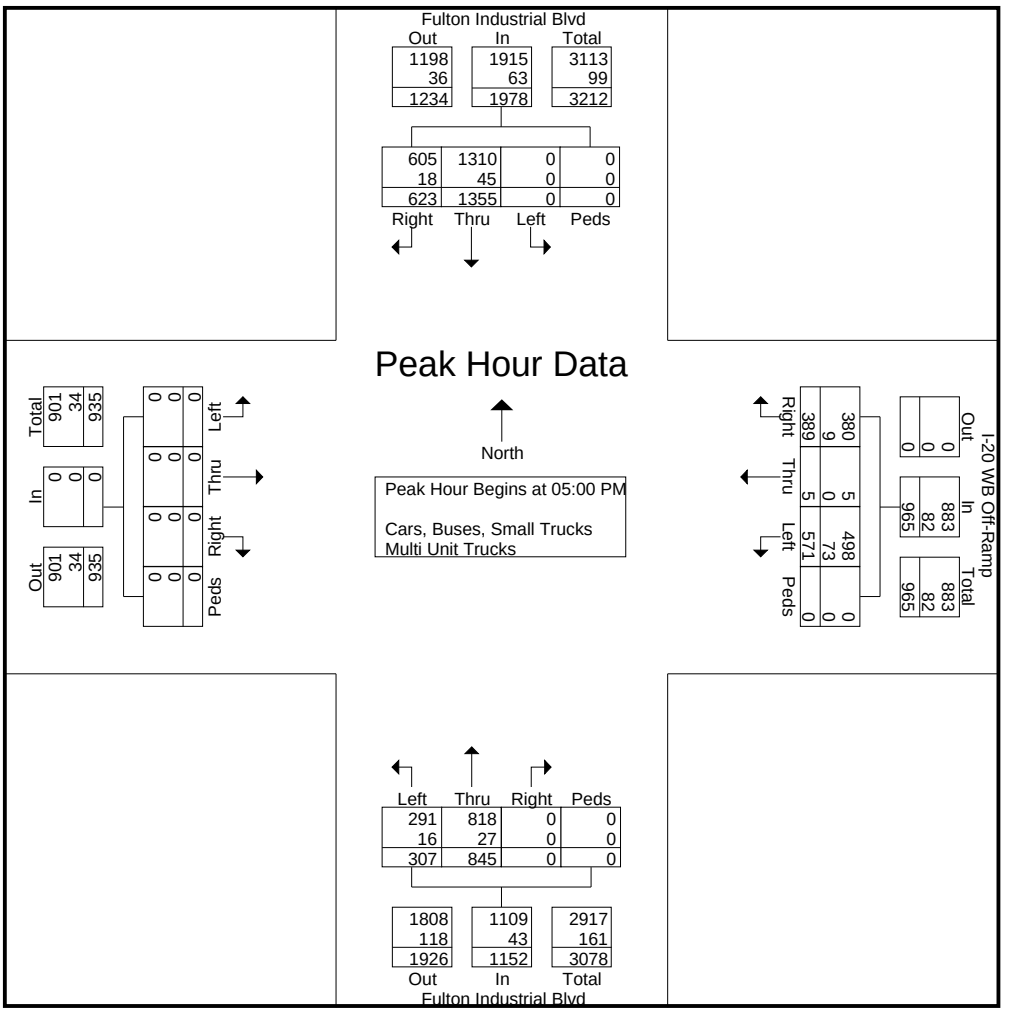
TMC Data
Fulton Industrial Blvd @
I-20 WB Off-Ramp
7-9am I 4-6pm

File Name : 38510002
Site Code : 38510002
Start Date : 5/17/2016
Page No : 3

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Eastbound					I-20 WB Off-Ramp Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	**105**	**230**	0	0	**335**	0	341	**162**	0	**503**	0	0	0	0	0	130	1	86	0	217	**1055**
05:15 PM	72	205	0	0	277	0	334	149	0	483	0	0	0	0	0	143	**2**	94	0	239	999
05:30 PM	86	208	0	0	294	0	**346**	157	0	503	0	0	0	0	0	148	1	100	0	249	1046
05:45 PM	44	202	0	0	246	0	334	155	0	489	0	0	0	0	0	**150**	1	**109**	0	**260**	995
Total Volume	307	845	0	0	1152	0	1355	623	0	1978	0	0	0	0	0	571	5	389	0	965	4095
% App. Total	26.6	73.4	0	0		0	68.5	31.5	0		0	0	0	0		59.2	0.5	40.3	0		
PHF	.731	.918	.000	.000	.860	.000	.979	.961	.000	.983	.000	.000	.000	.000	.000	.952	.625	.892	.000	.928	.970
Cars, Buses, Small Trucks	291	818	0	0	1109	0	1310	605	0	1915	0	0	0	0	0	498	5	380	0	883	3907
% Cars, Buses, Small Trucks	94.8	96.8	0	0	96.3	0	96.7	97.1	0	96.8	0	0	0	0	0	87.2	100	97.7	0	91.5	95.4
Multi Unit Trucks	16	27	0	0	43	0	45	18	0	63	0	0	0	0	0	73	0	9	0	82	188
% Multi Unit Trucks	5.2	3.2	0	0	3.7	0	3.3	2.9	0	3.2	0	0	0	0	0	12.8	0	2.3	0	8.5	4.6



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TMC Data
Fulton Industrial Blvd @ Wendell Dr

7-9am I 4-6pm

File Name : 38510003
Site Code : 38510003
Start Date : 5/17/2016
Page No : 1

Groups Printed- Cars, Buses, Small Trucks - Multi Unit Trucks

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Wendell Dr Eastbound					Wendell Dr Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	18	308	32	0	358	7	219	8	0	234	1	0	1	0	2	8	0	4	0	12	606
07:15 AM	15	330	24	0	369	4	275	7	0	286	0	1	6	0	7	6	2	0	0	8	670
07:30 AM	25	336	20	0	381	7	320	2	0	329	2	1	2	0	5	18	0	1	0	19	734
07:45 AM	10	338	18	0	366	1	311	6	0	318	1	2	7	0	10	15	2	1	0	18	712
Total	68	1312	94	0	1474	19	1125	23	0	1167	4	4	16	0	24	47	4	6	0	57	2722
08:00 AM	13	331	22	0	366	3	301	2	0	306	3	2	4	0	9	13	1	3	0	17	698
08:15 AM	8	324	13	0	345	3	301	5	0	309	2	1	7	0	10	10	3	3	0	16	680
08:30 AM	9	308	21	0	338	2	296	0	0	298	0	1	5	0	6	9	1	4	0	14	656
08:45 AM	13	319	23	0	355	2	286	5	0	293	0	0	5	0	5	11	2	3	0	16	669
Total	43	1282	79	0	1404	10	1184	12	0	1206	5	4	21	0	30	43	7	13	0	63	2703
*** BREAK ***																					
04:00 PM	11	263	17	0	291	5	375	2	0	382	6	3	14	0	23	18	2	5	0	25	721
04:15 PM	14	268	19	0	301	6	389	5	0	400	3	5	11	0	19	18	2	6	0	26	746
04:30 PM	4	282	18	0	304	6	400	2	0	408	2	1	18	0	21	18	0	3	0	21	754
04:45 PM	6	296	18	0	320	8	444	5	0	457	5	0	13	0	18	21	0	2	0	23	818
Total	35	1109	72	0	1216	25	1608	14	0	1647	16	9	56	0	81	75	4	16	0	95	3039
05:00 PM	3	301	19	0	323	5	462	0	0	467	14	2	16	0	32	26	0	2	0	28	850
05:15 PM	5	266	16	0	287	6	457	0	0	463	2	4	7	0	13	18	0	2	0	20	783
05:30 PM	4	270	22	0	296	7	461	2	0	470	1	5	5	0	11	21	0	5	0	26	803
05:45 PM	9	265	20	0	294	5	434	1	0	440	2	1	13	0	16	21	1	4	0	26	776
Total	21	1102	77	0	1200	23	1814	3	0	1840	19	12	41	0	72	86	1	13	0	100	3212
Grand Total	167	4805	322	0	5294	77	5731	52	0	5860	44	29	134	0	207	251	16	48	0	315	11676
Apprch %	3.2	90.8	6.1	0		1.3	97.8	0.9	0		21.3	14	64.7	0		79.7	5.1	15.2	0		
Total %	1.4	41.2	2.8	0	45.3	0.7	49.1	0.4	0	50.2	0.4	0.2	1.1	0	1.8	2.1	0.1	0.4	0	2.7	
Cars, Buses, Small Trucks	164	4630	319	0	5113	77	5521	52	0	5650	44	29	127	0	200	247	16	48	0	311	11274
% Cars, Buses, Small Trucks	98.2	96.4	99.1	0	96.6	100	96.3	100	0	96.4	100	100	94.8	0	96.6	98.4	100	100	0	98.7	96.6
Multi Unit Trucks	3	175	3	0	181	0	210	0	0	210	0	0	7	0	7	4	0	0	0	4	402
% Multi Unit Trucks	1.8	3.6	0.9	0	3.4	0	3.7	0	0	3.6	0	0	5.2	0	3.4	1.6	0	0	0	1.3	3.4

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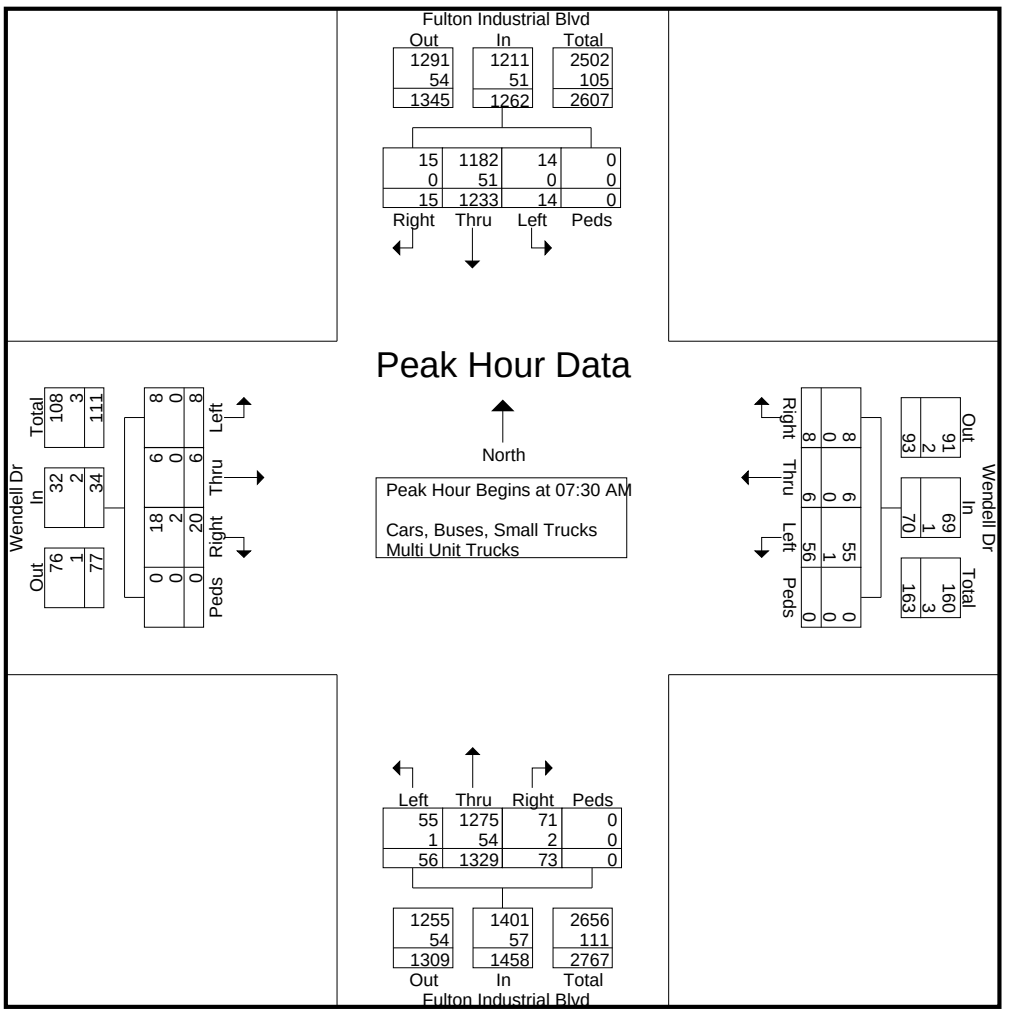
TMC Data
Fulton Industrial Blvd @ Wendell Dr

7-9am I 4-6pm

File Name : 38510003
Site Code : 38510003
Start Date : 5/17/2016
Page No : 2

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Wendell Dr Eastbound					Wendell Dr Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**25**	336	20	0	**381**	**7**	**320**	2	0	**329**	2	1	2	0	5	**18**	0	1	0	**19**	**734**
07:45 AM	10	**338**	18	0	366	1	311	**6**	0	318	1	**2**	**7**	0	**10**	15	2	1	0	18	712
08:00 AM	13	331	**22**	0	366	3	301	2	0	306	**3**	2	4	0	9	13	1	**3**	0	17	698
08:15 AM	8	324	13	0	345	3	301	5	0	309	2	1	7	0	10	10	**3**	3	0	16	680
Total Volume	56	1329	73	0	1458	14	1233	15	0	1262	8	6	20	0	34	56	6	8	0	70	2824
% App. Total	3.8	91.2	5	0		1.1	97.7	1.2	0		23.5	17.6	58.8	0		80	8.6	11.4	0		
PHF	.560	.983	.830	.000	.957	.500	.963	.625	.000	.959	.667	.750	.714	.000	.850	.778	.500	.667	.000	.921	.962
Cars, Buses, Small Trucks	55	1275	71	0	1401	14	1182	15	0	1211	8	6	18	0	32	55	6	8	0	69	2713
% Cars, Buses, Small Trucks	98.2	95.9	97.3	0	96.1	100	95.9	100	0	96.0	100	100	90.0	0	94.1	98.2	100	100	0	98.6	96.1
Multi Unit Trucks	1	54	2	0	57	0	51	0	0	51	0	0	2	0	2	1	0	0	0	1	111
% Multi Unit Trucks	1.8	4.1	2.7	0	3.9	0	4.1	0	0	4.0	0	0	10.0	0	5.9	1.8	0	0	0	1.4	3.9



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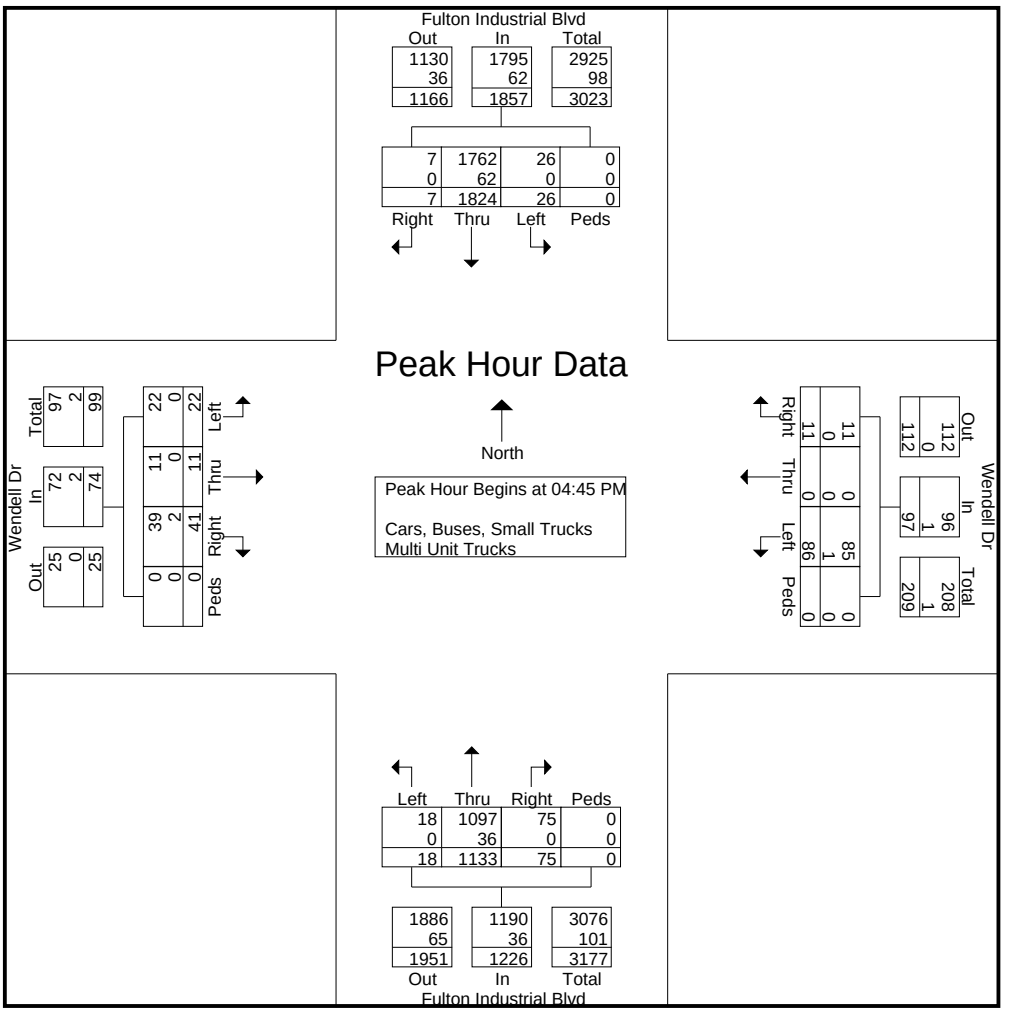
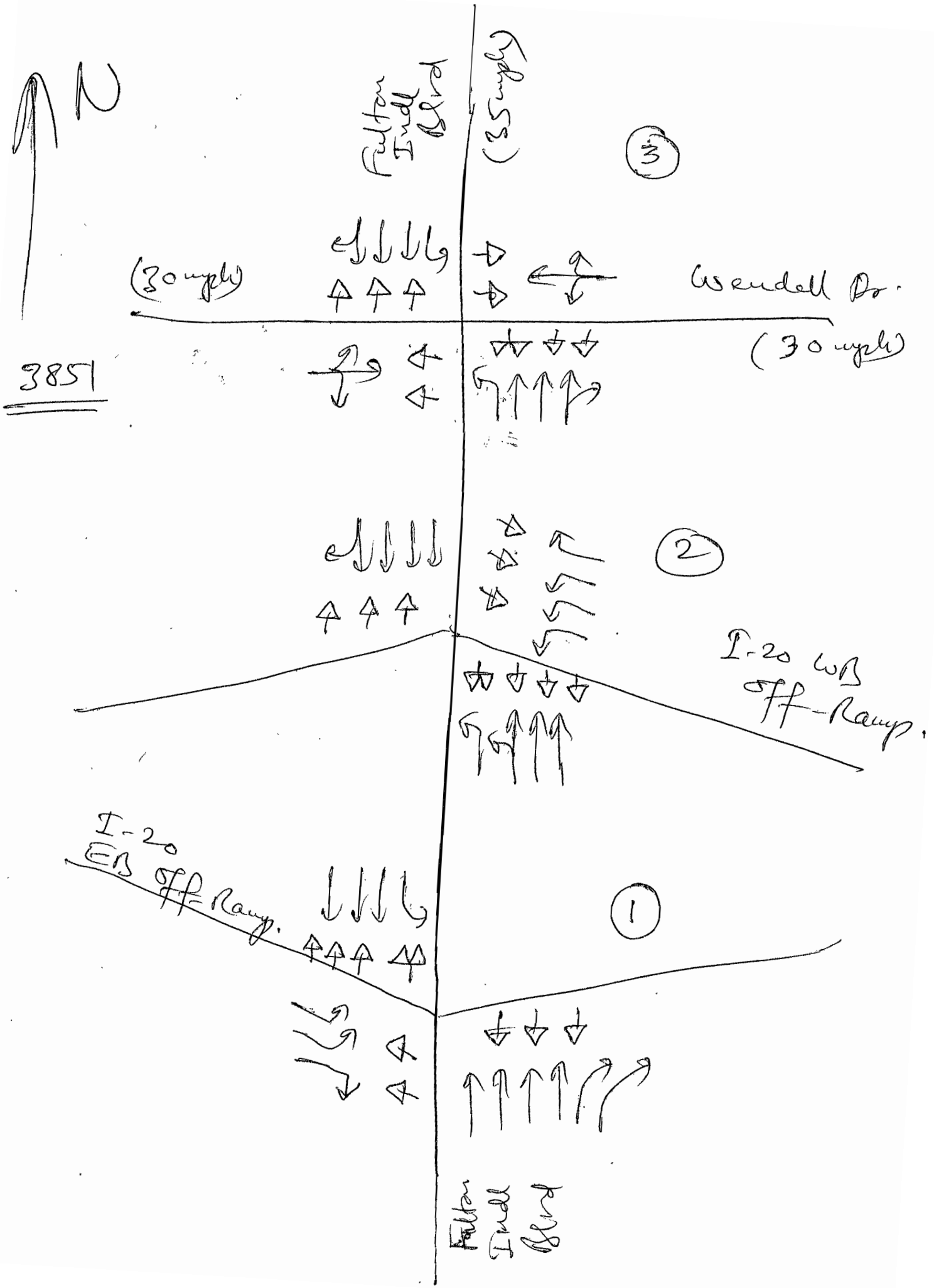
Fulton Industrial Blvd @ Wendell Dr

