

**TRAFFIC IMPACT STUDY
FOR
RIVERVIEW ROAD RESIDENTIAL DEVELOPMENT
COBB COUNTY, GEORGIA**



Prepared for:

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A & R Project # 22-233

TABLE OF CONTENTS

Item	Page
1.0 Introduction	1
2.0 Existing Facilities / Conditions	3
2.1 Roadway Facilities.....	3
2.1.1 SR 8/US 78/US 278 (Veterans Memorial Highway)	3
2.1.2 Riverview Road.....	3
2.1.3 Nichols Drive	3
3.0 Study Methodology	4
3.1 Unsignalized Intersections	4
3.2 Signalized Intersections	5
4.0 Existing 2023 Traffic Analysis	6
4.1 Existing Traffic Volumes	6
4.2 Nearby Developments Under Construction.....	6
4.3 Existing Traffic Operations	13
5.0 Proposed Development	14
5.1 Trip Generation	16
5.2 Trip Distribution	16
6.0 Future Traffic Analysis	18
6.1 Future “No-Build” Conditions	18
6.1.1 Annual Traffic Growth.....	18
6.1.2 Nearby Planned Developments	20
6.2 Future “Build” Conditions	25
6.3 Auxiliary Lane Analysis	28
6.4 Future Opening Year 2024 Traffic Operations	29
6.4.1 Recommendations for System Improvements	29
6.5 Future Horizon Year 2034 Traffic Operations	31
7.0 Signal Warrant Analysis	33
8.0 Conclusions and Recommendations	34
8.1 Recommendations for System Improvements	35
8.2 Recommendation for Site Access Configuration	35
Appendix	

LIST OF TABLES

Item	Page
Table 1 – Level-of-service Criteria for Unsignalized Intersections.....	4
Table 2 – Level-of-service Criteria for Signalized Intersections	5
Table 3A – Trip Generation (Pod C1 & C2).....	7
Table 3B – Trip Generation (The Drift at Riverview Landing)	7
Table 4 – Existing Intersection Operations	13
Table 5 – Trip Generation (Proposed Development).....	16
Table 6 – Trip Generation (Nearby Planned Developments).....	20
Table 7a – Future (Opening Year) 2024 Intersection Operations.....	29
Table 7b – Future (Opening Year) 2024 Intersection Operations – with System Improvements	30
Table 8 – Future (Horizon Year) 2034 Intersection Operations.....	31

LIST OF FIGURES

Item	Page
Figure 1 – Location Map.....	2
Figure 2 – Existing Weekday Peak Hour Volumes.....	8
Figure 3 – Pod C1 & C2 - Trip Distribution and Site Peak Hour Volumes.....	9
Figure 4 – The Drift at Riverview Landing - Trip Distribution and Site Peak Hour Volumes	10
Figure 5 – Total Base Year 2023 Weekday Peak Hour Volumes	11
Figure 6 – Existing Traffic Control and Lane Geometry	12
Figure 7 – Site Plan.....	15
Figure 8 – Proposed Development - Trip Distribution and Site Generated Peak Hour Volumes	17
Figure 9 – Future Opening Year 2024 (No-Build) Peak Hour Volumes	19
Figure 10 – Pod A2 - Trip Distribution and Site Peak Hour Volumes	21
Figure 11 – Pod B - Trip Distribution and Site Peak Hour Volumes	22
Figure 12 – Pod E - Trip Distribution and Site Peak Hour Volumes	23
Figure 13 – Future Horizon Year 2034 (No-Build) Peak Hour Volumes	24
Figure 14 – Future Opening Year 2024 (Build) Peak Hour Volumes	26
Figure 15 – Future Horizon Year 2034 (Build) Peak Hour Volumes	27
Figure 16 – Future Traffic Control and Lane Geometry	32

1.0 INTRODUCTION

The purpose of this study is to determine the traffic impact from the proposed residential development located on Riverview Road in Cobb County, Georgia. The traffic analysis evaluates the current operations and the future conditions with the traffic generated by the development. The proposed development will consist of:

- Multifamily Housing: 390 units
- Retail: 6,000 sf



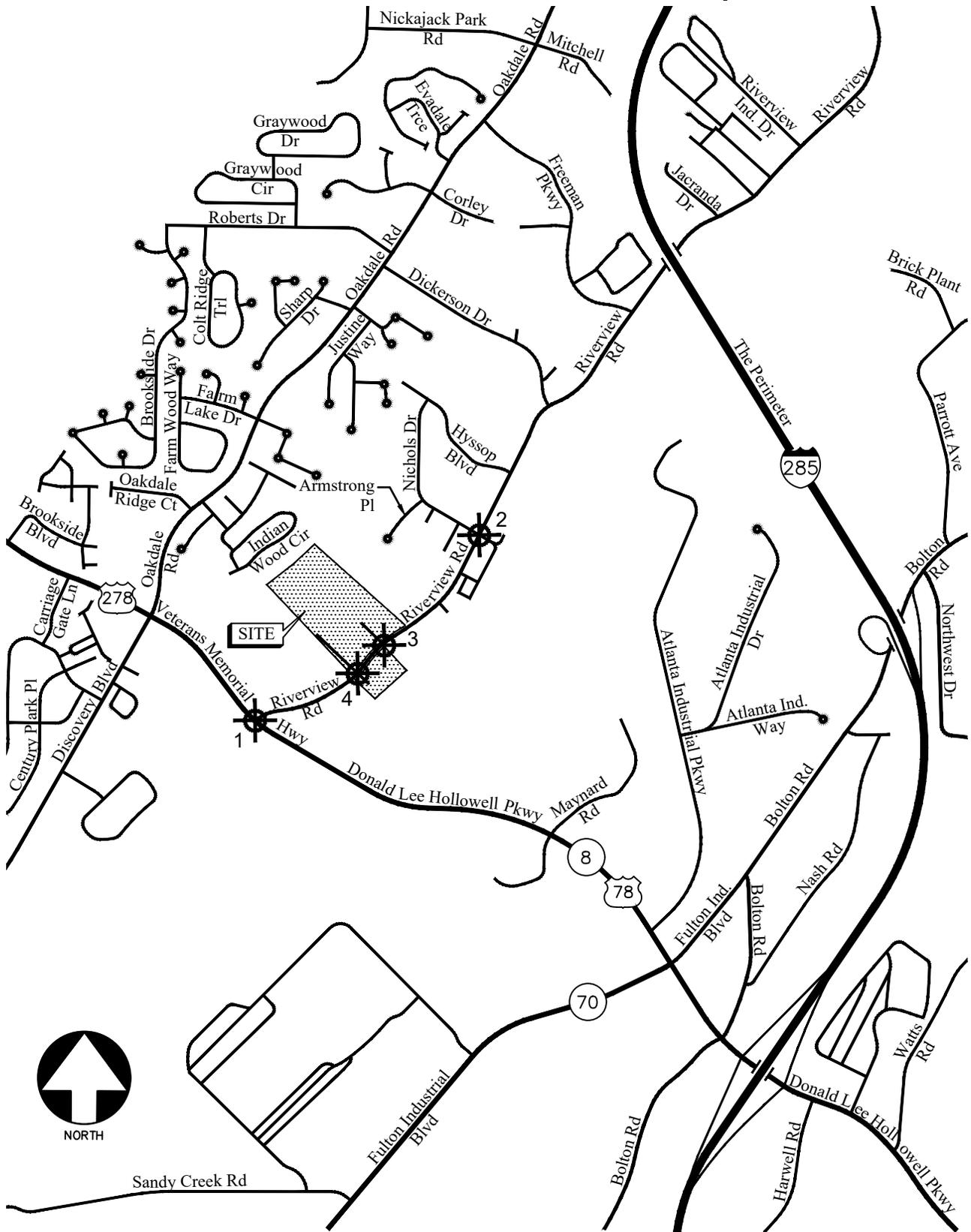
The development proposes two full access driveways on Riverview Road.

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

- SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road
- Riverview Road @ Nichols Drive

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

⊕ Study Intersection



LOCATION MAP

FIGURE 1

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2.0 EXISTING FACILITIES / CONDITIONS

2.1 Roadway Facilities

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

2.1.1 SR 8/US 78/US 278 (Veterans Memorial Highway)

SR 8/US 78/US 278 (Veterans Memorial Highway) is an east-west, four-lane roadway with a two-way left-turn lane and a posted speed limit of 45 mph in the vicinity of the site. Georgia Department of Transportation (GDOT) traffic counts (Station ID's 067-2303 & 121-5068) indicate that the daily traffic volume on SR 8/US 78/US 278 (Veterans Memorial Highway) in 2021 was 27,300 vehicles per day west of Riverview Road and 26,400 vehicles per day east of Riverview Road. Cobb County's Major Thoroughfare Plan classifies SR 8/US 78/US 278 (Veterans Memorial Highway) as an Arterial roadway.

2.1.2 Riverview Road

Riverview Road is a north-south, two-lane, undivided roadway with a posted speed limit of 35 mph. Cobb County's Major Thoroughfare Plan classifies Riverview Road as a Major Collector roadway.

2.1.3 Nichols Drive

Nichols Drive is a two-lane, undivided, local roadway with an assumed posted speed limit of 25 mph.

3.0 STUDY METHODOLOGY

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

3.1 Unsignalized Intersections

For unsignalized intersections controlled by a stop sign on minor streets, the level-of-service (LOS) for motor vehicles with controlled movements is determined by the computed control delay according to the thresholds stated in Table 1 below. LOS is determined for each minor street movement (or shared movement), as well as major street left turns. LOS is not defined for the intersection as a whole or for major street approaches. The LOS of any controlled movement which experiences a volume to capacity ratio greater than 1 is designed as “F” regardless of the control delay.

Control delay for unsignalized intersections includes initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Several factors affect the control 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 the main road without experiencing long delays.

TABLE 1 — LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS		
Control Delay (sec/vehicle)	LOS by Volume-to-Capacity Ratio*	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 and ≤ 15	B	F
> 15 and ≤ 25	C	F
> 25 and ≤ 35	D	F
> 35 and ≤ 50	E	F
> 50	F	F

*The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection.

Source: Highway Capacity Manual, 6th edition, Exhibit 20-2 *LOS Criteria: Motorized Vehicle Mode*

3.2 Signalized Intersections

According to HCM procedures, LOS can be calculated for the entire intersection, each intersection approach, and each lane group. HCM uses control delay alone to characterize LOS for the entire intersection or an approach. Control delay per vehicle is composed of initial deceleration delay, queue move-up time, stopped delay and final acceleration delay. Both control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. A volume-to-capacity ratio greater than 1.0 for a lane group indicates failure from capacity perspective. Therefore, such a lane group is assigned LOS F regardless of the amount of control delay.

Table 2 below summarizes the LOS criteria from HCM for motorized vehicles at signalized intersections.

TABLE 2 — LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS		
Control Delay (sec/vehicle) *	LOS for Lane Group by Volume-to-Capacity Ratio*	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 and ≤ 20	B	F
> 20 and ≤ 35	C	F
> 35 and ≤ 55	D	F
> 55 and ≤ 80	E	F
> 80	F	F

*For approach-based and intersection wide assessments, LOS is defined solely by control delay

Source: Highway Capacity Manual, 6th edition, Exhibit 19-8 *LOS Criteria: Motorized Vehicle Mode*

LOS A is typically assigned when the volume-to-capacity (v/c) ratio is low and either progression is exceptionally favorable, or the cycle length is very short. LOS B is typically assigned when the v/c ratio is low and either progression is highly favorable, or the cycle length is short. However, more vehicles are stopped than with LOS A. LOS C is typically assigned when progression is favorable, or the cycle length is moderate. Individual cycle failures (one or more queued vehicles are not able to depart because of insufficient capacity during the cycle) may begin to appear at this level. Many vehicles still pass through the intersection without stopping, but the number of vehicles stopping is significant. LOS D is typically assigned when the v/c ratio is high and either progression is ineffective, or the cycle length is long. There are many vehicle-stops and individual cycle failures are noticeable. LOS E is typically assigned when the v/c ratio is high, progression is very poor, the cycle length is long, and individual cycle failures are frequent. LOS F is typically assigned when the v/c ratio is very high, progression is very poor, the cycle length is long, and most cycles fail to clear the queue.

4.0 EXISTING 2023 TRAFFIC ANALYSIS

4.1 Existing Traffic Volumes

Existing traffic counts were obtained at the following study intersections:

- SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road
- Riverview Road @ Nichols Drive

Turning movement counts were collected on Wednesday, February 1, 2023. All turning movement counts were recorded during the AM and PM peak hours between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. The four consecutive 15-minute interval volumes that summed to produce the highest volume at the intersections were then determined. These volumes make up the peak hour traffic volumes for the intersections counted and are shown in Figure 2.

4.2 Nearby Developments Under Construction

The following two developments are currently under construction in the vicinity of the proposed development and will be complete by the end of 2023:

Pod C1 & C2 at 6140 Riverview Road

This development will consist of 111 townhomes and will be served by two full access driveways (Hyslop Boulevard and Purple Coneflower Avenue) on Riverview Road as well as a connection to Nichols Drive.

The Drift at Riverview Landing at 6025 & 6140 Riverview Road

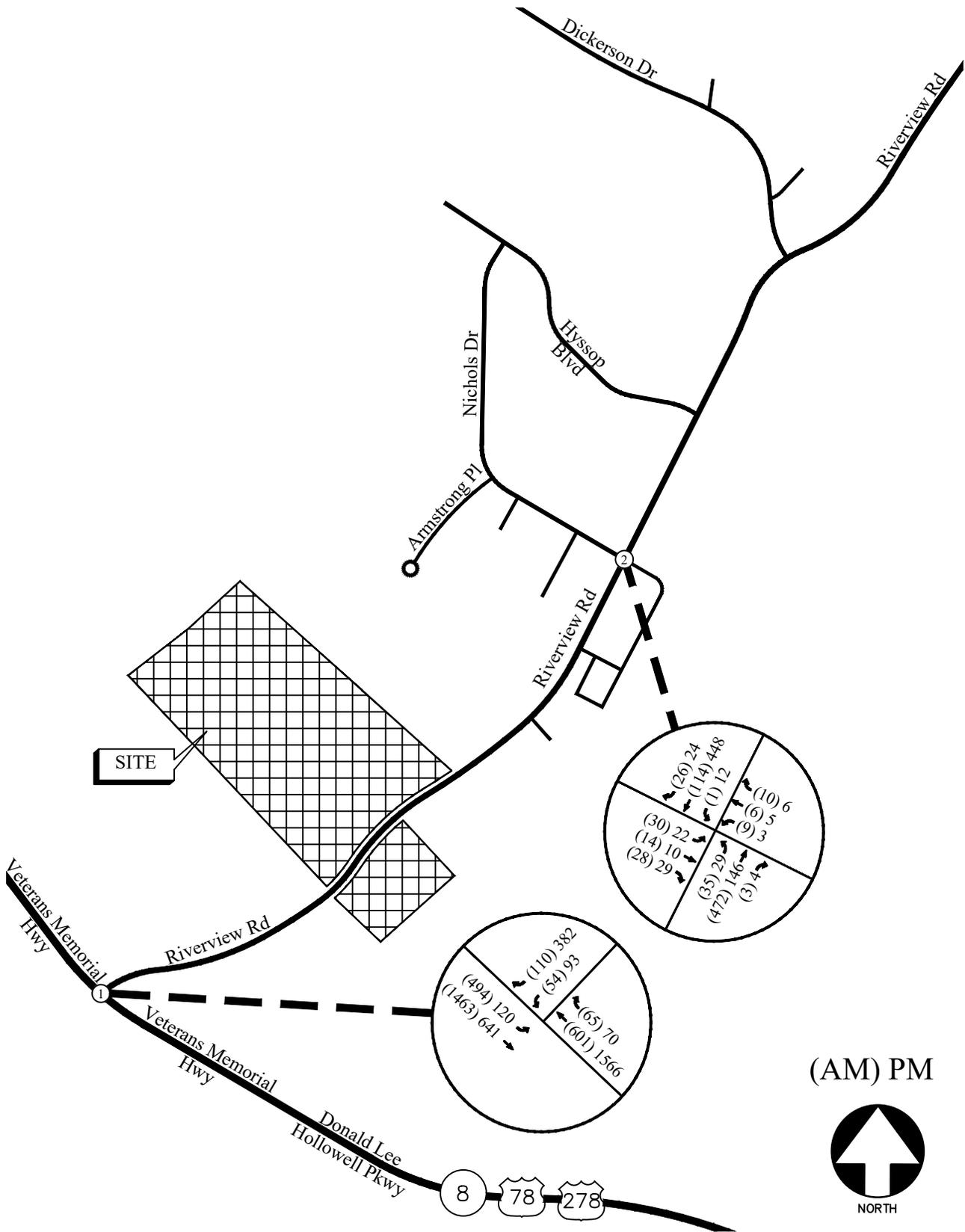
This development will consist of 270 multifamily housing units and 7,983 sf of retail and will be located on either side of Riverview Road. The eastern portion will have three full access driveways on Riverview Road and the western portion will have two full access driveways on Nichols Drive.

ITE trip generation was used to project traffic volumes from these two developments using land uses 215 – *Single-Family Attached Housing*, 221 – *Multifamily Housing (Mid-Rise)* and 822 – *Strip Retail Plaza (<40k)*. The estimated trip generation is shown in Table 3A for Pod C1 & C2 and Table 3B for The Drift at Riverview Landing.

TABLE 3A – TRIP GENERATION (POD C 1 & C2)								
Land Use	Size	AM Peak Hour			PM Peak Hour			24 Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
ITE 215 – Single-Family Attached Housing	111 units	13	39	52	37	26	63	795

TABLE 3B – TRIP GENERATION (THE DRIFT AT RIVERVIEW LANDING)								
Land Use	Size	AM Peak Hour			PM Peak Hour			24 Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
ITE 221 – Multifamily Housing (Mid-Rise) - Not Close to Rail Transit	270 units	25	82	107	64	42	106	1,241
Mixed-Use Reduction		-1	-1	-2	-4	-3	-7	-57
ITE 822 – Strip Retail Plaza (<40k)	7,983 sf	15	10	25	33	33	66	567
Mixed-Use Reduction		-1	-1	-2	-3	-4	-7	-57
Total Trips (without Reductions)		40	92	132	97	75	172	1,808
New External Trips (with Reductions)		38	90	128	90	68	158	1,694

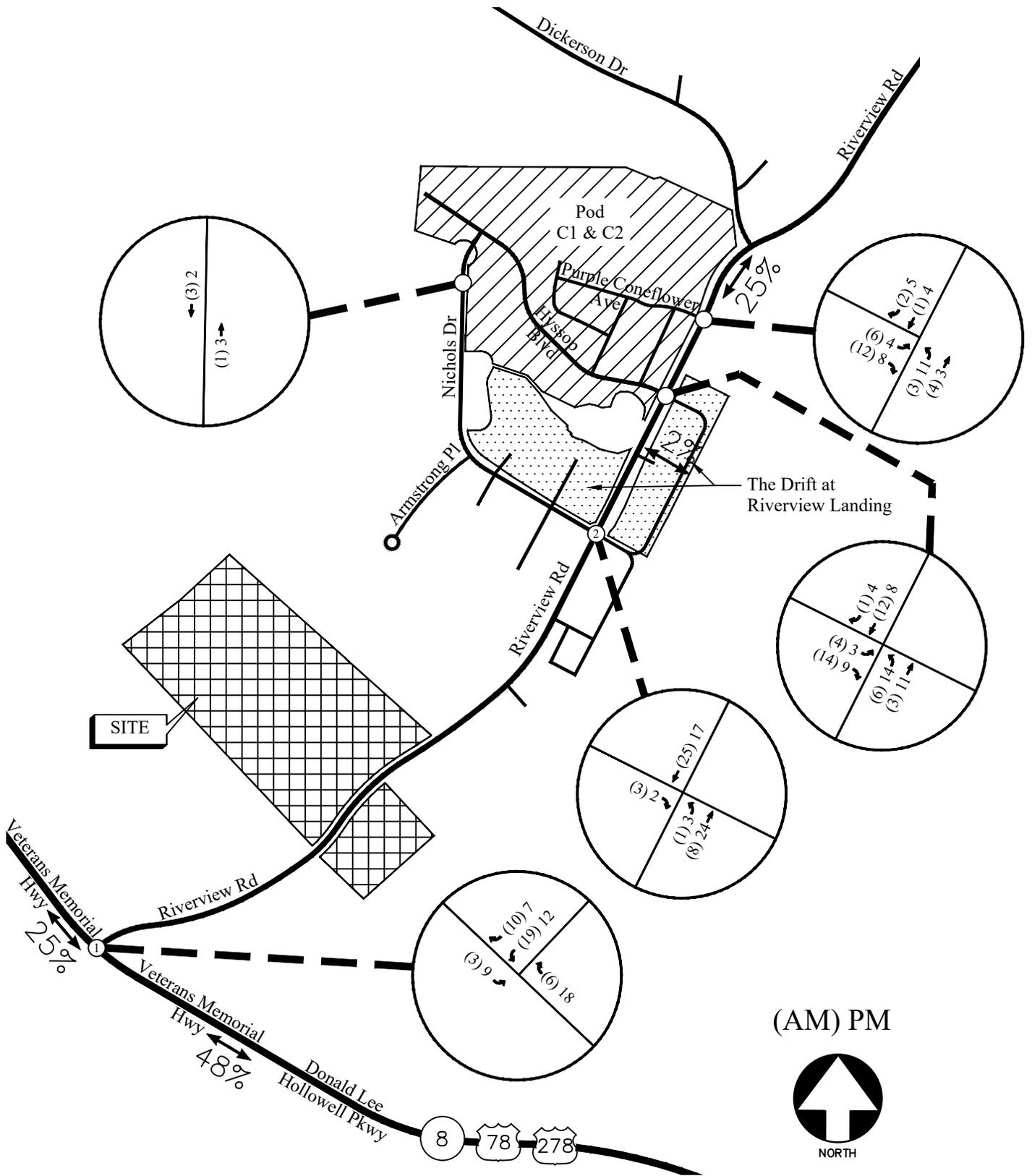
Overall trip distributions were developed for the sites based on a review of the existing travel patterns in the area and the locations of major roadways and highways that will serve the developments. The two developments' trips in Tables 3A and 3B were assigned to the respective sites' driveways using these trip distributions and are shown in Figure 3 (Pod C1 & C2) and Figure 4 (The Drift at Riverview Landing). These trips were added to the existing volumes in Figure 2 to obtain the total existing volumes. These total existing peak hour volumes at the study intersections are shown in Figure 5 and were used in the existing traffic operations analysis. The existing traffic control and lane geometry for the intersections are shown in Figure 6.



EXISTING 2023 WEEKDAY PEAK-HOUR VOLUMES

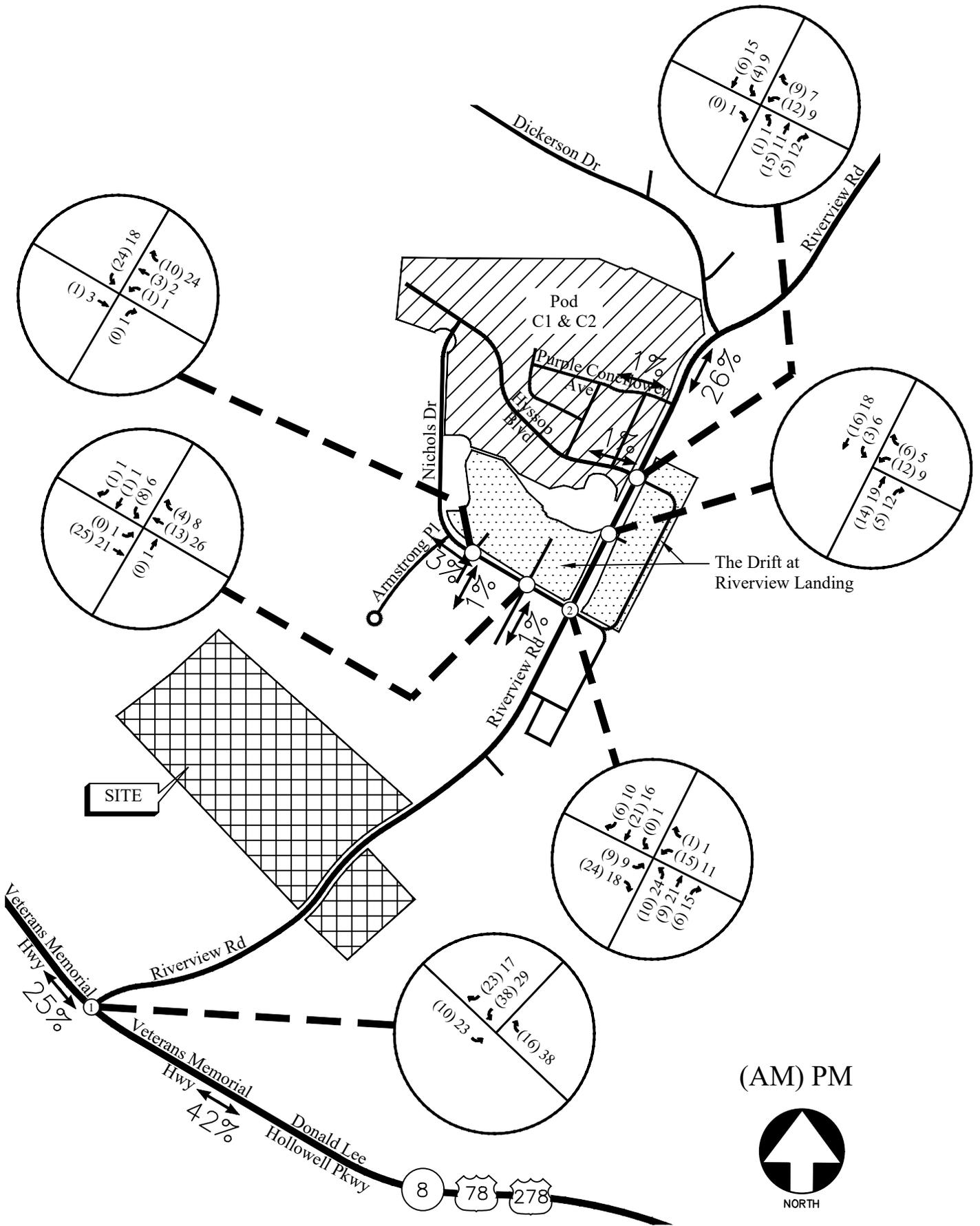
FIGURE 2

A&R Engineering Inc.



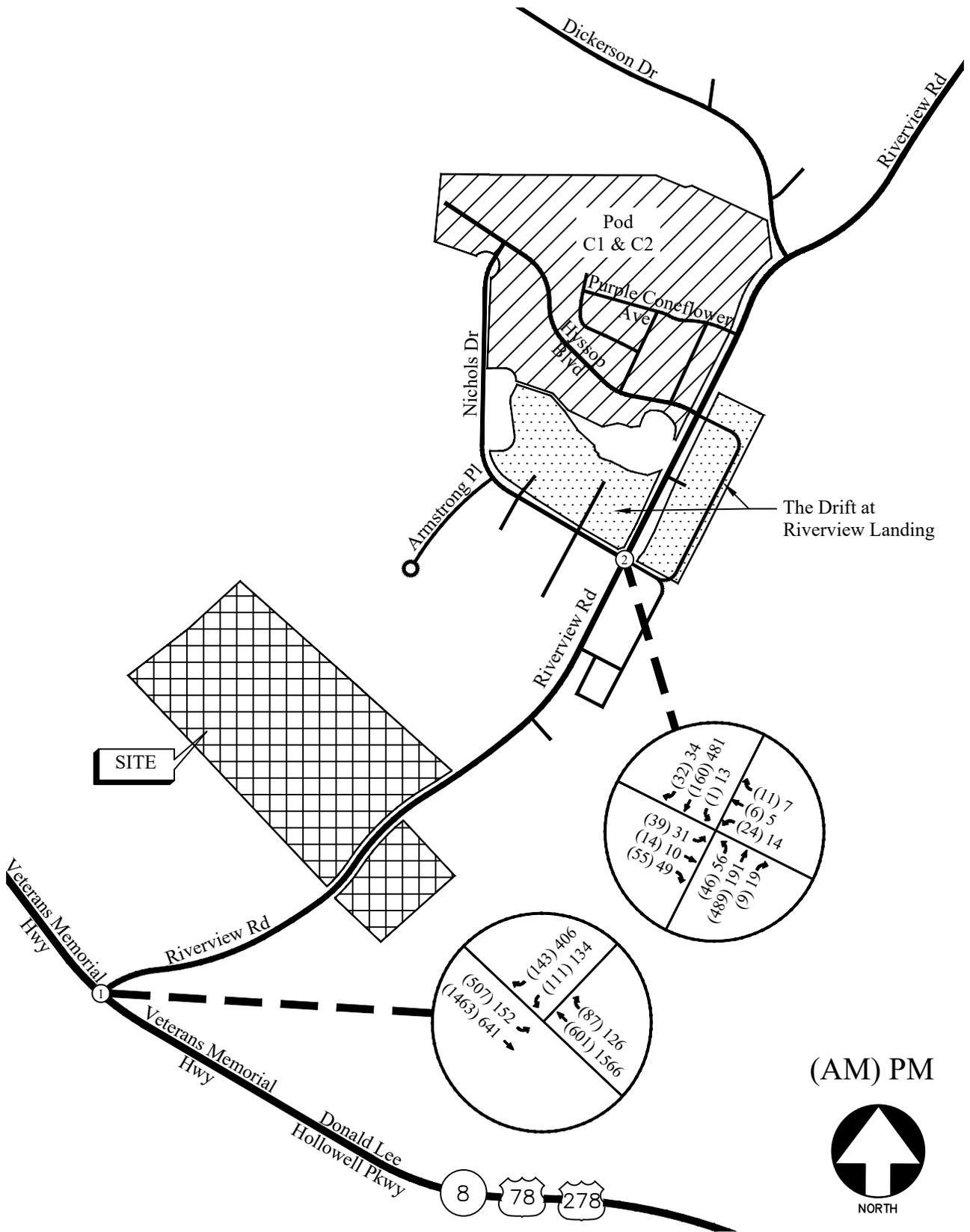
RIVERVIEW ROAD POD C1 & C2 - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES

FIGURE 3
A&R Engineering Inc.



THE DRIFT AT RIVERVIEW LANDING - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES

FIGURE 4
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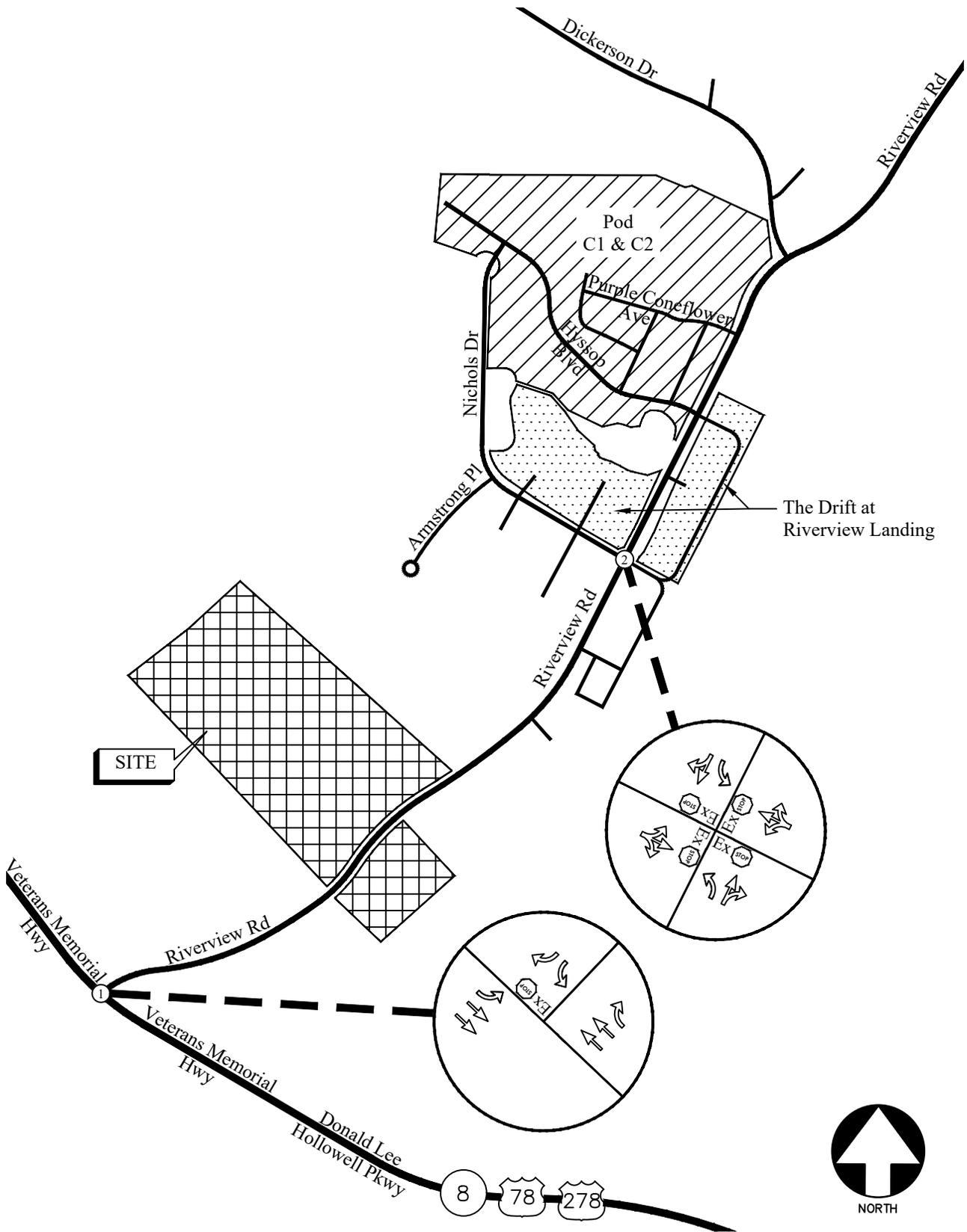
TOTAL EXISTING 2023 WEEKDAY PEAK-HOUR VOLUMES

FIGURE 5

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LEGEND

- Ex  Existing Signed Approach
-  Existing Lane Geometry



EXISTING TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 6

A&R Engineering Inc.

4.3 Existing Traffic Operations

Existing 2023 traffic operations were analyzed at the study intersections in accordance with the HCM methodology. The results of the analyses are shown in Table 4.

TABLE 4 – EXISTING INTERSECTION OPERATIONS				
Intersection		Traffic Control	LOS (Delay)	
			AM Peak Hour	PM Peak Hour
1	<u>SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road</u>	Stop Controlled on SB Approach		
	-Eastbound Left -Southbound Approach		B (13.4) F (183.3)	C (19.7) F (271.0)
2	<u>Riverview Road @ Nichols Drive</u>	All-Way Stop Controlled	<u>C (16.4)</u>	<u>C (18.7)</u>
	-Eastbound Approach		A (9.9)	A (10.0)
	-Westbound Approach		A (9.5)	A (9.6)
	-Northbound Approach		C (20.3)	B (10.6)
	-Southbound Approach		B (10.6)	C (24.7)

The results of existing traffic operations analysis indicate that all the approaches at the intersection of Riverview Road at Nichols Drive are operating at level-of-service “C” or better in both the AM and PM peak hours. The intersection of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road is operating at LOS “F” for the stop-controlled southbound (Riverview Road) approach in both the AM and PM peak hours. These areas are addressed in the Future Traffic Operations section.

5.0 PROPOSED DEVELOPMENT

The proposed development will be located on Riverview Road in Cobb County, Georgia. The development will consist of:

- Multifamily Housing: 390 units
- Retail: 6,000 sf

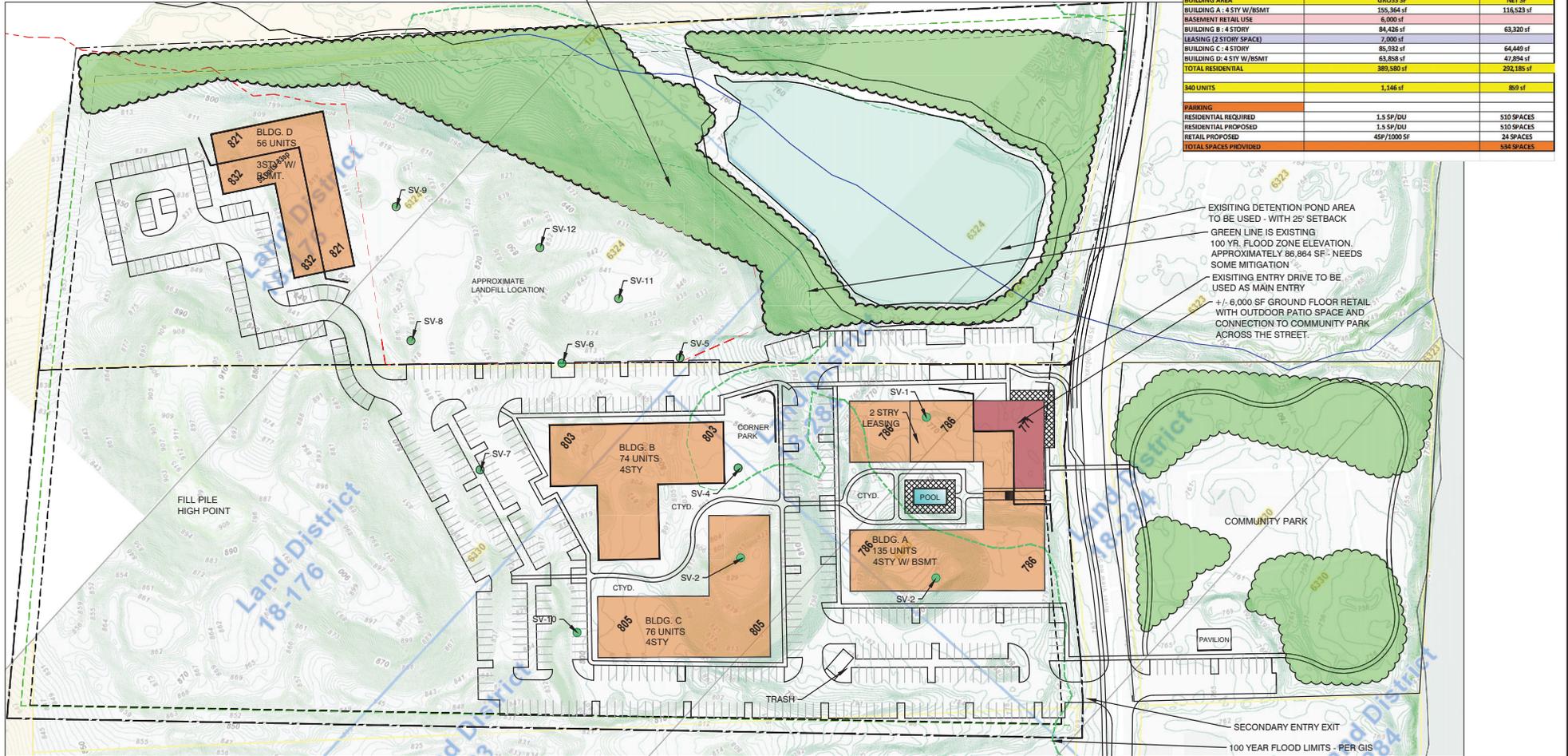


The development proposes two full access driveways on Riverview Road.

A site plan is shown in Figure 7.

- NOTES:**
1. USED CITY OF SMYRNA CODE FOR STUDY - PROPOSED MU-MIXED USE DISTRICT
 2. PROPERTY LINE AND TOPOGRAPHY OBTAINED FROM SMYRNA GIS ONLINE
 3. FLOOD ZONE LIMITS AND WATER LINE FEATURES OBTAINED FROM GIS ONLINE
 4. ASSUMED THAT LARGE FILL AREAS WILL BE REMOVED PRIOR TO DEVELOPMENT. STUDY ASSUMES ALL GRADES WORKABLE
 5. ASSUMED THAT AREAS OF FLOODZONE CAN BE FILLED AND RELOCATED ELSEWHERE ON SITE. NEEDS CONFIRMATION FROM CIVIL ENGINEER.
 6. WATER QUALITY/RETENTION REQUIREMENTS ASSUMED TO BE ABLE TO DRAIN INTO EXISTING POND ON SITE.

AREA TO BE USED TO DISPLACE FLOOD ZONE AREA ON SITE - PER CIVIL ENGINEER DESIGN. ASSUMED AREA SHOULD SUFFICE APPROXIMATELY 88,320 SF.



RIVERVIEW ROAD		PR-22-081
BUILDING TYPE	4 STY & 4 STY RESIDENTIAL W/ BASEMENT(TYPE S)	
EXISTING ZONING	HI-COBB COUNTY SURFACE PARKING	
PROPOSED ZONING	MU - ADOPT TO SMYRNA	
LAND USE	INDUSTRIAL	
GROSS LAND AREA	28.51 ACRES	
MAX DENSITY ALLOWED	25 UNITS/ACRE = 712 UNITS	
SETBACKS (PROPOSED)	FRONT = 25', SIDE = 15', REAR= 40'	
ISR - IMPERVIOUS SURFACE RATIO	TBD	
BUILDING AREA	GROSS SF	NET SF
BUILDING A : 4 STY W/BSMT	155,364 sf	116,523 sf
BASEMENT RETAIL USE	6,000 sf	
BUILDING B : 4 STORY	84,426 sf	68,320 sf
LEASING (2 STORY SPACE)	7,000 sf	
BUILDING C : 4 STORY	85,932 sf	64,449 sf
BUILDING D : 4 STY W/BSMT	63,858 sf	47,894 sf
TOTAL RESIDENTIAL	383,580 sf	292,186 sf
340 UNITS	1,146 sf	890 sf
PARKING		
RESIDENTIAL REQUIRED	1.5 SP/DU	510 SPACES
RESIDENTIAL PROPOSED	1.5 SP/DU	510 SPACES
RETAIL PROPOSED	4SP/1000 SF	24 SPACES
TOTAL SPACES PROVIDED		534 SPACES

EXISTING DETENTION POND AREA TO BE USED - WITH 25' SETBACK
 GREEN LINE IS EXISTING 100 YR. FLOOD ZONE ELEVATION, APPROXIMATELY 86,864 SF - NEEDS SOME MITIGATION
 EXISTING ENTRY DRIVE TO BE USED AS MAIN ENTRY
 +/- 6,000 SF GROUND FLOOR RETAIL WITH OUTDOOR PATIO SPACE AND CONNECTION TO COMMUNITY PARK ACROSS THE STREET.

PROJECT: Stamps
 Smyrna, Ga.
 Brand
 PROJ. NO. PR-22-_081
 Property of Studio Architects, LLC. All Rights Reserved.



FEASIBILITY STUDY
 SCALE: 1" = 150'-0"
 PROJECT NORTH
 DATE: October 5, 2022

NUMBER:
FS3

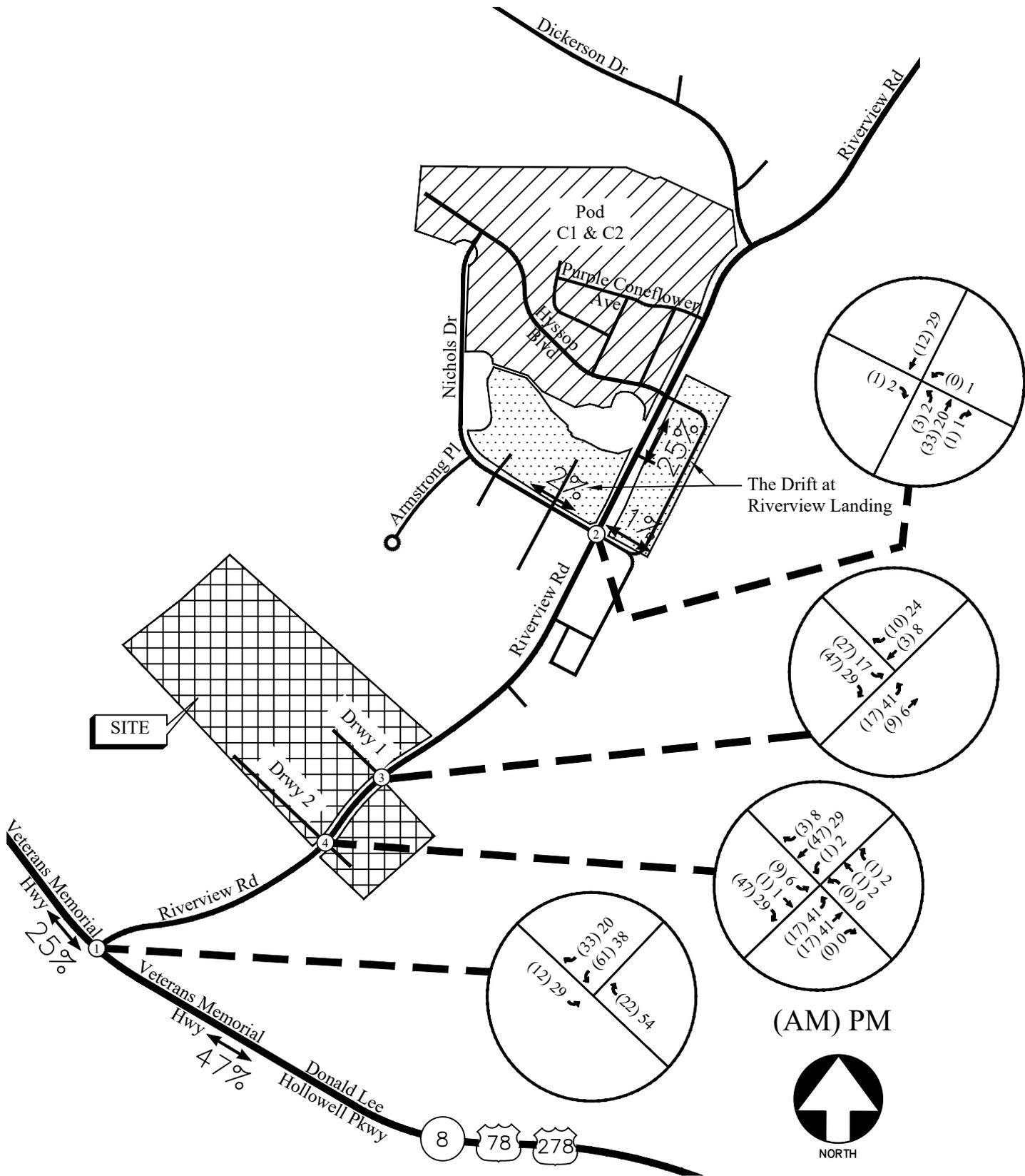
5.1 Trip Generation

Trip generation estimates for the project were based on the rates and equations published in the 11th edition of the Institute of Transportation Engineers (ITE) Trip Generation report. This reference contains traffic volume count data collected at similar facilities nationwide. The trip generation was based on the following ITE *Land Uses: 221 – Multifamily Housing (Mid-Rise) - Not Close to Rail Transit* and *822 – Strip Retail Plaza (<40k)*. Due to the nature of the development, mixed-use reductions have been applied per ITE standards. The calculated total trip generation for the proposed development is shown in Table 5.

TABLE 5 – TRIP GENERATION (PROPOSED DEVELOPMENT)								
Land Use	Size	AM Peak Hour			PM Peak Hour			24 Hour
		Enter	Exit	Total	Enter	Exit	Total	Two-way
ITE 221 – Multifamily Housing (Mid-Rise) - Not Close to Rail Transit	390 units	37	123	160	93	59	152	1,814
Mixed-Use Reduction		-1	-1	-2	-3	-2	-5	-49
ITE 822 – Strip Retail Plaza (<40k)	6,000 sf	12	9	21	27	27	54	483
Mixed-Use Reduction		-1	-1	-2	-2	-3	-5	-49
Total Trips (without Reductions)		49	132	181	120	86	206	2,297
New External Trips (with Reductions)		47	130	177	115	81	196	2,199

5.2 Trip Distribution

The trip distribution describes how traffic arrives and departs from the site. An overall trip distribution was developed for the site based on a review of the existing travel patterns in the area and the locations of major roadways and highways that will serve the development. The site-generated peak hour traffic volumes, shown in Table 5, were assigned to the study area intersections based on this distribution. The outer-leg distribution and AM and PM peak hour new traffic generated by the site are shown in Figure 8.



PROPOSED RIVERVIEW DEVELOPMENT - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES

FIGURE 8

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6.0 FUTURE TRAFFIC ANALYSIS

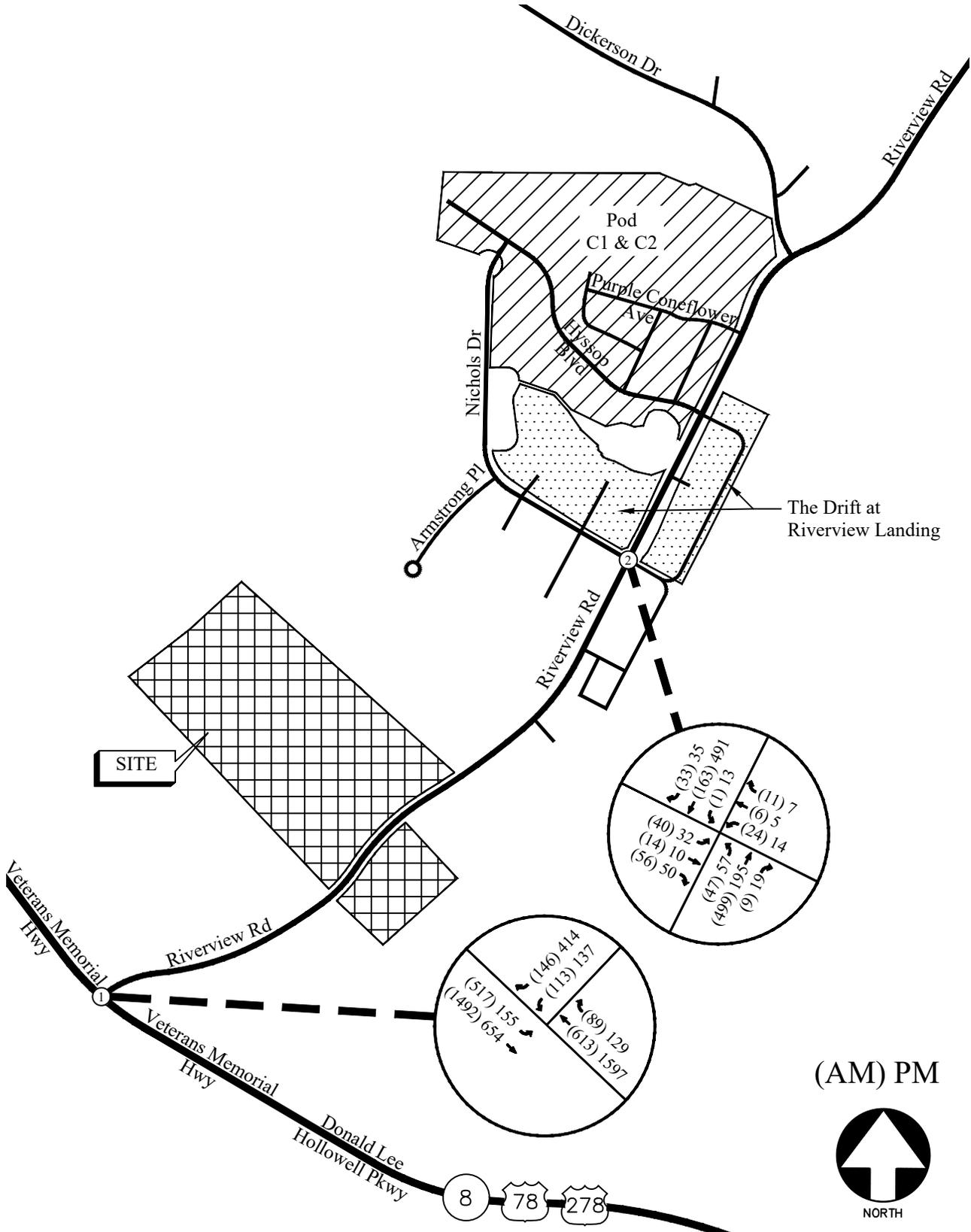
The future traffic operations are analyzed for Opening Year 2024 and Horizon Year 2034 for both the “Build” and “No-Build” conditions.

6.1 Future “No-Build” Conditions

The “No-Build” (or background) conditions provide an assessment of how traffic will operate in the Opening 2024 and Horizon 2034 years without the study site being developed as proposed, with projected increases in through traffic volumes due to normal annual growth and traffic from other nearby planned developments.

6.1.1 Annual Traffic Growth

In order to evaluate future traffic operations in this area, a projection of normal traffic growth was applied to the existing volumes. GDOT recorded average daily traffic volumes at several locations in the vicinity of the site. Reviewing the growth over the last three years (2017-2019) revealed growth of approximately 2% in the area. The total existing traffic volumes (Figure 5) were increased using this 2% growth rate for one year to obtain the Future “No-Build” volumes for the Opening Year 2024. The Future “No-Build” volumes for the Opening Year 2024 are shown in Figure 9.



FUTURE OPENING YEAR 2024 (NO-BUILD)
WEEKDAY PEAK HOUR VOLUMES

FIGURE 9
A&R Engineering Inc.

6.1.2 Nearby Planned Developments

There are three planned residential developments proposed in the study area.

- Riverview Landing (POD A2) - 6140 Riverview Road – Build out year: 2034
- River View Road (POD B) – Build out year: 2034
- POD E - 1648 Armstrong Place – Build out year: 2025

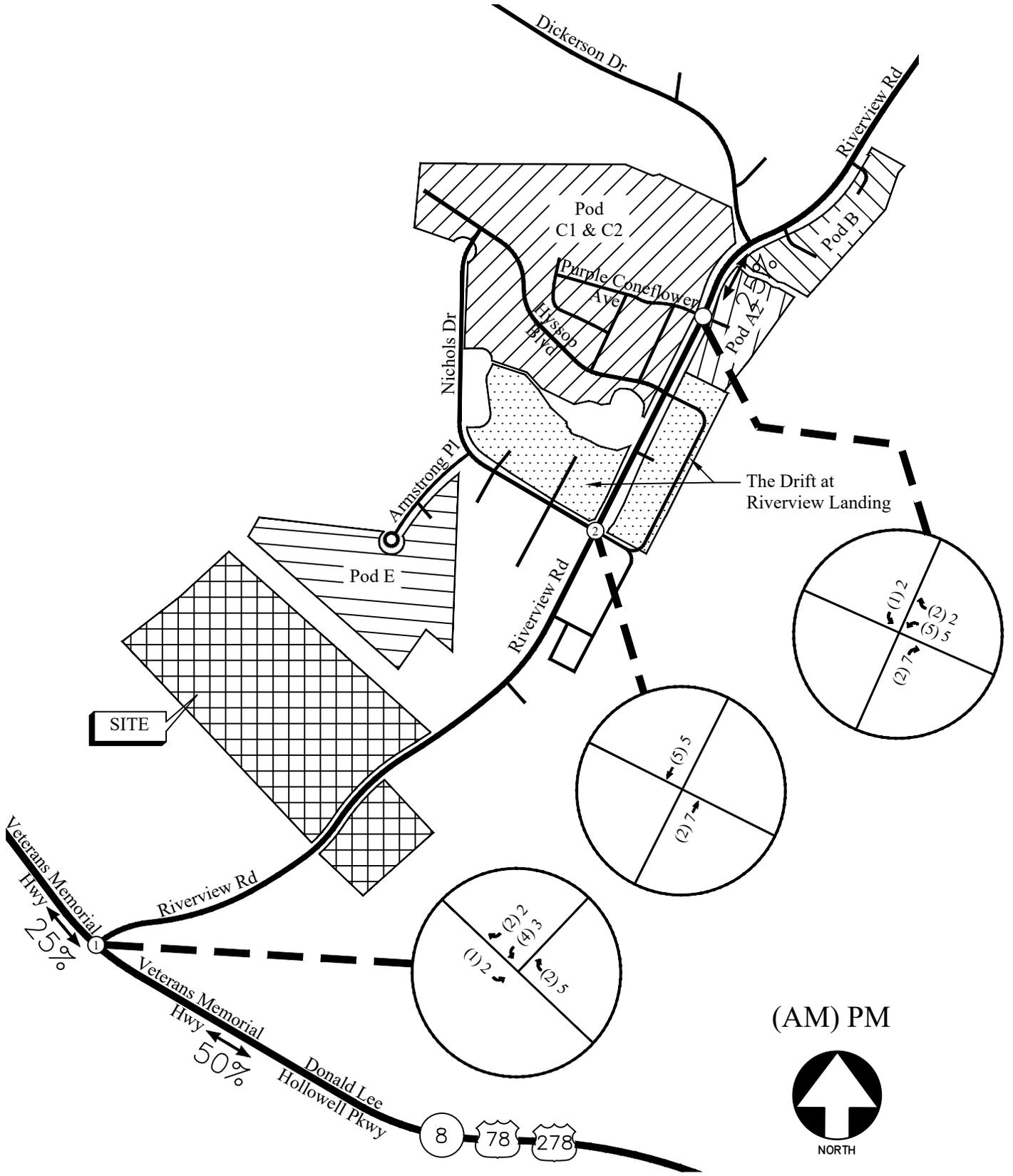
Pod A2, Pod B and Pod E developments consist of 31, 27 and 63 townhome units, respectively. Pod A2 will be served by one full access driveway on Riverview Road, across from Purple Coneflower Avenue. Pod B will be served by two full access driveways on Riverview Road. Pod E will be served by one full access driveway on Armstrong Place.

Trip generation for these developments was estimated using the 11th edition of the Institute of Transportation Engineers (ITE) land use 215 – *Single-Family Attached Housing* and is shown in Table 6.

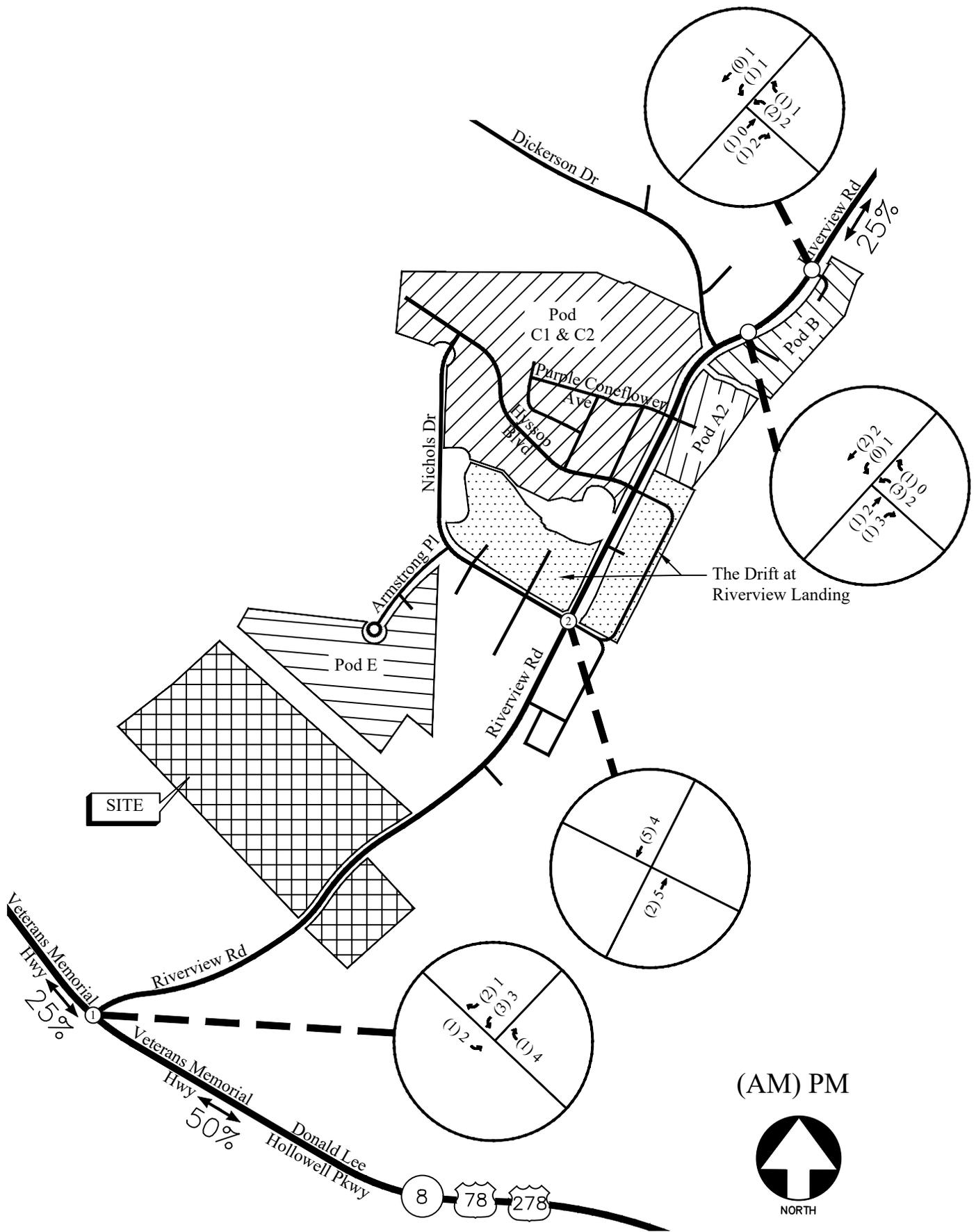
TABLE 6 – TRIP GENERATION (NEARBY PLANNED DEVELOPMENTS)								
Land Use	Size	AM Peak Hour			PM Peak Hour			24 Hr
		Enter	Exit	Total	Enter	Exit	Total	2-way
Riverview Landing (POD A2)								
ITE 215 – Single-Family Attached Housing	31 units	3	7	10	9	6	15	186
River View Road - POD B								
ITE 215 – Single-Family Attached Housing	27 units	2	6	8	7	5	12	155
Pod E								
ITE 215 – Single-Family Attached Housing	63 units	7	20	27	20	14	34	430

Overall trip distributions were developed for the sites based on a review of the existing travel patterns in the area and the locations of major roadways and highways that will serve the developments. The residential developments’ trips in Table 6 were assigned to the respective sites’ driveways using these trip distributions. The AM and PM peak hour new volumes generated by the sites are shown at the study intersections in Figure 10 (Pod A2), Figure 11 (Pod B) and Figure 12 (Pod E).