7-9am I 4-6pm

File Name : 38510003
Site Code : 38510003
Start Date : 5/17/2016
Page No : 3

	Fulton Industrial Blvd Northbound					Fulton Industrial Blvd Southbound					Wendell Dr Eastbound					Wendell Dr Westbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**6**	296	18	0	320	**8**	444	**5**	0	457	5	0	13	0	18	21	0	2	0	23	818
05:00 PM	3	**301**	19	0	**323**	5	**462**	0	0	467	**14**	2	**16**	0	**32**	**26**	0	2	0	**28**	**850**
05:15 PM	5	266	16	0	287	6	457	0	0	463	2	4	7	0	13	18	0	2	0	20	783
05:30 PM	4	270	**22**	0	296	7	461	2	0	**470**	1	**5**	5	0	11	21	0	**5**	0	26	803
Total Volume	18	1133	75	0	1226	26	1824	7	0	1857	22	11	41	0	74	86	0	11	0	97	3254
% App. Total	1.5	92.4	6.1	0		1.4	98.2	0.4	0		29.7	14.9	55.4	0		88.7	0	11.3	0		
PHF	.750	.941	.852	.000	.949	.813	.987	.350	.000	.988	.393	.550	.641	.000	.578	.827	.000	.550	.000	.866	.957
Cars, Buses, Small Trucks	18	1097	75	0	1190	26	1762	7	0	1795	22	11	39	0	72	85	0	11	0	96	3153
% Cars, Buses, Small Trucks	100	96.8	100	0	97.1	100	96.6	100	0	96.7	100	100	95.1	0	97.3	98.8	0	100	0	99.0	96.9
Multi Unit Trucks	0	36	0	0	36	0	62	0	0	62	0	0	2	0	2	1	0	0	0	1	101
% Multi Unit Trucks	0	3.2	0	0	2.9	0	3.4	0	0	3.3	0	0	4.9	0	2.7	1.2	0	0	0	1.0	3.1




N
Fulton Indl Blvd
(35 mph)
3
(30 mph)
Wendell Dr.
(30 mph)
3851
2
I-20 WB
Off-Ramp
I-20
EB Off-Ramp
1
Fulton Indl Blvd

Appendix B:
GRTA Letter of Understanding

LETTER OF UNDERSTANDING

May 10, 2016

John L Varner
J&P Fulton REO Properties, LLC
131 Roswell Street, Suite B210
Roswell, Georgia 30009

RE: **DRI 2580 Fulton Industrial Truck Stop (J&P Fulton REO Properties, LLC Travel Center)**

Dear Mr. Varner:

The purpose of this letter is to document the discussions during the Pre-Review and Methodology Meeting held at ARC's office on May 5, 2016 regarding **DRI 2580 Fulton Industrial Truck Stop (J&P Fulton REO Properties, LLC Travel Center).** Some of the following items were discussed in this meeting and should assist you and your consultant team in preparing the DRI Review Package.

PROJECT OVERVIEW

- The project is located in Fulton County. The proposed development is located on the northern corner of Fulton Industrial Boulevard/SR 70 and I-20 West Interstate with proposed access onto Fulton Industrial Boulevard (relocated right-in/right-out) and Wendell Drive (full movement).
- The DRI trigger for this development is a rezoning.
- The proposed development is consisting of approximately 14,900 sq ft 2-story building convenience store, 20 fueling positions for cars, 6 fueling positions for trucks and truck parking.
- The estimated vehicular trip generation is 3,307 gross daily trips based on the ITE *Trip Generation Manual, 9th Edition, 2012*.
- The projected build out for this DRI is 2017 in one phase.
- The applicant is applying for approval under GRTA's non-expedited review process.

METHODOLOGY

- All intersections identified as within the study network shall be analyzed during the AM and PM peak hours for (1) existing conditions, (2) future "no-build" conditions [may not be applicable for the site driveways], and (3) future "build" conditions. This DRI shall be reviewed in one phase to be completed by 2017.
- Capacity analysis shall be based on turning movement counts collected not more than 12-months prior to the date of the actual DRI submittal to GRTA. As appropriate, pedestrian counts and heavy vehicle counts shall be collected with vehicle counts and considered within the capacity analysis. Turning movement counts shall be collected while local schools are in session and ordinarily not between the week of Thanksgiving and the second week of January or any week of a major holiday.
- A 1.0% background traffic growth rate shall be used for all roadways.
- The level of service standard for all analyses shall be LOS D.

- Pass-by trip reductions are allowed with no alternative mode or mixed use reductions.
- Default values should not be assumed in the traffic modeling. Existing conditions shall be taken into account.
- The applicant shall research TIP, STIP, RTP, and GDOT's construction work program, as well as any local government plans (SPLOST, CIP, etc.), to determine the open-to-traffic date, sponsor, cost of the project, funding source(s), for future roadway projects in the project vicinity. This information shall be included within the traffic analysis.

STUDY NETWORK

1. Fulton Industrial Boulevard/SR70 at Wendell Drive
2. Fulton Industrial Boulevard/SR70 at I-20 Westbound Ramps
3. Fulton Industrial Boulevard/SR70 at I-20 Eastbound Ramps
4. All site driveways

ADDITIONAL INFORMATION

Every roadway segment and intersection listed above will be analyzed for "required improvements." If the existing LOS for the segment or intersection is below the applicable level of service for a particular time period (e.g., A.M. peak period, P.M. peak period, etc.), then the measured LOS service for that segment and time periods is the standard by which the "base" and "future" traffic conditions will be designed. For example, if the County's LOS standard is LOS D, but an intersection or segment currently operates at LOS E for a certain peak period, then the LOS standard for that intersection or segment for "base" and "future" conditions becomes LOS E (only for that intersection and only for that peak period). The "base" is the phase year traffic without the development traffic (also called future "no-build" conditions) and the "future" is the phase year with the development traffic (also called future "build" conditions). As required in the technical guidelines, specific "required improvements" will be identified to bring the "base" LOS and "future" LOS for every roadway segment and intersection up to the applicable LOS standard. If the existing LOS for the segment or intersection is LOS F, then the future "no-build' and future "build" LOS standard will be LOS E. The improvements required to achieve the desired LOS standard will be provided in a table and graphic within the study. The traffic study should indicate the existing roadway laneage at each studied intersection as well as the laneage required (to meet the LOS standard) for future "no-build" and future "build" conditions. The improvements may include both programmed improvements and improvements identified in the study.

The planned and programmed improvement should indicate the project sponsor, the anticipated funding by source (federal, state, city/county, developer, CID, etc.), the year open-to-traffic, and estimate of the total project cost. All other required improvements identified in the study should, to the extent known, identify the cost, sponsor, funding, and timing. If any of these elements are not known, please state as "unknown."

The future "no-build" and the future "build" analyses should NOT automatically include/assume the additional lanes/capacity associated with planned and programmed improvement projects unless those roadway projects are currently under construction. Instead, the traffic consultant should recommend the additional laneage required to satisfy the level of service standard.

DRI REVIEW PACKAGE CHECKLIST

Please use the DRI Review Package Checklist to help you prepare your GRTA DRI Review Package for expedited review of your application. The Checklist reflects the understandings set forth in this letter, and is incorporated into this letter by reference.

The site plan shall be prepared in accordance with Section 4-104 of the DRI Review Package Technical Guidelines and it shall be dated, and shall be at a scale of 1"= 200' or larger (showing more detail). The site plan shall be consistent with GRTA's Site Plan Information Guidelines, which represents the minimum required information on site plans.

The applicant shall indicate on the site plans all adjacent land uses, current zoning, and future land use as indicated on the future land use map. Additionally, all existing and proposed sidewalks, existing and proposed pedestrian trails, and existing and proposed roadway laneage should be indicated on the site plan.

DRI REVIEW PACKAGE SUBMITTAL

At the time you are ready to submit your DRI Review Package to GRTA, please note the following:

- Provide one (1) paper copy of all materials:
  - Transportation analysis
  - Site Plan
- Provide one (1) CD-ROM with electronic versions of all submittal documents:
  - Provide a PDF of each document
  - Provide the native format for each document
    - .dwg is the preferred CAD format (AutoCAD)
    - .doc is the preferred word processing format (Word)
    - .xls is the preferred spreadsheet format (Excel)
    - .sy6, .sy7, .sy8 or .sy9 is the preferred capacity analysis format (Synchro)

As part of the completeness certification process, please have your consultant forward one copy of the completed GRTA DRI Review Package (traffic analysis, site plan, CD) to the GDOT District Office, Regional Commission and local government Planning & Development and Transportation group (contact information provided below). GRTA shall be copied on each of the transmittal letters.

ATLANTA REGIONAL COMMISSION	**GDOT DISTRICT 7**	**FULTON COUNTY PLANNING AND COMMUNITY SERVICES**
Andrew Smith 40 Courtland Street, NE Atlanta, GA 30303	Patrick Allen 5025 New Peachtree Rd, NE Chamblee, GA 30341	Morgan Ellington 5440 Fulton Industrial Blvd Atlanta, GA 30336

We encourage your consultant team to verify the items covered in this letter prior to compiling the submittal materials. If you have any questions, please feel free to contact me directly at 404-463-3068 (lbeall@grta.org).

Sincerely,

Laura F. Beall, AICP
Program Manager

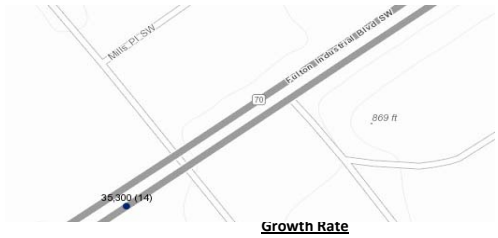
cc:

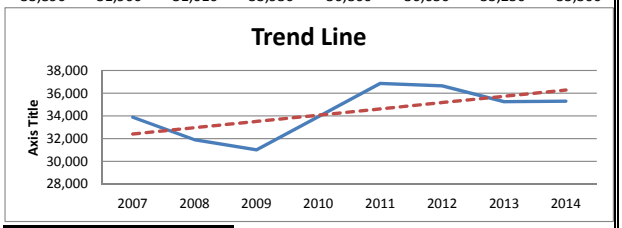
Jon West, DCA
Andrew Smith, ARC
Patrick Allen, GDOT District 7
Greg Floyd, MARTA
Gil Prado, Boulevard CID
Morgan Ellington, Fulton Co Planning and Community Services
Penn Hodge, Penn Hodge Properties
Grant Schmeelk, FTS
Pete Hendrix, Attorney
Brian Cole, BC Engineering
Abdul Amer, A & R Engineering, Inc.

Appendix C:
Linear Regression of Daily Traffic

Location	Growth Rate	Station ID	Route	2007	2008	2009	2010	2011	2012	2013	2014
SR 70 (South of Patton Dr)	1.6%	1215266	7000	33,890	31,900	31,010	33,930	36,860	36,650	35,250	35,300
I-20 WB Off Ramp (at SR 70)	1.4%	121r801	402057	17,750	14,310	20,900	18,120	15,660	17,710	19,000	19,000
I-20 EB Off Ramp (at SR 70)	-4.3%	121r201	402055	8,200	8,150	8,290	6,740	5,700	6,200	6,650	6,650
SR 70 (North of MLK Jr. Road)	-0.6%	1215268	7000	28,990	27,290	27,290	23,420	23,390	24,430	24,550	30,200
I-20 WB On Ramp (at SR 70)	-5.0%	121r802	402058	9,190	9,140	8,420	6,760	6,230	6,590	6,990	6,990
Weighted Average	**-1.4%**										

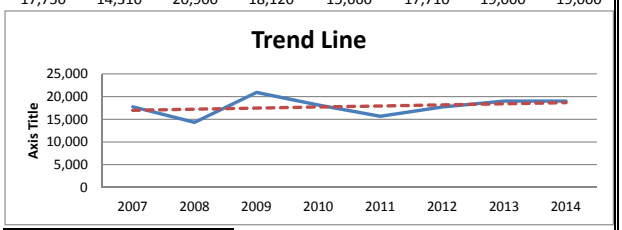
Location	Traffic Counter	RCLINK	2007	2008	2009	2010	2011	2012	2013	2014
SR 70 (South of Patton Dr)	1215266	7000	33,890	31,900	31,010	33,930	36,860	36,650	35,250	35,300





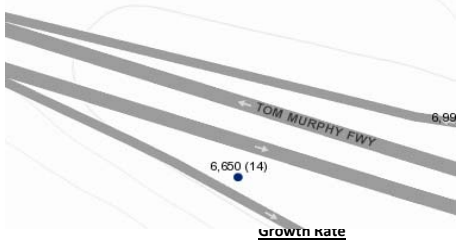
Growth Rate	1.6%				**Intercept**	-1,077,889		**Slope**	553.21	
Trend Line	32,413	32,966	33,519	34,072	34,625	35,179	35,732	36,285		

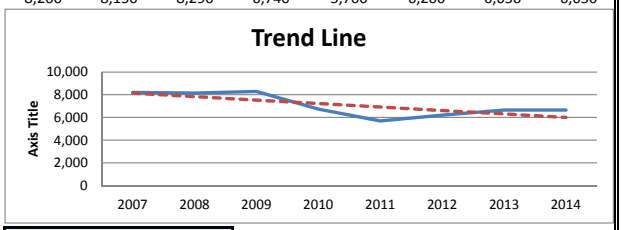
Location	Traffic Counter	RCLINK	2007	2008	2009	2010	2011	2012	2013	2014
I-20 WB Off Ramp (at SR 70)	121r801	402057	17,750	14,310	20,900	18,120	15,660	17,710	19,000	19,000



Growth Rate	1.4%				**Intercept**	-464,953		**Slope**	240.12	
Trend Line	16,966	17,206	17,446	17,686	17,926	18,166	18,407	18,647		

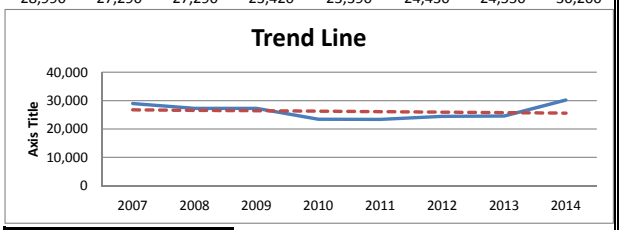
Location	Traffic Counter	RCLINK	2007	2008	2009	2010	2011	2012	2013	2014
I-20 EB Off Ramp (at SR 70)	121r201	402055	8,200	8,150	8,290	6,740	5,700	6,200	6,650	6,650





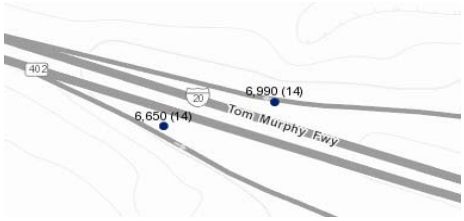
Growth Rate	-4.3%				**Intercept**	621,232		**Slope**	-305.48	
Trend Line	8,142	7,836	7,531	7,225	6,920	6,614	6,309	6,003		

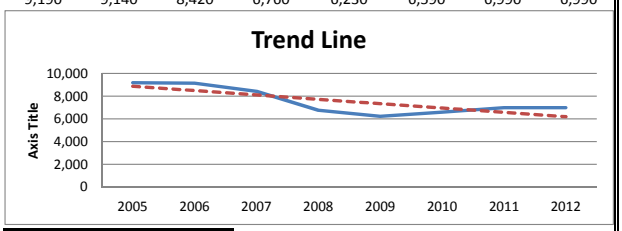
Location	Traffic Counter	RCLINK	2007	2008	2009	2010	2011	2012	2013	2014
SR 70 (North of MLK Jr. Road)	1215268	7000	28,990	27,290	27,290	23,420	23,390	24,430	24,550	30,200



Growth Rate	-0.6%				**Intercept**	357,449		**Slope**	-164.76	
Trend Line	26,772	26,607	26,442	26,277	26,113	25,948	25,783	25,618		

Location	Traffic Counter	RCLINK	2005	2006	2007	2008	2009	2010	2011	2012
I-20 WB On Ramp (at SR 70)	121r802	402058	9,190	9,140	8,420	6,760	6,230	6,590	6,990	6,990





Growth Rate	-5.0%				**Intercept**	776,746		**Slope**	-382.98	
Trend Line	8,879	8,496	8,113	7,730	7,347	6,964	6,581	6,198		

Appendix D:
Fact Sheets for Planned and Programmed Improvements

AR-ML-800

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	I-20 WEST MANAGED LANES FROM I-285 WEST TO SR 92 (FAIRBURN ROAD)
GDOT Project No.	TBD
Federal ID No.	N/A
Status	Long Range
Service Type	Roadway / Managed Lanes
Sponsor	GDOT
Jurisdiction	Regional - West
Analysis Level	In the Region's Air Quality Conformity Analysis
Existing Thru Lane	0
Planned Thru Lane	2

Network Year	2040
Corridor Length	11.0 miles

Detailed Description and Justification

This is a managed lanes project along I-20 West from I-285 West to SR 92 (Fairburn Road).

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
ALL	General Federal Aid 2022-2040		LR 2031-2040	**$201,000,000**	$160,800,000	$40,200,000	$0,000	$0,000
ALL	Toll Revenue Bonds		LR 2031-2040	**$165,000,000**	$0,000	$0,000	$165,000,000	$0,000
				$366,000,000	**$160,800,000**	**$40,200,000**	**$165,000,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

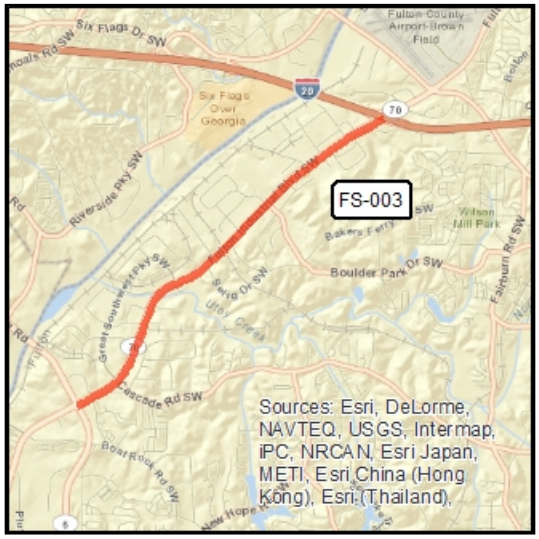
? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 2/24/2016

FS-003

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	SR 70 (FULTON INDUSTRIAL BOULEVARD) WIDENING FROM SR 6 (CAMP CREEK PARKWAY) TO JAMES ALDREDGE BOULEVARD
GDOT Project No.	720960-
Federal ID No.	STP00-0021-01(023)
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	GDOT
Jurisdiction	Fulton County (South)
Analysis Level	In the Region's Air Quality Conformity Analysis
Existing Thru Lane	4
Planned Thru Lane	6



Network Year	2030		
Corridor Length	2.3	miles	

Detailed Description and Justification

This project involves adding one general purpose lane in each direction along SR 70 (Fulton Industrial Boulevard) between SR 6 (Camp Creek Parkway) and James Aldredge Boulevard.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
ALL	General Federal Aid 2022-2040		LR 2022-2030	**$3,770,000**	$3,016,000	$754,000	$0,000	$0,000
				$3,770,000	**$3,016,000**	**$754,000**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

Report Generated: 2/24/2016

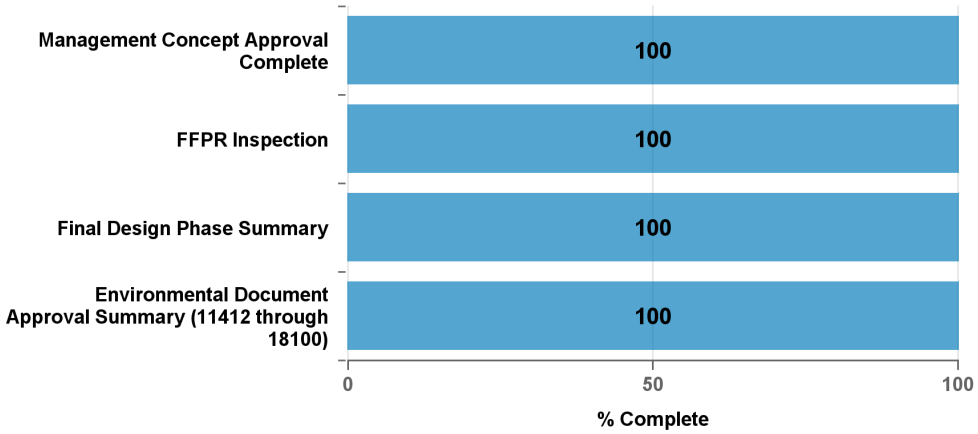
PROJ ID	COUNTY	DESCRIPTION
0013226	Douglas	**I-20 FROM SR 5/DOUGLAS TO SR 139/FULTON - NAVIGATOR ITS**
Mgmt Let Date:	3/20/2015	This project will extend Georgia Navigator along I-20 West from SR5 to SR7.

PROJ NO:
MPO TIP#:
MPO: Atlanta TMA
PROJ LENGTH (MI): 15.43
TYPE WORK: ITS
LET RESPONSIBILITY: GDOT Let
BIKE PROVISIONS INCLUDED? N

SPONSOR: GDOT
PROJ MGR: Decker, Sue Anne
DOT DIST: 7
CONG DIST: 005, 013
TYPE WORK: ITS
HOUSE DIST:
SENATE DIST:

Phase	FY Approved	Approved FY Estimate *	Fund	Phase Status
Engineering	2015	$250,000.00	41597	AUTHORIZED
Construction	2015	$5,716,612.73	41597	AUTHORIZED

*** Inflation Included in Estimate**



Activity	Actual Start Date	Actual Finish Date
Management Concept Approval Complete	12/22/2014	12/22/2014
Environmental Document Approval Summary (11412 th	10/30/2014	10/30/2014
Final Design Phase Summary	10/31/2014	12/30/2014
FFPR Inspection	12/17/2014	12/17/2014

Right of Way Aqcuisition Information:

Preliminary Parcel Count: 0 **Total Parcel Count:** **Acquired by:** N/R

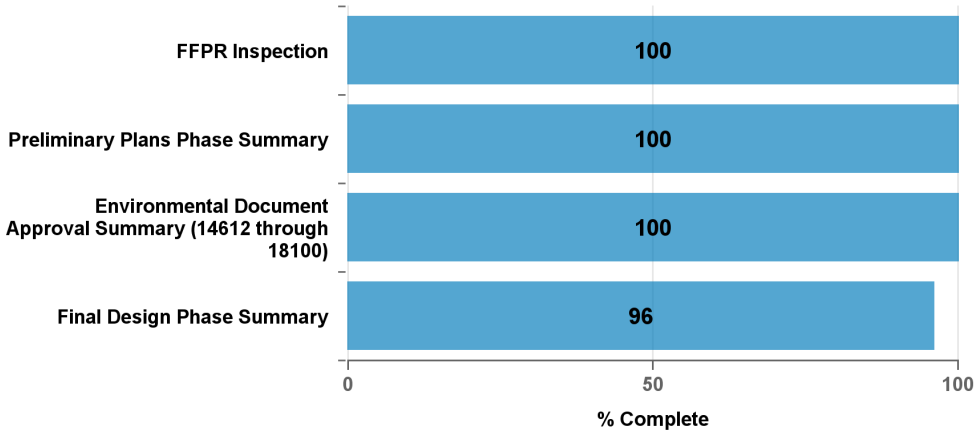
PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0013640	Fulton	**I-20 FM E OF CHATTAHOOCHEE RIVER TO E OF SR 124 @ 83 BCT LOC**
Mgmt Let Date:	6/17/2016	This project proposes to replace existing BCT (Breakaway Cable Terminial) anchors on guardrail.

PROJ NO:		**SPONSOR:**	GDOT
MPO TIP#:		**PROJ MGR:**	Decker, Sue Anne
MPO:	Atlanta TMA	**DOT DIST:**	7
PROJ LENGTH (MI):	28.57	**CONG DIST:**	004, 005
TYPE WORK:	Operational Improvement	**TYPE WORK:**	Operational Improvement
LET RESPONSIBILITY:	GDOT Let	**HOUSE DIST:**	
BIKE PROVISIONS INCLUDED?	N	**SENATE DIST:**	

Phase	FY Approved	Approved FY Estimate *	Fund	Phase Status
Engineering	2016	$25,000.00	MS30F	AUTHORIZED
Construction	2016	$746,585.94	HB170	PRECST

*** Inflation Included in Estimate**



Activity	Actual Start Date	Actual Finish Date
Environmental Document Approval Summary (14612 th	3/2/2016	3/4/2016
Preliminary Plans Phase Summary	12/16/2015	2/9/2016
Final Design Phase Summary	2/19/2016	
FFPR Inspection	3/17/2016	3/17/2016

Right of Way Aqcuisition Information:

Preliminary Parcel Count: **Total Parcel Count:** **Acquired by:** N/R

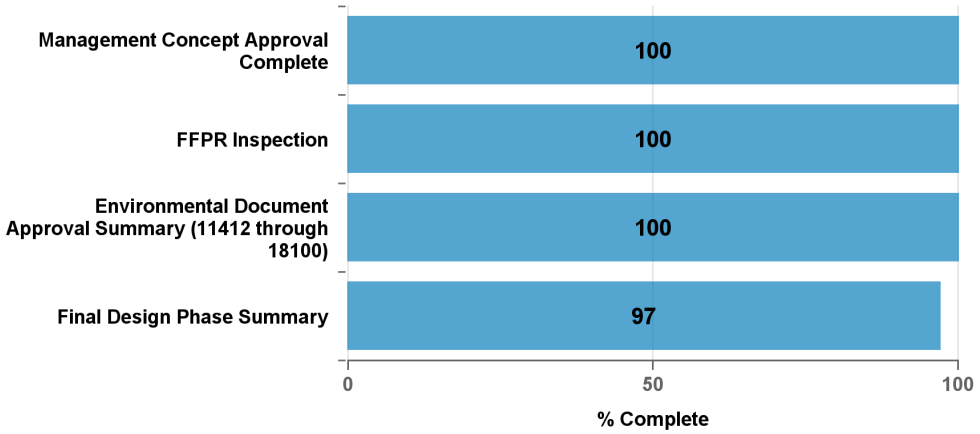
PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0013863	Douglas	**I-20 FROM SR 5/DOUGLAS TO SR 139/FULTON - RAMP METERS**
Mgmt Let Date:	8/19/2016	Ramp meters will be installed at the following ramps along I-20 on the west side of Atlanta: Fulton Industrial Blvd WB, Riverside Parkway EB and WB, SR 6/Thornton Rd EB and WB, Lee Road EB and WB, SR 92 EB and WB, Chapel Hill Road EB and WB, SR 5/Bill Arp Road EB and WB.

PROJ NO:		**SPONSOR:**	GDOT
MPO TIP#:		**PROJ MGR:**	Decker, Sue Anne
MPO:	Atlanta TMA	**DOT DIST:**	7
PROJ LENGTH (MI):	15.43	**CONG DIST:**	005, 013
TYPE WORK:	Operational Improvement	**TYPE WORK:**	Operational Improvement
LET RESPONSIBILITY:	GDOT Let	**HOUSE DIST:**	
BIKE PROVISIONS INCLUDED?	N	**SENATE DIST:**	

Phase	FY Approved	Approved FY Estimate *	Fund	Phase Status
Engineering	2016	$77,957.99	HB170	AUTHORIZED
Construction	2016	$1,600,000.00	HB170	PRECST

*** Inflation Included in Estimate**



Activity	Actual Start Date	Actual Finish Date
Management Concept Approval Complete	1/20/2016	1/20/2016
Environmental Document Approval Summary (11412 th	3/7/2016	3/14/2016
Final Design Phase Summary	10/31/2014	
FFPR Inspection	3/14/2016	3/14/2016

Right of Way Aqcuisition Information:

Preliminary Parcel Count: 0 **Total Parcel Count:** **Acquired by:** N/R

PRECONSTRUCTION STATUS REPORT

PROJ ID	COUNTY	DESCRIPTION
0013916	Douglas	**I-20 FROM I-285 TO SR 92 - EXPRESS LANES**

Mgmt Let Date:

PROJ NO:		**SPONSOR:**	GDOT
MPO TIP#:	AR-ML-800	**PROJ MGR:**	
MPO:	Atlanta TMA	**DOT DIST:**	7
PROJ LENGTH (MI):	10.5	**CONG DIST:**	005, 013
TYPE WORK:	Managed Lanes	**TYPE WORK:**	Managed Lanes
LET RESPONSIBILITY:	GDOT Let	**HOUSE DIST:**	
BIKE PROVISIONS INCLUDED?	N	**SENATE DIST:**	

Phase	FY Approved	Approved FY Estimate *	Fund	Phase Status
Engineering	2020	$500,000.00	Z001	PRECST
Engineering	2023	$500,000.00	Z001	PRECST
Engineering	2024	$7,820,000.00	Z001	PRECST
Engineering	2025	$24,970,000.00	Z001	PRECST
Engineering	2026	$8,320,000.00	Z001	PRECST
Engineering	NONE	$500,000.00	Z001	PRECST
Right of Way	2026	$9,670,000.00	Z001	PRECST
Right of Way	2027	$9,670,000.00	Z001	PRECST
Construction	2027	$137,090,000.00	Z001	PRECST
Construction	2028	$36,720,000.00	Z001	PRECST
Construction	2029	$36,720,000.00	Z001	PRECST
Construction	2030	$110,160,000.00	Z001	PRECST
Construction	2031	$62,450,000.00	Z001	PRECST
Construction	2032	$63,700,000.00	Z001	PRECST
Construction	2033	$64,970,000.00	Z001	PRECST
Construction	2034	$66,270,000.00	Z001	PRECST
Construction	2035	$67,600,000.00	Z001	PRECST
Construction	2036	$68,950,000.00	Z001	PRECST
Construction	2037	$70,330,000.00	Z001	PRECST
Construction	2038	$71,736,600.00	Z001	PRECST
Construction	2039	$73,171,332.00	Z001	PRECST
Construction	2040	$74,634,759.00	Z001	PRECST

*** Inflation Included in Estimate**

Right of Way Aqcuisition Information:

Preliminary Parcel Count: **Total Parcel Count:** **Acquired by:** N/R

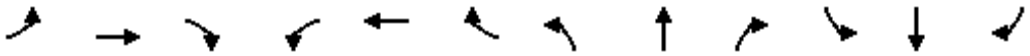
Appendix E:
Existing Intersection Analysis

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	410	6	310	813	857	544	1502
Future Volume (vph)	410	6	310	813	857	544	1502
Lane Group Flow (vph)	289	281	260	913	952	388	1873
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		4		2		1	6
Permitted Phases	4		4		2	6	
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	4.0	15.0
Minimum Split (s)	28.0	28.0	28.0	24.0	24.0	11.0	24.0
Total Split (s)	38.0	38.0	38.0	42.0	42.0	40.0	82.0
Total Split (%)	31.7%	31.7%	31.7%	35.0%	35.0%	33.3%	68.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.79	0.80	0.69	0.34	0.56	0.80	0.78
Control Delay	59.5	58.1	38.4	25.7	3.4	31.4	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	59.5	58.1	38.4	25.7	3.4	31.4	12.2
Queue Length 50th (ft)	223	212	134	136	0	224	285
Queue Length 95th (ft)	303	141	213	200	50	273	362
Internal Link Dist (ft)		656		633			526
Turn Bay Length (ft)			400		310		
Base Capacity (vph)	448	424	442	2659	1701	575	2413
Starvation Cap Reductn	0	0	0	0	0	0	70
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.66	0.59	0.34	0.56	0.67	0.80

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 53 (44%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	410	6	310	0	0	0	0	813	857	544	1502	0
Future Volume (vph)	410	6	310	0	0	0	0	813	857	544	1502	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.86	0.88	0.86	0.86	
Frt	1.00	0.95	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1681	1538	1434					6225	2707	1522	4616	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.23	0.66	
Satd. Flow (perm)	1681	1538	1434					6225	2707	361	3077	
Peak-hour factor, PHF	0.88	0.50	0.88	0.92	0.92	0.92	0.92	0.89	0.90	0.80	0.95	0.92
Adj. Flow (vph)	466	12	352	0	0	0	0	913	952	680	1581	0
RTOR Reduction (vph)	0	16	64	0	0	0	0	0	545	0	0	0
Lane Group Flow (vph)	289	265	196	0	0	0	0	913	407	388	1873	0
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	5%	5%	2%	6%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	26.1	26.1	26.1					51.3	51.3	81.9	81.9	
Effective Green, g (s)	26.1	26.1	26.1					51.3	51.3	81.9	81.9	
Actuated g/C Ratio	0.22	0.22	0.22					0.43	0.43	0.68	0.68	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	365	334	311					2661	1157	484	2415	
v/s Ratio Prot								0.15		0.16	c0.16	
v/s Ratio Perm	0.17	0.17	0.14						0.15	c0.38	0.37	
v/c Ratio	0.79	0.79	0.63					0.34	0.35	0.80	0.78	
Uniform Delay, d1	44.4	44.4	42.6					23.0	23.1	13.4	12.9	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.40	0.88	
Incremental Delay, d2	11.2	12.3	4.0					0.4	0.8	8.3	1.4	
Delay (s)	55.5	56.7	46.5					23.4	24.0	27.1	12.7	
Level of Service	E	E	D					C	C	C	B	
Approach Delay (s)		53.1			0.0			23.7			15.2	
Approach LOS		D			A			C			B	

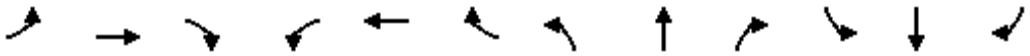
Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	845	1	337	117	1133	1214
Future Volume (vph)	845	1	337	117	1133	1214
Lane Group Flow (vph)	602	301	370	122	1207	1423
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	47.0	47.0	47.0	23.0	73.0	50.0
Total Split (%)	39.2%	39.2%	39.2%	19.2%	60.8%	41.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.78	0.78	0.80	0.56	0.43	0.46
Control Delay	48.3	54.5	44.6	23.3	15.9	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	54.5	44.6	23.3	15.9	14.7
Queue Length 50th (ft)	240	240	215	63	241	200
Queue Length 95th (ft)	273	68	294	m116	298	304
Internal Link Dist (ft)		813			526	633
Turn Bay Length (ft)	500					
Base Capacity (vph)	1039	521	594	277	2811	3111
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.58	0.62	0.44	0.43	0.46

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 113 (94%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	845	1	337	117	1133	0	0	1214	120
Future Volume (vph)	0	0	0	845	1	337	117	1133	0	0	1214	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.98	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				3042	1527	1583	1362	4705			6140	
Flt Permitted				0.95	0.95	1.00	0.12	0.91			1.00	
Satd. Flow (perm)				3042	1527	1583	169	4300			6140	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.25	0.91	0.86	0.95	0.92	0.92	0.95	0.83
Adj. Flow (vph)	0	0	0	899	4	370	136	1193	0	0	1278	145
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	602	301	309	122	1207	0	0	1410	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	2%	14%	4%	2%	2%	4%	12%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				30.6	30.6	30.6	77.4	77.4			60.5	
Effective Green, g (s)				30.6	30.6	30.6	77.4	77.4			60.5	
Actuated g/C Ratio				0.26	0.26	0.26	0.65	0.65			0.50	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				775	389	403	217	2810			3095	
v/s Ratio Prot							c0.05	0.04			0.23	
v/s Ratio Perm				c0.20	0.20	0.20	c0.31	0.24				
v/c Ratio				0.78	0.77	0.77	0.56	0.43			0.46	
Uniform Delay, d1				41.5	41.5	41.4	11.1	10.5			19.1	
Progression Factor				1.00	1.00	1.00	1.18	1.38			0.69	
Incremental Delay, d2				4.9	9.3	8.5	3.0	0.1			0.5	
Delay (s)				46.4	50.7	49.9	16.1	14.6			13.7	
Level of Service				D	D	D	B	B			B	
Approach Delay (s)		0.0			48.5			14.7			13.7	
Approach LOS		A			D			B			B	

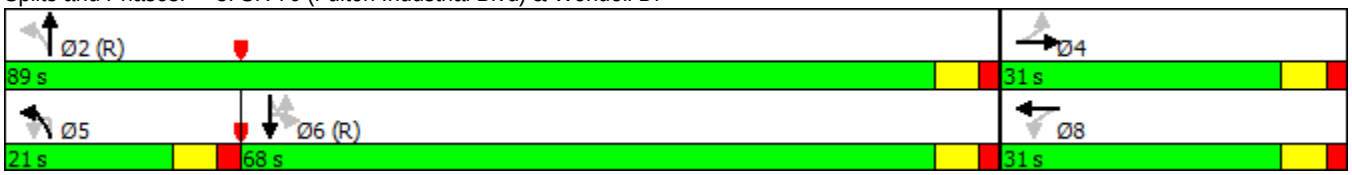
Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	56	6	8	48	1329	14	1233
Future Volume (vph)	8	6	56	6	8	48	1329	14	1233
Lane Group Flow (vph)	0	48	0	96	0	95	1444	28	1308
Turn Type	Perm	NA	Perm	NA	custom	pm+pt	NA	Perm	NA
Protected Phases		4		8		5	2		6
Permitted Phases	4		8		5	2		6	
Detector Phase	4	4	8	8	5	5	2	6	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	21.0	21.0	89.0	68.0	68.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	17.5%	17.5%	74.2%	56.7%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0	6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min
v/c Ratio		0.25		0.59		0.29	0.37	0.13	0.39
Control Delay		27.5		61.5		3.7	0.8	10.1	9.3
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		27.5		61.5		3.7	0.8	10.1	9.3
Queue Length 50th (ft)		14		68		1	3	7	145
Queue Length 95th (ft)		38		61		3	17	12	212
Internal Link Dist (ft)		541		544			633		581
Turn Bay Length (ft)						120		150	
Base Capacity (vph)		336		304		427	3908	217	3382
Starvation Cap Reductn		0		0		0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0
Reduced v/c Ratio		0.14		0.32		0.22	0.37	0.13	0.39