The Future “No-Build” volumes for the Opening Year 2024 were increased for ten years and then the nearby planned developments’ trips were added to them to obtain the Future “No-Build” volumes for the Horizon Year 2034. The Future “No-Build” volumes for the Horizon Year 2034 are shown in Figure 13.

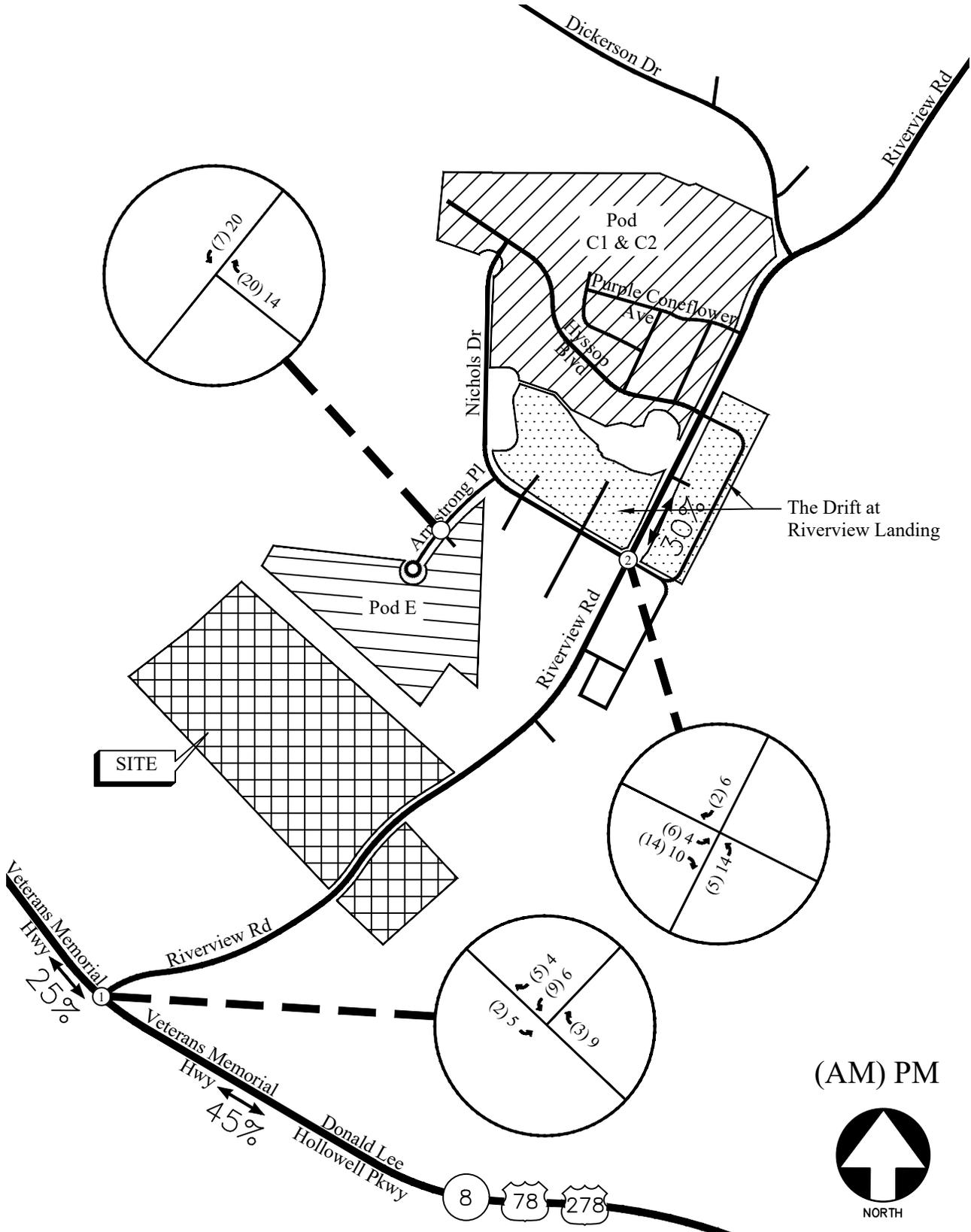


POD A2 - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES FIGURE 10
A&R Engineering Inc.



POD B - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY
PEAK HOUR VOLUMES

FIGURE 11
A&R Engineering Inc.



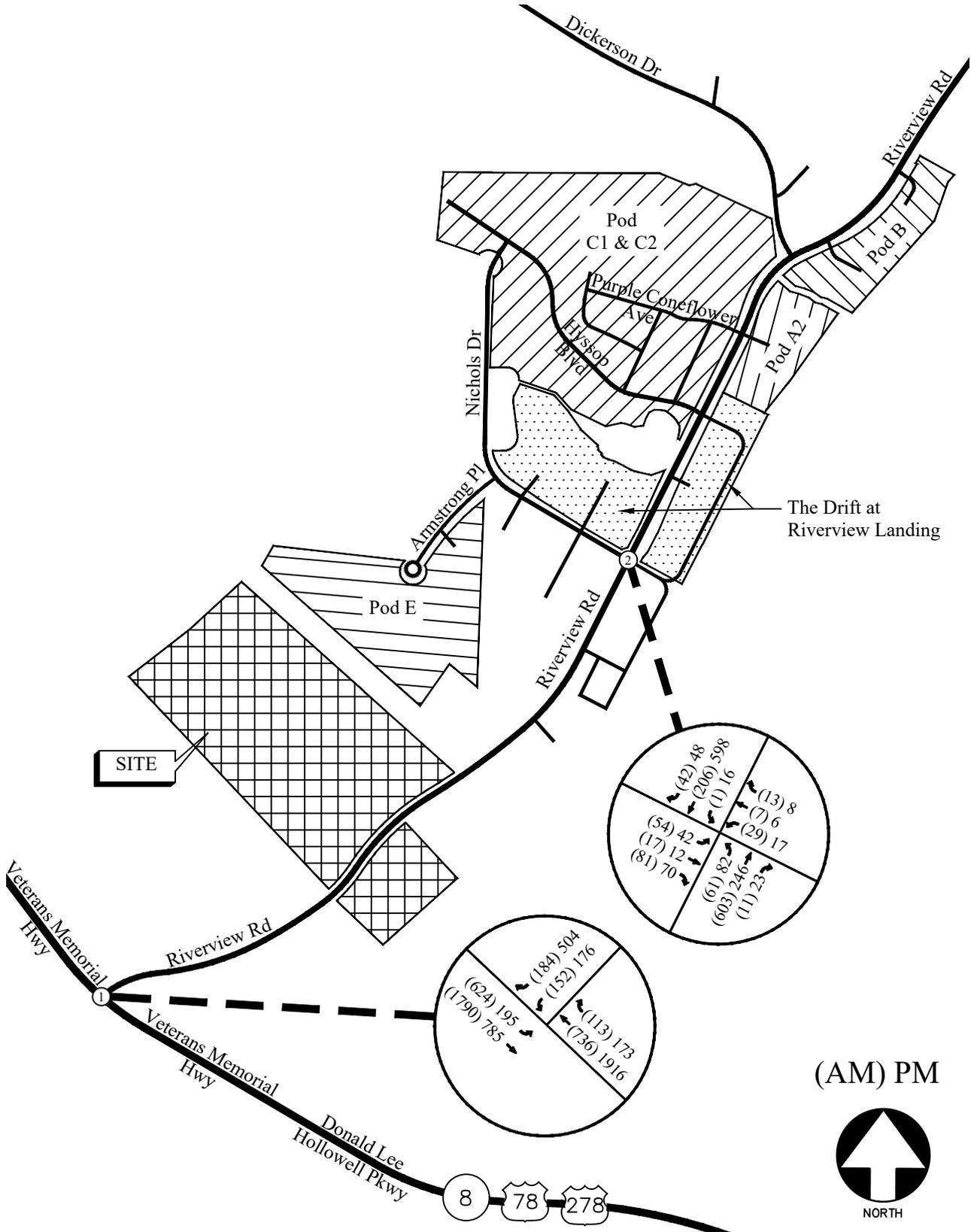
(AM) PM



POD E - TRIP DISTRIBUTION AND SITE-GENERATED WEEKDAY PEAK HOUR VOLUMES

FIGURE 12

A&R Engineering Inc.

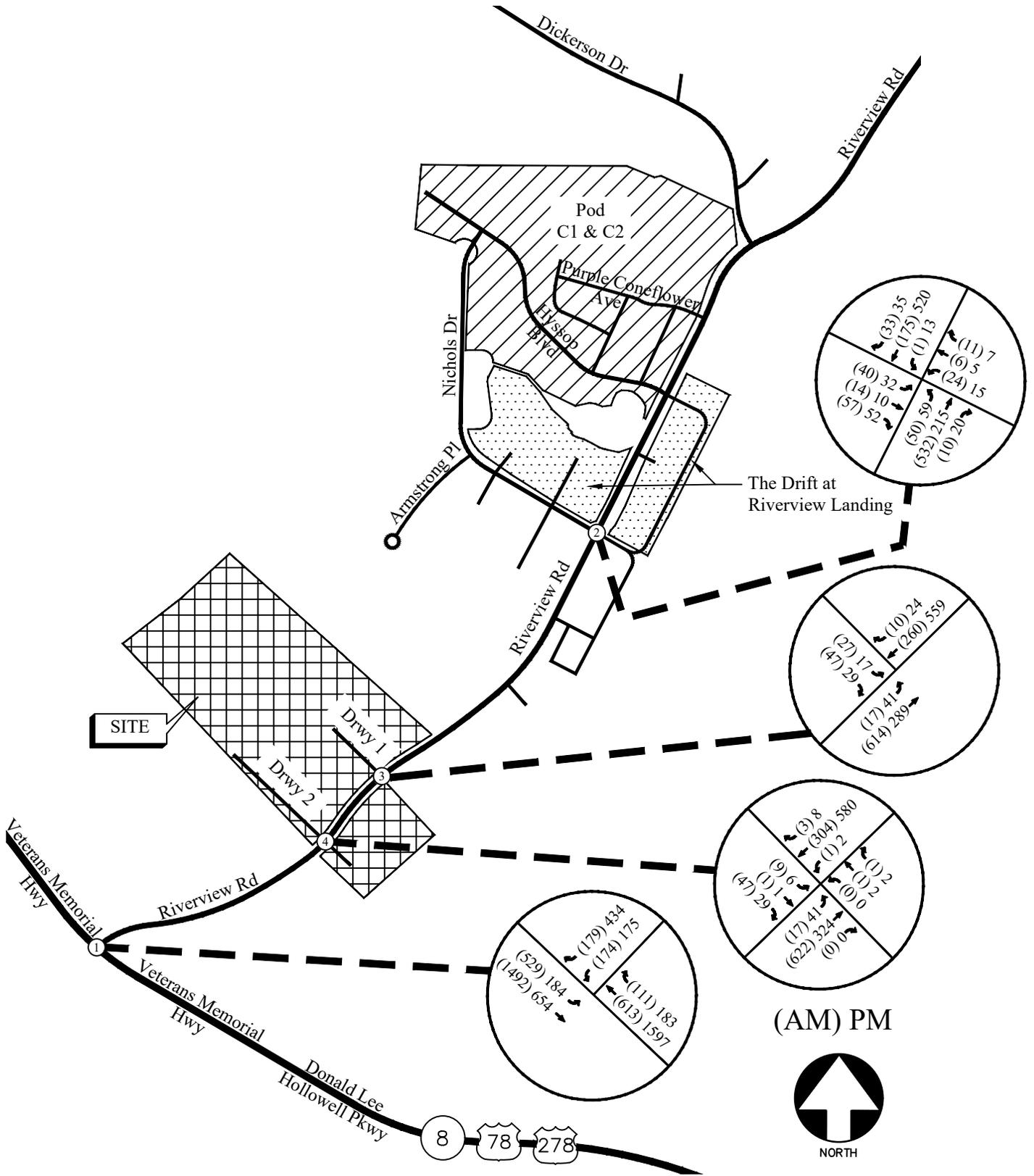


FUTURE HORIZON YEAR 2034 (NO-BUILD)
WEEKDAY PEAK HOUR VOLUMES

FIGURE 13
A&R Engineering Inc.

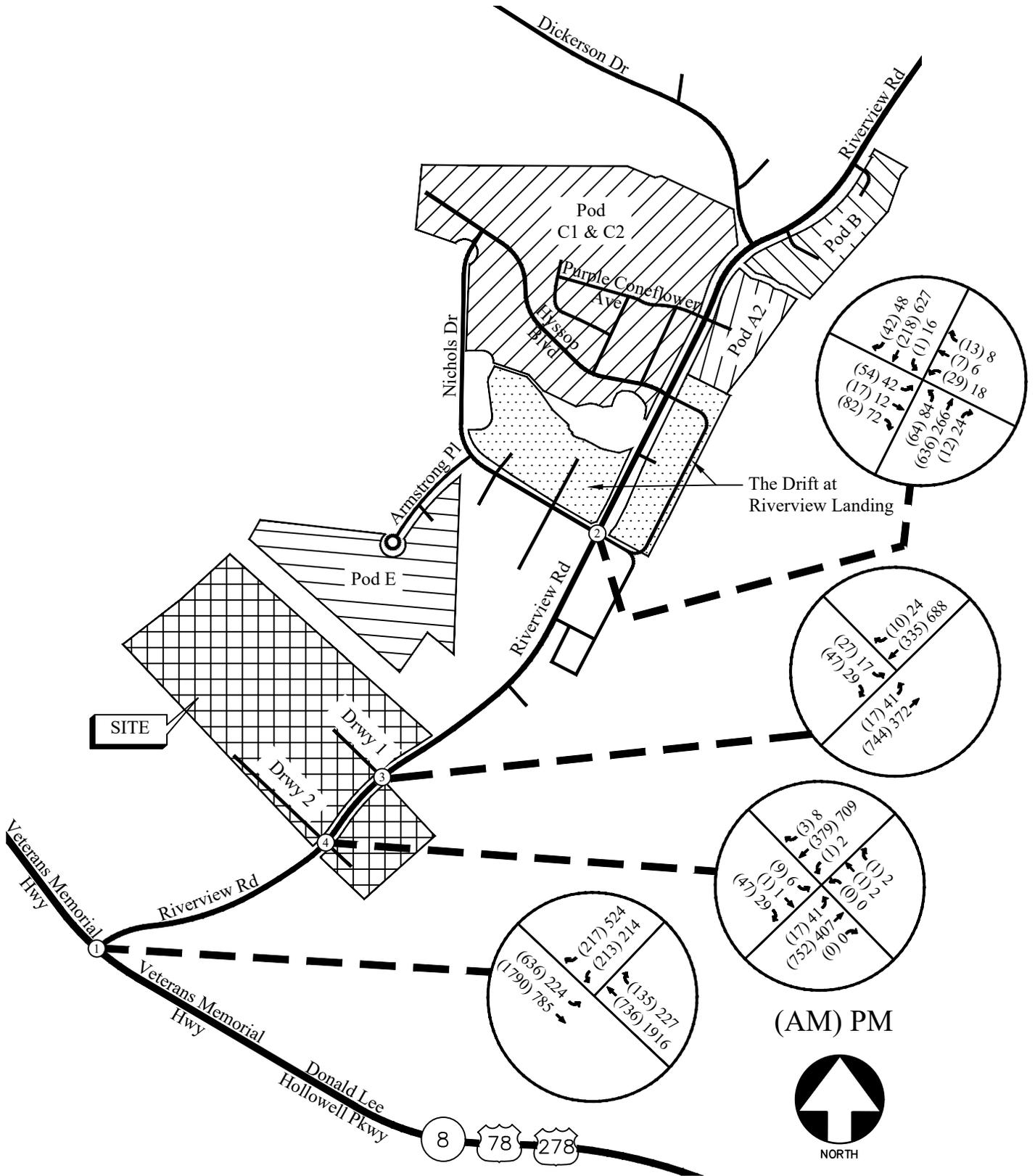
6.2 Future “Build” Conditions

The “Build” or development conditions include the estimated background traffic from the “No-Build” conditions plus the traffic from the proposed development. In order to evaluate future traffic operations in this area, the additional traffic volumes from the site were added to base traffic volumes for the corresponding years to calculate the future traffic volumes after the construction of the development. These total future “Build” traffic volumes for the Opening Year 2024 and Horizon Year 2034 are shown in Figure 14 and Figure 15, respectively.



FUTURE OPENING YEAR 2024 (BUILD)
WEEKDAY PEAK HOUR VOLUMES

FIGURE 14
A&R Engineering Inc.



FUTURE HORIZON YEAR 2034 (BUILD)
 WEEKDAY PEAK HOUR VOLUMES

FIGURE 15
 A&R Engineering Inc.

6.3 Auxiliary Lane Analysis

Cobb County has the following requirements, among others, for exclusive turn lanes at development access points, as detailed in Cobb Development Standards, 402.9 and 402.10:

- Standard right turn lanes are required on any roadway that is included in the county's major thoroughfare plan network. Cobb County may require a deceleration lane (right turn lane) for all developments.
- Standard left turn lane thresholds are as follows:
 - Residential developments 30 lots and greater
 - Commercial developments of 10,000 s.f. and greater

Since the proposed development consists of 390 units which is greater than the County's 30 lot threshold for left turn lanes, left turn lanes are required at the proposed development's site driveways. And since Riverview Road is classified as a Major Collector roadway in the Cobb County's Major Thoroughfare Plan, deceleration lanes are also required at the proposed developments' site driveways.

6.4 Future Opening Year 2024 Traffic Operations

The future Opening Year 2024 “No-Build” and “Build” traffic operations were analyzed using the volumes in Figure 9 and Figure 14, respectively. The results of the future traffic operations analysis are shown below in Table 7A.

TABLE 7A – FUTURE (OPENING YEAR) 2024 INTERSECTION OPERATIONS					
Intersection		LOS (Delay)			
		NO-BUILD		BUILD	
		AM Peak	PM Peak	AM Peak	PM Peak
1	SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road				
	-Eastbound Left -Southbound Approach	B (13.8) F (212.4)	C (20.6) F (*)	B (14.1) F (*)	C (22.7) F (*)
2	Riverview Road @ Nichols Drive	C (17.1)	C (19.7)	C (20.5)	C (24.5)
	-Eastbound Approach	A (10.0)	B (10.1)	B (10.3)	B (10.3)
	-Westbound Approach	A (9.6)	A (9.7)	A (9.8)	A (9.9)
	-Northbound Approach	C (21.3)	B (10.7)	D (26.4)	B (11.4)
	-Southbound Approach	B (10.7)	D (26.4)	B (11.1)	D (34.3)
3	Riverview Road @ Site Driveway 1 (Northern)				
	-Eastbound Approach -Northbound Left	-	-	B (14.6) A (7.9)	C (16.4) A (9.0)
4	Riverview Road @ Site Driveway 2 (Southern)				
	-Eastbound Approach			B (13.3)	C (15.9)
	-Westbound Approach	-	-	C (17.1)	C (16.5)
	-Northbound Left -Southbound Left			A (8.0) A (8.9)	A (9.0) A (8.0)

* Delay exceeds 300 seconds

The results of the future Opening Year 2024 traffic operations analysis indicate that the intersection of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road will continue to operate at LOS “F” for the stop-controlled southbound (Riverview Road) approach in both the AM and PM peak hours. All the approaches at the other intersections will operate at LOS “D” or better.

6.4.1 Recommendations for System Improvements

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

SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road

- Install a traffic signal
- Provide ‘protected-permissive’ phasing for eastbound left turn movements
- Coordinate the signal with adjacent signals on SR 8/US 78/US 278 (Veterans Memorial Highway) at Oakdale Road/Discovery Boulevard

Riverview Road @ Nichols Drive

- Remove “STOP” signs and stop bars on the northbound and southbound approaches of Riverview Road to convert the all-way stop controlled intersection to a two-way stop-controlled intersection with Riverview Road being free flow and Nichols Drive continue to be stop controlled

The results of the future Opening Year 2024 traffic operations analysis at the intersections of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road and Riverview Road at Nichols Drive with the recommended system improvements are shown below in Table 7B.

TABLE 7B – FUTURE (OPENING YEAR) 2024 INTERSECTION OPERATIONS – WITH SYSTEM IMPROVEMENTS					
Intersection		LOS (Delay)			
		NO-BUILD		BUILD	
		AM Peak	PM Peak	AM Peak	PM Peak
1	<u>SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road</u>	<u>A (8.1)</u>	<u>B (11.3)</u>	<u>B (11.4)</u>	<u>B (14.0)</u>
	-Eastbound Approach	A (4.7)	A (5.0)	A (6.6)	A (7.6)
	-Westbound Approach	A (8.7)	B (10.1)	B (11.8)	B (12.2)
	-Southbound Approach	E (64.6)	E (62.8)	E (65.6)	E (61.2)
2	<u>Riverview Road @ Nichols Drive</u>				
	-Eastbound Approach	C (16.5)	C (20.4)	C (17.5)	C (22.1)
	-Westbound Approach	C (19.1)	C (20.8)	C (20.5)	C (22.9)
	-Northbound Left	A (7.7)	A (8.8)	A (7.8)	A (9.0)
	-Southbound Left	A (8.5)	A (7.7)	A (8.6)	A (7.8)

The future 2024 volumes at the intersection of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road satisfy the threshold for installation of a traffic signal during the AM and PM peak hours. After installation of a signal, the intersection will operate at an overall LOS “B” or better in both the AM and PM peak hours.

At the intersection of Riverview Road and Nichols Drive, Riverview Road carries and will continue to carry more than 80% of the total traffic and will not meet the all-way stop warrants.

6.5 Future Horizon Year 2034 Traffic Operations

The future Horizon Year 2034 “No-Build” and “Build” traffic operations were analyzed using the volumes in Figure 13 and Figure 15, respectively. The results of the analysis are shown below in Table 8.

TABLE 8 – FUTURE (HORIZON YEAR) 2034 INTERSECTION OPERATIONS									
Intersection		LOS (Delay)							
		NO IMPROVEMENTS				SYSTEM IMPROVEMENTS			
		NO-BUILD		BUILD		NO-BUILD		BUILD	
		AM	PM	AM	PM	AM	PM	AM	PM
1	SR 8/US 78 (Veterans Memorial Hwy) @ Riverview Road								
	-Eastbound Left/Approach	C (22.1)	E (41.6)	C (23.1)	F (53.0)	B (14.2) B (10.9)	B (19.7) B (14.8)	B (19.3) B (14.4)	C (26.7) C (23.8)
	-Westbound Approach	-	-	-	-	B (13.5)	B (18.4)	B (19.8)	C (24.2)
	-Southbound Approach	F (*)	F (*)	F (*)	F (*)	E (71.7)	E (61.2)	E (72.9)	E (62.0)
2	Riverview Rd @ Nichols Dr	E (35.5)	F (50.6)	E (45.1)	F (61.7)				
	-Eastbound Approach	B (11.7)	B (11.5)	B (11.9)	B (11.8)	C (24.5)	E (36.8)	D (27.3)	E (42.7)
	-Westbound Approach	B (10.6)	B (10.6)	B (10.7)	B (10.8)	D (27.7)	D (33.9)	D (30.2)	E (39.0)
	-Northbound Approach/Left	F (50.9)	B (12.9)	F (66.1)	B (13.7)	A (7.9)	A (9.5)	A (7.9)	A (9.6)
3	Riverview Road @ Site Driveway 1 (Northern)								
	-Eastbound Approach	-	-	C (17.8)	C (20.5)	-	-	-	-
	-Northbound Left	-	-	A (8.1)	A (9.5)	-	-	-	-
4	Riverview Road @ Site Driveway 2 (Southern)								
	-Eastbound Approach	-	-	C (15.7)	C (19.6)	-	-	-	-
	-Westbound Approach	-	-	C (20.9)	C (20.3)	-	-	-	-
	-Northbound Left	-	-	A (8.2)	A (9.5)	-	-	-	-

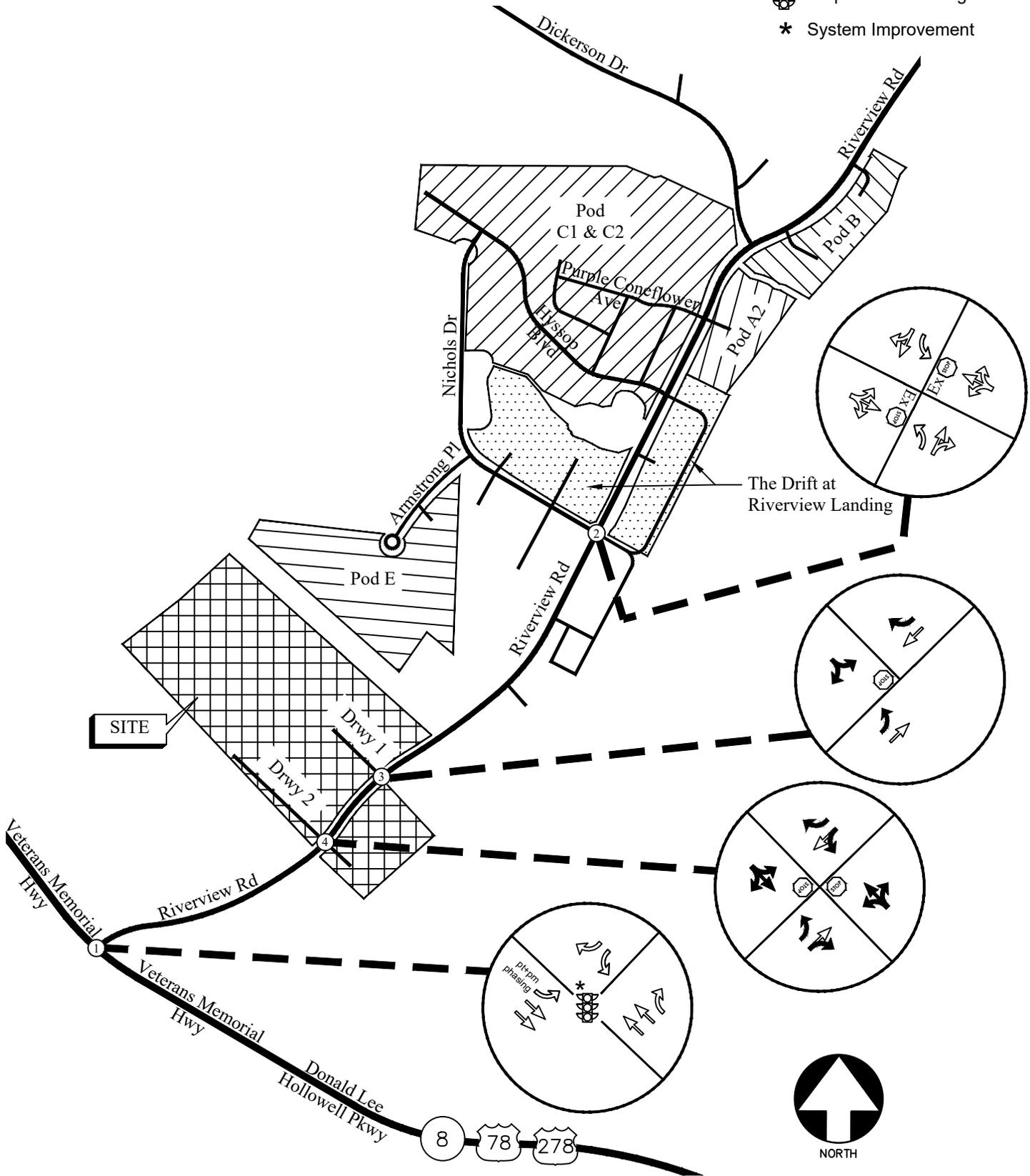
* Delay exceeds 300 seconds

The results of the future Horizon Year 2034 traffic operations analysis indicate that the intersection of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road will continue to operate at LOS “F” in both the AM and PM peak hours. After a traffic signal is installed, the intersection will operate at an overall LOS “C” or better. At the all-way stop controlled intersection of Riverview Road and Nichols Drive, the LOS will be “F” for the northbound approach in the AM peak hour and the southbound approach in the PM peak hour. After converting Riverview Road to have free-flow movements, the northbound and southbound approaches of Riverview Road will operate at LOS “A” in both the AM and PM peak hours. The stop-controlled eastbound and westbound approaches of Nichols Drive will operate at LOS “E” in the PM peak hour. It is not uncommon for stop-controlled side-streets to experience delays during peak hours as delays are caused by side-street wait times to turn left onto the mainline. The traffic volumes on side streets are not high enough to warrant a traffic signal.

Recommendations on future traffic control and lane geometry are shown in Figure 16.