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 93 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	6	20	56	6	8	8	48	1329	73	14	1233
Future Volume (vph)	8	6	20	56	6	8	8	48	1329	73	14	1233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frt		0.92			0.98			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1621			1765			1770	4948		1770	4976
Flt Permitted		0.92			0.79			0.17	1.00		0.17	1.00
Satd. Flow (perm)		1511			1441			311	4948		321	4976
Peak-hour factor, PHF	0.67	0.75	0.71	0.78	0.50	0.67	0.92	0.56	0.98	0.83	0.50	0.96
Adj. Flow (vph)	12	8	28	72	12	12	9	86	1356	88	28	1284
RTOR Reduction (vph)	0	25	0	0	4	0	0	0	4	0	0	1
Lane Group Flow (vph)	0	23	0	0	92	0	0	95	1440	0	28	1307
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4			8			5	2			6	
Actuated Green, G (s)		13.3			13.3			94.7	94.7		81.6	81.6
Effective Green, g (s)		13.3			13.3			94.7	94.7		81.6	81.6
Actuated g/C Ratio		0.11			0.11			0.79	0.79		0.68	0.68
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0		5.0	5.0
Lane Grp Cap (vph)		167			159			331	3904		218	3383
v/s Ratio Prot								0.02	c0.29			c0.26
v/s Ratio Perm		0.02			c0.06			0.21			0.09	
v/c Ratio		0.14			0.58			0.29	0.37		0.13	0.39
Uniform Delay, d1		48.2			50.7			3.9	3.8		6.7	8.3
Progression Factor		1.00			1.00			0.53	0.13		1.00	1.00
Incremental Delay, d2		0.4			5.0			0.4	0.2		1.2	0.3
Delay (s)		48.6			55.6			2.5	0.7		7.9	8.7
Level of Service		D			E			A	A		A	A
Approach Delay (s)		48.6			55.6				0.8			8.7
Approach LOS		D			E				A			A

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.62
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

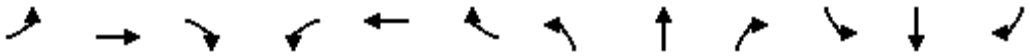
Intersection Summary

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	134	0	160	1031	1070	430	1416
Future Volume (vph)	134	0	160	1031	1070	430	1416
Lane Group Flow (vph)	140	133	127	1242	1274	346	1782
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		4		2		1	6
Permitted Phases	4		4		2	6	
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	4.0	15.0
Minimum Split (s)	28.0	28.0	28.0	24.0	24.0	11.0	24.0
Total Split (s)	28.0	28.0	28.0	55.0	55.0	37.0	92.0
Total Split (%)	23.3%	23.3%	23.3%	45.8%	45.8%	30.8%	76.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.80	0.60	0.58	0.35	0.65	0.79	0.64
Control Delay	81.8	32.1	30.3	16.8	5.8	22.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	81.8	32.1	30.3	16.8	5.8	22.6	5.2
Queue Length 50th (ft)	113	40	34	144	50	65	131
Queue Length 95th (ft)	140	27	64	214	114	167	107
Internal Link Dist (ft)		656		633			526
Turn Bay Length (ft)			400		310		
Base Capacity (vph)	308	328	322	3509	1962	532	2794
Starvation Cap Reductn	0	0	0	0	0	0	387
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.41	0.39	0.35	0.65	0.65	0.74

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 53 (44%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	0	160	0	0	0	0	1031	1070	430	1416	0
Future Volume (vph)	134	0	160	0	0	0	0	1031	1070	430	1416	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.86	0.88	0.86	0.86	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1425	1395					6285	2707	1507	4578	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.16	0.69	
Satd. Flow (perm)	1681	1425	1395					6285	2707	256	3188	
Peak-hour factor, PHF	0.73	0.50	0.74	0.92	0.92	0.92	0.92	0.83	0.84	0.93	0.85	0.92
Adj. Flow (vph)	184	0	216	0	0	0	0	1242	1274	462	1666	0
RTOR Reduction (vph)	0	73	73	0	0	0	0	0	451	0	0	0
Lane Group Flow (vph)	140	60	54	0	0	0	0	1242	823	346	1782	0
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	4%	5%	3%	7%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	12.6	12.6	12.6					67.0	67.0	95.4	95.4	
Effective Green, g (s)	12.6	12.6	12.6					67.0	67.0	95.4	95.4	
Actuated g/C Ratio	0.10	0.10	0.10					0.56	0.56	0.80	0.80	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	176	149	146					3509	1511	437	2793	
v/s Ratio Prot								0.20		c0.15	0.12	
v/s Ratio Perm	c0.08	0.04	0.04						0.30	c0.48	0.39	
v/c Ratio	0.80	0.40	0.37					0.35	0.54	0.79	0.64	
Uniform Delay, d1	52.4	50.2	50.0					14.6	16.8	17.5	5.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.73	0.87	
Incremental Delay, d2	21.5	1.8	1.6					0.3	1.4	7.9	0.4	
Delay (s)	73.9	51.9	51.6					14.9	18.2	20.6	4.8	
Level of Service	E	D	D					B	B	C	A	
Approach Delay (s)		59.5			0.0			16.6			7.4	
Approach LOS		E			A			B			A	

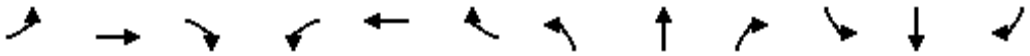
Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	571	5	389	307	845	1355
Future Volume (vph)	571	5	389	307	845	1355
Lane Group Flow (vph)	409	200	437	232	1107	2032
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	39.0	39.0	39.0	27.0	81.0	54.0
Total Split (%)	32.5%	32.5%	32.5%	22.5%	67.5%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.64	0.62	0.92	0.88	0.47	0.68
Control Delay	46.5	50.0	52.3	52.8	18.9	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	50.0	52.3	52.8	18.9	19.4
Queue Length 50th (ft)	156	152	213	156	268	352
Queue Length 95th (ft)	201	145	327	197	337	440
Internal Link Dist (ft)		813			526	633
Turn Bay Length (ft)	500					
Base Capacity (vph)	799	402	556	306	2338	3003
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.50	0.79	0.76	0.47	0.68

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 113 (94%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	571	5	389	307	845	0	0	1355	623
Future Volume (vph)	0	0	0	571	5	389	307	845	0	0	1355	623
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.95	1.00	0.95	0.99			1.00	
Satd. Flow (prot)				2907	1466	1583	1478	4703			6042	
Flt Permitted				0.95	0.95	1.00	0.06	0.65			1.00	
Satd. Flow (perm)				2907	1466	1583	97	3095			6042	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.62	0.89	0.73	0.92	0.92	0.92	0.98	0.96
Adj. Flow (vph)	0	0	0	601	8	437	421	918	0	0	1383	649
RTOR Reduction (vph)	0	0	0	0	0	130	0	0	0	0	61	0
Lane Group Flow (vph)	0	0	0	409	200	307	232	1107	0	0	1971	0
Heavy Vehicles (%)	2%	2%	2%	13%	2%	2%	5%	3%	2%	2%	3%	3%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				26.3	26.3	26.3	81.7	81.7			58.4	
Effective Green, g (s)				26.3	26.3	26.3	81.7	81.7			58.4	
Actuated g/C Ratio				0.22	0.22	0.22	0.68	0.68			0.49	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				637	321	346	265	2338			2940	
v/s Ratio Prot							c0.13	0.07			0.33	
v/s Ratio Perm				0.14	0.14	c0.19	c0.47	0.25				
v/c Ratio				0.64	0.62	0.89	0.88	0.47			0.67	
Uniform Delay, d1				42.6	42.4	45.4	36.0	9.0			23.5	
Progression Factor				1.00	1.00	1.00	0.66	2.07			0.76	
Incremental Delay, d2				2.2	3.7	22.7	24.8	0.1			1.1	
Delay (s)				44.8	46.1	68.1	48.6	18.8			18.9	
Level of Service				D	D	E	D	B			B	
Approach Delay (s)		0.0			54.8			24.0			18.9	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBU	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	22	11	86	0	12	6	1133	4	22	1824
Future Volume (vph)	22	11	86	0	12	6	1133	4	22	1824
Lane Group Flow (vph)	0	140	0	124	0	21	1293	0	31	1862
Turn Type	Perm	NA	Perm	NA	custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4		8		5	2			6
Permitted Phases	4		8		5	2		6	6	
Detector Phase	4	4	8	8	5	5	2	6	6	6
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	13.0	13.0	89.0	76.0	76.0	76.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	10.8%	10.8%	74.2%	63.3%	63.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0		6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.68		0.62		0.10	0.33		0.11	0.50
Control Delay		54.1		32.6		1.6	1.2		8.6	8.5
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0
Total Delay		54.1		32.6		1.6	1.2		8.6	8.5
Queue Length 50th (ft)		81		30		1	8		5	153
Queue Length 95th (ft)		72		20		m2	30		22	344
Internal Link Dist (ft)		541		544			633			581
Turn Bay Length (ft)						120			150	
Base Capacity (vph)		337		285		215	3896		277	3713
Starvation Cap Reductn		0		0		0	0		0	0
Spillback Cap Reductn		0		0		0	0		0	0
Storage Cap Reductn		0		0		0	0		0	0
Reduced v/c Ratio		0.42		0.44		0.10	0.33		0.11	0.50

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 88 (73%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	11	41	86	0	11	12	6	1133	75	4	22
Future Volume (vph)	22	11	41	86	0	11	12	6	1133	75	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0			6.0
Lane Util. Factor		1.00			1.00			1.00	0.91			1.00
Frt		0.94			0.98			1.00	0.99			1.00
Flt Protected		0.98			0.96			0.95	1.00			0.95
Satd. Flow (prot)		1691			1763			1770	4988			1770
Flt Permitted		0.87			0.58			0.08	1.00			0.20
Satd. Flow (perm)		1497			1060			157	4988			376
Peak-hour factor, PHF	0.39	0.55	0.64	0.83	0.50	0.55	0.92	0.75	0.94	0.85	0.92	0.81
Adj. Flow (vph)	56	20	64	104	0	20	13	8	1205	88	4	27
RTOR Reduction (vph)	0	28	0	0	72	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	112	0	0	52	0	0	21	1288	0	0	31
Heavy Vehicles (%)	2%	2%	5%	1%	2%	2%	2%	2%	3%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		custom	pm+pt	NA		Perm	Perm
Protected Phases		4			8			5	2			
Permitted Phases	4			8			5	2			6	6
Actuated Green, G (s)		14.4			14.4			93.6	93.6			85.1
Effective Green, g (s)		14.4			14.4			93.6	93.6			85.1
Actuated g/C Ratio		0.12			0.12			0.78	0.78			0.71
Clearance Time (s)		6.0			6.0			6.0	6.0			6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0			5.0
Lane Grp Cap (vph)		179			127			156	3890			266
v/s Ratio Prot								0.00	c0.26			
v/s Ratio Perm		c0.07			0.05			0.10				0.08
v/c Ratio		0.62			0.41			0.13	0.33			0.12
Uniform Delay, d1		50.2			48.9			5.0	3.9			5.5
Progression Factor		1.00			1.00			0.17	0.24			1.00
Incremental Delay, d2		6.6			2.1			0.3	0.2			0.9
Delay (s)		56.9			51.0			1.2	1.1			6.4
Level of Service		E			D			A	A			A
Approach Delay (s)		56.9			51.0				1.1			
Approach LOS		E			D				A			

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1824	7
Future Volume (vph)	1824	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5028	
Flt Permitted	1.00	
Satd. Flow (perm)	5028	
Peak-hour factor, PHF	0.99	0.35
Adj. Flow (vph)	1842	20
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1861	0
Heavy Vehicles (%)	3%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	85.1	
Effective Green, g (s)	85.1	
Actuated g/C Ratio	0.71	
Clearance Time (s)	6.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	3565	
v/s Ratio Prot	c0.37	
v/s Ratio Perm		
v/c Ratio	0.52	
Uniform Delay, d1	8.1	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	8.6	
Level of Service	A	
Approach Delay (s)	8.6	
Approach LOS	A	

Intersection Summary

Appendix F:
AASHTO Left Turn Lane Analysis

LEFT TURN LANE ANALYSIS
per AASHTO standards

The following left turn lane analyses were used to determine the need for dedicated turn bays at the proposed site driveway locations that are not located on State Routes.

Methodology

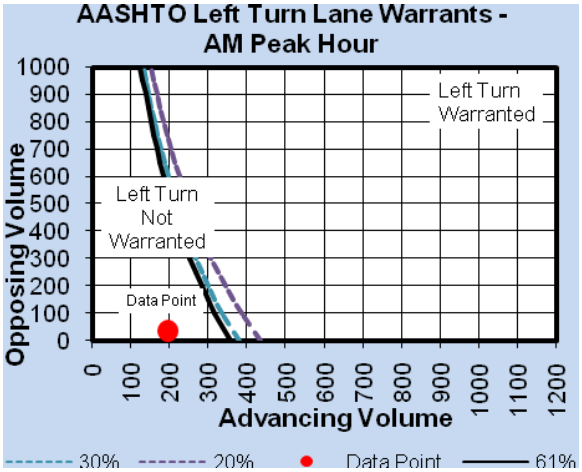
M.D. Harmelink utilized a probabilistic model to establish left turn lane warrants for two-lane and four-lane highways at unsignalized T-intersections. These warrants are the basis for AASHTO guidelines for justifying a left-turn lane at an unsignalized intersection. The warrants developed are in the form of sets of different volume combinations, specifically, the advancing volume, the percentage of left-turns in the advancing volume, and the opposing volume. These warrants are based on maximum allowable probabilities that one or more through vehicles are present in the queue formed by the left-turning vehicles that is waiting for a suitable gap. The warrants, as summarized by AASHTO, were developed for the approach speeds of 40, 50 and 60 mph and left turn volumes that are 5%, 10%, 20%, and 30% of the advancing stream.

AASHTO Thresholds (Exhibit 9-75, pg 685), 40 MPH				
Opposing Volumes	Advancing Volumes (by left turn %)			
	5%	10.0%	20.0%	30.0%
100	720	515	390	340
200	640	470	350	305
400	510	380	275	245
600	410	305	225	200
800	330	240	180	160

An interpolation of the thresholds is needed for other volumes and percentages that are not in the AASHTO table for left turn percentages that are not represented in the table.

Results

A graphic of the peak hour turning movements for the site, as they relate to the AASHTO criteria are provided in the following figures.



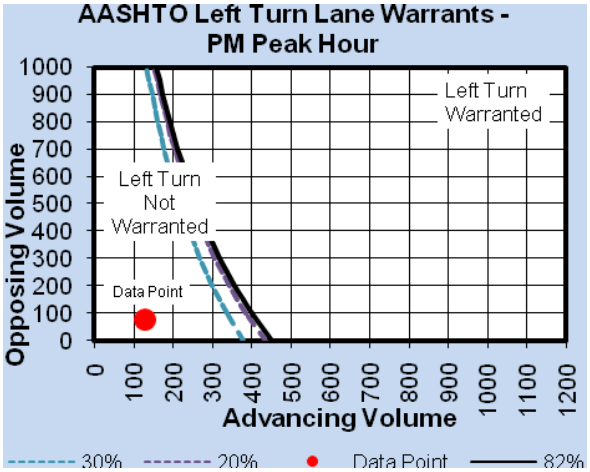


Figure 1 – AASHTO Left Turn Lane Guidelines: Site Driveway 1

Findings

The results of the analysis show that the probability of one or more vehicles queuing behind a waiting left-turn vehicle is below the 2% probability criterion. This remains the case for left turn volumes as high as 60% of the advancing traffic. Therefore, unless stopping sight distance (335 feet for 30 mph) is obstructed on the westbound approach, a left turn lane is not warranted per AASHTO criteria at Site Driveway #1 on Wendell Drive.

Appendix G:
GDOT Right Turn Lane Analysis

RIGHT TURN LANE ANALYSIS
per GDOT standards

The following right turn lane analyses were used to determine the need for dedicated turn bays at the proposed site driveway locations that are located on State Routes.

GDOT standards require the installation of a deceleration lane on state routes at no cost to the department when traffic entering the development meets or exceeds the values shown in the following table.

GDOT Requirements For Deceleration Lanes					
Site Driveway	Right Turn Traffic (% Total Entering)	Right Turn Volume (veh/day)	Roadway Speed / # Lanes	GDOT Threshold (veh/day)	Requirement
SR 70 @ Site Drwy 2 (RIRO)	10.5%	162	35 mph / 6-Lane	100	100' storage 50' taper

Findings

Based on the number of projected daily right turns the right-in / right-out site driveway on SR 70 (Fulton Industrial Boulevard) will meet the GDOT requirements for construction of a deceleration lane.

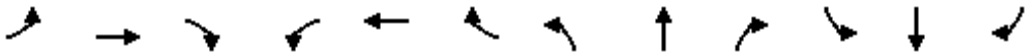
Appendix H:
Future “No-Build” Intersection Analysis

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	414	6	313	821	866	549	1517
Future Volume (vph)	414	6	313	821	866	549	1517
Lane Group Flow (vph)	291	284	263	922	962	391	1892
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		4		2		1	6
Permitted Phases	4		4		2	6	
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	4.0	15.0
Minimum Split (s)	28.0	28.0	28.0	24.0	24.0	11.0	24.0
Total Split (s)	37.0	37.0	37.0	43.0	43.0	40.0	83.0
Total Split (%)	30.8%	30.8%	30.8%	35.8%	35.8%	33.3%	69.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.80	0.81	0.70	0.35	0.57	0.81	0.78
Control Delay	60.0	59.0	39.0	25.9	3.4	31.6	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	60.0	59.0	39.0	25.9	3.4	31.6	11.8
Queue Length 50th (ft)	222	212	135	140	0	232	289
Queue Length 95th (ft)	310	145	220	199	50	246	361
Internal Link Dist (ft)		656		633			526
Turn Bay Length (ft)			400		310		
Base Capacity (vph)	434	411	431	2641	1702	573	2414
Starvation Cap Reductn	0	0	0	0	0	0	48
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.69	0.61	0.35	0.57	0.68	0.80

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 52 (43%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	414	6	313	0	0	0	0	821	866	549	1517	0
Future Volume (vph)	414	6	313	0	0	0	0	821	866	549	1517	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.86	0.88	0.86	0.86	
Frt	1.00	0.95	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.97	1.00					1.00	1.00	0.95	0.99	
Satd. Flow (prot)	1681	1538	1434					6225	2707	1522	4616	
Flt Permitted	0.95	0.97	1.00					1.00	1.00	0.22	0.66	
Satd. Flow (perm)	1681	1538	1434					6225	2707	355	3071	
Peak-hour factor, PHF	0.88	0.50	0.88	0.92	0.92	0.92	0.92	0.89	0.90	0.80	0.95	0.92
Adj. Flow (vph)	470	12	356	0	0	0	0	922	962	686	1597	0
RTOR Reduction (vph)	0	16	64	0	0	0	0	0	554	0	0	0
Lane Group Flow (vph)	291	268	199	0	0	0	0	922	408	391	1892	0
Heavy Vehicles (%)	2%	2%	7%	2%	2%	2%	2%	5%	5%	2%	6%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	26.2	26.2	26.2					50.9	50.9	81.8	81.8	
Effective Green, g (s)	26.2	26.2	26.2					50.9	50.9	81.8	81.8	
Actuated g/C Ratio	0.22	0.22	0.22					0.42	0.42	0.68	0.68	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	367	335	313					2640	1148	484	2413	
v/s Ratio Prot								0.15		0.17	c0.16	
v/s Ratio Perm	0.17	0.17	0.14						0.15	c0.38	0.37	
v/c Ratio	0.79	0.80	0.64					0.35	0.36	0.81	0.78	
Uniform Delay, d1	44.3	44.4	42.6					23.4	23.4	14.3	13.1	
Progression Factor	1.00	1.00	1.00					1.00	1.00	1.36	0.84	
Incremental Delay, d2	11.2	12.9	4.2					0.4	0.9	8.5	1.5	
Delay (s)	55.5	57.3	46.8					23.7	24.3	28.0	12.5	
Level of Service	E	E	D					C	C	C	B	
Approach Delay (s)		53.4			0.0			24.0			15.1	
Approach LOS		D			A			C			B	

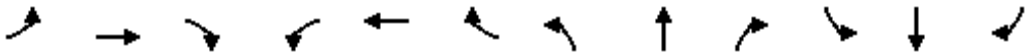
Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	853	1	340	118	1144	1226
Future Volume (vph)	853	1	340	118	1144	1226
Lane Group Flow (vph)	608	303	374	123	1218	1437
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	47.0	47.0	47.0	23.0	73.0	50.0
Total Split (%)	39.2%	39.2%	39.2%	19.2%	60.8%	41.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.78	0.77	0.80	0.57	0.43	0.46
Control Delay	48.3	54.4	45.0	24.3	16.5	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	54.4	45.0	24.3	16.5	14.9
Queue Length 50th (ft)	242	241	218	66	247	204
Queue Length 95th (ft)	275	69	298	m116	310	308
Internal Link Dist (ft)		813			526	633
Turn Bay Length (ft)	500					
Base Capacity (vph)	1039	521	594	275	2804	3097
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.58	0.63	0.45	0.43	0.46

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 114 (95%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	853	1	340	118	1144	0	0	1226	121
Future Volume (vph)	0	0	0	853	1	340	118	1144	0	0	1226	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.98	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				3042	1527	1583	1362	4706			6141	
Flt Permitted				0.95	0.95	1.00	0.12	0.91			1.00	
Satd. Flow (perm)				3042	1527	1583	165	4299			6141	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.25	0.91	0.86	0.95	0.92	0.92	0.95	0.83
Adj. Flow (vph)	0	0	0	907	4	374	137	1204	0	0	1291	146
RTOR Reduction (vph)	0	0	0	0	0	61	0	0	0	0	12	0
Lane Group Flow (vph)	0	0	0	608	303	313	123	1218	0	0	1425	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	2%	14%	4%	2%	2%	4%	12%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				30.7	30.7	30.7	77.3	77.3			60.3	
Effective Green, g (s)				30.7	30.7	30.7	77.3	77.3			60.3	
Actuated g/C Ratio				0.26	0.26	0.26	0.64	0.64			0.50	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				778	390	404	216	2806			3085	
v/s Ratio Prot							c0.05	0.04			0.23	
v/s Ratio Perm				c0.20	0.20	0.20	c0.31	0.24				
v/c Ratio				0.78	0.78	0.77	0.57	0.43			0.46	
Uniform Delay, d1				41.5	41.5	41.4	11.3	10.5			19.3	
Progression Factor				1.00	1.00	1.00	1.21	1.42			0.69	
Incremental Delay, d2				5.1	9.4	9.0	3.1	0.1			0.5	
Delay (s)				46.7	50.8	50.4	16.7	15.1			13.9	
Level of Service				D	D	D	B	B			B	
Approach Delay (s)		0.0			48.7			15.2			13.9	
Approach LOS		A			D			B			B	

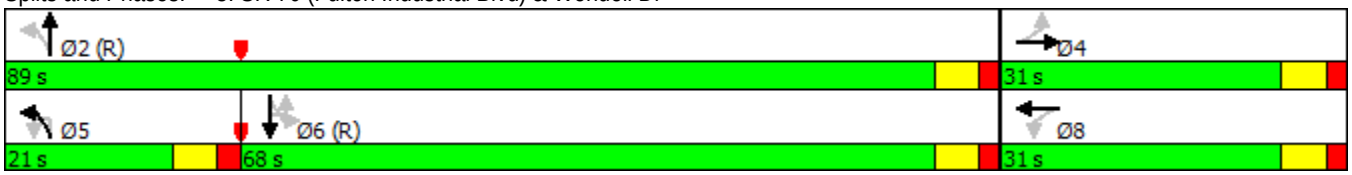
Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	8	6	57	6	8	48	1342	14	1245
Future Volume (vph)	8	6	57	6	8	48	1342	14	1245
Lane Group Flow (vph)	0	48	0	97	0	95	1458	28	1321
Turn Type	Perm	NA	Perm	NA	custom	pm+pt	NA	Perm	NA
Protected Phases		4		8		5	2		6
Permitted Phases	4		8		5	2		6	
Detector Phase	4	4	8	8	5	5	2	6	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	21.0	21.0	89.0	68.0	68.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	17.5%	17.5%	74.2%	56.7%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0	6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min
v/c Ratio		0.25		0.59		0.29	0.37	0.13	0.39
Control Delay		27.4		61.5		4.0	0.8	10.2	9.4
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		27.4		61.5		4.0	0.8	10.2	9.4
Queue Length 50th (ft)		14		69		1	3	7	147
Queue Length 95th (ft)		38		62		3	17	12	215
Internal Link Dist (ft)		541		544			633		581
Turn Bay Length (ft)						120		150	
Base Capacity (vph)		336		303		423	3904	215	3377
Starvation Cap Reductn		0		0		0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0
Reduced v/c Ratio		0.14		0.32		0.22	0.37	0.13	0.39

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 94 (78%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	6	20	57	6	8	8	48	1342	74	14	1245
Future Volume (vph)	8	6	20	57	6	8	8	48	1342	74	14	1245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frt		0.92			0.98			1.00	0.99		1.00	1.00
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1621			1765			1770	4948		1770	4976
Flt Permitted		0.92			0.79			0.16	1.00		0.17	1.00
Satd. Flow (perm)		1511			1439			306	4948		316	4976
Peak-hour factor, PHF	0.67	0.75	0.71	0.78	0.50	0.67	0.92	0.56	0.98	0.83	0.50	0.96
Adj. Flow (vph)	12	8	28	73	12	12	9	86	1369	89	28	1297
RTOR Reduction (vph)	0	25	0	0	4	0	0	0	4	0	0	1
Lane Group Flow (vph)	0	23	0	0	93	0	0	95	1454	0	28	1320
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	2%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		custom	pm+pt	NA		Perm	NA
Protected Phases		4			8			5	2			6
Permitted Phases	4			8			5	2			6	
Actuated Green, G (s)		13.4			13.4			94.6	94.6		81.5	81.5
Effective Green, g (s)		13.4			13.4			94.6	94.6		81.5	81.5
Actuated g/C Ratio		0.11			0.11			0.79	0.79		0.68	0.68
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0		5.0	5.0
Lane Grp Cap (vph)		168			160			327	3900		214	3379
v/s Ratio Prot								0.02	c0.29			c0.27
v/s Ratio Perm		0.02			c0.06			0.21			0.09	
v/c Ratio		0.14			0.58			0.29	0.37		0.13	0.39
Uniform Delay, d1		48.1			50.6			4.0	3.8		6.8	8.4
Progression Factor		1.00			1.00			0.57	0.14		1.00	1.00
Incremental Delay, d2		0.4			5.0			0.4	0.2		1.3	0.3
Delay (s)		48.5			55.6			2.7	0.8		8.0	8.7
Level of Service		D			E			A	A		A	A
Approach Delay (s)		48.5			55.6				0.9			8.7
Approach LOS		D			E				A			A

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	15
Future Volume (vph)	15
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.62
Adj. Flow (vph)	24
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

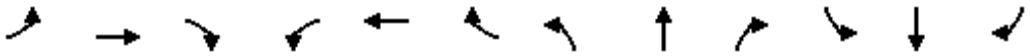
Intersection Summary

Lane Group	EBL	EBT	EBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	135	0	162	1041	1081	434	1430
Future Volume (vph)	135	0	162	1041	1081	434	1430
Lane Group Flow (vph)	141	134	129	1254	1287	350	1799
Turn Type	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		4		2		1	6
Permitted Phases	4		4		2	6	
Detector Phase	4	4	4	2	2	1	6
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0	15.0	15.0	4.0	15.0
Minimum Split (s)	28.0	28.0	28.0	24.0	24.0	11.0	24.0
Total Split (s)	28.0	28.0	28.0	55.0	55.0	37.0	92.0
Total Split (%)	23.3%	23.3%	23.3%	45.8%	45.8%	30.8%	76.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lag	Lag	Lead	
Lead-Lag Optimize?							
Recall Mode	None	None	None	C-Min	C-Min	None	C-Min
v/c Ratio	0.80	0.60	0.59	0.36	0.66	0.80	0.64
Control Delay	81.2	32.3	30.9	17.1	6.2	23.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	81.2	32.3	30.9	17.1	6.2	23.1	5.8
Queue Length 50th (ft)	114	41	35	148	55	77	190
Queue Length 95th (ft)	140	27	66	216	125	182	136
Internal Link Dist (ft)		656		633			526
Turn Bay Length (ft)			400		310		
Base Capacity (vph)	308	328	322	3482	1953	529	2790
Starvation Cap Reductn	0	0	0	0	0	0	390
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.41	0.40	0.36	0.66	0.66	0.75

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 53 (44%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	0	162	0	0	0	0	1041	1081	434	1430	0
Future Volume (vph)	135	0	162	0	0	0	0	1041	1081	434	1430	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Lane Util. Factor	0.95	0.91	0.95					0.86	0.88	0.86	0.86	
Frt	1.00	0.90	0.85					1.00	0.85	1.00	1.00	
Flt Protected	0.95	0.98	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1681	1425	1395					6285	2707	1507	4578	
Flt Permitted	0.95	0.98	1.00					1.00	1.00	0.16	0.69	
Satd. Flow (perm)	1681	1425	1395					6285	2707	251	3176	
Peak-hour factor, PHF	0.73	0.50	0.74	0.92	0.92	0.92	0.92	0.83	0.84	0.93	0.85	0.92
Adj. Flow (vph)	185	0	219	0	0	0	0	1254	1287	467	1682	0
RTOR Reduction (vph)	0	73	73	0	0	0	0	0	453	0	0	0
Lane Group Flow (vph)	141	61	56	0	0	0	0	1254	834	350	1799	0
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	4%	5%	3%	7%	2%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		4						2		1	6	
Permitted Phases	4		4						2	6		
Actuated Green, G (s)	12.7	12.7	12.7					66.5	66.5	95.3	95.3	
Effective Green, g (s)	12.7	12.7	12.7					66.5	66.5	95.3	95.3	
Actuated g/C Ratio	0.11	0.11	0.11					0.55	0.55	0.79	0.79	
Clearance Time (s)	6.0	6.0	6.0					6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0					5.0	5.0	3.0	5.0	
Lane Grp Cap (vph)	177	150	147					3482	1500	437	2788	
v/s Ratio Prot								0.20		c0.15	0.12	
v/s Ratio Perm	c0.08	0.04	0.04						0.31	c0.48	0.39	
v/c Ratio	0.80	0.40	0.38					0.36	0.56	0.80	0.65	
Uniform Delay, d1	52.4	50.1	50.0					14.9	17.2	18.5	5.2	
Progression Factor	1.00	1.00	1.00					1.00	1.00	0.72	0.97	
Incremental Delay, d2	21.5	1.8	1.6					0.3	1.5	8.3	0.4	
Delay (s)	73.9	51.9	51.6					15.2	18.7	21.6	5.5	
Level of Service	E	D	D					B	B	C	A	
Approach Delay (s)		59.5			0.0			17.0			8.1	
Approach LOS		E			A			B			A	

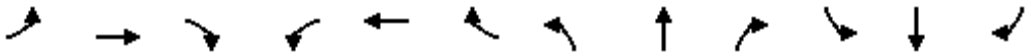
Intersection Summary			
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	577	5	393	310	853	1369
Future Volume (vph)	577	5	393	310	853	1369
Lane Group Flow (vph)	413	202	442	234	1118	2052
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	39.0	39.0	39.0	28.0	81.0	53.0
Total Split (%)	32.5%	32.5%	32.5%	23.3%	67.5%	44.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.64	0.62	0.92	0.87	0.48	0.69
Control Delay	46.1	49.5	53.5	49.9	18.5	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	49.5	53.5	49.9	18.5	20.2
Queue Length 50th (ft)	157	152	219	158	267	361
Queue Length 95th (ft)	203	147	#347	200	333	452
Internal Link Dist (ft)		813			526	633
Turn Bay Length (ft)	500					
Base Capacity (vph)	799	402	554	319	2333	2962
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.50	0.80	0.73	0.48	0.69

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 112 (93%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	577	5	393	310	853	0	0	1369	629
Future Volume (vph)	0	0	0	577	5	393	310	853	0	0	1369	629
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.95	1.00	0.95	0.99			1.00	
Satd. Flow (prot)				2907	1466	1583	1478	4703			6042	
Flt Permitted				0.95	0.95	1.00	0.06	0.65			1.00	
Satd. Flow (perm)				2907	1466	1583	98	3100			6042	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.62	0.89	0.73	0.92	0.92	0.92	0.98	0.96
Adj. Flow (vph)	0	0	0	607	8	442	425	927	0	0	1397	655
RTOR Reduction (vph)	0	0	0	0	0	128	0	0	0	0	60	0
Lane Group Flow (vph)	0	0	0	413	202	314	234	1118	0	0	1992	0
Heavy Vehicles (%)	2%	2%	2%	13%	2%	2%	5%	3%	2%	2%	3%	3%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				26.7	26.7	26.7	81.3	81.3			57.7	
Effective Green, g (s)				26.7	26.7	26.7	81.3	81.3			57.7	
Actuated g/C Ratio				0.22	0.22	0.22	0.68	0.68			0.48	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				646	326	352	268	2335			2905	
v/s Ratio Prot							c0.13	0.07			0.33	
v/s Ratio Perm				0.14	0.14	c0.20	c0.46	0.25				
v/c Ratio				0.64	0.62	0.89	0.87	0.48			0.69	
Uniform Delay, d1				42.3	42.1	45.3	36.0	9.2			24.1	
Progression Factor				1.00	1.00	1.00	0.65	1.99			0.76	
Incremental Delay, d2				2.1	3.5	23.7	24.3	0.1			1.2	
Delay (s)				44.4	45.6	68.9	47.5	18.5			19.6	
Level of Service				D	D	E	D	B			B	
Approach Delay (s)		0.0			54.9			23.5			19.6	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBU	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	22	11	87	0	12	6	1144	4	22	1842
Future Volume (vph)	22	11	87	0	12	6	1144	4	22	1842
Lane Group Flow (vph)	0	140	0	125	0	21	1306	0	31	1881
Turn Type	Perm	NA	Perm	NA	custom	pm+pt	NA	Perm	Perm	NA
Protected Phases		4		8		5	2			6
Permitted Phases	4		8		5	2		6	6	
Detector Phase	4	4	8	8	5	5	2	6	6	6
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	13.0	13.0	89.0	76.0	76.0	76.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	10.8%	10.8%	74.2%	63.3%	63.3%	63.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0		6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.68		0.63		0.11	0.34		0.11	0.51
Control Delay		53.9		33.1		1.5	1.0		8.7	8.6
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0
Total Delay		53.9		33.1		1.5	1.0		8.7	8.6
Queue Length 50th (ft)		81		31		1	8		5	156
Queue Length 95th (ft)		72		21		m2	30		22	349
Internal Link Dist (ft)		541		544			633			581
Turn Bay Length (ft)						120			150	
Base Capacity (vph)		337		285		213	3896		274	3713
Starvation Cap Reductn		0		0		0	0		0	0
Spillback Cap Reductn		0		0		0	0		0	0
Storage Cap Reductn		0		0		0	0		0	0
Reduced v/c Ratio		0.42		0.44		0.10	0.34		0.11	0.51

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 86 (72%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	22	11	41	87	0	11	12	6	1144	76	4	22
Future Volume (vph)	22	11	41	87	0	11	12	6	1144	76	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0			6.0
Lane Util. Factor		1.00			1.00			1.00	0.91			1.00
Frt		0.94			0.98			1.00	0.99			1.00
Flt Protected		0.98			0.96			0.95	1.00			0.95
Satd. Flow (prot)		1691			1764			1770	4988			1770
Flt Permitted		0.87			0.58			0.08	1.00			0.20
Satd. Flow (perm)		1499			1060			153	4988			371
Peak-hour factor, PHF	0.39	0.55	0.64	0.83	0.50	0.55	0.92	0.75	0.94	0.85	0.92	0.81
Adj. Flow (vph)	56	20	64	105	0	20	13	8	1217	89	4	27
RTOR Reduction (vph)	0	28	0	0	72	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	112	0	0	53	0	0	21	1301	0	0	31
Heavy Vehicles (%)	2%	2%	5%	1%	2%	2%	2%	2%	3%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		custom	pm+pt	NA		Perm	Perm
Protected Phases		4			8			5	2			
Permitted Phases	4			8			5	2			6	6
Actuated Green, G (s)		14.4			14.4			93.6	93.6			85.1
Effective Green, g (s)		14.4			14.4			93.6	93.6			85.1
Actuated g/C Ratio		0.12			0.12			0.78	0.78			0.71
Clearance Time (s)		6.0			6.0			6.0	6.0			6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0			5.0
Lane Grp Cap (vph)		179			127			153	3890			263
v/s Ratio Prot								0.00	c0.26			
v/s Ratio Perm		c0.07			0.05			0.10				0.08
v/c Ratio		0.62			0.42			0.14	0.33			0.12
Uniform Delay, d1		50.2			48.9			5.1	3.9			5.5
Progression Factor		1.00			1.00			0.17	0.19			1.00
Incremental Delay, d2		6.6			2.2			0.3	0.2			0.9
Delay (s)		56.9			51.1			1.2	0.9			6.5
Level of Service		E			D			A	A			A
Approach Delay (s)		56.9			51.1				0.9			
Approach LOS		E			D				A			

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1842	7
Future Volume (vph)	1842	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	5028	
Flt Permitted	1.00	
Satd. Flow (perm)	5028	
Peak-hour factor, PHF	0.99	0.35
Adj. Flow (vph)	1861	20
RTOR Reduction (vph)	1	0
Lane Group Flow (vph)	1880	0
Heavy Vehicles (%)	3%	2%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	85.1	
Effective Green, g (s)	85.1	
Actuated g/C Ratio	0.71	
Clearance Time (s)	6.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	3565	
v/s Ratio Prot	c0.37	
v/s Ratio Perm		
v/c Ratio	0.53	
Uniform Delay, d1	8.1	
Progression Factor	1.00	
Incremental Delay, d2	0.6	
Delay (s)	8.7	
Level of Service	A	
Approach Delay (s)	8.6	
Approach LOS	A	

Intersection Summary

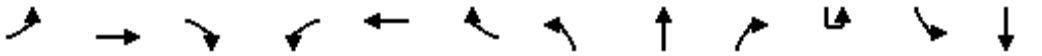
Appendix I:
Future “Build” Intersections Analysis

Lane Group	EBL	EBT	EBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	420	6	313	865	866	38	563	1558
Future Volume (vph)	420	6	313	865	866	38	563	1558
Lane Group Flow (vph)	243	246	356	972	962	0	414	1971
Turn Type	Perm	NA	Free	NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4		2		1	1	6
Permitted Phases	4		Free		2	6	6	
Detector Phase	4	4		2	2	1	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0		15.0	15.0	4.0	4.0	15.0
Minimum Split (s)	11.0	11.0		24.0	24.0	11.0	11.0	24.0
Total Split (s)	31.0	31.0		48.0	48.0	41.0	41.0	89.0
Total Split (%)	25.8%	25.8%		40.0%	40.0%	34.2%	34.2%	74.2%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag				Lag	Lag	Lead	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None		C-Min	C-Min	None	None	C-Min
v/c Ratio	0.89	0.90	0.24	0.35	0.56		0.82	0.78
Control Delay	81.2	82.3	0.4	22.8	4.3		29.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.2
Total Delay	81.2	82.3	0.4	22.8	4.3		29.2	10.0
Queue Length 50th (ft)	194	197	0	138	18		239	306
Queue Length 95th (ft)	274	143	0	198	77		219	147
Internal Link Dist (ft)		656		633				526
Turn Bay Length (ft)			400		310			
Base Capacity (vph)	346	348	1509	2816	1732		586	2539
Starvation Cap Reductn	0	0	0	0	0		0	94
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.70	0.71	0.24	0.35	0.56		0.71	0.81