LEGEND

- Ex  Existing Signed Approach
-  Existing Lane Geometry
-  Proposed Signed Approach
-  Proposed Lane Geometry
-  Proposed Traffic Signal
- * System Improvement



FUTURE TRAFFIC CONTROL AND LANE GEOMETRY

FIGURE 16

A&R Engineering Inc.

7.0 SIGNAL WARRANT ANALYSIS

The posted speed limit on Riverview Road is 35 mph. A signal warrant analysis was performed for the study intersection of Nichols Drive and Riverview Road per MUTCD (2009 Edition) using a main street approach speed limit of 35 mph with the intersection geometry of a single-lane approach for the major street and a single lane for the minor street. Eastbound and westbound right-turn reductions of 100% were applied to the side streets (Nichols Drive).

The future traffic volumes were used in the signal warrant analyses. The results of the signal warrant analysis indicate that signal warrants 1, 2 and 3 are not satisfied for 100% standard from 7am to 7pm. A detailed copy of the signal warrant analysis is included in Appendix.

MUTCD Signal Warrant Analysis (Major and Minor Street Volumes):

For Warrant 1 to be satisfied, either Standard 1 or Standard 2 criteria has to be satisfied.

- Warrant 1 – Eight-hour vehicular volume – **NOT SATISFIED.**
 - Standard 1 (Condition A): 0 Hours
 - Standard 1 (Condition B): 0 Hours
(Criteria for satisfaction of Warrant 1, Standard 1: Criteria must be met for 8 hours for either Condition A, or Condition B.)
 - Standard 2 (Condition A): 0 Hours
 - Standard 2 (Condition B): 1 Hours
(Criteria for satisfaction of Warrant 1, Standard 2: Criteria must be met for 8 hours for both Condition A and Condition B.)
- Warrant 2 – Four-hour vehicular volume – **NOT SATISFIED.**
- Warrant 3 – Peak hour vehicular volume – **NOT SATISFIED.**

8.0 CONCLUSIONS AND RECOMMENDATIONS

Traffic impacts were evaluated for the added traffic from the proposed development that will be located on Riverview Road in Cobb County, Georgia. The development will consist of:

- Multifamily Housing: 390 units
- Retail: 6,000 sf

The development proposes two full access driveways on Riverview Road. Traffic operations were analyzed at the intersections of:

- SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road
- Riverview Road @ Nichols Drive
- Riverview Road @ Site Driveway 1 (Northern)
- Riverview Road @ Site Driveway 2 (Southern)

The analysis included the evaluation of Existing operations and Future operations for Opening Year 2024 and Horizon Year 2034 for “No-Build” and “Build” conditions, both of which account for increases in annual growth of through traffic and added traffic from other nearby planned developments. The results of the analysis indicate that the intersection of SR 8/US 78/US 278 (Veterans Memorial Highway) at Riverview Road will continue to operate at LOS “F” for the stop-controlled southbound (Riverview Road) approach. The future 2024 volumes at the intersection satisfy the threshold for installation of a traffic signal during the AM and PM peak hours. After a traffic signal is installed, the intersection will have an overall LOS “C” or better in both the AM and PM peak hours.

The results of the future Horizon Year 2034 traffic operations analysis at the all-way stop controlled intersection of Riverview Road and Nichols Drive show that the LOS will be “F” for the northbound approach in the AM peak hour and the southbound approach in the PM peak hour. Riverview Road carries and will continue to carry more than 80% of the total traffic at the intersection and will not meet the all-way stop warrants. After converting Riverview Road to have free-flow movements, the northbound and southbound approaches of Riverview Road will operate at LOS “A” in both the AM and PM peak hours. The stop-controlled eastbound and westbound approaches of Nichols Drive will operate at LOS “E” in the PM peak hour. It is not uncommon for stop-controlled side-streets to experience delays during peak hours as delays are caused by side-street wait times to turn left onto the mainline. The traffic volumes on side streets are not high enough to warrant a traffic signal.

8.1 Recommendations for System Improvements

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

SR 8/US 78/US 278 (Veterans Memorial Highway) @ Riverview Road

- Install a traffic signal
- Provide ‘protected-permissive’ phasing for eastbound left turn movements
- Coordinate the signal with adjacent signals on SR 8/US 78/US 278 (Veterans Memorial Highway) at Oakdale Road/Discovery Boulevard and Maynard Road

Riverview Road @ Nichols Drive

- Remove “STOP” signs and stop bars on the northbound and southbound approaches of Riverview Road to convert the all-way stop controlled intersection to a two-way stop controlled intersection with Riverview Road being free flow and Nichols Drive continue to be stop controlled

8.2 Recommendation for Site Access Configuration

The following access configuration is recommended for the proposed site driveway intersections:

- Site Driveway 1: Full Access Driveway on Riverview Road (Northern)
 - One entering and one exiting lanes
 - Stop-sign controlled on the driveway approach with Riverview Road remaining free flow
 - Left Turn Lane and Right Turn Lane on Riverview Road for entering traffic
 - Confirm adequate sight distance per AASHTO standards
- Site Driveway 2: Full Access Driveway on Riverview Road (Southern)
 - One entering and one exiting lanes
 - Stop-sign controlled on the driveway approaches with Riverview Rd remaining free flow
 - Left Turn Lane and Right Turn Lane on Riverview Road for traffic entering traffic
 - Confirm adequate sight distance per AASHTO standards

Appendix

Existing Intersection Traffic Counts	
Linear Regression of Daily Traffic.....	
Existing Intersection Analysis.....	
Future Opening Year 2024 "No-Build" Intersection Analysis	
Future Opening Year 2024 "No-Build" Intersection Analysis (With Improvements).....	
Future Opening Year 2024 "Build" Intersection Analysis	
Future Opening Year 2024 "Build" Intersection Analysis (With Improvements).....	
Future Horizon Year 2034 "No-Build" Intersection Analysis.....	
Future Horizon Year 2034 "No-Build" Intersection Analysis (With Improvements).....	
Future Horizon Year 2034 "Build" Intersection Analysis	
Future Horizon Year 2034 "Build" Intersection Analysis (With Improvements).....	
Signal Warrant Analysis Base Year 2023 (Veterans memorial Highway and Riverview Road).....	
Signal Warrant Analysis No Build 2024 (Veterans memorial Highway and Riverview Road).....	
Signal Warrant Analysis Horizon Year 2034 (Nichols Drive and Riverview Road)	
Traffic Volume Worksheets	

EXISTING INTERSECTION TRAFFIC COUNTS

A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC Data
Riverview Rd @ Nichols Dr
7am - 7pm

File Name : 20230030
Site Code : 20230030
Start Date : 2/1/2023
Page No : 1

Groups Printed- Cars, Buses & Trucks

Start Time	Riverview Rd Northbound				Riverview Rd Southbound				Nichols Dr Eastbound				Nichols Dr Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	2	1	1	4	2	0	6	8	7	102	0	109	0	27	2	29	150
07:15 AM	0	3	0	3	2	0	5	7	7	103	0	110	1	22	2	25	145
07:30 AM	4	0	0	4	9	1	13	23	4	125	1	130	1	19	4	24	181
07:45 AM	4	0	2	6	8	4	10	22	8	119	1	128	0	31	8	39	195
Total	10	4	3	17	21	5	34	60	26	449	2	477	2	99	16	117	671
08:00 AM	3	3	1	7	9	3	4	16	13	113	1	127	1	32	8	41	191
08:15 AM	2	1	4	7	7	2	6	15	6	116	1	123	0	21	7	28	173
08:30 AM	0	2	3	5	6	5	8	19	8	124	0	132	0	30	3	33	189
08:45 AM	0	0	1	1	6	1	6	13	3	84	0	87	2	20	4	26	127
Total	5	6	9	20	28	11	24	63	30	437	2	469	3	103	22	128	680
09:00 AM	1	1	4	6	8	0	6	14	7	72	1	80	0	13	4	17	117
09:15 AM	2	0	0	2	5	2	5	12	3	48	1	52	1	24	5	30	96
09:30 AM	0	2	1	3	6	0	4	10	4	52	1	57	1	16	3	20	90
09:45 AM	0	2	1	3	8	3	4	15	1	55	1	57	3	20	6	29	104
Total	3	5	6	14	27	5	19	51	15	227	4	246	5	73	18	96	407
10:00 AM	1	2	2	5	3	0	8	11	2	52	0	54	2	23	2	27	97
10:15 AM	0	2	0	2	12	1	5	18	4	40	0	44	3	22	6	31	95
10:30 AM	1	0	2	3	2	2	7	11	5	28	1	34	2	16	4	22	70
10:45 AM	1	0	1	2	3	0	6	9	6	25	0	31	1	23	4	28	70
Total	3	4	5	12	20	3	26	49	17	145	1	163	8	84	16	108	332
11:00 AM	0	2	0	2	6	2	4	12	7	31	0	38	1	21	2	24	76
11:15 AM	0	1	1	2	5	3	6	14	7	27	1	35	2	20	1	23	74
11:30 AM	1	0	1	2	6	2	3	11	7	25	2	34	4	18	5	27	74
11:45 AM	2	1	1	4	5	0	8	13	5	24	0	29	3	25	5	33	79
Total	3	4	3	10	22	7	21	50	26	107	3	136	10	84	13	107	303
12:00 PM	1	0	1	2	5	2	10	17	7	27	0	34	1	25	4	30	83
12:15 PM	0	2	2	4	7	1	6	14	2	32	0	34	4	33	6	43	95
12:30 PM	0	1	1	2	5	2	8	15	8	30	0	38	0	23	6	29	84
12:45 PM	0	1	1	2	12	0	6	18	6	31	2	39	0	23	9	32	91
Total	1	4	5	10	29	5	30	64	23	120	2	145	5	104	25	134	353
01:00 PM	2	1	3	6	6	3	5	14	4	29	1	34	1	30	9	40	94
01:15 PM	0	1	1	2	6	1	4	11	4	27	2	33	2	27	9	38	84
01:30 PM	0	0	1	1	8	1	4	13	2	35	1	38	2	28	9	39	91
01:45 PM	0	2	0	2	3	2	7	12	4	31	2	37	1	32	6	39	90
Total	2	4	5	11	23	7	20	50	14	122	6	142	6	117	33	156	359
02:00 PM	0	1	0	1	6	1	5	12	2	31	0	33	1	34	9	44	90
02:15 PM	0	0	0	0	7	0	2	9	5	21	0	26	0	29	6	35	70
02:30 PM	2	1	2	5	1	1	6	8	5	20	0	25	2	33	7	42	80
02:45 PM	1	1	3	5	2	0	2	4	6	31	1	38	6	40	4	50	97
Total	3	3	5	11	16	2	15	33	18	103	1	122	9	136	26	171	337
03:00 PM	1	0	2	3	6	2	9	17	2	23	1	26	1	49	6	56	102
03:15 PM	0	1	3	4	2	1	6	9	8	21	1	30	1	50	1	52	95
03:30 PM	1	0	1	2	1	0	14	15	6	29	0	35	2	80	6	88	140
03:45 PM	3	1	3	7	6	1	10	17	7	27	0	34	1	80	6	87	145
Total	5	2	9	16	15	4	39	58	23	100	2	125	5	259	19	283	482
04:00 PM	1	0	2	3	3	0	7	10	7	20	0	27	0	90	7	97	137

A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC Data
Riverview Rd @ Nichols Dr
7am - 7pm

File Name : 20230030
Site Code : 20230030
Start Date : 2/1/2023
Page No : 2

Groups Printed- Cars, Buses & Trucks

Start Time	Riverview Rd Northbound				Riverview Rd Southbound				Nichols Dr Eastbound				Nichols Dr Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:15 PM	1	1	0	2	7	0	7	14	8	41	0	49	1	81	1	83	148
04:30 PM	2	1	4	7	6	3	8	17	6	22	1	29	4	103	5	112	165
04:45 PM	0	0	0	0	4	2	5	11	9	43	0	52	3	129	6	138	201
Total	4	2	6	12	20	5	27	52	30	126	1	157	8	403	19	430	651
05:00 PM	1	2	1	4	6	3	8	17	7	44	1	52	4	113	7	124	197
05:15 PM	0	2	1	3	6	2	8	16	7	37	2	46	1	103	6	110	175
05:30 PM	0	1	2	3	5	0	10	15	5	42	3	50	5	88	4	97	165
05:45 PM	1	1	3	5	3	3	6	12	8	30	0	38	5	86	13	104	159
Total	2	6	7	15	20	8	32	60	27	153	6	186	15	390	30	435	696
06:00 PM	0	0	3	3	6	0	3	9	10	20	0	30	2	62	7	71	113
06:15 PM	1	0	2	3	8	1	4	13	5	20	1	26	1	100	9	110	152
06:30 PM	3	0	3	6	7	0	4	11	14	22	5	41	4	97	9	110	168
06:45 PM	0	1	2	3	6	1	11	18	14	16	1	31	6	52	6	64	116
Total	4	1	10	15	27	2	22	51	43	78	7	128	13	311	31	355	549
Grand Total	45	45	73	163	268	64	309	641	292	2167	37	2496	89	2163	268	2520	5820
Apprch %	27.6	27.6	44.8		41.8	10	48.2		11.7	86.8	1.5		3.5	85.8	10.6		
Total %	0.8	0.8	1.3	2.8	4.6	1.1	5.3	11	5	37.2	0.6	42.9	1.5	37.2	4.6	43.3	

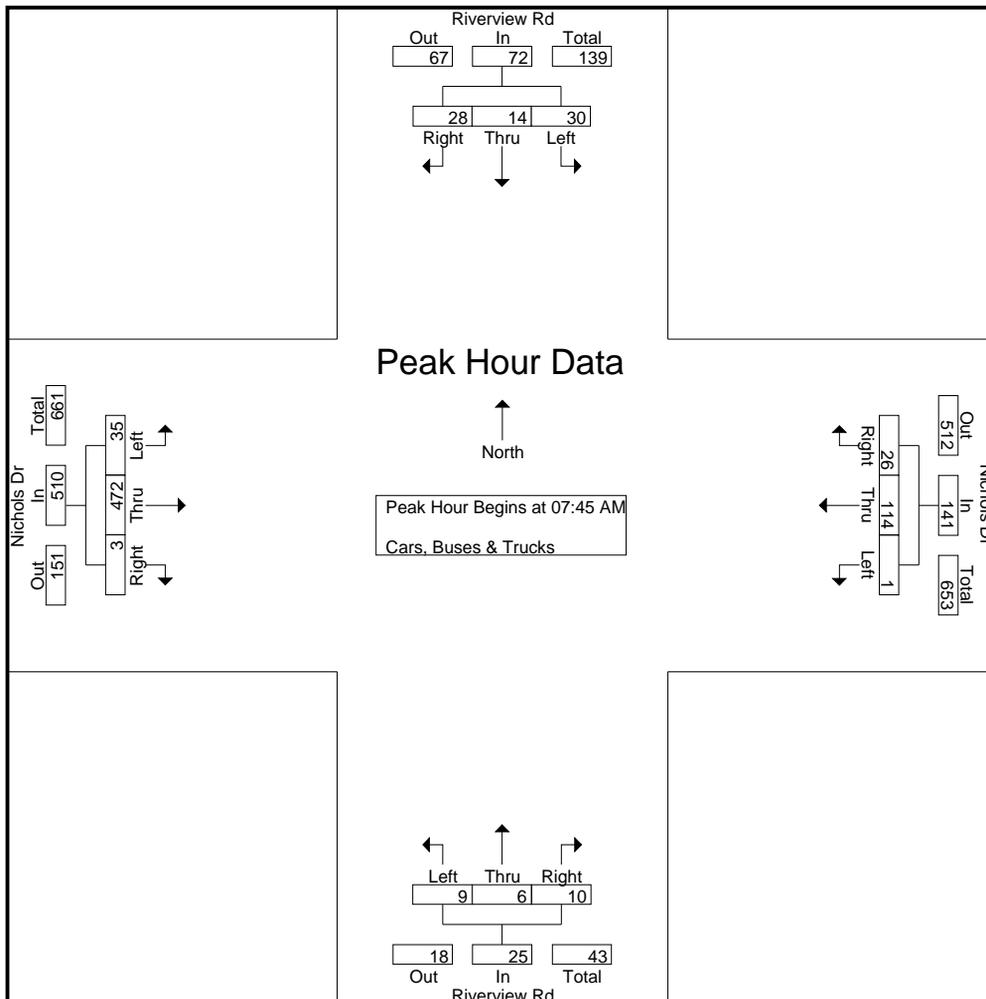
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC Data
Riverview Rd @ Nichols Dr
7am - 7pm

File Name : 20230030
Site Code : 20230030
Start Date : 2/1/2023
Page No : 3

Start Time	Riverview Rd Northbound				Riverview Rd Southbound				Nichols Dr Eastbound				Nichols Dr Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	4	0	2	6	8	4	10	22	8	119	1	128	0	31	8	39	195
08:00 AM	3	3	1	7	9	3	4	16	13	113	1	127	1	32	8	41	191
08:15 AM	2	1	4	7	7	2	6	15	6	116	1	123	0	21	7	28	173
08:30 AM	0	2	3	5	6	5	8	19	8	124	0	132	0	30	3	33	189
Total Volume	9	6	10	25	30	14	28	72	35	472	3	510	1	114	26	141	748
% App. Total	36	24	40		41.7	19.4	38.9		6.9	92.5	0.6		0.7	80.9	18.4		
PHF	.563	.500	.625	.893	.833	.700	.700	.818	.673	.952	.750	.966	.250	.891	.813	.860	.959



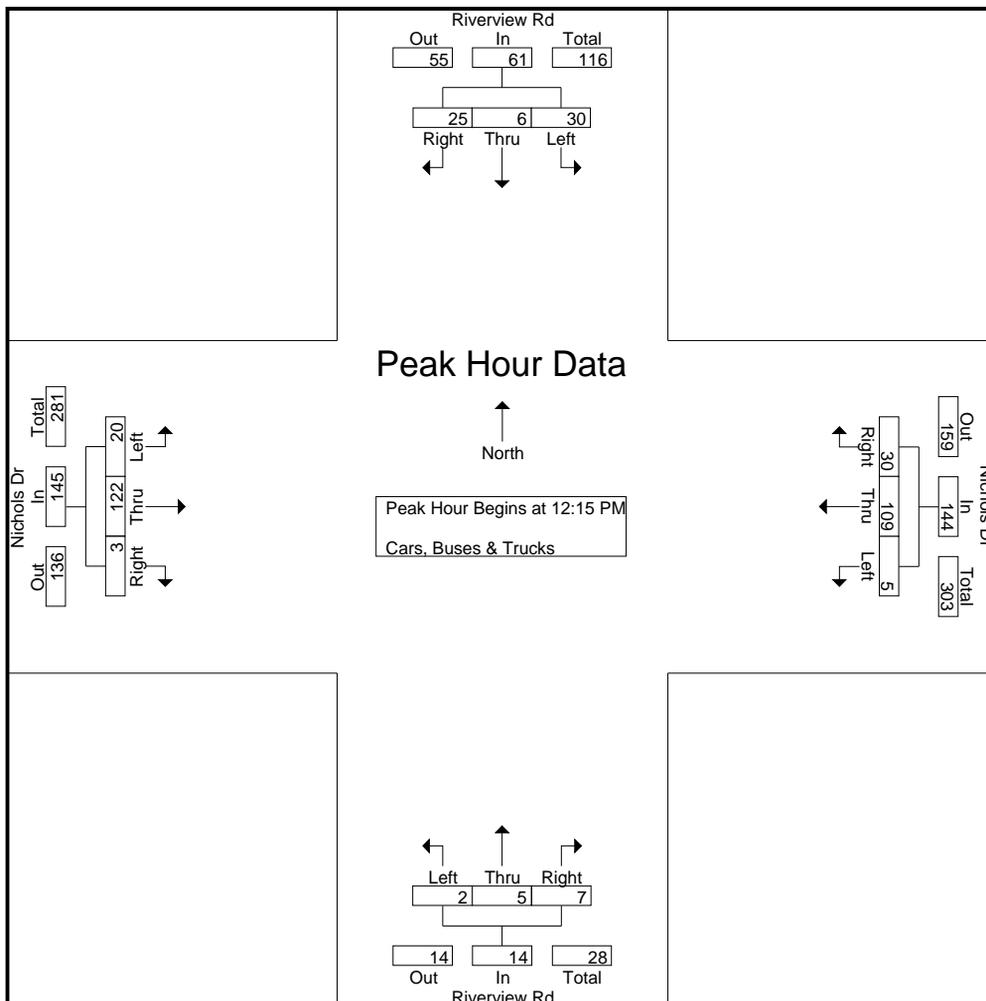
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2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC Data
Riverview Rd @ Nichols Dr
7am - 7pm

File Name : 20230030
Site Code : 20230030
Start Date : 2/1/2023
Page No : 4

Start Time	Riverview Rd Northbound				Riverview Rd Southbound				Nichols Dr Eastbound				Nichols Dr Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 12:00 PM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:15 PM																	
12:15 PM	0	2	2	4	7	1	6	14	2	32	0	34	4	33	6	43	95
12:30 PM	0	1	1	2	5	2	8	15	8	30	0	38	0	23	6	29	84
12:45 PM	0	1	1	2	12	0	6	18	6	31	2	39	0	23	9	32	91
01:00 PM	2	1	3	6	6	3	5	14	4	29	1	34	1	30	9	40	94
Total Volume	2	5	7	14	30	6	25	61	20	122	3	145	5	109	30	144	364
% App. Total	14.3	35.7	50		49.2	9.8	41		13.8	84.1	2.1		3.5	75.7	20.8		
PHF	.250	.625	.583	.583	.625	.500	.781	.847	.625	.953	.375	.929	.313	.826	.833	.837	.958



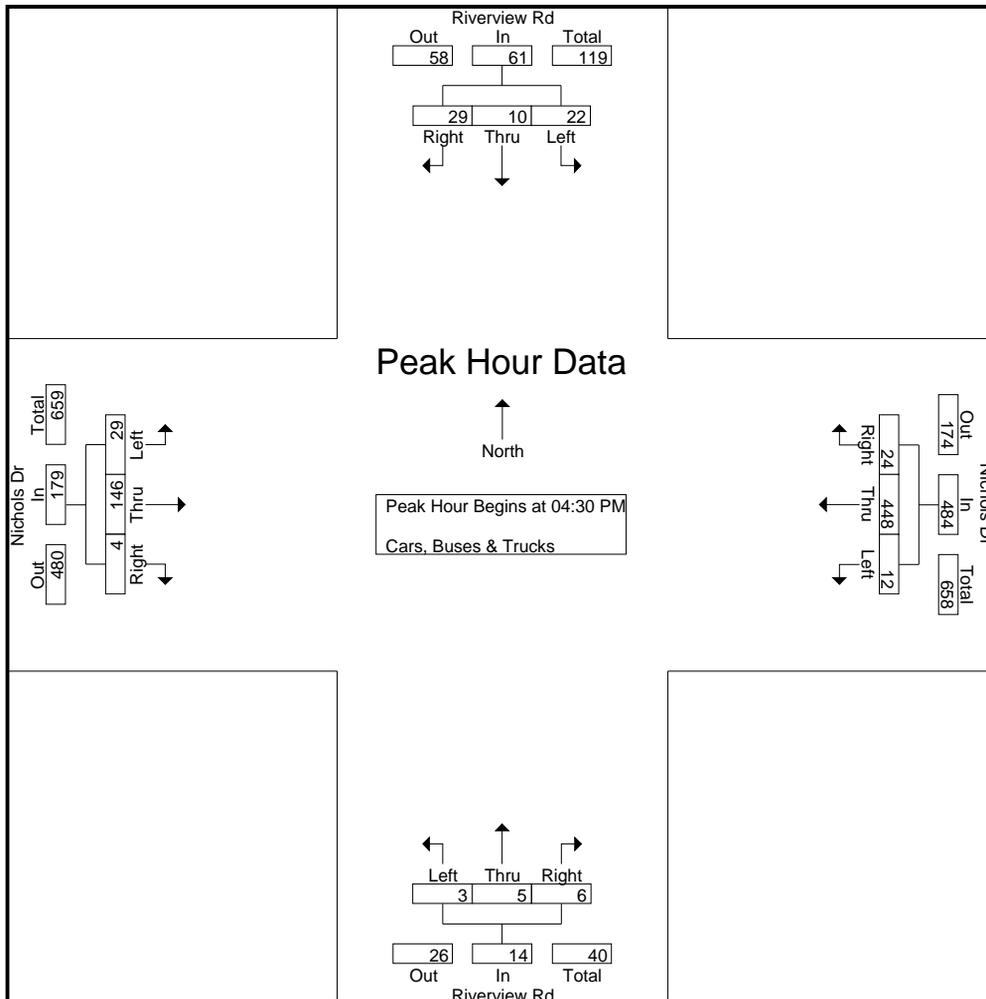
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC Data
Riverview Rd @ Nichols Dr
7am - 7pm

File Name : 20230030
Site Code : 20230030
Start Date : 2/1/2023
Page No : 5

Start Time	Riverview Rd Northbound				Riverview Rd Southbound				Nichols Dr Eastbound				Nichols Dr Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	1	4	7	6	3	8	17	6	22	1	29	4	103	5	112	165
04:45 PM	0	0	0	0	4	2	5	11	9	43	0	52	3	129	6	138	201
05:00 PM	1	2	1	4	6	3	8	17	7	44	1	52	4	113	7	124	197
05:15 PM	0	2	1	3	6	2	8	16	7	37	2	46	1	103	6	110	175
Total Volume	3	5	6	14	22	10	29	61	29	146	4	179	12	448	24	484	738
% App. Total	21.4	35.7	42.9		36.1	16.4	47.5		16.2	81.6	2.2		2.5	92.6	5		
PHF	.375	.625	.375	.500	.917	.833	.906	.897	.806	.830	.500	.861	.750	.868	.857	.877	.918



A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Riverview Rd @ Veterans Memorial Hwy
7-9 am | 4-6 pm

File Name : 20230032
Site Code : 20230032
Start Date : 2/1/2023
Page No : 1

Groups Printed- Cars,Buses & Trucks

Start Time	Northbound				Riverview Rd Southbound				Veterans Memorial Hwy Eastbound				Veterans Memorial Hwy Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	0	0	0	0	11	0	22	33	102	367	0	469	0	99	18	117	619
07:15 AM	0	0	0	0	14	0	15	29	133	414	0	547	0	103	6	109	685
07:30 AM	0	0	0	0	15	0	27	42	136	410	0	546	0	123	13	136	724
07:45 AM	0	0	0	0	16	0	25	41	117	395	0	512	0	156	18	174	727
Total	0	0	0	0	56	0	89	145	488	1586	0	2074	0	481	55	536	2755
08:00 AM	0	0	0	0	7	0	39	46	112	320	0	432	0	138	15	153	631
08:15 AM	0	0	0	0	16	0	19	35	129	338	0	467	0	184	19	203	705
08:30 AM	0	0	0	0	11	0	19	30	83	297	0	380	0	165	12	177	587
08:45 AM	0	0	0	0	11	0	19	30	85	334	0	419	0	182	6	188	637
Total	0	0	0	0	45	0	96	141	409	1289	0	1698	0	669	52	721	2560
*** BREAK ***																	
04:00 PM	0	0	0	0	12	0	85	97	32	122	0	154	0	267	11	278	529
04:15 PM	0	0	0	0	18	0	95	113	31	93	0	124	0	329	14	343	580
04:30 PM	0	0	0	0	21	0	109	130	33	129	0	162	0	303	21	324	616
04:45 PM	0	0	0	0	17	0	131	148	37	157	0	194	0	367	26	393	735
Total	0	0	0	0	68	0	420	488	133	501	0	634	0	1266	72	1338	2460
05:00 PM	0	0	0	0	27	0	82	109	29	156	0	185	0	355	13	368	662
05:15 PM	0	0	0	0	20	0	88	108	20	183	0	203	0	410	14	424	735
05:30 PM	0	0	0	0	29	0	81	110	34	145	0	179	0	434	17	451	740
05:45 PM	0	0	0	0	33	0	97	130	24	132	0	156	0	298	6	304	590
Total	0	0	0	0	109	0	348	457	107	616	0	723	0	1497	50	1547	2727
Grand Total	0	0	0	0	278	0	953	1231	1137	3992	0	5129	0	3913	229	4142	10502
Apprch %	0	0	0	0	22.6	0	77.4	22.2	77.8	0	0	94.5	5.5	0	0	39.4	
Total %	0	0	0	0	2.6	0	9.1	11.7	10.8	38	0	48.8	2.2	37.3	2.2	39.4	

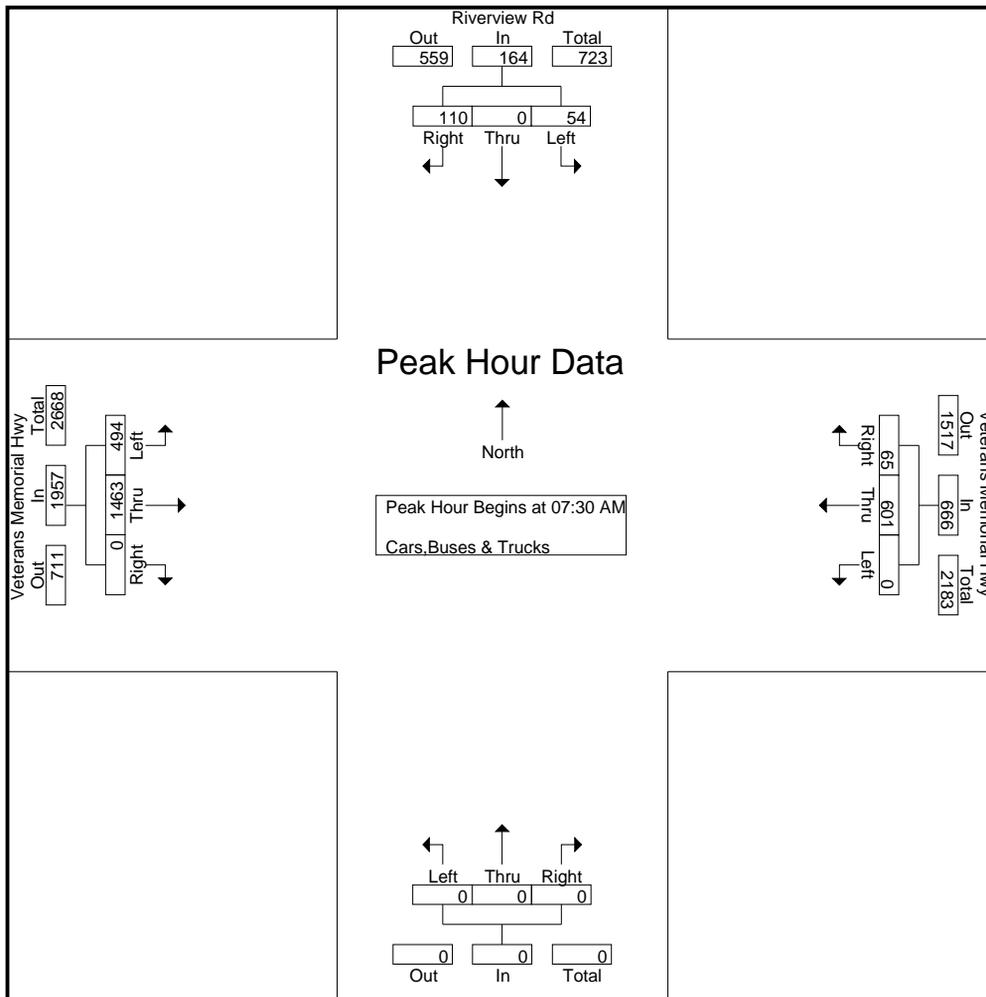
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Marietta, GA 30067