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 45 (38%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	420	6	313	0	0	0	0	865	866	38	563	1558
Future Volume (vph)	420	6	313	0	0	0	0	865	866	38	563	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0					6.0	6.0		6.0	6.0
Lane Util. Factor	0.95	0.95	1.00					0.86	0.88		0.86	0.86
Frt	1.00	1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00					1.00	1.00		0.95	0.99
Satd. Flow (prot)	1665	1674	1509					6052	2707		1495	4529
Flt Permitted	0.95	0.95	1.00					1.00	1.00		0.21	0.65
Satd. Flow (perm)	1665	1674	1509					6052	2707		338	2986
Peak-hour factor, PHF	0.88	0.50	0.88	0.92	0.92	0.92	0.92	0.89	0.90	0.92	0.80	0.95
Adj. Flow (vph)	477	12	356	0	0	0	0	972	962	41	704	1640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	473	0	0	0
Lane Group Flow (vph)	243	246	356	0	0	0	0	972	489	0	414	1971
Heavy Vehicles (%)	3%	2%	7%	2%	2%	2%	2%	8%	5%	2%	4%	8%
Turn Type	Perm	NA	Free					NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4						2		1	1	6
Permitted Phases	4		Free						2	6	6	
Actuated Green, G (s)	19.7	19.7	120.0					55.8	55.8		88.3	88.3
Effective Green, g (s)	19.7	19.7	120.0					55.8	55.8		88.3	88.3
Actuated g/C Ratio	0.16	0.16	1.00					0.46	0.46		0.74	0.74
Clearance Time (s)	6.0	6.0						6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0						5.0	5.0		3.0	5.0
Lane Grp Cap (vph)	273	274	1509					2814	1258		504	2537
v/s Ratio Prot								0.16			c0.18	0.17
v/s Ratio Perm	0.15	0.15	0.24						0.18		c0.42	0.40
v/c Ratio	0.89	0.90	0.24					0.35	0.39		0.82	0.78
Uniform Delay, d1	49.1	49.2	0.0					20.5	21.0		15.6	9.8
Progression Factor	1.00	1.00	1.00					1.00	1.00		1.16	0.96
Incremental Delay, d2	28.1	29.1	0.4					0.3	0.9		9.1	1.3
Delay (s)	77.2	78.3	0.4					20.8	21.9		27.2	10.7
Level of Service	E	E	A					C	C		C	B
Approach Delay (s)		45.1			0.0			21.3				13.6
Approach LOS		D			A			C				B

Intersection Summary			
HCM 2000 Control Delay	21.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	853	1	355	118	1232	1320
Future Volume (vph)	853	1	355	118	1232	1320
Lane Group Flow (vph)	608	303	390	123	1311	1542
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	48.0	48.0	48.0	21.0	72.0	51.0
Total Split (%)	40.0%	40.0%	40.0%	17.5%	60.0%	42.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.76	0.75	0.84	0.62	0.48	0.51
Control Delay	46.3	51.7	48.0	30.2	17.6	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	51.7	48.0	30.2	17.6	10.7
Queue Length 50th (ft)	238	237	231	63	261	138
Queue Length 95th (ft)	271	68	316	m118	329	81
Internal Link Dist (ft)		813			526	199
Turn Bay Length (ft)	500					
Base Capacity (vph)	1064	534	591	241	2716	2997
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.57	0.66	0.51	0.48	0.51

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 107 (89%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	853	1	355	118	1232	0	0	1320	127
Future Volume (vph)	0	0	0	853	1	355	118	1232	0	0	1320	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.99	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				3042	1527	1538	1362	4618			6029	
Flt Permitted				0.95	0.95	1.00	0.10	0.91			1.00	
Satd. Flow (perm)				3042	1527	1538	140	4212			6029	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.25	0.91	0.86	0.95	0.92	0.92	0.95	0.83
Adj. Flow (vph)	0	0	0	907	4	390	137	1297	0	0	1389	153
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	608	303	330	123	1311	0	0	1529	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	5%	14%	6%	2%	2%	6%	14%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				31.7	31.7	31.7	76.3	76.3			59.4	
Effective Green, g (s)				31.7	31.7	31.7	76.3	76.3			59.4	
Actuated g/C Ratio				0.26	0.26	0.26	0.64	0.64			0.49	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				803	403	406	200	2715			2984	
v/s Ratio Prot							c0.06	0.04			0.25	
v/s Ratio Perm				0.20	0.20	c0.21	c0.34	0.26				
v/c Ratio				0.76	0.75	0.81	0.61	0.48			0.51	
Uniform Delay, d1				40.6	40.5	41.4	13.1	11.5			20.5	
Progression Factor				1.00	1.00	1.00	1.17	1.38			0.46	
Incremental Delay, d2				4.1	7.7	11.7	5.0	0.1			0.6	
Delay (s)				44.7	48.3	53.1	20.2	16.0			10.0	
Level of Service				D	D	D	C	B			A	
Approach Delay (s)		0.0			48.0			16.3			10.0	
Approach LOS		A			D			B			A	

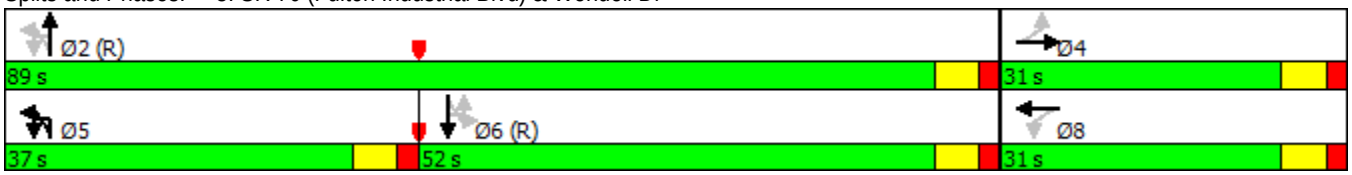
Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	6	57	6	55	96	1350	14	1253
Future Volume (vph)	25	6	57	6	55	96	1350	14	1253
Lane Group Flow (vph)	0	135	0	97	0	231	1467	28	1358
Turn Type	Perm	NA	Perm	NA	pm+pt	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	5	2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	5	5	2	6	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0
Total Split (s)	31.0	31.0	31.0	31.0	37.0	37.0	89.0	52.0	52.0
Total Split (%)	25.8%	25.8%	25.8%	25.8%	30.8%	30.8%	74.2%	43.3%	43.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0	6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min
v/c Ratio		0.72		0.70		0.70	0.38	0.16	0.49
Control Delay		43.6		72.0		40.2	0.9	21.9	18.9
Queue Delay		0.0		0.0		0.0	0.0	0.0	0.0
Total Delay		43.6		72.0		40.2	0.9	21.9	18.9
Queue Length 50th (ft)		44		70		85	12	10	217
Queue Length 95th (ft)		76		60		86	23	20	371
Internal Link Dist (ft)		537		544			354		581
Turn Bay Length (ft)						120		150	
Base Capacity (vph)		260		225		441	3831	176	2757
Starvation Cap Reductn		0		0		0	0	0	0
Spillback Cap Reductn		0		0		0	0	0	0
Storage Cap Reductn		0		0		0	0	0	0
Reduced v/c Ratio		0.52		0.43		0.52	0.38	0.16	0.49

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 98 (82%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	25	6	64	57	6	8	55	96	1350	74	14	1253
Future Volume (vph)	25	6	64	57	6	8	55	96	1350	74	14	1253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor		1.00			1.00			1.00	0.91		1.00	0.91
Frt		0.91			0.98			1.00	0.99		1.00	0.99
Flt Protected		0.99			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1065			1765			1327	4948		1770	4881
Flt Permitted		0.89			0.58			0.14	1.00		0.17	1.00
Satd. Flow (perm)		962			1062			192	4948		313	4881
Peak-hour factor, PHF	0.67	0.75	0.71	0.78	0.50	0.67	0.92	0.56	0.98	0.83	0.50	0.96
Adj. Flow (vph)	37	8	90	73	12	12	60	171	1378	89	28	1305
RTOR Reduction (vph)	0	66	0	0	4	0	0	0	4	0	0	3
Lane Group Flow (vph)	0	69	0	0	93	0	0	231	1463	0	28	1355
Heavy Vehicles (%)	56%	2%	67%	2%	2%	2%	2%	48%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA		Perm	NA
Protected Phases		4			8		5	5	2			6
Permitted Phases	4			8			2	2			6	
Actuated Green, G (s)		15.2			15.2			92.8	92.8		67.7	67.7
Effective Green, g (s)		15.2			15.2			92.8	92.8		67.7	67.7
Actuated g/C Ratio		0.13			0.13			0.77	0.77		0.56	0.56
Clearance Time (s)		6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0		5.0	5.0
Lane Grp Cap (vph)		121			134			329	3826		176	2753
v/s Ratio Prot								c0.11	0.30			0.28
v/s Ratio Perm		0.07			c0.09			c0.43			0.09	
v/c Ratio		0.57			0.69			0.70	0.38		0.16	0.49
Uniform Delay, d1		49.3			50.2			16.2	4.4		12.5	15.8
Progression Factor		1.00			1.00			2.18	0.13		1.00	1.00
Incremental Delay, d2		6.0			14.3			5.9	0.3		1.9	0.6
Delay (s)		55.3			64.4			41.3	0.8		14.4	16.4
Level of Service		E			E			D	A		B	B
Approach Delay (s)		55.3			64.4				6.3			16.4
Approach LOS		E			E				A			B

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.62
Adj. Flow (vph)	53
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	46%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	3	65	69	1	63
Future Volume (Veh/h)	31	3	65	69	1	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.92	0.92	0.50	0.92	0.92
Hourly flow rate (vph)	41	3	71	138	1	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				617		
pX, platoon unblocked						
vC, conflicting volume			44		322	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			44		322	42
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			94		100	92
cM capacity (veh/h)			1112		478	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	44	209	69
Volume Left	0	71	1
Volume Right	3	0	68
cSH	1700	1112	799
Volume to Capacity	0.03	0.06	0.09
Queue Length 95th (ft)	0	5	7
Control Delay (s)	0.0	3.3	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	3.3	9.9
Approach LOS			A

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

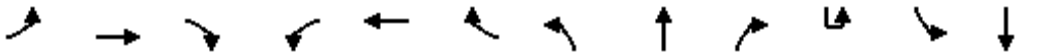
Channelized right turn lanes are not counted.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	140	0	162	1077	1081	51	448	1467
Future Volume (vph)	140	0	162	1077	1081	51	448	1467
Lane Group Flow (vph)	96	96	219	1298	1287	0	373	1890
Turn Type	Perm	NA	Free	NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4		2		1	1	6
Permitted Phases	4		Free		2	6	6	
Detector Phase	4	4		2	2	1	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0		15.0	15.0	4.0	4.0	15.0
Minimum Split (s)	28.0	28.0		24.0	24.0	11.0	11.0	24.0
Total Split (s)	28.0	28.0		53.0	53.0	39.0	39.0	92.0
Total Split (%)	23.3%	23.3%		44.2%	44.2%	32.5%	32.5%	76.7%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag				Lag	Lag	Lead	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None		C-Min	C-Min	None	None	C-Min
v/c Ratio	0.72	0.72	0.15	0.38	0.66		0.80	0.68
Control Delay	81.1	81.1	0.2	17.2	6.3		21.8	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.5
Total Delay	81.1	81.1	0.2	17.2	6.3		21.8	6.2
Queue Length 50th (ft)	77	77	0	156	59		79	63
Queue Length 95th (ft)	106	71	0	221	127		m203	189
Internal Link Dist (ft)		656		633				526
Turn Bay Length (ft)			400		310			
Base Capacity (vph)	308	308	1468	3440	1945		549	2772
Starvation Cap Reductn	0	0	0	0	0		0	395
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.31	0.31	0.15	0.38	0.66		0.68	0.80

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 46 (38%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	140	0	162	0	0	0	0	1077	1081	51	448	1467
Future Volume (vph)	140	0	162	0	0	0	0	1077	1081	51	448	1467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0					6.0	6.0		6.0	6.0
Lane Util. Factor	0.95	0.95	1.00					0.86	0.88		0.86	0.86
Frt	1.00	1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00					1.00	1.00		0.95	1.00
Satd. Flow (prot)	1681	1681	1468					6225	2707		1497	4534
Flt Permitted	0.95	0.95	1.00					1.00	1.00		0.15	0.65
Satd. Flow (perm)	1681	1681	1468					6225	2707		235	2965
Peak-hour factor, PHF	0.73	0.50	0.74	0.92	0.92	0.92	0.92	0.83	0.84	0.92	0.93	0.85
Adj. Flow (vph)	192	0	219	0	0	0	0	1298	1287	55	482	1726
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	449	0	0	0
Lane Group Flow (vph)	96	96	219	0	0	0	0	1298	838	0	373	1890
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	5%	5%	2%	4%	8%
Turn Type	Perm	NA	Free					NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4						2		1	1	6
Permitted Phases	4		Free						2	6	6	
Actuated Green, G (s)	9.6	9.6	120.0					66.3	66.3		98.4	98.4
Effective Green, g (s)	9.6	9.6	120.0					66.3	66.3		98.4	98.4
Actuated g/C Ratio	0.08	0.08	1.00					0.55	0.55		0.82	0.82
Clearance Time (s)	6.0	6.0						6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0						5.0	5.0		3.0	5.0
Lane Grp Cap (vph)	134	134	1468					3439	1495		467	2772
v/s Ratio Prot								0.21			c0.17	0.15
v/s Ratio Perm	c0.06	0.06	0.15						0.31		c0.48	0.41
v/c Ratio	0.72	0.72	0.15					0.38	0.56		0.80	0.68
Uniform Delay, d1	53.9	53.9	0.0					15.2	17.4		20.8	4.4
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.66	1.31
Incremental Delay, d2	16.6	16.6	0.2					0.3	1.5		7.1	0.5
Delay (s)	70.5	70.5	0.2					15.5	18.9		20.8	6.3
Level of Service	E	E	A					B	B		C	A
Approach Delay (s)		33.1			0.0			17.2				8.7
Approach LOS		C			A			B				A

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

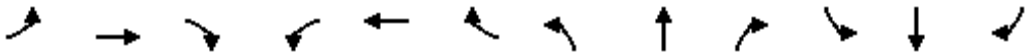
Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	577	5	405	310	945	1471
Future Volume (vph)	577	5	405	310	945	1471
Lane Group Flow (vph)	413	202	455	246	1206	2162
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	38.0	38.0	38.0	26.0	82.0	56.0
Total Split (%)	31.7%	31.7%	31.7%	21.7%	68.3%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.59	0.57	0.95	0.90	0.54	0.77
Control Delay	43.4	46.2	61.4	55.7	18.5	15.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	46.2	61.4	55.7	18.5	15.2
Queue Length 50th (ft)	150	146	248	173	283	421
Queue Length 95th (ft)	205	149	#432	212	337	191
Internal Link Dist (ft)		813			526	199
Turn Bay Length (ft)	500					
Base Capacity (vph)	775	390	514	297	2244	2795
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.52	0.89	0.83	0.54	0.77

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 96 (80%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	577	5	405	310	945	0	0	1471	635
Future Volume (vph)	0	0	0	577	5	405	310	945	0	0	1471	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.95	1.00	0.95	0.99			1.00	
Satd. Flow (prot)				2907	1466	1553	1478	4634			5974	
Flt Permitted				0.95	0.95	1.00	0.07	0.65			1.00	
Satd. Flow (perm)				2907	1466	1553	102	3047			5974	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.62	0.89	0.73	0.92	0.92	0.92	0.98	0.96
Adj. Flow (vph)	0	0	0	607	8	455	425	1027	0	0	1501	661
RTOR Reduction (vph)	0	0	0	0	0	104	0	0	0	0	61	0
Lane Group Flow (vph)	0	0	0	413	202	351	246	1206	0	0	2101	0
Heavy Vehicles (%)	2%	2%	2%	13%	2%	4%	5%	5%	2%	2%	5%	3%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				29.0	29.0	29.0	79.0	79.0			55.0	
Effective Green, g (s)				29.0	29.0	29.0	79.0	79.0			55.0	
Actuated g/C Ratio				0.24	0.24	0.24	0.66	0.66			0.46	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				702	354	375	273	2243			2738	
v/s Ratio Prot							c0.13	0.08			0.35	
v/s Ratio Perm				0.14	0.14	c0.23	c0.46	0.27				
v/c Ratio				0.59	0.57	0.94	0.90	0.54			0.77	
Uniform Delay, d1				40.2	40.0	44.6	36.8	10.8			27.2	
Progression Factor				1.00	1.00	1.00	0.68	1.76			0.50	
Incremental Delay, d2				1.3	2.2	30.4	28.8	0.2			1.7	
Delay (s)				41.5	42.2	75.0	53.9	19.3			15.2	
Level of Service				D	D	E	D	B			B	
Approach Delay (s)		0.0			55.9			25.2			15.2	
Approach LOS		A			E			C			B	

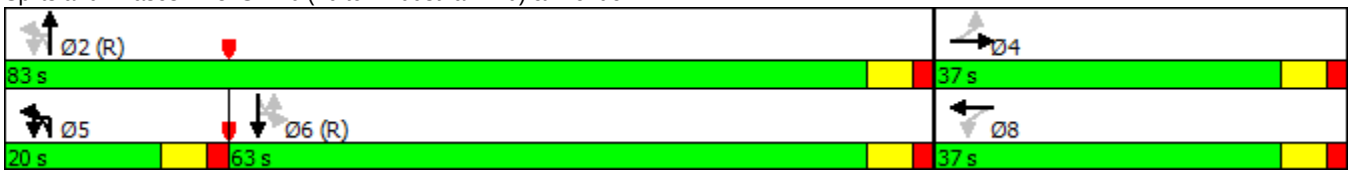
Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBU	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	11	87	0	76	31	1159	4	22	1857
Future Volume (vph)	32	11	87	0	76	31	1159	4	22	1857
Lane Group Flow (vph)	0	205	0	125	0	124	1322	0	31	1922
Turn Type	Perm	NA	Perm	NA	pm+pt	pm+pt	NA	Perm	Perm	NA
Protected Phases		4		8	5	5	2			6
Permitted Phases	4		8		2	2		6	6	
Detector Phase	4	4	8	8	5	5	2	6	6	6
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	37.0	37.0	37.0	37.0	20.0	20.0	83.0	63.0	63.0	63.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	16.7%	16.7%	69.2%	52.5%	52.5%	52.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0		6.0		6.0	6.0		6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio		0.82		0.49		0.63	0.37		0.15	0.67
Control Delay		61.4		22.3		44.1	1.5		17.8	20.4
Queue Delay		0.0		0.0		0.0	0.0		0.0	0.0
Total Delay		61.4		22.3		44.1	1.5		17.8	20.4
Queue Length 50th (ft)		124		28		45	19		11	353
Queue Length 95th (ft)		96		18		m78	56		32	519
Internal Link Dist (ft)		537		544			354			581
Turn Bay Length (ft)						120			150	
Base Capacity (vph)		329		320		249	3560		211	2886
Starvation Cap Reductn		0		0		0	0		0	0
Spillback Cap Reductn		0		0		0	0		0	0
Storage Cap Reductn		0		0		0	0		0	0
Reduced v/c Ratio		0.62		0.39		0.50	0.37		0.15	0.67

Intersection Summary

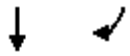
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 80 (67%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	32	11	66	87	0	11	76	31	1159	76	4	22
Future Volume (vph)	32	11	66	87	0	11	76	31	1159	76	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.0	6.0			6.0
Lane Util. Factor		1.00			1.00			1.00	0.91			1.00
Frt		0.93			0.98			1.00	0.99			1.00
Flt Protected		0.98			0.96			0.95	1.00			0.95
Satd. Flow (prot)		1343			1764			1622	4988			1770
Flt Permitted		0.84			0.55			0.06	1.00			0.20
Satd. Flow (perm)		1156			1007			101	4988			365
Peak-hour factor, PHF	0.39	0.55	0.64	0.83	0.50	0.55	0.92	0.75	0.94	0.85	0.92	0.81
Adj. Flow (vph)	82	20	103	105	0	20	83	41	1233	89	4	27
RTOR Reduction (vph)	0	33	0	0	67	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	172	0	0	58	0	0	124	1317	0	0	31
Heavy Vehicles (%)	25%	2%	38%	1%	2%	2%	2%	30%	3%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA		Perm	Perm
Protected Phases		4			8		5	5	2			
Permitted Phases	4			8			2	2			6	6
Actuated Green, G (s)		22.5			22.5			85.5	85.5			69.7
Effective Green, g (s)		22.5			22.5			85.5	85.5			69.7
Actuated g/C Ratio		0.19			0.19			0.71	0.71			0.58
Clearance Time (s)		6.0			6.0			6.0	6.0			6.0
Vehicle Extension (s)		3.0			3.0			3.0	5.0			5.0
Lane Grp Cap (vph)		216			188			196	3553			212
v/s Ratio Prot								c0.05	0.26			
v/s Ratio Perm		c0.15			0.06			0.40				0.09
v/c Ratio		0.79			0.31			0.63	0.37			0.15
Uniform Delay, d1		46.5			42.1			22.6	6.7			11.5
Progression Factor		1.00			1.00			1.69	0.17			1.00
Incremental Delay, d2		18.0			0.9			5.0	0.2			1.4
Delay (s)		64.5			43.0			43.1	1.4			13.0
Level of Service		E			D			D	A			B
Approach Delay (s)		64.5			43.0				5.0			
Approach LOS		E			D				A			

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1857	16
Future Volume (vph)	1857	16
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4970	
Flt Permitted	1.00	
Satd. Flow (perm)	4970	
Peak-hour factor, PHF	0.99	0.35
Adj. Flow (vph)	1876	46
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	1920	0
Heavy Vehicles (%)	3%	44%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	69.7	
Effective Green, g (s)	69.7	
Actuated g/C Ratio	0.58	
Clearance Time (s)	6.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	2886	
v/s Ratio Prot	c0.39	
v/s Ratio Perm		
v/c Ratio	0.67	
Uniform Delay, d1	17.2	
Progression Factor	1.00	
Incremental Delay, d2	1.2	
Delay (s)	18.4	
Level of Service	B	
Approach Delay (s)	18.3	
Approach LOS	B	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	73	2	35	25	0	38
Future Volume (Veh/h)	73	2	35	25	0	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.55	0.92	0.92	0.50	0.92	0.92
Hourly flow rate (vph)	133	2	38	50	0	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				617		
pX, platoon unblocked						
vC, conflicting volume			135		260	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		260	134
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			96		100	94
cM capacity (veh/h)			1016		539	708

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	88	41
Volume Left	0	38	0
Volume Right	2	0	41
cSH	1700	1016	708
Volume to Capacity	0.08	0.04	0.06
Queue Length 95th (ft)	0	3	5
Control Delay (s)	0.0	3.9	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	3.9	10.4
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	19.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

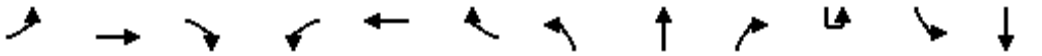
Appendix J:
Future “Build” Improved
Intersection Analysis

Lane Group	EBL	EBT	EBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	420	6	313	865	866	38	563	1558
Future Volume (vph)	420	6	313	865	866	38	563	1558
Lane Group Flow (vph)	243	246	356	972	962	0	414	1971
Turn Type	Perm	NA	Free	NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4		2		1	1	6
Permitted Phases	4		Free		2	6	6	
Detector Phase	4	4		2	2	1	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0		15.0	15.0	4.0	4.0	15.0
Minimum Split (s)	11.0	11.0		24.0	24.0	11.0	11.0	24.0
Total Split (s)	31.0	31.0		48.0	48.0	41.0	41.0	89.0
Total Split (%)	25.8%	25.8%		40.0%	40.0%	34.2%	34.2%	74.2%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag				Lag	Lag	Lead	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None		C-Min	C-Min	None	None	C-Min
v/c Ratio	0.89	0.90	0.24	0.35	0.56		0.82	0.78
Control Delay	81.2	82.3	0.4	22.8	4.3		29.3	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.2
Total Delay	81.2	82.3	0.4	22.8	4.3		29.3	10.1
Queue Length 50th (ft)	194	197	0	138	18		238	329
Queue Length 95th (ft)	274	143	0	198	77		218	148
Internal Link Dist (ft)		656		633				526
Turn Bay Length (ft)			400		310			
Base Capacity (vph)	346	348	1509	2816	1732		586	2539
Starvation Cap Reductn	0	0	0	0	0		0	94
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.70	0.71	0.24	0.35	0.56		0.71	0.81

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 45 (38%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	420	6	313	0	0	0	0	865	866	38	563	1558
Future Volume (vph)	420	6	313	0	0	0	0	865	866	38	563	1558
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0					6.0	6.0		6.0	6.0
Lane Util. Factor	0.95	0.95	1.00					0.86	0.88		0.86	0.86
Frt	1.00	1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00					1.00	1.00		0.95	0.99
Satd. Flow (prot)	1665	1674	1509					6052	2707		1495	4529
Flt Permitted	0.95	0.95	1.00					1.00	1.00		0.21	0.65
Satd. Flow (perm)	1665	1674	1509					6052	2707		338	2986
Peak-hour factor, PHF	0.88	0.50	0.88	0.92	0.92	0.92	0.92	0.89	0.90	0.92	0.80	0.95
Adj. Flow (vph)	477	12	356	0	0	0	0	972	962	41	704	1640
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	473	0	0	0
Lane Group Flow (vph)	243	246	356	0	0	0	0	972	489	0	414	1971
Heavy Vehicles (%)	3%	2%	7%	2%	2%	2%	2%	8%	5%	2%	4%	8%
Turn Type	Perm	NA	Free					NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4						2		1	1	6
Permitted Phases	4		Free						2	6	6	
Actuated Green, G (s)	19.7	19.7	120.0					55.8	55.8		88.3	88.3
Effective Green, g (s)	19.7	19.7	120.0					55.8	55.8		88.3	88.3
Actuated g/C Ratio	0.16	0.16	1.00					0.46	0.46		0.74	0.74
Clearance Time (s)	6.0	6.0						6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0						5.0	5.0		3.0	5.0
Lane Grp Cap (vph)	273	274	1509					2814	1258		504	2537
v/s Ratio Prot								0.16			c0.18	0.17
v/s Ratio Perm	0.15	0.15	0.24						0.18		c0.42	0.40
v/c Ratio	0.89	0.90	0.24					0.35	0.39		0.82	0.78
Uniform Delay, d1	49.1	49.2	0.0					20.5	21.0		15.6	9.8
Progression Factor	1.00	1.00	1.00					1.00	1.00		1.17	0.97
Incremental Delay, d2	28.1	29.1	0.4					0.3	0.9		9.1	1.3
Delay (s)	77.2	78.3	0.4					20.8	21.9		27.3	10.8
Level of Service	E	E	A					C	C		C	B
Approach Delay (s)		45.1			0.0			21.3				13.7
Approach LOS		D			A			C				B

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

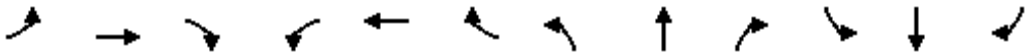
Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	853	1	355	118	1232	1320
Future Volume (vph)	853	1	355	118	1232	1320
Lane Group Flow (vph)	608	303	390	123	1311	1542
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	48.0	48.0	48.0	21.0	72.0	51.0
Total Split (%)	40.0%	40.0%	40.0%	17.5%	60.0%	42.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.76	0.75	0.84	0.62	0.48	0.51
Control Delay	46.3	51.7	48.0	30.2	17.6	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	51.7	48.0	30.2	17.6	11.6
Queue Length 50th (ft)	238	237	231	63	261	193
Queue Length 95th (ft)	271	68	316	m118	329	150
Internal Link Dist (ft)		813			526	199
Turn Bay Length (ft)	500					
Base Capacity (vph)	1064	534	591	241	2716	2997
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.57	0.66	0.51	0.48	0.51

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 107 (89%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	853	1	355	118	1232	0	0	1320	127
Future Volume (vph)	0	0	0	853	1	355	118	1232	0	0	1320	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.99	
Flt Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				3042	1527	1538	1362	4618			6029	
Flt Permitted				0.95	0.95	1.00	0.10	0.91			1.00	
Satd. Flow (perm)				3042	1527	1538	140	4212			6029	
Peak-hour factor, PHF	0.92	0.92	0.92	0.94	0.25	0.91	0.86	0.95	0.92	0.92	0.95	0.83
Adj. Flow (vph)	0	0	0	907	4	390	137	1297	0	0	1389	153
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	13	0
Lane Group Flow (vph)	0	0	0	608	303	330	123	1311	0	0	1529	0
Heavy Vehicles (%)	2%	2%	2%	8%	2%	5%	14%	6%	2%	2%	6%	14%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				31.7	31.7	31.7	76.3	76.3			59.4	
Effective Green, g (s)				31.7	31.7	31.7	76.3	76.3			59.4	
Actuated g/C Ratio				0.26	0.26	0.26	0.64	0.64			0.49	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				803	403	406	200	2715			2984	
v/s Ratio Prot							c0.06	0.04			0.25	
v/s Ratio Perm				0.20	0.20	c0.21	c0.34	0.26				
v/c Ratio				0.76	0.75	0.81	0.61	0.48			0.51	
Uniform Delay, d1				40.6	40.5	41.4	13.1	11.5			20.5	
Progression Factor				1.00	1.00	1.00	1.17	1.38			0.50	
Incremental Delay, d2				4.1	7.7	11.7	5.0	0.1			0.6	
Delay (s)				44.7	48.3	53.1	20.2	16.0			10.8	
Level of Service				D	D	D	C	B			B	
Approach Delay (s)		0.0			48.0			16.3			10.8	
Approach LOS		A			D			B			B	

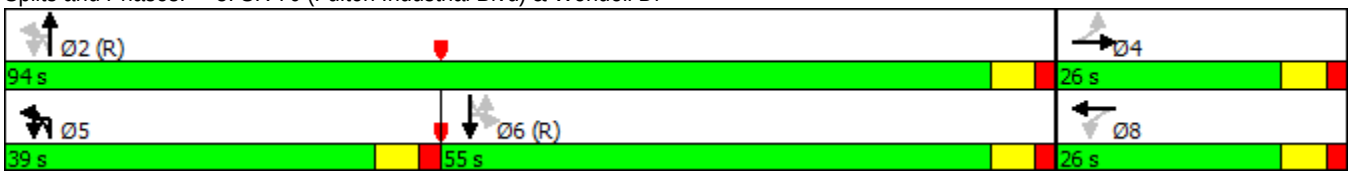
Intersection Summary			
HCM 2000 Control Delay	24.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	25	6	57	6	55	96	1350	14	1253
Future Volume (vph)	25	6	57	6	55	96	1350	14	1253
Lane Group Flow (vph)	37	98	0	97	0	231	1467	28	1358
Turn Type	Perm	NA	Perm	NA	pm+pt	pm+pt	NA	Perm	NA
Protected Phases		4		8	5	5	2		6
Permitted Phases	4		8		2	2		6	
Detector Phase	4	4	8	8	5	5	2	6	6
Switch Phase									
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0
Total Split (s)	26.0	26.0	26.0	26.0	39.0	39.0	94.0	55.0	55.0
Total Split (%)	21.7%	21.7%	21.7%	21.7%	32.5%	32.5%	78.3%	45.8%	45.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0	6.0	6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min
v/c Ratio	0.37	0.50		0.64		0.71	0.38	0.15	0.48
Control Delay	57.6	20.4		65.8		38.6	0.7	19.4	17.0
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0	0.0
Total Delay	57.6	20.4		65.8		38.6	0.7	19.4	17.0
Queue Length 50th (ft)	27	6		69		83	11	9	208
Queue Length 95th (ft)	44	34		62		80	10	18	342
Internal Link Dist (ft)		537		544			354		581
Turn Bay Length (ft)	200					120		150	
Base Capacity (vph)	147	243		220		465	3893	182	2853
Starvation Cap Reductn	0	0		0		0	0	0	0
Spillback Cap Reductn	0	0		0		0	0	0	0
Storage Cap Reductn	0	0		0		0	0	0	0
Reduced v/c Ratio	0.25	0.40		0.44		0.50	0.38	0.15	0.48

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 95 (79%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	25	6	64	57	6	8	55	96	1350	74	14	1253
Future Volume (vph)	25	6	64	57	6	8	55	96	1350	74	14	1253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Lane Util. Factor	1.00	1.00			1.00			1.00	0.91		1.00	0.91
Frt	1.00	0.86			0.98			1.00	0.99		1.00	0.99
Flt Protected	0.95	1.00			0.96			0.95	1.00		0.95	1.00
Satd. Flow (prot)	1157	1013			1765			1327	4948		1770	4881
Flt Permitted	0.72	1.00			0.71			0.14	1.00		0.17	1.00
Satd. Flow (perm)	882	1013			1300			197	4948		313	4881
Peak-hour factor, PHF	0.67	0.75	0.71	0.78	0.50	0.67	0.92	0.56	0.98	0.83	0.50	0.96
Adj. Flow (vph)	37	8	90	73	12	12	60	171	1378	89	28	1305
RTOR Reduction (vph)	0	80	0	0	4	0	0	0	5	0	0	2
Lane Group Flow (vph)	37	18	0	0	93	0	0	231	1462	0	28	1356
Heavy Vehicles (%)	56%	2%	67%	2%	2%	2%	2%	48%	4%	2%	2%	4%
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA		Perm	NA
Protected Phases		4			8		5	5	2			6
Permitted Phases	4			8			2	2			6	
Actuated Green, G (s)	13.7	13.7			13.7			94.3	94.3		70.1	70.1
Effective Green, g (s)	13.7	13.7			13.7			94.3	94.3		70.1	70.1
Actuated g/C Ratio	0.11	0.11			0.11			0.79	0.79		0.58	0.58
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	5.0		5.0	5.0
Lane Grp Cap (vph)	100	115			148			326	3888		182	2851
v/s Ratio Prot		0.02						c0.11	0.30			0.28
v/s Ratio Perm	0.04				c0.07			c0.45			0.09	
v/c Ratio	0.37	0.16			0.63			0.71	0.38		0.15	0.48
Uniform Delay, d1	49.2	48.0			50.7			15.0	3.9		11.4	14.4
Progression Factor	1.00	1.00			1.00			2.20	0.12		1.00	1.00
Incremental Delay, d2	2.3	0.6			8.0			6.1	0.2		1.8	0.6
Delay (s)	51.5	48.6			58.7			39.0	0.7		13.2	14.9
Level of Service	D	D			E			D	A		B	B
Approach Delay (s)		49.4			58.7				5.9			14.9
Approach LOS		D			E				A			B

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	33
Future Volume (vph)	33
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.62
Adj. Flow (vph)	53
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	46%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	31	3	65	69	1	63
Future Volume (Veh/h)	31	3	65	69	1	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.92	0.92	0.50	0.92	0.92
Hourly flow rate (vph)	41	3	71	138	1	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				617		
pX, platoon unblocked						
vC, conflicting volume			44		322	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			44		322	42
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			94		100	92
cM capacity (veh/h)			1112		478	807

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	44	209	69
Volume Left	0	71	1
Volume Right	3	0	68
cSH	1700	1112	799
Volume to Capacity	0.03	0.06	0.09
Queue Length 95th (ft)	0	5	7
Control Delay (s)	0.0	3.3	9.9
Lane LOS		A	A
Approach Delay (s)	0.0	3.3	9.9
Approach LOS			A

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

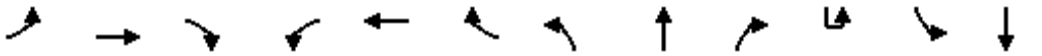
Channelized right turn lanes are not counted.

Lane Group	EBL	EBT	EBR	NBT	NBR	SBU	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	140	0	162	1077	1081	51	448	1467
Future Volume (vph)	140	0	162	1077	1081	51	448	1467
Lane Group Flow (vph)	96	96	219	1298	1287	0	373	1890
Turn Type	Perm	NA	Free	NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4		2		1	1	6
Permitted Phases	4		Free		2	6	6	
Detector Phase	4	4		2	2	1	1	6
Switch Phase								
Minimum Initial (s)	6.0	6.0		15.0	15.0	4.0	4.0	15.0
Minimum Split (s)	28.0	28.0		24.0	24.0	11.0	11.0	24.0
Total Split (s)	28.0	28.0		53.0	53.0	39.0	39.0	92.0
Total Split (%)	23.3%	23.3%		44.2%	44.2%	32.5%	32.5%	76.7%
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0
Lead/Lag				Lag	Lag	Lead	Lead	
Lead-Lag Optimize?								
Recall Mode	None	None		C-Min	C-Min	None	None	C-Min
v/c Ratio	0.72	0.72	0.15	0.38	0.66		0.80	0.68
Control Delay	81.1	81.1	0.2	17.2	6.3		21.8	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.5
Total Delay	81.1	81.1	0.2	17.2	6.3		21.8	6.2
Queue Length 50th (ft)	77	77	0	156	59		79	64
Queue Length 95th (ft)	106	71	0	221	127		m203	190
Internal Link Dist (ft)		656		633				526
Turn Bay Length (ft)			400		310			
Base Capacity (vph)	308	308	1468	3440	1945		549	2772
Starvation Cap Reductn	0	0	0	0	0		0	395
Spillback Cap Reductn	0	0	0	0	0		0	0
Storage Cap Reductn	0	0	0	0	0		0	0
Reduced v/c Ratio	0.31	0.31	0.15	0.38	0.66		0.68	0.80

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 46 (38%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: SR 70 (Fulton Industrial Blvd) & I-20 EB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	140	0	162	0	0	0	0	1077	1081	51	448	1467
Future Volume (vph)	140	0	162	0	0	0	0	1077	1081	51	448	1467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	4.0					6.0	6.0		6.0	6.0
Lane Util. Factor	0.95	0.95	1.00					0.86	0.88		0.86	0.86
Frt	1.00	1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected	0.95	0.95	1.00					1.00	1.00		0.95	1.00
Satd. Flow (prot)	1681	1681	1468					6225	2707		1497	4534
Flt Permitted	0.95	0.95	1.00					1.00	1.00		0.15	0.65
Satd. Flow (perm)	1681	1681	1468					6225	2707		235	2965
Peak-hour factor, PHF	0.73	0.50	0.74	0.92	0.92	0.92	0.92	0.83	0.84	0.92	0.93	0.85
Adj. Flow (vph)	192	0	219	0	0	0	0	1298	1287	55	482	1726
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	449	0	0	0
Lane Group Flow (vph)	96	96	219	0	0	0	0	1298	838	0	373	1890
Heavy Vehicles (%)	2%	2%	10%	2%	2%	2%	2%	5%	5%	2%	4%	8%
Turn Type	Perm	NA	Free					NA	Perm	pm+pt	pm+pt	NA
Protected Phases		4						2		1	1	6
Permitted Phases	4		Free						2	6	6	
Actuated Green, G (s)	9.6	9.6	120.0					66.3	66.3		98.4	98.4
Effective Green, g (s)	9.6	9.6	120.0					66.3	66.3		98.4	98.4
Actuated g/C Ratio	0.08	0.08	1.00					0.55	0.55		0.82	0.82
Clearance Time (s)	6.0	6.0						6.0	6.0		6.0	6.0
Vehicle Extension (s)	3.0	3.0						5.0	5.0		3.0	5.0
Lane Grp Cap (vph)	134	134	1468					3439	1495		467	2772
v/s Ratio Prot								0.21			c0.17	0.15
v/s Ratio Perm	c0.06	0.06	0.15						0.31		c0.48	0.41
v/c Ratio	0.72	0.72	0.15					0.38	0.56		0.80	0.68
Uniform Delay, d1	53.9	53.9	0.0					15.2	17.4		20.8	4.4
Progression Factor	1.00	1.00	1.00					1.00	1.00		0.66	1.30
Incremental Delay, d2	16.6	16.6	0.2					0.3	1.5		7.1	0.5
Delay (s)	70.5	70.5	0.2					15.5	18.9		20.8	6.3
Level of Service	E	E	A					B	B		C	A
Approach Delay (s)		33.1			0.0			17.2				8.7
Approach LOS		C			A			B				A