TMC DATA
Riverview Rd @ Veterans Memorial Hwy
7-9 am | 4-6 pm

File Name : 20230032
Site Code : 20230032
Start Date : 2/1/2023
Page No : 2

Start Time	Northbound				Riverview Rd Southbound				Veterans Memorial Hwy Eastbound				Veterans Memorial Hwy Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	0	0	0	15	0	27	42	136	410	0	546	0	123	13	136	724
07:45 AM	0	0	0	0	16	0	25	41	117	395	0	512	0	156	18	174	727
08:00 AM	0	0	0	0	7	0	39	46	112	320	0	432	0	138	15	153	631
08:15 AM	0	0	0	0	16	0	19	35	129	338	0	467	0	184	19	203	705
Total Volume	0	0	0	0	54	0	110	164	494	1463	0	1957	0	601	65	666	2787
% App. Total	0	0	0	0	32.9	0	67.1		25.2	74.8	0		0	90.2	9.8		
PHF	.000	.000	.000	.000	.844	.000	.705	.891	.908	.892	.000	.896	.000	.817	.855	.820	.958



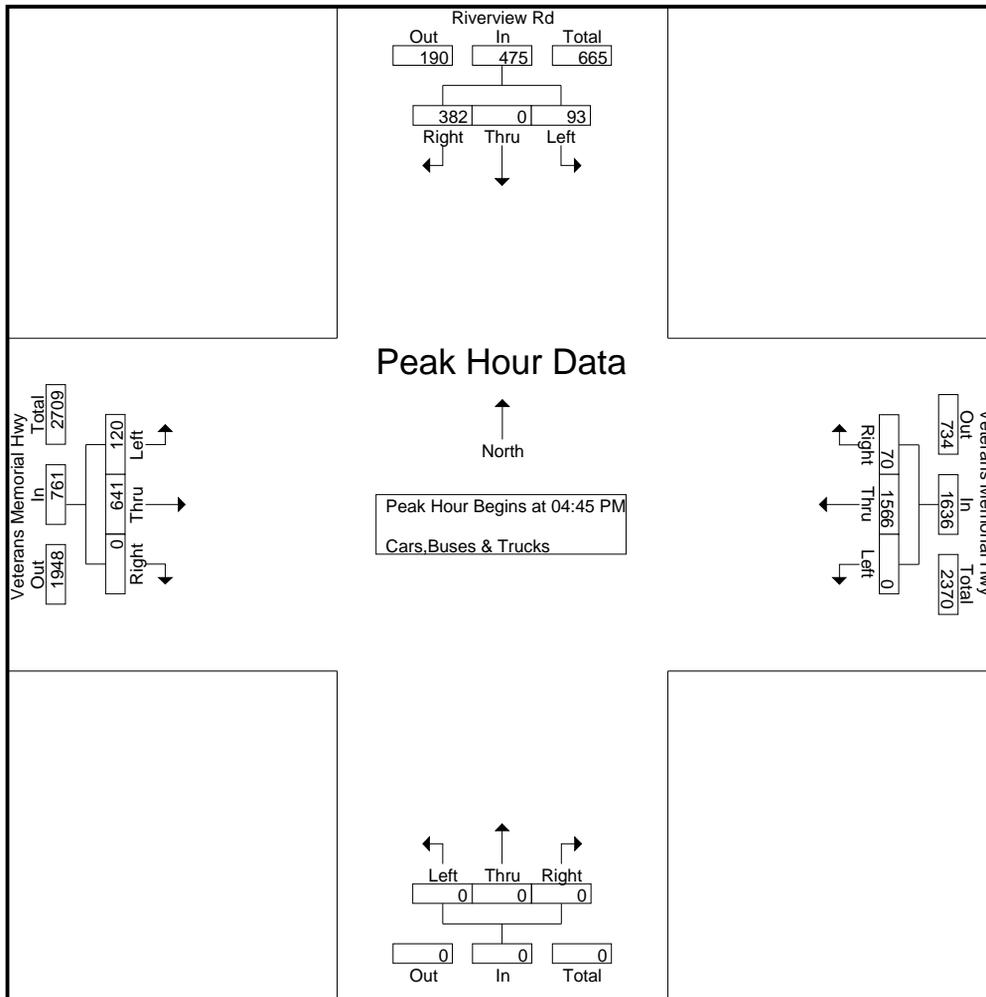
A & R Engineering, Inc.

2160 Kingston Court Suite 'O'
Marietta, GA 30067

TMC DATA
Riverview Rd @ Veterans Memorial Hwy
7-9 am | 4-6 pm

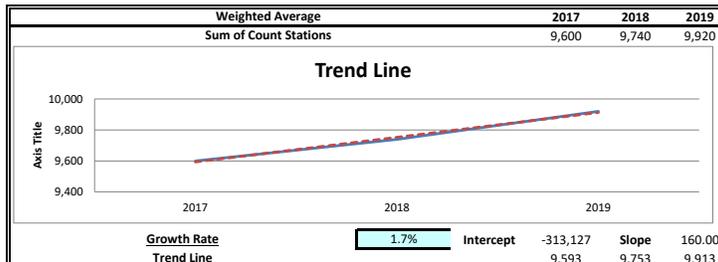
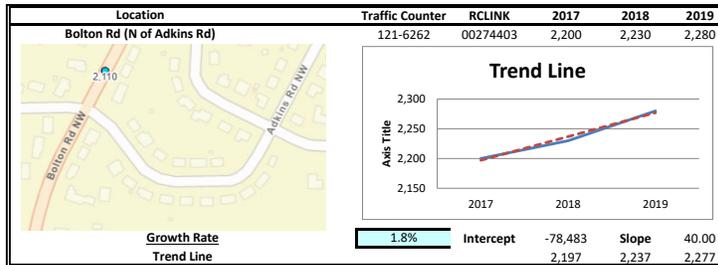
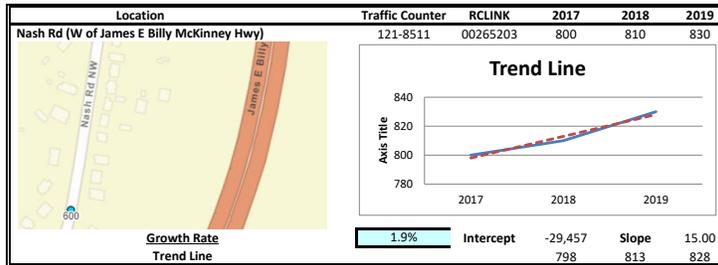
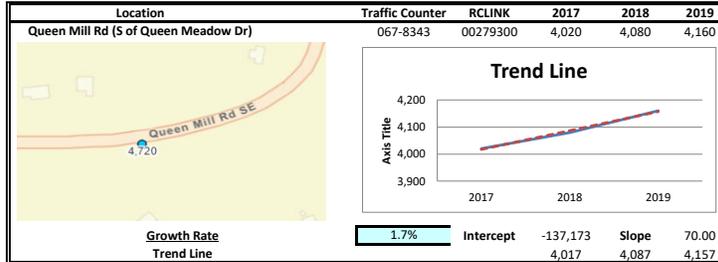
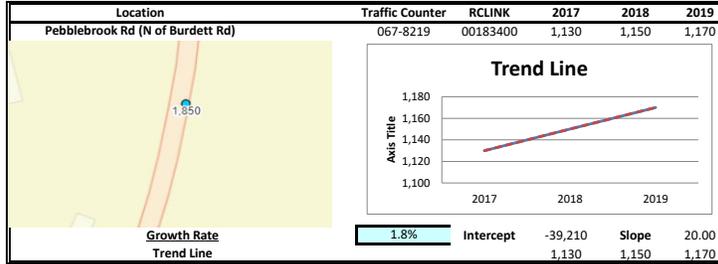
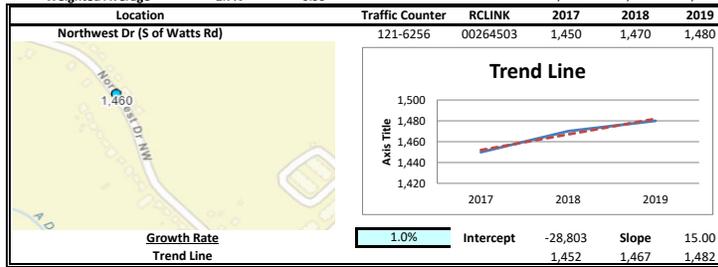
File Name : 20230032
Site Code : 20230032
Start Date : 2/1/2023
Page No : 3

Start Time	Northbound				Riverview Rd Southbound				Veterans Memorial Hwy Eastbound				Veterans Memorial Hwy Westbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. 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	0	0	0	17	0	131	148	37	157	0	194	0	367	26	393	735
05:00 PM	0	0	0	0	27	0	82	109	29	156	0	185	0	355	13	368	662
05:15 PM	0	0	0	0	20	0	88	108	20	183	0	203	0	410	14	424	735
05:30 PM	0	0	0	0	29	0	81	110	34	145	0	179	0	434	17	451	740
Total Volume	0	0	0	0	93	0	382	475	120	641	0	761	0	1566	70	1636	2872
% App. Total	0	0	0	0	19.6	0	80.4		15.8	84.2	0		0	95.7	4.3		
PHF	.000	.000	.000	.000	.802	.000	.729	.802	.811	.876	.000	.937	.000	.902	.673	.907	.970



LINEAR REGRESSION OF DAILY TRAFFIC

Location	Growth Rate	R Squared	Station ID	Route	2017	2018	2019
Northwest Dr (S of Watts Rd)	1.0%	0.96	121-6256	00264503	1,450	1,470	1,480
Pebblebrook Rd (N of Burdett R	1.8%	1.00	067-8219	00183400	1,130	1,150	1,170
Queen Mill Rd (S of Queen Mea	1.7%	0.99	067-8343	00279300	4,020	4,080	4,160
Nash Rd (W of James E Billy Mct	1.9%	0.96	121-8511	00265203	800	810	830
Bolton Rd (N of Adkins Rd)	1.8%	0.98	121-6262	00274403	2,200	2,230	2,280
Weighted Average	1.7%	0.99	Sum of Count Stations =		9,600	9,740	9,920



EXISTING INTERSECTION ANALYSIS

Intersection						
Int Delay, s/veh	18.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	507	1463	601	87	111	143
Future Vol, veh/h	507	1463	601	87	111	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	528	1524	626	91	116	149

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	626	0	-	0	2444 313
Stage 1	-	-	-	-	626 -
Stage 2	-	-	-	-	1818 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	952	-	-	-	~ 26 683
Stage 1	-	-	-	-	495 -
Stage 2	-	-	-	-	~ 115 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	952	-	-	-	~ 12 683
Mov Cap-2 Maneuver	-	-	-	-	~ 74 -
Stage 1	-	-	-	-	220 -
Stage 2	-	-	-	-	~ 115 -

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	183.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	952	-	-	-	74	683
HCM Lane V/C Ratio	0.555	-	-	-	1.563	0.218
HCM Control Delay (s)	13.4	-	-	-	\$ 404.3	11.7
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	3.5	-	-	-	9.7	0.8

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	39	14	55	24	6	11	46	489	9	1	160	32
Future Vol, veh/h	39	14	55	24	6	11	46	489	9	1	160	32
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	15	57	25	6	11	48	509	9	1	167	33
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.9	9.5	20.3	10.6
HCM LOS	A	A	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	36%	59%	100%	0%
Vol Thru, %	0%	98%	13%	15%	0%	83%
Vol Right, %	0%	2%	51%	27%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	46	498	108	41	1	192
LT Vol	46	0	39	24	1	0
Through Vol	0	489	14	6	0	160
RT Vol	0	9	55	11	0	32
Lane Flow Rate	48	519	112	43	1	200
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.075	0.741	0.178	0.072	0.002	0.306
Departure Headway (Hd)	5.655	5.139	5.695	6.049	6.124	5.5
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	627	695	632	594	588	658
Service Time	3.446	2.929	3.707	4.063	3.824	3.2
HCM Lane V/C Ratio	0.077	0.747	0.177	0.072	0.002	0.304
HCM Control Delay	8.9	21.3	9.9	9.5	8.8	10.6
HCM Lane LOS	A	C	A	A	A	B
HCM 95th-tile Q	0.2	6.6	0.6	0.2	0	1.3

Intersection						
Int Delay, s/veh	49.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	152	641	1566	126	134	406
Future Vol, veh/h	152	641	1566	126	134	406
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	157	661	1614	130	138	419

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	1614	0	-	0	2259 807
Stage 1	-	-	-	-	1614 -
Stage 2	-	-	-	-	645 -
Critical Hdwy	4.14	-	-	-	6.84 6.94
Critical Hdwy Stg 1	-	-	-	-	5.84 -
Critical Hdwy Stg 2	-	-	-	-	5.84 -
Follow-up Hdwy	2.22	-	-	-	3.52 3.32
Pot Cap-1 Maneuver	400	-	-	-	~ 35 ~ 324
Stage 1	-	-	-	-	148 -
Stage 2	-	-	-	-	484 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	400	-	-	-	~ 21 ~ 324
Mov Cap-2 Maneuver	-	-	-	-	~ 74 -
Stage 1	-	-	-	-	~ 90 -
Stage 2	-	-	-	-	484 -

Approach	EB	WB	SB
HCM Control Delay, s	3.8	0	271
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	400	-	-	-	74	324
HCM Lane V/C Ratio	0.392	-	-	-	1.867	1.292
HCM Control Delay (s)	19.7	-	-	-	\$ 529.6	185.6
HCM Lane LOS	C	-	-	-	F	F
HCM 95th %tile Q(veh)	1.8	-	-	-	12.2	19.8

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	18.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	31	10	49	14	5	7	56	191	19	13	481	34
Future Vol, veh/h	31	10	49	14	5	7	56	191	19	13	481	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	11	53	15	5	8	61	208	21	14	523	37
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10	9.6	10.6	24.7
HCM LOS	A	A	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	34%	54%	100%	0%
Vol Thru, %	0%	91%	11%	19%	0%	93%
Vol Right, %	0%	9%	54%	27%	0%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	56	210	90	26	13	515
LT Vol	56	0	31	14	13	0
Through Vol	0	191	10	5	0	481
RT Vol	0	19	49	7	0	34
Lane Flow Rate	61	228	98	28	14	560
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.102	0.339	0.159	0.049	0.022	0.797
Departure Headway (Hd)	6.011	5.343	5.862	6.252	5.673	5.123
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	600	664	615	576	626	700
Service Time	3.711	3.141	3.865	4.259	3.457	2.907
HCM Lane V/C Ratio	0.102	0.343	0.159	0.049	0.022	0.8
HCM Control Delay	9.4	10.9	10	9.6	8.6	25.1
HCM Lane LOS	A	B	A	A	A	D
HCM 95th-tile Q	0.3	1.5	0.6	0.2	0.1	8.1

**FUTURE OPENING YEAR 2024 "NO-BUILD"
INTERSECTION ANALYSIS**

Intersection

Int Delay, s/veh 21

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	517	1492	613	89	113	146
Future Vol, veh/h	517	1492	613	89	113	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	539	1554	639	93	118	152

Major/Minor

	Major1	Major2	Minor2		
Conflicting Flow All	639	0	0	2494	320
Stage 1	-	-	-	639	-
Stage 2	-	-	-	1855	-
Critical Hdwy	4.14	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	3.52	3.32
Pot Cap-1 Maneuver	941	-	-	~ 24	676
Stage 1	-	-	-	488	-
Stage 2	-	-	-	~ 109	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	941	-	-	~ 10	676
Mov Cap-2 Maneuver	-	-	-	~ 69	-
Stage 1	-	-	-	208	-
Stage 2	-	-	-	~ 109	-

Approach

	EB	WB	SB
HCM Control Delay, s	3.6	0	212.4
HCM LOS			F

Minor Lane/Major Mvmt

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	941	-	-	-	69	676
HCM Lane V/C Ratio	0.572	-	-	-	1.706	0.225
HCM Control Delay (s)	13.8	-	-	-	\$ 471.5	11.9
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	3.7	-	-	-	10.4	0.9

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	17.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	40	14	56	24	6	11	47	499	9	1	163	33
Future Vol, veh/h	40	14	56	24	6	11	47	499	9	1	163	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	15	58	25	6	11	49	520	9	1	170	34
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10	9.6	21.3	10.7
HCM LOS	A	A	C	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	36%	59%	100%	0%
Vol Thru, %	0%	98%	13%	15%	0%	83%
Vol Right, %	0%	2%	51%	27%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	508	110	41	1	196
LT Vol	47	0	40	24	1	0
Through Vol	0	499	14	6	0	163
RT Vol	0	9	56	11	0	33
Lane Flow Rate	49	529	115	43	1	204
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.077	0.757	0.183	0.072	0.002	0.313
Departure Headway (Hd)	5.668	5.152	5.735	6.095	6.15	5.525
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	693	628	590	585	655
Service Time	3.462	2.945	3.745	4.111	3.85	3.225
HCM Lane V/C Ratio	0.078	0.763	0.183	0.073	0.002	0.311
HCM Control Delay	8.9	22.4	10	9.6	8.9	10.7
HCM Lane LOS	A	C	A	A	A	B
HCM 95th-tile Q	0.2	7	0.7	0.2	0	1.3

Intersection

Int Delay, s/veh	56.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗↗	↗↗	↘	↘	↘
Traffic Vol, veh/h	155	654	1597	129	137	414
Future Vol, veh/h	155	654	1597	129	137	414
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	160	674	1646	133	141	427

Major/Minor	Major1	Major2		Minor2	
Conflicting Flow All	1646	0	-	0	2303
Stage 1	-	-	-	-	1646
Stage 2	-	-	-	-	657
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	389	-	-	-	~ 32
Stage 1	-	-	-	-	142
Stage 2	-	-	-	-	477
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	389	-	-	-	~ 19
Mov Cap-2 Maneuver	-	-	-	-	~ 69
Stage 1	-	-	-	-	~ 84
Stage 2	-	-	-	-	477

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	\$ 309.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	389	-	-	-	69	317
HCM Lane V/C Ratio	0.411	-	-	-	2.047	1.346
HCM Control Delay (s)	20.6	-	-	-	\$ 614.5	208.1
HCM Lane LOS	C	-	-	-	F	F
HCM 95th %tile Q(veh)	2	-	-	-	13.1	21.3

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	32	10	50	14	5	7	57	195	19	13	491	35
Future Vol, veh/h	32	10	50	14	5	7	57	195	19	13	491	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	11	54	15	5	8	62	212	21	14	534	38
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

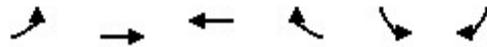
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.1	9.7	10.7	26.4
HCM LOS	B	A	B	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	35%	54%	100%	0%
Vol Thru, %	0%	91%	11%	19%	0%	93%
Vol Right, %	0%	9%	54%	27%	0%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	57	214	92	26	13	526
LT Vol	57	0	32	14	13	0
Through Vol	0	195	10	5	0	491
RT Vol	0	19	50	7	0	35
Lane Flow Rate	62	233	100	28	14	572
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.104	0.354	0.164	0.05	0.022	0.816
Departure Headway (Hd)	6.039	5.471	5.907	6.308	5.686	5.136
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	597	661	609	569	623	698
Service Time	3.739	3.171	3.922	4.325	3.483	2.932
HCM Lane V/C Ratio	0.104	0.352	0.164	0.049	0.022	0.819
HCM Control Delay	9.4	11.1	10.1	9.7	8.6	26.8
HCM Lane LOS	A	B	B	A	A	D
HCM 95th-tile Q	0.3	1.6	0.6	0.2	0.1	8.6

**FUTURE OPENING YEAR 2024 "NO-BUILD"
INTERSECTION ANALYSIS (WITH
IMPROVEMENTS)**

Timings

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷	↷	↶	↷
Traffic Volume (vph)	517	1492	613	89	113	146
Future Volume (vph)	517	1492	613	89	113	146
Lane Group Flow (vph)	539	1554	639	93	118	152
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	52.0	97.0	45.0	45.0	23.0	23.0
Total Split (%)	43.3%	80.8%	37.5%	37.5%	19.2%	19.2%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.71	0.58	0.36	0.11	0.61	0.49
Control Delay	10.6	5.8	19.8	4.7	64.0	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.6	5.8	19.8	4.7	64.0	13.1
Queue Length 50th (ft)	99	193	147	0	89	0
Queue Length 95th (ft)	204	287	248	34	146	60
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	939	2696	1776	870	258	360
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	0.58	0.36	0.11	0.46	0.42

Intersection Summary

Cycle Length: 120

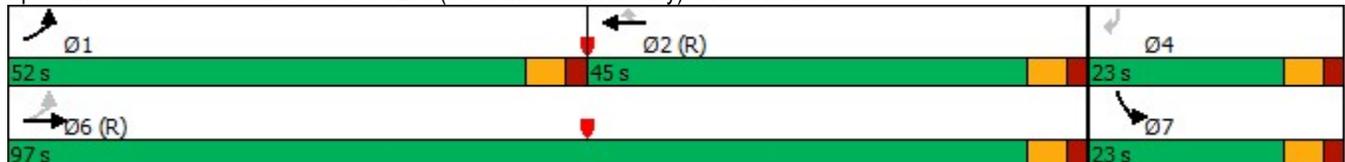
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 2c. No-Build (Opening Year) 2024 AM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	517	1492	613	89	113	146
Future Volume (veh/h)	517	1492	613	89	113	146
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	539	1554	639	0	118	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	734	2822	2279		145	
Arrive On Green	0.12	0.83	0.66	0.00	0.08	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	539	1554	639	0	118	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	10.5	17.4	9.2	0.0	7.8	0.0
Cycle Q Clear(g_c), s	10.5	17.4	9.2	0.0	7.8	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	734	2822	2279		145	
V/C Ratio(X)	0.73	0.55	0.28		0.81	
Avail Cap(c_a), veh/h	1212	2822	2279		260	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	5.2	3.3	8.4	0.0	54.2	0.0
Incr Delay (d2), s/veh	1.4	0.8	0.3	0.0	10.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.5	3.1	0.0	3.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.6	4.1	8.7	0.0	64.6	0.0
LnGrp LOS	A	A	A		E	
Approach Vol, veh/h		2093	639		118	
Approach Delay, s/veh		4.7	8.7		64.6	
Approach LOS		A	A		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	19.8	85.0		15.3		104.7
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	46.5	39.5		17.5		91.5
Max Q Clear Time (g_c+I1), s	12.5	11.2		9.8		19.4
Green Ext Time (p_c), s	1.7	8.1		0.1		39.7

Intersection Summary

HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

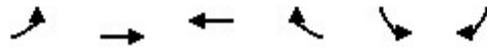
Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	
Traffic Vol, veh/h	40	14	56	24	6	11	47	499	9	1	163	33
Future Vol, veh/h	40	14	56	24	6	11	47	499	9	1	163	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	15	58	25	6	11	49	520	9	1	170	34

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	820	816	187	849	829	525	204	0	0	529	0	0
Stage 1	189	189	-	623	623	-	-	-	-	-	-	-
Stage 2	631	627	-	226	206	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	294	311	855	281	306	552	1368	-	-	1038	-	-
Stage 1	813	744	-	474	478	-	-	-	-	-	-	-
Stage 2	469	476	-	777	731	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	275	299	855	245	295	552	1368	-	-	1038	-	-
Mov Cap-2 Maneuver	275	299	-	245	295	-	-	-	-	-	-	-
Stage 1	784	743	-	457	461	-	-	-	-	-	-	-
Stage 2	437	459	-	709	730	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.5	19.1	0.7	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	427	297	1038	-
HCM Lane V/C Ratio	0.036	-	-	0.268	0.144	0.001	-
HCM Control Delay (s)	7.7	-	-	16.5	19.1	8.5	-
HCM Lane LOS	A	-	-	C	C	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.1	0.5	0	-

Timings



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑↑	↑↑	↗	↙	↗
Traffic Volume (vph)	155	654	1597	129	137	414
Future Volume (vph)	155	654	1597	129	137	414
Lane Group Flow (vph)	160	674	1646	133	141	427
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	15.0	87.0	72.0	72.0	33.0	33.0
Total Split (%)	12.5%	72.5%	60.0%	60.0%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.80	0.29	0.84	0.14	0.38	0.94
Control Delay	54.3	7.6	27.0	2.4	43.0	58.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	7.6	27.0	2.4	43.0	58.9
Queue Length 50th (ft)	72	100	553	0	92	217
Queue Length 95th (ft)	#187	128	671	28	153	#406
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	204	2350	1951	963	405	480
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	0.78	0.29	0.84	0.14	0.35	0.89

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

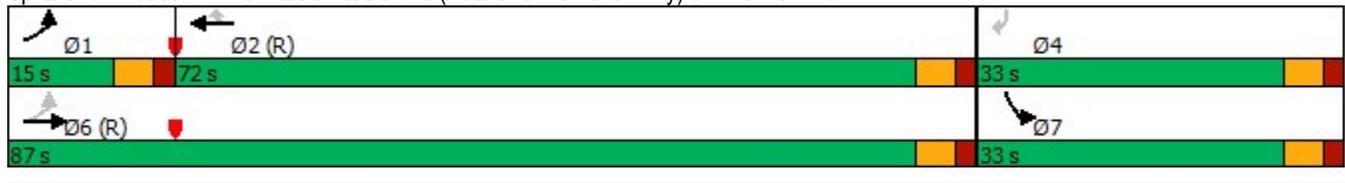
Natural Cycle: 90

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 2d. No-Build (Opening Year) 2024 PM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	155	654	1597	129	137	414
Future Volume (veh/h)	155	654	1597	129	137	414
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	160	674	1646	0	141	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	278	2772	2495		171	
Arrive On Green	0.04	0.81	0.73	0.00	0.10	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	160	674	1646	0	141	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	2.6	5.5	30.3	0.0	9.3	0.0
Cycle Q Clear(g_c), s	2.6	5.5	30.3	0.0	9.3	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	278	2772	2495		171	
V/C Ratio(X)	0.58	0.24	0.66		0.82	
Avail Cap(c_a), veh/h	345	2772	2495		408	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	12.3	2.6	8.7	0.0	53.2	0.0
Incr Delay (d2), s/veh	1.9	0.2	1.4	0.0	9.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.2	9.3	0.0	4.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	14.1	2.8	10.1	0.0	62.8	0.0
LnGrp LOS	B	A	B		E	
Approach Vol, veh/h		834	1646		141	
Approach Delay, s/veh		5.0	10.1		62.8	
Approach LOS		A	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.5	92.5		17.0		103.0
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	9.5	66.5		27.5		81.5
Max Q Clear Time (g_c+I1), s	4.6	32.3		11.3		7.5
Green Ext Time (p_c), s	0.2	26.0		0.3		10.5

Intersection Summary

HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	32	10	50	14	5	7	57	195	19	13	491	35
Future Vol, veh/h	32	10	50	14	5	7	57	195	19	13	491	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	11	54	15	5	8	62	212	21	14	534	38

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	934	938	553	961	947	223	572	0	0	233	0	0
Stage 1	581	581	-	347	347	-	-	-	-	-	-	-
Stage 2	353	357	-	614	600	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	246	264	533	236	261	817	1001	-	-	1335	-	-
Stage 1	499	500	-	669	635	-	-	-	-	-	-	-
Stage 2	664	628	-	479	490	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	226	245	533	194	242	817	1001	-	-	1335	-	-
Mov Cap-2 Maneuver	226	245	-	194	242	-	-	-	-	-	-	-
Stage 1	468	495	-	628	596	-	-	-	-	-	-	-
Stage 2	611	589	-	416	485	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	20.4		20.8		1.9		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1001	-	-	333	256	1335	-	-
HCM Lane V/C Ratio	0.062	-	-	0.3	0.11	0.011	-	-
HCM Control Delay (s)	8.8	-	-	20.4	20.8	7.7	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.2	0.4	0	-	-

**FUTURE OPENING YEAR 2024 "BUILD"
INTERSECTION ANALYSIS**

Intersection

Int Delay, s/veh 52.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	529	1492	613	111	174	179
Future Vol, veh/h	529	1492	613	111	174	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	551	1554	639	116	181	186

Major/Minor

	Major1	Major2	Minor2		
Conflicting Flow All	639	0	0	2518	320
Stage 1	-	-	-	639	-
Stage 2	-	-	-	1879	-
Critical Hdwy	4.14	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	3.52	3.32
Pot Cap-1 Maneuver	941	-	-	~ 23	676
Stage 1	-	-	-	488	-
Stage 2	-	-	-	~ 106	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	941	-	-	~ 10	676
Mov Cap-2 Maneuver	-	-	-	~ 68	-
Stage 1	-	-	-	202	-
Stage 2	-	-	-	~ 106	-

Approach

	EB	WB	SB
HCM Control Delay, s	3.7	0	\$ 442.1
HCM LOS			F

Minor Lane/Major Mvmt

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	941	-	-	-	68	676
HCM Lane V/C Ratio	0.586	-	-	-	2.665	0.276
HCM Control Delay (s)	14.1	-	-	-	\$ 884.2	12.3
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	3.9	-	-	-	17.9	1.1