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

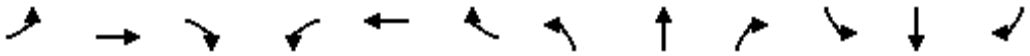
Intersection Summary

Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Configurations						
Traffic Volume (vph)	577	5	405	310	945	1471
Future Volume (vph)	577	5	405	310	945	1471
Lane Group Flow (vph)	413	202	455	246	1206	2162
Turn Type	Perm	NA	Perm	pm+pt	NA	NA
Protected Phases		8		5	2	6
Permitted Phases	8		8	2		
Detector Phase	8	8	8	5	2	6
Switch Phase						
Minimum Initial (s)	6.0	6.0	6.0	4.0	15.0	15.0
Minimum Split (s)	31.0	31.0	31.0	11.0	24.0	24.0
Total Split (s)	38.0	38.0	38.0	26.0	82.0	56.0
Total Split (%)	31.7%	31.7%	31.7%	21.7%	68.3%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag				Lead		Lag
Lead-Lag Optimize?						
Recall Mode	None	None	None	None	C-Min	C-Min
v/c Ratio	0.59	0.57	0.95	0.90	0.54	0.77
Control Delay	43.4	46.2	61.4	55.7	18.5	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	46.2	61.4	55.7	18.5	18.9
Queue Length 50th (ft)	150	146	248	173	283	417
Queue Length 95th (ft)	205	149	#432	212	337	381
Internal Link Dist (ft)		813			526	199
Turn Bay Length (ft)	500					
Base Capacity (vph)	775	390	514	297	2244	2795
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.52	0.89	0.83	0.54	0.77

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 96 (80%), Referenced to phase 2:NBTL and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: SR 70 (Fulton Industrial Blvd) & I-20 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	577	5	405	310	945	0	0	1471	635
Future Volume (vph)	0	0	0	577	5	405	310	945	0	0	1471	635
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Lane Util. Factor				0.91	0.91	1.00	0.86	0.86			0.86	
Frt				1.00	1.00	0.85	1.00	1.00			0.95	
Flt Protected				0.95	0.95	1.00	0.95	0.99			1.00	
Satd. Flow (prot)				2907	1466	1553	1478	4634			5974	
Flt Permitted				0.95	0.95	1.00	0.07	0.65			1.00	
Satd. Flow (perm)				2907	1466	1553	102	3047			5974	
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.62	0.89	0.73	0.92	0.92	0.92	0.98	0.96
Adj. Flow (vph)	0	0	0	607	8	455	425	1027	0	0	1501	661
RTOR Reduction (vph)	0	0	0	0	0	104	0	0	0	0	61	0
Lane Group Flow (vph)	0	0	0	413	202	351	246	1206	0	0	2101	0
Heavy Vehicles (%)	2%	2%	2%	13%	2%	4%	5%	5%	2%	2%	5%	3%
Turn Type				Perm	NA	Perm	pm+pt	NA			NA	
Protected Phases					8		5	2			6	
Permitted Phases				8		8	2					
Actuated Green, G (s)				29.0	29.0	29.0	79.0	79.0			55.0	
Effective Green, g (s)				29.0	29.0	29.0	79.0	79.0			55.0	
Actuated g/C Ratio				0.24	0.24	0.24	0.66	0.66			0.46	
Clearance Time (s)				6.0	6.0	6.0	6.0	6.0			6.0	
Vehicle Extension (s)				3.0	3.0	3.0	3.0	5.0			5.0	
Lane Grp Cap (vph)				702	354	375	273	2243			2738	
v/s Ratio Prot							c0.13	0.08			0.35	
v/s Ratio Perm				0.14	0.14	c0.23	c0.46	0.27				
v/c Ratio				0.59	0.57	0.94	0.90	0.54			0.77	
Uniform Delay, d1				40.2	40.0	44.6	36.8	10.8			27.2	
Progression Factor				1.00	1.00	1.00	0.68	1.76			0.63	
Incremental Delay, d2				1.3	2.2	30.4	28.8	0.2			1.8	
Delay (s)				41.5	42.2	75.0	53.9	19.3			18.9	
Level of Service				D	D	E	D	B			B	
Approach Delay (s)		0.0			55.9			25.2			18.9	
Approach LOS		A			E			C			B	

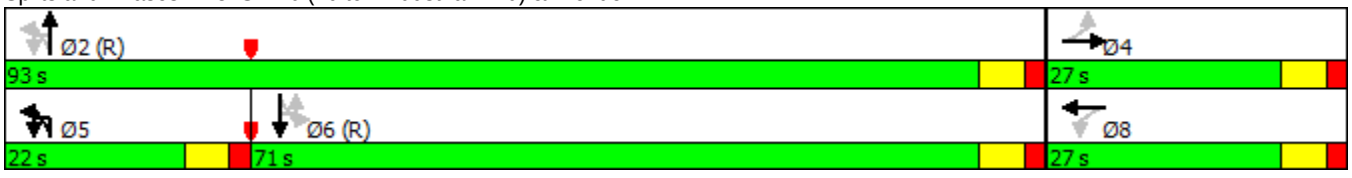
Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	53.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBU	NBL	NBT	SBU	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	32	11	87	0	76	31	1159	4	22	1857
Future Volume (vph)	32	11	87	0	76	31	1159	4	22	1857
Lane Group Flow (vph)	82	123	0	125	0	124	1322	0	31	1922
Turn Type	Perm	NA	Perm	NA	pm+pt	pm+pt	NA	Perm	Perm	NA
Protected Phases		4		8	5	5	2			6
Permitted Phases	4		8		2	2		6	6	
Detector Phase	4	4	8	8	5	5	2	6	6	6
Switch Phase										
Minimum Initial (s)	6.0	6.0	6.0	6.0	4.0	4.0	15.0	15.0	15.0	15.0
Minimum Split (s)	24.0	24.0	24.0	24.0	11.0	11.0	24.0	24.0	24.0	24.0
Total Split (s)	27.0	27.0	27.0	27.0	22.0	22.0	93.0	71.0	71.0	71.0
Total Split (%)	22.5%	22.5%	22.5%	22.5%	18.3%	18.3%	77.5%	59.2%	59.2%	59.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0		0.0	0.0		0.0	0.0
Total Lost Time (s)	6.0	6.0		6.0		6.0	6.0		6.0	6.0
Lead/Lag					Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	None	None	C-Min	C-Min	C-Min	C-Min
v/c Ratio	0.61	0.51		0.62		0.57	0.34		0.13	0.60
Control Delay	67.4	20.3		32.7		33.3	0.8		12.8	14.4
Queue Delay	0.0	0.0		0.0		0.0	0.0		0.0	0.0
Total Delay	67.4	20.3		32.7		33.3	0.8		12.8	14.4
Queue Length 50th (ft)	61	14		31		34	10		8	282
Queue Length 95th (ft)	44	13		21		m60	24		27	445
Internal Link Dist (ft)		537		544			354			581
Turn Bay Length (ft)	200					120			150	
Base Capacity (vph)	201	304		258		294	3905		236	3221
Starvation Cap Reductn	0	0		0		0	0		0	0
Spillback Cap Reductn	0	0		0		0	0		0	0
Storage Cap Reductn	0	0		0		0	0		0	0
Reduced v/c Ratio	0.41	0.40		0.48		0.42	0.34		0.13	0.60

Intersection Summary

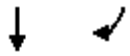
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 76 (63%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: SR 70 (Fulton Industrial Blvd) & Wendell Dr



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	32	11	66	87	0	11	76	31	1159	76	4	22
Future Volume (vph)	32	11	66	87	0	11	76	31	1159	76	4	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0			6.0			6.0	6.0			6.0
Lane Util. Factor	1.00	1.00			1.00			1.00	0.91			1.00
Frt	1.00	0.87			0.98			1.00	0.99			1.00
Flt Protected	0.95	1.00			0.96			0.95	1.00			0.95
Satd. Flow (prot)	1444	1257			1764			1622	4988			1770
Flt Permitted	0.76	1.00			0.59			0.07	1.00			0.20
Satd. Flow (perm)	1149	1257			1090			119	4988			365
Peak-hour factor, PHF	0.39	0.55	0.64	0.83	0.50	0.55	0.92	0.75	0.94	0.85	0.92	0.81
Adj. Flow (vph)	82	20	103	105	0	20	83	41	1233	89	4	27
RTOR Reduction (vph)	0	91	0	0	72	0	0	0	5	0	0	0
Lane Group Flow (vph)	82	32	0	0	53	0	0	124	1317	0	0	31
Heavy Vehicles (%)	25%	2%	38%	1%	2%	2%	2%	30%	3%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		pm+pt	pm+pt	NA		Perm	Perm
Protected Phases		4			8		5	5	2			
Permitted Phases	4			8			2	2			6	6
Actuated Green, G (s)	14.2	14.2			14.2			93.8	93.8			77.8
Effective Green, g (s)	14.2	14.2			14.2			93.8	93.8			77.8
Actuated g/C Ratio	0.12	0.12			0.12			0.78	0.78			0.65
Clearance Time (s)	6.0	6.0			6.0			6.0	6.0			6.0
Vehicle Extension (s)	3.0	3.0			3.0			3.0	5.0			5.0
Lane Grp Cap (vph)	135	148			128			218	3898			236
v/s Ratio Prot		0.03						c0.05	0.26			
v/s Ratio Perm	c0.07				0.05			0.40				0.09
v/c Ratio	0.61	0.22			0.41			0.57	0.34			0.13
Uniform Delay, d1	50.3	47.9			49.0			14.1	3.9			8.1
Progression Factor	1.00	1.00			1.00			1.99	0.14			1.00
Incremental Delay, d2	7.5	0.7			2.1			2.6	0.2			1.1
Delay (s)	57.8	48.6			51.2			30.7	0.7			9.3
Level of Service	E	D			D			C	A			A
Approach Delay (s)		52.3			51.2				3.3			
Approach LOS		D			D				A			

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1857	16
Future Volume (vph)	1857	16
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	
Lane Util. Factor	0.91	
Frt	1.00	
Flt Protected	1.00	
Satd. Flow (prot)	4970	
Flt Permitted	1.00	
Satd. Flow (perm)	4970	
Peak-hour factor, PHF	0.99	0.35
Adj. Flow (vph)	1876	46
RTOR Reduction (vph)	2	0
Lane Group Flow (vph)	1920	0
Heavy Vehicles (%)	3%	44%
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	77.8	
Effective Green, g (s)	77.8	
Actuated g/C Ratio	0.65	
Clearance Time (s)	6.0	
Vehicle Extension (s)	5.0	
Lane Grp Cap (vph)	3222	
v/s Ratio Prot	c0.39	
v/s Ratio Perm		
v/c Ratio	0.60	
Uniform Delay, d1	12.1	
Progression Factor	1.00	
Incremental Delay, d2	0.8	
Delay (s)	12.9	
Level of Service	B	
Approach Delay (s)	12.9	
Approach LOS	B	

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	73	2	35	25	0	38
Future Volume (Veh/h)	73	2	35	25	0	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.55	0.92	0.92	0.50	0.92	0.92
Hourly flow rate (vph)	133	2	38	50	0	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				617		
pX, platoon unblocked						
vC, conflicting volume			135		260	134
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			135		260	134
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			96		100	94
cM capacity (veh/h)			1016		539	708

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	135	88	41
Volume Left	0	38	0
Volume Right	2	0	41
cSH	1700	1016	708
Volume to Capacity	0.08	0.04	0.06
Queue Length 95th (ft)	0	3	5
Control Delay (s)	0.0	3.9	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	3.9	10.4
Approach LOS			B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	19.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.

Channelized right turn lanes are not counted.

Appendix K:
Traffic Volume Worksheets

Project Name
Traffic Volumes
Future Conditions

A&R Engineering
June 2016

1. SR 70 @ I-20 EB Ramps

A.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	813	857	1670	0	544	1502	0	2046	0	410	6	310	726	0	0	0	0	0
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	821	866	1687	0	549	1517	0	2066	0	414	6	313	733	0	0	0	0	0
New Truck Trips:	0	0	30	0	30	0	8	28	0	36	0	4	0	0	4	0	0	0	0	0
New Passenger Trips:	0	0	14	0	14	11	6	13	0	30	0	2	0	0	2	0	0	0	0	0
Total New Trips:	0	0	44	0	44	11	14	41	0	66	0	6	0	0	6	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	27	0	0	0	27	0	0	0	0	0	0	0	0	0	0
Future Traffic Volumes:	0	0	865	866	1731	38	563	1558	0	2159	0	420	6	313	739	0	0	0	0	0

P.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	1031	1070	2101	0	430	1416	0	1846	0	134	0	160	294	0	0	0	0	0
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	1041	1081	2122	0	434	1430	0	1864	0	135	0	162	297	0	0	0	0	0
New Truck Trips:	0	0	15	0	15	0	5	16	0	21	0	2	0	0	2	0	0	0	0	0
New Passenger Trips:	0	0	21	0	21	17	9	21	0	47	0	3	0	0	3	0	0	0	0	0
Total New Trips:	0	0	36	0	36	17	14	37	0	68	0	5	0	0	5	0	0	0	0	0
Pass-by Trips:	0	0	0	0	0	34	0	0	0	34	0	0	0	0	0	0	0	0	0	0
Future Traffic Volumes:	0	0	1077	1081	2158	51	448	1467	0	1966	0	140	0	162	302	0	0	0	0	0

Project Name
Traffic Volumes
Future Conditions

A&R Engineering
June 2016

2. SR 70 @ I-20 WB Ramps

A.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	117	1133	0	1250	0	0	1214	120	1334	0	0	0	0	0	0	845	1	337	1183
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	118	1144	0	1262	0	0	1226	121	1347	0	0	0	0	0	0	853	1	340	1194
New Truck Trips:	0	0	34	0	34	0	0	37	4	41	0	0	0	0	0	0	0	0	11	11
New Passenger Trips:	0	0	27	0	27	0	0	30	2	32	0	0	0	0	0	0	0	0	4	4
Total New Trips:	0	0	61	0	61	0	0	67	6	73	0	0	0	0	0	0	0	0	15	15
Pass-by Trips:	0	0	27	0	27	0	0	27	0	27	0	0	0	0	0	0	0	0	0	0
Future Traffic Volumes:	0	118	1232	0	1350	0	0	1320	127	1447	0	0	0	0	0	0	853	1	355	1209

P.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	307	845	0	1152	0	0	1355	623	1978	0	0	0	0	0	0	571	5	389	965
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	310	853	0	1163	0	0	1369	629	1998	0	0	0	0	0	0	577	5	393	975
New Truck Trips:	0	0	17	0	17	0	0	21	2	23	0	0	0	0	0	0	0	0	6	6
New Passenger Trips:	0	0	41	0	41	0	0	47	4	51	0	0	0	0	0	0	0	0	6	6
Total New Trips:	0	0	58	0	58	0	0	68	6	74	0	0	0	0	0	0	0	0	12	12
Pass-by Trips:	0	0	34	0	34	0	0	34	0	34	0	0	0	0	0	0	0	0	0	0
Future Traffic Volumes:	0	310	945	0	1255	0	0	1471	635	2106	0	0	0	0	0	0	577	5	405	987

Project Name
Traffic Volumes
Future Conditions

A&R Engineering
June 2016

3. SR 70 @ Wendell Dr

A.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	8	48	1329	73	1458	0	14	1233	15	1262	0	8	6	20	34	0	56	6	8	70
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	8	48	1342	74	1472	0	14	1245	15	1274	0	8	6	20	34	0	57	6	8	71
New Truck Trips:	0	45	0	0	45	0	0	0	15	15	0	14	0	41	55	0	0	0	0	0
New Passenger Trips:	20	0	11	0	31	0	0	11	0	11	0	0	0	0	0	0	0	0	0	0
Total New Trips:	20	45	11	0	76	0	0	11	15	26	0	14	0	41	55	0	0	0	0	0
Pass-by Trips:	27	3	-3	0	27	0	0	-3	3	0	0	3	0	3	6	0	0	0	0	0
Future Traffic Volumes:	55	96	1350	74	1575	0	14	1253	33	1300	0	25	6	64	95	0	57	6	8	71

P.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	12	6	1133	75	1226	4	22	1824	7	1857	0	22	11	41	74	0	86	0	11	97
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	12	6	1144	76	1238	4	22	1842	7	1875	0	22	11	41	74	0	87	0	11	98
New Truck Trips:	0	23	0	0	23	0	0	0	7	7	0	8	0	23	31	0	0	0	0	0
New Passenger Trips:	30	0	17	0	47	0	0	17	0	17	0	0	0	0	0	0	0	0	0	0
Total New Trips:	30	23	17	0	70	0	0	17	7	24	0	8	0	23	31	0	0	0	0	0
Pass-by Trips:	34	2	-2	0	34	0	0	-2	2	0	0	2	0	2	4	0	0	0	0	0
Future Traffic Volumes:	76	31	1159	76	1342	4	22	1857	16	1899	0	32	11	66	109	0	87	0	11	98

Project Name
Traffic Volumes
Future Conditions

A&R Engineering
June 2016

4. Wendell Dr @ Site Drwy 1

A.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	0	0	0	34	0	34	0	0	69	0	69
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	0	0	0	0	0	0	0	0	0	0	34	0	34	0	0	70	0	70
New Truck Trips:	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0	0	59	0	0	59
New Passenger Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total New Trips:	0	0	0	55	55	0	0	0	0	0	0	0	0	0	0	0	59	0	0	59
Pass-by Trips:	0	1	0	8	9	0	0	0	0	0	0	0	-3	3	0	0	6	-1	0	5
Future Traffic Volumes:	0	1	0	63	64	0	0	0	0	0	0	0	31	3	34	0	65	69	0	134

P.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	0	0	0	0	0	0	0	0	0	0	74	0	74	0	0	13	0	13
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	0	0	0	0	0	0	0	0	0	0	75	0	75	0	0	13	0	13
New Truck Trips:	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	30	0	0	30
New Passenger Trips:	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total New Trips:	0	0	0	31	31	0	0	0	0	0	0	0	0	0	0	0	30	0	0	30
Pass-by Trips:	0	0	0	7	7	0	0	0	0	0	0	0	-2	2	0	0	5	0	0	5
Future Traffic Volumes:	0	0	0	38	38	0	0	0	0	0	0	0	73	2	75	0	35	13	0	48

Project Name
Traffic Volumes
Future Conditions

A&R Engineering
June 2016

5. SR 70 @ Site Drwy 2 (RIRO)

A.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	1470	0	1470	0	0	1334	0	1334	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	1485	0	1485	0	0	1347	0	1347	0	0	0	0	0	0	0	0	0	0
New Truck Trips:	0	0	45	0	45	0	0	41	0	41	0	0	0	0	0	0	0	0	0	0
New Passenger Trips:	0	0	31	0	31	0	0	0	31	31	0	0	0	32	32	0	0	0	0	0
Total New Trips:	0	0	76	0	76	0	0	41	31	72	0	0	0	32	32	0	0	0	0	0
Pass-by Trips:	0	0	27	0	27	0	0	-26	54	28	0	0	0	54	54	0	0	0	0	0
Future Traffic Volumes:	0	0	1588	0	1588	0	0	1362	85	1447	0	0	0	86	86	0	0	0	0	0

P.M. Peak Hour

	Northbound					Southbound					Eastbound					Westbound				
Condition	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot	U	L	T	R	Tot
Existing:	0	0	1234	0	1234	0	0	1978	0	1978	0	0	0	0	0	0	0	0	0	0
Growth Factor (%):	1	1	1	1		1	1	1	1		1	1	1	1		1	1	1	1	
Base Condition:	0	0	1246	0	1246	0	0	1998	0	1998	0	0	0	0	0	0	0	0	0	0
New Truck Trips:	0	0	23	0	23	0	0	23	0	23	0	0	0	0	0	0	0	0	0	0
New Passenger Trips:	0	0	47	0	47	0	0	0	47	47	0	0	0	50	50	0	0	0	0	0
Total New Trips:	0	0	70	0	70	0	0	23	47	70	0	0	0	50	50	0	0	0	0	0
Pass-by Trips:	0	0	34	0	34	0	0	-35	69	34	0	0	0	69	69	0	0	0	0	0
Future Traffic Volumes:	0	0	1350	0	1350	0	0	1986	116	2102	0	0	0	119	119	0	0	0	0	0