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	40	14	57	24	6	11	50	532	10	1	175	33
Future Vol, veh/h	40	14	57	24	6	11	50	532	10	1	175	33
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	15	59	25	6	11	52	554	10	1	182	34
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.3	9.8	26.4	11.1
HCM LOS	B	A	D	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	36%	59%	100%	0%
Vol Thru, %	0%	98%	13%	15%	0%	84%
Vol Right, %	0%	2%	51%	27%	0%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	542	111	41	1	208
LT Vol	50	0	40	24	1	0
Through Vol	0	532	14	6	0	175
RT Vol	0	10	57	11	0	33
Lane Flow Rate	52	565	116	43	1	217
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.084	0.827	0.188	0.074	0.002	0.336
Departure Headway (Hd)	5.793	5.276	5.856	6.233	6.197	5.578
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	622	689	613	574	578	646
Service Time	3.493	2.976	3.896	4.279	3.926	3.307
HCM Lane V/C Ratio	0.084	0.82	0.189	0.075	0.002	0.336
HCM Control Delay	9	28	10.3	9.8	8.9	11.1
HCM Lane LOS	A	D	B	A	A	B
HCM 95th-tile Q	0.3	8.9	0.7	0.2	0	1.5

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	Y
Traffic Vol, veh/h	27	47	17	614	260	10
Future Vol, veh/h	27	47	17	614	260	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	51	18	667	283	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	986	283	294	0	-	0
Stage 1	283	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	275	756	1268	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	271	756	1268	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1268	-	457	-	-
HCM Lane V/C Ratio	0.015	-	0.176	-	-
HCM Control Delay (s)	7.9	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	9	1	47	0	1	1	17	622	0	1	304	3
Future Vol, veh/h	9	1	47	0	1	1	17	622	0	1	304	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	51	0	1	1	18	676	0	1	330	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1045	1044	330	1072	1047	676	333	0	0	676	0	0
Stage 1	332	332	-	712	712	-	-	-	-	-	-	-
Stage 2	713	712	-	360	335	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	207	229	712	198	228	453	1226	-	-	915	-	-
Stage 1	681	644	-	423	436	-	-	-	-	-	-	-
Stage 2	423	436	-	658	643	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	203	225	712	181	224	453	1226	-	-	915	-	-
Mov Cap-2 Maneuver	203	225	-	181	224	-	-	-	-	-	-	-
Stage 1	671	643	-	417	429	-	-	-	-	-	-	-
Stage 2	415	429	-	609	642	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.3		17.1		0.2		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1226	-	-	497	300	915	-	-
HCM Lane V/C Ratio	0.015	-	-	0.125	0.007	0.001	-	-
HCM Control Delay (s)	8	-	-	13.3	17.1	8.9	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Intersection

Int Delay, s/veh 89.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	184	654	1597	183	175	434
Future Vol, veh/h	184	654	1597	183	175	434
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	190	674	1646	189	180	447

Major/Minor

	Major1	Major2	Minor2		
Conflicting Flow All	1646	0	0	2363	823
Stage 1	-	-	-	1646	-
Stage 2	-	-	-	717	-
Critical Hdwy	4.14	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	3.52	3.32
Pot Cap-1 Maneuver	389	-	-	~ 29	~ 317
Stage 1	-	-	-	~ 142	-
Stage 2	-	-	-	445	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	389	-	-	~ 15	~ 317
Mov Cap-2 Maneuver	-	-	-	~ 60	-
Stage 1	-	-	-	~ 73	-
Stage 2	-	-	-	445	-

Approach

	EB	WB	SB
HCM Control Delay, s	5	0	\$ 469.1
HCM LOS			F

Minor Lane/Major Mvmt

	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	389	-	-	-	60	317
HCM Lane V/C Ratio	0.488	-	-	-	3.007	1.411
HCM Control Delay (s)	22.7	-	-	\$ 1050.5	234.6	
HCM Lane LOS	C	-	-	-	F	F
HCM 95th %tile Q(veh)	2.6	-	-	-	18.7	23.5

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	24.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	32	10	52	15	5	7	59	215	20	13	520	35
Future Vol, veh/h	32	10	52	15	5	7	59	215	20	13	520	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	11	57	16	5	8	64	234	22	14	565	38
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.3	9.9	11.4	34.3
HCM LOS	B	A	B	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	34%	56%	100%	0%
Vol Thru, %	0%	91%	11%	19%	0%	94%
Vol Right, %	0%	9%	55%	26%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	59	235	94	27	13	555
LT Vol	59	0	32	15	13	0
Through Vol	0	215	10	5	0	520
RT Vol	0	20	52	7	0	35
Lane Flow Rate	64	255	102	29	14	603
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.108	0.392	0.172	0.053	0.023	0.886
Departure Headway (Hd)	6.09	5.524	6.047	6.482	5.838	5.29
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	589	651	593	552	617	688
Service Time	3.818	3.252	4.088	4.53	3.538	2.99
HCM Lane V/C Ratio	0.109	0.392	0.172	0.053	0.023	0.876
HCM Control Delay	9.6	11.8	10.3	9.9	8.7	34.9
HCM Lane LOS	A	B	B	A	A	D
HCM 95th-tile Q	0.4	1.9	0.6	0.2	0.1	11

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	17	29	41	289	559	24
Future Vol, veh/h	17	29	41	289	559	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	32	45	314	608	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1012	608	634	0	-	0
Stage 1	608	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	496	949	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	253	496	949	-	-	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	949	-	366	-	-
HCM Lane V/C Ratio	0.047	-	0.137	-	-
HCM Control Delay (s)	9	-	16.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	6	1	29	0	2	2	41	324	0	2	580	8
Future Vol, veh/h	6	1	29	0	2	2	41	324	0	2	580	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	32	0	2	2	45	352	0	2	630	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1078	1076	630	1097	1085	352	639	0	0	352	0	0
Stage 1	634	634	-	442	442	-	-	-	-	-	-	-
Stage 2	444	442	-	655	643	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	196	219	482	191	217	692	945	-	-	1207	-	-
Stage 1	467	473	-	594	576	-	-	-	-	-	-	-
Stage 2	593	576	-	455	468	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	186	208	482	171	206	692	945	-	-	1207	-	-
Mov Cap-2 Maneuver	186	208	-	171	206	-	-	-	-	-	-	-
Stage 1	445	472	-	565	548	-	-	-	-	-	-	-
Stage 2	561	548	-	423	467	-	-	-	-	-	-	-

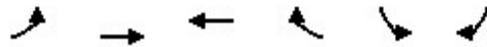
Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.9		16.5		1		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	945	-	-	370	317	1207	-	-
HCM Lane V/C Ratio	0.047	-	-	0.106	0.014	0.002	-	-
HCM Control Delay (s)	9	-	-	15.9	16.5	8	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0	-	-

**FUTURE OPENING YEAR 2024 "BUILD"
INTERSECTION ANALYSIS (WITH
IMPROVEMENTS)**

Timings

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↖↖	↗	↖	↗
Traffic Volume (vph)	529	1492	613	111	174	179
Future Volume (vph)	529	1492	613	111	174	179
Lane Group Flow (vph)	551	1554	639	116	181	186
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	50.0	93.0	43.0	43.0	27.0	27.0
Total Split (%)	41.7%	77.5%	35.8%	35.8%	22.5%	22.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.74	0.60	0.40	0.14	0.72	0.48
Control Delay	13.9	7.7	23.9	5.1	65.1	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	7.7	23.9	5.1	65.1	10.6
Queue Length 50th (ft)	125	237	166	0	135	0
Queue Length 95th (ft)	260	339	270	41	206	63
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	888	2586	1612	810	317	436
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	0.60	0.40	0.14	0.57	0.43

Intersection Summary

Cycle Length: 120

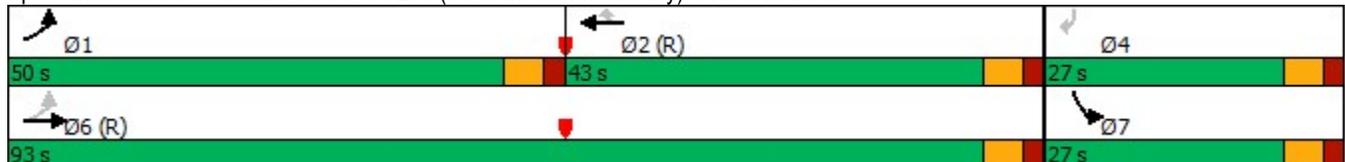
Actuated Cycle Length: 120

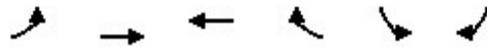
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷	↷	↶	↷
Traffic Volume (veh/h)	529	1492	613	111	174	179
Future Volume (veh/h)	529	1492	613	111	174	179
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	551	1554	639	0	181	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	714	2696	2084		211	
Arrive On Green	0.14	0.79	0.61	0.00	0.12	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	551	1554	639	0	181	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	12.9	21.1	10.8	0.0	12.0	0.0
Cycle Q Clear(g_c), s	12.9	21.1	10.8	0.0	12.0	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	714	2696	2084		211	
V/C Ratio(X)	0.77	0.58	0.31		0.86	
Avail Cap(c_a), veh/h	1128	2696	2084		319	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	7.2	4.9	11.5	0.0	51.9	0.0
Incr Delay (d2), s/veh	1.8	0.9	0.4	0.0	13.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	5.3	3.9	0.0	6.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.0	5.8	11.8	0.0	65.6	0.0
LnGrp LOS	A	A	B		E	
Approach Vol, veh/h		2105	639		181	
Approach Delay, s/veh		6.6	11.8		65.6	
Approach LOS		A	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	22.1	78.2		19.7		100.3
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	44.5	37.5		21.5		87.5
Max Q Clear Time (g_c+I1), s	14.9	12.8		14.0		23.1
Green Ext Time (p_c), s	1.8	7.6		0.3		37.4

Intersection Summary

HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	40	14	57	24	6	11	50	532	10	1	175	33
Future Vol, veh/h	40	14	57	24	6	11	50	532	10	1	175	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	42	15	59	25	6	11	52	554	10	1	182	34

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	873	869	199	901	881	559	216	0	0	564	0	0
Stage 1	201	201	-	663	663	-	-	-	-	-	-	-
Stage 2	672	668	-	238	218	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	271	290	842	259	285	529	1354	-	-	1008	-	-
Stage 1	801	735	-	450	459	-	-	-	-	-	-	-
Stage 2	445	456	-	765	723	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	253	279	842	224	274	529	1354	-	-	1008	-	-
Mov Cap-2 Maneuver	253	279	-	224	274	-	-	-	-	-	-	-
Stage 1	771	734	-	433	442	-	-	-	-	-	-	-
Stage 2	413	439	-	696	722	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	17.5		20.5		0.7		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1354	-	-	402	274	1008	-	-
HCM Lane V/C Ratio	0.038	-	-	0.288	0.156	0.001	-	-
HCM Control Delay (s)	7.8	-	-	17.5	20.5	8.6	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.5	0	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	47	17	614	260	10
Future Vol, veh/h	27	47	17	614	260	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	51	18	667	283	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	986	283	294	0	-	0
Stage 1	283	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	275	756	1268	-	-	-
Stage 1	765	-	-	-	-	-
Stage 2	491	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	271	756	1268	-	-	-
Mov Cap-2 Maneuver	271	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1268	-	457	-	-
HCM Lane V/C Ratio	0.015	-	0.176	-	-
HCM Control Delay (s)	7.9	-	14.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	9	1	47	0	1	1	17	622	0	1	304	3
Future Vol, veh/h	9	1	47	0	1	1	17	622	0	1	304	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	51	0	1	1	18	676	0	1	330	3

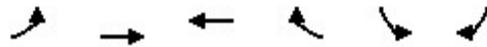
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1045	1044	330	1072	1047	676	333	0	0	676	0	0
Stage 1	332	332	-	712	712	-	-	-	-	-	-	-
Stage 2	713	712	-	360	335	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	207	229	712	198	228	453	1226	-	-	915	-	-
Stage 1	681	644	-	423	436	-	-	-	-	-	-	-
Stage 2	423	436	-	658	643	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	203	225	712	181	224	453	1226	-	-	915	-	-
Mov Cap-2 Maneuver	203	225	-	181	224	-	-	-	-	-	-	-
Stage 1	671	643	-	417	429	-	-	-	-	-	-	-
Stage 2	415	429	-	609	642	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	13.3		17.1		0.2		0	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1226	-	-	497	300	915	-	-
HCM Lane V/C Ratio	0.015	-	-	0.125	0.007	0.001	-	-
HCM Control Delay (s)	8	-	-	13.3	17.1	8.9	0	-
HCM Lane LOS	A	-	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0	0	-	-

Timings

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd

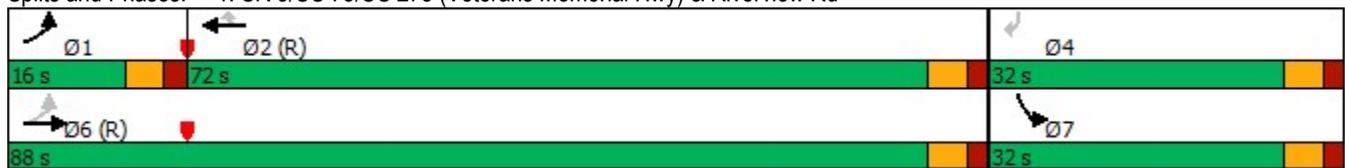


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗↗	↗↗	↖	↖	↖
Traffic Volume (vph)	184	654	1597	183	175	434
Future Volume (vph)	184	654	1597	183	175	434
Lane Group Flow (vph)	190	674	1646	189	180	447
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	16.0	88.0	72.0	72.0	32.0	32.0
Total Split (%)	13.3%	73.3%	60.0%	60.0%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.89	0.29	0.86	0.19	0.48	0.96
Control Delay	67.5	7.5	28.2	2.3	45.9	62.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	7.5	28.2	2.3	45.9	62.3
Queue Length 50th (ft)	96	96	553	0	122	230
Queue Length 95th (ft)	#233	124	671	33	194	#434
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	217	2347	1920	975	390	478
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	0.88	0.29	0.86	0.19	0.46	0.94

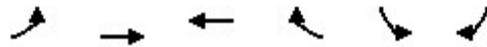
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, 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: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 3d. Build (Opening Year) 2024 PM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↗	↖	↙	↘
Traffic Volume (veh/h)	184	654	1597	183	175	434
Future Volume (veh/h)	184	654	1597	183	175	434
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	190	674	1646	0	180	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	271	2696	2399		211	
Arrive On Green	0.05	0.79	0.70	0.00	0.12	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	190	674	1646	0	180	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	3.4	6.2	33.3	0.0	11.9	0.0
Cycle Q Clear(g_c), s	3.4	6.2	33.3	0.0	11.9	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	271	2696	2399		211	
V/C Ratio(X)	0.70	0.25	0.69		0.85	
Avail Cap(c_a), veh/h	343	2696	2399		393	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	17.5	3.3	10.6	0.0	51.9	0.0
Incr Delay (d2), s/veh	4.5	0.2	1.6	0.0	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	1.5	10.9	0.0	5.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.1	3.5	12.2	0.0	61.2	0.0
LnGrp LOS	C	A	B		E	
Approach Vol, veh/h		864	1646		180	
Approach Delay, s/veh		7.6	12.2		61.2	
Approach LOS		A	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.1	89.1		19.7		100.3
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	10.5	66.5		26.5		82.5
Max Q Clear Time (g_c+I1), s	5.4	35.3		13.9		8.2
Green Ext Time (p_c), s	0.2	24.2		0.4		10.5

Intersection Summary

HCM 6th Ctrl Delay	14.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	32	10	52	15	5	7	59	215	20	13	520	35
Future Vol, veh/h	32	10	52	15	5	7	59	215	20	13	520	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	11	57	16	5	8	64	234	22	14	565	38

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	992	996	584	1019	1004	245	603	0	0	256	0	0
Stage 1	612	612	-	373	373	-	-	-	-	-	-	-
Stage 2	380	384	-	646	631	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	225	244	512	215	242	794	975	-	-	1309	-	-
Stage 1	480	484	-	648	618	-	-	-	-	-	-	-
Stage 2	642	611	-	460	474	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	206	225	512	174	224	794	975	-	-	1309	-	-
Mov Cap-2 Maneuver	206	225	-	174	224	-	-	-	-	-	-	-
Stage 1	448	479	-	605	577	-	-	-	-	-	-	-
Stage 2	589	571	-	396	469	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	22.1		22.9		1.8		0.2	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	975	-	-	312	230	1309	-	-
HCM Lane V/C Ratio	0.066	-	-	0.327	0.128	0.011	-	-
HCM Control Delay (s)	9	-	-	22.1	22.9	7.8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4	0.4	0	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	17	29	41	289	559	24
Future Vol, veh/h	17	29	41	289	559	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	32	45	314	608	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1012	608	634	0	-	0
Stage 1	608	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	265	496	949	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	253	496	949	-	-	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	1.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	949	-	366	-	-
HCM Lane V/C Ratio	0.047	-	0.137	-	-
HCM Control Delay (s)	9	-	16.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.5	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	6	1	29	0	2	2	41	324	0	2	580	8
Future Vol, veh/h	6	1	29	0	2	2	41	324	0	2	580	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	32	0	2	2	45	352	0	2	630	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1078	1076	630	1097	1085	352	639	0	0	352	0	0
Stage 1	634	634	-	442	442	-	-	-	-	-	-	-
Stage 2	444	442	-	655	643	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	196	219	482	191	217	692	945	-	-	1207	-	-
Stage 1	467	473	-	594	576	-	-	-	-	-	-	-
Stage 2	593	576	-	455	468	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	186	208	482	171	206	692	945	-	-	1207	-	-
Mov Cap-2 Maneuver	186	208	-	171	206	-	-	-	-	-	-	-
Stage 1	445	472	-	565	548	-	-	-	-	-	-	-
Stage 2	561	548	-	423	467	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB			
HCM Control Delay, s	15.9		16.5		1		0			
HCM LOS	C		C							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	945	-	-	370	317	1207	-	-
HCM Lane V/C Ratio	0.047	-	-	0.106	0.014	0.002	-	-
HCM Control Delay (s)	9	-	-	15.9	16.5	8	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0	-	-

**FUTURE HORIZON YEAR 2034 "NO-BUILD"
INTERSECTION ANALYSIS**

Intersection

Int Delay, s/veh	76.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↗	↗	↘	↘	↘
Traffic Vol, veh/h	624	1790	736	113	152	184
Future Vol, veh/h	624	1790	736	113	152	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	650	1865	767	118	158	192

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	767	0	-	0	3000
Stage 1	-	-	-	-	767
Stage 2	-	-	-	-	2233
Critical Hdwy	4.14	-	-	-	6.84
Critical Hdwy Stg 1	-	-	-	-	5.84
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	2.22	-	-	-	3.52
Pot Cap-1 Maneuver	842	-	-	-	~ 11
Stage 1	-	-	-	-	419
Stage 2	-	-	-	-	~ 67
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	842	-	-	-	~ 3
Mov Cap-2 Maneuver	-	-	-	-	~ 37
Stage 1	-	-	-	-	~ 96
Stage 2	-	-	-	-	~ 67

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	\$ 774.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	842	-	-	-	37	614
HCM Lane V/C Ratio	0.772	-	-	-	4.279	0.312
HCM Control Delay (s)	22.1	-	-	-	\$ 1695.6	13.5
HCM Lane LOS	C	-	-	-	F	B
HCM 95th %tile Q(veh)	7.7	-	-	-	18.4	1.3

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	35.5
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	54	17	81	29	7	13	61	603	11	1	206	42
Future Vol, veh/h	54	17	81	29	7	13	61	603	11	1	206	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	18	84	30	7	14	64	628	11	1	215	44
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.7	10.6	50.9	13.1
HCM LOS	B	B	F	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	36%	59%	100%	0%
Vol Thru, %	0%	98%	11%	14%	0%	83%
Vol Right, %	0%	2%	53%	27%	0%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	61	614	152	49	1	248
LT Vol	61	0	54	29	1	0
Through Vol	0	603	17	7	0	206
RT Vol	0	11	81	13	0	42
Lane Flow Rate	64	640	158	51	1	258
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.107	0.986	0.275	0.096	0.002	0.428
Departure Headway (Hd)	6.069	5.55	6.248	6.78	6.596	5.967
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	590	652	573	525	541	602
Service Time	3.806	3.287	4.311	4.861	4.349	3.72
HCM Lane V/C Ratio	0.108	0.982	0.276	0.097	0.002	0.429
HCM Control Delay	9.5	55	11.7	10.6	9.4	13.1
HCM Lane LOS	A	F	B	B	A	B
HCM 95th-tile Q	0.4	14.9	1.1	0.3	0	2.1

Intersection

Int Delay, s/veh 222.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	195	785	1916	173	176	504
Future Vol, veh/h	195	785	1916	173	176	504
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	201	809	1975	178	181	520

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1975	0	0 2782 988
Stage 1	-	-	- 1975 -
Stage 2	-	-	- 807 -
Critical Hdwy	4.14	-	- 6.84 6.94
Critical Hdwy Stg 1	-	-	- 5.84 -
Critical Hdwy Stg 2	-	-	- 5.84 -
Follow-up Hdwy	2.22	-	- 3.52 3.32
Pot Cap-1 Maneuver	289	-	- ~ 15 ~ 246
Stage 1	-	-	- ~ 94 -
Stage 2	-	-	- 399 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	289	-	- ~ 5 ~ 246
Mov Cap-2 Maneuver	-	-	- ~ 25 -
Stage 1	-	-	- ~ 29 -
Stage 2	-	-	- 399 -

Approach	EB	WB	SB
HCM Control Delay, s	8.3	0	\$ 1213.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	289	-	-	-	25	246
HCM Lane V/C Ratio	0.696	-	-	-	7.258	2.112
HCM Control Delay (s)	41.6	-	-	-	\$ 3123.1	\$ 546.5
HCM Lane LOS	E	-	-	-	F	F
HCM 95th %tile Q(veh)	4.8	-	-	-	22.6	39.2

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	50.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↵	↵		↵	↵	
Traffic Vol, veh/h	42	12	70	17	6	8	82	246	23	16	598	48
Future Vol, veh/h	42	12	70	17	6	8	82	246	23	16	598	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	13	76	18	7	9	89	267	25	17	650	52
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.5	10.6	12.9	79.7
HCM LOS	B	B	B	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	34%	55%	100%	0%
Vol Thru, %	0%	91%	10%	19%	0%	93%
Vol Right, %	0%	9%	56%	26%	0%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	82	269	124	31	16	646
LT Vol	82	0	42	17	16	0
Through Vol	0	246	12	6	0	598
RT Vol	0	23	70	8	0	48
Lane Flow Rate	89	292	135	34	17	702
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.155	0.463	0.236	0.064	0.029	1.081
Departure Headway (Hd)	6.468	5.899	6.54	7.139	6.101	5.543
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	558	614	553	505	590	660
Service Time	4.168	3.599	4.54	5.139	3.801	3.243
HCM Lane V/C Ratio	0.159	0.476	0.244	0.067	0.029	1.064
HCM Control Delay	10.4	13.6	11.5	10.6	9	81.5
HCM Lane LOS	B	B	B	B	A	F
HCM 95th-tile Q	0.5	2.4	0.9	0.2	0.1	19.8

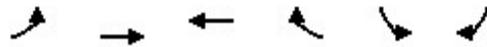
**FUTURE HORIZON YEAR 2034 "NO-BUILD"
INTERSECTION ANALYSIS (WITH
IMPROVEMENTS)**

Timings

4c. No-Build (Horizon Year) 2034 AM - Improved

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd

02/14/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↕	↕	↗	↖	↗
Traffic Volume (vph)	624	1790	736	113	152	184
Future Volume (vph)	624	1790	736	113	152	184
Lane Group Flow (vph)	650	1865	767	118	158	192
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	53.0	98.0	45.0	45.0	22.0	22.0
Total Split (%)	44.2%	81.7%	37.5%	37.5%	18.3%	18.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.84	0.70	0.54	0.16	0.74	0.53
Control Delay	26.5	8.2	30.2	5.5	71.0	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.5	8.2	30.2	5.5	71.0	12.3
Queue Length 50th (ft)	280	320	240	0	118	0
Queue Length 95th (ft)	421	401	340	41	#192	67
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	867	2655	1415	727	243	383
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	0.75	0.70	0.54	0.16	0.65	0.50

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

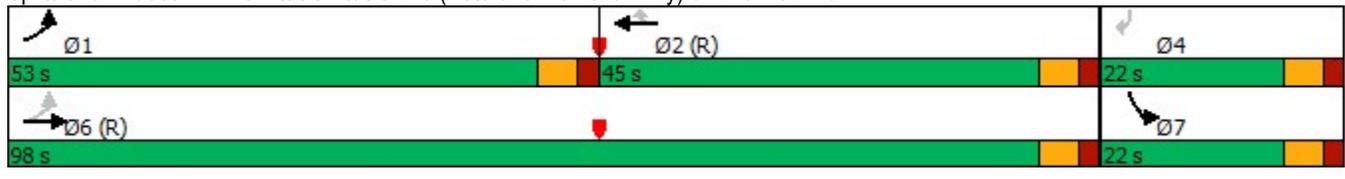
Natural Cycle: 75

Control Type: Actuated-Coordinated

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 4c. No-Build (Horizon Year) 2034 AM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↗	↖	↗
Traffic Volume (veh/h)	624	1790	736	113	152	184
Future Volume (veh/h)	624	1790	736	113	152	184
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	650	1865	767	0	158	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	690	2744	2033		186	
Arrive On Green	0.17	0.80	0.59	0.00	0.10	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	650	1865	767	0	158	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	15.8	28.4	14.1	0.0	10.5	0.0
Cycle Q Clear(g_c), s	15.8	28.4	14.1	0.0	10.5	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	690	2744	2033		186	
V/C Ratio(X)	0.94	0.68	0.38		0.85	
Avail Cap(c_a), veh/h	1097	2744	2033		245	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	12.6	5.1	12.9	0.0	52.8	0.0
Incr Delay (d2), s/veh	10.9	1.4	0.5	0.0	18.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	6.7	5.1	0.0	5.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.5	6.5	13.5	0.0	71.7	0.0
LnGrp LOS	C	A	B		E	
Approach Vol, veh/h		2515	767		158	
Approach Delay, s/veh		10.9	13.5		71.7	
Approach LOS		B	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.6	76.4		18.0		102.0
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	47.5	39.5		16.5		92.5
Max Q Clear Time (g_c+I1), s	17.8	16.1		12.5		30.4
Green Ext Time (p_c), s	2.2	9.1		0.1		46.5

Intersection Summary

HCM 6th Ctrl Delay	14.2
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	54	17	81	29	7	13	61	603	11	1	206	42
Future Vol, veh/h	54	17	81	29	7	13	61	603	11	1	206	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	18	84	30	7	14	64	628	11	1	215	44

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1011	1006	237	1052	1023	634	259	0	0	639	0	0
Stage 1	239	239	-	762	762	-	-	-	-	-	-	-
Stage 2	772	767	-	290	261	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	218	241	802	204	236	479	1306	-	-	945	-	-
Stage 1	764	708	-	397	414	-	-	-	-	-	-	-
Stage 2	392	411	-	718	692	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	199	229	802	165	224	479	1306	-	-	945	-	-
Mov Cap-2 Maneuver	199	229	-	165	224	-	-	-	-	-	-	-
Stage 1	727	707	-	378	394	-	-	-	-	-	-	-
Stage 2	356	391	-	626	691	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	24.5		27.7		0.7		0	
HCM LOS	C		D					

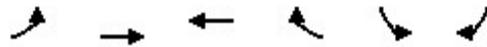
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1306	-	-	340	209	945	-
HCM Lane V/C Ratio	0.049	-	-	0.466	0.244	0.001	-
HCM Control Delay (s)	7.9	-	-	24.5	27.7	8.8	-
HCM Lane LOS	A	-	-	C	D	A	-
HCM 95th %tile Q(veh)	0.2	-	-	2.4	0.9	0	-

Timings

4d. No-Build (Horizon Year) 2034 PM - Improved

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd

02/14/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↗	↖	↗
Traffic Volume (vph)	195	785	1916	173	176	504
Future Volume (vph)	195	785	1916	173	176	504
Lane Group Flow (vph)	201	809	1975	178	181	520
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	15.0	88.0	73.0	73.0	32.0	32.0
Total Split (%)	12.5%	73.3%	60.8%	60.8%	26.7%	26.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	1.00	0.35	1.03	0.18	0.46	1.13
Control Delay	93.4	8.2	55.7	2.3	45.1	114.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.4	8.2	55.7	2.3	45.1	114.3
Queue Length 50th (ft)	106	122	~862	1	123	~377
Queue Length 95th (ft)	#265	154	#1001	32	195	#595
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	202	2319	1915	967	390	460
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	1.00	0.35	1.03	0.18	0.46	1.13

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

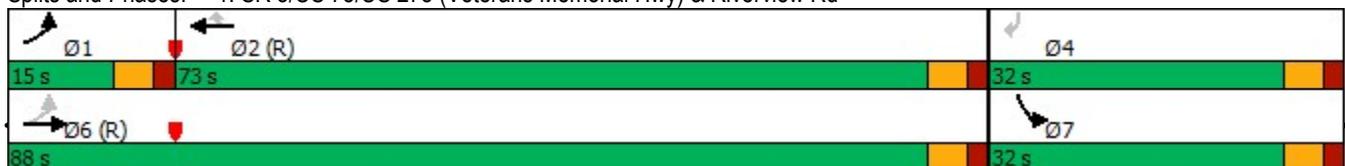
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 4d. No-Build (Horizon Year) 2034 PM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑	↖	↗	↖
Traffic Volume (veh/h)	195	785	1916	173	176	504
Future Volume (veh/h)	195	785	1916	173	176	504
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	201	809	1975	0	181	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	229	2694	2338		212	
Arrive On Green	0.06	0.79	0.68	0.00	0.12	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	201	809	1975	0	181	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	5.6	7.9	51.8	0.0	12.0	0.0
Cycle Q Clear(g_c), s	5.6	7.9	51.8	0.0	12.0	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	229	2694	2338		212	
V/C Ratio(X)	0.88	0.30	0.84		0.85	
Avail Cap(c_a), veh/h	256	2694	2338		393	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	3.5	14.5	0.0	51.8	0.0
Incr Delay (d2), s/veh	25.9	0.3	4.0	0.0	9.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.4	1.9	17.8	0.0	5.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	59.0	3.8	18.4	0.0	61.2	0.0
LnGrp LOS	E	A	B		E	
Approach Vol, veh/h		1010	1975		181	
Approach Delay, s/veh		14.8	18.4		61.2	
Approach LOS		B	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	13.2	87.0		19.8		100.2
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	9.5	67.5		26.5		82.5
Max Q Clear Time (g_c+I1), s	7.6	53.8		14.0		9.9
Green Ext Time (p_c), s	0.1	12.8		0.4		13.5

Intersection Summary

HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	42	12	70	17	6	8	82	246	23	16	598	48
Future Vol, veh/h	42	12	70	17	6	8	82	246	23	16	598	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	13	76	18	7	9	89	267	25	17	650	52

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1176	1180	676	1213	1194	280	702	0	0	292	0	0
Stage 1	710	710	-	458	458	-	-	-	-	-	-	-
Stage 2	466	470	-	755	736	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	190	453	159	187	759	895	-	-	1270	-	-
Stage 1	424	437	-	583	567	-	-	-	-	-	-	-
Stage 2	577	560	-	401	425	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	148	169	453	114	166	759	895	-	-	1270	-	-
Mov Cap-2 Maneuver	148	169	-	114	166	-	-	-	-	-	-	-
Stage 1	382	431	-	525	511	-	-	-	-	-	-	-
Stage 2	507	505	-	319	419	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	36.8		33.9		2.2		0.2	
HCM LOS	E		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	895	-	-	243	158	1270	-	-
HCM Lane V/C Ratio	0.1	-	-	0.555	0.213	0.014	-	-
HCM Control Delay (s)	9.5	-	-	36.8	33.9	7.9	-	-
HCM Lane LOS	A	-	-	E	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3	0.8	0	-	-

**FUTURE HORIZON YEAR 2034 "BUILD"
INTERSECTION ANALYSIS**

Intersection

Int Delay, s/veh 154.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	636	1790	736	135	213	217
Future Vol, veh/h	636	1790	736	135	213	217
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	663	1865	767	141	222	226

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	767	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	842	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	842	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	\$ 1308.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	842	-	-	-	35	614
HCM Lane V/C Ratio	0.787	-	-	-	6.339	0.368
HCM Control Delay (s)	23.1	-	-	-	\$ 2627	14.2
HCM Lane LOS	C	-	-	-	F	B
HCM 95th %tile Q(veh)	8.1	-	-	-	26.5	1.7

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	45.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	54	17	82	29	7	13	64	636	12	1	218	42
Future Vol, veh/h	54	17	82	29	7	13	64	636	12	1	218	42
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	18	85	30	7	14	67	663	13	1	227	44
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.9	10.7	66.1	13.6
HCM LOS	B	B	F	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	35%	59%	100%	0%
Vol Thru, %	0%	98%	11%	14%	0%	84%
Vol Right, %	0%	2%	54%	27%	0%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	648	153	49	1	260
LT Vol	64	0	54	29	1	0
Through Vol	0	636	17	7	0	218
RT Vol	0	12	82	13	0	42
Lane Flow Rate	67	675	159	51	1	271
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.113	1.048	0.278	0.096	0.002	0.448
Departure Headway (Hd)	6.107	5.588	6.432	7.004	6.713	6.089
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	589	655	563	515	536	596
Service Time	3.829	3.31	4.432	5.004	4.413	3.789
HCM Lane V/C Ratio	0.114	1.031	0.282	0.099	0.002	0.455
HCM Control Delay	9.6	71.7	11.9	10.7	9.4	13.6
HCM Lane LOS	A	F	B	B	A	B
HCM 95th-tile Q	0.4	17.9	1.1	0.3	0	2.3

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	27	47	17	744	335	10
Future Vol, veh/h	27	47	17	744	335	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	51	18	809	364	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1209	364	375	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	202	681	1183	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	681	1183	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	421	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1183	-	362	-	-
HCM Lane V/C Ratio	0.016	-	0.222	-	-
HCM Control Delay (s)	8.1	-	17.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	9	1	47	0	1	1	17	752	0	1	379	3
Future Vol, veh/h	9	1	47	0	1	1	17	752	0	1	379	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	51	0	1	1	18	817	0	1	412	3

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1268	1267	412	1295	1270	817	415	0	0	817	0	0
Stage 1	414	414	-	853	853	-	-	-	-	-	-	-
Stage 2	854	853	-	442	417	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	145	169	640	139	168	376	1144	-	-	811	-	-
Stage 1	616	593	-	354	376	-	-	-	-	-	-	-
Stage 2	353	376	-	594	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	142	166	640	126	165	376	1144	-	-	811	-	-
Mov Cap-2 Maneuver	142	166	-	126	165	-	-	-	-	-	-	-
Stage 1	606	592	-	348	370	-	-	-	-	-	-	-
Stage 2	345	370	-	544	590	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		20.9		0.2		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	399	229	811	-	-
HCM Lane V/C Ratio	0.016	-	-	0.155	0.009	0.001	-	-
HCM Control Delay (s)	8.2	-	-	15.7	20.9	9.4	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Intersection

Int Delay, s/veh 402.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑	↗	↘	↗
Traffic Vol, veh/h	224	785	1916	227	214	524
Future Vol, veh/h	224	785	1916	227	214	524
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Yield	-	Yield
Storage Length	125	-	-	350	0	150
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	2	7	6	2	2	2
Mvmt Flow	231	809	1975	234	221	540

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1975	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.14	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.22	-	-
Pot Cap-1 Maneuver	289	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	289	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	11.8	0	\$ 2104
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	289	-	-	-	17	246
HCM Lane V/C Ratio	0.799	-	-	-	-12.978	2.196
HCM Control Delay (s)	53	-	-	-	\$ 5827.1	\$ 583.5
HCM Lane LOS	F	-	-	-	F	F
HCM 95th %tile Q(veh)	6.4	-	-	-	28.4	41.6

Notes
 ~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	61.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	42	12	72	18	6	8	84	266	24	16	627	48
Future Vol, veh/h	42	12	72	18	6	8	84	266	24	16	627	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	13	78	20	7	9	91	289	26	17	682	52
Number of Lanes	0	1	0	0	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.8	10.8	13.7	99.1
HCM LOS	B	B	B	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	33%	56%	100%	0%
Vol Thru, %	0%	92%	10%	19%	0%	93%
Vol Right, %	0%	8%	57%	25%	0%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	84	290	126	32	16	675
LT Vol	84	0	42	18	16	0
Through Vol	0	266	12	6	0	627
RT Vol	0	24	72	8	0	48
Lane Flow Rate	91	315	137	35	17	734
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.161	0.506	0.239	0.067	0.03	1.138
Departure Headway (Hd)	6.529	5.961	6.683	7.316	6.142	5.586
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	552	608	541	493	585	653
Service Time	4.229	3.661	4.683	5.316	3.854	3.298
HCM Lane V/C Ratio	0.165	0.518	0.253	0.071	0.029	1.124
HCM Control Delay	10.5	14.6	11.8	10.8	9	101.2
HCM Lane LOS	B	B	B	B	A	F
HCM 95th-tile Q	0.6	2.9	0.9	0.2	0.1	23

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	17	29	41	372	688	24
Future Vol, veh/h	17	29	41	372	688	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	32	45	404	748	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1242	748	774	0	-	0
Stage 1	748	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	193	412	842	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	183	412	842	-	-	-
Mov Cap-2 Maneuver	183	-	-	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	613	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.5	0.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	842	-	282	-	-
HCM Lane V/C Ratio	0.053	-	0.177	-	-
HCM Control Delay (s)	9.5	-	20.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	6	1	29	0	2	2	41	407	0	2	709	8
Future Vol, veh/h	6	1	29	0	2	2	41	407	0	2	709	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	32	0	2	2	45	442	0	2	771	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1309	1307	771	1328	1316	442	780	0	0	442	0	0
Stage 1	775	775	-	532	532	-	-	-	-	-	-	-
Stage 2	534	532	-	796	784	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	136	160	400	132	158	615	837	-	-	1118	-	-
Stage 1	391	408	-	531	526	-	-	-	-	-	-	-
Stage 2	530	526	-	380	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	151	400	116	149	615	837	-	-	1118	-	-
Mov Cap-2 Maneuver	128	151	-	116	149	-	-	-	-	-	-	-
Stage 1	370	407	-	502	498	-	-	-	-	-	-	-
Stage 2	498	498	-	348	403	-	-	-	-	-	-	-

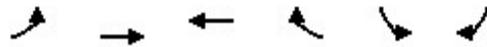
Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.6		20.3		0.9		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	837	-	-	286	240	1118	-	-
HCM Lane V/C Ratio	0.053	-	-	0.137	0.018	0.002	-	-
HCM Control Delay (s)	9.5	-	-	19.6	20.3	8.2	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0	-	-

**FUTURE HORIZON YEAR 2034 "BUILD"
INTERSECTION ANALYSIS (WITH
IMPROVEMENTS)**

Timings

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd

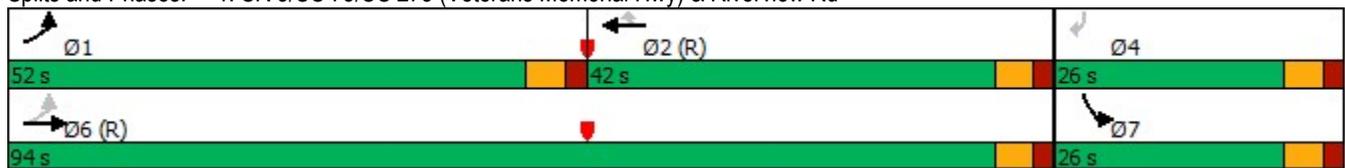


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↶	↷	↷	↷	↶	↷
Traffic Volume (vph)	636	1790	736	135	213	217
Future Volume (vph)	636	1790	736	135	213	217
Lane Group Flow (vph)	663	1865	767	141	222	226
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	52.0	94.0	42.0	42.0	26.0	26.0
Total Split (%)	43.3%	78.3%	35.0%	35.0%	21.7%	21.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	0.87	0.73	0.62	0.21	0.81	0.52
Control Delay	33.4	10.7	35.5	5.8	71.5	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	10.7	35.5	5.8	71.5	10.2
Queue Length 50th (ft)	334	389	267	0	165	0
Queue Length 95th (ft)	494	475	354	47	#272	69
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	822	2543	1245	668	302	457
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	0.81	0.73	0.62	0.21	0.74	0.49

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, 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: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 5c. Build (Horizon Year) 2034 AM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑↑	↑↑	↖	↘	↘
Traffic Volume (veh/h)	636	1790	736	135	213	217
Future Volume (veh/h)	636	1790	736	135	213	217
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	662	1865	767	0	222	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	701	2620	1735		251	
Arrive On Green	0.22	0.77	0.50	0.00	0.14	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	662	1865	767	0	222	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	21.9	33.6	17.1	0.0	14.7	0.0
Cycle Q Clear(g_c), s	21.9	33.6	17.1	0.0	14.7	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	701	2620	1735		251	
V/C Ratio(X)	0.94	0.71	0.44		0.89	
Avail Cap(c_a), veh/h	1004	2620	1735		304	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	16.9	7.1	19.0	0.0	50.6	0.0
Incr Delay (d2), s/veh	13.2	1.7	0.8	0.0	22.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	9.2	6.6	0.0	8.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.1	8.8	19.8	0.0	72.9	0.0
LnGrp LOS	C	A	B		E	
Approach Vol, veh/h		2527	767		222	
Approach Delay, s/veh		14.4	19.8		72.9	
Approach LOS		B	B		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	31.6	66.0		22.4		97.6
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	46.5	36.5		20.5		88.5
Max Q Clear Time (g_c+I1), s	23.9	19.1		16.7		35.6
Green Ext Time (p_c), s	2.2	7.8		0.2		41.1

Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	54	17	82	29	7	13	64	636	12	1	218	42
Future Vol, veh/h	54	17	82	29	7	13	64	636	12	1	218	42
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	18	85	30	7	14	67	663	13	1	227	44

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1065	1061	249	1107	1077	670	271	0	0	676	0	0
Stage 1	251	251	-	804	804	-	-	-	-	-	-	-
Stage 2	814	810	-	303	273	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	200	224	790	188	219	457	1292	-	-	915	-	-
Stage 1	753	699	-	377	396	-	-	-	-	-	-	-
Stage 2	372	393	-	706	684	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	181	212	790	151	207	457	1292	-	-	915	-	-
Mov Cap-2 Maneuver	181	212	-	151	207	-	-	-	-	-	-	-
Stage 1	714	698	-	357	375	-	-	-	-	-	-	-
Stage 2	336	373	-	613	683	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	27.3		30.2		0.7		0	
HCM LOS	D		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	317	193	915	-	-
HCM Lane V/C Ratio	0.052	-	-	0.503	0.264	0.001	-	-
HCM Control Delay (s)	7.9	-	-	27.3	30.2	8.9	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	1	0	-	-

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘		↘	↑	↑	↘
Traffic Vol, veh/h	27	47	17	744	335	10
Future Vol, veh/h	27	47	17	744	335	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	51	18	809	364	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1209	364	375	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	202	681	1183	-	-	-
Stage 1	703	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	199	681	1183	-	-	-
Mov Cap-2 Maneuver	199	-	-	-	-	-
Stage 1	692	-	-	-	-	-
Stage 2	421	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1183	-	362	-	-
HCM Lane V/C Ratio	0.016	-	0.222	-	-
HCM Control Delay (s)	8.1	-	17.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	9	1	47	0	1	1	17	752	0	1	379	3
Future Vol, veh/h	9	1	47	0	1	1	17	752	0	1	379	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	51	0	1	1	18	817	0	1	412	3

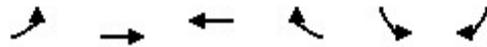
Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1268	1267	412	1295	1270	817	415	0	0	817	0	0
Stage 1	414	414	-	853	853	-	-	-	-	-	-	-
Stage 2	854	853	-	442	417	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	145	169	640	139	168	376	1144	-	-	811	-	-
Stage 1	616	593	-	354	376	-	-	-	-	-	-	-
Stage 2	353	376	-	594	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	142	166	640	126	165	376	1144	-	-	811	-	-
Mov Cap-2 Maneuver	142	166	-	126	165	-	-	-	-	-	-	-
Stage 1	606	592	-	348	370	-	-	-	-	-	-	-
Stage 2	345	370	-	544	590	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	15.7		20.9		0.2		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	399	229	811	-	-
HCM Lane V/C Ratio	0.016	-	-	0.155	0.009	0.001	-	-
HCM Control Delay (s)	8.2	-	-	15.7	20.9	9.4	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Timings

1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd

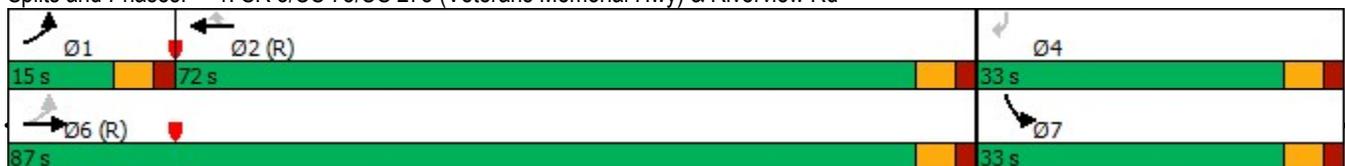


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑↑	↑↑	↗	↖	↗
Traffic Volume (vph)	224	785	1916	227	214	524
Future Volume (vph)	224	785	1916	227	214	524
Lane Group Flow (vph)	231	809	1975	234	221	540
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		7	
Permitted Phases	6			2		4
Detector Phase	1	6	2	2	7	4
Switch Phase						
Minimum Initial (s)	5.0	15.0	15.0	15.0	5.0	6.0
Minimum Split (s)	15.0	28.5	28.5	28.5	15.0	15.0
Total Split (s)	15.0	87.0	72.0	72.0	33.0	33.0
Total Split (%)	12.5%	72.5%	60.0%	60.0%	27.5%	27.5%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5
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)	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Recall Mode	None	C-Min	C-Min	C-Min	None	None
v/c Ratio	1.14	0.35	1.05	0.24	0.55	1.14
Control Delay	137.6	8.6	61.3	2.5	46.6	117.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.6	8.6	61.3	2.5	46.6	117.8
Queue Length 50th (ft)	~158	126	~874	2	152	~399
Queue Length 95th (ft)	#322	158	#1013	38	235	#619
Internal Link Dist (ft)		1223	766		682	
Turn Bay Length (ft)	125			350		150
Base Capacity (vph)	202	2291	1887	978	405	473
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	1.14	0.35	1.05	0.24	0.55	1.14

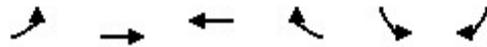
Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBTL, Start of Green
 Natural Cycle: 140
 Control Type: Actuated-Coordinated
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd



HCM 6th Signalized Intersection Summary 5d. Build (Horizon Year) 2034 PM - Improved
 1: SR 8/US 78/US 278 (Veterans Memorial Hwy) & Riverview Rd 02/14/2023



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	224	785	1916	227	214	524
Future Volume (veh/h)	224	785	1916	227	214	524
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1796	1811	1870	1870	1870
Adj Flow Rate, veh/h	231	809	1975	0	221	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	7	6	2	2	2
Cap, veh/h	236	2616	2207		253	
Arrive On Green	0.08	0.77	0.64	0.00	0.14	0.00
Sat Flow, veh/h	1781	3503	3532	1585	1781	1585
Grp Volume(v), veh/h	231	809	1975	0	221	0
Grp Sat Flow(s),veh/h/ln	1781	1706	1721	1585	1781	1585
Q Serve(g_s), s	9.1	8.7	58.0	0.0	14.6	0.0
Cycle Q Clear(g_c), s	9.1	8.7	58.0	0.0	14.6	0.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	236	2616	2207		253	
V/C Ratio(X)	0.98	0.31	0.89		0.87	
Avail Cap(c_a), veh/h	236	2616	2207		408	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	1.00	0.00
Uniform Delay (d), s/veh	38.8	4.3	18.1	0.0	50.4	0.0
Incr Delay (d2), s/veh	52.4	0.3	6.1	0.0	11.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	2.4	21.4	0.0	7.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	91.2	4.6	24.2	0.0	62.0	0.0
LnGrp LOS	F	A	C		E	
Approach Vol, veh/h		1040	1975		221	
Approach Delay, s/veh		23.8	24.2		62.0	
Approach LOS		C	C		E	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.0	82.5		22.5		97.5
Change Period (Y+Rc), s	5.5	5.5		5.5		5.5
Max Green Setting (Gmax), s	9.5	66.5		27.5		81.5
Max Q Clear Time (g_c+I1), s	11.1	60.0		16.6		10.7
Green Ext Time (p_c), s	0.0	6.3		0.4		13.5

Intersection Summary

HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Vol, veh/h	42	12	72	18	6	8	84	266	24	16	627	48
Future Vol, veh/h	42	12	72	18	6	8	84	266	24	16	627	48
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	90	-	-	85	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	46	13	78	20	7	9	91	289	26	17	682	52

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	1234	1239	708	1272	1252	302	734	0	0	315	0	0
Stage 1	742	742	-	484	484	-	-	-	-	-	-	-
Stage 2	492	497	-	788	768	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	153	175	435	144	172	738	871	-	-	1245	-	-
Stage 1	408	422	-	564	552	-	-	-	-	-	-	-
Stage 2	558	545	-	384	411	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	133	155	435	101	152	738	871	-	-	1245	-	-
Mov Cap-2 Maneuver	133	155	-	101	152	-	-	-	-	-	-	-
Stage 1	366	416	-	505	495	-	-	-	-	-	-	-
Stage 2	487	488	-	301	405	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	42.7		39		2.2		0.2	
HCM LOS	E		E					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	871	-	-	226	140	1245	-	-
HCM Lane V/C Ratio	0.105	-	-	0.606	0.248	0.014	-	-
HCM Control Delay (s)	9.6	-	-	42.7	39	7.9	-	-
HCM Lane LOS	A	-	-	E	E	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	3.5	0.9	0	-	-

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	↔
Traffic Vol, veh/h	17	29	41	372	688	24
Future Vol, veh/h	17	29	41	372	688	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	160	-	-	100
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	32	45	404	748	26

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1242	748	774	0	-	0
Stage 1	748	-	-	-	-	-
Stage 2	494	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	193	412	842	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	183	412	842	-	-	-
Mov Cap-2 Maneuver	183	-	-	-	-	-
Stage 1	443	-	-	-	-	-
Stage 2	613	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.5	0.9	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	842	-	282	-	-
HCM Lane V/C Ratio	0.053	-	0.177	-	-
HCM Control Delay (s)	9.5	-	20.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	↕
Traffic Vol, veh/h	6	1	29	0	2	2	41	407	0	2	709	8
Future Vol, veh/h	6	1	29	0	2	2	41	407	0	2	709	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	160	-	-	-	-	100
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	32	0	2	2	45	442	0	2	771	9

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1309	1307	771	1328	1316	442	780	0	0	442	0	0
Stage 1	775	775	-	532	532	-	-	-	-	-	-	-
Stage 2	534	532	-	796	784	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	136	160	400	132	158	615	837	-	-	1118	-	-
Stage 1	391	408	-	531	526	-	-	-	-	-	-	-
Stage 2	530	526	-	380	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	128	151	400	116	149	615	837	-	-	1118	-	-
Mov Cap-2 Maneuver	128	151	-	116	149	-	-	-	-	-	-	-
Stage 1	370	407	-	502	498	-	-	-	-	-	-	-
Stage 2	498	498	-	348	403	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	19.6		20.3		0.9		0	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	837	-	-	286	240	1118	-	-
HCM Lane V/C Ratio	0.053	-	-	0.137	0.018	0.002	-	-
HCM Control Delay (s)	9.5	-	-	19.6	20.3	8.2	0	-
HCM Lane LOS	A	-	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0	-	-

**SIGNAL WARRANT ANALYSIS BASE YEAR 2023
(RIVERVIEW ROAD AND VETERANS MEMORIAL
HWY)**

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - SR 8/US 78/US 278 (Veterans Memorial Hwy) @ Riverview Rd

Project Number : 22-233

Report Date : February 28, 2023

Counts Date : February 1, 2023

Major Street : SR 8/US 78/US 278 (Veterans Me

Minor Street : Riverview Rd

Speed on Major Street : 45

Lanes @ Intersection : Major Street - 2

Minor Street - 1

Analyst : SDP

WARRANT 1. EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	1	HOURS
		CONDITION B	4	HOURS
STANDARD 2	NOT SATISFIED	CONDITION A	2	HOURS
		CONDITION B	4	HOURS

WARRANT 2. FOUR-HOUR VEHICULAR VOLUME

WARRANT 2 SATISFIED 4 HOURS

WARRANT 3. PEAK HOUR

WARRANT 3	SATISFIED			
STANDARD A	NOT EVALUATED	0	VEHICLE HOURS	
STANDARD B	SATISFIED	4	HOURS	

WARRANT 4. PEDESTRIAN VOLUME

WARRANT 4	NOT EVALUATED			
STANDARD A	NOT SATISFIED	0	HOURS	
STANDARD B	NOT SATISFIED	0	HOURS	

WARRANT 5. SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6. COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7. CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8. ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9. INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - SR 8/US 78/US 278 (Veterans Memorial Hwy) @ Riverview Rd

Project Number : 22-233	Report Date : February 28, 2023
	Counts Date : February 1, 2023
Major Street : SR 8/US 78/US 278 (Veterans Me	Lanes @ Intersection : Major Street - 2
Minor Street : Riverview Rd	Minor Street - 1
Speed on Major Street : 45	Analyst : SDP

24-HOUR TRAFFIC VOLUME
TABLE 1

Time	Minor Street				Minor Street			
	Northbound				Southbound			
	Total Approach Volume	Right Turn	% Right Turn	With 100 % RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 100% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	0	0	0	0	245	125	51	120
8:00 AM	0	0	0	0	232	129	56	103
9:00 AM	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	541	439	81	102
5:00 PM	0	0	0	0	527	374	71	153
6:00 PM	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				0				478

A&R ENGINEERING, INC.

24-HOUR TRAFFIC VOLUME
TABLE 2

Time	Major Street				Major Street			
	Eastbound				Westbound			
24 Hours	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	2085	0	0	2085	554	73	13	554
8:00 AM	1711	0	0	1711	744	75	10	744
9:00 AM	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0
4:00 PM	665	0	0	665	1393	127	9	1393
5:00 PM	756	0	0	756	1606	109	7	1606
6:00 PM	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				5217				4297

A&R ENGINEERING, INC.

WARRANT ANALYSIS RESULTS - SR 8/US 78/US 278 (Veterans Memorial Hwy) @ Riverview

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	1	HOURS
		CONDITION B	4	HOURS
<hr/>				
STANDARD 2	NOT SATISFIED	CONDITION A	2	HOURS
		CONDITION B	4	HOURS

24-HOUR TRAFFIC VOLUME EVALUATION

TABLE 3

HOUR OF DAY	MAJOR ST TOTAL OF BOTH APPROACHES	MINOR ST HIGH VOLUME APPROACH	WARRANT 1			
			STANDARD 1		STANDARD 2	
			CONDITION A	CONDITION B	CONDITION A	CONDITION B
12:00 AM	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0
7:00 AM	2639	120	MAJOR	BOTH	BOTH	BOTH
8:00 AM	2455	103	MAJOR	BOTH	MAJOR	BOTH
9:00 AM	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0
4:00 PM	2058	102	MAJOR	BOTH	MAJOR	BOTH
5:00 PM	2362	153	BOTH	BOTH	BOTH	BOTH
6:00 PM	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0
TOTAL	9514	478				

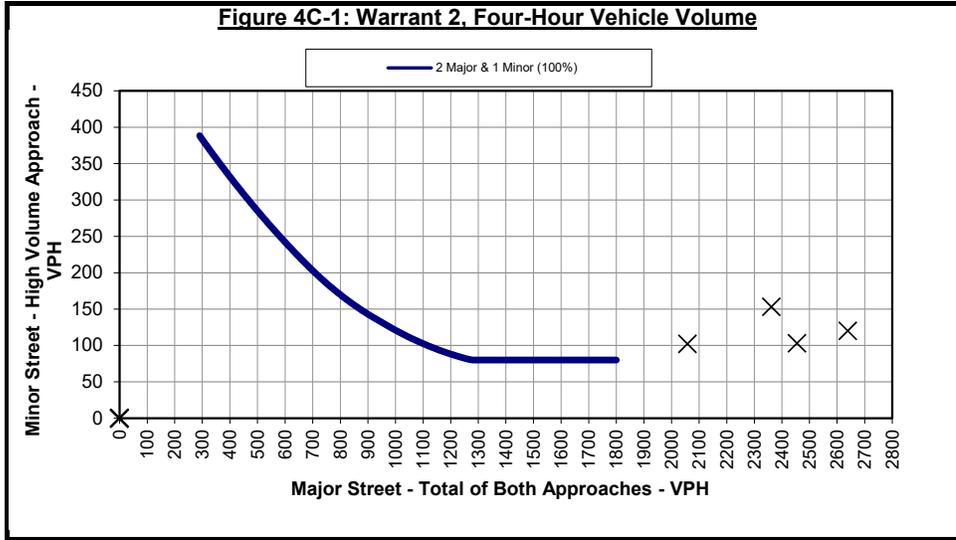
CRITERIA**	STANDARD 1 - 100%		STANDARD 2 - 80%	
	CONDITION A	CONDITION B	CONDITION A	CONDITION B
MAJOR ST	600	900	480	720
MINOR ST	150	75	120	60
NO. OF HOURS MET	1	4	2	4

A&R ENGINEERING, INC.

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

WARRANT 2* SATISFIED

4 HOURS



WARRANT 3, PEAK HOUR

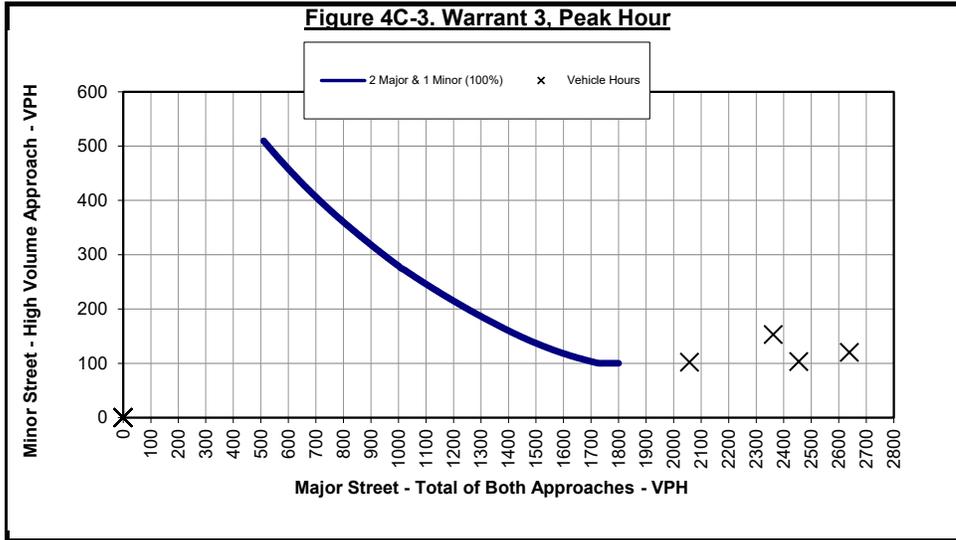
STANDARD A NOT EVALUATED

0 VEHICLE HOURS

- 0 Peak Hour Minor-Street Volume
- 0 Average Minor-Street Delay (seconds)
- 1 Number of Approach Lanes (Minor Street)

STANDARD B* SATISFIED

4 HOURS



*Note: Curves for minimum volumes are based on the curves from FIGURES 4C-1 & 4C-2, Page 4C-7 for WARRANT 2, and FIGURES 4C-3 & 4C-4, Page 4C-9 in section C of the MUTCD 2009 edition for WARRANT 3.

A&R ENGINEERING, INC.

WARRANT 4, PEDESTRIAN VOLUME

WARRANT 4	NOT EVALUATED		
	STANDARD A	NOT SATISFIED	0 HOURS
	STANDARD B	NOT SATISFIED	0 HOURS

WARRANT 5, SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6, COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7, CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8, ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9, INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

**SIGNAL WARRANT ANALYSIS NO BUILD 2024
(RIVERVIEW ROAD AND VETERANS MEMORIAL
HWY)**

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - Riverview Rd @ Nichols Drive

Project Number : 22-233

Report Date : February 28, 2023

Counts Date : February 1, 2023

Major Street : Riverview Rd

Minor Street : Nichols Drive

Speed on Major Street : 35

Lanes @ Intersection : Major Street - 1

Minor Street - 1

Analyst : SDP

WARRANT 1. EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS
STANDARD 2	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS

WARRANT 2. FOUR-HOUR VEHICULAR VOLUME

WARRANT 2 NOT SATISFIED 0 HOURS

WARRANT 3. PEAK HOUR

WARRANT 3	NOT SATISFIED			
STANDARD A	NOT EVALUATED	0	VEHICLE HOURS	
STANDARD B	NOT SATISFIED	0	HOURS	

WARRANT 4. PEDESTRIAN VOLUME

WARRANT 4	NOT EVALUATED			
STANDARD A	NOT SATISFIED	0	HOURS	
STANDARD B	NOT SATISFIED	0	HOURS	

WARRANT 5. SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6. COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7. CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8. ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9. INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - Riverview Rd @ Nichols Drive

Project Number : 22-233	Report Date : February 28, 2023
	Counts Date : February 1, 2023
Major Street : Riverview Rd	Lanes @ Intersection : Major Street - 1
Minor Street : Nichols Drive	Minor Street - 1
Speed on Major Street : 35	Analyst : SDP

24-HOUR TRAFFIC VOLUME
TABLE 1

Time	Major Street				Major Street			
	Northbound				Southbound			
	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	552	8	1	552	192	22	11	192
8:00 AM	592	10	2	592	209	33	16	209
9:00 AM	302	10	3	302	141	23	16	141
10:00 AM	217	8	4	217	146	20	14	146
11:00 AM	201	12	6	201	154	18	12	154
12:00 PM	218	12	6	218	187	33	18	187
1:00 PM	212	16	8	212	207	41	20	207
2:00 PM	189	10	5	189	222	32	14	222
3:00 PM	209	13	6	209	338	26	8	338
4:00 PM	265	16	6	265	505	30	6	505
5:00 PM	294	20	7	294	568	35	6	568
6:00 PM	248	24	10	248	436	42	10	436
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				3499				3305

A&R ENGINEERING, INC.

24-HOUR TRAFFIC VOLUME
TABLE 2

Time	Minor Street				Minor Street			
	Eastbound				Westbound			
24 Hours	Total Approach Volume	Right Turn	% Right Turn	With 100% RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 100% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	101	65	64	36	35	4	11	31
8:00 AM	111	57	51	54	41	11	27	30
9:00 AM	76	37	49	39	24	7	29	17
10:00 AM	70	41	59	29	20	6	30	14
11:00 AM	72	37	51	35	20	4	20	16
12:00 PM	90	48	53	42	21	6	29	15
1:00 PM	76	38	50	38	22	6	27	16
2:00 PM	55	32	58	23	21	6	29	15
3:00 PM	81	56	69	25	26	10	38	16
4:00 PM	81	47	58	34	24	7	29	17
5:00 PM	94	52	55	42	27	7	26	20
6:00 PM	81	43	53	38	27	11	41	16
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				435				223

A&R ENGINEERING, INC.

WARRANT ANALYSIS RESULTS - Riverview Rd @ Nichols Drive

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS
<hr/>				
STANDARD 2	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS

24-HOUR TRAFFIC VOLUME EVALUATION

TABLE 3

HOUR OF DAY	MAJOR ST TOTAL OF BOTH APPROACHES	MINOR ST HIGH VOLUME APPROACH	WARRANT 1			
			STANDARD 1		STANDARD 2	
			CONDITION A	CONDITION B	CONDITION A	CONDITION B
12:00 AM	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0
7:00 AM	744	36	MAJOR	0	MAJOR	MAJOR
8:00 AM	801	54	MAJOR	MAJOR	MAJOR	MAJOR
9:00 AM	443	39	0	0	MAJOR	0
10:00 AM	363	29	0	0	0	0
11:00 AM	355	35	0	0	0	0
12:00 PM	405	42	0	0	MAJOR	0
1:00 PM	419	38	0	0	MAJOR	0
2:00 PM	411	23	0	0	MAJOR	0
3:00 PM	547	25	MAJOR	0	MAJOR	0
4:00 PM	770	34	MAJOR	MAJOR	MAJOR	MAJOR
5:00 PM	862	42	MAJOR	MAJOR	MAJOR	MAJOR
6:00 PM	684	38	MAJOR	0	MAJOR	MAJOR
7:00 PM	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0
TOTAL	6804	435				

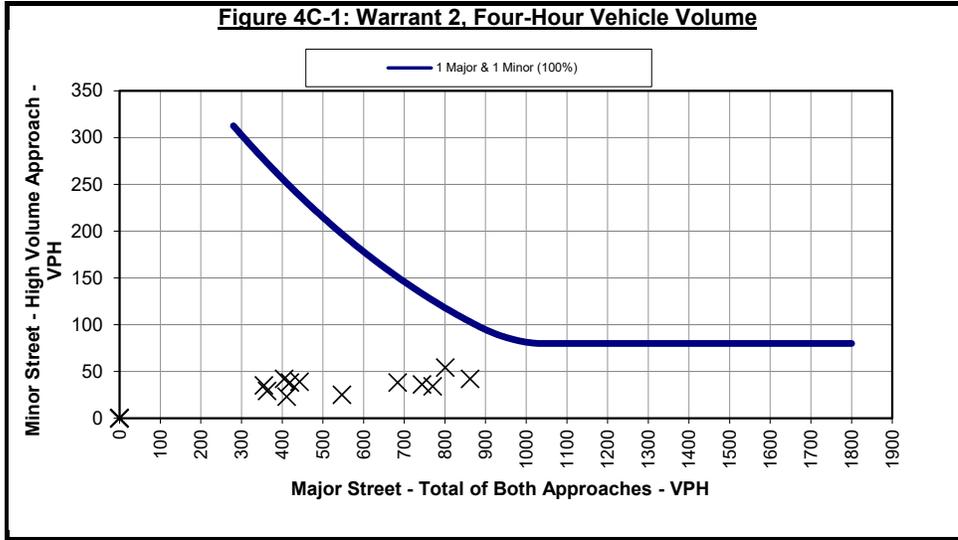
CRITERIA**	STANDARD 1 - 100%		STANDARD 2 - 80%	
	CONDITION A	CONDITION B	CONDITION A	CONDITION B
MAJOR ST	500	750	400	600
MINOR ST	150	75	120	60
NO. OF HOURS MET	0	0	0	0

A&R ENGINEERING, INC.

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

WARRANT 2* NOT SATISFIED

0 HOURS



WARRANT 3, PEAK HOUR

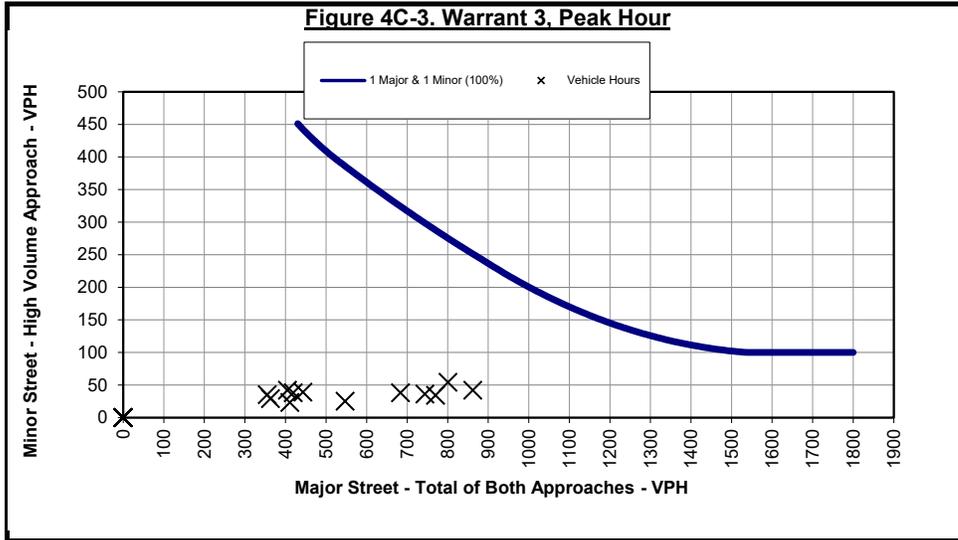
STANDARD A NOT EVALUATED

0 VEHICLE HOURS

- 0 Peak Hour Minor-Street Volume
- 0 Average Minor-Street Delay (seconds)
- 1 Number of Approach Lanes (Minor Street)

STANDARD B* NOT SATISFIED

0 HOURS



*Note: Curves for minimum volumes are based on the curves from FIGURES 4C-1 & 4C-2, Page 4C-7 for WARRANT 2, and FIGURES 4C-3 & 4C-4, Page 4C-9 in section C of the MUTCD 2009 edition for WARRANT 3.

A&R ENGINEERING, INC.

WARRANT 4, PEDESTRIAN VOLUME

WARRANT 4	NOT EVALUATED		
	STANDARD A	NOT SATISFIED	0 HOURS
	STANDARD B	NOT SATISFIED	0 HOURS

WARRANT 5, SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6, COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7, CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8, ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9, INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

**SIGNAL WARRANT ANALYSIS HORIZON YEAR
2034(NICHOLS DRIVE AND RIVERVIEW ROAD)**

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - Riverview Rd @ Nichols Drive

Project Number : 22-233

Report Date : February 28, 2023

Counts Date : February 1, 2023

Major Street : Riverview Rd

Minor Street : Nichols Drive

Speed on Major Street : 35

Lanes @ Intersection : Major Street - 1

Minor Street - 1

Analyst : SDP

WARRANT 1. EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS
STANDARD 2	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	1	HOURS

WARRANT 2. FOUR-HOUR VEHICULAR VOLUME

WARRANT 2 NOT SATISFIED 0 HOURS

WARRANT 3. PEAK HOUR

WARRANT 3 NOT SATISFIED

STANDARD A	NOT EVALUATED	0	VEHICLE HOURS
STANDARD B	NOT SATISFIED	0	HOURS

WARRANT 4. PEDESTRIAN VOLUME

WARRANT 4 NOT EVALUATED

STANDARD A	NOT SATISFIED	0	HOURS
STANDARD B	NOT SATISFIED	0	HOURS

WARRANT 5. SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6. COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7. CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8. ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9. INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

A&R ENGINEERING, INC.

SIGNAL WARRANT ANALYSIS SUMMARY REPORT - Riverview Rd @ Nichols Drive

Project Number : 22-233	Report Date : February 28, 2023
	Counts Date : February 1, 2023
Major Street : Riverview Rd	Lanes @ Intersection : Major Street - 1
Minor Street : Nichols Drive	Minor Street - 1
Speed on Major Street : 35	Analyst : SDP

24-HOUR TRAFFIC VOLUME

TABLE 1

Time	Major Street				Major Street			
	Northbound				Southbound			
	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 0% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	664	9	1	664	247	28	11	247
8:00 AM	712	12	2	712	261	42	16	261
9:00 AM	370	12	3	370	179	30	17	179
10:00 AM	268	9	3	268	182	27	15	182
11:00 AM	251	14	6	251	192	25	13	192
12:00 PM	273	14	5	273	233	44	19	233
1:00 PM	265	19	7	265	255	53	21	255
2:00 PM	239	12	5	239	276	42	15	276
3:00 PM	272	15	6	272	413	36	9	413
4:00 PM	342	19	6	342	614	42	7	614
5:00 PM	374	24	6	374	691	48	7	691
6:00 PM	322	29	9	322	532	56	11	532
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				4352				4075

A&R ENGINEERING, INC.

24-HOUR TRAFFIC VOLUME
TABLE 2

Time	Minor Street				Minor Street			
	Eastbound				Westbound			
24 Hours	Total Approach Volume	Right Turn	% Right Turn	With 100% RT Turn Reduction	Total Approach Volume	Right Turn	% Right Turn	With 100% RT Turn Reduction
12:00 AM	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0
7:00 AM	149	98	66	51	42	5	12	37
8:00 AM	153	82	54	71	49	13	27	36
9:00 AM	107	55	51	52	28	8	29	20
10:00 AM	93	55	59	38	24	7	29	17
11:00 AM	98	52	53	46	24	5	21	19
12:00 PM	118	65	55	53	25	7	28	18
1:00 PM	100	52	52	48	26	7	27	19
2:00 PM	78	47	60	31	25	7	28	18
3:00 PM	107	74	69	33	31	12	39	19
4:00 PM	108	64	59	44	28	8	29	20
5:00 PM	126	72	57	54	32	8	25	24
6:00 PM	110	61	55	49	32	13	41	19
7:00 PM	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0	0	0
Total				570				266

A&R ENGINEERING, INC.

WARRANT ANALYSIS RESULTS - Riverview Rd @ Nichols Drive

WARRANT 1 - EIGHT-HOUR VEHICULAR VOLUME

WARRANT 1 NOT SATISFIED

STANDARD 1	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	0	HOURS
<hr/>				
STANDARD 2	NOT SATISFIED	CONDITION A	0	HOURS
		CONDITION B	1	HOURS

24-HOUR TRAFFIC VOLUME EVALUATION

TABLE 3

HOUR OF DAY	MAJOR ST TOTAL OF BOTH APPROACHES	MINOR ST HIGH VOLUME APPROACH	WARRANT 1			
			STANDARD 1		STANDARD 2	
			CONDITION A	CONDITION B	CONDITION A	CONDITION B
12:00 AM	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0
7:00 AM	911	51	MAJOR	MAJOR	MAJOR	MAJOR
8:00 AM	973	71	MAJOR	MAJOR	MAJOR	BOTH
9:00 AM	549	52	MAJOR	0	MAJOR	0
10:00 AM	450	38	0	0	MAJOR	0
11:00 AM	443	46	0	0	MAJOR	0
12:00 PM	506	53	MAJOR	0	MAJOR	0
1:00 PM	520	48	MAJOR	0	MAJOR	0
2:00 PM	515	31	MAJOR	0	MAJOR	0
3:00 PM	685	33	MAJOR	0	MAJOR	MAJOR
4:00 PM	956	44	MAJOR	MAJOR	MAJOR	MAJOR
5:00 PM	1065	54	MAJOR	MAJOR	MAJOR	MAJOR
6:00 PM	854	49	MAJOR	MAJOR	MAJOR	MAJOR
7:00 PM	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0
9:00 PM	0	0	0	0	0	0
10:00 PM	0	0	0	0	0	0
11:00 PM	0	0	0	0	0	0
TOTAL	8427	570				

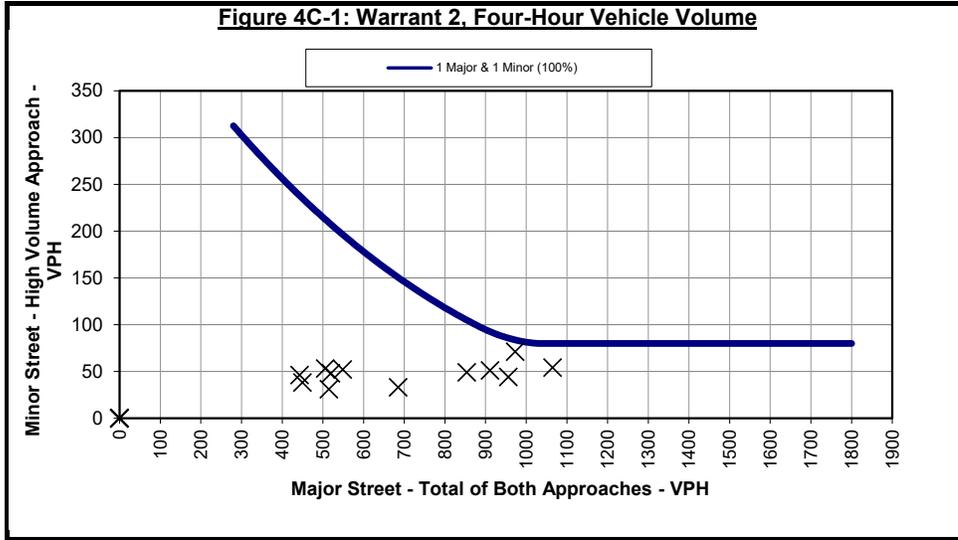
CRITERIA**	STANDARD 1 - 100%		STANDARD 2 - 80%	
	CONDITION A	CONDITION B	CONDITION A	CONDITION B
MAJOR ST	500	750	400	600
MINOR ST	150	75	120	60
NO. OF HOURS MET	0	0	0	1

A&R ENGINEERING, INC.

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

WARRANT 2* NOT SATISFIED

0 HOURS



WARRANT 3, PEAK HOUR

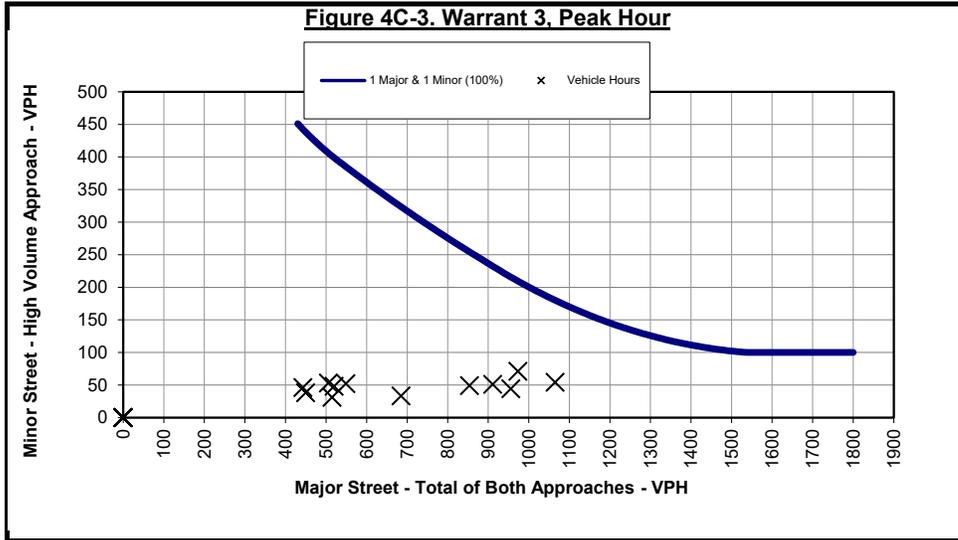
STANDARD A NOT EVALUATED

0 VEHICLE HOURS

- 0 Peak Hour Minor-Street Volume
- 0 Average Minor-Street Delay (seconds)
- 1 Number of Approach Lanes (Minor Street)

STANDARD B* NOT SATISFIED

0 HOURS



*Note: Curves for minimum volumes are based on the curves from FIGURES 4C-1 & 4C-2, Page 4C-7 for WARRANT 2, and FIGURES 4C-3 & 4C-4, Page 4C-9 in section C of the MUTCD 2009 edition for WARRANT 3.

A&R ENGINEERING, INC.

WARRANT 4, PEDESTRIAN VOLUME

WARRANT 4	NOT EVALUATED		
	STANDARD A	NOT SATISFIED	0 HOURS
	STANDARD B	NOT SATISFIED	0 HOURS

WARRANT 5, SCHOOL CROSSING

WARRANT 5 NOT EVALUATED

WARRANT 6, COORDINATED SIGNAL SYSTEM

WARRANT 6 NOT EVALUATED

WARRANT 7, CRASH EXPERIENCE

WARRANT 7 NOT EVALUATED

WARRANT 8, ROADWAY NETWORK

WARRANT 8 NOT EVALUATED

WARRANT 9, INTERSECTION NEAR A GRADE CROSSING

WARRANT 9 NOT EVALUATED

TRAFFIC VOLUME WORKSHEETS

22-233 Riverview Road Residential Development - Cobb County, GA
Traffic Volumes

A&R Engineering
 February 2023

1. SR 8 @ Riverview Rd

A.M. Peak Hour

Condition	-				Riverview Road				SR 8/US 78/US 278 (Veterans Memorial Highway)				Nichols Drive			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	0	0	0	54	0	110	164	494	1463	0	1957	0	601	65	666
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	0	0	0	19	0	10	29	3	0	0	3	0	0	6	6
The Drift at Riverview Landing (to be built in 2023) Trips:	0	0	0	0	38	0	23	61	10	0	0	10	0	0	16	16
Total Existing 2023 Volumes:	0	0	0	0	111	0	143	254	507	1463	0	1970	0	601	87	688
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	0	0	0	113	0	146	259	517	1492	0	2009	0	613	89	702
Proposed Development Trips:	0	0	0	0	61	0	33	94	12	0	0	12	0	0	22	22
Future 2024 Traffic Volumes:	0	0	0	0	174	0	179	353	529	1492	0	2021	0	613	111	724
Armstrong Place Pod E (to be built in 2025) Trips:	0	0	0	0	9	0	5	14	2	0	0	2	0	0	3	3
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	0	0	0	4	0	2	6	1	0	0	1	0	0	2	2
Riverview Road Pod B (to be built in 2034) Trips:	0	0	0	0	3	0	2	5	1	0	0	1	0	0	1	1
No-Build 2034 Volumes:	0	0	0	0	152	0	184	336	624	1790	0	2414	0	736	113	849
Future 2034 Traffic Volumes:	0	0	0	0	213	0	217	430	636	1790	0	2426	0	736	135	871

P.M. Peak Hour

Condition	-				Riverview Road				SR 8/US 78/US 278 (Veterans Memorial Highway)				Nichols Drive			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	0	0	0	93	0	382	475	120	641	0	761	0	1566	70	1636
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	0	0	0	12	0	7	19	9	0	0	9	0	0	18	18
The Drift at Riverview Landing (to be built in 2023) Trips:	0	0	0	0	29	0	17	46	23	0	0	23	0	0	38	38
Total Existing 2023 Volumes:	0	0	0	0	134	0	406	540	152	641	0	793	0	1566	126	1692
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	0	0	0	137	0	414	551	155	654	0	809	0	1597	129	1726
Proposed Development Trips:	0	0	0	0	38	0	20	58	29	0	0	29	0	0	54	54
Future 2024 Traffic Volumes:	0	0	0	0	175	0	434	609	184	654	0	838	0	1597	183	1780
Armstrong Place Pod E (to be built in 2025) Trips:	0	0	0	0	6	0	4	10	5	0	0	5	0	0	9	9
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	0	0	0	3	0	2	5	2	0	0	2	0	0	5	5
Riverview Road Pod B (to be built in 2034) Trips:	0	0	0	0	3	0	1	4	2	0	0	2	0	0	4	4
No-Build 2034 Volumes:	0	0	0	0	176	0	504	680	195	785	0	980	0	1916	173	2089
Future 2034 Traffic Volumes:	0	0	0	0	214	0	524	738	224	785	0	1009	0	1916	227	2143

22-233 Riverview Road Residential Development - Cobb County, GA
Traffic Volumes

A&R Engineering
 February 2023

2. Riverview Rd @ Nichols Dr

A.M. Peak Hour

Condition	Riverview Road				Riverview Road				Nichols Drive				Nichols Drive			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	35	472	3	510	1	114	26	141	30	14	28	72	9	6	10	25
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	1	8	0	9	0	25	0	25	0	0	3	3	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	10	9	6	25	0	21	6	27	9	0	24	33	15	0	1	16
Total Existing 2023 Volumes:	46	489	9	544	1	160	32	193	39	14	55	108	24	6	11	41
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	47	499	9	555	1	163	33	197	40	14	56	110	24	6	11	41
Proposed Development Trips:	3	33	1	37	0	12	0	12	0	0	1	1	0	0	0	0
Future 2024 Traffic Volumes:	50	532	10	592	1	175	33	209	40	14	57	111	24	6	11	41
Armstrong Place Pod E (to be built in 2025) Trips:	5	0	0	5	0	0	2	2	6	0	14	20	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	61	603	11	675	1	206	42	249	54	17	81	152	29	7	13	49
Future 2034 Traffic Volumes:	64	636	12	712	1	218	42	261	54	17	82	153	29	7	13	49

P.M. Peak Hour

Condition	Riverview Road				Riverview Road				Nichols Drive				Nichols Drive			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	29	146	4	179	12	448	24	484	22	10	29	61	3	5	6	14
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	3	24	0	27	0	17	0	17	0	0	2	2	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	24	21	15	60	1	16	10	27	9	0	18	27	11	0	1	12
Total Existing 2023 Volumes:	56	191	19	266	13	481	34	528	31	10	49	90	14	5	7	26
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	57	195	19	271	13	491	35	539	32	10	50	92	14	5	7	26
Proposed Development Trips:	2	20	1	23	0	29	0	29	0	0	2	2	1	0	0	1
Future 2024 Traffic Volumes:	59	215	20	294	13	520	35	568	32	10	52	94	15	5	7	27
Armstrong Place Pod E (to be built in 2025) Trips:	14	0	0	14	0	0	6	6	4	0	10	14	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	7	0	7	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	5	0	5	0	4	0	4	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	82	246	23	351	16	598	48	662	42	12	70	124	17	6	8	31
Future 2034 Traffic Volumes:	84	266	24	374	16	627	48	691	42	12	72	126	18	6	8	32

22-233 Riverview Road Residential Development - Cobb County, GA
Traffic Volumes

A&R Engineering
 February 2023

3. Riverview Rd @ Site Drwy 1 N

A.M. Peak Hour

Condition	Riverview Road				Riverview Road				Site Driveway 1 (Northern)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	559	0	559	0	164	0	164	0	0	0	0	0	0	0	0
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	9	0	9	0	28	0	28	0	0	0	0	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	0	25	0	25	0	60	0	60	0	0	0	0	0	0	0	0
Total Existing 2023 Volumes:	0	593	0	593	0	252	0	252	0	0	0	0	0	0	0	0
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	605	0	605	0	257	0	257	0	0	0	0	0	0	0	0
Proposed Development Trips:	17	9	0	26	0	3	10	13	27	0	47	74	0	0	0	0
Future 2024 Traffic Volumes:	17	614	0	631	0	260	10	270	27	0	47	74	0	0	0	0
Armstrong Place Pod E (to be built in 2025) Trips:	0	5	0	5	0	14	0	14	0	0	0	0	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	0	735	0	735	0	332	0	332	0	0	0	0	0	0	0	0
Future 2034 Traffic Volumes:	17	744	0	761	0	335	10	345	27	0	47	74	0	0	0	0

P.M. Peak Hour

Condition	Riverview Road				Riverview Road				Site Driveway 1 (Northern)				-			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	190	0	190	0	475	0	475	0	0	0	0	0	0	0	0
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	27	0	27	0	19	0	19	0	0	0	0	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	0	60	0	60	0	46	0	46	0	0	0	0	0	0	0	0
Total Existing 2023 Volumes:	0	277	0	277	0	540	0	540	0	0	0	0	0	0	0	0
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	283	0	283	0	551	0	551	0	0	0	0	0	0	0	0
Proposed Development Trips:	41	6	0	47	0	8	24	32	17	0	29	46	0	0	0	0
Future 2024 Traffic Volumes:	41	289	0	330	0	559	24	583	17	0	29	46	0	0	0	0
Armstrong Place Pod E (to be built in 2025) Trips:	0	14	0	14	0	10	0	10	0	0	0	0	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	7	0	7	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	5	0	5	0	4	0	4	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	0	366	0	366	0	680	0	680	0	0	0	0	0	0	0	0
Future 2034 Traffic Volumes:	41	372	0	413	0	688	24	712	17	0	29	46	0	0	0	0

22-233 Riverview Road Residential Development - Cobb County, GA
Traffic Volumes

A&R Engineering
 February 2023

4. Riverview Rd @ Site Drwy 2 S

A.M. Peak Hour

Condition	Riverview Road				Riverview Road				Site Driveway 2 (Southern)				Site Driveway 2 (Southern)			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	559	0	559	0	164	0	164	0	0	0	0	0	0	0	0
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	9	0	9	0	28	0	28	0	0	0	0	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	0	25	0	25	0	60	0	60	0	0	0	0	0	0	0	0
Total Existing 2023 Volumes:	0	593	0	593	0	252	0	252	0	0	0	0	0	0	0	0
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	605	0	605	0	257	0	257	0	0	0	0	0	0	0	0
Proposed Development Trips:	17	17	0	34	1	47	3	51	9	1	47	57	0	1	1	2
Future 2024 Traffic Volumes:	17	622	0	639	1	304	3	308	9	1	47	57	0	1	1	2
Armstrong Place Pod E (to be built in 2025) Trips:	0	5	0	5	0	14	0	14	0	0	0	0	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	0	735	0	735	0	332	0	332	0	0	0	0	0	0	0	0
Future 2034 Traffic Volumes:	17	752	0	769	1	379	3	383	9	1	47	57	0	1	1	2

P.M. Peak Hour

Condition	Riverview Road				Riverview Road				Site Driveway 2 (Southern)				Site Driveway 2 (Southern)			
	Northbound				Southbound				Eastbound				Westbound			
	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot	L	T	R	Tot
Existing 2023 Traffic Counts:	0	190	0	190	0	475	0	475	0	0	0	0	0	0	0	0
Riverview Road Pod C1 & C2 (to be built in 2023) Trips:	0	27	0	27	0	19	0	19	0	0	0	0	0	0	0	0
The Drift at Riverview Landing (to be built in 2023) Trips:	0	60	0	60	0	46	0	46	0	0	0	0	0	0	0	0
Total Existing 2023 Volumes:	0	277	0	277	0	540	0	540	0	0	0	0	0	0	0	0
Growth Factor (%):	2	2	2		2	2	2		2	2	2		2	2	2	
No-Build 2024 Volumes:	0	283	0	283	0	551	0	551	0	0	0	0	0	0	0	0
Proposed Development Trips:	41	41	0	82	2	29	8	39	6	1	29	36	0	2	2	4
Future 2024 Traffic Volumes:	41	324	0	365	2	580	8	590	6	1	29	36	0	2	2	4
Armstrong Place Pod E (to be built in 2025) Trips:	0	14	0	14	0	10	0	10	0	0	0	0	0	0	0	0
Riverview Landing Pod A2 (to be built in 2034) Trips:	0	7	0	7	0	5	0	5	0	0	0	0	0	0	0	0
Riverview Road Pod B (to be built in 2034) Trips:	0	5	0	5	0	4	0	4	0	0	0	0	0	0	0	0
No-Build 2034 Volumes:	0	366	0	366	0	680	0	680	0	0	0	0	0	0	0	0
Future 2034 Traffic Volumes:	41	407	0	448	2	709	8	719	6	1	29	36	0	2	2	4